

# **INSTRUCTION MANUAL**

**FOR**

**STRAPPING TOOL**

**MODEL   【SUMO】**






Rev.1.B

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## Safety instructions

- Before starting operation, maintenance or inspection of this device, carefully read this instruction manual.
- Contents shown in this instruction manual are described to assist safe operation and prevent danger and the damage to you and other people beforehand.
- For individual operation, observe the contents of this instruction manual. Although this device is designed and manufactured in consideration of safety, failure to follow this precaution may cause serious personal accidents such as the death or serious injuries.
- Before starting individual operation, understand the knowledge of the equipment, safety information, and all contents of this instruction manual.
- In this instruction manual, the ranks of the safety precautions have been divided with “Danger” , ”Warning” , ”Caution” ,and “Notes”.

 <b>DANGER】</b>	Indicates a hazardous situation which, if not avoided, will result in death or serious bodily injury.
 <b>WARNING】</b>	Indicates a hazardous or potentially dangerous situation which, if not avoided, could result in death or serious bodily injury.
 <b>CAUTION】</b>	Indicates a hazardous or potentially dangerous situation which, if not avoided, could result in minor or moderate bodily injury or property damage.
<b>【※ Notes】</b>	Indicates that mishandling may cause an operational mistake.

Even if the matter described to “Caution”, there is the possibility to relate to an important result according to the situation. Observe all safety precautions because the important contents have been described.

## 1. Safety Instructions

### 1-1. General precautions

- (1) Always keep “safety” in mind when using this tool.  
For proper use of this tool, sufficiently understand the safe use methods.
- (2) Please carefully read this instruction manual to understand proper usage before running, inspection, and maintenance of the tool.
- (3) Never remove any safety device such as a safety cover attached to the tool.
- (4) Do not remove or make illegible labels and indications affixed to the tool.
- (5) When not using the tool or during inspection or maintenance of the tool, shut off the air supply. And, do not touch the knife part (tip) with your bare hands.
- (6) If you notice any unusual movement or abnormality, stop using the tool.
- (7) Please inform us of any comments or questions you may have concerning safe use of our tools.

### 1-2. Application

This tool is designed to bind around various objects by using straps. Please do not use for purposes other than binding.

### 1-3. Work wear

When using this tool, wear protective equipment such as “protective glasses,” “protective mask,” “earplugs,” “leather gloves,” “protective footwear,” and a “helmet.”

In addition, make sure to wear long-sleeve outer wear and button the cuffs before use. Be careful so that neckties and long hair do not become tangled in the tool.

### 1-4. Protective equipment



#### (1) Protective glasses

If a strongly bound strap is cut by scissors, a rebound strap may damage the eyes of an operator and make the operator blind. Never fail to wear protective glasses.

Also, dust attached to the tool may enter your eyes when cleaning the tool by air blow. Never fail to wear protective glasses.

#### (2) Protective mask

Turbine oil is contained in exhaust air from the tool. Never fail to wear a protective mask.

#### (3) Earplugs

It is recommended to wear earplugs in order to protect ears from running noise and exhaust noise from the tool.

#### (4) Protective gloves

For handling straps and sharp objects, wear protective gloves because touching them accidentally or carelessly may cause an incision wound.

(5) Safety shoes

Wear protective footwear (safety shoes) as heavy objects may drop and injure your feet.

(6) Helmet (Protective cap)

Wear a helmet or hard hat as the strap after cutting may snap back and injure your head.

1-5. Precautions

(1) Never touch the cutter part with your fingertips, because doing so may cause injury or severing of fingers.

(2) Vibration

- 3-axis composite vibration value is measured based on the description in “JIS B 7761-2:2004 (ISO 5349-2:2001)” using a vibration meter specified in “JIS B 7761-1:2004” and “JIS B 7761-3:2007 (ISO 5349-1:2001).”
- Depending on the total operating time, operators may be at risk. Get a physical checkup based on “Guidelines for Preventive Measures against Vibration Hazards in Work with Vibratory Tools other than Chain Saws,” etc., and take measures, safety and health education, and exercise based on the checkup result.

(3) Rotation

During rotation of the feed wheel when tightening straps, do not touch or stick fingers into the feed wheel, otherwise, fingers may be entangled.

1-6. Inspection and repair

- (1) Remove the tool from the air hose or stop feeding compressed air before inspection or repair.
- (2) Check the attached portion of the tool to which a suspension (lifting component) is attached for looseness before operation.
- (3) Stop using the tool before inspection and repair any worn or damaged parts. Please contact us wherever necessary.

1-7. Disposal of the tool

“Steel,” “aluminum alloy,” “copper alloy,” “rubber,” or “plastics,” etc., is used for the tool. Please dispose of the tool according to the related ordinances etc., of the laws and regulations of the related national and local governments.

1-8. Inspection before work

- (1) Check the tool to confirm that there is no looseness or damage of the bolts before work every day. Clean the feed wheel for clogging by using a wire brush, etc.
- (2) Discharge the drain in the air supply piping.
- (3) Check if the air pressure is correct (0.6MPa) at the pipe end.
- (4) Check if oil level and drop amount of lubricant (turbine oil ISO VG32) in the lubricator are correct.
- (5) When connecting the air piping, do not push the valve button.

