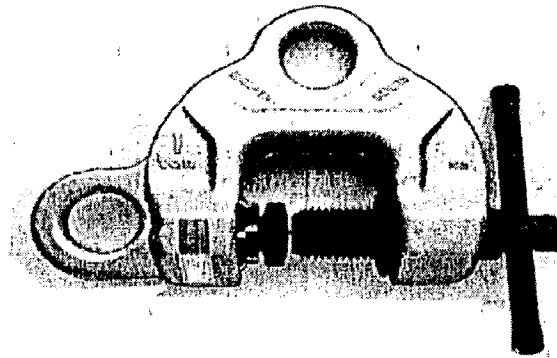


# SAFETY LIFTING CLAMPS



SCREW CA CLAMP  
(DOUBLE EYE TWIN CAM TYPE)

## SDC-S



INSTRUCTION FOR OPERATION

**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 the plate to be lifted.  
Do not exceed limited working load shown on clamp.  
Plate thickness must be within grip range on clamp.
- Always use slings correctly ! Pay special attention to the correlation between the lifting angle and the rated load! Use within specified angles.
- Before lifting the load, confirm that the clamps are in good condition and functioning properly! Inspect clamp. If cam or pad teeth are worn or if clamp is damaged, do not use. All personal must stand clear of plate while it is being lifted or moved.
- Never vertically lift material that tapers down to the edge!
- Never lift more than one steel plate at a time!
- 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!
- Take up slack slowly. Do not bounce or jerk load.
- Always protect the surfaces of the 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 coatings or other foreign matters that can reduce friction!
- Do not lift if cam teeth are not bitten sufficiently on work piece when work piece to be lifted is hard material or light weight (less than 1/5 against capacity or less than 1/4 against maximum opening jaw).
- Note that the service life of clamps is reduced considerably when stainless steel or high-tensile steel are clamped! Do not use clamps for lifting high-tensile steel (over 300 HB) or soft steel (under 80 HB)!
- Do not weld electrically work piece being lifted by clamp.
- Do not modify clamp by gas cutting or welding.
- Only use genuine parts when repairing clamps!
- Use clamp in the correct manner in accordance with this instruction.
- Never use a steel lifting 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 time!

# ✘ WRONG MANNERS-IT'S DANDEROUS

Two-point lifting using one rope

Side gripping

Insufficient gripping not reaching the reference line

Offset center of gravity

Lifting more than one plate simultaneously

One point lifting of long object

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

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.

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

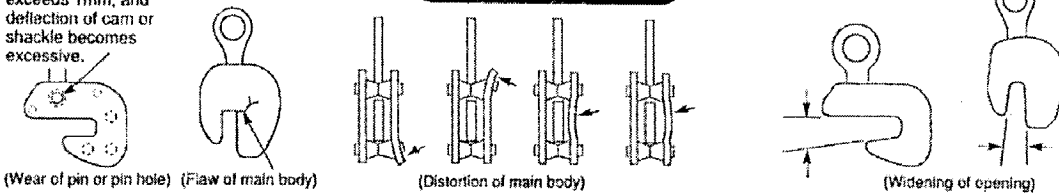
## Common Check Points

- 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.

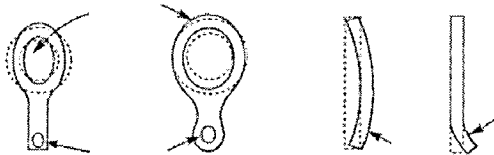
When clearance between bolt and hole exceeds 1mm, and deflection of cam or shackle becomes excessive.



### DISCARD

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	0.5mm or more
1 ton	
2 tons	
3 tons	
5 tons	

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.

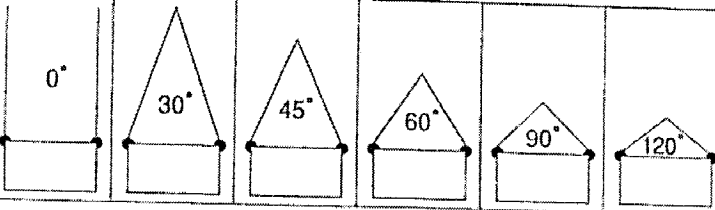
Check the type capacity of clamp. Is the wire rope proper? How about its size and length? Overloaded or not? Where's the center of gravity? Is the material inserted fully? Is it locked securely? Lift at two points for an object longer than a meter. Lift at three or four points where

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.

