
OWNER'S (OPERATOR'S) MANUAL AND SAFETY INSTRUCTIONS FOR TF SERIES (MODEL TF2) PLAIN AND GEARED TROLLEY

BEFORE USING THIS PRODUCT :

ALWAYS SAVE THIS BOOK FOR FUTURE REFERENCE

ALWAYS READ OWNER'S (OPERATOR'S) MANUAL AND SAFETY INSTRUCTIONS

▲ WARNING : **IMPROPER** trolley use could result in death or serious injury. To avoid these hazards:

- : **NEVER** transport loads over or near people.
- : **NEVER** work under or near lifted loads.
- : **ALWAYS** operate, inspect and maintain this trolley in accordance with applicable safety codes and regulations.
- : **ALWAYS** follow the installation procedure on this manual when using the hoist with this TF2 trolley.

These safety instructions contain important information to help you use the TF2 Trolley in a safe manner. Please refer to this Owner's (Operator's) Manual for additional safety information.

KITO

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DEFINITIONS

⚠ WARNING : Death or serious injury could result in potentially hazardous situation.

1. SAFETY

1-1 Safety summary

Danger exists when heavy loads are transported, particularly if the equipment is not being used properly or is poorly maintained. Because accidents and serious injury could result, special safety precautions apply to the operation, maintenance and inspection of trolleys.

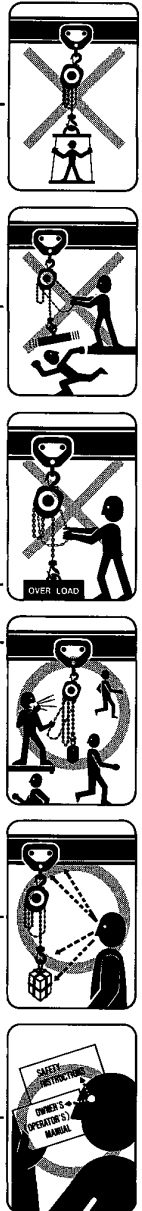
Following these simple rules can help to avoid transporting accidents;

⚠ WARNING : Death or serious injury could result in improper trolley use.
To avoid these hazards ;

- NEVER** use a trolley for transporting people.
- NEVER** lift or transport loads over or near people.
- NEVER** work near or under suspended loads.
- NEVER** transport more than the trolley's rated capacity.
- ALWAYS** notify others when a transport is about to begin.
- ALWAYS** make sure that the supporting structures are strong enough to support the weight of the load and hoist.
- ALWAYS** read owner's (operator's) manual and safety instructions before operating.

REMEMBER : proper rigging and lifting techniques are the responsibility of the operator. Be sure you read and understand the instructions contained in this manual before using your trolley. Check all applicable safety codes, regulations and other applicable laws for further information about the safe use of your trolley.

More detailed safety information is contained in the following pages. For additional information, please contact Kito Corporation or your authorized Kito dealer.

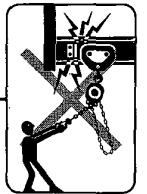


1-2 Safety instructions

Serious injury could result if the following safety instructions are not followed.
(If this trolley is used in conjunction with a hoist, also refer to the hoist manual for additional precautions and instructions.)

⚠ WARNING : Death or serious injury could result in improper trolley use. To avoid these hazards :

- NEVER** allow an unqualified (not trained in safety and operation) person to operate the trolley.
- NEVER** apply loads which exceed the rated capacity of the trolley.
- NEVER** attach the hoist that has a rated capacity which exceeds the rated capacity of the trolley.
- NEVER** operate the trolley when a "DO NOT OPERATE" sign is placed on the trolley.
- NEVER** use a trolley if the width does not fit the rail.
- NEVER** use the hand chain to support a load.
- NEVER** transport a load over people.
- NEVER** use the trolley for transporting people.
- NEVER** allow anyone to stand on a suspended load.
- NEVER** swing a suspended load.
- NEVER** leave a suspended load unattended.
- NEVER** weld or cut a load suspended by the trolley.
- NEVER** connect the hoist to the trolley with improper fittings.
- NEVER** operate the trolley hand chain if excessive noise, jamming, overloading or binding occurs.
- NEVER** work near or under suspended loads.
- NEVER** operate a trolley if damaged or malfunctioning.
- NEVER** use a trolley which has been taken out of service until the trolley has been properly repaired or replaced.
- NEVER** use a trolley without a nameplate or warning labels or with illegible nameplate or labels.
- NEVER** remove or obscure the warning tags.
- NEVER** operate a trolley unless you are physically capable of doing so.
- NEVER** allow a trolley to collide with another trolley or stopper on the beam.
- NEVER** operate trolley unless load is centered under trolley.



⚠ WARNING : **IMPROPER trolley use could result in death or serious injury. To avoid these hazards :**

- ALWAYS** make sure that you and others are clear of the load path.
- ALWAYS** inspect the trolley for wear or damage before each shift.
- ALWAYS** inspect the trolley thoroughly and replace worn or damaged parts.
- ALWAYS** lubricate the trolley regularly.
- ALWAYS** pay attention to the load at all times when operating the trolley.
- ALWAYS** rig the load properly and carefully.
- ALWAYS** check the trolley before daily use according to the Recommended Daily Inspection.
- ALWAYS** let the authorized personnel inspect the trolley periodically.
- ALWAYS** consult the manufacturer or your dealer if you plan to use a trolley in an excessively corrosive environment.
- ALWAYS** use the trolley within rail slope of 1/50.

2. TROLLEY SPECIFICATIONS

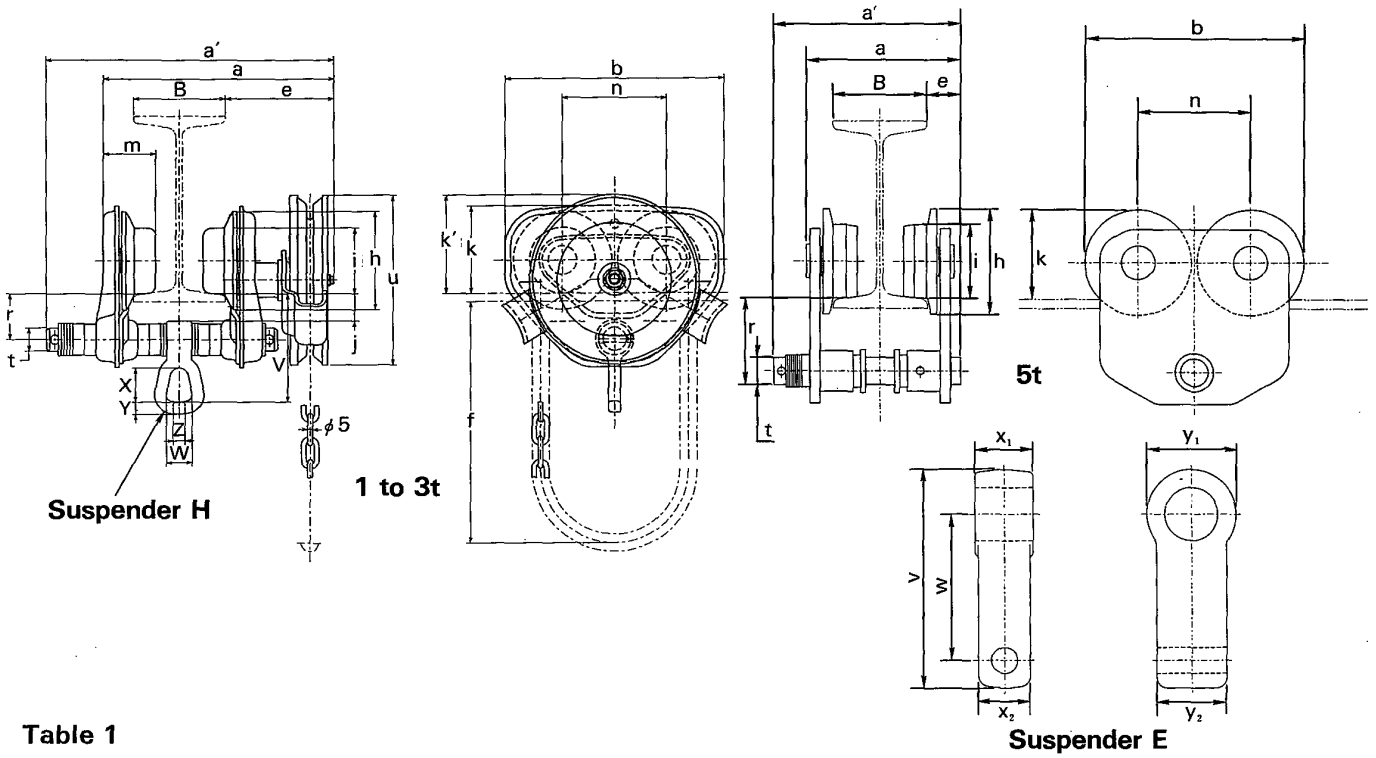


Table 1

Model	Code		Capacity (t)	Rail Width Adjustability			Min. Radius for Curve (mm)	Net Weight (kg)		Hand Chain Folded Length (m)	V (mm)	W (mm)	X (mm)	Y (mm)	Z (mm)	a [Max.] (mm)	a' (mm)	b (mm)
	Plain Trolley	Geared Trolley		Standard	Option			TFP	TFG									
					W20	W30												
TF2	TFP005	—	0.5	50 to 102	103 to 203	204 to 305	350	4.0	—	—	96	26	33	10	10	173	204	182
TF2	TFP010	TFG010	1	58 to 127	128 to 203	204 to 305	450	7.0	11	2.5	117	28	37	13	13	275 (215)	309 (249)	236
TF2	TFP015	TFG015	1.5	82 to 153		154 to 305	550	13	17	2.5	145	36	46	19	19	349 (264)	385 (300)	280
TF2	TFP020	TFG020	2	82 to 153		154 to 305	550	13	17	3.0	145	36	46	19	19	349 (264)	385 (300)	280
TF2	TFP025	TFG025	2.5	82 to 153		154 to 305	650	21	25	3.0	167	42	54	22	22	359 (280)	398 (320)	324
TF2	TFP030	TFG030	3	82 to 153		154 to 305	650	21	25	3.0	167	42	54	22	22	359 (280)	398 (320)	324
TF2	TFP050	TFG050	5	125 to 178		179 to 305	2000	43	47	3.5	—	—	—	—	—	376 (273)	400 (297)	347

