Manual Update Notice

The following manual has been revised and released:

Manual title:	AIM Mechanical Reference
Manual number (updated edition):	QD052-02
Manual number (previous edition):	QD052-01
Date of issue:	April 14, 2006

The 12S nozzle, tray unit-M, PCU (pallet change unit), PSU (pallet starage unit) have been added, details are listed below.

Chapter, Section	Summary of changes
2. AIM Components	
2.2 Placing Head Components	The 12S nozzle head has been added.
2.5 Feeder Pallet Components	The bucket-type tape holder has been added.
2.7 Tray Unit-M Components	This section has been newly added.
2.9 Nozzle Changer Components	The nozzle station for 12S nozzle and the nozzle station for 4 nozzle head have been added.
3. Functions	
3.2 Placing Head	Section 3.2.4 "12S nozzle head" has been newly added.
3.3 Nozzle Changer Unit	The nozzle station for 12S nozzle and the nozzle station for 4 nozzle head have been added.
3.4 Parts Supply System	Section 3.4.3 "Tray Unit-M" has been newly added.
4. Sensor Positions	
4.2 Placing Head Sensors	Section 4.2.4 "12S nozzle head" has been newly added.
4.10 Tray Unit-M	This section has been newly added.
5. Basic Operation	
5.1 Removing/Inserting a Feeder Pallet	Operation procedures have been changed such that the PCU and the PSU are used.
5.2 Removing/Attaching a Tray Unit-L	Operation procedures have been changed such that the PCU and the PSU are used.
5.3 Removing/Attaching a Placing Head	Operation procedures have been revised.
5.5 Removing/Attaching Tray Unit-Ms	This section has been newly added.
6. Preventive Maintenance	
6.5 Monthly Maintenance (700 Hrs)	Section 6.5.4 "Cleaning the 1 nozzle head filter" has been newly added. Operation procedures have been changed such that the grease application jig is used in section 6.5.5 "Syringes and o-rings inside syringe lubrication".
6.6 6 Monthly Maintenance (4000 Hrs)	Maintenance items for the 8 nozzle head, 12S nozzle head, and the tray unit-M have been added.
6.7 Yearly Maintenance (8000 Hrs)	Section 6.7.2 "Lubricating the nozzle changer up/down shafts" has been newly added.

改訂の概要

Chapter, Section	Summary of changes
6.8 12,000 Hr Maintenance	Maintenance items for the 8 nozzle head, 12S nozzle head, and the tray unit-M have been added.
7. Replacing Consumable Parts	
7.5 Replacing the Module CPU Battery	This section has been newly added.
7.6 Replacing Base CPU Battery	This section has been newly added.
7.16 Replacing the Tray Unit-M Control Board Fuses	This section has been newly added.
9. Adjustments	
9.1 On machine PAM (Placement Accuracy Measurement)	This section has been newly added.
	Minor changes and corrections have also been made at various locations throughout manual.

Note:

For a copy of the entire manual, contact your nearest Fuji sales representative or send an e-mail request to the address below.

E-mail: intnetqst@fuji.co.jp

Fuji Flexible Placement Platform

AIM

Mechanical Reference

QD052-02

FUJI® Machine Mfg.Co.,Ltd.

Consult Fuji beforehand if you are considering selling this equipment to a third party after it has been installed.

Fuji Flexible Placement Platform

AIM

Mechanical Reference

The manuals listed below are shipped with the AIM machine.

AIM Setup Manual

AIM System Reference

AIM Mechanical Reference

FUJI Intelligent Feeder Manual

AIM Programming Manual

In order to operate this machine in the safest and most efficient manner, please read the provided manuals thoroughly and observe all instructions and warnings.

Keep these manuals in an accessible location near the machine.

QD052-02

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Contents

MEMO:

About This Manual

This manual contains important machine maintenance information for the operator.

The manual content is intended for specialized technicians who are familiar with Surface Mount Technology (SMT). Please read this manual carefully in order to ensure safe and efficient machine maintenance.

Keep this manual close to hand when operating the machine.

System-of-Units Used in This Manual & Conversion Rates

The system-of-units used in this manual, and the conversion rates to other unit systems are given below.

Force

Manual system-of-units	Conversion to other unit system	Remarks
kg	1 kg = 9.80665 N	

Torque

Manual system-of-units	Conversion to other unit system	Remarks
N·m	1 N·m = 0.10197 kgf·m, 1 N·m = 10.19720 kgf·cm	

Pressure

Manual system-of-units	Conversion to other unit system	Remarks
MPa	1 MPa = 10.19716 kgf/cm^2	

Vacuum pressure

Manual system-of-units	Conversion to other unit system	Remarks
–kPa	–1 kPa = –7.5 mmHg	

XP1MF202E

MEMO:

1. Safety Guideline

Fuji machines are designed and produced with safety as one of our main considerations. However, even a perfectly designed machine can be damaged, or someone can still be injured if the user does not follow the safety rules. It is the responsibility of the user to make sure all safety rules are followed during operation and maintenance.
Be sure to read these safety rules before operating the machine.

1.1 About Symbols

To avoid injury to persons and damage to the machine, Fuji employs a number of messages and symbols that are used in manuals and on the machines. Be sure you understand the meanings of these symbols before reading the manual.

1.1.1 Degree of Hazards

Symbol	Definition
⚠ DANGER	Failure to observe this hazard warning will lead to severe injury or death.
⚠ WARNING	Failure to observe this hazard warning could lead to severe injury or death.
⚠ CAUTION	Failure to observe this hazard warning may lead to personal injury or damage to the machine.

1.1.2 Examples of the Symbols

Symbol	Explanation
	Hazard A triangle is used to draw your attention to a hazard. The symbol inside the triangle indicates the nature of the hazard (in this case, electrical shock).
	Prohibition A circle with a diagonal line is used to draw your attention to an operation that is prohibited. The symbol inside the circle indicates the nature of the operation (in this case, “do not touch”).
	A circle with an exclamation mark is used to draw your attention to to a mandatory action. In other words, you are required to carefully carry out the given instructions.

1.2 Safety Rules for All Machine Types

⚠DANGER

Do not approach moving parts during automatic or manual operation

- Do not place hands or other body parts inside the machine during automatic operation or positioning. Body parts or clothing may be caught in the machine causing personal injury.

⚠WARNING

Do not insert hands or other body parts into the conveyor inlets

- Body parts may get caught in the machine resulting in injury.
- If using a single machine independently, install safety covers or interlock sensors at the conveyor openings, in accordance with your local safety regulations, to prevent injuries at the conveyor.

Do not operate the machine with the safety covers or doors open

- When safety covers or doors are removed, body parts or clothing may be caught in the machine causing personal injury.
- When maintenance works are completed, return the safety covers and doors to their original (closed) position.

Always verify the position of the EMERGENCY STOP buttons before operating the machine

- Always be aware of the positions of the EMERGENCY STOP buttons so that they can be pressed quickly in case of an emergency.

Check the safety functions before starting operation

- Before starting the machine check the operation of the EMERGENCY STOP button, the safety switches on the covers, doors and all other machine safety features.
- Contact a Fuji serviceman immediately if any of the safety functions fails.

Do not remove safety switches or disarm the safety functions

- Do not short or remove the machine's safety switches. Persons working on the machine may be seriously injured if operation commands are issued by mistake.

⚠WARNING

Check that there is nobody inside the machine when working on the machine with two persons or more

- Verify that nobody is within or near the machine before operating the machine. Operating the machine may cause injury to the person who is carrying out maintenance.

Do not approach a machine that has stopped moving

- There are times during automatic operation when the machine may appear to have stopped while it is waiting for a board, waiting for the next machine, reading marks, transmitting data, etc. In such cases, once certain conditions are fulfilled, the machine will begin moving again automatically, so care should be taken. Only approach the machine after the EMERGENCY STOP button has been pressed.
- When the message "Ready" displays at the machine display, the machine will begin to move once certain conditions are satisfied. Keep in mind that the machine will begin to move regardless of whether these conditions are satisfied intentionally or inadvertently.

Do not place hands near the main conveyor

- Hands or other body parts may be caught in the machine.

Always perform maintenance work after turning OFF the machine power supply.

- Failure to observe this may result in sudden machine movements or electric shock, and is therefore extremely dangerous.

Do not insert or remove connectors while power is being supplied to the machine

- Removing or inserting connectors while power is supplied to the machine may not only cause damage to the machine, but may also cause electrical shock.

Stay clear from the machine when it is being lifted

- Never put hands or feet under the machine when the machine is being raised by means of a jack or other device for leveling or transport.

⚠WARNING

Do not wear gloves made of cloth when operating the machine

- Rubber gloves will tear when caught by the machine and prevent hands from being drawn into the machine. Gloves made of cotton or similarly strong material may cause hands to be drawn into the machine.

Long hair should be tied back

- Long hair may get caught in running machines.
  Hair should be kept short or tied back so that it does not get caught in the machine.

Turn off the air supply when carrying out maintenance on cylinders, valves, and filters

- Removing cylinders, valves, or filters without turning the air supply off, may cause parts or particles to be propelled into the eyes.
- Be sure to turn off the air supply when carrying out maintenance on cylinders, valves, and filters.

Be sure to wear protective glasses when removing parts from the machine

- Be sure to wear protective glasses when removing or disassembling parts.

Check the machine monitor and the target axes while manually operating the machine

- When operating the machine, carefully follow the instructions that are displayed at the machine display.
- Operating the machine without looking at the machine display may lead to operating errors or result in damage to the machine or products.

Do not touch the servo amp power terminal for at least five minutes after turning off the power

- The servo amp retains a high voltage even after the power has been turned off.
- Always wait at least five minutes, and ensure that the CHARGE lamp is off, before undertaking any work that may result in contact with the servo amp terminal.

⚠ CAUTION

Do not operate the machine after removing or disabling sensors

- Removing or disabling sensors will disarm the interlock, leading to collisions and damage to the machine.

Confirm the operational status at the machine messages for machines that support automatic changeover

- On machines equipped with an automatic changeover system, it is difficult to ascertain the changeover status from the front of the machine during operation in production mode. Follow the instructions that display at the machine monitor

Ensure to use the handle when opening or closing the safety doors, fences or covers

- Opening or closing the safety doors, fences or covers without using the handle may result in injury to the hand.
- Opening or closing the safety doors, fences or covers with force, without using the handle may result in damage to the machine.

1.3 Safety Rules for AIM

1.3.1 Main Unit

⚠WARNING

Do not insert hands or other body parts into the machine in the area between feeders especially when there are only a few feeders present on the feeder pallet.

- Failure to do so could result in injury due to contact with the body part and the head during movement.

Wear hearing protectors such as ear plugs when operating the machine and the noise level exceeds acceptable level.

- There is a risk of hearing damage or loose if hearing protectors are not used in a environment that exceeds acceptable noise levels.

Do not look directly into the conveyor panel right and left sensors.

- Failure to do so could result in eye injury due to the sensor laser LED light.

⚠CAUTION

Be careful to not pinch your hands when opening and closing the front or side covers.

- Failure to do so could result in injury.

Do not stare at the vision process light sources with naked eyes. Wear protective glasses.

- Eye damage may be caused by the light.

Do not push the mark camera unit by hand when moving the placing head.

- The position of the mark camera may be shifted, which negatively affects the placing accuracy of the machine.

Be careful to not put your hands underneath the nozzle station when loading it in the machine.

- Failure to do so could result in injury.

⚠CAUTION

Never insert hands or other body parts into the duct of the waste tape disposal unit.

- There is a very sharp cutter blade. Exercise extreme caution especially when carrying the unit.

Two or more people should carry the waste tape disposal unit.

- Maintenance of the waste tape disposal unit is usually accompanied by removing the unit from the machine. Two or more people should carry the unit because it is very heavy.

Ensure that the work bench where the waste tape disposal unit is placed is flat.

- The unit may fall to the ground if the work bench is tilted.

Ensure to place the waste tape disposal unit upside down on the work bench.

- The duct of the unit may creep by its own weight.

Open the safety doors completely (move all the way up).

- Injury to any body parts, such as the head, back or arm, in the machine may occur if the safety door is not completely opened (moved up). This is due to the possibility that it might fall (slide back down) and injure any body parts in the way.
- Injury may result to body parts, such as hands, between the tray unit L and the safety door when the tray unit L is attached and the safety door is closed or falls.

Be careful not to hit the operation panel when standing up after working on the feeder pallet area or on the machine.

- Failure to do so could result in injury.

Be careful not to hit the operation panel when it is protruding from the machine.

- Failure to do so could result in injury.

Be careful not to hit the Y-axis cover when performing actions such as exchanging the reject parts box or nozzle station.

- Failure to do so could result in injury.

⚠CAUTION

Be careful not to get fingers or other body parts caught between the Y-axis slide and machine covers especially when moving the Y-axis slide by hand.

- Failure to do so could result in injury.

Maintain a good posture when moving the X- and Y-axes by hand.

- Failure to do so could result in injury.

Connect a 200 to 230 V AC +/-10%, 50/60 Hz power supply to the machine primary power supply side.

- The machine may not function properly or be damaged if a power supply voltage other than that above is used.

When moving the engineering panel rack up and down or from left to right, ensure to move it slowly.

- Failure to observe this could result in the computer falling.

When sliding the engineering panel rack, push the side of the rack slowly. Do not grip the sides.

- Failure to observe this could result in fingers being jammed.

Avoid bodily contact with the engineering panel rack when working nearby.

- Failure to observe this could result in bodily harm.

When performing maintenance work inside one of the modules, slide the engineering panel rack to the side of the module on which work is not being performed, and be careful not to bump against the rack.

- Failure to observe this could result in bodily harm.

Do not connect devices other than the computer to the engineering panel power supply connector.

- Failure to observe this could adversely affect machine operation.

The engineering panel power supply connector voltage is 200 to 230 V AC. Connect the computer only after checking that the input voltage for the computer being used lies within this range.

- Failure to observe this could result in damage to the computer.

1.3.2 Tray Unit-L

⚠WARNING

When pushing the tray unit-L into the machine, ensure that no one is between the tray unit-L and machine base.

- A person could be seriously injured or crushed to death if caught between the tray unit-L and machine.

Lock the caster brake whenever the tray unit-L is removed from the machine.

- Depending on the slope and condition of the floor, the tray unit-L could roll unexpectedly, possibly resulting in injury.

Always perform maintenance work after turning OFF the machine power supply.

- Failure to observe this may result in sudden machine movements or electric shock, and is therefore extremely dangerous.

⚠CAUTION

Be careful to not pinch your fingers when opening or closing the tray unit-L covers (upper cover, front cover, lower cover, etc.). Do not leave the doors open while the tray unit-L is unattended.

- Failure to do so could result in injury.

When operating the handle for adjusting the tray unit-L height, make sure that hands are not caught between the handle and cover.

- Failure to do so could result in injury.

When removing or replacing the empty tray box, be careful to not pinch your hands between the tray unit-L and empty tray box.

- Failure to do so could result in injury.

Do not insert your hand through the bottom of the tray unit-L into the inner section where the mechanical parts are.

- Failure to do so could result in injury.

1.3.3 Tray Unit-M

⚠WARNING

Do not insert hands or other body parts in the space between the tray unit-M and the feeder pallet when attaching or removing the tray unit-M.

- Failure to do so could result in injury.

Use two or more people to lift, carry and position the tray unit-M.

- The tray unit-M is extremely heavy and injury could result if dropped.

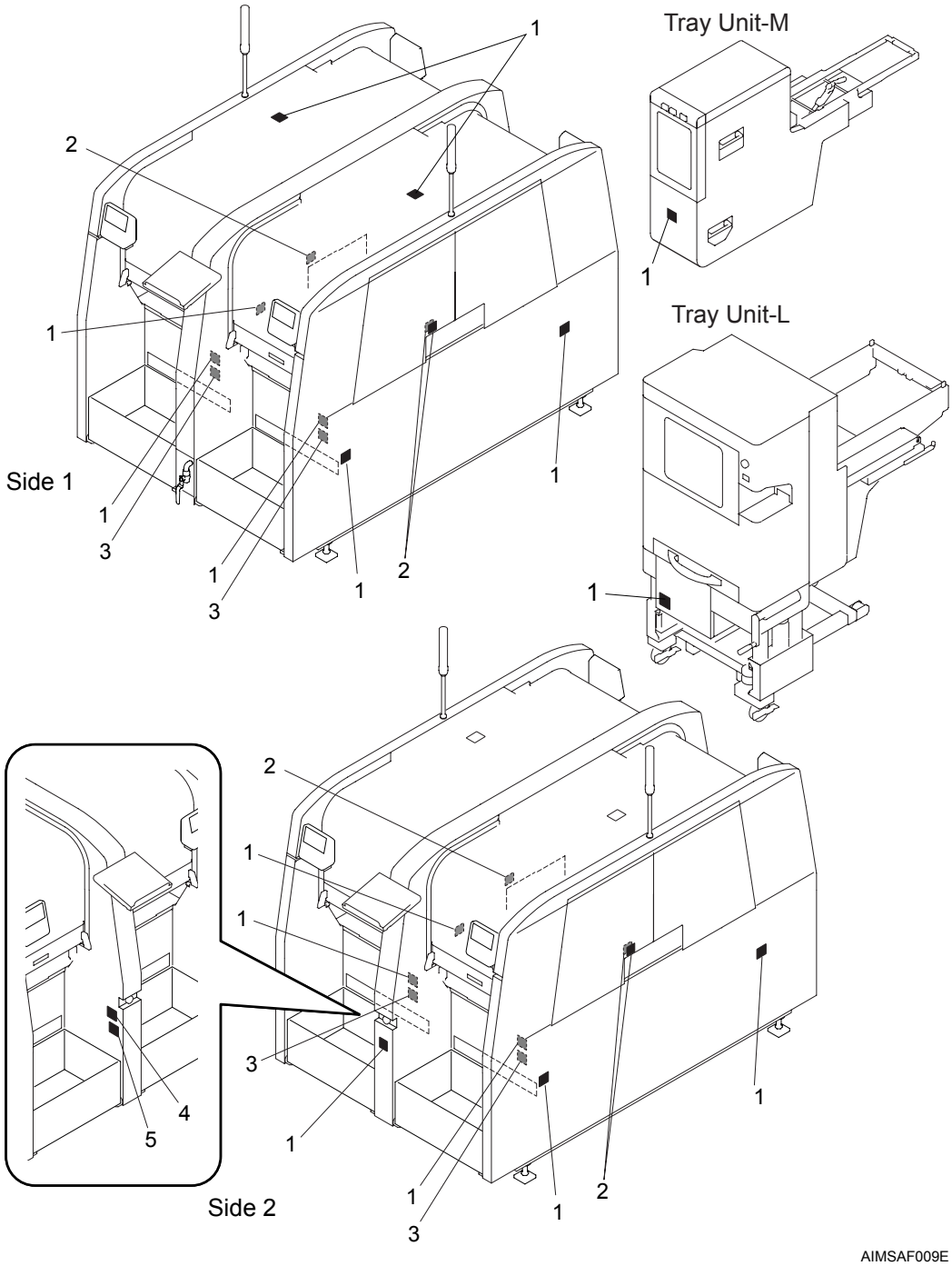
⚠CAUTION

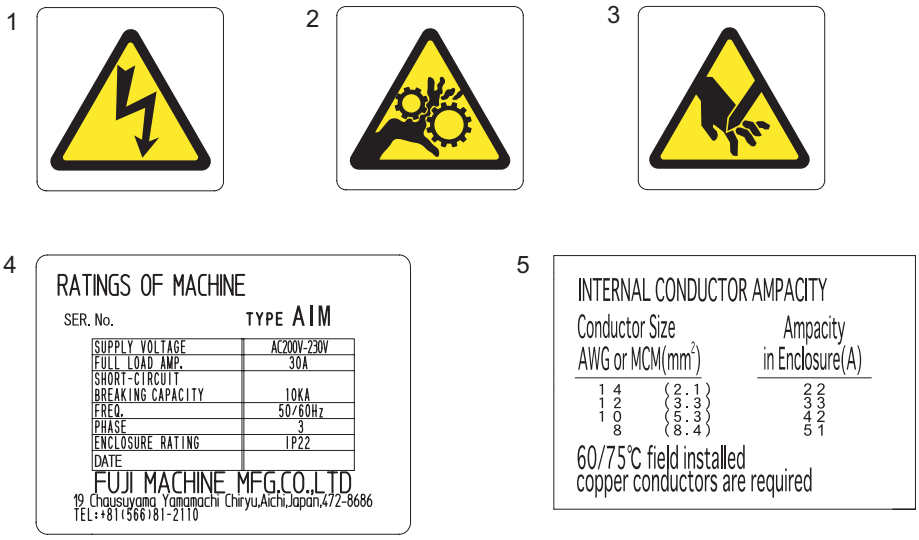
Be careful to not pinch or get body parts caught on the tray unit-M door when opening and closing it. Ensure that the door is never left open.

- Body parts may be pinched or caught, resulting in injury.

1.4 Safety Labels

To warn the operator of hazards, safety labels are attached to the machine at the positions indicated in the figure below.





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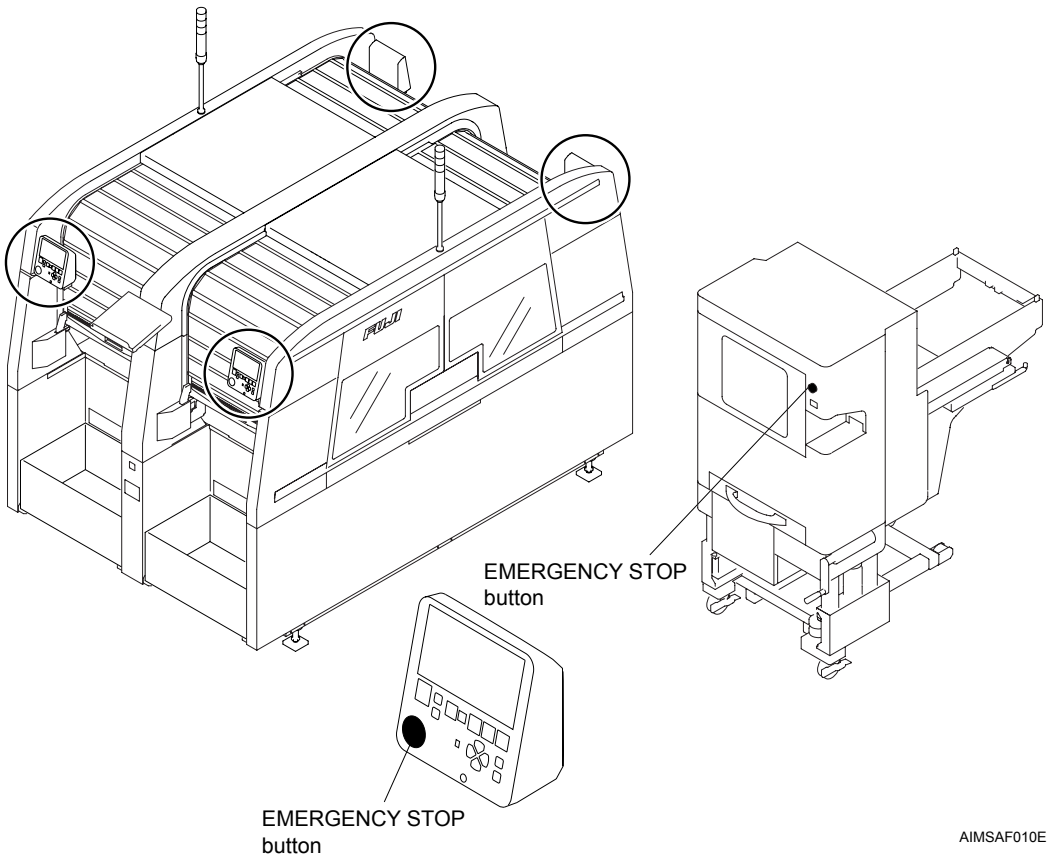
1.4.1 AIM Safety Labels Explanation

Symbol	Explanation
	Caution, Warning: Electrical shock hazard *1: High voltage! Contact may cause electric shock. Turn off the power prior to servicing. *2: Connect a 200 - 230V AC +/-10% 50/60Hz primary power supply to the machine.
	Caution, Warning: Moving parts Do not insert hands or other body parts. Moving parts may cause injury. Turn off the power before inserting any body parts.
	Caution, Warning: Cutting danger An automatic tape cutter is positioned behind this frame. Exercise extreme caution when performing maintenance.

1.5 The EMERGENCY STOP Buttons

In the event of an emergency, press any of the red EMERGENCY STOP buttons located on the machine at the positions indicated in the figure below.



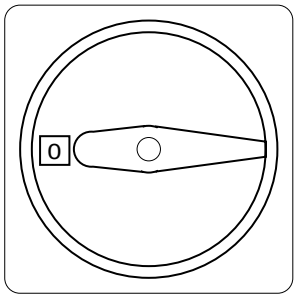
1.6 Locking System

When performing maintenance or service on the machine, all personnel who service the machine should use locks to prevent others from turning on the machine power or air. This procedure is referred to as a lockout.
To prevent accidents, especially those caused by mistakes when multiple operators are present, all related personnel should have thorough knowledge of lockout procedures.

1.6.1 Lockout Procedure

Prepare 2 commercially available padlocks, and require all service personnel to carry lockout nametags.

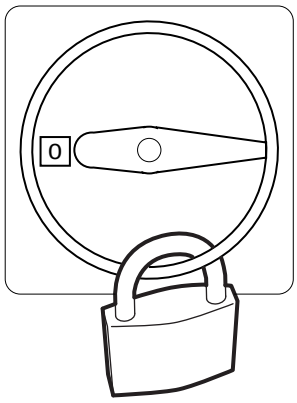
1. Switch off the machine power.
2. Rotate the main switch to the OFF position.



NXTSAF004

3. Lock the main switch with a padlock.
   All personnel working on the machine should attach their lockout nametags to the padlock.

Note: Note:The presence of a nametag on the padlock signals that the machine is being serviced and that the lock is not to be removed.



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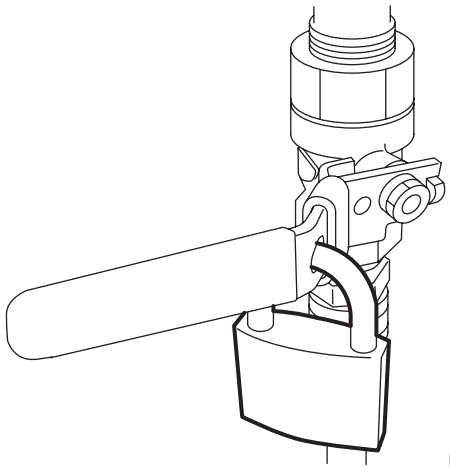
4. In the same manner, rotate the air valve handle to the OFF position and lock with the second padlock.
   All personnel working on the machine should attach their nametags to the padlock.

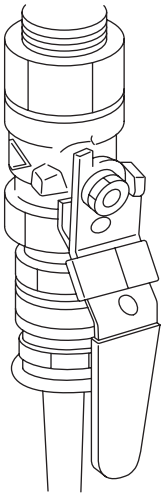


5. The lockout is complete.

1.6.2 Unlocking Procedure

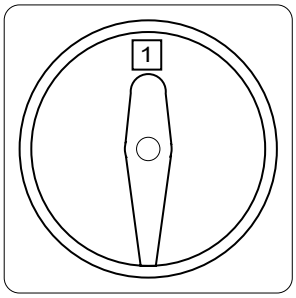
When finished servicing the machine, all personnel should remove their lockout nametags from the padlocks.

1. Confirm that all personnel are clear of the machine.
2. Confirm that the machine is in a safe condition. Remove the padlock from the air valve and rotate the handle to the ON position.



NXTSAF007

3. Remove the padlock from the main switch and rotate it to the ON position.



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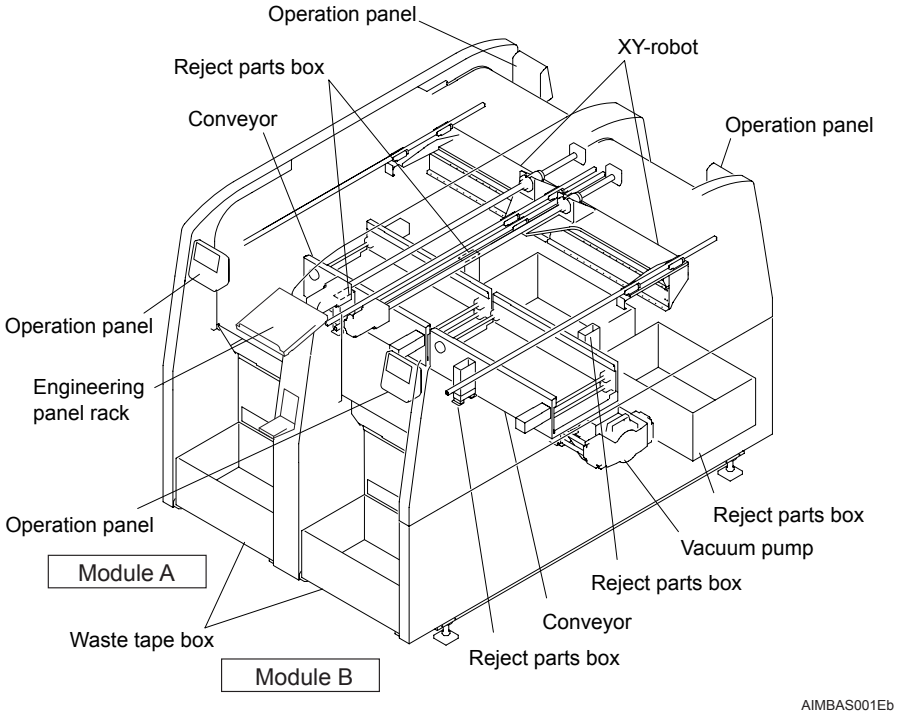
4. This concludes the unlocking procedure.

2. AIM Components

The primary machine compoments are identified here.

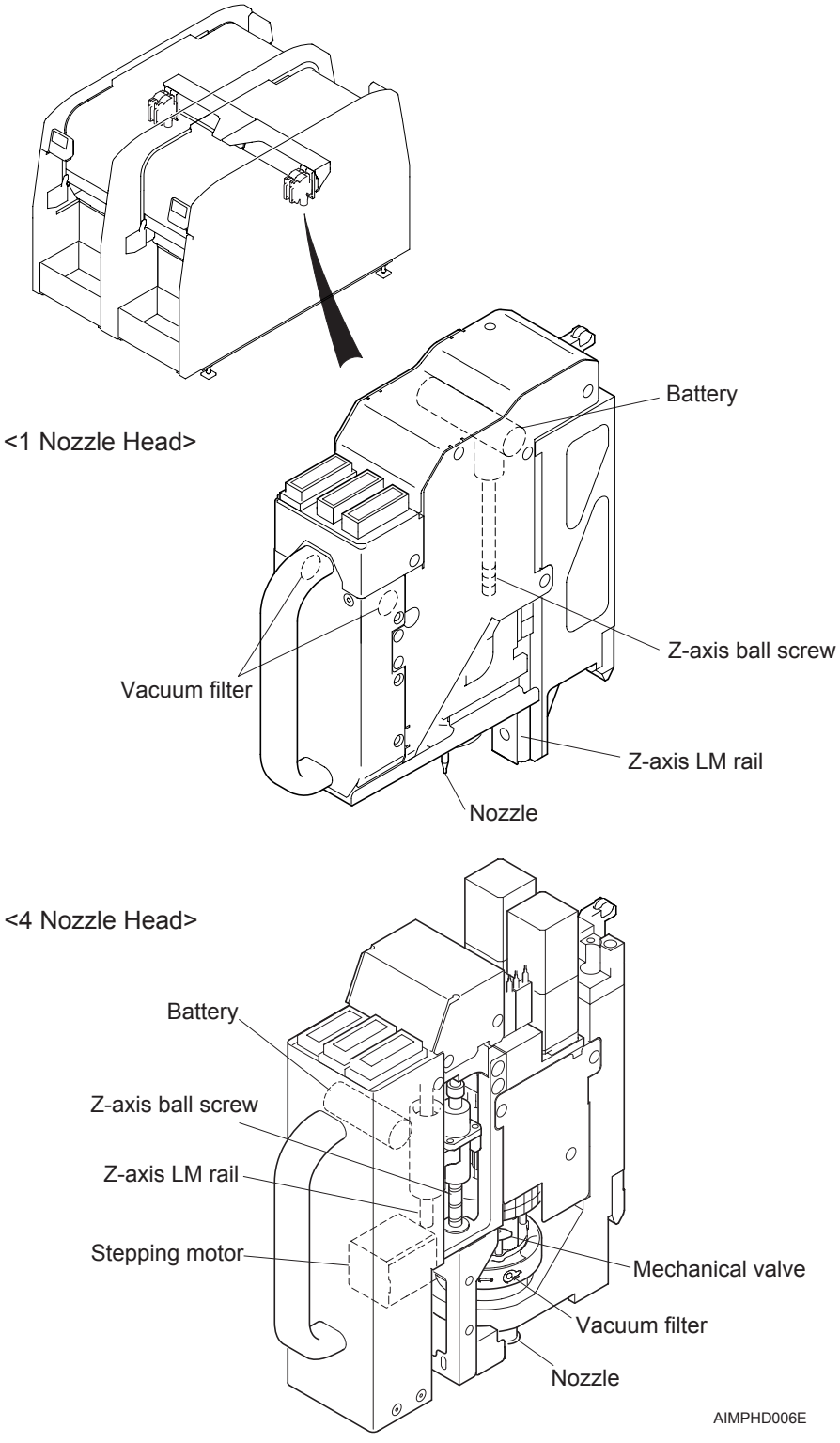
2.1 Components

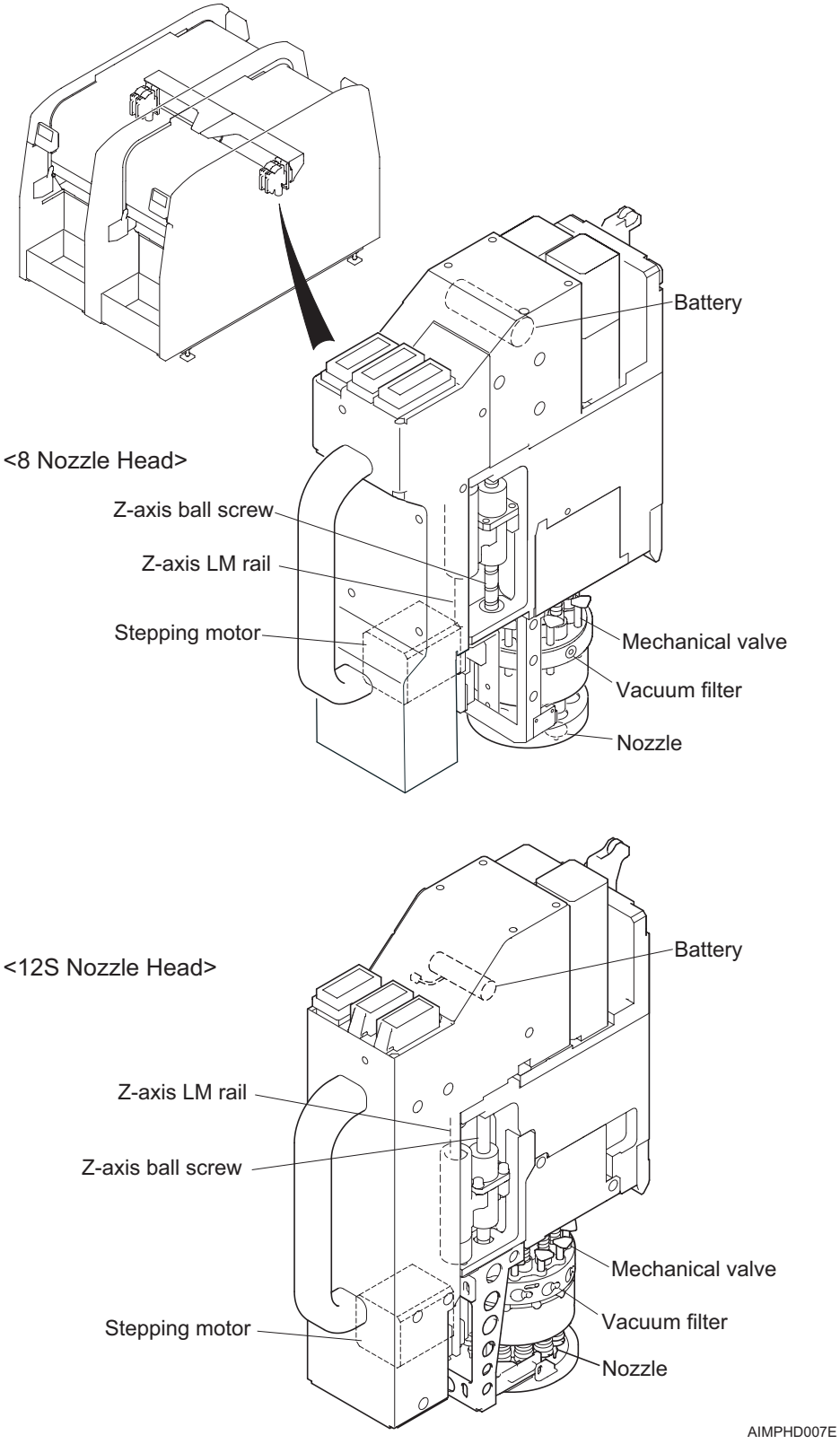


- Operation Panel:
  Used to perform machine operation.
- Engineering panel rack:
  The engineering panel (notebook-sized personal computer) is mounted here.
- XY-Robot:
  The placing head is attached to the XY-robot.
- Main Unit:
  AIM comprises two modules. Module 1 is on the left and module 2 on the right of the machine.
- Conveyor:
  The conveyor is responsible for transporting the panels to and from the production area.
- Reject Parts Box:
  Parts that are deemed not to be fit for placement are dumped in the reject parts box.
- Waste Tape Box:
  Used to collect used tape after parts have been picked up.
- Main Switch:
  Used to turn the power to the machine ON/OFF (lower part on side 2).

2.2 Placing Head Components

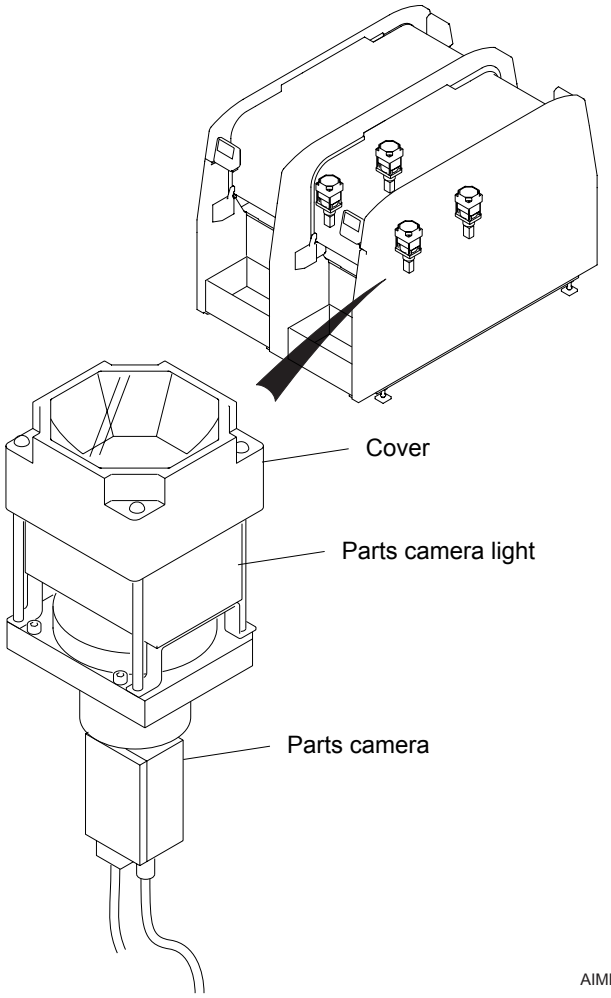
The placing head picks up parts from supply devices and places them on the panel.




<8 Nozzle Head>
Battery
Z-axis ball screw
Z-axis LM rail
Stepping motor
Mechanical valve
Vacuum filter
Nozzle
<12S Nozzle Head>
Battery
Z-axis LM rail
Z-axis ball screw
Mechanical valve
Vacuum filter
Stepping motor
Nozzle
AIMPHD007E

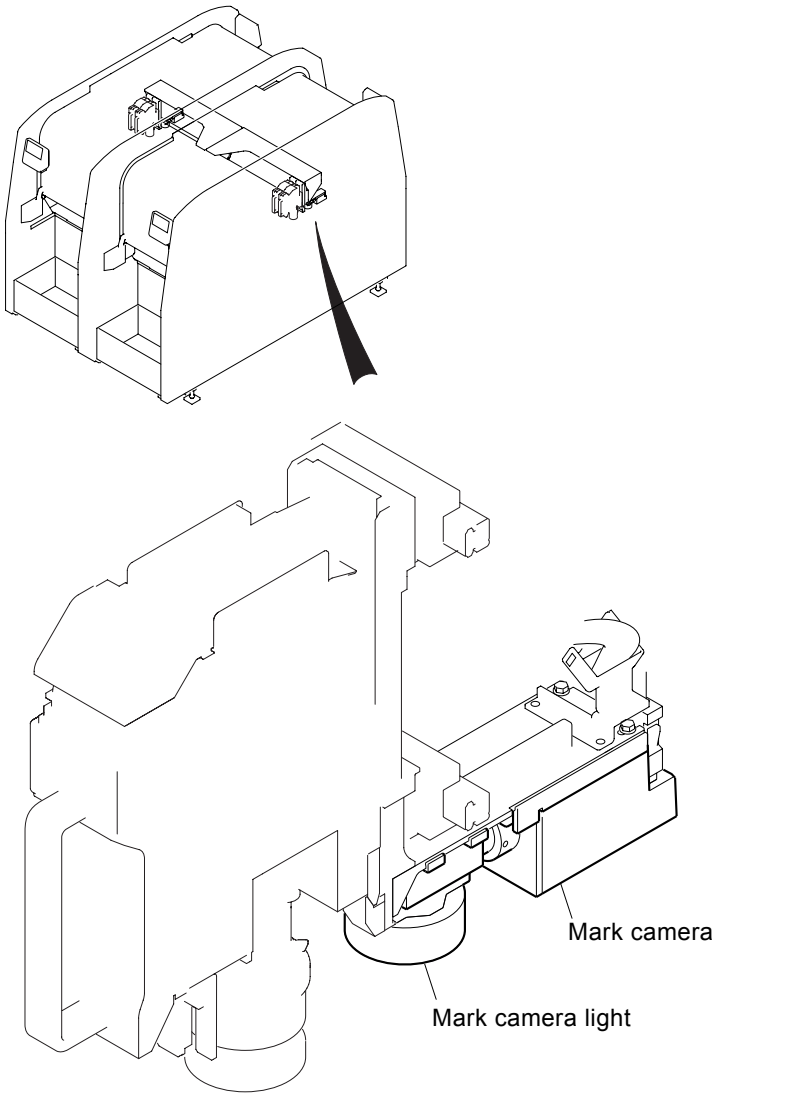
2.3 Parts Camera & Lighting Components

The parts camera captures part images.



2.4 Mark Camera & Lighting Components

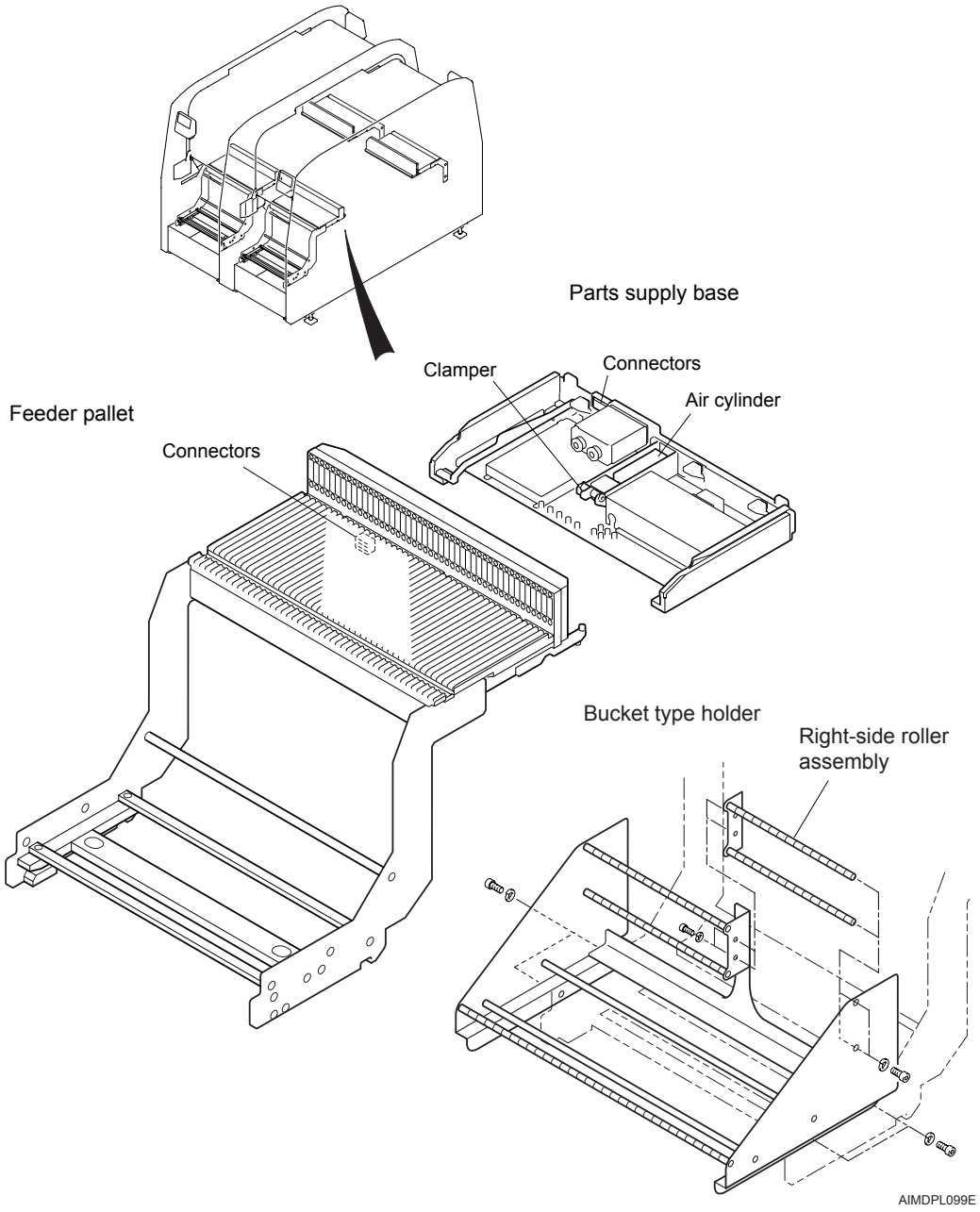
The mark camera is used to read fiducial marks on the panel.



AIMMCA001Ea

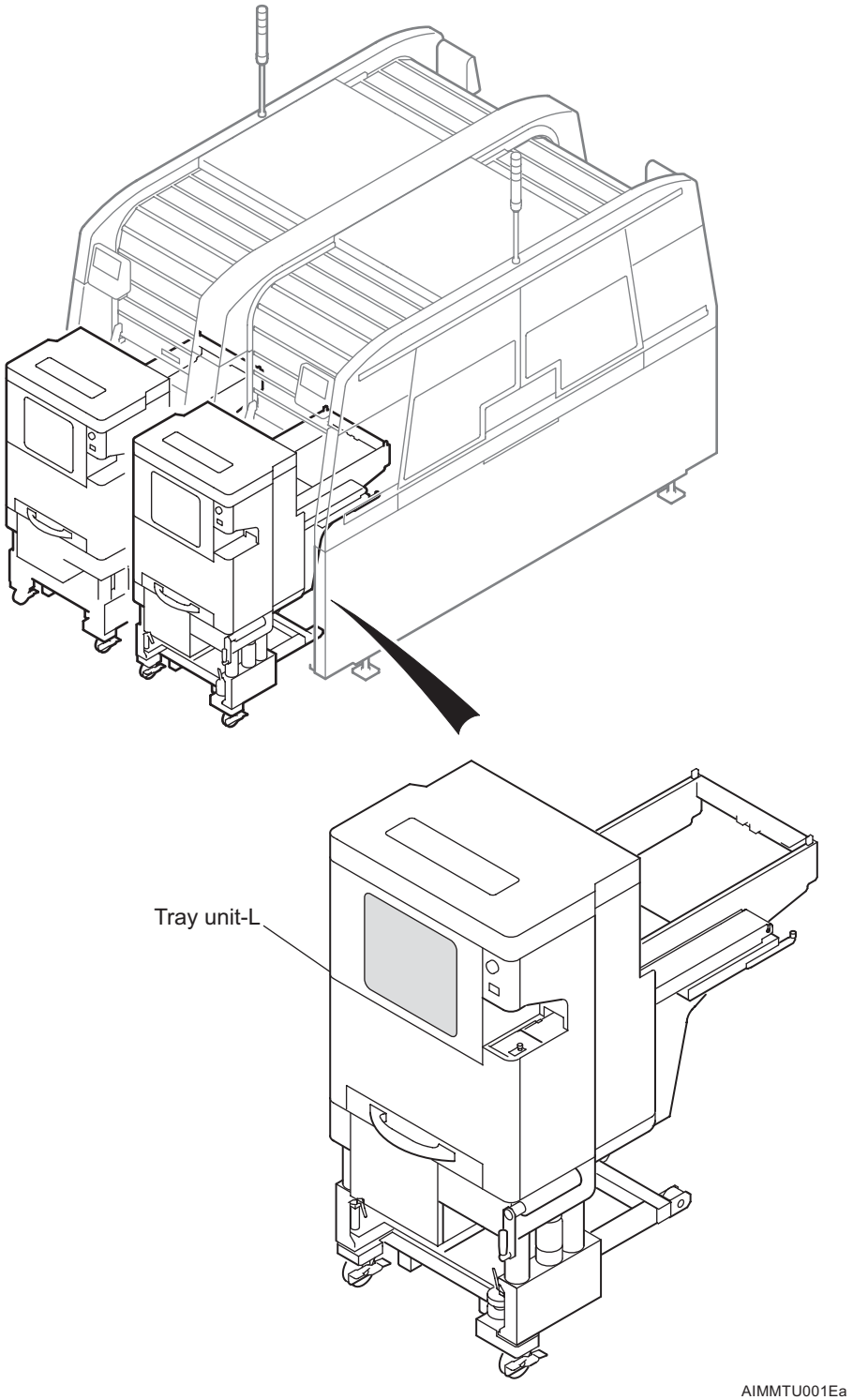
2.5 Feeder Pallet Components

Tape feeders are loaded here.
Bach changeover can be performed with feeders loaded on the feeder pallet.



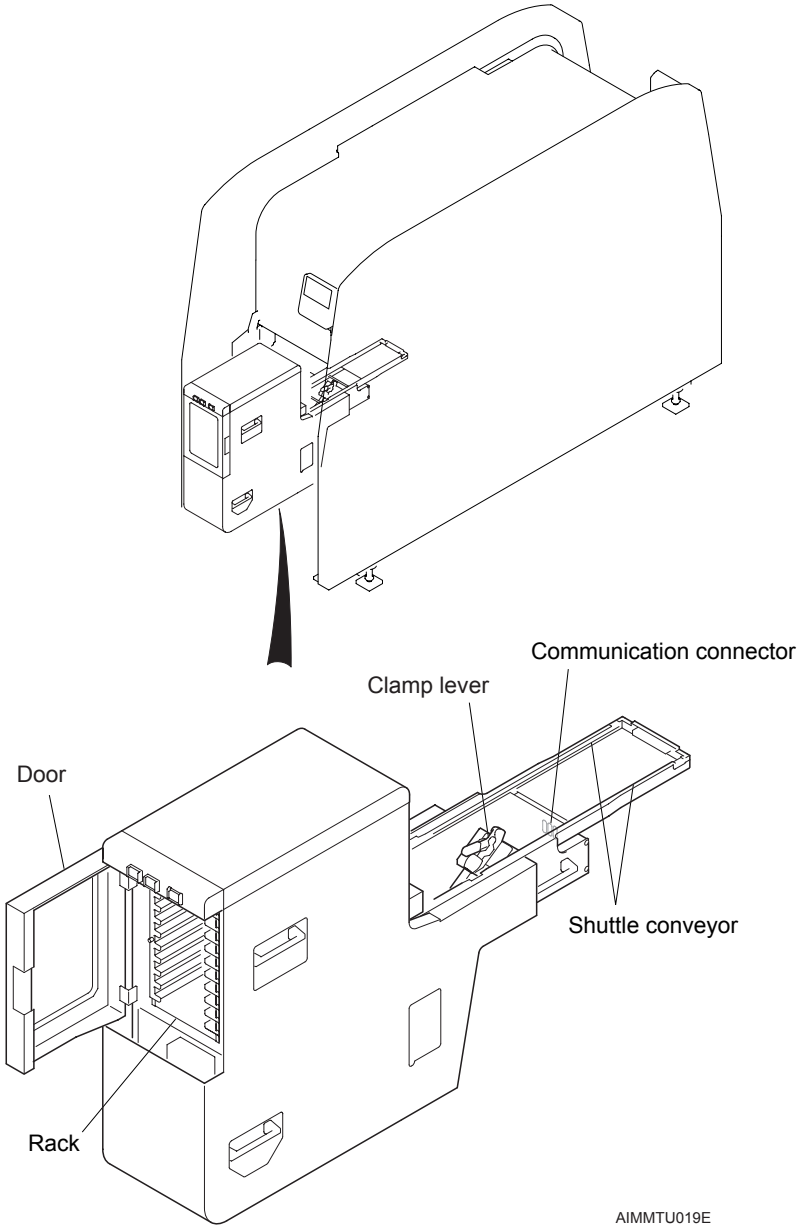
2.6 Tray Unit-L Components

The tray unit is used to supply parts to the machine.



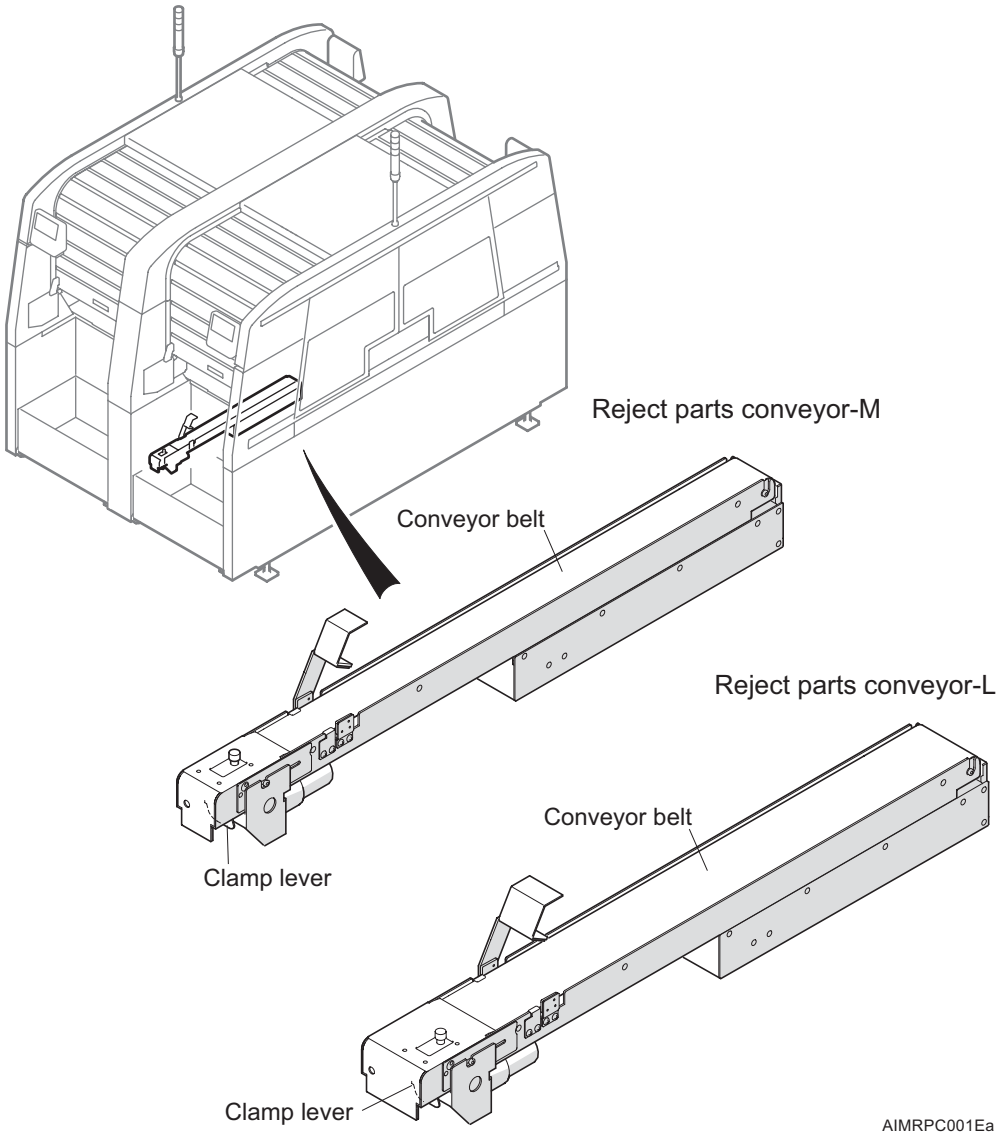
2.7 Tray Unit-M Components

The tray unit is used to supply parts to the module.



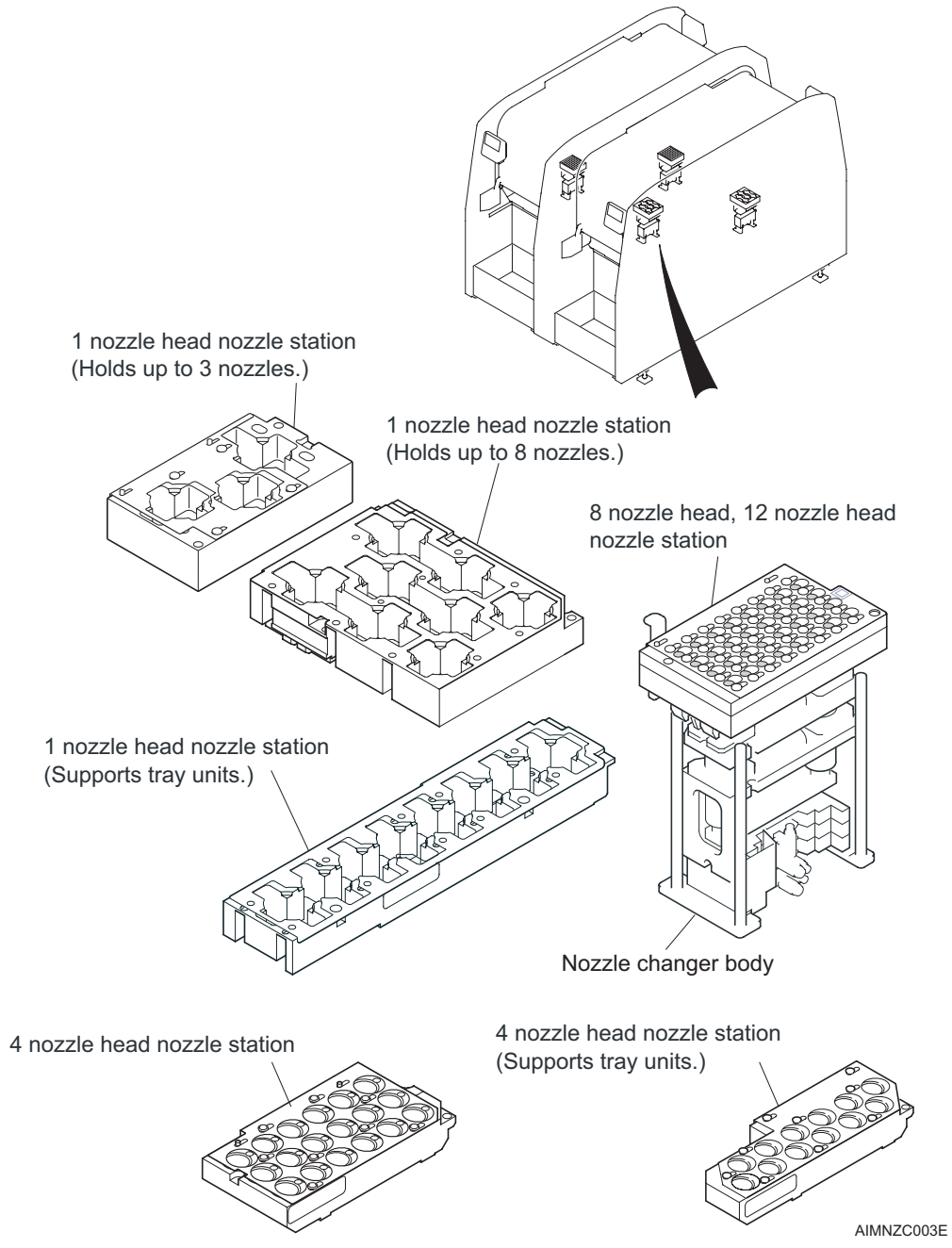
2.8 Reject Parts Conveyor Components

Parts that are rejected based on vision processing results are rejected here.



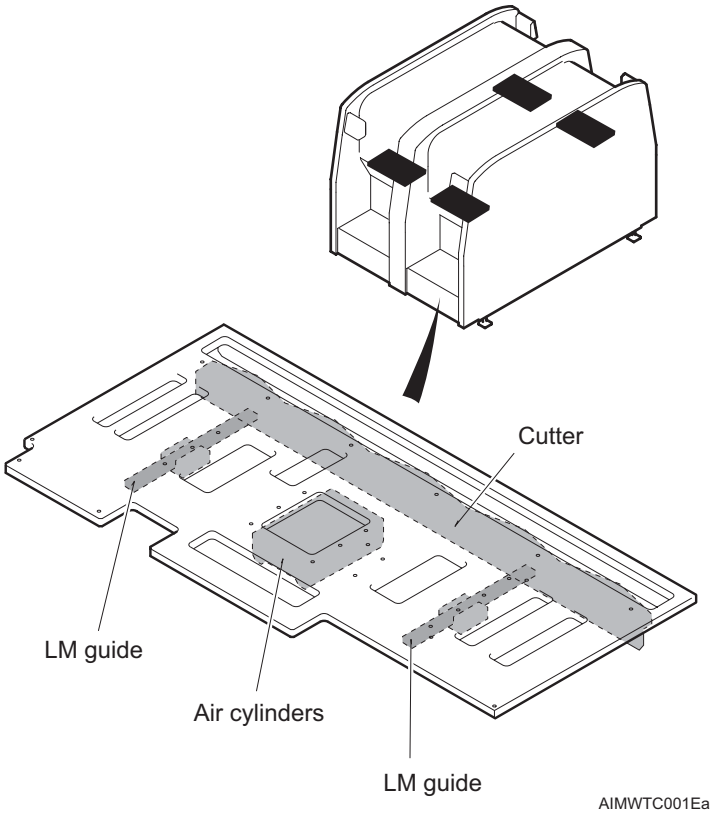
2.9 Nozzle Changer Components

The nozzle changer is used to store nozzles. The machine automatically changes to the optimum nozzles during production.

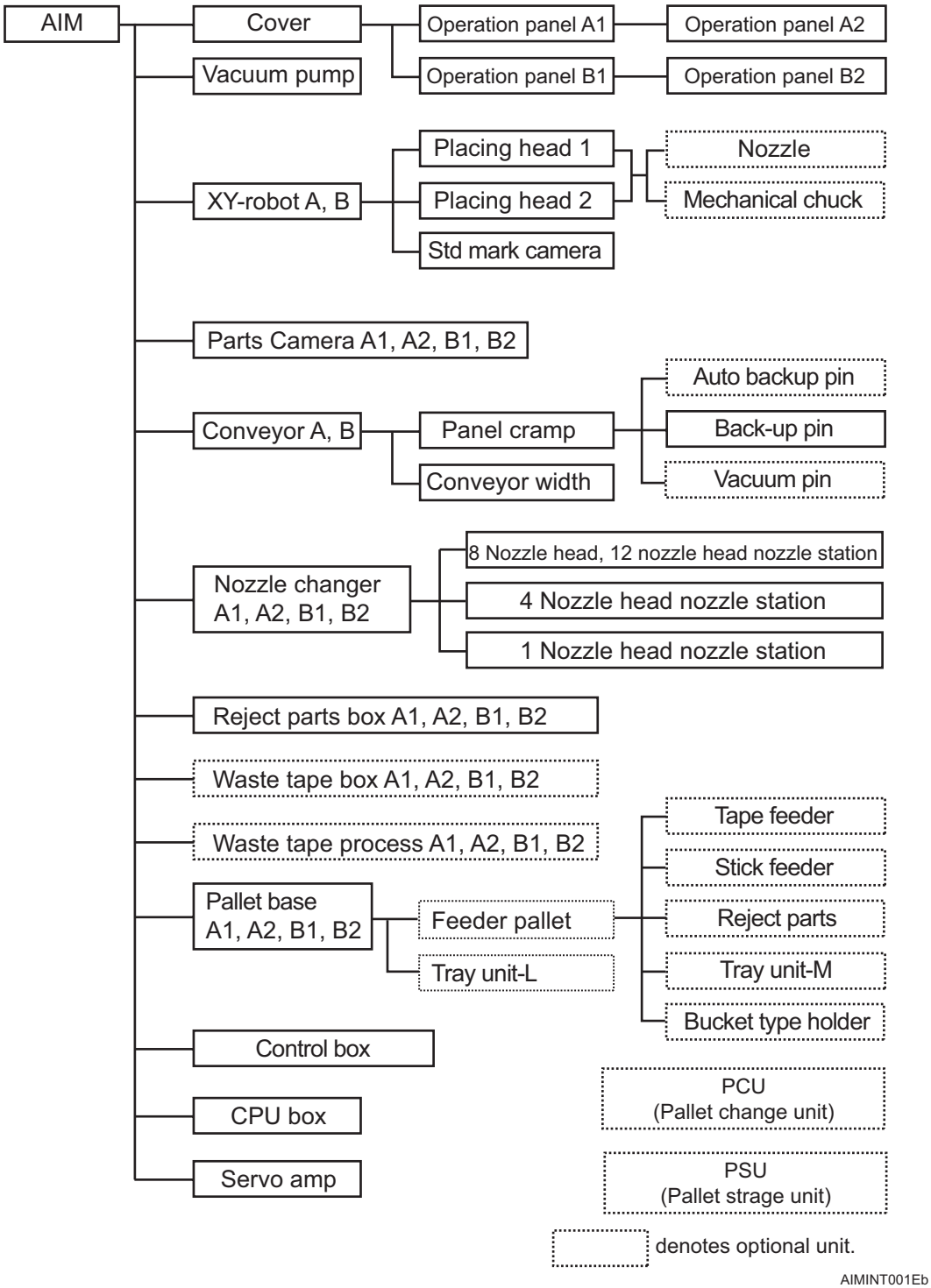


2.10 Waste Tape Processing Unit Components

This unit cuts waste tape after parts have been picked up.



2.11 Machine Configuration



3. Functions

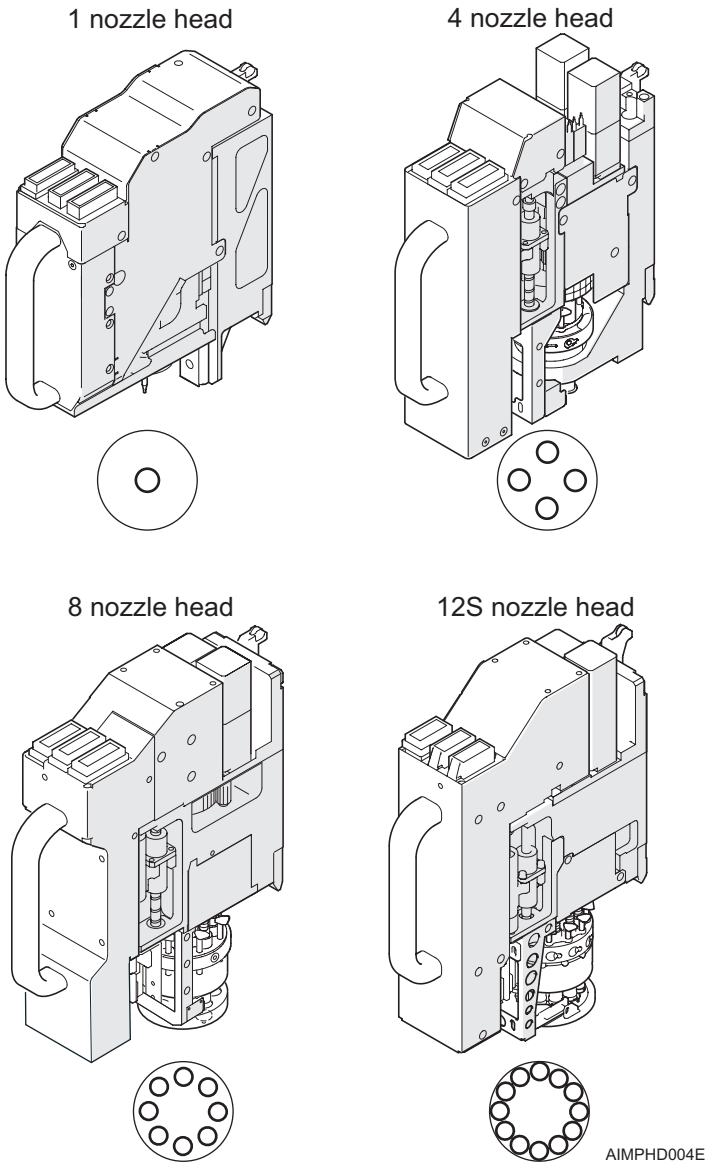
This section explains the functions of the machine.

3.1 The Machine

The machine comprises two modules. The module consists of an XY-robot, panel conveyor, panel clamper, feeder pallet, and vision system cameras. The XY-robot has a holder in which to mount the placing head.

3.2 Placing Head

The placing head is responsible for carrying the parts from the feeder to the panel. There are four type of heads. These heads can be easily exchanged between modules.



3.2.1 1 nozzle head

This placing head has a position for one nozzle and can handle a wide range of different sized parts. When this head is used, a compatible nozzle station type must be used.

3.2.2 4 nozzle head

This placing head has positions for up to four nozzles. This head is designed to mostly place small to medium size components. When this head is mounted in a module, a compatible nozzle station must be used.

3.2.3 8 nozzle head

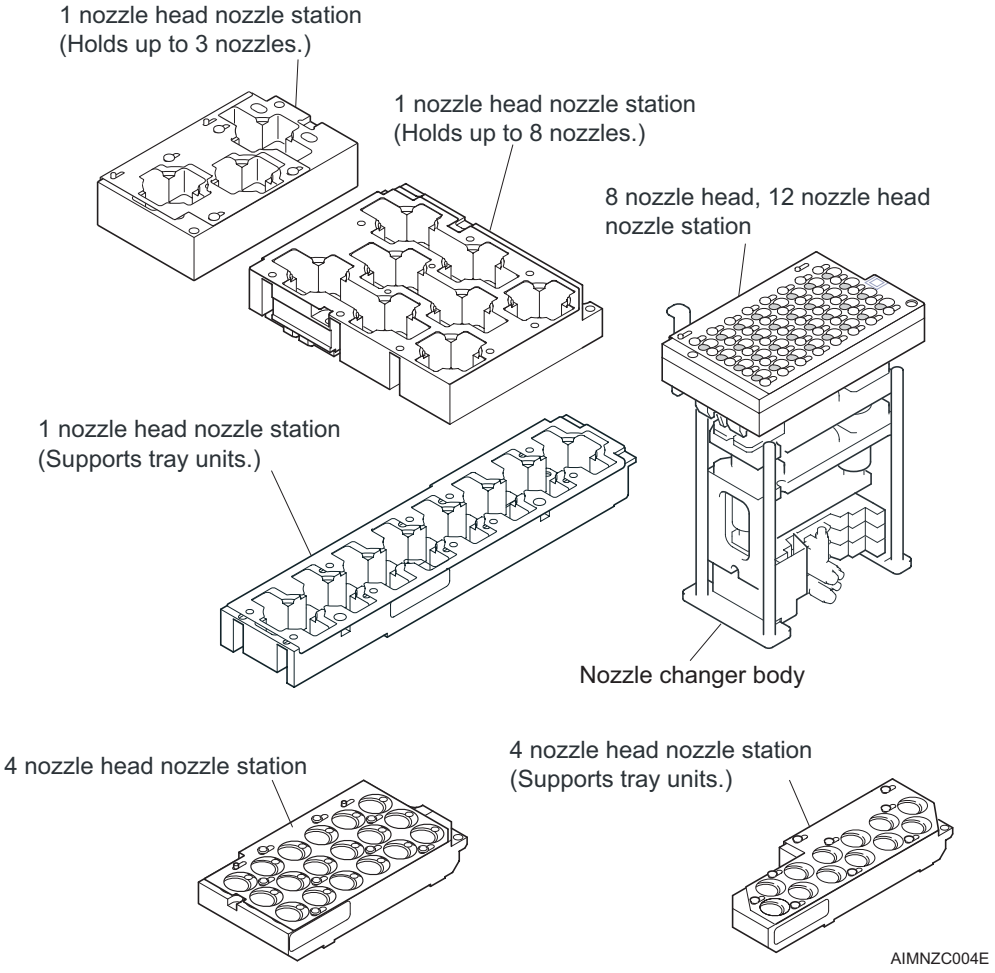
This placing head has positions for up to eight nozzles. This head is designed to mostly place small components. When this head is mounted in a module, a compatible nozzle station must be used.

3.2.4 12S nozzle head

This placing head has positions for up to twelve nozzles. This head is designed to mostly place small chips at high speed. When this head is mounted in a module, a compatible nozzle station must be used. The nozzle station for this head is the same nozzle station used for the eight nozzle head.

3.3 Nozzle Changer Unit

These units hold the nozzle station which in turn holds the replacement nozzles for the head mounted in the module. The nozzle station is attached to the top of the nozzle changer and can be easily changed. The nozzle changer is the same regardless of the nozzle station used.



3.4 Parts Supply System

3.4.1 Feeder pallet

Fuji Intelligent Feeders are loaded on the feeder pallet. The feeder pallet is loaded with feeders and attached to the front and rear of the module to perform parts supply. Up to 45 feeders (calculated based on 8 mm feeders) can be loaded on the pallet. The feeder pallet also supports bucket type reel holders (option).

3.4.2 Tray unit-L

This unit supplies parts on trays and can be detached from the machine.

3.4.3 Tray unit-M

The tray unit-M is set on the feeder pallet and used to supply tray parts. It is possible to set two tray unit-Ms on one feeder pallet. The first tray unit-M is set in slot 35, and the second tray unit-M is set in slot 10.

3.5 Vision System

3.5.1 Parts camera

The parts camera is used to identify the shape and size of parts which have been picked up by the nozzles. The lighting unit above the camera provides frontlighting for vision processing.

3.5.2 Mark camera

This camera is mounted on the XY-robot and is used to read the marks required by the machine for positioning.

3.6 Panel Conveyance

3.6.1 Main conveyor

This unit loads the panel from the previous machine and unloads it to the next machine when the panel is completed. This unit is equipped with the panel clampers. The machine automatically adjusts the width of the conveyor to match the panel being produced.

3.7 Electrical Control System

3.7.1 Operation panel

The operation panel is equipped with the buttons required for operating the machine and is used to display instructions, the machine condition, and vision processing images.

3.7.2 CPU boxes

The control circuitry for running the machine is located in these boxes. One base CPU box and two module CPU boxes are installed in the machine.

3.7.3 Servo box

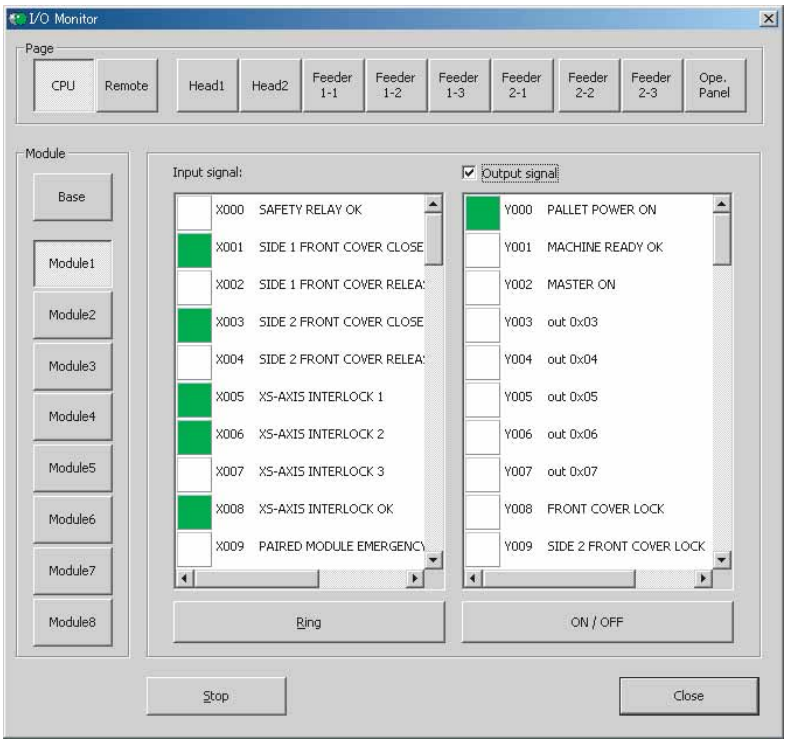
This box is located in the top of the modules and contains the servo amplifiers and control boards used for controlling the servo axes in that module.

4. Sensor Positions

This section displays the position of the various sensors in the AIM and the I/O listing.

4.1 About the I/O Monitor

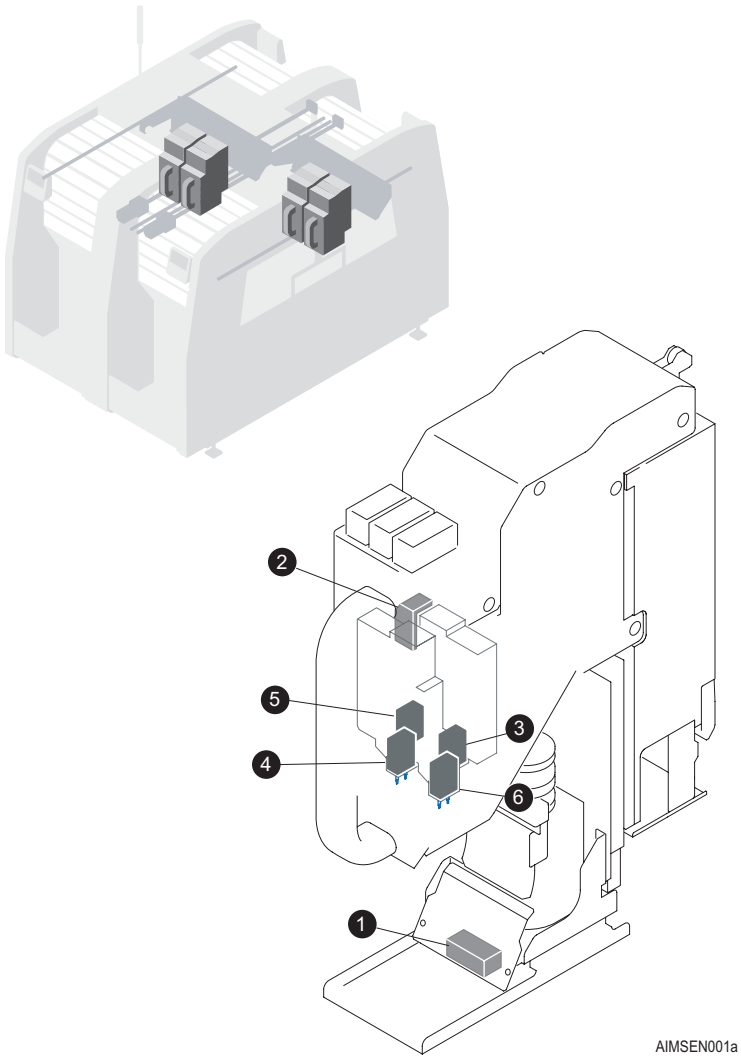
Dedicated [I/O Monitor] software is required to view the I/O. Start [I/O Monitor] to view the I/O screen. For instructions on how to use I/O Monitor, see the AIM System Reference.



