
**ASSEMBLY MANUALS
FOR KITO MOTORIZED CRANES
N6_{SERIES}**

ALWAYS SAVE THIS BOOK FOR FUTURE REFERENCE.

KITO

Thank you for purchasing Kito N6 series Motorized Crane.

This crane has the simple construction of all our traveling cranes. Assembly requires only that the girder be coupled to the end carriage.

All Kito products are manufactured in line with thorough quality controls. We are sure this crane will satisfy your requirements for durability.

DEFINITIONS

⚠ CAUTION : indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

⚠ CAUTION : Read this manual carefully to properly assemble your crane. Refer to other manuals provided with the equipment for instructions on operation and safety.

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1. End carriage parts

Check the delivered product conforms to your order. Follow the instructions herein to assemble parts.

The end carriage and geared motor are packaged separately (Fig.1 and Fig. 2).

End carriage packaging details

Part	End carriage	
	End carriage	Bolts and accessories*
Low-head	2 sets	1 set
Overhead		—

*High tension bolts (H.T.B.) are delivered to couple the end carriage to the girder as standard for low-head type.

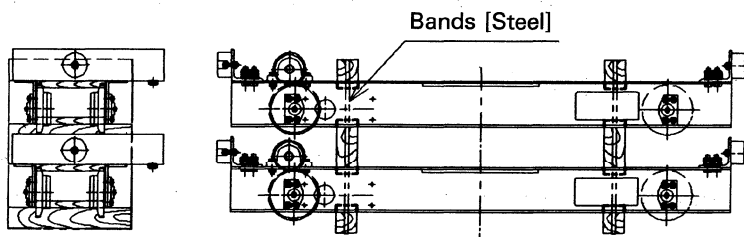


Fig. 1

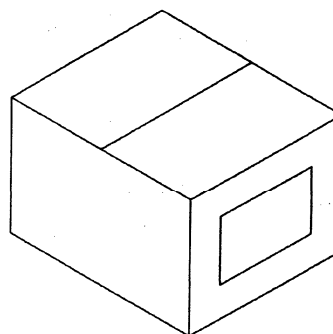


Fig. 2

2. Travel rail preparation

Travel rail size will depend on building structures and span (distance between pillars).

2.1 Determining rail size

2.1.1 Low-head cranes

Use I beam as travel rail

(1) Travel rail height

Select a travel rail with a height of 150 mm or higher (See H in Fig. 3). If less than 125 mm, make sure bolts and nuts do not protrude to the inside of the rail (Fig. 3).

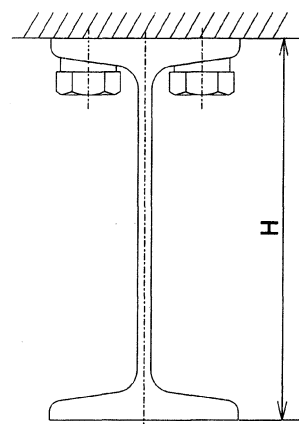


Fig. 3

(2) End carriage and travel rail combinations

Travel rail width (T) is determined by the type of end carriage used. Refer to Table 1.

Table 1

End carriage		JIS Travel rail width [T]				Unit:mm
Type	Code	75	100	125	150	
EL010-6	N6QL210V	○				
EL010-9	N6QL310V					
EL010-12	N6QL410V					
EL020-6	N6QL220V	×	○	○	○	
EL020-9	N6QL320V					
EL020-12	N6QL420V					
EL030-6	N6QL230V					
EL030-12	N6QL430V					
EL030-15	N6QL530V					
EL050-9	N6QL350V					
EL050-15	N6QL550V					

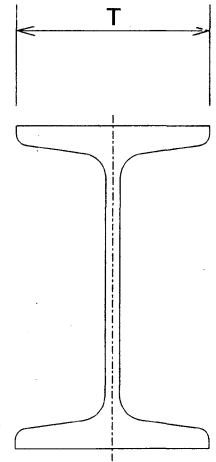


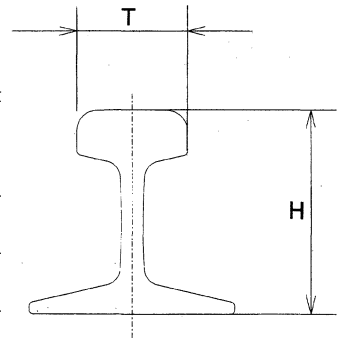
Fig. 4

2.1.2 Overhead cranes (single and double girder)

(1) Use a light rail or square rail for the travel rail. Refer to Fig. 5 and Table 2.

Table 2

〈JIS Light rail〉						Unit:mm
Rail type / Dimension	9kg/m	15kg/m	22kg/m	30kg/m	37kg/m	
H	63.5	80	94	108	122	
T	32	43	51	60	63	



〈JIS Square rail〉									Unit:mm
Square rail	32	38	40	45	50	55	60	65	
H · T	32	38	40	45	50	55	60	65	

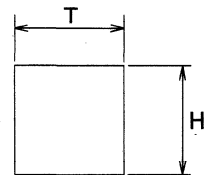


Fig. 5

(2) End carriage and travel rail combinations

The type of travel rail is determined by the type of end carriage used. Refer to Table 3.