Capacity (t)	e (mm)	f (m)	h (mm)	i (mm)	j (mm)	k (mm)	k' (mm)	m (mm)	n (mm)	r (mm)	t (mm)	u (mm)
0.5	46	—	82	60	20	76	—	45	84	38	22	—
1	116 (56)	2.2	106	71	29	95	106	56	112	50	25	183
1.5	154 (69)	2.2	127	85	35	112	109	71	131	62	32	183
2	154 (69)	2.7	127	85	35	112	109	71	131	62	32	183
2.5	157 (79)	2.7	148	100	36	134	114	80	152	68	36	183
3	157 (79)	2.7	148	100	36	134	114	80	152	68	36	183
5	156 (53)	3.2	144	118		144	131	81	178	117	44	183

v (mm)	w (mm)	x ₁ (mm)	x ₂ (mm)	y ₁ (mm)	y ₂ (mm)
91.5	60	27	24	37	33
103	69	27	24	42	33
123	76	39	36	54	44
123	76	39	36	54	44
139	85	39	45	63	44
139	85	39	45	63	44

- Figures in parentheses show the data for plain trolley type.
- The maximum 200mm and 300mm rail width are available as option.
- Minimum flange width for curved rail : 0.5t trolley : 57mm
 : 1t trolley : 73mm
 : 3ton trolley : 89mm

- Net weight is when flange width is in standard range.
- Dimension "a" is when flange width is in standard range.
- Dimension "a" is when flange width is adjusted to the maximum of the standard range.

3. TROLLEY INSTALLATION

3-1 Coupling with manual chain hoist.

This trolley is to be used combining with CF series hoist. It can be coupled with hanging the top hook onto the suspender as shown in Fig. A. However, only M3 series hoist can be coupled either in the hook suspension, method (the top hook is hung from the suspender C), or in the direct coupling method (the hoist body, with the top hook removed, is directly coupled to the suspender C as shown in Fig. B).

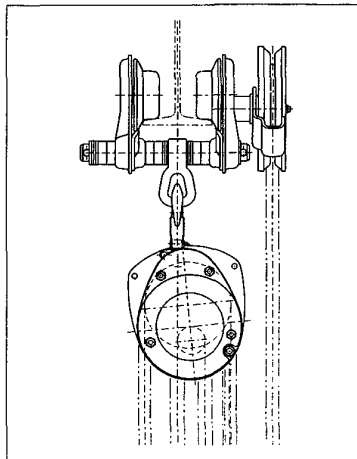


Fig. A

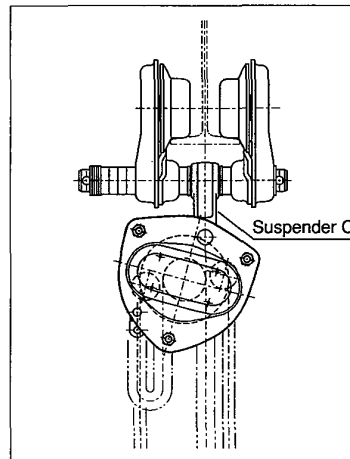


Fig. B

3-2 Coupling with electric chain hoists

· EF, ES series

The direct coupling method shown in Fig. C and D should be applied.

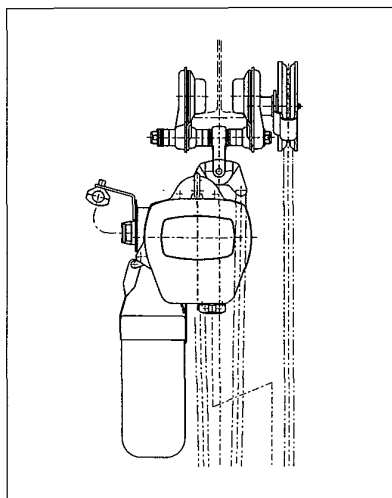


Fig. C

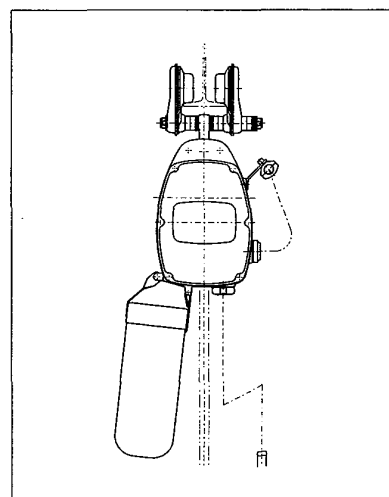


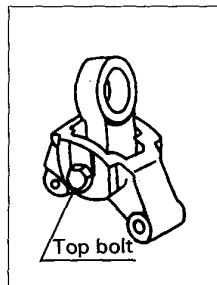
Fig. D

(1) Remove the top hook from the hoist body. (Refer to Fig. 1-1)

Straighten the bent split pin, remove the slotted nut and the top pin (in the case of double falls of chain, the top bolt), and then remove the top hook.

(2) Installation of suspender

Mount the suspender to the hoist body using the top pin (or top bolt), and nut which have been removed as above and a new split pin. Firmly bend the pointed end of the split pin as shown in Fig. 4.



Suspender for double falls of chain

Fig. 2

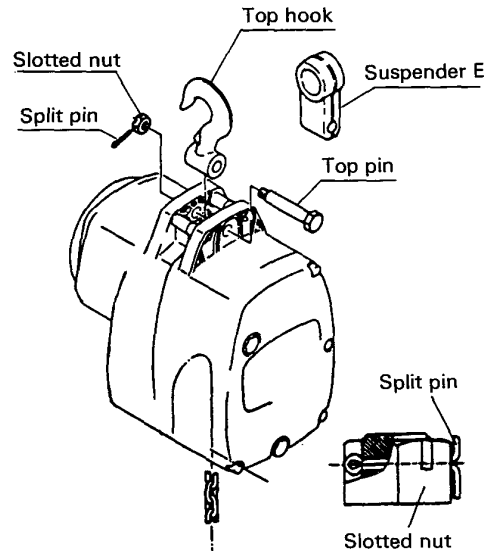


Fig. 1-1

• ER series

The direct coupling method is shown in Fig. E.

Installation of suspender (Refer to Fig. 1-2)

Mount the suspender G to the connection yoke with the connection yoke rubber, the yoke bolt and the slotted nut. Then insert a new split pin and bend it securely as shown in Fig. 4.

Note: Some capacity of the geared trolley are not available for some beam width. Please consult KITO or your KITO agency.

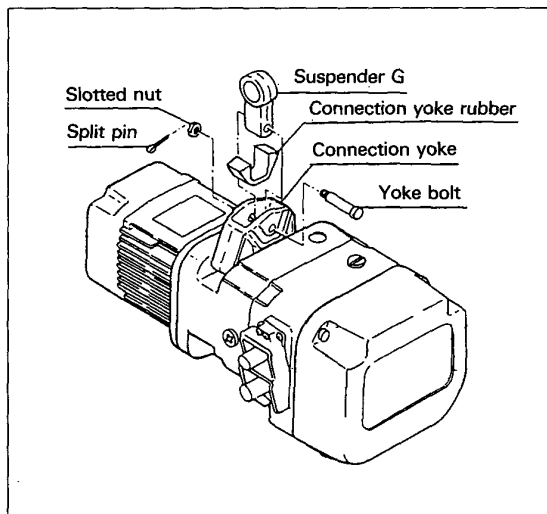


Fig. 1-2

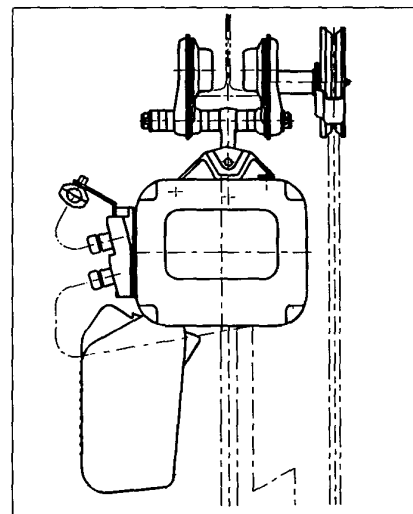


Fig. E

3-3 Adjusting trolley width before installation

When the trolley and the chain hoist are combined, the following procedures must be followed to adjust the trolley width by using the inner and outer adjusting spacers (Refer to Table 3 on Page 9).

- (1) Make sure that the direction is as shown in Fig. A to E.
- (2) The right and left side plates should be as far apart as possible, and the space between A and B should be approximately 4mm (Refer to Fig. 3).
- (3) Bend the split pin of the shaft stopper pin as shown in Fig. 4.

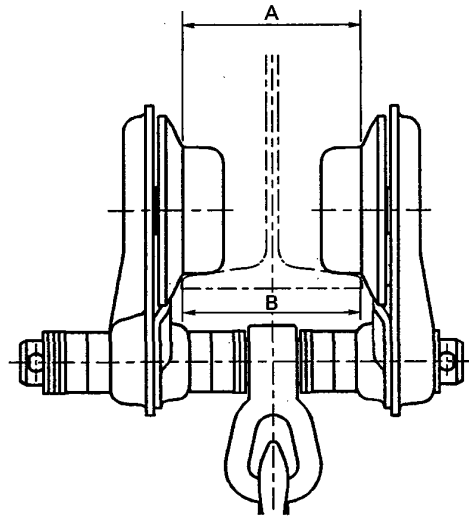


Fig. 3

3-4 Installation of trolley onto beam

- (1) It is preferable to install the trolley from the end of the beam, with the chain hoist and trolley coupled. After installation, make sure to re-install stopper as it was.
- (2) When there is no space between the end of beam and building, first remove the side plate S from the suspension shaft. After placing the side plate G on the other side of the beam, reassemble and re-install side plate S as it was before. Also, bend the split pin of shaft stopper pin correctly as shown in Fig. 4.

