Beam Clamp

SBN-E
SBN

Operation Manual

SUPERTOOL

Proper Handling of "Super" Lifting Clamps

We are thankful for your purchase of our Lifting. Our Lifting Clamps (hereinafter, called "Lifting Clamp" or "Clamp") is energy-saving lifting tools designed and developed for transportation of steel materials and other steel products.

Proper use of Lifting Clamps demanded

You are kindly requested to operate the Lifting Clamps after carefully reading and understanding this instruction manual for the purpose of enhancing safety and efficiency at work.

Prime efficiency and economy

The sophisticated functions, reasonableness and wide applications of the finely and carefully designed Lifting Clamps ensure best efficiency and economy.

Special care of safety

We execute tensile tests with loads three times (or twice) the rated capacity and inspection numbers to individual products are attached, thus directing special attention to the safety.

Cautions for safety operation

Do not fail to read this instruction manual carefully before use of the Lifting Clamps.
Mistaken use of the Lifting Clamps (hereinafter to be called "Clamps") may cause troubles such as the dropping of lifted work.
Never fail to read this manual carefully for proper operation before use.
Education of "crane safety regulations," "operation manual for lifting clamps," "in-house operation standards," etc. should be provided before actual operation not only to business owners who have purchased the Clamps but also to their operators to ensure the sufficient acquisition of the knowledge of them, safety information, and cautions by the actual operators.

"Lifting clamp safety council," divide cautions in general into two designations as "Dangers" and "Cautions," which are followed in this instruction manual.

⚠ DANGER

Indicates mistaken handling may cause a potentially hazardous situation which, if not avoided, may result in death or serious injury.

⚠ CAUTION

Indicates mistaken handling may cause a potentially hazardous situation which, if not avoided, may result in medium damage or slight injury, or could result in property damage.

Moreover, what are mentioned in the Cautions, may also result in a serious situation depending upon the circumstances. As such, do not fail to pay attention to dangers and cautions , both of which are of great importance in the proper operation of the Clamps.

Meanings of Signs

The signs of ◇ and △ indicate that attention is to be given to the marks indicative of dangers and cautions respectively. The signs figuratively show the contents of danger or caution. (The left-side sign indicates a caution against pinching.)

The sign indicates prohibited actions.

The sign of ○indicates that an action is enforced or instructions are provided. Inside the sign or beside, any specific instruction is described. (The left-side sign indicates the requirement of a lifting at two points.)

* After reading this manual, keep it at a convenient place to which any user can gain an easy access for reference.

1. Handling in general

⚠ DANGER	
•Any person, who is not well informed about the instruction manual, tags or signs of cautions, is not eligible for use of the Lifting Clamps. •Any person without the legal qualifications, may never operate a crane or a lifting clamp. •While lifting or turning the work, do not enter the area where the lifted work may fall down or fall over. •Do not use this lifting clamp for other purposes than lifting work.	
•Never fail to execute an inspection before use and periodical inspections.	

2. Checks before operation

⚠ DANGER	
•Do not use a clamp not complying with the operation method. •Do not use a defective clamp with deformation, cracks, abrasion, malfunction, etc. •If the work to lift is under the following conditions, do not use the clamp. (fragile materials, high-hardness materials, low-hardness, extremely low-hardness materials, or members with the large inclined gripping part with more than 8 degrees inclination.	
•Check on the model type of the Clamp, rated capacity, jaw opening diameter, and designation of completion of periodical inspections. •The load of the work to lift shall be within the allowable range of the basically applicable load of the clamp. •The thickness of the work to be lifted should be within the allowable clamping range.	

⚠ CAUTION	
•Do not use the clamp under the following conditions. (The temperature of the work to be lifted is more than 150℃, or less than –20℃. or the attachment of such chemicals as any acid or alkaline.)	
•Slings to be used for the clamp should be in conformity to the lifting operation.	

3. Methods of the use and lifting operation

⚠ DANGER	
•Do not use the Clamp in the following way of lifting: (lifting two or more works at one time in any style regardless of the number of clamps used or one work with side gripping) •Do not use the Clamp to pull out a steel plate from the piles or lifting them vertically. •Do not use the Clamp when there's a strong wind to avoid any danger. •Do not use the Clamp with a hydraulic shovel.	
•The lifting and hooking angle of the Clamp should be within the allowable angles according to the specifications of respective types. •The work is to be inserted to the innermost end of the Clamp opening. •When you use the Clamp with a locking system, never fail to make the lock on when the Clamp is used.	
⚠ CAUTION	
•If oil, paint, scales, rust, etc. are on the gripping pad, do not use the Clamp. •Do not drop or drag the Clamp the ground.	