## 2. Specifications

Model	Steel Strap		MAX.Strap Tension (0.6MPa)	Weight (kg)	Standard seal (mm)	Air Pressure (MPa)	3-axis composite vibration	Noise
	Width (mm)	Thickness (mm)					(m/s <sup>2</sup> )	(dB)
SUMO-19se	19	0.5~1.2	7840N	4.7	50	0.6 ※Note.1	0.68 ※ Note.2	100
SUMO-25se	25							
SUMO-32se	32							

Note.1) ◇ Minimum operating pressure changes according to the Thickness of strap and seal etc.

Note.2) ◇3-axis composite vibration value is measured based on JIS B 7761-2:2004 (ISO5349-2:2001).

Daily vibration exposure limit: 5.0m/s<sup>2</sup> or less.

Note.3) ◇Tightening force should be used within the elastic range of the strap.

### 3. Pneumatic Information

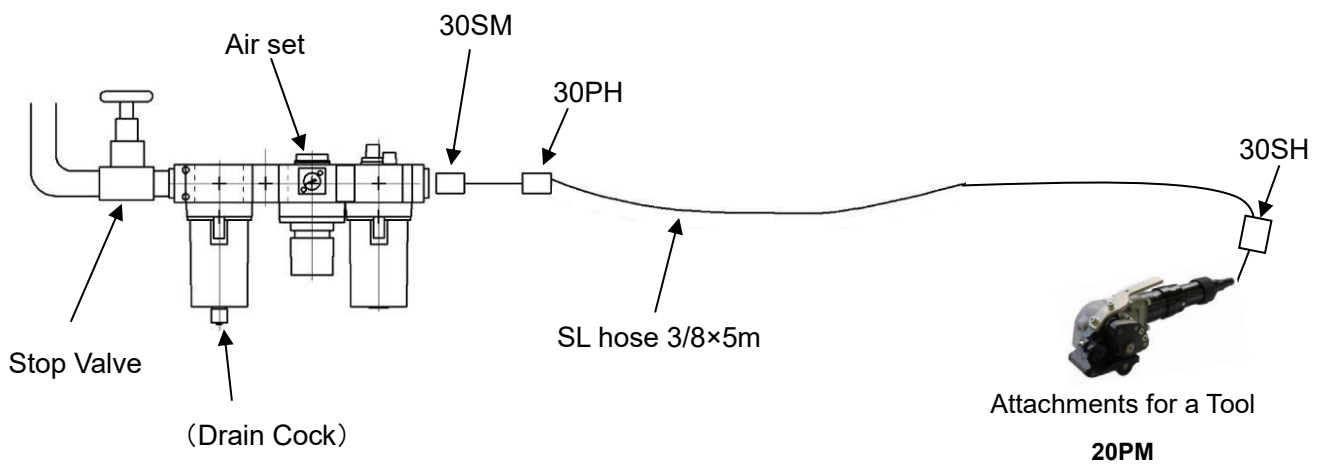
#### 3-1. Air source

As an air source of this tool, use a compressed air source of which the air pressure (source pressure) is 0.6MPa or more in the plant with a piping diameter of 3/8B (10A) or more, air flow rate of 1Nm<sup>3</sup>/min or more.

#### 3-2. Used air component

The following components are recommended for this tool.

SL hose: WS18Z-06(3/8)×5m (Yokohama Rubber), Plug 30SH, 30SM, 30PH (Nitto Kohki)