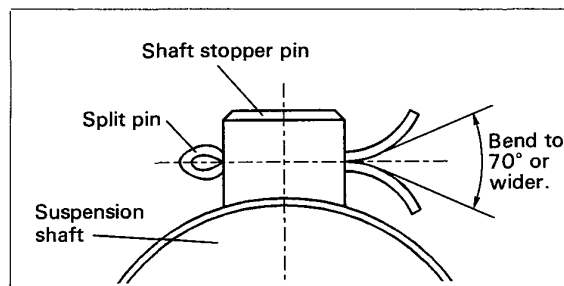
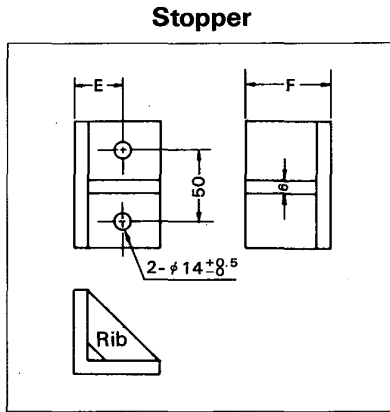


Fig. 4

3-5 Installation of stopper onto traversing beam

Make sure to install the stopper at both ends of the beam. Also, refer to Table 2, Fig. 5 and Fig. 6 below when installing the stopper.



Stopper Size

Beam Width B (mm)	Stopper material (mm)	E (mm)	F (mm)	Quantity	Bolt	Nut
75	L-50×50×6	30	30	4	M12×55×55 4 (Four bolts)	M12 8 (Eight nuts)
100	L-50×50×6	30	40	4		
125	L-50×50×6	30	50	4		
150	L-65×65×8	35	65	4		
175	L-75×75×9	40	75	4		

Table 2

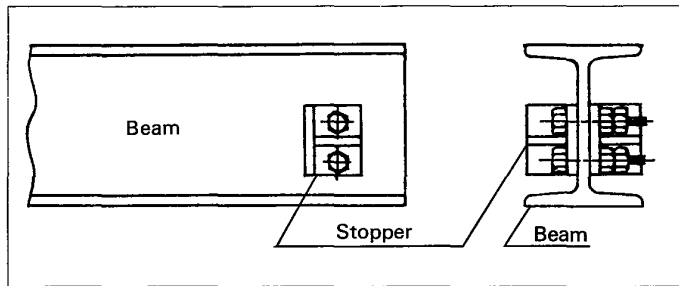


Table 3

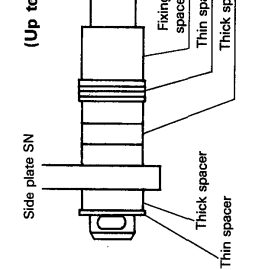
Beam flange width Capacity	Number of Adjusting Spacers																	
	(in) 2 2 1/2 2 5/8	3 3 1/4 3 3/4	4 4 1/8 4 1/2	5 4 5/8 5 1/4	6 5 3/4 6 1/8	7 6 1/2 7 1/8	8 7 1/4 8 1/8	9 8 1/8 9 1/8	10 9 1/4 10 1/4	11 10 1/4 11 1/8	12 11 1/8 12 1/8	13 12 1/4 13 1/8	14 13 1/4 14 1/8	15 14 1/4 15 1/8	16 15 1/4 16 1/8	17 16 1/4 17 1/8	18 17 1/4 18 1/8	
Parts	See table body for parts (Inner, Outer, Fixing spacer, Thin spacer, Thick spacer, Balancing collar)																	
Thin spacer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Outer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Inner	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fixing spacer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Thin spacer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Thick spacer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Outer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Inner	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Outer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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Inner	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Outer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Note: 1) Take note the numbers on spacers of inner side as follows.

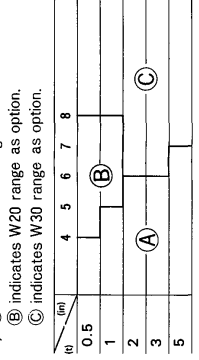


- Example: 0 + 1 (Number on side plate S)
- 2) Adjustment of trolley width: See clause 3-3. Adjust the dimensions by appropriately increasing or decreasing the number of inner or outer adjusting spacers, without strictly adhering to the number of adjusting spacers shown in the above table.
- 3) These spacers are delivered in the following color sets: Type A: Thick Spacer, Thin Spacer and Thin Spacer L in yellow, and Fixing Spacer in white; Type B: Thick Spacer, Thin Spacer and Thin Spacer L in white, and Fixing Spacer in black. Both Types are equivalent except for color.

4) Spacers arrangement examples



(A) indicates standard range.
(B) indicates W20 range as option.
(C) indicates W30 range as option.



3-6 Check points after installation

When the entire installation is completed, check the following.

- (1) Check whether the relative position of the trolley and the chain hoist is correct (See Fig. A to E).
- (2) Check that the beam stoppers are securely fastened on the beam to prevent trolley run away.
- (3) Make sure that no bolt, nut, split pin or snap pin are missing, and that these are all adequately fastened.

4. OPERATION

4-1 Safety considerations

The three most important aspects of trolley operation are :

- (1) Follow all safety instructions when operating trolley.
- (2) Allow only qualified people to operate a trolley.
- (3) Subject each trolley to a regular inspection and a maintenance procedure.

4-2 Handling

(1) Plain trolley

For plain trolley, movement is controlled by pushing on the load or the hook of the attached hoist.

(2) Geared trolley

For geared trolley, when facing the trolley hand wheel :

- Pull down on right side of hand chain (clockwise rotation) to move left.
- Pull down on left side of hand chain (counterclockwise rotation) to move right.

4-3 Trolley storage

NEVER expose the trolley to rain or dew.

NEVER leave the trolley in a damp place.

ALWAYS be sure to house the trolley under the eaves or under some cover after use, in the case of outdoor installation.

ALWAYS wipe off all dirt and water.

ALWAYS install in a dry place.

ALWAYS lubricate gear side of the pinion and track wheel G.

4-4 Precaution in handling

(1) Avoid slant loading

It is dangerous to pull the load slant, with the trolley connected to the hoist, as the trolley is inclined and gives too much strain to the trolley.

(2) Avoid collision

The trolley will be damaged if it is bumped against stopper or against another trolley.

(3) Never allow articles to become caught or hooked onto the hand chain.

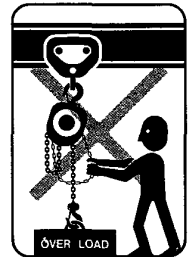
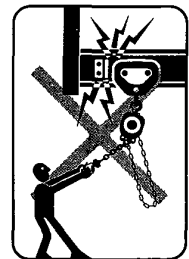
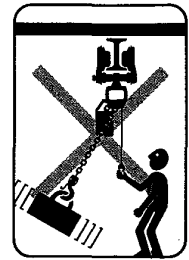
When articles are hooked or caught on the hand chain and the hand chain is strongly pulled, severe damage will be caused not only to the hand chain but also to the trolley itself.

(4) Never overload

The name plate of the trolley shows the maximum lifting capacity. If the capacity of the trolley is different from the capacity of the chain hoist which would be combined, operate them under the capacity of smaller side.

(5) Never throw

Never throw or drag the trolley.
Always handle the trolley with care.



5. INSPECTION

5-1 Outline

There are two types of inspection, the daily inspection performed by the operator while using the trolley, and the more thorough periodic inspection performed by qualified personnel who have the authority to remove the unit from service.

5-2 Daily inspection

ALWAYS check the following points before each work shift.

- (1) Check for visual signs or abnormal noises which could indicate a potential malfunction.
- (2) Check hand chain movement around the hand wheel.
- (3) Clean the chain, if it binds, jumps, "clicks" or is excessively noisy.
- (4) Replace the chain, if problem persists.
- (5) Check for smooth operation.

5-3 Periodic inspection

Periodic inspection should be made at the interval shown below and should follow the given procedures.

NORMAL (Normal use) : Semiannual inspection
 HEAVY (Frequent use) : Quarterly inspection
 SEVERE (Excessively frequent use) : Monthly inspection

Inspect all the items in "Periodic Inspection". Also inspect the following.

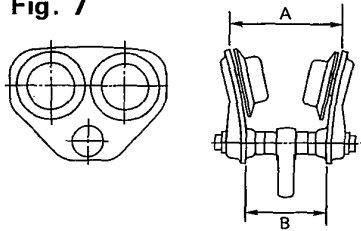
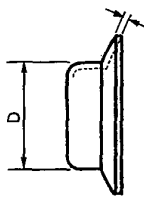
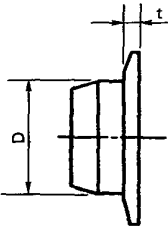
- (1) Check rivets, split pins, cap screws and nuts. Replace if missing and tighten if loose.
- (2) Inspect for wear, damage, distortion, deformation and cleanliness. If external evidence indicates the need, disassemble.
- (3) Check gears, shafts, bearings and chain guides. Replace worn or damaged parts. Clean, lubricate and reassemble.
- (4) Check for damage or excessive wear. Replace if necessary.
- (5) Check for distortion, wear and continued ability to support load.
- (6) Check that the trolley wheels track the beam properly and total clearance between wheels and flange equals 3/32 to 5/32 in. (2 to 4mm). (Refer to 3-3)
Adjust the clearance if necessary.
- (7) Check side plates for spreading due to bending. Repair as necessary.
- (8) Check name plates for presence and legibility. Replace if necessary.

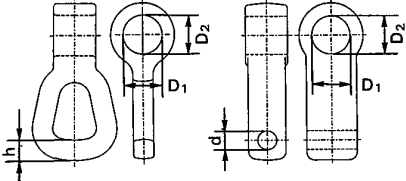
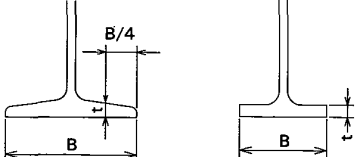
5-4 Inspection method and judgment criteria

5-4-1 Daily inspection procedure

Inspection Item	Inspection Method	Discard Limits / Judgment Criteria	Countermeasures/ Others
1. Function	• Run under no load condition.	• Trolley should run smoothly and is not tilt when a light load is applied.	• If the movement is not smooth, try to determine its cause and replace the trolley with a new one if necessary.
2. Deformations and damages of each part	• Check visually.	• There should be no deformation or damage.	• Replace the part with new one if deformed or damaged.
3. Part loosening	• Check visually.	• Parts should not be loosened.	• Fasten tightly.
4. Name plate	• Check visually.	• Every description should be clear and visible.	• Replace the name plate with new one.

