

SAFETY LIFTING CLAMPS



INSTRUCTION FOR OPERATION

"SUPER" BRAND LIFTING CLAMPS

SCC•SCC-W



SUPERTOOL

OSAKA, JAPAN

INSTRUCTIONS FOR USE

Keep these instructions within easy access of operators.

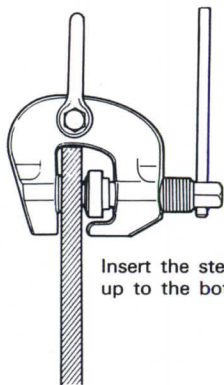
It is important that operators understand these warnings and instructions before using.

WARNINGS

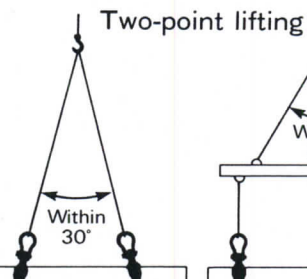
- Select proper size clamp for the job! Determine the weight of the plate, H-beam or steel structure to be lifted!
Do not exceed limited working load shown on clamp!
Plate thickness must be within grip range shown on clamp. In some cases with hardened plates, light plates (less than 1/5 of capacity marked on the clamp) and thin plates (less than 1/4 of the maximum clamping range), the clamping force of the clamp will be reduced. In these cases, confirm that the clamp has positive grip before lifting!
- Inspect clamp! If cam or pad teeth are worn, or if clamp is damaged, do not use!
- All personnel must stand clear of load while it is being lifted or moved!
- Take up slack slowly! Do not bounce or jerk load!
- Use clamp with correct manners after read following illustration for lifting and clamping manners!
- Never use a steel lifting clamp (hereafter called clamp) on material other than steel!
- When operating clamps, always maintain a firm footing and only operate from a location that will be safe at all times!
- Before lifting the load, confirm that clamps are in good condition and functioning properly!
- Always protect the surface of cam and pad from weld spatters or other damaging contaminants! The surface of the load must always be clean and free of scale, grease, paint, dirt and coating or other foreign matters that can reduce friction!
- Note that the service life of clamps is reduced considerably when stainless steel sheets or high-tensile steel are clamped! Do not use clamps for lifting high-tensile steel (over 300HB) or soft steel (under 80HB) !
- Never vertically lift material that tapers down to the edge!
- Never vertically lift with horizontal or lateral clamps!
- Never lift more than one steel plate at a time!
- Always use slings correctly! Pay special attention to the correlation between the lifting angle and the rated load!

- Never operate clamps unless the load is properly centered!
- After the load has been lifted a few centimeters, confirm that the load is well balanced!
- Never allow the operator's attention to be diverted when operating clamps and never leave the suspended load unattended!
- Never modify clamps!
- Only use genuine parts when repairing clamps!
- Please refer, also, to the warnings in the catalog.

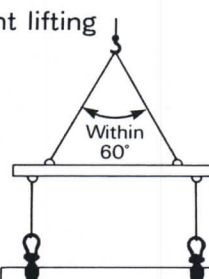
CORRECT MANNER OF USING VERTICAL LIFTING CLAMPS



Insert the steel plate up to the bottom



When balance is not used, keep the angle within 30° for safety precaution.

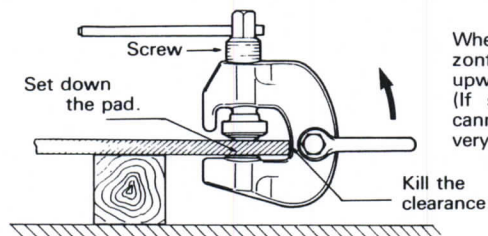


When balance is used, the maximum angle is 60°.

Where center of gravity is hard to locate

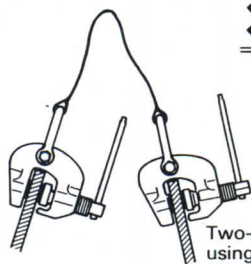


Lift at three points as shown above. In this case, do not use clamps of smaller capacity. (Since the lifting angle is widened, select wire ropes of proper diameter.)