## 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)	$\sigma$ Breakage 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 (safeload).

### 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  $D = \sqrt{W \times C}$

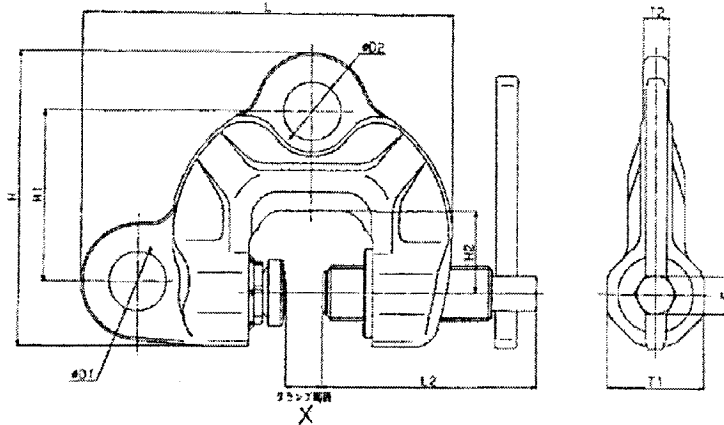
$D = \sqrt{3 \times 120} = \sqrt{360} = 19 \rightarrow 20 \text{ mm}$

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

②  $W = \frac{D^2}{C}$

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

ITEM NO.	RATED CAPA. (TON)	CLAMPING RANGE	WEGHT
SDC0.5S	0.5	0 to 25 mm	1.9 Kg
SDC1S	1	0 to 40 mm	3.6 Kg
SDC2S	2	0 to 40 mm	4.8 Kg
SDC3.2S	3.2	0 to 40 mm	7 Kg
SDC6.3S	6.3	0 to 50 mm	17 Kg



ITEM NO.	CAPA (TON)	X (mm)	(mm)										WEIGHT (Kg)
			L	L''	H	H1	H2	D1	D2	T1	T2	S	
SDC0.5S	0.5	0-25	158	89	121	72	30	27	46	46	13	17	1.9
SDC1S	1	0-40	208	121	161	94	45	32	54	54	14	21	3.6
SDC2S	2	0-40	227	121	177	105	45	32	60	60	18	21	4.8
SDC3.2S	3.2	0-40	252	136	196	119	50	35	64	64	20	21	7
SDC6.3S	6.3	0-50	291	151	225	132	55	50	41	90	43	21	17

## FEATURES

### FIRM&RELIABLE BITE & HOLD

Cam turns as screw is tightened.

This bears reliable force of bite into a work piece.

### MATCHING POINT LINE

Cam actuation is confirmed by the matching point-line.

The line is a kind of FLUORESCENCE or ACCUMLATING material for easy observation in the dark situation is applied.

### RELIABLE BULT-IN SPRING

Tough and reliable spring (approx. 100kg) prevents the screw from loose.

