



Operation Manual
for
AUTOMATIC SCREW FEEDER
NEJITARO HS III Series

HS III -10 HS III -12 HS III -14
HS III -17 HS III -20 HS III -23
HS III -26 HS III -30

(July 2012)

Hios Inc.

111-6 Akiyama, Matudo City, Chiba Pref., Japan

TEL:81(Japan)47-392-2001

12A

Operation Manual NO.ET-D004

IMPORTANT NOTICES

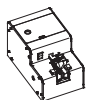
- The contents of this manual are subject to change without prior notice.
- This manual is written for persons who have some knowledge and experience of disassembling and reassembling machines.
- Always use this manual together with NEJITARO HS III operation manual.
- When ordering replacement parts, please supply the production serial number, model number, nominal dimensions, and part names. Please also supply the model number, work type, part name, and part number, if known.
- This manual uses the following symbols and marks for quick and easy identification.

	Model, others		Grease Recommended product: Dow Corning Asia Co., Ltd. Product name: BR2 Plus
	Service data Refer to this when assembling or disassembling The sizes and special precautions are given.		Screw loosening preventer Recommended product: Three Bond Co., Ltd. Product name: 1401B
	Diagrams for assembling and disassembling Refer to this in assembling or disassembling		Screw lock Recommended product: Three Bond Co., Ltd. Product name: 1377N
			Clamping torque Refer to the diagrams for the recommended torque.

- Every effort has been made to supply complete and accurate information. However, if you find any errors or omissions, please notify us.

CONTENTS

IMPORTANT NOTICES	2
CONTENTS	2
MAJOR SPECIFICATIONS	3
OPTIONAL ATTACHMENTS	4
REPLACEMENT OF CONSUMPTION PARTS	5
CHECK AND ADJUSTMENT BEFORE USE	8
WIRING DIAGRAM	13
CIRCUIT DIAGRAM	14
HOW TO READ THE ASSEMBLY (DISASSEMBLY) WORK DRAWINGS	15



MAJOR SPECIFICATIONS

Body type	Nominal diameter of screw	Rail model No. (Note)	Passing plate model No. (Note)	Brush model No. (Note)
HS3-300	Ø1.0	SR10	SW1017	SH1030
	Ø1.2	SR12		
	Ø1.4	SR14		
	Ø1.7	SR17		
	Ø2.0	SR20	SW2030	
	Ø2.3	SR23		
	Ø2.6	SR26		
	Ø3.0	SR30		

Note: Rails and a body are treated separately. When ordering them, place an order for a proper rail in accordance with the body. Passing plate (2 types) and a brush are built in the main body.

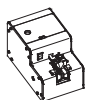
Power supply	Body side: DC12V 500mA
Dimensions	123W × 181D × 145H (mm)
Weight	Approx. 2.92 Kg

Notes:

- Each model is provided with the model-standard passing plate (2 types) and brush. As the rail is treated separately from the body, place an order for it separately.
- When the rail and passing plate are changed, the nominal diameter of the screw to be used can be changed.
- Replacement rails, passing plate, and brush are separately sold. The expendable parts separately mentioned are also separately available.
- The design, performance, specifications, etc. are subject to change without prior notice for the sake of improvement.

● Reference Table of Available Screws

Nominal diameter of screw	Screw length range (mm)	Screw head shape						
		Pan head			Bind screw	Truss head screw	Flat head screw	Hexagon socket head cap screw
		Screw with a washer and spring	Screw with double washer and a spring	Washer head screw				
Ø1.0	1.6 to 10	—	—	—	—	—	○	—
Ø1.2	1.8 to 10	—	—	—	—	—	○	—
Ø1.4	2.0 to 10	—	—	—	—	—	○	—
Ø1.7	2.3 to 10	—	—	—	—	—	○	—
Ø2.0	2.6 to 20	○	○	○	○	○	○	○
Ø2.3	2.9 to 20	○	○	○	○	○	○	○
Ø2.6	3.2 to 20	○	○	○	○	○	○	○
Ø3.0	3.6 to 20	○	○	○	○	○	○	○



OPTIONAL ATTACHMENTS

Replacement Parts for Changing the Nominal Diameter of Screw

When the nominal diameter of the screw is changed, the rail and passing plate must be replaced with those suitable for the new screw.

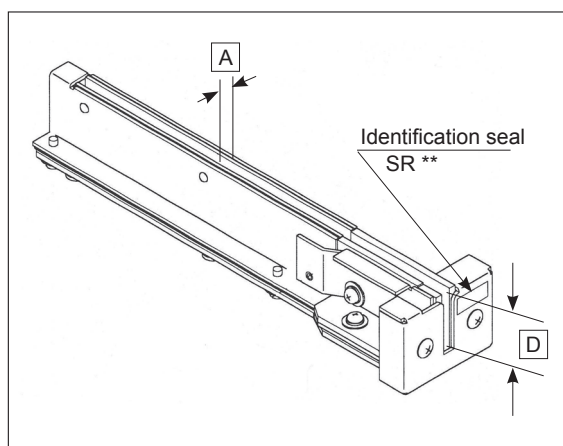
For replacement, refer to "Assembly (Disassembly) Work Drawing".

Use replacement parts fit for the nominal diameter. The replacement parts are sold separately.

• Rail

Rails are treated separately from the body. Replacement rails are separately sold.

