

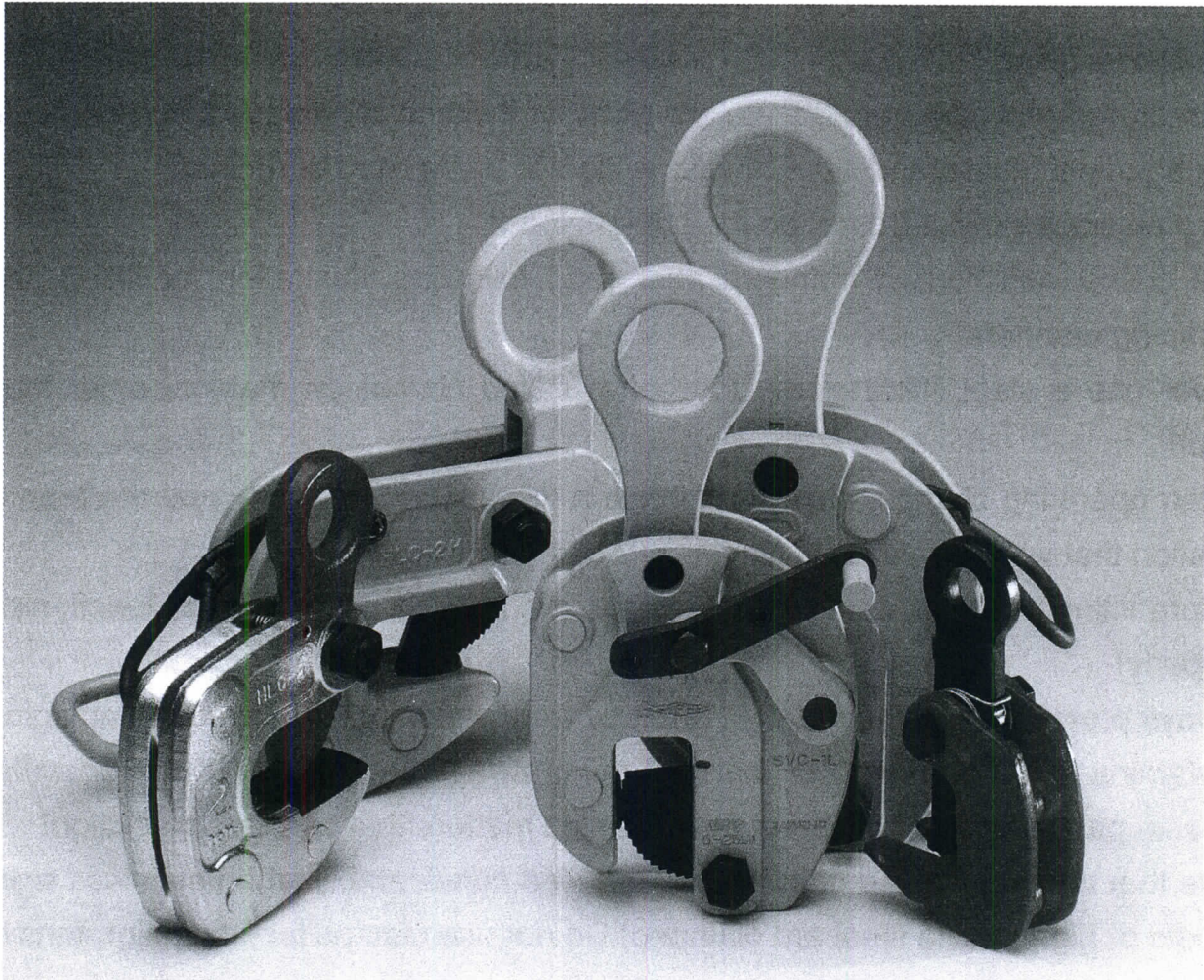
SAFETY LIFTING CLAMPS



INSTRUCTION FOR OPERATION

“SUPER” BRAND LIFTING CLAMPS

GVC-E



SUPER TOOL

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 H-beam or steel structure to be lifted!

Do not exceed safety 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 a positive grip before lifting!