## REPLACEMENT PARTS AND FITINGS

Model: SDC-S

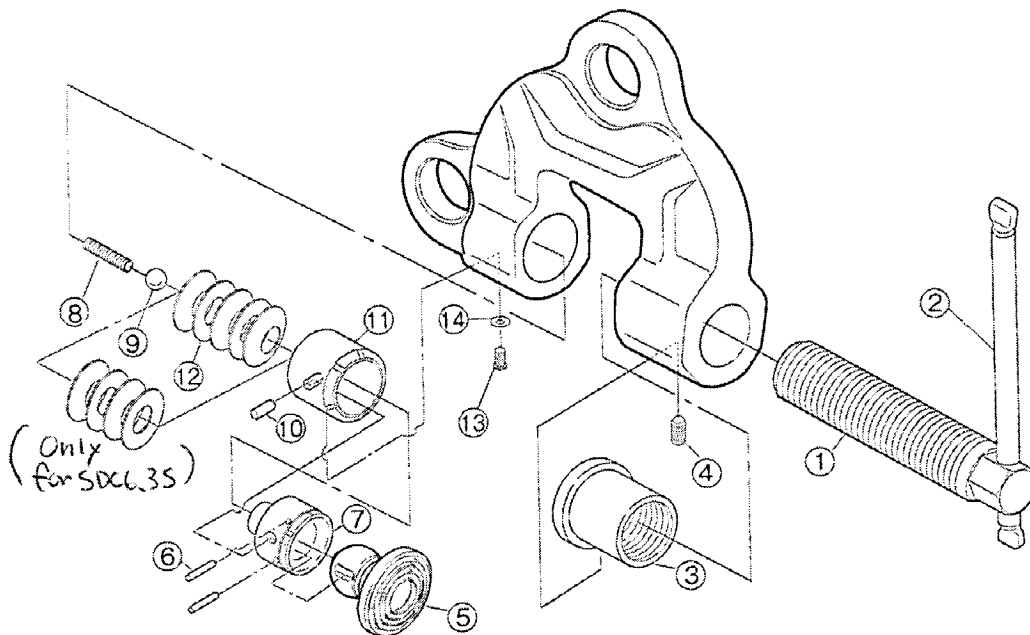
PARTS NO.	ITEM NAME			QTY.
	SET	DETAIL	ITEM No.	
1	SCREW	SCREW	SDCR	1
2		HANDLE		1
3	SLEEVE	SLEEVE	SDCB	1
4		HEX. HOLE HEAD CREW		1
5	CAM	CIRCULAR CAM	SDT	1
6		STOPPER PIN		2
7		CAM HOLDER		1
8		SPRING		1
9		STEEL BALL		1
10		GIUD PIN		1
11		COLLAR		1
12		DISC SPRING		5 (SDC6.3S: 4pcs)
13		HEX. SCOKET HEAD SCREW		1
14		SPRING WASHER		1

ITEM NO. SET SUPPLYS ONLY.

When ordering, specify the CAPA (TON) with ITEM NO.

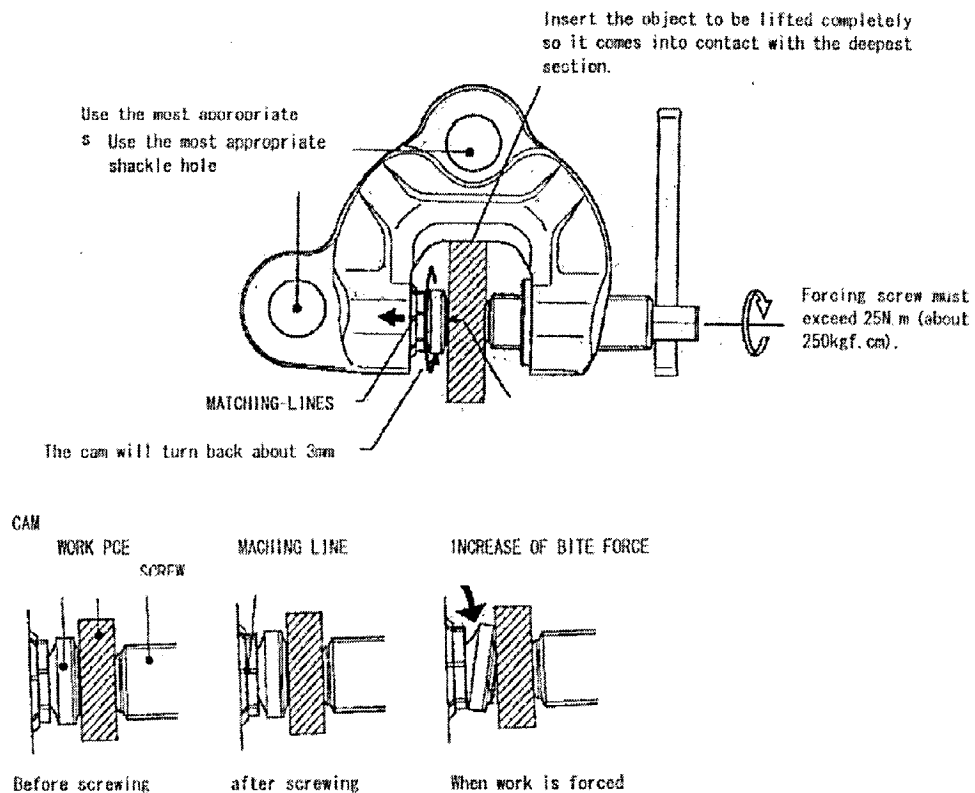
For instance, SDCR3.2S.