Model No.	Nominal diameter of screw	Rail groove width A (mm)	Rail groove depth D (mm)
SR10	Ø1.0	1.0 to 1.14	20
SR12	Ø1.2	1.2 to 1.34	↓
SR14	Ø1.4	1.48 to 1.66	↓
SR17	Ø1.7	1.78 to 1.96	↓
SR20	Ø2.0	2.16 to 2.34	↓
SR23	Ø2.3	2.47 to 2.66	↓
SR26	Ø2.6	2.77 to 2.95	↓
SR30	Ø3.0	3.15 to 3.36	↓

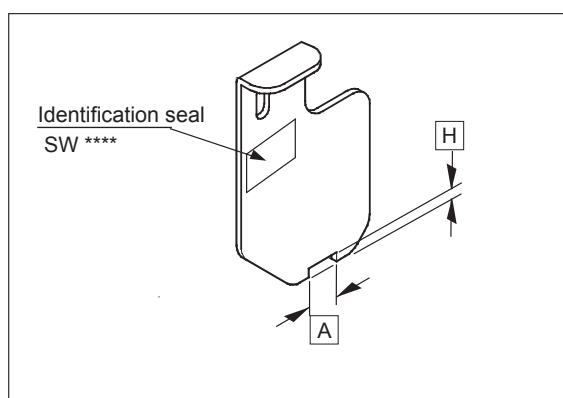


• Passing plate

The following two types of passing plate are attached to the body. You need not place an order for them anew.

The reference sizes of the passing plate attached as the standard are shown below.

Model No.	Nominal diameter of screw	Passing plate width A (mm)	Passing plate height H (mm)
SW1017	Ø1.0	5.0	0.7
	Ø1.2		
	Ø1.4		
	Ø1.7		
SW2030	Ø2.0	6.5	1.8
	Ø2.3		
	Ø2.6		
	Ø3.0		



Consumption Parts

Brush, motor, holding plate, bit guide, and stopper are consumption parts.

For replacement, refer to "Replacement of Consumption Parts" and "Assembly (Disassembly) Work Drawing". The consumption parts are separately sold.



REPLACEMENT OF CONSUMPTION PARTS

● Replacing the brush assembly

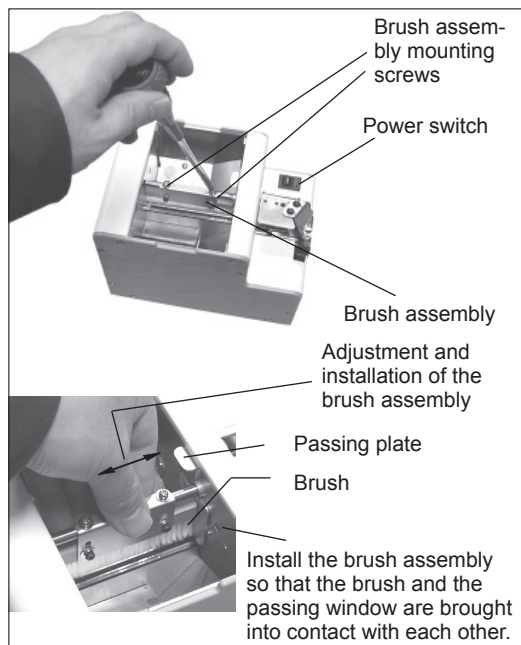
Reference Assembly (Disassembly) Drawing > F

When the brush is worn away and cannot brush away jammed screws, it must be replaced with a new one.

- Turn on and off the power switch of the body and set the brush at the position shown in the figure at right (the position that facilitates removal of the brush assembly mounting screws), and then remove the brush assembly.
- The brush assembly can be disassembled as shown in the assembly (disassembly) work drawing F.
- For assembly, reverse the disassembling procedure.
- After completion of assembly, check if when the brush assembly is operated, the brush and the passing plate are not brought into contact with each other.

The ideal clearance is 0.

- For installation adjustment, refer to "Check and Adjustment before Use".



● Replacing the main motor

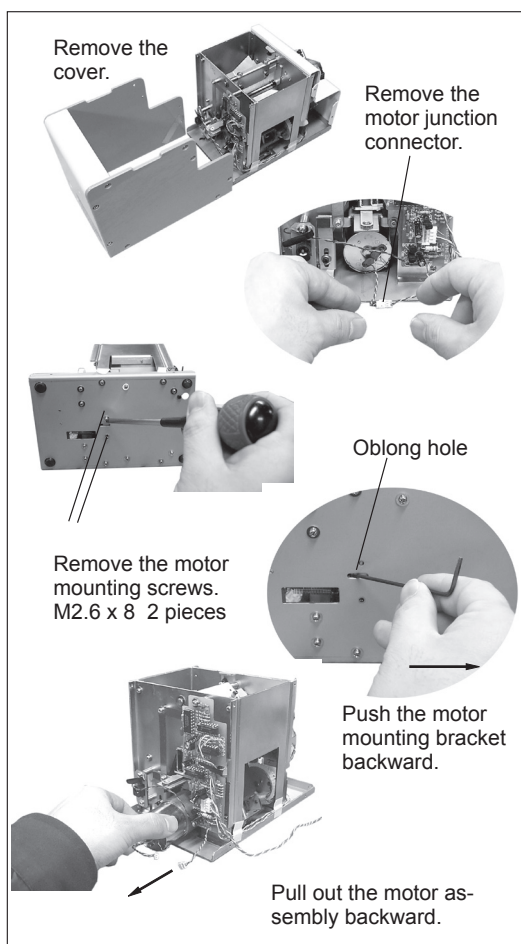
Reference Assembly (Disassembly) Drawing > A, G, I
Wiring Diagram

When the motor is damaged, it must be replaced with a new one.