4. The operation of a crane

⚠ DANGER	
•Never lift the work weighing more than the rated capacity. •Do not operate the crane in such a way that an impacting load to the work or the Clamp is given. •Do not allow a man to stand on the lifted work. Never use the Clamp for the purpose of carrying a man. •Do not lift the earth itself. •During the course of lifting the work, do not release the lock of the Clamp. •Do not let the Clamp, which has been removed from the work, collide with the work or with any materials nearby.	
•When you wind up the wire by the crane and notice the load at the lifting ring, stop the operation temporarily for safety checking (depth of the work into the Clamp opening; status of locking). •Stop the operation of the crane just before the work reaches the ground, check the following items of things: (Slant and falling over of the work; security at the landing site and its surroundings)	

⚠ CAUTION	
•Do not operate the crane in such a way as to drag the work along the ground. •Do not make the crane unattended while the work is at hang by the Clamp.	
•Hoisting and lowering operation by the crane should be made slowly and carefully.	

5. Maintenance, storage and remodeling

⚠ DANGER	
•Never remodel the Clamp or its accessories. •Do not weld or heat the Clamp or its accessories. •Do not use any other parts than our company's brand-name parts. •Segregate and store the clamps with any repairing needs at a different location to avoid the use by mistake.	
•Maintenance and repairing work must be done by a person with the expertise designated by the business owner. •When you detect abnormality with the Clamp, do not use it and immediately repair or dispose of it. •Remove, if any, paint or mud sticking to the moving parts of the Clamp, cams, and pads.	
⚠ CAUTION	
•Conduct repairing and maintenance only when no work is at the Clamp. •Conduct repairing and maintenance after posting such a sign as "Under Inspection". •Never fail to lubricate any rotating parts of the Clamp (around the pin), guide grooves, sliding parts, etc. •Store Clamps inside a room.	

Note: Please contact our company's sales agents or sales offices to take advantage of our services for the items of inspections and maintenance standards associated with assembly and disassembly.

Maintenance and Inspection

1. Maintenance

Daily maintenance is important for efficient and safe operation even under the severe use condition and for such purposes, please comply with the followings.

(1) Designate the use standards and control.

(2) Keep it in-house and do not leave it outside.

(3) Check the followings to maintain in a good condition.

  (a) Operating condition.

  (b) Any abrasion, damage, or clogging at teeth of cam and pad.

  (c) Deformation of main body, jaw opening in particular.

(4) From non-defective clamps, separate any defective and problematic clamps identified during use or inspection by designating the defective sections and perform immediate maintenance.

(5) For the storage, place soft material as wooden chip in-between cam and pad to protect the teeth.

(6) Perform inspection and maintenance once a week by referring to "Inspection Standards". Lubricate sliding sections periodically. (However, remove the oil at teeth of cam and pad.)

2. Periodic Inspection

Perform periodic inspection in accordance with the periodic inspection and maintenance standards. Functions and life of clamps may differ in a great degree as they are used in varieties of fields under different conditions of use. Therefore, preparation and practice of effective handling/inspection standards manual by users themselves is recommended. We ask you to establish complete maintenance and control for the assurance of safety in reference to the inspection standards of "Super" clamp. Clamp is designed for easy replacement of parts and therefore, do not fail to replace defective parts. Also, keeping spare parts at all times is recommended. For your preparation of the standards, pay special attention to the followings.

(1) Operation and maintenance standards

  (a) Preparation of application criteria (Load shape, operating methods).

  (b) Through understanding and compliance of cautions on handling.

  (c) Maintenance and storage.

  (d) Rules of inspection and check at site.

(2) Standards on periodic inspection

  (A) Establishing dates of periodic inspection.

  (B) Establishing inspection and maintenance methods.

    (a) Inspecting period

    (b) Person in charge for the inspection.

    (c) Inspection site.

    (d) Tools and devices for inspection.

(e) Establishment of permissible limit of use.

(f) Designation of maintenance and repair methods.

Please feel free to consult custom-made clamp by advising us the following.

(1) Material and weight of loads.