Periodic lubrication is regularly required.



## OPERATION METHOD

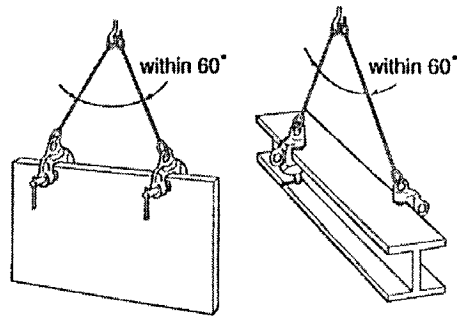
- 1) The forcing screw will tighten when turned clockwise, and will loosen when turned counterclockwise.
- 2) The cam will turn back about 3mm after coming into contact with the steel plate when tightening the forcing screw. Continue to tighten the forcing screw until it stops where MATCHING-LINES fit each other on one line.
- 3) Confirming the matching-line meets each other, the tightening of the forcing screw must exceed 25N.m (about 250Kgf. Cm).
- 4) Determine which shackle hole (wire rope hole) to use from the method of use and from the shape of the object to be lifted.
- 5) When setting the clamp, insert the object to be lifted completely into the jaw opening until it comes into contact with the deepest end section. Next turn the handle and tighten the forcing screw firmly with all circumferences of cam by square contact with the object.
- 6) When hoisting or during other operations, special attention must be given to prevent the handle from coming into contact with the wire rope or other objects. When the handle comes into contact with something, there is a possibility that the forcing screw will turn and loosen.



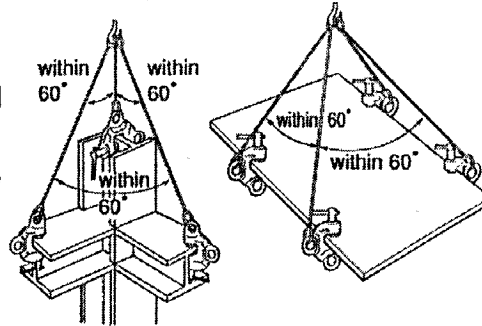


# METHODS OF USE

1) When lifting at 2 points, keep the lifting angle within 60° .



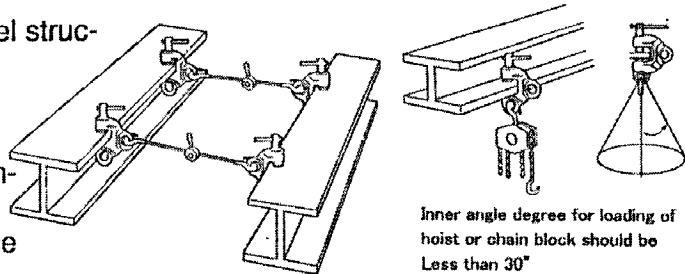
2) Always lift at 3 points with complicated shaped objects.  
(When lifting steel plates horizontally, always lift at 4 points.)



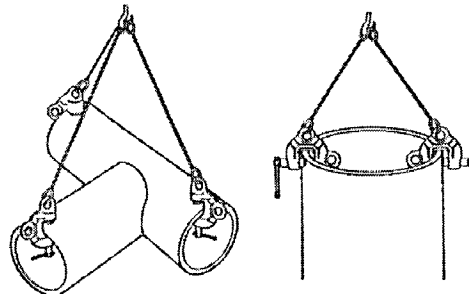
3) Clamps used for positioning steel structure for welding, for pulling and for hanging.

N.B.