- Remove the cover from the body.
(At this time, the cover should be removed without removing the rear 4 cover mounting screws as shown in the figure at right.)
(It is recommended to remove the front cover as a matter of operational convenience.)
- Remove the motor junction connector.
- Remove the motor mounting screws on the bottom of the body.
- Pull out the motor from the rear side of the body.
(At this time, if the motor is hard to pull out, insert a hexagonal wrench in the oblong hole of the body base and push the motor mounting bracket backward.)
- The motor assembly can be disassembled as shown in the assembly (disassembly) work drawing A.
- For installing the motor assembly in the body, reverse the disassembling procedure. The relationship with operation timing is shown on the next page.

Note:

Don't apply excessive force to the motor wire, otherwise this will cause wire breaking.





REPLACEMENT OF CONSUMPTION PARTS

● Replacing the main motor

Reference Assembly (Disassembly) Drawing > A, G, I
Wiring Diagram

Operation timing when the motor is replaced

- To adjust the scooping blocks to the operation timing of the brush, it is necessary to adjust the gear engagement as described in the precautions in the assembly (disassembly) work drawing A.
- When the motor assembly has been removed from the body, the operation timing can be adjusted if the motor assembly is reassembled with the timing shown in the figure at right.
- If it is hard to engage the driving gear of the motor assembly with the left and right driven gears, loosen the installation of the driving shaft bracket (right), and assembling can be easily performed. (Refer to the figure at right.)

However, after the motor assembly is installed, be sure to tighten the loosened screws again.

- After completion of installation, supply power to the motor and check the operation timing. (The left and right scooping blocks should be operated up and down almost simultaneously.)
- After making an operation check, perform wire forming referring to the wiring diagram. (When installing the cover, take care not to nip the wire.)

Note:

Don't apply excessive force to the motor wire, otherwise it will cause wire breaking.

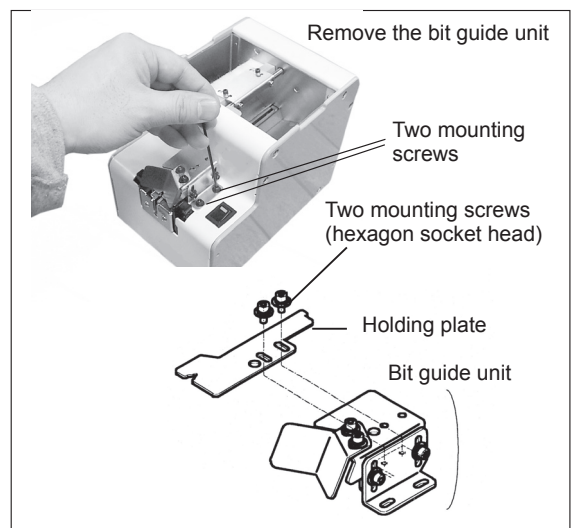
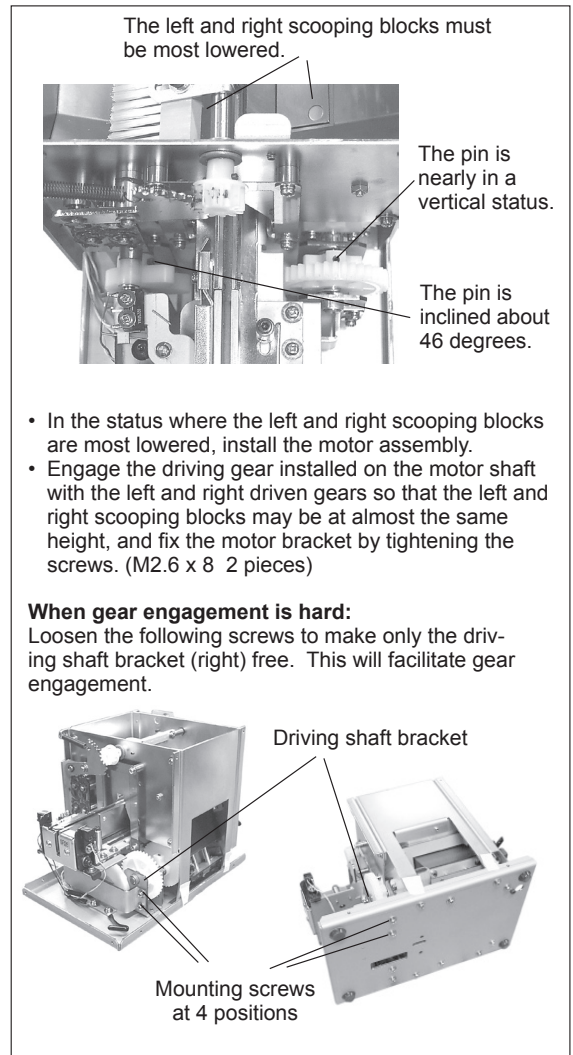
● Replacing the holding plate

Reference Assembly (Disassembly) Drawing > I

When the holding plate is worn away and this constitutes a hindrance to use, the holding plate must be replaced.

To prevent the mounting screws from falling into the body, remove the bit guide unit from the body before replacing the holding plate.

- Remove the bit guide unit as shown in the figure at right and replace the holding plate.
- For installation adjustment, refer to "Check and Adjustment before Use".





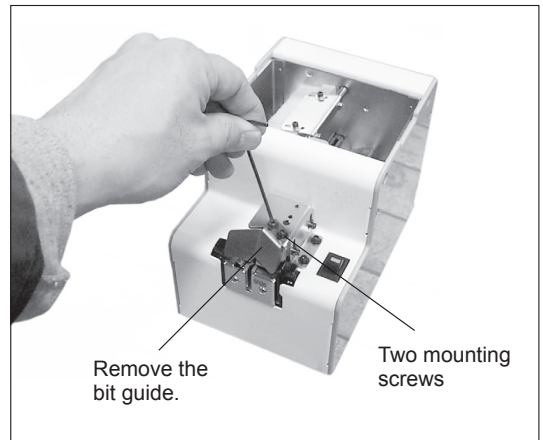
REPLACEMENT OF CONSUMPTION PARTS

● Replacing the bit guide

Reference Assembly (Disassembly) Drawing > I

When the bit guide is worn away and this constitutes a hindrance to use, the bit guide must be replaced.