(2) Shape and size of the loads.

(3) How to handle (application, grip position).

(4) Clamp capacity (grip range, rated capacity)

(5) Conditions of a site to be used.

(6) Other requests/inquiries.

Selection Standard of SUPER LIFTING CLAMPS in Two-Point Lifting

The maximum allowable load of a clamp varies with the lifting angle. The larger the angle, the more increases the load applied t clamp and rope and the more decreases the lifting efficiency as shown in the table below. Therefore, considering the lifting angle select a clamp of proper capacity.

Correlation between lifting angle and safe load (in two-point lifting)

Clamp name and Item no.						0°	30°	45°	60°	90°	120°
Vertical lifting clamps (SVC-H, SVC-L, SVC)					Lifting efficiency →	100%	96%	92%	86%	70%	50%
Lateral, horizontal lifting clamps (HLC-H, HPC)					Clamp capacity(per 2pcs)	Safe load per 2 clamps (tons)					
Structure clamps (HLCS, HLC)					0.5 X2 pcs = 1 ton	1	0.96	0.92	0.86	0.7	0.5
Screw cam clamp (SCC)					0.75X2 pcs = 1.5ton	1.5	1.44	1.38	1.29	1.05	0.75
Lifting hook (HHC, HHC-G)					1 X2 pcs = 2 ton	2	1.9	1.8	1.7	1.4	1
○	○		○	○	1.5 X2 pcs = 3 ton	3	2.9	2.8	2.6	2.1	1.5
○	○	○		○	2 X2 pcs = 4 ton	4	3.8	3.7	3.4	2.8	2
○	○	○	○	○	3 X2 pcs = 6 ton	6	5.8	5.5	5.2	4.2	3
○	○	○		○	5 X2 pcs =10 ton	10	9.6	9.2	8.6	7	5
			○		6 X2 pcs =12 ton	12	11.5	11	10.3	8.4	6
○					10 X2 pcs =20 ton	20	19.2	18.4	17.2	14	10

★. In this table, lifting angles are given from 0° to 120°, but it is recommended for the sake of safety to keep within 60° in the case of two-point or four-point lifting.

★ When using two or more clamps, it is safe to use those of same capacity.

HOW TO SEE THE TABLE Example: To lift a 5.5-ton steel plate at two points, at the following lifting angles.

a. When lifting angle is 0° (vertical lifting):

(1) In the column of 0° lifting angle, find the smallest value over 5.5 tons, then "6" is picked up in the sixth frame from the top.

(2) Look to the left from the "6" frame, and look for the clamp capacity. That is, "3 x 2 pcs = 6 tons," which means two 3-ton clamps should be used.

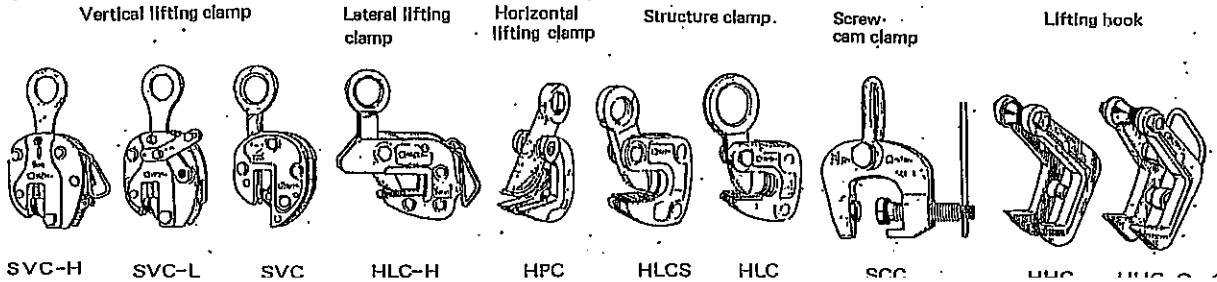
b. When lifting angle is 60° (steel plate weight is same):

(1) In the column of 60° lifting angle, find the smallest value over 5.5 tons, then "8.6" is picked up in the seventh frame from the top.

(2) Look to the left from the "8.6" frame, and look for the clamp capacity. That is, "5 x 2 pcs = 10 tons," which means two 5-ton clamps should be used.

WARNING.