Table 3

End carriage		JIS Travel rail	End carriage		JIS Travel rail
Type	Code		Type	Code	
EO010-12	N6QO410E	(9kg/m) 15kg/m	WEO030-15	N6WO530E	22kg/m 50 [□]
EO010-18	N6QO610E	(32 [□])38 [□] , 40 [□] , 45 [□]	WEO030-21	N6WO730E	
EO020-12	N6QO420E	(9kg/m) 15kg/m	WEO030-27	N6WO930E	
EO020-18	N6QO620E	(32 [□])38 [□] , 40 [□] , 45 [□]	WEO050-21	N6WO750E	30kg/m 50 [□] ,60 [□] (30kg/m)
EO030-12	N6QO430E	(15kg/m)22kg/m (38 [□] ,40 [□] ,45 [□]) 50 [□]	WEO050-27	N6WO950E	
EO030-18	N6QO630E		WEO075-21	N6WO775E	
EO030-21	N6QO730E		WEO075-27	N6WO975E	
EO050-9	N6QO350E	22kg/m 50 [□]	WEO100-21	N6WO711E	37kg/m 65 [□] (60 [□])
EO050-18	N6QO650E		WEO100-27	N6WO911E	
EO050-21	N6QO750E		WEO150-27	N6WO915E	
EO100-12	N6QO411E	30kg/m 55 [□] ,60 [□]	WEO150-27H	N6WB915E	
EO100-18	N6QO611E		WEO200-27	N6WO921E	
EO100-21	N6QO711E		WEO200-27H	N6WB921E	

NOTE 1 : Rails shown in parentheses can be used, but girder span must be adjusted.

2 : Contact Kito for details on using rails not listed in the above table.

3. Girder preparation

Shop drawings of girders are not provided with the end carriage. Contact Kito with the type of end carriage purchased, as the shop drawing based on JIS material is available upon request.

3.1 Determining girder size

Girder size based on JIS material depends on the rated load of your hoist and travel rail span. Select your girder from the table on page 35 in the Kito Crane catalogue.

In case you use girder other than JIS material, make sure that your selected girder has sufficient strength for your crane.

Also, note that girder combinations in the table vary whether using an electric chain hoist or a wire rope hoist.

NOTE : If using an electric chain hoist with motorized trolley, or motorized traverse hoist (wire rope hoist), use a girder with a height of 200 mm or more.

3.1.1 Girders for low-head cranes

(1) For spans of 16m or less

Select your girder from the table on page 35 in the Kito Crane catalogue.

(2) For spans over 16m

Contact Kito or your local Kito dealer for girders not included on tables in the Kito Crane catalogue.

3.1.2 Girders for overhead cranes

(1) For spans of 16m or less

Select your girder from the table on page 35 in the Kito Crane catalogue.

(2) For spans over 16m

Contact Kito or your local Kito dealer for girders not included on tables in the Kito Crane catalogue.

3.2 Girder manufacture

<For low-head cranes>

Overhang dimensions are marked 400 mm as shown in Fig. 6. Contact Kito or your local Kito dealer for longer dimensions. Refer to Fig. 6.

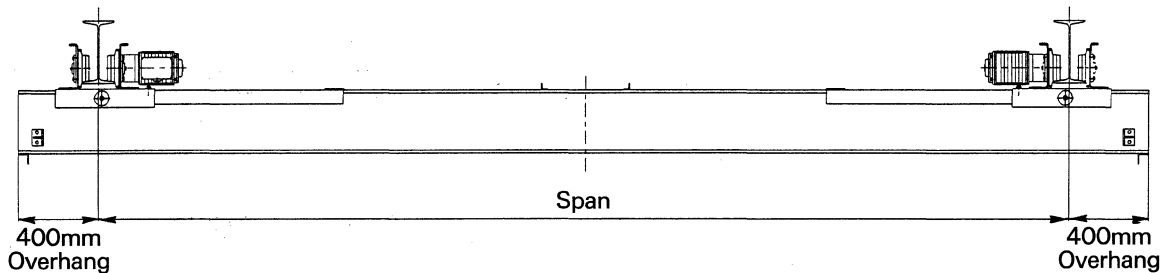


Fig. 6

<For overhead cranes>

Due to building structures, sometimes girder ends need to be notched or trimmed. Depth of cut limit, however, varies with girder material. Refer to Fig. 7 and contact Kito or your local Kito dealer for details.

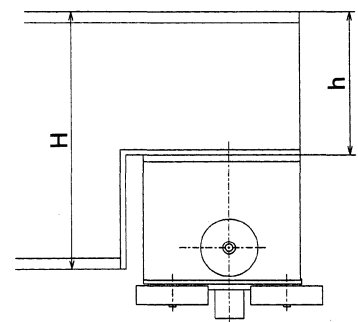


Fig. 7

4. End carriage punching and assembly

Punch holes in the end carriages to couple with girder, but note that hole pitch will vary with girder size.

4.1 Punching holes in low-head end carriages

Once girder size has been determined, drill holes at a pitch that conforms to the girder. Refer to Fig. 8 and Tables 4 and 5.