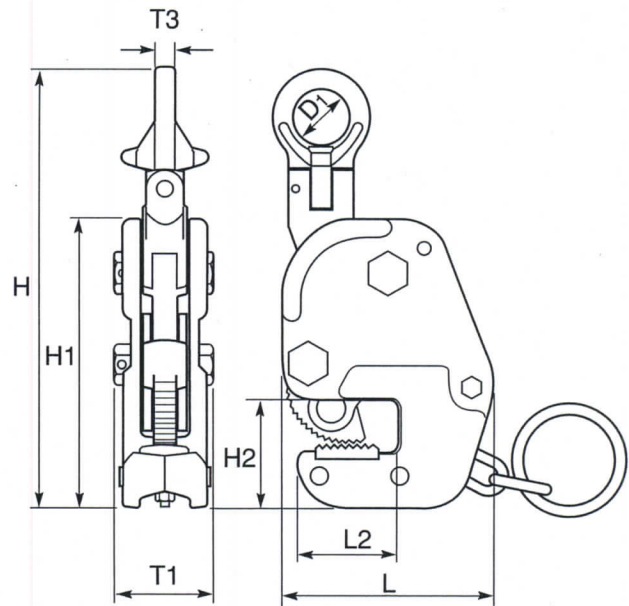
- Inspect clamp! If cam or pad teeth are worn, or if clamp is damaged, do not use!
- All personnel must stand clear of load while it is being lifted or moved!
- Take up slack slowly! Do not bounce or jerk load!
- Use clamp with correct manners after read following illustration for lifting and clamping 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!

LATERAL STRUCTURE CLAMP

FREE DIRECTION TYPE (with tightening lock)

MODEL : **GVC-E**

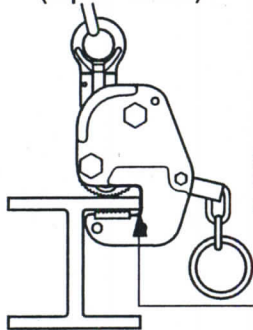


(Dimensions in mm)

| Item No. | Capacity (TON) | Clamping Range(mm) | H | H1 | H2 | L | L2 | T1 | T3 | D1 | Weight (kg) |
|------------------|----------------|--------------------|---------|-----|----|-----|----|----|----|----|-------------|
| GVC 0.35E | 0.35 | 0-16 | 174-191 | 120 | 26 | 87 | 42 | 41 | 8 | 26 | 1.7 |
| GVC 0.5E | 0.5 | 0-20 | 206-229 | 145 | 34 | 103 | 47 | 45 | 10 | 30 | 2.6 |
| GVC 1E | 1 | 0-25 | 249-276 | 183 | 40 | 130 | 62 | 52 | 12 | 35 | 4.5 |
| SVC 2E | 2 | 0-35 | 306-343 | 222 | 50 | 163 | 70 | 63 | 14 | 45 | 9.0 |

CORRECT MANNER OF USE

(Open state)

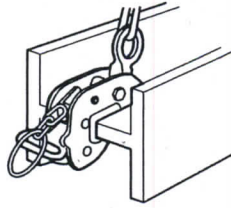


Make sure lock handle is set securely.

PUSH STEEL plate to the full depth.

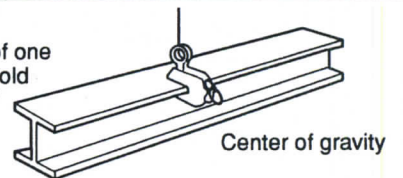
Do not lift yet in this state.

Tightening is complete. Now ready to lift.



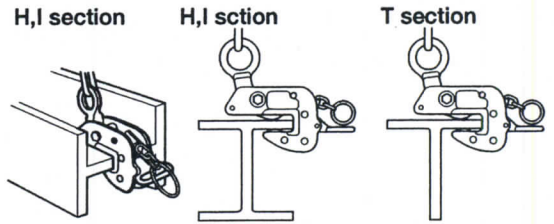
Safety lock is applied and the clamp is firm.

In the case of one point lifting hold the center of gravity.

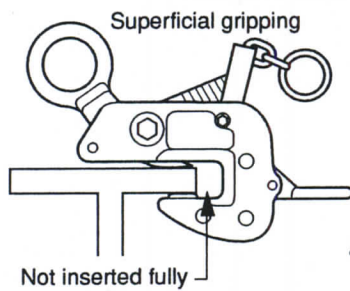


Center of gravity

Chucking direction and lifting method of section steels.