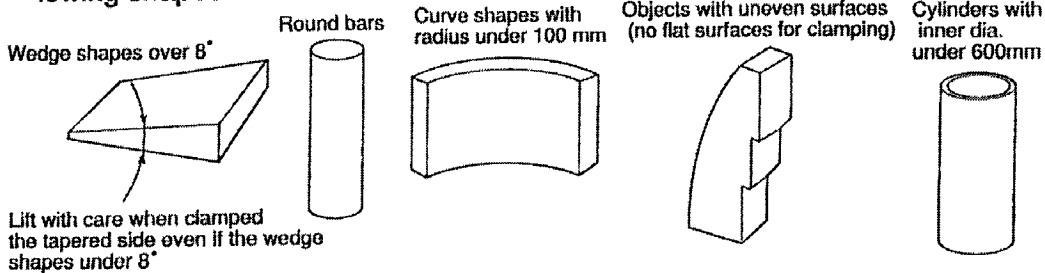
When the clamps are used continuously over a long period of time, check the clamping force regularly at short intervals.



4) The clamps can also be used for lifting pipe shaped objects and for turning over objects.



5) The clamps can not be used on the following shaped structures:



Never vertically lift material that tapers down to the edge!

### 3. Disassembling and Assembling

#### Disassembling (screw side)

Turn screw (1) anticlockwise to remove. Handle and screw cannot be apart.

Loosen hex. Screw (4) and remove (3).

#### Disassembling (cam side)

Loosen hex. Screw (13) and remove (5), (7), and (11).

Pull out (10) and remove (11).

Pull out (6) and remove (5).

#### Assembling (screw side)

Fit and match the hole of (3) into the body hole of (4). Screw (4) and fix (3).

Turn (1) into the internal screw of body finally after all assembling of both screw and cam sides.

#### Assembling (cam side)

Set (5) into (7) and fix them with (6).

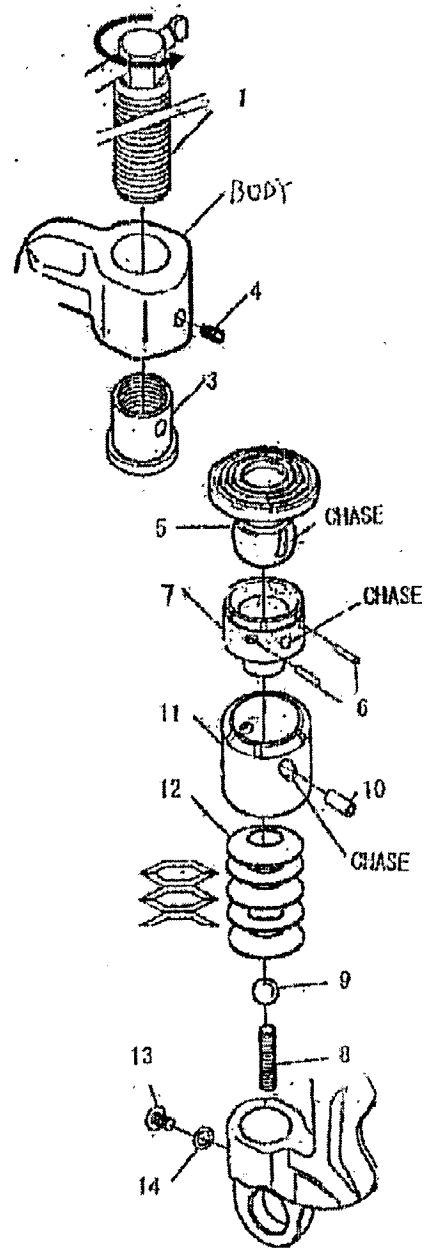
Set (11) over (7) by matching all chases of (5), (7), and (11) in one line. Insert (10) to fix them all.

Fix 5pcs of disc spring as shown

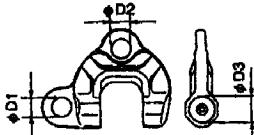
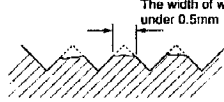
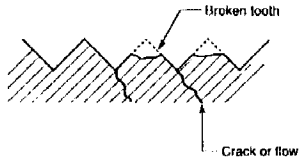
Set and fix 5 pieces of (12) as per fig.