#### ※Caution

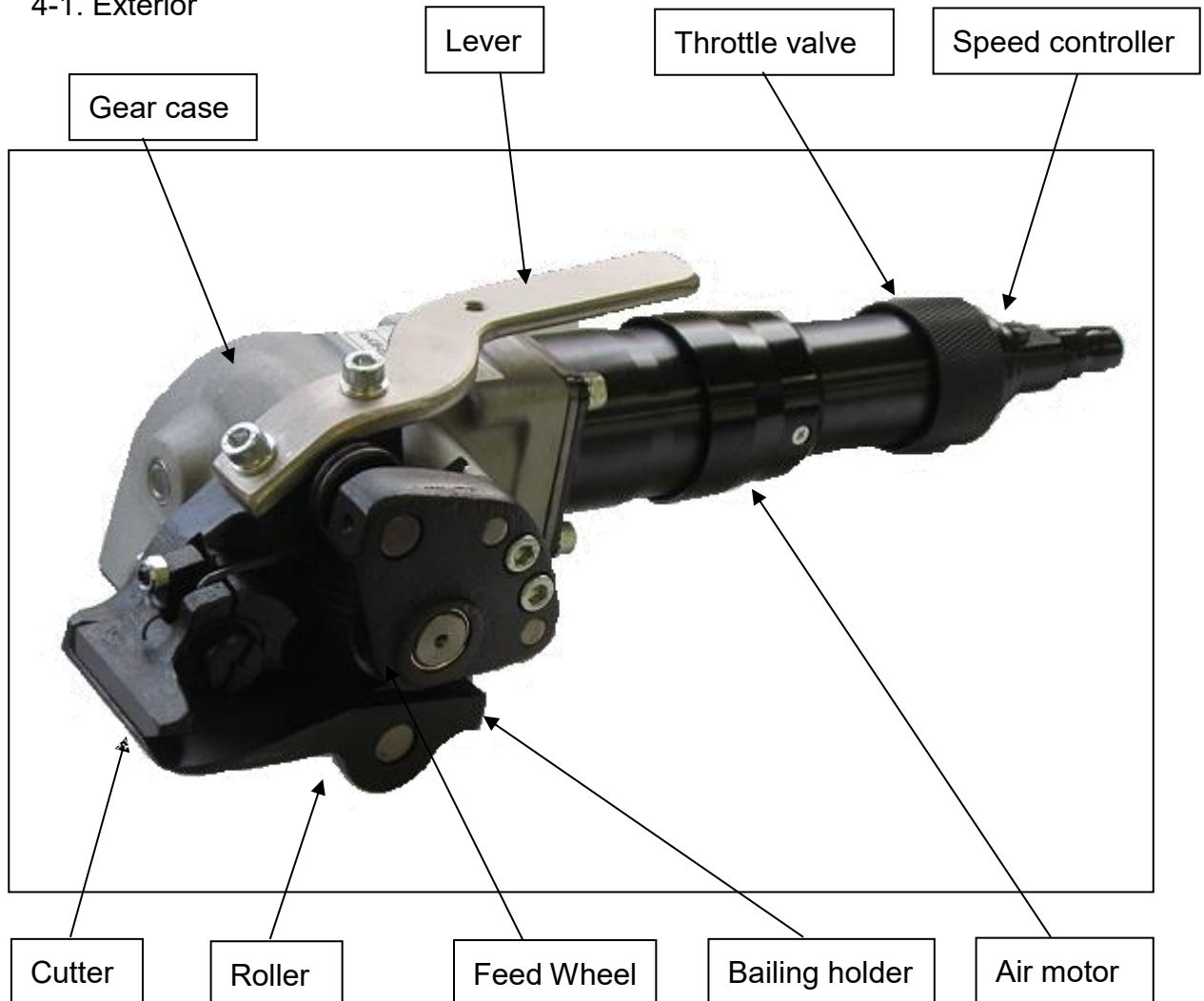
If you use hoses other than the specified hoses, use hoses at 9.5 or more in inner diameter and 5m or less in length. Use of hoses other than the above-specified hoses will cause a drastic reduction in pressure during operation. Please pay attention.

#### 3-3. Precautions for piping

- (1) Attach an air set of 3/8B or greater (filter, regulator, and lubricator) to the air source.
- (2) To prevent a reduction in pressure during operation, completely use parts of 3/8B or greater for piping.
- (3) An air motor is used for this tool. Be careful so as not to allow drain, rust, and pieces of seal tape in the piping to enter in the tool.
- (4) As the rotor of the air motor rotates at a high speed, if lubrication oil is insufficient in the air, the rotational number may drastically decrease or the tool may not start running. Always, pay attention to the level of lubrication oil (turbine oil: ISO VG32) of the lubricator, and adjust the oil drop amount so that 20 to 30 drops drip per minute.

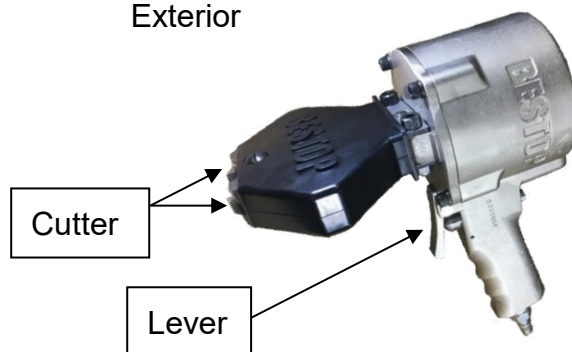
## 4. Operating Instructions and Adjustments

### 4-1. Exterior



-----Reference----- MODEL S SEALER-----

### Exterior





## 4-2. Operating method

### 1) How to pass a seal through a strap and bind strap

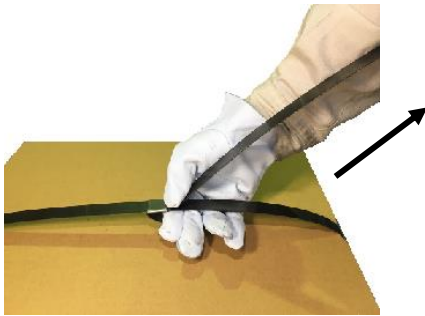


- ① Pass a strap through in a seal.  
Then, wind the strap around an object.

