

INSTRUCTION MANUAL

SQUARE REEL

RS3W / RS3N

RS5W / RS5N



WARNING

- Read this manual before use.
- Keep this manual available.

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SAFETY ALERT SYMBOL AND ALERT SIGNS

Please read this manual carefully and follow its instructions.

The SAFETY ALERT SYMBOL () , WARNING, CAUTION, and NOTE carry special messages.



This SAFETY ALERT SYMBOL is used to call your attention to items or operations that could be dangerous to you or other persons using this equipment.

Please read these messages and follow these instructions carefully.



WARNING :WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION :CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury, damage or destruction of the equipment and others.

NOTE : NOTE indicates a special instruction in operation or maintenance.

Scope of warranty and liabilities for the equipment

1. We will repair or replace the product free of charge if a failure due to manufacturing defects occurs under proper usage during the warranty period.
For details, contact us or your dealer.
2. The warranty will be void in the following cases:
 - 1) Change in ownership.
 - 2) Repair, adjustment, or modification performed by a party other than the manufacturer, agents, or dealers.
3. Warranty period is 1 year from your purchase.
However, wire rope, wire guide and spring are not covered by warranty.
4. Repairs applicable to any of the following shall be charged even during the warranty period:
 - 1) Failure/damage caused by incorrect use.
 - 2) Failure/damage caused by use of non-genuine parts.
 - 3) Failure/damage caused by fire, earthquake, natural disaster, or other unexpected incident.
 - 4) Incident caused by fall, shock, negligence, or by inadequate storage.
 - 5) Failure/damage caused by use of parts or other equipment that are not included in this product.
 - 6) Replacement of consumables.
 - 7) Usage in violation of dangers or cautions stipulated in this Instruction Manual or the warning labels.
 - 8) Failure/damage caused by any reason that is not attributable to the manufacturer.
5. Warranty exclusions such as mechanical loss.
Either during or after the warranty period, mechanical loss, damage to anything other than our product(s), or other duties incurred on you/your customer as a result of the failure of our product(s) are outside the scope of the warranty.

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1. Safety Instructions

WARNING

- Incorrect use of the reel could cause personal injury.
- Observe instructions in the manual and use the spring rod correctly.
- Install the reel correctly.
- Never use overhead or at the place where may cause an accident in case of suspended load falling.
- Never place hands, feet, etc., under suspended loads or movable range of rope.
- Never alter the reel.
- Periodically inspect the reel.

2. Definitions

Terms used in this manual have the following meaning:

Initial tension ; The spring tension when the rope is fully retracted

Specified maximum initial tension ;

The maximum initial tension which allows the specified cable travel

Tension increase ; Increase of the spring tension when the rope is fully extended

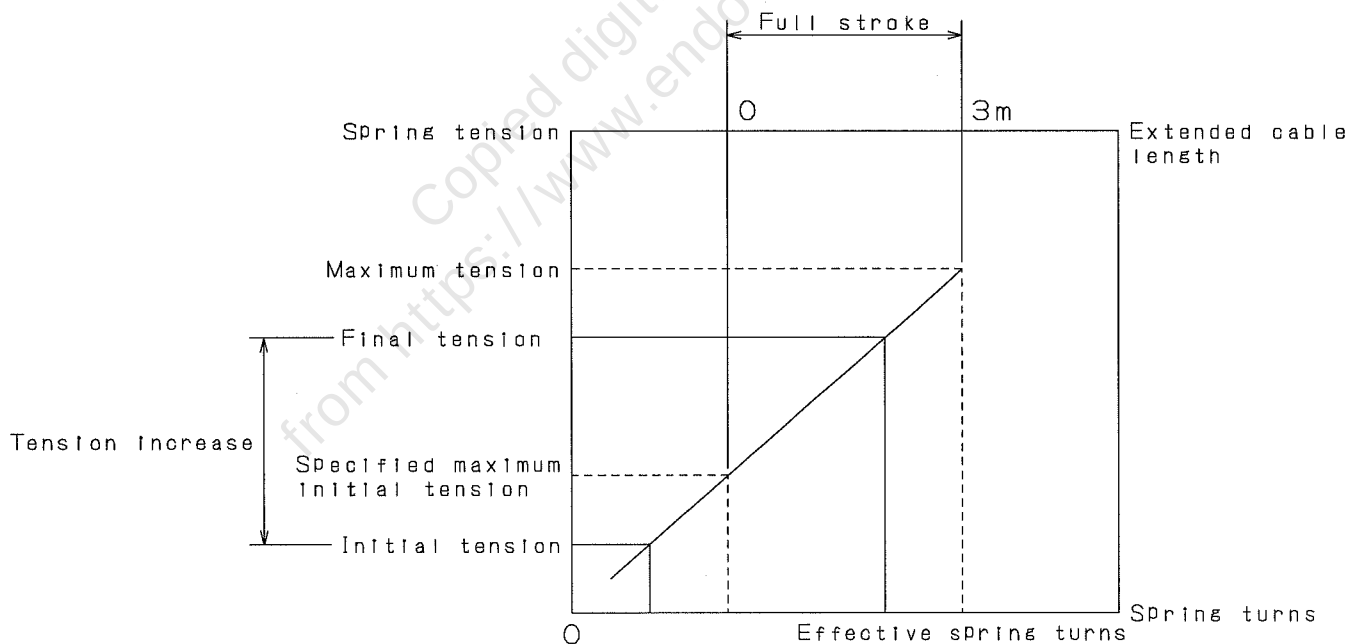
Final tension ; The spring tension when the rope is fully extended