NOTE: Never open holes with a gas torch.

Maintain dimension "e" when making holes regardless of the size of the girder.

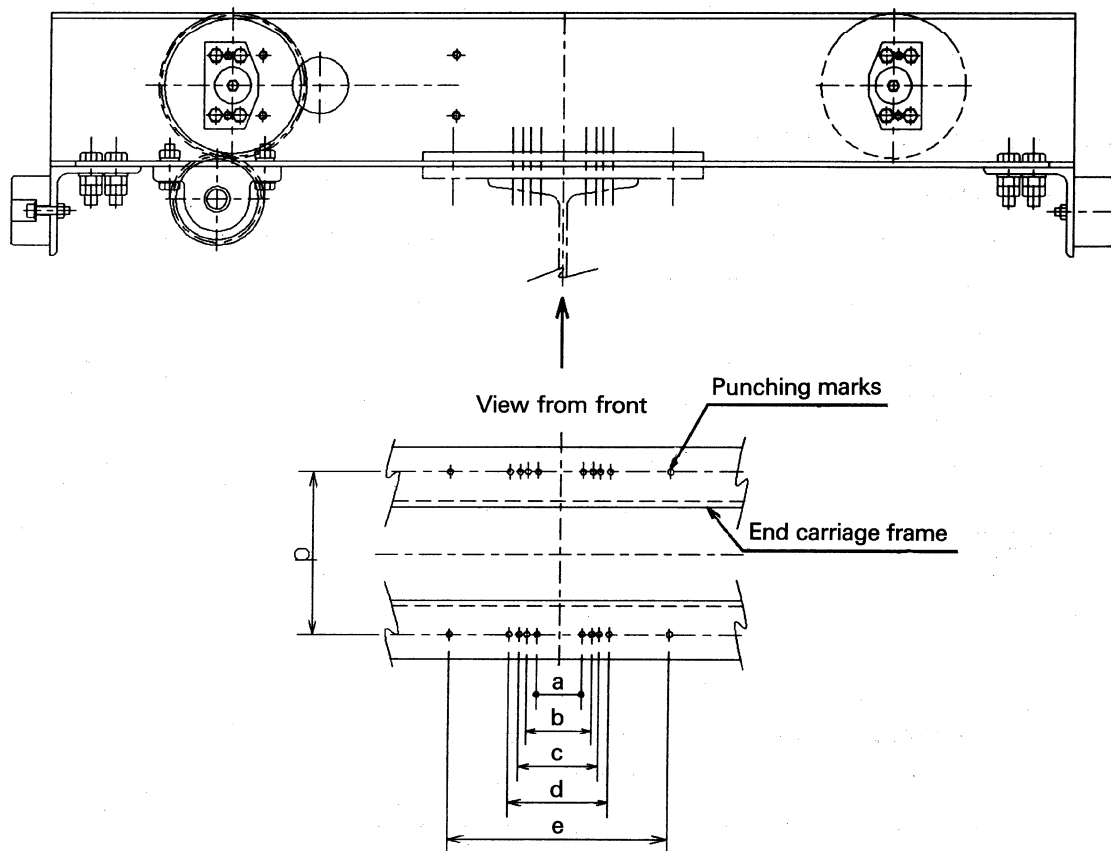
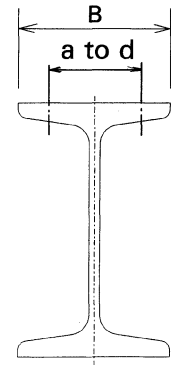


Fig. 8

Table 4 Girder width (B) and punch pitch for JIS I-beams

Unit:mm

End carriage Type	Girder width(B) Code	Punch pitch					p	Hole diameter	Bolt diameter
		75	100	125	150	—			
		a	b	c	d	e			
EL010-6	N6QL210V	45	65	80	—	270	T+121	φ16	M14 (H.T.B.)
EL010-9	N6QL310V	45	65	80	100	270			
EL010-12	N6QL410V	—	—	80	100	270			
EL020-6	N6QL220V	—	65	80	100	270	T+131	φ18	M16 (H.T.B.)
EL020-9	N6QL320V	—	65	80	100	270			
EL020-12	N6QL420V	—	—	—	100	270			
EL030-6	N6QL230V	—	—	80	100	270			
EL030-12	N6QL430V	—	—	—	100	370			
EL030-15	N6QL530V	—	—	—	—	370			
EL050-9	N6QL350V	—	—	80	100	370	T+149	φ22	M20 (H.T.B.)
EL050-15	N6QL550V	—	—	—	—	370			

