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Before beginning work

In most cases, maintenance should be performed with the main power turned off.

However, some maintenance tasks are performed under emergency stop conditions with the power turned on. In such cases, ensure adequate safety and press the emergency stop before beginning the maintenance.

The power is turned on during maintenance where any servo-axis must be operated or YSi-V operation checked. In this case, also ensure adequate safety before beginning the maintenance. When operating the YSi-V, make sure the following conditions are met.

■ Operating conditions

1. Supply air pressure is kept at correct pressure.
2. All safety covers are closed.
3. Power cable is correctly connected.

1. Maintaining YSi-V performance

The most important condition essential for maintaining the performance of the YSi-V you purchased is using it under good environmental conditions. Performing daily maintenance and periodic inspections is also absolutely essential.

1.1 Essential conditions and working environment

■ Air

Item	Description
Air pressure	Supply air pressure: 0.45MPa Setting air pressure: 0.40MPa (0.39MPa to 0.41MPa) Head unit air pressure: 0.040MPa (0.039MPa to 0.041MPa)
Air consumption	Air consumption: 24L/min. (ANR) or more can be kept.
Use conditions	Use an air hose with an inner diameter (I.D.) of 3/8-inch and a Hi Cupla (30SH). Clean air passed through air dryer and air filter should be used.

■ Power

Item	Description
Power supply	200/208/220/240/380/400/416VAC ($\pm 10\%$), 3-phase AC line
Frequency	50 Hz or 60 Hz
Power supply capacity	7.0KVA
Average power consumption	0.7KW
Power supply connection	Conductor cross-section area of power cable: 3.3mm ² (AWG12) or more

■ Environment

Item	Description
Noise	Complies with EN61000-6-2 standard.
Humidity	20 to 80% (no condensation), optimal range: 50 to 60%
Temperature	Functions guaranteed within 15 to 35°C. Machine precision guaranteed within 20 to 28°C.
Overvoltage category	category III
Pollution degree	degree 2
Altitude	1000m or less above sea level
Atmosphere	No dust or powder. (The number of dust particles of more than 0.5 μm in diameter should be less than 100000/feet ³) No organic solvent vapor, sulfurous acid gas, chlorine gas and flammable gases, etc.
Installation floor condition	Flat level location sturdy enough so no vibration occurs during operation. Wooden floors in particular are unsuitable. Floor load-bearing strength should be 1050 kg/m ² or higher. For load-bearing strength, consult a professional contractor who is familiar with the installation location with information on the equipment weight, floor space, positions for adjuster feet, etc.



NOTE If using an industrial humidifier to prevent generation of electrostatic charges, use pure water or equivalent.

1.2 Importance of periodic inspections and cleaning

Periodic inspections and cleaning are extremely important maintenance tasks. Failure to perform inspections and cleaning will prevent the YSi-V from delivering full performance and may lead to inspection errors or YSi-V breakdowns.

Examples:

- Dirty optical system (camera, lighting, etc.) may cause recognition errors.
- Poor greasing of axes may cause abnormal noises.
- Poor inspections such as of valves may cause errors in PCB clamping and conveying.

As these examples show, failure to make inspections may lead to YSi-V problems. We strongly recommend you perform periodic inspections and cleaning to ensure the YSi-V is used under optimal conditions.

2. Maintenance list

■ Maintenance list

The following maintenance procedure codes are used:

S: Inspection C: Cleaning L: Lubrication E: Replacement (): Procedure required only when a problem exists.



NOTE

Example) C (E) is indicated in the Others, Air, Mist filter, and Filter items of the table shown below. This indication means that the part needs to be replaced if the contamination cannot be removed as a result of the filter cleaning work.

Section	Unit name	Check items	Weekly	Monthly	3 Mon.	6 Mon.	1 Year	2 Years	3 Years
Servo controlled axes	X-axis	Ball screw		SCL					
		Guide		SCL					
	Y-axis	Ball screw		SCL					
		Guide		SCL					
	CZ-axis (option)	Ball screw			SCL				
Conveyor	Board transport unit	Board sensor	SC						
		Board clamp	S						
		Conveyor belt					SC		E
	W-axis	Ball screw					CL		
		Guide					CL		
		Hexagon spline					CL		
Vision system Lighting unit	Optical camera	Camera lighting unit		CL					
Others	Base unit	Filter			C (E)				
	Air/mist filter	Filter, Cup					C (E)		
Main unit (inside)	Controller	Filter (For Type HS2 specification only)					C (E)		
	UPS	UPS battery			*1				
Option	Marker pen unit	Cam block				CL			

*1: The UPS battery will wear down, reaching the end of its service life. The service life slightly differs depending on the usage environment (ambient temperature, etc.). As a general guide, the UPS battery should be replaced with a new one after the UPS has been operated for 2.5 years even under the optimal conditions.
For detailed information on how to replace the UPS battery, see the user's manual that comes with the UPS.

3. Preparing for maintenance tasks

3.1 Consumable parts

The term "consumable parts" in this manual indicates parts subject to continual wear during use causing gradual loss of functions.

The following parts are classified in this manual as consumable parts and should be replaced as needed during maintenance.

■ Consumable parts list (optional parts)

Product Name	Parts List Designation	Parts No.
Conveyor belt (for single lane)	BELT 1, CONVEYOR	KLT-M9127-00X
Conveyor belt (for dual lane)	BELT 1, CONVEYOR	KKT-M9127-00X
Air filter element	FILTER ELEMENT	KLC-M8506-00X
Oil mist filter element	MIST FILTER ELEMENT	KLC-M8507-00X
Air intake fan filter	FILTER,CP FAN	KLF-M115J-00X
Filter for controller	FILTER	KLC-M421L-00X
UPS battery	BATTERY,UPS2	LG0-M53H8-01X



CAUTION

- Parts (part numbers) listed in this manual are current as of the time this manual was issued.
- When placing an order, always contact us to obtain the latest information.
- Part numbers are subject to change without notice. Please contact our sales representative before ordering.

3.2 Maintenance tools

3.2.1 Cleaning tools

Cleaning tools

Parts supplied with YSi-V

CLEANER, VISION SET

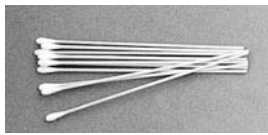
Lens blower brush



Lens cleaner, cleaning paper



Cotton swab sticks



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■ Cleaning tools

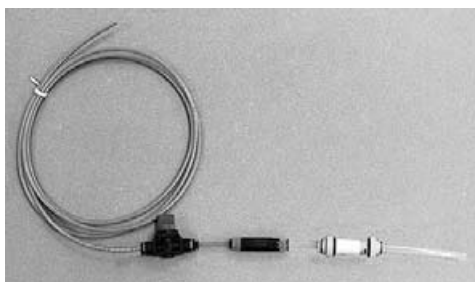
Parts supplied with YSi-V

Product Name	Parts List Designation	Parts No.	Note
Cotton swab sticks	SWAB	KGA-M3802-00X	CLEANER, VISION SET (KHW-M3801-YYY)
Lens blower brush	BLOWER	KGA-M3803-00X	
Lens cleaner, Cleaning paper	CLEANER, LENS	KGA-M3801-00X	

Cleaning tools

Optional parts

Vacuum ASSY



Air blow tool



53407-M9-00

■ Cleaning tools

Optional parts

Product Name	Parts List Designation	Parts No.	Note
Vacuum ASSY	VACUUM ASSY	KHY-M88V0-YYY	For cleaning (vacuum)
Air blow tool	AIR BLOW TOOL	KU4-M8590-00X	



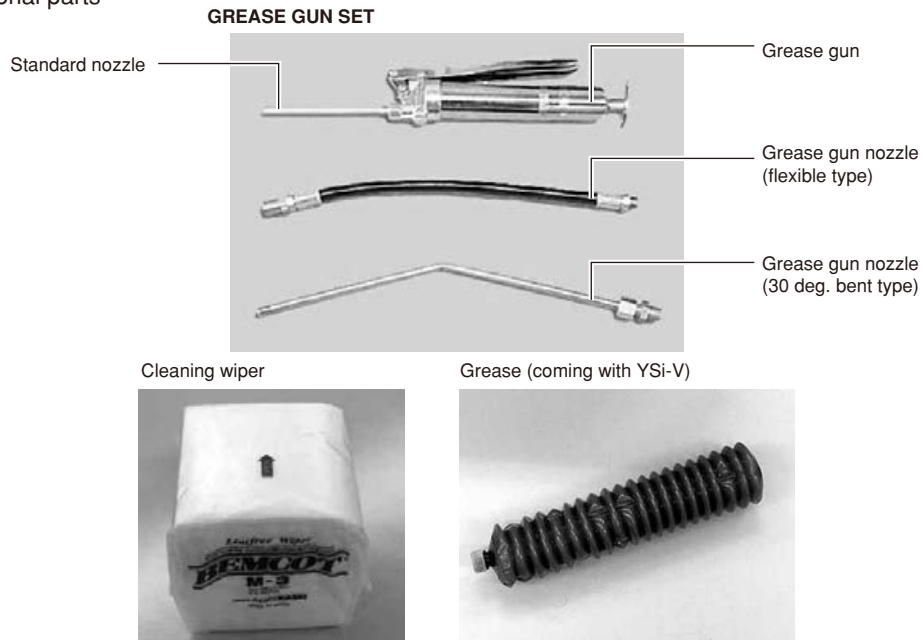
CAUTION

Part numbers are subject to change without notice. Please contact our sales representative before ordering.

3.2.2 Lubricating tools and grease

Lubricating and greasing tools

Optional parts



53408-M9-10

■ Lubricating and greasing tools

Optional parts

Product Name	Parts List Designation	Parts No.	Note
Lithium-based grease	GREASE PACK	K48-M3856-00X	NSL 80g
Grease gun (with standard nozzle)	GREASE GUN	K48-M3852-01X	GREASE GUN SET KHW-M3852-A0X
Nozzle (flexible type)	GREASE NOZZLE	K48-M3857-00X	
Grease gun nozzle (30 deg. bent type)	GREASE NOZZLE	K48-M3854-00X	
Cleaning wiper	WIPER	KGS-M3840-YYY	



CAUTION

Part numbers are subject to change without notice. Please contact our sales representative before ordering.

