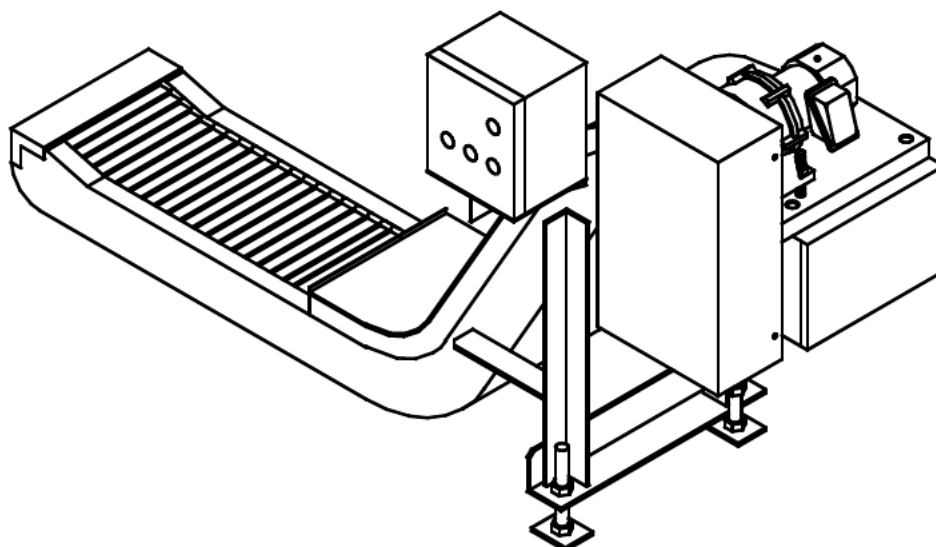


Maintenance & Inspection Manual

Chip Conveyor

(This manual includes the description for both floor type and scraper type)



For Safety

- Make sure that an experienced operator operates this machine. DO NOT operate this machine until an operator has read this manual completely and understands it thoroughly.
- Be sure to keep the manual close at hand for the operator to read it whenever necessary.
- Preserve this manual with care so that it may be referred to before using this machine.

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Thank you very much for purchasing our chip conveyor.


In this manual the levels of injury or damage, which can result if this machine is used incorrectly, are categorized into two levels: warning and caution. The definitions and descriptions are as follows:

 WARNING	This is used where, if the designated instructions or procedures are not strictly followed, a strong possibility exists that either serious or fatal injury can result.
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 CAUTION	This is used where, if the designated instructions or procedures are not strictly followed, a bodily injury or machine damage can result.
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Even if an instruction is categorized in “CAUTION” a serious accident may result depending on the condition. Be sure to pay strict attention to the instructions and observe them.

 WARNING	
<p>DO NOT use this machine in an explosive environment. It may cause explosion, fire, electrical shock, and injury or machine damage. Make sure that qualified personnel performs carriage, installation, wiring, operation, maintenance and inspection. Explosion, fire, electrical shock, injury or machine damage may result. DO NOT remove the machine plate. DO NOT modify the machine. We cannot take responsibility for modification.</p>	

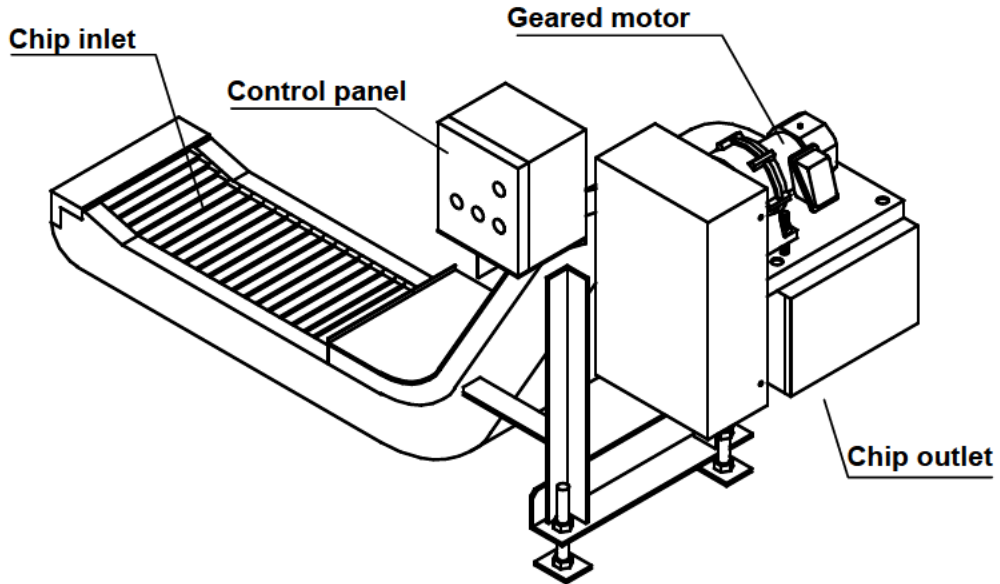
 CAUTION	
<p>Be sure to follow the specifications on the machine plate, the drawings, and the control panel assembly drawing. Electrical shock, injury or machine damage may result. DO NOT put a hand or a foot in the opening section of the chip conveyor such as the chip inlet or outlet. Electrical shock, injury or machine damage may result. DO NOT remove the machine plate. DO NOT modify the machine. We cannot take responsibility for modification.</p>	

Index

1	SECTIONNAMES	P . 3	6	OPERATION	P . 1 0
2	UNPACKING	P . 9	7	MAINTENANCE AND INSPECTION	P . 1 0
3	CARRIAGE	P . 9	8	TROUBLESHOOTING	P . 1 4
4	INSTALLATION	P . 9	9	.DISPOSAL	P . 1 4
5	WIRING	P . 9	1 0	GUARANTEE	P . 1 4

1 Section Names

(1) Outline Drawing



(2) Safety Device

In order to protect the conveyor against an excessive torque this machine is provided a torque limiter as a standard attachment. Also a torque limit plus limit switch or proximity switch type is optionally available as a mechanism to automatically stop the conveyor when an excessive torque is generated. The following describes the safety devices.