NXTST0010Ea

4.2 Placing Head Sensors

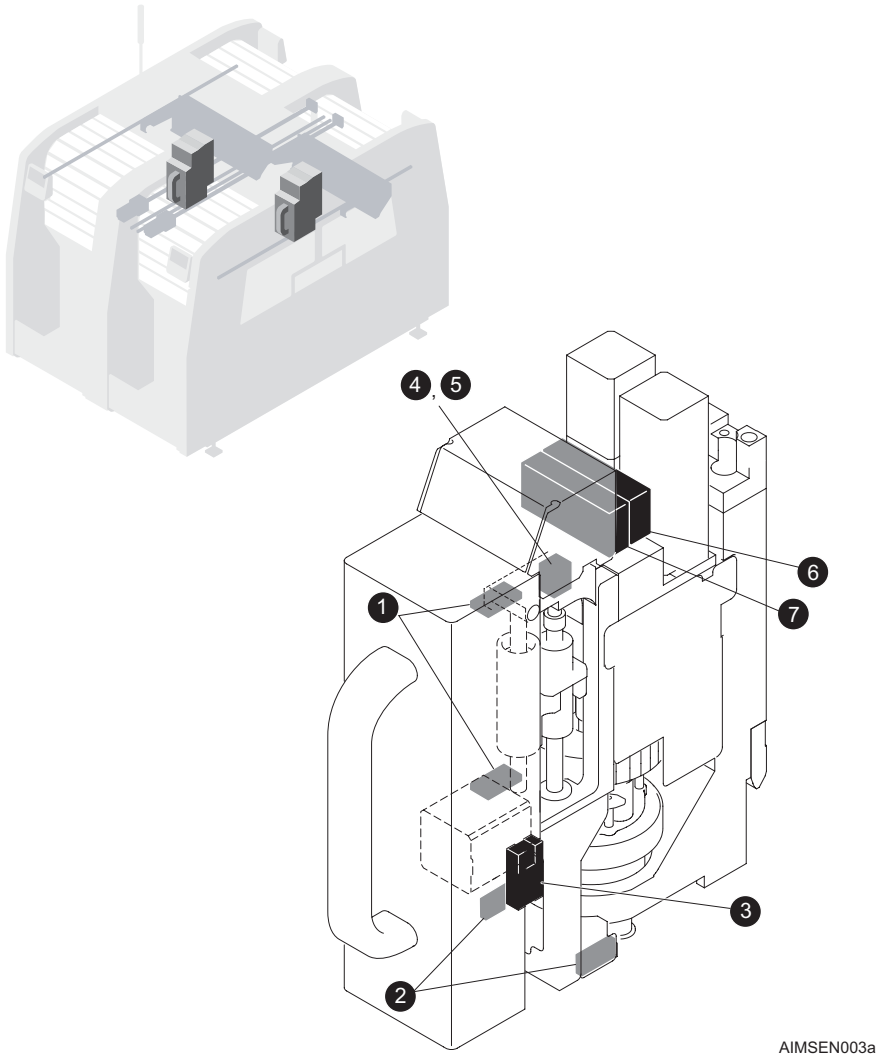
4.2.1 1 nozzle head



Module Head

No.	Address Number	Signal Name	Sensor Name
1	X100	Pressure check	Pressure check
2	X110	Nozzle pickup check	Nozzle pickup check
3	X111	Vacuum break check	Vacuum break check
4	Y100	Part pickup on	-
5	Y102	Nozzle pickup on	-
6	Y103	Nozzle cleaning	-

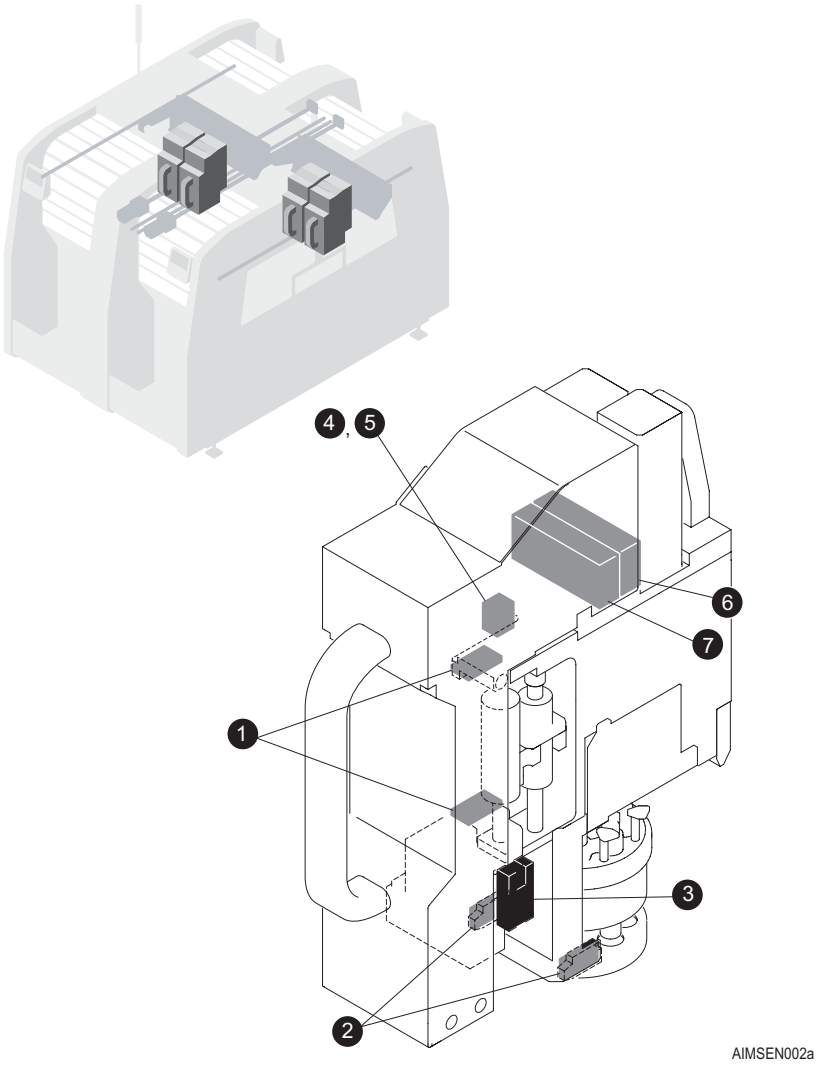
4.2.2 4 nozzle head



Module Head

No.	Address Number	Signal Name	Sensor Name
1	X103	Nozzle lowering lever off check	Nozzle lowering lever check
2	X104	Nozzle check	Nozzle check
3	X109	Lever returned check (origin)	Lever origin position
4	X110	Nozzle pickup check (orange)	Nozzle pickup check
5	X111	Part pickup check (red)	Part pickup check
6	Y101	Vacuum break	-
7	Y103	Nozzle cleaning	-

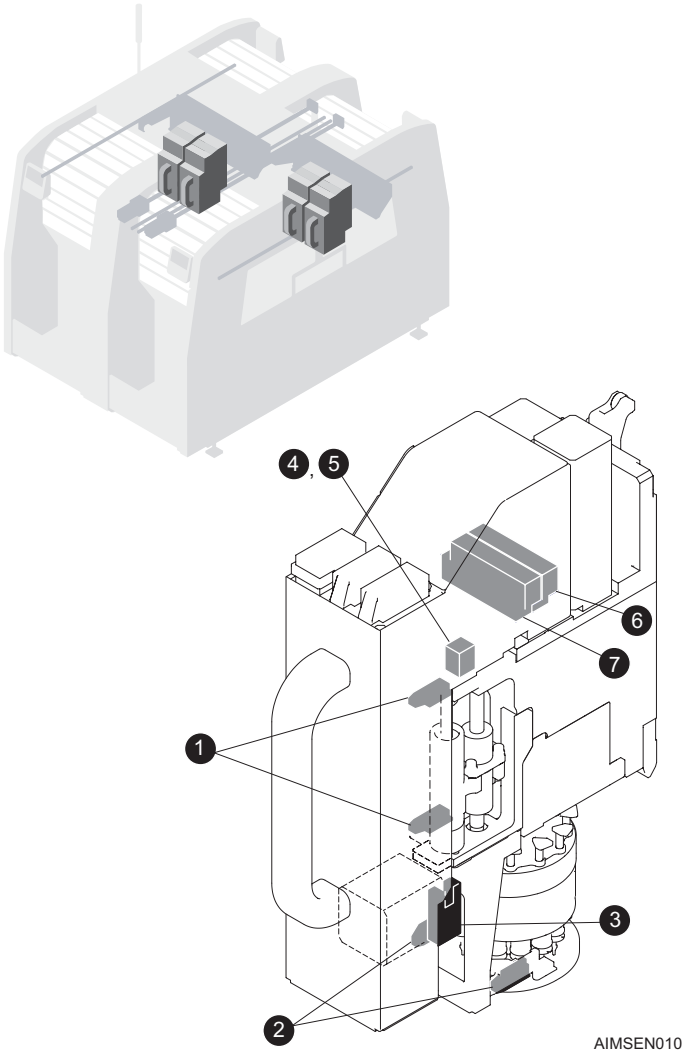
4.2.3 8 nozzle head



Module Head

No.	Address Number	Signal Name	Sensor Name
1	X103	Nozzle lowering lever off check	Nozzle lowering lever check
2	X104	Nozzle check	Nozzle check
3	X109	Lever returned check (origin)	Lever origin position
4	X110	Nozzle pickup check (orange)	Nozzle pickup check
5	X111	Part pickup check (red)	Part pickup check
6	Y101	Vacuum break	-
7	Y103	Nozzle cleaning	-

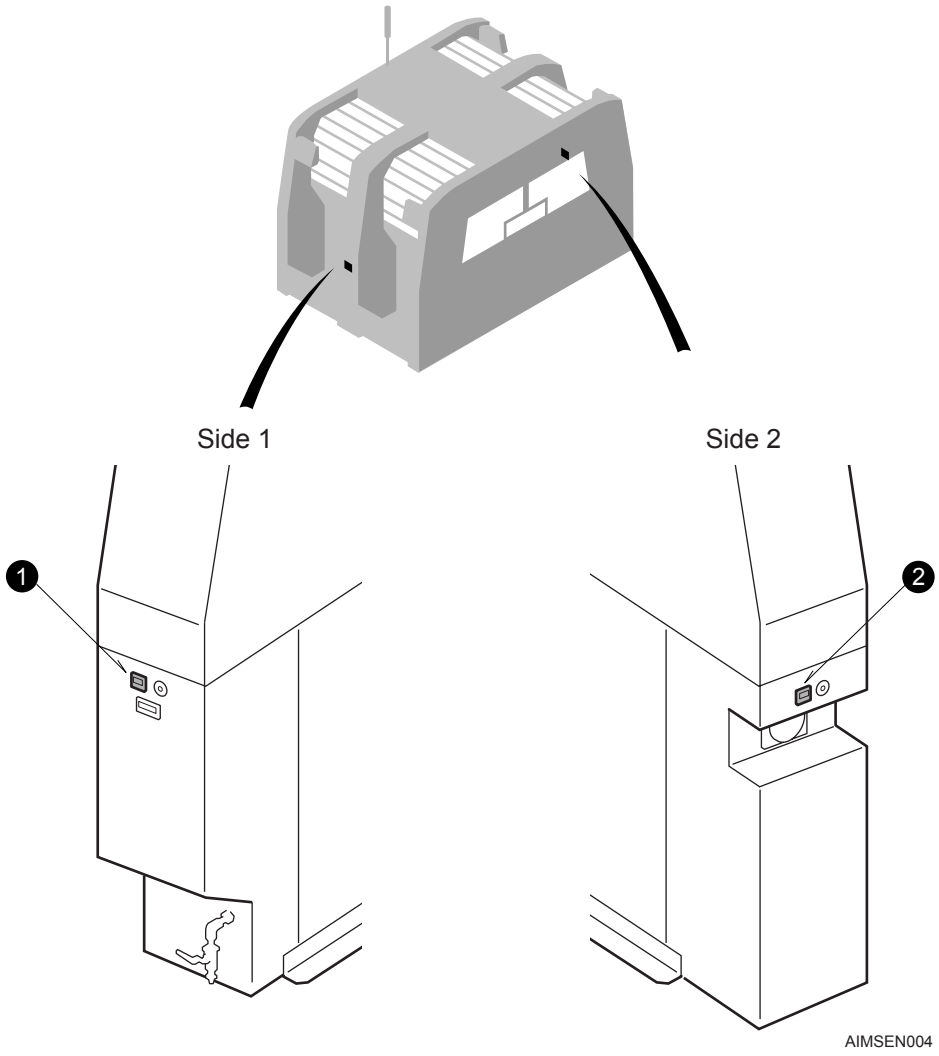
4.2.4 12S nozzle head



Module Head

No.	Address Number	Signal Name	Sensor Name
1	X103	Nozzle lowering lever off check	Nozzle lowering lever check
2	X104	Nozzle check	Nozzle check
3	X109	Lever returned check (origin)	Lever origin position
4	X110	Nozzle pickup check (orange)	Nozzle pickup check
5	X111	Part pickup check (red)	Part pickup check
6	Y101	Vacuum break	-
7	Y103	Nozzle cleaning	-

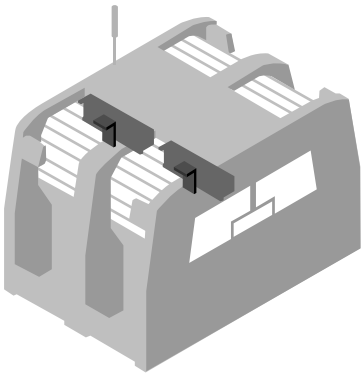
4.3 Machine Body Sensors

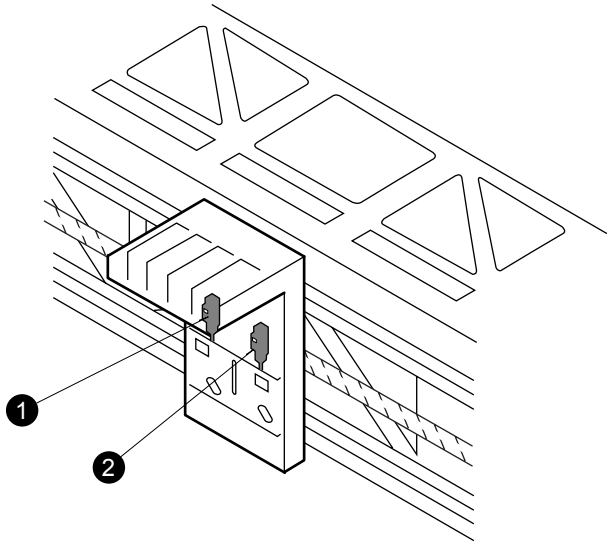


Base CPU

No.	Address Number	Signal Name	Sensor Name
1	X007	Part vacuum pressure OK	Part vacuum
2	X006	Air OK	Air pressure

4.4 XY-Robot Sensors





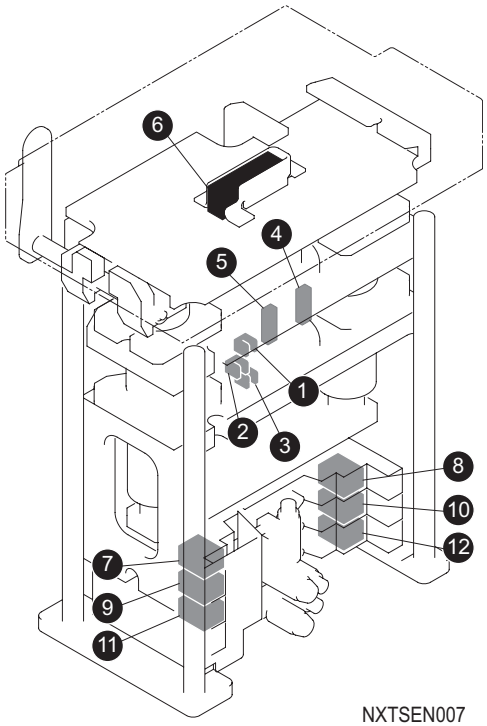
AIMSEN005

Module Remote

No.	Address Number	Signal Name	Sensor Name
1	X00D	Head docked confirmation 1	-
2	X00E	Head docked confirmation 2	-

4.5 Nozzle Changer Sensors

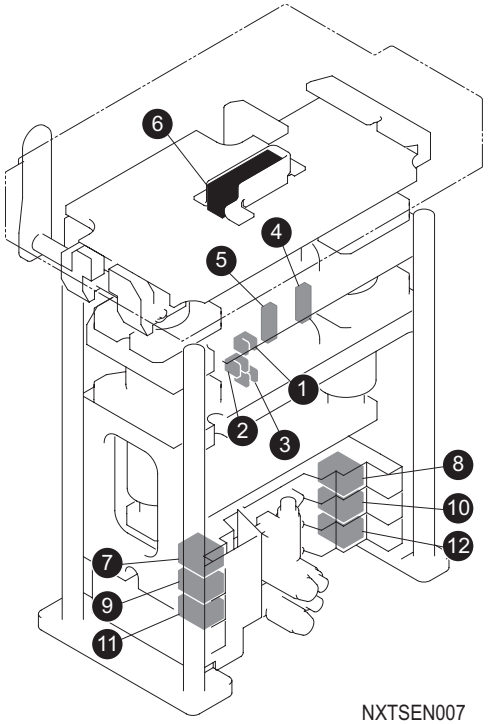
4.5.1 Side 1



Module Remote

No.	Address Number	Signal Name	Sensor Name
1	X003	Nozzle changer 1 upper limit 1 check	Changer upper limit 1
2	X004	Nozzle changer 1 upper limit 2 check	Changer upper limit 2
3	X005	Nozzle changer 1 lower limit check	Changer lower limit
4	X006	Nozzle changer 1 table shutter closed check	Nozzle station shutter closed
5	X007	Nozzle changer 1 table shutter open check	Nozzle station shutter opened
6	X009	Nozzle changer 1 docking check	Nozzle station docked
7	Y000	Nozzle changer 1 up 1	-
8	Y001	Nozzle changer 1 down 1	-
9	Y002	Nozzle changer 1 up 2	-
10	Y003	Nozzle changer 1 down 2	-
11	Y004	Nozzle changer 1 table shutter open	-
12	Y005	Nozzle changer 1 table shutter close	-

4.5.2 Side 2

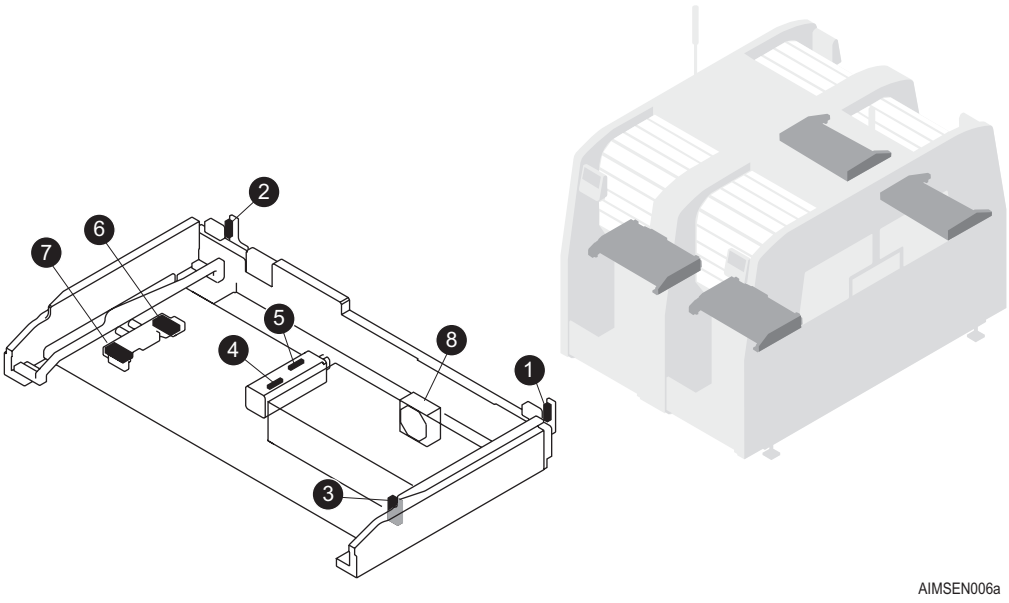


Module Remote

No.	Address Number	Signal Name	Sensor Name
1	X020	Nozzle changer 2 upper limit 1 check	Changer upper limit 1
2	X021	Nozzle changer 2 upper limit 2 check	Changer upper limit 2
3	X022	Nozzle changer 2 lower limit check	Changer lower limit
4	X023	Nozzle changer 2 table shutter closed check	Nozzle station shutter closed
5	X024	Nozzle changer 2 table shutter open check	Nozzle station shutter opened
6	X026	Nozzle changer 2 docking check	Nozzle station docked
7	Y020	Nozzle changer 2 up 1	-
8	Y021	Nozzle changer 2 down 1	-
9	Y022	Nozzle changer 2 up 2	-
10	Y023	Nozzle changer 2 down 2	-
11	Y024	Nozzle changer 2 table shutter open	-
12	Y025	Nozzle changer 2 table shutter close	-

4.6 Feeder Pallet Sensors

4.6.1 Side 1



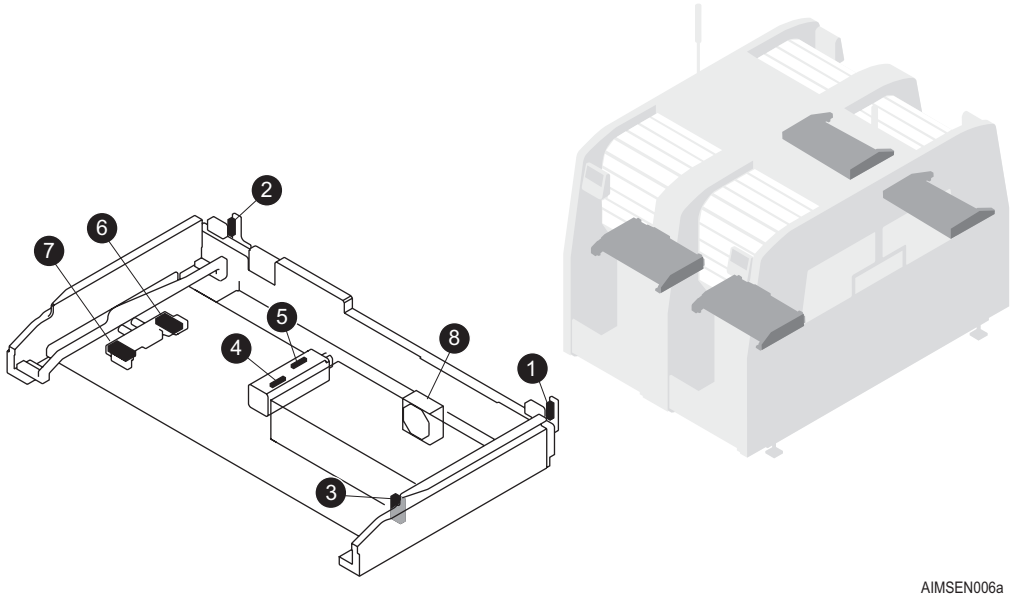
Module Remote

No.	Address Number	Signal Name	Sensor Name
1	X010	Side 1 - feeder pallet set check (R)	Feeder pallet right set
2	X011	Side 1 - feeder pallet set check (L)	Feeder pallet left set
3	X012	Side 1 - feeder pallet check	Feeder pallet detection
4	X015	Side 1 - feeder pallet clamp check	Feeder pallet clamped
5	X016	Side 1 - feeder pallet unclamp check	Feeder pallet unclamped
6	Y010	Side 1 - feeder pallet clamp	-
7	Y011	Side 1 - feeder pallet unclamp	-

Module CPU

No.	Address Number	Signal Name	Sensor Name
8	X01B	Pallet base cooling fan OK	Pallet cooling fan

4.6.2 Side 2



Module Remote

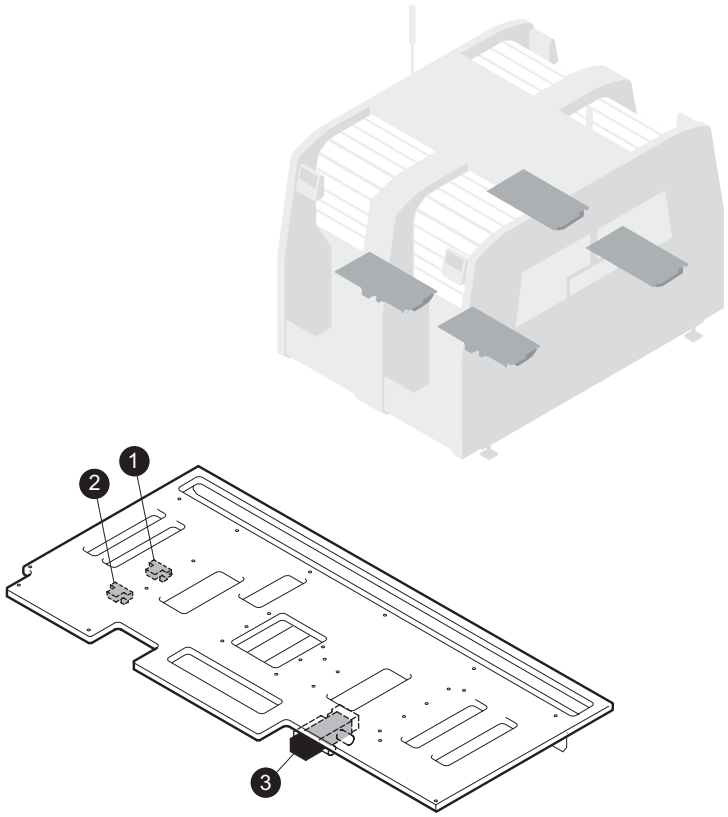
No.	Address Number	Signal Name	Sensor Name
1	X030	Side 2 - feeder pallet set check (R)	Feeder pallet right set
2	X031	Side 2 - feeder pallet set check (L)	Feeder pallet left set
3	X032	Side 2 - feeder pallet check	Feeder pallet detection
4	X035	Side 2 - feeder pallet clamp check	Feeder pallet clamped
5	X036	Side 2 - feeder pallet unclamp check	Feeder pallet unclamped
6	Y030	Side 2 - feeder pallet clamp	-
7	Y031	Side 2 - feeder pallet unclamp	-

Module CPU

No.	Address Number	Signal Name	Sensor Name
8	X01B	Pallet base cooling fan OK	Pallet cooling fan

4.7 Waste Tape Processing Sensors

4.7.1 Side 1

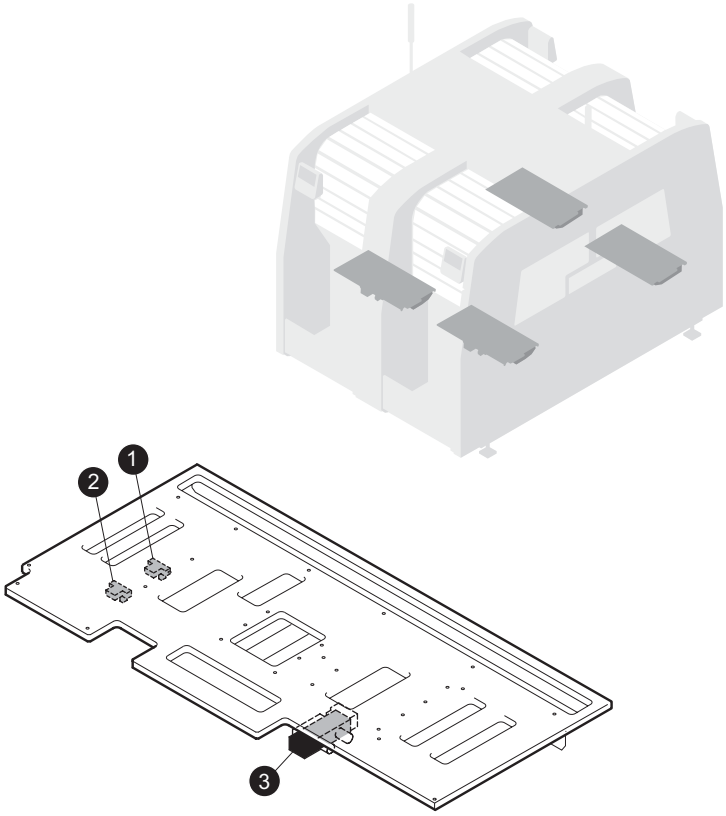


AIMSEN007a

Module Remote

No.	Address Number	Signal Name	Sensor Name
1	X019	Side 1 - tape cutter stroke end	Tape cutter advanced sensor
2	X01A	Side 1 - tape cutter origin position	Tape cutter origin sensor
3	Y012	Side 1 - tape cutter tape cut	-

4.7.2 Side 2

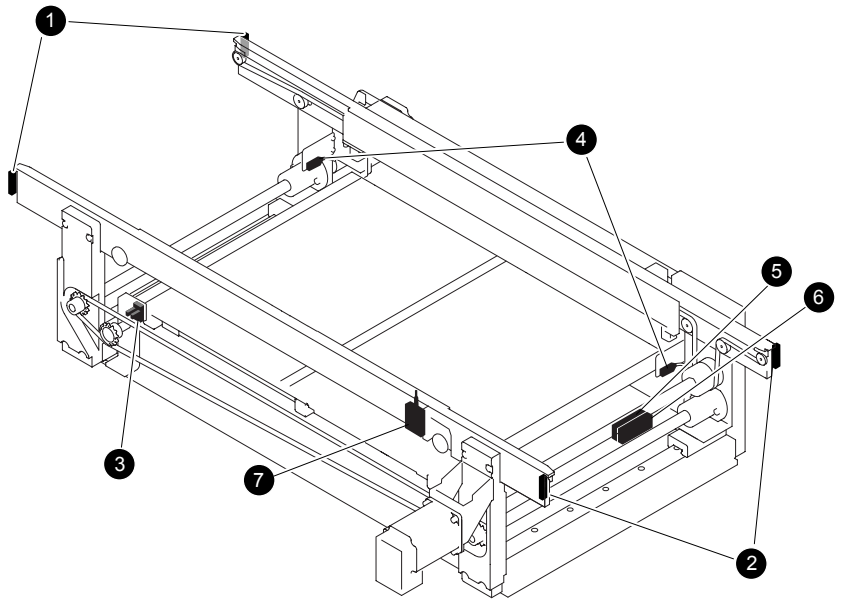


AIMSEN007a

Module Remote

No.	Address Number	Signal Name	Sensor Name
1	X039	Side 2 - tape cutter stroke end	Tape cutter advanced sensor
2	X03A	Side 2 - tape cutter origin position	Tape cutter origin sensor
3	Y032	Side 2 - tape cutter tape cut	-

4.8 Main Conveyor Sensors



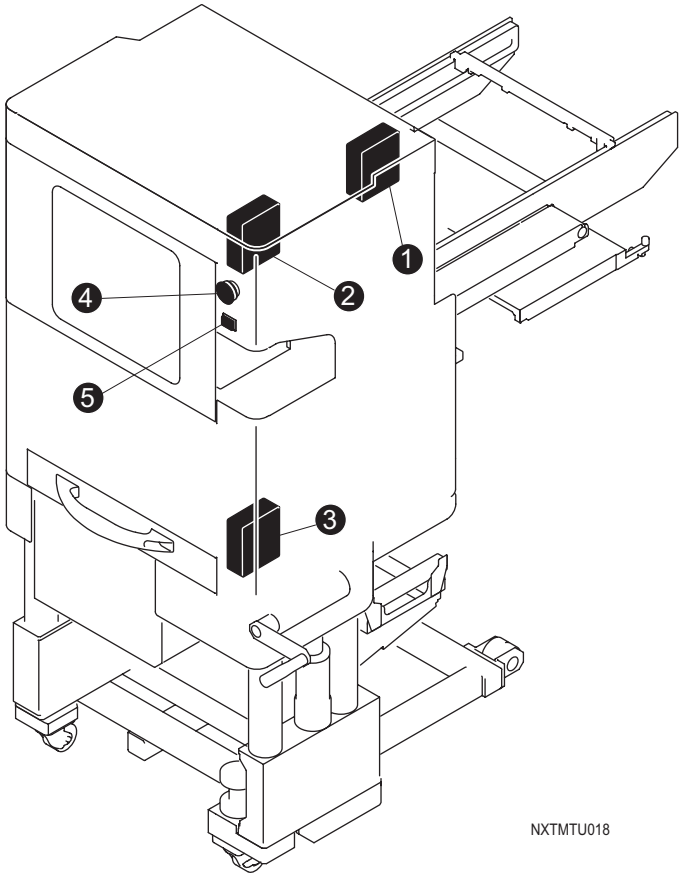
AIMSEN008

No.	Address Number	Signal Name	Sensor Name
1	CX000	Lane 1 conveyor panel pass check L	Lane 1 conveyor panel left
2	CX001	Lane 1 conveyor panel pass check R	Lane 1 conveyor panel right
3	CX004	Lane 1 conveyor panel clamp/ unclamp check	Lane 1 panel clamp/unclamp
4	CX005	Lane 1 conveyor backup pin check	Lane 1 backup pin detection
5	-	Lane 1 conveyor panel pass check L amplifier	Lane 1 conveyor in amplifier
6	-	Lane 1 conveyor panel pass check R amplifier	Lane 1 conveyor out amplifier
7	-	Z0	-Z0 sensor

This I/Os cannot be displayed in I/O Monitor.

4.9 Tray Unit-L

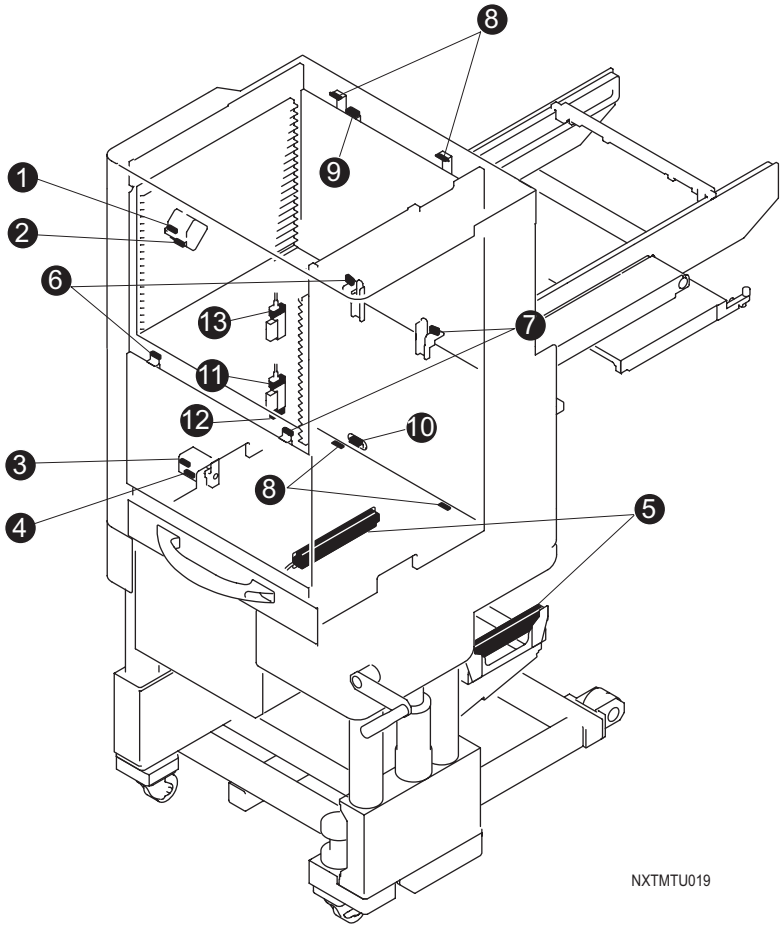
4.9.1 Safety components



No.	Address Number	Signal Name	Sensor Name
1	IN00	Upper door closed	-
2	IN01	Rear door closed	-
3	IN02	Lower door closed	-
4	IN04	Emergency stop	-
5	IN1E	Supply complete	-

These I/Os cannot be displayed in I/O Monitor

4.9.2 Tray tower components

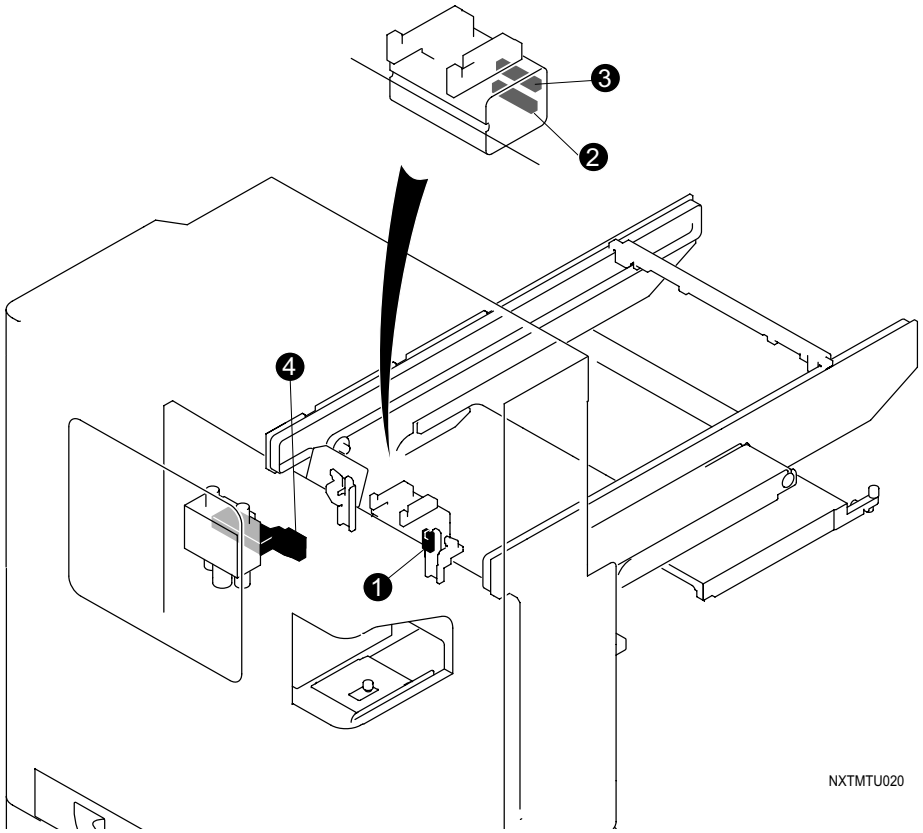


No.	Address Number	Signal Name	Sensor Name
1	IN1D	Pallet clamp close check	Drawer clamp close check
2	IN1C	Pallet clamp open check	Drawer clamp open check
3	IN15	Lower pallet clamp close check 1-2	Lower drawer clamp close check 1-2
4	IN14	Lower pallet clamp open check 1-2	Lower drawer clamp open check 1-2
5	IN27	Tray discharge check	Empty tray removal check
6	IN28	Tray height check 1	Tray height check 1
7	IN29	Tray height check 2	Tray height check 2
8	IN2B	Pallet storage check	Drawer stowed check
9	IN2C	Upper pallet check	Upper drawer check
10	IN2D	Lower pallet check	Lower drawer check
11	OUT20	Pallet clamp closed	Drawer clamp

No.	Address Number	Signal Name	Sensor Name
12	OUT21	Pallet clamp open	Drawer unclamp
13	OUT25	Lower pallet clamp open/closed	Lower drawer clamp open/ closed

These I/Os cannot be displayed in I/O Monitor

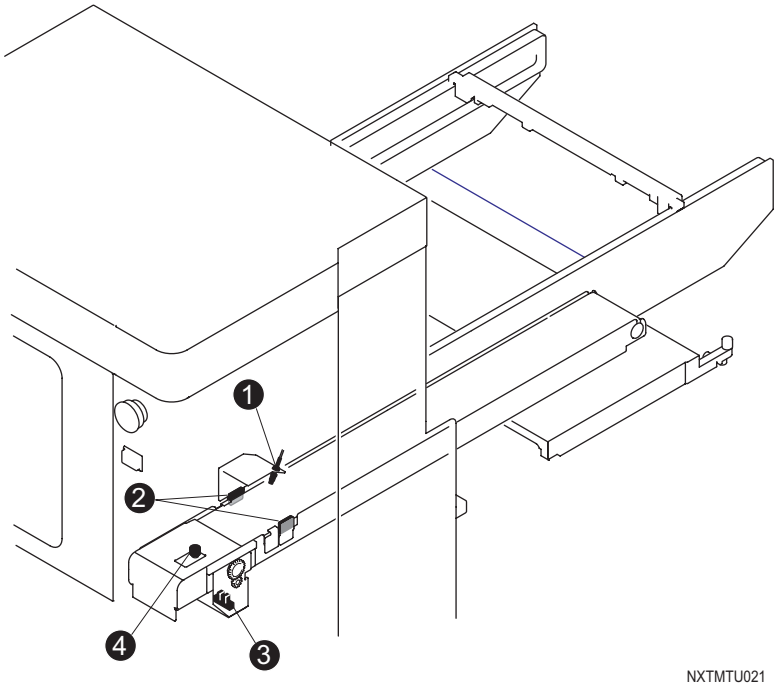
4.9.3 Shuttle components



No.	Address Number	Signal Name	Sensor Name
1	IN20	Shuttle reverse check	Shuttle retracted
2	IN21	Shuttle chuck open check	Shuttle chuck open check
3	IN22	Shuttle chuck close check	Shuttle chuck closed check
4	OUT22	Shuttle pallet chuck closed/open	Shuttle drawer chuck closed/ open

These I/Os cannot be displayed in I/O Monitor

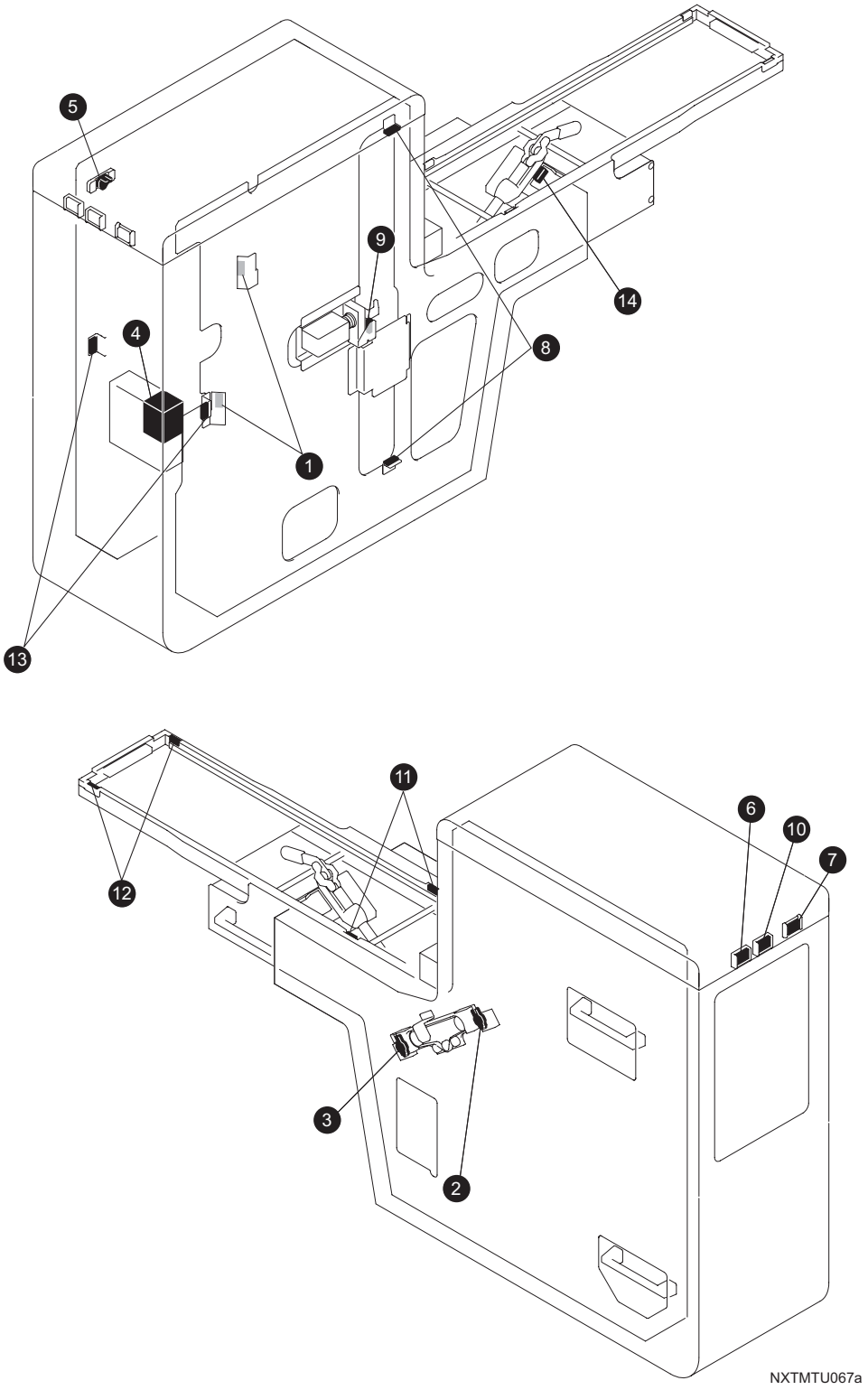
4.9.4 Reject parts conveyor



No.	Address Number	Signal Name	Sensor Name
1	IN11	NG parts full check (center)	Reject parts full check (center)
2	IN12	NG parts full check (side)	Reject parts full check (side)
3	IN13	NG parts count	Reject parts conveyor count
4	OUT18	NG conveyor on	Reject conveyor on

These I/Os cannot be displayed in I/O Monitor

4.10 Tray Unit-M



No.	Address Number	Signal Name	Sensor Name
1	IN02	Tray presence check	-
2	IN03	Clutch ON check	-
3	IN04	Clutch OFF check	-
4	IN05	Door closed check	-
5	IN06	Magazine closed check	-
6	IN07	SUPPLY PARTS button input	-
7	IN10	COMPLETE button input	-
8	IN11	TZ-axis collision check	-
9	IN12	Tray stopper ON check	-
10	IN13	CHANGE PARTS button input	-
11	IN14	Tray forward/back deceleration check	-
12	IN15	Tray stopped forward check	-
13	IN16	Tray back check	-
14	-	Unit clamp check	-

These I/Os cannot be displayed in I/O Monitor.

5. Basic Operation

5.1 Removing/Inserting a Feeder Pallet

Feeder pallets loaded with feeders can be replaced with other feeder pallets to perform batch changeover.

Batch changeover requires a PCU and PSU (both optional), with the PSU used to transfer feeder pallets to and from the machine.

Align the PSU height with the panel conveyance height beforehand. (Refer to the “AIM Setup Manual” for details of the PSU height adjustment procedure.)

5.1.1 Removal procedure

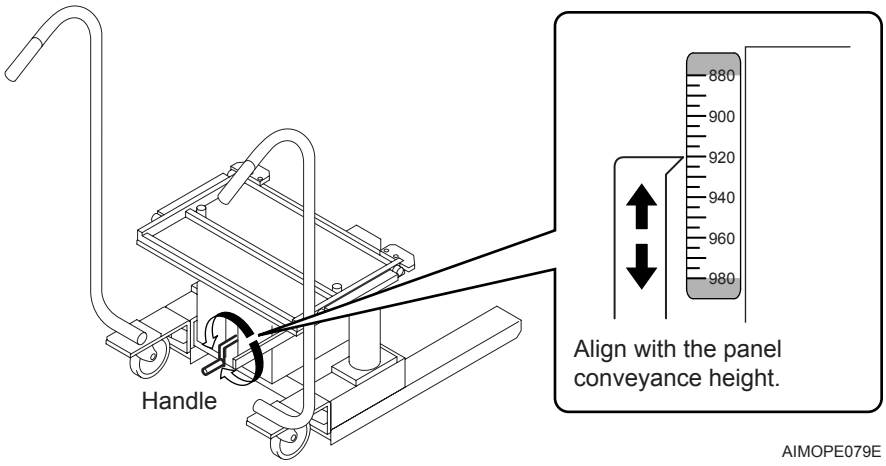
Use the PCU to remove the feeder pallet from the machine and store it on the PSU.

⚠CAUTION

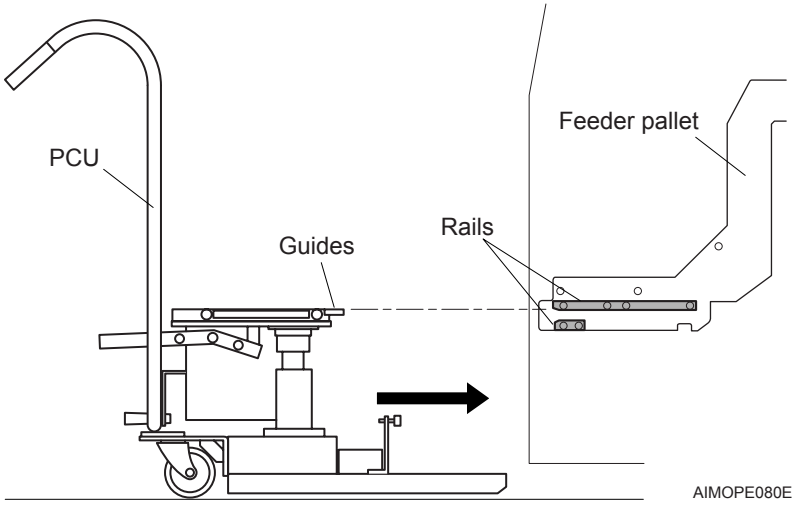
Ensure that the PSU casters are locked prior to performing this procedure.

1. Stop the machine (module).
2. Remove the waste tape box and attach the PCU facing the machine.
3. Rotate the handle at the bottom of the PCU until the scale is aligned with the panel conveyance height.

Note: The scale indicates the panel conveyance height (mm). Ensure that the pointer remains between the red marks indicated on the scale (880 mm and under, 980 mm and above).

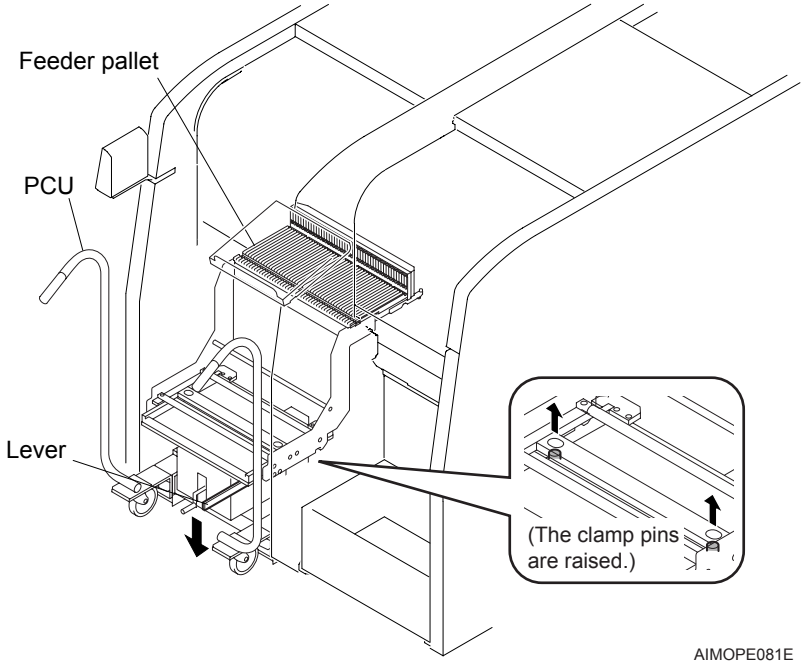


4. Insert the PCU guides into the feeder pallet rails and push the PCU firmly until it contacts the stoppers.

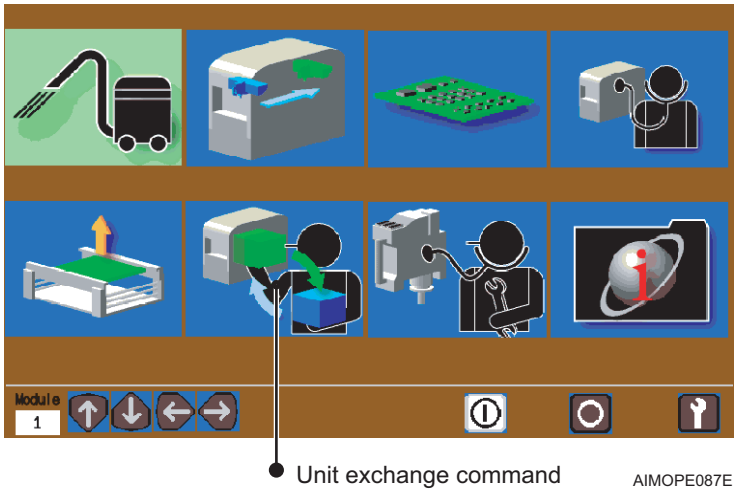


5. Push the PCU lever down to clamp the feeder pallet.

Note: The lever cannot be operated unless the PCU has been properly pushed into the machine.

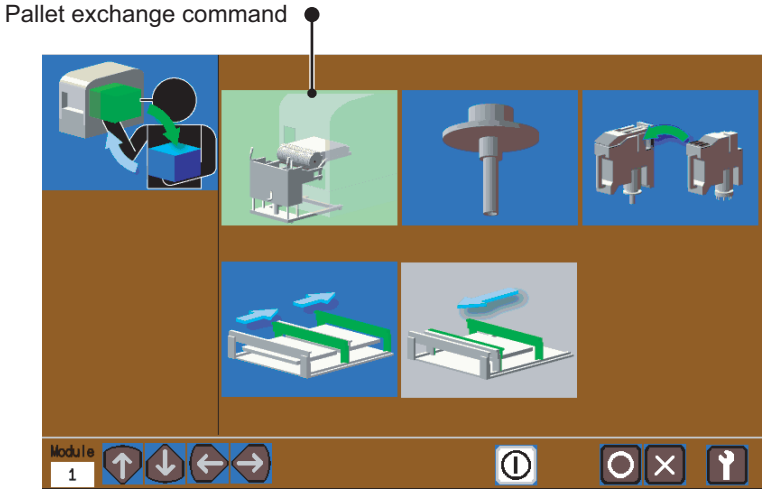


6. Use the manual command to unclamp the feeder pallet from the machine.
   a. Push MANUAL.
   b. Use the arrow keys to select the unit exchange command and push OK.



AIMOPE087E

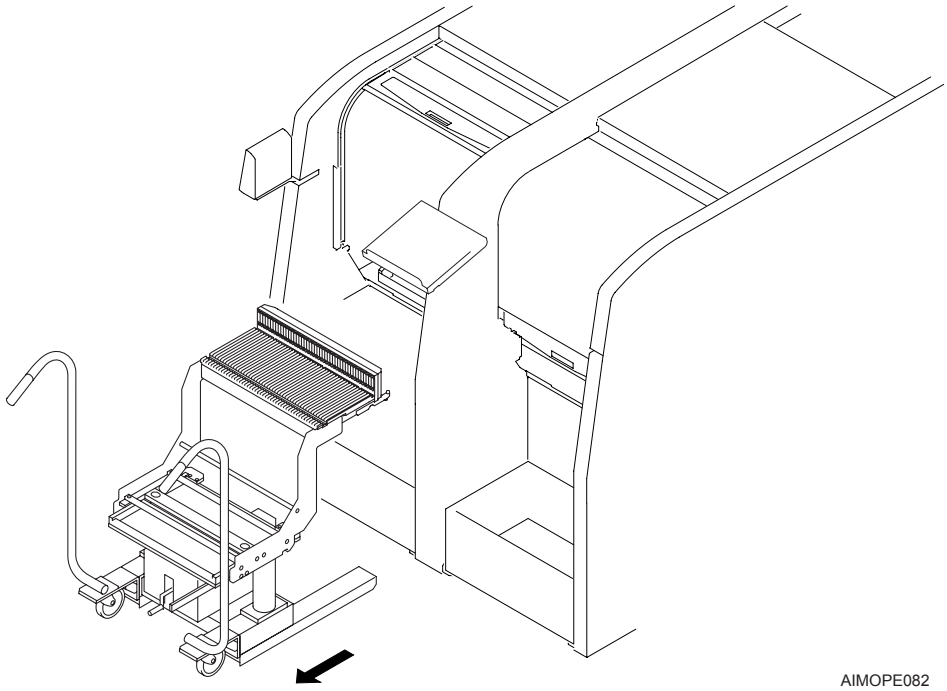
   c. Use the arrow keys to select the pallet exchange command.



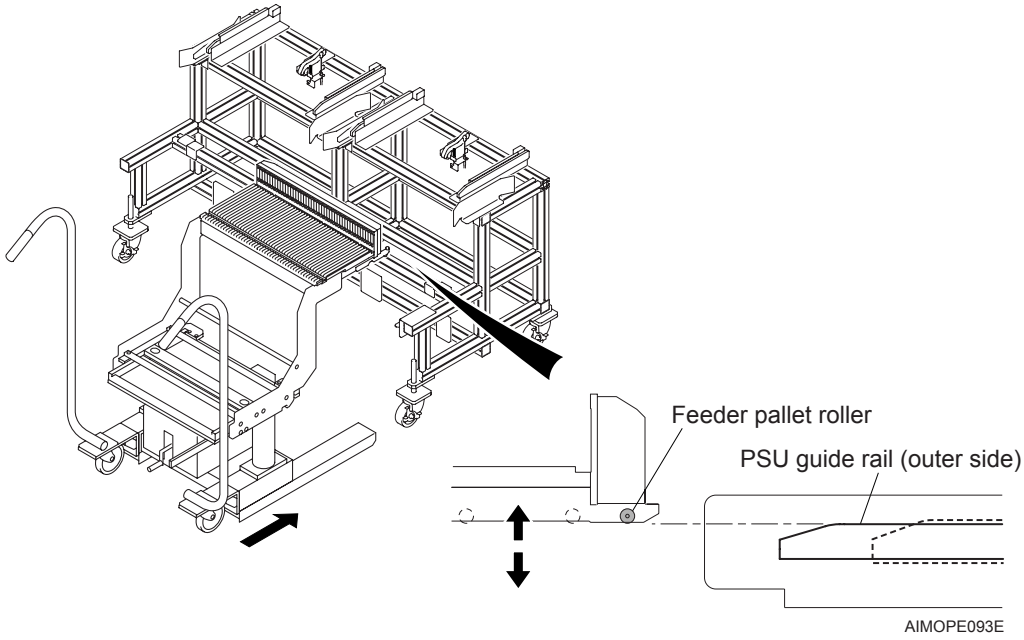
AIMOPE089E

   d. Push OK.

7. Slowly pull the PCU away from the module to remove the feeder pallet from the machine.

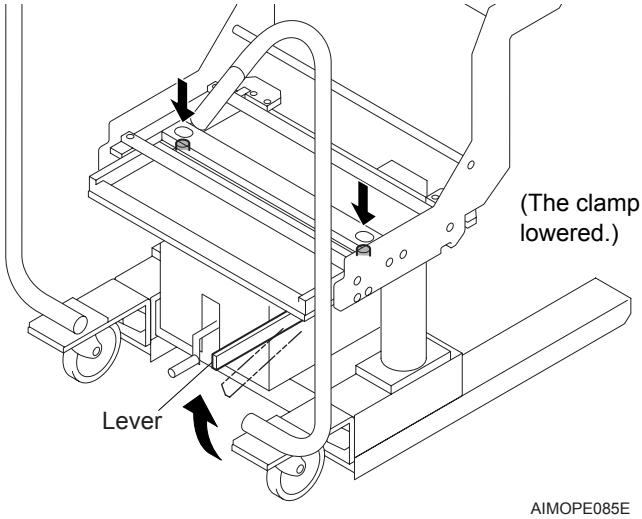


8. Next store the feeder pallet on the PSU.
   Mount the feeder pallet rollers on the PSU guide rails and push the PCU firmly until it contacts the stoppers.



9. Pull up the PCU lever to unclamp the feeder pallet.

Note: The lever cannot be operated unless the PCU has been properly pushed onto the PSU.



10. Pull the PCU slowly to separate it from the feeder pallet.
    Fix the PCU in position by locking the casters.

Feeder pallet removal with the power off

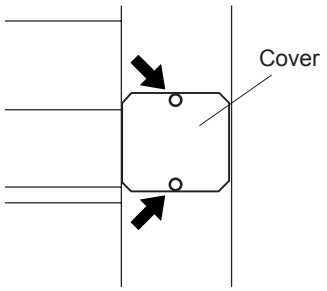
Use the following procedure to remove the feeder pallet when power to the machine is off.

⚠CAUTION

• Use the method described here to open the air valves and remove the feeder pallet only when it is not possible to turn ON the machine power. These air valves should never be used under normal circumstances.

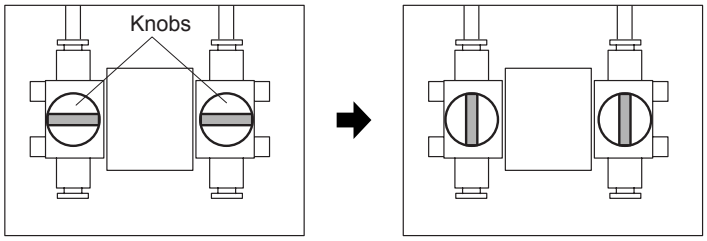
• Return the air valves to their original positions (closed) after the feeder pallet has been removed.

1. Remove the cover from the side of the module from which the feeder pallet is to be removed.



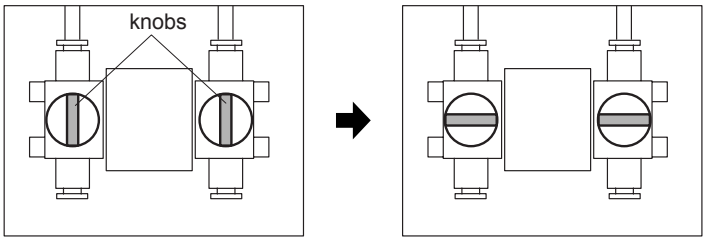
AIMOPE090E

2. Insert the PCU into the feeder pallet and clamp the pallet. (Refer to section 5.1.1 "Removal procedure".)
3. Rotate the air valve knobs (2) to release the air.



AIMOPE091E

4. Pull the PCU slowly to remove the feeder pallet from the machine (module).
5. Return both air valve knobs to their original positions and reattach the cover.



AIMOPE092E

5.1.2 Attachment procedure

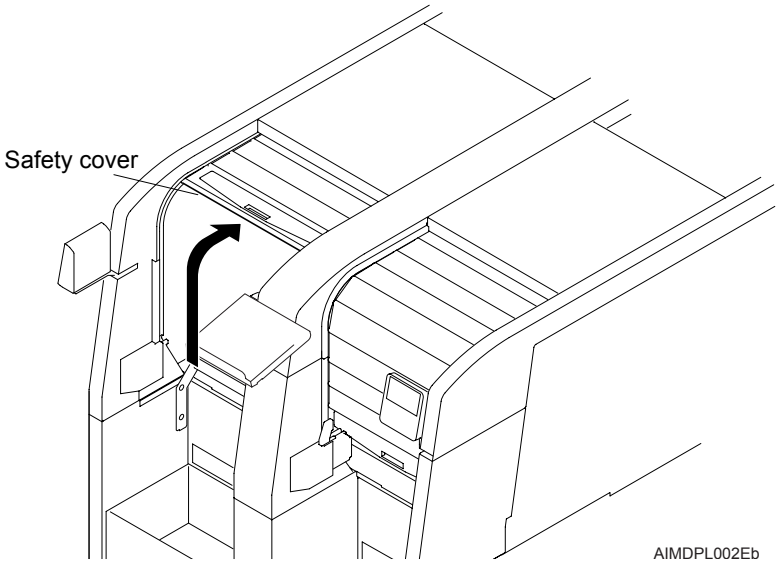
Pre-attachment preparations

When using the feeder pallet, attach together with any required tape part related devices (waste tape duct etc.). The parts camera attachment position should also be changed.

1. Raise the safety cover.

⚠CAUTION

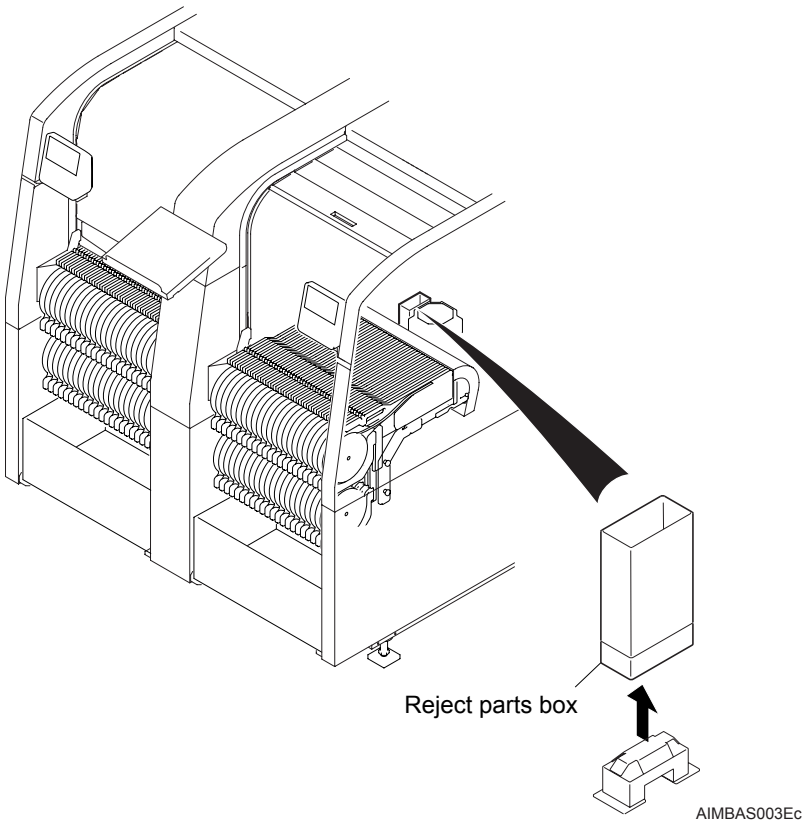
Raise the safety cover fully to the top. The cover may slide down if the door is not fully open.



2. Change the parts camera attachment position to the center of the inside of the module. (See section 8.1 "Parts Camera Replacement" for details.)

Note: The machine will automatically perform recalibration if the parts camera attachment position is changed. Ensure to insert jig nozzle(s) in the nozzle station beforehand.

3. Set the reject parts box in the position next to the parts camera.



4. Set the waste tape duct in position and secure it with bolts. (See section 5.5.3 "Waste tape duct and cover" for details.)

Attaching the feeder pallet

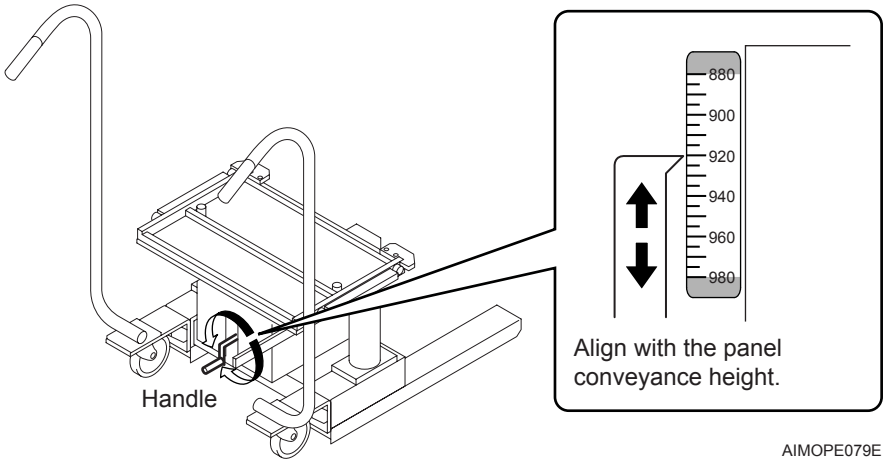
Use the PCU to remove the feeder pallet from the PSU and attach it to the machine.

⚠CAUTION

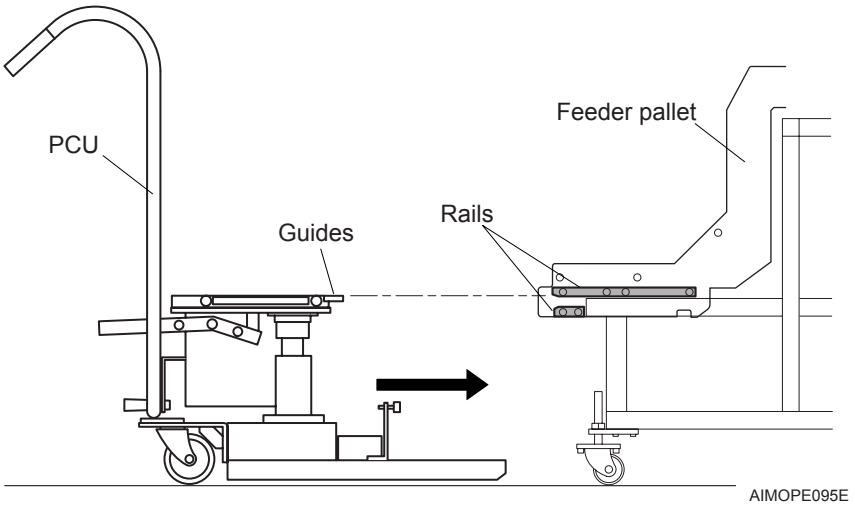
Ensure that the PSU casters are locked prior to performing this procedure.

1. Prepare to start operation at the machine (module).
2. Rotate the handle at the bottom of the PCU until the scale is aligned with the panel conveyance height.

Note: The scale indicates the panel conveyance height (mm). Ensure that the pointer remains between the red marks indicated on the scale (880 mm and under, 980 mm and above).

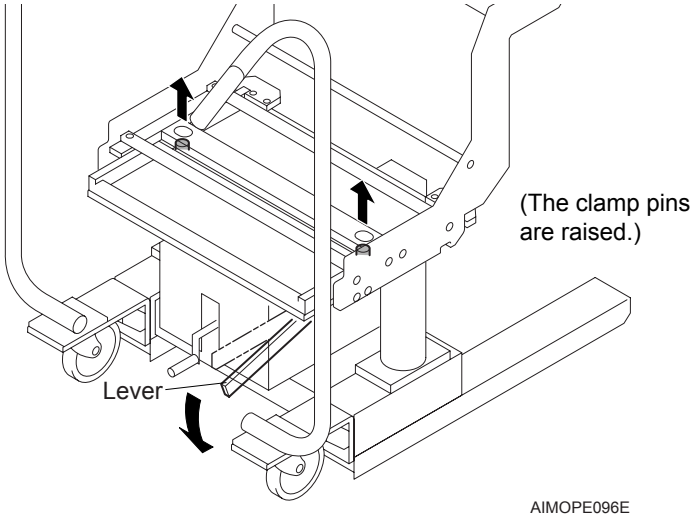


3. Insert the PCU guides into the rails of the feeder pallet on the PSU and push the PCU firmly until it contacts the stoppers.

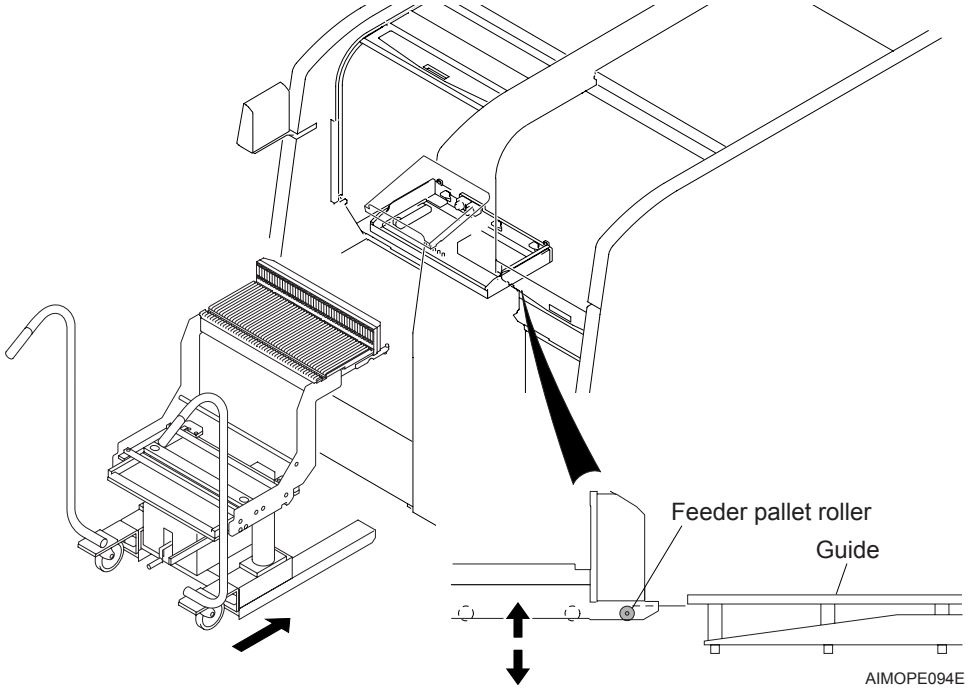


4. Push the PCU lever down to clamp the feeder pallet.

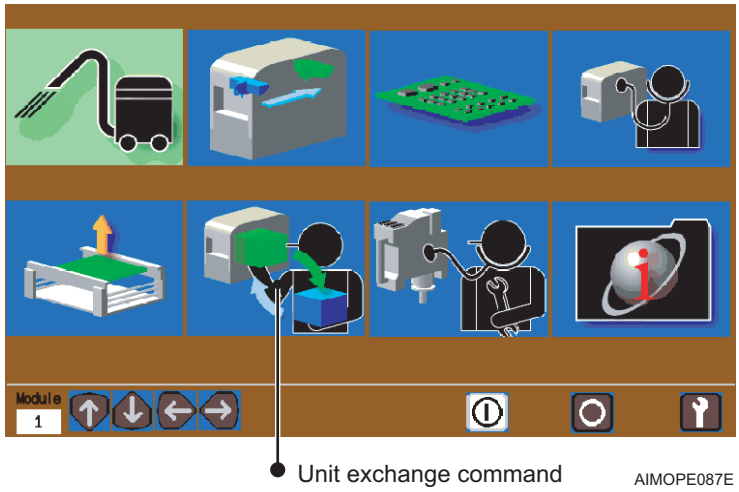
Note: The lever cannot be operated unless the PCU has been properly pushed onto the PSU.



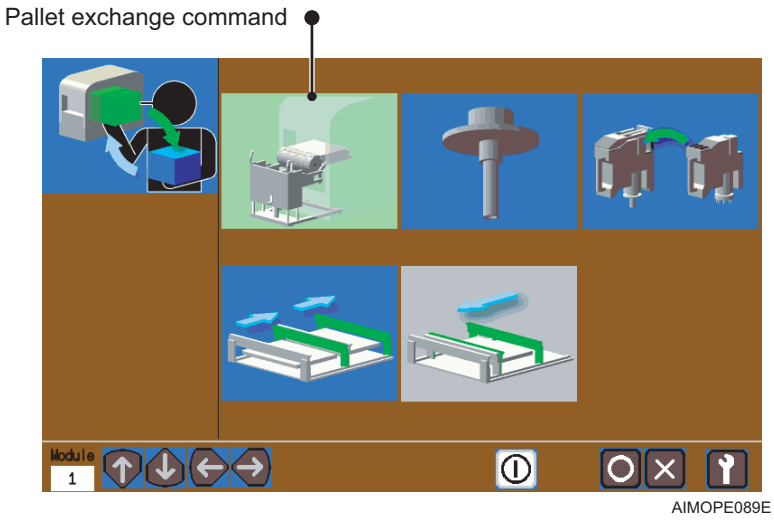
5. Pull the PCU slowly to remove the feeder pallet from the PSU.
6. Next attach the PCU with feeder pallet loaded facing the machine.
7. Align the feeder pallet rollers with the parts supply base guides and push the PCU firmly until it contacts the stoppers.



8. Use the manual command to clamp the feeder pallet.
   a. Push MANUAL.
   b. Use the arrow keys to select the unit exchange command and push OK.

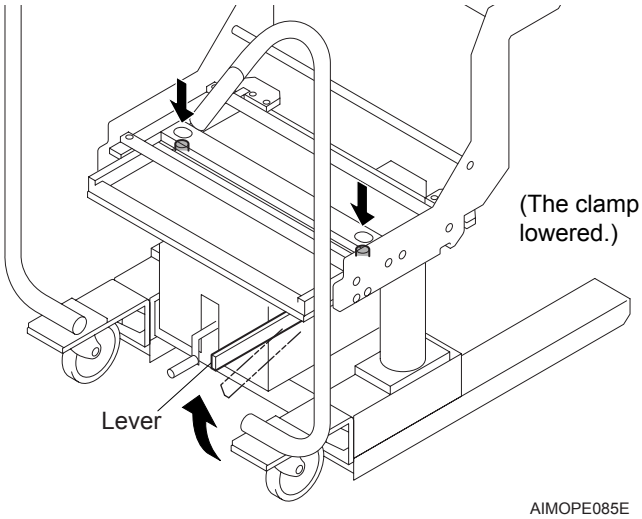


   c. Use the arrow keys to select the pallet exchange command.

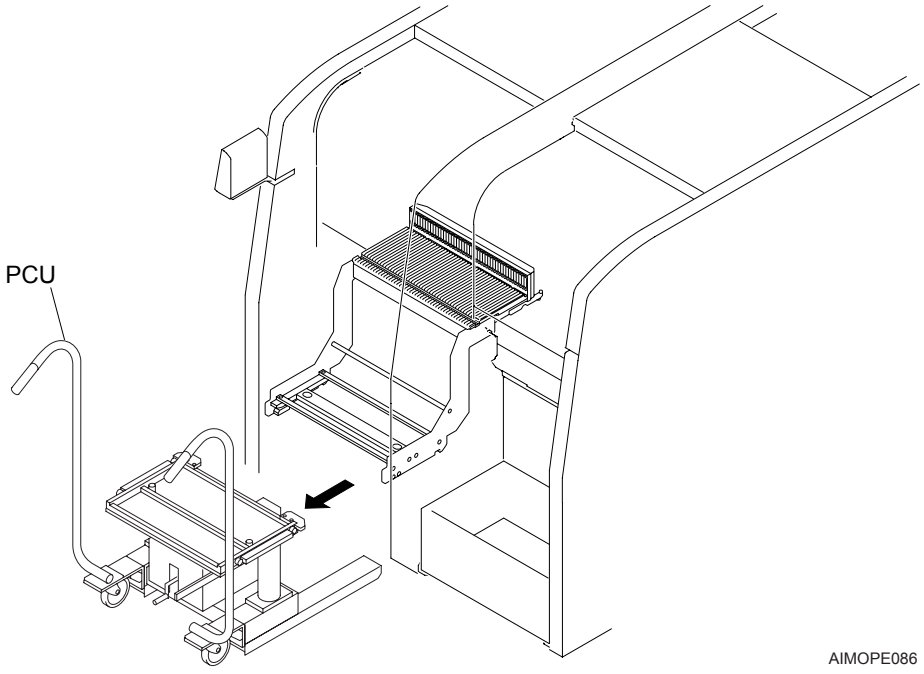


   d. Push OK.

9. Pull up the PCU lever to unclamp the feeder pallet.



10. Pull the PCU slowly to separate it from the feeder pallet.



11. Fix the PCU in position by locking the casters.

12. Attach the waste tape box to the machine.

5.2 Removing/Attaching a Tray Unit-L

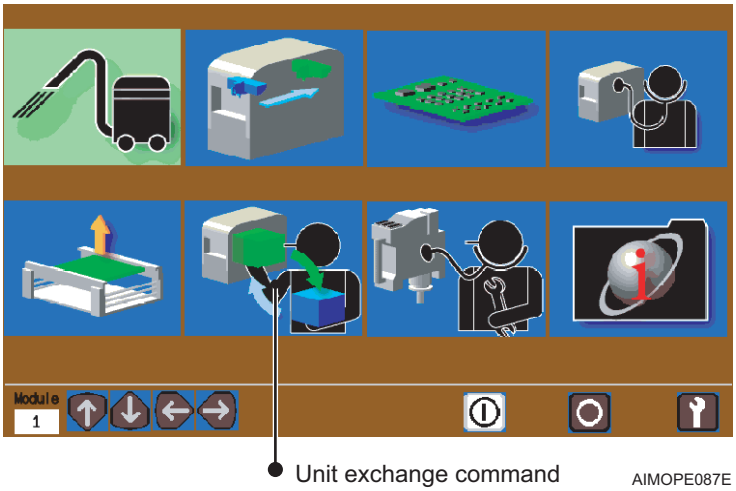
The tray unit-L can be easily removed from the machine (module) in order to be replaced with a feeder pallet and so forth.

⚠CAUTION

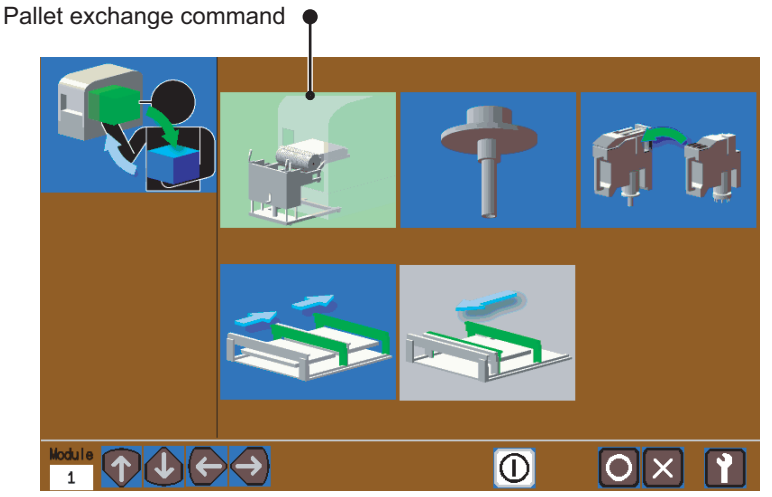
- ***Do not move the tray unit-L or attach/remove it from a module when tray parts are set in the drawers inside the unit. It is possible that the parts will shift or be jarred from their tray cavities.***
- ***Be gentle when attaching or removing the tray unit-L so as to not shock the mechanical components. It is possible that machine damage may occur under such circumstances.***
- ***In order to avoid interference with the machine engineering panel rack when attaching or removing the tray unit-L, raise the rack or slide it to the left or right.***

5.2.1 Removal procedure

1. Stop the machine (module).
2. Push MANUAL to display the manual commands.
3. Use the arrow keys to select the unit exchange command and push OK.



4. Use the arrow keys to select the pallet exchange command.



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5. Push OK to unclamp the tray unit-L.
6. Release the caster brakes and gently pull the tray unit-L away from the machine (module).
7. Lock the casters to prevent the tray unit-L from moving accidentally.

Tray unit-L removal with the power off

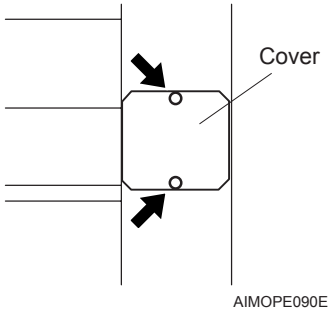
Use the following procedure to remove the tray unit-L when power to the machine is off.

⚠CAUTION

• Use the method described here to open the air valves and remove the tray unit-L only when it is not possible to turn ON the machine power. These air valves should never be used under normal circumstances.

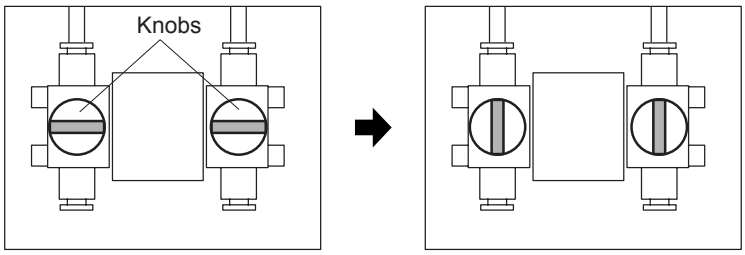
• Return the air valves to their original positions (closed) after the tray unit-L has been removed.