■ Precautions when handling grease



WARNING

INFLAMMATION MAY OCCUR IF GREASE OR LUBRICANT GETS INTO THE EYES. BEFORE HANDLING THE GREASE OR LUBRICANT, WEAR SAFETY GOGGLES TO ENSURE THE GREASE OR LUBRICANT DOES NOT GET INTO THE EYES.



WARNING

INFLAMMATION MAY OCCUR IF GREASE OR LUBRICANT COMES INTO CONTACT WITH SKIN. BE SURE TO WEAR PROTECTIVE GLOVES TO PREVENT CONTACT WITH SKIN.



WARNING

DO NOT TAKE ORALLY OR EAT GREASE OR LUBRICANT. EATING WILL CAUSE DIARRHEA AND VOMITING.



CAUTION

After use, tightly cap the grease tube to ensure dust, debris and moisture do not enter inside. Store the grease in a dark location not exposed to direct sunlight and keep it away from fire and heating sources.



CAUTION

Be sure to use the specified grease and apply it to the specified location by following the instructions in this manual. Failure to follow the instructions may cause damage to the YSi-V.

3.3 Required tools

Prepare the following tools and items necessary for maintenance.

■ Tool list

● : Supplied with YSi-V, ○ : Options

Name	Description	Remarks
<input type="radio"/> Phillips screwdriver	Large, small	D-2
<input type="radio"/> Slotted (flat-blade) screwdriver	Large, small	
<input type="radio"/> Hex wrench set	1 set	HEX, WRENCH SET
Tweezers	Used to remove foreign objects or debris falling on ball screw or guide.	
<input type="radio"/> Grease gun	Used to supply grease	
<input type="radio"/> Vacuum ASSY	Used to clean belt groove and sensor detection surface.	
<input type="radio"/> Air blow tool	Used for cleaning	

■ Other tool list

● : Supplied with YSi-V, ○ : Options

Name	Description
● Grease (lithium-based grease: NSL)	Used to lubricate each axis.
Cleaning cloth	Used to clean filter cup.
Cleaning wipe	Use lint-free cleaning wipe (for clean room).
Square bandage	Used to prevent parts from being lost or contaminated. (2 sheets)
● Cotton swab stick	Used to clean camera lens, half mirror and lighting unit.
● Lens cleaner, Cleaning paper	Used to clean camera lens and lighting unit.
● Lens blower brush	Used to clean camera lens and lighting unit.
Fine brush (tooth brush, etc.)	Used to clean the belt groove, etc.

■ Safety goggles and mask

Name	Description
Dust-proof goggles	Always wear these goggles and mask when applying grease or when using an air blow tool.
Dust-proof mask	
Protective gloves	Always wear protective gloves when applying grease or when removing optical camera cover.

4. Weekly inspection

4.1 Checking the board sensor condition

This equipment uses transmission type fiber sensors as the board sensors. Periodically check that these sensors correctly operate even when the conveyor rail width is changed.

Step 1 Open the [Unit] – [Conveyor] tab.

Step 2 Press the [Width] button to change the conveyor width.

1. When the "Conveyor" dialog box appears, enter the maximum conveyor width in the "Target Width" box and press the (OK) button. The conveyor width will automatically change to the specified size.
2. Then, enter the minimum conveyor width (50mm) in the "Target Width" box and press the (OK) button. The conveyor width will automatically change to the specified size.

54400-M9-10

Step 3 Check whether an error has occurred.

The conveyor sensor is operating properly unless an error message appears when the conveyor width is changed. No further check is necessary.

If an error message appears, follow the steps below to adjust the sensor.

■ Adjusting the conveyor sensor

If an error occurred when the conveyor width was changed, perform the auto-tuning of the conveyor sensor.

1. Open the [Unit] – [I/O] tab.
2. In the Output list, select "CONVEYOR" (T01000E0).



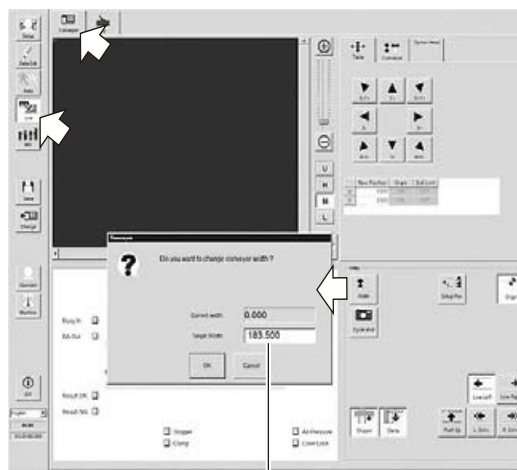
NOTE

For the dual lane specifications, (T01000E0) corresponds to lane 1 while (T01000E2) corresponds to lane 2.

3. Press the [ON/OFF] button to change to 0 (OFF) → 1 (ON) → 0 (OFF) and perform the auto-tuning.
4. Press the [Width] button again to change the conveyor width in the same manner as described in Step 2. When no error message appears, the sensor operates correctly.

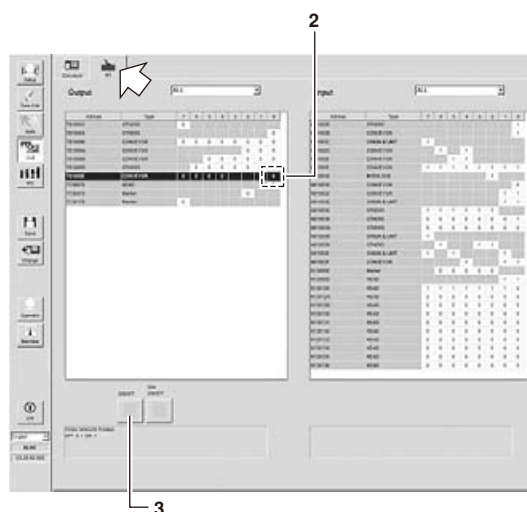
54401-M9-10

▶ Step 2 Changing the conveyor width



Enter the conveyor width here.

▶ Tuning conveyor sensor



4.2 Checking the board clamp condition

Check the following points when a board is clamped on the conveyor.

1. Check that the board is securely clamped and there is no play.
2. Check that there is no clearance between the board hold plate and the board.
3. Check that the board surface is flush with the conveyor rail upper surface.
4. Check that the board clamp unit moves smoothly.

5. Monthly

5.1 Inspecting each axis

Inspect the ball screws and the guides on each axis.
Check the following points.



NOTE

A grease spattering prevention cover is attached along each axis. Remove the cover before inspection and reattach it in place after inspection.

Checkpoints

1. Any foreign matter or chips adhering to the ball screws and linear guides?
2. Do the ball screws and linear guides have the correct amount of grease?
Check if grease has flowed off or splattered in the air failing to adhere. Also check if grease has discolored or hardened.
3. Any abnormal sounds from the ball screws?
Press the emergency stop button. Then check for any abnormal sounds while pushing the unit by hand along the X-axis or Y-axis back and forth.

Countermeasures

1. Ball screws and linear guides may be damaged when chips or debris bite into them. If chips or debris are adhering, wipe them off along with the grease or remove with tweezers, etc.
2. Apply grease while referring to "Cleaning and greasing the ball screws and linear guides of each axis" described later.
3. Consult your YAMAHA sales office or representative when abnormal sounds occur even after trying the countermeasures in the above steps 1 and 2.



CAUTION

- When handling grease or lubricant, read and follow the precautions listed in section 3.2.2, "Lubricating tools and grease", in this chapter.
- If abnormal noise is emitted from the ball screw or guide of each axis, then contact our sales representative for assistance. Disassembly and cleaning of the ball screw or guide by the user will void the warranty.

5.2 Cleaning and greasing the ball screws and linear guides

To clean and grease the ball screws and linear guides of each axis, follow the steps below. See “Chapter 5 Lubrication points” for the modes and points of lubrication.

5.2.1 Cleaning and greasing the X axis ball screws

■ Required tool

- Phillips screwdriver
- Lint-free paper wipe
- Grease gun
- Specified grease (NSL)
- Protective glasses
- Protective gloves



CAUTION

Wear protective glasses and gloves when handling grease.



Step 1 Press the emergency stop button.

The YSi-V must be in emergency stop to ensure safety during work.

Step 2 Remove the grease spattering prevention cover.

1. Use a Phillips screwdriver to remove the left side of the grease spattering prevention cover.
2. Move the head all the way to the left side and remove the screws securing the right side of the grease spattering prevention cover.
3. Remove the grease spattering prevention cover by pulling it to the right.

53401-M9-00

Step 3 Clean the ball screws.

1. Wipe away the old grease and dirt from the entire ball screw with a lint-free cloth or paper towel (for clean room).
2. Move the head to the opposite end of each axis and wipe the ball screw clean.

53402-M9-00



NOTE

Wipe away the old grease and dirt in the lead groove of the ball screw. Also check that no debris or residue remains in the lead groove.

Step 4 Apply grease to the ball screws.

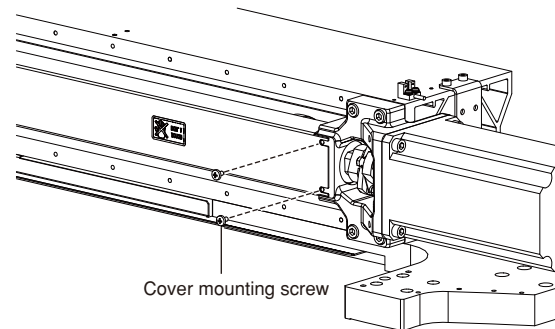
Use the grease gun to supply the specified grease (NSL) to the grease nipples. Then move the head back and forth by hand along each axis and wipe away excess grease.

53403-M9-00

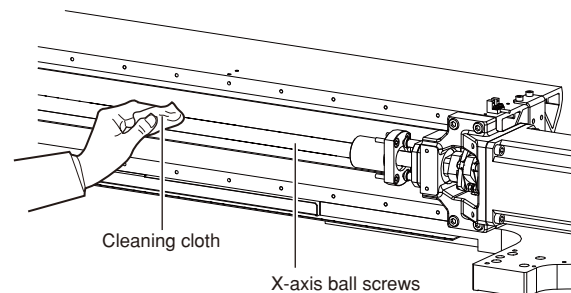
Step 5 Reattach the covers.