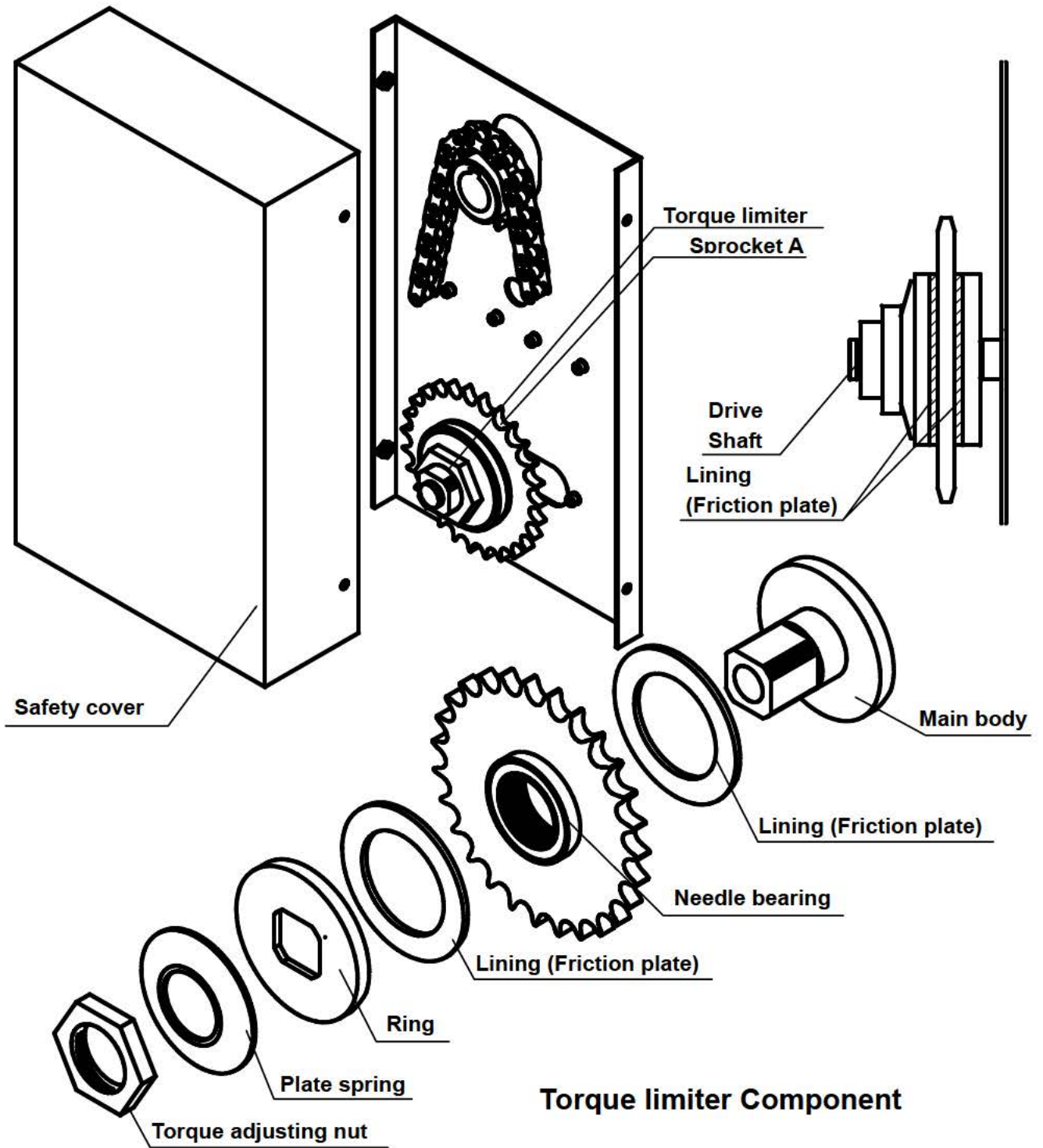


- Stop the conveyor, when removing the safety cover for safety device adjustment.
- the chain might catch you.

(2) – 1 Torque limiter type

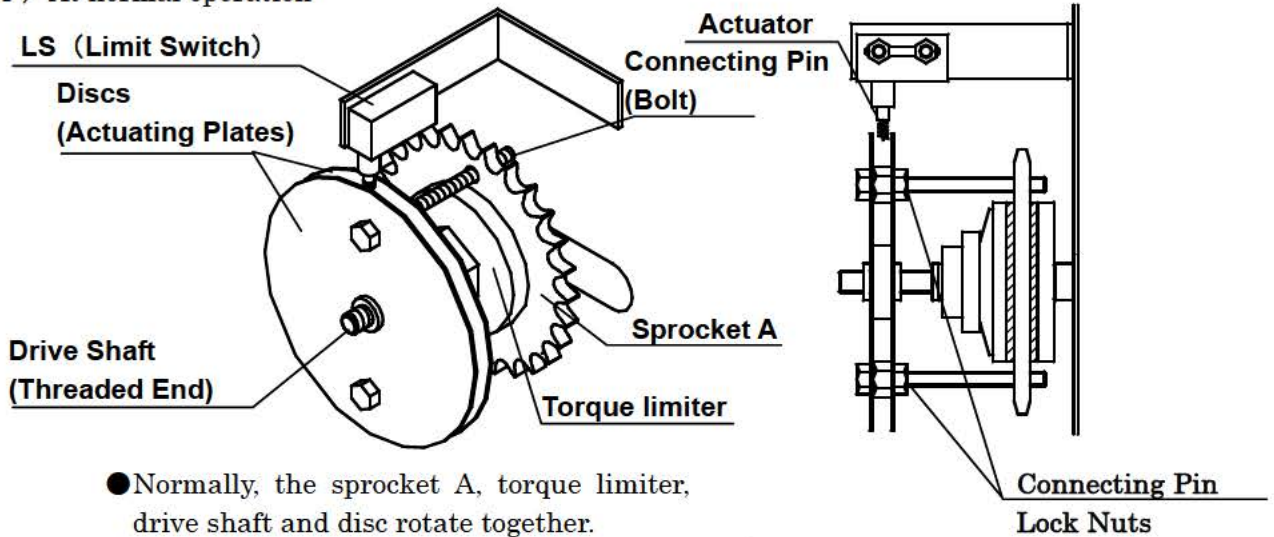
When an excessive torque is generated, the sprocket A slips against the linings and stops conveying the power, thus preventing damages on the conveyor. (At this time, the geared motor dose not stops)

The torque limiter is automatically reverted by elimination a cause of the excessive torque.