(= initial tension + tension increase)

Effective spring turns; The maximum available spring turns

Maximum tension ; The spring tension when the spring is wound up to the effective spring turns

Available cable travel; The cable travel length, which does not fully wind the spring, when the initial tension is set over the specified maximum initial tension (the maximum extended cable length)



3. Specifications

Model	Specified max. initial tension	Tension increase	Cable travel	Type of rope	Effective Spring Turns	Mass
	N {k g f}	N {k g f}	m			k g
RS3W	1 8 {1. 8}	1 2 {1. 2}	3	Wire rope	1 6	2. 4
RS5W	2 5 {2. 5}	2 5 {2. 5}		With thimble	1 3	2. 6
RS3N	1 8 {1. 8}	1 2 {1. 2}		Nylon rope	1 6	2. 4
RS5N	2 5 {2. 5}	2 5 {2. 5}		Without thimble	1 3	2. 6

Remark: Tension gradually increases as you pull wire rope.

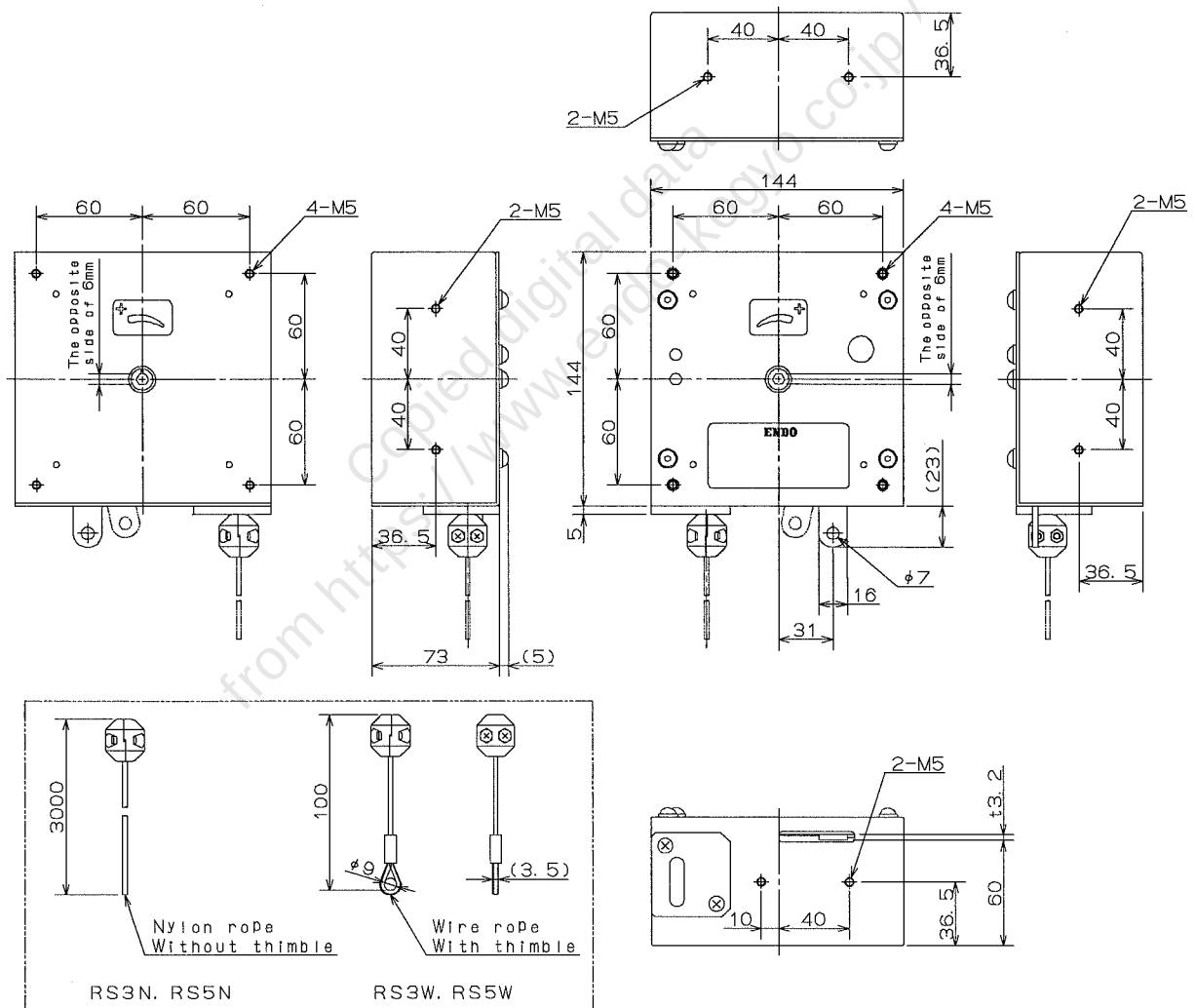
For example, in case of RS5W, its initial tension is set to 25N {2.5kgf} ,
the tension reaches 50N (=25N+25N) {2.5+2.5=5.0kgf} at the point that rope is
pulled with 3m.