Reattach the grease spattering prevention covers in the reverse order of the removal procedures.

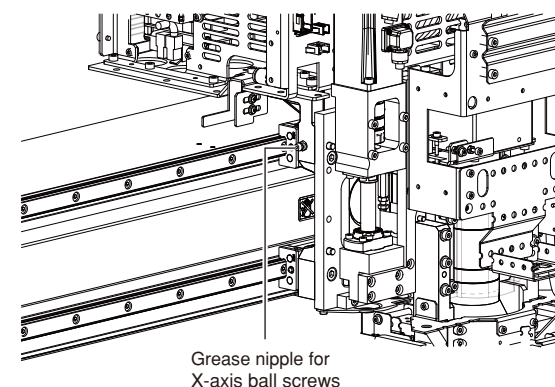
▶ Step 2 Removing the X-axis grease spattering prevention cover



▶ Step 3 Cleaning the X-axis ball screws



▶ Step 4 Greasing the X-axis ball screws



5.2.2 Cleaning and lubricating the X axis guides

■ Required tools

- Lint-free paper wipe
- Grease gun
- Specified grease (NSL)
- Protective glasses
- Protective gloves



CAUTION

Wear protective glasses and gloves when handling grease.



Step 1 Press the emergency stop button.

The YSi-V must be in emergency stop to ensure safety during work.

Step 2 Clean the guides.

1. Move the head (or conveyor rails) to one end of its axis, and wipe away the old grease and dirt from the guides with a lint-free cloth or paper towel.
2. Move the head (or conveyor rails) to the opposite side of its axis and wipe the guides.

53404-M9-00



NOTE

Wipe away thoroughly the old grease in the grooves of the guide rails.

Step 3 Apply new grease to the guide rails.

Use the grease gun to supply the specified grease (NSL) to the X-axis guide grease nipples.

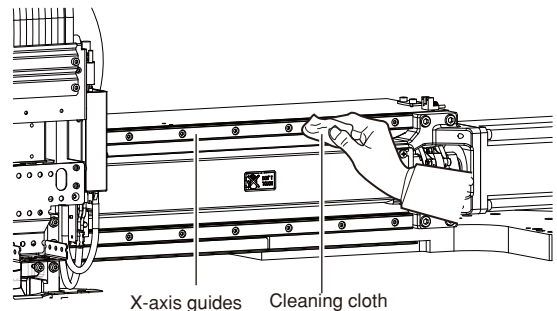
The grease nipples are located behind the head unit, two each on the right and left at the positions (heights) of the upper and lower guides (total of 4 places).

53405-M9-00

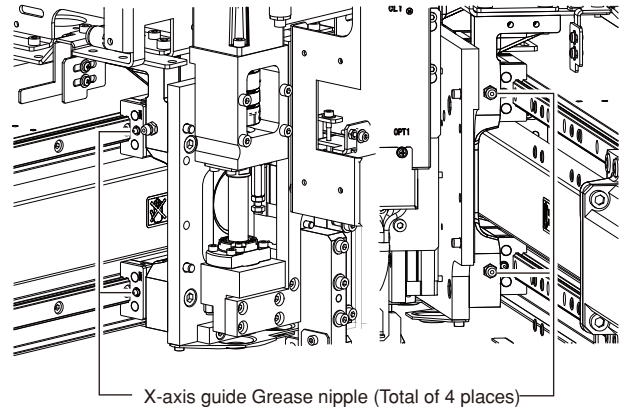
Step 4 Remove excess grease.

After moving the axis back and forth a few times manually, wipe away excess grease.

► Step 2 Cleaning the X-axis guides



► Step 3 Greasing the X-axis guide



5.2.3 Cleaning and greasing the Y axis ball screws

■ Required tools

- Phillips screwdriver
- Hex wrench
- Lint-free cleaning wipe
- Grease gun
- Specified grease (NSL)
- Protective glasses
- Protective gloves



CAUTION

Wear protective glasses and gloves when handling grease.



Step 1 Press the emergency stop button.

The YSi-V must be in emergency stop to ensure safety during work.

Step 2 Remove the rear cover.

Use a Phillips screwdriver to remove the four screws and then remove the rear cover.

53411-M9-00

Step 3 Remove the grease spattering prevention covers.

Remove the Y-axis grease spattering prevention covers as follows:

1. Using the hex wrench, remove the bolts (3 pcs.) that secure the Y-axis front grease spattering prevention cover.
2. In the same way, remove the bolts (2 pcs.) that secure the rear grease spattering prevention cover.
3. Remove the grease spattering prevention cover by pulling it toward you (YSi-V front side).

53412-M9-00

TIP

When reattaching the Y-axis grease spattering prevention covers, use the reverse order of the above procedure.

Step 4 Clean the ball screws.

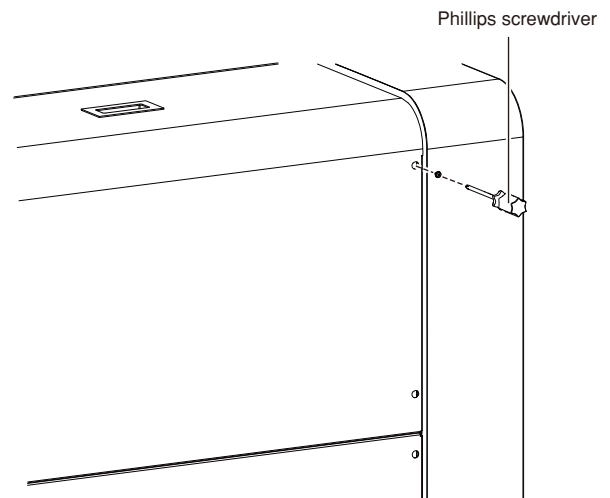
1. Using the handle, move the head unit to the rear side of the Y-axis.
2. Wipe away the old grease and dirt from the entire ball screws with a lint-free cloth or paper towel (for clean room).
3. Move the head unit to the opposite side of the Y-axis and wipe the ball screws on the opposite side.



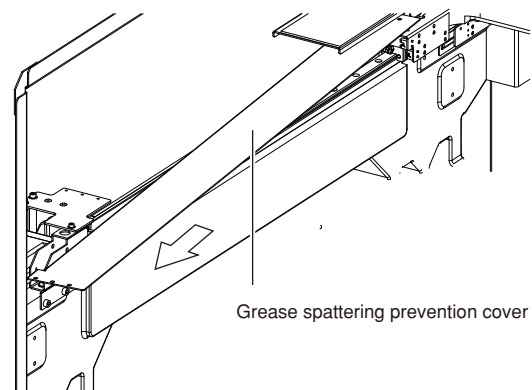
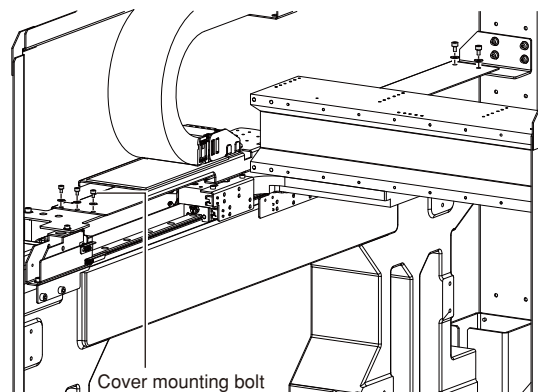
NOTE

Wipe away thoroughly the old grease in the lead grooves of the ball screws. Also check that no debris or residue remains in the lead grooves.

▶ Step 2 Remove the rear cover.



▶ Step 3 Removing the Y-axis grease spattering prevention cover



Step 5 *Apply grease to the ball screws.*

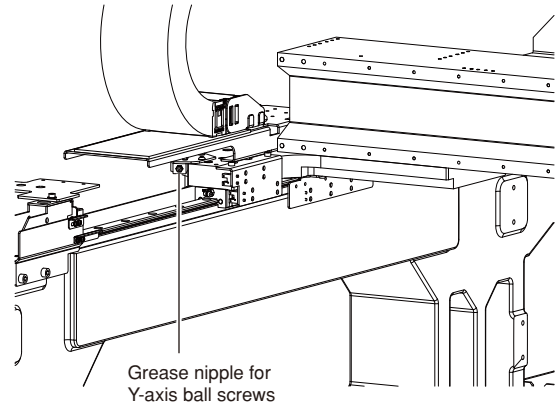
Use the grease gun to supply the specified grease (NSL) through the grease nipples shown in the figure at right. Then move the head unit back and forth by hand along the Y-axis and wipe away excess grease.

53414-M9-00

Step 6 *Reattach the cover.*

Reattach the grease spattering prevention covers in the reverse order of the removal procedure.

► **Step 5** **Greasing the Y-axis ball screws**



5.2.4 Cleaning and greasing the Y axes guides

■ Required tools

- Lint-free cleaning wipe
- Grease gun
- Specified grease (NSL)
- Protective glasses
- Protective gloves



CAUTION

Wear protective glasses and gloves when handling grease.



Step 1 Press the emergency stop button.

The YSi-V must be in emergency stop to ensure safety during work.

Step 2 Clean the guides.

1. Using the handle, move the head to the rear side.
2. Wipe away the old grease and dirt from the entire guides with a lint-free cloth or paper towel (for clean room).
3. Move the head to the opposite side and wipe also the guide on the opposite side.

53415-M9-00



NOTE

Wipe away thoroughly the old grease in the grooves of the guide rails.

Step 3 Apply grease to the guides.