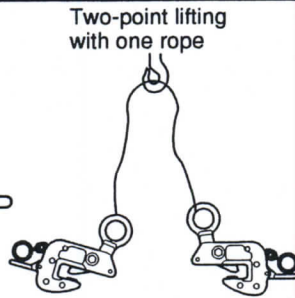


✗ WRONG MANNERS --- DANGEROUS!

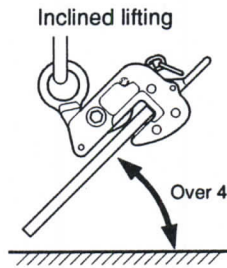


Superficial gripping

Not inserted fully

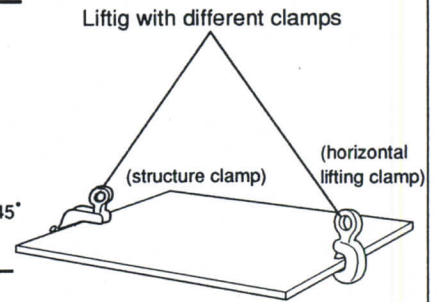


Two-point lifting with one rope



Inclined lifting

Over 45°

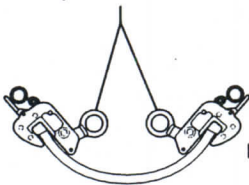


Lifting with different clamps

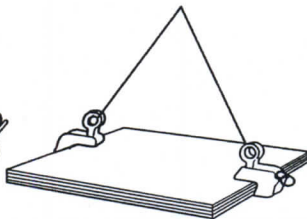
(structure clamp)

(horizontal lifting clamp)

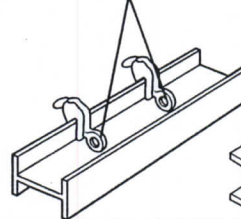
Lifting of extremely curved steel plate or end plate