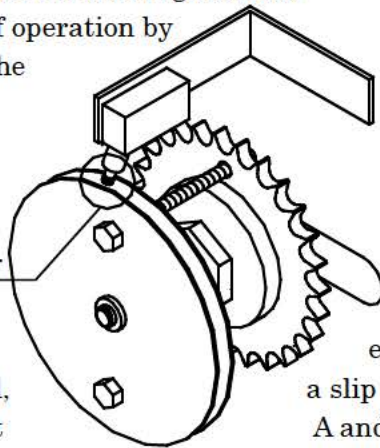
Torque limiter Component

- (2) - 2 Torque limiter Plus Limit Switch Type.
 (I) At normal operation



(II) When an overload is generated
 (Suspension of operation by a reaction of the limit switch)

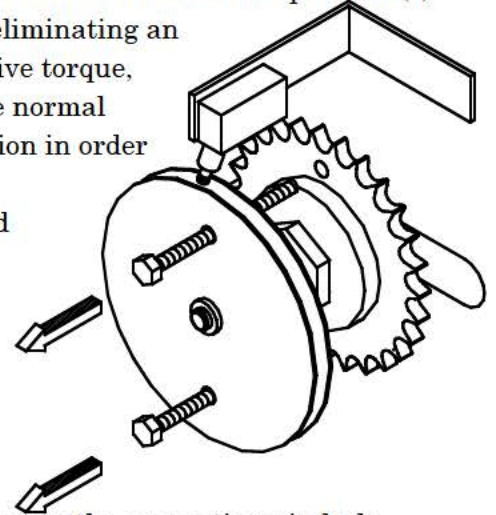
Discs come into contact with Actuator



- When an excessive torque is generated, a slip occurs between the sprocket A and torque limiter.
- When the torque limiter and drive shaft stop rotation and only the sprocket A and discs keeps on rotating, the threaded end of the drive shaft causes the disc to move into contact with the actuator, and as a result, the geared motor stops.

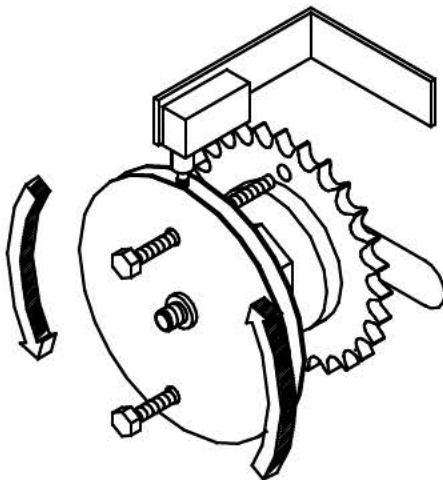
(II) Restoration of normal operation(a)

*After eliminating an excessive torque, restore normal operation in order of (3), (4) and (5).



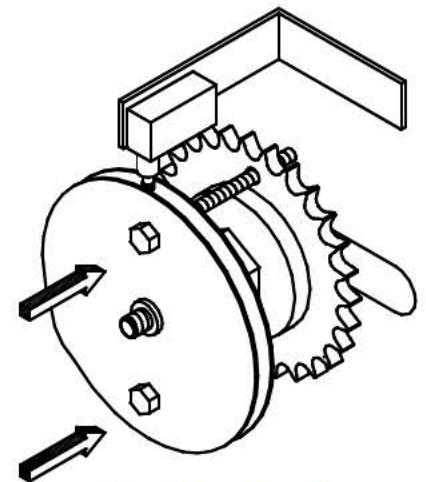
- Loosen the connecting pin lock nut and remove each connecting pin from the sprocket A.

(IV) Restoration of normal operation(b)



- Turn the disc counterclockwise until the actuator comes to the center position. (Clockwise depending on the model used)

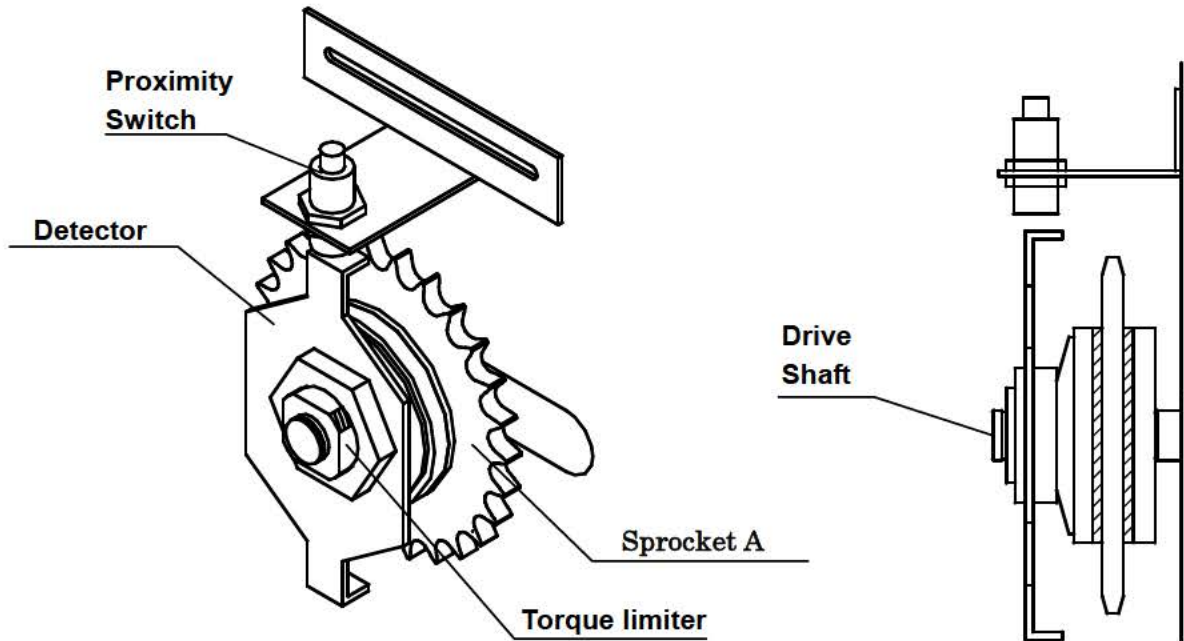
(V) Restoration of normal operation(c)



- After inserting the connecting pins into the sprocket A, Tighten the lock nuts.

