

- This manual should be surely handed over to the users.
- The users of the chain hoist should thoroughly read this manual.

(NO.3)

MANUALLY OPERATED CHAIN HOIST MODEL C21 OPERATION MANUAL



- Thank you for purchase of our product.
- It is quite important that you carefully read this operation manual before using the chain hoist.
- This manual should be kept close to the chain hoist, as the maintenance and inspection works absolutely require it.
- Please consult distributors of our products about the inspection requiring dismantling and assembling of the unit.

I) SAFE OPERATING PRACTICES

Improper operation of the chain hoist will possibly cause a dangerous situation such as falling of lifted loads and so on. Carefully read this manual for proper operation before setting-up, installation, operation, maintenance and inspection of the chain hoist.

Do not begin to operate it before you have got familiar with its knowledge, safety information and all the special cares.

The cautions in handling the unit are classified into two levels in this manual;

	WARNING	This symbol is used to indicate that a death or serious injuries will be caused in all probability to the user or persons around when the products are improperly used.
	CAUTION	This symbol is used to indicate that damage may be caused to the user or persons around or only material loss will occur when the products are improperly used.

Even the matters indicated "△ Caution" may bring a serious result depending on the situation. Strictly observe both the notices as they contain very important matters.

Examples of the symbol:

- △-mark indicates that there are warning / cautious matters. In a sketch a concrete warning ("caution for falling of load" in case of the symbol on the left) is described.
- ⊘-mark indicates actions to be prohibited. In a sketch or nearby a concrete warning is described.
- ⓘ-mark indicates that any action will be required or directed. In a sketch a concrete warning ("general duties for operator" in the case of the symbol on the left) is described.
- * The manual must be kept in place where the operator can read it whenever he needs.

1. General

	WARNING	<ul style="list-style-type: none"> ● The unit should be operated only by those who are familiar with the manual and contents of the instructing label. ● Do not lift a load which exceed the rated load. ● Do not stay under a suspended load and do not move a load over persons. ● Do not use a chain hoist which was damaged or causes abnormal sound and/or vibration. ● Do not use a chain hoist with twisted, kinked, damaged, severely worn, deformed, or elongated load chains. ● Never make modifications to the chain hoist and its accessories. 	
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2. Installation and Setting-up

	WARNING	<ul style="list-style-type: none"> ● Inspection before operation and periodic inspection must be by all means carried out. ● The installation work should be performed only by the specialized contractor or experienced technician. ● The chain hoist should not be installed in places deviated from the provision where it is, for example, exposed to rain, water or other unsuitable chemicals. 	
	CAUTION	<ul style="list-style-type: none"> ● Attach a stopper to the ends of the traverse and travel rails. ● Make sure that a location on which the chain hoist is installed has a sufficient strength. 	
	CAUTION	<ul style="list-style-type: none"> ● Suspend the chain hoist in a manner that it can freely swing about. 	

3. Operation and Handling

	WARNING	<ul style="list-style-type: none"> ● Do not get on a suspended load. ● Do not leave a suspended load unattended. ● Do not allow your attention to be diverted from operating the chain hoist. ● Do not use the chain hoist for the oblique pulling. ● *First move the chain hoist to right above a load and then lift it. ● Do not use the chain hoist for the earth lifting (for example, hooking fixed objects such as houses or structures). ● Do not carry out turnover of a suspended load. ● *Turnover should be done by means of a device specialized in that purpose or only by a skilled person. ● Make sure before operation that the hand chain properly functions. Do not operate the chain hoist when the hand chain is in disorder. ● Make sure before operation that the brake properly functions. Do not operate the chain hoist when the brake is in disorder. ● Do not apply the electric welding on a suspended load. ● Do not allow the load chain to be used as a ground (earth) for the welding machine. ● Do not allow the load chain to be touched by a live welding electrode. ● Do not operate the chain hoist in such a manner that a load and/or its hand chain is suspended from any structure. 	
	CAUTION	<ul style="list-style-type: none"> ● Do not use the chain hoist with a damaged safety latch of the hook. ● Do not have the chain hoist body or trolley hit against stoppers or other structures. ● Do not use the chain hoist with the nameplate and label attached to the body removed or left unclear. ● Operate the chain hoist only by means of a manual pulling force (of the operator). ● Do not throw away or drag the chain hoist. ● Stop lifting once when the load chain becomes tense to check safety. 	
	CAUTION	<ul style="list-style-type: none"> ● In lifting a load with two chain hoists, select a chain hoist of which rated load exceeds the load to be lifted. ● Always keep the hoist body and the load chain clean so that dust, sands and the like will not be deposited on them. ● Make sure that the range of lift of the chain hoist is sufficient for the intended work. ● Always lubricate the load chain before use. ● Pay attention that the load chain should not be over-lowered. 	