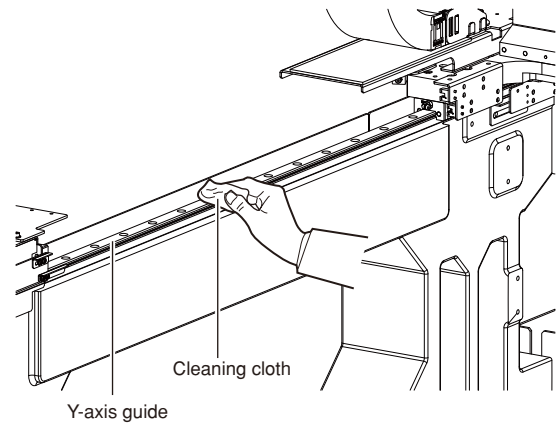
Use the grease gun to supply the specified grease (NSL) through the grease nipples for the Y-axis guides. There is one grease nipple each on the left and right sides as shown in the figure at right. (4 places in total, including the front and rear nipples)

53416-M9-00

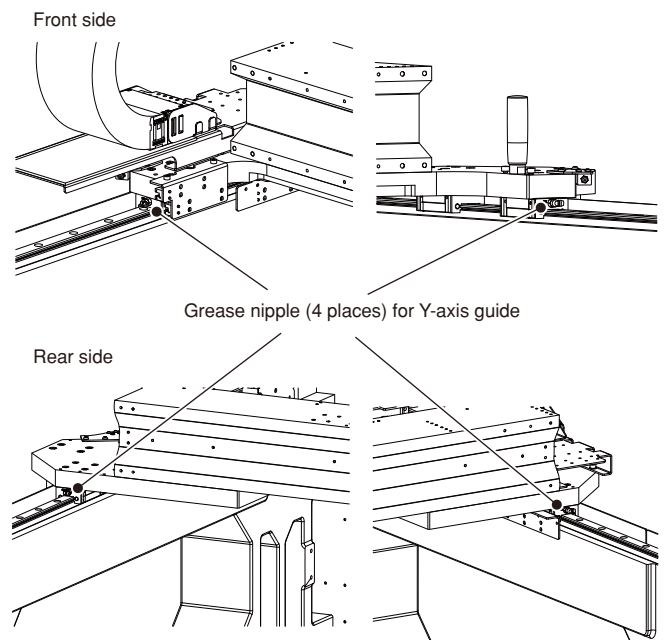
Step 4 Remove excess grease.

After moving the axis back and forth a few times manually, wipe away excess grease.

► Step 2 Cleaning the Y-axis guide



► Step 3 Greasing the Y-axis guide



5.3 Cleaning the camera lighting unit

Dirt or dust particles sticking to the lighting unit of the optical camera can cause recognition errors during inspection. Monthly inspection and cleaning are recommended to prevent this problem.



CAUTION

Do not apply strong force or shock to the camera unit and lighting unit during cleaning. Optical axis adjustment might become unreliable.

Required tools

- Phillips screwdriver
- Lint-free cleaning wipe
- Optical lens brush
- Lens cleaner and cleaning paper
- Protective gloves made for handling lead



CAUTION

The inner side of the camera cover uses lead to shield X-rays. Wear gloves for protection from lead when handling the camera cover.



Step 1 Press the emergency stop button.

The YSi-V must be in emergency stop to ensure safety during work.



CAUTION

To ensure safety, make sure that the YSi-V power switch is off or the emergency stop button is pressed before starting work.

Step 2 Remove the diffuser plate.

Using the Phillips screwdriver, remove the four screws holding the diffuser plate and remove the diffuser plate.

53425-M9-10



CAUTION

When removing the diffuser plate mounting screws, be careful not to lose the spacer.

Step 3 Clean the diffuser plate.

Remove dirt and dust on the entire diffuser plate with a paper wipe.

Step 4 Clean the optical camera lighting unit.

Use a lens blower brush to remove dust on the lighting unit of the optical camera lighting unit.

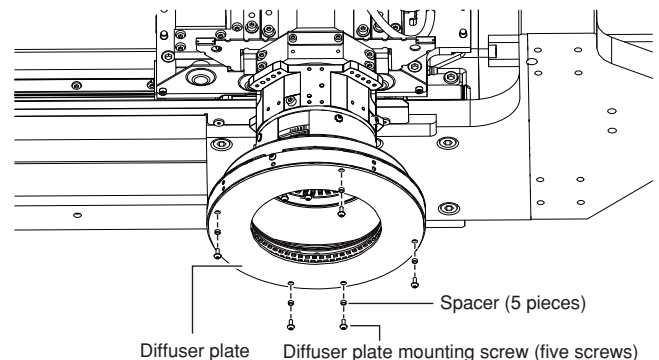
If excessively dirty, wet a piece of cleaning paper with a few drops of lens cleaner and wipe the dirt off.

53426-M9-00

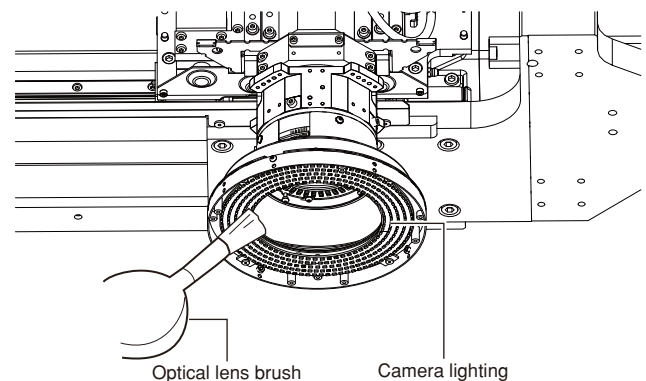
Step 5 Reattach the diffuser plate.

Reattach the diffuser plate in the reverse order of the removal procedure.

Step 2 Removing the diffuser plate



Step 4 Cleaning the lighting for optical camera

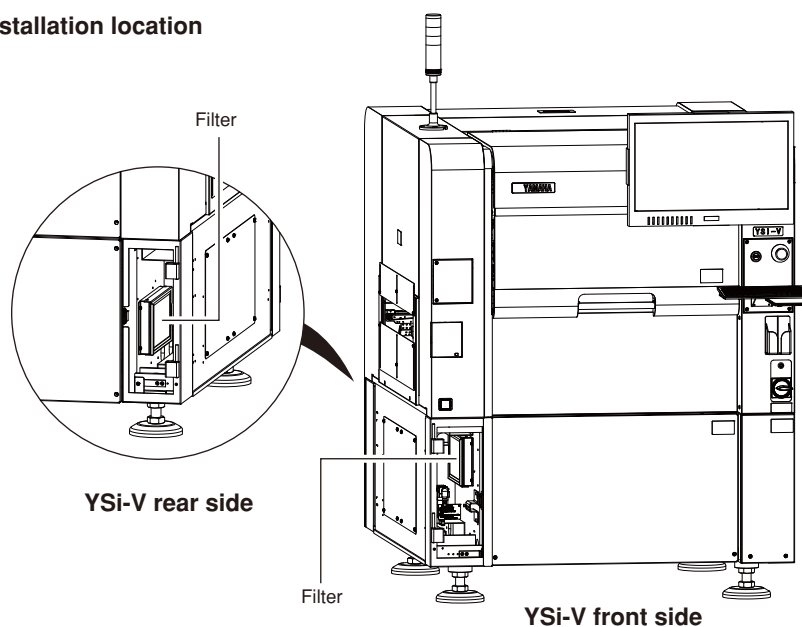


6. Three-month inspection

6.1 Air intake fan filter

Failure to clean the filter may cause filter clogging, leading to increase in temperature inside the YSi-V. To prevent YSi-V malfunction or shortening of the service life, be sure to clean each filter. The filter to be cleaned is one kind and installed at two locations shown in the figure below.

Filter installation location



53450-M9-00

■ Cleaning the filter

Step 1 Perform the preparations for work.

1. Turn off the YSi-V power and open the cover.
2. Prepare a vacuum cleaner to be used for the cleaning.

Step 2 Remove the filter.

Remove the filter as shown in the figure at right.

53451-M9-00

Step 3 Clean the filter.

Suck the filter with the vacuum cleaner.



CAUTION

When using the filter in the wet state, dust may be solidified by moisture, causing filter clogging to easily occur. Since the filter can be cleaned enough with the vacuum cleaner, do not use any water to clean the filter.



NOTE

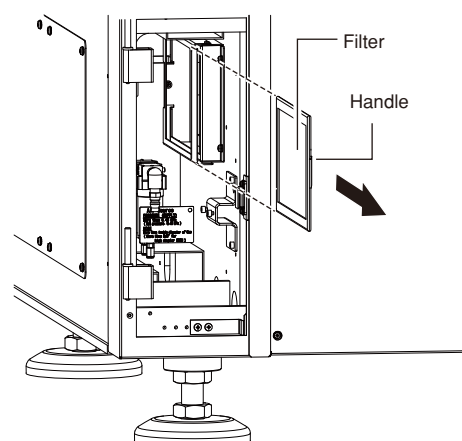
If the contamination cannot be removed or the filter deteriorates, replace the filter with a new one.

Step 4 Reattach the filter in place.

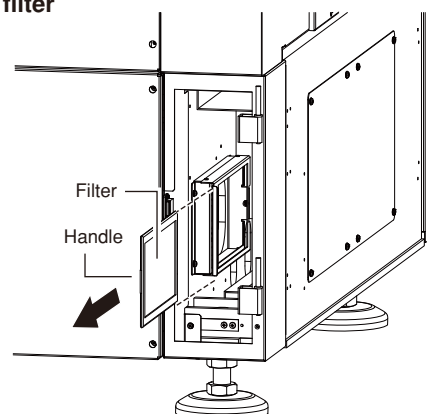
Reattach the filter in the reverse order of the removal procedures.

► Step 2 Removing the filter

■ Front filter



■ Rear filter



6.2 Cleaning and greasing the CZ axis (option) ball screws

■ Required tools

- Lint-free cleaning wipe
- Specified grease (NSL)
- Protective glasses
- Protective gloves



CAUTION

Wear protective glasses and gloves when handling grease.



Step 1 Press the emergency stop button.

The YSi-V must be in emergency stop to ensure safety during work.

Step 2 Clean the W axis ball screw.

Wipe away the old grease and dirt from the entire ball screw with a paper wipe.

53466-M9-00



NOTE

Wipe away the old grease and dirt in the lead groove of the ball screw. Also check that no debris or residue remains in the lead groove.