- Remove the mounting screws as shown in the figure at right and replace the bit guide.
- For installation adjustment, refer to "Check and Adjustment before Use".



● Replacing the stopper

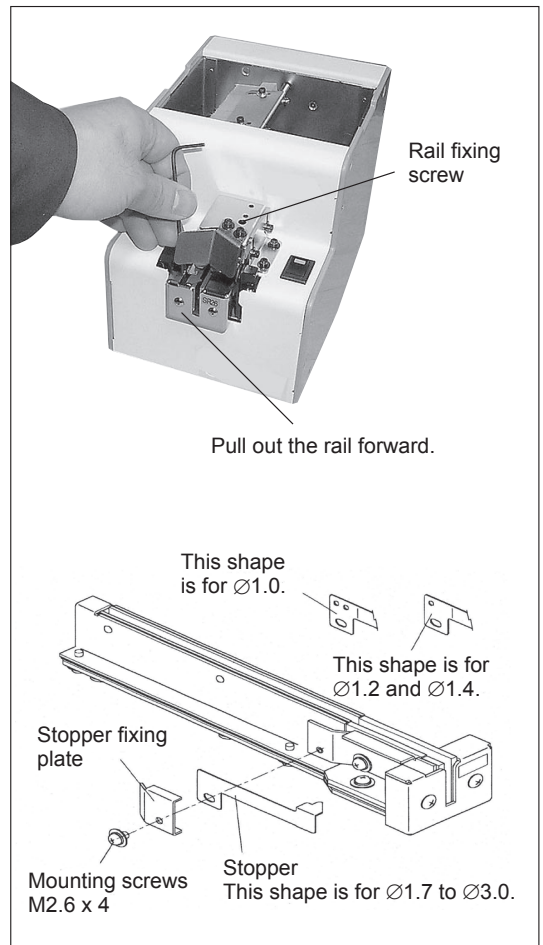
Reference Assembly (Disassembly) Drawing > H

When the stopper is worn away and this constitutes a hindrance to use, the stopper must be replaced.

- Loosen the rail fixing screws and remove the rail from the body as shown in the figure at right.
- The stopper can be replaced as shown in the figure at right.
- There are 3 types of stopper.

Note that the applicable type stopper depends on the nominal diameter to be used. Identify the applicable type of stopper by the hole at the installation portion.

- At replacement, refer to the precautions in the assembly (disassembly) work drawing H.





CHECK AND ADJUSTMENT BEFORE USE

Before use, check if the parts fit for the screw to be used are attached to the body. For the rail, the nominal diameter of the screw is $\varnothing 1.0$ to $\varnothing 3.0$. A different rail model is used for each nominal diameter. Identify each model by the identification seal stuck on the front cover of the rail. Two types of passing plate are available for $\varnothing 1.0$ to $\varnothing 1.7$ and $\varnothing 2.0$ to $\varnothing 3.0$. Identify each type by the identification seal stuck on the passing plate.

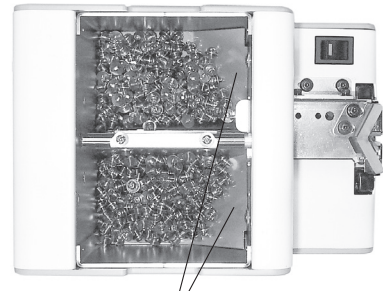
Reference Refer to the page pertaining to "Specifications".

● Screw loading amount

Loading too many screws will affect screw alignment and transport adversely. The figure at right shows the approximate maximum amount. Load screws in the scooping chamber referring to this figure.

- Set the scooping block into the lower limit status.
- Load screws up to a 2 to 3 mm lower position than the rail groove surface.
- At this time, make sure that the forward inclined surface of the inclined plate is not made invisible by loaded screws.

The screw should not make the rail groove surface invisible. (The screw surface should be 2 to 3 mm lower.)



This inclined surface on the left/right side of the inclined plate should be visible.

● Checking and adjusting the brush

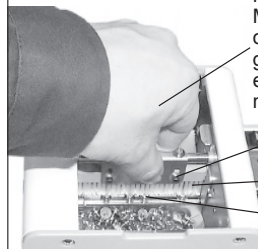
Check the height, front position, and rear position of the brush.

- Put the brush nearly in a level status as shown in the figure at right.
- Make sure that the head of the screw in use put in the rail groove grazes the brush end.
- Too large or small height of the brush will affect screw alignment and transport adversely.
- When an adjustment is required, loosen the brush height adjusting screw for this adjustment.
- Regarding the front and rear sides of the brush, make a front/rear adjustment referring to "Replacing the brush". While the brush is in operation, the front side and the passing window must not be brought into contact with each other.

Turn on the power switch and make the brush nearly level.



Move the brush by hand. Make sure that the head of the screw put in the rail groove grazes the brush end. Make an adjustment if necessary.



Brush height adjusting screw

Brush

Screw in use

● Checking and adjusting the passing plate

Check the height of the passing plate.

- Make sure that the passing plate is already adjusted to the height at which the screw in use passes at the very limit.
- If the passing plate is low, the screw cannot pass. If the passing plate is high, the screw is easily hitched.
- When an adjustment is required, loosen the passing plate mounting screw for this adjustment.

Note: Slide the half-press on both sides of the passing plate up and down along the guide.