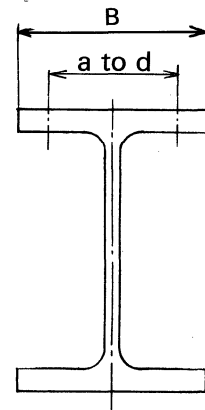


I-beam

Table 5 Girder width (B) and punch pitch for JIS H-beams

Unit:mm

End carriage Type	Girder width(B) Code	Punch pitch					p	Hole diameter	Bolt diameter
		75	100	125	150·175·200	—			
		a	b	c	d	e			
EL010-6	N6QL210V	45	65	80	—	270	T+121	φ16	M14 (H.T.B.)
EL010-9	N6QL310V	45	65	80	100	270			
EL010-12	N6QL410V	—	—	80	100	270			
EL020-6	N6QL220V	—	65	80	100	270	T+131	φ18	M16 (H.T.B.)
EL020-9	N6QL320V	—	65	80	100	270			
EL020-12	N6QL420V	—	—	—	100	270			
EL030-6	N6QL230V	—	—	80	100	270			
EL030-12	N6QL430V	—	—	—	100	370			
EL030-15	N6QL530V	—	—	—	—	370			
EL050-9	N6QL350V	—	—	—	100	370	T+149	φ22	M20 (H.T.B.)
EL050-15	N6QL550V	—	—	—	—	370			



H-beam

NOTE : When the girder width is 300mm, the hole is elective.

4.1.1 End carriage assembly for low-head cranes

(1) End carriage to girder assembly

Assemble parts, as shown in Fig. 9, with the provided bolts, nuts and washers (Table 6).

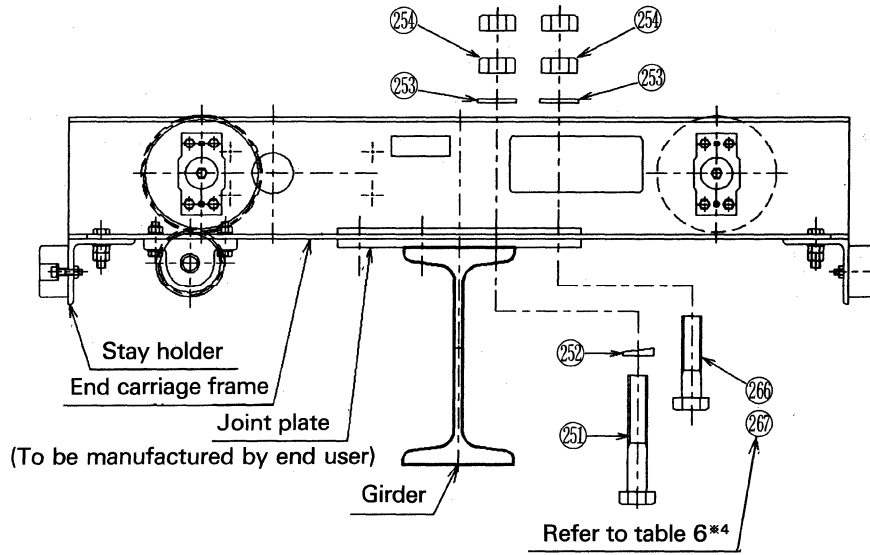


Fig. 9

Table 6

Unit:mm

End carriage Type	Part No. Code	Part					
		(251)	(252)	(253)	(254)	(266)	(267)
		Bolt(H.T.B.)	Tapered washer	Washer	Nut	Bolt(H.T.B.)	Bolt(H.T.B.)
EL010-6	N6QL210V						
EL010-9	N6QL310V	M14×85×65	8° for M14	For M14	M14	M14×60×40	—
EL010-12	N6QL410V						
EL020-6	N6QL220V						*4 M16×60×40
EL020-9	N6QL320V						—
EL020-12	N6QL420V	M16×105×85	8° for M16	For M16	M16	M16×75×55	—
EL030-6	N6QL230V						*4 M16×60×40
EL030-12	N6QL430V						—
*2 EL030-15	N6QL530V	—	—	—	—	—	—
EL050-9	N6QL350V	M20×110×90	8° for M20	For M20	M20	M20×80×60	—
*2 EL050-15	N6QL550V	—	—	—	—	—	—

NOTE *1: Tapered washer part No. (252) is used for I-beam girders and not with H-beam girders.

*2: This model comes without bolts and accessories. Contact Kito or your local Kito dealer for details.

*3: Bolt length varies depending on how much of the girder coupling is notched or trimmed. Contact Kito or your local dealer for details.

*4: Used in the vicinity of geared motor.

(2) Stay holder assembly and hole punching

〈For JIS rail〉

The stay holder can be used as is. The stay holders are holed as they are to assemble with end carriage according to travel rail width (T) (Refer to Fig. 10). Assemble end carriage frame based on travel rail width determined.