■ Working conditions

Application area : Indoor and normal atmospheric conditions

Temperature range: -10 °C to +50 °C

4. Drawing



5. Spring tension attachment



CAUTION

- Never move releasing lever with inserting hexagon socket screw key (adjustment tool).
- If the initial tension is set over the specified maximum initial tension, the spring will be fully wound during cable extension so that the square reel can not provide the specified cable travel.
- Calculate the available cable travel when setting the initial tension over the specified maximum initial tension.
- Extending the rope until the spring is fully wound could cause damage to the square reel body or the rope.

- 1) Confirm that the weight of suspended load is within the capacity range of the reel when you suspend tool/device or when you pull rope sideways.
- 2) Increase the spring tension by turning the spindle to the + side with a hexagon socket screw key. (see Fig.1)
- 3) Refer to graph and adjust tension that load is balanced. (see Fig.2)
("0" indicates the condition that rope is fully retracted into drum and all spring tension is released.)

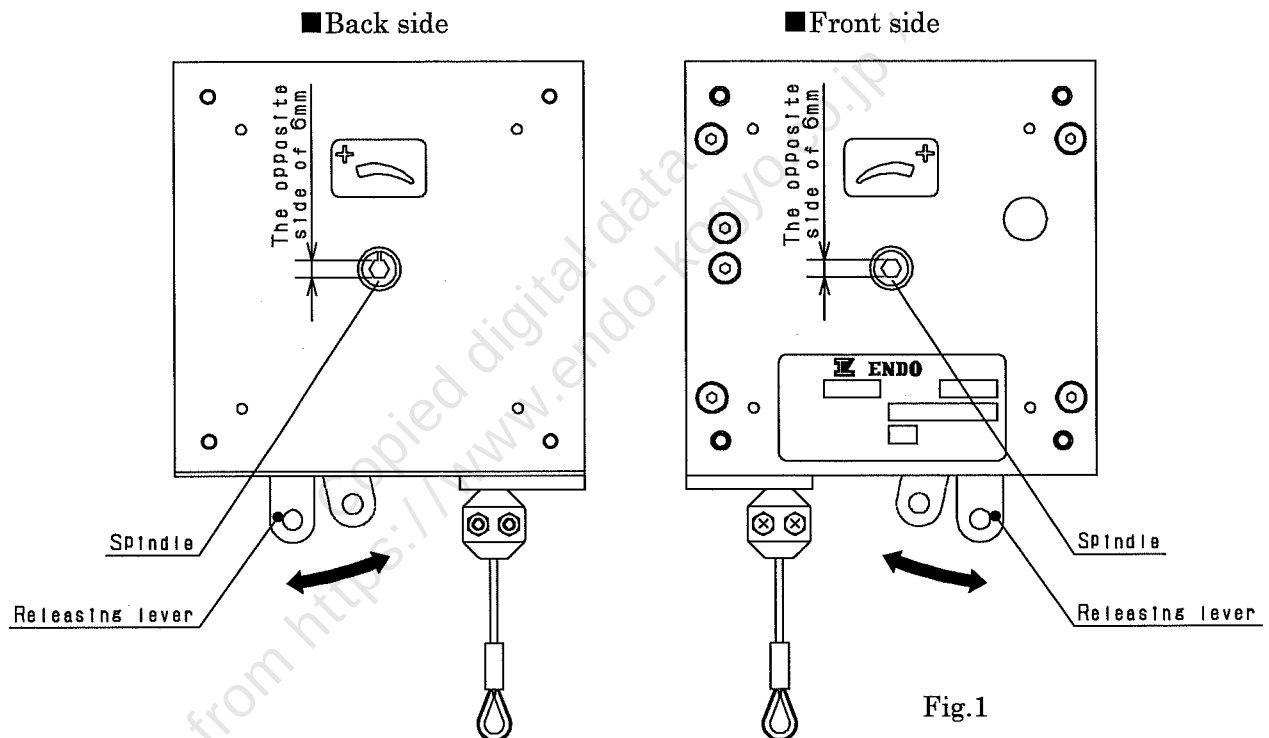


Fig.1

■ Tension curves

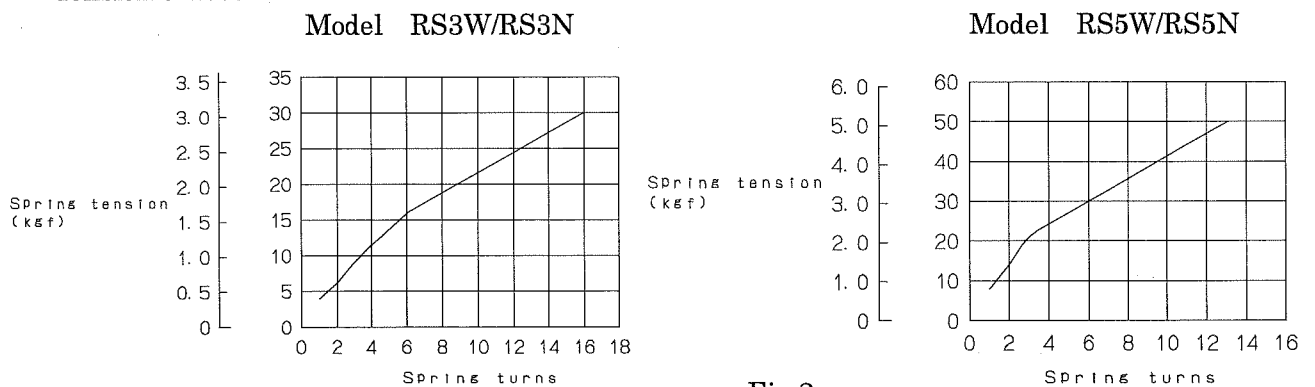


Fig.2

- Retracted rope length per drum turn
RS3W/3N, RS5W/5N: Approx.350mm

■ Relationship between initial tension and available cable travel

Example : When RS5W/5N is used and the initial tension is set to 30N (3.1kgf);

Effective spring turns; 13

Retracted rope length per drum turn; 350mm

- According to the tension curve, the initial spring turns are 6 when the initial tension is 30N(3.1kgf).
- The available cable travel can be calculated as follows;
 Remaining spring turns = effective spring turns(13) – initial spring turns(6) = 7
 Available cable travel = retracted rope length(350mm) × remaining spring turns(7) = 2450mm
- According to the tension curve, the spring tension is 49N(5.0kgf) when the rope is extended to 2450mm.

NOTE: The available cable travel is smaller than the specified cable travel because the initial tension is set over the specified maximum initial tension.