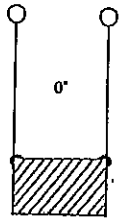
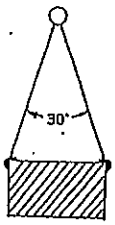
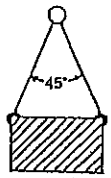
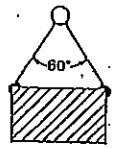
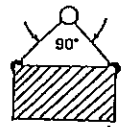
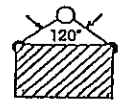
In this case, one 3-ton clamp and one 6-ton clamp cannot be combined. Mathematically, the capacity in tons is sufficed, but it is very dangerous.



LIFTING ANGLE AND SAFE LOAD OF WIRE ROPE

The maximum allowable load ((safe load)) of wire rope also varies with the lifting angle.
Therefore, select a wire rope of proper diameter in consideration of the lifting angle.
((The breakage load specified in the table below refers to No.4, 6 x 24A class of JIS G3525.))

Correlation between Lifting Angle and Safe Load of Wire Rope (in two-point lifting)

D Wire rope dia (mm)	σ Breakage load (tons)	W Safe load (on one rope) W=σ/S (safety factor S=6) (tons)	 0°	 30°	 45°	 60°	 90°	 120°
			(Changes in lifting efficiency due to lifting angle, %)					
			100%	96%	92%	86%	70%	50%
			Max. allowable load (safe load) on two wire ropes (tons)					
8	3.21	0.54	1.08	1.04	0.99	0.93	0.76	0.54
9	4.06	0.68	1.36	1.31	1.25	1.17	0.95	0.68
10	5.02	0.84	1.68	1.61	1.55	1.44	1.18	0.84
11.2	6.29	1.05	2.1	2.02	1.93	1.81	1.47	1.05
12.5	7.84	1.31	2.62	2.52	2.41	2.25	1.83	1.31
14	9.83	1.64	3.28	3.15	3.02	2.82	2.3	1.64
16	12.8	2.13	4.26	4.09	3.92	3.66	2.98	2.13
18	16.2	2.7	5.4	5.18	4.97	4.64	3.78	2.7
20	20.1	3.35	6.7	6.43	6.16	5.76	4.69	3.35
22.4	25.2	4.2	8.4	8.06	7.73	7.22	5.88	4.2
25	31.3	5.22	10.44	10.02	9.6	8.98	7.31	5.22
28	39.3	6.55	13.1	12.58	12.05	11.27	9.17	6.55
30	45.1	7.52	15.04	14.44	13.84	12.93	10.53	7.52
31.5	49.8	8.3	16.6	15.94	15.27	14.28	11.62	8.3
33.5	56.3	9.38	18.76	18.01	17.26	16.13	13.13	9.38
35.5	63.2	10.53	21.06	20.22	19.38	18.11	14.74	10.53

Note: For four-point lifting, multiply the corresponding figure in the table by 2 to find the maximum allowable load (safe load).

Simplified calculation method of wire rope diameter and safe load (one-point lifting)

1) $D=\sqrt{W \times C}$

2) $W=\frac{D^2}{C}$

Where D : wire rope diameter(mm)
W: safe load (tons)
C : constant=120
(safety factor S=6)

★To find the diameter of wire rope for 3 tons:

① $D=\sqrt{W \times C}$

$D=\sqrt{3 \times 120}=\sqrt{360}=19 \rightarrow 20\,mm$

★To find the service load (safe load) on 25mm diameter wire rope:

② $W=\frac{D^2}{C}$

$W=\frac{25^2}{120}=\frac{625}{120}=5.2 \rightarrow 5.2\,ton$

Select the type and capacity best suited to the job. Check periodically, repair and replace parts, and use correctly in order to the clamps over the full service life, safely.

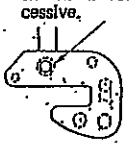
Common Check Points

- ★ Check the main body for distortion or flaw.
- ★ Make sure the opening is normal (check if widened).
- ★ Check if the shackle is distorted.
- ★ Check the shackle pin hole for widening or looseness.
- ★ Check cam and pad teeth for defect or wear.
- ★ Check cam pin hole in main body for widening.
- ★ Check if cam pin is worn and thinned.
- ★ Check the performance of tightening lock (handle, lever), shackle, and other mechanism.

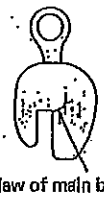
Check all the listed items. Inspect according to the Checkir Standard.
Most items may be checked visually or by touching. T measure the safety point distance and opening size, use slid calipers or the like to obtain precise measurements.