1. Remove the cover from the side of the module from which the tray unit-L is to be removed.



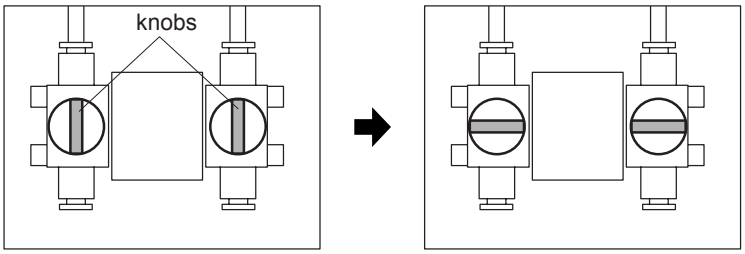
AIMOPE090E

2. Rotate the air valve knobs (2) to release the air.



AIMOPE091E

3. Pull out the tray unit-L slowly from the machine (module).
4. Return both air valve knobs to their original positions and reattach the cover.



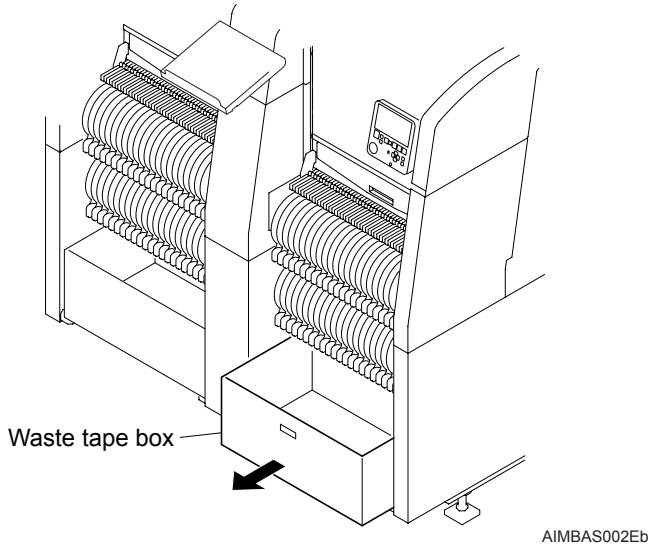
AIMOPE092E

5.2.2 Attachment procedure

Pre-attachment preparations

When using the tray unit-L, attach together with any tape part related devices (waste tape box, reject parts box, waste tape duct etc.). The parts camera should also be reattached on the right side of the machine.

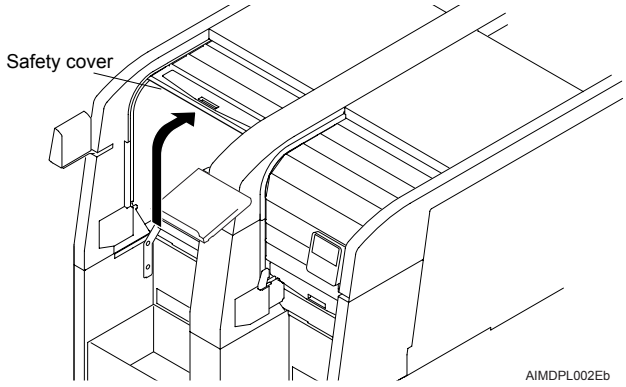
1. Take out the waste tape box.



2. Raise the safety cover.

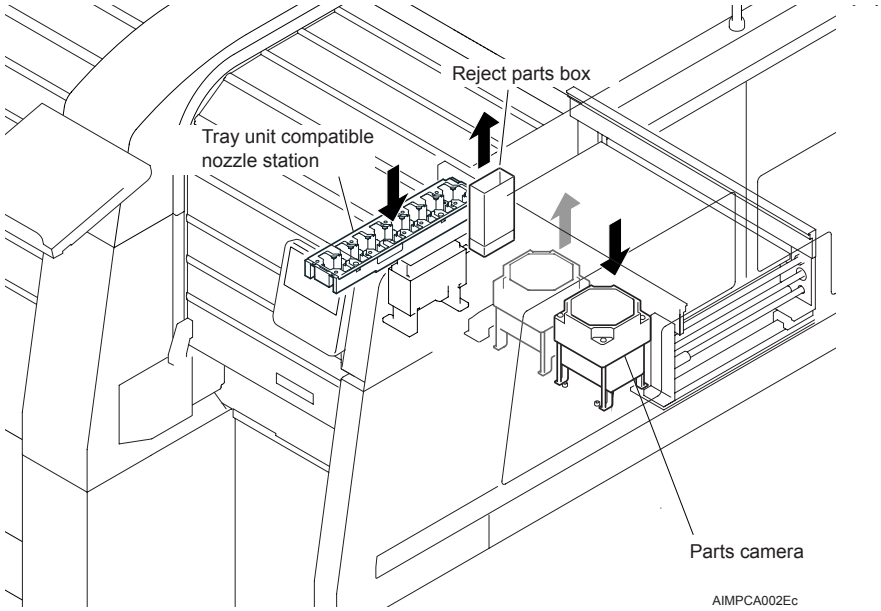
⚠*CAUTION*

Raise the safety cover fully to the top. The cover may slide down if the door is not fully open.



3. Remove the reject parts box.
4. Replace the nozzle station to the one for tray unit-L. (See section 5.4 "Removing/ Attaching a Nozzle Station" for details.)

5. If the parts camera is located in the center of the inside of the module, remove and then reattach on the right side of the machine. (Refer to section 8.1 "Parts Camera Replacement" for details.)
6. Remove the waste tape duct.
   (Refer to sections section 5.5.3 "Waste tape duct and cover" for details.)

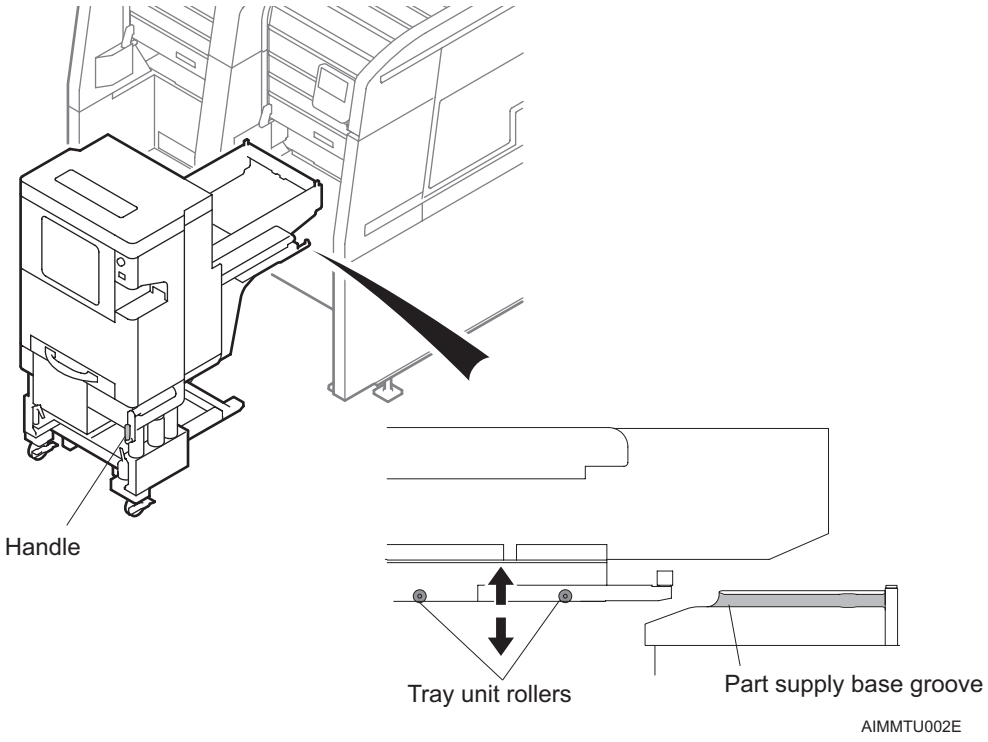


Attaching the tray unit-L

1. Attach the tray unit-L facing the machine (module).
2. Align the tray unit-L rollers with the parts supply base guides and then push the tray unit-L firmly until it contacts the stoppers inside the machine. The tray unit-L will then be automatically clamped by the machine.

⚠WARNING

When pushing the tray unit-L into the machine, ensure that no one is between the tray unit-L and machine. A person could be seriously injured or crushed to death if caught between the tray unit and machine.

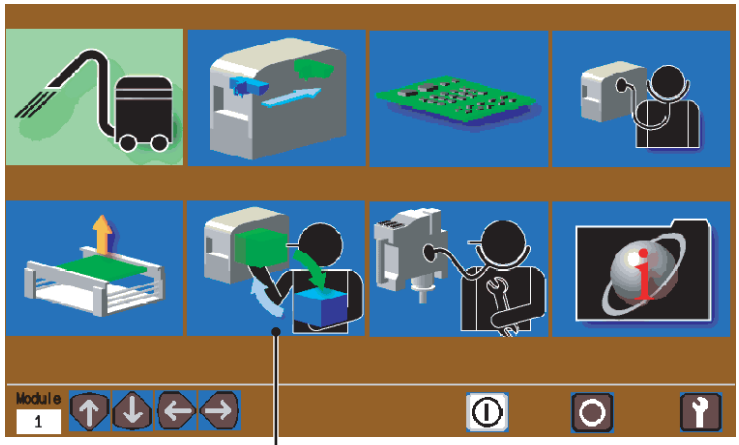


5.3 Removing/Attaching a Placing Head

Placing heads should be used with a nozzle station that is compatible with the placing head. (Refer to section 2.2 "Placing Head Components", 2.9 "Nozzle Changer Components".)

5.3.1 Removal procedure

1. Stop the machine (module).
2. Push MANUAL to display the manual commands.
3. Use the arrow keys to highlight the unit exchange command and push OK.



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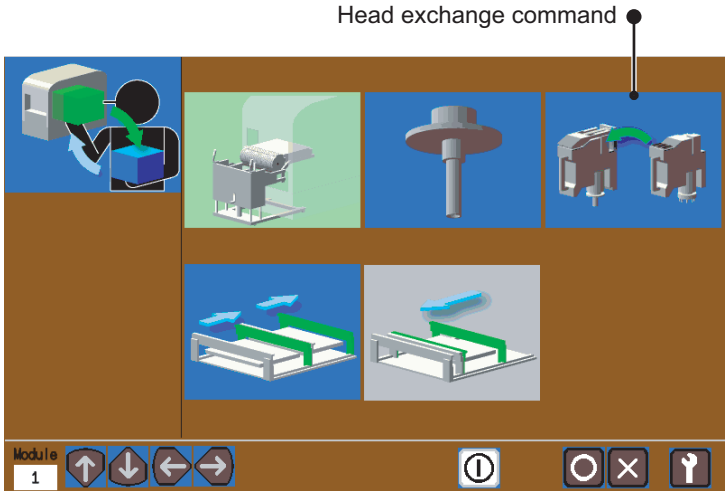
4. Use the arrow keys to highlight the head exchange command.



AIMOPE076E

5. Push START and the head moves to the removal position and power to the head is turned off.

Note: If a tray unit-L is attached to the module, the guidance screen changes to display guidance for removing the tray unit-L at this point. Follow the instructions to remove the tray unit-L.

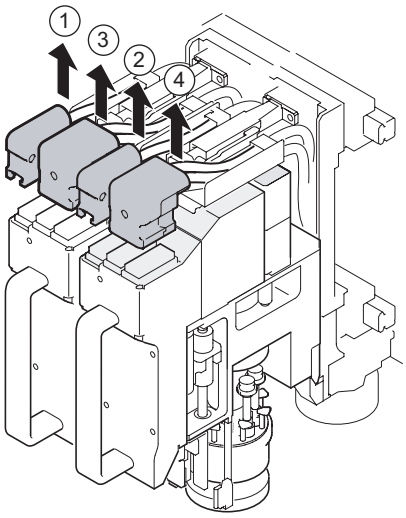
6. Raise the safety cover.

⚠CAUTION

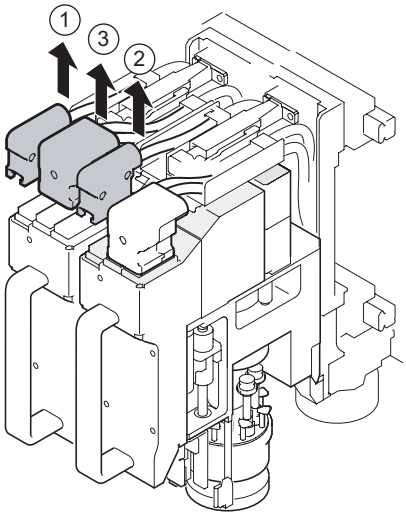
Raise the safety cover fully to the top. The cover may slide down if it is not fully open.

7. Disconnect the connectors from the head. The numbers in the diagram below show the order in which the connectors should be removed.

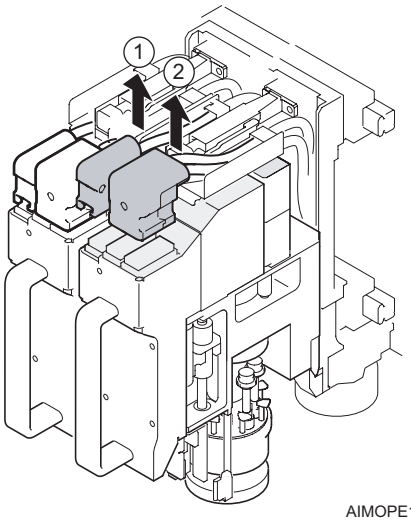
<When removing heads 1 and 2>



<When removing head 1 only>



<When removing head 2 only>



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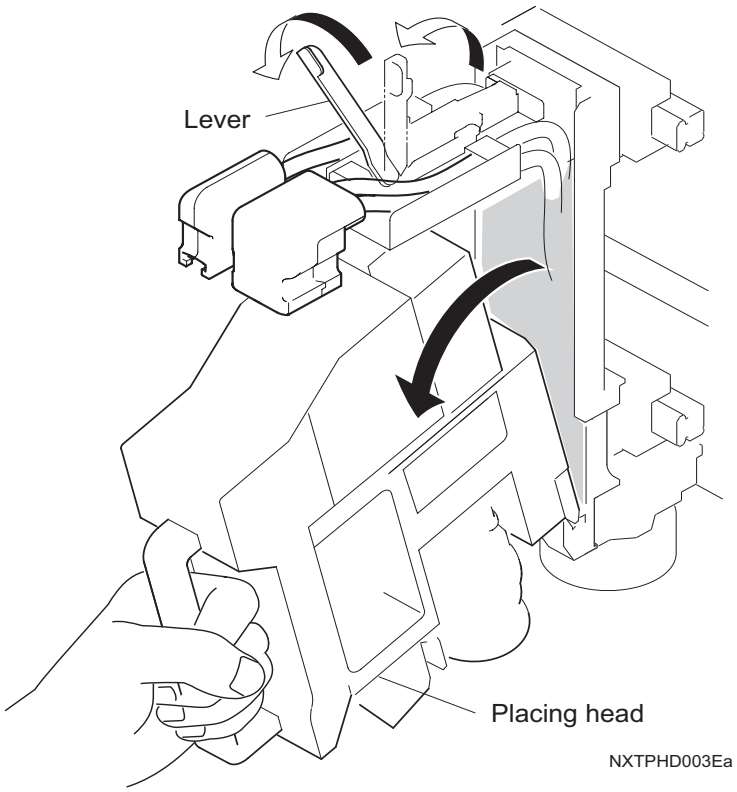
8. Raise the lever and push to the left. Holding the handle, gently remove the head as shown in the illustration below.

Note: When the placing head cannot be detached from the holder smoothly due to residual vacuum inside of the head, slightly slide the head upward to release the vacuum.



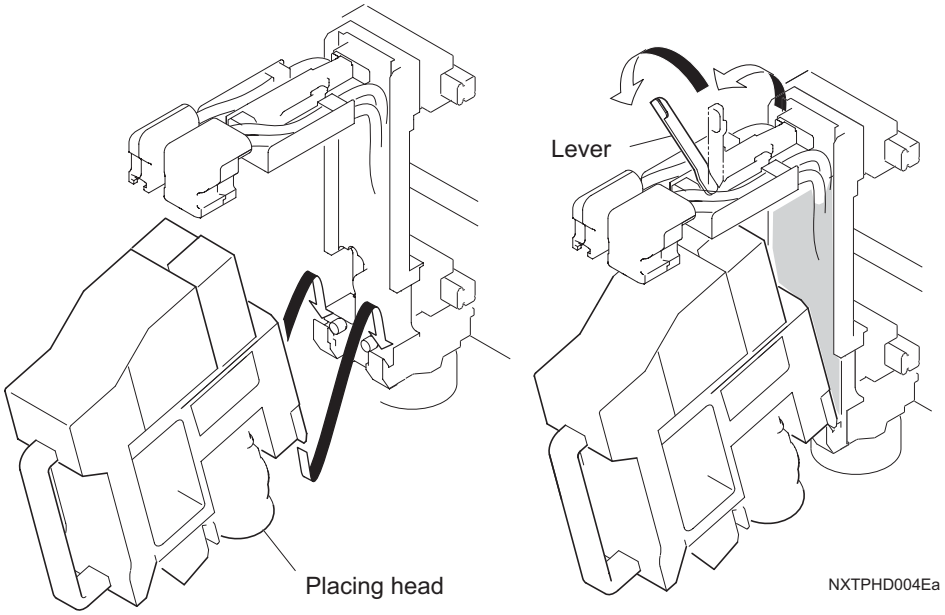
Note: Set the removed head in the optional head maintenance stand in order to prevent damage when working on the head.

5.3.2 Attachment procedure

1. Turn off the power to the head using the head exchange command, or turn off the power to the machine (module). (See the AIM System Reference manual for details.)
2. Raise the safety cover.

> ***⚠CAUTION***
>
> ***Raise the safety cover fully to the top. The cover may slide down if it is not fully open.***

3. Ensure that there is no objects or dust on the attaching surface of the placing head and the holder. Use a dry cloth to remove any foreign objects.
4. Hold the handle of the new placing head and hook the lower corner of the placing head on the XY-robot holder. And while holding the lever down to the left, push the head into position and release the lever.



5. Prepare a nozzle station that is compatible with the attached head.
6. Set the appropriate nozzle jigs in a nozzle station and set the station in the module. Refer to section 5.3.3 "Setting nozzle jigs" for more detale.

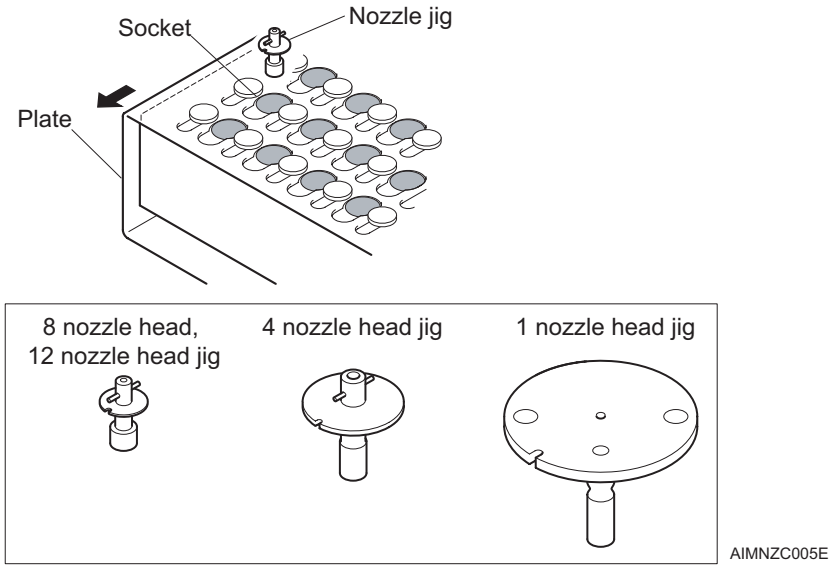
Note: Nozzle jigs are required when the head is exchanged because it is necessary to perform autocalibration. Set the nozzle jigs at the same time as putting on the head. Even if the same head type is put on the machine autocalibration is still required because the serial number is different. The only time it is not necessary to set nozzle jigs is if the same head is put back on the module.

7. Close the safety cover.

5.3.3 Setting nozzle jigs

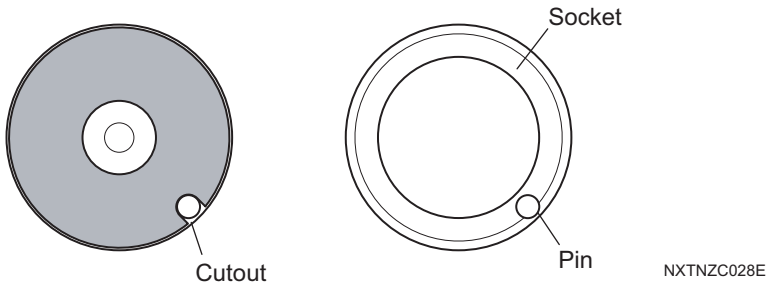
Prepare a nozzle station that is compatible with the placing head to be attached. Set the same number of nozzle jigs in the nozzle station as there are holders on the head. Follow the procedures below to set the nozzle jigs in the nozzle station.

1. Remove the nozzle station from the module.
2. Slide the plate on the prepared nozzle station and insert the same number of nozzle jigs as there are holders on the head into the nozzle station. The actual position for the nozzle jigs is not important as long as the quantity is correct.

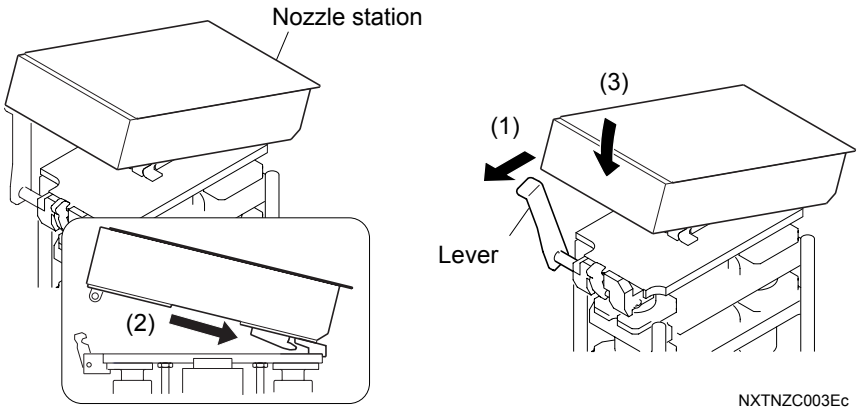


⚠ CAUTION

When setting nozzles in the nozzle station, align the cutout on the nozzle with the alignment pin in the nozzle station and make sure that the pin goes into the cutout. If they are not aligned, nozzle exchange errors occur.



3. When attaching the nozzle station, pull the lever on the left side in the direction indicated by the arrow at (1) below, seat the projection at the rear of the nozzle station onto the nozzle changer, and then push on the front part of the nozzle station.



⚠ *CAUTION*

Be careful to not put your hands underneath the nozzle station when setting it in the machine.

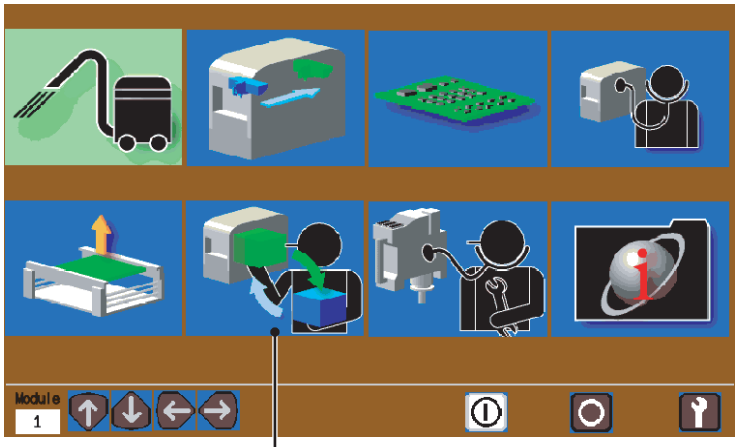
4. Return the lever back to its original position.
5. Confirm that the nozzle station is fully seated on the nozzle changer.

5.4 Removing/Attaching a Nozzle Station

Placing heads should be used with a nozzle station that is compatible with the placing head. (Refer to section 2.2 "Placing Head Components", 2.9 "Nozzle Changer Components".)

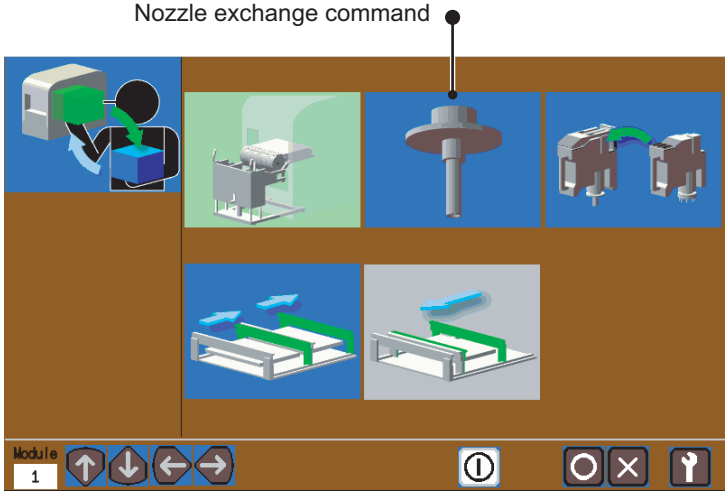
5.4.1 Removal procedure

1. Stop the machine (module).
2. Push MANUAL to display the manual commands.
3. Use the arrow keys to highlight the unit exchange command and then push OK.



AIMOPE075E

4. Use the arrow keys to highlight the nozzle exchange command.



AIMOPE077E

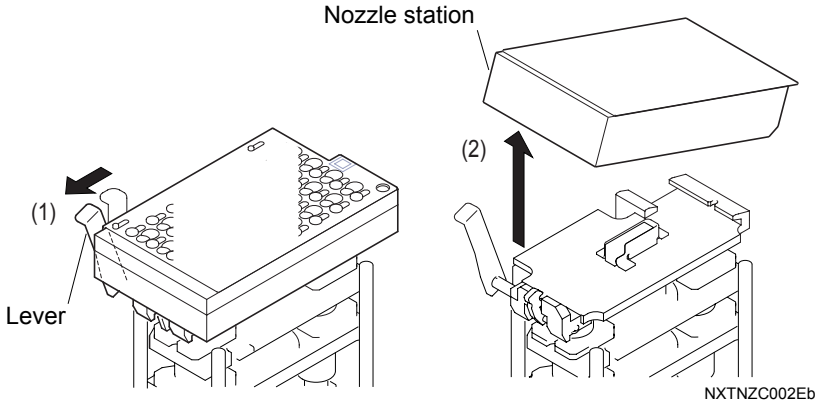
5. Push START and nozzles on the head are automatically ejected to the nozzle station.

Note: If a tray unit-L is attached to the module, the guidance screen changes to display guidance for removing the tray unit-L at this point. Follow the instructions to remove the tray unit-L.

6. Raise the safety cover.

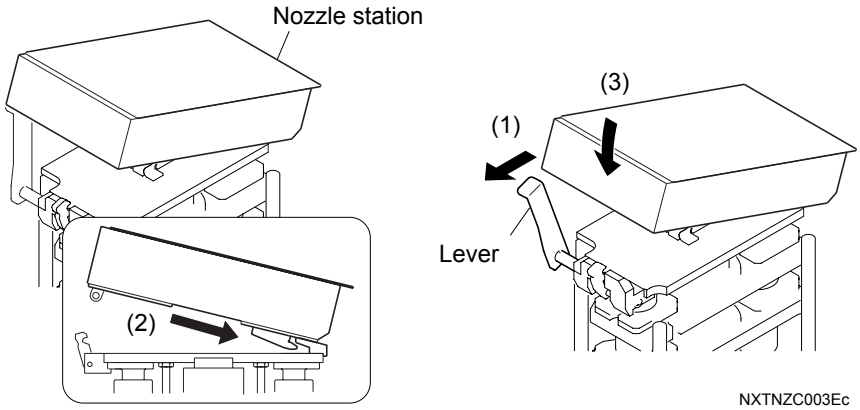
> ⚠ ***CAUTION***
>
> ***Raise the safety cover fully to the top. The cover may slide down if the door is not fully open.***

7. Move the lever on the left side of the nozzle station frontwards and pull upwards on the front half of the nozzle station to remove it.



5.4.2 Attachment procedure

1. Ensure that there is no objects or dust on the attaching surface of the placing head and the holder. Use a dry cloth to remove any foreign objects.
2. Move the lever frontwards and insert the rear bottom of the nozzle station to the nozzle changer. Then push the front top of the nozzle station downwards to seat it.



3. Return the lever back to its original position.
4. Confirm that the nozzle station is fully seated on the nozzle changer base.
5. If the fiducial marks (2 places) on the nozzle station are dirty, use a dry cloth to carefully clean them.

5.5 Removing/Attaching Tray Unit-Ms

It is possible to set one or two tray unit-Ms on the feeder pallet.

⚠CAUTION

• Do not move the tray unit-M or attach/remove it from a module when tray parts are set in the drawers inside the unit. It is possible that the parts will shift or be jarred from their tray cavities. When using a PCU to carry a feeder pallet with a tray unit-M mounted on it, be careful to not dislodge any of the tray parts loaded in the tray unit.

• Be gentle when attaching or removing the tray unit-M so as to not shock the mechanical components. It is possible that machine damage may occur under such circumstances.

• Stop the machine before attaching or removing a tray unit-M. There is a possibility that the machine can be damaged if the tray unit-M is removed or attached while the machine is producing.

• It is necessary to set the parts camera in the middle of the module when using the tray unit-M.

5.5.1 Removing a tray unit-M

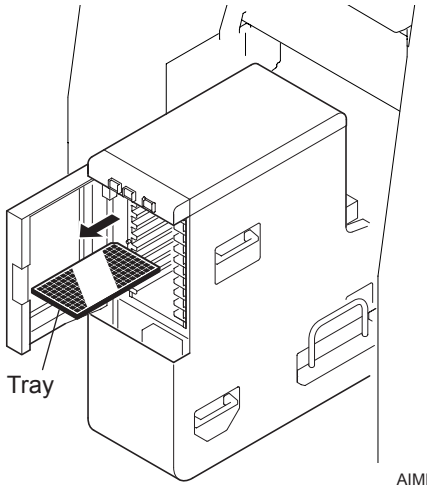
When one tray unit-M is set

1. Raise the safety cover.

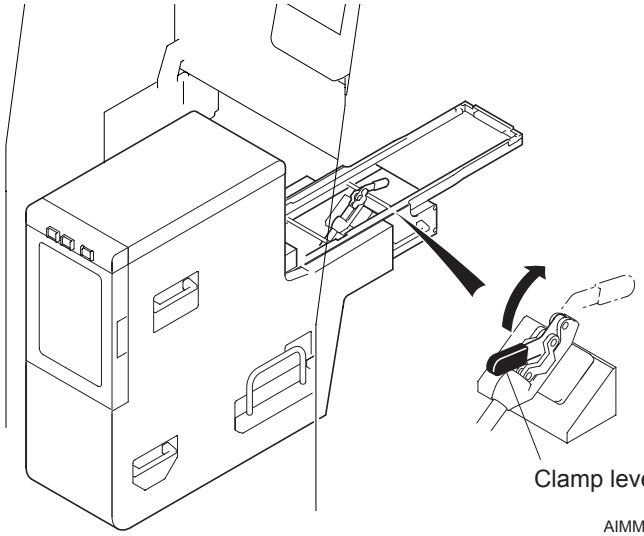
⚠CAUTION

Raise the safety cover fully to the top. The cover may slide down if the door is not fully open.

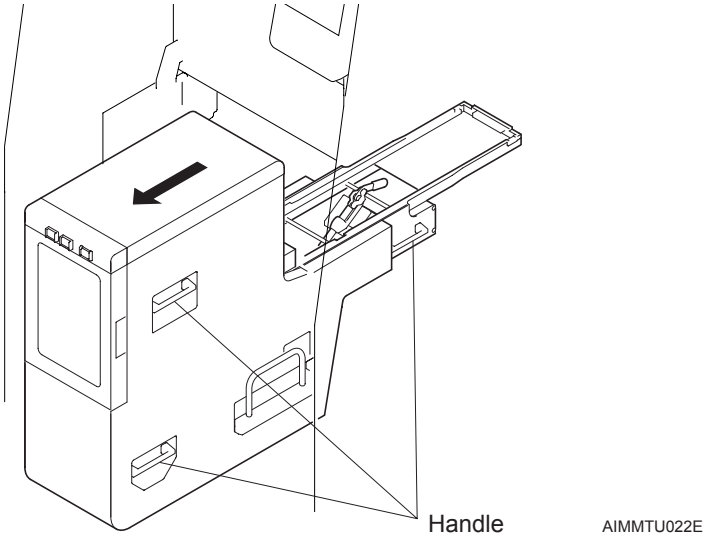
2. Open the door and then remove all trays set in the tray unit.



3. Raise the clamp lever to unclamp the tray unit-M.



4. Slowly pull out the tray unit-M from the module.



⚠WARNING

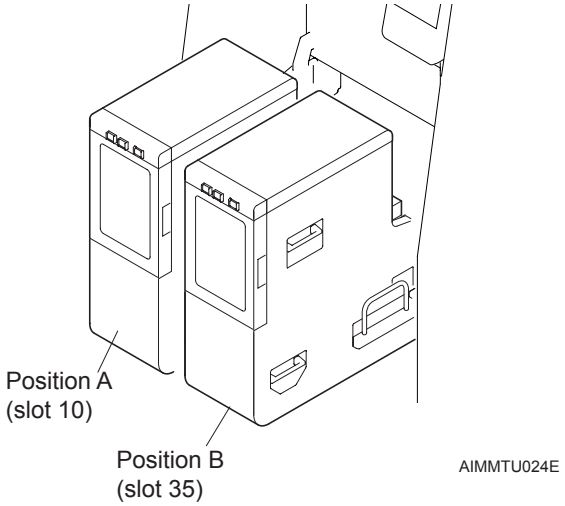
Use two or more people to lift, carry, and position the tray unit-M. Be sure to firmly grip the right and left handles. Injury and machine damage can occur if the tray unit is dropped.

⚠WARNING

Do not insert hands or other body parts in the side spaces between the feeder pallet and the tray unit-M. Failure to do so could result in injury.

This completes removal of the tray unit-M. Set the standard waste tape duct back in the module. Refer to section 5.5.3 "Waste tape duct and cover", 5.5.4 "Backet type tape holder" for details.

When two tray unit-Ms are set



The clamp lever operation is difficult and therefore two tray unit-M supply units should be removed while still mounted on the feeder pallet.

1. Use the PCU to remove the feeder pallet from the machine. (Refer to section 5.1 "Removing/Inserting a Feeder Pallet".)
2. Loosen the clamp lever and remove the two tray unit-M supply units from the feeder pallet. (Refer to section "When one tray unit-M is set".)

⚠WARNING

• Use two or more people to lift, carry, and position the tray unit-M. Be sure to firmly grip the right and left handles. Injury and machine damage can occur if the tray unit is dropped.

• Do not insert hands or other body parts in the side spaces between the feeder pallet and the tray unit-M. Failure to do so could result in injury.

This completes removal of the tray unit-M. Set the standard waste tape duct back in the module. Refer to section 5.5.3 "Waste tape duct and cover", 5.5.4 "Backet type tape holder" for details.

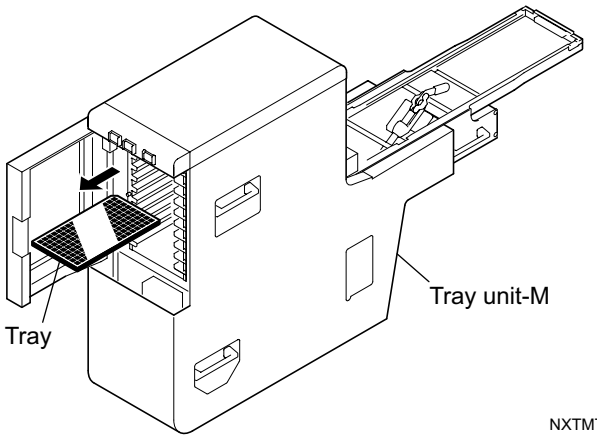
5.5.2 Attaching a tray unit-M

When one tray unit-M is set

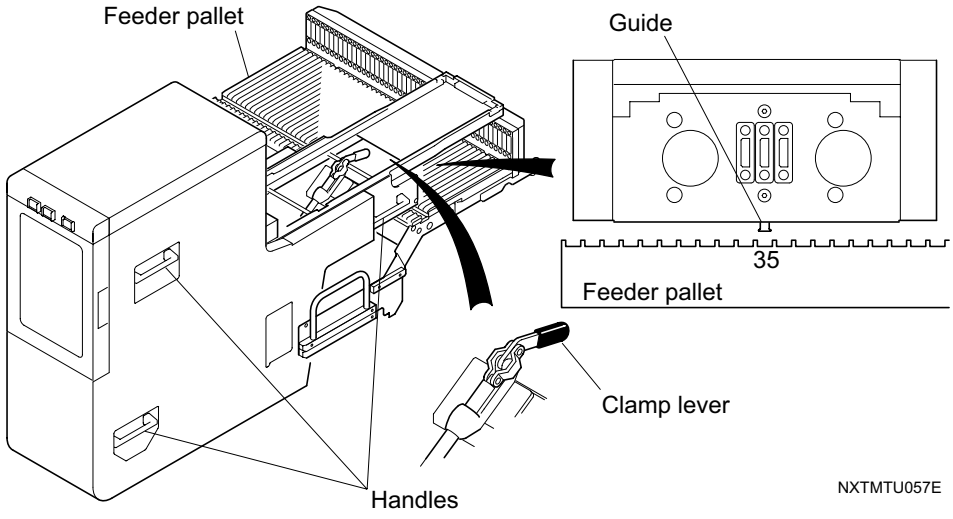
Change to the dedicated waste tape duct beforehand. (Refer to section 5.5.3 "Waste tape duct and cover".)

When using a bucket type holder on the feeder pallet, remove the roller assembly located on the right. (Refer to section 5.5.4 "Backet type tape holder".)

1. Prepare the tray unit-M by removing any trays that are in the unit.



2. Set the tray unit-M in the feeder pallet slot.
   a. Set the tray unit-M guides in slot 35.
   b. Then raise the clamp lever.

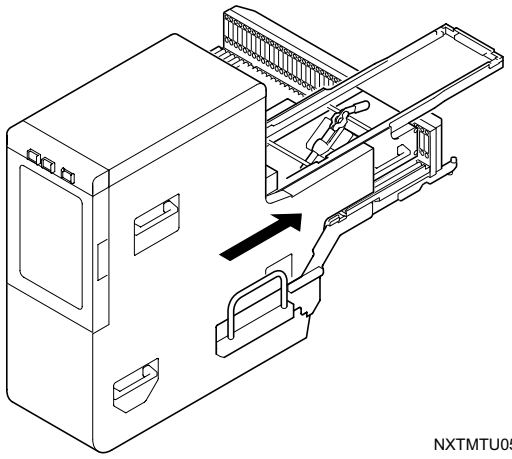


⚠ WARNING

• Use two or more people to lift, carry, and position the tray unit-M. Be sure to firmly grip the right and left handles. Injury and machine damage can occur if the tray unit is dropped.

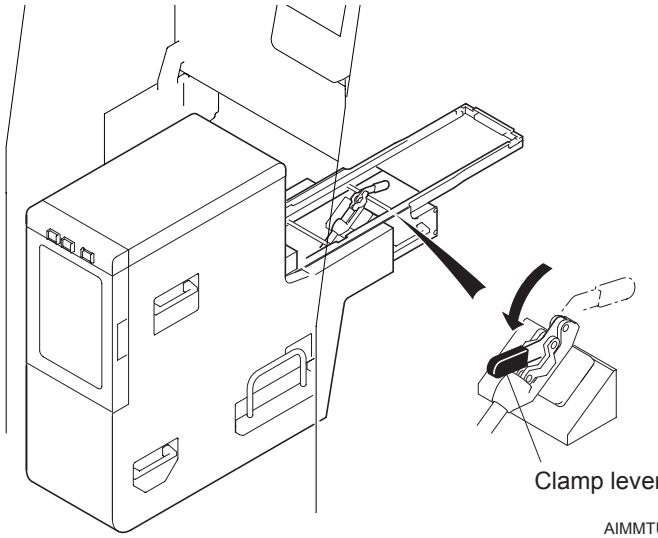
• Do not insert hands or other body parts in the side spaces between the feeder pallet and the tray unit-M. Failure to do so could result in injury.

3. In this condition, push the tray unit forward on the feeder pallet. Firmly push in the unit until the connectors between the tray unit and the feeder pallet are together.



NXTMTU058

4. Lower the clamp lever to fix the tray unit to the feeder pallet.



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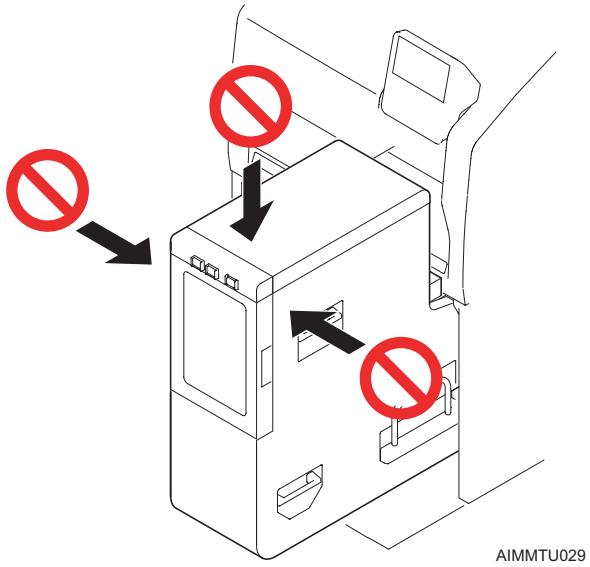
This completes attaching the tray unit to the module.

⚠ CAUTION

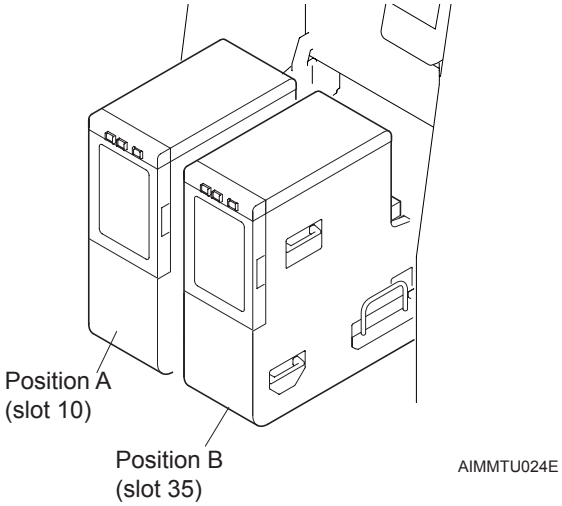
After mounting the tray unit-M in the module do not apply force through actions such as leaning and pushing against the top and sides of the tray unit-M to prevent from overloading the tray unit-M. This can affect the parts pickup and cause possible machine damage.



When two tray unit-Ms are set

Remove the waste tape duct beforehand and reattach to the dedicated cover. (Refer to section 5.5.3 "Waste tape duct and cover".)

When using a bucket type holder on the feeder pallet, remove the entire holder. (Refer to section 5.5.4 "Backet type tape holder".)



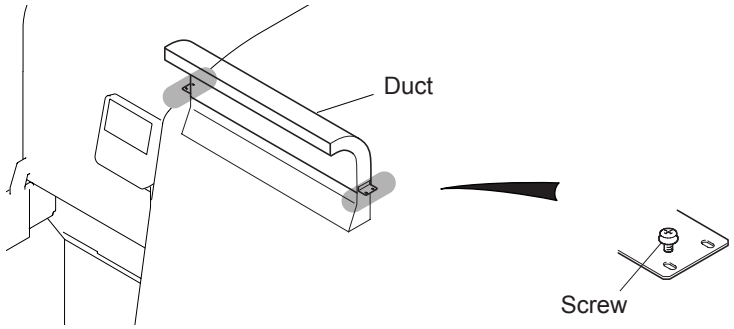
The clamp lever operation is difficult and therefore two tray unit-M supply units should first be attached to the feeder pallet outside the machine and then clamped.

1. Load the feeder pallet onto the PCU. (Refer to section 5.1 "Removing/Inserting a Feeder Pallet".)
2. Attach the two tray unit-M supply units to the feeder pallet and then tighten the clamp levers. (Refer to section "When one tray unit-M is set".)
3. Insert the two tray unit-M supply units together with the feeder pallet into the machine. (Refer to section 5.1 "Removing/Inserting a Feeder Pallet".)

5.5.3 Waste tape duct and cover

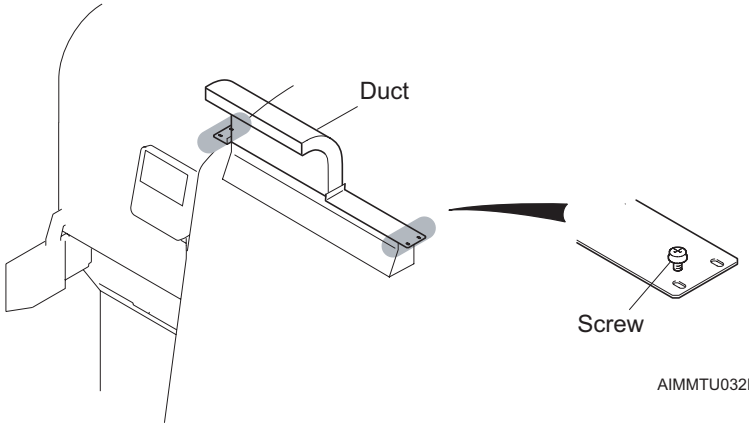
Use the procedures shown in the diagrams below to attach and remove the waste tape duct and cover.

Standard duct



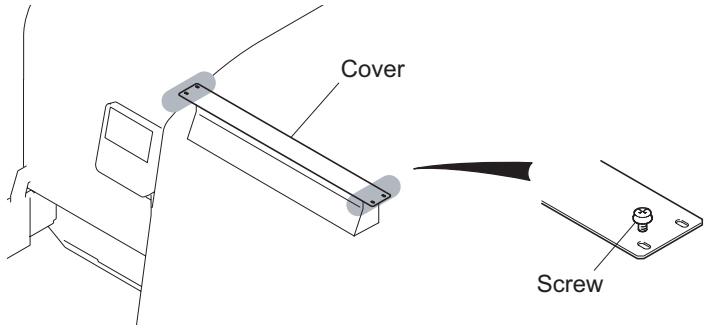
AIMMTU027E

Duct (used when one tray unit-M is set)



AIMMTU032E

Cover (used when two tray unit-Ms or one tray unit-L is set)



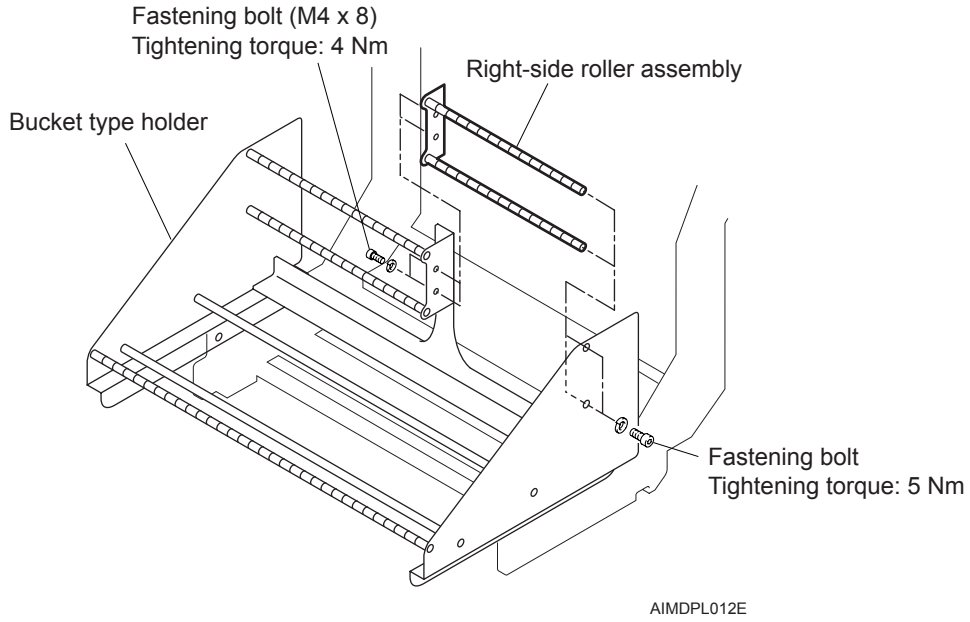
AIMMTU033E

5.5.4 Backet type tape holder

Use the procedures shown in the diagrams below to attach and remove the bucket type tape holder.

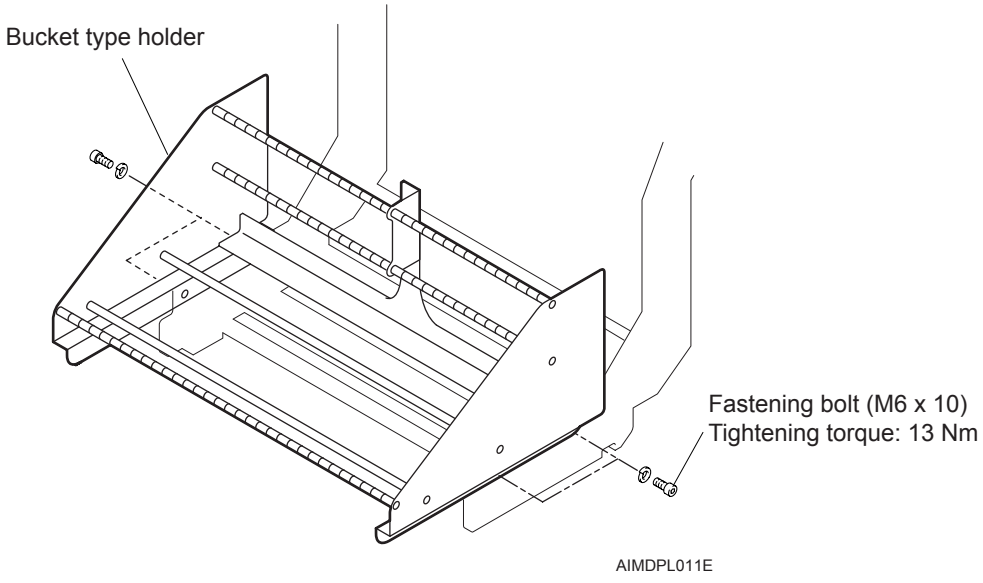
When one tray unit-M is set

It is necessary remove the right-side roller assembly from the main body of the holder when one tray unit-M is set.



When two tray unit-Ms are set

Remove the entire bucket type tape holder.



6. Preventive Maintenance

6.1 About Preventative Maintenance

Preventative maintenance involves such tasks as regular inspections, cleaning and lubrication, and is indispensable for the purpose of avoiding machine errors, and ensuring that the machine performs according to the design specifications. Please ensure to adhere strictly to the following guidelines when performing preventative maintenance procedures.

Note: The preventive maintenance items noted here are mainly directed towards maintenance staff, however, there are certain tasks whose responsibility lies with the operators.
This section lists only those maintenance items related to the machine itself. Please refer to the "FUJI Intelligent Feeder Manual" for details on feeder maintenance.

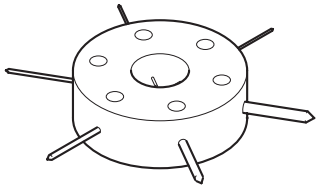
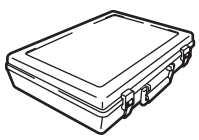
6.1.1 Maintenance frequency

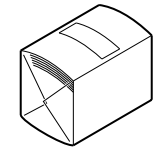
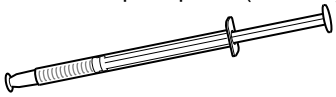
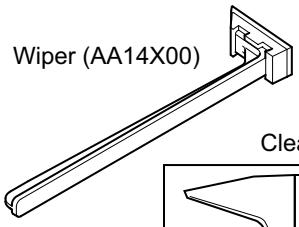
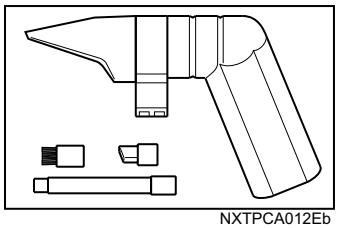
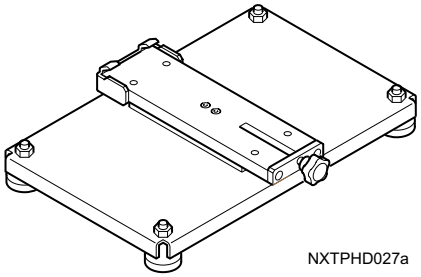
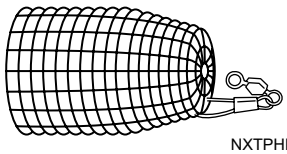
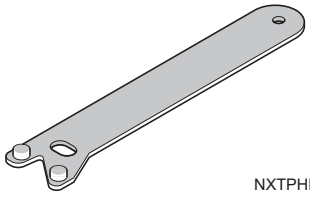
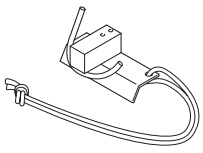
Fuji recommends that preventative maintenance tasks be performed at 1 day (24 hrs), 1 week (160 hrs), 1 month (700 hrs), 3 month (2000 hrs), 6 month (4000 hrs), 1 year (8000 hrs) and 12,000 hour intervals. Furthermore, it is also recommended that maintenance be performed periodically after long periods of continuous operation, and at those times when experiencing production related problems on the machine.

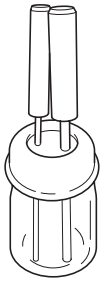
6.1.2 Points of caution

- Follow the prescribed procedures for performing preventative maintenance only after stopping the machine. At all other times, perform maintenance after turning OFF the machine power, disconnecting the air supply and releasing existing air from the air-hose.
- Do not direct compressed air inside the machine when performing maintenance, as scattered small chips or foreign objects may result in damage to the machine during operation.
- Use a cloth to wipe off any excess grease.

6.1.3 Required equipment

Jig	Nozzle cleaning drill AWPJ8100 	Used to clean the inside of nozzles
Jig	Fuji grease gun kit AWPJ8201 	Used to apply lubricant to grease fittings

Jig	Parts camera cleaning kit Cleaning paper (A4565T)  Vacuum pickup tool (A21010)  Wiper (AA14X00)  Cleaner (K3018H)  NXTPCA012Eb	Used to clean the parts camera glass
Jig	Head maintenance stand AA0AMO*  NXTPHD027a	Used to clean and lub the placing head
Jig	Filter cleaning basket K1325B  NXTPHD028	Used to clean the head filters.
Jig	1 nozzle head, Q-axis gear fixing jig PM28083  NXTPHD104	Used when removing the 1 nozzle head sleeve assembly.
Jig	Nozzle changer lubirication jig AA4CM0* 	Used when lubricating the nozzle changer without holes.

Jig	Syringe O-ring lubrication jig AA40R0*  NXTPHD122	Used to lubricate the O-ring in the syringe of the 4 head, 8 head, 12S heads.
Tools	Metric spanner set	-
	Metric Allen wrench set	-
Lubricants	Daphne Eponex No.2 (Idemitsu)	-
	Silicon grease MDV-ZB (Kuroda)	-
	Mobilith SHC100 (Mobil)	-
	LRL3	-
	AV2 (NSK)	-
	Biral T&D (Sugai Chemical Industry)	-
Other	Vacuum cleaner	-
	Cloth	Ensure to use a soft, clean cloth.
	Soft brush	-
	Vacuum pickup tool	For removing rejected parts
	Neutral detergent	Used to clean the conveyor belt
	Industrial ethanol	Used to clean nozzles
	Ultrasonic cleaner	Used to clean nozzle filters

6.2 Maintenance Checklist

Note: CLN: Indecates cleaning LUB: Indecates lubrication CHK: Indecates check.

Note: The times listed in this chart are only recommendations. Actual work time may differ. The time required for personnel to pull modules forward or load and unload units may add to the total work time required.

<Maintenance performed by operators when the machine is waiting to produce>

Maintenance Locations		Daily (24 hrs)	Weekly (160 hrs)	Monthly (700 hrs)	Every 6 months (4000 hrs)	Yearly (8000 hrs)	irregular	Time Required (min.)
Reject parts box	Remove parts	CLN						1
Waste tape box	Clean waste tepe box	CLN						1
Reject parts conveyor	Remove rejected parts						CLN *1	0.1
Tray unit-L	Remove rejected parts						CLN *1	0.1
	Remove empty trays						CLN *2	2

*1: Performed when the box is full of parts

*2: Performed when the box is full of trays

<Maintenance performed by maintenance personnel>

Maintenance Locations		Weekly (160 hrs)	Monthly (700 hrs)	Every 6 months (4000 hrs)	Yearly (8000 hrs)	12,000 hrs	irregular	Time Required (min.)
Nozzle							CLN *3	10
Nozzle changer	Nozzle station holders	CLN						5
	Up/down shafts				LUB			5
Feeder pallet	Feeder pallet	CLN						1
	Connector between pallet and part supply base						CLN *4	10
1 nozzle head	Q-axis gear					LUB		10
	Z-axis ball screw					LUB		10
	Z-axis LM guide					LUB		10
	Nozzle vacuum filter						CLN *5	10
	Replacing the clamp pins		CHK					5
	Flange filter		CLN					10
	Sleeve assembly			CLN				10

Maintenance Locations		Weekly (160 hrs)	Monthly (700 hrs)	Every 6 months (4000 hrs)	Yearly (8000 hrs)	12,000 hrs	irregular	Time Required (min.)
4 nozzle head	Z-axis ball screw					LUB		10
	Z-axis guide shaft					LUB		10
	Mechanical valve drive rollers					LUB		10
	Q-axis gear					LUB		5
	R-axis gear					LUB		5
	Mechanical valves					LUB		10
	Syringes, O-rings inside syringe		LUB					10
	Nozzle vacuum filter						CLN *5	20
8 nozzle head	Z-axis ball screw					LUB		10
	Z-axis guide shaft					LUB		10
	Mechanical valve drive rollers					LUB		10
	Q-axis gear					LUB		5
	R-axis gear					LUB		5
	Mechanical valves					LUB		10
	Syringes, O-rings inside syringe		LUB					10
	Nozzle vacuum filter						CLN *5	20
	Arm rotation axis			LUB				5
12 nozzle head	Z-axis ball screw					LUB		10
	Z-axis guide shaft					LUB		10
	Mechanical valve drive rollers					LUB		10
	Q-axis gear					LUB		5
	R-axis gear					LUB		5
	Mechanical valves					LUB		10
	Syringes, O-rings inside syringe		LUB					10
	Nozzle vacuum filter						CLN *5	20
	Arm rotation axis			LUB				5
Main conveyor	Panel clamp plate		LUB					10x2
	Ballscrews for width change					LUB		10x2
	Chain for width change					CHK		10x2
XY-robot	X-axis gear			LUB				2x2
	X-axis ball screw			LUB				5x2
	Y-axis ball screw			LUB				5x2
	X-axis LM guide			LUB				5x2
	Y-axis LM guide			LUB				5x2
Parts camera	Glass cover	CLN						2
	Glass inside light unit	CLN						2

Maintenance Locations		Weekly (160 hrs)	Monthly (700 hrs)	Every 6 months (4000 hrs)	Yearly (8000 hrs)	12,000 hrs	irregular	Time Required (min.)
Waste tape processing unit	Cutter						CLN *7	20
	Duct						CLN *8	15
Machine body	Inside module	CLN						2x4
	Air regulator				CLN			15
	Mist separator					CLN		15
	Vacuum pump filter					CLN		15
Reject parts conveyor	Conveyor belt		CLN					5
Tray unit-L	Reject parts conveyor belt		CLN					5
	Shuttle belt		CLN					5
	Air filter					CLN		5
	TZ-axis ballscrew					LUB		10
	Lifter gear					LUB		10
	Check the TZ-axis belt tension					CHK		10
	Check the TY-axis belts (for shuttle) tension					CHK		10
	Check the TY-axis belt (for motor gear) tension					CHK		10
Tray unit-M	Shuttle belts			CLN				5
	Magazine belts			CLN				10
	Tray stopper					LUB		10
	TY-axis clutch					LUB		10
	Check the TZ-axis belt tension (belt on the magazine side)					CHK		10
	Check the TZ-axis belt tension (motor side)					CHK		10
	Check the TY-axis belt tension (for the clutch)					CHK		10
	Check the TY-axis belt tension (motor side)					CHK		10

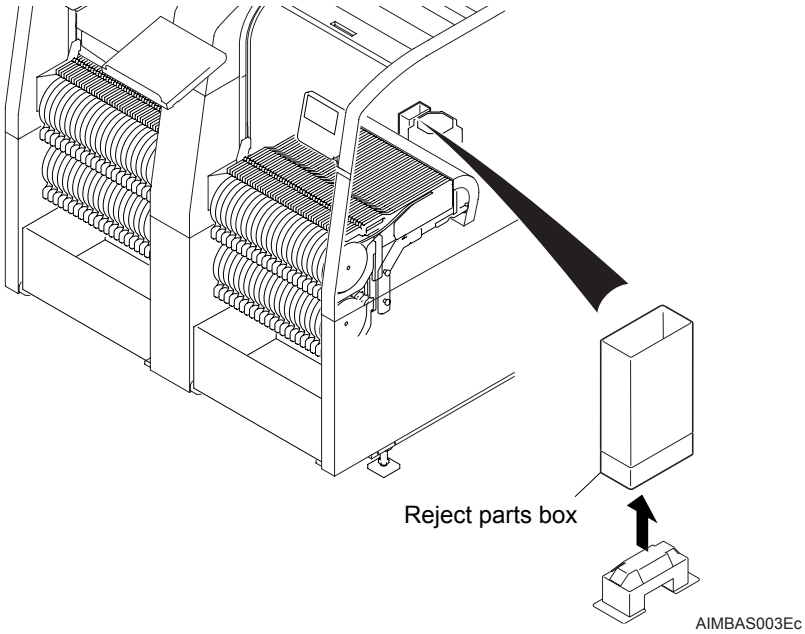
*3: Every 150,000 pickups or when a pickup error occurs
*4: When a pallet clamp error occurs
*5: When a nozzle vacuum pressure error occurs
*6: When a conveyor error occurs
*7: When a cutter operation problems occurs
*8: When a tepe feed error occurs

6.3 Daily Maintenance (Every 24 Hrs)

Perform cleaning in the following areas.

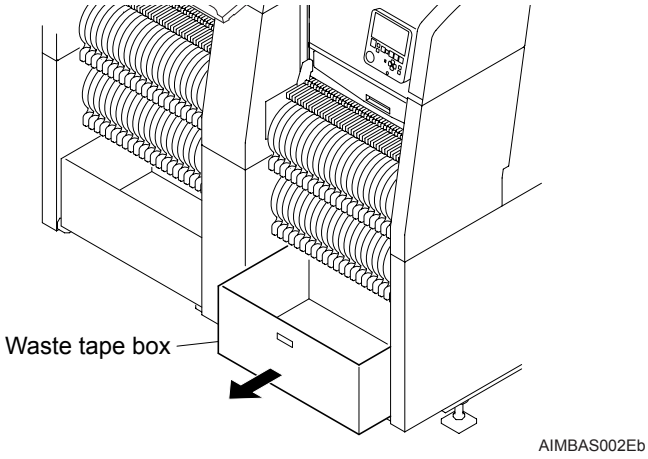
6.3.1 Cleaning the reject parts box

1. Pull out the feeder pallet and raise the safety cover. (See section 5.1 "Removing/ Inserting a Feeder Pallet" for details.)
2. Pull up and remove the reject parts box.
3. Empty the reject parts box.



6.3.2 Cleaning the waste tape box

1. Pull out the waste tape box.
2. Use a scissor to cut an excessive cover tape hanging over the tape feeder.
3. Empty the waste tape box.

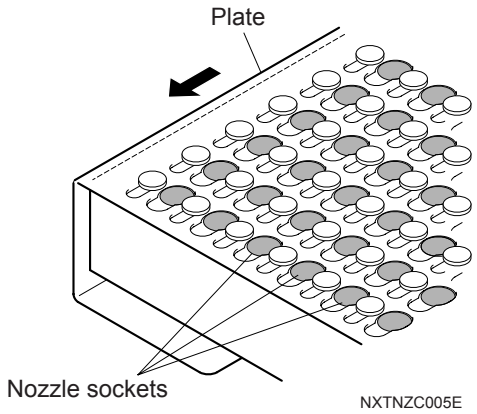


6.4 Weekly Maintenance (Every 160 Hrs)

Perform cleaning in the following areas.

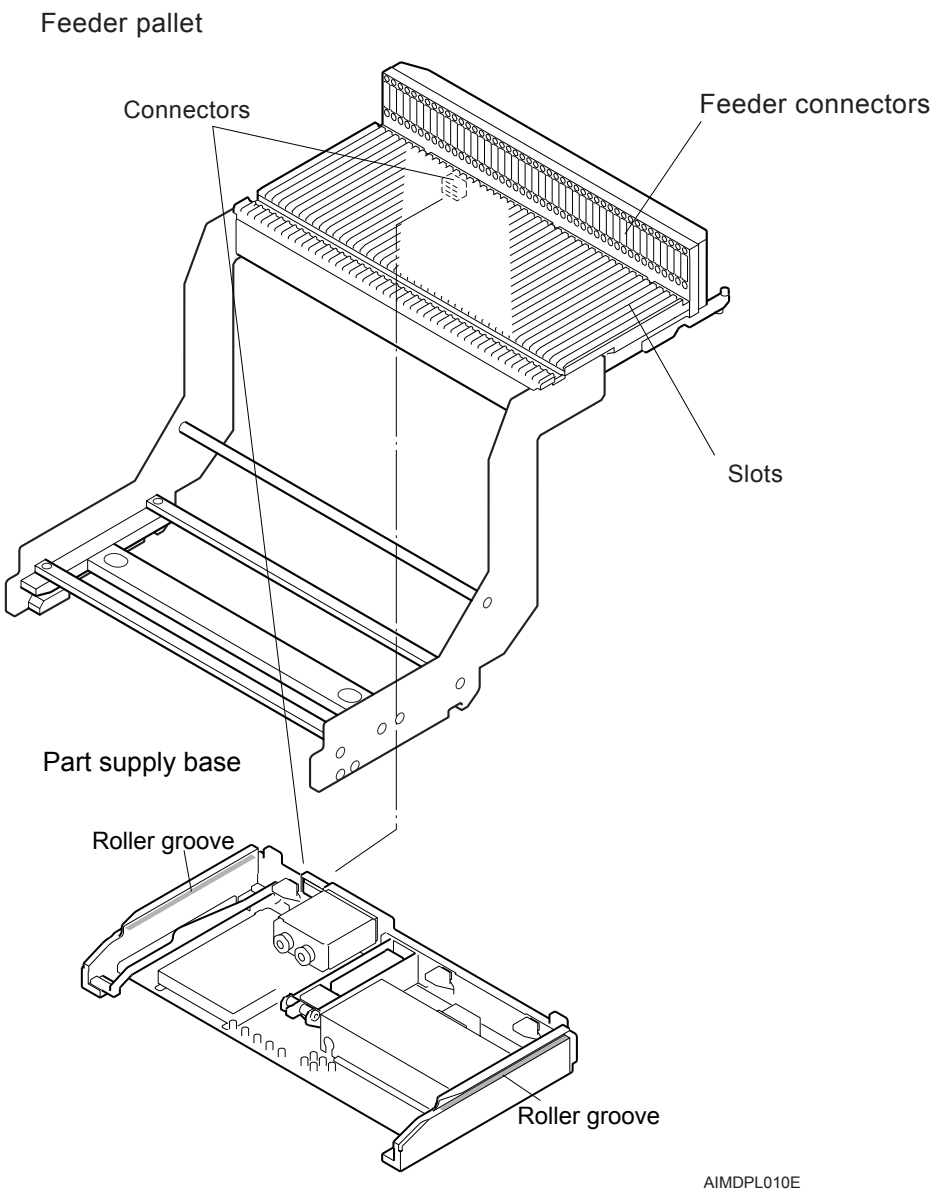
6.4.1 Cleaning the nozzle station

1. Pull out the feeder pallet and raise the safety cover. (See section 5.1 "Removing/ Inserting a Feeder Pallet" for details.)
2. Remove the nozzle station. (See section 5.4 "Removing/Attaching a Nozzle Station" for details.)
3. Slide the plate over and remove all nozzles.
4. Use a vacuum cleaner to remove any dirt or foreign objects from inside the nozzle sockets.



6.4.2 Cleaning the feeder pallet

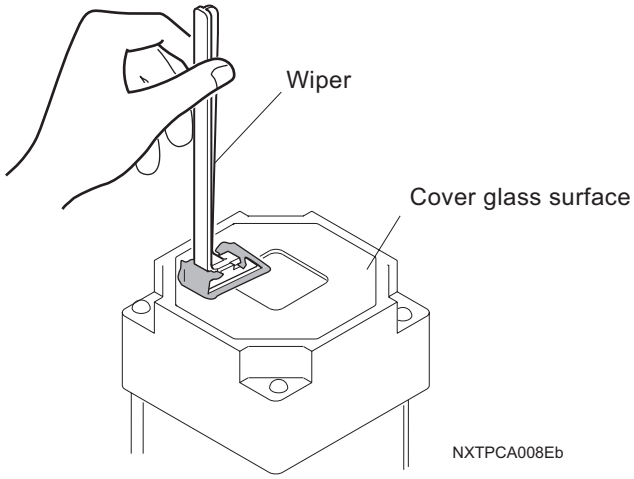
1. Remove the feeder pallet. (See section 5.1 "Removing/Inserting a Feeder Pallet" for details.)
2. Use a vacuum cleaner to remove foreign objects and dust from the feeder slots and pallet connectors. If necessary, use a soft brush to carefully remove any remaining items.
3. Use a vacuum cleaner to remove any foreign objects and dust from the connectors for the part supply base and the feeder pallet.
4. Ensure to clean any foreign objects or dust from the part supply base roller grooves prior to returning the feeder pallet to the machine.



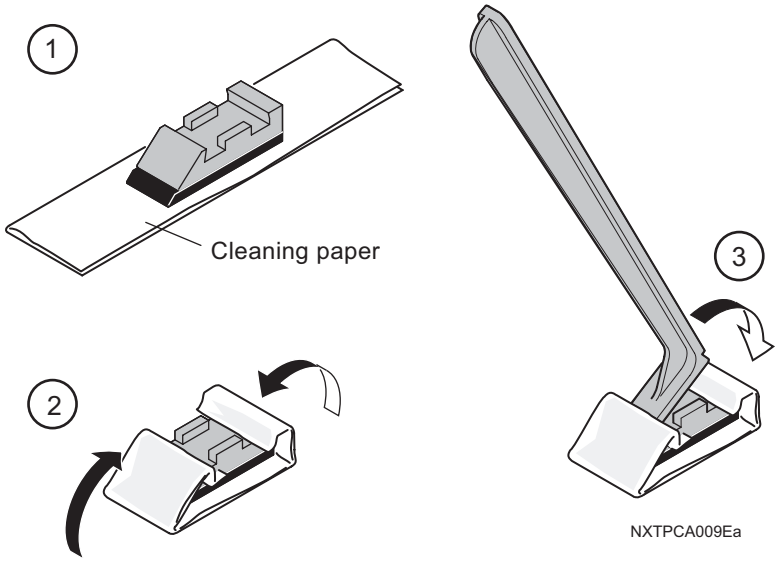
6.4.3 Cleaning the glass cover on the parts camera

1. Pull out the feeder pallet and raise the safety cover. (See section 5.1 "Removing/ Inserting a Feeder Pallet" for details.)
2. Set the wiper with a paper of the parts camera cleaning kit. Use it to remove any dirt or foreign objects from the glass cover.

Note: Do not apply too much pressure when cleaning the glass surface in order to avoid breaking the glass.



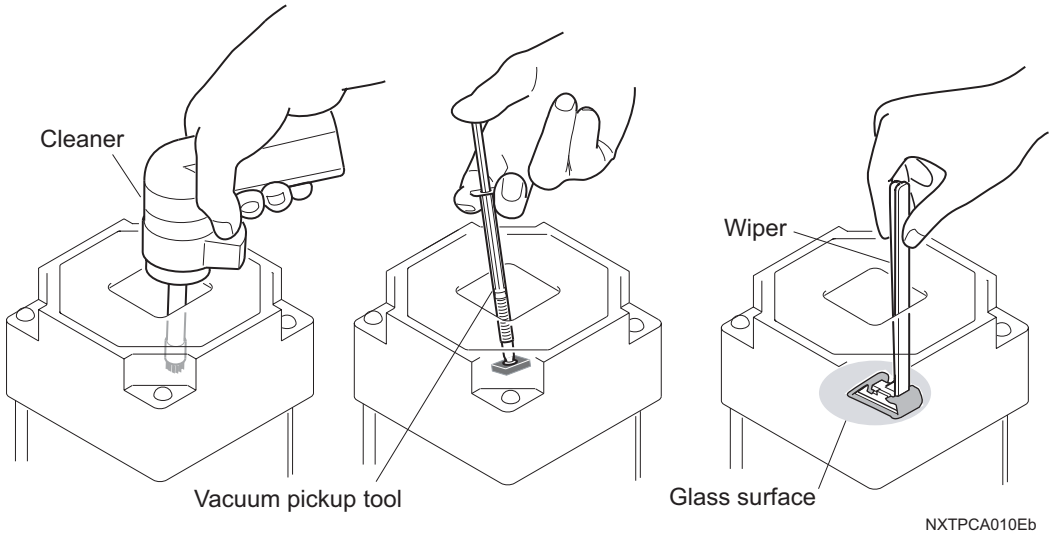
Note: Refer to the illustration below for setting the cleaning paper on the wiper.



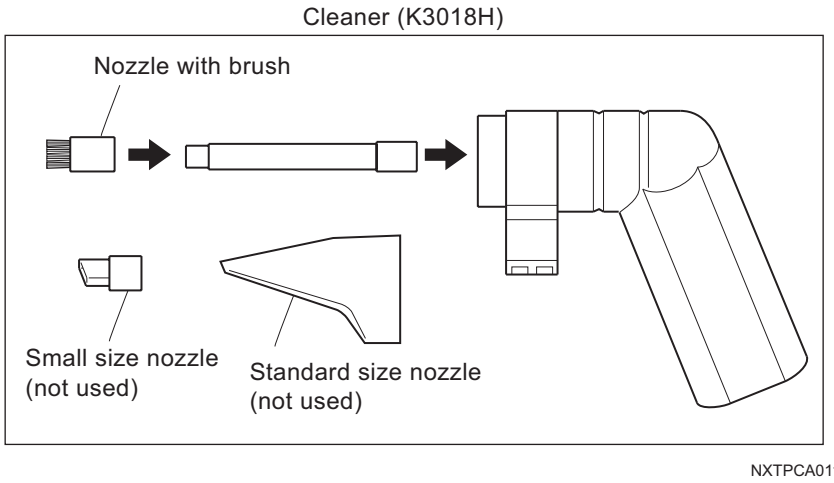
6.4.4 Cleaning the glass cover inside parts camera lighting unit

1. Pull out the feeder pallet and raise the safety cover. (See section 5.1 "Removing/ Inserting a Feeder Pallet" for details.)
2. Use the cleaner of the parts camera cleaning kit to remove any dirt or foreign objects from the glass cover inside the unit. Use the vacuum pickup tool for large objects that the cleaner could not remove.
3. Use the wiper with a cleaning paper to wipe off any dirt or stain on the glass cover.

Note: Refer to section 6.4.3 "Cleaning the glass cover on the parts camera" for setting the cleaning paper on the wiper.

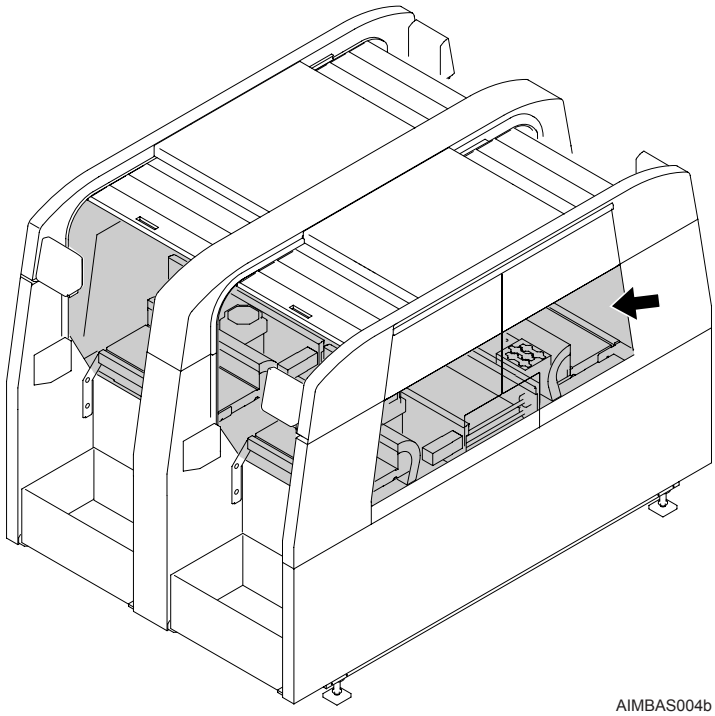


Note: Use the brush nozzle with the cleaner. Do not use other types of the nozzle, as it could damage the glass.



6.4.5 Cleaning inside the module

1. Pull out the feeder pallet and raise the safety cover. (See section 5.1 "Removing/ Inserting a Feeder Pallet" for details.)
2. Use a vacuum cleaner to remove any foreign objects or dirt scattered inside the module.
3. Use a dry cloth to carefully remove grease from areas other than those specified.



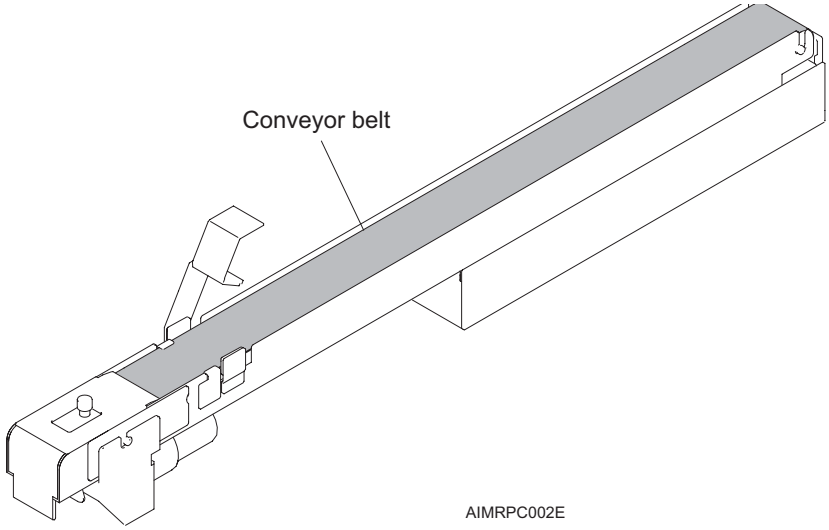
AIMBAS004b

6.5 Monthly Maintenance (700 Hrs)

Perform cleaning and lubrication in the following areas.

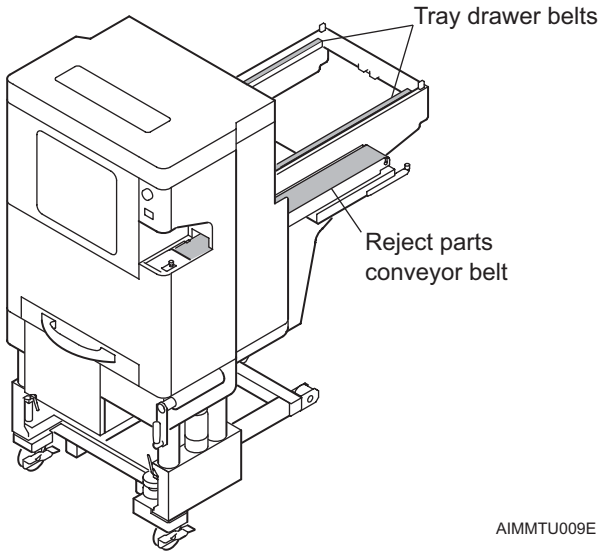
6.5.1 Cleaning the reject parts conveyor unit

1. Remove the reject parts unit. (See section 8.3 "Reject Parts Unit Replacement" for details.)
2. Clean the surface of the conveyor belt with a clean, dry cloth.



6.5.2 Cleaning the tray unit-L (reject parts conveyor belt, tray drawer belts)

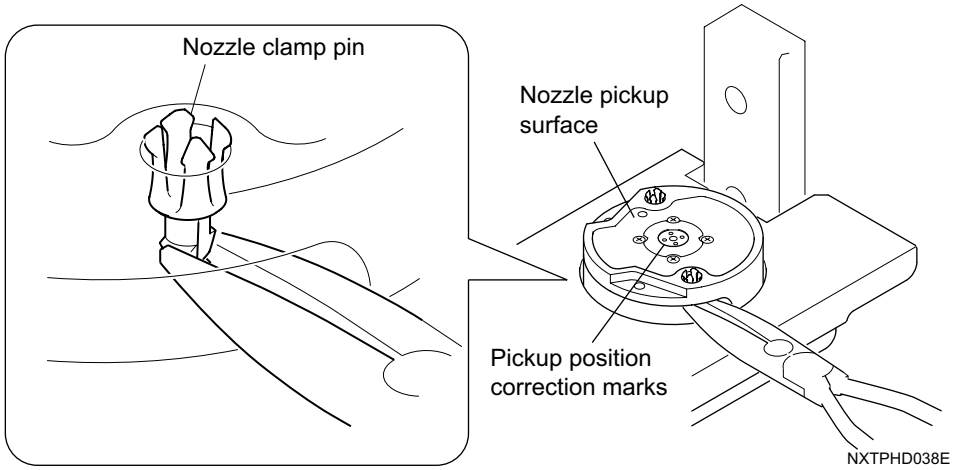
1. Remove the tray uniy-L. (See section 5.2 "Removing/Attaching a Tray Unit-L" for details.)
2. Clean the surfaces of the conveyor belts with a clean, dry cloth.