5-4-2 Periodic inspection procedure

Inspection Item	Inspection Method	Discard Limits / Judgment Criteria	Countermeasures/ Others																																		
1. Traversing function	<ul style="list-style-type: none"> Move trolley with light load suspended. 	<ul style="list-style-type: none"> Trolley should run smoothly, and not tilt when a light load applied. Overall movement should be smooth. 	<ul style="list-style-type: none"> If not smooth, adjust beam, readjust balance or lubricate pinion holder, pinion and gear of track wheel G. 																																		
2. Side plate deformation	<ul style="list-style-type: none"> Check with calipers. 	<ul style="list-style-type: none"> The difference between dimension A and dimension B should not exceed 2mm. <p>Fig. 7</p> 	<ul style="list-style-type: none"> If the difference exceeds 2mm, replace it with a new one. 																																		
3. Track wheel abrasion	<ul style="list-style-type: none"> Check visually or with calipers as needed. <p>Fig. 8 For 0.5 to 3t</p>  <p>Fig. 9 For 5 t</p> 	<ul style="list-style-type: none"> Abrasion of tread or flange should not exceed the limits on the table below. <p>Table 4</p> <table border="1"> <thead> <tr> <th rowspan="2">Capacity (t)</th> <th colspan="2">Larger tread diameter : D</th> <th colspan="2">Flange thickness : t</th> </tr> <tr> <th>Standard</th> <th>Limit</th> <th>Standard</th> <th>Limit</th> </tr> </thead> <tbody> <tr> <td>0.5</td> <td>60</td> <td>58.5</td> <td>3.2</td> <td>2.5</td> </tr> <tr> <td>1</td> <td>71</td> <td>69.5</td> <td>4</td> <td>3.3</td> </tr> <tr> <td>2</td> <td>85</td> <td>83.5</td> <td>4.5</td> <td>3.8</td> </tr> <tr> <td>3</td> <td>100</td> <td>98.5</td> <td>5</td> <td>4.3</td> </tr> <tr> <td>5</td> <td>118</td> <td>112</td> <td>9.6</td> <td>6.7</td> </tr> </tbody> </table>	Capacity (t)	Larger tread diameter : D		Flange thickness : t		Standard	Limit	Standard	Limit	0.5	60	58.5	3.2	2.5	1	71	69.5	4	3.3	2	85	83.5	4.5	3.8	3	100	98.5	5	4.3	5	118	112	9.6	6.7	<ul style="list-style-type: none"> Replace it with a new one if it exceeds the limit.
Capacity (t)	Larger tread diameter : D			Flange thickness : t																																	
	Standard	Limit	Standard	Limit																																	
0.5	60	58.5	3.2	2.5																																	
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2	85	83.5	4.5	3.8																																	
3	100	98.5	5	4.3																																	
5	118	112	9.6	6.7																																	
4. Name plate missing or damaged	<ul style="list-style-type: none"> Check visually. 	<ul style="list-style-type: none"> Never use trolley if missing or damaged. 	<ul style="list-style-type: none"> Replace it with new one. 																																		
5. Damage of hand wheel	<ul style="list-style-type: none"> Check visually. 	<ul style="list-style-type: none"> Never use the damaged one. 	<ul style="list-style-type: none"> Replace it with new one. 																																		

Inspection Item	Inspection Method	Discard Limits / Judgment Criteria	Countermeasures/ Others																																								
6. Deformation and abrasion of gear (track wheel G, pinion)	• Check visually or use calipers as needed.	• Never use the deformed or abraded one.	• Replace it with new one.																																								
7. Deformation and abrasion of suspension shaft	• Check visually or use calipers as needed.	• Never use the suspension shaft if its diameter is worn by 10% or more.	• Replace it with new one.																																								
8. Abrasion of suspender	• Check visually or use calipers as needed.	• Never use the suspender if its dimension of $D_2 - D_1$, d or h exceeds the limit in the Table 5.	• Replace if it exceeds the limit below.																																								
<p>Fig. 10</p> 																																											
<p>Table 5 (mm)</p> <table border="1"> <thead> <tr> <th rowspan="2">Trolley Capacity (t)</th> <th rowspan="2">$D_2 - D_1$ Limit</th> <th colspan="2">h</th> <th colspan="2">d</th> </tr> <tr> <th>Standard</th> <th>Limit</th> <th>Standard</th> <th>Limit</th> </tr> </thead> <tbody> <tr> <td>0.5</td> <td>1</td> <td>10</td> <td>8.5</td> <td>12.2</td> <td>13</td> </tr> <tr> <td>1</td> <td>1</td> <td>13</td> <td>11.5</td> <td>12.5</td> <td>13</td> </tr> <tr> <td>2</td> <td>1</td> <td>19</td> <td>17</td> <td>20.2</td> <td>21</td> </tr> <tr> <td>3</td> <td>1.5</td> <td>22</td> <td>20</td> <td>20.2</td> <td>21</td> </tr> <tr> <td>5</td> <td>1.5</td> <td colspan="2">—</td> <td>28.2</td> <td>30</td> </tr> </tbody> </table>				Trolley Capacity (t)	$D_2 - D_1$ Limit	h		d		Standard	Limit	Standard	Limit	0.5	1	10	8.5	12.2	13	1	1	13	11.5	12.5	13	2	1	19	17	20.2	21	3	1.5	22	20	20.2	21	5	1.5	—		28.2	30
Trolley Capacity (t)	$D_2 - D_1$ Limit	h				d																																					
		Standard	Limit	Standard	Limit																																						
0.5	1	10	8.5	12.2	13																																						
1	1	13	11.5	12.5	13																																						
2	1	19	17	20.2	21																																						
3	1.5	22	20	20.2	21																																						
5	1.5	—		28.2	30																																						
9. Rail deformation	• Check visually or use calipers as needed.	• The flange should not be deformed.	• Replace or repair.																																								
10. Welding section	• Check visually.	• There should be no crack. • There should be no rust.	• Repair or strengthen.																																								
11. Rail abrasion	• Check visually. • Use calipers as needed.	• The tread should not be abraded. • Replace it if the dimension B becomes 95% t becomes 90% of new one.	• Replace.																																								
<p>Fig. 11</p> <p>Tapered flange Flat flange</p> 																																											
12. Loosening of fixing bolt	• Try to turn it with a spanner.	• The bolt should be tightened firmly.	• Tighten the bolt.																																								

6. MAINTENANCE

ALWAYS maintain, inspect and test the trolley in accordance with applicable safety codes and regulations.

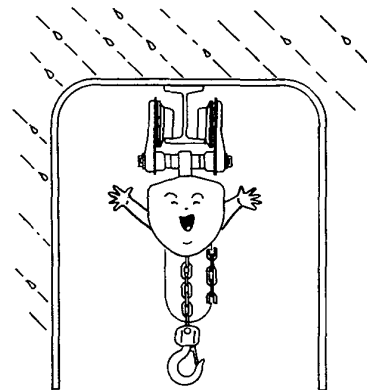
Safety regulations for hoists and cranes regulates implementations and maintenances of daily inspection, monthly inspection, annual inspection and testings. All inspection and maintenance records should be kept for at least 3 years.

- ⚠ WARNING** : **IMPROPER trolley use could result in serious injury or death.**
- To avoid these hazards:**
- : **NEVER perform maintenance on the trolley while it is suspending a load.**
 - : **Before performing maintenance, attach the tag:**
[**"DANGER": DO NOT OPERATE EQUIPMENT BEING REPAIRED.**]
 - : **Only allow qualified service personnel to perform maintenance.**
 - : **After performing maintenance, test trolley to 100% of its rated capacity before returning to service.**

6-1 Conditioning

6-1-1 Storing

- (1) In the event that the trolley or hoist becomes wet, dry the trolley or hoist with a dry cloth.
- (2) In the case of outdoor installation, make sure to house the trolley or hoist under the eaves or under some cover after operation.



6-2 Lubrication

6-2-1 Geared wheels (geared trolley only)

Lubricate exposed trolley drive pinion and wheel teeth. Brush with grease as often as necessary to keep teeth liberally covered. If the grease becomes contaminated with sand, dirt or other abrasive materials, remove old grease and replace with new grease (standard grease*), during monthly or annual inspection.

Temperature range of standard grease is -40°C (-40°F) to $+60^{\circ}\text{C}$ (140°F). If the hoist is used at temperatures below -40°C (-40°F) or above $+60^{\circ}\text{C}$ ($+140^{\circ}\text{F}$), consult the manufacturer or dealer since some parts should be changed.

* Calcium soap grease equivalent of NLGI (National Lubricating Grease Institute) / 2, or EP 2.

6-2-2 Trolley wheels and hand chain

Trolley wheel bearings do not need to be lubricated and must be replaced if worn or damaged. Hand chain, used on geared trolley, do not normally require lubrication.

6-3 Overhaul and assembly

Overhaul and assembly should be performed with reference to the following figures.

Fig. 18 : for 0.5 ton to 3 ton plain trolley.

Fig. 19 : for 5 ton plain trolley.

Fig. 20 : for 0.5 ton to 3 ton geared trolley.

Fig. 21 : for 5 ton geared trolley.

6-3-1 Precaution in overhauling and assembly

- (1) Parts name are described in parts list on page 20 to 25.
- (2) For overhauling a geared trolley, remove the track wheel first, then take off the pinion.
- (3) Arrange the adjusting spacers as shown in Table 3.
- (4) When connecting with geared trolley, install it so that the trolley's hand chain comes on right side from the hoist's name plate side.
- (5) Bend the split pin firmly as shown in Fig. 12-1 or 12-2. When removing the side plate for installing the trolley onto rail, tighten the split pin firmly after the installation is completed.
- (6) Place the shaft stopper pin as shown in Fig. 12-1 or 12-2 and the flat surface should touch the adjusting spacers.