DISCARD

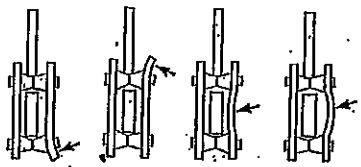
When clearance between bolt and hole exceeds 1 mm, and deflection of cam or shackle becomes excessive.



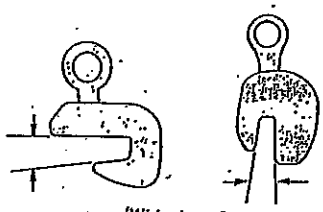
(Wear of pin or pin hole)



(Flaw of main body)



(Distortion of main body)

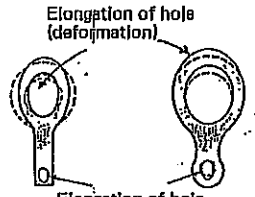


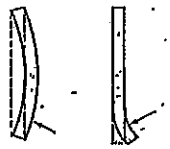
(Widening of opening)

Discard the clamp if obvious flaw or distortion is found in the main body. Defects in the main body cannot be repaired in the light of safety. The main body may be cracked or deformed only after several uses if it is used incorrectly. Dent or swelling o main body, or widening of opening may be caused by overload or wrong manner of use. If the defect is repaired by welding hardening, or pressing, the original strength is not recovered. When used and controlled correctly, the clamp may be safely usec for a long time only by replacing parts.

REPLACE

(Shackle)



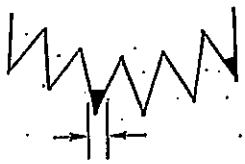


Distortion (deformation)

Regard the shackle as part of body. If deformed as shown above, replace it immediately. If deformed shackle is straightening up, the initial strength is not restored.

(Cam and pad)

Where limit width of cam, pac 0.5mm or more



When worn as shown above, replace immediately. Or, if no worn, when even one tooth is missing, replace also immedi ately. The wear rate is accelerated when stainless steel o other hard material is clamped. Or when plates of specifiec thickness are continuously clamped, only particular thread will be worn in a short time. In such a case, too, replace immediately.

Besides, replace the support pins, bolts, springs, and other parts according to the Checking Standard.

Check Twice to Confirm Safety.

Check the type capacity of clamp. Is the wire rope proper? How about its size and length? Overloaded or not? Where's th center of gravity? Is the material inserted fully? Is it locked securely?
Lift at two points for an object longer than a meter. Lift at three or four points where the center of gravity is hard to locate. I the lifting angle proper? Check all these items, and confirm them once again.
Lift, carry, touch down slowly. Be careful not to hit against surrounding objects while carrying. Keep off hands. Do not ente hazardous zone. Always pay attention to safety.

Beam Clamp

SBN-E
SBN

Operation Manual

SUPERTOOL

Operation Manual for Beam Clamp

Be sure to read this Operation Manual before the use of the product.
It is used for the best use of the product with its full capacity by the good understanding of users.
It contains important information so that the product is used properly, efficiently and safely. By following the instructions in this manual, the risk can be avoided, and time and cost can be saved, the life of the product is made longer with higher reliability. Place this manual at the workplace so that it can be referred to anytime. The compliance with accident prevention law, and other safety rules in general of any country where the product is used must be followed along with the guidance and instruction of this manual.

Usage

1. Most suited to be used temporarily to hang a chain block or hoist.
2. Most suited to pull by attaching to a beam pillar.

Characteristics

1. Fix it to a beam (H or I), then it can be hung at a hook of a chain block, hoist or trolley.
2. As a connecting device to a beam, it can be used in various settings as in a factory or construction site.
3. Attaching/detaching is easily performed by turning the screw.

Proper methods of use

The capacity shown on the product is the maximum load under the safety use. Do not use it in excess of the capacity.