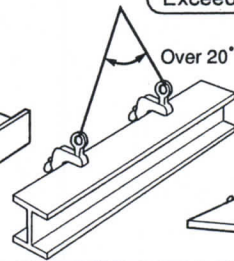
Lifting plural plates at two points



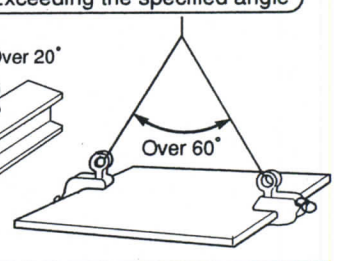
One side lifting



Exceeding the specified angle



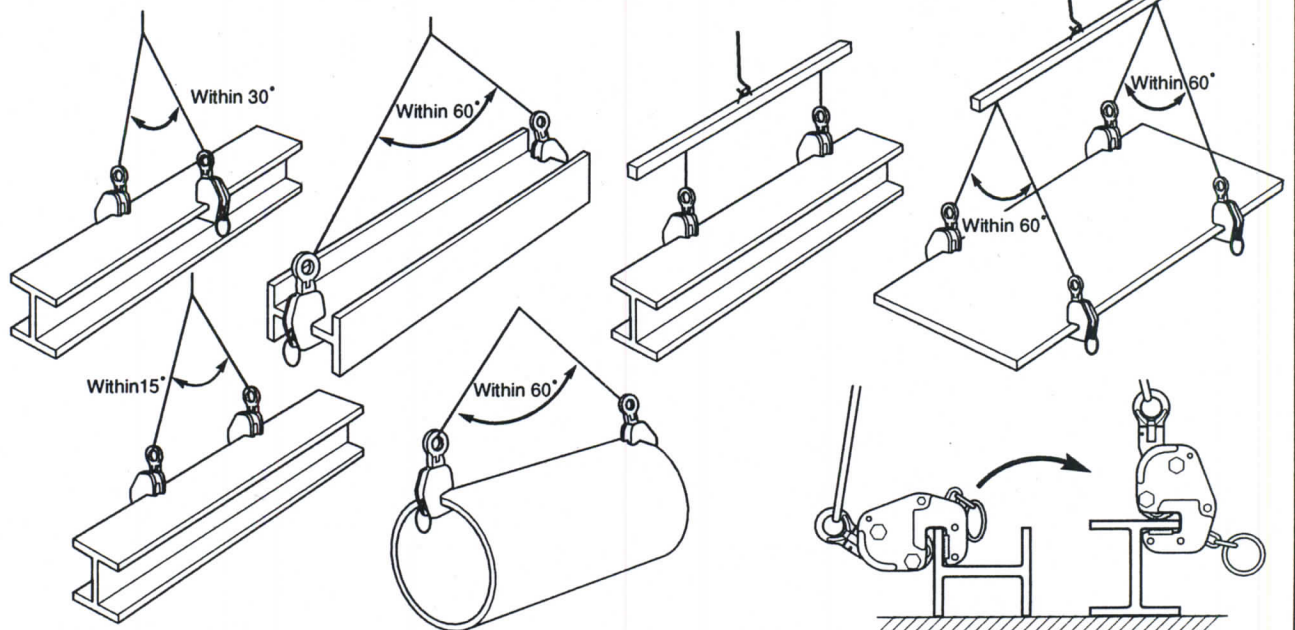
Over 20°



Over 60°

Other Cautions • Do not lift object exceeding the clamping range. • Do not weld electrically the plate being lifted by clamps.

For horizontal lifting or lateral carrying of structural section steels (H,I,T,L shapes) and flat steel plates.



✚ Observe the specified lifting angle for the safety of job.

The clamp may be also used to turn over a selection steel

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. 6X24A 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 Sale load (on one rope) $W=\sigma/S$ (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 $D = \sqrt{W \times C}$

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

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

② $W = \frac{D^2}{C}$

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

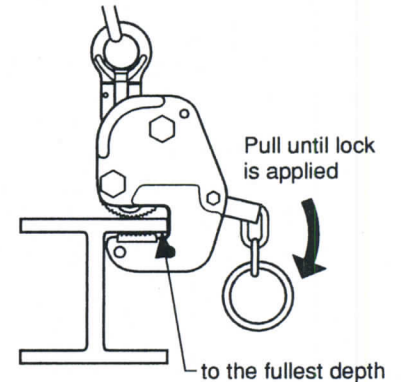
LATERAL STRUCTURE CLAMP

FREE DIRECTION TYPE (with tightening lock)

MODEL : **GVC-E**

Operating method

1. Insert flange of structure steel or plate to be lifted sufficiently to the fullest depth of clamp mouth.
2. Then, set lock handle as shown.
3. When plate to be lifted has been just taken off, stop winding rope. Then, re-start lifting operation after confirmed to be lifted at position of center of gravity.
4. When detaching plate, release lock handle after loosed rope.
5. Do not lift plate at the state in 4).



Replacement Procedure for Cam and Pad

Disassembling

A) PAD

1. Be sure to keep lock handle releasing.
2. Turn main body upside down.
3. Take out Pad (2) by loosening Cap screw (11-1) and Nut(12-1).

