

# **SAFETY LIFTING CLAMPS**



## **INSTRUCTION FOR OPERATION**

### **“SUPER” BRAND LIFTING CLAMPS**

#### **Screw Cam Clamp** (Universal Shackle type)

**SUC**

**Operation and Maintenance Manual  
& Inspection Standards**

** SUPERTOOL**

OSAKA, JAPAN

# Screw Cam Clamp

(Universal Shackle type)

## SUC

### Applications

Best suited for lifting up, lateral pulling or turning-over steel plates and beams for the industries as in civil engineering, construction, ship building, steel and can manufacturing industries. Also best suited for lifting down chain block or hoist as a jig or pulling steel materials.

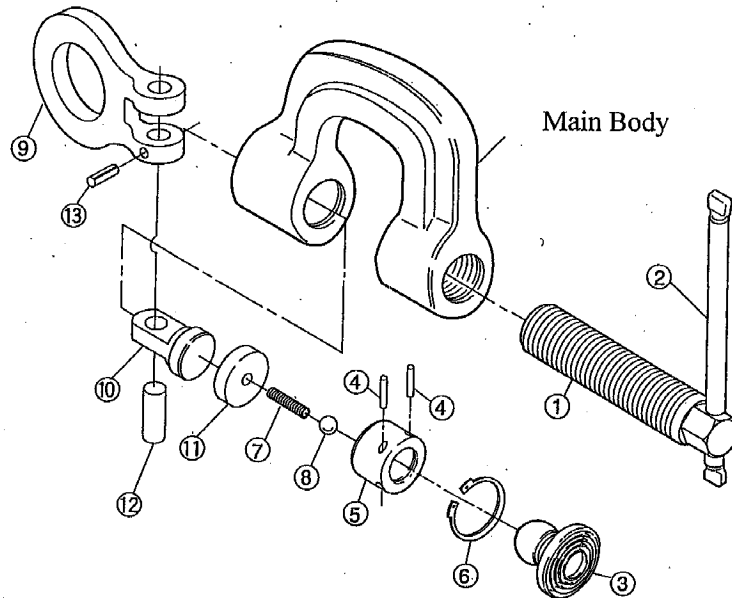
### Features

1. Stable angle lifting and wide range of pulling operations are possible because it makes 360° free rotation in lifting or pulling direction.
2. Reliable grip is attained by screw and round cam.
3. Gripping pressure becomes stronger with tilting of round cam in proportion to degree of the loading force in lateral direction.
4. Round cam is designed to always return to the original position by spring mechanism.
5. Robust with superb durability. Main body is made of die-forged special alloy with the optimum heat treatment.

### Specifications

Part No.	Rated Capacity (ton)	Clamping Range	Net weight (kg)
SUC 0.5	0.5	0~25	2.0
SUC 1	1	0~30	2.8
SUC 1.6	1.6	0~30	3.5
SUC 3.2	3.2	0~40	5.1

Part name



No.	Part name		Part Code (Set)	Quantity (pc)
	Individual part	Set part		
1	Screw	Screw	SUCR	1
2	Handle			1
3	Round Cam	Cam	SUT	2
4	Stopper Pin			1
5	Cam Receiver			1
6	Stopper Ring			1
7	Spring			1
8	Steel Ball			1
9	Shackle			Shackle
10	Shaft	1		
11	Plate	1		
12	Connection Pin	1		
13	Spring Pin	1		

Remarks)

- 1) When ordering parts, add the rated capacity after the part code. (ex. SUT3.2 for SUC3.2)
- 2) Lubricate periodically at the cam receiver and its contacting portions of main body.

## INSTRUCTION FOR USE

Keep these instructions within easy access of operators.  
It is important that operators understand these warnings and instructions before using.