6. Working stroke (cable travel) check

⚠ CAUTION

- Extending the rope past the specified or available cable travel could cause damage to the reel.

1) Check the cable travel is long enough for the application.

NOTE: Take care the reel can not provide the specified cable travel if the initial tension is set over the specified maximum initial tension.

Refer to section 5 "Spring tensioning adjustment and relations of the initial tension and the available stroke".

7. Safety instructions on use

⚠ WARNING

- Never use overhead or at the place might lead to injury accident when load dropped.
- Never place hands, feet, etc., under suspend loads or movable range of rope.
- Never alter the reel.

⚠ CAUTION

- Always use within maximum spring tension.
- Always adjust the spring tension before use.
- Do not extend the rope past the maximum cable travel.
- Do not extend the rope longer than available cable travel length when the initial tension is set to above specified maximum initial tension. (See 5. Spring tension attachment)
- Install reel so that a rope does not interfere to a plate and do not pull diagonally. Otherwise rope might rewind defectively.
- Nylon rope type: attach so that rope does come loose with the tension of the Reel.
- Fix the main body in two M5 bolts or more.

The bolt length

6-10mm: cover and case (front and back side)

8-10mm: side of case (see fig.3)

Clamping torque: 3N·m

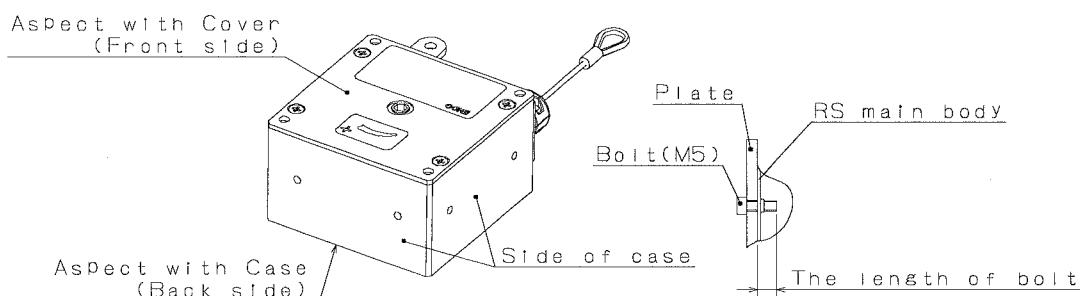


Fig.3

8. Inspections



WARNING

- Periodically inspect the reel, and replace any worn or damaged parts.



CAUTION

- Always use genuine parts for replacement.

■ Inspect the balancer at least once a month.

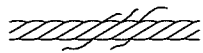
Correct and repair any problems which are detected.

Make the inspection interval shorter when operating frequently or under hostile environments.

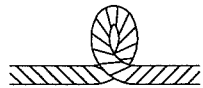
■ Items to be inspected

● Wire rope type

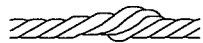
- Is there any broken wire, deformation or kink in wire?



Broken wire



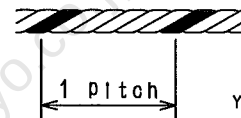
Kink



Deformation

YBM000017

Allowable number of broken wires in 1 pitch 13.



YBM000017

- Is there any part of wire rope worn beyond service limit?

Standard dimension: 2.5mm
Limit dimension : 2.3mm



YBM000017

- Is there any remarkable wear of thimble?

● Nylon rope type

- Is there any broken fiber or damage (kink, fuzzing)?
- Is there any loosen on the rope attaching device?
- Is there any melting by heat?

● Is there any loosen screws?

9. Rope replacement

- 1) Get rid of the spring tension by moving releasing lever in right and left.
See Chapter 5 "Spring tension attachment".



WARNING

Do not take the body apart before tensility of the spring disappears.
It take it apart, the rope will snap back and could cause personal injury.