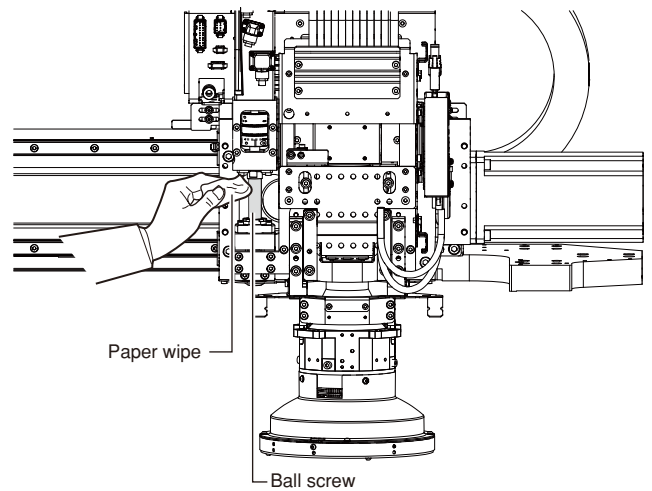
Step 3 Apply grease to the ball screw.

Apply the specified grease (NSL) by hand uniformly over the entire ball screws.

Step 4 Wipe away excess grease.

After moving the CZ axis up and down, wipe away excess grease with a paper towel.

► Step 2 Cleaning the CZ axis ball screw



7. Six-month inspection

7.1 Cleaning and greasing the marking unit (option) cam

■ Required tools

- Lint-free cleaning wipe
- Specified grease (NSL)
- Hex wrench (3mm)
- Protective glasses
- Protective gloves



CAUTION

Wear protective glasses and gloves when handling grease.



Step 1 Press the emergency stop button.

The YSi-V must be in emergency stop to ensure safety during work.

Step 2 Remove the grease cover.

Using the hex wrench, loosen the bolts that secure the grease cover and remove the cover.

53452-M9-10

Step 3 Clean each part.

Wipe away the old grease and dirt from the cam block, cam follower, and grease cover with a lint-free cloth.

Step 4 Apply the grease.

Apply the specified grease (NSL) by hand uniformly over the slant surface of the cam block.

53453-M9-00

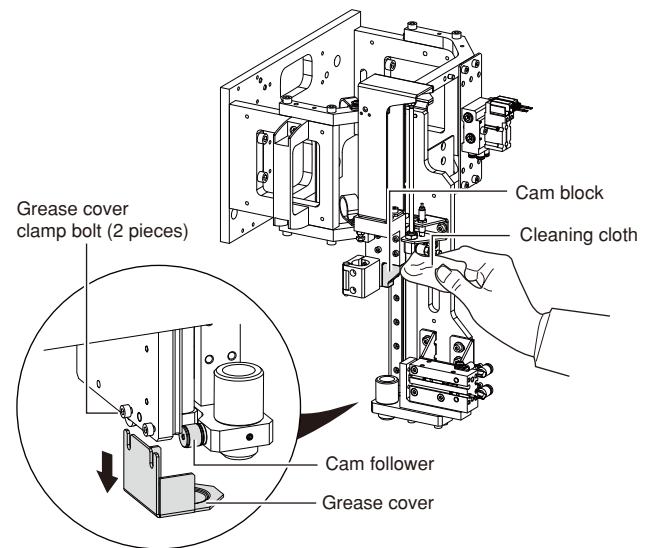
Step 5 Remove excess grease.

After moving the marking unit up and down, wipe away excess grease with a lint-free cloth.

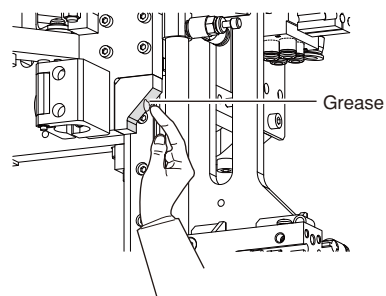
Step 6 Reattach the grease cover.

Reattach the grease cover in place that has been removed in Step 2.

▶ Step 2,3 Cleaning each part



▶ Step 4 Applying the grease



7.2 Cleaning controller filter (For Type HS2 only)

The controller for controlling the YSi-V is equipped with a filter. Depending on the operation of the YSi-V, the filter requires cleaning every 6 months as a guideline.

■ Required tools

- Vacuum cleaner or vacuum assembly (option)

Step 1 Turn off the power supply to the YSi-V.

Step 2 Remove the front lower panel.

1. Open the safety cover.
2. Pull out the front center panel.
3. Pull out front lower panel.

53454-M9-00

Step 3 Remove the filter.

Remove the filter installed on the back of the controller with hands.

53455-M9-00



CAUTION

Note that the circuit breaker is near the filter. Do not unintentionally turn off the circuit breaker when pulling out the filter.

Step 4 Remove the dirt on the filter.

Use a vacuum cleaner or a vacuum assembly (option) to remove dirt on the filter.

53456-M9-00



NOTE

If the dirt is too excessive to remove or if the filter is deteriorated, replace the filter with a new one.

Step 5 Re-assemble the filter.

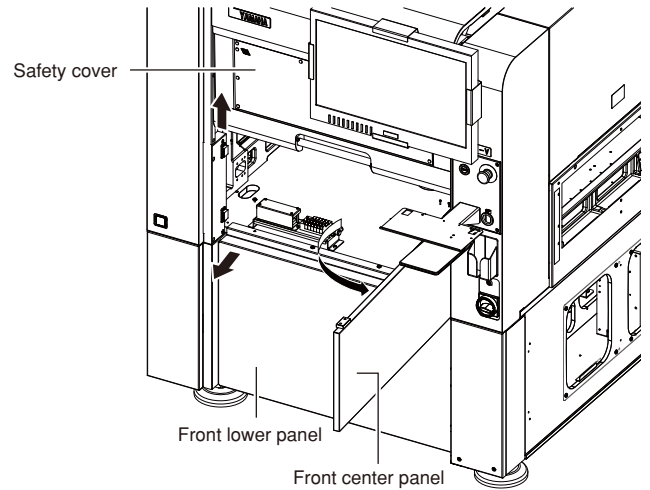
1. Install the filter in the original place.
2. Install the front lower panel. Close the front center panel and safety cover.



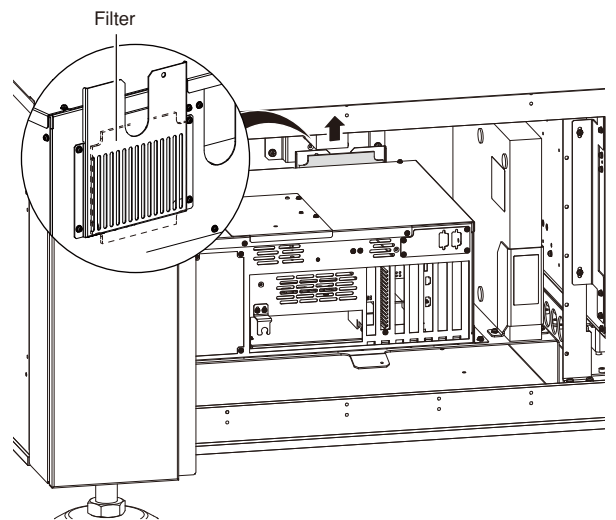
CAUTION

When installing the filter, do not unintentionally turn off the nearby circuit breaker.

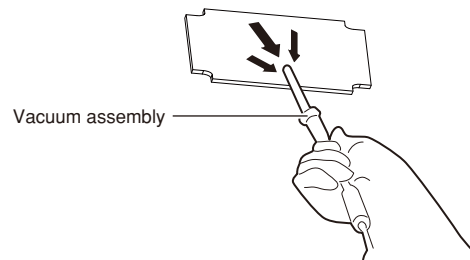
► Step 2 Removing front lower panel



► Step 3 Removing filter



► Step 4 Cleaning filter



8. One-year inspection

8.1 W axis

8.1.1 Cleaning and greasing the W axis ball screws

■ Required tools

- Lint-free cleaning wipe
- Specified grease (NSL)
- Protective glasses
- Protective gloves



CAUTION

Wear protective glasses and gloves when handling grease.



Step 1 Clean the ball screws.

1. Operate the (Width) button on the "Unit" - "Conveyor" screen to set the conveyor width to the maximum. Put the YSi-V in the state of emergency stop.
2. Wipe away the old grease and dirt from the entire ball screws with a lint-free cloth (for clean room).
3. Cancel the emergency stop state. After narrowing the board width, press the emergency stop button again and wipe the remaining parts.

53421-M9-00



NOTE

Carefully wipe away the old grease and dirt in the lead groove of the ball screw during cleaning work. Also check that no debris is generated.

Step 2 Apply grease to the ball screw.

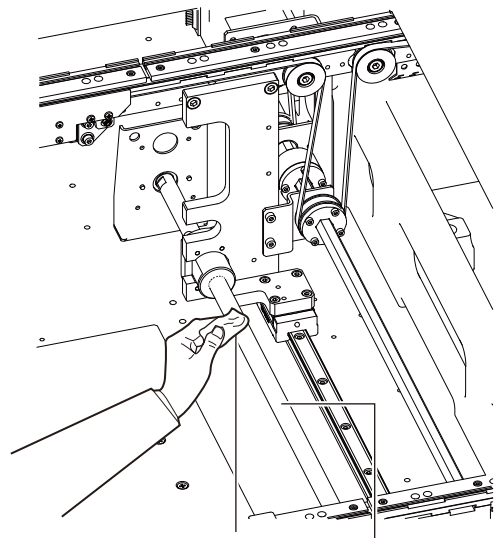
Apply the specified grease (NSL) by hand uniformly over the entire ball screw.



NOTE

Adjust the board width in the same manner as described in Step 1, and then apply the grease over the entire ball screws.

▶ Step 1 Cleaning the W-axis ball screws



Cleaning cloth W-axis ball screws

8.1.2 Cleaning and greasing the W axes guides

■ Required tools

- Lint-free cleaning wipe
- Grease gun
- Specified grease (NSL)
- Protective glasses
- Protective gloves



CAUTION

Wear protective glasses and gloves when handling grease.



Step 1 Clean the guide.

1. Operate the (Width) button on the "Unit" – "Conveyor" screen to set the conveyor width to the maximum. Put the YSi-V in the state of emergency stop.
2. Use lint-free cleaning paper (for clean room application) or a similar one to wipe off old grease and dirt on the entire guide.
3. Reset the state of emergency stop. Narrow the board width. Then, press the emergency stop button to clean the rest of the area.