6.5.3 Nozzle clamp pin replacement and nozzle pick-up surface cleaning <1 nozzle head>

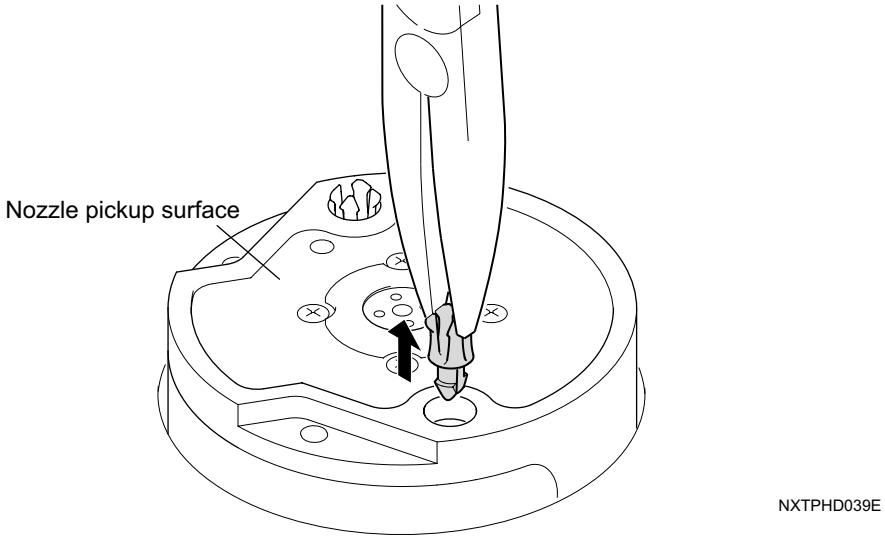
Inspect the nozzle clamp pins and replace if necessary.

1. Remove the placing head. (Refer to section 5.4 "Removing/Attaching a Nozzle Station" for details.)
2. Pinch the nozzle clamp pin fixing tabs with needle nose pliers to make removal easy.



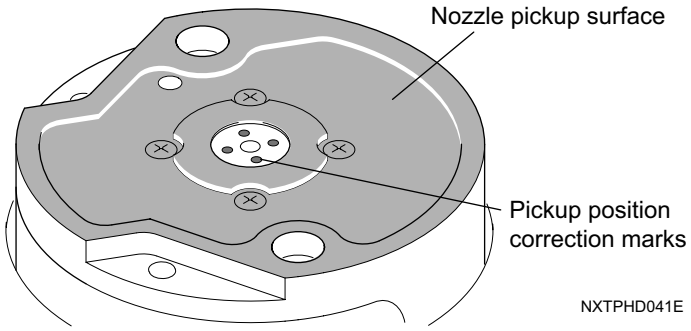
Caution: There are four marks for pickup position correction. Do not touch these marks.

3. Remove the nozzle clamp pin.



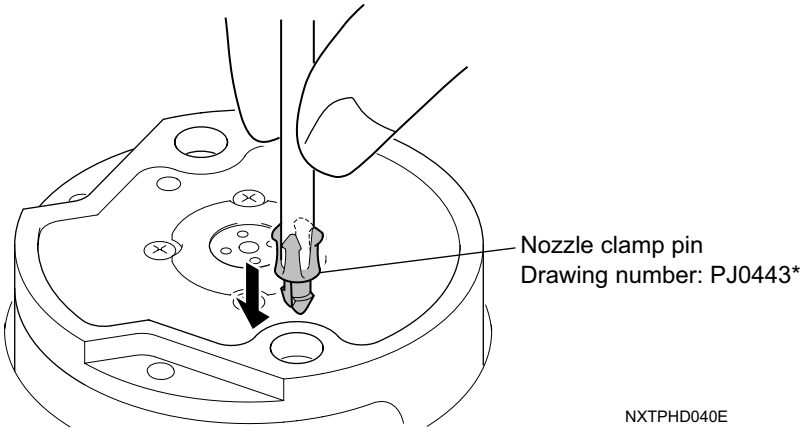
Caution: Be careful to not damage the nozzle pickup surface.

4. There are two pins used to clamp the nozzle. Repeat these procedures to remove the second pin.
5. Clean the nozzle pickup surface. Gently wipe with cleaning paper to remove items from the surface.



Caution: There are four marks for pickup position correction. Do not touch these marks.

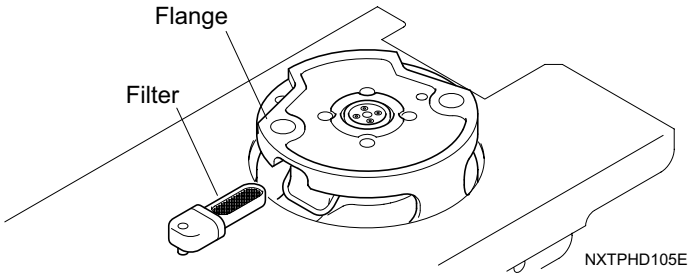
6. Attach the new nozzle clamp pins. Use an item that matches the inside diameter of the pin in order to be able to securely push in the pin into place.



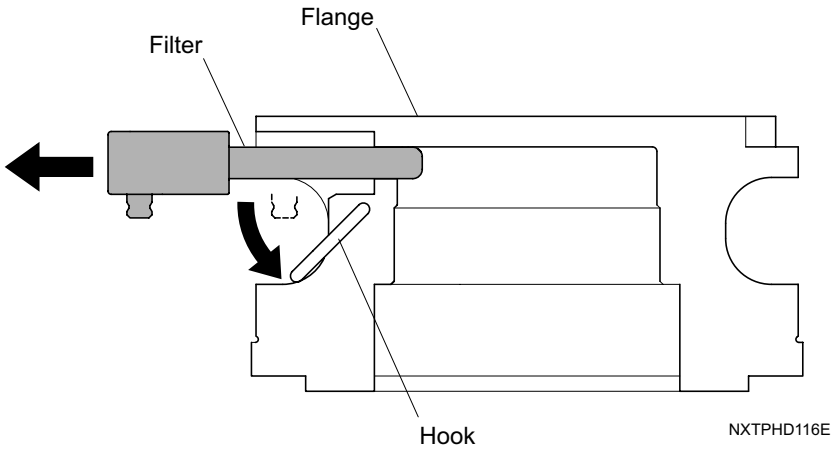
Caution: Be careful to not damage the clamp items on the clamp pins.

6.5.4 Cleaning the 1 nozzle head filter

For heads that do not have the filter in the flange unit, it is necessary to clean the sleeve assembly. Refer to section 6.6.1 "Cleaning the sleeve assembly <1 nozzle head>" for details.



1. Remove the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Remove the filter lock and then gently pull out the filter from the head.



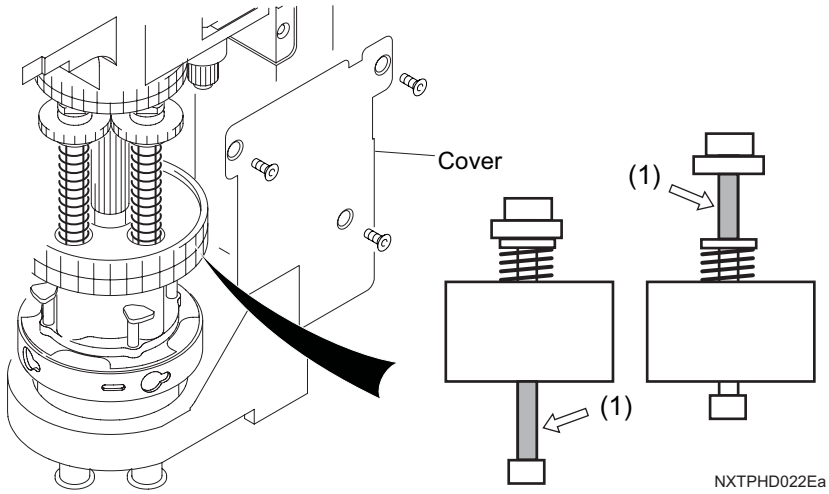
3. Use an air gun to clean the filter.

6.5.5 Syringes and o-rings inside syringe lubrication

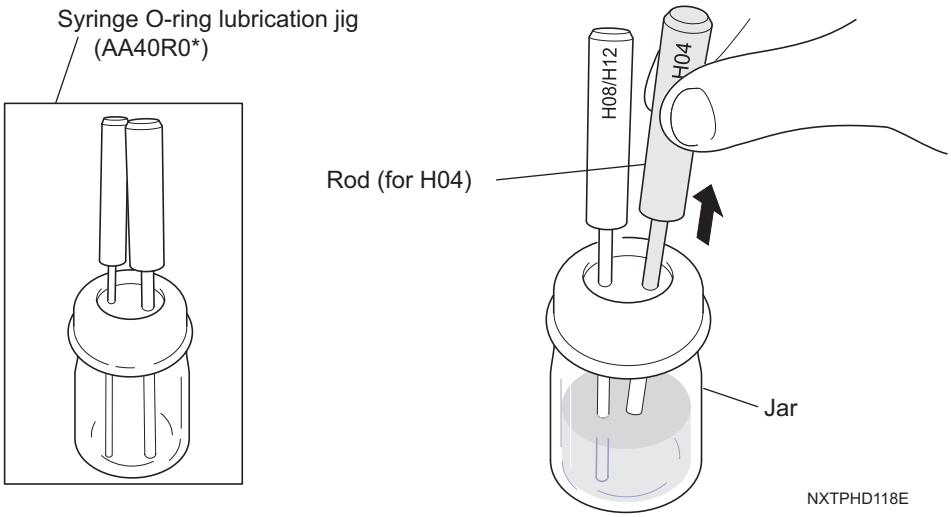
<1 nozzle head>

Required greases	Items used on
Biral T&D (Sugai Chemical Industry)	(1) Syringes
Daphne Eponex No.2 (Idemitsu)	(2) O-rings inside syringe

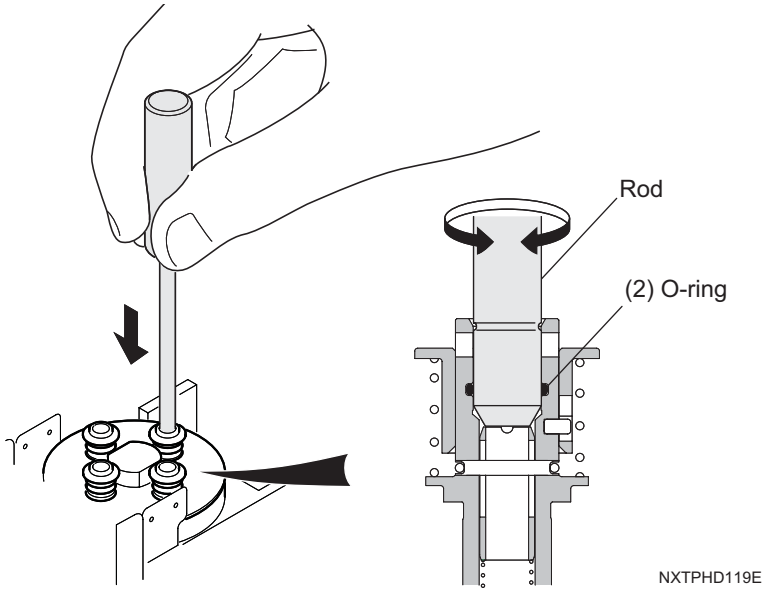
1. Remove the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Use a thin brush to apply a thin layer of the Biral T&D to the syringe.



3. Lubricate the O-ring in the syringes with Daphne Eponex No. 2 grease by following the steps below.
   a. Put the specified grease in the jar and then put the lid with the rods in it back on the jar.
   b. Remove the rod for lubricating the O-ring on the H04 head from the jig.

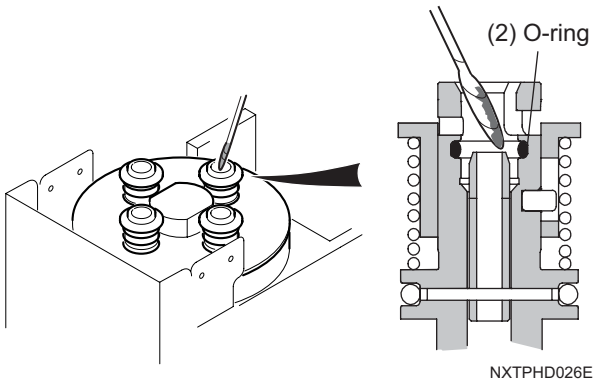


c. Gently insert the rod into the syringe. Then turn the rod to apply lubricant to the O-ring.



d. Put the rod back in the jig to apply more grease and then continue to lubricate the other syringes on the head.

Note: If the jig for lubricating the O-ring is not available, then use a cotton swab to apply a thin layer of Daphne Eponex No. 2 grease to the O-ring.

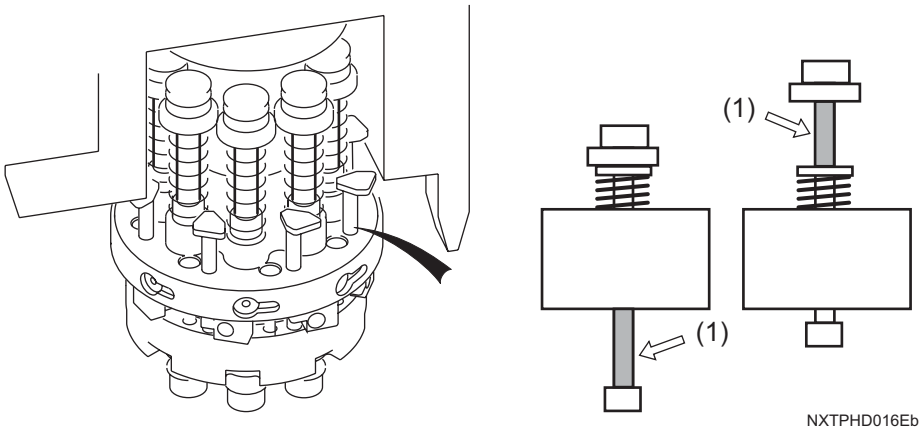


4. Use a clean cotton swab to remove any excess grease, to prevent clogging of holes inside the syringe.

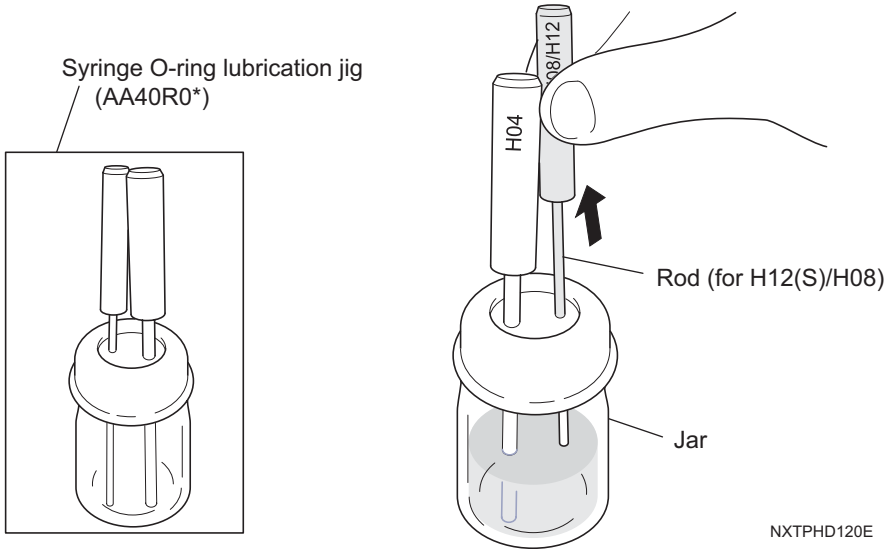
<8 nozzle / 12S nozzle head>

Required greases	Items used on
Biral T&D (Sugai Chemical Industry)	(1) Syringes
Daphne Eponex No.2 (Idemitsu)	(2) O-rings inside syringe

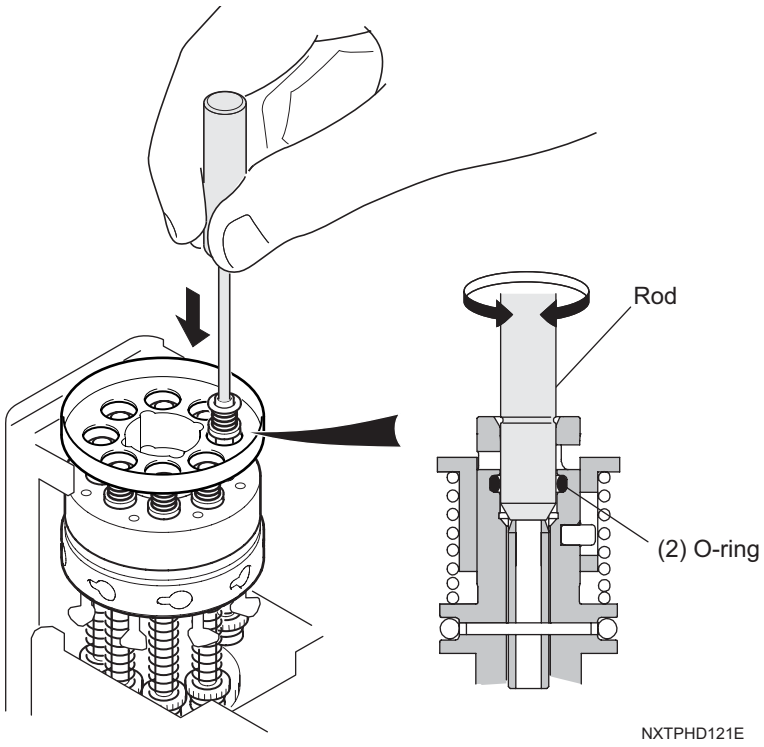
1. Remove the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Use a thin brush to apply a thin layer of the Biral T&D to the syringe.



3. Lubricate the O-ring in the syringes with Daphne Eponex No. 2 grease by following the steps below.
   a. Put the specified grease in the jar and then put the lid with the rods in it back on the jar.
   b. Remove the rod for lubricating the O-ring on the H12(S)/H08 head from the jig.

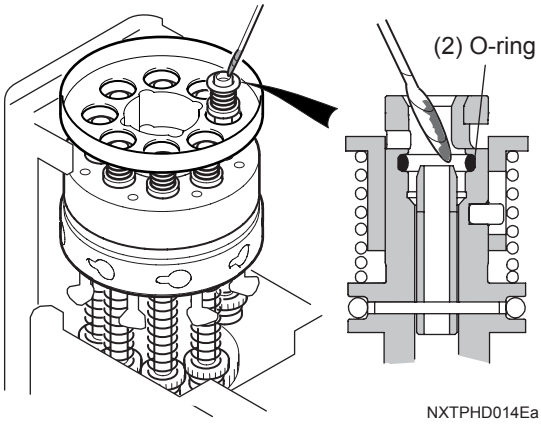


c. Gently insert the rod into the syringe. Then turn the rod to apply lubricant to the O-ring.



d. Put the rod back in the jig to apply more grease and then continue to lubricate the other syringes on the head.

Note: If the jig for lubricating the O-ring is not available, then use a cotton swab to apply a thin layer of Daphne Eponex No. 2 grease to the O-ring.



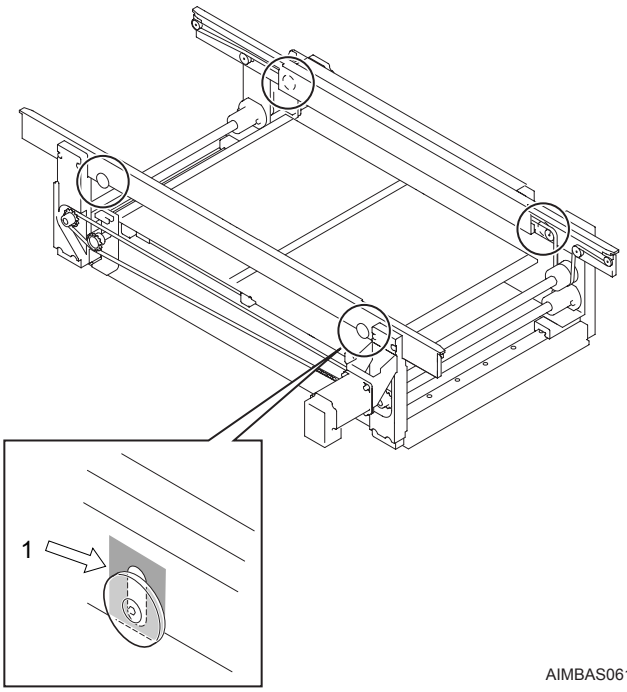
4. Use a clean cotton swab to remove any excess grease, to prevent clogging of holes inside the syringe.

6.5.6 Lubricating the main conveyor

Required greases	Items used on
Daphne Eponex No. 2 (Idemitsu)	(1) Panel clamp plate

Note: It is not necessary to lubricate the width change LM-rails/ball screws, clamp LM rails, or chain.

1. Apply a thin layer of Daphne Eponex No.2 grease to the surface of the moving parts (up/down) for the panel clamp plates.

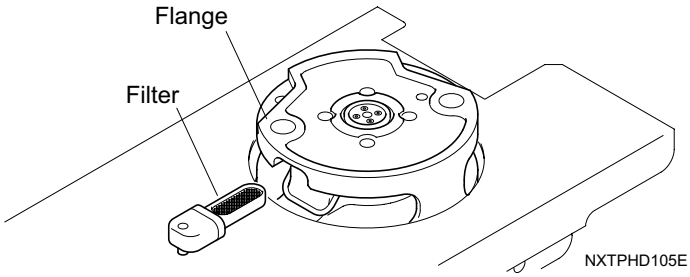


6.6 6 Monthly Maintenance (4000 Hrs)

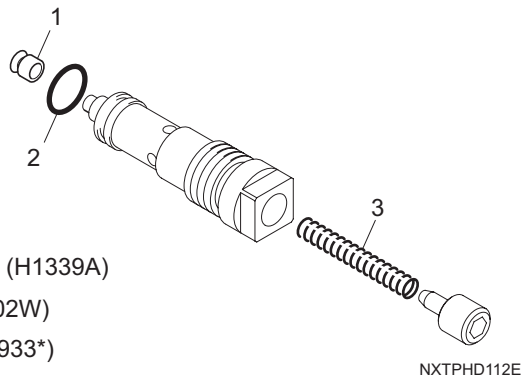
Perform cleaning and lubrication in the following areas.

6.6.1 Cleaning the sleeve assembly <1 nozzle head>

For heads that have the filter in the flange unit, it is not necessary to clean the sleeve assembly

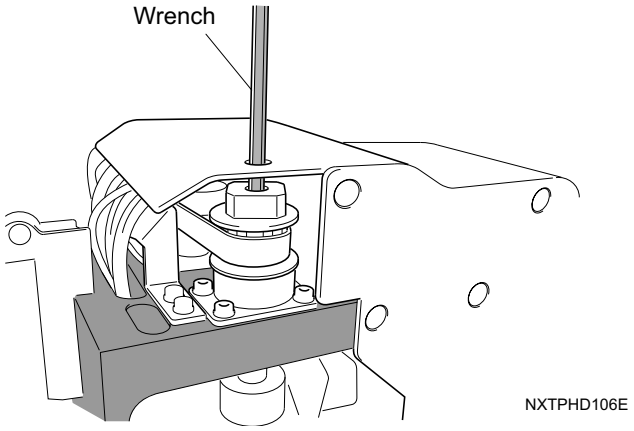


When preparing to clean the head sleeve assembly, it is highly recommended to have 2 spares of each of spare part shown below.

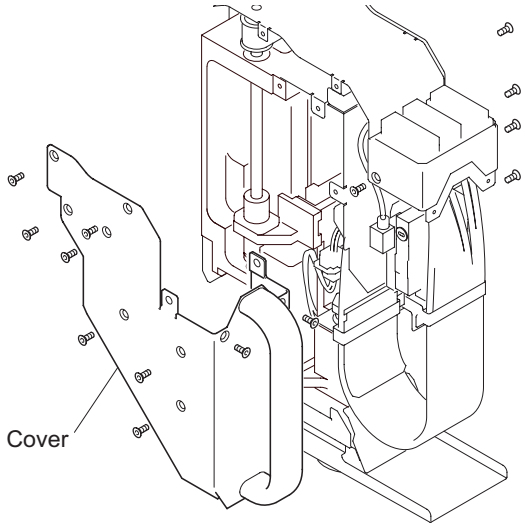


1. Vacuum pad (H1339A)
2. O-ring (A5202W)
3. Spring (PZ0933*)

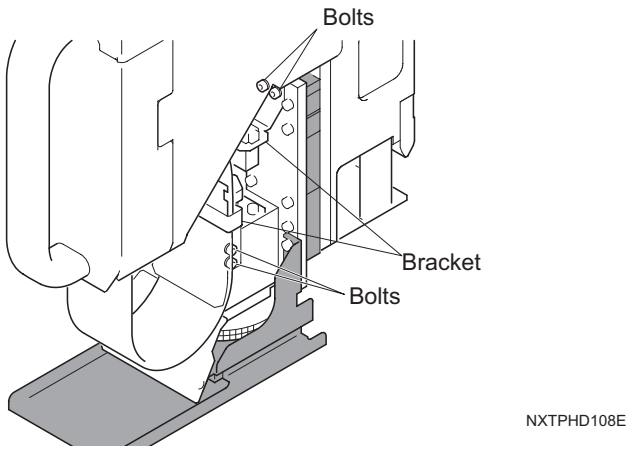
1. Remove the placing head. (Refer to section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Put a 2.5 mm Allen wrench in the hole at the top of the head and use it to turn the ballscrew until the Z-axis has been fully lowered.



3. Remove the head side cover.

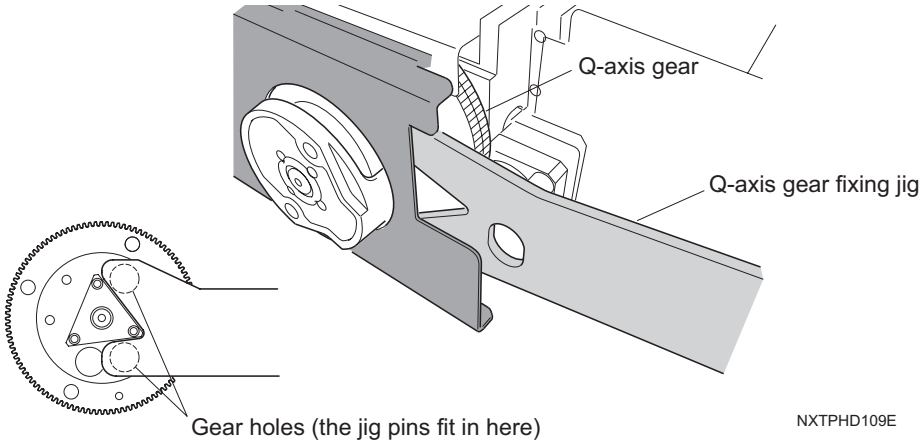


4. Remove the bolts shown in the diagram and then move the bracket.

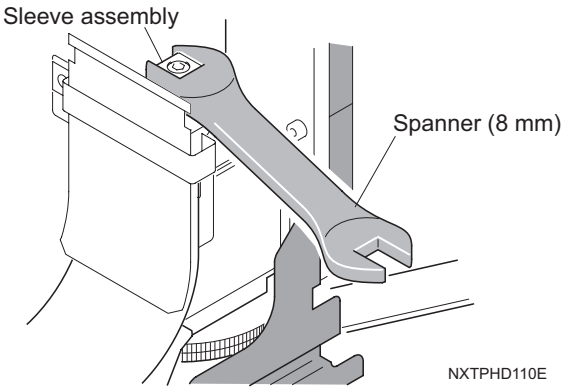


Note: A short ended 2.5 mm Allen wrench is required to remove these bolts.

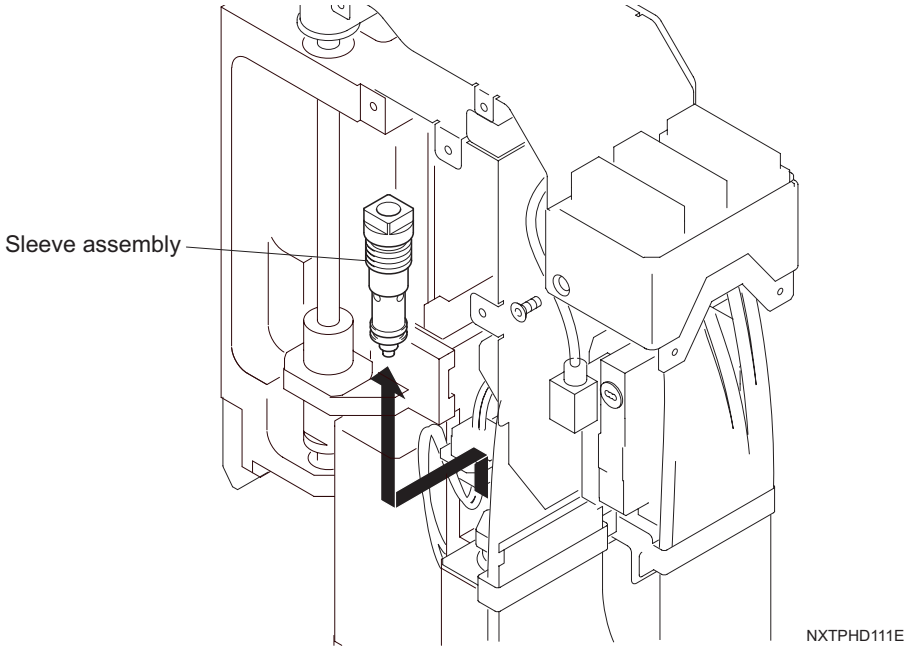
5. Set the Q-axis gear fixing jig in the holes in the Q-axis gear.



6. Lock the Q-axis in place and using an 8 mm spanner, loosen the sleeve assembly.

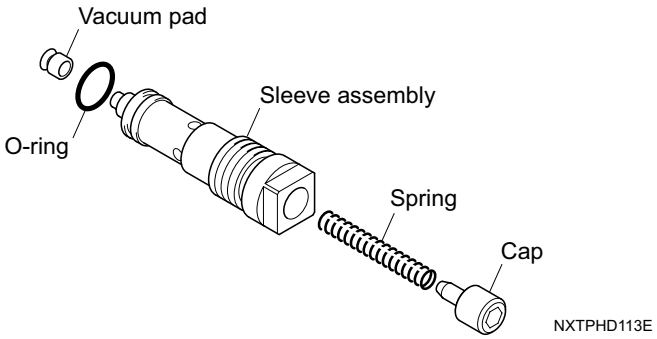


7. Remove the sleeve assembly from the placing head.

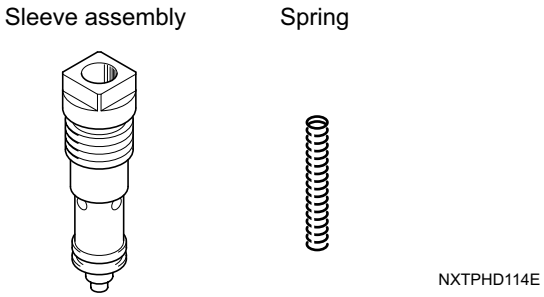


Note: There are cases when the vacuum pad comes off. Be careful to not lose it.

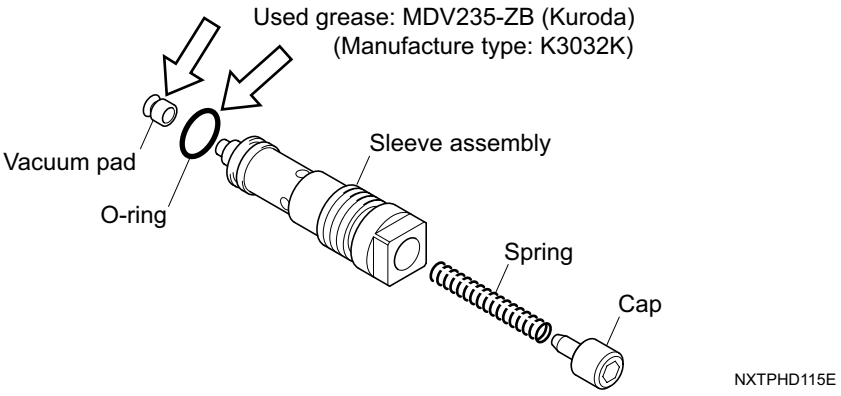
8. Take apart the sleeve assembly.



9. Use an air gun to remove any grime from the spring and internal section of the sleeve assembly. Use a cloth to clean and wipe off any grime that was not removed.



10. After cleaning the parts, lubricate the sleeve assembly O-ring and spring. Then put back together the sleeve assembly. Ensure that the up and down movement of the shaft with the attached vacuum pad is smooth.

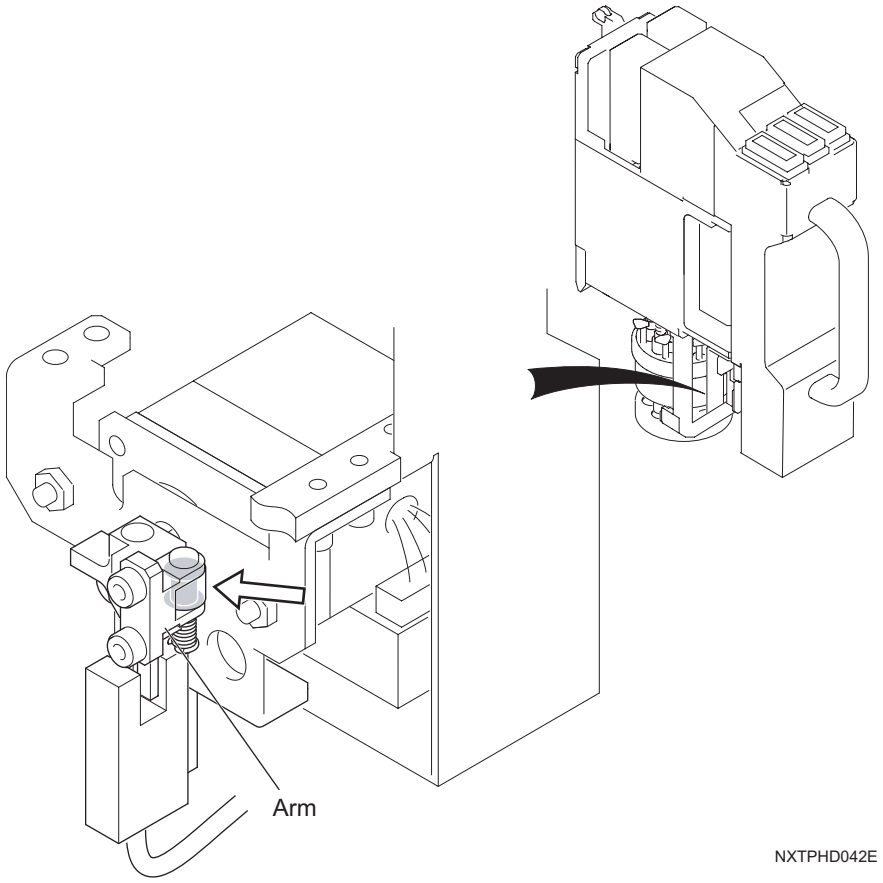


11. Follow the removal steps in reverse order to reattach the sleeve assembly back into the head.

6.6.2 Lubricating the 8 nozzle head, 12S nozzle head

Required greases	Items used on
Daphne Eponex No. 2 (Idemitsu)	Arm rotation axis

1. Remove the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Use an item like a cotton swab to apply a thin layer of Daphne Eponex No. 2 grease to the stepping motor axis item arm rotation axis and to the immediate items around it.



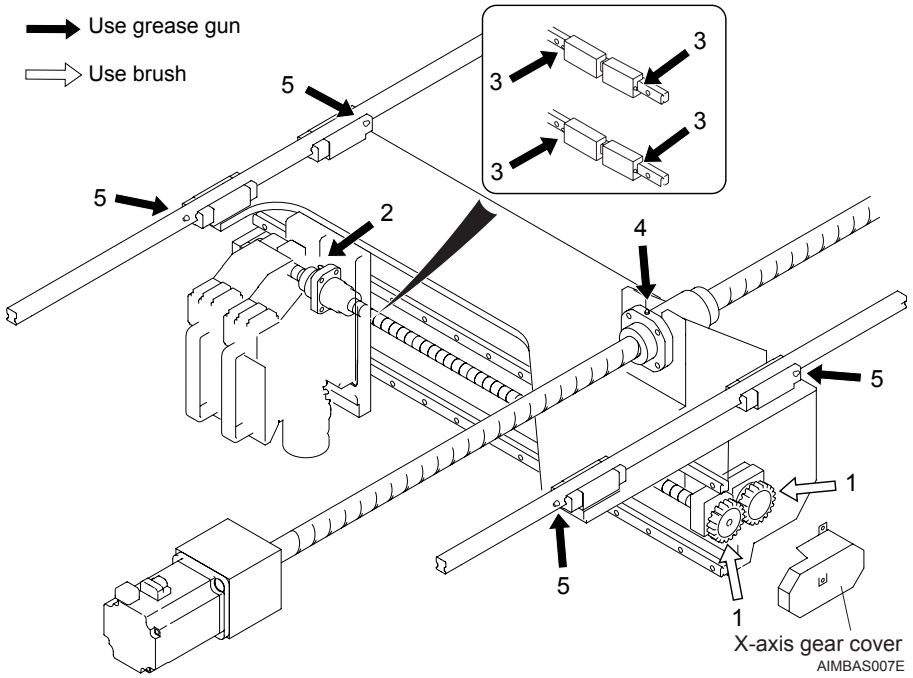
3. Turn the arm rotation axis several times and apply a thin coat of lubricate to the immediate items around the axis.

6.6.3 XY-robot lubrication

The grease gun kit is required to lubricate several items.

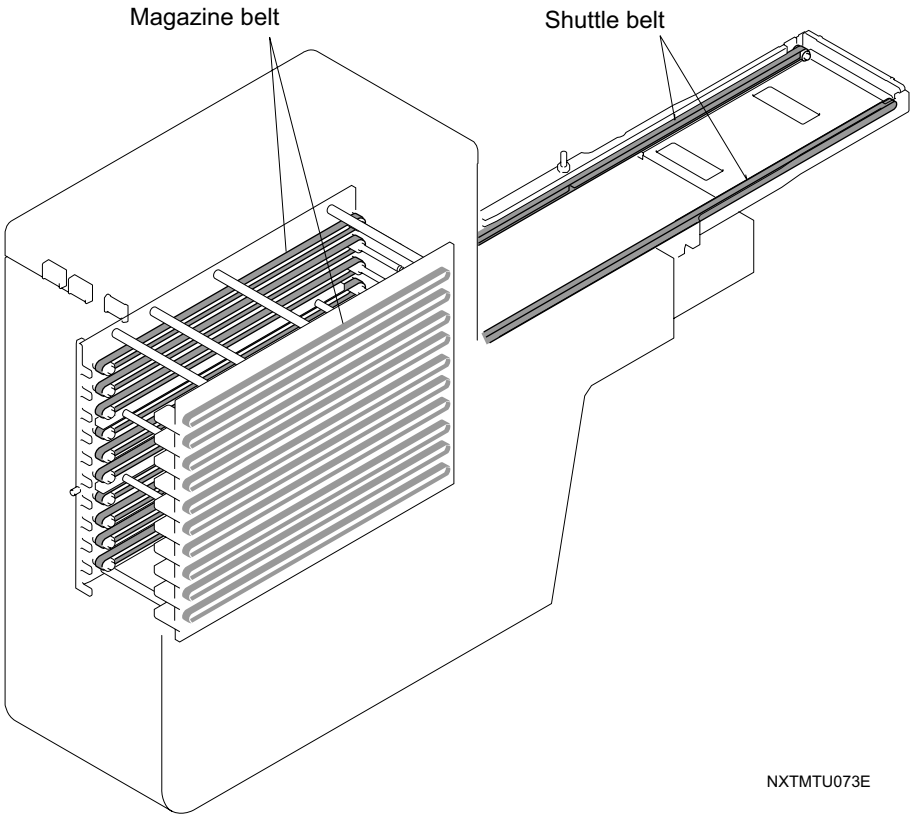
Required greases	Items used on
Daphne Eponex No. 2 (Idemitsu)	(1) X-axis gear
	(3) X-axis LM guides
	(5) Y-axis LM guides
LRL3	(2) X-axis ball screw
	(4) Y-axis ball screw

1. In order to create space in which to perform the lubrication procedures, remove the front and rear covers from the safety cover between the modules. Move the XY robot into the space that is created by removing these covers.
2. Remove the X-axis gear cover.
3. Apply a thin layer of Daphne Eponex No. 2 grease to the X-axis gear (1)
4. Use the grease gun to apply an appropriate amount of LRL3 grease to the grease fittings for the X-axis ball screw (2) and the Y-axis ball screw (4).
5. Use the grease gun to apply an appropriate amount of Daphne Eponex No. 2 grease to the grease fittings for the X-axis LM blocks (3) and the Y-axis LM blocks (5).
6. Remove any the old grease pushed out by the freshly applied grease using a cloth.
7. Reattach the X-axis gear cover.



6.6.4 Cleaning the tray unit-M

1. Remove the tray unit-M from the machine. (Refer to section 5.5 "Removing/Attaching Tray Unit-Ms" for details.)
2. Clean the surfaces of the shuttle and magazine belts with a dry, clean cloth.

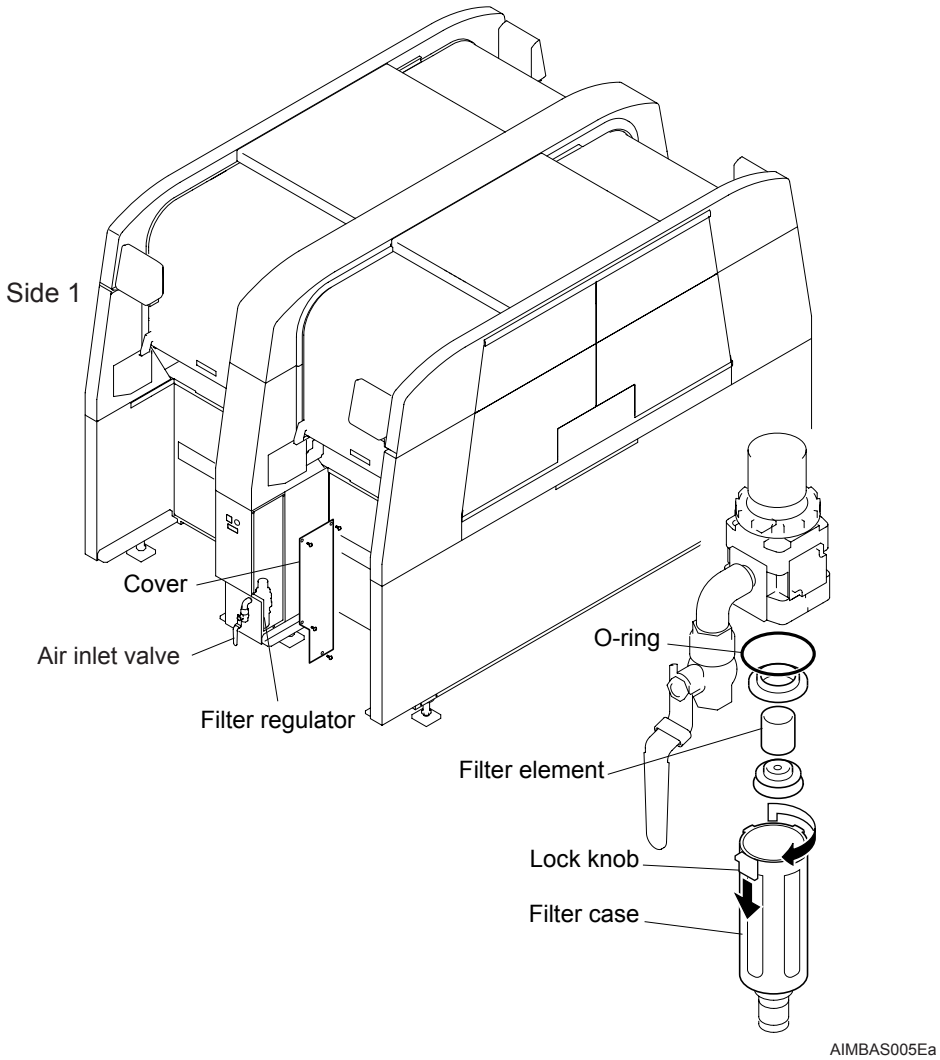


6.7 Yearly Maintenance (8000 Hrs)

Perform cleaning and lubrication in the following areas.

6.7.1 Cleaning the air regulator

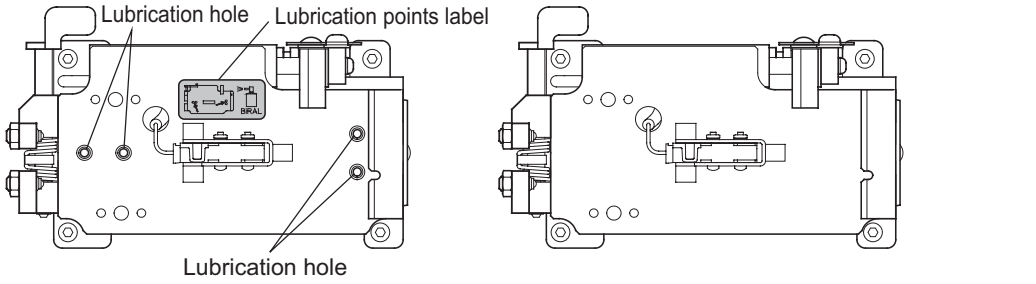
1. Turn OFF the air supply at the air inlet valve, and allow the air pressure in the air piping to decompress.
2. Remove the cover from the body.
3. Push down on the lock knob, turn the filter case and remove.
4. Clean the filter case using a neutral detergent.
5. Clean the filter element using a high-pressure air-gun, or replace if excessively dirty.



6.7.2 Lubricating the nozzle changer up/down shafts

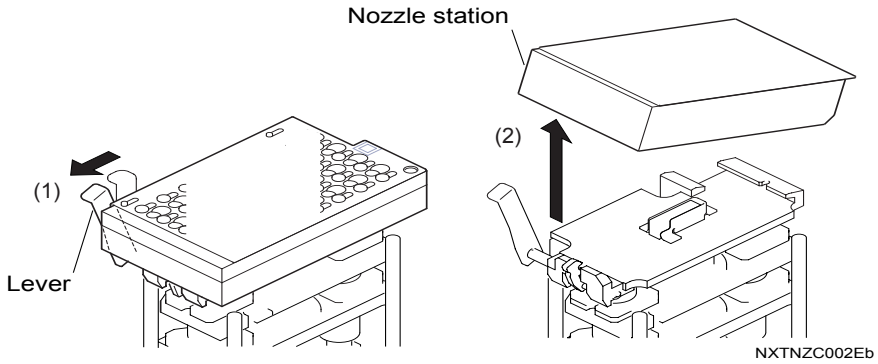
Required greases	Items used on
Biral T&D (Sugai Chemical Industry)	Up/down shafts

There are nozzle changers that have lubrication holes for the shafts and there are nozzle changers without these lubrication holes. The procedures for lubricating the shafts are different depending on this condition. Use the procedure that is applicable for the type of nozzle changer present.

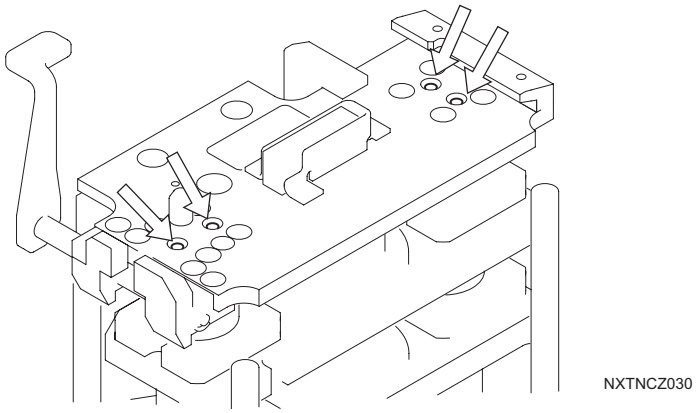


For a nozzle changer with lubrication holes

1. Remove the nozzle station.

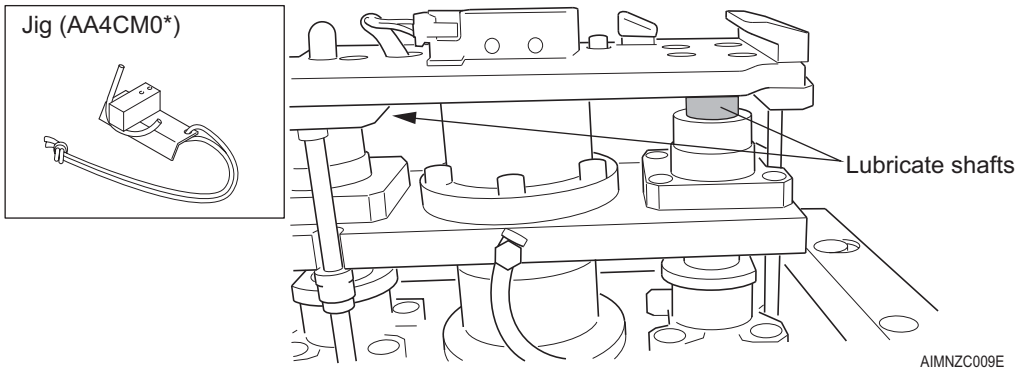


2. Apply a small amount of the specified lubricate in the four lubrication holes.



For a nozzle changer without lubrication holes

For nozzle changers without the lubrication holes, use a jig to apply lubricant to the up/down shafts.



1. Use the nozzle station exchange command in manual mode to remove the nozzle station. Refer to section 5.4 "Removing/Attaching a Nozzle Station" for details on performing this action.

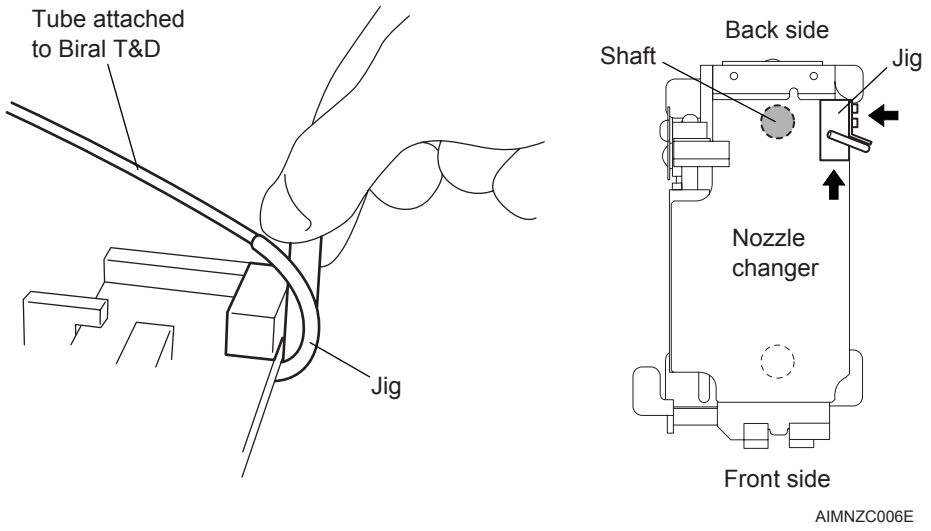
Note: When the nozzle station exchange command is used, the nozzle changer is raised and exposes the locations on the shafts to be lubricated.

2. In order to not get any grease on the parts camera, cover the parts camera with some type of cover such as cloth.
3. Push the jig firmly against the top of the nozzle changer while pushing in the direction of the arrows shown below depending on the shaft being lubricated. With the jig in place, insert the nozzle of the Biral T&D lubricant into the jig and apply a small amount of lubricant (approximately 0.5 seconds).

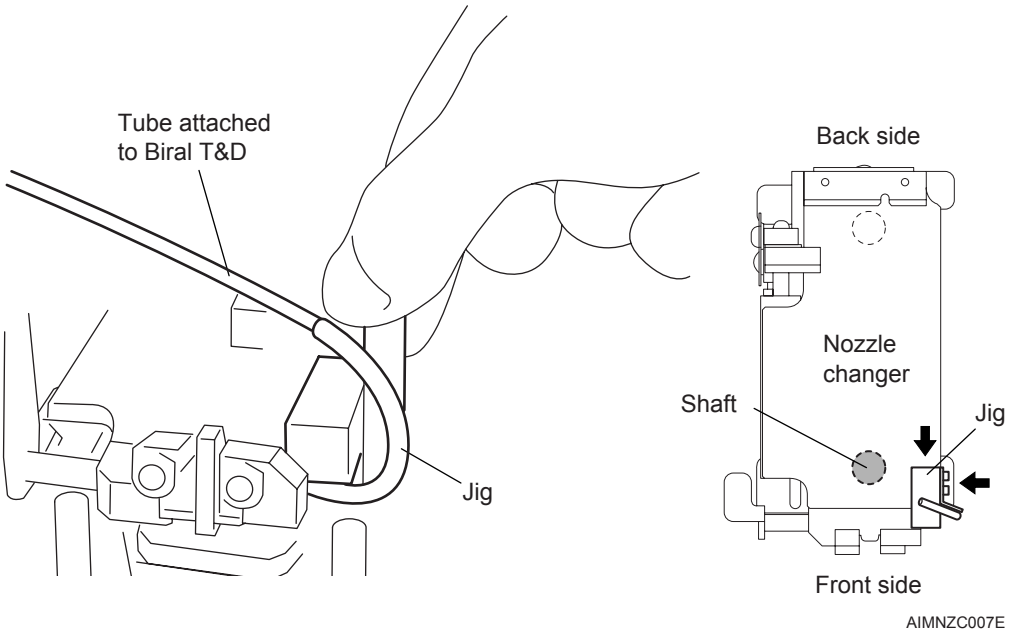
Caution: It is necessary to use the tube supplied with the Biral T&D (2.2 mm in diameter). If a different diameter tube is used, then the proper amount of lubricate cannot be applied or the lubricant will not go to the correct place.

Note: If the jig strap is placed around the hand when using the jig, then the jig cannot be dropped while using it.

Lubricate the back side nozzle



Lubricate the front side nozzle



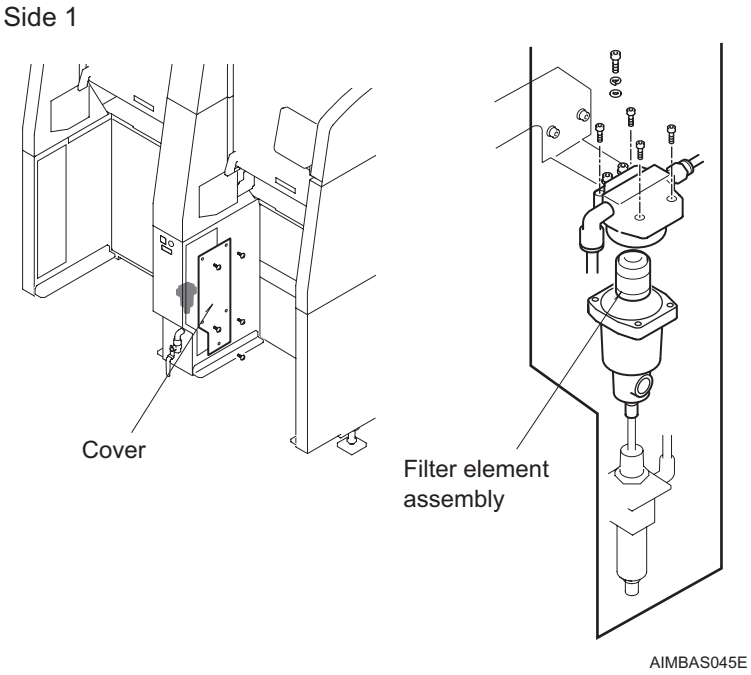
4. Reattach the nozzle station. Refer to section 5.4 "Removing/Attaching a Nozzle Station" for details on performing this action. Return the module and when production is started, the nozzle changer is automatically lowered.

6.8 12,000 Hr Maintenance

Perform cleaning and lubrication in the following areas.

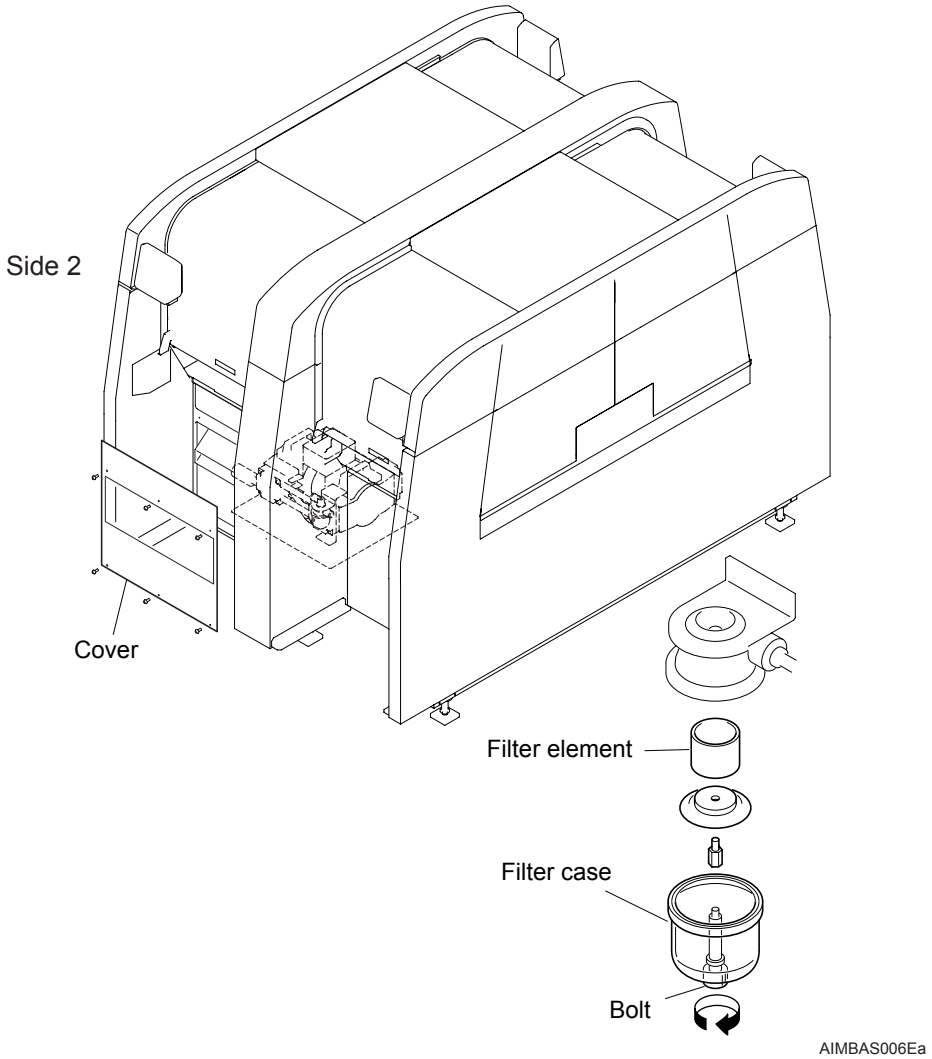
6.8.1 Cleaning the mist separator filter

1. Turn OFF the air supply at the air inlet valve, and allow the air pressure in the air piping to decompress.
2. Remove the cover from the body.
3. Rotate the filter element assembly and remove.
4. Clean the filter element using a high-pressure air-gun, or replace if excessively dirty.



6.8.2 Cleaning the vacuum pump filter

1. Allow the pressure in the vacuum supply piping to decompress.
2. Remove the cover from the body.
3. Loosen the bolt and remove the filter case.
4. Clean the filter case using a neutral detergent.
5. Clean the filter element using a high-pressure air-gun, or replace if excessively dirty.



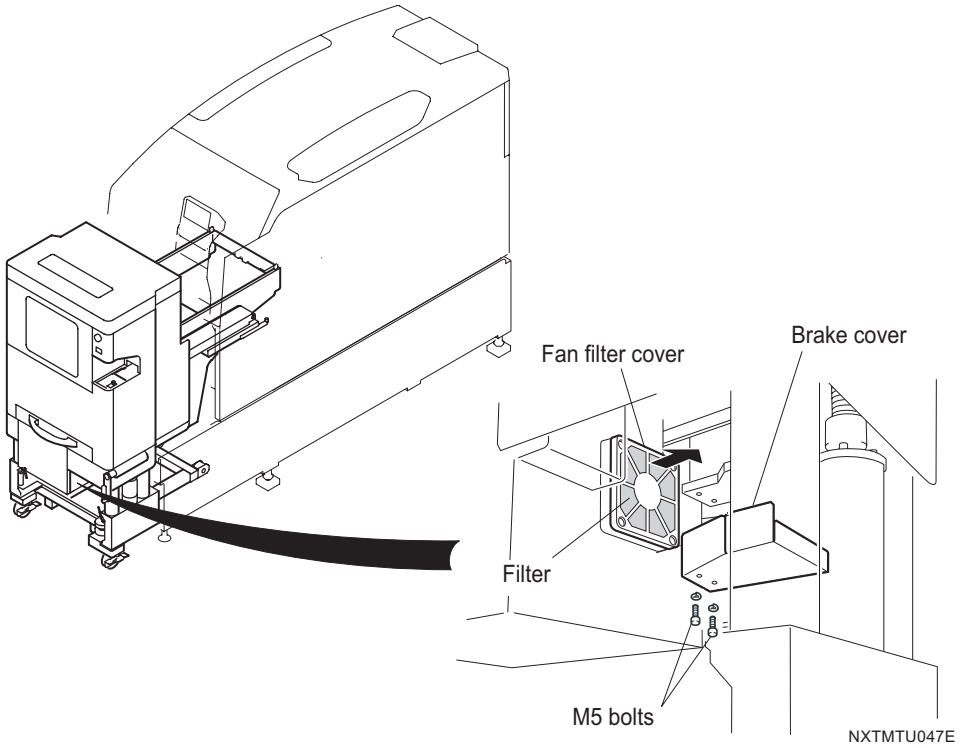
6.8.3 Cleaning the tray unit-L fan filter

⚠ WARNING

Do not perform this work while the fan is operating. It is possible that hands or other body parts can be injured by the fan.

Do not perform this work during production. Because the brake cover is removed, it is possible for hands or other body parts to become caught and injured in the TZ-axis items.

1. Remove the two M5 bolts from the brake cover and then remove the cover.
2. Remove the fan filter holder.
3. Remove the filter for the fan.
4. Use compressed air to clean the filter. If the filter is very dirty, replace it with a new filter.

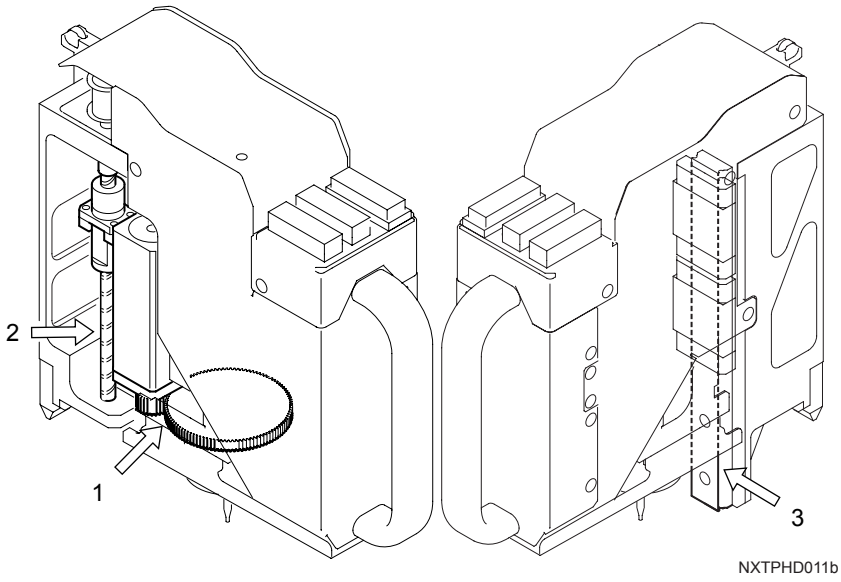


5. Reattach the filter and cover, and the brake cover.

6.8.4 Lubricating the 1 nozzle head

Required greases	Items used on
Mobilith SHC100 (Mobil)	(1) Q-axis gear
Daphne Eponex No. 2 (Idemitsu)	(2) Z-axis ball screw (3) Z-axis LM guide

1. Remove the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Apply a small amount of Mobilith SHC100 grease to the Q-axis gear (1).
3. Apply a thin layer of Daphne Eponex No. 2 grease to the circumference of the Z-axis ball screw (2).
4. Apply a thin layer of Daphne Eponex No. 2 grease to the surface of the Z-axis LM guide rail (3).

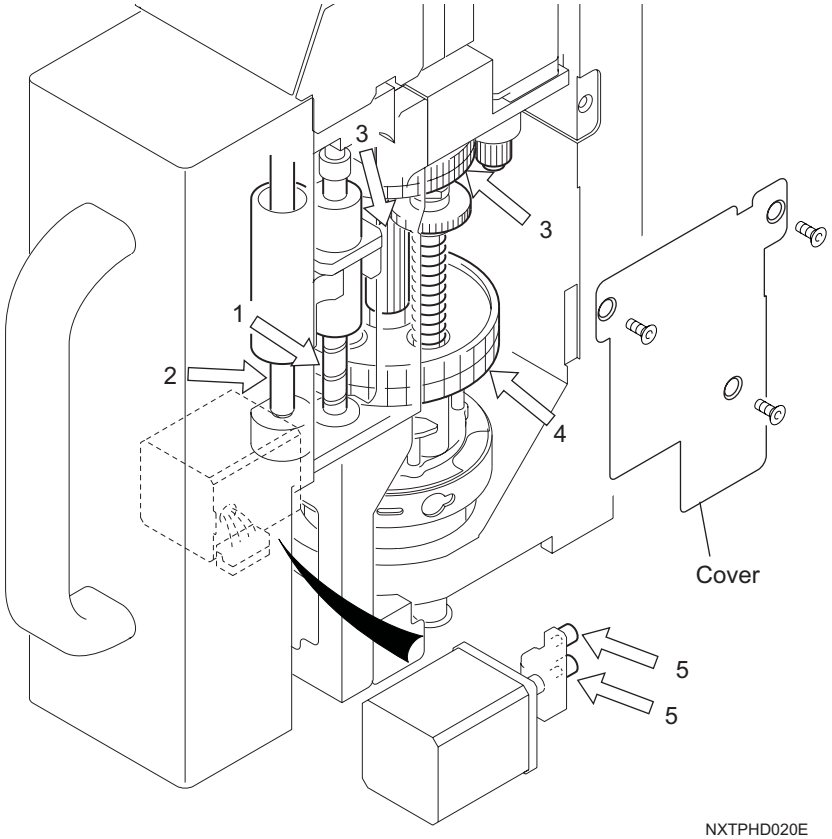


6.8.5 Lubricating the 4 nozzle head

<Gears, z-axis>

Required greases	Items used on
Daphne Eponex No. 2 (Idemitsu)	(1) Z-axis ball screw (2) Z-axis guide (5) Mechanical valve drive rollers
Mobilith SHC100 (Mobil)	(3) Q-axis gear (4) R-axis gear

1. Removing the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Remove the cover.
3. Apply a thin layer of Daphne Eponex No. 2 grease to the circumference of the Z-axis ball screw (1).
4. Apply a thin layer of Daphne Eponex No. 2 grease to the circumference of the Z-axis guide shaft (2).
5. Apply a thin layer of Daphne Eponex No. 2 grease to the inside and circumference of the rollers (5).
6. Apply a small amount of Mobilith SHC100 grease to the Q-axis gear (3) and the R-axis gear (4).

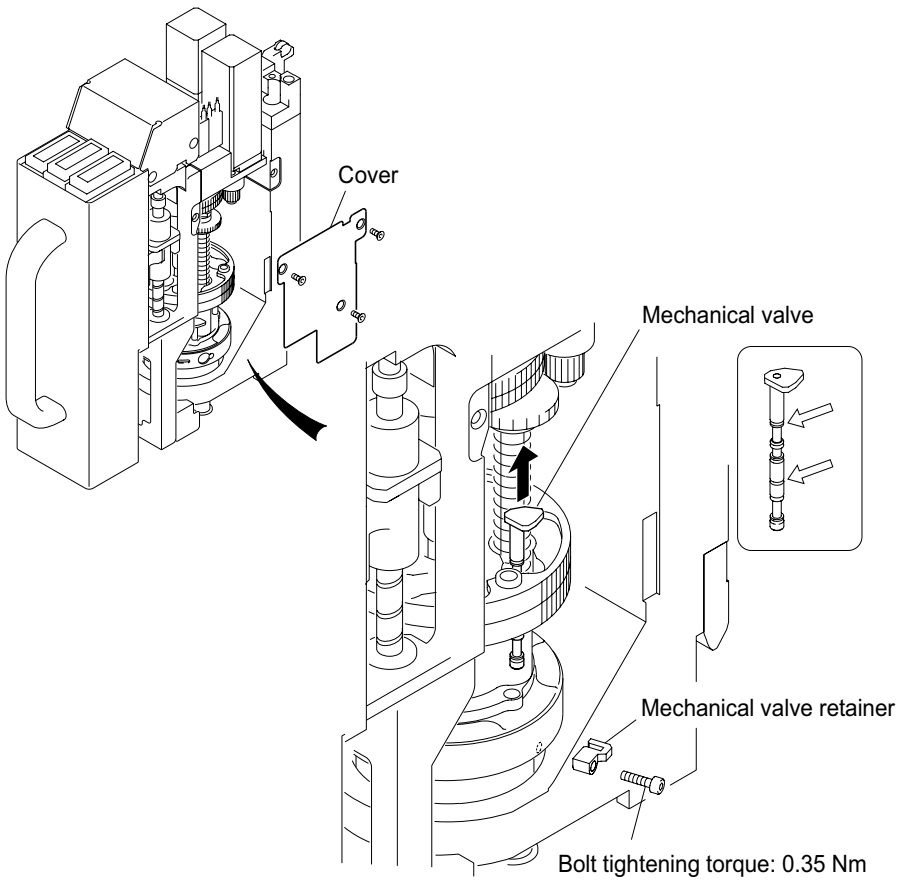


<Mechanical valves>

Required greases	Items used on
MDV235-ZB (Kuroda) (K3032K)	Mechanical valve O-rings

1. Remove the side cover from the head.
2. Loosen the attachment bolts and then remove the mechanical valve retainers and valves (4).
3. Gently pull up on the mechanical valves to remove them from the head.
4. Apply a thin layer of the specified grease to the surface of the mechanical valve O-rings.
5. Reinsert the mechanical valves and then tighten the bolts for the retainers to the specified torque as shown below.

Caution: Do not over tighten. If over tightened, the threads for the bolt on the head will be damaged and the head will need to be replaced.



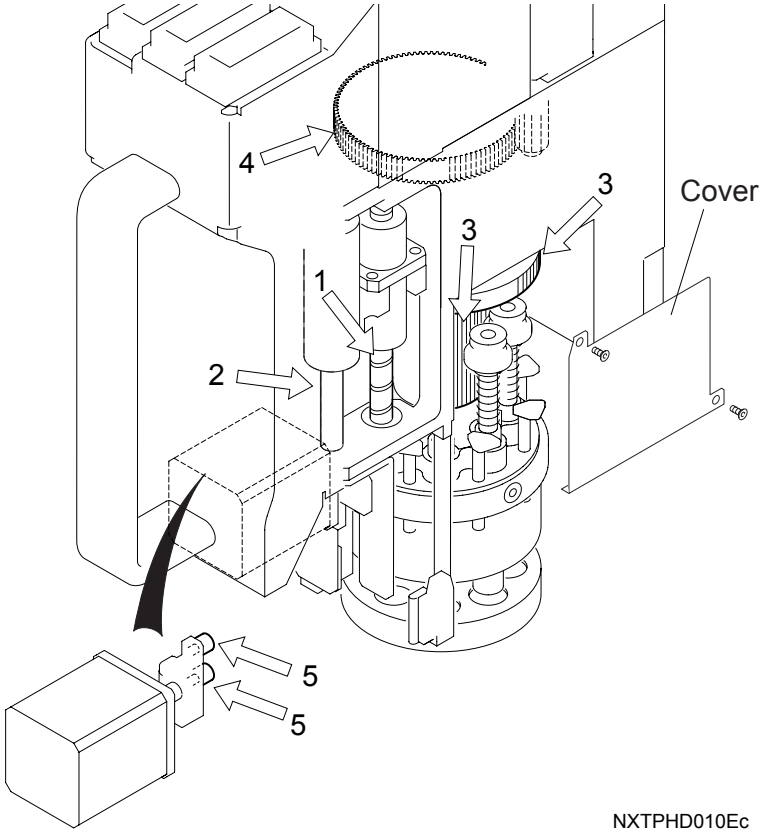
Note: It is not possible to remove the mechanical valves for heads with serial number 00590 and prior. Contact your Fuji representative to perform maintenance on these heads.

6.8.6 Lubricating the 8 nozzle head, 12S nozzle head

<Gears, z-axis>

Required greases	Items used on
Daphne Eponex No. 2 (Idemitsu)	(1) Z-axis ball screw (2) Z-axis guide (5) Mechanical valve drive rollers
Mobilith SHC100 (Mobil)	(3) Q-axis gear (4) R-axis gear

1. Removing the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Remove the cover.
3. Apply a thin layer of Daphne Eponex No. 2 grease to the circumference of the Z-axis ball screw (1).
4. Apply a thin layer of Daphne Eponex No. 2 grease to the circumference of the Z-axis guide shaft (2).
5. Apply a thin layer of Daphne Eponex No. 2 grease to the inside and circumference of the rollers (5).
6. Apply a small amount of Mobilith SHC100 grease to the Q-axis gear (3) and the R-axis gear (4).



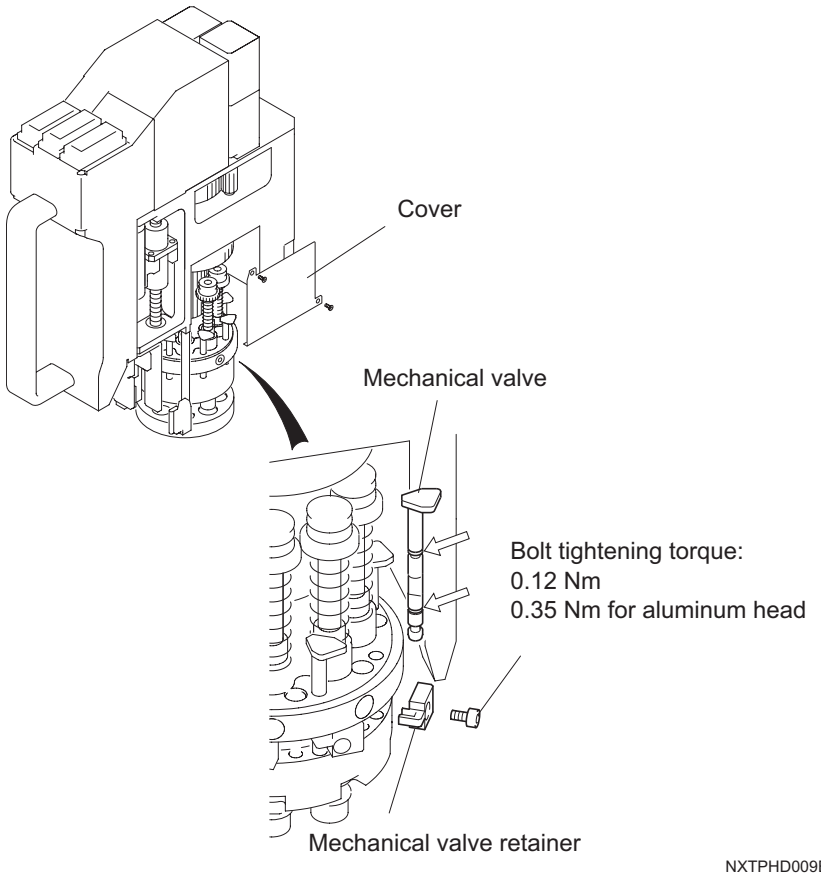
NXTPHD010Ec

<Mechanical valves>

Required greases	Items used on
Silicon grease MDV-ZB (Kuroda)	Mechanical valve O-rings

1. Remove the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Remove the cover.
3. Loosen the attachment bolts, and remove the mechanical valve retainers and valves (8).
4. Apply a thin layer of the silicon grease MDV-ZB to the surface of the mechanical valve O-rings.
5. Reinsert the mechanical valves
6. Tighten the bolts for the retainers to the specified torque as shown below.

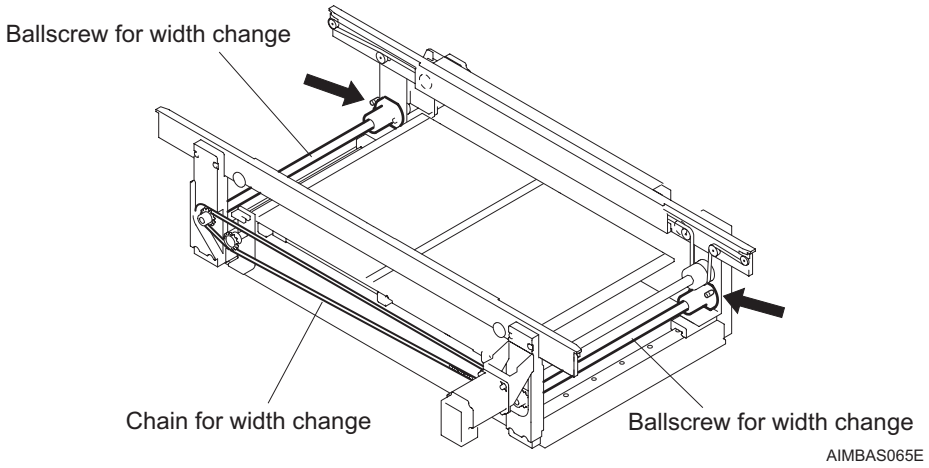
Caution: Do not overtighten. If overtightened the threads for the bolt on the head will be damaged and the head will need to be replaced.



6.8.7 Lubricating the main conveyor (ballscrews for width change)

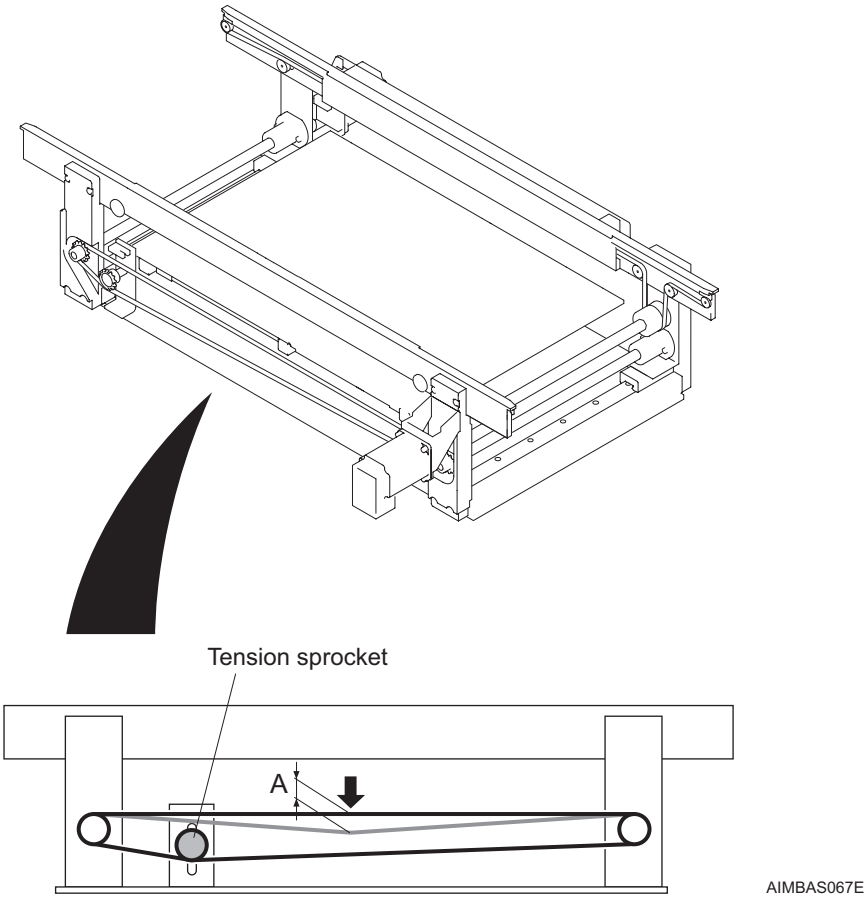
Required greases	Items used on
Daphne Eponex No. 2 (Idemitsu)	Ballscrew nuts for width change

1. Adjust the conveyor to the maximum width.
2. Use the grease gun to apply an appropriate amout of Daphne Eponex No.2 to the grease fitting for the ballscrews.
3. Remove the old grease pushed out by the freshly applied grease using a cloth.



6.8.8 Inspecting the main conveyor (chain for width change)

1. Check the chain for any rust or damage.
2. Ensure that the slack of the chain is within the standard range, and the chain runs smoothly.
   a. Press downward the middle of the chain with 500 gf.
   b. Ensure that the amount of the slack (A) is 9 to 11 mm.