- 2) Remove Hex. Head screw (22) then remove cover (1).
- 3) Remove drum assembly (11) from casing assembly (21).
- 4) Remove Screws (18), and remove Cover (17).
- 5) Remove plate (16), and remove Rope from Drum.
- 6) Insert the lock tube of the new rope (14) from the A side of the plate (5). (see Fig.4)
- 7) Then install lock tube to the hook ditch of the drum (11) and draw in.
- 8) Fix lock tube to drum (11) by infixing plate (16). (see Fig.5)
- 9) Reassemble in reverse order.
- 10) Prevent 4 shafts (20) from deviating from the shaft receiving (burring). (See ● on Fig.4)

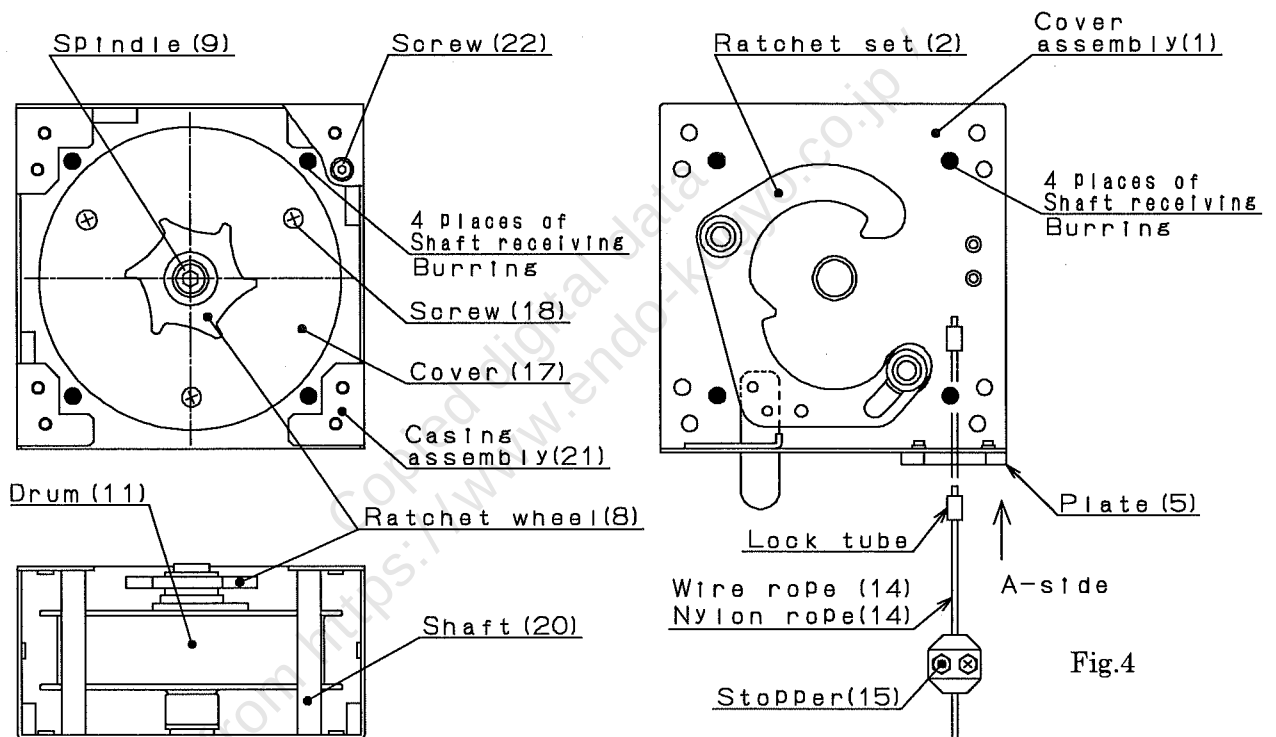


Fig.4

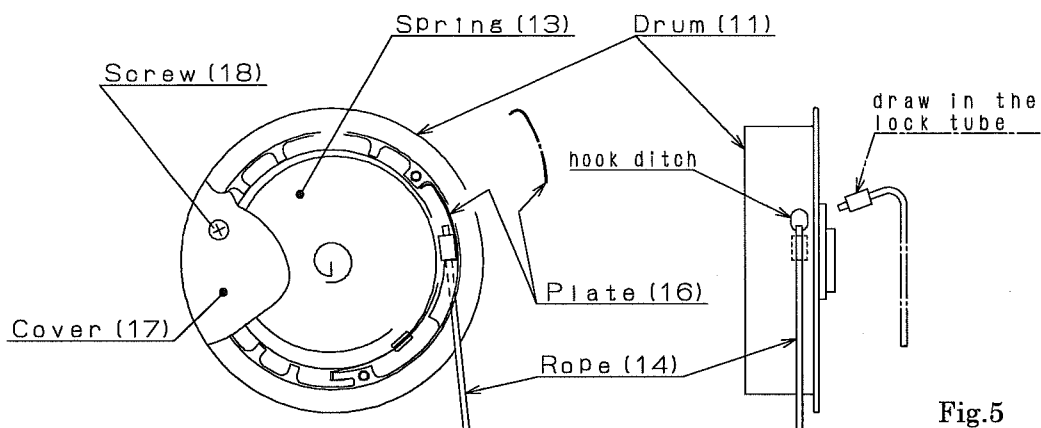


Fig.5

10. Spring replacement

Never remove the spring from the drum unless the replacement is required.



WARNING

- The spring is extremely dangerous. Be careful when handling the spring.
- Never pull the center of the spring when removing the spring from the drum.
If pulled, the spring will expand explosively and cause personal injury.

Referring to the disassembly drawing (on page 10),

- 1) Remove the reel when in the state that rope rolled up.
- 2) Check the spring tension by pulling rope.