**【 ⚠ DANGER 】**  
Wear protective gloves

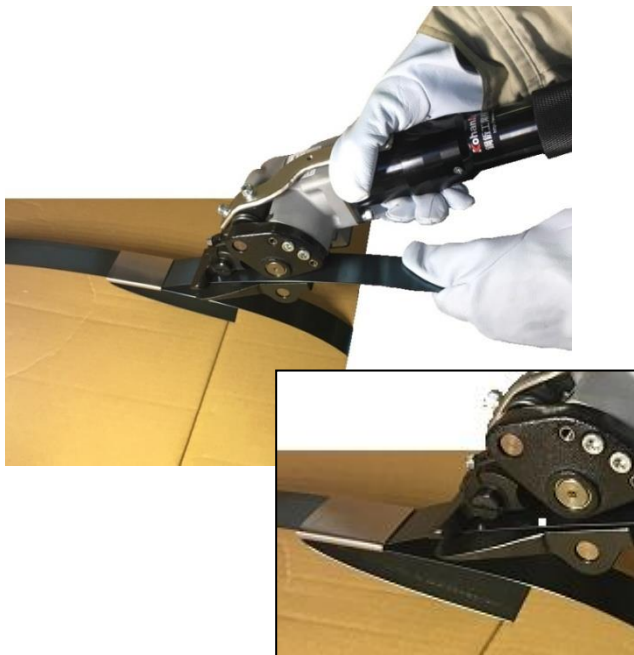


- ② Pass the end of the strap through in the seal.  
Then, fold the end of the strap under the seal  
(folding length is approximately 50mm)



- ③ Tighten the strap passed through the seal in  
the arrow direction to remove excess  
looseness.  
At that time, locate the seal at the  
approximately final position.

### 2) Strap setting



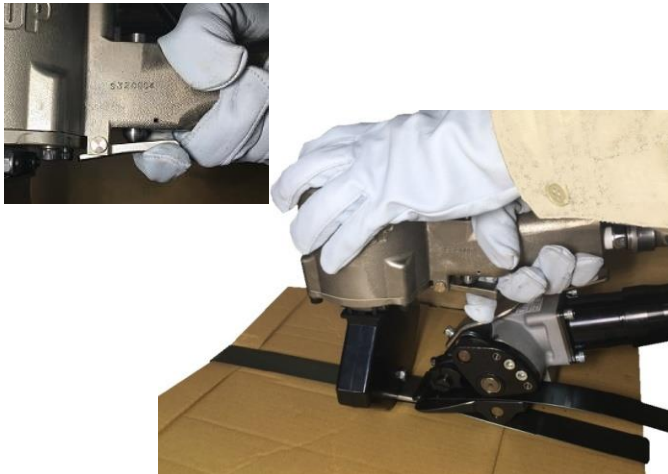
Place your thumb on the lever and hold the air  
motor with other fingers and grip them.  
The gear case goes up, and put the upper strap  
between bailing holder and feed wheel.  
Then push Tightener against seal, and release  
the lever.

### 3) Tightening



Turn throttle valve counterclockwise.  
(Feed wheel rotates by air motor)  
Tightener fastens the strap and holds correct tension on it.

### 4) Sealing



Place sealer over seal, press valve button.  
After sealing operation is finished,  
release valve lever and remove sealer from the seal.

#### 【 ⚠ DANGER】

After sealing take your face away  
the body.

### 5) Cutting



Tilt tightener upward to vertical position  
while keeping throttle valve at full open  
position.

After strap is cut off, turn throttle valve  
clockwise to stop.

#### 【 ⚠ WARNING】

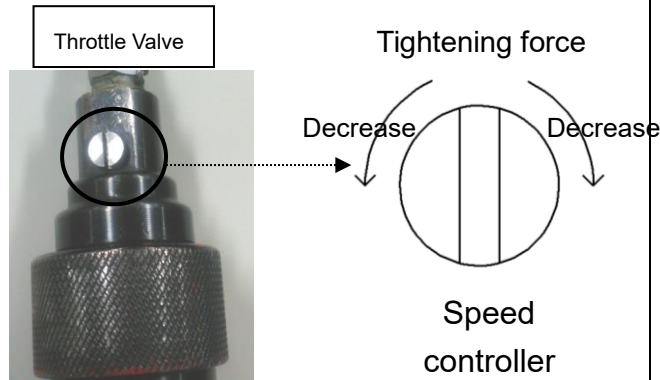
Do not insert the finger between the  
handle lever and the air motor at the  
cut-off the strap.

#### 【 ⚠ WARNING】

Relief air pressure before remove  
Tightener from the air hose.