53423-M9-00



NOTE

Wipe away thoroughly the old grease in the grooves of the guide rails.

Step 2 Inject new grease.

Prepare a grease gun and inject the specified grease (NSL) from the right grease nipple.

The grease nipple is provided at one location on each of the left and right guides (two locations in total).



NOTE

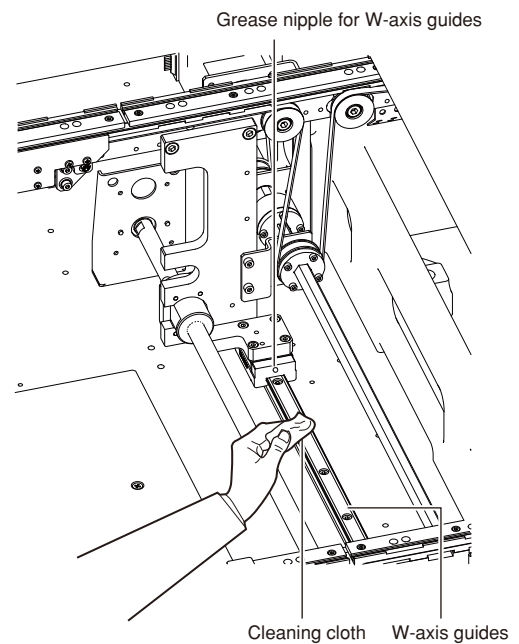
See Chapter 5, "Lubrication points", for details on the lubrication points and grease gun nozzles.

Step 3 Wipe away excess grease.

1. Widen and narrow the conveyor width several times.
2. Press the emergency stop button again and wipe away excess grease with a lint-free cloth.



► Step 1,2 Cleaning and greasing the W axes guides



8.1.3 Cleaning and greasing the hexagon spline

■ Required tools

- Lint-free cleaning wipe
- Specified grease (NSL)
- Protective glasses
- Protective gloves



CAUTION

Wear protective glasses and gloves when handling grease.



Step 1 Clean the hexagon spline.

1. Operate the (Width) button on the "Unit" – "Conveyor" screen to set the conveyor width to the maximum. Put the YSi-V in the state of emergency stop.
2. Wipe away the old grease and dirt from the entire hexagon spline with a lint-free paper wipe (for clean room).
3. Cancel the emergency stop state. After narrowing the board width, press the emergency stop button again and wipe the remaining parts.

53448-M9-00



Step 2 Apply the grease.

Apply the specified grease (NSL) by hand uniformly over the entire surface of the hexagon spline.

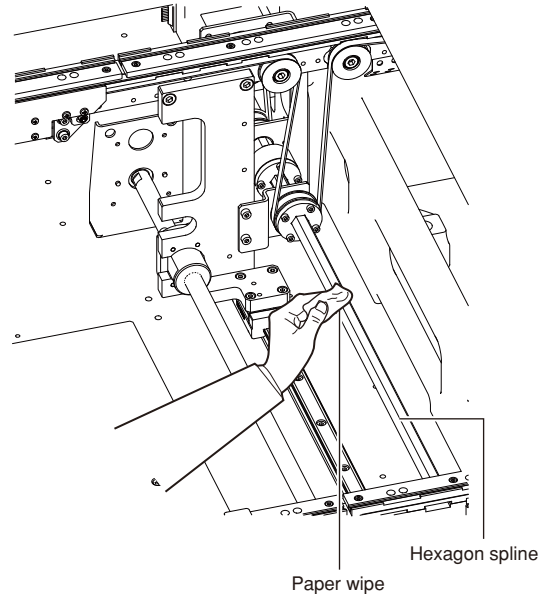
53449-M9-00



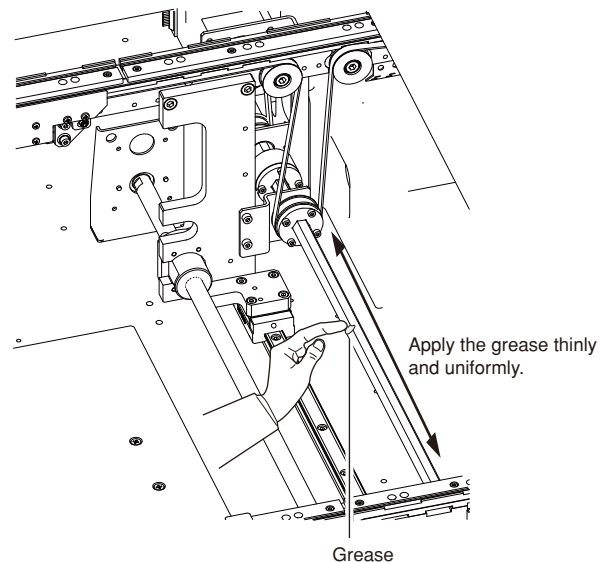
NOTE

Adjust the board width in the same manner as described in Step 1, and then apply the grease over the hexagon spline.

► Step 1 Cleaning the hexagon spline



► Step 2 Applying the grease



8.2 Inspecting and cleaning the air/mist filters

Air/mist filters are used to prevent oil, mist and other impurities in the air compressor from penetrating into the YSi-V. These filters should be inspected and cleaned periodically as instructed below.



CAUTION

Remove the coupler to ensure safety during work. At this time, pay special attention so that oil, water, or impurity does not scatter.

Additionally, be aware that a large air exhaust sound is heard when removing the coupler.

Required tools

- Neutral detergent
- Air blow tool (Option tool to be purchased)
- Cloth rag
- Slotted precision screwdriver
- Hex wrench (2.5mm)
- Dust-proof goggles
- Dust-proof mask



CAUTION

The cleaning blow air may be in contact with your face. So, be sure to wear dust-proof goggles and dust-proof mask before starting the air blow.

Step 1 Check the inside of the filter cup.

Check the inside of the cup for oil or water. If the inside of the cup is contaminated, follow the steps below to clean it.

Step 2 Separate the air and mist filters.

1. Using the hex wrench (2.5), loosen the bolts.
2. Slide the pin downwards. Remove the bracket. Separate the air filter and mist filter.

53431-M9-00

Step 3 Remove the filter cup.

Air filter

1. Turn the air filter counterclockwise as shown in the figure at right to pull it downward.
2. Put the slotted precision screwdriver in the groove close to the snap fit of the deflector and remove the element assembly from the filter cup.

Mist filter

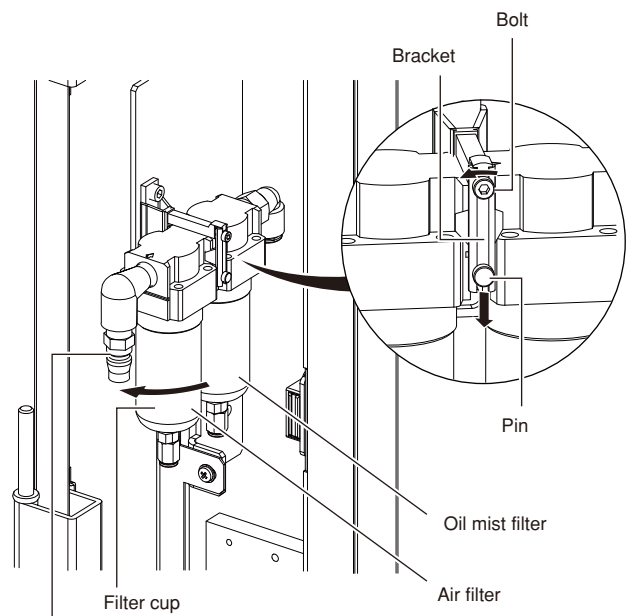
Turn the filter cup counterclockwise as shown in the figure at right to pull it downward.

53432-M9-10

Step 4 Remove the contamination inside the filter cup.

1. Lightly wash the cup with water.
2. Further wash the inside of the cup with neutral detergent diluted with water.
3. After blowing the air with the air blow tool, wipe away water with a cloth rag.

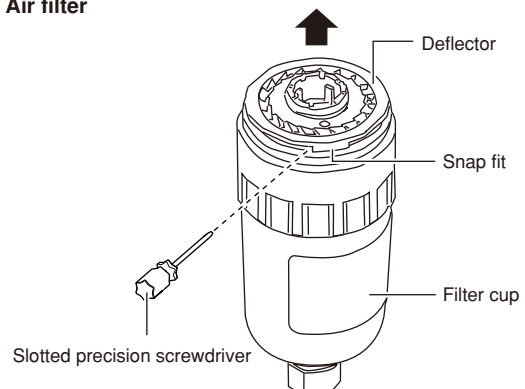
Step 2,3 Removing the filter cup



Remove the air coupler.

Step 3 Removing the element assembly

Air filter



Step 5 Remove the filter element.

Air filter

Turn the baffle in the direction shown in the figure at right to remove it from the element assembly.

Mist filter

Turn the filter element in the direction shown in the figure at right to remove it.

53433-M9-00

Step 6 Check the filter element conditions.

Check the filter element for contamination or clogging.

If the filter element is contaminated, replace it with the new filter element stated in the consumable parts list.

Step 7 Reattach the filter element and filter cup.

Reattach the filter media and cup in the reverse order of the removal procedures.

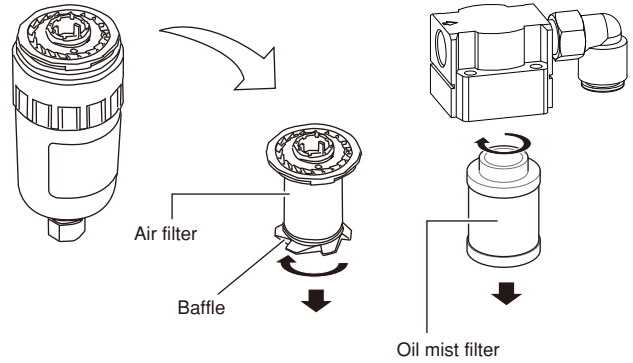
TIP

The manual tightening torque for the cup must be set to approximately 2.2N·m.

Step 8 Reattach the air coupler.