4. Maintenance, Inspection and Modification

	WARNING	<ul style="list-style-type: none"> ● Never use parts other than genuine ones made by us. ● Never do shortening or lengthening of the load chain. ● Do not use load chains made by any other manufacturers than us. ● *Our load chain is different from other manufactures' chains in terms of strength, hardness, elongation and dimensions. ● You are therefore strictly requested not to apply any other manufactures' chains to our chain hoist. ● Only specialists authorized by the employer may carry out the maintenance, inspection or repair. ● Carry out the maintenance, inspection or repair with the chain hoist unloaded (e.g. without loads). ● When any disorder is found in the maintenance or inspection, immediately make repair before re-operating the chain hoist. 	
	CAUTION	<ul style="list-style-type: none"> ● Whenever carrying out the maintenance, inspection or repair, prepare a warning indication of "Under working" ("Under Inspection", etc.). 	

Notice:
● Inspections requiring dismantling and assembling of the unit should be carried out by dealers of our products.

II) INSTALLATION AND OPERATION

1. Installation

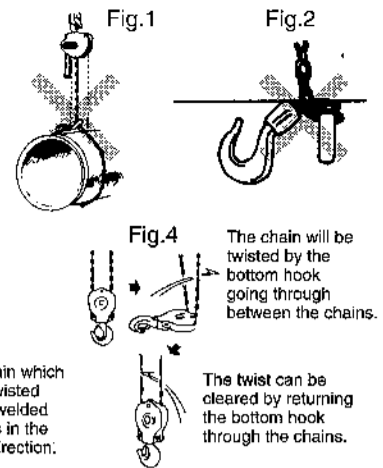
	WARNING	<ul style="list-style-type: none"> ● The unit should not be operated by persons who have not fully understood this manual, instructions or plates on the unit. ● The support (structure such as buildings) on which the hoist body is installed is to bear loads more than 4 times the rated load. ● *In case that the chain hoist is suspended from a crane as an auxiliary device, its safety factor should be 5. ● *It is very dangerous to use a support of which strength is not sufficient, as it may be damaged due to the load. 	
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PROPER HANDLING AND CAUTIONS