Passing plate

Passing window mounting screw

Half-press (provided on both sides of the passing window)

Screw in use

Make sure that the passing plate is at the height that permits the screw in use to pass at the very limit. Make an adjustment if necessary.



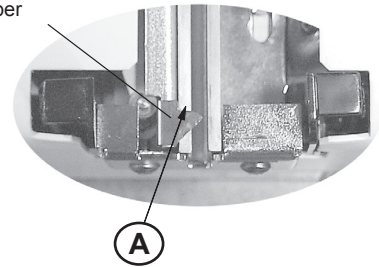
CHECK AND ADJUSTMENT BEFORE USE

● Checking and adjusting the rail

Check the positional relation between the stopper and the sensor.

- Make sure that the rail is fixed so that the portion A of the stopper may be 0 to 0.5 mm ahead of the optical axis of the sensor.
- When an adjustment is required, loosen the rail fixing screw and adjust the rail forward or backward.

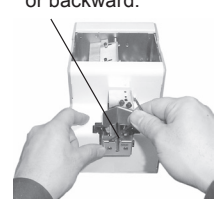
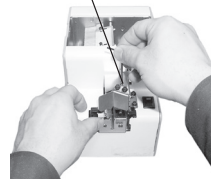
Stopper



This portion of the stopper should be 0 mm to 0.5 mm ahead of the optical axis of the sensor when viewed from above. (The bit guide does not need to be removed.)

Loosen the rail fixing screw.

Adjust the rail forward or backward.



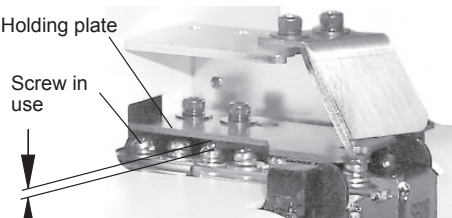
● Checking and adjusting the holding plate

Check the position of the holding plate.

- Make sure that the clearance between the head of the screw in use put in the rail groove and the holding plate is about 0 to 1 mm.
- In the case of no clearance, the screw will be hitched. A too large clearance will cause a screw jam or jump-out.
- When an adjustment is required, loosen the bit guide bracket mounting screw and adjust the holding plate upward or downward.

Holding plate

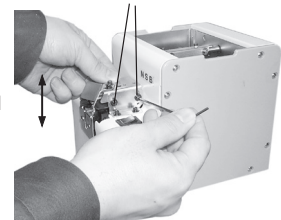
Screw in use



The clearance between the holding plate and the head of the screw in use should be about 0 to 1 mm. The holding plate should be in parallel with the rail.

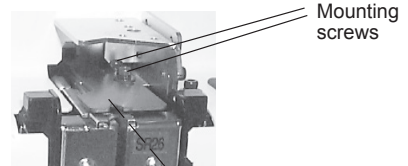
Bit guide bracket mounting screw

Adjust upward or downward.



Note: Centering of the unloading block

- Make sure that the center of the unloading part of the holding plate coincides with the center of the rail.
- If they do not coincide with each other, loosen the mounting screws for this adjustment.



The center of the unloading part of the holding plate should coincide with the center of the rail. (The bit guide does not need to be removed.)



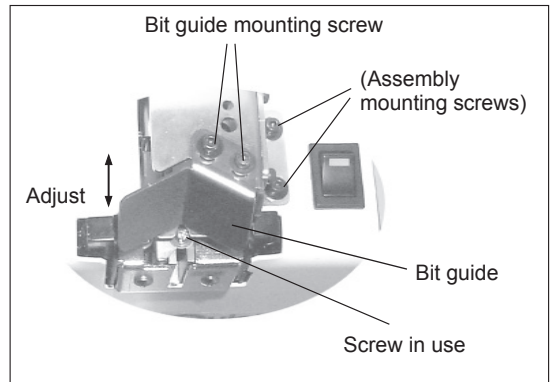
CHECK AND ADJUSTMENT BEFORE USE

● Checking and adjusting the bit guide

Check and adjust the position of the bit guide.

- Adjust the bit guide to a position that allows the operator to easily take out screws. Make this adjustment by practically taking screws. Make the adjustment by loosening the mounting screws.

Note: As described on the previous page, the rail is adjusted in positional relation with the sensor. Accordingly, the rail is not adjusted here as a rule.



● Checking and adjusting the rail vibration

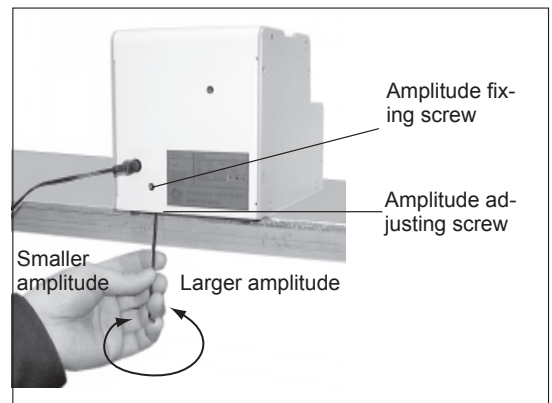
The screw transport speed depends on each screw type. This machine permits adjusting the transport speed by changing the rail amplitude.

- Loosen the amplitude fixing screw at the rear of the machine and turn the amplitude adjusting screw on the bottom of the machine to adjust the amplitude.

The amplitude is increased by turning the screw clockwise when viewed from the bottom.

The amplitude is reduced by turning the screw counterclockwise when viewed from the bottom.

- If the amplitude is excessively increased to increase the transport speed, it may be hard to take out screws. Adjust the amplitude in accordance with the screws in use.
- After completion of the adjustment, be sure to tighten the amplitude fixing screw.