If the tension is left, of the tension by moving ratchet set lever (2) in right and left.

Tension should not be left. See clause 5 " spring tension attachment" ,

- 3) Remove Hex. Head screw (22) then remove cover (1).
- 4) Remove Drum assembly (11) from casing assembly (21).
- 5) Loosen Screws (18) and remove Cover (17) from Drum (11).
- 6) Check spring (13) fracture point and rivet condition.

If fracture caused in the inside, remove spring.

If fracture caused near outer periphery or rivet of spring is broken. do not remove spring.

Reassemble the cover (17) to drum (11), then contact to the store. (see Fig.6)

- 7) Remove spring (13) from drum (11).

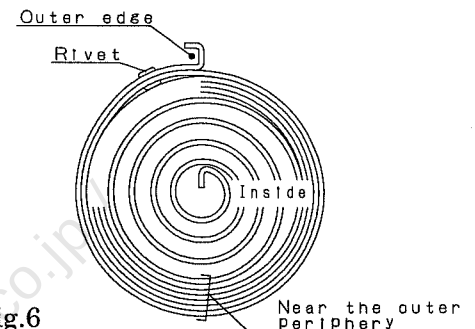


Fig.6



WARNING

Never remove Spring (13) from Drum (11) when Spring is broken near the outer periphery or the rivet of Spring is broken (see Fig.6).

If removed, Spring will expand explosively and cause personal injury.

- 8) Reassemble in reverse order.
 - After drum (11) assembling, install spring (13).
 - After assembling new Spring (13), lubricate Spring with grease.

NOTE : Turn spindle (9) and wind rope (14).

Prevent 4 shafts (20) from deviating from the shaft receiving (burring).