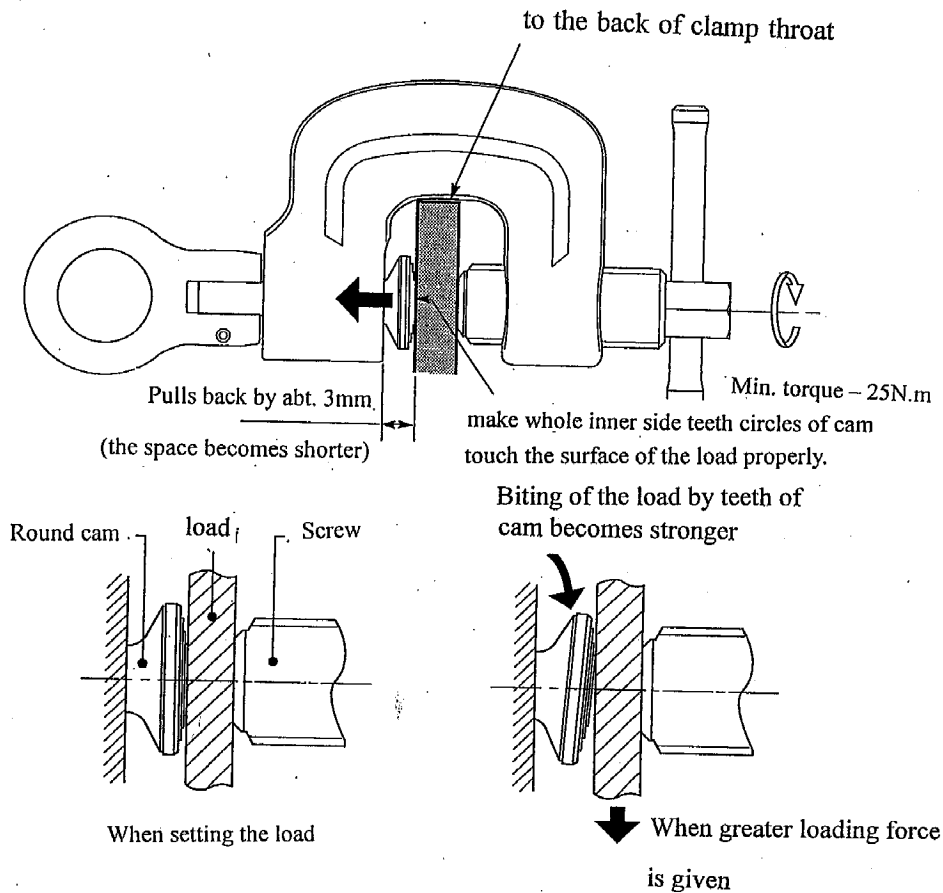
### WARNINGS

- Select proper size clamp for the job. Determine the weight of the plate, H beam, steel structure or drum 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!

# Handling

## 1. Operation Methods

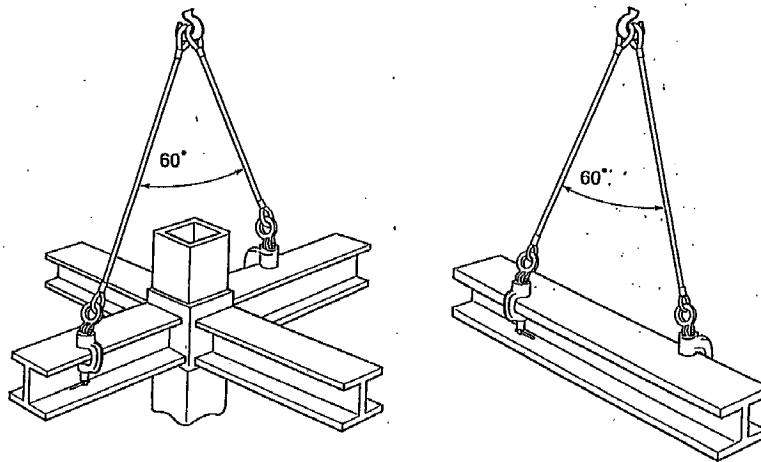
- ① Screw closes by turning the handle clockwise and opens by turning it counter-clockwise.
- ② Round cam pulls back by 3mm when screw is tightened, and so, make sure to continue tightening till screwing action stops. Make the torque minimum 25N.m (abt.250kgf.cm)
- ③ When setting the clamp, the load must be fully engaged to the back of clamp throat and also make whole inner side teeth circles of cam touch the surface of the load properly.
- ④ During operation as lifting, pay particular attention to avoid loosening of screw by unexpected interfering force by wire rope or any other objects nearby.