#### 4-3. Adjustment

##### Tightening force adjustment by Speed controller

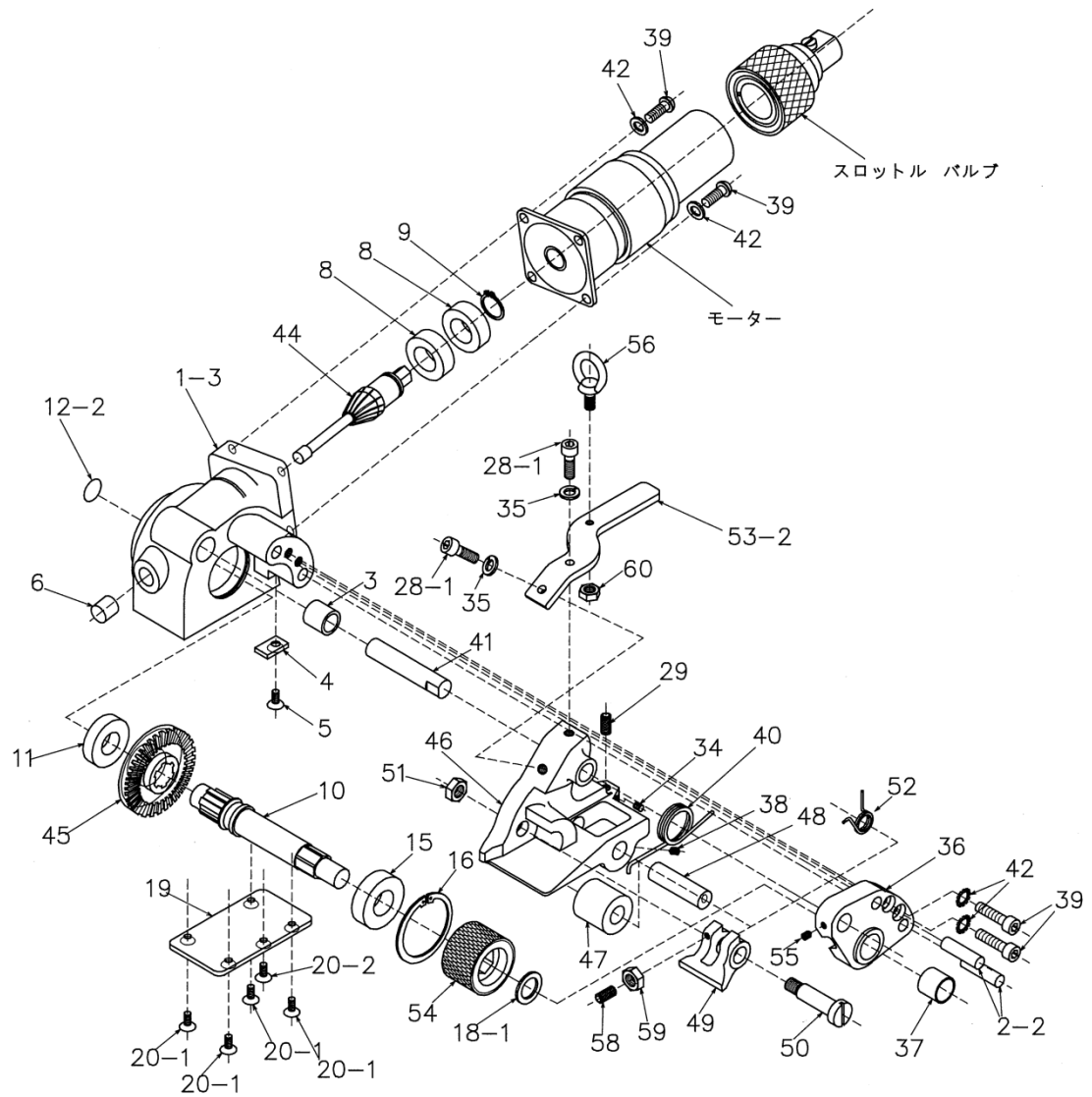


It is possible to adjust tightening force by Speed controller.

In order to adjust tightening force:  
Turn Speed controller as in the left figure by flathead screwdriver.