11. Spring disposal

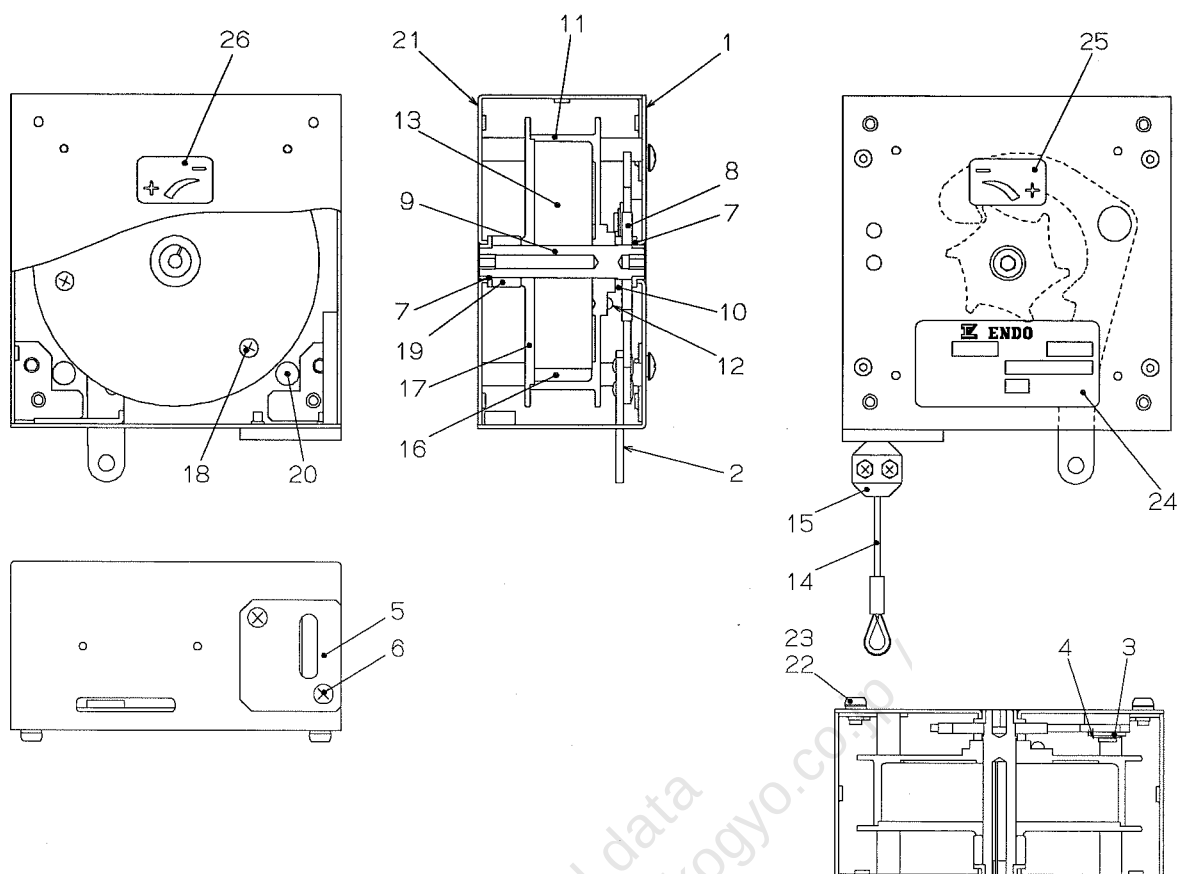


WARNING

The spring is dangerous due to remaining tension even if it is broken.

Give a warning to disposal companies that the spring will expand explosively and cause danger if the spring is treated roughly or the center of the spring is pulled.

12. PARTS LIST



Ref.No.	Part No.	Description	Quantity			
			RS3W	RS3N	RS5W	RS5N
1	LBP001776	Cover complete	1	1	1	1
2	LBP001777	Ratchet set	1	1	1	1
3	KA30220800	Plain washer	2	2	2	2
4	KA40310060	Retaining ring	2	2	2	2
5	P2B402095	Wire guide	1	1	1	1
6	KA10220410	Screw	2	2	2	2
7	P2B402093	Bushing	2	2	2	2
8	P2B301336	Ratchet wheel	1	1	1	1
9	P2B301339	Spindle	1	1	1	1
10	P2B402096	Collar	1	1	1	1
-	LBP000094	Drum assembly	1	1	1	1
11	P2B200038	-Drum	1	1	1	1
12	KA46300311	-Rivet	3	3	3	3
13	P2B300089	Spring	1	1	-	-
13	P2B300507	Spring	-	-	1	1
-	LBP001676	Wire rope assembly	1	-	1	-
-	LBP001869	Nylon rope assembly	-	1	-	1
14	-	-Wire rope	1	-	1	-
14	-	-Nylon rope assembly	-	1	-	1
15	LBP000924	-Stopper set	1	1	1	1
16	P2B400209	Plate	1	1	1	1

Ref .No.	Part No.	Description	Quantity			
			RS3W	RS3N	RS5W	RS5N
17	P2B300091	Cover	1	1	1	1
18	KA10220412	Screw	3	3	3	3
19	P2B402097	Collar	1	1	1	1
20	P2B402098	Shaft	4	4	4	4
21	LBP001778	Casing complete	1	1	1	1
22	P2B402102	Hex. socket button bolt	4	4	4	4
23	KA31120500	Spring washer	4	4	4	4
24	P2B301345	Name plate	1	—	—	—
24	P2B301421	Name plate	—	1	—	—
24	P2B301346	Name plate	—	—	1	—
24	P2B301422	Name plate	—	—	—	1
25	P2B301347	Label	1	1	1	1
26	P2B301348	Label	1	1	1	1

NOTE) When placing an order, clearly specify the product model, part number and description.
Parts without a part number cannot be supplied individually.
Please purchase a set or complete unit.

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