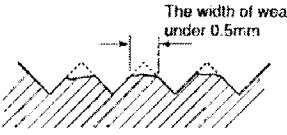
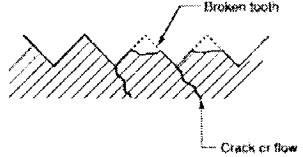
Set (9) and (12) to the bottom part of (7).

Set partly assemble combination of (5), (7), and (11) to the body and fix them by (13).



### INSPECTION STANDARDS FOR MODEL SDC-S:

Category	Inspecting method	Permissible limit	Causes of the trouble																						
Body	Visually check or use color dyes to find cracks	Dispose of the clamp when a crack is found.  Replace when hole diameter on circumference exceeds the size in the below table at least	<ul style="list-style-type: none"> <li>● Overloading</li> <li>● Dynamic load</li> <li>● Overloading</li> <li>● Too large lifting angle</li> <li>● Overloading</li> <li>● Too large lifting angle</li> </ul>																						
	Check wear or deformation of shackle and screw hole	 <table border="1" data-bbox="646 571 1252 683"> <thead> <tr> <th>(ton)</th> <th>0.5</th> <th>1</th> <th>2</th> <th>3.2</th> <th>6.3</th> </tr> </thead> <tbody> <tr> <td>D1(1mm)</td> <td>27.5</td> <td>32.5</td> <td>36.5</td> <td>45.5</td> <td>51.0</td> </tr> <tr> <td>D2(mm)</td> <td>27.5</td> <td>32.5</td> <td>32.5</td> <td>35.5</td> <td>41.5</td> </tr> <tr> <td>D3(mm)</td> <td>34.5</td> <td>42.5</td> <td>44.5</td> <td>46.5</td> <td>58.5</td> </tr> </tbody> </table>		(ton)	0.5	1	2	3.2	6.3	D1(1mm)	27.5	32.5	36.5	45.5	51.0	D2(mm)	27.5	32.5	32.5	35.5	41.5	D3(mm)	34.5	42.5	44.5
(ton)	0.5	1	2	3.2	6.3																				
D1(1mm)	27.5	32.5	36.5	45.5	51.0																				
D2(mm)	27.5	32.5	32.5	35.5	41.5																				
D3(mm)	34.5	42.5	44.5	46.5	58.5																				
Forcing screw	Measure the jaw opening	Dispose of the clamp when the difference of "A" and "B" exceeds 5%.  Dispose of the clamp when the displacement of the center of the forcing screw and cam exceed 2 mm.	<ul style="list-style-type: none"> <li>● Overloading</li> <li>● Dynamic load</li> <li>● Natural wear from use</li> <li>● Insufficient lubrication</li> <li>● Natural wear from use</li> <li>● Wear from clamping hardened material</li> <li>● Wear from clamping hardened material</li> <li>● Overloading</li> </ul>																						
	Visually check or use color dyes to find cracks	Replace when a crack is found.																							
	Visually check the forcing screw for bends.	Replace when the movement is not smooth, or when the displacement of the screw center exceeds 2mm.																							
	Visually check the forcing screw for wear or damage.	Replace when thread part on circumference exceeds the size in the below table at least.																							
	Visually check and measure the amount of wear.	Replace amount of exceeds	 <p>when the wear 0.5mm..</p>																						
	Visually check or use color dyes to find crack or flow at the teeth bottom.	Replace when the crack or flow is found.	 <p>Broken tooth Crack or flow</p>																						
	Visually check for broken teeth	Replace when the broken tooth is found.																							