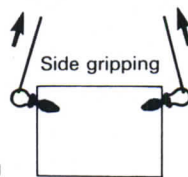


When gripping an object placed horizontally, set the clamp by directing upward screw. (If set reversely, the state of screw cannot be visually observed, and it is very dangerous.)

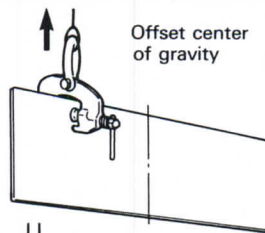
✗ WRONG MANNERS—IT'S DANGEROUS.



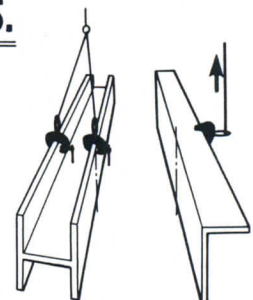
Two-point lifting using one rope



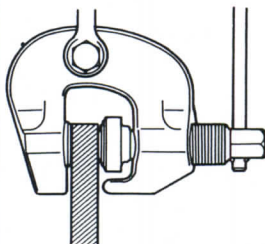
Side gripping



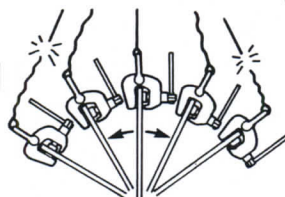
Offset center of gravity



One point lifting of long object

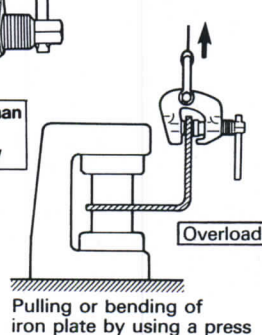


Insufficient gripping not reaching the reference line



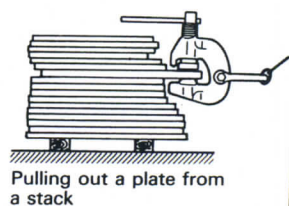
Lifting more than one plate simultaneously

Inverting angle exceeding 30° momentarily (Keep within 30°)



Overload

Pulling or bending of iron plate by using a press



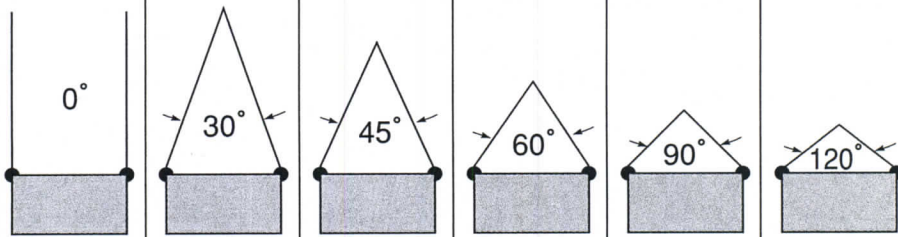
Pulling out a plate from a stack

Other cautions: Do not lift object exceeding the clamping range. Do not weld electrically the plate being lifted by clamp.

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 table below refers to No.4. 6×24A class of JIS G3525.)

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

D Wire rope dia (mm)	σ Break-age load (tons)	W Safe load (on one rope) $W=\sigma/S$ (safety factor S=6) (tons)						
			(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 $D = \sqrt{W \times C}$

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

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

② $W = \frac{D^2}{C}$

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

"SUPER" CLAMPS Maintenance and Repair

Check periodically, repair and replace parts, and use correctly in order to use the clamps over the full service life, safely.

Common Check Points

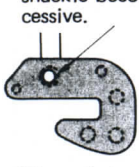
- ★ Check the main body for distortion or flaw.
- ★ Make sure the opening is normal (check if widened).
- ★ Check if the shackle is distorted.
- ★ Check the shackle pin hole for widening or looseness.
- ★ Check cam and pad teeth for defect or wear.
- ★ Check cam pin hole in main body for widening.
- ★ 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 Checking Standard.