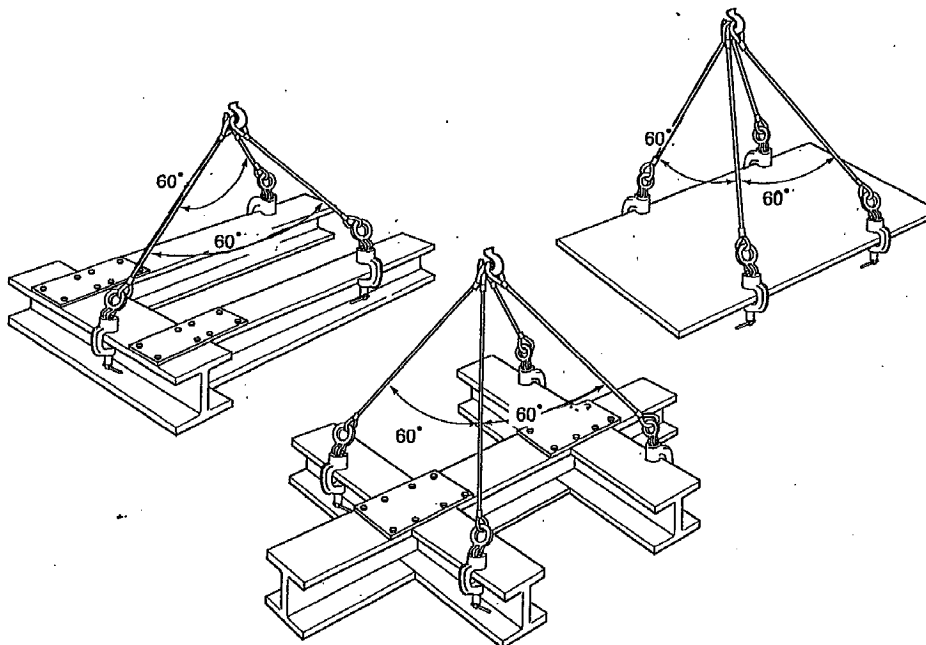
## 2. Operation patterns

### ① Lifting operation (Be sure to apply at least 2 -point lifting)

- (1) Make the lifting angle within  $60^\circ$  when 2-point lifting is applied.



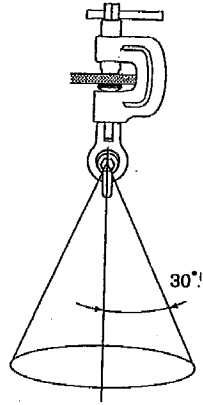
- (2) Apply at least 3-point lifting when lifting the load whose center of gravity is hard to identify and make the load stable by adjusting the clamp position and the length of wire rope. Make the lifting angle of adjacent ropes within  $60^\circ$ . (Make sure to apply 4-point lifting for lateral lifting of a plate shape load.)



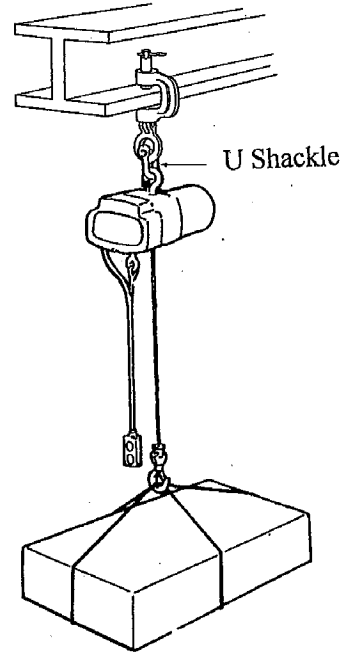
\*Keep the angle within the above designation respectively.

② For hanging down

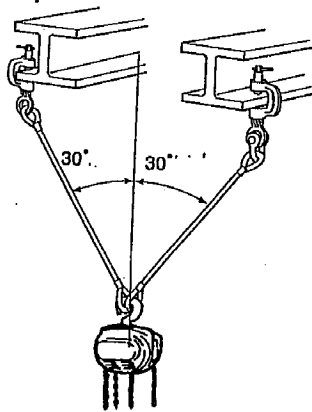
- (1) When hanging down hoist and chain block, keep the hanging angle within 30°.



- (2) When hanging hoist and chain block, use such attachment as U shackle to the lifting ring for the connection.