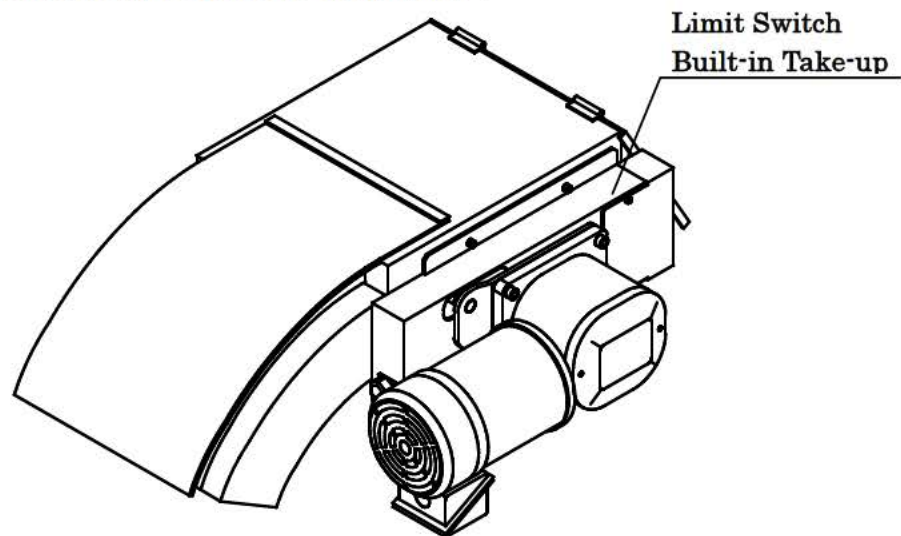
(2) - 3 Torque limiter Plus Proximity Switch Type

- At the time of normal operation, the sprocket A, torque limiter, drive shaft, and detector rotate together, and the detector causes the proximity switch to issue a signal at constant intervals.
- when an excessive torque is generated and the torque limit slips, disturbance of the signal issued from the proximity switch is detected and the geared motor stops automatically.
- The torque limiter and proximity switch are automatically reverted by eliminating a cause for the excessive torque.

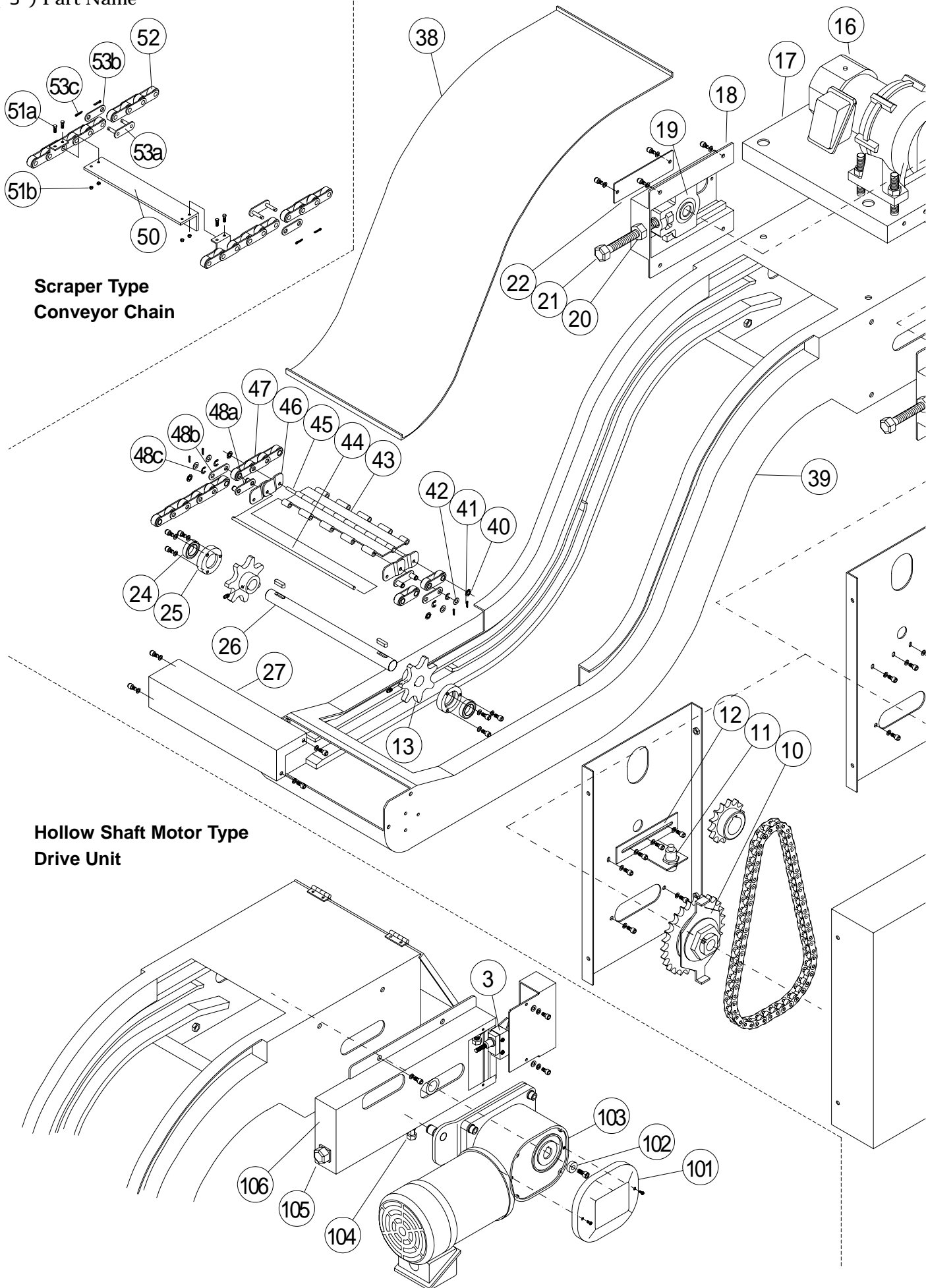


(2) - 4 Hollow Shaft Motor Type

- the hollow shaft motor type incorporates the safety device in the limit switch built-in take-up.
- when an excessive torque is generated on the conveyor, the safety device is actuated to automatically stop or reversibly run(optional)the conveyor.
- when the conveyor stops automatically, check a cause for an excessive load, run the conveyor reversibly, and eliminate the cause.
- Reverse rotation automatically reverts the safety device.