## 5. Exploded-view Drawing & Bill of Materials

### 5-1. Exploded-view Drawing : HP TIGHTENER



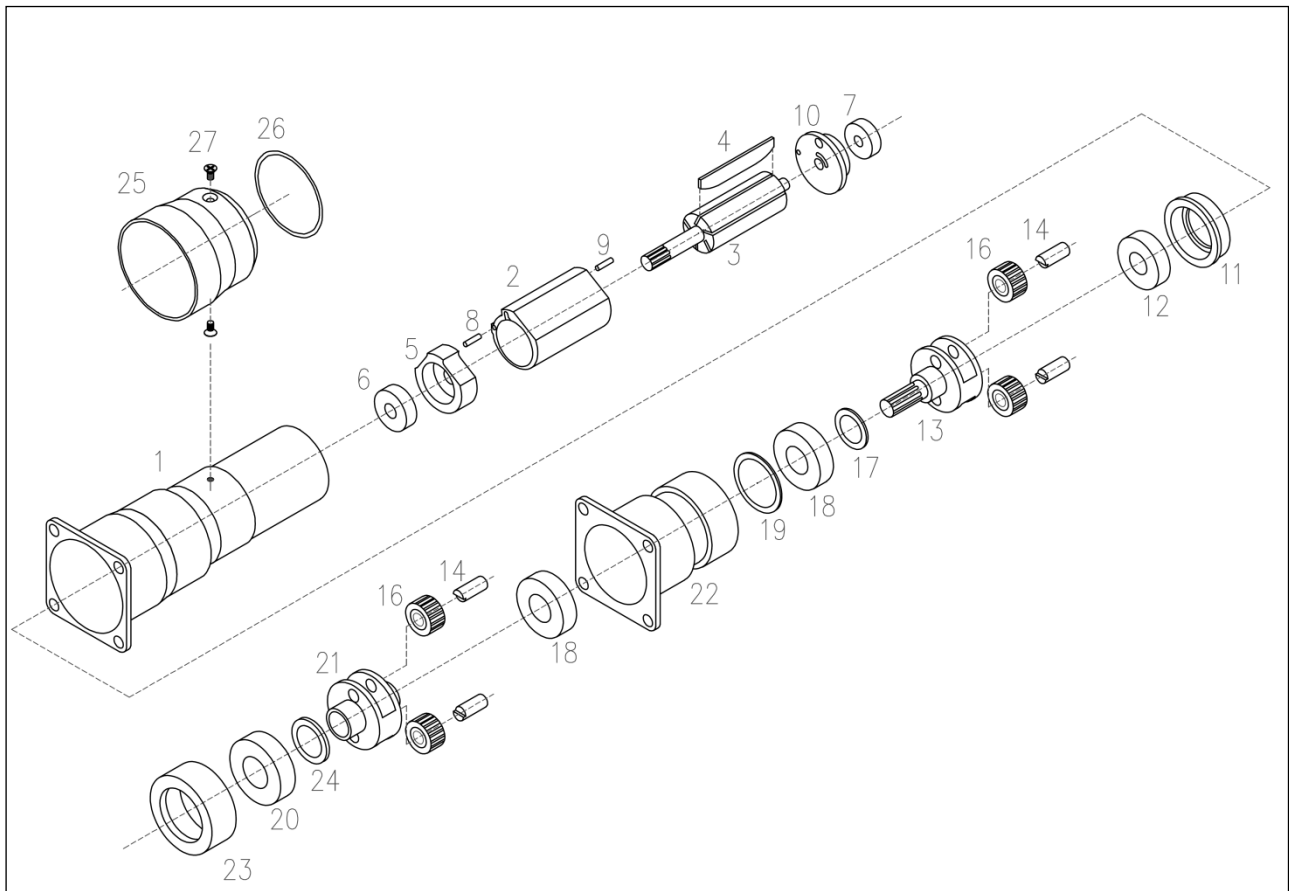
## 5-2. Bill of Materials :HP TIGHTENER

(1/2)

KEY No.	Parts Name	(Parts No.)	DWG.No (Model No)	Q'ty	Expendable-parts
1-3	Gear case	0005	CK13476-1	1	
2-2	Nock pin	0017	(MST8-30)	2	
3	Gear case bush	0016	EK8936-1	1	
4	Stopper plate	0012	EK8934-1	1	
5	Countersunk head screw	Purchase	(M5×12)	1	
6	Needle bearing	Purchase	(BK0810CT)	1	○
8	Ball bearing	Purchase	(#6003ZZ)	2	○
9	C-type retaining ring for shaft	Purchase	(17)	1	
10	Main shaft	0015	DK9194-1	1	○
11	Ball bearing	Purchase	(#16002)	1	○
12-2	Plug	1127	EK10284-1	1	
15	Ball bearing	Purchase	(#6003ZZ)	1	○
16	C-type retaining ring for bore	Purchase	(35)	1	
18-1	Washer	0031	EK15799-1	1	○
19	Bottom plate	00212	DK12728-1	1	
20-1	Countersunk head screw	Purchase	(M4×20)	4	
20-2	Countersunk head screw	Purchase	(M4×12)	1	
28-1	Hexagon socket head cap screw	Purchase	(M6×16)	2	
29	Hexagon socket set screw (Long dog point)	Purchase	(M6×15)	1	
34	Hexagon socket set screw (Truncated cone point)	Purchase	(M4×5)	1	
35	Spring lock washer	Purchase	(M6)	2	
36	Hanger	00323	DK9192-1	1	
37	Bush	Purchase	(K5B1515)	1	○
38	Hexagon socket set screw ( Truncated cone point)	Purchase	(M6×5)	1	
39	Hexagon socket head cap screw	Purchase	(M6×25)	6	
40	Holder spring	00041	EK19610-1	1	○
41	Hanger pin	0018	EK8933-1	1	
42	Hexagon socket head spring lock washer	Purchase	(M6)	6	
44	Hypoid pinion	0009	DK9117-4	1	○
45	Hypoid gear	0014	DK9113-4	1	○

KEY No.	Parts Name	(Parts No.)	DWG.No (Model No)	Q'ty	Expendable-parts
46	Baling holder	0026	CK3802-1	1	
47	Roller	0035	EK8932-1	1	○
48	Roller shaft	0036	EK8953-1	1	○
49	Cutter	00383	DK18801-1	1	○
50	Cutter pin bolt	0040	EK8954-1	1	○
51	Hexagon nut small size	Purchase	(M8)	1	
52	Cutter spring	00042	EK19618-1	1	○
53-2	Lever	00236	DK19113-1	1	
54	Feed wheel	00301	DK16794-1	1	○
55	Hexagon socket set screw (Cup point)	Purchase	(M4×5)	1	
56	Eye bolt	Purchase	(M6)	1	
58	Hexagon socket set screw (Flat point)	Purchase	(M5×15)	1	
59	U-nut	Purchase	(M5)	1	
60	Nut	Purchase	(M6)	1	