Fig. 12-1

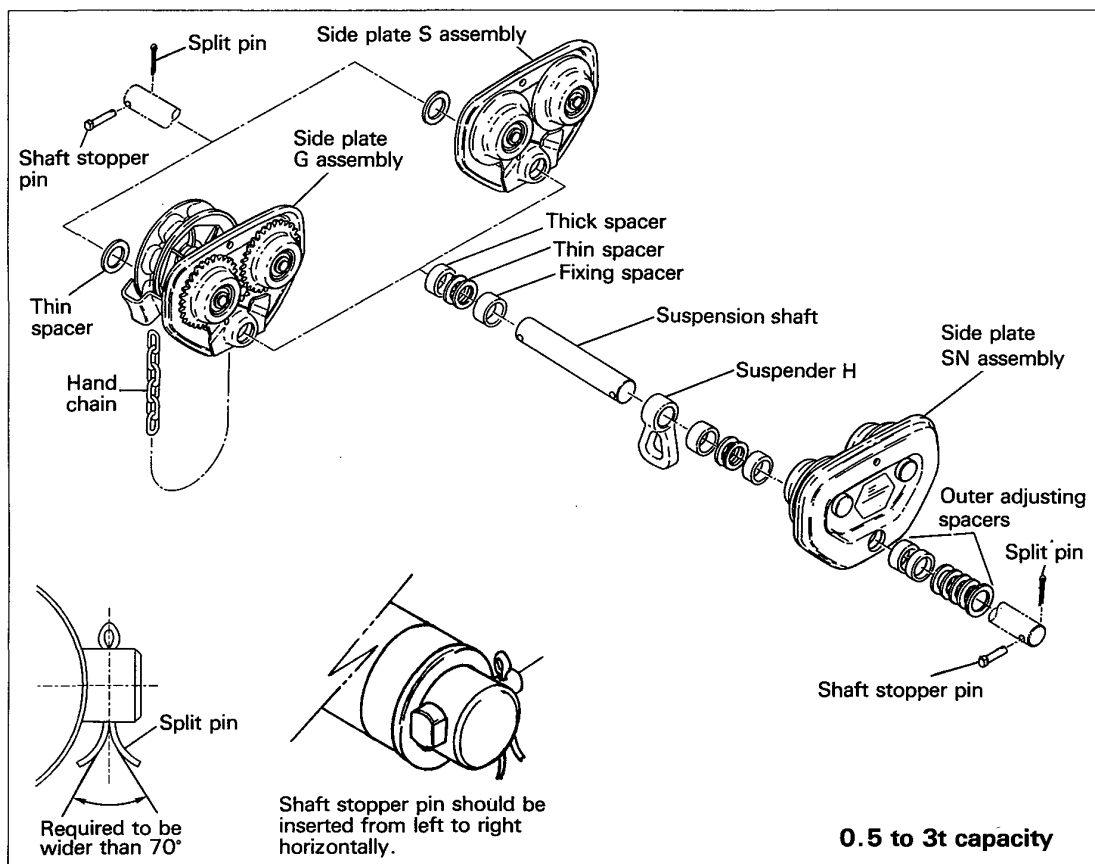
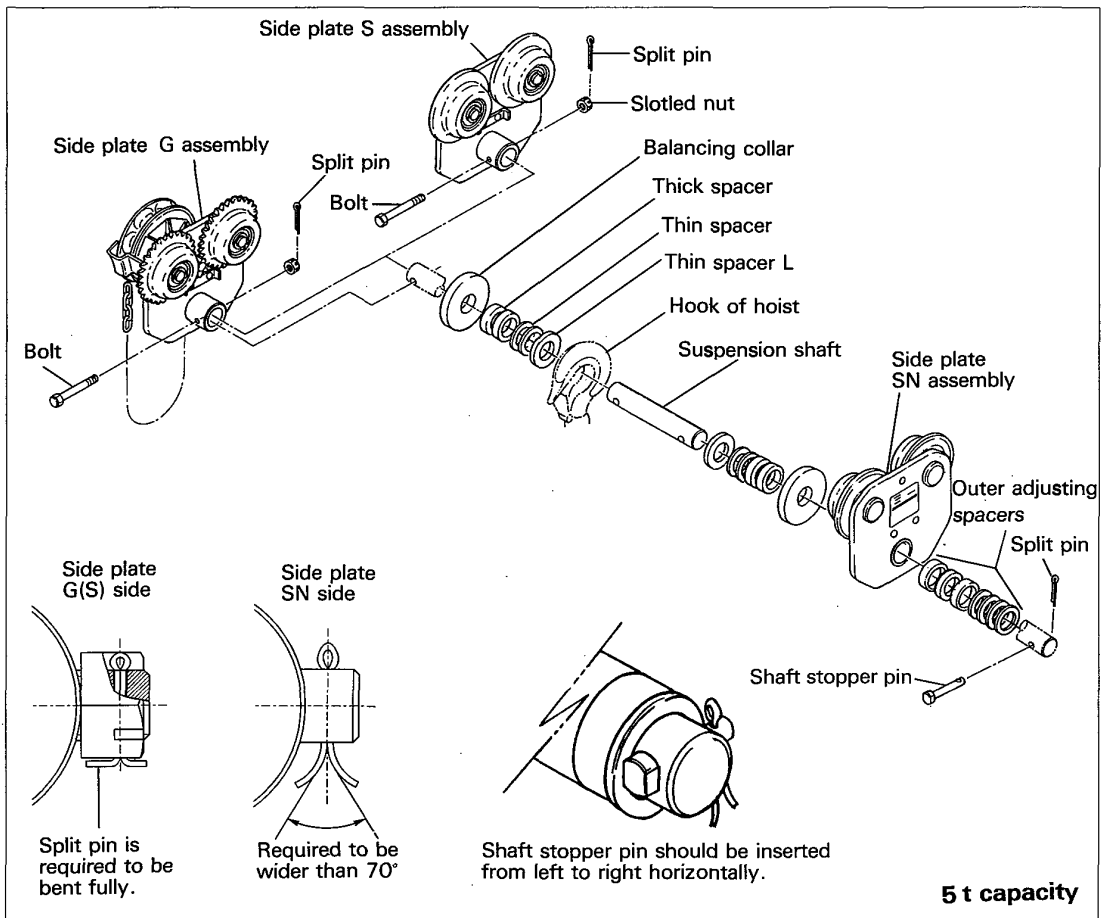


Fig. 12-2



7 T-TYPE HANGER

7-1 T-type hanger

A T-type hanger is used for moving the power supply cable while running together with the trolley on the same rail. When employing a T-type hanger, an additional fitting (cable pusher) is needed.

7-1-1 Installation of cable pusher

(1) Up to 3 t capacity

Fix the cable pusher by the M5 socket bolts with a spring washer from outside the side plate. When the power supply is on right as shown in Fig. 13, place the cable pusher on right side of the side plate. When the power supply is on left, turn the cable arm fitting 180° (upside down direction) and re-install it. Then install the cable pusher on the left side of the side plate.

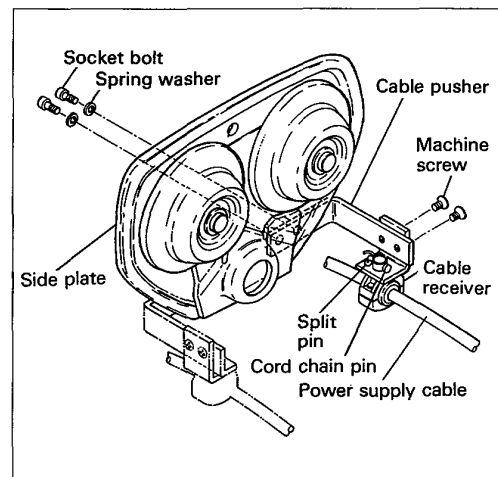


Fig. 13

(2) 5 t capacity

Fix the cable arm by the bolts and spring washers into the $\phi 8$ mm hole of the side plate from inside. The method of installation depends on the direction of the power supply cable.

*When there is no taps or holes for installation of the cable pusher on the side plate, make them as shown in Fig. 15 and Table 6.

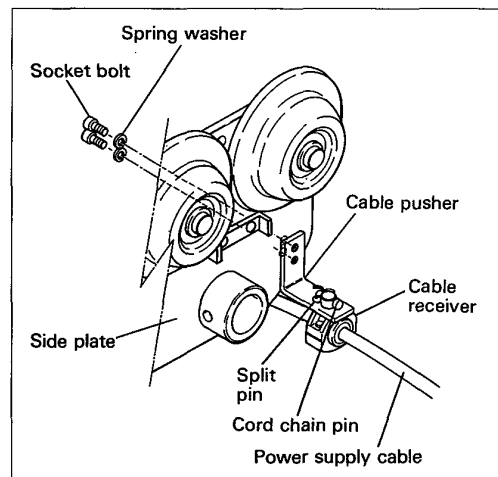


Fig. 14

Fig. 15

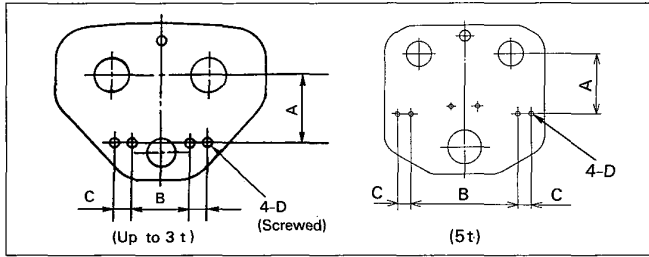


Table 6

	A	B	C	D
½t	62	50	15	M5
1t	75	80	15	M5
2t	86	80	22	M5
3t	93.5	124	22	M5
5t	114	200	25	φ8.5

7-1-2 Installation of cable receiver

Install the cable receiver onto the hole (φ 14mm) from the bottom side of the cable pusher (cable arm) with a cord chain pin and a split pin. (Bend the split pin firmly).

7-1-3 Installation of T-type hanger

(1) Type

There are 3 types. After adjusting the rail width referring to the table below, install the T-type hanger from the rail end.

(2) Installation of T-type hanger

After adjusting beam width as refer to the table 7, install the required number of the T-type hanger as shown in Fig. 17.