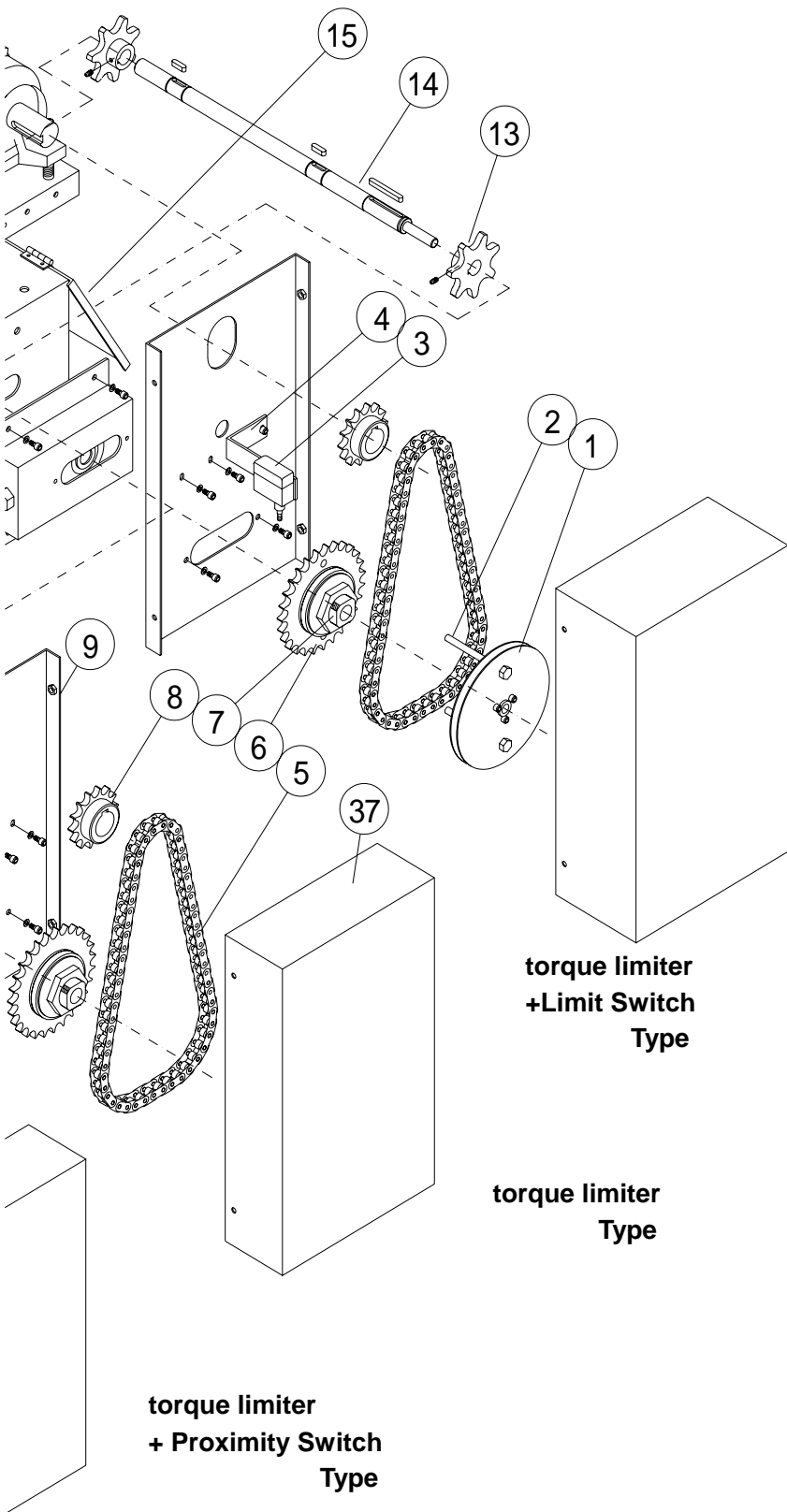


(3) Part Name



**Scraper Type
Conveyor Chain**

**Hollow Shaft Motor Type
Drive Unit**



- 1 Discs(Actuating Plates)
- 2 Connecting Pin(Bolt)
- 3 L S (Limit Switch)
- 4 L S bracket
- 5 Drive Chain
- 6 Sprocket A
- 7 Torque limiter
- 8 Sprocket B
- 9 Safety Plate
- 10 Detector
- 11 Proximity Switch
- 12 Proximity Switch bracket
- 13 Sprocket R
- 14 Drive shaft
- 15 Top cover
- 16 Geared motor
- 17 Motor base
- 18 Take-up bracket
- 19 Take-up unit
- 20 Lock nut
- 21 Tension bolt
- 22 Bracket cover
- 24 Bearing
- 25 Housing
- 26 Driven shaft
- 27 Tail cover
- 37 Safety Cover
- 38 Center cover
- 39 Main frame
- 40 Bush nut
- 41 Split pin
- 42 Washer
- 43 Hinge plate
- 44 Pin B
- 45 Pin A
- 46 Side plate
- 47 Roller link
- 48 a Link
- 48 b Link plate
- 48 c E-ring
- 50 Scraper
- 51 a Bolt (Scraper use)
- 51 b Nut (Scraper use)
- 52 Roller link (Scraper type)
- 53 a Link (Scraper type)
- 53 b Link plate (Scraper type)
- 53 c Split pin (Scraper type)
- 101 End cover
- 102 Spacer
- 103 Geared motor (Hollow Shaft)
- 104 Lock nut b
- 105 Tension bolt b
- 106 LS Built-in Take-up

Since this is a standard unit drawing, it may be slightly different from the actual machine. The machine is subject to technical modification without prior notice.

2 Unpacking

Check the following after opening the package. If something is wrong or you find any problems, contact your sales agent.



CAUTION

Check that the machine is the one you ordered. Installing the wrong machine may cause injury or machine damage.

- (1) Check the specifications on the machine plate to confirm your order.
- (2) Check that the machine has not been damaged during transportation.
- (3) Check that bolts and nuts are firmly tightened.
- (4) Check that all accessories you have ordered are included in the package.

3 Carriage



WARNING

DO NOT go under the machine while it is being hoisted for carriage. A fatal accident may result if the machine falls.



CAUTION

Take the greatest care to prevent this machine from dropping when carrying it. Be sure to use hoisting fittings if provided. However, DO NOT hoist the whole machine with hoisting fittings after installation. This may damage hoisting fittings or the machine, or cause injury due to the machine's fall.

4 Installation



CAUTION

Attach a cover to the chip inlet of the chip conveyor to keep hands from entering during operation. Injury may result.
DO NOT climb onto or hang from the chip conveyor. Injury may result.
DO NOT put any obstacles which prevent ventilation around the geared motor.
Burns due to overheating or fire may result.