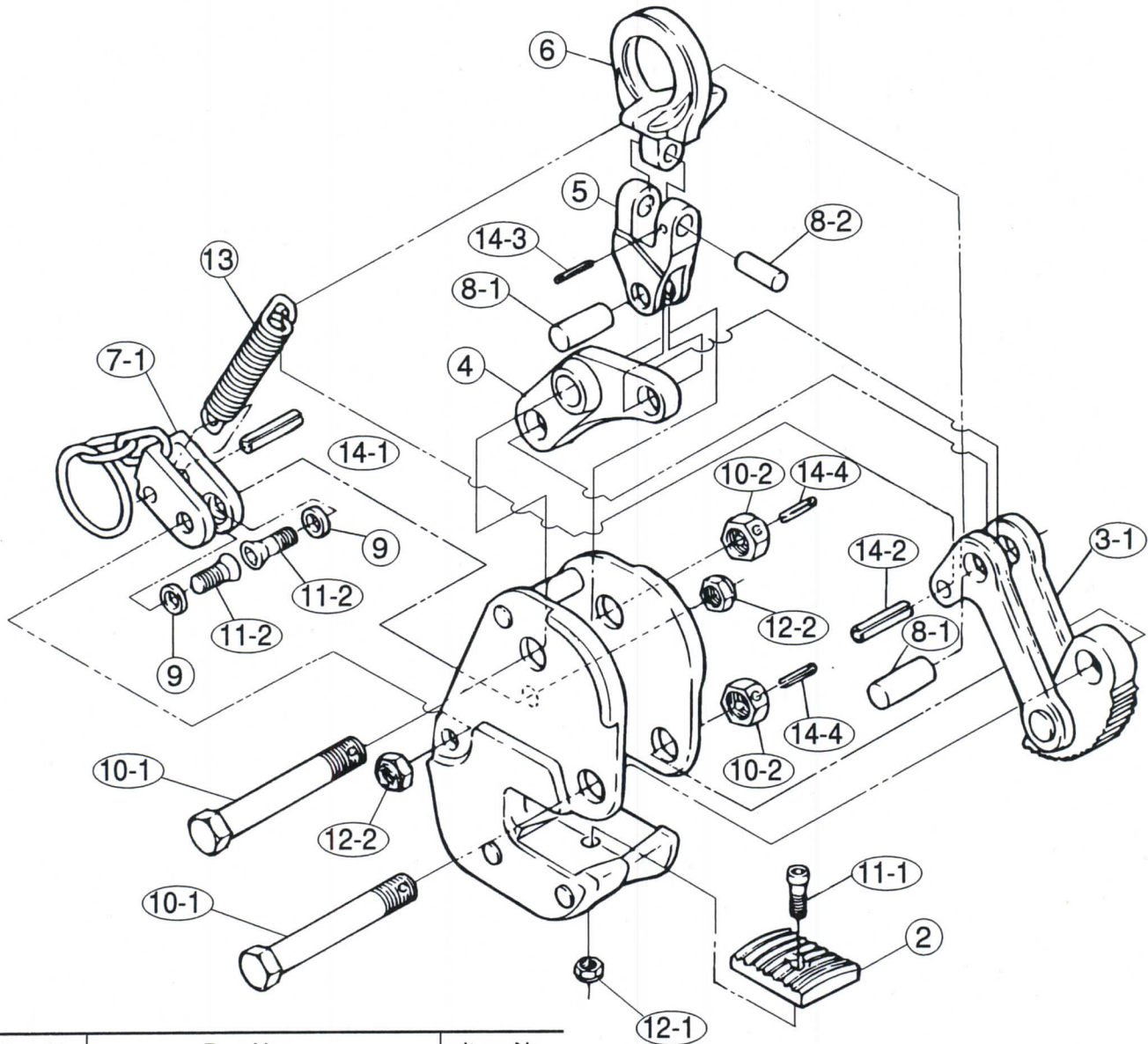
A) CAM

1. Pull out Spring pin (14-4) from Cam support nut(10-2) and Link support nut(10-2). (Be sure to keep lock handle releasing.)
2. Pull out Spring pin(14-2) from "I" shaped ling.
3. Take out Shackle (6) , Connector (5), "L" shaped link (4) and Cam (3-1) from body. Then, take out Connecting pin (Long)(8-1).

Reassembling

Reassembling in the reverse order.

Replacement Parts and fittings



| Part No. | Part Name | Item No. |
|----------------------------------|----------------------------|------------|
| HANDLE ASSEMBLY | | GVG |
| 7-1 | "U" shaped handle | GVCG |
| 9 | Collar | GVCZ |
| 11-2 | Hex.socket flant head bolt | GVCF |
| 12-2 | U nut | |
| 14-1 | Spring pin | GVCQ |
| "L" SHAPED LINK | | GVM |
| 4 | Link | GVCM |
| 8-1 | Connecting pin (Long) | GVCY |
| CAM SURPORT BOLT ASSEMBLY | | GVK |
| 10-1 | Cam support bolt | GVCK |
| 10-2 | Cam support nut | |
| 14-4 | Spring pin | GVCO |
| 13 | Spring | GVCS |

| Part No. | Part Name | Item No. |
|-------------------------|---------------------------|------------|
| SHACKLE ASSEMBLY | | GVH |
| 5 | Connector | GVCL |
| 6 | Shackle | GVCH |
| 8-2 | Connecting pin(Short) | GVCX |
| 14-3 | Spring pin | GVCR |
| CAM ASSEMBLY | | GVT |
| 3-1 | Cam(with Link) | GVCT |
| 14-2 | Spring pin | GVCU |
| PAD ASSEMBLY | | GVP |
| 2 | Pad | GVCP |
| 11-1 | Hex.socket head cap screw | GVCV |
| 12-1 | Nylon nut | |

“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.