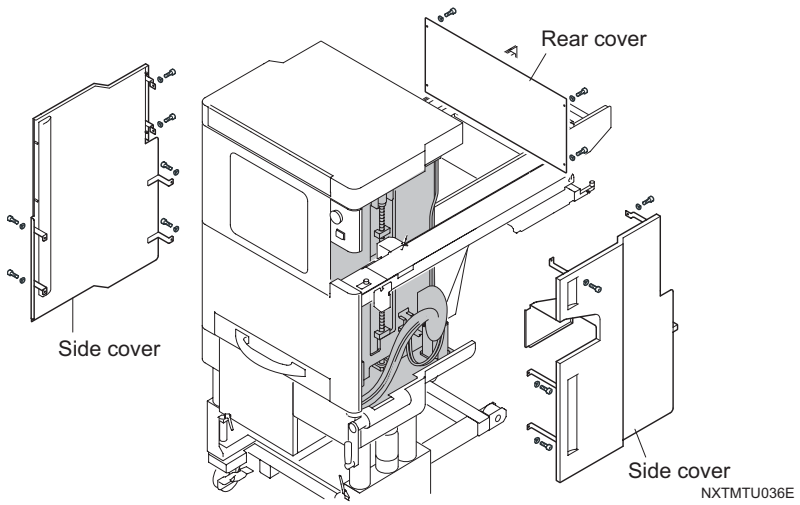
3. If the amount of the slack is not within the standard range, adjust the chain as follows.
   a. Loosen the tension sprocket.
   b. Move the tension sprocket up and down to adjust the slack of the chain to the above range.
   c. Tighten the tension sprocket to the prescribed torque.
   (Tension sprocket tightening torque: 13 Nm)

6.8.9 Lubricating the tray unit-L moving parts

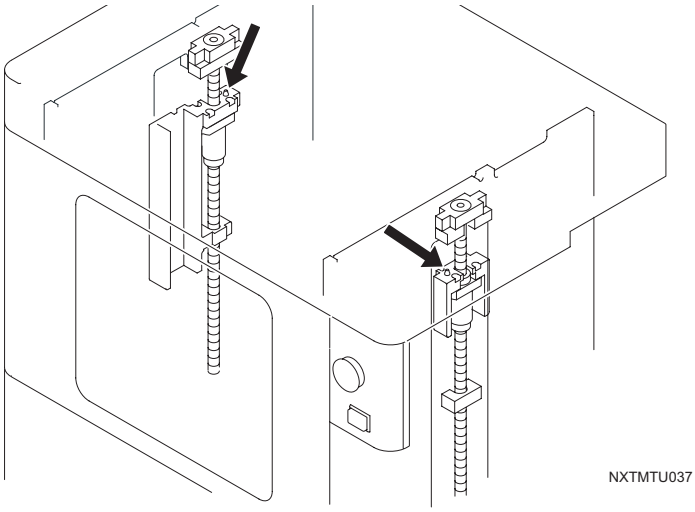
<TZ-axis ballscrews>

Required greases	Items used on
AV2 (NSK)	TZ-axis ballscrews

1. Prepare the grease gun kit.
2. Remove the tray unit-L from the machine. (Refer to section 5.2 "Removing/Attaching a Tray Unit-L" for details.)
3. Remove the tray unit-L covers.



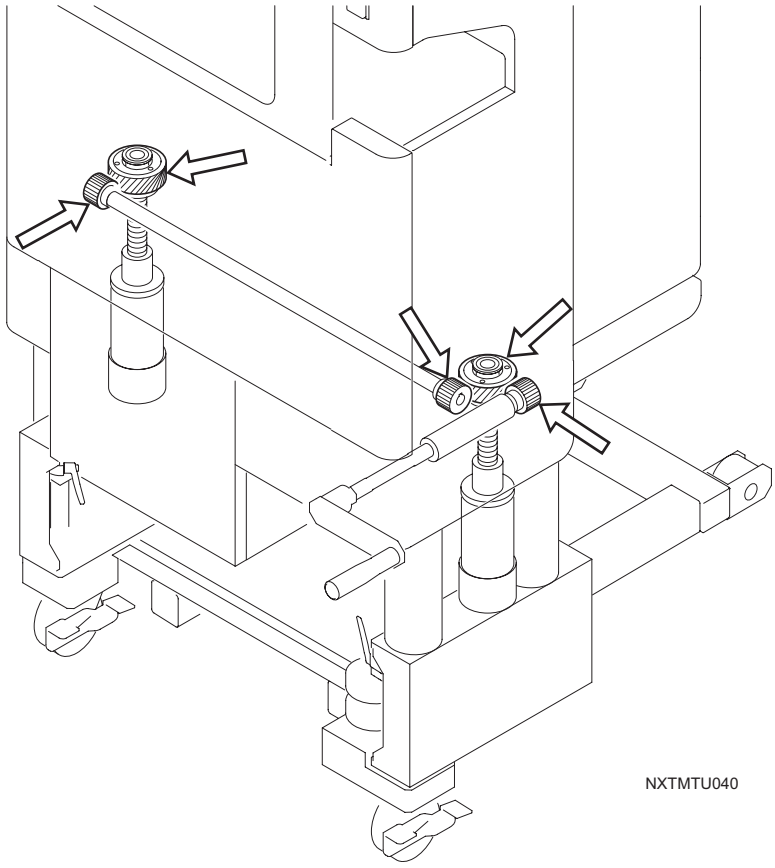
4. Use the grease gun to apply the correct lubricant to the nipples for the TZ-axis ballscrews.



<TZ-axis lifting gears>

Required greases	Items used on
AV2 (NSK)	TZ-axis lifting gears

1. Use a brush to apply the correct lubricant to the areas indicated below. (Refer to section 5.2 "Removing/Attaching a Tray Unit-L" for details.)
2. After lubrication has been completed, reattach the tray unit-L covers.

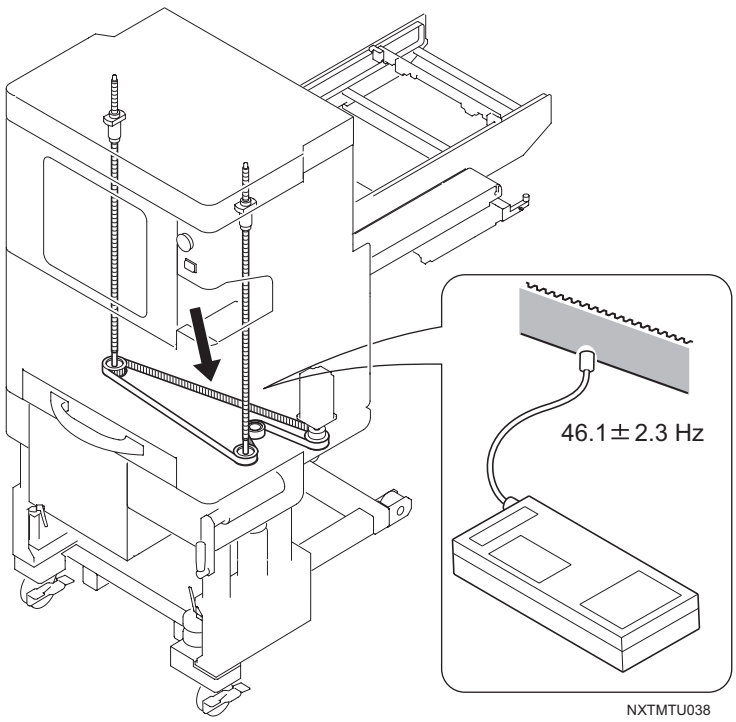


6.8.10 Checking the tray unit-L belt tension

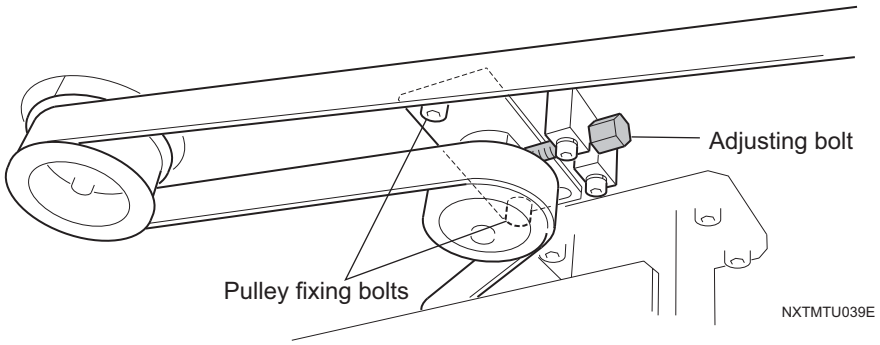
Obtain the tension meter necessary to measure the tension of the various belts before starting these procedures. In addition, remove the tray unit-L from the machine. (Refer to section 5.2 "Removing/Attaching a Tray Unit-L" for details.)

<TZ-axis belt tension>

1. Measure the belt tension in the middle of the longest span of the belt as indicated below. Ensure that the tension is 46.1 ± 2.3 Hz.

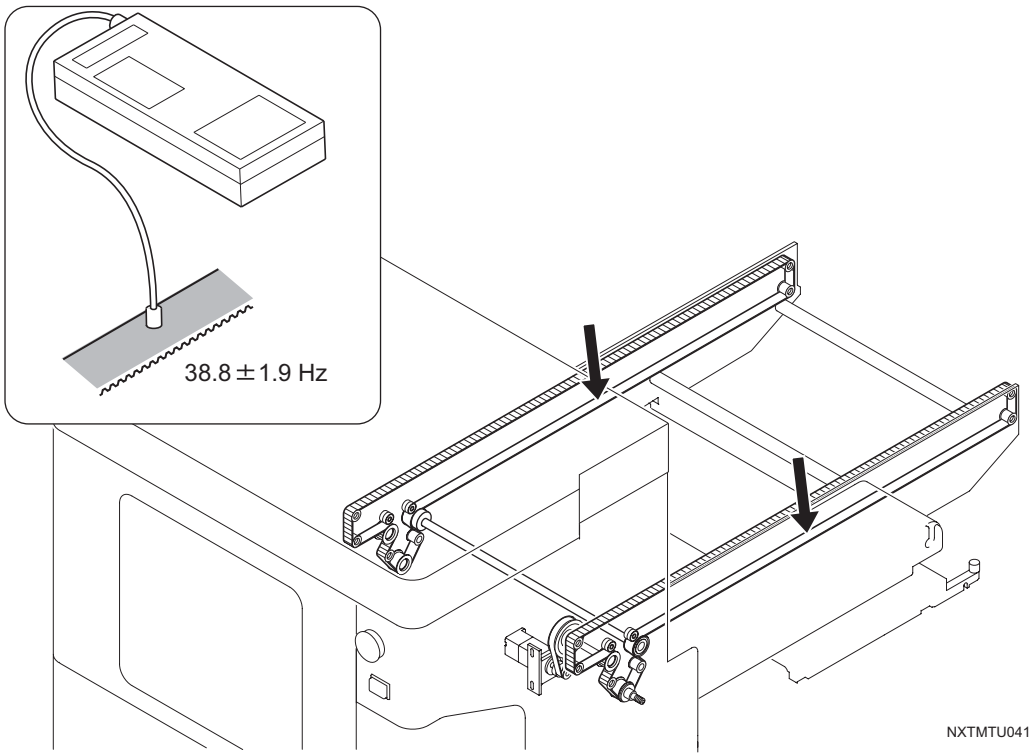


2. If the tension is outside of this range, adjust the belt tension until it is within the correct range. Lightly loosen the pulley fixing bolts and then use the adjusting bolt to adjust the tension. Ensure that the tension is still within range after retightening the pulley fixing bolts.

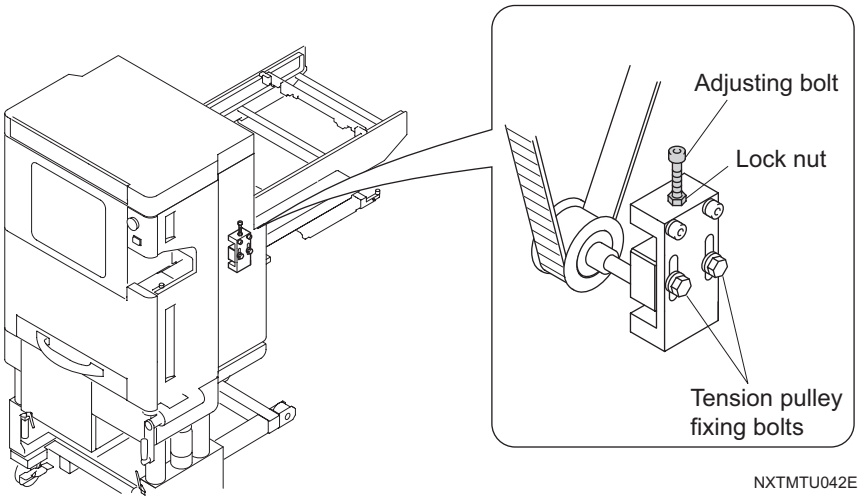


<TY-axis belt tension>

1. Measure the belt tension in the middle of the longest span of the belt as indicated below. Ensure that the tension is 38.8 ± 1.9 Hz.

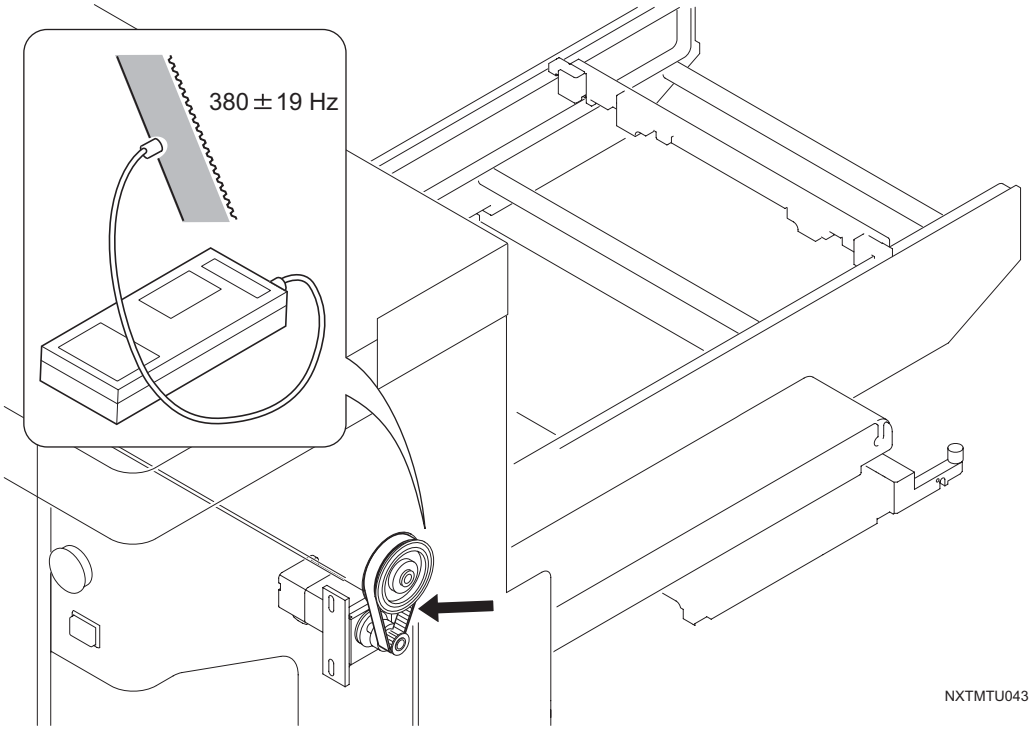


2. If the tension is outside of this range, adjust the belt tension until it is within the correct range. Lightly loosen the tension pulley fixing bolts. Loosen the lock nut on the adjusting bolt and then use the adjusting bolt to adjust the tension. Ensure that the tension is still within range after retightening the tension pulley fixing bolts.

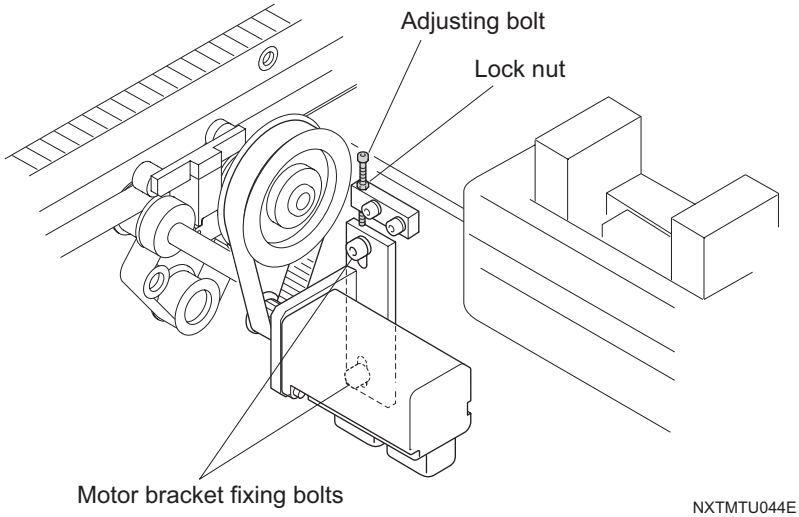


<TY-axis motor gear belt tension>

1. Measure the belt tension in the middle of the longest span of the belt as indicated below. Ensure that the tension is 380 ± 19 Hz.



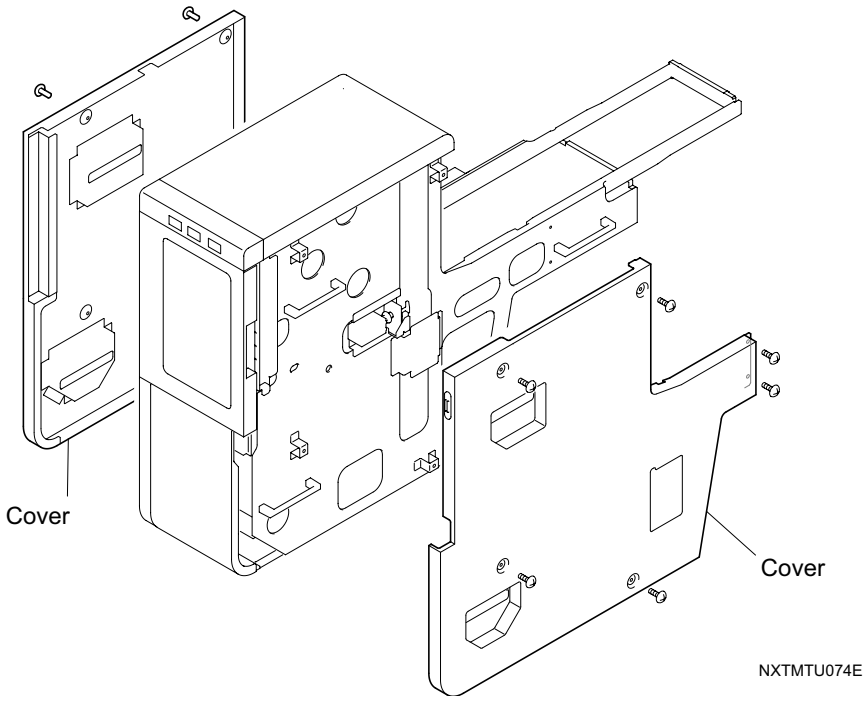
2. If the tension is outside of this range, adjust the belt tension until it is within the correct range. Lightly loosen the motor bracket fixing bolts. Loosen the lock nut on the adjusting bolt and then use the adjusting bolt to adjust the tension. Ensure that the tension is still within range after retightening the motor bracket fixing bolts.



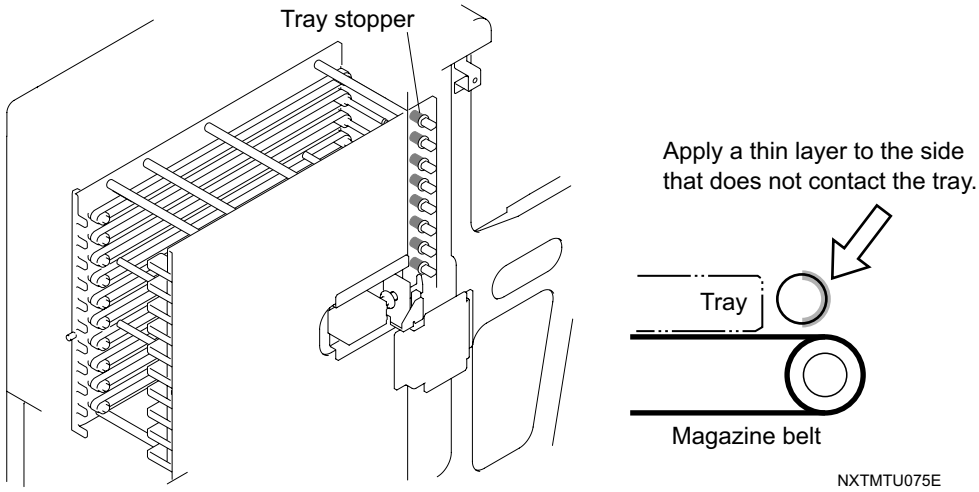
6.8.11 Lubricating the tray unit-M stoppers

Required greases	Items used on
Daphne Eponex No. 2 (Idemitsu)	Tray stopper

1. Remove the tray unit-M from the machine. (Refer to section 5.5 "Removing/Attaching Tray Unit-Ms" for details.)
2. Remove the tray unit-M covers.



3. Apply a thin layer of Daphne Eponex No. 2 grease to the tray stoppers (10 points).

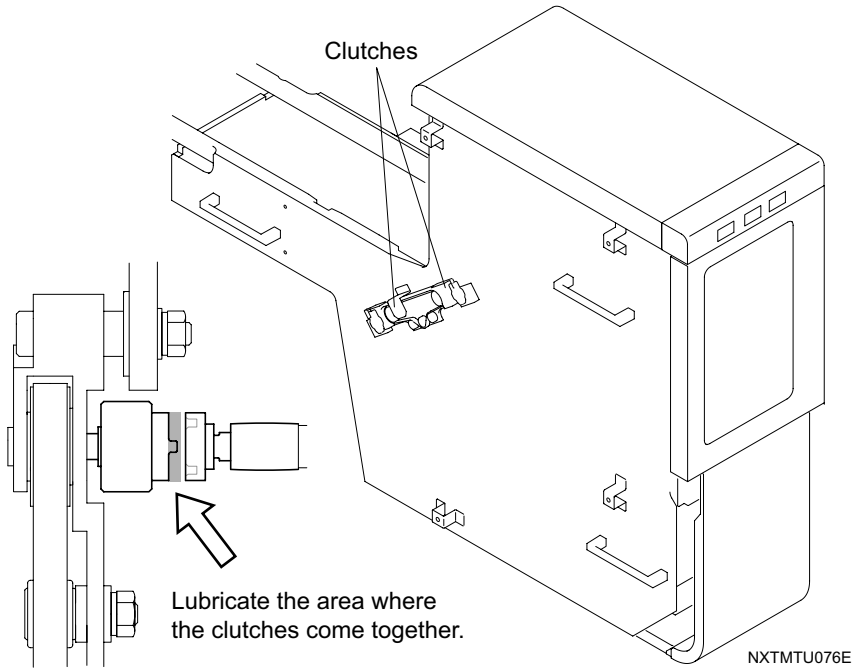


4. Continue on the procedures on the next page to lubricate the TY-axis clutch in the tray unit-M.

6.8.12 Lubricating the tray unit-M TY-axis clutches

Required greases	Items used on
Daphne Eponex No. 2 (Idemitsu)	TY-axis clutches

1. Apply an appropriate amount of Daphne Eponex No. 2 grease to the specified locations.



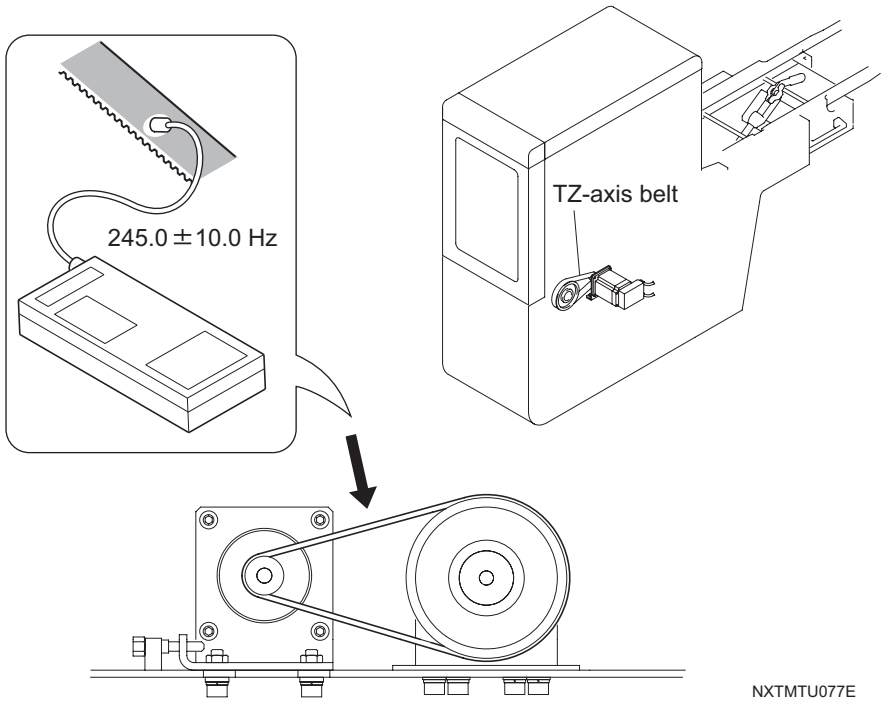
2. Continue on the procedures on the next page to check the tension of the tray unit-M belts.

6.8.13 Checking the tray unit-M belt tension

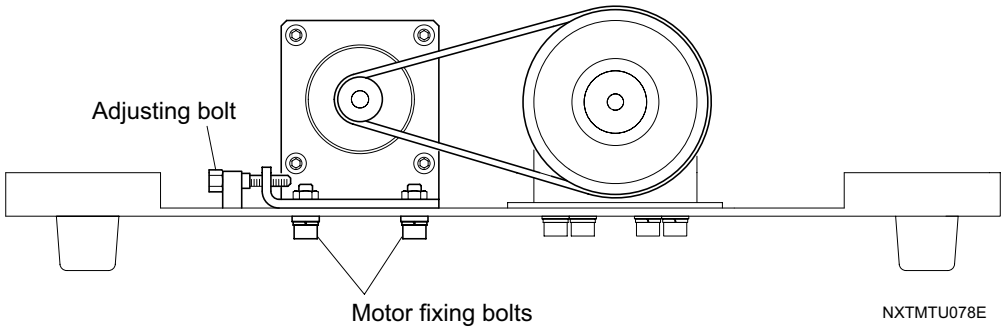
Obtain the tension meter necessary to measure the tension of the various belts before starting these procedures. In addition, remove the tray unit-M from the machine. (Refer to section 5.5 "Removing/Attaching Tray Unit-Ms" for details.)

<TZ-axis belt tension (motor side)>

1. Measure the belt tension in the middle of the longest span of the belt as indicated below. Ensure that the tension is 245.0 ± 10.0 Hz.

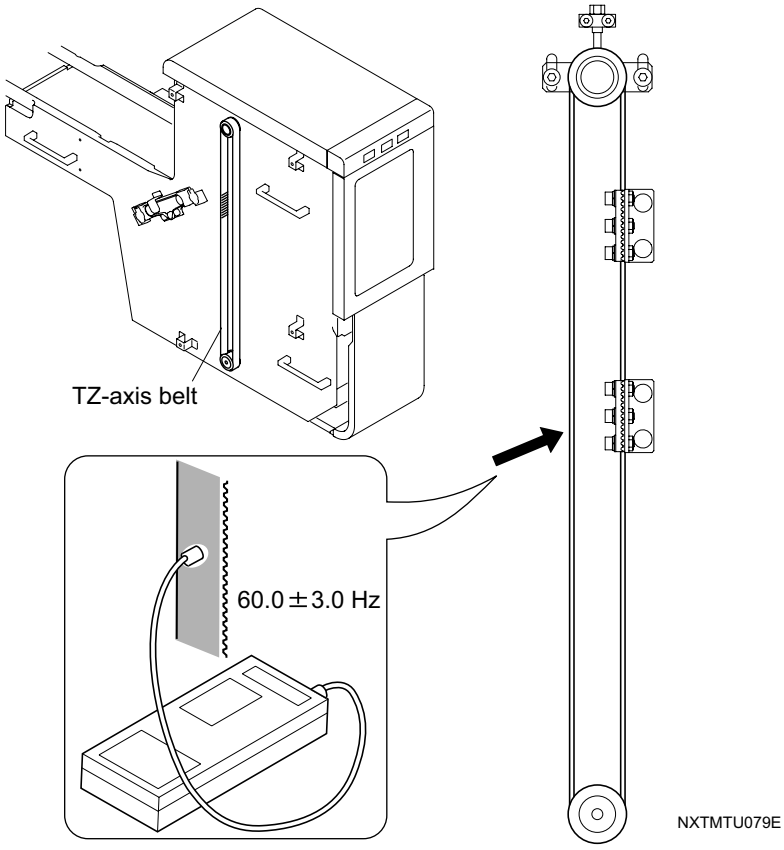


2. If the tension is outside of this range, adjust the belt tension until it is within the correct range. Lightly loosen the motor fixing bolts and then use the adjusting bolt to adjust the tension. Ensure that the tension is still within range after retightening the motor fixing bolts.

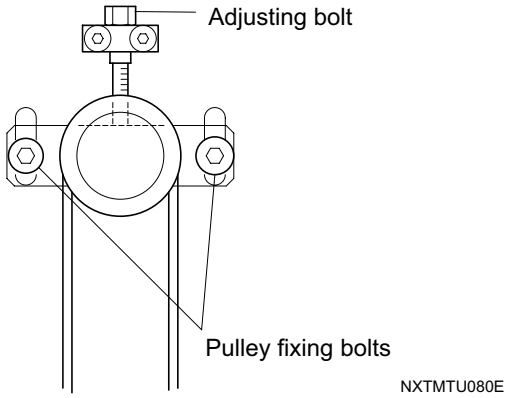


<TZ-axis belt tension (belt on the magazine side)>

1. Measure the belt tension in the middle of the longest span of the belt as indicated below. Ensure that the tension is 60.0 ± 3.0 Hz.

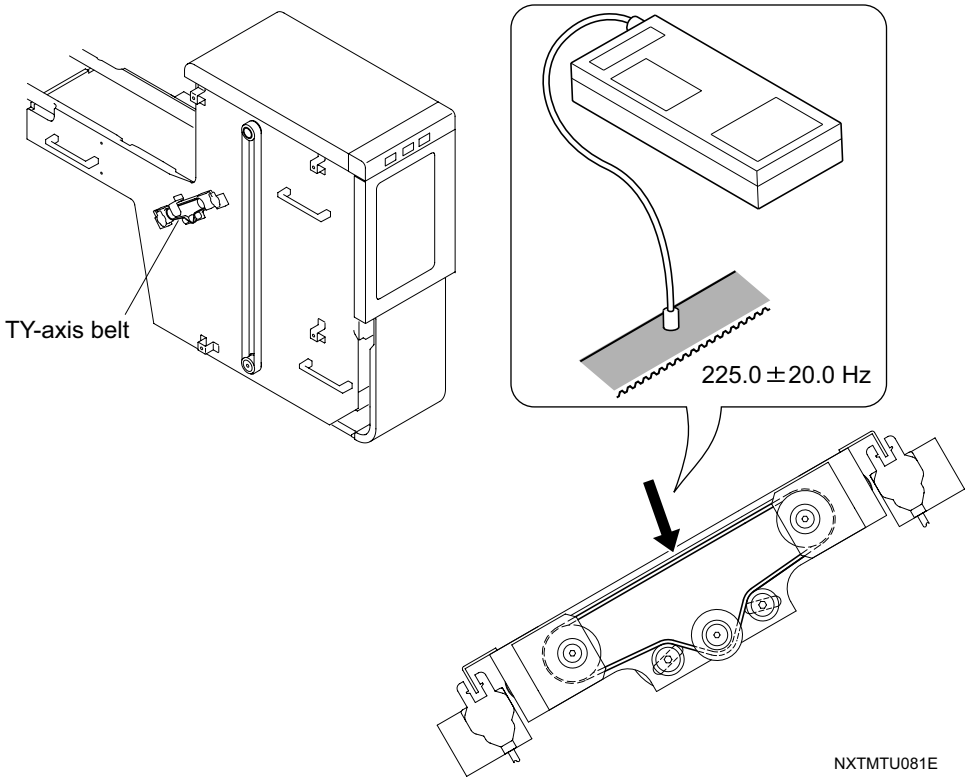


2. If the tension is outside of this range, adjust the belt tension until it is within the correct range. Lightly loosen the pulley fixing bolts and then use the adjusting bolt to adjust the tension. Ensure that the tension is still within range after retightening the pulley fixing bolts.

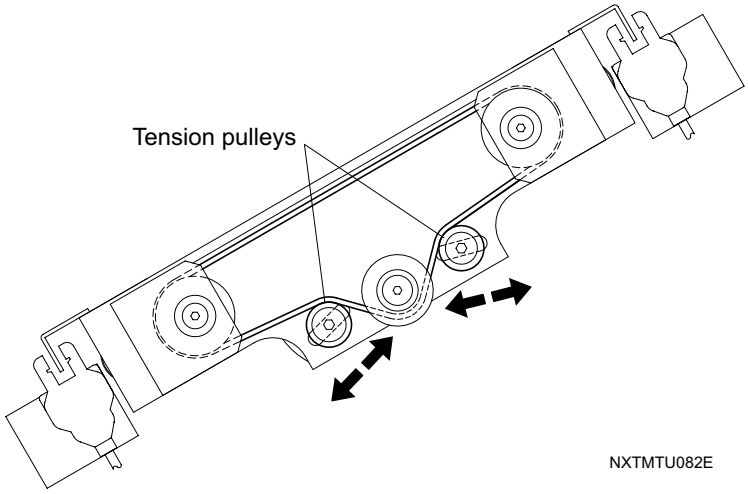


<TY-axis belt tension (for the clutch)>

1. Measure the belt tension in the middle of the longest span of the belt as indicated below. Ensure that the tension is 225.0 ± 20.0 Hz.

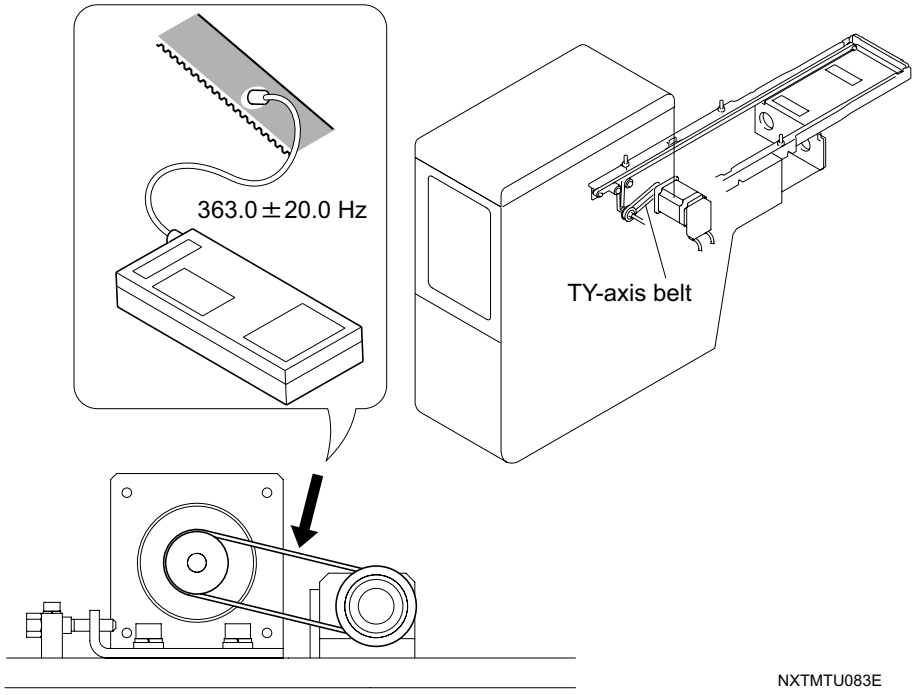


2. If the tension is outside of this range, adjust the belt tension until it is within the correct range. Lightly loosen the tension pulley fixing bolts. Loosen the lock nut on the adjusting bolt and then use the adjusting bolt to adjust the tension. Ensure that the tension is still within range after retightening the tension pulley fixing bolts.

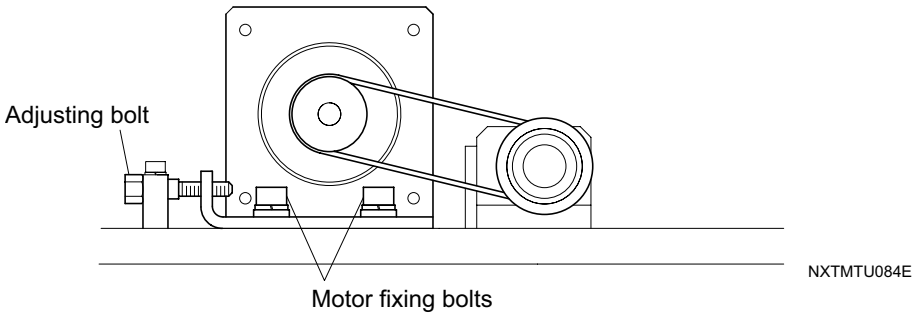


<TY-axis belt tension (motor side)>

1. Measure the belt tension in the middle of the longest span of the belt as indicated below. Ensure that the tension is 363.0 ± 20.0 Hz.



2. If the tension is outside of this range, adjust the belt tension until it is within the correct range. Lightly loosen the motor fixing bolts and then use the adjusting bolt to adjust the tension. Ensure that the tension is still within range after retightening the motor fixing bolts.

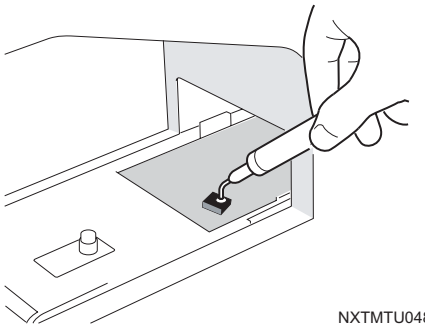


6.9 Irregular Maintenance

6.9.1 Removing rejected parts from the reject parts conveyor

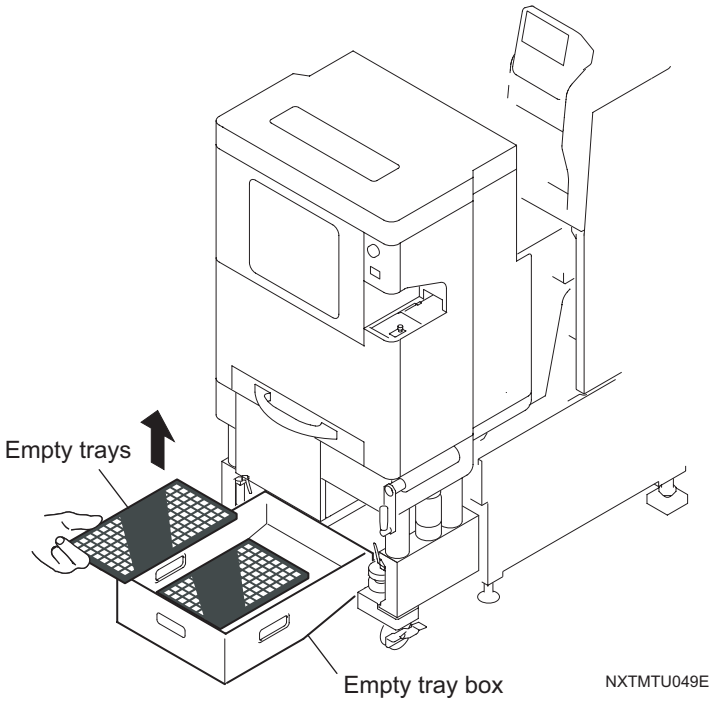
Parts can be removed from the reject parts conveyor even during auto operation. The machine will stop when the sensor detects that the conveyor is full. Resume operation after the parts have been removed.

1. Use the vacuum pickup tool to remove the parts from the reject parts conveyor.



6.9.2 Removing empty trays

1. Pull out the empty tray box.
2. Remove the empty trays from the box.



6.9.3 Cleaning the nozzles

Clean the nozzles after 150,000 pickups have been performed.

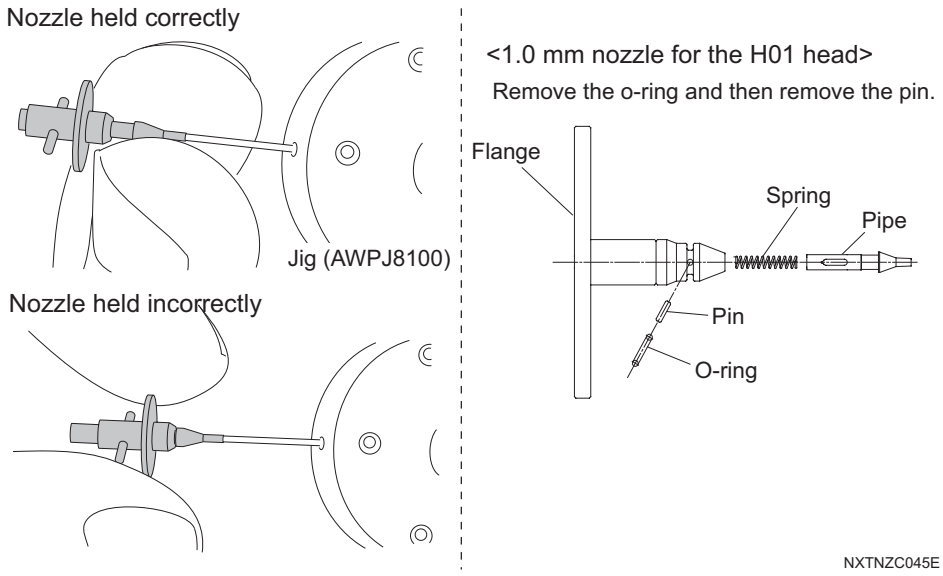
Cleaning procedure

1. Remove the nozzles from the nozzle station.
2. While holding the nozzle correctly, use the correct size of drill on the nozzle cleaning jig for the nozzle in question to clean the nozzle tip area and back area. Refer to the chart in the section "Selecting the correct drill bit for the nozzle size" section on the next page. In addition, disassemble the 1 nozzle (1.0 mm) and clean the nozzle end.

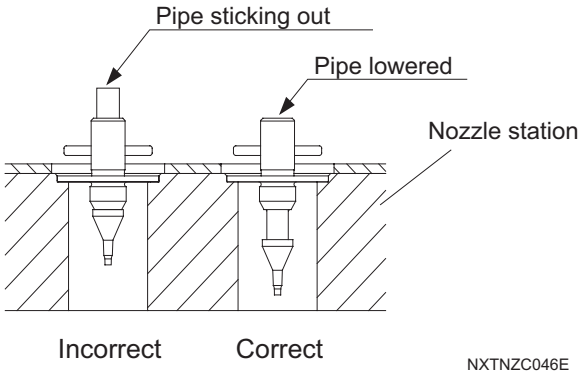
Note:

1.Hold the nozzle at the ceramic part of the tip as shown below when cleaning nozzles with the drill jig. If the sleeve of the nozzle is held (as shown below) to clean the nozzle, the connection to the ceramic part of the nozzle may become loose or damaged.

2.It is not possible to use the nozzle cleaning jig (AWPJ8100) to clean nozzles 0.4 mm or smaller.

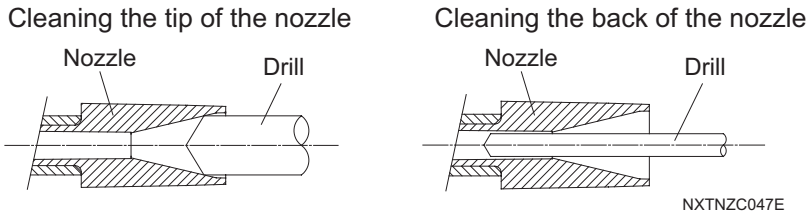


3. After cleaning the nozzle, check the up/down sliding action of the nozzle pipe. In addition, check the flange surface of 1 nozzles for indentations, bulges, or burrs.
4. Set the nozzles back in the nozzle station. Ensure that the pipes for the nozzles are lowered. In addition, wipe any oil off the flanges for 1 nozzles.



Selecting the correct drill bit for the nozzle size

The internal diameter of the nozzle tip is sometimes different than the back of the nozzle. Refer to the chart below and select the appropriate drill for the area to be cleaned. Nozzle damage can occur if an incorrect drill size is used.



8 nozzle			4 nozzle		
Nozzle diameter (etched on the top of the nozzle)	Drill diameter		Nozzle diameter	Drill diameter	
	Tip	Back		Tip	Back
dia. 0.3	(Ultrasonic cleaning)		dia. 1.0	dia. 0.6	dia. 0.35
dia. 0.4	(Ultrasonic cleaning)		dia. 1.3	dia. 0.9	dia. 0.6
dia. 0.7	dia. 0.35		dia. 1.8	dia. 0.9	dia. 0.6
dia. 1.0	dia. 0.6	dia. 0.35	dia. 2.5	dia. 1.9	dia. 0.6
dia. 1.3	dia. 0.9	dia. 0.35	1 nozzle		
dia. 1.8	dia. 0.9	dia. 0.35	dia. 1.0	dia. 0.6	dia. 0.35
dia. 2.5	dia. 1.9	dia. 0.35	dia. 1.3	dia. 0.9	
dia. 1.3A	dia. 0.9	dia. 0.6	dia. 1.8	dia. 0.9	
dia. 1.8A	dia. 0.9	dia. 0.6	dia. 2.5	dia. 1.9	dia. 1.35
dia. 2.5A	dia. 1.9	dia. 0.6	-	-	-

Cleaning with an ultrasonic cleaner

Follow the conditions below when using an ultrasonic cleaning unit to clean nozzles.

- Cleaning equipment: 60W or more for eyewear use or precious metal cleaning
- Cleaning fluid: Ethanol or isopropyl alcohol based cleaning fluids
- Cleaning time: 15 minutes
- Do not use an ultrasonic cleaner to clean nozzles with 2D code labels (stickers). It is only possible to use the ultrasonic cleaner for nozzles which have laser etched 2D codes.
- To ensure that the cleaning fluid used does not damage the coating of the nozzles, it is recommended to test 1 or 2 nozzles before cleaning all of the nozzles.

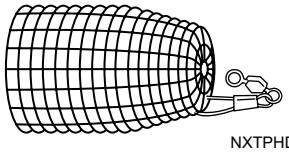
6.9.4 Cleaning the nozzle vacuum filter

Perform nozzle vacuum filter cleaning if a nozzle vacuum pressure error warning displays. Cleaning should also be performed once a month (every 700 hours) when using the 8 nozzle head or 12S nozzle head.

About the filter cleaning basket

Cleaning the filters is easier when using the special filter cleaning basket. When using this basket, put in the filters along with any cases and put the basket in an ultrasonic cleaning machine to clean them. The quantities of filters that can be put in the basket are provided below.

- 4, 8, 12S nozzle head: Maximum 40 filters
- 1 nozzle head: Maximum 20 filters



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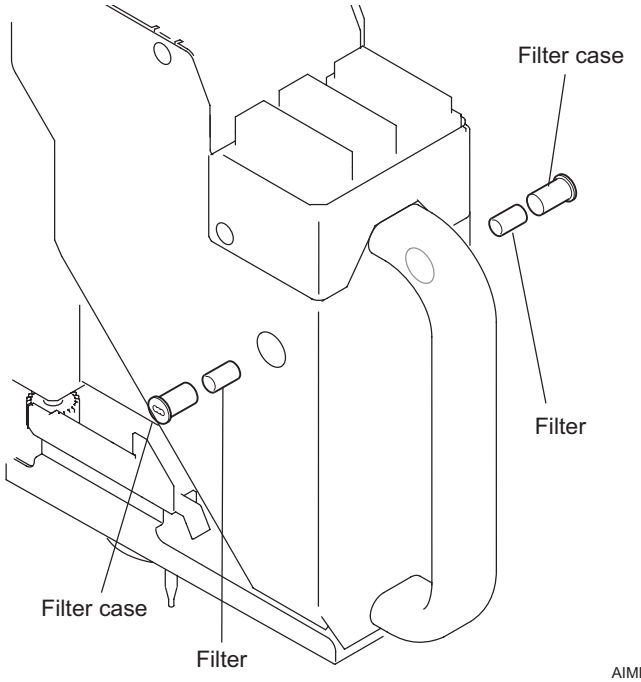
<1 nozzle head>

1. Remove the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Using the small-type blade screw driver, loosen and remove the filter cases and filters.



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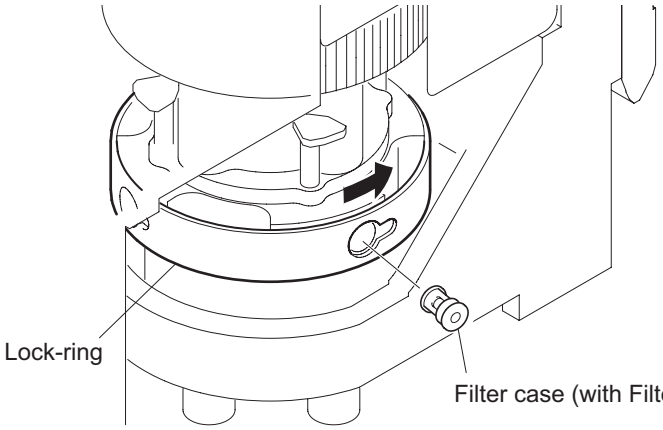
3. Wash the filter cases and filters in neutral detergent solvent, or replace if excessively dirty.

Note: Put the filter while still in the case in the optional filter cleaning basket (K1325B). Clean them by soaking them in neutral detergent in an ultrasonic cleaning machine for 5 minutes.

<4 nozzle head>

1. Remove the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Slide the aluminum lock-ring to the right and remove the filter cases (with filter inside).

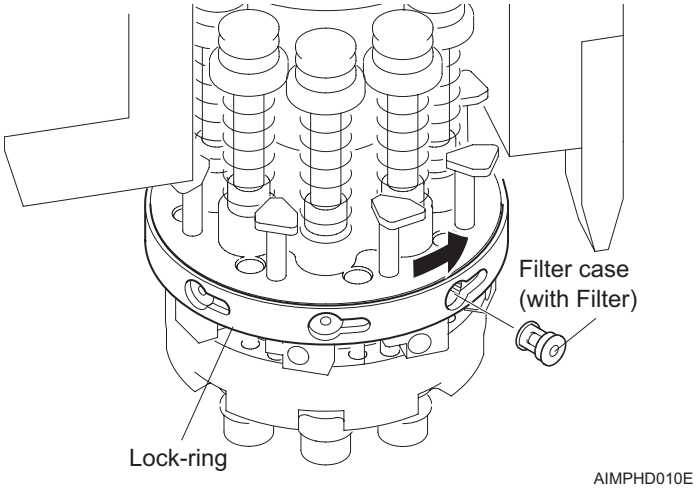


3. Wash the filter cases and filters in neutral detergent solvent, or replace if excessively dirty.

Note: Put the filter while still in the case in the optional filter cleaning basket (K1325B). Clean them by soaking them in neutral detergent in an ultrasonic cleaning machine for 5 minutes.

<8 nozzle head, 12S nozzle head>

1. Remove the placing head. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Slide the aluminum lock-ring to the right and remove the filter cases (with filter inside).



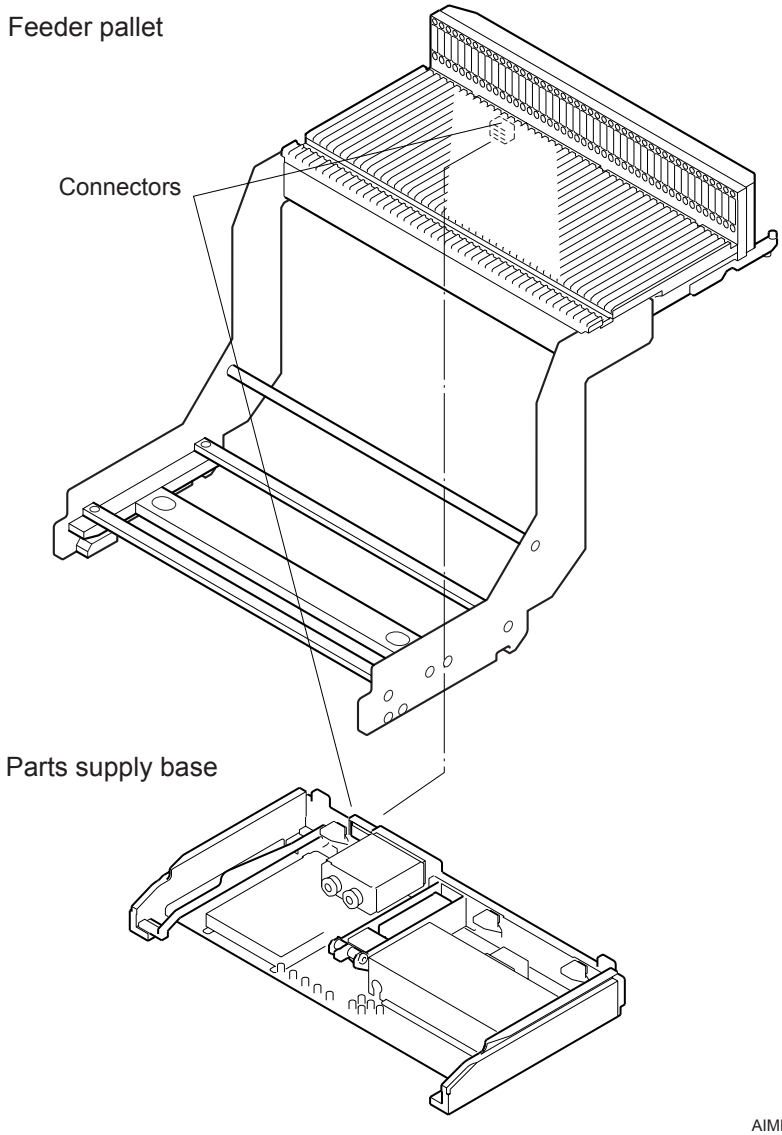
3. Wash the filter cases and filters in neutral detergent solvent, or replace if excessively dirty.

Note: Put the filter while still in the case in the optional filter cleaning basket (K1325B). Clean them by soaking them in neutral detergent in an ultrasonic cleaning machine for 5 minutes.

6.9.5 Cleaning the feeder pallet and parts supply base connector

Perform cleaning if a pallet clamp error warning displays.

1. Remove the feeder pallet. (See section 5.1 "Removing/Inserting a Feeder Pallet" for details.)
2. Use a vacuum cleaner to remove any dirt or foreign objects clogging both sides of the connector.



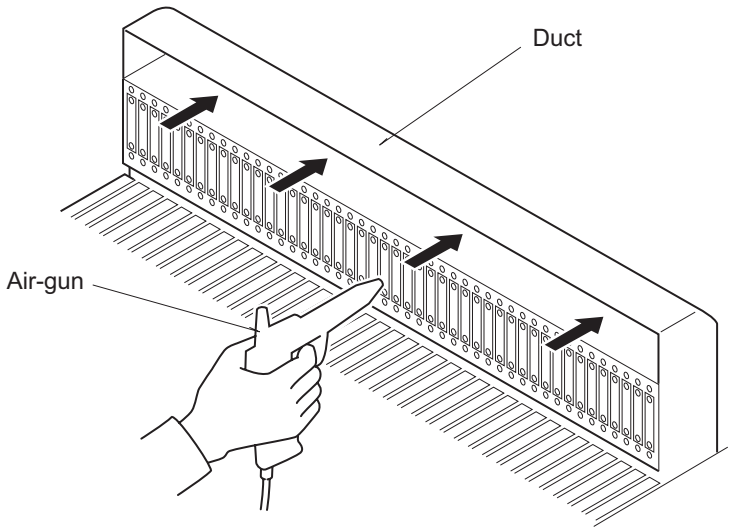
6.9.6 Cleaning the waste tape processing unit duct

Perform cleaning if a feeder tape indexing defect displays.

⚠WARNING

Avoid injury by keeping fingers clear of the entrance to the waste tape processing unit duct.

1. Remove all tape feeders from the feeder pallet.
2. Use an air-gun to clear the duct of any waste tape and parts.



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6.9.7 Cleaning the waste tape cutter

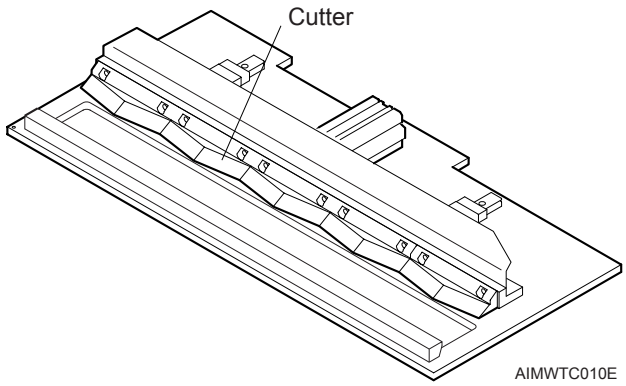
Perform cleaning if a cutter operation defect warning displays.

⚠WARNING

• Do not put your hands or any other body parts in the waste tape processing unit. Injury may result.

• Be sure to remove the waste tape processing unit from the machine when cleaning. When it is in the machine, it may move and cause injury.

1. Remove the waste tape processing unit. (See section 8.4 "Waste Tape Processing Unit Replacement" for details.)
2. Use an air-gun to clear the cutter of any waste tape and parts.



MEMO:

7. Replacing Consumable Parts

7.1 Replacing the Main Conveyor Belts

7.1.1 Recommended frequency

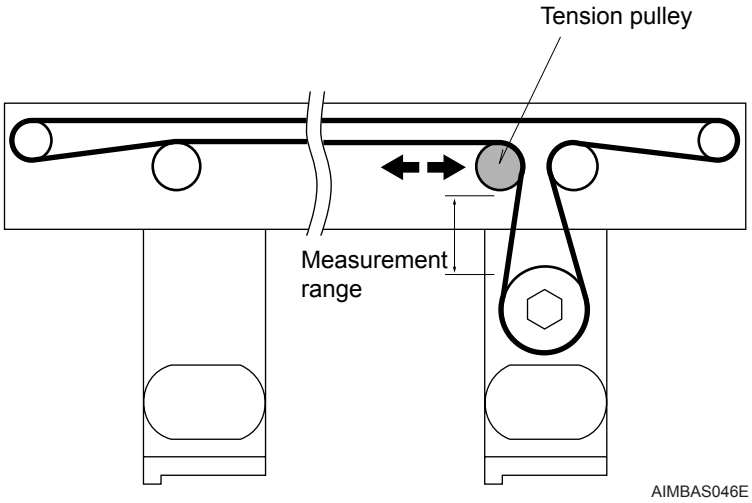
Replace when damage to the belt results in panel conveyance errors.

Note: It is necessary to replace both the reference side and adjustable side conveyor belts at the same time.

7.1.2 Conveyor belt tension adjustment

1. Use a tension meter at the location indicated to measure belt tension. Adjust the tension pulley so that tension is at the specified frequency.

Conveyor Belt	Specified Frequency (Hz)
Reference side / Adjustable side	390±15

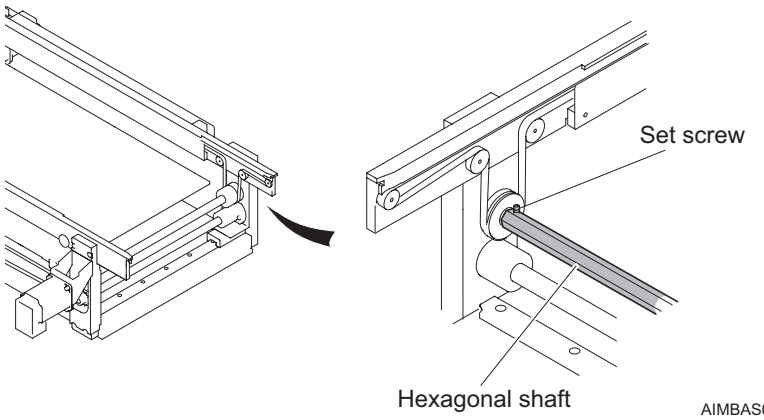


2. Tighten the tension pulley to the prescribed torque.

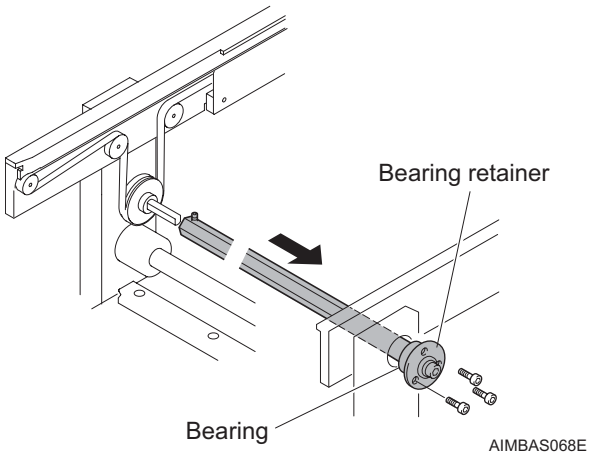
   Tension pulley tightening torque:2 Nm

7.1.3 Exchanging the main conveyor belt

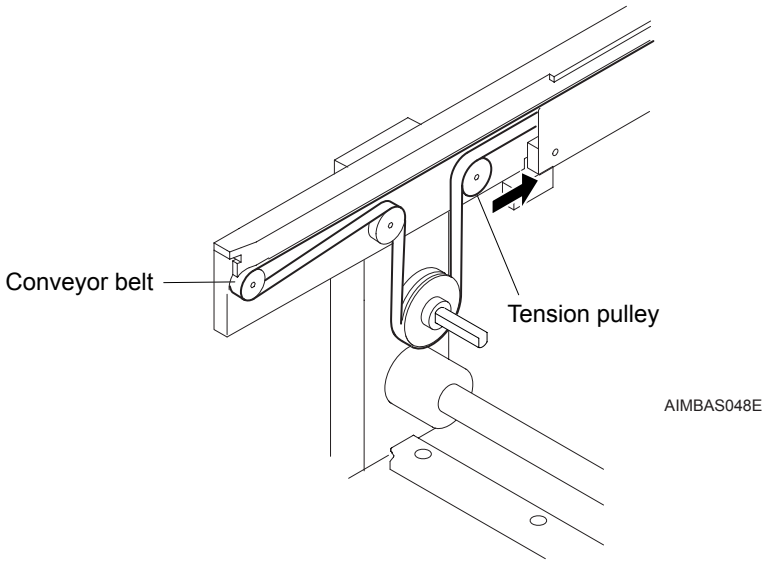
1. Adjust the conveyor to its maximum width using the backup plate exchange command.
2. Loosen the set screw with an Allen wrench.



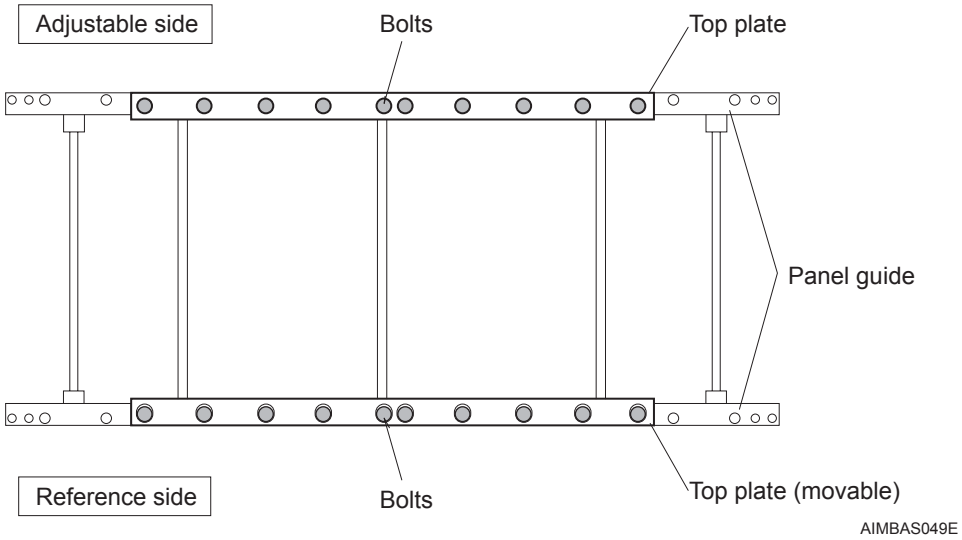
3. Remove the bearing retainer mounting bolts (3).
4. Pull the hexagonal shaft together with the bearing.



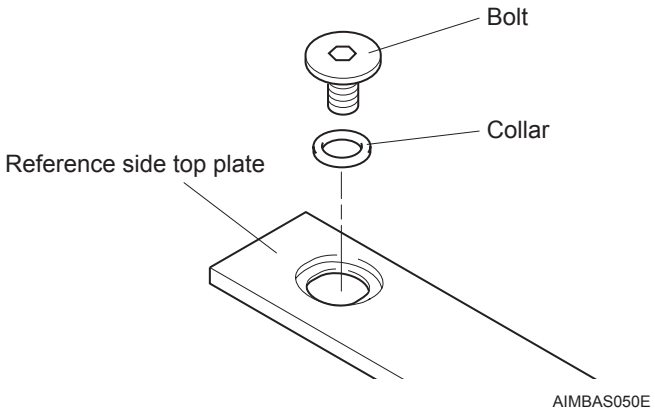
5. Add some slack to the belt by loosening the tension pulley using an Allen wrench.



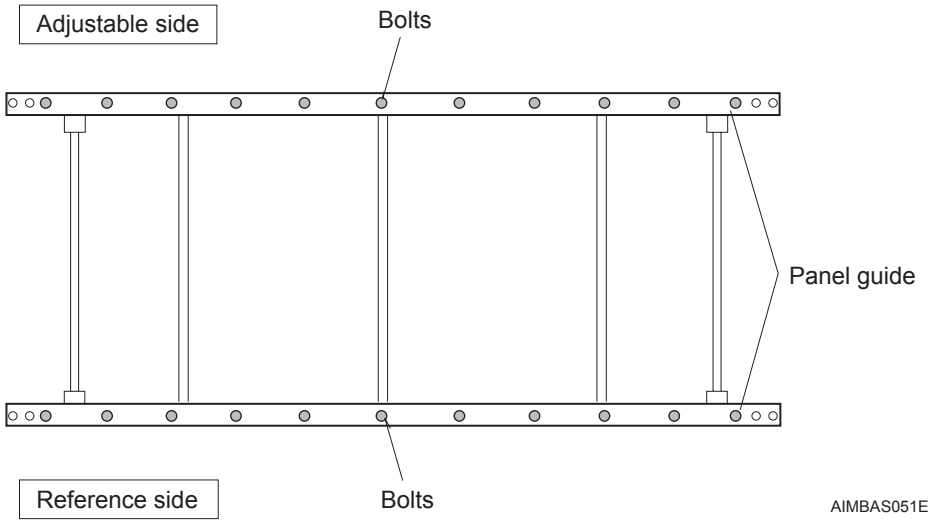
6. Remove the 20 bolts (10 on each side) fastening the top plate to the panel guide using an Allen wrench, and then remove the top plate.



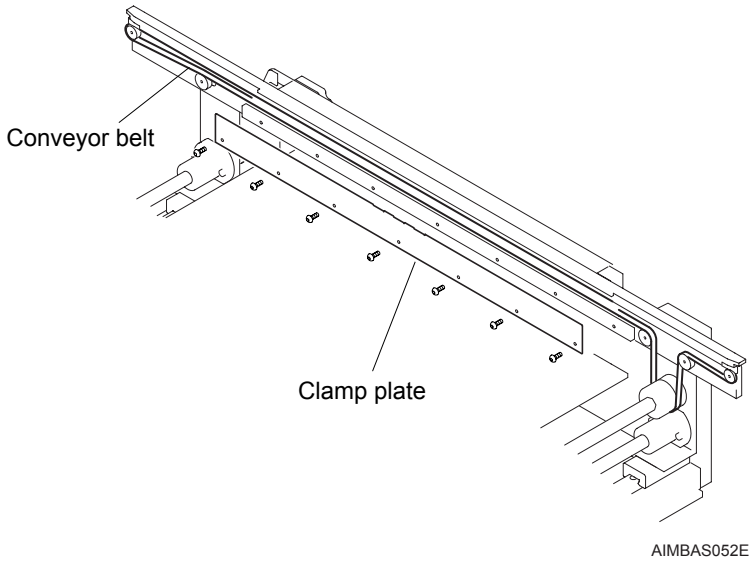
When removing the movable top plate on the reference side, be sure to remove the collars together with the bolts.



7. Remove the 22 bolts (11 on each side) using an Allen wrench, and then remove the panel guide from the conveyor.

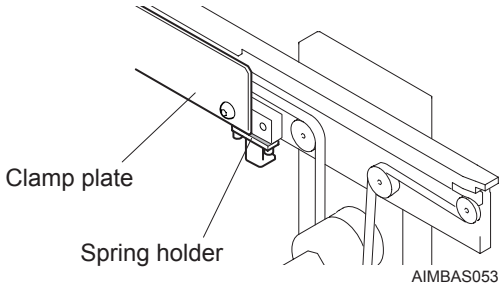


8. Remove the 7 screws, and then remove the clamp plate from the clamp rail.

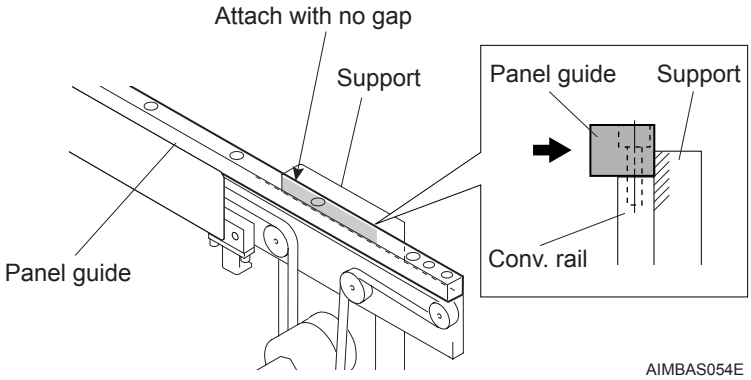


9. Replace the conveyor belt with a new one.

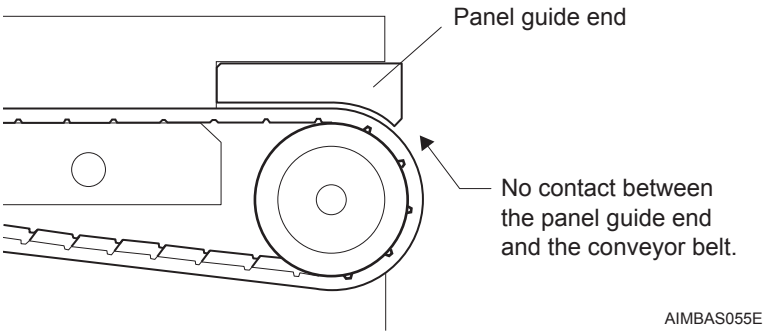
10. Reattach the clamp plate to the clamp rail. Ensure there is no gap between the bottom of the clamp plate and the spring holder.



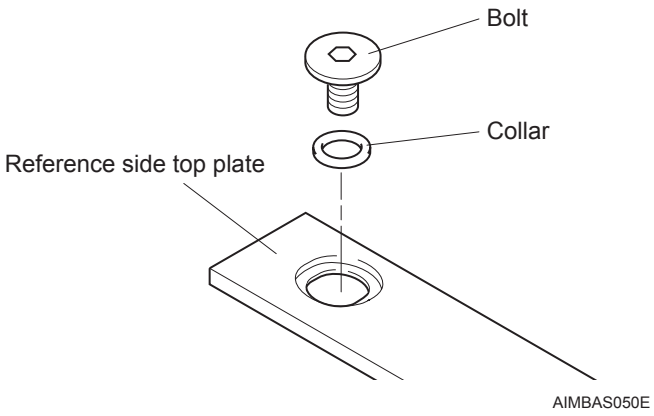
11. Reattach the panel guide to the conveyor rail. Ensure there is no gap between the panel guide and the ground surface of the conveyor support.
Fastening torque between the panel guide and the conveyor rail: 4 Nm



In addition, ensure there is no contact between each end of the panel guide and the conveyor belt.



12. Reattach the top plate to the panel guide using the specified fastening torque.
    When attaching the top plate on the reference side of the conveyor, insert the collars to the hex-bolts before tightening them.
    Fastening torque between the top plate and the panel guide: 1.8 Nm



13. Adjust the tension in the conveyor belt at the tension pulley (refer to section 7.1.2 "Conveyor belt tension adjustment" for details).

7.2 Replacing the Conveyor Belt Cleaner

7.2.1 Recommended frequency

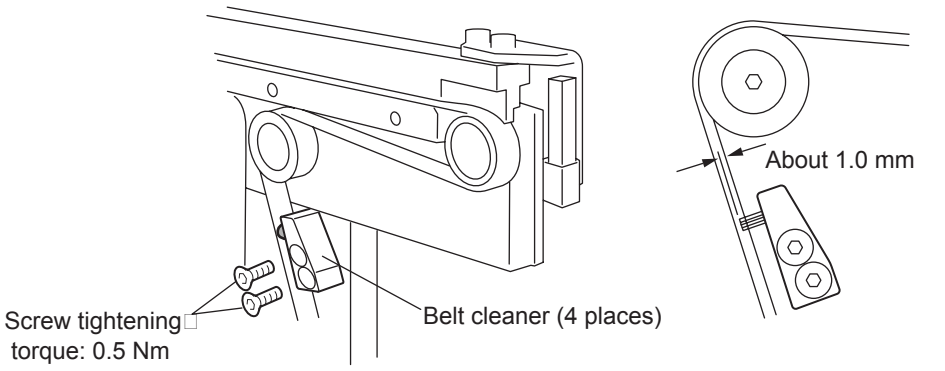
When panel conveyance errors occur.

7.2.2 Procedure

1. Raise the safety cover.

> ⚠ ***WARNING***
>
> ***Raise the safety cover fully to the top. The cover may slide down if the door is not fully open.***

2. Turn off the machine by turning the main switch off.
3. Replace the belt cleaner. When mounting the new belt cleaner, the end of the brushes should push in about 1.0 mm from the edge of the conveyor belt.



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4. Turn on the main switch and turn on the machine.
5. Close the safety cover

7.3 Replacing the Servo Amplifier Battery

7.3.1 Recommended frequency

Replace upon the occurrence of a battery alarm.

7.3.2 Procedure

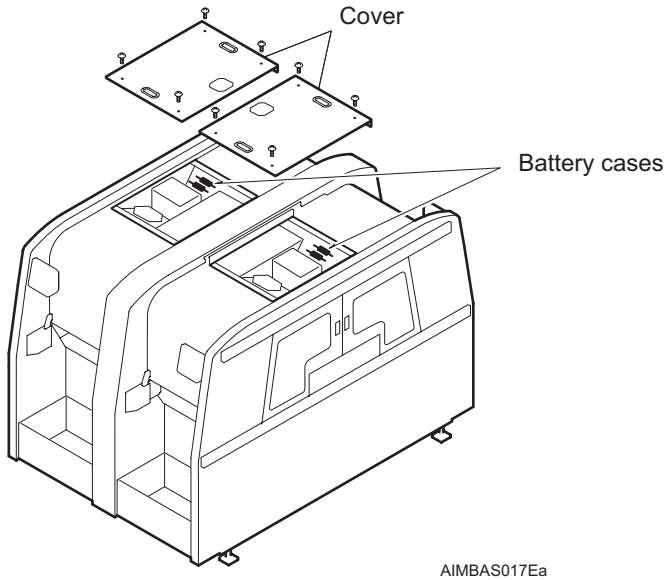
⚠CAUTION

Do not use any battery other than the specified battery.

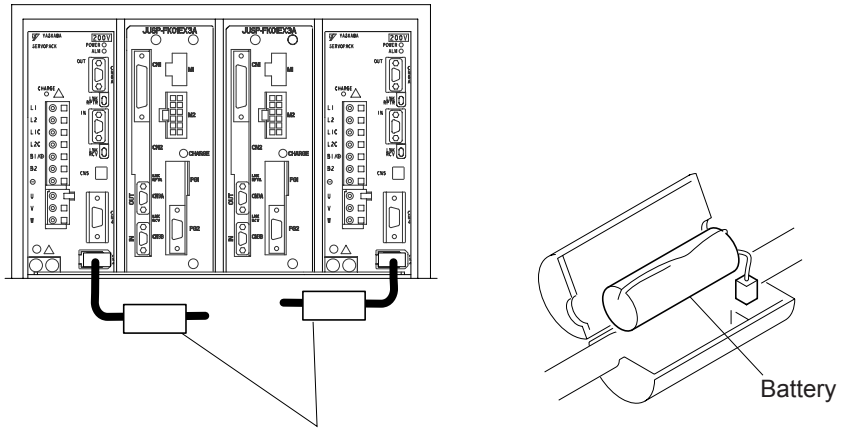
Replace the battery with the machine power turned ON.
It will be necessary to reset the motor origin if the battery is replaced with the machine power turned OFF.

Dispose of the used battery in accordance with your local regulations.

1. Set the main switch to off to cut the machine power.
2. Remove the upper cover mounting screws.
3. Disconnect the cooling fan harness connector.
4. Disconnect the ground wire from the cover.
5. Remove the cover.
6. Turn the main switch on.



7. Open the battery case of which the servo amplifier battery alarm is ON, and replace the battery.



8. Again, turn the main switch off.
9. Connect the ground wire to the cover.
10. Connect the cooling fan harness connector.
11. Attach the cover.

7.4 Replacing the Placing Head Battery

7.4.1 Recommended frequency

Replace the battery upon the occurrence of a battery alarm.

7.4.2 Procedure

⚠CAUTION

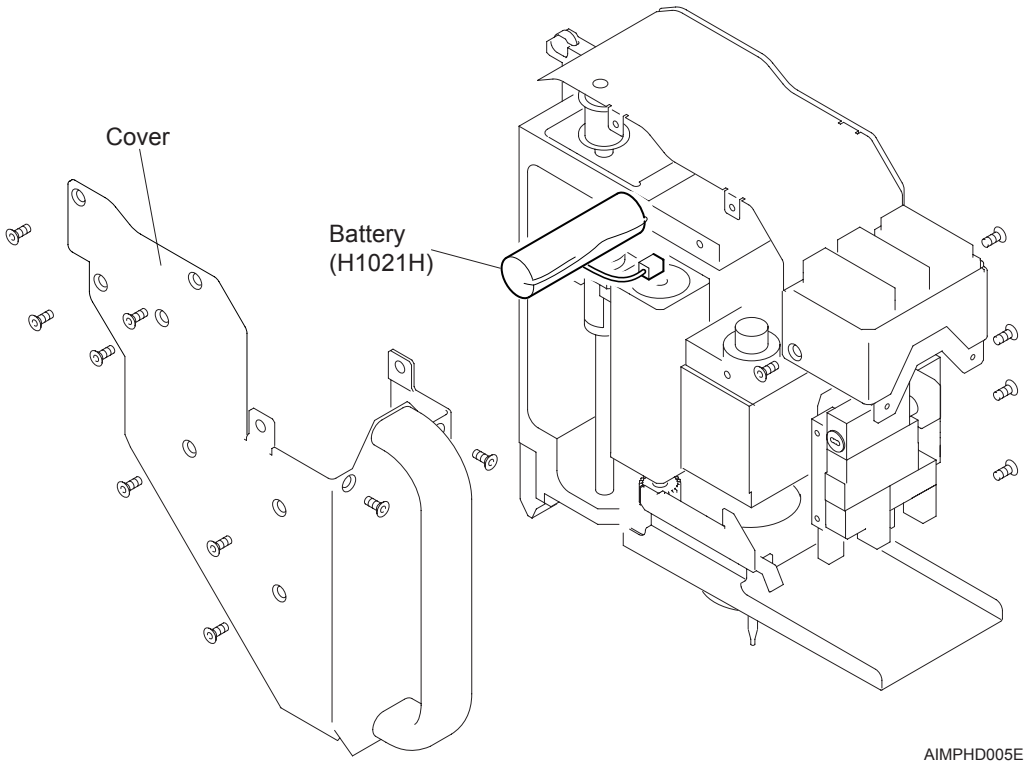
Do not use any battery other than the specified battery.

Replace the battery with the machine power turned ON. It will be necessary to reset the motor origin if the battery is replaced with the machine power turned OFF.

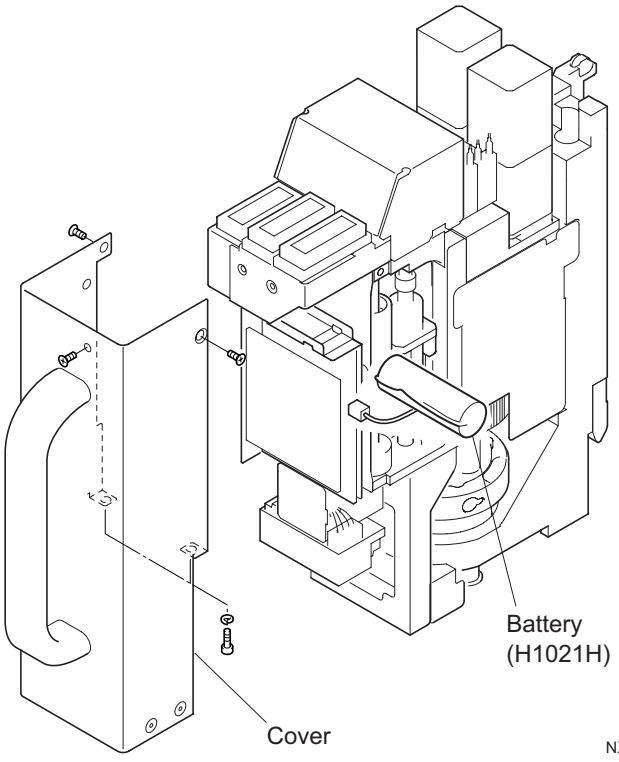
Dispose of the used battery in accordance with your local regulations.

1. Remove the head from the machine. (See section 5.3 "Removing/Attaching a Placing Head" for details.)
2. Remove the covers on the head that cover the battery area. Do not disconnect the battery at this time.
3. Reattach the placing head to the machine, and then connect three harness connectors to the placing head.
4. Make sure that the machine is powered on and power is being supplied to the head.
5. Replace the battery with a new one.
6. Use the head exchange command to remove the head.
7. Reattach the cover which covers the placing head.