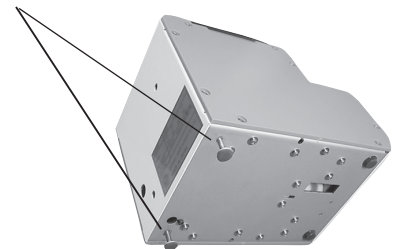


● Adjustment

- Please operate the unit as follows for the use by the inclination. (If the smooth flow of the screws is expected.) The basic installation of the unit is to set up at level position, but depending on the sort of screws, screws may not flow smoothly. In that case, it is possible to use the unit by the inclination with bend forward accordance with Checking and adjusting the rail vibration.
- Pull out two parts of decline adjustable screws and set up the both screws at the same length.
- There is no stopper to protect coming out screws for the decline adjustable screws.
Please make sure not to lose the screws once you take them out from the unit.
- Please check out the movement after the adjustment.

Decline adjustable screw

- Set up the both decline adjustable screws at the same length and install the unit at the stoop position.



- Please make sure to keep the balance of the unit when install.





CHECK AND ADJUSTMENT BEFORE USE

● Adjusting the timer

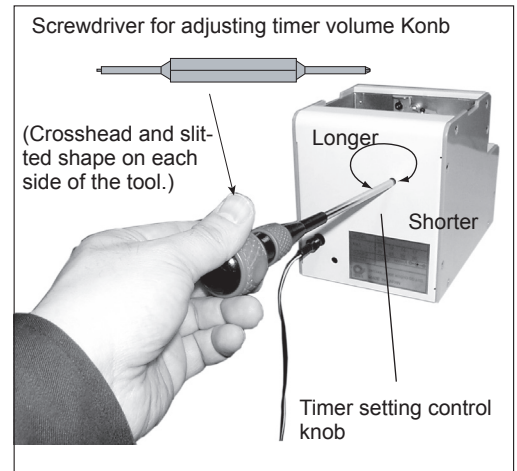
The screw transport speed depends on each type of screw. When the time of this machine is adjusted, it can be easier to take out screws.

- If a screw at the stopper is taken out and the next screw is not taken out for a certain time, this machine stops. When this next screw is taken out, the machine will restart. This time can be changed by adjusting the timer.
- Make the timer with the timer setting control knob at the rear side of the machine body as shown in the figure at right.
- The time is extended by turning the control knob clockwise when viewed from the rear side.

The time is shortened by turning the control knob counterclockwise when viewed from the rear side.

- Make this adjusting within the allowable rotation range without applying excessive force.
- The screwdriver is attached with all type of HIOS screw-feeder.

This screwdriver makes easy to adjust for the timer volume knob which is inside of HIOS screwfeeder.

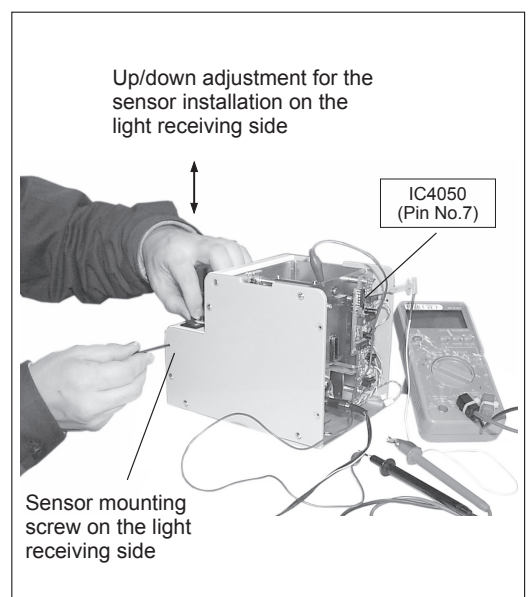


● Adjusting the screw filling sensor

When no screw exists at the stopper, the machine continues to operate. When a screw exists at the stopper, the machine stops its operation after the lapse of a certain time. In the machine, the screw filling sensor level is factory-adjusted by the reference rail.

As a matter of fact, however, the sensor level must be made for variations that may occur when thin-head screws are used or the rail is replaced. If this adjustment is required, make it according to the following procedure.

- Remove the rear cover of the body and measure the voltage level.
Check the voltage level at pin No.7 of IC4050. At the measurement, the ground is the metallic portion of the body.
- Put the rail to be used. If the voltage level is in the range of 1.5 to 2 V when no screw exists at the stopper, no adjustment is required.
- When an adjustment is required, loosen the sensor mounting screw on the light receiving side and move it up or down to adjust the voltage level. (At this time, if the junction connector of the main motor is removed, the voltage level can be easily adjusted.)
- After completion of the adjustment, use the screws to be used and make an operation check.)





CHECK AND ADJUSTMENT BEFORE USE

- **Making an operation check of the electric circuit**

- Detecting an overload and checking the protective circuit
Stop the up/down operation of the scooping block forcibly. Then, detect an overload and make an operation check of the overload protective circuit.

When the up/down operation of the scooping block is forcibly stopped, the main motor repeats the cycle of reverse rotation, normal rotation, reverse rotation,

In the above case, if the stop duration is limited to about 4.5 sec. or less, the motor will be recovered to the normal rotation.

When the up/down operation of the scooping block is stopped forcibly over about 4.5 sec., the main motor will repeat the cycle of reverse rotation, normal rotation, reverse rotation, ... and then stop.

To clear the above, turn on the power switch again.

- Checking the optical axis of the sensor
Check the voltage level as described above. The voltage level should be as follows:
When the optical axis is not blocked -> 1.5 to 2 V
When the optical axis is blocked -> 3 V or more
- Checking the timer
Make sure that when the timer setting control knob is adjusted, the time changes as described before.
(The adjustable range is approximately 1 to 6 sec.)