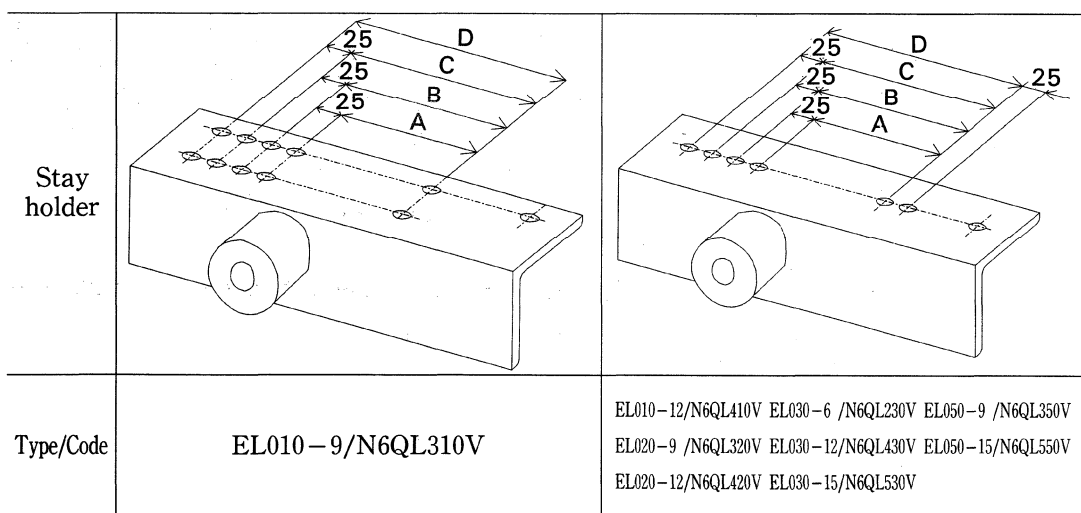


Fig. 10

Table 7 JIS rail width (T) and stay holder holes

Unit:mm

End carriage		Hole			
Type	Code	A	B	C	D
EL010-6	N6QL210V	75	100	125	150
EL010-9	N6QL310V				
EL010-12	N6QL410V				
EL020-6	N6QL220V				
EL020-9	N6QL320V				
EL020-12	N6QL420V				
EL030-6	N6QL230V				
EL030-12	N6QL430V				
EL030-15	N6QL530V				
EL050-9	N6QL350V				
EL050-15	N6QL550V				

<For other than JIS rail>

Make holes in the stay holders A and B coupled with the end carriage in accordance with travel rail width (T).

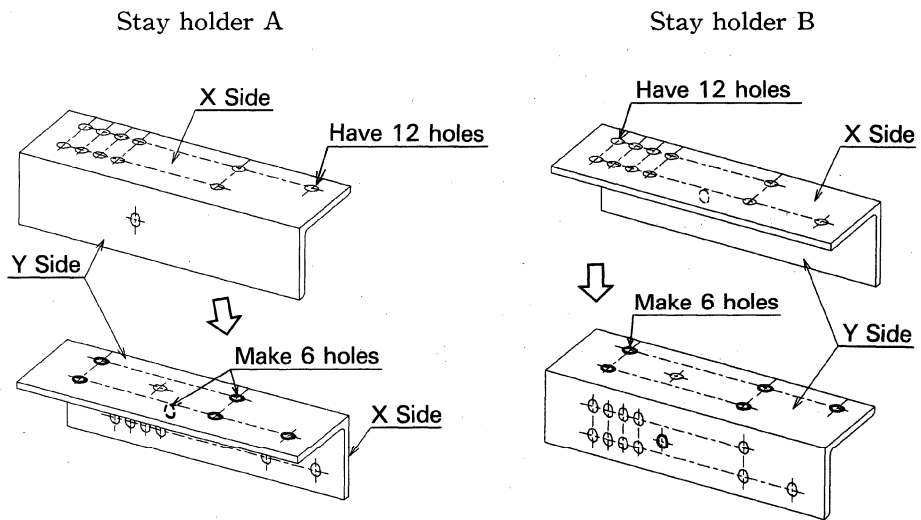


Fig. 11

As shown in the above Fig. 11, holes were made in X side for JIS rails. Make holes in Y side in accordance with travel rail width (T).

(3) Assembling pinion axle, collars and washers

<For JIS rail>

The pinion axle can be used for JIS rail as is.

Numbers of collar A determined by the travel rail width (T) is built in the pinion axle (Fig. 12) for adjustment of collar A, by referring to Fig. 12 and Table 8.

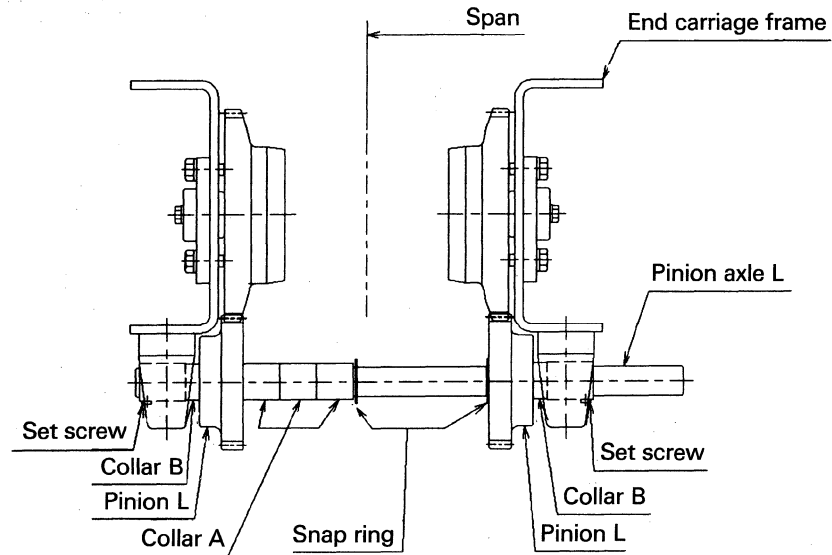


Fig. 12

Table 8 Numbers of collar

End carriage		Applicable travel rail width(T)			
Type	Code	A	B	C	D
EL010-6	N6QL210V	0	1	2	3
EL010-9	N6QL310V				
EL010-12	N6QL410V				
EL020-6	N6QL220V				
EL020-9	N6QL320V				
EL020-12	N6QL420V				
EL030-6	N6QL230V				
EL030-12	N6QL430V				
EL030-15	N6QL530V				
EL050-9	N6QL350V				
EL050-15	N6QL550V	0	1		

〈For other than JIS rail〉

The pinion axle can be used for travel rail other than JIS material. Numbers of collar A determined by the travel rail width (T) is built in the pinion axle (Fig. 13) for adjustment of collar A by referring to Fig. 13 and Table 9.