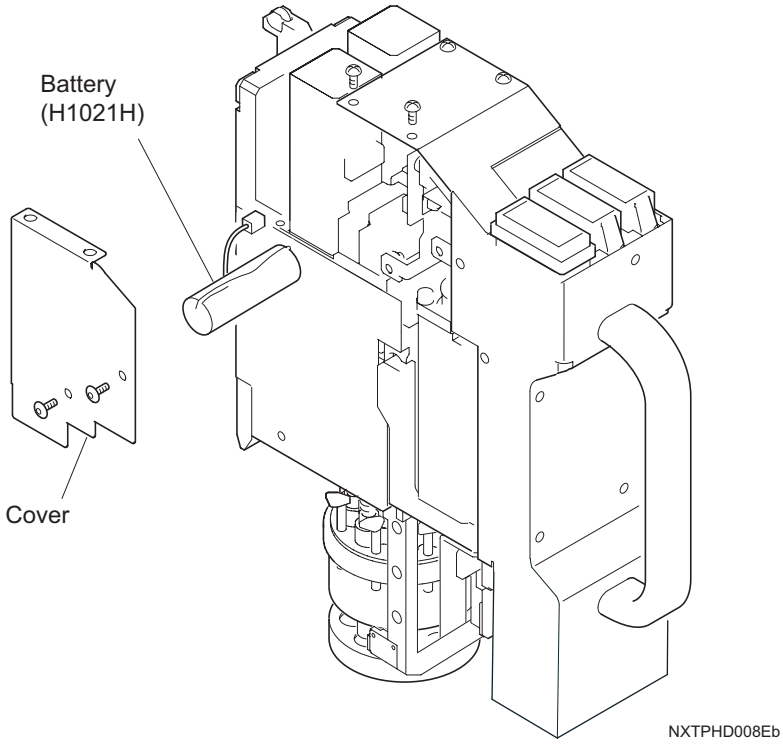
<1 nozzle placing head>



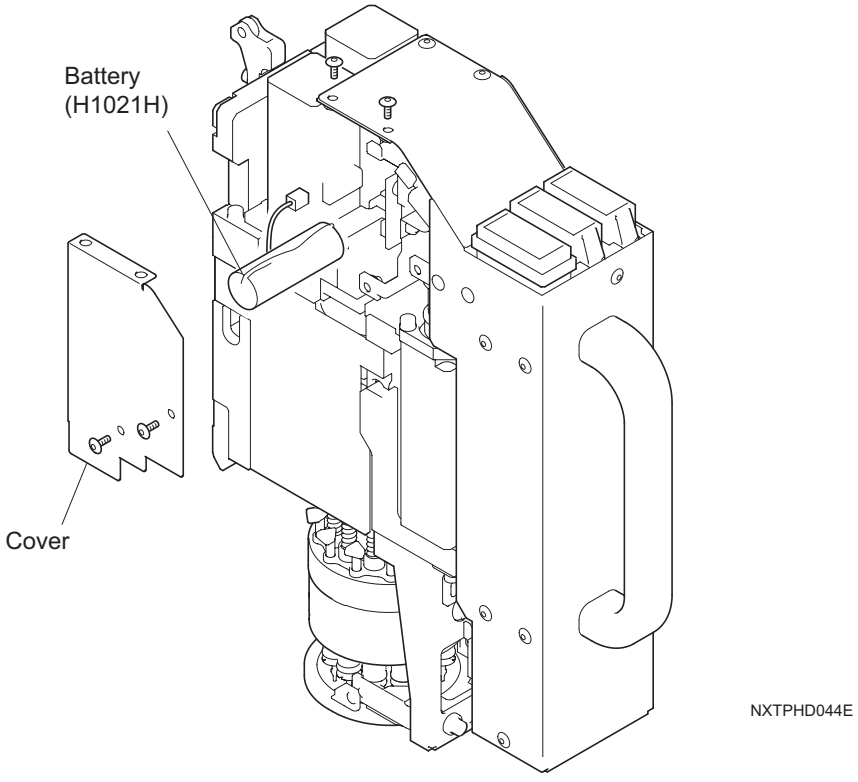
<4 nozzle placing head>



<8 nozzle placing head>



<12S nozzle placing head>



7.5 Replacing the Module CPU battery

A battery retains the data listed below when the main switch for the machine is turned off. However, the following data is deleted when the main switch is turned off and the battery has no power.

a. Module calibration data

- Matrix data, Feeder pallet levelness data, and auto-calibration values.

b. Module configuration settings

c. Production information

- Current job name, Production information, Profiler information, and completed sequences.

Perform the preparation procedures in order to ensure that the necessary data is available and then proceed to change the battery.

7.5.1 Recommended frequency

Replace the battery upon the occurrence of a battery alarm.

7.5.2 Preparation procedures

1. Ensure that the floppy disk with the matrix and feeder pallet levelness backup data is available and useable. This disk is shipped with the module. If the disk cannot be located or is bad, then perform the procedures below.
   a. Save the module matrix data from the module on a computer. Refer to the AIM System Reference manual for details.
   b. Record the feeder pallet levelness values for the module. This data is displayed in the information command in manual mode.
2. Record the module configuration settings. Use Accessory Software to display the module configuration settings for the module in question. Refer to the AIM System Reference manual for details. Once all of the module data has been checked and/or recorded, then proceed to the next step.
3. Eject all nozzles from the head by using the manual mode command.
4. Remove any panels that are in the module.
5. Set the nozzle jigs for the type of head in the module in the nozzle station. Set the same number of nozzle jigs as there are holders on the head.
6. Have the replacement battery and an electrostatic discharge wrist strap (with an internal resistance of 1MΩ and above) prepared and ready to be used.

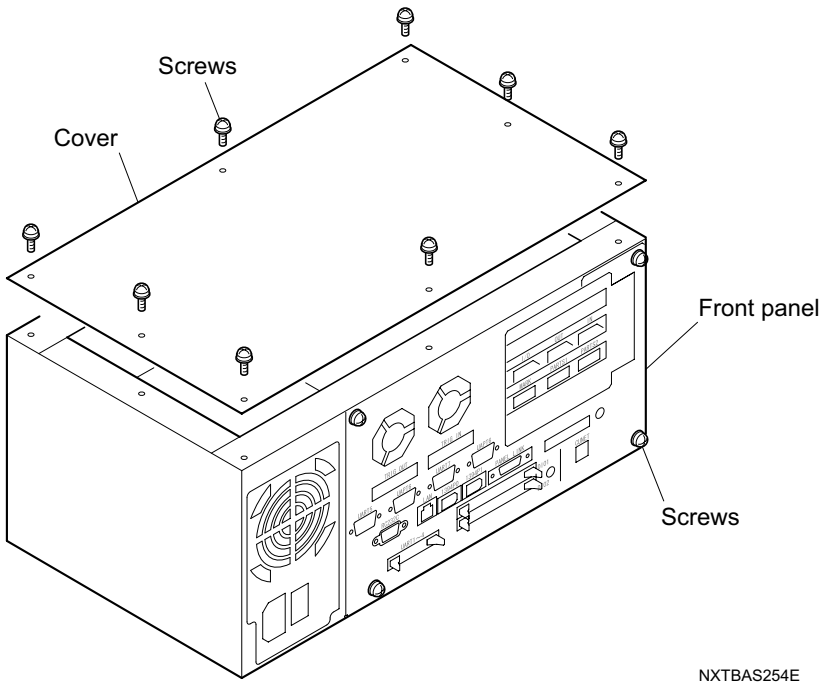
7.5.3 Procedure for replacing the battery

Be sure to use the electrostatic discharge wrist strap (with an internal resistance of 1MΩ and above) before replacing the battery. Attach the wrist strap to the EARTH BONDING POINT on the front of the base to ground it.

⚠CAUTION

• Do not use a battery other than the specified battery.
• Properly dispose of the used battery according to local regulations.
• After replacing the battery, do not attempt to run the module. It is possible for items in the module to collide because calibration data for the module is not correct.

1. Turn off the main switch and then remove the CPU box. Refer to section 8.7 "Module CPU Box Replacement" for details.
2. Remove the top cover for the CPU box and then remove the screws from the front panel.

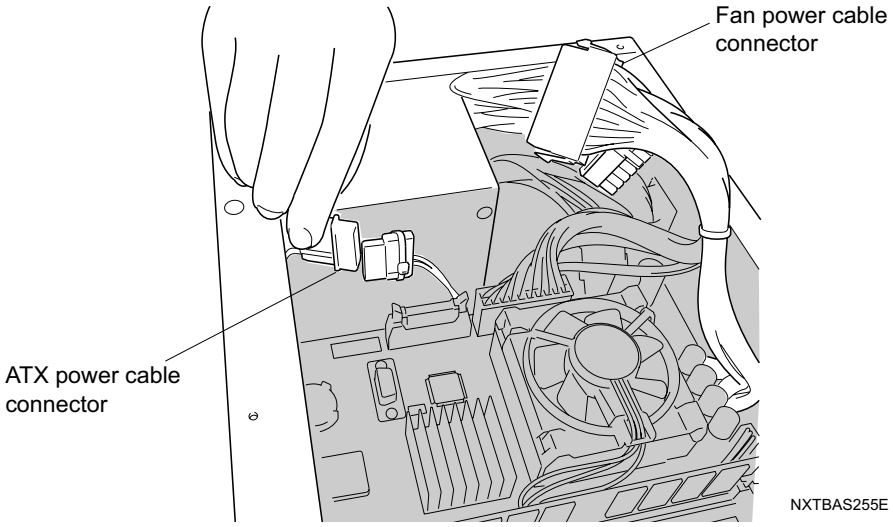


3. Put on the electrostatic discharge wrist strap.

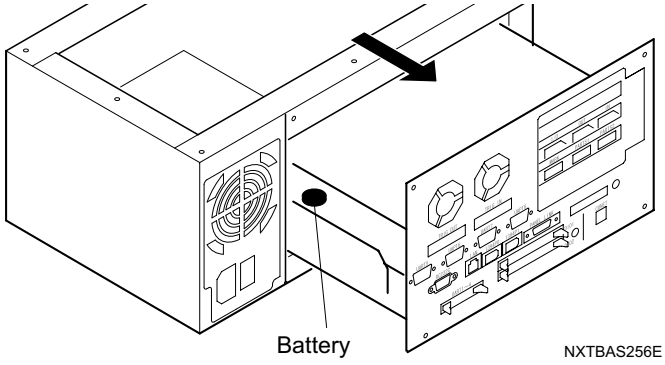
⚠CAUTION

It is possible that electrical items in the CPU box will be damaged if the person performing the work is not grounded to prevent electrostatic.

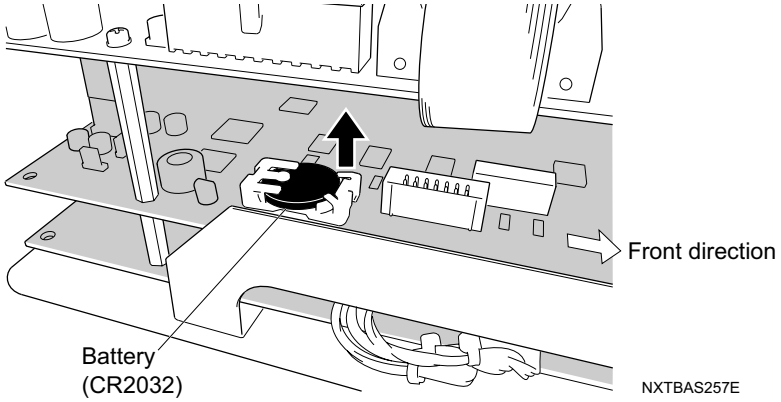
4. Remove the connectors for the ATX power cable and the fan cable.



5. Gently pull the front panel with the boards attached forward just until the point that the battery can be replaced.



6. Replace the battery. Pull up on the front of the battery in order to remove it from the battery holder. It set the new battery, set the rear of the battery in the battery holder and then gently push down on the front of the battery.



7. After replacing the battery, follow the procedures in reverse to return the CPU box back in the module.

7.5.4 Making all settings after changing the battery

After changing the battery, the following items must be performed.

a. Register matrix data

b. Register feeder pallet levelness data

c. Transmit the job

d. Remeasure calibration data

e. Specify module configuration settings

Before proceeding with these procedures, ensure that there are no nozzles on the placing head, no panels in the modules. Once this has been confirmed, turn on the main switch for the machine and follow the procedures below.

1. Check the serial number for the target module.
2. Direct load the matrix measurement software and then register the matrix data from the floppy disk (or the file that was previously saved) that matches the module serial number. Refer to the NXT System Reference manual for details. After registering the matrix data, turn off the machine and then turn it back on and the new matrix data is enabled.
3. Direct load the feeder pallet levelness measurement software and then register the feeder pallet levelness data that was noted (or from a file that was previously saved). Refer to "12. Feeder pallet level measurement" in the Accessory Software Online manual for details. After registering the feeder pallet levelness data, turn off the machine and then turn it back on and the new feeder pallet levelness data is enabled.
4. Transmit the job to the machine. If another module in the machine is currently producing, then transmit the job to the background and then change the background job to the foreground at the module.
5. Set the nozzle jigs in the nozzle station and then specify that the calibration data is to be remeasured. Refer to "6.10 Remeasure Calibration Data" in the Accessory Software Online manual for details.
6. Push START and auto-calibration is performed by the machine.

Note: Ensure that the main switch has been on and the module has been powered on for more than 30 minutes prior to performing this step. This ensures that temperature for the parts camera is warm.

7. If a manual final offset is required, then measure the PAM data on the machine and then send the calculated final offset file to the machine.
8. Specify the module configuration settings at were noted before the battery was changed using Accessory Software.

7.6 Replacing Base CPU Battery

A battery retains the network data when the main switch for the machine is turned off. However, this data is deleted when the main switch is turned off and the battery has no power.

Perform the preparation procedures in order to ensure that the necessary data is available and then proceed to change the battery.

7.6.1 Recommended frequency

Replace the battery upon the occurrence of a battery alarm.

7.6.2 Preparation procedures

Use the manual mode Information command to display the network settings for the machine. The following is a list of the network settings that is required.

- IP address, Subnet mask, Default gateway, and Other settings such as DNS server.

Have the replacement battery and an electrostatic discharge wrist strap (with an internal resistance of 1MΩ and above) prepared and ready to be used.

7.6.3 Procedure

Be sure to use the electrostatic discharge wrist strap (with an internal resistance of 1MΩ and above) before replacing the battery. Attach the wrist strap to the EARTH BONDING POINT on the front of the base to ground it.

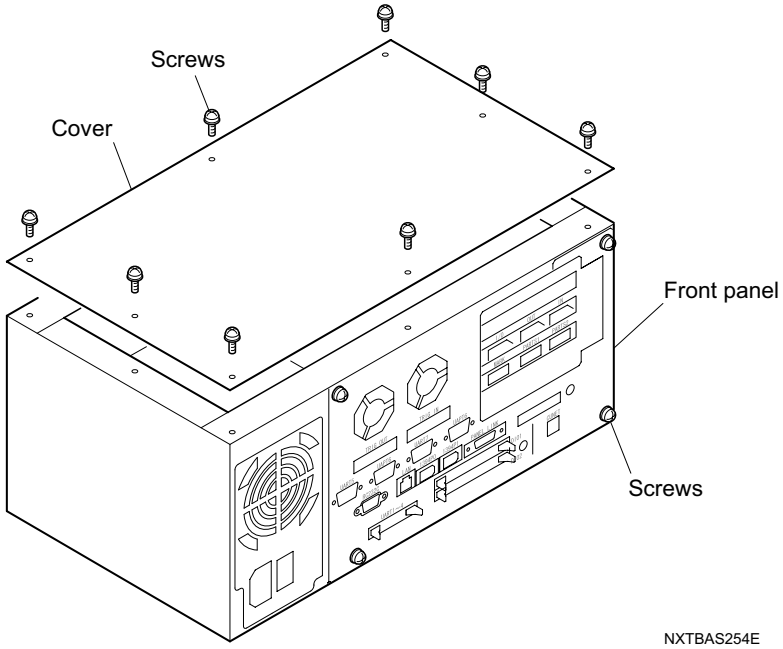
⚠CAUTION

Do not use a battery other than the specified battery.

Properly dispose of the used battery according to local regulations.

1. Turn off the main switch and then remove the CPU box. Refer to section 8.9 "Base CPU Box Replacement" for details.

2. Remove the top cover for the CPU box and then remove the screws from the front panel.

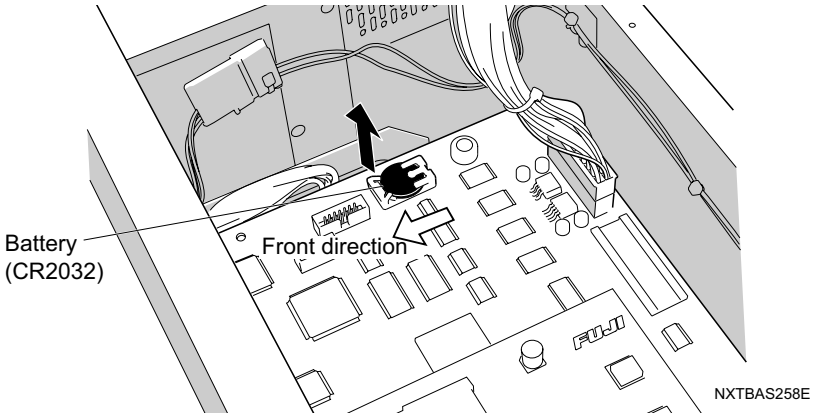


3. Put on the electrostatic discharge wrist strap.

⚠CAUTION

It is possible that electrical items in the CPU box will be damaged if the person performing the work is not grounded to prevent electrostatic.

4. Replace the battery. Pull up on the front of the battery in order to remove it from the battery holder. It set the new battery, set the rear of the battery in the battery holder and then gently push down on the front of the battery.



5. After replacing the battery, follow the procedures in reverse to return the CPU box back in the base.

7.6.4 Making all settings after changing the battery

After changing the battery, the network settings for the base must be specified. Turn on the main switch for the machine and follow the procedures below.

1. Use the software tool "NetworkSetting" to specify the network settings. Refer to the AIM System Reference manual for details.
2. Restart the machine to enable the new network settings.

7.7 Replacing the Nozzle Station Fluorescent Stickers

7.7.1 Recommended frequency

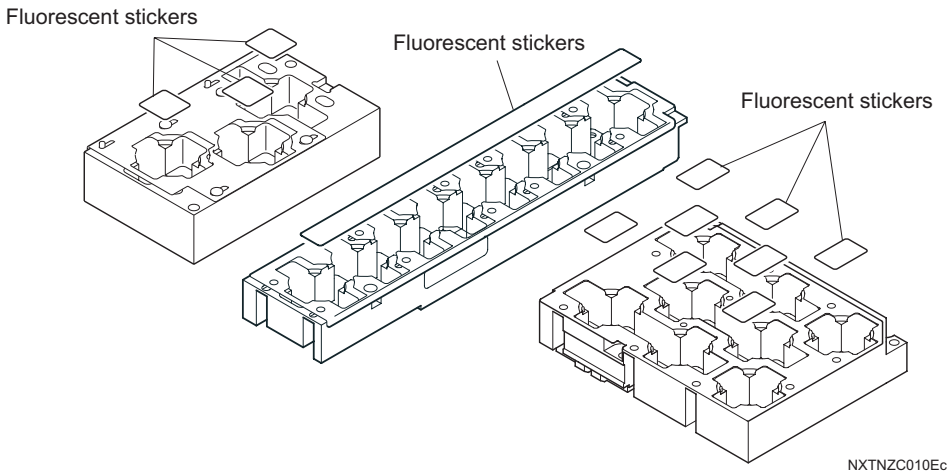
Replace if errors occur when the machine tries to detect the presence of a nozzle.

7.7.2 Procedure

1. Remove the nozzle station from the module. (See section 5.4 "Removing/Attaching a Nozzle Station" for details.)
2. Attach new fluorescent seals to the bottom of the nozzle slots on the nozzle changer based on the procedures for the head type.

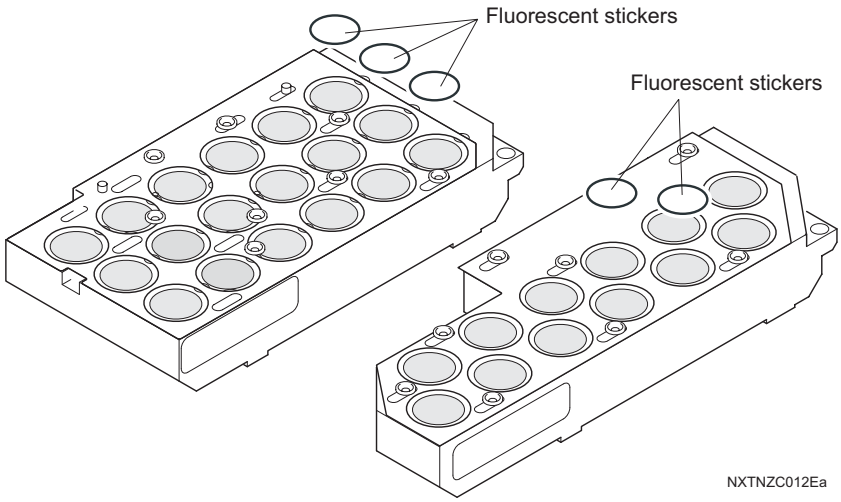
1 nozzle head nozzle station

Peel off the existing fluorescent stickers and replace them with new ones.



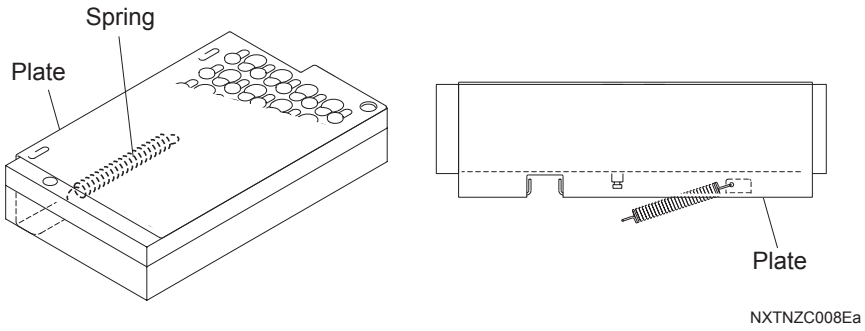
4 nozzle head nozzle station

Peel off the existing fluorescent stickers and then replace them with new ones.

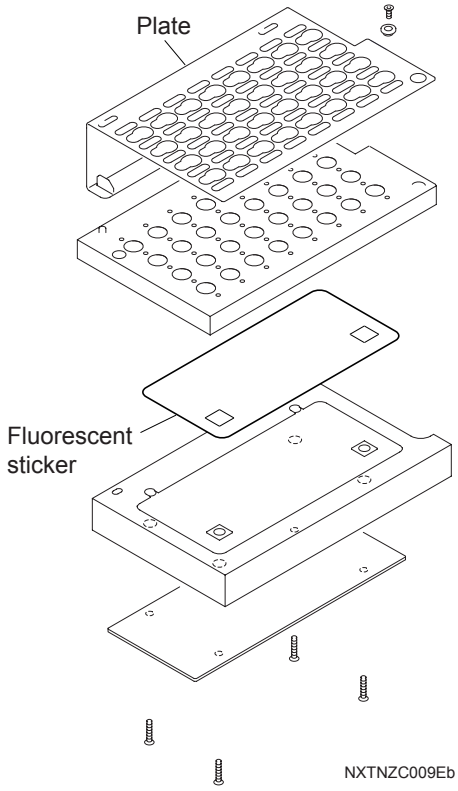


8 nozzle head, 12 nozzle head nozzle station

1. Detach the spring located below the nozzle station.



2. Remove the plate, peel off the existing sticker and replace it with a new one.

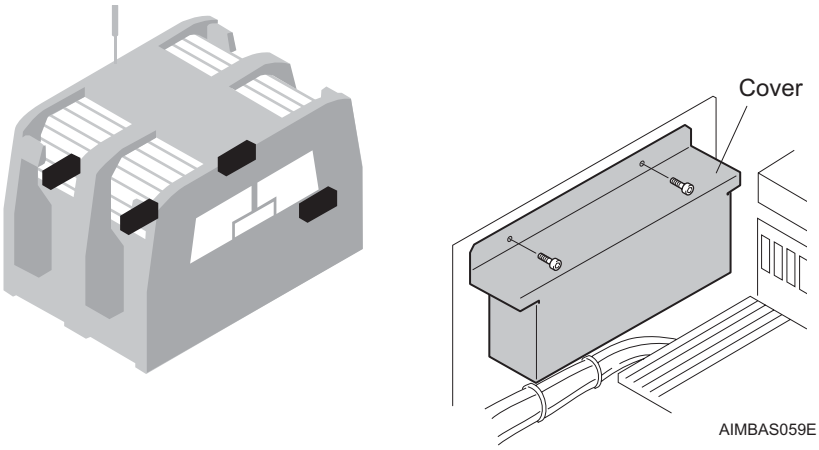


7.8 Replacing Fuses on the Remote I/O Boards

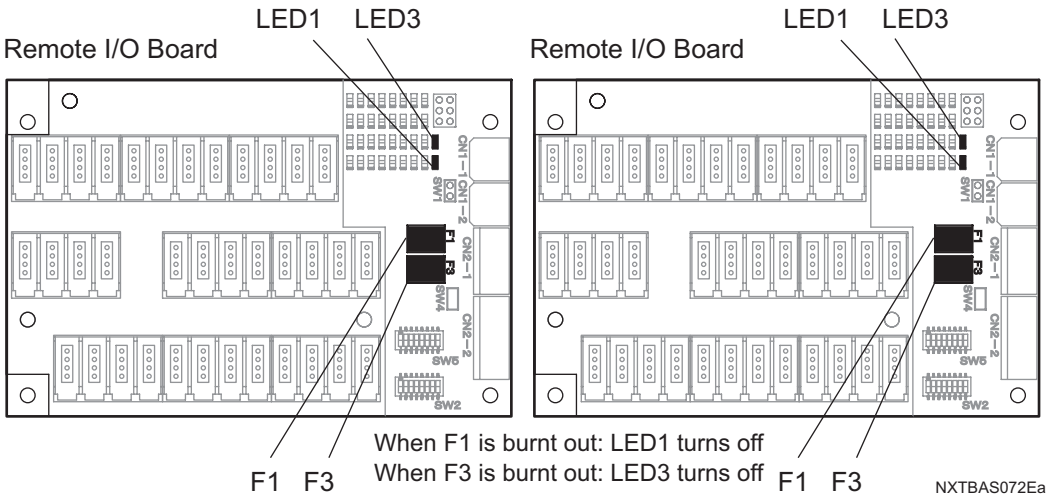
A fuse check LED on the board turns off when a fuse on that board inside the module is burnt out. Ensure that the fuse is burnt out before replacing it.

7.8.1 Procedure

1. Remove the three screws and then the front cover that covers the remote I/O board.



2. Locate the burnt out fuse, and then turn off the power to the machine by turning the main switch off.



3. Remove any burnt out fuses (F1 or F3) from the remote I/O board and replace them.

⚠CAUTION

Be sure to turn off the machine power before replacing any fuses.

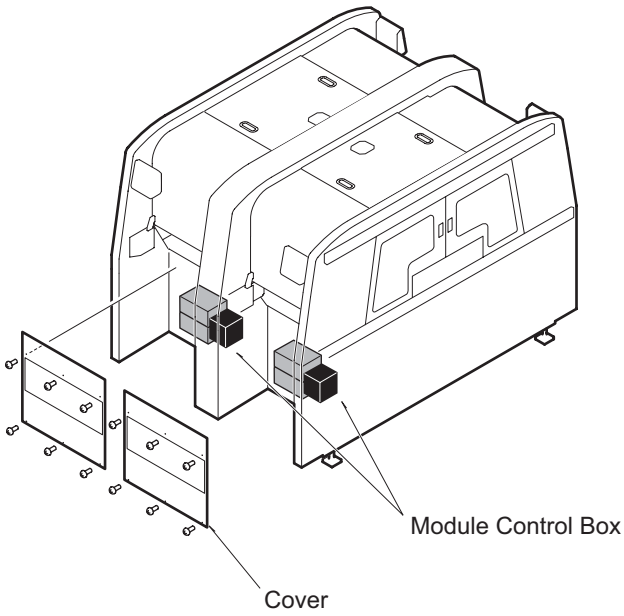
Replace fuses with fuses of the same capacity.

7.9 Replacing Fuses on the Boards Inside the Module Control Box

A fuse check LED on the board turns off when a fuse on that board inside the module is burnt out. Ensure that the fuse is burnt out before replacing it.

7.9.1 Procedure

1. Remove the front covers of the machine.

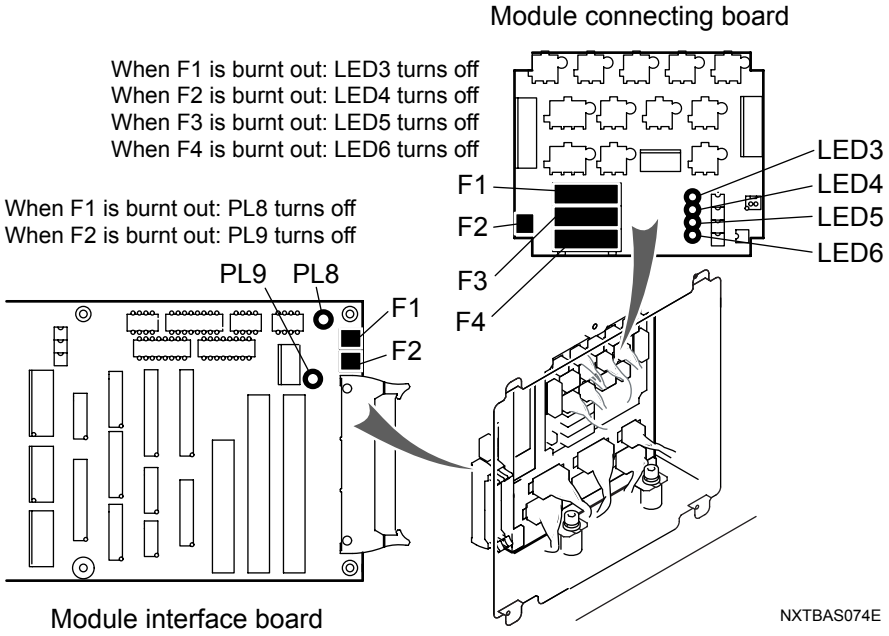


2. Locate the burnt out fuse, and then turn off the power to the machine by turning the main switch off.

> ⚠ ***CAUTION***
>
> ***Be sure to turn off the machine power before replacing any fuses.***
>
> ***Replace fuses with fuses of the same capacity.***

3. Remove any burnt out fuses (F1 or F3) from the module interface board and replace them.

4. Remove any burnt out fuses (F1, F2, F3 or F4) from the module connecting board and replace them. Remove the holder cover when removing the fuses F1, F3, or F4.

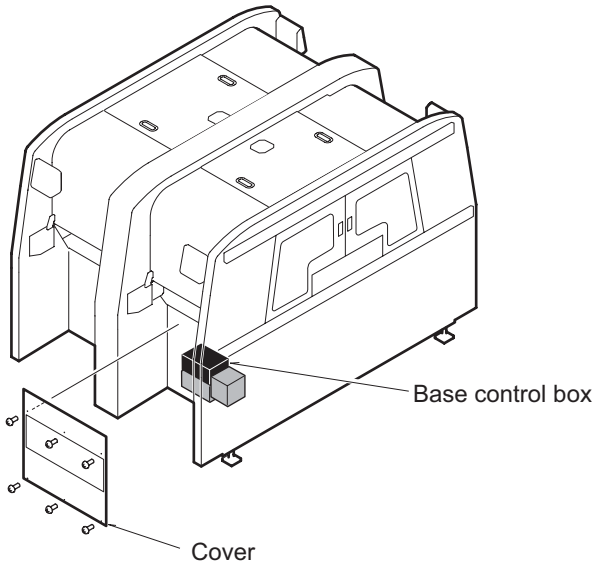


7.10 Replacing Fuses on the Boards Inside the Base Control Box

A fuse check LED on the board turns off when a fuse on that board inside the module is burnt out. Ensure that the fuse is burnt out before replacing it.

7.10.1 Procedure

1. Remove the cover from side 1 of module 2.



AIMBAS013Ea

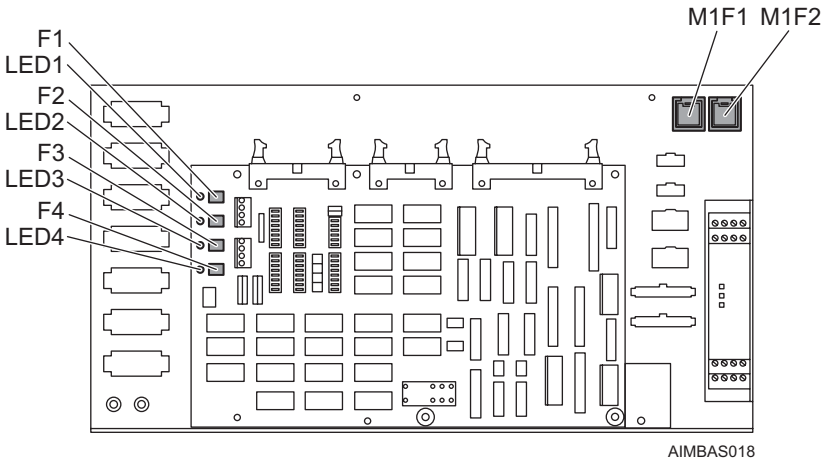
2. Locate the burnt out fuse, and then turn off the power to the machine by turning the main switch off.

⚠CAUTION

Be sure to turn off the machine power before replacing any fuses.

Replace fuses with fuses of the same capacity.

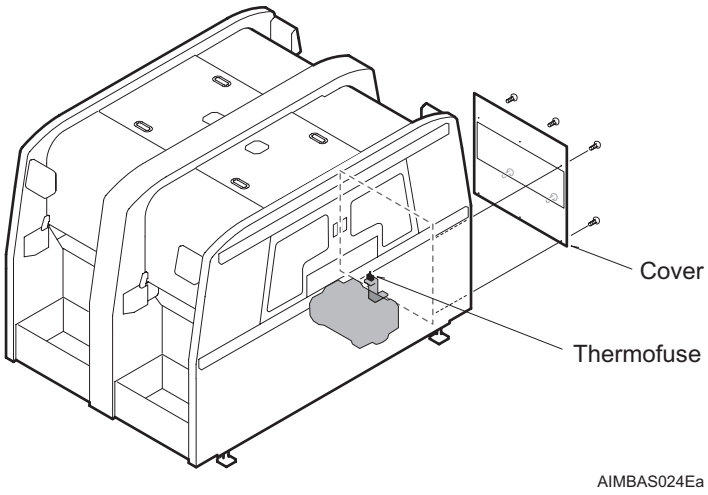
3. Remove any burnt out fuses (F1, F2, F3 or F4) from the base interface board by pulling them forward, and replace them.
   When removing the M1F1 or M2F2 fuses, insert a small minus driver into the slot to pull them out.



7.11 Replacing the Thermofuse on the Vacuum Pump

7.11.1 Procedure

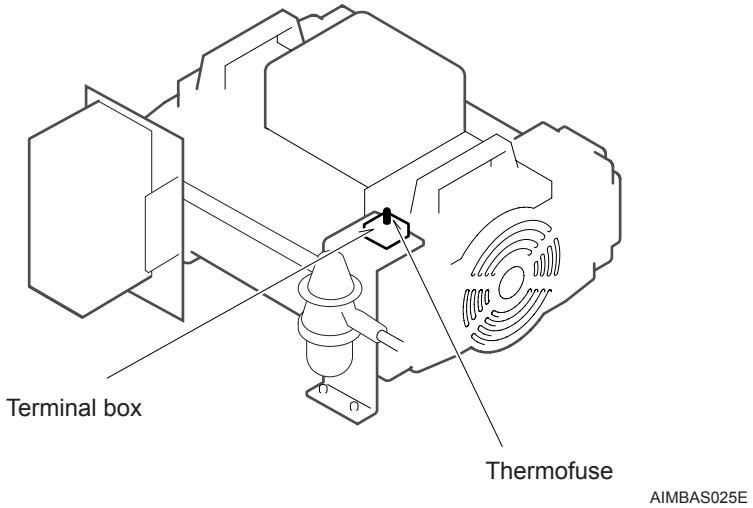
1. Remove the cover from side 2 of module 2.



2. Turn off the power to the machine by turning the main switch off.

> ***⚠CAUTION***
>
> ***Be sure to turn off the machine power before replacing any fuses.***
>
> ***Replace fuses with fuses of the same capacity.***

3. Pull out the thermofuse from the terminal box on the vacuum pump and replace with a new one.



7.12 Replacing a Cooling Fan

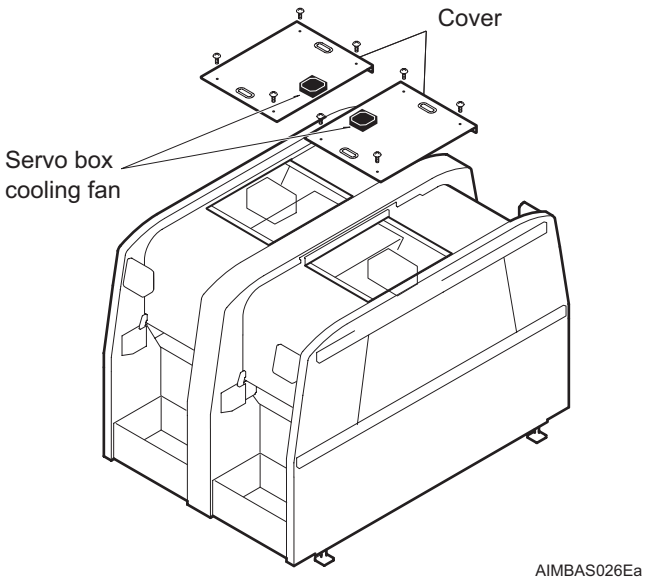
7.12.1 Servo box cooling fan

1. Turn the main switch off.

⚠WARNING

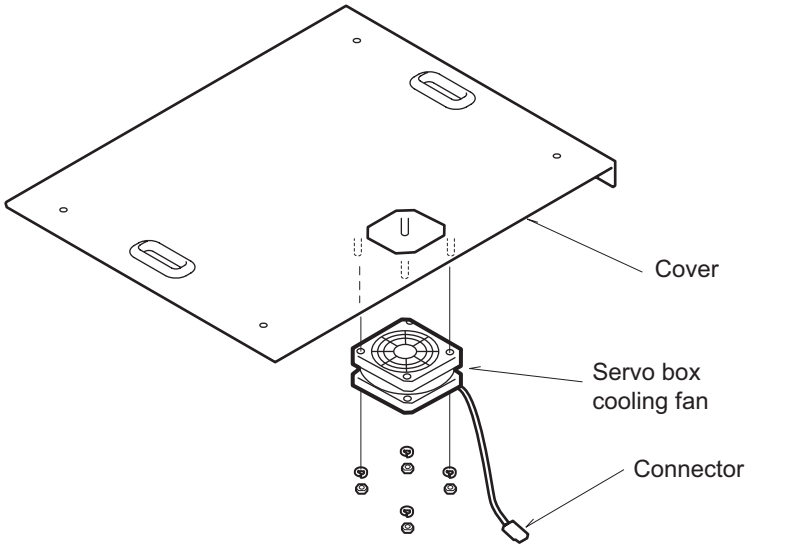
Be sure to turn off the power to the machine before performing any replacement work.

2. Remove the upper cover mounting screws.



3. Disconnect the cooling fan harness connector.
4. Disconnect the ground wire from the cover.
5. Remove the cover.

6. Remove the four nuts and then remove the cooling fan from the cover.



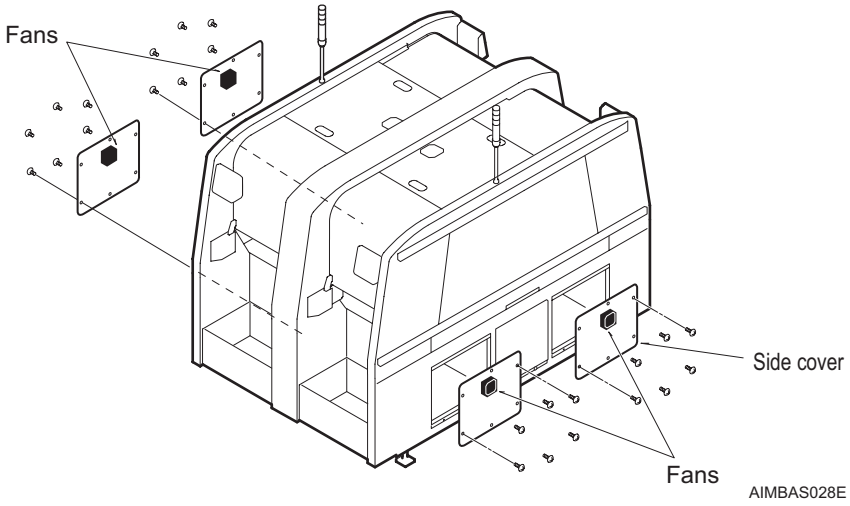
7. Attach a new fan to the cover.
8. Connect the ground wire to the cover.
9. Connect the cooling fan harness connector.
10. Attach the cover.

7.12.2 Side cover fan

1. Turn the main switch off.

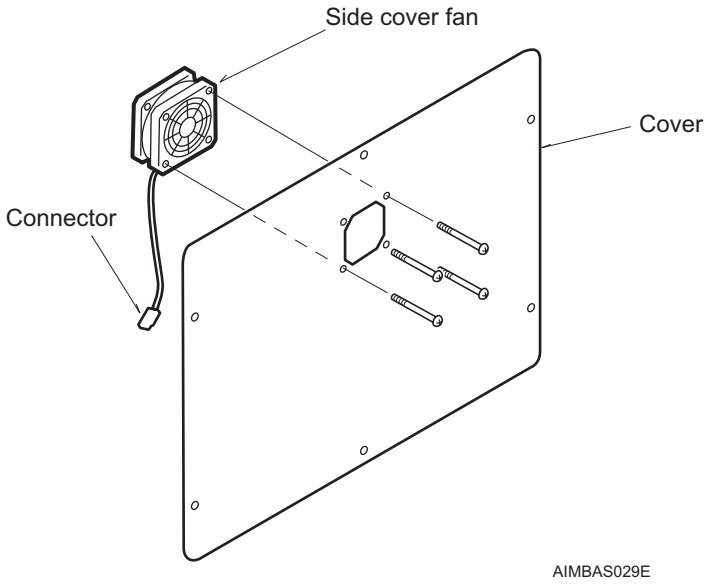
> ⚠ ***WARNING***
>
> ***Be sure to turn off the power to the machine before performing any replacement work.***

2. Remove the side cover mounting screws.



3. Disconnect the cooling fan harness connector.
4. Disconnect the ground wire from the cover.
5. Remove the cover.

6. Remove the bolts (4), and remove the fan from the cover.



7. Attach a new fan to the cover.
8. Connect the ground wire to the cover.
9. Connect the cooling fan harness connector.
10. Attach the cover.

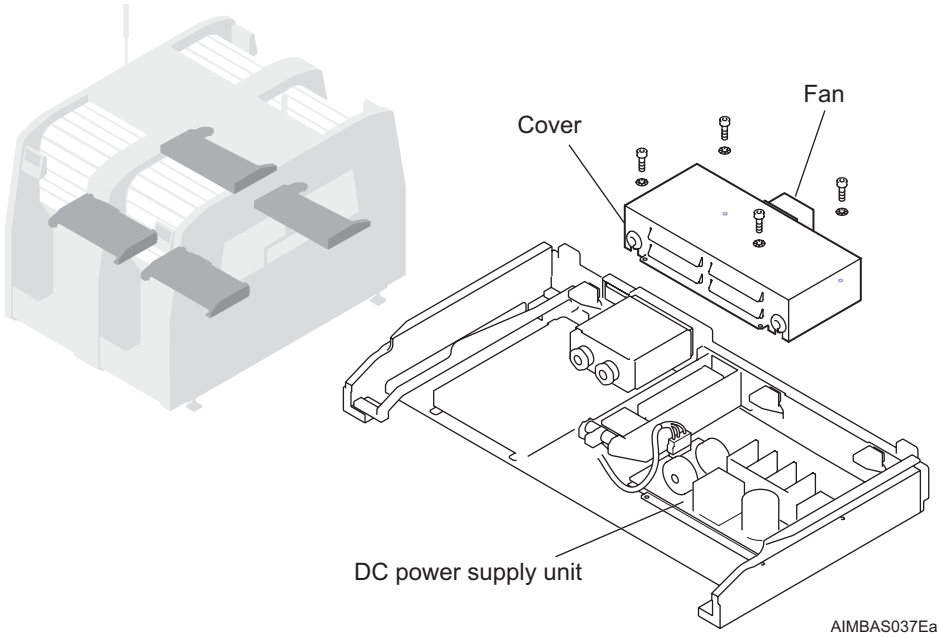
7.12.3 Fan for the DC power unit on the parts supply base

Remove a feeder pallet prior to replacing the fan for the DC power supply unit on the parts supply base. (See section 5.1 "Removing/Inserting a Feeder Pallet".)

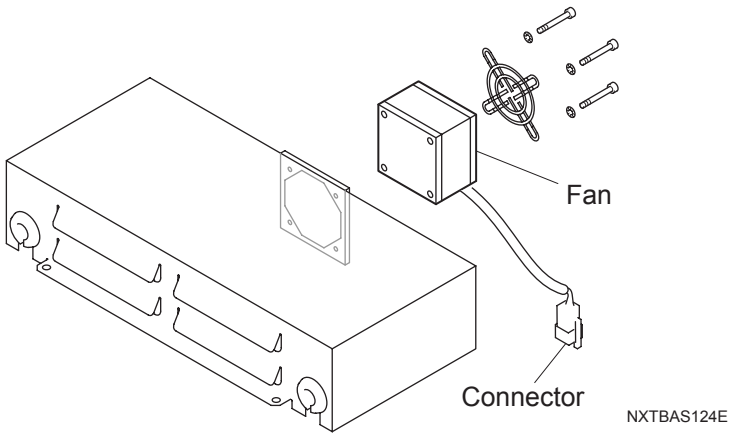
1. Turn the main switch off.

> ⚠ ***WARNING***
>
> ***Be sure to turn off the power to the machine before performing any replacement work.***

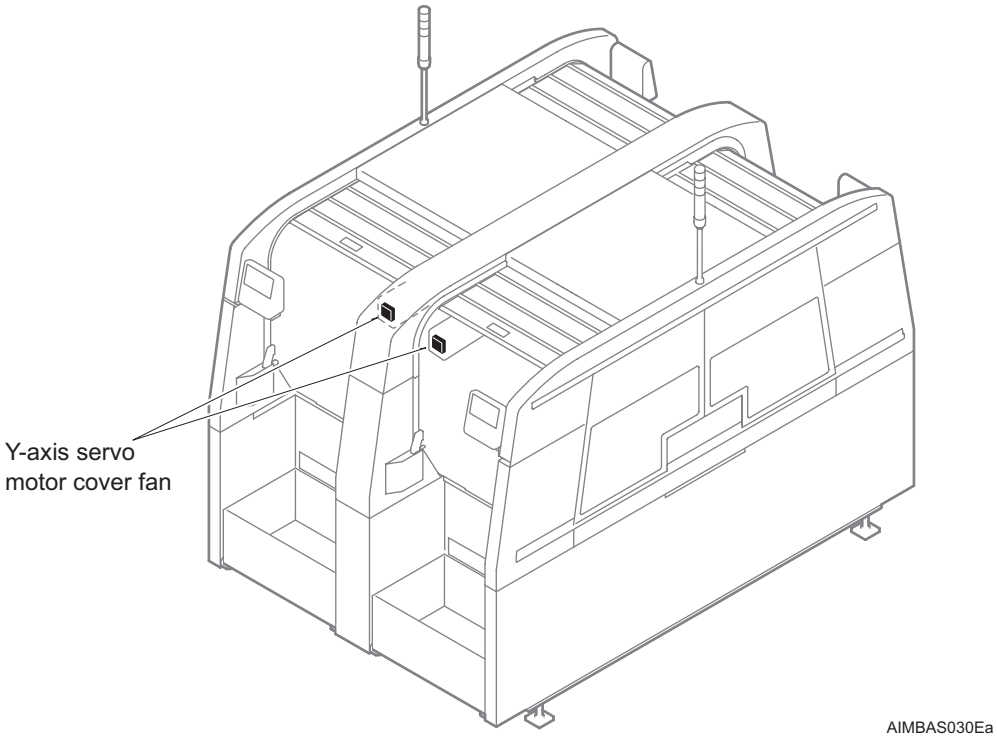
2. Remove the four screws and disconnect any connectors for the fan and then remove the cover of the DC power supply unit from the parts supply base.



3. Remove the four screws and remove the fan from the cover of the DC power supply unit and replace the fan.



7.12.4 Y-axis servo motor cover fan

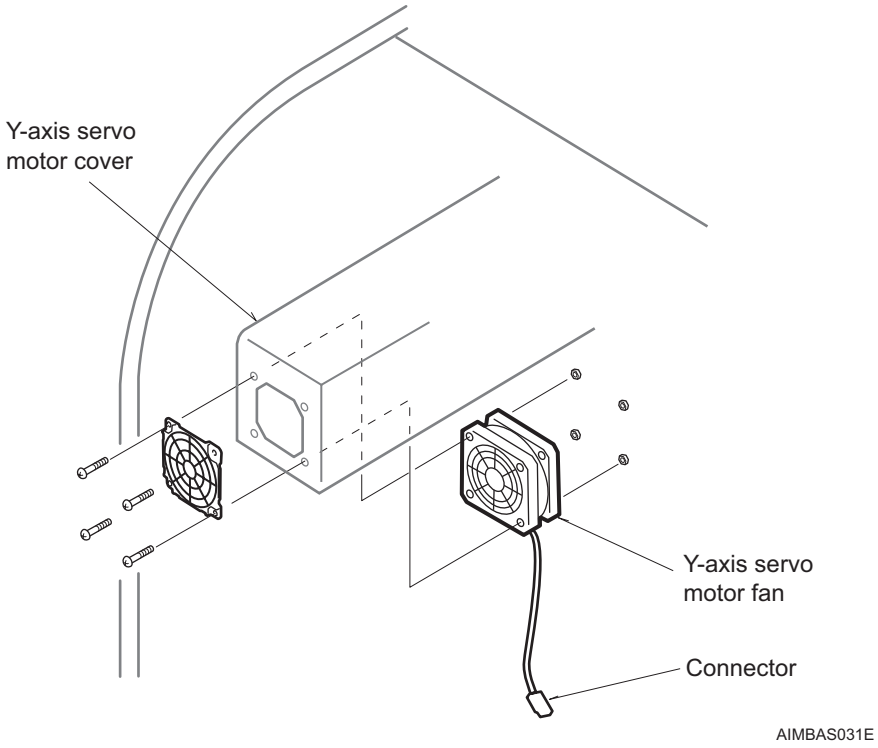


1. Turn the main switch off.

⚠WARNING

Be sure to turn off the power to the machine before performing any replacement work.

2. Remove the Y-axis servo motor mounting screws (3).



3. Disconnect the cooling fan harness connector.
4. Disconnect the ground wire from the cover.
5. Remove the cover.
6. Attach a new fan to the cover.
7. Connect the ground wire to the cover.
8. Connect the cooling fan harness connector.
9. Attach the cover.

7.13 Replacing the Tray Unit-L Servo Controller Battery

7.13.1 Recommended frequency

Replace upon the occurrence of a battery alarm.

7.13.2 Procedure

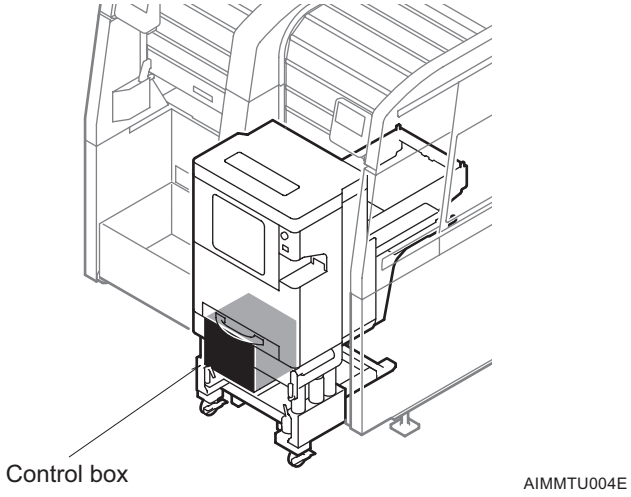
⚠CAUTION

Do not use any battery other than the specified battery.

Replace the battery with the machine power turned ON.
It will be necessary to reset the motor origin if the battery is replaced with the machine power turned OFF.

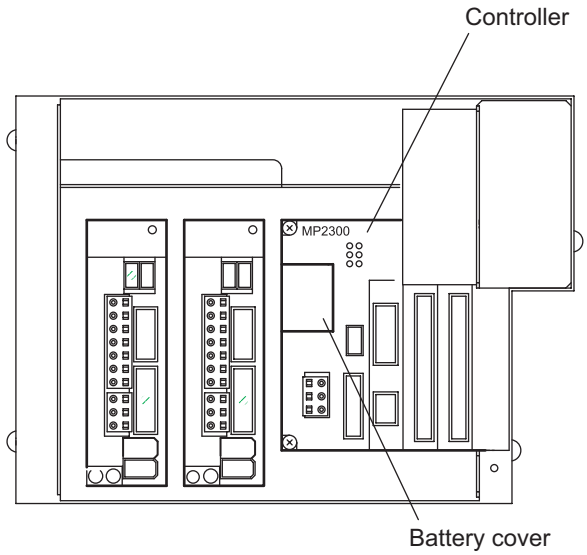
Dispose of the used battery in accordance with your local regulations.

1. Loosen the screws for the control box cover, and then open the control box.

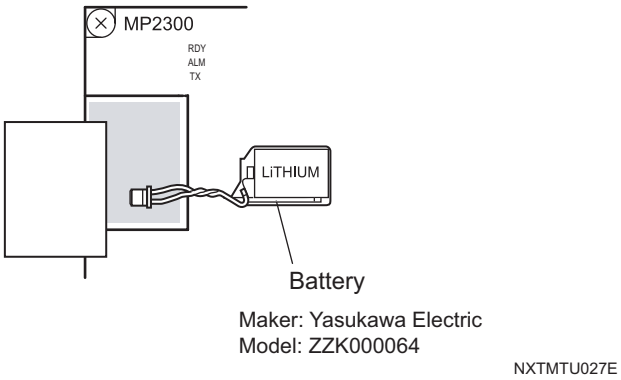


2. Ensure that the controller [RDY] LED is lite.

3. Gently remove the battery cover from the front of the controller.



4. Detach the battery connector and remove the old battery. Attach and insert the new battery.



5. Ensure that the [BAT] LED turns off and then reattach the battery cover.
6. Close and retighten the control box cover.

7.14 Replacing the Tray Unit-L Servo Axis Amplifier Battery (TY-, TZ-axis)

7.14.1 Recommended frequency

Replace upon the occurrence of a battery alarm.

7.14.2 Procedure

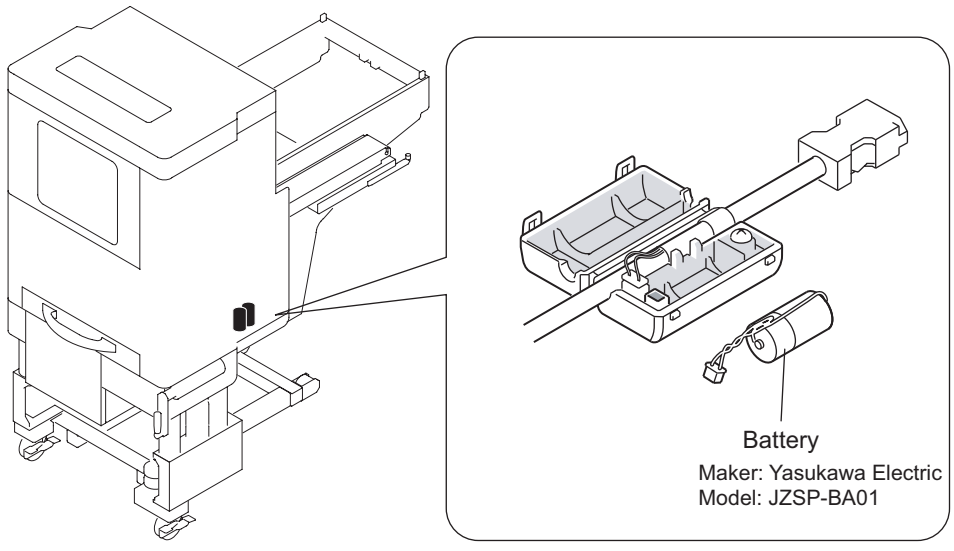
⚠CAUTION

Do not use any battery other than the specified battery.

Replace the battery with the machine power turned ON.
It will be necessary to reset the motor origin if the battery is replaced with the machine power turned OFF.

Dispose of the used battery in accordance with your local regulations.

1. Remove the cover for the tray unit L.
2. Open the battery case and replace the battery for the axis to be changed (TY- or TZ-axis).



NXTMTU028E

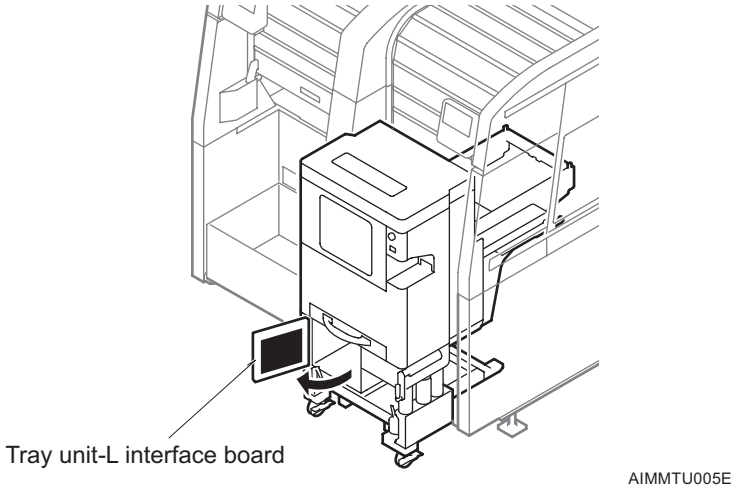
3. Reattach the cover of the tray unit-L.

7.15 Replacing the Tray Unit-L Interface Board Fuse

A fuse check LED on the board turns off when a fuse on that board inside the tray unit-L is burnt out. Ensure that the fuse is burnt out before replacing it.

7.15.1 Procedure

1. Loosen the screws for the control box cover, and then open the control box.



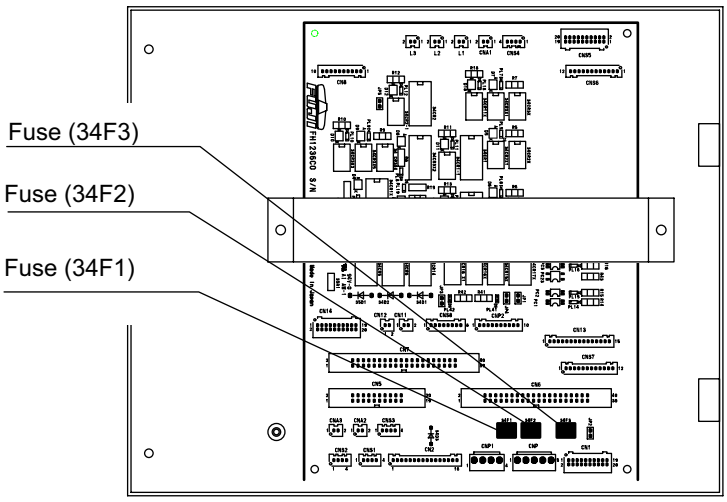
2. Locate the burnt out fuse, and then turn off the power to the machine by turning the main switch off.

⚠CAUTION

Be sure to turn off the machine power before replacing any fuses.

Replace fuses with fuses of the same capacity.

3. Remove any burnt out fuses (34F1, 34F2, or 34F3) from the interface board and replace them.



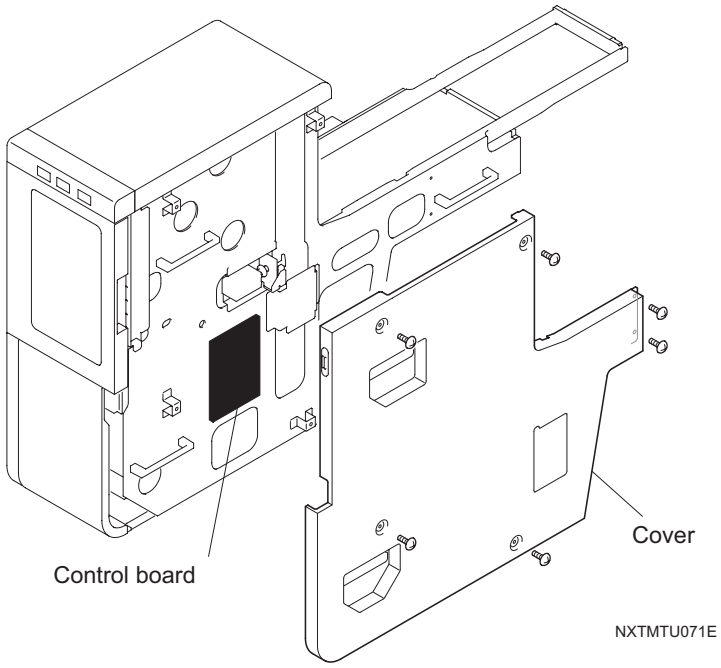
NXTMTU025E

4. Close and retighten the control box cover.

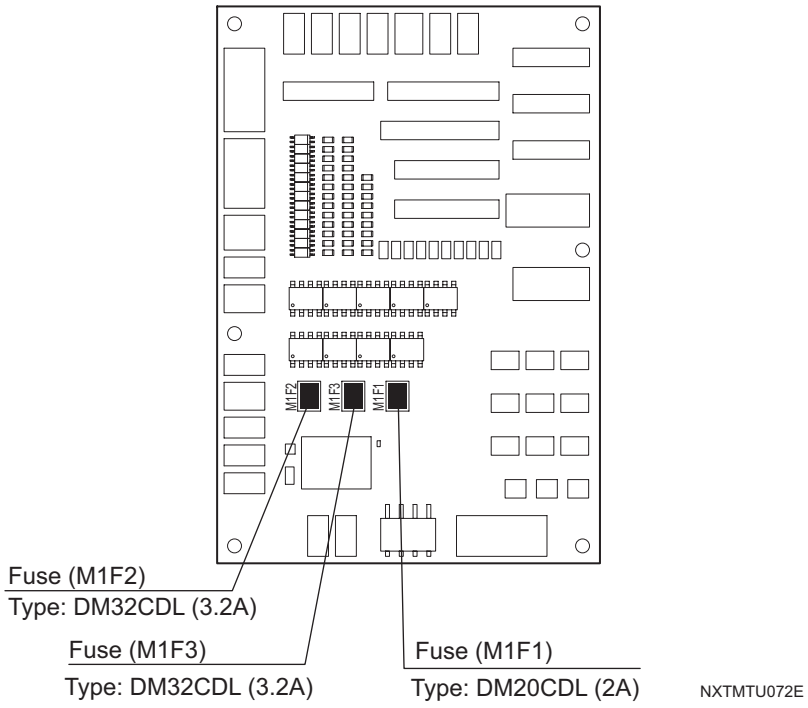
7.16 Replacing the Tray Unit-M Control Board Fuses

7.16.1 Procedure

1. Before performing these procedures, first remove the tray unit-M from the machine.



2. Remove any burnt out fuses (M1F1, M1F2, M1F3) from the control board and replace them.



3. Reattach the side cover.

7.17 Replacing the Vacuum Pump's Inlet Valves/ Outlet Valves & Gaskets

The inlet valves, outlet valves and gaskets are consumable items, and should be replaced by the new items provided in the vacuum pump maintenance kit.

7.17.1 Recommended frequency

Consumables should be replaced after every 10,000 hours of operation.

7.17.2 Required equipment

DOP-300SA Maintenance Kit	Inlet valve rubber separator	4
	Inlet & outlet valves	12
	Backup outlet valves	4
	Cup packing	4
	Gaskets	4
	Backup inlet valves	4
	Connecting tubes	1

Tools	Hex wrench set	
	Torque wrench	5mm hex socket-head wrench (torque settable to 8N•m)
	Plus driver	No.2
Other	Cleaning solvent (Industrial Ethyl alcohol)	For wiping clean
	Paper wipe	For wiping clean
	Dust mask, gloves, oil-based marker pen	-

7.17.3 Procedure

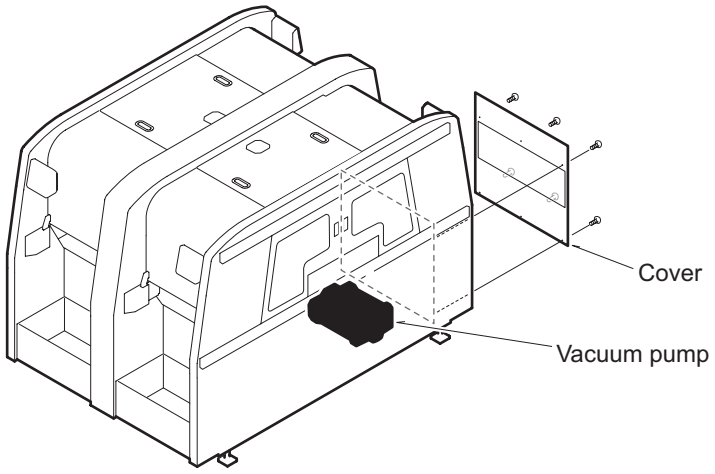
⚠WARNING

After stopping pump operation, allow the pump 30 minutes or more to cool before beginning the replacement procedure. Failure to do this could result in burns, as the pump interior is extremely hot immediately after operation is stopped.

Be sure that the machine's main power has been turned off before attempting to remove the vacuum pump.

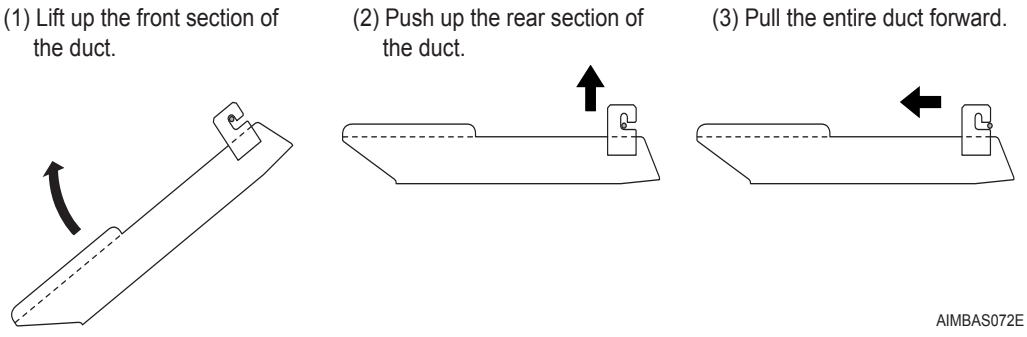
Removing the vacuum pump

1. Remove the cover from side 2 of module 2.



AIMBAS019Ea

2. Remove the waste tape duct from inside the machine.



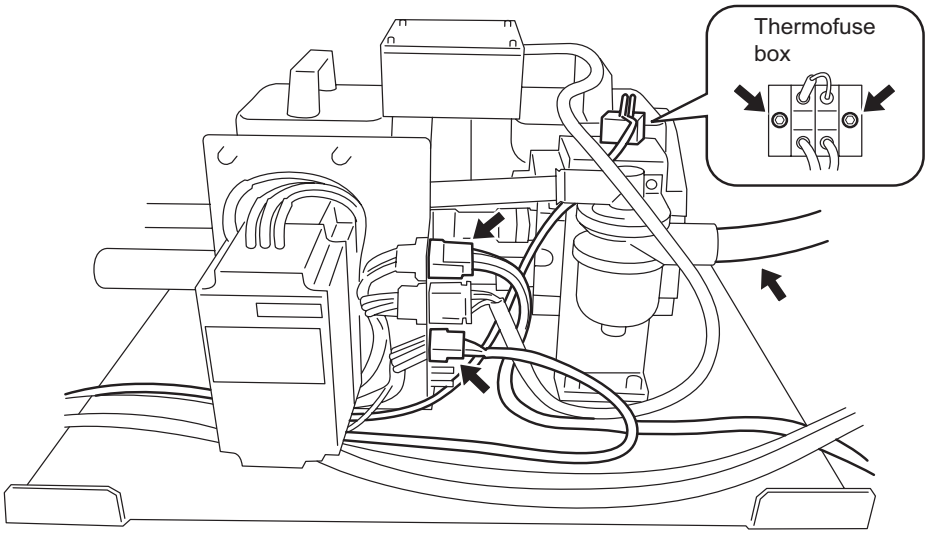
AIMBAS072E

3. Remove the following items.

   a. Use an Allen wrench (2.5 mm) to loosen the thermofuse box mounting screws, then remove it.

   b. Disconnect the vacuum hose.

   c. Disconnect the two harness connectors.

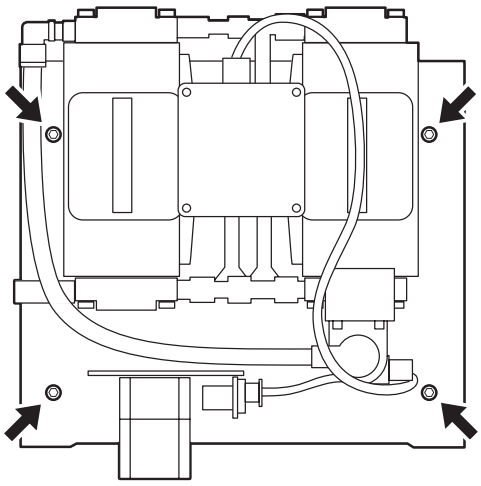


AIMBAS038E

4. Use an Allen wrench (5 mm) to remove the 4 bolts that secure the vacuum pump under plate to the base, then take out the pump with the under plate attached from the machine.

⚠*WARNING*

Pump handling requires two or more personnel. To avoid back injuries, etc., avoid strained postures when lifting the pump.



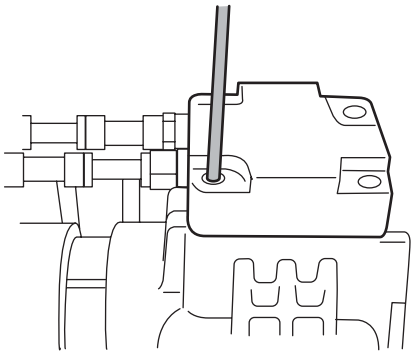
AIMBAS039

Disassembling the vacuum pump

⚠WARNING

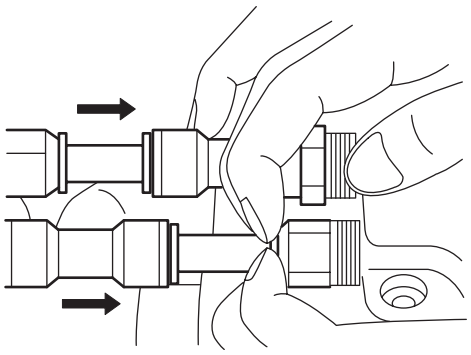
To prevent the ingestion of microscopic particles from worn components, always wear a dust mask and gloves before performing the following procedure.

1. Use a hex wrench to loosen the hex socket head bolt (M6 x L16) that secures the handle, then remove the handles.
2. Stand the pump upright so that the head to be replaced can be removed vertically.
3. Remove the head cover as follows.
   a. Use a hex wrench to loosen the 4 hex socket head bolts (M6 x L30) that secure the head cover, then remove the bolts.



NXTBAS153

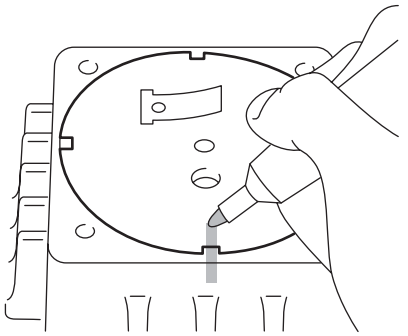
   b. Pull the fitting joint forward with both hands, then remove the connecting tube and the head cover. Pull the left and right fitting joints in an alternating and gradual manner until they are removed.



NXTBAS154

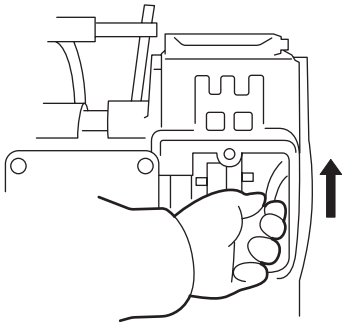
4. Remove the cylinder as follows.

   a. Use a permanent marker to mark the cylinder and casing before removing the cylinder.



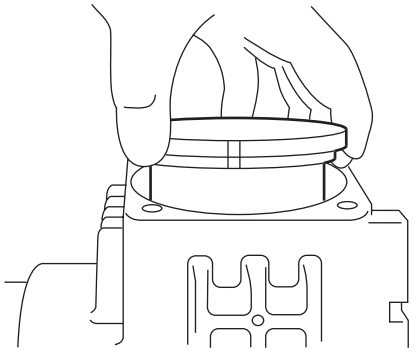
NXTBAS155

   b. With gloves on, slowly turn the fan. Do not attempt this without gloves.



NXTBAS156

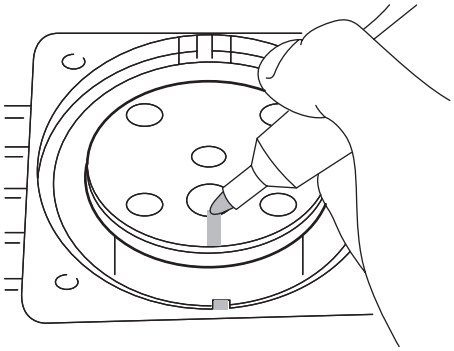
   c. Lift the cylinder upward to remove it.



NXTBAS157

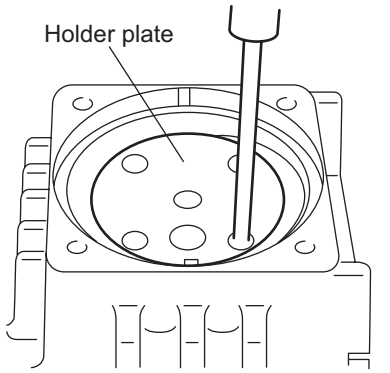
5. Remove the holder plate and the packing as follows.

   a. Mark the holder plate at the casing's mark position.



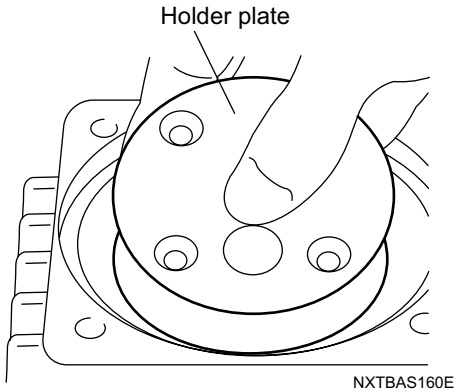
NXTBAS158

   b. Loosen the 4 countersunk screws (M5 x L12) in the holder plate. With a gloved hand, hold the connecting rod in place when loosening the countersunk screws.



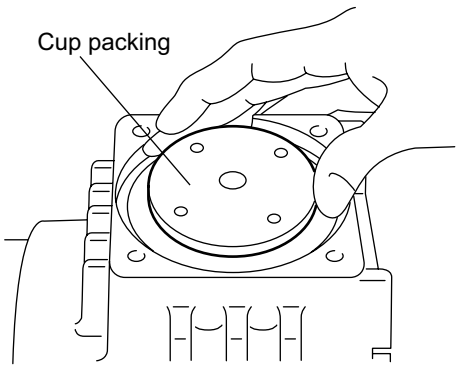
NXTBAS159E

   c. Remove the holder plate.



NXTBAS160E

d. Remove the cup packing.

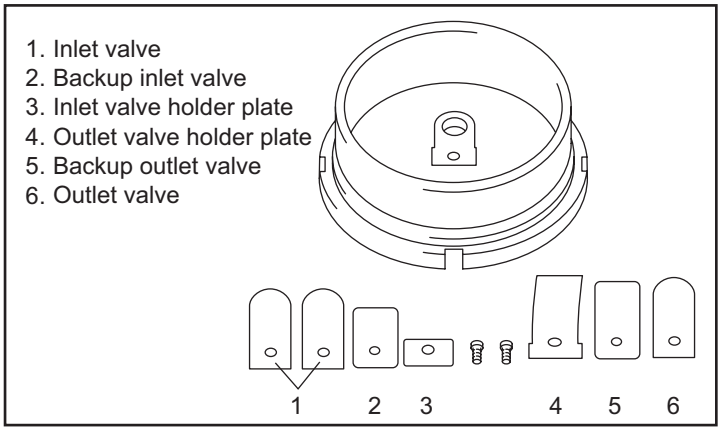


NXTBAS161E

e. Remove the inlet valve's rubber separator from the holder plate.

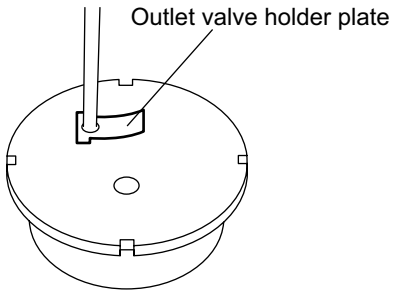
f. Wipe the holder plate clean using a cloth or paper wipe dampened with industrial alcohol.

6. Remove the cylinder's small components as follows.



NXTBAS164E

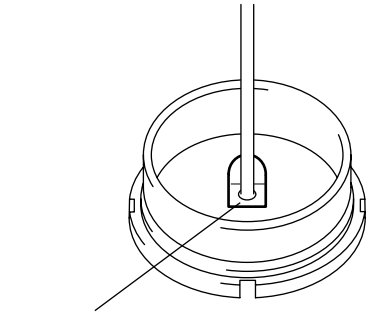
a. Loosen the roundhead screw (M3 x L5) that secures the outlet valve holder plate.



NXTBAS162E

b. Remove the outlet valve holder plate, the backup outlet valve, and the outlet valve.

c. Loosen the roundhead screw (M3 x L5) that secures the inlet valve holder plate.

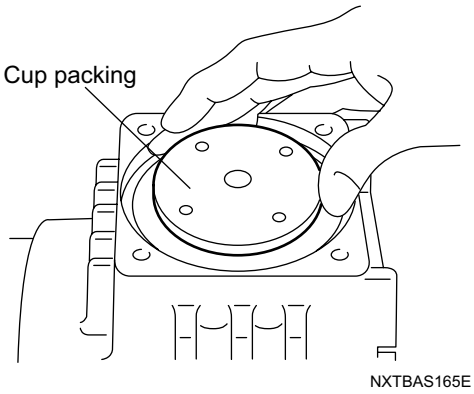


d. Remove the inlet valve holder plate and the inlet valve.

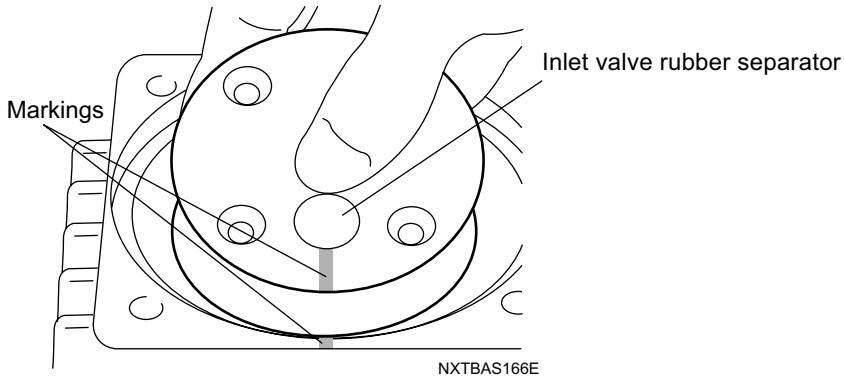
e. Wipe the entire cylinder clean using a cloth or paper wipe dampened with industrial alcohol. Pay particular attention to cleaning the inlet/outlet valve mounting faces, and the cup packing's vibrating face. When cleaning, use care to avoid wiping off the mark.

Reassembling the vacuum pump

1. Set the new cup packing on the connecting rod with the cup's flange facing downward.



2. Insert a new inlet valve rubber separator into the groove on the rear side of the holder plate.
3. Align the holder plate mark, then tighten the 4 countersunk screws (M5 x L12).

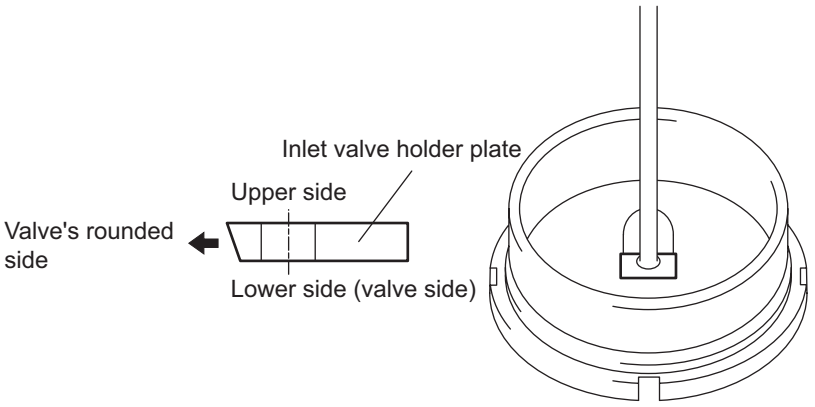


4. Mount the inlet valves on the cylinder as follows.

   a. Place the 2 inlet valves on the cylinder, then place the inlet valve backup and inlet valve holder plate on top of them.

   b. While verifying that the inlet valve is not making contact with the groove's inner perimeter, tighten the roundhead screw (M3 X L5) that secure the inlet valve holder plate.

Note: Be sure that the orientation of the inlet valve holder plate is correct. The top of the inlet valve holder plate must be set facing upward and the shorter direction (distance from center of hole to end face) is facing the rounded side of the inlet valves.

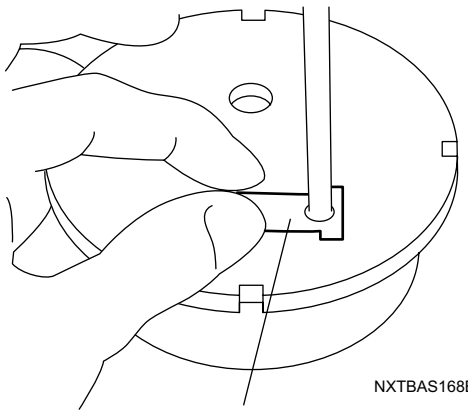


NXTBAS167E

5. Mount the outlet valve on the cylinder as follows.

   a. Place the outlet valve on the cylinder, then place the outlet valve backup and outlet valve holder plate on top of it.