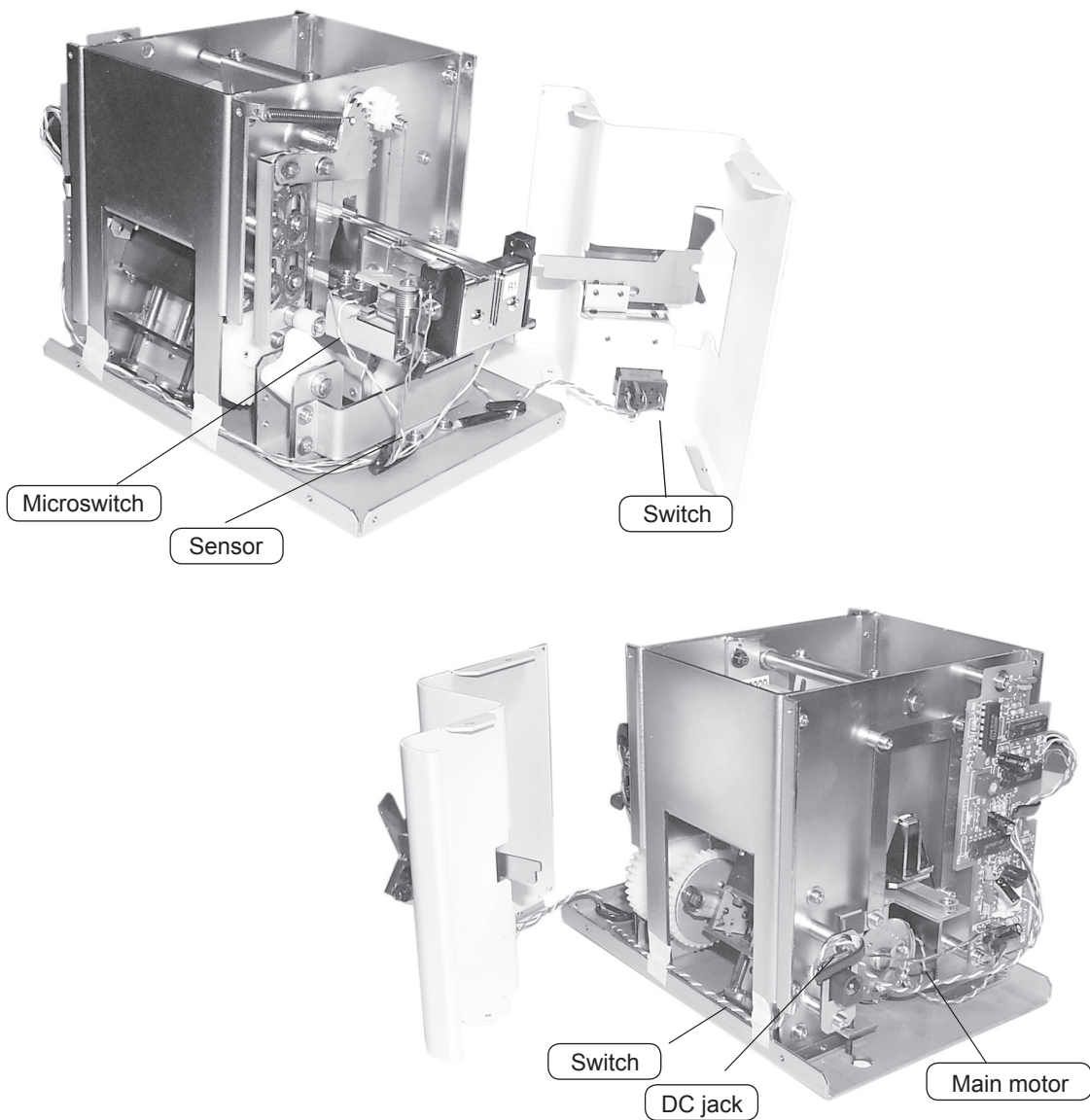
Stop the up/down operation of the scooping block forcibly and then check.





WIRING DIAGRAM

Wiring is as shown below.