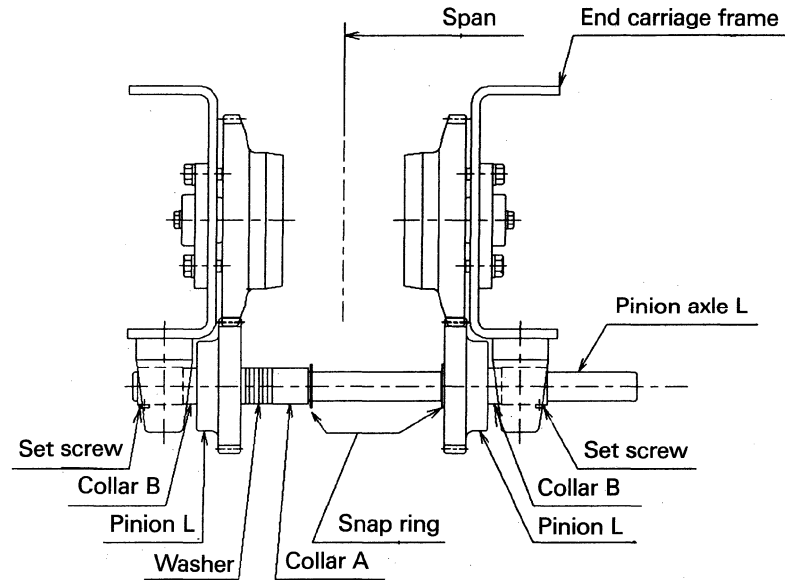
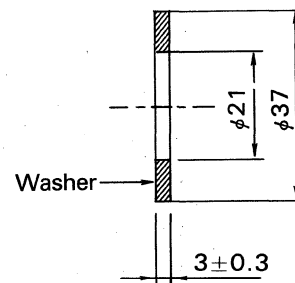


Fig. 13

Numbers of washer and collar A for travel rail width (T)

Table 9

Type	Code
EL010-6	N6QL210V
EL010-9	N6QL310V
EL010-12	N6QL410V
EL020-6	N6QL220V
EL020-9	N6QL320V
EL020-12	N6QL420V
EL030-6	N6QL230V
EL030-12	N6QL430V
EL030-15	N6QL530V
EL050-9	N6QL350V



T	(in)	3	3¼	3⅝	3⅞	3⅞	4	4⅛	4⅛	4⅛	4⅞	4⅞	5	5⅛	5⅛	5⅞	5⅞	5⅞	5⅞	6
	(mm)	75·76	82	90·91	98	100	102	106	110	113	119·120	125	127	131	135	137	143	149·150	153	
Nos of washer		0	2	5	7	0	0	2	3	4	6	0	0	2	3	4	5	0	1	
Nos of collar A		0					1 p'ce					2 p'cs					3 p'cs			

Code	Type
N6QL550V	EL050-15

T	(in)	4⅛	5	5⅝	5⅞	5⅞	5⅞	5⅞	6
	(mm)	125	127	131	135	137	143	149·150	153
Nos of washer		0	0	2	3	4	5	0	1
Nos of collar A		0						1 p'ce	

(4) End carriage adjustment

The gap between the track wheel flange and the travel rail is important in determining whether the crane travels smoothly on the rails or not. Adjust the end carriage frame gap: S referring to Fig. 14 and Table 10.

Table 10 S dimension

End carriage		Unit:mm
Type	Code	S
EL010-6	N6QL210V	T+51
EL010-9	N6QL310V	
EL010-12	N6QL410V	
EL020-6	N6QL220V	
EL020-9	N6QL320V	
EL020-12	N6QL420V	
EL030-6	N6QL230V	
EL030-12	N6QL430V	
EL030-15	N6QL530V	
EL050-9	N6QL350V	
EL050-15	N6QL550V	T+69

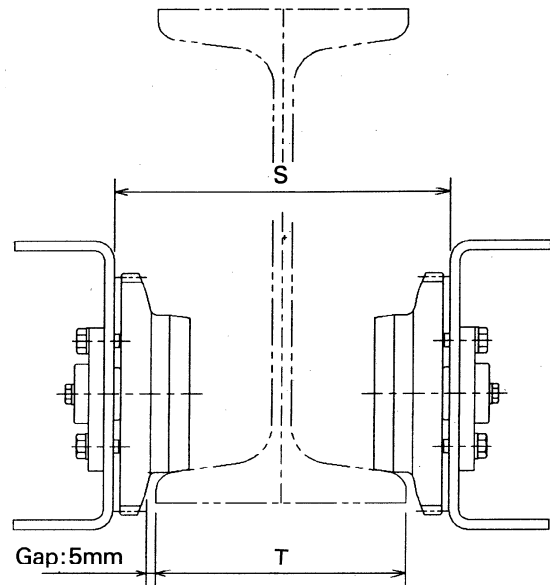


Fig. 14

(5) Bolt tightening torque

High tension bolts (H.T.B.) are used to couple the end carriage to the girder. Tighten bolts to the appropriate torque (Table 11).