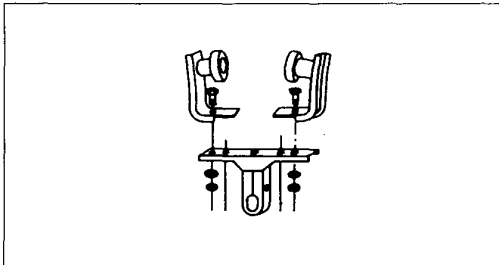


Fig. 16

Type	Beam Width (mm)
T-type hanger 200	76 to 102 (3" to 4")
T-type hanger 250	102 to 152 (4" to 6")
T-type hanger 275	127 to 178 (5" to 7")

Table 7

Note : Ask your authorized Kito dealer if the beam width exceeds 178mm.

*The intervals between adjacent hangers.

In case of the straight beam or the larger radius curved beam, 2m interval between hangers is adequate. In case of smaller radius curved beam, closer interval gives smooth operation. For example, if the curve radius is about 1.5m, about 1m interval is adequate.

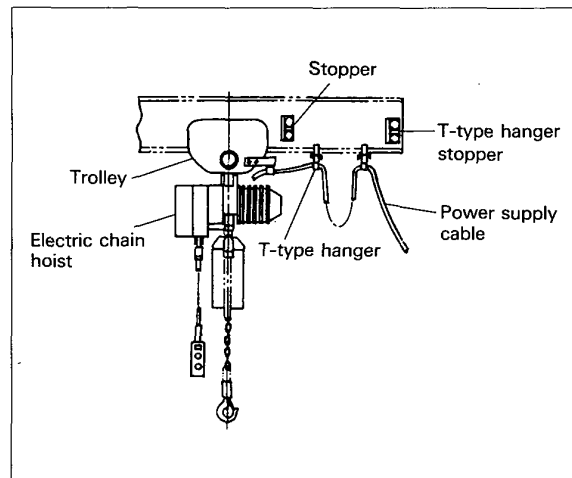


Fig. 17

8. WARRANTY

Kito Corporation ("Kito") extends the following warranty to the original purchaser ("Purchaser") of new products manufactured by "Kito" (Kito's Products).

- (1) "Kito" warrants that Kito's Products, when shipped, shall be free from defects in workmanship and/or materials under normal use and service and "Kito" shall, at the election of "Kito", repair or replace free of charge any parts or items which are proven to have said defects, provided that all claims for defects under this warranty shall be made in writing immediately upon discovery, and in any event, within one (1) year from the date of purchase of Kito's Products by "Purchaser" and provided, further, that defective parts or items shall be kept for examination by "Kito" or its authorized agents or returned to Kito's factory or authorized service center upon request by "Kito".
- (2) "Kito" does not warrant components of products provided by other manufacturers. However to the extent possible, "Kito" will assign to "Purchaser" applicable warranties of such other manufacturers.
- (3) Except for the repair or replacement mentioned in (1) above which is "Kito"'s sole liability and purchaser's exclusive remedy under this warranty, "Kito" shall not be responsible for any other claims arising out of the purchase and use of Kito's Products, regardless of whether "Purchaser"'s claims are based on breach of contract, tort or other theories, including claims for any damages whether direct, indirect, incidental or consequential.
- (4) This warranty is conditional upon the installation, maintenance and use of Kito's Products pursuant to the product manuals prepared in accordance with content instructions by "Kito". This warranty shall not apply to Kito's Products which have been subject to negligence, misuse, abuse, misapplication or any improper use or combination or improper fittings, alignment or maintenance.
- (5) "Kito" shall not be responsible for any loss or damage caused by transportation, prolonged or improper storage or normal wear and tear of Kito's Products or for loss of operating time.
- (6) This warranty shall not apply to Kito's Products which have been fitted with or repaired with parts, components or items not supplied or approved by "Kito" or which have been modified or altered.

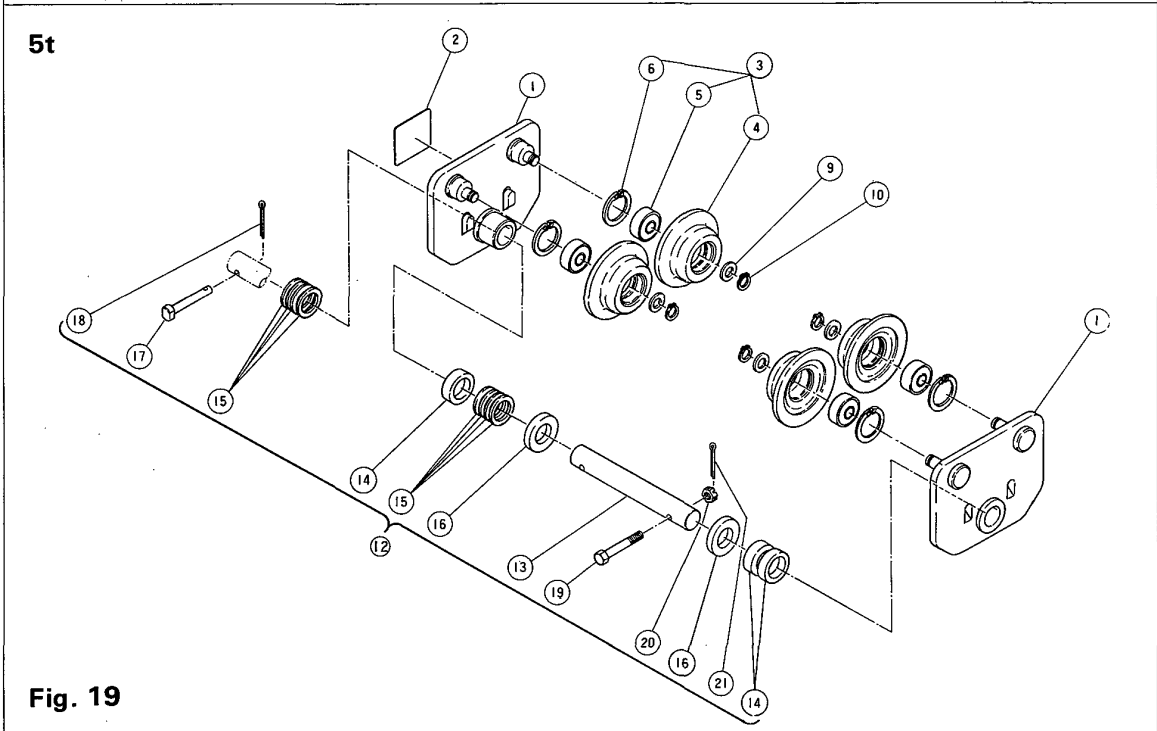
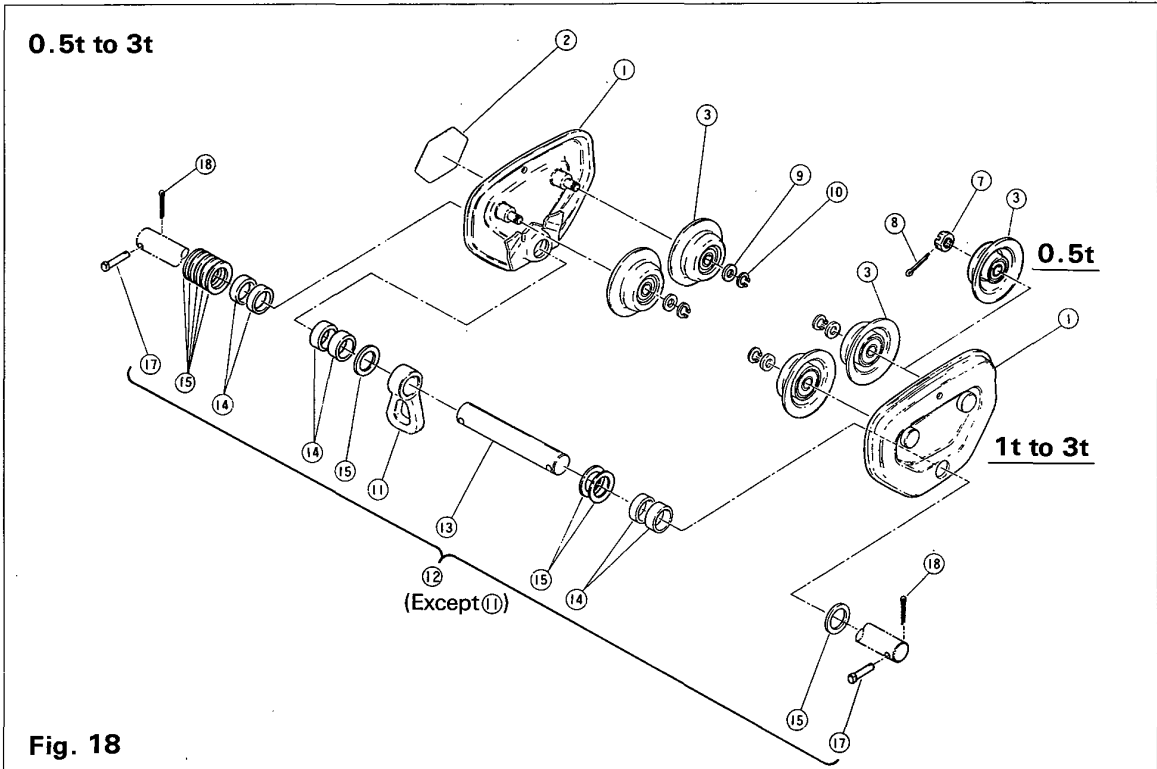
THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

9. PARTS LIST

*When ordering replacement parts, please specify the following points.