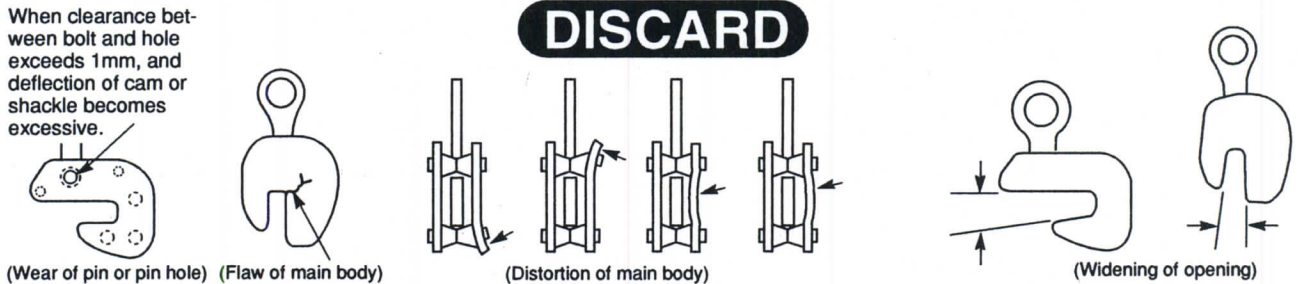
Common Check Points

- 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.

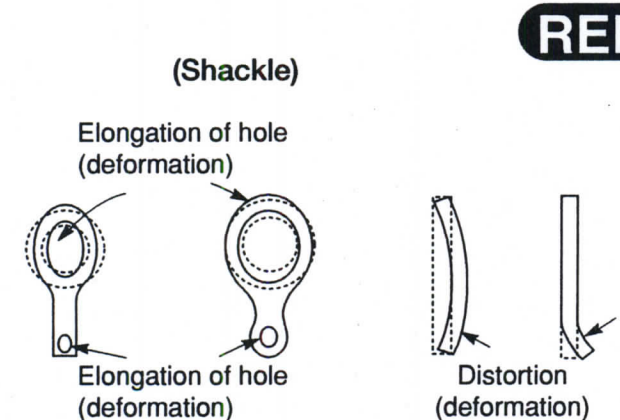
Most items may be checked visually or by touching. To measure the safety point distance and opening size, use slide calipers or the like to obtain precise measurements.

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



Discard the clamp if obvious flaw or distortion is found in the main body. Defects in the main body can not 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.



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.

REPLACE

| (Cam and pad) | |
|-------------------|------------------------------|
| Clamping capacity | Wear limit width of cam, pad |
| 0.5ton | 0.6mm or more |
| 1 ton | 0.7mm or more |
| 2 ton | 0.8mm or more |
| 3 ton | 0.9mm or more |
| 5 ton | 1.0mm or more |

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.

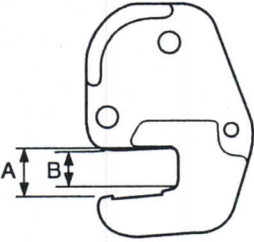
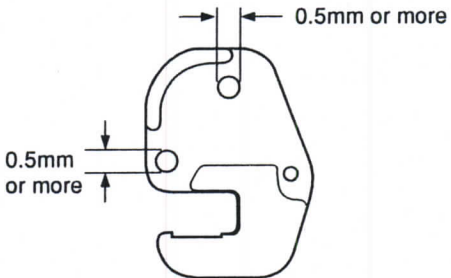
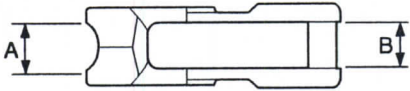
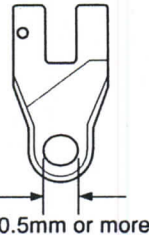
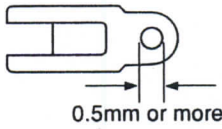
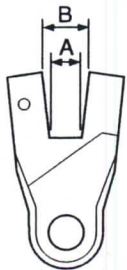
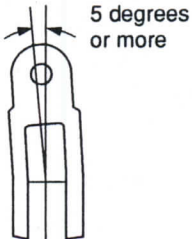
Besides, replace the support pins, bolts, springs, and other parts according to the Checking Standard.