Specifications

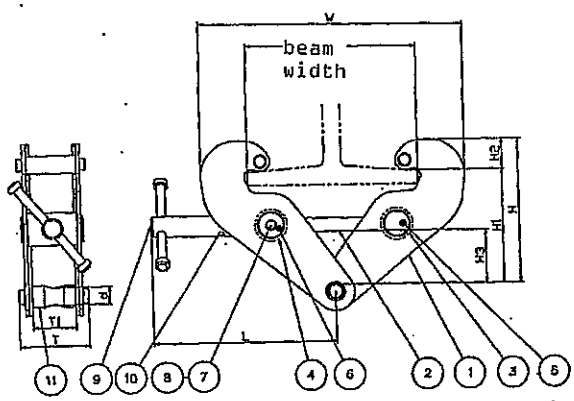
SBN-E

Item No.	Net weight (kg)	Capacity (ton)	Applicable beam flange width (mm) min~max	Applicable beam flange thickness (mm) min~max
SBN-1E	3.8	1	75~230	8~20
SBN-2E	4.6	2	75~230	8~20
SBN-3E	9.2	3	80~320	10~32
SBN-5E	11	5	90~320	10~32

SBN

Item No.	Net weight (kg)	Capacity (ton)	Applicable beam flange width (mm) min~max	Applicable beam flange thickness (mm) min~max
SBN-1	4.8	1	75~230	9~25
SBN-2	6.2	2	75~230	9~25
SBN-3	12.6	3	80~320	10~35
SBN-5	14.3	5	90~320	10~35

Dimensions and parts list for SBN-E

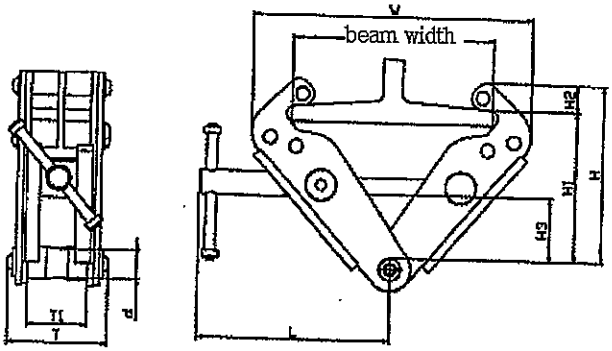


Item No.	W	L	H at Maximum	H1	H2	H3	T	T1	d
SBN-1E	182~350	212	198	115~150	32~48	44~82	84	50	20
SBN-2E	182~350	212	200	115~150	32~50	44~82	94	50	20
SBN-3E	211~451	255	285	180~225	42~60	75~120	122	70	22
SBN-5E	221~451	255	285	180~225	42~60	75~116	129	70	28

Item No.	Part Name		Q'ty
1	Body		1
2	Sliding Screw		1
3	Narrow collar		1
4	Wide collar		1
5	Narrow collar receptor		1
6	Wide collar receptor		1
7	Locking screw		1
8	Washer		1
9	Handle assembly		1
10	Spring Pin		1
11	Supporting pin		※

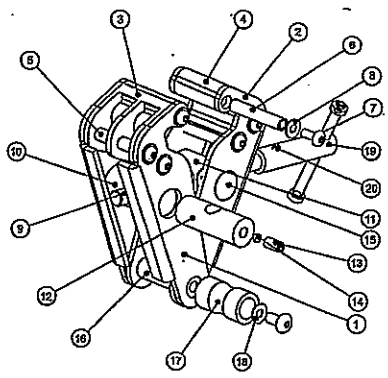
※Supporting pin has been set and assembled.

Dimensions and parts list for SBN



Item No.	W	L	H at Maximum	H1	H2	H3	T	T1	d
SBN-1	161~300	212	191	135~165	26	53~83	77	46	20
SBN-2	163~304	212	191	135~165	26	53~83	97	58	20
SBN-3	212~425	304	265	183~224	26~41	79~118	117	69	32
SBN-5	216~425	304	265	183~224	32~41	79~118	125	69	32

Item No.	Part Name		Q'ty
1	Body A		2
2	Body B		2
3	Wide width supporting rib		1
4	Narrow width supporting rib		1
5	Fixing Pin (Wide width supporting rib)		3
6	Fixing Pin (Narrow width supporting rib)		3
7	Button Bolt		14
8	Washer at rib fixing pin		12
9	Sliding screw		1
10	Wide collar		1
11	Narrow collar		1
12	Wide screw receptor		1
13	Locking screw		1
14	Washer		1
15	Narrow screw receptor		1
16	Supporting pin		1
17	Supporting pin collar		1
18	Supporting pin washer		2
19	Handle assembly		1
20	Spring pin		1