1. Part name and trolley capacity.
2. Correct figure number.

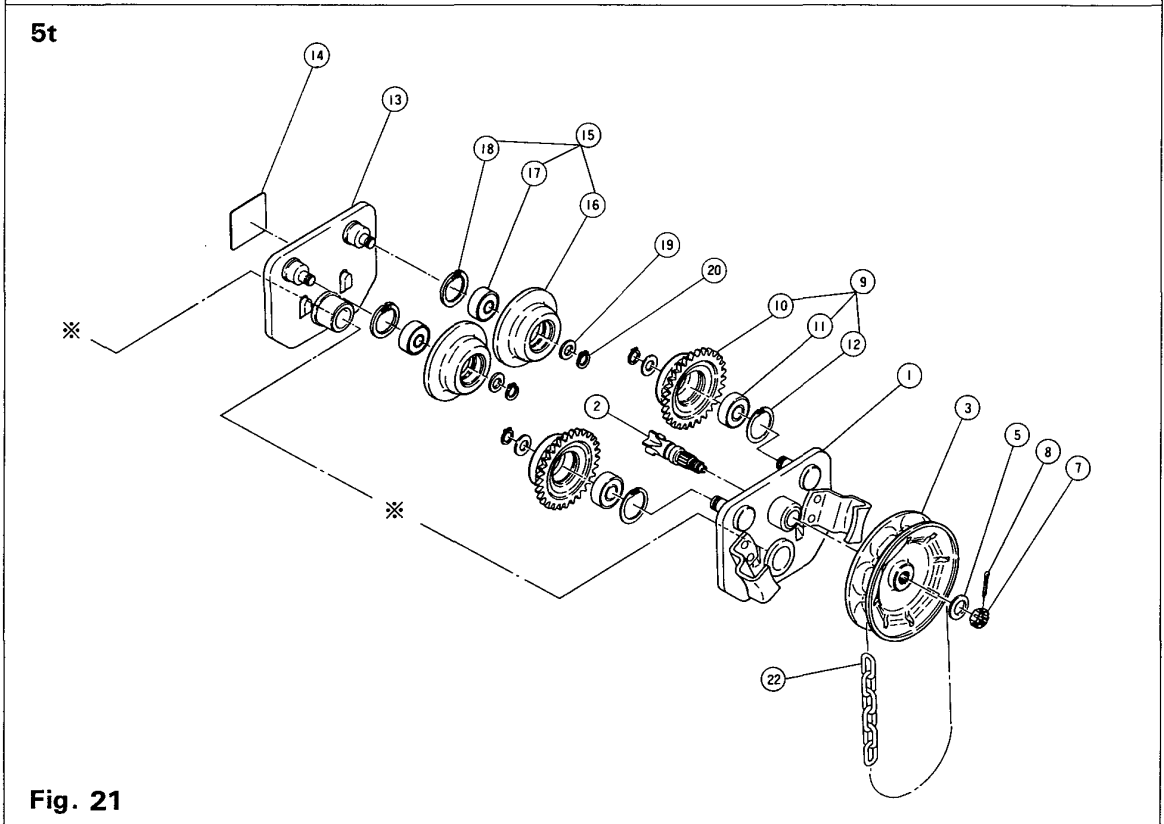
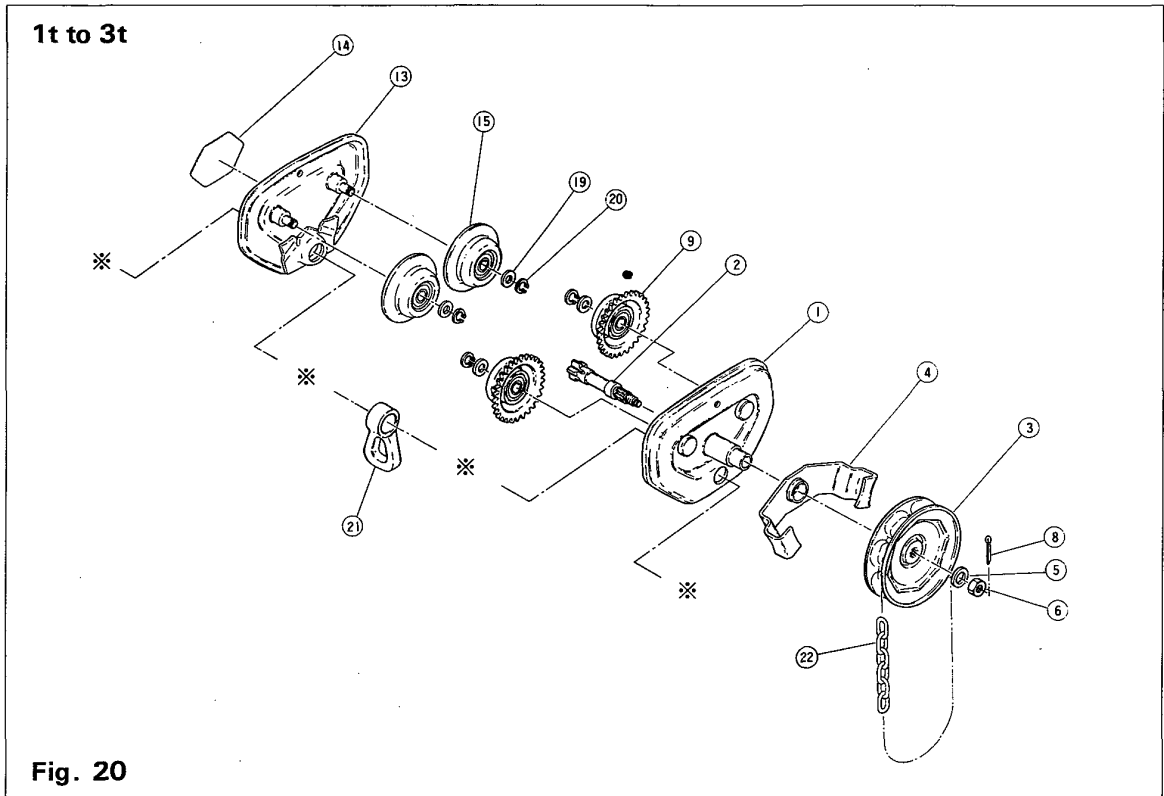
Plain trolley (Rail width-standard)



Plain trolley(Rail width-standard)

Fig. No.	Part No.	Part name	No. per Trolley	Capacity					Remarks
				0.5t	1t	2t	3t	5t	
1	5112	Side plate S Assembly	2	T6PA005-5112	T6GA010-5112	T6GA020-5112	T6GA030-5112		
	5110	Side plate S Assembly	1					T3PA050-5110	
		Side plate SN Assembly	1					T6GA050-5110	-With nameplate
2	800	Name plate B	1	T6PA005-9800	T6GA010-9800	T6GA020-9800	T6GA030-9800	T6GA050-9800	
	803	Name plate C	1	T5PE001-9803 (for 125kg)	T7GE001-9803 (for 125kg)			T6GB048-9803 (for 4.8t)	
				T5PE003-9803 (for 250kg)	T7GB003-9803 (for 250kg)				
				T7GA005-9803 (for 1/2t)					
3	5102	Track wheel S Assembly	4	T6PA005-5102	T6GA010-5102	T6GA020-5102	T6GA030-5102	T3GA050-1102	
4	102	Track wheel S	4					T3GA050-9102	
5	107	Ball bearing	4					J1GR020-06307	
6	105	Snap ring	4					J1SR000-00080	
7	158	Slotted nut	4	J1NL002-10100					
8	159	Split pin	4	J1PW01-020016					
9	104	Track wheel washer	4		T6GA010-9104	T1GA020-9104	T1GA030-9104	M6SE050S9104	
10	106	Snap ring	4		J1SS000-00015	J1SS000-00020	J1SS000-00025	J1SS000-00035	
11	019	Suspender	1	T6PA005-9019	T6GA010-9019	T6GA020-9019	T6GA030-9019		
12	1115	Suspension shaft (standard)Assembly	1	T7PD005-1115 (100mm)	T7GD010-1115 (125mm)	T7GD020-1115 (150mm)	T7GD030-1115 (150mm)	T6GD050-1115 (175mm)	
13	115	Suspension shaft (standard)	1	T7PA005-9115 (100mm)	T7GA010-9115 (125mm)	T7GA020-9115 (150mm)	T7GA030-9115 (150mm)	T6GA050-9115 (175mm)	
14	116	Thick spacer	→	T7PA005-9116	T7GA010-9116	T7GA020-9116	T7GA030-9116		
		Thick spacer	5	8	8	10	12		T6GA050-9116
15	117	Thin spacer	→	T6PA005-9117	T6GA010-9117	T6GA020-9117	T6GA030-9117		
16	119	Thin spacer L	2	13	12	8	15		T6GA050-9119
17	156	Shaft stopper pin	2	T6PA005-9156	T6GA010-9156	T6GA020-9156	M6FE020S9164	M6SE030S9164	
18	157	Split pin	→	J1PW01-032020		J1PW01-040020		J1PW02-040022	
19	153	Suspension shaft bolt	1					T1GA030-9153	
20	154	Slotted nut	1					J1NL002-20120	
21	155	Split pin	1					J1PW01-030022	

Geared trolley (Rail width-standard)



Note : ※Refer to the parts list of plain trolley for Suspension shaft assembly because the geared trolley suspension shaft is the same with the plain trolley's.