- (3) When hanging from two beams

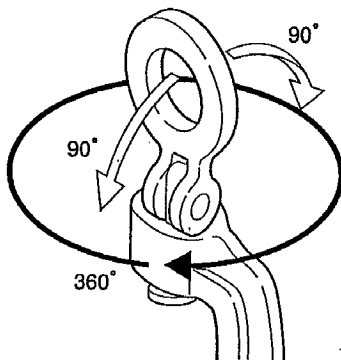


\* When hoist or chain block is suspended by the use of clamp for a long period, go through periodical checking and apply further tightening of the clamp.

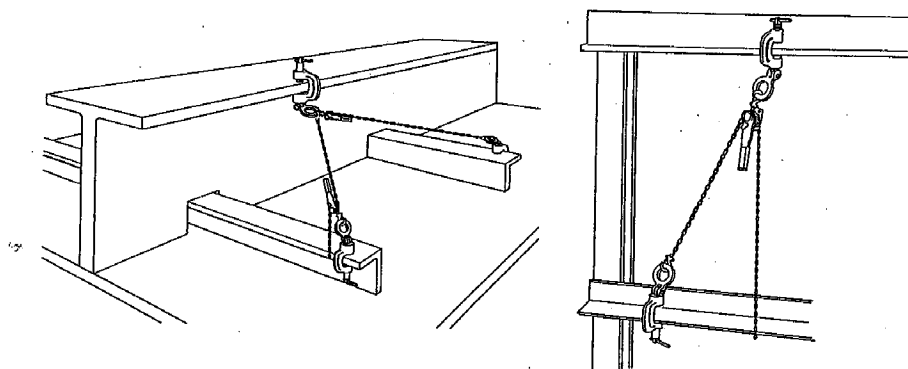
\*Keep the angle within the above designation respectively.

③ Can be used for such applications as positioning of the welding of steel materials or pulling them. (Pay special attention not to cause overload)

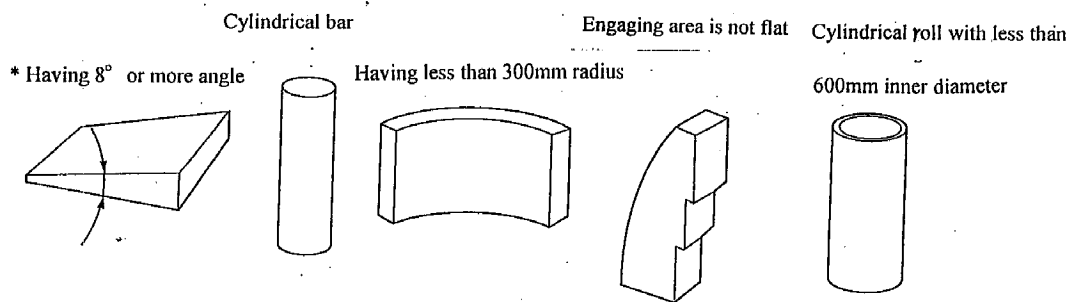
(1) Make the pulling direction of the shackle within the range shown below.



(2) Examples of pulling operation



④ Do not use the clamp for the following shapes of load.



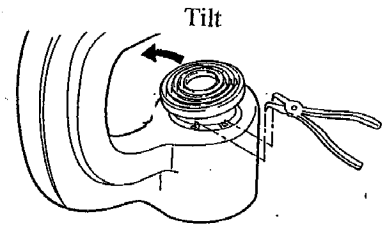
\*Clamp should not be used if the gripping portion of a load is tapered towards the lifting direction even in case the tapering is less than 8° .



### 3. Disassembling and assembling

#### ① Disassembling procedure

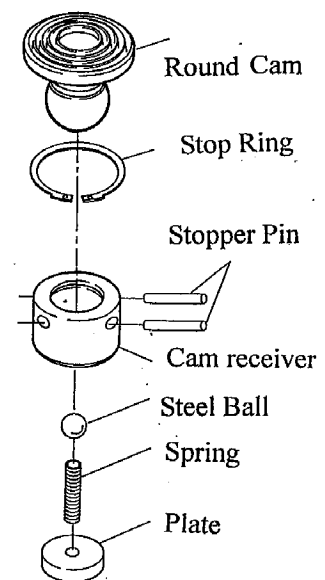
- 1) Turn the screw counter clockwise and remove it from the body. (Male screw and handle cannot be disassembled.)
- 2) Tilt round cam as shown at the right and remove stop ring by snap ring plier for hole and detach cam receiver, steel ball, spring and plate. (Fig. 1)
- 3) Pull out two stopper pins from cam receiver and remove round shape cam and stopper ring. (Fig.2)
- 4) Take out spring pin at shackle by pin punch or such tool and remove connecting pin and shaft from the body.