Table 11 Tightening torque

H.T.B.	M14	M16	M20
Tightening torque (kg·cm)	1970	3000	5100

4.2 Punching holes in overhead cranes

4.2.1 Single girder crane processing

- (1) Numbers, arrangement and sizes of the bolts are only for reference. Determine them depending on an actual girder which you choose.
- (2) Make every processing correctly enough by means of drilling based on both wheel base center punch marks and travel rail center punch marks.
- (3) Never open holes with a gas torch.

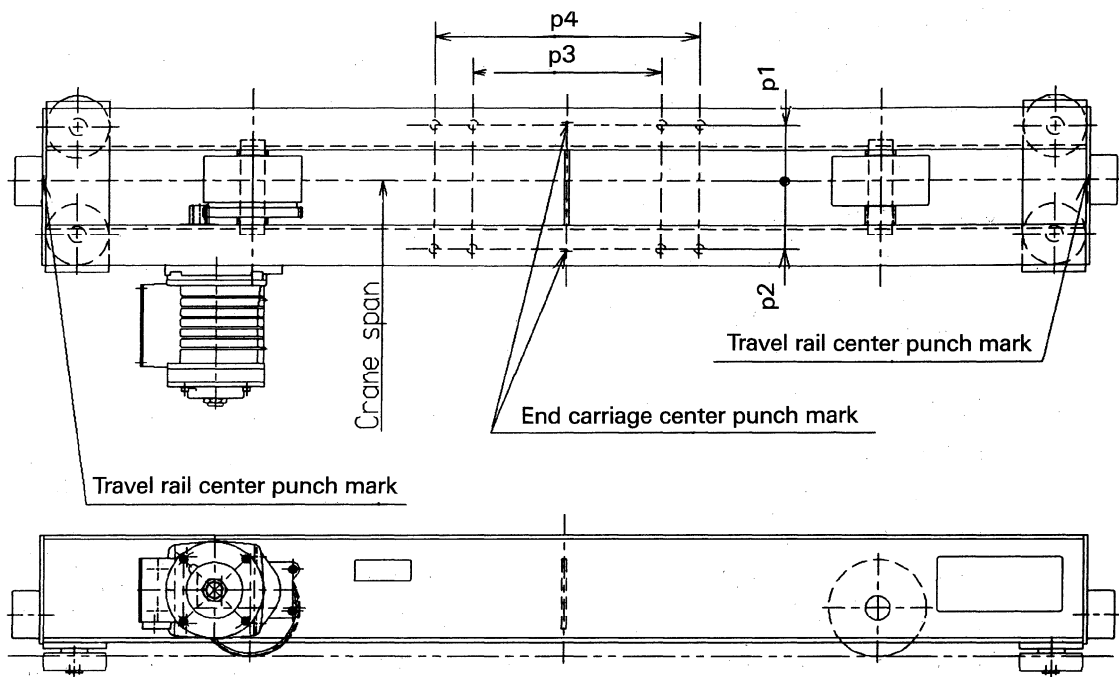


Fig. 15

Table 12 Girder holes

Unit:mm

End carriage		p1	p2	p3	p4	Recommended bolt size	
Type	Code					Hole diameter	Bolt diameter
EO010-12	N6QO410E	76	96	B+100	p3+110	$\phi 18$	M16 (H.T.B.)
EO010-18	N6QO610E	89	108				
EO020-12	N6QO420E	81	100				
EO020-18	N6QO620E	89	108				
EO030-12	N6QO430E	81	100				
EO030-18	N6QO630E	99	118				
EO030-21	N6QO730E	99	116		p3+120	$\phi 22$	M20 (H.T.B.)
EO050-9	N6QO350E	89	106				
EO050-18	N6QO650E	98	116				
EO050-21	N6QO750E	113	131				
EO100-12	N6QO411E	98	131				
EO100-18	N6QO611E	113	146				
EO100-21	N6QO711E	133	166				

4.2.2 Double girder crane processing

- (1) Numbers, arrangement and sizes of the bolts are only for reference. Determine them depending on an actual girder which you choose.
- (2) Make every processing correctly enough by means of drilling based on both wheel base center punch marks and travel rail center punch marks.
- (3) Determine the dimensions p3, p4 and rg depending on girder type and assembly method.
- (4) Never open holes with a gas torch.