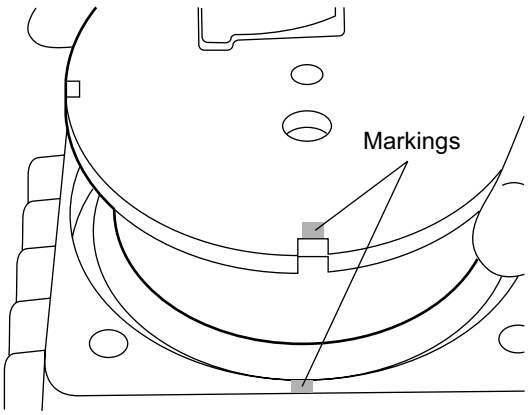
   b. While verifying that the outlet valve is not making contact with the groove's inner perimeter, tighten the roundhead screw (M3 x L5) that secures the outlet valve holder plate.



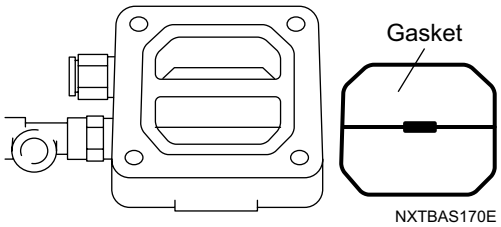
NXTBAS168E

Outlet valve holder plate

6. Align the cylinder with the mark, then insert it into the cup packing.



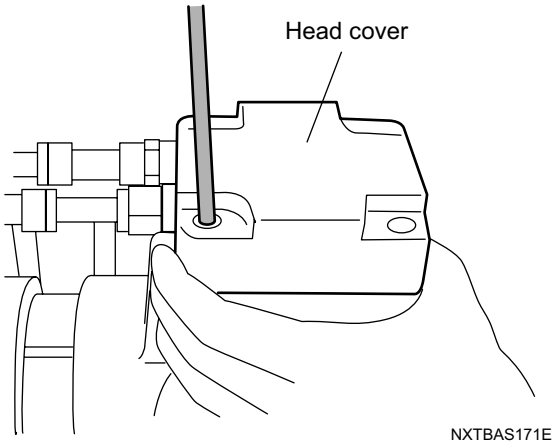
7. Replace the head cover gasket as follows.
   a. Remove the old gasket from the head cover.
   b. Clean the head cover by wiping it with industrial alcohol, then dry it with compressed air.
   c. Set the new gasket on the head cover.



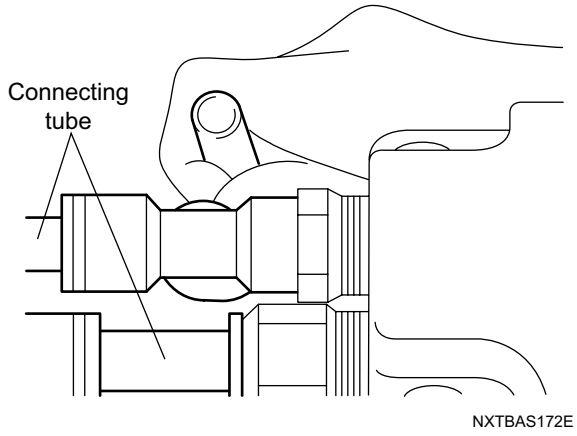
8. Mount the head cover on the casing as follows.

   a. Insert the head cover joint into the connecting tube and align the casing screw holes with those in the head cover.

   b. Tighten the 4 hex socket head bolts (M6 x L30) to a torque of 8N•m. (If replacing the connecting tube, be sure that the tube is cut to the same pump length.)



9. Connect the connecting tube. (If replacing the connecting tube, be sure that the tube is cut to the same pump length.)



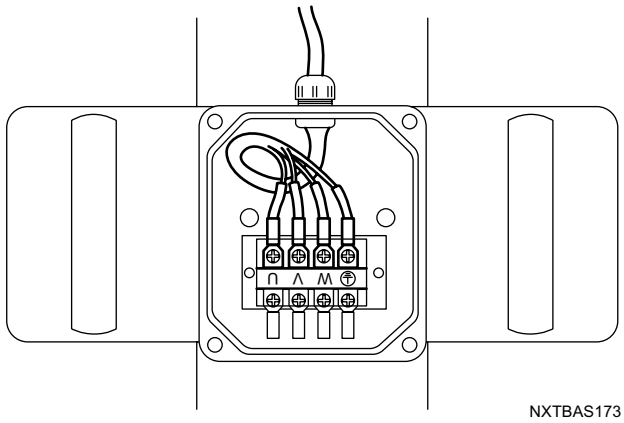
10. Lay the pump on its side, then mount the panel and handle.

Mounting the vacuum pump

1. Reverse the removal procedure in order to mount the vacuum pump on the machine base.

> ⚠ ***WARNING***
>
> ***Pump handling requires two or more personnel. To avoid back injuries, etc., avoid strained postures when lifting the pump.***

2. Connect the wiring to the terminal block (Earth, W, V, U) as shown below.



8. Replacing Parts

8.1 Parts Camera Replacement

The parts camera cover, lighting, lens, and camera should be treated as one unit. It is not possible to just replace an item on this unit without special equipment and training.

8.1.1 Required tools

Phillips screw driver, Allen wrench (3 mm)

8.1.2 Required time

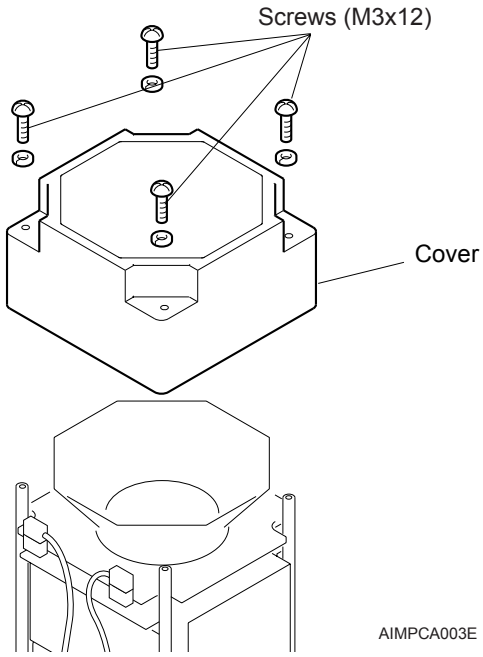
Approximately 12 minutes are required to remove the existing cover, light, and camera units and then attach the new unit.

8.1.3 Procedure

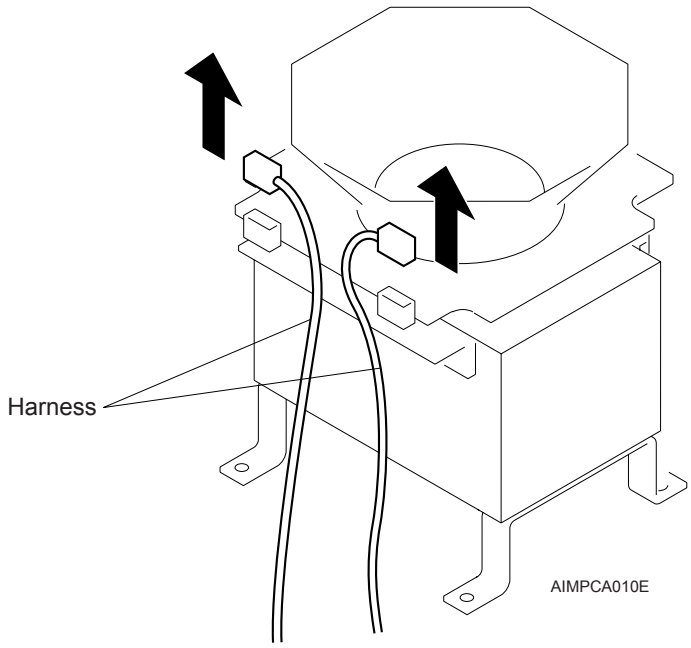
1. Remove the feeder pallet. (See section 5.1 "Removing/Inserting a Feeder Pallet".)
2. Open the safety cover.
3. Turn the main switch off.

> ⚠ ***WARNING***
>
> ***Always turn the machine main switch OFF before performing this work.***

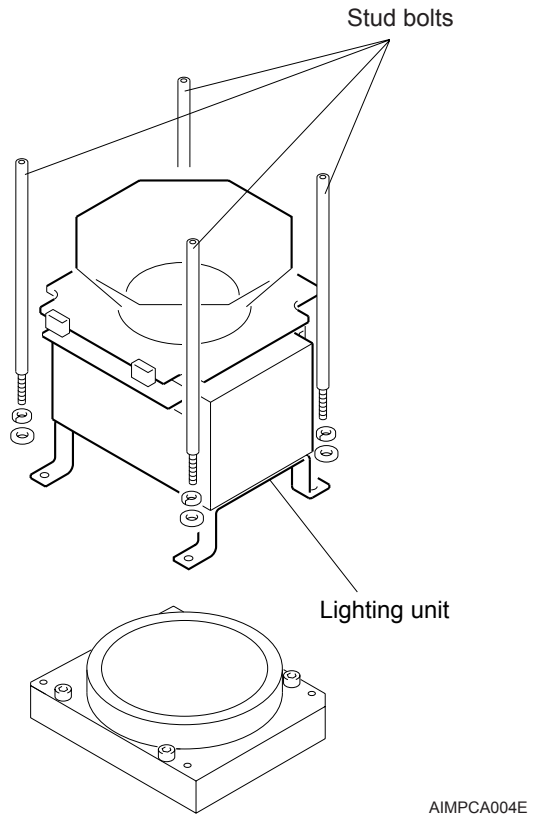
4. Loosen and remove the four screws which fix the cover by using a screw driver.



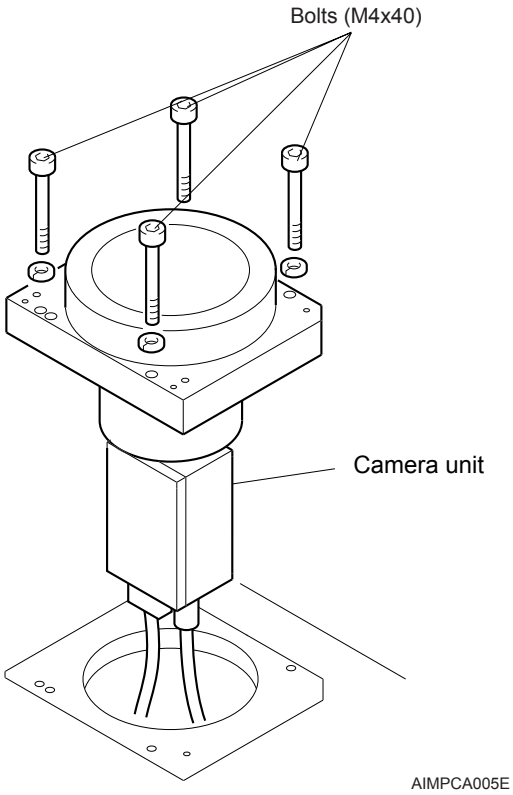
5. Disconnect the harness connectors from the lighting unit.



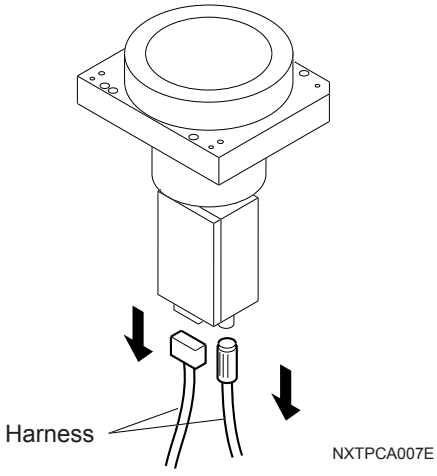
6. Use an Allen wrench to remove the four stud bolts. Then gently remove the lighting unit.



7. Use an Allen wrench to remove the four bolts. Then gently pull out the camera unit upward.



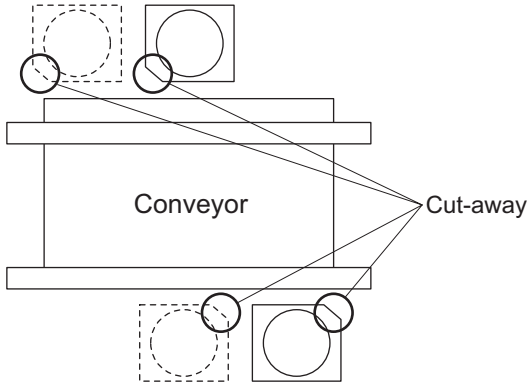
8. Disconnect both harness connectors at the bottom of the camera.



9. Use the reverse procedure to attach the new unit (camera, light, cover).

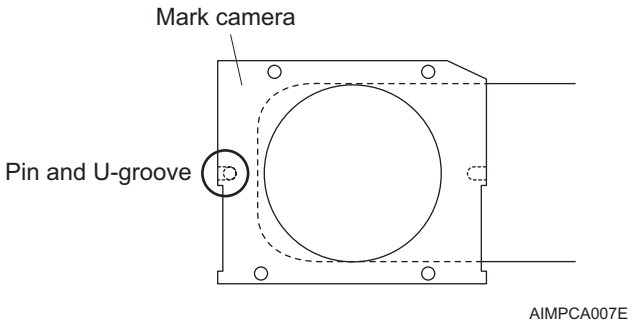
10. Pay attention to the following items when attaching the camera unit onto the base.

a. Set the camera unit at the direction which the cut-away portion of the camera unit is facing the conveyor side.

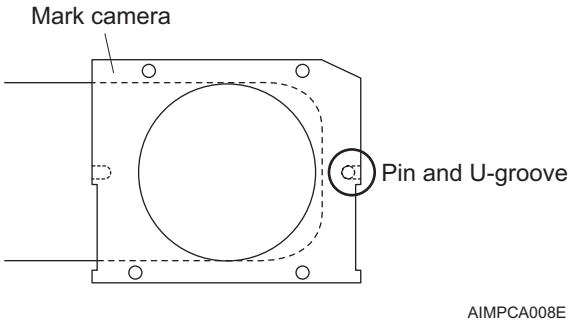


b. Fit the positioning pin of the base in the U-groove of the camera unit (back side).

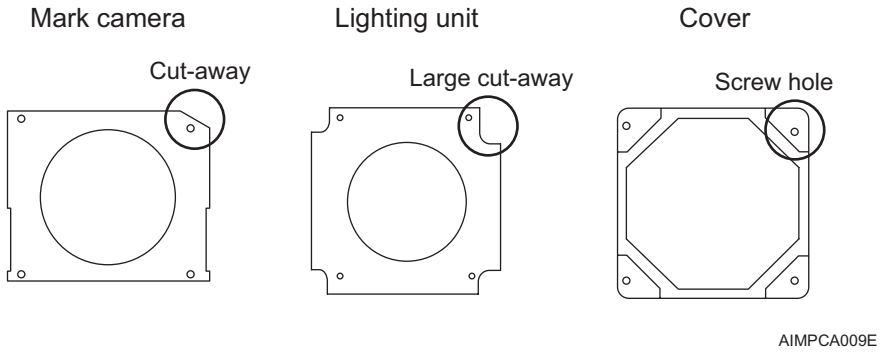
<Mark camera is mounted in the middle of the machine>



<Mark camera is mounted at the right hand side of the machine>



11. Make sure the direction of each part is right when assembling the lighting unit and the cover onto the camera unit.



8.2 Mark Camera Replacement

The mark camera lighting, lens, and camera should be treated as one unit. It is not possible to just replace an item on this unit without special equipment and training.

8.2.1 Required tools

Allen wrench (2.5 mm), spanner (5.5 mm)

8.2.2 Required time

Approximately 8 minutes are required to remove the existing light and camera units and attach the new unit.

8.2.3 Procedure

1. Remove the feeder pallet. (See section 5.1 "Removing/Inserting a Feeder Pallet".)
2. Open the safety cover.
3. Turn the main switch off.

⚠WARNING

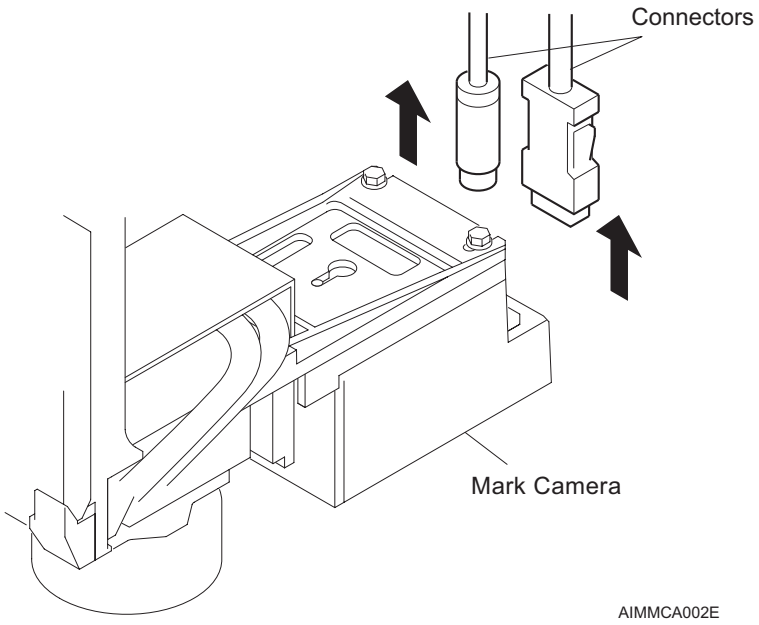
Always turn the machine main switch OFF before performing this work.

4. Move the placing head to side 2 to make working on the camera easier.

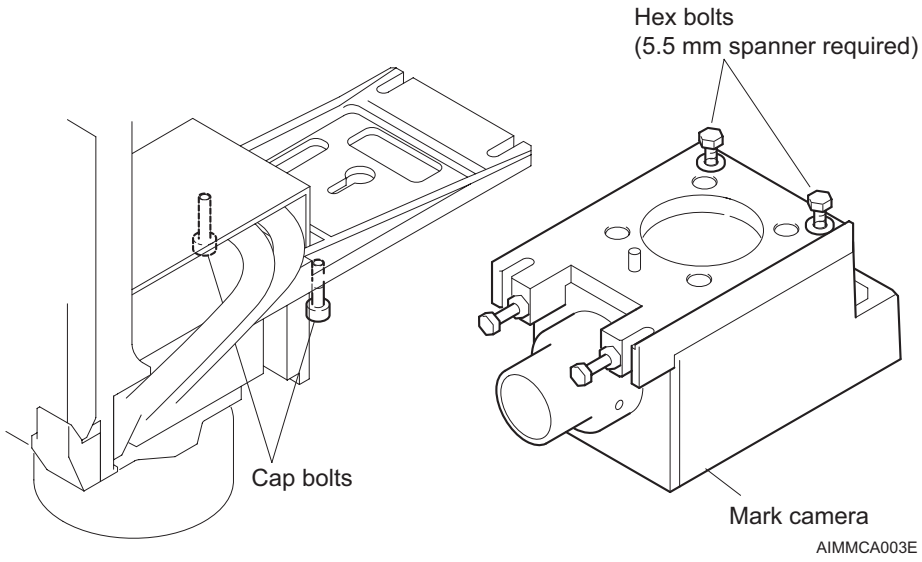
⚠CAUTION

Ensure that the placing head is pushed by the XY-robot frame, and in particular do not push the unit by the camera parts.

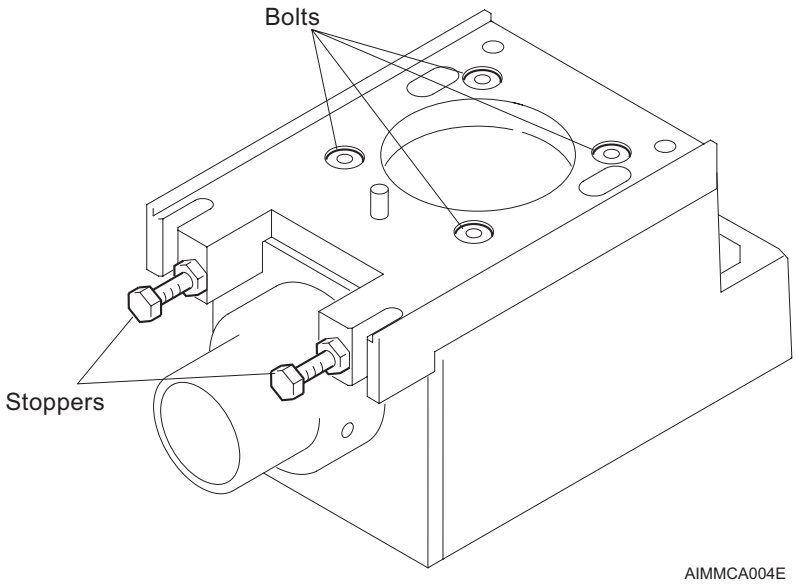
5. Disconnect the connectors from the rear of the camera unit.



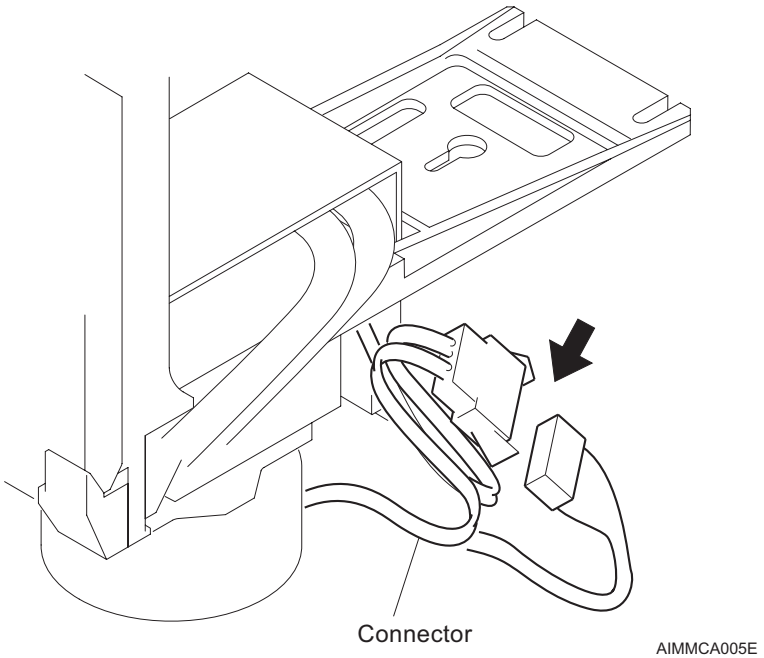
6. Loosen the two cap bolts and two hex bolts, slide the camera unit backwards and remove it.



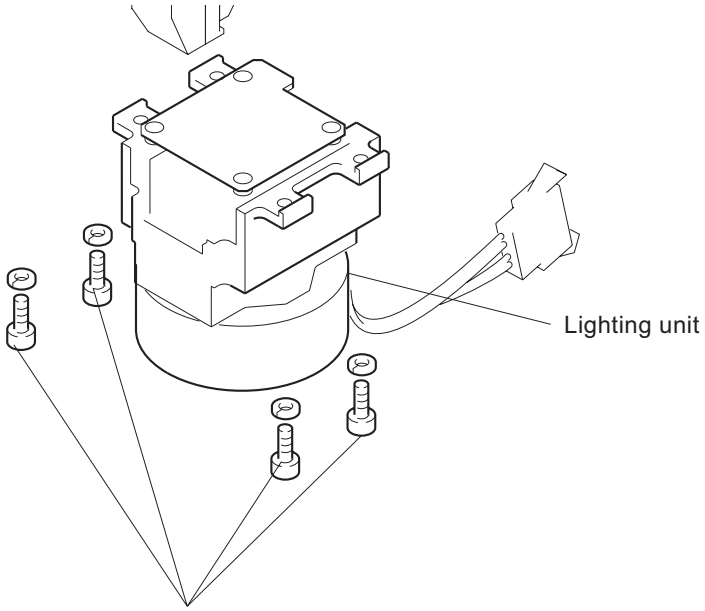
Note: Under no circumstances should the mark camera bolts or stoppers be loosened. (See the illustration below.)



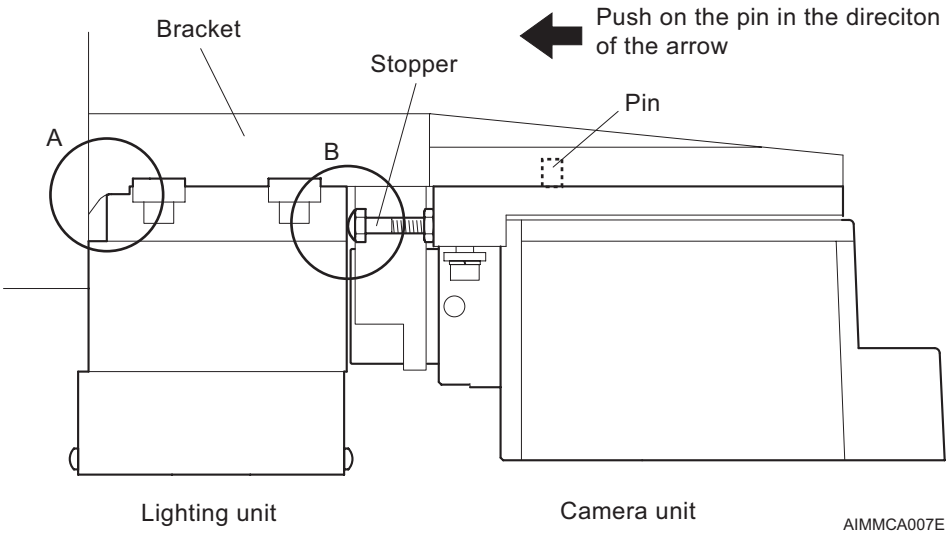
7. Disconnect the connector for the mark camera lighting unit.



8. Use an Allen wrench to loosen the four bolts, and then remove the lighting unit.



9. Use the reverse procedure to attach the new unit.
   a. Tempolarily tighten the lighting unit and the camera unit onto the bracket.
   b. While pushing on the pin in the direction of the arrow, tighten the lighting unit and the camera. Here, make sure that the bracket, lighting unit, and camera unit make contact each other (there is no gap at parts A and B in the figure below).



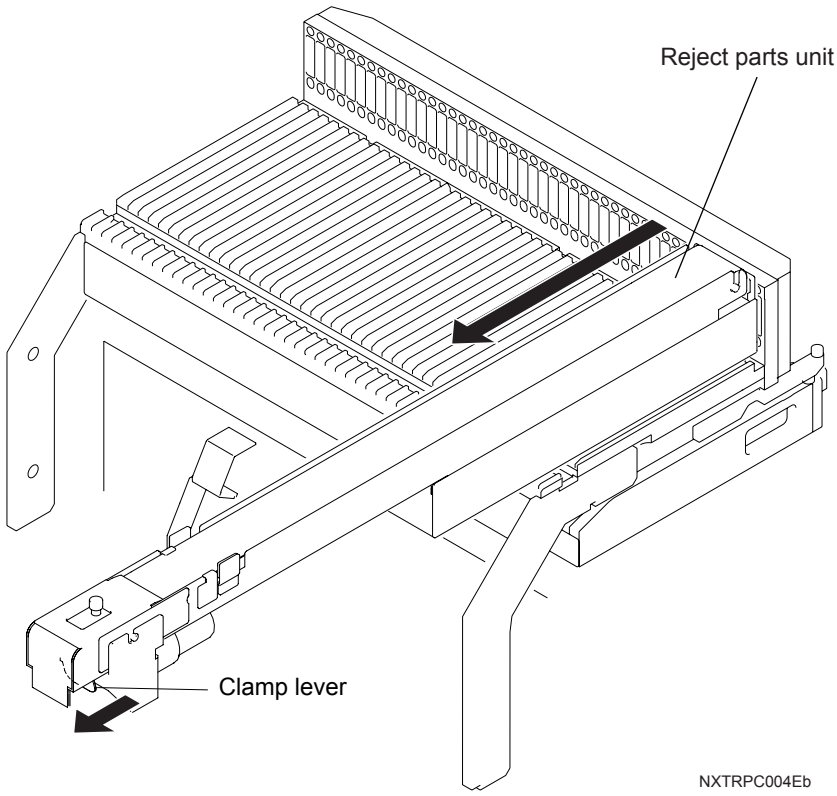
8.3 Reject Parts Unit Replacement

8.3.1 Required time

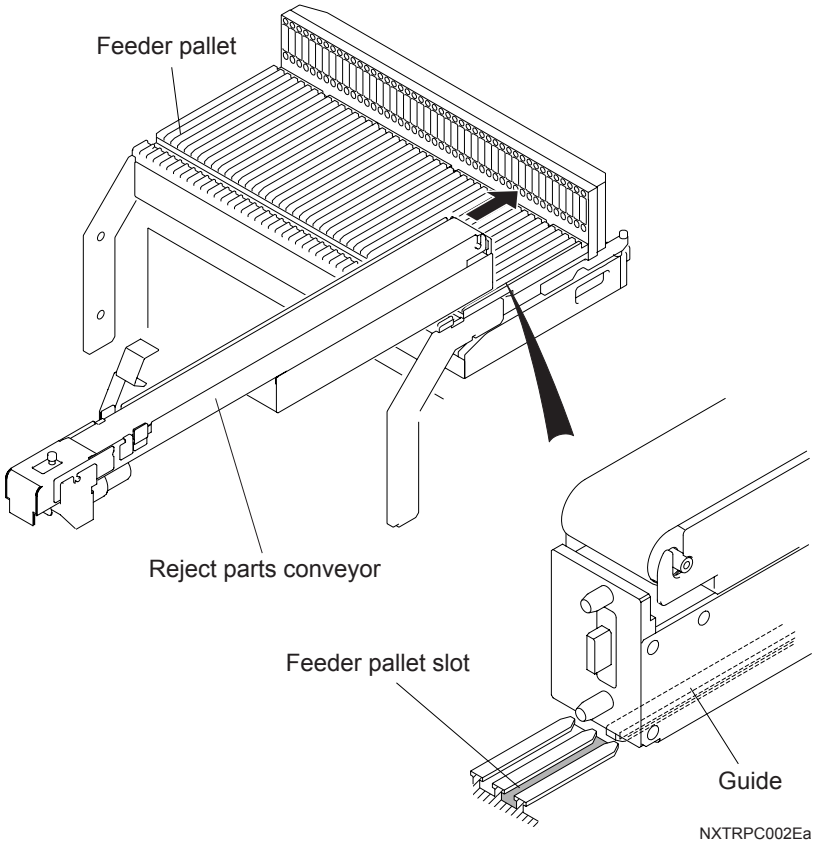
Approximately 3 minutes are required to remove the existing unit and attach the new unit.

8.3.2 Procedure

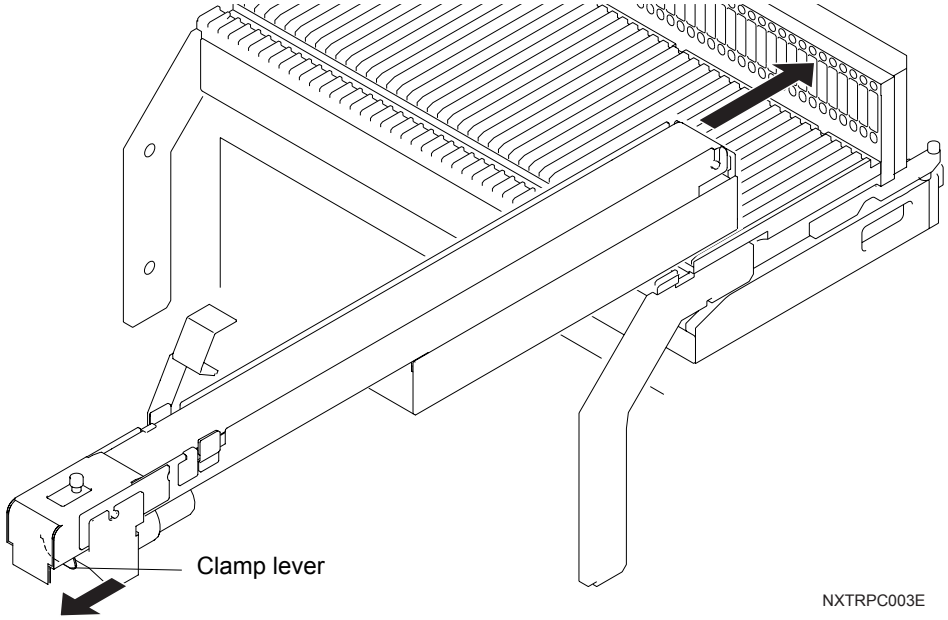
1. When removing the reject parts conveyor, pull out the conveyor horizontally, while pulling the clamp lever in the direction indicated in the diagram.



2. Align and slide the guide on the underside of the reject parts conveyor into one of the feeder pallet slots.



3. Slide the reject parts conveyor while pulling the clamp lever in the direction indicated in the illustration below. Release the clamp lever when set properly in position.
   Ensure that the connector on the reject parts conveyor is connected to the connector on the feeder pallet.



8.4 Waste Tape Processing Unit Replacement

8.4.1 Required tools

Phillips screw driver, Allen wrench (6 mm)

8.4.2 Required time

Approximately 13 minutes are required to remove the existing unit and attach the new unit (excludes the time required for work being performed on the unit such as cleaning and lubrication.)

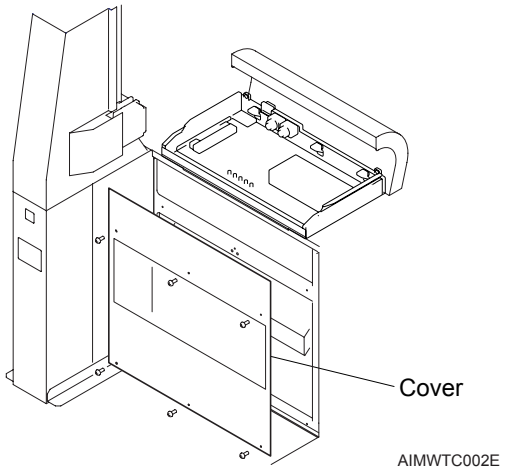
8.4.3 Procedure

1. Remove the feeder pallet. (See section 5.1 "Removing/Inserting a Feeder Pallet" for details.)
2. Turn the main switch off.

⚠WARNING

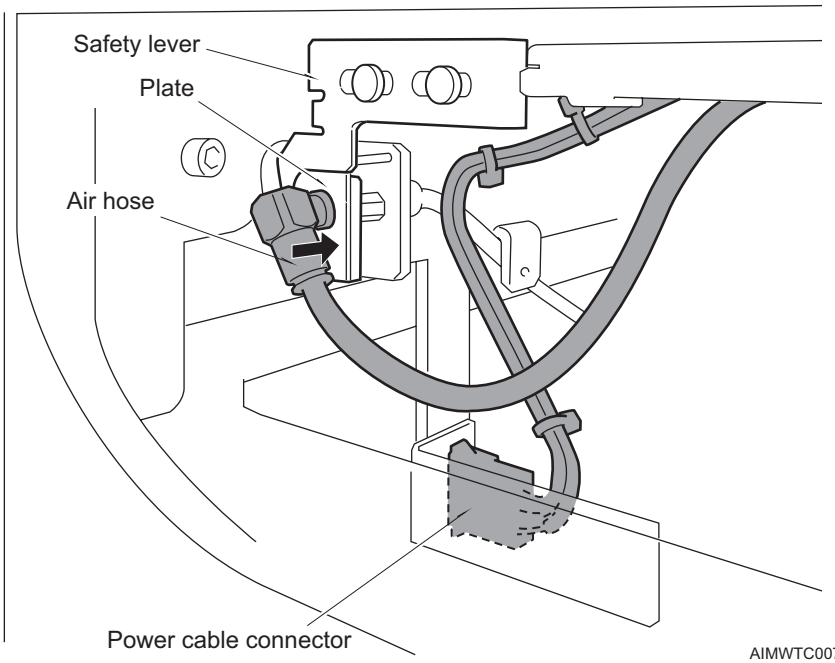
Always turn the machine main switch OFF before performing this work.

3. Remove the lower cover of the machine.

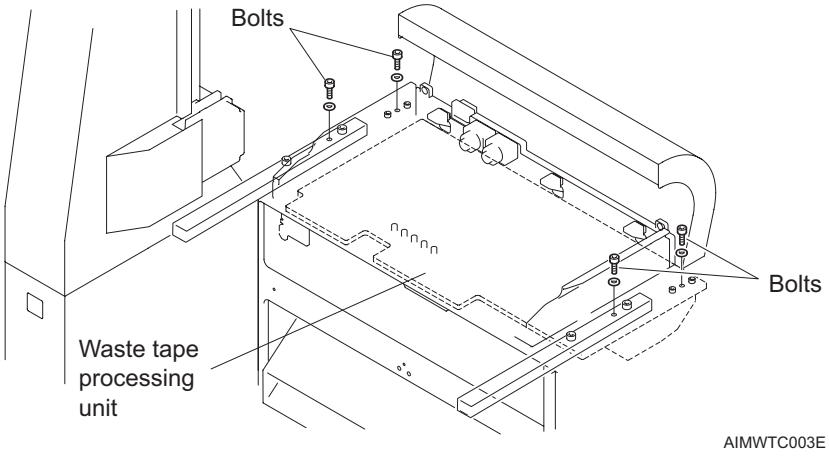


4. Disconnect the power cable connection from the front side of the waste tape processing unit. Push the plate in the direction of the arrow in the illustration to disconnect the air hose.

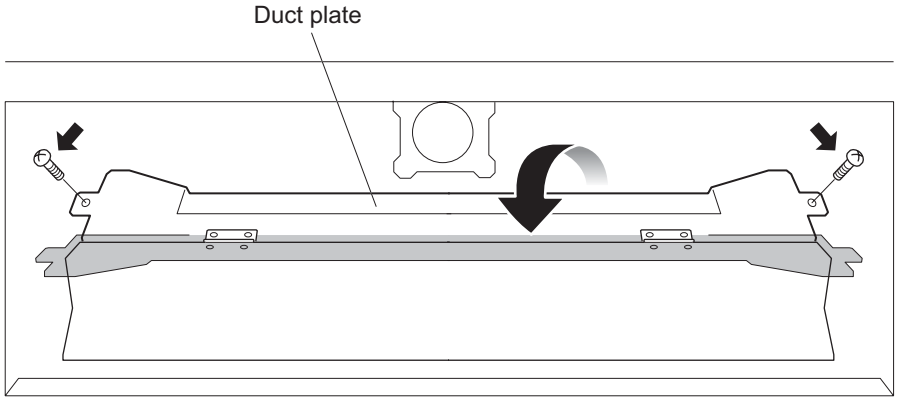
Note: When the air hose is disconnected, the safety lever moves to the right to lock the cutter blade.



5. Remove the four waste tape processing unit mounting bolts with an Allen wrench.



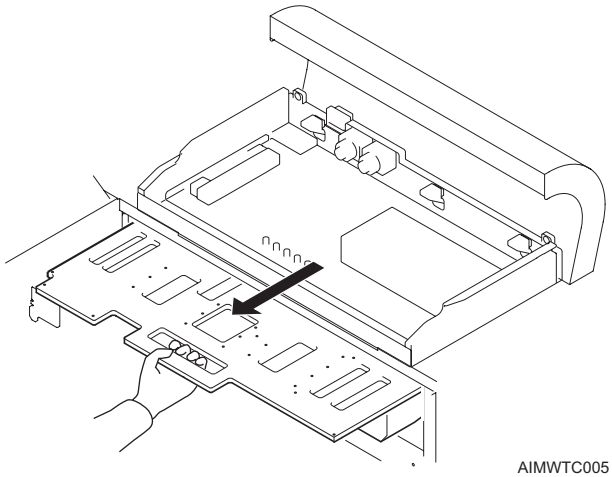
6. Remove the screws (2) which hold the plate on the duct inside the machine base, then pull the plate toward you.



AIMBAS069E

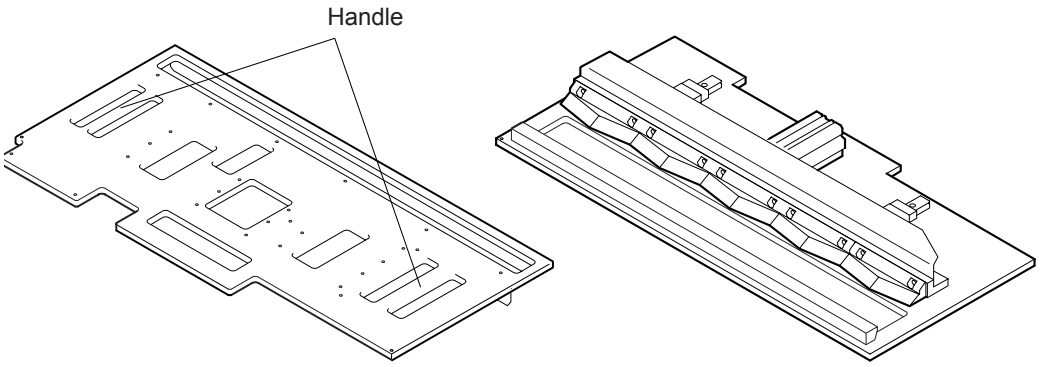
7. Slide the unit out of the machine using the handle on the front side.

Note: Care should be taken not to drop the unit on the floor, when it is pulled out.



AIMWTC005

8. Lift the unit using the handles and carry to the workbench.



AIMWTC006Ea

⚠*WARNING*

Ensure not to put your hands inside the waste tape processing unit when transporting the unit, as the cutter blade moves freely when the unit is removed from the machine.

⚠*CAUTION*

Be careful not to drop the unit while carrying as it is extremely heavy.

9. After maintenance work has been completed, use the reverse procedure to return the unit to the machine.

8.5 Servo Box Replacement

A servo box is located in the upper part of each module. The X-axis servo amplifier, Y-axis servo amplifier, and Z-Q-R-axis servo amplifier are installed in the servo box.

8.5.1 Required tools

Phillips screw driver, Allen wrench (5 mm)

8.5.2 Required time

Approximately 20 minutes (for each module)

8.5.3 Procedure

⚠WARNING

Always turn the machine main switch OFF before performing this work.

⚠CAUTION

Hold the harness connectors when disconnecting the connectors. Do not pull on the cables.

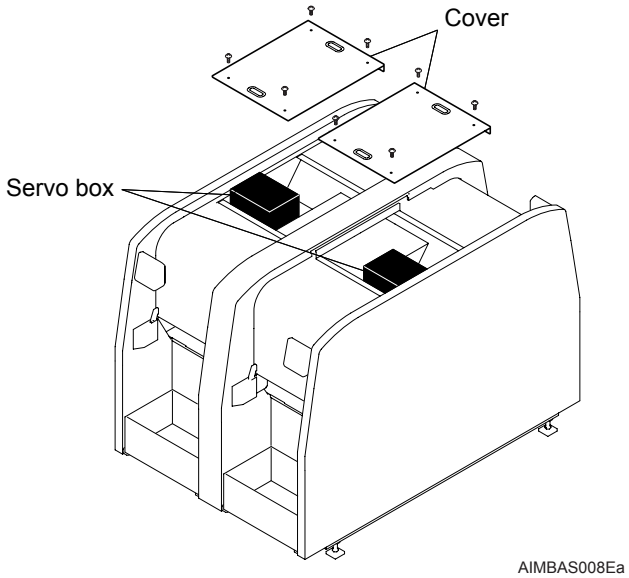
Take care not to hook and pull the wiring harnesses when taking out the servo box.

Confirm the connector names are right when reconnecting the connectors.

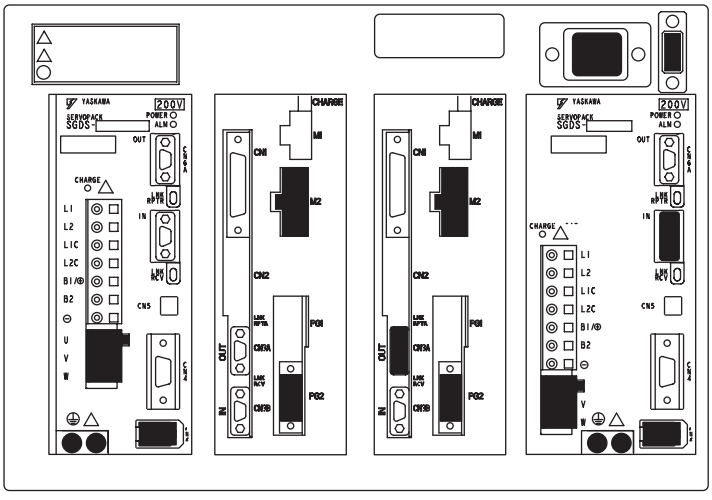
Take care not to pinch or damage the wiring harnesses when installing the servo box.

1. Turn off the power to the machine by turning the main switch off.

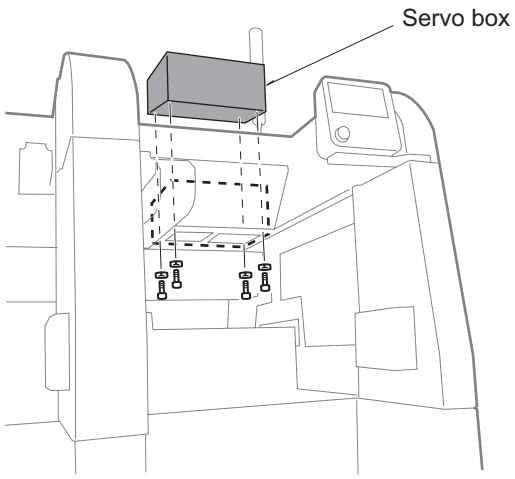
2. Remove the upper cover mounting screws.
3. Disconnect the cooling fan harness connector.
4. Disconnect the ground wire from the cover.
5. Remove the cover.



6. Disconnect the connectors in the black marked positions in the illustration below.



7. Remove the four bolts which fix the servo box by using an Allen wrench.



AIMBAS020E

8. Pull out the servo box from the upper part of the machine.
9. Use the reverse procedure when installing the new servo boxes.
10. Connect the ground wire to the cover.
11. Connect the cooling fan harness connector.
12. Attach the cover.

8.6 Module Control Box Replacement

A module control box is located in the lower-front side of each module. The module interface board and the connector board are installed in the module control box.

8.6.1 Required tools

Phillips screw driver, Allen wrench (3 and 4 mm)

8.6.2 Required time

Approximately 20 minutes (for each module)

8.6.3 Procedure

⚠WARNING

Always turn the machine main switch OFF before performing this work.

⚠CAUTION

Hold the harness connectors when disconnecting the connectors. Do not pull on the cables.

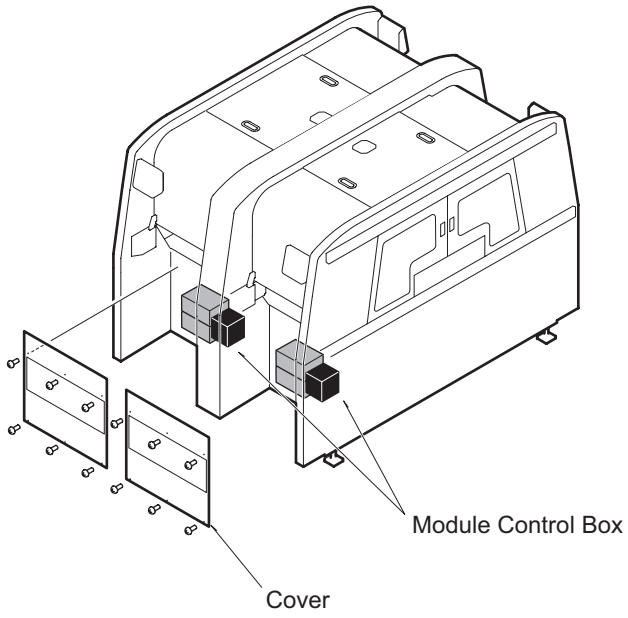
Take care not to hook and pull the wiring harnesses when taking out the servo box.

Confirm the connector names are right when reconnecting the connectors.

Take care not to pinch or damage the wiring harnesses when installing the unit.

1. Remove the feeder pallet. (See section 5.1 "Removing/Inserting a Feeder Pallet" for details.)
2. Turn off the main switch off.

3. Remove the cover from the front side of the machine.



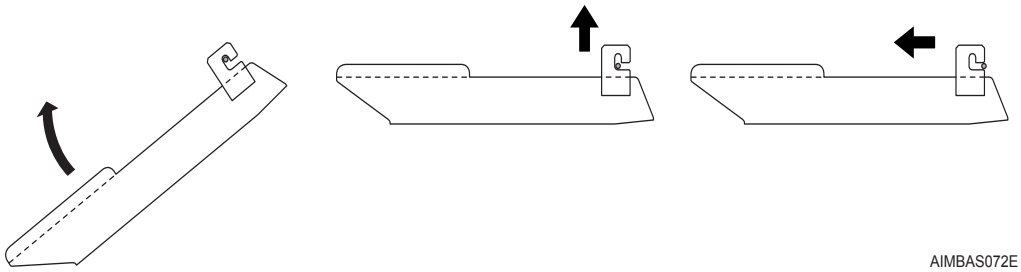
AIMBAS011Ea

4. Remove the waste tape duct from inside the machine.

(1) Lift up the front section of the duct.

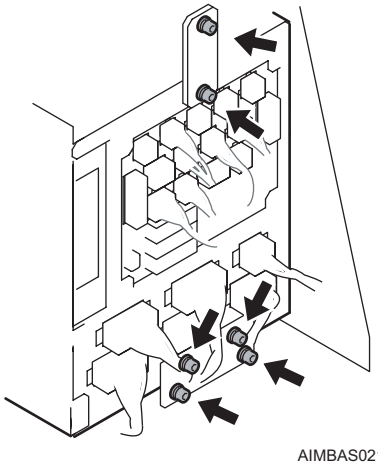
(2) Push up the rear section of the duct.

(3) Pull the entire duct forward.



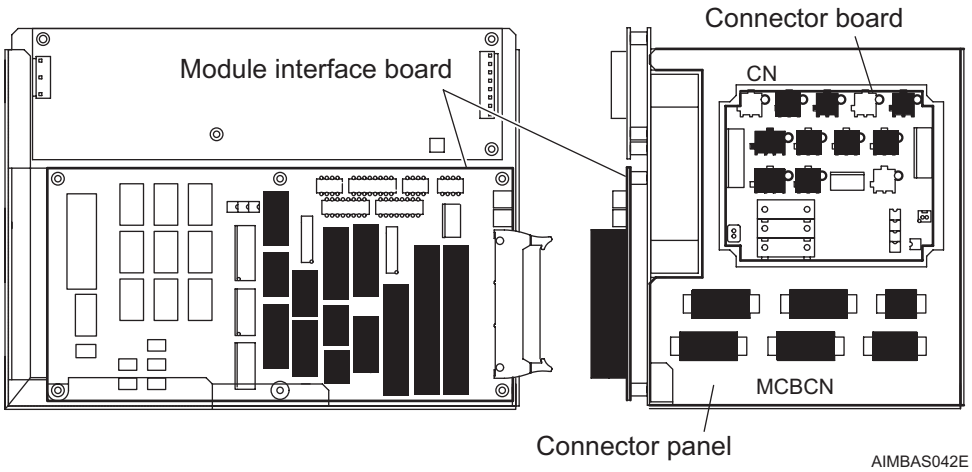
AIMBAS072E

5. Remove the bolts which fix the control box.



AIMBAS021

6. Disconnect the connectors in the black marked positions in the illustration below.



7. Take out the control box from the machine.
8. Use the reverse procedure when installing the new control box.

8.7 Module CPU Box Replacement

The moudle CPU box is located in the lower-front side of each module.

8.7.1 Required tools

Phillips screw driver, Allen wrench (2.5, 3, and 4 mm)

8.7.2 Required time

Approximately 15 minutes (for each module)

8.7.3 Procedure

⚠WARNING

Always turn the machine main switch OFF before performing this work.

⚠CAUTION

Hold the harness connectors when disconnecting the connectors. Do not pull on the cables.

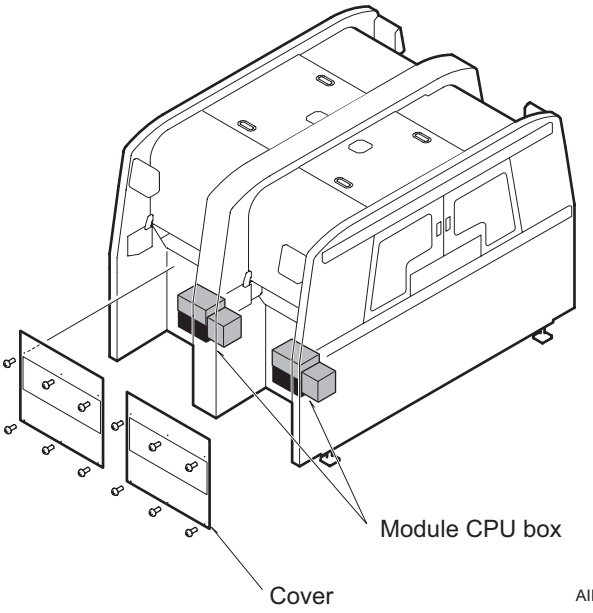
Take care not to hook and pull the wiring harnesses when taking out the servo box.

Confirm the connector names are right when reconnecting the connectors.

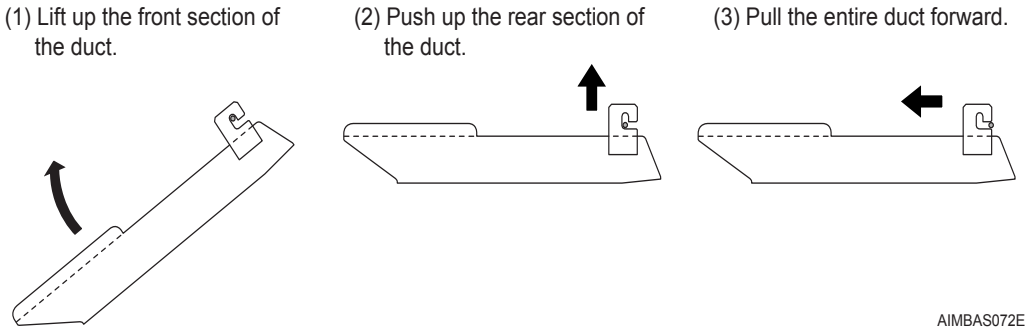
Take care not to pinch or damage the wiring harnesses when installing the unit.

1. Turn off the main switch off.

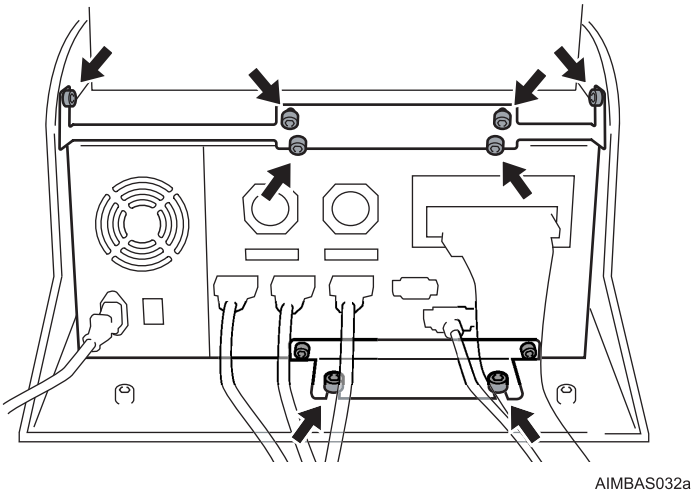
2. Remove the cover from the front side of the machine.



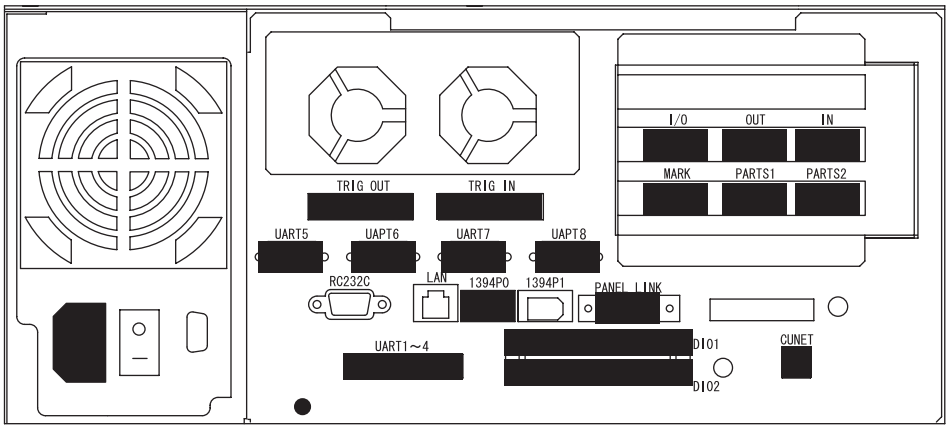
3. Remove the waste tape duct from inside the machine.



4. Remove the bolts which fix the CPU box.



5. Disconnect the connectors in the black marked positions in the illustration below.



AIMBAS043

6. Take out the CPU box from the machine body, and detach the brackets from the CPU box.
7. Use the reverse procedure when installing the new CPU box.
8. Turn the CPU box switch on.
9. After rebooting the machine, resend the matrix data to the machine.

8.8 Base Control Box Replacement

The base control box is located at the lower-front side of module 2. The base interface board is installed at the base control box.

8.8.1 Required tools

Phillips screw driver, Allen wrench (2.5, 3, and 4 mm)

8.8.2 Required time

Approximately 20 minutes (for each module)

8.8.3 Procedure

⚠WARNING

Always turn the machine main switch OFF before performing this work.

⚠CAUTION

Hold the harness connectors when disconnecting the connectors. Do not pull on the cables.

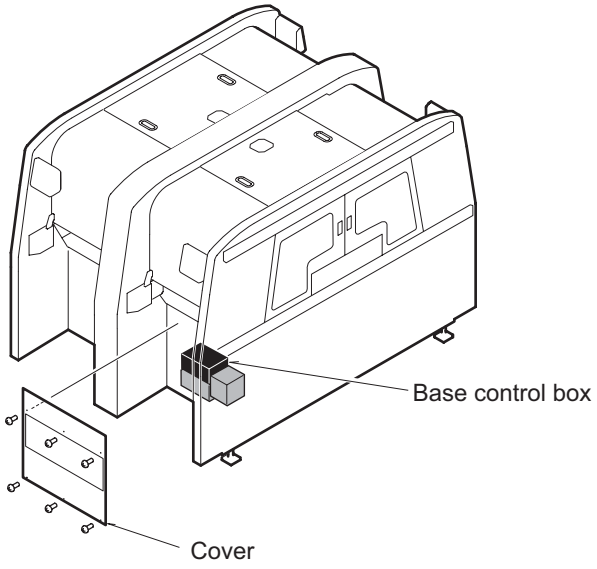
Take care not to hook and pull the wiring harnesses when taking out the servo box.

Confirm the connector names are right when reconnecting the connectors.

Take care not to pinch or damage the wiring harnesses when installing the unit.

1. Remove the feeder pallet. (See section 5.1 "Removing/Inserting a Feeder Pallet" for details.)
2. Turn the main switch off.

3. Remove the cover from the front side of module 2.



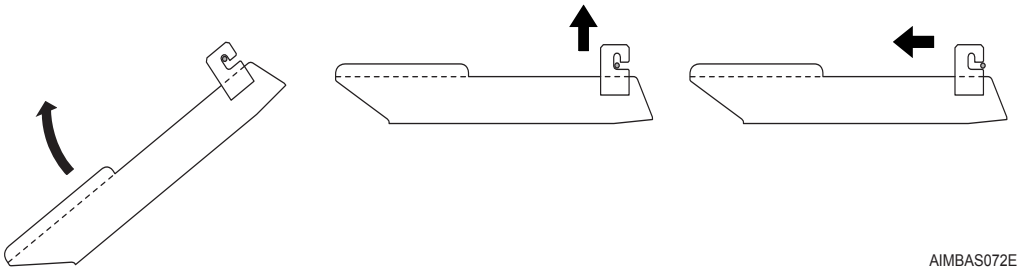
AIMBAS013Ea

4. Remove the waste tape duct from inside the machine.

(1) Lift up the front section of the duct.

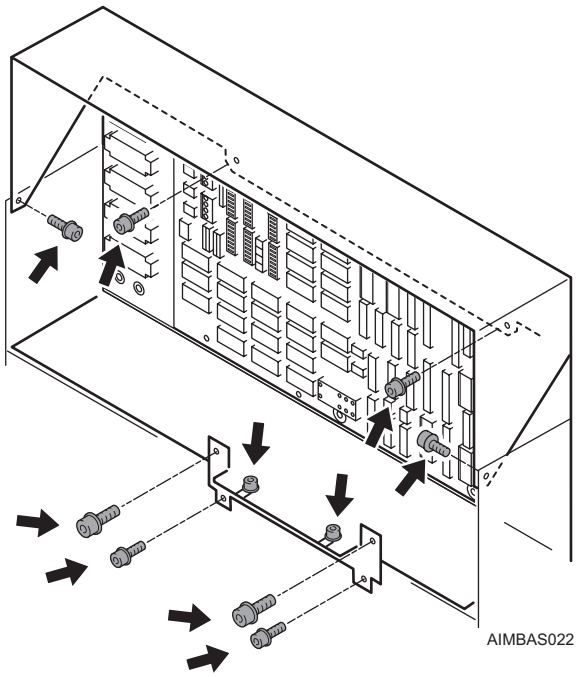
(2) Push up the rear section of the duct.

(3) Pull the entire duct forward.

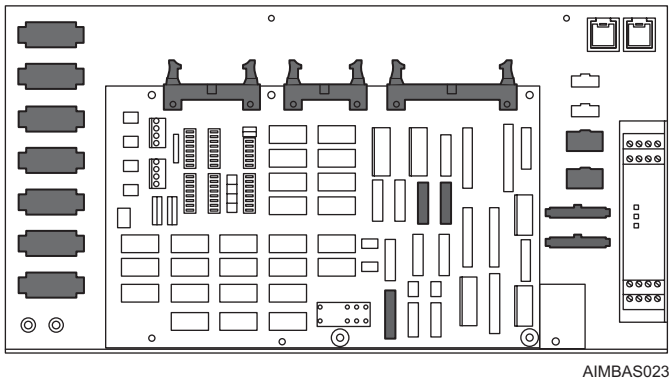


AIMBAS072E

5. Remove the bolts which fix the control box.



6. Disconnect the connectors in the black marked positions in the illustration below.



7. Take out the control box from the machine.
8. Use the reverse procedure when installing the new control box.

8.9 Base CPU Box Replacement

The base CPU box is located at the lower-front side of module 1.

8.9.1 Required tools

Phillips screw driver, Allen wrench (2.5, 3, and 4 mm)

8.9.2 Required time

Approximately 10 minutes (for each module)

8.9.3 Procedure

⚠WARNING

Always turn the main switch OFF before performing this work.

⚠CAUTION

Hold the harness connectors when disconnecting the connectors. Do not pull on the cables.

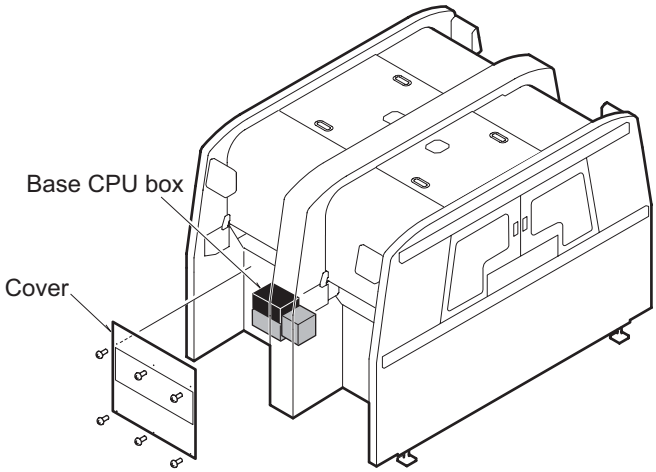
Take care not to hook and pull the wiring harnesses when taking out the servo box.

Confirm the connector names are right when reconnecting the connectors.

.Take care not to pinch or damage the wiring harnesses when installing the unit.

1. Turn the main switch off.

2. Remove the cover located at the front side of module 1.



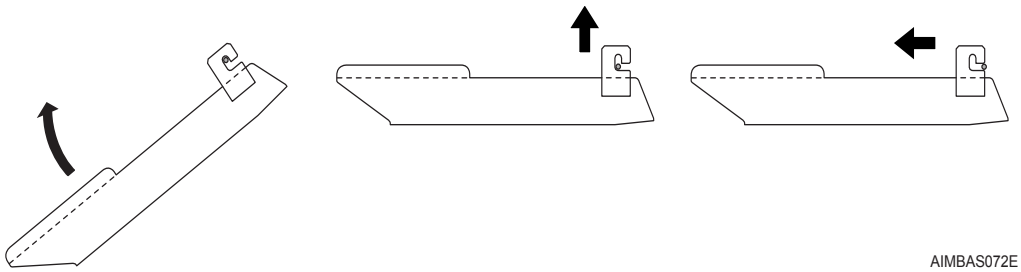
AIMBAS014Ea

3. Remove the waste tape duct from inside the machine.

(1) Lift up the front section of the duct.

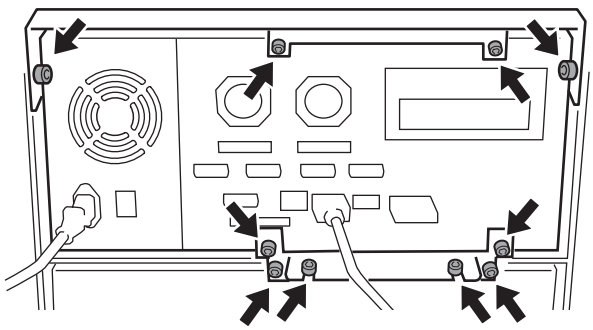
(2) Push up the rear section of the duct.

(3) Pull the entire duct forward.



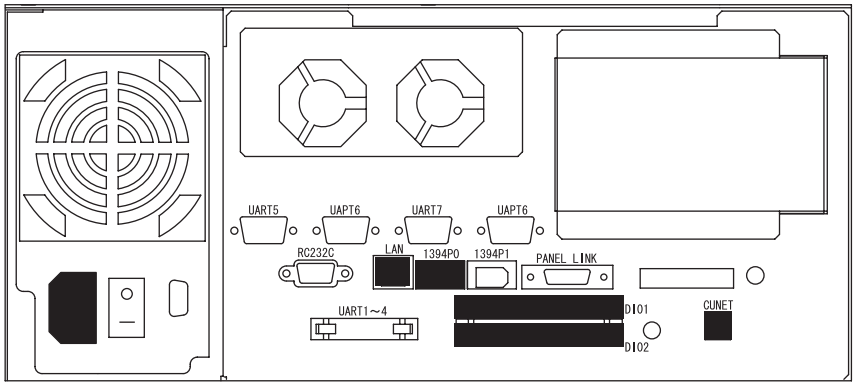
AIMBAS072E

4. Remove the bolts which fix the CPU box.



AIMBAS033

5. Disconnect the connectors in the black marked positions in the illustration below.



AIMBAS044

6. Remove the PC card from the old base CPU and put into the new base CPU.
7. Take out the CPU box from the machine, and detach the bracket.
8. Turn the CPU box switch on.
9. Use the reverse procedure when installing the new CPU box.

8.10 Vacuum Pump Control Box

8.10.1 Procedure

⚠*WARNING*

Always turn the machine main switch OFF before performing this work.

⚠*CAUTION*

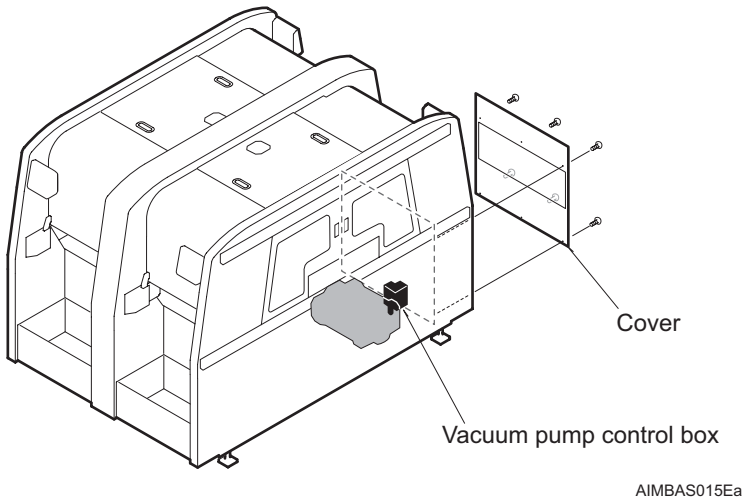
Hold the harness connectors when disconnecting the connectors. Do not pull on the cables.

Take care not to hook and pull the wiring harnesses when taking out the servo box.

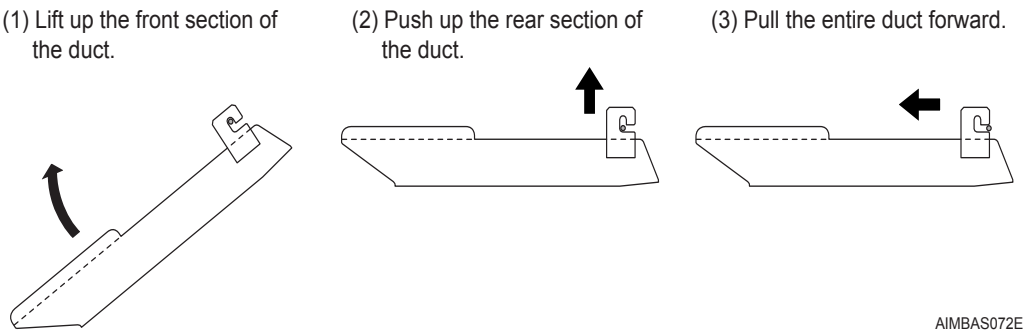
Confirm the connector names are right when reconnecting the connectors.

Take care not to pinch or damage the wiring harnesses when installing the unit.

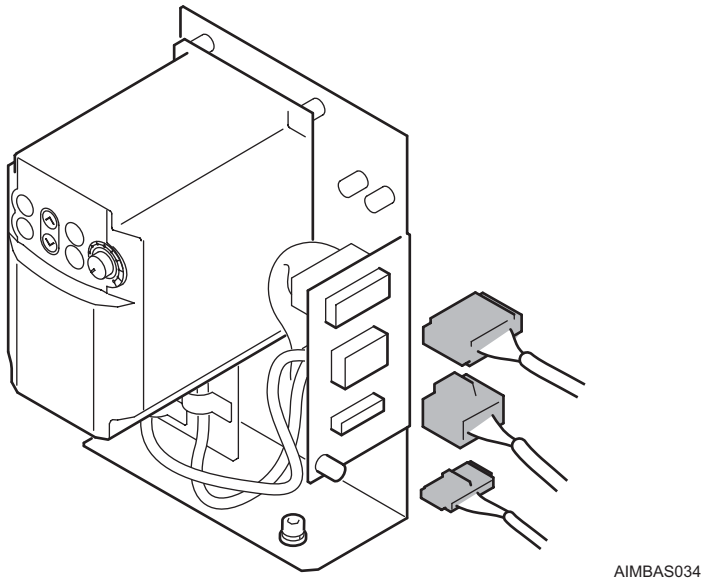
1. Turn the main switch off.
2. Remove the lower cover located at side 2 of module 2.



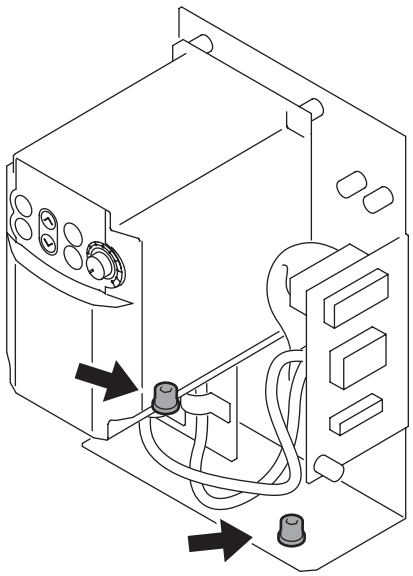
3. Remove the waste tape duct from inside the machine.



4. Disconnect the harness connectors (MS1CN1, MS1CN2, MS1CN3) from the bracket of the vacuum pump control box.



5. Remove the bolts which fix the bracket of the vacuum pump control box.



AIMBAS035

6. Take out the vacuum pump control box with the bracket attached.
7. Remove the control box from the bracket.
8. Use the reverse procedure when installing the new vacuum control box.

8.11 Replacing the DC Power Supply Unit on the Parts Supply Base

Remove the feeder pallet prior to replacing the DC power supply unit on the parts supply base.

8.11.1 Procedure

⚠WARNING

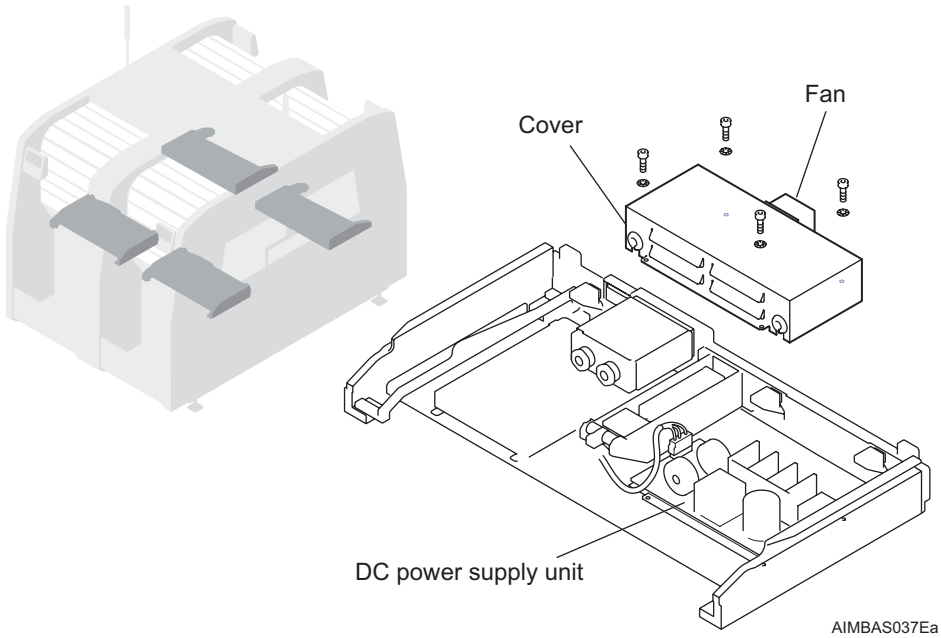
Always turn the machine main switch OFF before performing this work.

⚠CAUTION

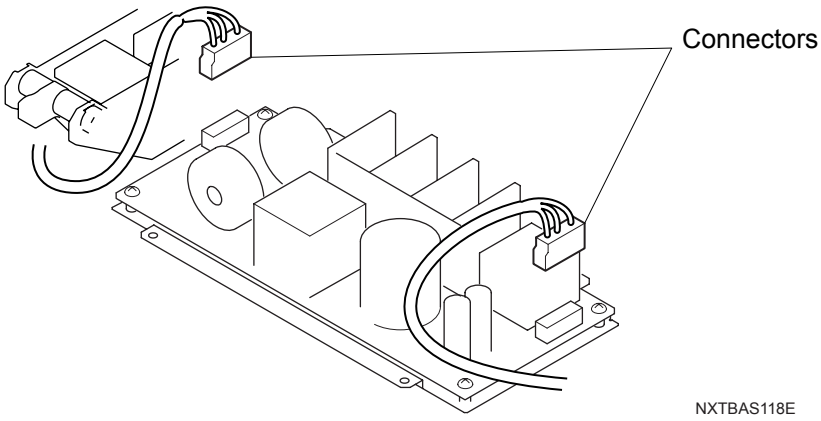
Hold the harness connectors when disconnecting the connectors. Do not pull on the cables.

Confirm the connector names are right when reconnecting the connectors.

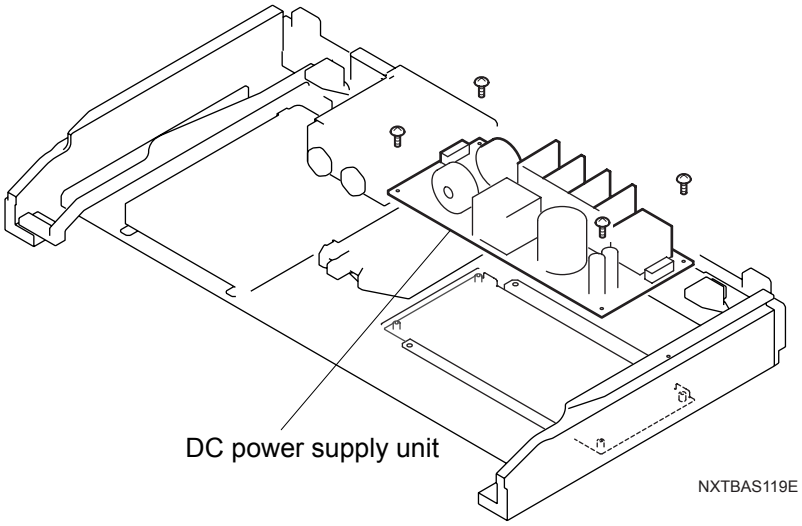
1. Turn the main switch off.
2. Remove the four bolts to remove the cover of the DC power supply unit from the parts supply base.



3. Disconnect any connectors connected to the DC power supply unit.



4. Remove the four screws and then remove the DC power supply unit from the parts supply base and replace it.



8.12 Conveyer Controller Replacement

8.12.1 Procedure

⚠WARNING

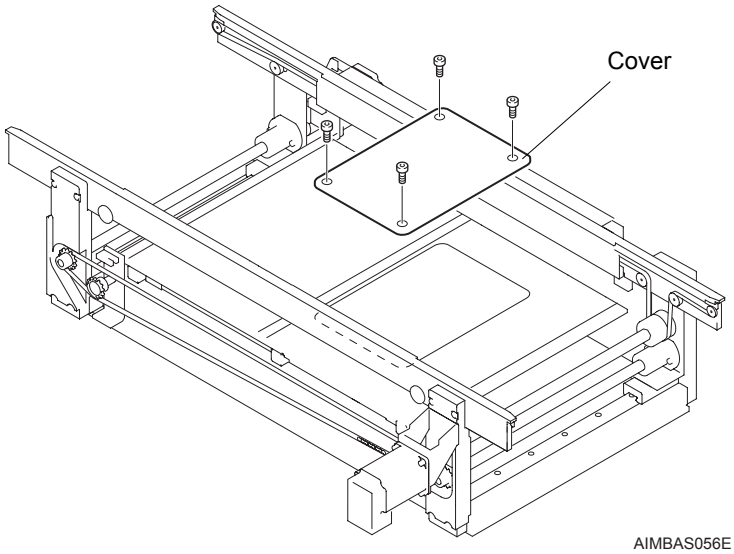
Always turn the machine main switch OFF before performing this work.

⚠CAUTION

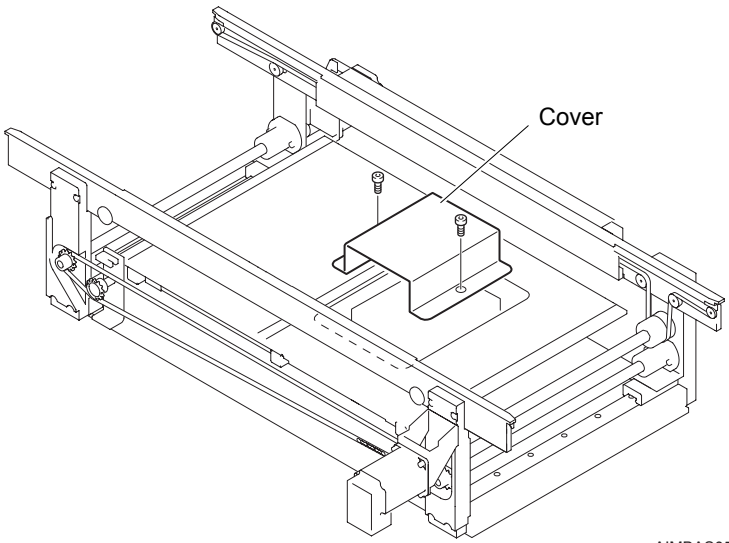
Hold the harness connectors when disconnecting the connectors. Do not pull on the cables.

Confirm the connector names are right when reconnecting the connectors.

1. Turn the main switch off.
2. Remove the four screws from the backup plate and then remove the cover.

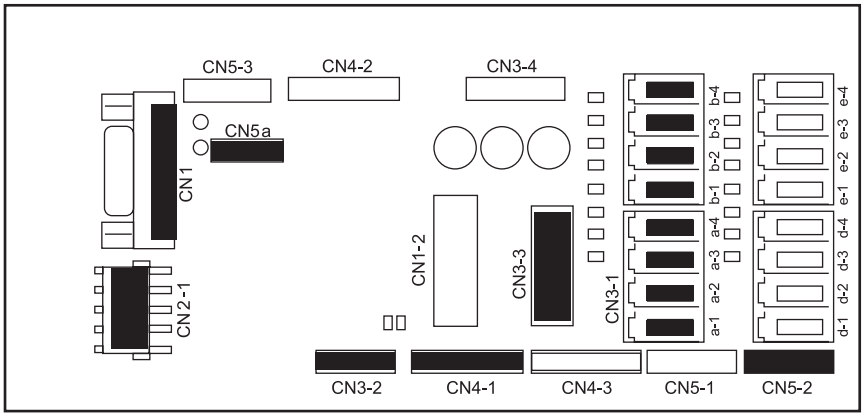


3. Remove the two screws and then remove the cover.



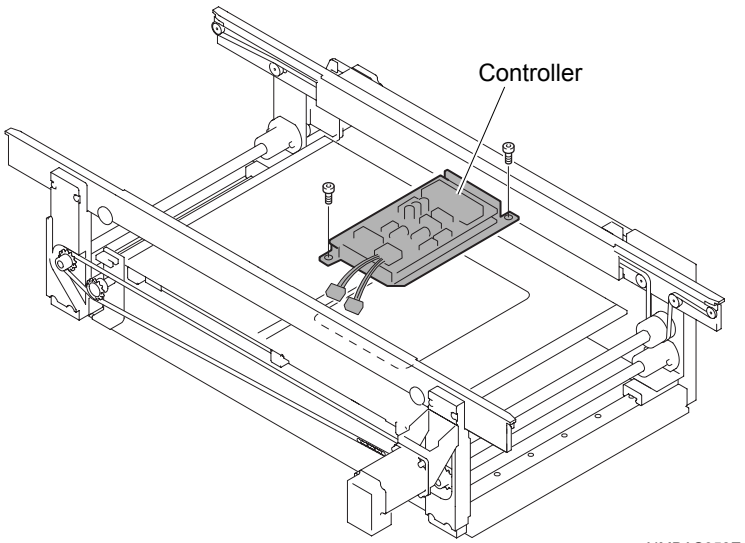
AIMBAS057E

4. From the conveyer controller, remove the connectors from the black portion as shown in the figures below.



AIMBAS040

5. Remove the two screws, then remove the controller.



6. Use the reverse procedure when installing the new conveyor controller.

8.13 Replacing the Connector for the Feeder Pallet and the Parts Supply Base

The feeder pallet and parts supply base connectors are made up of several connectors put together. When assembling the connectors ensure to follow the procedures below.