(Fig.1)

#### ② Assembling procedure

- 1) Insert shaft into cam receiver at the body, align the holes of shackle and shaft, insert connecting pin, and put and hammer down spring pin into the aligned hole. (Reverse procedure of Disassembly 4 )
- 2) Put on stop ring to the neck portion of round cam temporarily.
- 3) Put ball shape portion of round cam into cam receiver and fix them with two stopper pins.
- 4) Install plate to the hole of the body for cam and insert spring and steel ball into the hole of the plate.
- 5) Install round cam and cam receiver, which have been assembled in 3), at the hole of the main body. At this time, set the steel ball to be inserted into the hole at the bottom part of cam receiver.
- 6) Fix the stopper ring of 2) at the groove of the main body by snap ring plier for the hole.
- 7) Insert screw into the hole of main body.



(Fig.2)



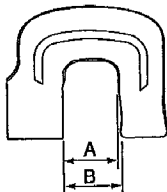
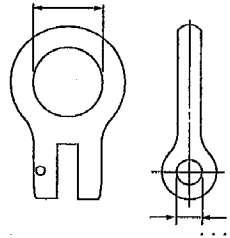
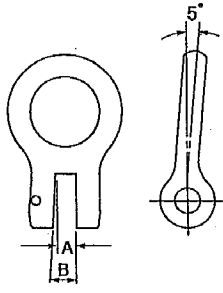
## Caution


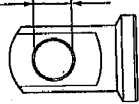
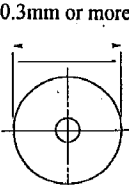
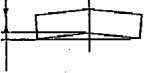
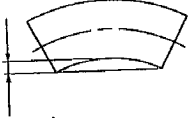
- ◆ Use within the rated capacity.
- ◆ Use within the clamp range.
- ◆ Do not use for other than steel material load.
- ◆ Do not use for high hardness material load (30HRC or higher).
- ◆ Do not use for load material having more than specified angle.
- ◆ Do not apply shock to the load or clamp.
- ◆ Multiple load lifting is not allowed.
- ◆ Before use, be sure to perform check/inspection on round cam, clogging at screw teeth, abrasion or any other damage or defects at any part.
- ◆ Do not make alteration and modification. Heating or processing may lead to substantial degradation (strength).

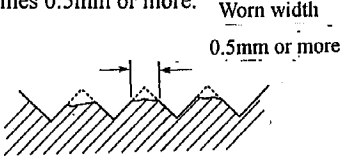
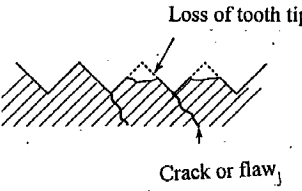
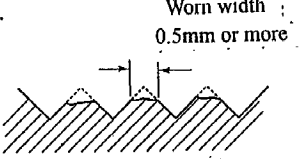
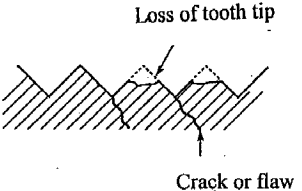
## Daily Inspection

For safety and efficient operation, perform daily inspection and maintenance.

1. For any damage as flaw or crack at main body, round cam or shackle ring.
2. For the condition of each part and lubrication.
3. **For any damage or attachment of clogging substance at the teeth at round shape cam or screw.**
4. Refer to Checking Standard for other than the above.