Proper use of beam clamp

- Use this Clamp within the allowable load to keep the safety operation. Do not use in excess of such rated load. Lift a load at the center of the supporting pin. To avoid any damage to the body, never perform horizontal lifting. Always lift in the direction where the lifting point at the center of the supporting pin and the attachment point to a load become straight. (fig.2)
- Do not engage in lifting or moving activity of a load when any person is within a risky working area.
- Walking under the suspended load is prohibited.
- Do not leave the suspended load for a long period of time.
- Decide the setting place of the clamp where all persons stay clear of the danger.
- Use the clamp under the environment between minus 10℃ and plus 50℃.
- Contact the manufacturer or the supplier for the use out of the above temperature range.
- Do comply with the anti-accident laws and safety regulations of the country where the clamp is used.
- Should there be any defect found in the product, stop the use immediately.

Wrong use (Do not perform)

- Do not use in excess of the rated capacity
- Do not make alteration and modification.
- Do not use to transport people.
- Do not perform welding on the clamp. (Fig.1)

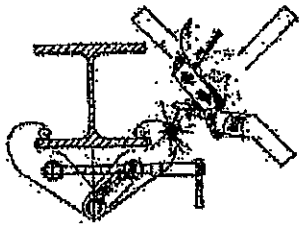


Fig.1

- Do not clamp and lift unintended direction. (Fig.2)

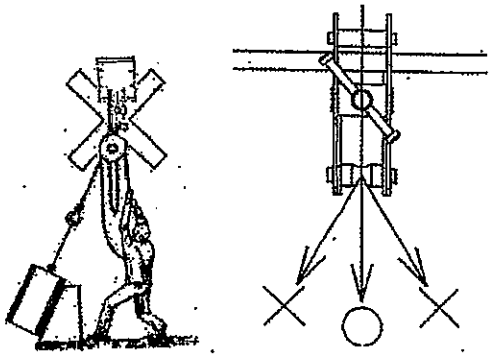


Fig.2

- Do not perform lifting in the inadequate directions shown with the hang of the supporting pin. (Fig.3)

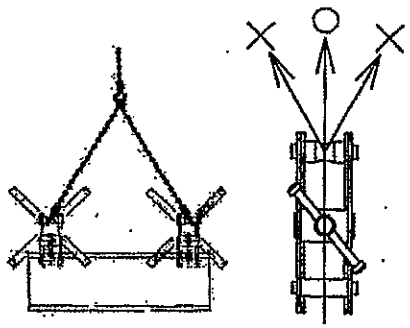


Fig.3

- Dropping the clamp from a very high position.

Operation Methods

① Turn the handle to open the mouth of the clamp to set the beam flange in the position. (Fig.4)

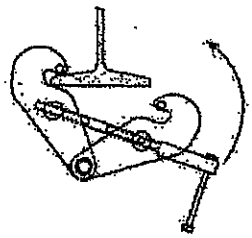
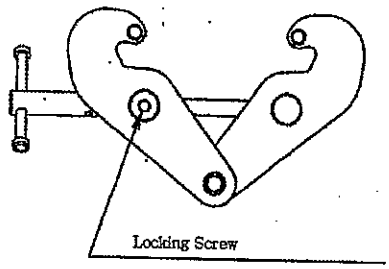


Fig.4

② Tighten the handle and clamp the beam flange tightly without any loosening.

③ If the clamp is intended to be set for unlimited time period or at the place where vibration occurs, tighten the locking screw with hexagonal wrench at the face of the body.



Inspection before the initial use

Check by personnel with expertise if the appearance and movement are usual. Do not use the clamp if any defect is found. Inspection on and repairing of such defect must be performed by the person with the expertise.

Check before the operation

Before each operation, make sure the rated capacity and applicable beam width of the clamp are suitable to lift a load. Also, set the clamp to the beam which has a sufficient strength.

Inspection of the clamp

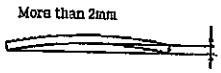
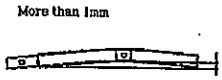
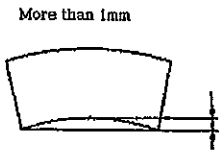
Check visually to see any defect, deformation, flaws on the surface, abrasion or corrosion.

Inspection and repair

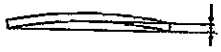
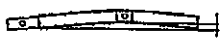
Perform the inspection at least once a year by an experienced person. Depending upon the situation, more frequent inspection may be recommended.