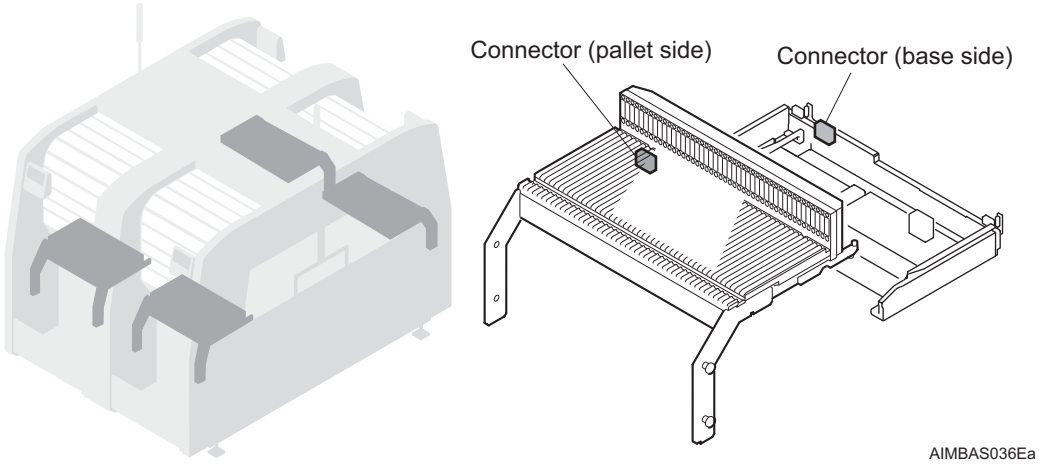
8.13.1 Procedure

⚠CAUTION

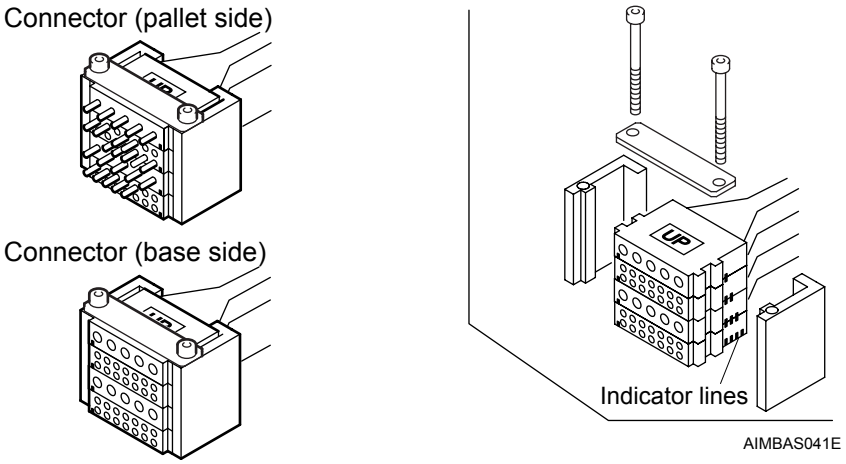
Always turn the machine main switch OFF before removing or attaching connectors.

If the connectors are disassembled, confirm that the connectors are correctly reassembled by referring the indicator lines on the side of the connectors.

1. Turn the main switch off.
2. A set of connectors (indicated in the figure below) is connected to the feeder pallet and the pallet supply base.



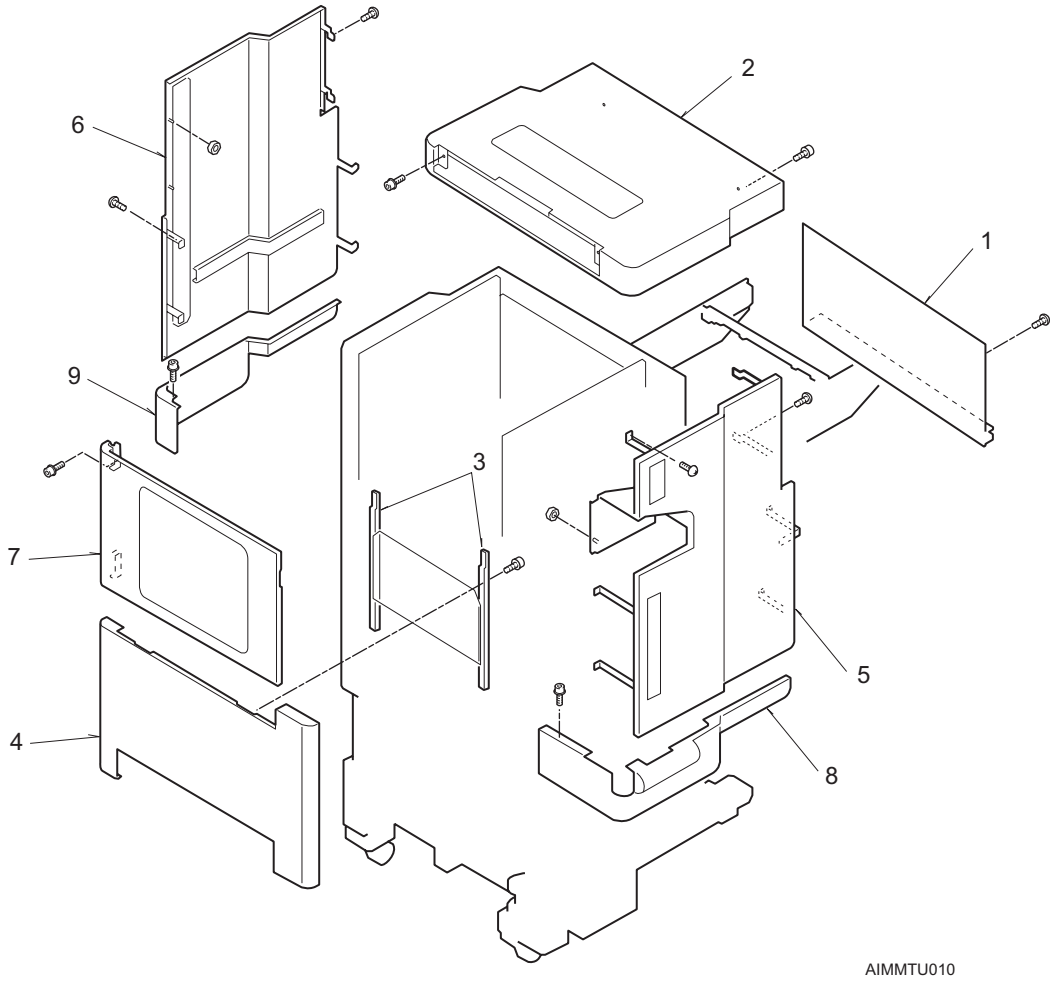
3. If the connectors are disassembled, confirm that they are correctly reassembled by referring the indicator lines on the sides of the connectors.



8.14 Detaching and Attaching the Tray Unit-L Cover

8.14.1 Tray unit-L cover nomenclature

The following exploded view of the unit parts are numbered in the order that they should be dismantled.
Detach the parts according to this order, and attach them in the reverse order.



1. Rear cover
2. Top cover
3. Front rails
4. Front cover
5. Upper right side cover
6. Upper left side cover
7. Front door
8. Lower right side cover
9. Lower left side cover

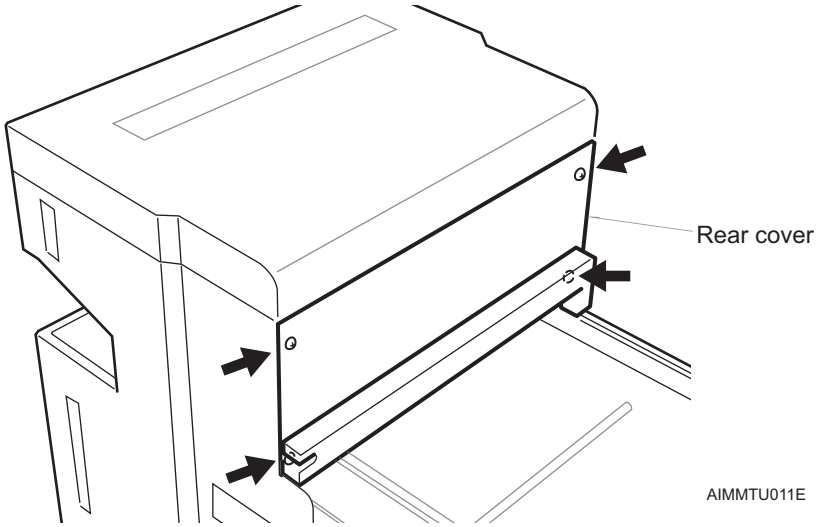
8.14.2 Detachment

⚠WARNING

Always turn the machine main switch OFF before performing this work.

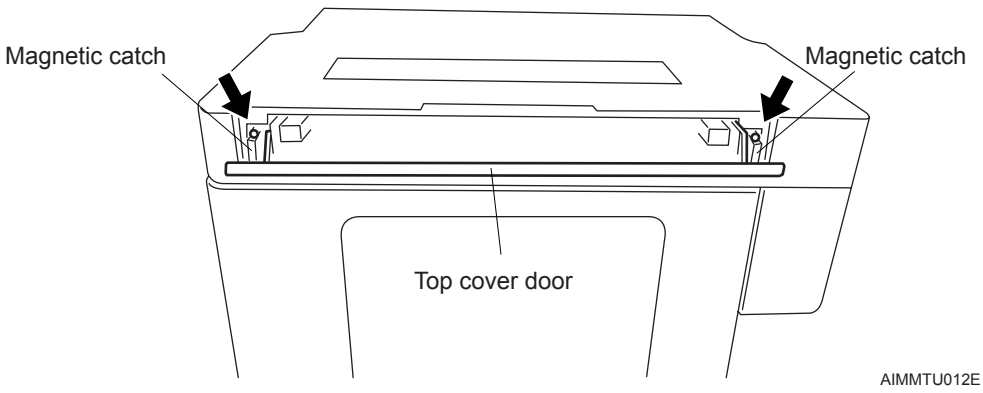
Detach the covers from the tray unit in the following order.

1. Rear cover.
   Remove the four screws, and then detach the rear cover.



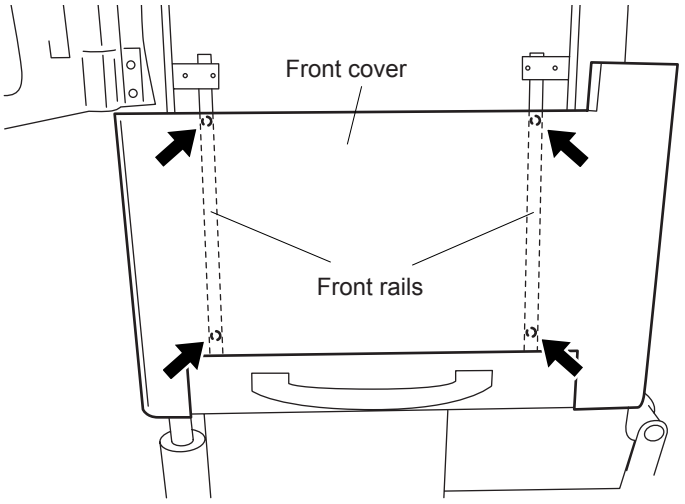
2. Top cover
   a. Remove the two screws at the back.
   b. Open the door at the front for the top cover, and then remove the bolts on the left and right.

Note: These bolts are tightened together with the magnet catches.



   c. Detach the top cover.

3. Front rails
   Remove the four bolts holding the front rails (together with the front cover) from the inside of the tray unit.



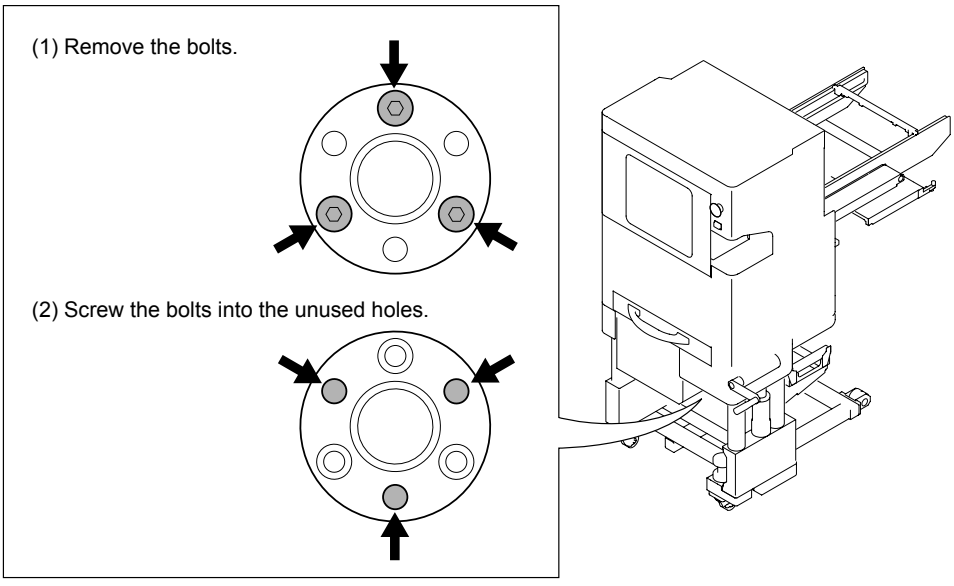
4. Front cover
   Detach the front cover together with the front rails when the four bolts holding both parts are removed in the step above.

5. Upper right side cover

   a. In order to remove the nut from the inside of the tray unit, lower the magazine rack as explained in the following procedure.

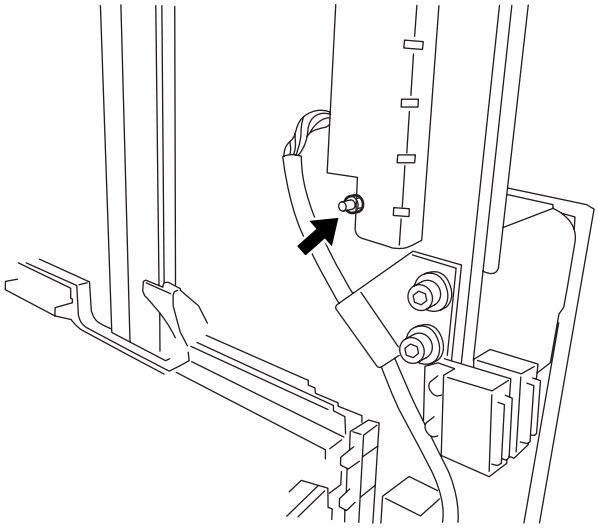
      • Remove the 3 bolts on each of the 2 couplings at the bottom of the TZ-axis.

      • Screw the bolts into the other, unused holes to push the couplings off.



      • Push down to lower the magazine rack.

b. Remove the nut holding the upper right side cover from the inside of the tray unit.

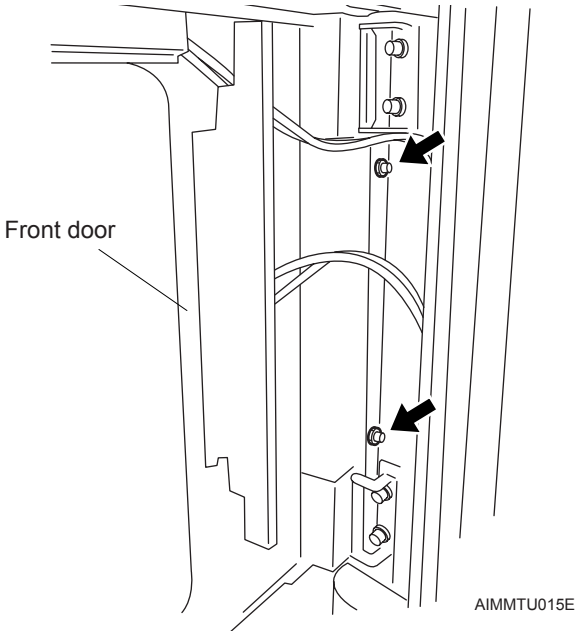


AIMMTU014

c. Remove the seven bolts holding the cover on the outside of the unit, and then remove the cover.

6. Upper left side cover.

a. Remove the two nuts holding the upper left side cover from the door hinge inside the machine.



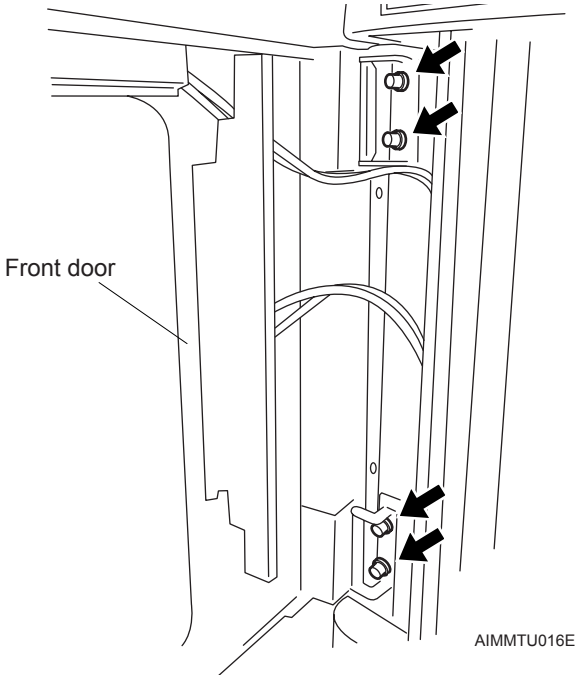
AIMMTU015E

b. Remove the six bolts holding the cover on the outside of the unit, and then remove the cover.

7. Front door

   a. Remove the four air hoses from the front door air cylinders.

   b. Remove the four bolts from the front door hinges.



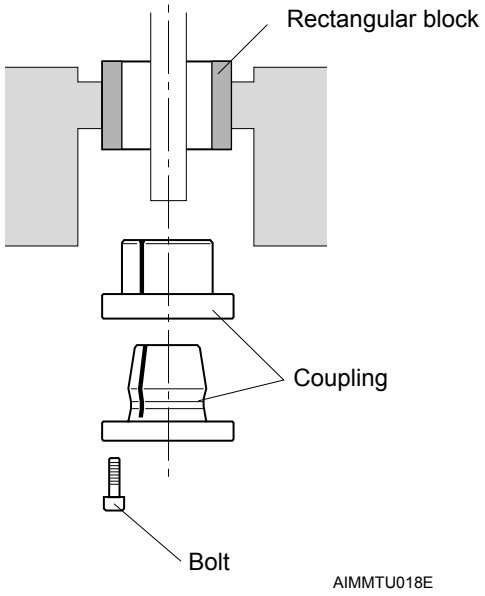
   c. Remove the front door.

8. Lower right side cover
   Remove the bolts, and then remove the cover.

9. Lower left side cover
   Remove the bolts, and then remove the cover.

8.14.3 Attachment

1. Attach the covers in the reverse order from their detachment.
2. Tighten the couplings with the magazine rack at its upper limit.
   Torque for the coupling bolts: 4.0 Nm



8.15 Replacing the Remote I/O Board

8.15.1 Replacing the board

⚠*WARNING*

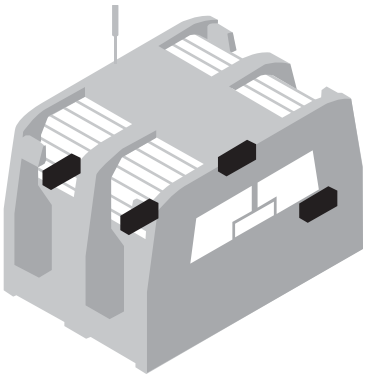
Always turn the machine main switch OFF before performing this work.

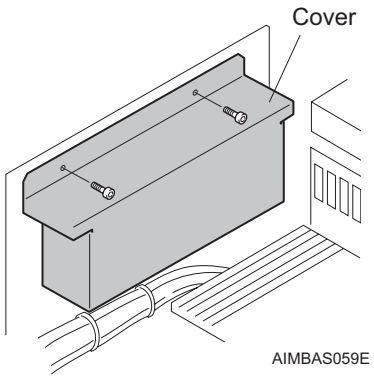
⚠*CAUTION*

Attachment and detachment of the harness connector must be carried out by holding the connector, and never by pulling on the cable.

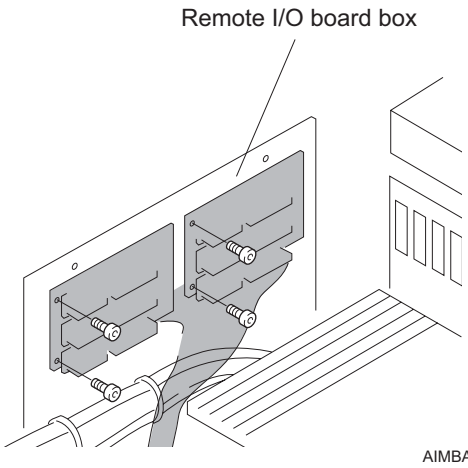
Ensure the connectors are attached to the correct positions by checking the connector labeling when they are attached.

1. Set the main switch to off to cut the machine power.
2. Remove the screws, then detach the front cover for the remote I/O board.

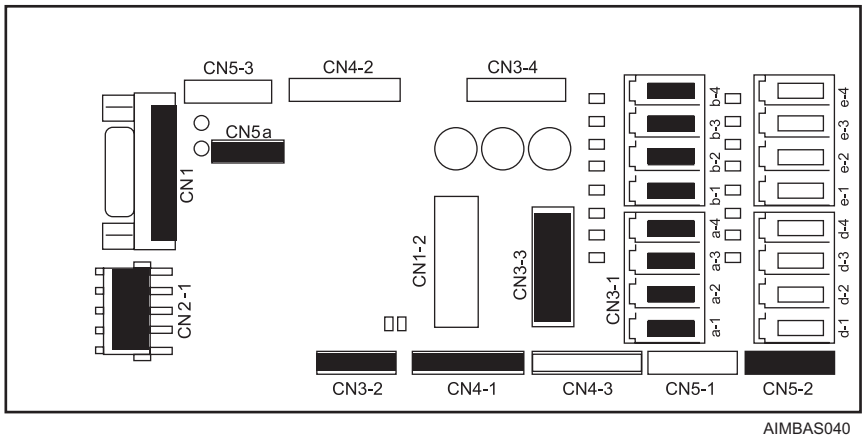




3. Remove the four bolts and then detach the remote I/O board box from the machine.



4. Detach the following connectors, and then detach the board.



5. Use the reverse procedure to attach the new unit.

8.16 Replacing the Distributor

8.16.1 Replacing the unit

⚠*WARNING*

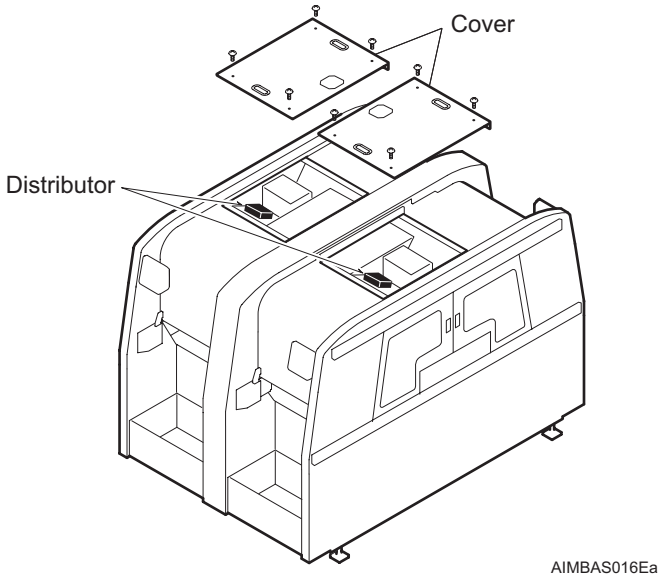
Always turn the machine main switch OFF before performing this work.

⚠*CAUTION*

Attachment and detachment of the harness connector must be carried out by holding the connector, and never by pulling on the cable.

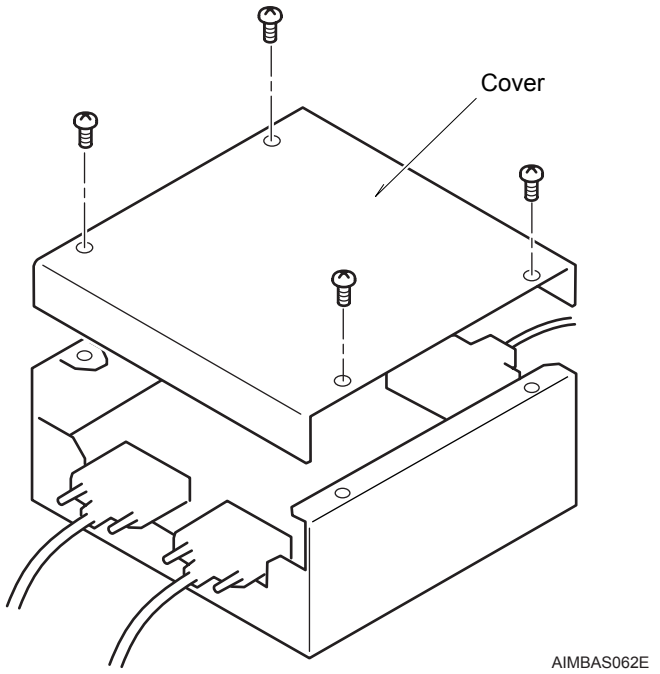
Ensure the connectors are attached to the correct positions by checking the connector labeling when they are attached.

1. Set the main switch to off to cut the machine power.
2. Remove the upper cover mounting screws.

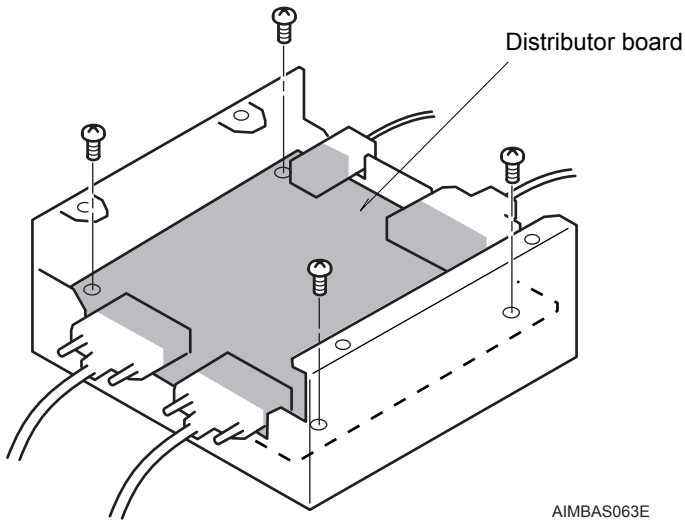


3. Disconnect the cooling fan harness connector.
4. Disconnect the ground wire from the cover.
5. Remove the cover.

6. Remove the screws, and then detach the cover from the distributor.



7. Disconnect the four harnesses shown in the following diagram. Remove the screws and the detach the distributor.



8. Use the reverse procedure to attach the new distributor board.
9. Connect the ground wire to the cover.
10. Connect the cooling fan harness connector.
11. Attach the cover.

MEMO:

9. Adjustments

9.1 On machine PAM (Placement Accuracy Measurement)

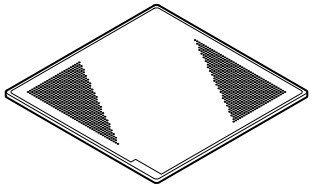
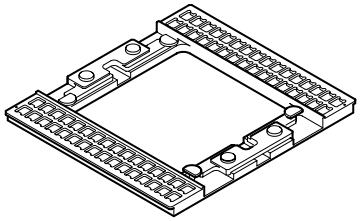
The following are explanations for on machine PAM (Placement Accuracy Measurement). To be able to conduct any of these measurements, the AIM has to be changed to on machine PAM mode. This section provides the steps to perform on machine PAM.

9.1.1 Required Parts

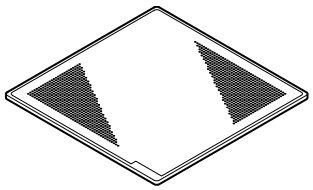
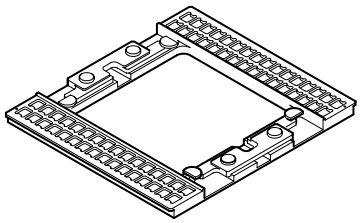
Set up the NXT for on machine PAM and ensure to have the right nozzles in place. Have the job for on machine PAM ready. The items required to perform on machine PAM are listed below.

Note: The Machine Application CD-ROM has a sample job [PAM_Sample] for on machine PAM. Make the necessary changes to the sample job if the default settings do not match the machine.

Required parts when using the 1 nozzle or 4 nozzle placing heads

Jig	Glass board PZ1459* 	1 nozzle, 4 nozzle, 8 nozzle, 12S nozzle heads
Jig	Jig plate AA01B** 	1 nozzle, 4 nozzle, 8 nozzle, 12S nozzle heads
Parts	Glass parts	64 parts for 4 nozzle head, 32 parts for 1 nozzle head
Nozzle	dia. 7.0 AA07C** (or AA07K**)	8 parts for 4 nozzle head
	dia. 7.0 AA751** (or AA755**)	2 parts for 1 nozzle head
Other	Glass part double-sided tape (available on market)	10 mm width, half transparent

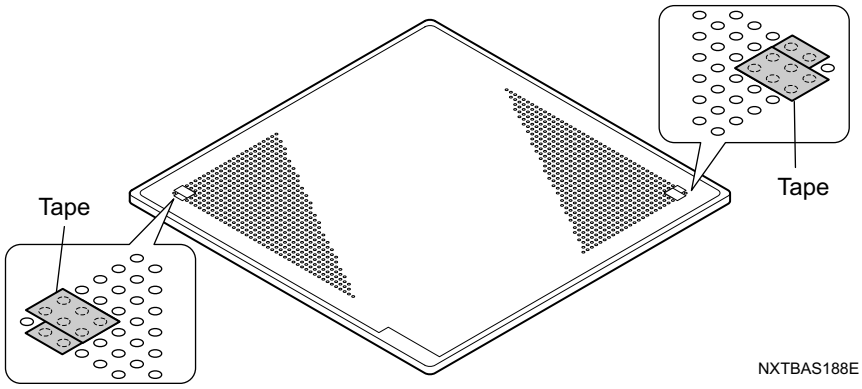
Required parts when using the 8 nozzle or 12S nozzle placing heads

Jig	Glass board PZ1459* 	1 nozzle, 4 nozzle, 8 nozzle, 12S nozzle heads
Jig	Jig plate AA01B** 	1 nozzle, 4 nozzle, 8 nozzle, 12S nozzle heads
Parts	1005 white parts	10,000 part / reel
Nozzle	dia. 0.7 AA735**	16 pcs for 8 nozzle, 24 pcs for 12S nozzle
Other	White part double-sided tape (available on market)	Double coated scotch tape 666 (transparent)

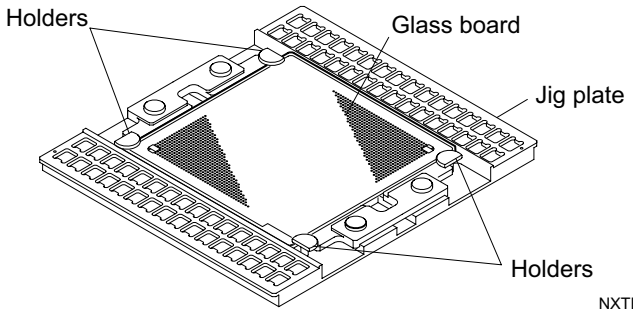
9.1.2 Preparing

Preparing to perform measurements for the 1 nozzle or 4 nozzle placing heads

1. Cover the two rows of dots immediately adjacent to the top right and bottom left corner marks with tape as illustrated in the diagram below. Leave the mark on both end corners exposed. This helps prevent mark read errors. The tape should be placed on the surface with the printing.

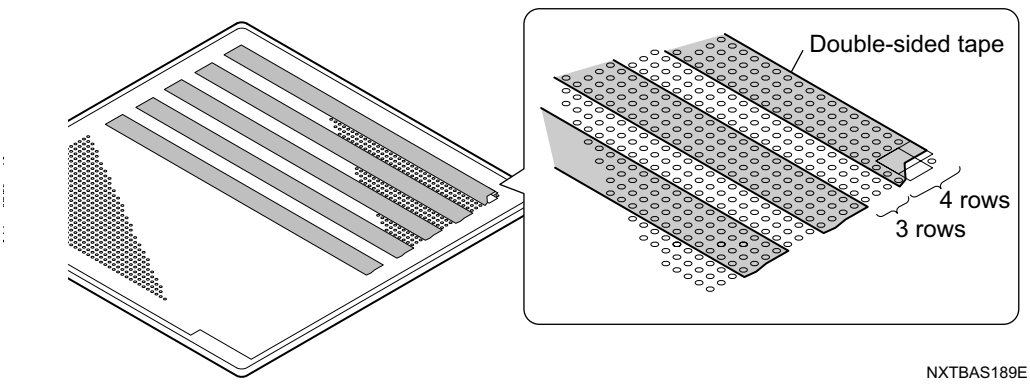


2. Next, set the glass board with the printed surface face up on the jig plate and secure the glass board with the holders at all 4 corners.

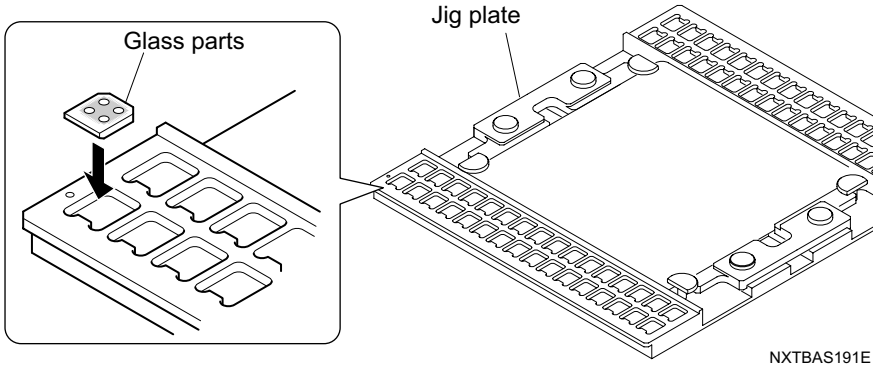


3. Affix the number of strips indicated below of double-sided tape (10 mm wide) with the first strip of tape covering the top 4 rows of dots, and the remaining strips affixed as shown below with a gap of 3 rows in between each strip. Do not cover the top right or bottom left end corner marks from step 1 with this tape.

    • 5 strips for the 1 nozzle head, 9 strips for the 4 nozzle head



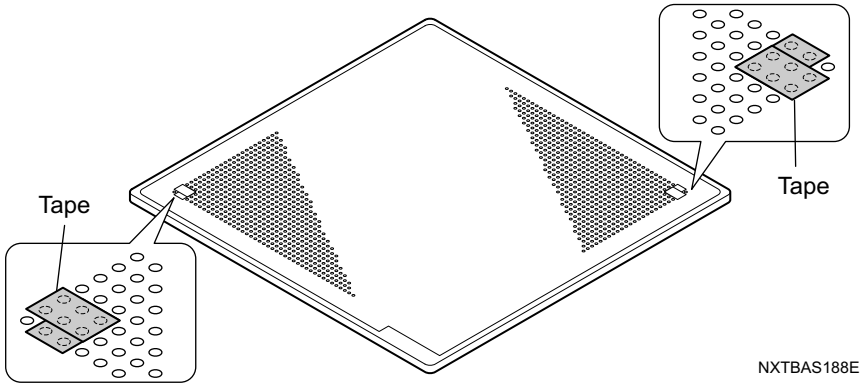
4. Set the glass parts with their beveled edges face down in jig plate. 32 glass parts are used for the 1 nozzle placing head and are set in a row at the bottom of the jig plate as shown below. When measuring the 4 nozzle placing head, 64 glass parts are used and placed in jig plate.



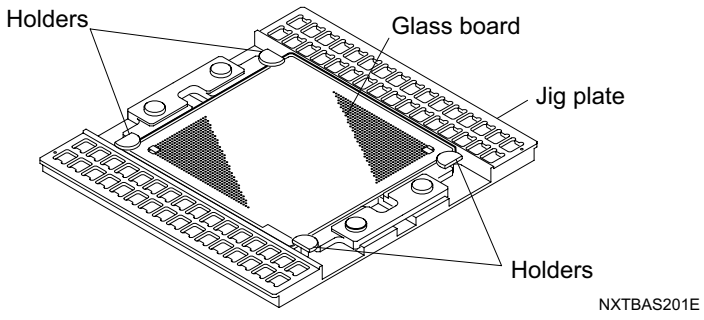
Note: Ensure that the surfaces of the glass board and parts are kept clean at all times.

Preparing to perform measurements for the 8 nozzle or 12S nozzle placing heads

1. Cover the two rows of dots immediately adjacent to the top right and bottom left corner marks with tape as illustrated in the diagram below. Leave the mark on both end corners exposed. This helps prevent mark read errors. The tape should be placed on the surface with the printing.

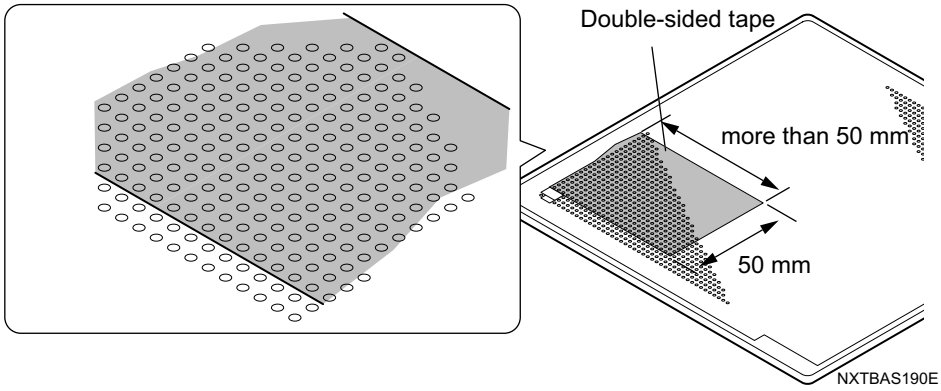


2. Next, set the glass board with the printed surface face up on the jig and secure the glass board with the holders at all 4 corners.



3. Affix a strip of double-sided tape (50 mm wide with a minimum of 50mm in length) across the bottom left corner of the glass board as shown below. Do not cover the top right or bottom left end corner marks from step 1 with this tape.

Note: It is essential that nothing is trapped between the tape and the glass board including air pockets.



4. Set the white 1005 parts on an 8 mm feeder and set the pitch to be 2 mm pitch and then set on the module to be used for PAM measurements.

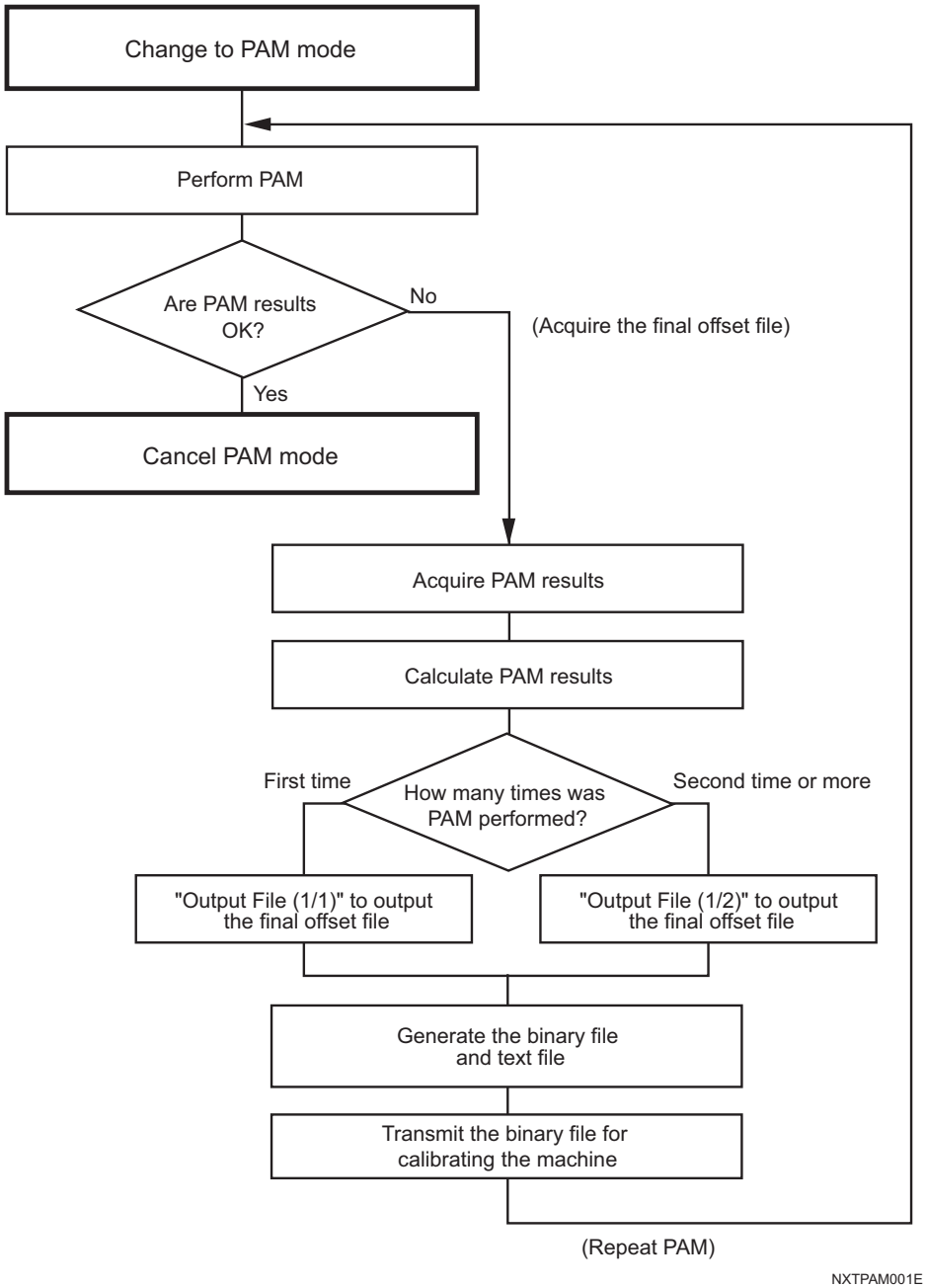
Note: Ensure that the surfaces of the glass board and parts are kept clean at all times.

9.1.3 Placing Accuracy Measurement (PAM) flow chart

PAM is performed for each head. For the AIM, measurement is performed for one head on both sides (stage 1 and stage 2) at one time. There are a total of 4 heads on the AIM (2 heads on each module), so it is necessary to perform measurement 4 times.

Remeasure the calibration data for the module before performing PAM.

To check the accuracy of a module where PAM has previously been performed, perform PAM without deleting the final offset file of the relevant head. The final offset file should only be deleted when the placement accuracy is not good before performing PAM.



9.1.4 Changing to PAM mode

The module must be changed to PAM mode in order to perform on machine PAM. Follow the procedures below to change the module to PAM mode. Before changing to PAM mode, ensure that the following items have been performed.

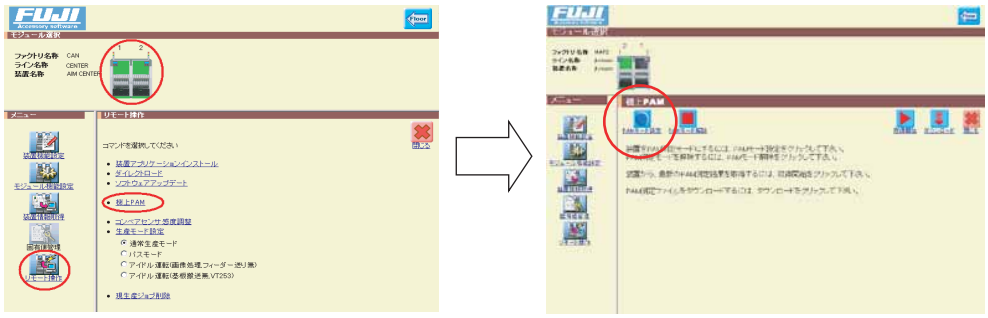
a. Transmit the job to the machine in normal mode.

b. Use the nozzle exchange command to return all nozzles currently held by the head to the nozzle station.

Jobs in the module are deleted when the module is changed to PAM mode or this mode is cancelled.

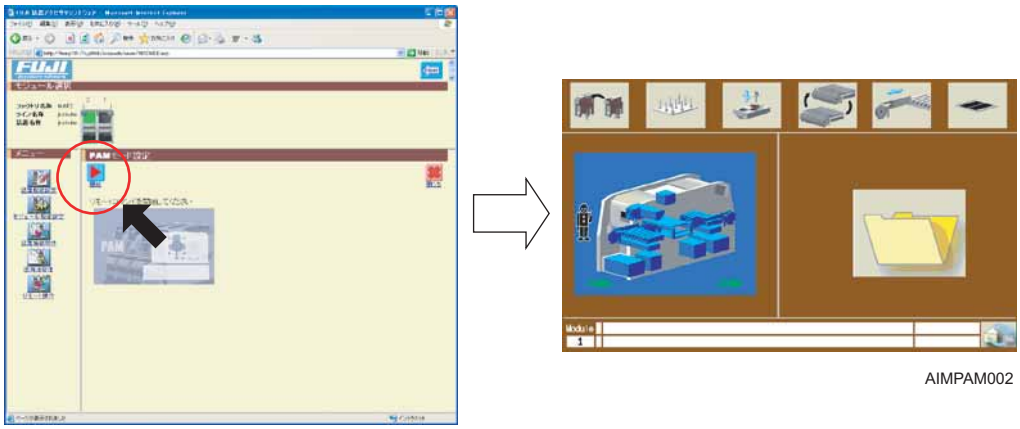
Note: The steps below are performed using Accessory Software. For further details, refer to "Performing on machine PAM" in the online Accessory Software operation manual on line.

1. From the machine accessories page in Accessory Software, select the module for which PAM measurement is to be performed and click [Remote operation].
2. Click [On machine PAM]. The page changes to display the available options.
3. Click [Change to PAM mode].



AIMPAM001

4. Click [Start]. The mode change is sent to the selected module. If completed successfully, the module changes to PAM mode.



AIMPAM002

Note: When in PAM mode, the background color of the operation panel is dark brown.

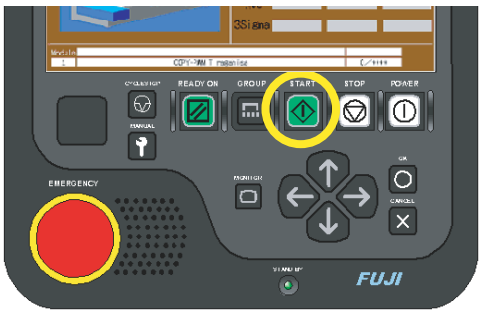
To cancel PAM mode, select [Remote Operation] - [On machine PAM] - [Cancel PAM mode]. Then, click [Start] - [Close] and the machine returns to normal mode.

9.1.5 PAM Measurements

Ensure that the module is in PAM mode before proceeding and then use the following procedure to perform PAM. Furthermore, if backup pins are on the backup plate remove them before performing PAM.

Note: If backup pins remain on the backup plate during PAM measurement, the jig will collide with the pins.

1. Transmit the PAM job from Flexa to the machine. (Refer to section 9.1.9 "About the sample job [PAM_Sample]".)
2. Set the necessary feeder on the module at the required slot.
   a. When performing PAM using a 8 nozzle or 12S nozzle heads, use the feeder with white 1005 parts prepared earlier in the appropriate position and push set for the feeder in the module.
   b. When performing PAM using a 1 nozzle or 4 nozzle heads on a module with a feeder pallet, set an empty 12 mm feeder with 4 mm pitch on the module using glass parts and push set for that feeder position.
   c. When performing PAM on module with a tray unit-L, skip this step.
3. Push START on all modules. Calibration is automatically performed and the conveyors are automatically adjusted to be the correct size for the jig.



NXTOPE139

Note: It is necessary to push START on all modules. The conveyor width has to be correct on all modules.

4. Upon completing calibration, the machine waits for panels to be loaded. Push CYCLE STOP on all of the modules.
5. Set the jig plate (if using a 1 nozzle or 4 nozzle head, with the loaded glass parts) in the conveyor on the module.
6. Push START. The module then places parts and then measures the placing accuracy. Upon completion, the jig plate is automatically unclamped.

NXTOPE139

7. Wait until all operations are completed and the jig plate is unclamped, and then push CYCLE STOP to return to the main screen.
8. Take note the placement accuracy results displayed on the operation panel.
9. For the 1 nozzle or 4 nozzle heads, remove all glass parts from the tape and place them back in the jig plate. For the 8 nozzle heads, remove the tape along with all components placed on it when measuring white 1005 parts and affix new tape on the glass board.
10. Next, it is necessary to obtain the results for PAM measurements from the module using Accessory Software if the results were out of tolerance.

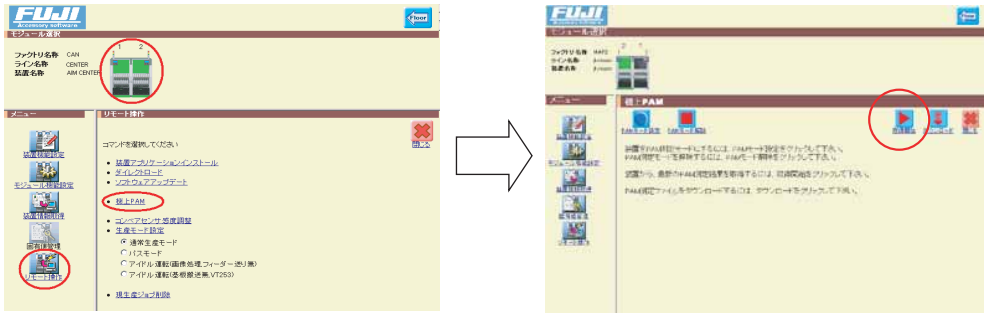
		8 nozzle head	4 nozzle head	1 nozzle head
Placement accuracy (3σ)	Cpk ≧ 1.00	± 0.050	± 0.050	± 0.030
	Cpk ≧ 1.33	± 0.066	± 0.066	± 0.040

AIMPAM027E

9.1.6 Acquiring the PAM results from the machine

Note: The steps shown below are guidance to operations in Accessory Software. For further details, refer to on machine PAM in the Accessory Software operation manual on line.

1. From the Machine Accessories page, ensure the module from which to acquire the PAM results is selected and then click [Remote operation]
2. Click [On machine PAM] and then [Start Acquisition] to start the acquisition process.

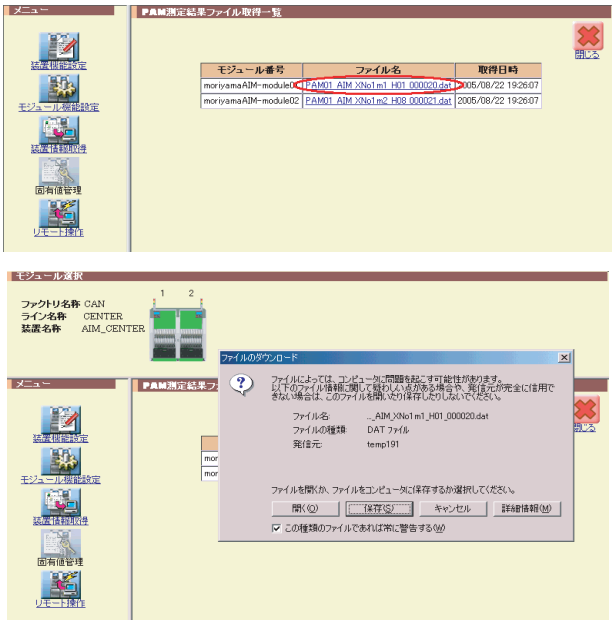


AIMPAM005

3. Right-click the file to download from the list that displays and click [Target As]. A [Save As] dialog box is displayed.

Note: [Start Acquisition] downloads the results from the machine to the server and then displays a list of the acquired files. By saving a file from this list, the results are downloaded from the server to the client computer. The results are used for correcting the placement accuracy.

4. Right-click the file to download from the list that displays and click [Save Target As]. A [Save As] dialog box is displayed.



AIMPAM006

5. Specify the location to save the file and click [Save]. The results are saved to the specified location.

Note: It is best to save each file to the desktop using an easily understood file name (such as PAM1.dat).

9.1.7 Correcting the placement accuracy (final offset file)

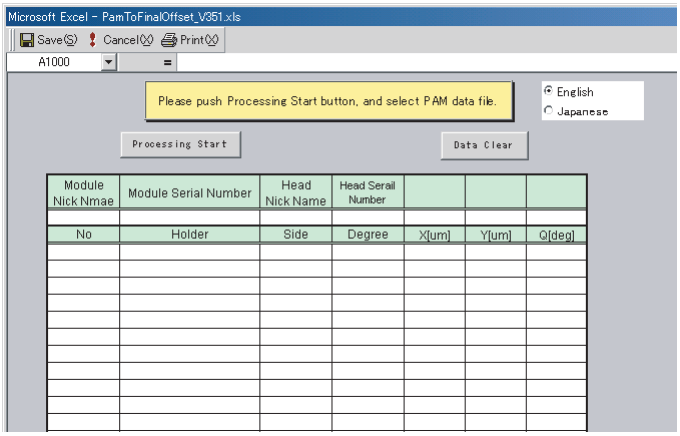
Creating calculation data

1. Open the excel file for calculating PAM data which is located on the AIM installation CD.

   • /Documents/PAM/PamToFinalOffset_v***.xls

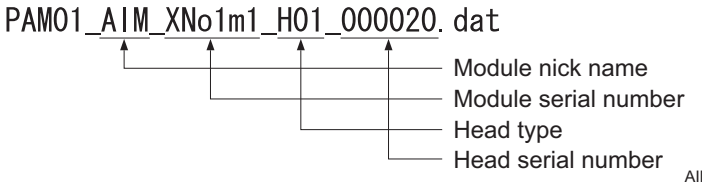
Note: It is necessary to click [Enable Macros] in the displayed message box.

2. Select the language to use, click [Processing Start], then specify the PAM1.dat file that is measured.



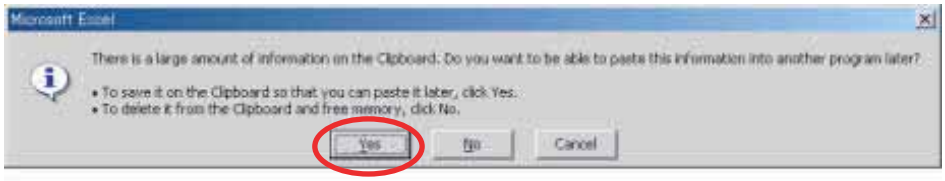
NXTOPE144Ea

Note: The .dat file naming system is as follows; select the target file checking by the module serial No. and the head serial No. Those serial numbers can be confirmed on the information command of the machine manual mode.



AIMPAM007E

3. Click [Yes] in the dialog box after selecting the .dat file.



NXTOPE242E

4. The measured PAM results are loaded, calculated and displayed in the result and final offset sheets.

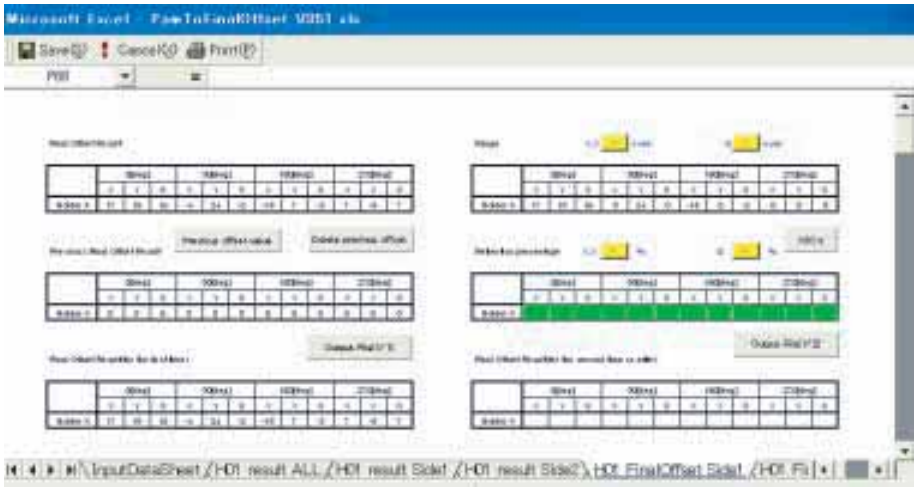
Result sheet

The result sheet shows the placement accuracy (3 sigma) for the entire module, each angle and each holder as well as the average placement accuracy for each angle and holder. Values in red indicate that the value is outside the tolerance range.

- Click [CPK..] to change the CPK coefficient.
- Click [Print] to print the result sheet enter the user name & production number. When the values of the results are outside the tolerance range, it is not possible to print.

Final offset sheet

The manual final offsets (X, Y, Q) display by placement angles for each nozzle holder. When the values of the results are outside the tolerance range, it is not possible to print.



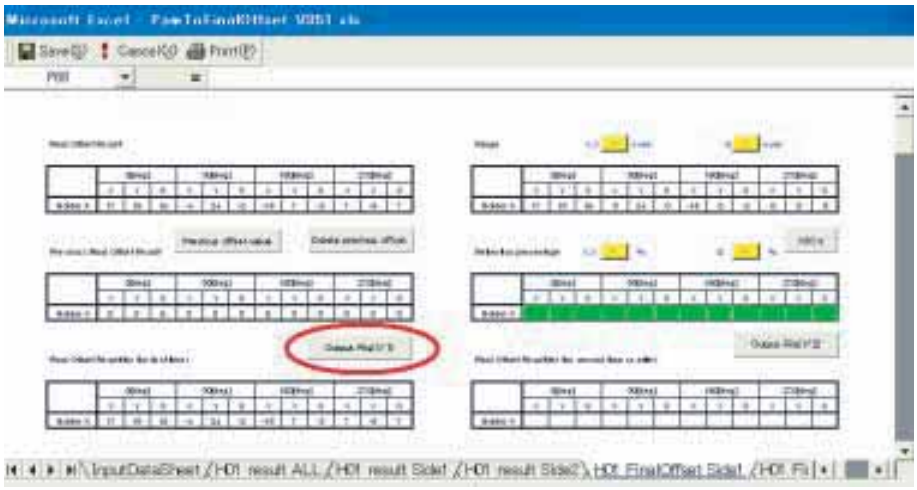
NXTOPE244E

Outputting the correction file

1. Generate the correction file from the final offset sheet. The method differs depending on the measurement and output conditions.

   a. If performing PAM for the first time

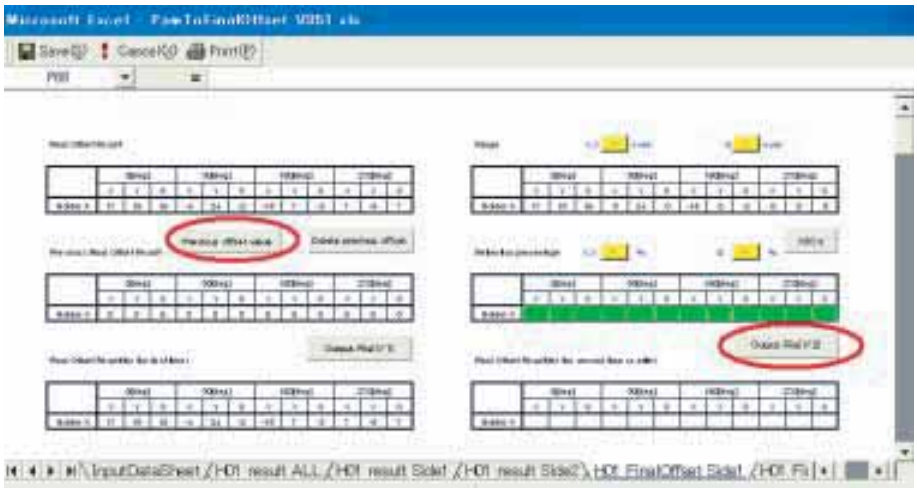
      • Click [Output File (1/1)].



NXTOPE245E

   b. If performing PAM for the second time or more

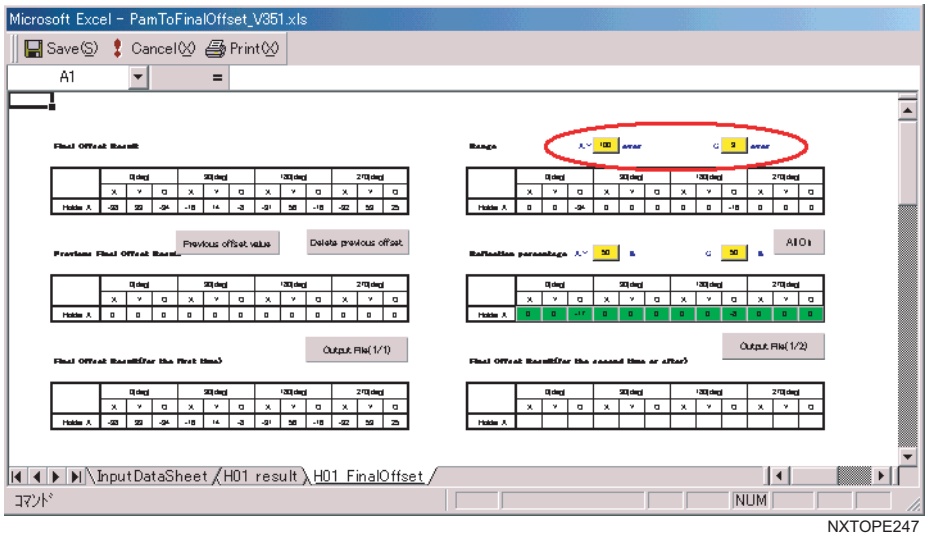
      • Click [Previous offset value] then [Output File (1/2)].



NXTOPE246E

c. If performing PAM for the second time or more, and changing the manual offset value only for items which have exceeded a specified value.

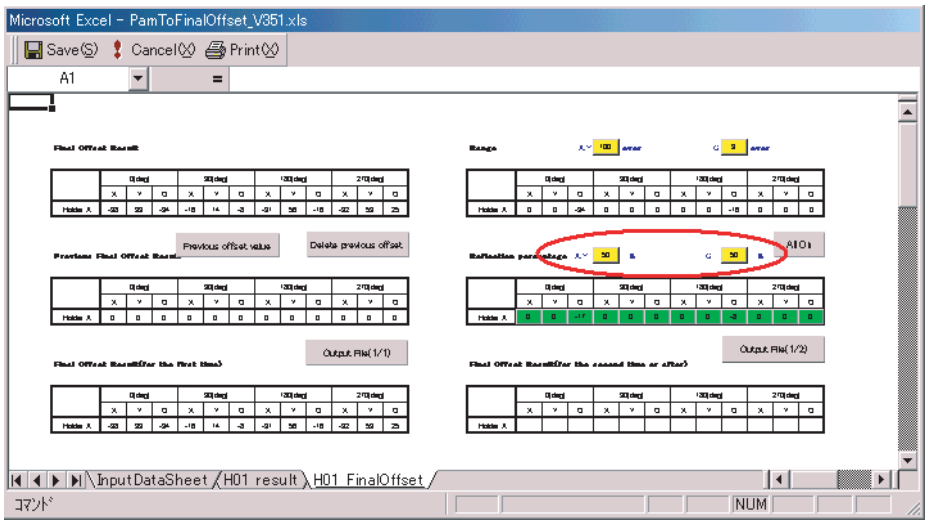
- Click each range button, then input the desired value.
- Click [Output File (1/2)].



NXTOPE247

d. If performing PAM for the second time or more, and updating a percentage of the measured results to the previous results.

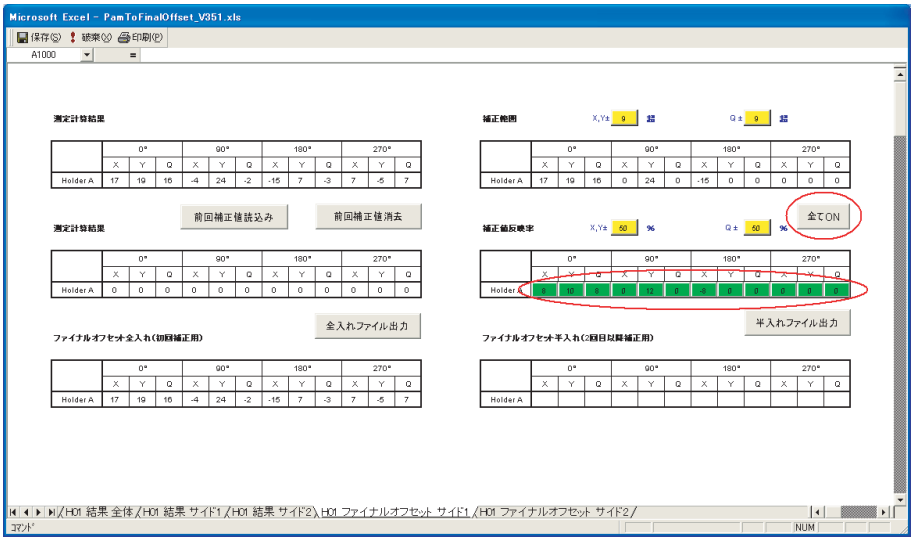
- Click each [Reflection percentage] button, then input the desired value.
- Click [Output File (1/2)].



NXTOPE248

e. If performing PAM for the second time or more, and changing the manual offset value only for certain items.

- Toggle the button (green) to OFF at the desired item.
- Click [Output File (1/2)].



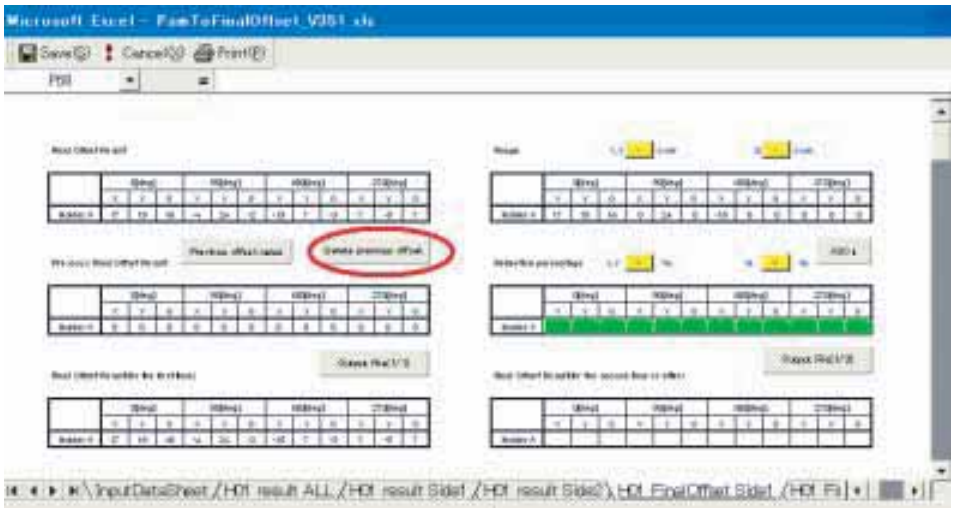
AIMPAM024

Note:

1.If there are many items to change, select [ON] for those items which are not to be changed.

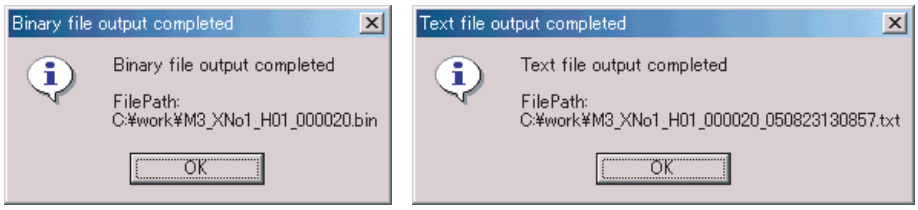
2.If there are only a few items to change, select [All ON] and then change only those items which are to be changed to [OFF].

In order to cancel the previous offset value, click [Delete previous offset].



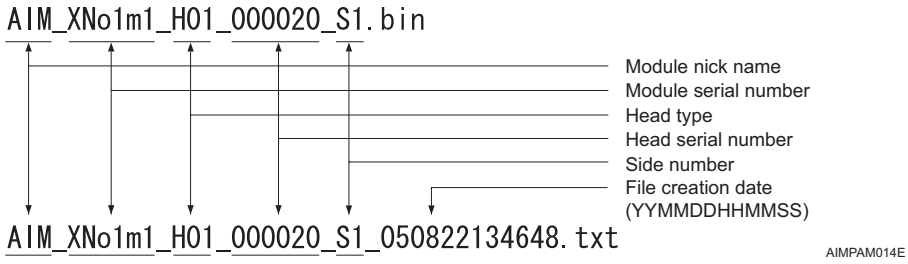
NXTOPE251E

2. Click [Output File (1/1)] or [Output File (1/2)] to generate successively the binary file and the text file. The dialog boxes display the file path and file name, click [OK].



NXTOPE252E

Note: The file naming system is as follows;



AIMPAM014E

3. In Accessory Software, transmit the binary file to the machine.
   a. From [Machine Configuration], select the module to which to send the file.
   b. Click [Calibration].
   c. Click [Send offset file].

NXTOPE254E

d. Select the target file, then click [Send File].

NXTOPE255E

e. The final offsets are updated at the machine at either of the following times.

- When START is pushed with the machine in PAM mode.
- When the machine is changed from PAM mode to normal production mode.
- When the machine is rebooted.

9.1.8 Changing the type of PAM mode

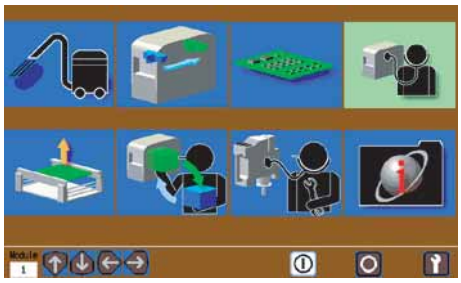
There are three type of PAM modes available. These three types are [Place & Measure], [Measure], and [Place]. The [Place & measure] mode is the default type. With this type of mode, the parts are picked and placed on the module and then the placing accuracy is measured on the module. If [Place] is specified, then the module only places the PAM parts on the glass board. If [Measure] is specified, then the module only measures the placing accuracy of previously placed PAM parts.

Follow the procedures below to change the type of PAM mode.

1. When in PAM mode, push MANUAL to display the manual commands

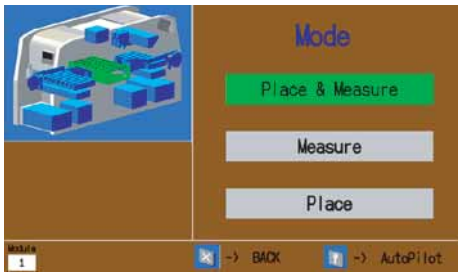
AIMPAM010

2. Use the arrow keys to highlight the diagnosis pictogram and then push OK.



AIMPAM011

3. The 3 modes are displayed on the operation panel. The one that is highlighted (green) represents the current type of mode in use. Use the arrow keys to highlight a different mode if necessary, and push OK to exit this screen.



AIMPAM012

4. Push MANUAL to return to the main screen.

9.1.9 About the sample job [PAM_Sample]

The machine application CD-ROM has sample jobs called PAM_Sample for on machine PAM.

Head type	Measured heads	Sample jobs	Note
12S nozzle head	Head1	KIJYO_H12s_Head1~GH12s+H12s~9.JOB	
	Head2	KIJYO_H12s_Head2~GH12s+H12s~9.JOB	
8 nozzle head	Head1	KIJYO_H08_Head1~GH08+H08~512~11.JOB	
	Head2	KIJYO_H08_Head2~GH08+H08~512~11.JOB	
4 nozzle head	Head1	GSS_H04_Head1~GH04+H04_64~10.JOB	
	Head2	GSS_H04_Head2~GH04+H04_64~10.JOB	
		GSS_H04_Head2-tray~GH01+H04_64~10.JOB	Tray -L in Stage2
1 nozzle head	Head1	GSS_H01_Head1~GH01+H01_32~10.JOB	
		GSS_H01_Head1-tray~GH01+H01_32~10.JOB	Tray -L in Stage2
	Head2	GSS_H01_Head2~GH01+H01_32~10.JOB	
		GSS_H01_Head2-tray~GH01+H01_32~10.JOB	Tray -L in Stage2

The contents of the sample PAM job

a. The number of parts used when performing measurement one time for the sample job is listed below.
   * For 1 nozzle head: 32 glass parts
   * For 4 nozzle head: 64 glass parts
   * For 8 nozzle head: 256 parts (rectangular 1005)
   * For 12S nozzle head: 288 parts (rectangular 1005)

b. Part data for glass parts is created as shown below.
   * For stage 1: Glass_1
   * For stage 2: Glass_2
   * For tray unit-L: Glass_3

It is determined in the job whether to measure with white 1005 parts or glass parts. In [Feeder Setup] for the machine configuration, a 8 mm wide feeder with a 2 mm pitch set in the module indicates that white 1005 parts are to be used for PAM for that module. Any feeder other than this indicates that glass parts are to be used for PAM for that module. For the tray unit-L, the decision for the glass parts is automatically detemined.

9.1.10 Notes on performing on machine PAM

During PAM measurements, the following are important:

- Measurement is performed for one head on both sides (stage 1 and stage 2) at one time.
- If "NaN" displays above the measured PAM results on the operation panel, this indicates that a vision processing error may have occurred during the measuring process. If "NaN" or blank lines are in the results file, ignore the affected data.

9.2 Conveyor In Sensor and Out Sensor

The sensitivity of the in and out sensors on the conveyor to detect panels are automatically adjusted when the conveyor width is changed by the machine. There are cases in which errors occur due to items such as manually changing the conveyor width because the automatic sensitivity adjustment is not performed. When errors occur, follow one of the methods below to restore the automatic adjustment.

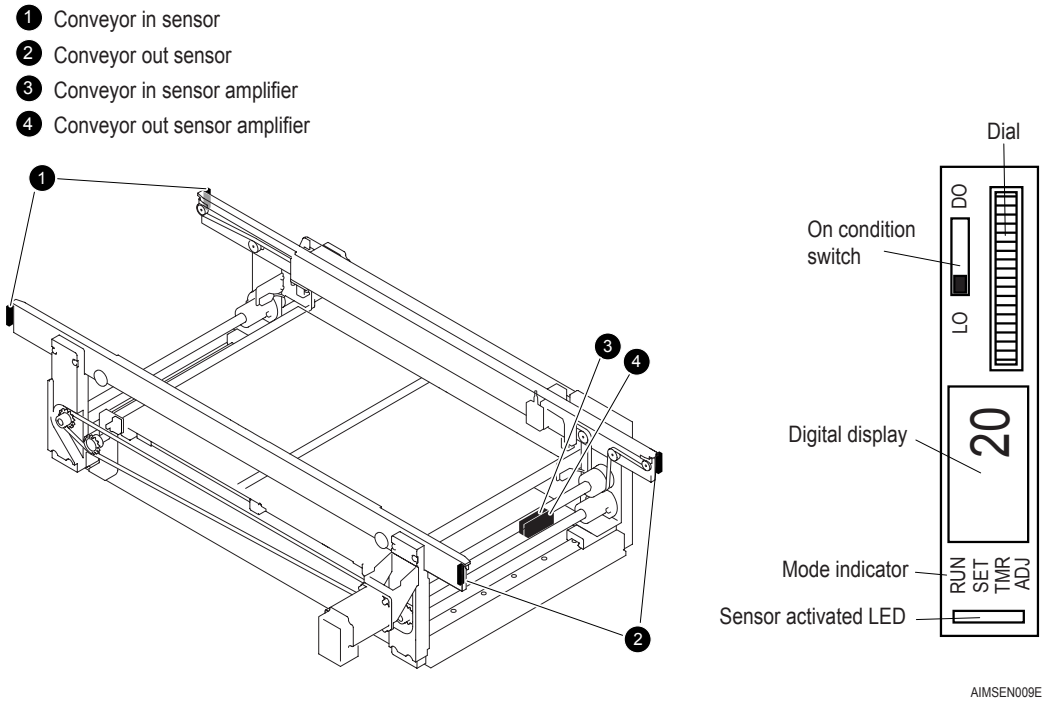
- Turn the ballscrew for the conveyor to make the width narrower until a positive values display in the sensor amplifiers. (Check the sensor amplifier and when a positive value displays, the automatic sensitivity adjust function is restored).

- Leave the conveyor width as is and reset the sensitivity of the sensors.

Follow the procedure below for how to perform this reset.

9.2.1 Sensor sensitivity reset

5. Open the lid of the sensor amplifier that needs to be adjusted.



6. Ensure that the on condition switch is set to LO.

7. Push in the dial once. RUN flashes in the mode indicator location, and the digital display changes to display "AA".

Note: If an error has occurred, the digital display may not change or display some other item but the mode indicator does change correctly.

8. Rotate the dial until SET flashes in the mode indicator. The digital display changes to “PH“.

9. Push the dial once again and the SET mode indicator remains lit while “PH“ flashes.

10. Push the dial once and the current value (the sensitivity of the sensor) for the sensor amplifier flashes on the digital display.
11. Rotate the dial until the display reads 90.
12. Once the value of 90 is specified, push the dial to enter that value. "PH" then displays.
13. Push the dial again and the SET mode indicator then flashes.
14. Rotate the dial until RUN flashes in the mode indicator. The digital display changes to “AA“.
15. Push the dial once again and RUN remains lit in the mode indicator, the digital display shows the current measured value.
16. Check the condition by blocking the light for the adjusted sensor and the sensor activated LED should turn off when the light is blocked. If it does not respond correctly, repeat these procedures.
17. Close the lid for the sensor amplifier.

9.3 Vacuum Sensor

9.3.1 Procedure

1. Locate the vacuum sensor in the middle of side 2.
2. Push and hold the SET button until "LoC" displays.
3. Continue pushing one of the arrow keys until "UnL" displays and then push SET.
4. Push and hold SET for longer than two (2) seconds. The display will change to display "SOG", "Sor", "rED", or "Grn".
5. Push an arrow key repeatedly until SoG displays.
6. Push SET and the characters "HYS" or "Ynd" display.
7. Push an arrow key repeatedly until HYS displays.
8. Push SET and the characters "no" or "nC" will display.
9. Push an arrow key repeatedly until "nC" displays.
10. Push SET and a value will display.
11. Push an arrow key repeatedly until 2.5 displays.
12. Push SET and characters will display.
13. Push an arrow key repeatedly until the characters like "nAn" display.
14. Push SET to complete the sensor initial settings.
15. Push SET and "n_1" flashes on the display alternating with the value.
16. Push the up key to display the value for n_1.
17. Use the arrow keys to change the blinking value to "0".

Note: If no actions are performed within ten seconds, the display changes back to the alternating display. Push one of the arrow keys to change the display back.

18. Push SET to change to the second digit.
19. Use the arrow keys to change the second digit to "9".
20. Push SET to change to the third digit.
21. Use the arrow keys to change the third digit to "5".
22. Push SET to change to the sign position.
23. Use the arrow keys to change the sign to the " ⌐ " shape. This indicates that the minus sign is selected.
24. Do not push any keys once the correct value of -59.0 has been entered. Automatically the display will begin to alternate between "n_1" and the value.
25. Push SET and then push SET again to display to the current measured value.
26. Push and hold SET until "UnL" displays.
27. Use the arrow keys to change the display to "LoC" and then push SET to complete the setting procedure.

9.4 Pressure Sensor

9.4.1 Procedure

1. Locate the pressure sensor in the middle of side 1.
2. Push and hold the SET button until "LoC" displays.
3. Continue pushing one of the arrow keys until "UnL" displays and then push SET.
4. Push and hold SET for longer than two (2) seconds. The display will change to display "SOG", "Sor", "rED", or "Grn".
5. Push an arrow key repeatedly until SoG displays.
6. Push SET and the characters "HYS" or "Ynd" display.
7. Push an arrow key repeatedly until HYS displays.
8. Push SET and the characters "no" or "nC" will display.
9. Push an arrow key repeatedly until "no" displays.
10. Push SET and a value will display.
11. Push an arrow key repeatedly until 2.5 displays.
12. Push SET and characters will display.
13. Push an arrow key repeatedly until the characters like "nAn" display.
14. Push SET to complete the sensor initial settings.
15. Push SET and "P_1" flashes on the display alternating with the value.
16. Push the up key to display the value for P_1.
17. Use the arrow keys to change the blinking value to "0".

Note: If no actions are performed within ten seconds, the display automatically changes back to the alternating display. Push an arrow key to change the display back.

18. Push SET to change to the second digit.
19. Use the arrow keys to change the second digit to "0".
20. Push SET to change to the third digit.
21. Use the arrow keys to change the third digit to "4".
22. Push SET to change to the sign position.
23. Use the arrow keys to change the sign to the " ı "shape. This indicates that the positive sign is selected.
24. Do not push any keys once the correct value of 0.40 has been entered. Automatically the display will begin to alternate between "P_1" and the value after a short time.
25. Push SET and then push SET again to display to the current measured value.
26. Push and hold SET until "UnL" displays.
27. Use the arrow keys to change the display to "LoC" and then push SET to complete the setting procedure.

10. Supplementary Information

10.1 Noise Levels

10.1.1 Measured noise levels

The following table shows the measured noise levels for the machine during operation.

Model	Maximum Noise Level (dB)	Remarks
AIM	74.7 dB	-

⚠WARNING

Operators should use hearing protection such as ear plugs in operating environments where noise levels are high enough to cause hearing damage (80 dB or higher).

MEMO:

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AIM Mechanical Reference

Management No.	Date	Notes
QD052-00	June 30, 2005	-
QD052-01	August 30, 2005	-
QD052-02	April 14, 2006	-

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