Section	Inspection method	Permissible Limit	Causes of degradation/defect	Action
Main Body	<ul style="list-style-type: none"> <li>● Flaw or crack (by visual or color check)</li> <li>● Enlargement of jaw aperture (by measuring device)</li> </ul>	<ul style="list-style-type: none"> <li>● When visually found.</li> <li>● The difference of 5mm (5%) or more between A and B when the depth is 100mm.</li> </ul>  <ul style="list-style-type: none"> <li>● When 2mm or more displacement of the center of the screw and cam is found.</li> </ul>	<ul style="list-style-type: none"> <li>● Overload</li> <li>● Sudden loading impact</li> <li>● Overload</li> <li>● Excessive hoisting angle</li> <li>● Overload</li> <li>● Excessive hoisting angle</li> </ul>	Dispose
Shackle	<ul style="list-style-type: none"> <li>● Abrasion or deformation at ring or pin hole (by visual check or measurement device)</li> <li>● Any bending or deformation (by visual check or measurement device)</li> </ul>	<ul style="list-style-type: none"> <li>● When 0.5mm or more deformation is found from the standard size.</li> </ul> <p>0.5mm or more</p>  <p>0.5mm or more</p> <ul style="list-style-type: none"> <li>● When 0.5mm or more difference between A and B is found.</li> <li>● When 5° or more distortion to the center line of main body is found.</li> </ul> 	<ul style="list-style-type: none"> <li>● Overload</li> <li>● Sudden loading impact</li> <li>● Insufficient lubrication</li> <li>● Overload</li> <li>● Excessive hoisting angle</li> </ul>	Replace

Section	Inspection method	Permissible Limit	Causes of degradation/defect	Action
Shaft	<ul style="list-style-type: none"> <li>● Abrasion (by measuring device)</li> <li>● Flaw or crack (by visual or color check)</li> <li>● Any bending or deformation (by visual check or measurement device)</li> <li>● Abrasion at pin hole (by measuring device)</li> </ul>	<ul style="list-style-type: none"> <li>● When 0.5mm or more wear from the standard size is found.</li> <li>● When visually found</li> <li>● When 0.5mm or more bending or deformation is found or when rotation is not smooth</li> </ul>  <p style="text-align: center;">0.5mm or more</p> <ul style="list-style-type: none"> <li>● When 0.5mm or more wear from the standard size is found.</li> </ul>  <p style="text-align: center;">0.5mm or more</p>	<ul style="list-style-type: none"> <li>● Natural abrasion</li> <li>● Insufficient lubrication</li> <li>● Overload</li> <li>● Sudden loading impact</li> <li>● Excessive hoisting angle</li> <li>● Overload</li> <li>● Sudden loading impact</li> <li>● Excessive hoisting angle</li> <li>● Repetition fatigue</li> <li>● Natural abrasion</li> <li>● Insufficient lubrication</li> <li>● Overload</li> </ul>	Replace
Plate	<ul style="list-style-type: none"> <li>● Abrasion at outside diameter (by measuring device)</li> <li>● Any bending or deformation (by visual check or measurement device)</li> </ul>	<ul style="list-style-type: none"> <li>● When 0.3mm or more wear from the standard size is found.</li> </ul>  <p style="text-align: center;">0.3mm or more</p>  <p style="text-align: center;">0.3mm or more</p>	<ul style="list-style-type: none"> <li>● Natural abrasion</li> <li>● Insufficient lubrication</li> <li>● Overload</li> <li>● Sudden loading impact</li> </ul>	Replace
Connection Pin	<ul style="list-style-type: none"> <li>● Abrasion (by measuring device)</li> <li>● Any bending or deformation (by visual check or measurement device)</li> </ul>	<ul style="list-style-type: none"> <li>● When 0.5mm or more wear from the standard size is found.</li> <li>● When 0.5mm or more bending or deformation is found.</li> </ul>  <p style="text-align: center;">0.5mm or more</p>	<ul style="list-style-type: none"> <li>● Natural abrasion</li> <li>● Insufficient lubrication</li> <li>● Overload</li> <li>● Sudden loading impact</li> </ul>	Replace