The inspection includes the presence of any defect, abrasion or corrosion. Check if all the parts are complete without improper movement. Use our original spare parts for any repair, and record such incidents on the "Periodic Self-Inspection sheet for Beam Clamp", and maintain such records.

Inspection Criteria SBN-E

Section	Inspection method	Permissible Limit	Main causes	Action
Main Body	● Distortion or deformation (by visual or by measuring device) ● Abrasion of screw receptor holes. (by measuring device)	● No more than 2mm deformation.  ● When the diameter becomes larger by more than 1mm in diameter than the standard.	● Excessive hoisting angle ● Sudden loading impact ● Overload ● Natural abrasion ● Insufficient lubrication	Dispose
Slide screw	● Abrasion at screw portion (by visual or by measuring device) ● Abrasion at shaft portion. (by visual or by measuring device) ● Distortion or deformation. (by visual or by measuring device)	● No more than 1mm deformation. 	● Sudden loading impact ● Overload ● Natural abrasion ● Insufficient lubrication	Replace
Screw receptor	● Abrasion at screw portion (by visual or by measuring device) ● Abrasion at shaft portion. (by visual or by measuring device) ● Distortion or deformation. (by visual or by measuring device) ● Missing bolt (by visual)	● No more than 1mm deformation. 	● Natural abrasion ● Insufficient lubrication ● Sudden loading impact ● Overload ● Natural abrasion ● Insufficient lubrication	Replace
Collar	● Distortion or deformation (by visual or by measuring device)	● When found visually.	● Sudden loading impact ● Natural abrasion ● Overload	Replace
Supporting Pin	● Distortion or deformation (by visual or by measuring device)	● When found visually.	● Excessive hoisting angle ● Sudden loading impact ● Overload	Dispose
Handle	● Distortion or deformation (by visual or by measuring device) ● Missing Spring Pin (by visual)	● When found visually. ● When the handle turn becomes idle.	● Excessive hoisting angle ● Sudden loading impact ● Overload	Replace

Inspection Criteria SBN

Section	Inspection method	Permissible Limit	Main causes	Action
Main Body panels	● Distortion or deformation (by visual or by measuring device) ● Abrasion of screw receptor holes. (by measuring device)	● No more than 2mm deformation. More than 2mm  ● When the diameter becomes larger by more than 1mm than the standard.	● Excessive hoisting angle ● Sudden loading impact ● Overload ● Natural abrasion ● Insufficient lubrication	Dispose
Reinforcing rib	● Distortion or deformation (by visual or by measuring device) ● Abrasion at pin hole (by measuring device) ● Missing pin, bolt, or washer (by visual)	● No more than 2mm deformation. ● When the diameter becomes larger by more than 1mm than the standard. ● When found visually.	● Excessive hoisting angle ● Sudden loading impact ● Overload ● Natural abrasion ● Insufficient lubrication	Replace
Slide screw	● Abrasion at screw portion (by visual or by measuring device) ● Abrasion at shaft portion. (by visual or by measuring device) ● Distortion or deformation. (by visual or by measuring device)	● No more than 1mm deformation. More than 1mm 	● Natural abrasion ● Insufficient lubrication ● Sudden loading impact ● Overload ● Natural abrasion ● Insufficient lubrication	Replace
Screw receptor	● Abrasion at screw portion (by visual or by measuring device) ● Abrasion at shaft portion. (by visual or by measuring device) ● Distortion or deformation. (by visual or by measuring device) ● Missing bolt (by visual)	● No more than 1mm deformation. More than 1mm 	● Natural abrasion ● Insufficient lubrication ● Sudden loading impact ● Overload ● Natural abrasion ● Insufficient lubrication	Replace
Collar	● Distortion or deformation (by visual or by measuring device)	● When found visually.	● Sudden loading impact ● Overload ● Natural abrasion	Replace
Supporting Pin	● Distortion or deformation (by visual or by measuring device) ● Any abrasion of collar ● Missing bolt.	● When found visually. ● When the diameter becomes shorter by more than 1mm.	● Sudden loading impact ● Overload ● Natural abrasion ● Insufficient lubrication	Replace
Handle	● Distortion or deformation (by visual or by measuring device) ● Missing spring pin.	● When found visually. ● When the handle turn becomes idle.	● Excessive hoisting angle ● Sudden loading impact ● Overload	Replace