Connect the air coupler and check that no air is leaking.

Step 5 Removing filter element



9. How to replace consumable parts

9.1 Cleaning and replacing the conveyor belts

■ Required tools

- Hex wrenches 3mm, 4mm, 5mm
- Paper wipe
- Fine brush
- New conveyor belt
- Square piece of cloth



Step 1 Press the emergency stop button.

The YSi-V must be in emergency stop to ensure safety during work.

Step 2 Open the front safety cover of the YSi-V.

Step 3 Loosen the belt.

1. Place a square piece of cloth over the guide and ball screw.
2. While referring to the figure on the right, loosen the tension pulley with the hex wrenches (4 and 5) and then slide it fully along the elongated hole (in the direction of slackening the belt).

53441-M9-00

Step 4 Detach the belt.

Using the M3 hex wrench, loosen the bolt securing the belt drive pulley and pull out the shaft. Then detach the belt from the pulley and take it out through the space between the pulley and the shaft.

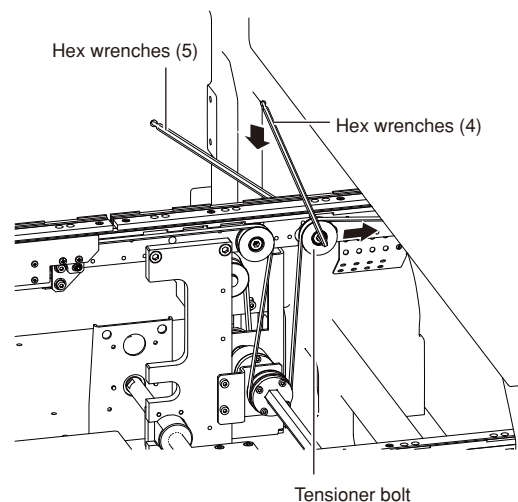
53442-M9-00

Step 5 Remove the board clamp board.

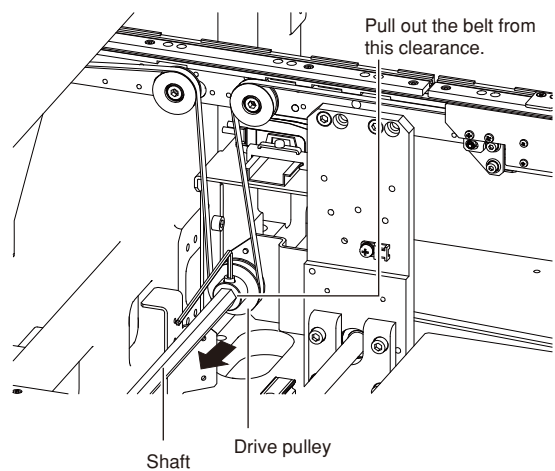
Using the hex wrench (3), remove the bolts (4 locations) that secure the board clamp board and remove the board clamp board.

53443-M9-00

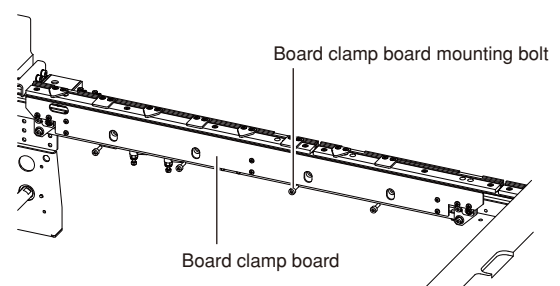
▶ Step 3 Loosening the belt tensioner bolt



▶ Step 4 Removing the shaft



▶ Step 5 Removing the board clamp board



Step 6 Detach the belt from the conveyor.

Step 7 Clean the conveyor rail.

Use a fine brush or cleaning cloth to clean the gap between the conveyor rail and board guide.

Step 8 Attach a new belt.

1. Temporarily fit a new belt onto the pulley.
2. Reconnect the shaft to the pulley and tighten the bolt.
3. Tighten the belt tensioner bolt while applying a proper tension to the belt by moving the belt tensioner bolt.

53447-M9-00

TIP

Proper belt tension and pulley pitch are as follows:

Tension 150 to 180Hz
Span length 138mm



CAUTION

The tightening torque for the tension pulley must be set to 5.5N-m.

Step 9 Reattach the board clamp board.

1. Fit the board clamp board to its original position and secure it temporarily with the clamp bolts.
2. On the (Unit) - (Conveyor) tab, press the (Board Clamp) button to raise the board clamp assembly and tighten the bolts securely.



CAUTION

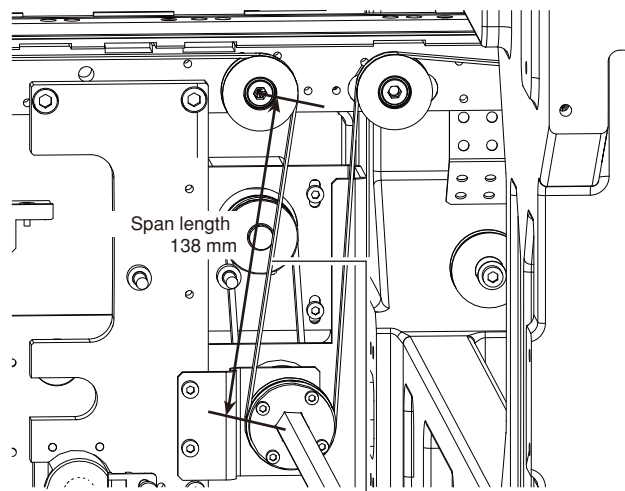
During adjustment, compressed air must be supplied and the board clamp raised.

Step 10 Check the belt rotating condition.

1. Open the (Unit)-(Conveyor) tab, and press the (Board Clamp) button again to unclamp. At this point, make sure that the top of the board clamp assembly is 0.5mm lower than the upper surface of the belt.
2. On the (Unit)-(Conveyor) tab, press the (Conveyor In) button or (Conveyor Out) button to turn on the conveyor motor and check the belt rotation.
3. If the rotation speed fluctuates or there is slack in the belt, adjust the position of the tensioner bolt and then check the rotation again.

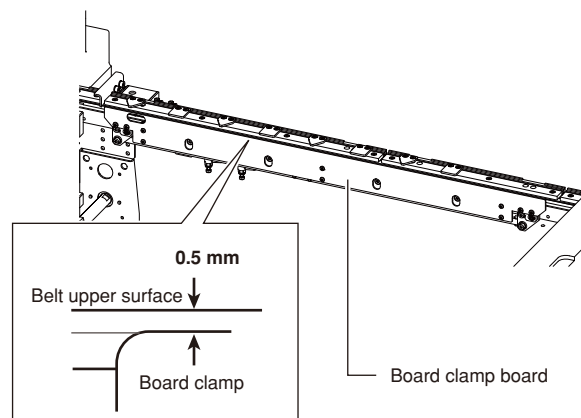
53445-M9-00

Step 8 Attaching a new belt



Tension measurement location

Step 10 Checking the belt rotating condition



9.2 Replacing the UPS (uninterruptible power supply) battery

The UPS battery used in this equipment will wear down, reaching the end of its service life. The battery service life and replacement interval differ depending on the usage environment (ambient temperature, etc.). For detailed information on how to replace the UPS battery, see the user's manual that comes with the UPS.



NOTE

When you have replaced the UPS battery, write the replacement date on the label affixed to the UPS unit and the left side of the main switch.

Contents

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2.1.3 W axis guide and ball screw	5-4

1. Applicable grease and grease gun

1.1 Applicable grease

When greasing the lubrication points, be sure to use appropriate grease specified by YAMAHA as listed below.



CAUTION

If grease other than that specified is used, this may cause damage to the YSi-V.

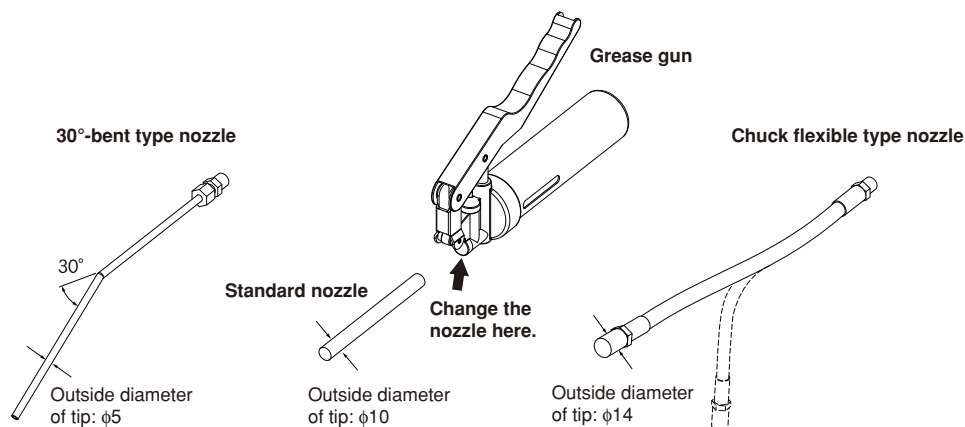
List of specified grease

Lubrication point	Guide	Ball screw	Remarks
X-axis	NSL grease	NSL grease	
Y-axis	NSL grease	NSL grease	
CZ-axis	—	NSL grease	Option
W-axis	NSL grease	NSL grease	

1.2 Grease gun

Select an appropriate nozzle suitable for the lubrication point from three kinds of nozzles shown below and attach it to the grease gun to apply the grease. Change the nozzle according to the greasing instructions.

Grease gun



53501-M9-00



CAUTION

Prepare different nozzles by grease. If two or more kinds of grease with different characteristics are mixed in the nozzle and it is applied, this may cause the YSi-V performance to lower.