Category	Inspecting method	Permissible limit	Causes of the trouble
<b>Spring</b>	<p>Check if cam Returns automatically to original position when moved by hands.</p> <p>Visually check the clearance of spring.</p>	<p>Replace when no repulsive power from deformation and not return to original position.</p> <p>Replace when the spring becomes 5% shorter than its original length or when the clearance between the coils becomes small.</p>	<ul style="list-style-type: none"> <li>● Fatigue from repeated use.</li> </ul>
<b>Circular Cam</b>	<p>Visually check and measure the amount of wear.</p> <p>Visually check or use color dyes to find cracks or flows at the bottom cam teeth.</p> <p>Visually check for broken cam teeth</p> <p>Inspect each section for wear.</p>	<p>Replace when the amount of wear exceeds 0.5mm.</p>  <p>Replace when the crack or flow is found.</p>  <p>Replace when the broken tooth is found.</p> <p>Replace when the clearance between circular cam and cam holder exceeds 0.5mm</p>	<ul style="list-style-type: none"> <li>● Natural wear from use</li> <li>● Wear from clamping hardened material</li> <li>● Overloads</li> <li>● Dynamic load</li> <li>● Wear from clamping hardened material</li> <li>● Overloads</li> <li>● Dynamic load</li> <li>● Wear from clamping hardened material</li> </ul>
<b>Cam-holder</b>	<p>Inspect each section for wear.</p>	<p>Replace when the clearance between the body, cam holder and cam becomes large, and exceeds 0.5 mm.</p>	<ul style="list-style-type: none"> <li>● Natural wear from use</li> <li>● Overloads</li> <li>● Dynamic load</li> </ul>
<b>Stopper pin</b>	<p>Measure each section for wear.</p> <p>Visually check for deformation.</p>	<p>Replace when the clearance of chase hole exceeds 0.2mm.</p> <p>Replace when distortion exceeds 0.2mm.</p> <p>Replace when the circular cam is not smooth.</p>	<ul style="list-style-type: none"> <li>● Natural wear from use</li> <li>● In sufficient lubrication</li> <li>● Overloading</li> </ul>

Category	Inspecting method	Permissible limit	Causes of the trouble												
<b>Steel ball</b>	Inspect each section for wear, or deformation.	Replace when ball diameter of ball exceeds the size in the below at least: <table border="1" data-bbox="651 331 1251 405"> <tr> <td>(Ton)</td> <td>0.5</td> <td>1</td> <td>2</td> <td>3.2</td> <td>6.3</td> </tr> <tr> <td>(mm)</td> <td>4.8</td> <td>6.8</td> <td>6.8</td> <td>6.8</td> <td>7.8</td> </tr> </table>	(Ton)	0.5	1	2	3.2	6.3	(mm)	4.8	6.8	6.8	6.8	7.8	<ul style="list-style-type: none"> <li>● Natural wear from use</li> <li>● In sufficient lubrication</li> </ul>
(Ton)	0.5	1	2	3.2	6.3										
(mm)	4.8	6.8	6.8	6.8	7.8										
<b>Collar</b>	Inspect each section for wear.  Visually check for state of attachment	Replace when the clearance between collar, body, and cam holder become large, and exceeds 0.3mm.  Replace when extreme low head hexagon bolt with hole disconnect or loosen	<ul style="list-style-type: none"> <li>● Natural wear from use</li> <li>● Dynamic load</li> <li>● Over loading</li> <li>● Lack of oil filling</li> </ul>												
<b>Disc spring</b>	Check proper repulsive power when cam pushed	Replace normal repulsive power lost from deformation and lack of movement of circular cam	<ul style="list-style-type: none"> <li>● Aging due to reputation</li> </ul>												
<b>Guide pin</b>	Inspect each section for wear and distortion.  Visually check and measure the forcing screw for bends, or deformation.	Replace when the clearance of chase hole exceeds 0.1mm. Replace when distortion exceeds 0.1mm.  Replace when the clearance of the forcing screw for bends, or deformation exceeds 0.1mm.	<ul style="list-style-type: none"> <li>● Natural wear from use</li> <li>● Dynamic load</li> <li>● Over loading</li> <li>● Lack of oil filling</li> </ul>												
<b>Sleeve</b>	Inspect for blemish, or crack by eye check, or by color liquid/spray check.	Replace when inspected by color liquid/spray check.  Replace when backlash exceeds 2 mm between screws and sleeves.  Replace when Hex. Socket head disconnects or loosen.	<ul style="list-style-type: none"> <li>● Natural wear from use</li> <li>● Dynamic load</li> <li>● Over loading</li> <li>● Lack of oil filing</li> </ul>												