### 5-3. Exploded-view Drawing : MOTOR

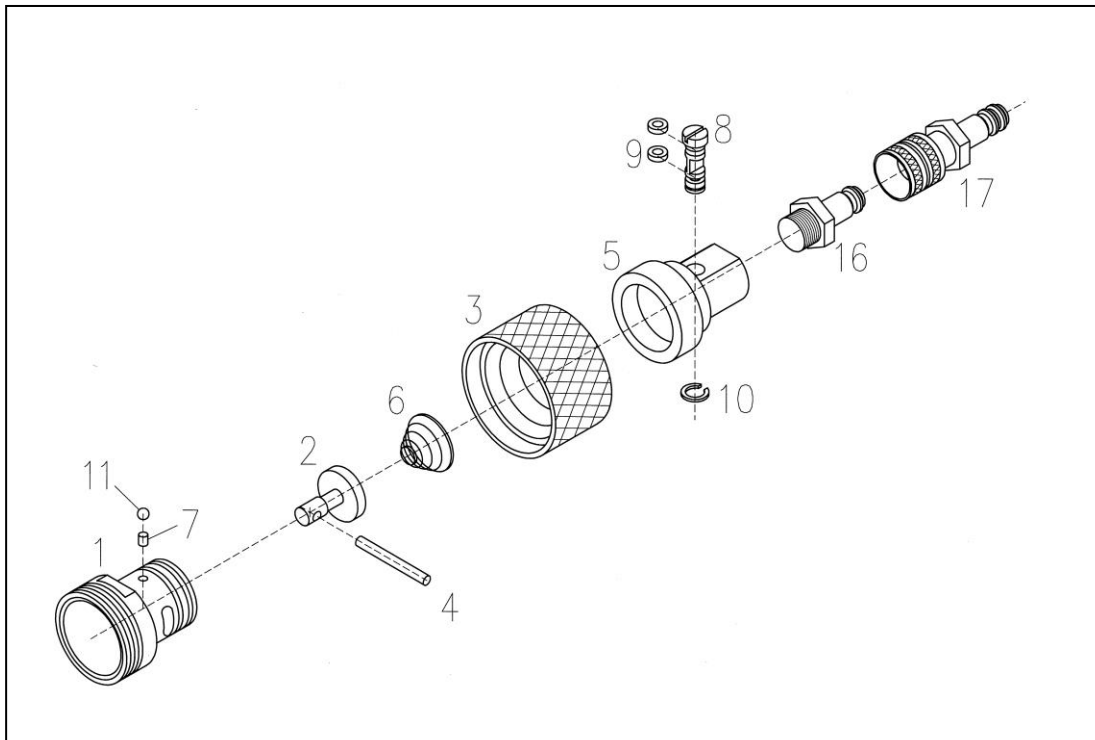


#### 5-4. Bill of Materials :MOTOR

KEY No.	Parts Name	(Parts No.)	DWG.No (Model No)	Q'ty	Expendable- parts
M1	Motor case	01012	DK18412-1	1	
M2	Cylinder	01181	CK12522-1	1	○
M3	Rotor	01211	DK18012-1	1	○
M4	Vane	01222	EK19753-1	5	○
M5	Front cylinder cover	01171	DK18057-1	1	○
M6	Ball bearing	Purchase	(#608ZZ)	1	○
M7	Ball bearing	Purchase	(#626ZZ)	1	○
M8	Needle pin	Purchase	(φ2×7.8)	1	○
M9	Needle pin	Purchase	(φ2×6.8)	1	○
M10	Rear cylinder cover	01241	DK18058-1	1	○
M11	Bearing box for 1ST idle frame	0115	DK12135-1	1	○
M12	Ball bearing	Purchase	(#6001ZZ)	1	○
M13	1ST idle frame	0110	DK12136-1	1	○
M14	Idle gear shaft	0111	EK13332-1	4	○
M16	Idle gear	0113	EK13333-1	4	○
M17	1ST idle frame washer	0109	EK8744-1	1	○
M18	Ball bearing	Purchase	(#6002ZZ)	2	○
M19	Bearing ring for internal gear	0108	EK13628-1	1	○
M20	Ball bearing	Purchase	(#6003ZZ)	1	○
M21	2ND idle frame	01061	DK19086-1	1	○
M22	Internal gear	0102	DK0270-1	1	○
M23	Spacer	0103	EK13629-1	1	○
M24	2ND idle frame washer	0105	EK8745-1	1	○
M25	Exhaust cover	01301	EK20213-1	1	
M26	O-ring	Purchase	(S42)	1	
M27	Countersunk head screw	Purchase	(M3×8)	2	



## 5-5. Exploded-view Drawing : THROTTLE VALVE



## 5-6. Bill of Materials : THROTTLE VALVE

KEY No.	Parts Name	(Parts No.)	DWG.No (Model No)	Q'ty	Expendable parts
B1	Case cap	0200	DK18026-1	1	
B2	Throttle valve	02051	EK19769-1	1	
B3	Throttle valve handle	02071	DK18027-1	1	
B4	Throttle valve pin	0202	EK15776-1	1	
B5	Throttle valve cover	02081	DK18029-1	1	
B6	Valve spring	0206	EK17905-1	1	
B7	Plunger ball spring	02001	EK19788-1	1	
B8	Speed controller	1914	E64459-1	1	
B9	O-ring	Purchase	(P4)	2	
B10	E-type retaining ring	Purchase	(φ5)	1	
B11	Steel ball	Purchase	$\left[ \begin{array}{c} \phi 1/8'' \\ (\phi 3.175) \end{array} \right]$	1	
B16	Coupler(Plug)	Purchase	(20PM)	1	
B17	Coupler(socket)	Purchase	(30SH)		