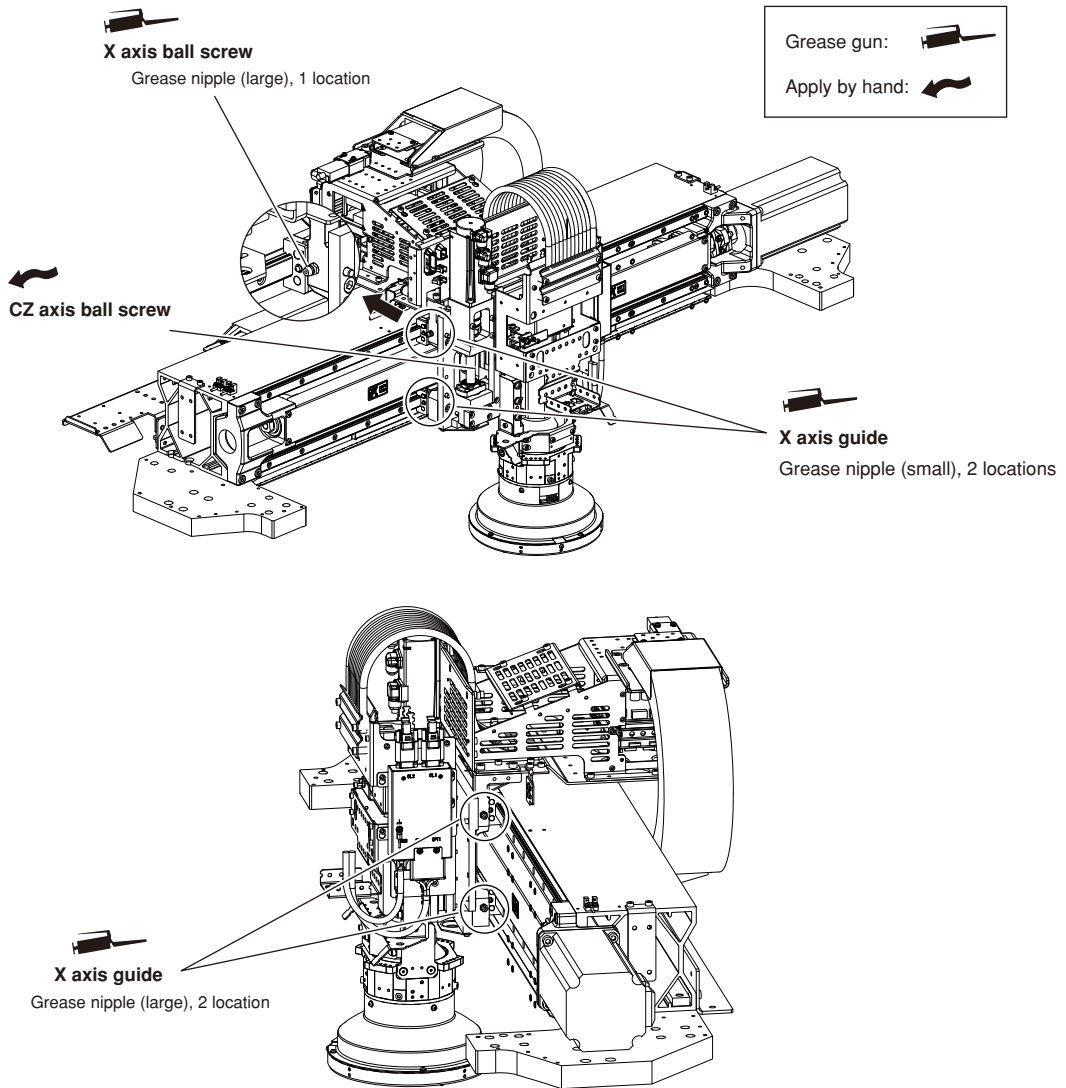
2. Lubrication of each unit

This section explains the lubrication points of each unit, lubrication intervals, and lubrication methods.

2.1 Each axis unit

2.1.1 X and CZ axis guide and ball screw

Lubrication points for X and CZ axes

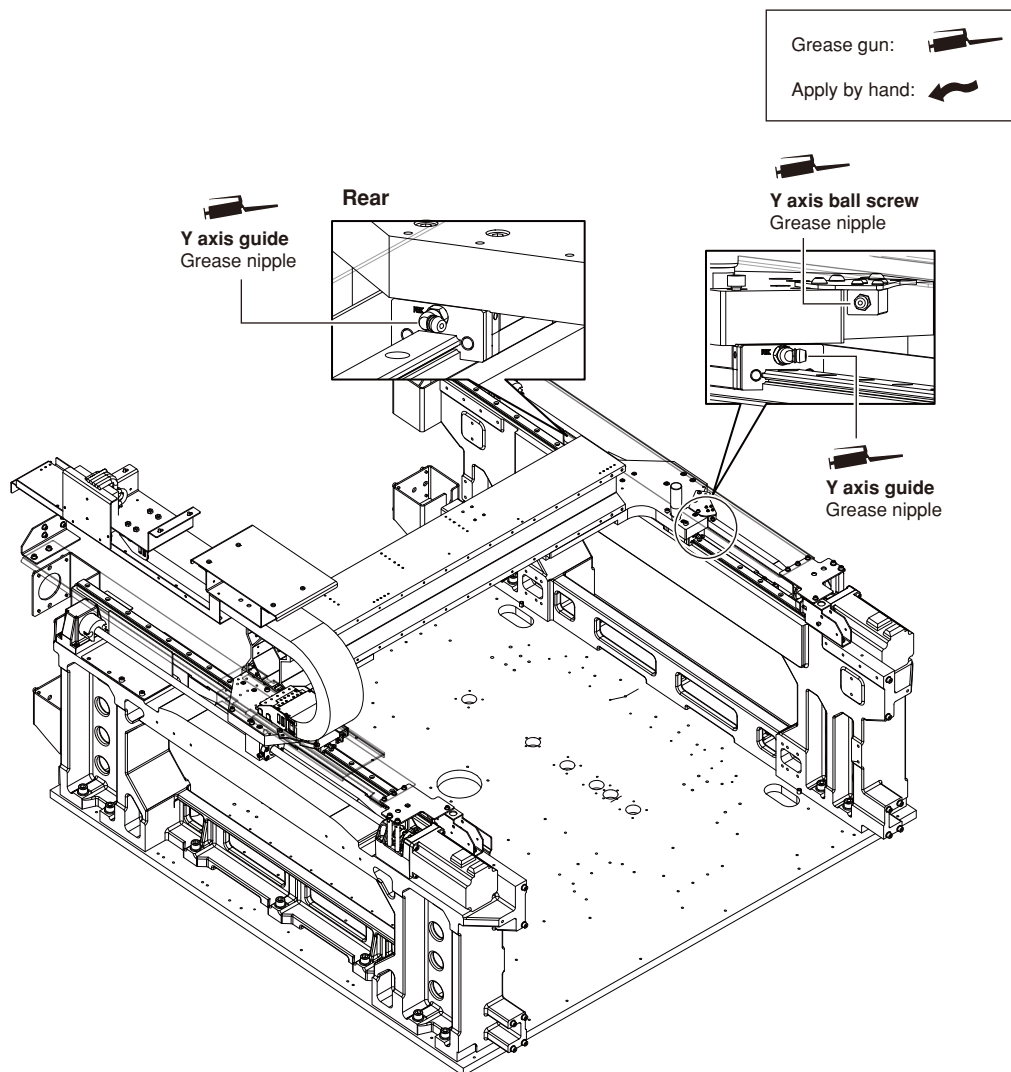


53502-M9-00

Unit to be lubricated	Lubrication point	Interval	Lubrication method
X axis ball screw	1	Once a month	Grease gun with standard nozzle
X axis guide	4		Left side Grease gun: Bend type nozzle Right side Grease gun: Standard nozzle
CZ axis ball screw	1	Once every 3 months	Apply grease by hand

2.1.2 Y axis guide and ball screw

Lubrication points for Y axis

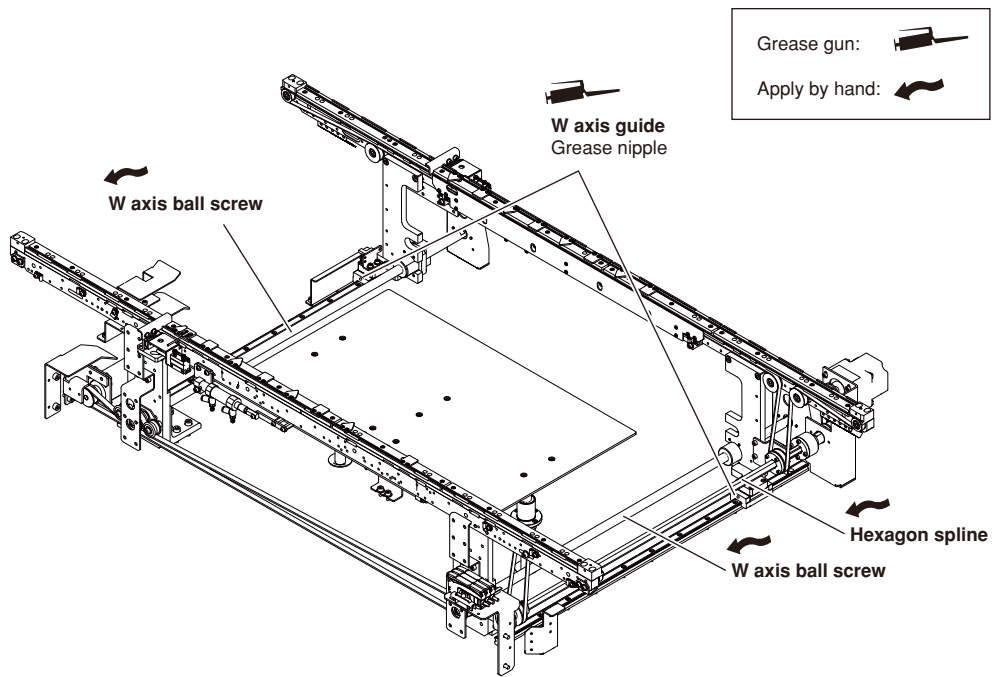


53503-M9-00

Unit to be lubricated	Lubrication point	Interval	Lubrication method
Guide	4	Once a month	Grease gun with standard nozzle
Ball screw	2		

2.1.3 W axis guide and ball screw

Lubrication points for W axis



53505-M9-00

Unit to be lubricated	Lubrication point	Interval	Lubrication method
Guide	2	Once a year	Grease gun: Bend type nozzle
Ball screw	2		Apply grease by hand
Hexagon spline	1		Apply grease by hand