Most items may be checked visually or by touching. To measure the safety point distance and opening size, use slide calipers or the like to obtain precise measurements.

DISCARD

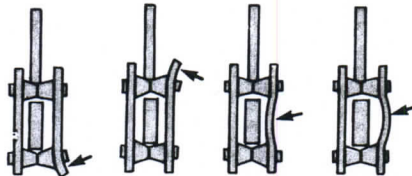
When clearance between bolt and hole exceeds 1 mm, and deflection of cam or shackle becomes excessive.



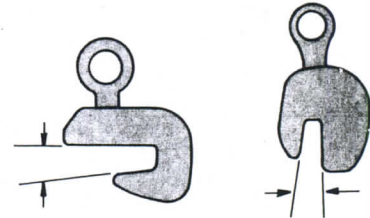
(Wear of pin or pin hole)



(Flaw of main body)



(Distortion of main body)

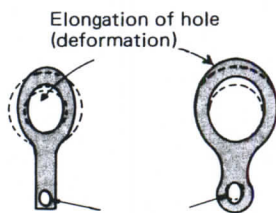


(Widening of opening)

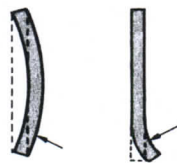
Discard the clamp if obvious flaw or distortion is found in the main body. Defects in the main body cannot be repaired in the light of safety. The main body may be cracked or deformed only after several uses if it is used incorrectly. Dent or swelling of main body, or widening of opening may be caused 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 used for a long time only by replacing parts.

REPLACE

(Shackle)



Elongation of hole (deformation)

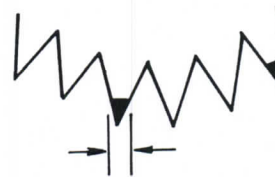


Distortion (deformation)

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)

Clamping capacity	Wear limit width of cam, pad
0.5 ton	0.5mm or more
1 ton	
1.5 ton	
3 ton	
6 ton	



When worn as shown above, replace immediately. Or, if not worn, when even one tooth is missing, replace also immediately. The wear rate is accelerated when stainless steel or other hard material is clamped. Or when plates of specified thickness are continuously clamped, only particular threads 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 the 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. Is 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 enter hazardous zone. Always pay attention to safety.

Screw Cam Clamps

Model : SCC · SCC-W

Operation method

1. Lower clamp onto plate (object to be lifted).
Be sure that end of plate is extremely near to the deepest jaw bottom of body.
When lifting from horizontal, place jaw of pad side under plate.
2. Turn screw clockwise until minor center-ring on cam touches to plate.
3. Tighten screw further with furnished handle;
over 350 Kgfcmm·····SCC 1 to SCC 6, SCC 1W and SCC 3W
over 50 Kgfcmm·····SCC 0.5
Increase initial tightening force when lifting thicker or heavier object to be lifted.

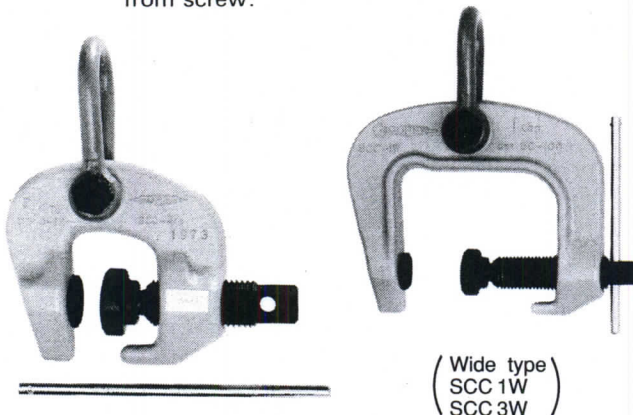
When starting to lift;
Minor center-ring touches upon plate and cam is vertical against axis center of screw.