Section	Inspection method	Permissible Limit	Causes of degradation/defect	Action
Screw	<ul style="list-style-type: none"> <li>● Flaw or crack (by visual or color check)</li> <li>● Bending at screwing part (by visual check)</li> <li>● Abrasion or scratch at screw thread (by visual check)</li> <li>● Abrasion at the tip (by visual check or measurement device)</li> <li>● Abrasion at tip of teeth (by visual check)</li> </ul>	<ul style="list-style-type: none"> <li>● When found by color check etc.</li> <li>● When rotation is not smooth or displacement of the center exceeds 2mm.</li> <li>● Displacement of the center with more than 2mm wobbling.</li> <li>● When worn width at tip of teeth becomes 0.5mm or more. </li> <li>● When a tooth is missing or flaw at teeth is found. </li> </ul>	<ul style="list-style-type: none"> <li>● Overload</li> <li>● Excessive impact</li> <li>● Overload</li> <li>● Excessive impact</li> <li>● Natural abrasion</li> <li>● Insufficient lubrication</li> <li>● Natural abrasion</li> <li>● Clamping high hardness material</li> <li>● Clamping high hardness material</li> <li>● Overload</li> </ul>	Replace
Spring	<ul style="list-style-type: none"> <li>● Adequate repulsion exist when cam is pressed down</li> <li>● When no pressure is applied, check if adjoining helical layers are not attached each other (by visual check)</li> </ul>	<ul style="list-style-type: none"> <li>● When cam movement becomes not smooth by the loss of normal repulsion due to deformation or other causes.</li> <li>● When helical layer spaces become small and total length becomes short by 5%.</li> </ul>	<ul style="list-style-type: none"> <li>● Repetition fatigue</li> </ul>	Replace
Round Cam	<ul style="list-style-type: none"> <li>● Abrasion at tip of teeth (by visual check or measurement device)</li> <li>● Any crack or flaw between teeth (by visual or color check)</li> <li>● Any lost portion of teeth (by visual check)</li> </ul>	<ul style="list-style-type: none"> <li>● When 0.5mm or more worn width is found. </li> <li>● When loss, crack or flaw is found at teeth. </li> </ul>	<ul style="list-style-type: none"> <li>● Natural abrasion</li> <li>● Clamping high hardness material</li> <li>● Overload</li> <li>● Sudden loading impact</li> <li>● Clamping high hardness material</li> <li>● Overload</li> <li>● Sudden loading impact</li> <li>● Clamping high hardness material</li> </ul>	Replace

Section	Inspection method	Permissible Limit	Causes of degradation/defect	Action
Cam receiver	<ul style="list-style-type: none"> <li>● Abrasion at any part (by measuring device)</li> </ul>	<ul style="list-style-type: none"> <li>● When the idle space becomes large between main body and cam receiver/cam and 0.5mm or more wobbling is identified.</li> </ul>	<ul style="list-style-type: none"> <li>● Natural abrasion</li> <li>● Overload</li> <li>● Sudden loading impact</li> </ul>	Replace (together with cam)
Stop Ring	<ul style="list-style-type: none"> <li>● Distortion or deformation (by visual check or measurement device)</li> <li>● Sufficient repulsive force is there when it is pressed down</li> </ul>	<ul style="list-style-type: none"> <li>● When 0.5mm or more deformation from the standard size is identified.</li> <li>● When normal repulsion is lost due to deformation or other causes and wobbling is identified when installed at the main body.</li> </ul>	<ul style="list-style-type: none"> <li>● Natural abrasion</li> <li>● Overload</li> </ul>	Replace
Stopper Pin	<ul style="list-style-type: none"> <li>● Abrasion at any part (by measuring device)</li> <li>● Deformation (by visual or measurement device)</li> </ul>	<ul style="list-style-type: none"> <li>● When wobbling is identified with 0.3mm or more idle space when it is set at cam receiver.</li> <li>● When 0.3mm or more deformation is found from the standard size.</li> </ul>	<ul style="list-style-type: none"> <li>● Natural abrasion</li> <li>● Insufficient lubrication</li> <li>● Overload</li> </ul>	Replace
Steel Ball	<ul style="list-style-type: none"> <li>● Abrasion at any part (by measuring device)</li> <li>● Deformation (by visual check or measurement device)</li> </ul>	<ul style="list-style-type: none"> <li>● When 0.3mm or more deformation is found from the standard size.</li> </ul>	<ul style="list-style-type: none"> <li>● Natural abrasion</li> <li>● Insufficient lubrication</li> </ul>	Replace

Remark) Color check – Locating or identifying crack or flaw by applying paint.