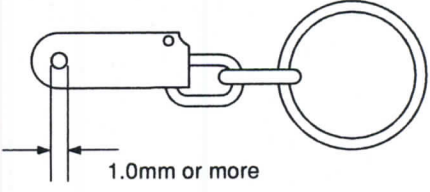
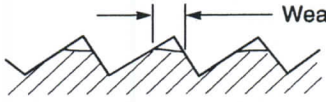
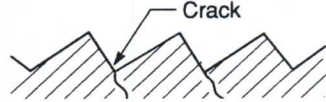
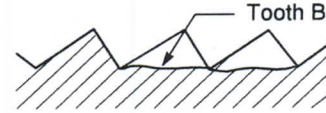
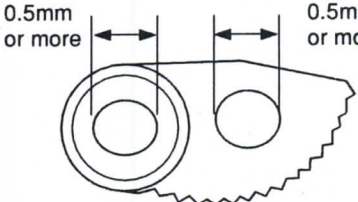
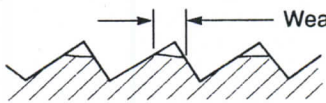


Check Twice to Confirm Safety.

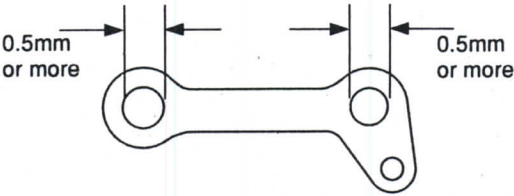
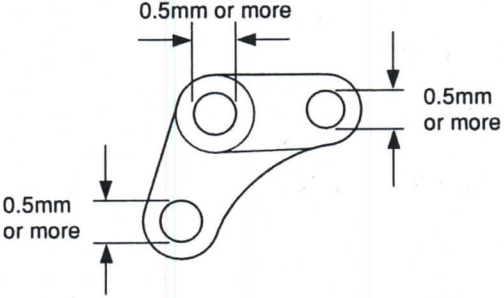
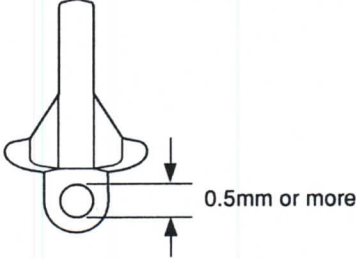
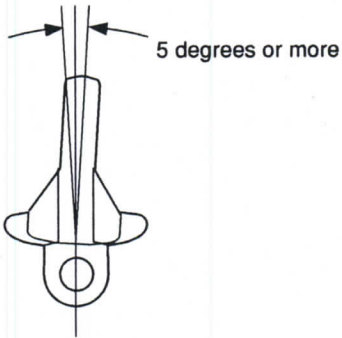
Check the type capacity of clamp. Is the wire rope proper? How about its size and length? Overloaded or not? Where's the center of gravity? Is the material inserted fully? Is it locked securely? Lift at two points for an object longer than a meter.

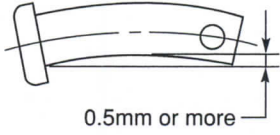
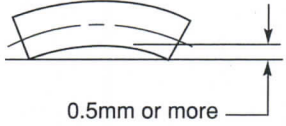
Lift at three or four points where the center of gravity is hard to locate. Is the lifting angle proper? Check all these items, and confirm them once again. Lift, carry, touch down slowly. Be careful not to hit against surrounding objects while carrying. Keep off hands. Do not enter hazardous zone. Always pay attention to safety.

CHECKING STANDARD

| Part to be checked | Check List | Working life limitation | Disposal |
|-------------------------|---|---|-------------------------|
| <p>Body</p> | Cracks | When crack is found visually. | <p>Disregard</p> |
| | Deformation in the jaw opening | <p>When difference between A and B exceeds 2mm.</p>  | |
| | Wear and deformation in hole of cam and link support bolt | <p>When diameter of hole exceeds 0.5mm from standard and play of cam and shackle becomes large.</p>  | |
| | Damage in each part | <p>When difference between A and B exceeds 2mm.</p>  | |
| <p>Connector</p> | Cracks | When crack is found visually | <p>Replacing</p> |
| | Wear of pin hole |   | |
| | Bends and deformation | <p>When 1.0mm exceed in difference of distance between A and B</p>   | |