When loaded;
Cam swivels in proportion to load applied and teeth edges of cam bite into plate firmly to grip strongly.

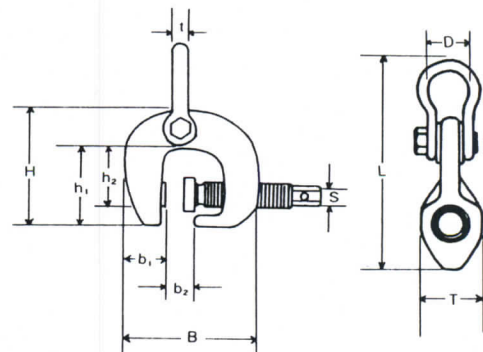
4. When detaching plate, touch down plate on the ground slowly. After that, loosen screw.

Warning :

- (1) Do not loosen screw until plate is at rest.
- (2) Excessive loosening operation makes cam detach from screw.



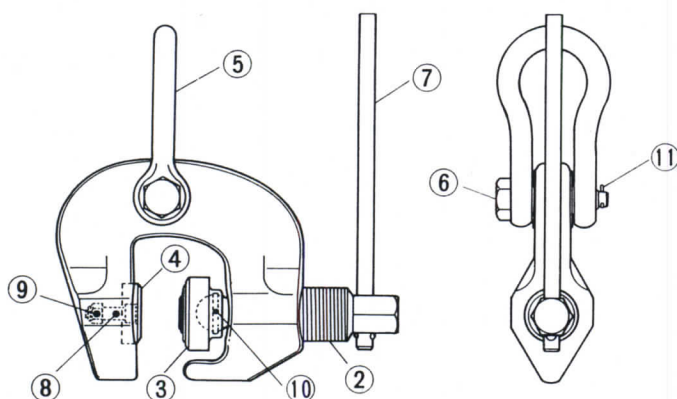
(Wide type
SCC 1W
SCC 3W)



ITEM No.	Capacity (tons)	Clamping range	H	h ₁	h ₂	B	b ₁	b ₂	T	t	L	D	S hex.opp.sides	Weight (kg)
SCC 0.5	0.5	0~28	76	42	26	104	34	30	30	10	113	17	13(square)	0.8
SCC 1	1	0~30	128	83	45	148	48	32	46	12	204	38	21	3.2
SCC 1.5	1.5	0~32	143	91	52	154	52	34	46	16	229	45	21	4
SCC 3	3	0~50	165	105	60	190	59	54	54	19	265	50	21	6
SCC 6	6	0~75	214	130	76	255	76	79	69	32	365	80	21	18
SCC 1W	1	50~100	190	126	88	225	54	106	46	16	273	45	21	6
SCC 3W	3	25~75	191	121	95	215	60	81	54	19	291	50	21	7.8

Finish : Main body is baked with yellow paint, shackle is painted red and the others are coated with manganese phosphate film.

Replacement parts and fittings (Model : SCC • SCC-W)



Part No.	Part Name	Item No.
SHACKLE ASSEMBLY		SCH
5	Shackle	SCCH
6	Bolt for shackle	SCCN
11	Cotter pin	
3 • 10		SCCT
PAD ASSEMBLY		SCP
4	Pad	SCCP
8	Hex. socket head cap screw	SCCV
9	Nylon nut	
SCREW ASSEMBLY		SCR
2	Screw	SCCR
7	Handle	SCCU

Replacement procedure for cam and pad

● Disassembling

A) PAD

1. Take out by loosening the cap screw ⑧ and nut ⑨.

B) CAM

1. Turn back the screw ② and hit the rear part of the cam ③ slightly with a hammer.

● Reassembling

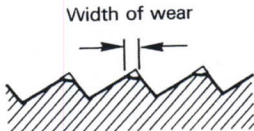
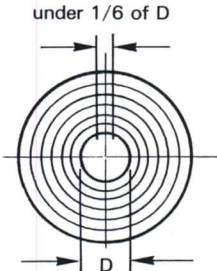
A) CAM