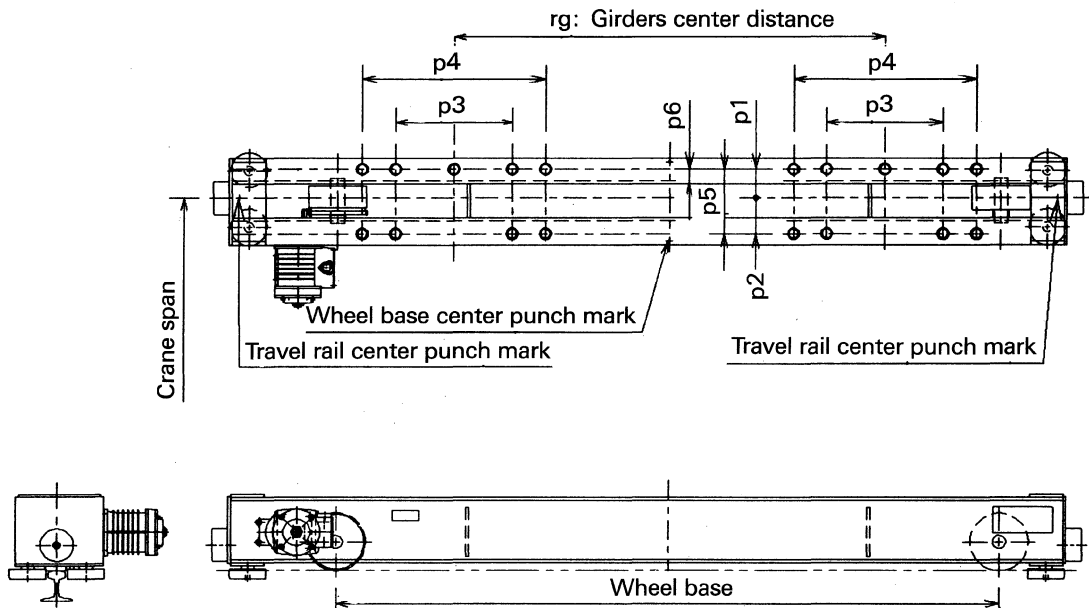


Fig. 16

Table 13

End carriage		p1	p2	p3	p4	p5	p6	rg	Recommended bolt size	
Type	Code								Hole diameter	Bolt size
WEO030-15	N6WO530E	91.5	108.5			200	47.5		φ22	M16(H.T.B.)
WEO030-21	N6WO730E	96.0	114			210	48			
WEO030-27	N6WO930E	96.0	114			210	48			
WEO050-21	N6WO750E	96.0	129			225	48			
WEO050-27	N6WO950E	101	134			235	53			
WEO075-21	N6WO775E	101	134			235	53			
WEO075-27	N6WO975E	101	134			235	53			
WEO100-21	N6WO711E	101	134			235	53			
WEO100-27	N6WO911E	105	155			260	55			
WEO150-27	N6WO915E	110	160			270	60			
WEO150-27H	N6WB915E	110	160			270	60			
WEO200-27	N6WO921E	113.5	161.5			275	62.5			
WEO200-27H	N6WB921E	113.5	161.5			275	62.5			

4.2.3 End carriage assembly for overhead cranes

Overhead end carriages do not come with bolts, nuts and washer for coupling the end carriage to the girder, therefore supply them yourself. Refer to Tables 12 or 13 for type of end carriage and bolt size.

NOTE : Use high tension bolts (H.T.B.) to couple the end carriage to the girder.

(1) End carriage assembly

A gap is opened between the side rollers and the travel rail to help the crane travel smoothly on the rails .

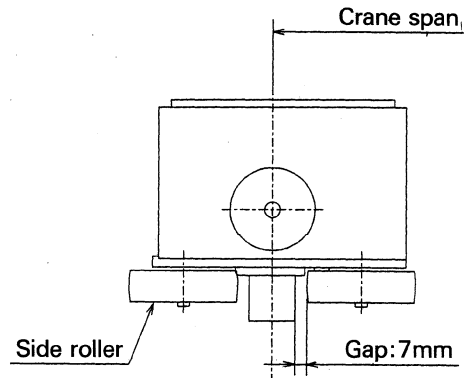


Fig. 17

4.2.4 Bolt tightening torque

Use high tension bolts (H.T.B.) to couple the end carriage to the girder. Tighten bolts to the appropriate torque (Table 14).

Table 14 Tightening torque

H.T.B.	M16	M20
Tightening torque (kg·cm)	2580	5070

5. Painting

The end carriage comes coated with a paint base primer. Refer to the below table when selecting a top coat.

End carriage length	1500mm and less	1501mm and more
Primer	Melamine resin base	Phenol alkyd base
Compatible top coat	Melamine resin base Phenol resin base	Phenol resin base Melamine resin base
Incompatible top coat	Epoxy resin base Urethane base	Lacquer base

NOTE 1 : When adding your top coat, never paint over bolts and nuts. Paint coated threads will make it harder to loosen parts and thus maintenance more difficult.

NOTE 2 : Protective shield for name plate.

The name plate on the end carriage is covered with a protective shield, therefore you can paint over it directly. Be sure to strip off the shield when finished painting.

6. Erecting the end carriage on the travel rail

Refer to "Assembly, wiring and test run" in the Motorized Crane Instruction Manual.

KITO

URL. <http://www.kito.co.jp>