Geared trolley(Rail width-standard)

Fig. No.	Part No.	Part name	No. per Trolley	Capacity				Remarks
				1t	2t	3t	5t	
1	5111	Side plate G Assembly	1	T6GC010-5111	T6GA020-5111	T6GA030-5111	T3GA050-5111	
2	121	Pinion	1		T7GB010-9121		T4GB010-9121	
	127	Pinion	1	T6GC010-9127				
3	123	Hand wheel	1	T6GA010-9123				
4	5125	Hand chain guide Assembly	1	T6GA010-5125				
5	152	Washer	1	J1WB012-10120			J1WB011-10120	
6	151	Lever nut	1	C2BA400-9074				
7	151	Slotted nut	1				J1NL002-20120	
8	160	Split pin	1	J1PW01-030018				
	153	Split pin	1				J1PW01-030022	
9	5101	Track wheel G Assembly	2	T6GA010-5101	T6GA020-5101	T6GA030-5101		
	1101	Track wheel G Assembly	2				T3GA050-1101	
10	101	Track wheel G	2				T3GA050-9101	
11	107	Ball bearing	2				J1GR020-06307	
12	105	Snap ring	2				J1SR000-00080	
13	5112	Side plate S Assembly	1	T6GA010-5112	T6GA020-5112	T6GA030-5112		
		Side plate SN Assembly					T6GA050-5112	With nameplate
14	800	Name plate B	1	T6GA010-9800	T6GA020-9800	T6GA030-9800	T6GA050-9800	
	803	Name plate C	1	T7GE001-9803 (for 125kg)				
				T7GE003-9803 (for 250kg)				
		T7GE005-9803 (for 1/5t)						
15	5102	Track wheel S Assembly	2	T6GA010-5102	T6GA020-5102	T6GA030-5102		
	1102	Track wheel S Assembly	2				T3GA050-1102	
16	102	Track wheel S	2				T3GA050-9102	
17	107	Ball bearing	2				J1GR020-06307	
18	105	Snap ring	2				J1SR000-00080	
19	104	Track wheel washer	4	T6GA010-9104	T1GA020-9104	T1GA030-9104	M6SE050S9104	
20	106	Snap ring	4	J1SS000-00015	J1SS000-00020	J1SS000-00025	J1SS000-00035	
21	019	Suspender H	1	T6GA010-9019	T6GA020-9019	T6GA030-9019		
22	1842	Hand chain	1	C1FA015-1842	C1FA020-1842		T3GC050-1842	

Rail width-option

Suspension shaft Assembly. (0.5t W100 W200 1t W125 W200 2t W150 3t W150)

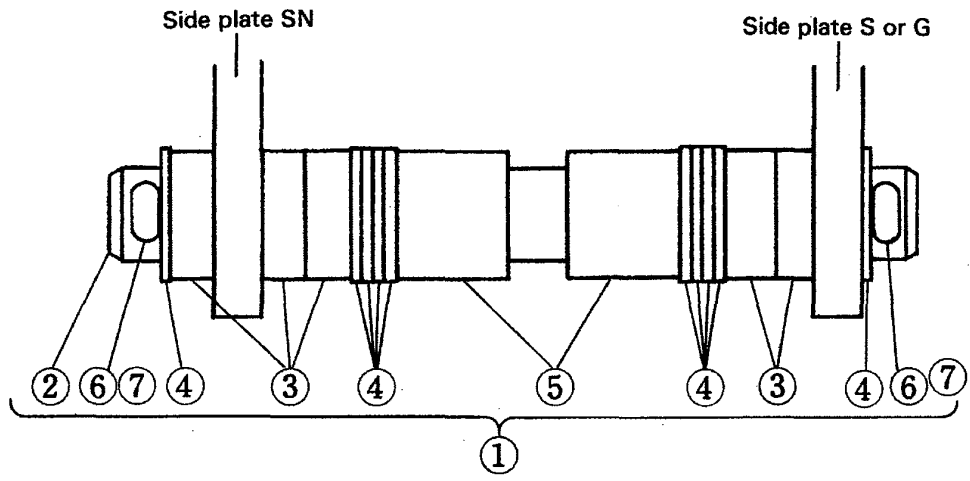


Fig. 22

Suspension shaft Assembly. (0.5t to 3t W300)

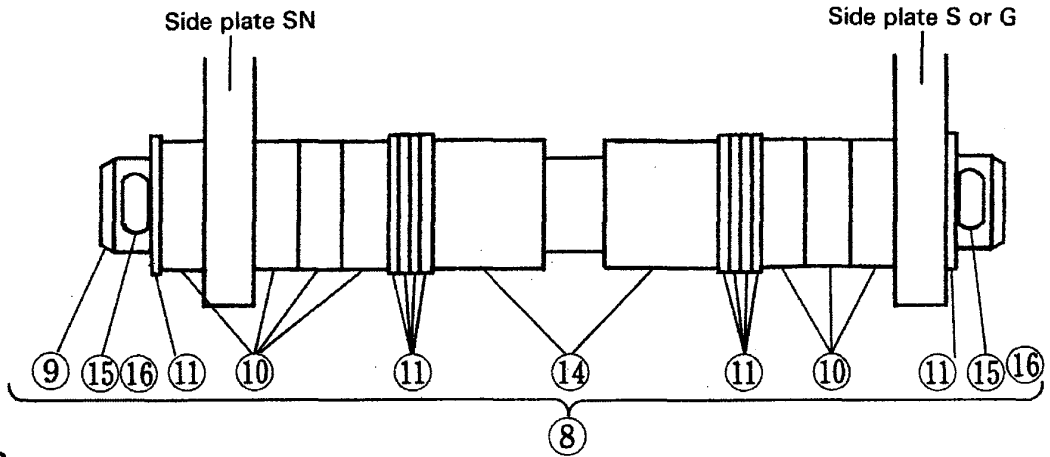


Fig. 23

Suspension shaft Assembly. (5t W175. W300)

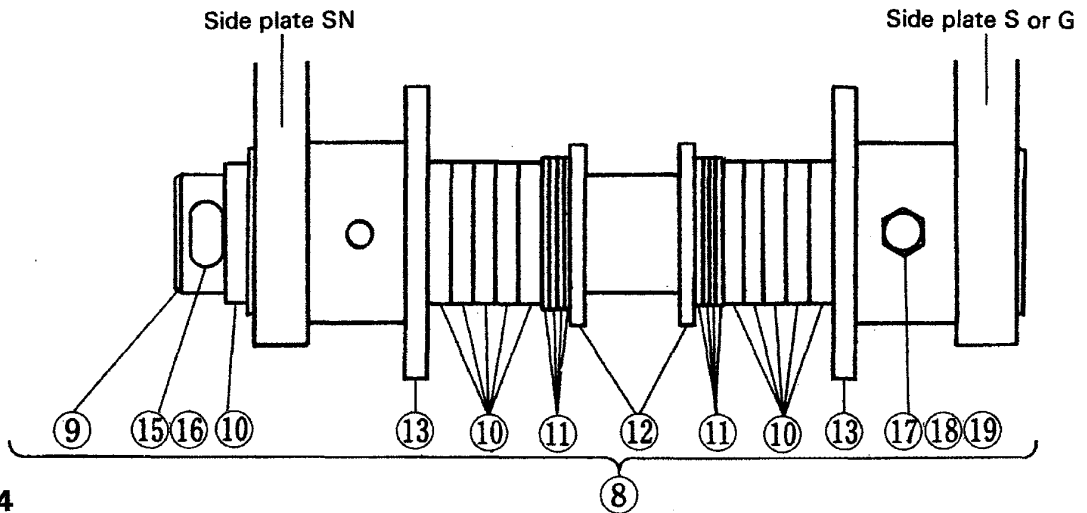


Fig. 24

Rail width-option

Fig. No.	Part No.	Part name	No. per Trolley	Capacity					Remarks
				0.5t	1t	2t	3t	5t	
1	1115	Suspension shaft W100 Assembly	1	T7PD005-1115					
2	115	Suspension shaft W100	1	T7PA005-9115					
3	116	Thick spacer	4	T7PA005-9116					
4	117	Thin spacer	10	T6PA005-9117					
6	156	Shaft stopper pin	2	T6PA005-9156					
7	157	Split pin	2	J1PW01-032020					
1	1115	Suspension shaft W125 Assembly	1		T7GD010-1115				
2	115	Suspension shaft W125	1		T7GA010-9115				
3	116	Thick spacer	6		T7GA010-9116				
4	117	Thin spacer	9		T6GA010-9117				
6	156	Shaft stopper pin	2		T6GA010-9156				
7	157	Split pin	2		J1PW01-032020				
1	1115	Suspension shaft W150 Assembly	1			T7GD020-1115	T7GD030-1115		
2	115	Suspension shaft W150	1			T7GA020-9115	T7GA030-9115		
3	116	Thick spacer				T7GA020-9116	T7GA030-9116		
4	117	Thin spacer	→			6	9		
6	156	Shaft stopper pin	2			T6GA020-9117	T6GA030-9117		
7	157	Split pin	2			8	11		
8	1115	Suspension shaft W175 Assembly	1					T6GD050-1115	
9	115	Suspension shaft W175	1					T6GA050-9115	
10	116	Thick spacer	3					T6GA050-9116	
11	120	Thin spacer	8					T6GD050-9120	
12	119	Thin spacer L	2					T6GA050-9119	
15	156	Shaft stopper pin	1					M6SE030S91645	
16	157	Split pin	1					J1PW02-040022	
17	153	Fixing spacer W175	2					T1GA030-9153	
18	154	Slotted nut	1					J1NL002-20120	
19	155	Split pin	1					J1PW01-030022	
1	1136	Suspension shaft W200 Assembly	1	T7PD005-1136	T7GD010-1136				
2	136	Suspension shaft W200	1	T7PA005-9136	T7GA010-9136				
3	116	Thick spacer	→	T7PA005-9116	T7GA010-9116				
4	117	Thin spacer	10	7	5				
5	137	Fixing spacer W200	2	T6PA005-9117	T6GA010-9117				
6	156	Shaft stopper pin	2	T7PA005-9137	T7GA010-9137				
7	157	Split pin	2	T6PA005-9156	T6GA010-9156				
				J1PW01-032020		J1PW01-040020			
8	1181	Suspension shaft W300 Assembly	1	T7PD005-1181	T7GD010-1181	T7GD020-1181	T7GD030-1181	T6GD050-1181	
9	181	Suspension shaft W300	1	T7PA005-9181	T7GA010-9181	T7GA020-9181	T7GA030-9181	T6GA050-9181	
10	116	Thick spacer	→	T7PA005-9116	T7GA010-9116	T7GA020-9116	T7GA030-9116	T6GA050-9116	
11	117	Thin spacer	10	7	7	11	11	11	
12	120	Thin spacer	8					T6GD050-9120	
13	119	Thin spacer	2			T7GA020-9116	T7GA030-9116	T6GA050-9119	
14	137	Thin spacer	2					T3GA050-9137	
14	182	Fixing spacer W300	2	T7PA005-9182	T7GA010-9182	T7GA020-9182	T7GA030-9182	T7GA030-9182	
15	156	Shaft stopper pin	2	T6PA005-9156	T6GA010-9156	T6GA020-9156	M6FE020S9164	M6FE020S9164	
16	157	Split pin	→	J1PW01-032020		J1PW01-040020		J1PW02-040022	
17	153	Suspension shaft bolt	1	2		2		1	
18	154	Slotted nut	1					T1GA030-9153	
19	155	Split pin	1					J1NL002-20120	
								J1PW01-030022	

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