5 Wiring



WARNING

Perform wiring according to the electric equipment technical standards and wiring regulations. Burns, electrical shock, fire or injury may result.
Make sure that qualified personnel, such as an electrician, perform wiring.
Burns, electrical shock, fire or injury may result.
Be sure to place the ground leakage breaker at the power source.
Burns, electrical shock, fire or injury may result.

- (1) Connect this machine to a power source of appropriate voltage.
- (2) Be sure to ground the machine.
- (3) Use IV or KIV wire with a rated cross section of more than 2 mm² or vinyl cable for wiring.

6 Operation



WARNING

DO NOT operate the machine with the operation panel open. Electrical shock may result. Be sure to turn OFF the machine when electric failure occurs. When electricity recovers, the machine starts suddenly, which may result in electrical shock, injury or machine damage. DO NOT put a hand or foot in the opening section of the chip conveyor during operation. Injury may result due to a hand or foot being caught in the machine.



CAUTION

Stop the machine immediately when trouble occurs. Electrical shock, injury or machine damage may result. DO NOT touch the machine during operation. The geared motor becomes very hot, and may cause burns. DO NOT continue to feed the conveyor in reverse. The machine may be damaged.

- (1) Before turning on the machine, check the following
 - 1 . That the wiring is correct.
 - 2 . That the terminals are firmly connected.
 - 3 . That grounding is properly performed.
- (2) When commissioning, check the following
 - 1 . That no foreign matter is on the conveyor.
 - 2 . That the conveyor's actual rotating direction matches the machine's arrow direction. When they are different, turn off the machine and switch two of the three electric lines.
 - 3 . Feed the conveyor more than one round by inching with a two-second interval to make sure that there are no abnormalities.
- (3) Check the following during operation
 - 1 . There is no abnormal sound, vibration and heat.

7 Maintenance and Inspection



WARNING

Be sure turn OFF the machine and cut OFF the power supply to the machine before maintenance, inspection, changing parts, adjustment, or repairing the machine. Fatal accidents may result. When performing maintenance or inspection, make sure to inform other workers who are concerned with the machine. DO NOT operate the machine without the cover after maintenance or inspection work. Serious accidents may result due to an operator's is being caught in machine.



CAUTION

Make sure that only a specialist adjusts, fixes, disassembles or assembles the machine. Electrical shock or injury may result without knowledge of the machine. Be sure to wear a helmet, safety glasses, safety shoes, and gloves before adjusting, fixing, disassembling or assembling the machine. Injury may result.

(1) Daily inspection

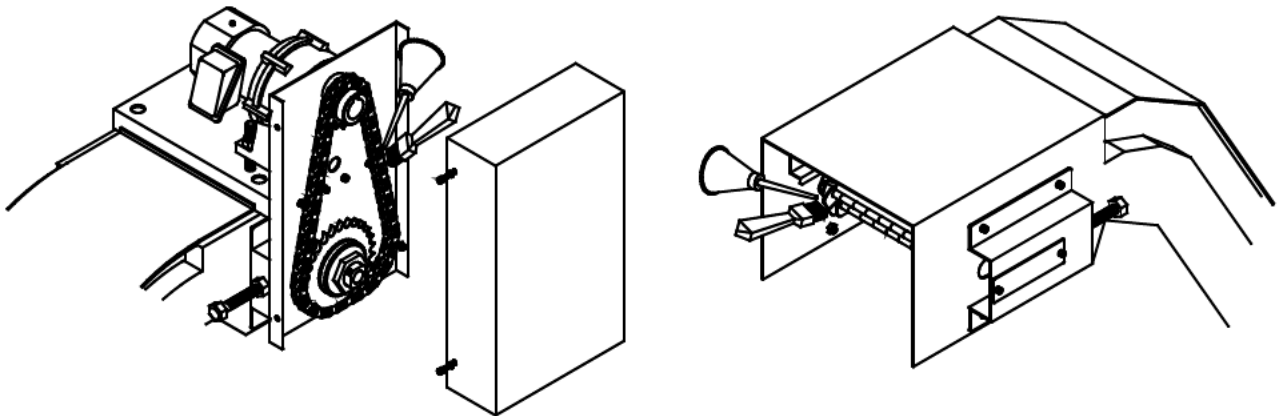
Check point	How to check	Description
Over currenecy	Ammeter	Currenecy is less than rated current specified on the specification plate.
Noise	Listen	Noise.
Vibration	Touch	Abnormal vibration.
Surface temperature	Touch	The geared motor surface temperature is less than 80°C.
Emergency button	Press the button	The emergency button stops the conveyor.

(2) Periodical inspection

Check point	How to check	Description
Conveyor chain tension	Monthly	Check the conveyor chain for looseness and tightness. Adjust the tension, referring to (4)
Drive chain lubrication	Every 6 months	Lubricate SAE30 Mobil oil or oil close to it or apply grease, referring to (3)
Conveyor chain lubrication	Every 3 months	Lubricate SAE30 Mobil oil or oil close to it or apply grease, referring to (3)
Bolts' looseness	Annually	Check bolts for looseness with a spanner or a wrench. if they are loose, tighten them.
Cleaning inside the conveyor	Annually	Clean inside the conveyor referring to (5)