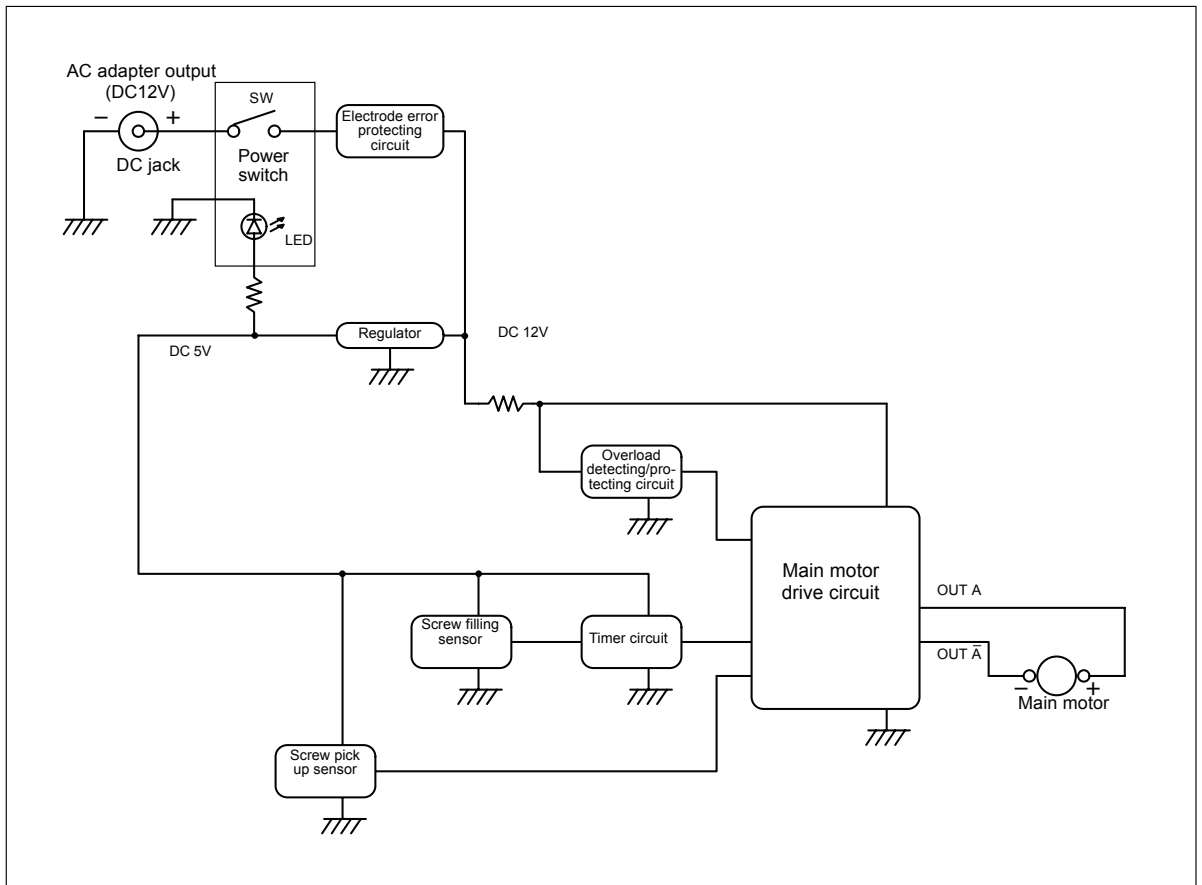


- Form the wires so that they may not touch the moving parts of the body.
- When the cover is installed, the wires must not disturb the operation of the body, for example, without causing vibration of the rails.
- Fix the wires with coatching clips as shown in the figure. (4 positions)
- Perform taping as shown in the figure.



CIRCUIT DIAGRAM

A block diagram for "NEJITARO" HS III type is shown below.

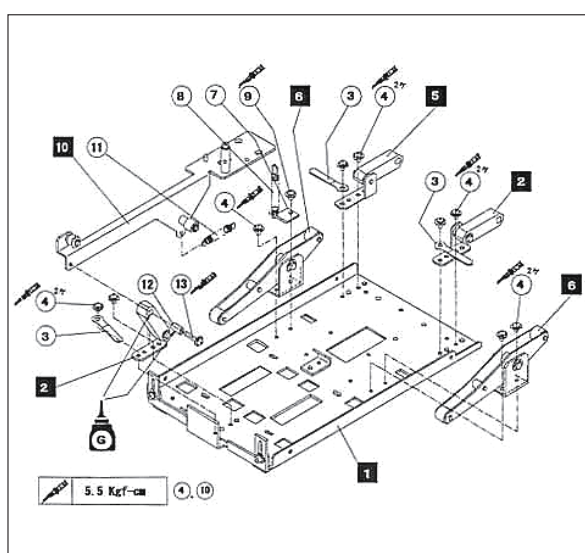




HOW TO READ THE ASSEMBLY (DISASSEMBLY) WORK DRAWINGS

- Perform assembly (disassembly) work referring to the assembly (disassembly) work drawings.
For assembly work, refer to the assembly (disassembly) work drawings A, B, C, D, E, F, G, H, and I in this order.
- When there are parts of half-press for positioning, combine parts without causing part floating at assembly.
- When there are parts having positioning holes, match the holes at assembly.
- For points to which grease, screw anti-loosing agent, and screw locking paint are applied, refer to the work drawings.
- For screw tightening torque values, refer to the work drawings.

How to Read Drawings



The numbers in the diagram indicates the steps in the work.

- 1** indicates that a disassembling diagram is provided.
- 1** indicates that no disassembling diagram is provided but further disassembling is possible. However, disassembling is not recommended.
- ① indicates that further disassembling is impossible.
- indicates points to which grease is applied. Recommended product: Dow Corning Asia Co., Ltd. Product name: BR2 Plus
- indicates points to which the anti-loosing agent is applied. Recommended product: Three Bond Co., Ltd. Product name: 1401B
- indicates points to which anti-loosing agent is applied. Recommended product: Three Bond Co., Ltd. Product name: 1377N
- indicates points to be controlled by a torque control driver. The recommended torque is shown in the diagram.

No.	Part name & Work name	Part number	Q'ty	Notes
1	Base unit	NJ07001T1N5 a	1	Shinagawa Shoko Co., Ltd.
2	Rail link L unit	NJ03005T1N5 a	2	
3	Coaching clip	CS-9	3	
4	+ Pan head screw with washer & spring	M2.6x5	9	
5	Rail link R unit	NJ03006T1N5 a	1	
6	Drive link plate unit	NJ03001T1N5 a	2	
7	Brush spring hanger	NJ03053T1N5	1	Showa Hatsuju Seisakujyo Co., Ltd.
8	Tension spring	NJ02041T1N5 c	1	
9	+ Pan head screw with washer & spring	M2.6x8	1	Hirosugi Keiki Co., Ltd.
10	Rail supporter unit	NJ03007T1N5 a	1	
11	Vibration spring	SH05-15	1	
12	Brass spacer	CB-2609	1	
13	+ Pan head screw with washer & spring	M2.6x14	1	

This section includes information on the parts and working process.