## 6. Troubleshooting

Trouble condition	Cause	Actions to take
1. Malfunction	1. Low air pressure	1. Check to see whether the pressure gauge attached to the pressure reducing valve indicates the correct pressure. If the pressure is too low, make adjustment to the correct pressure.
	2. Insufficient air pressure ( Hose size : 3/8B×5m Flow : Max1.1Nm <sup>3</sup> /min)	1. Check to see if the size of the hose supplying air to the tool is correct. If the size is not correct, replace the hose. 2.
		2. Remove the main body and blow off compressed air through the air hose only, and check to see if the flow rate to the hose is correct. At this time hold the end of the hose firmly. Replace the rubber hose if the air supply amount is small due to the internal diameter having become small due to oil etc.
		3. Check if Throttle Valve and Speed controller are adjusted correctly.
		4. Check each part for air leakage and take action. If air leaks, it is considered that the packing is broken or tightening is poor, repair is required.
	3. Insufficient lubricant	1. If lubricator drop of the air set (F.R.L combination) is insufficiently adjusted, correct it. And inject some drops of turbine oil from the air supply port on the main body.

Trouble condition	Cause	Actions to take
1. Malfunction	4. Looseness of screw bolt	1. Looseness of the following screws or bolts results in a start failure, therefore, check and tighten them. <ul style="list-style-type: none"> <li>●Joining screw for motor case and throttle valve</li> <li>●Mounting bolts for the motor case and gear case.</li> <li>●Mounting bolts for main shaft hanger unit.</li> </ul>
	5. If there is no improvement even by the above operation	1. Internal abnormality is considered. Therefore, contact our distributor or our company. <Example> ~Motor-related~ <ul style="list-style-type: none"> <li>●Rotation failure to rust (caused by inflow of moisture etc.)or foreign substance etc., in air motor.</li> <li>●Breakage, wear and adherence of internal parts such as Rotor, Gear, Bearing etc.</li> <li>●Misalignment between Cylinder and Nock pin for cylinder cover.</li> </ul> ~Gear case-related~ <ul style="list-style-type: none"> <li>●Breakage or wear of gear and bearing, etc.</li> </ul> ~Throttle valve-related~ <ul style="list-style-type: none"> <li>●Breakage or wear of spring and O-ring, etc.</li> </ul>
2. Strap insertion failure	1. Cutter opening shortage	1. Check if the end condition of the screw for cutter angle adjustment is correct.
. Insufficient tightening force	1. When air supply pressure and supply amount are insufficient	1. For inspection of air amount, check to see if the difference in pressure between when the tightener is stopped and when idling has not significantly decreased. If it has decreased, the flow rate is insufficient. 2. If the distance from the air set(F.R.L combination) to Tightener is too long and they are connected with an air hose for piping, the air pressure is reduced. Therefore the distance should be 5 m or less.

Trouble condition	Cause	Actions to take
3. Insufficient tightening force	1. When air supply pressure and supply amount are insufficient	3. Check to see if the tightening speed is low by adjusting the speed controller.
		4. Check to see that there are no air leaks etc., from the main body. If there are air leaks etc., tighten screw etc. additionally. Contact our distributor or our company because disassembly will be required in case of defective internal parts.
	2. Malfunction by feed wheel	1. Inspect the feed wheel for clogging. Remove the feed wheel from the tightener. Then clean the feed wheel by contacting a wire brush. Periodic cleaning of the feed wheel is effective. If it is worn or damaged, etc., replace with a new one.
		2. Inspect if the clearance between the roller and the feed wheel open correctly. Adjust the clearance by the adjustment screw on the rear of the bailing holder.
		3. Inspect the blade edge of the feed wheel. Replace any worn or damaged blades with new ones.
		4. Check carefully if the bailing holder is not significantly deformed or cracked.
	3. Air motor does not work	1. Check to see if there is abnormal noise or low rotating noise of air motor. dust may be contained in the air motor. Therefore, disassembly or maintenance is immediately required.
		2. If exhaust noise becomes large at the completion of tightening (motor load stop), the vanes may be excessively worn at the sliding surface. Therefore, the vanes etc. must be replaced.

Trouble condition	Cause	Actions to take
4. Strap cutting failure	1. Malfunction of cutter part.	1. If sharp edge of Cutter and tip of Bailing Holder are worn, replace them significantly. Check carefully that sharp edge of Cutter has not been deformed. If it is deformed, replace with new one.
		2. If the gap between the tip of Bailing Holder and sharp edge of Cutter is too large, adjust the gap by adjustment screw (refer to 6-1. General assembly drawing - Gear Head, Key No. 58). If cutting is still insufficient, repair or replace them. The gap must be adjusted between 0.9mm and 1.5mm regardless of the thickness of the strap.
		3. Check carefully if Cutter Pin Hole is worn. If worn, then replace it with a new one.
	2. When the strap is not tightened.	1. If the strap is not tightened due to insufficient tension, retighten it.
3. Other	1. Abnormal noise or heat is generated	1. If any abnormal noise or heat is generated during operation, immediately stop operation and inspect each part.



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