(3) Lubrication

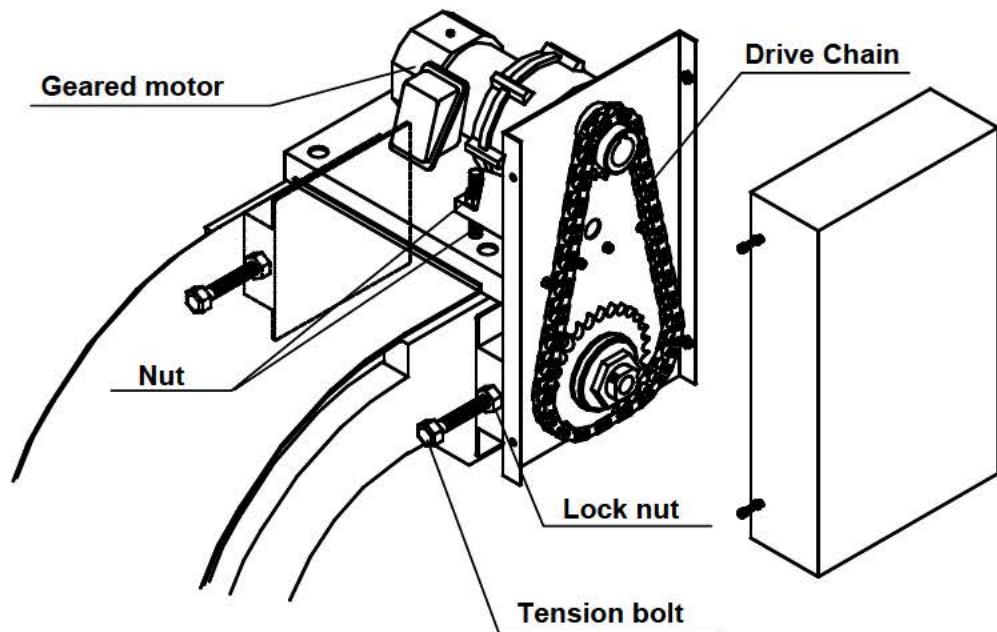
- 1 . The geared motor does not require lubrication since it is prelubricated.
- 2 . Lubricate the conveyor chain with a brush or a lubricator.



(4) Adjusting the conveyor chain tension

The conveyor loses its tension as it is used. Adjust the tension in the following procedure.

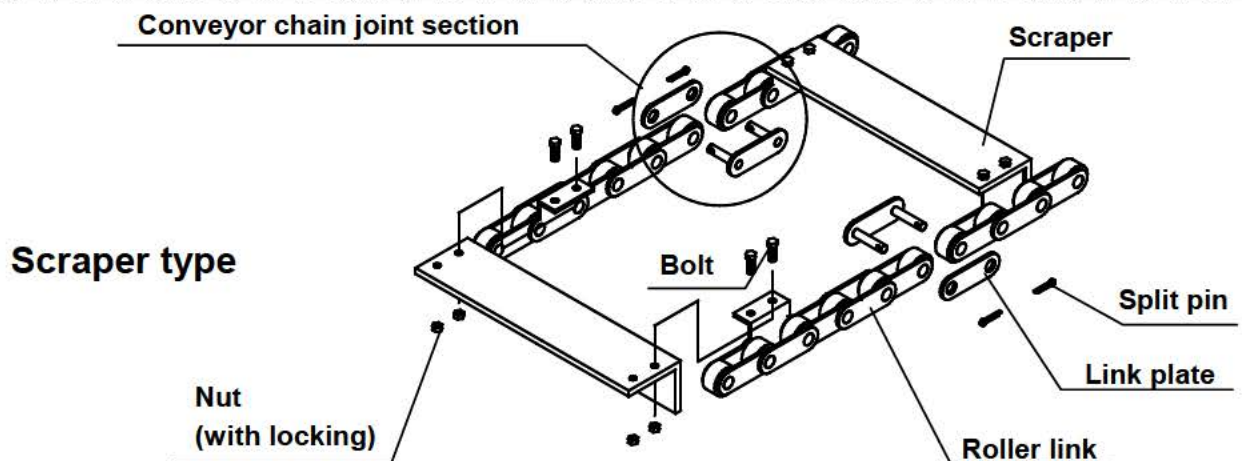
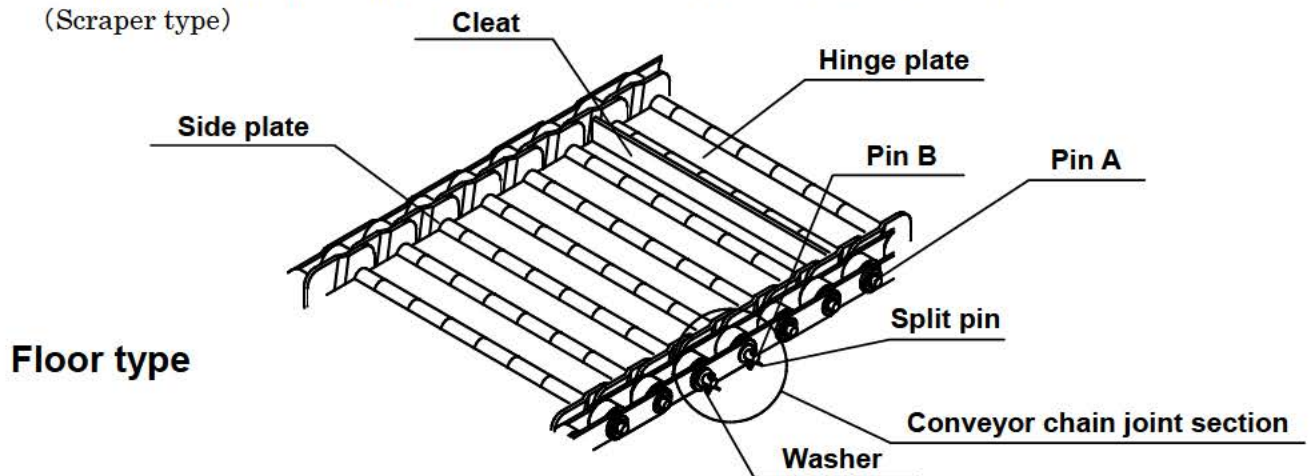
- 1 . Loosen the nuts used to lock the geared motor and lower the motor position about 20mm to give some allowance to the drive chain.
- 2 . Loosen the lock nuts of the take-up bracket.
- 3 . Turn the tension bolt gradually to give an appropriate tension to the conveyor chain.
- 4 . Tighten the lock nuts of the take-up bracket.
- 5 . Lift the geared motor until the drive chain has an appropriate tension, and them, fix it firmly with the nuts.
- 6 . When either limit switch or proximity switch is used for the safety device, move then as much as the tension bolts have been. Refer to [(2) Safety Device]