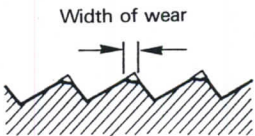
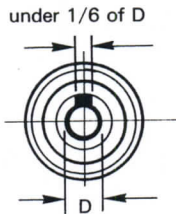
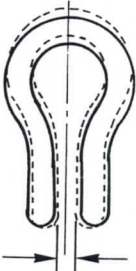
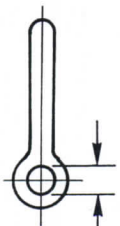
1. Stand the body toward pad side down. (Hold by a hand)
2. Replace the pad ④ upside down. In case of a short screw (SCC-W), insert a rest such as a round bar between the cam ③ and pad ④.
3. Place the cam ③ and a stop ring ⑩ on the center of the pad (or the rest).
4. Turn the screw ② until the cam sets in place.
5. Check the cam movement.

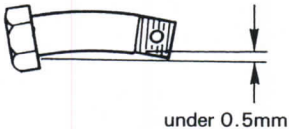
B) PAD

1. Set a new pad and tighten with the cap screw ⑧ and nut ⑨.

Standards for checking clamps (Model ; SCC · SCC-W)

SECTION	INSPECTING METHOD	PERMISSIBLE LIMIT	CAUSES OF THE TROUBLE
Body	Visually check or use color dyes to locate cracks.	Replace when cracks are found.	* Overloading * Changes in the meterial structure caused by exposure to heat * Fatigue from repeated use
	Measure the displacement of the center of the screw to determine the amount of elongation.	Replace when the displace-ment of the center of the screw exceeds 2mm.	* Too large hoisting angle
Screw	Visually check or use color dyes to locate cracks.	Replace when cracks are found.	* Overloading * Dynamic loads
	Visually check for bends in the screw.	Replace when the movement is not smooth, or when the displacement of the screw center is large.	
	Visually check for wear or damage on the screw.	Replace when the displacement or when the play becomes large.	* Natural wear from use * Insufficient lubrication
Cam	Visually check and measure the amount of wear.	Width of wear  Capacity 0.5T 1T 1.5T 3T 6T Permissible limit of width of wear under 0.5mm	* Natural wear from use * Wear from clamping hardened material
	Visually check for broken cam teeth.	under 1/6 of D 	* Wear from clamping hardened material * Overloading

SECTION	INSPECTING METHOD	PERMISSIBLE LIMIT	CAUSES OF THE TROUBLE
Pad	Visually check and measure the amount of wear.	 Width of wear Capacity 0.5T 1T 1.5T 3T 6T Permissible limit of width of wear under 0.5mm	* Natural wear from use * Wear from clamping hardened material
	Visually check for broken pad teeth.	 under $\frac{1}{6}$ of D D	* Wear from clamping hardened material * Overloading
Shackle	Visually check for deformation.	 Narrow clearance Replace when the clearance becomes narrow and prevents the shackle from rotating smoothly.	* Overloading * Too large hoisting angle
	Visually check or use color dyes to locate cracks.	Replace when cracks are found.	* Overloading
	Measure the bolt hole for wear and deformation.	Replace when the wear exceeds 0.5mm.  under 0.5mm	* Insufficient lubrication

SECTION	INSPECTING METHOD	PERMISSIBLE LIMIT	CAUSES OF THE TROUBLE
Shackle bolt	Measure the shaft and check for wear. Visually check and measure for bends and other forms of deformation.	Replace when the clearance between the shaft and hole exceeds 1mm, or when the play of the cam becomes large.  The diagram shows a side view of a shackle bolt. A horizontal line represents the shaft, and a vertical line represents the hole. A double-headed arrow indicates the clearance between them, labeled 'under 0.5mm'.	* Natural wear from use * Insufficient lubrication * Overloading * Dynamic loads