| Part to be checked | Check List | Working life limitation | Disposal | | | | | | | | | | |
|--------------------|--|---|------------|---------------|------|---------------|-----|---------------|---|---------------|---|---------------|-----------|
| “U” Handle | <p>Cracks</p> <p>Wear of hole</p> <p>Deformation in other parts</p> | <p>When crack is found visually.</p>  <p>1.0mm or more</p> <p>When handle operation is not smooth.</p> | Replacing | | | | | | | | | | |
| Cam | <p>Amount of wear</p> <p>Cracks of the base of cam teeth</p> <p>Teeth breakage</p> <p>Wear of pin hole</p> |  <table border="1" data-bbox="893 728 1212 862"> <thead> <tr> <th>Capa (ton)</th> <th>Width of Wear</th> </tr> </thead> <tbody> <tr> <td>0.35</td> <td>0.5mm or more</td> </tr> <tr> <td>0.5</td> <td>0.6mm or more</td> </tr> <tr> <td>1</td> <td>0.7mm or more</td> </tr> <tr> <td>2</td> <td>0.8mm or more</td> </tr> </tbody> </table>    | Capa (ton) | Width of Wear | 0.35 | 0.5mm or more | 0.5 | 0.6mm or more | 1 | 0.7mm or more | 2 | 0.8mm or more | Replacing |
| Capa (ton) | Width of Wear | | | | | | | | | | | | |
| 0.35 | 0.5mm or more | | | | | | | | | | | | |
| 0.5 | 0.6mm or more | | | | | | | | | | | | |
| 1 | 0.7mm or more | | | | | | | | | | | | |
| 2 | 0.8mm or more | | | | | | | | | | | | |
| Pad | <p>Amount of wear</p> <p>Cracks at the base of cam teeth</p> <p>Teeth breakage</p> |  <table border="1" data-bbox="893 1568 1212 1702"> <thead> <tr> <th>Capa (ton)</th> <th>Width of Wear</th> </tr> </thead> <tbody> <tr> <td>0.35</td> <td>0.5mm or more</td> </tr> <tr> <td>0.5</td> <td>0.6mm or more</td> </tr> <tr> <td>1</td> <td>0.7mm or more</td> </tr> <tr> <td>2</td> <td>0.8mm or more</td> </tr> </tbody> </table>   | Capa (ton) | Width of Wear | 0.35 | 0.5mm or more | 0.5 | 0.6mm or more | 1 | 0.7mm or more | 2 | 0.8mm or more | Replacing |
| Capa (ton) | Width of Wear | | | | | | | | | | | | |
| 0.35 | 0.5mm or more | | | | | | | | | | | | |
| 0.5 | 0.6mm or more | | | | | | | | | | | | |
| 1 | 0.7mm or more | | | | | | | | | | | | |
| 2 | 0.8mm or more | | | | | | | | | | | | |

| Part to be checked | Check List | Working life limitation | Disposal |
|------------------------|--|--|-----------|
| "I" shaped Link | <p>Bends and deformation</p> <p>Wear of pin hole</p> | <p>When unusual sounds generate or when the movement is not smooth.</p> <p>When diameter of hole exceeds 0.5mm from standard.</p>  | Replacing |
| "L" shaped Link | <p>Bends and deformation</p> <p>Wear of pin hole</p> | <p>When unusual sounds generate or when the movement is not smooth.</p> <p>When diameter of hole exceeds 0.5mm from standard.</p>  | Replacing |
| Shackle | <p>Cracks</p> <p>Wear in pin hole</p> <p>Bends and deformation</p> | <p>When crack is found visually.</p>  <p>When permanent deformation or play exceeds 5 degrees from center of clamp.</p>  | Replacing |

| Part to be checked | Check List | Working life limitation | Disposal |
|--|---|--|------------------|
| <p>Link support bolt</p> <p>Cam support bolt</p> | <p>Wear</p> <p>Bends and deformation</p> <p>Looseness of nut caused by coming off spring pin.</p> | <p>When exceeds 1.0mm or more in the clearance between shaft and hole and when the play of cam becomes large.</p>  | <p>Replacing</p> |
| <p>Rivet Pin for Link</p> | <p>Wear in shaft</p> | <p>When becomes bigger in the clearance between shaft and hole or when exceeds 0.5mm or more in the play of cam or link.</p> | <p>Replacing</p> |
| <p>Connecting Pin</p> | <p>Wear in shaft</p> <p>Bends and deformation</p> | <p>When exceeds 1.0mm or more in the clearance between shaft and hole.</p>  | <p>Replacing</p> |
| <p>Spring</p> | <p>Elongation</p> <p>Deformation</p> <p>Reduction in tension</p> | <p>When the normal length elongate 5% or more becoming large in the clearance.</p> <p>When deformation of others prevent a normal spring force and when the cam and others do not move smoothly.</p> | <p>Replacing</p> |

Remark:

The working life limitation shows the limitation which has to dispose.