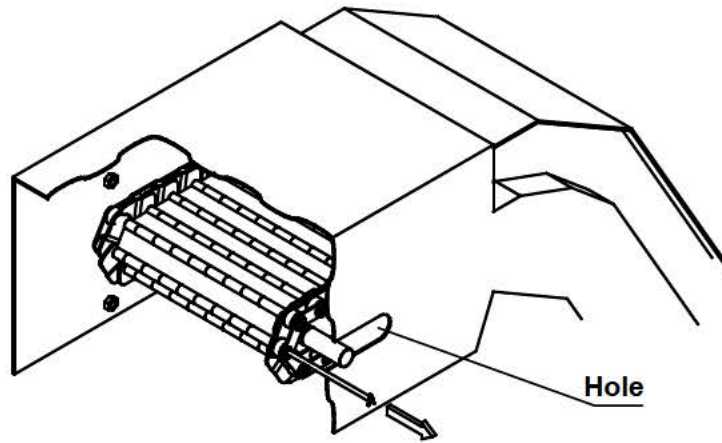


(5) Cleaning inside the conveyor

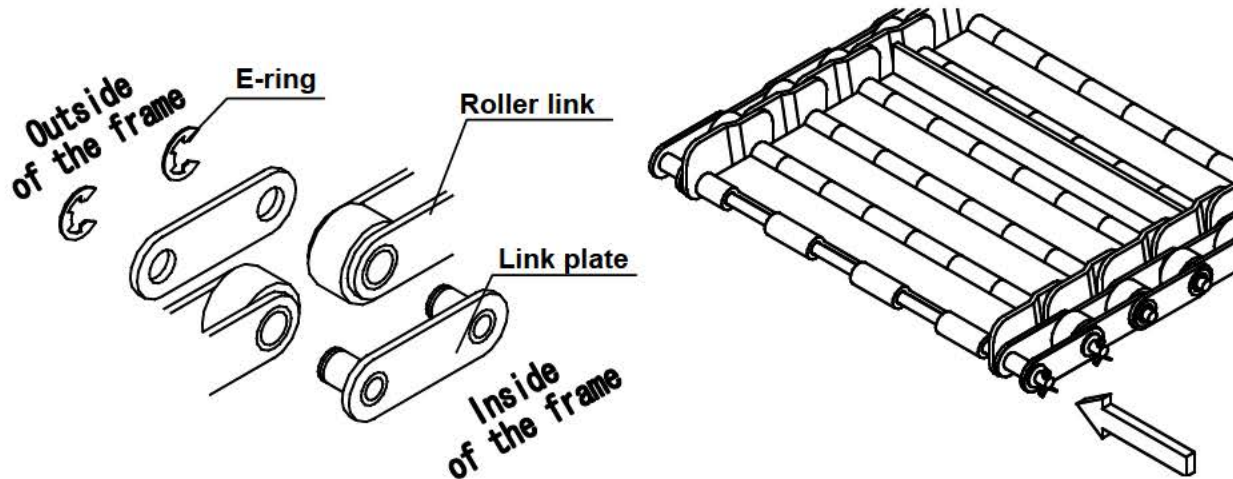
Clean inside the conveyor once a year. Following is the procedure for disassembling and assembling the hinge plate and the scraper when cleaning the conveyor.

1. Find the conveyor chain joint section. Feed the conveyor so that the joint section reaches the chip outlet. (where the split pin is seen through a slot.)
2. After loosening the lock nut, loosen the tension bolt fully. Refer to (4)
3. Remove one split pin from the pair of pin Bs on one side of the joint section. (Floor type)
Remove the split pin from the conveyor chain and remove the link on both sides.
(Scraper type)

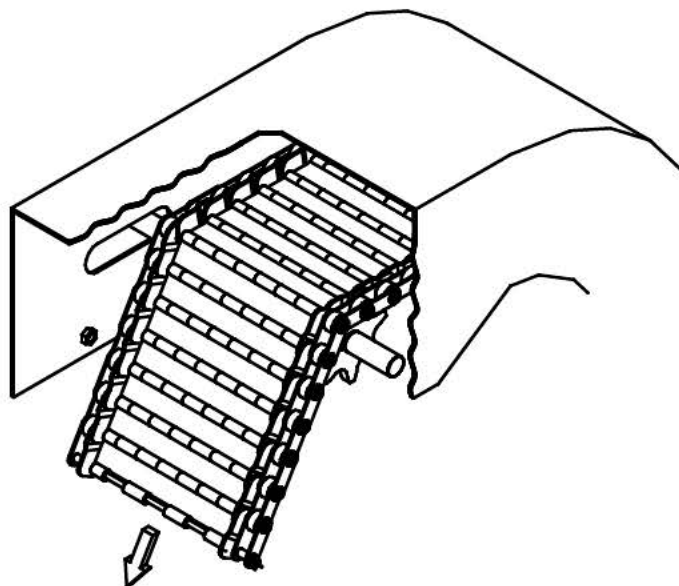




4. Pull out pin B to remove the side plate and hinge plate.(Floor type)
5. Remove the conveyor chain E-ring with pliers. Then remove the links on both sides of the coupling (Floor type)
6. Return pin B to its original position to fix the end of the conveyor chain. (Floor type)



7. Pull out the conveyor chain . (When replacing the hinge plate and scraper, attach a new conveyor chain to the old one to facilitate replacement.)
8. Reassemble the machine in the reverse order of disassembly.(Set the conveyor chain from the bottom. Pay attention to the direction of the side plate or the scraper.)



8 Troubleshooting

Trouble	Cause		Countermeasure
The conveyor does not start.	Electricity is not supplied to the control panel.		Check for power failure, line breakage, and disconnection.
	Thermal relay is activated.		Press the reset button.
The conveyor stops.	Foreign matter is in the machine.		Remove the foreign matter by reversing the machine.
	Chips are in the machine.		Remove the chips by reversing the machine.
	A split pin (bush nut) is damaged or missing.		Replace the split pin (bush nut).
	The safety device is activated.		Reverse the machine to set it.
	A large amount of chips are loaded at one time.		Feel the conveyor in reverse to remove the chips.
Others	Knocking	Chain has lost its tension.	Adjust the conveyor chain tension.
	Abnormal sound	Bearing malfunctions.	Replace the bearing and the take-up unit.
		Chain needs soil.	Lubricate
	Side plate damage	Foreign matter is in the machine.	Remove the foreign matter and replace the side plate.
	Hinge plate damage	A heavy object fell on the hinge plate.	Replace the hinge plate and pins.
	Scraper breakage	The Scraper is caught or wound by long chips.	Replace the scraper.

chips differ in forms and amount depending on the machining conditions and materials . Consult us (Hakusan Kiko CO.,Ltd.)if you have any problems or inquiries.

9 Disposal



CAUTION

Dispose of the chip conveyor as general industrial waste.

10 Guarantee

This machine is guaranteed for one year after delivery as long as it is installed in a designated way and operated with proper maintenance and inspections. Only the main unit is guaranteed to be repaired.

(Torque limiter / LS built-in take-up)

2 0 1 2 - 0 2