Slings method

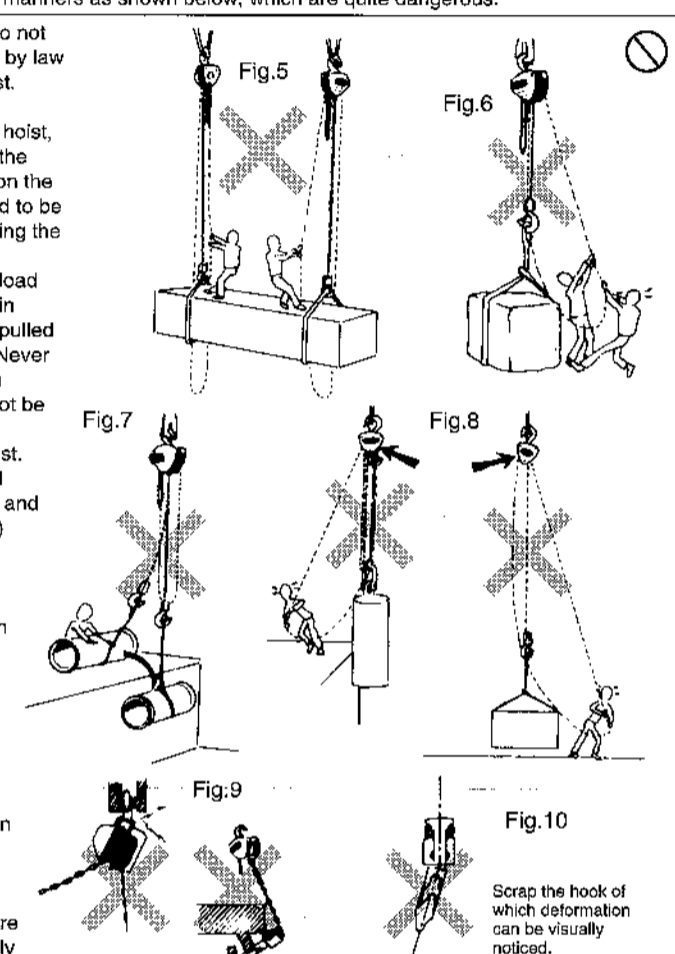
	WARNING	<ul style="list-style-type: none"> ● Inspect all the tools to be used on the day before use. ● Wrong slinging may cause quite dangerous situations such as fallen loads etc. 	
*Avoid slinging methods as shown below, with are very dangerous.			
1) How to apply a load to the hook			
	*Correct slinging: the load coincides with the axle of the hook.		*A supporting structure or the sling is set on an improper point of the hook
	*Too wide slinging angle, it should be within 60 degrees.		*The safety latch does not properly function.
	*Only the tip of hook cannot bear a load.		

- Never wind a load chain directly around a load regardless of its weight. It is quite dangerous, since the load chain may be broken. (Fig.1)
It is dangerous to wind the load chain around the hook of a chassis etc., because the strength of the chain will be reduced to 1/3 to 1/5 of the normal value. (Fig.2)
- The load chain twisted should not be loaded, as the bearing capacity of the chain will be reduced in a twisted state. Be sure to bring the load chain into straight state before applying a load. (Fig.3)
In a chain hoist with more than 2 falls, it will happen that the chain is twisted by the bottom hook which goes through between the chains and is turned. In this case, the twist should be cleared by returning the bottom hook through the chains. (Fig.4)
- Do not suspend the top hook on a single wire rope. The hook cover may be worn out due to the movement of the wire rope being detwisted.



CAUTION DURING OPERATION

- WARNING**
 - Never lift a load beyond the rated load of the unit (over-loading).
 - *Operating the large crane in conditions of overloading or earth-lifting will cause a quite dangerous situation such as damage of the chain hoist and the like.
 - Do not perform over-lifting and over-lowering.
 - Do not give a shock to the chain hoist.
 - Do not get on a load to be lifted and do not stay under a load lifted.
 - Do not use a chain hoist which is not in order.
 - *Do not use chain hoist in the incorrect manners as shown below, which are quite dangerous.
- Do not get on a load to be lifted and do not stay under a load lifted. It is prohibited by law to get on a load lifted by the chain hoist. (Fig.5)
- Do not apply an overload to the chain hoist, that is, do not apply a load exceeding the number of tons (rated load) indicated on the nameplate. The chain hoist is designed to be capable of lifting the rated load by pulling the hand chain with forces 25 to 40 kgs. It means that the load exceed the rated load (over-loaded) or the chain hoist is not in order, when the hand chain has to be pulled with force more than the said values. Never continue to use the chain hoist in such conditions where the hand chain cannot be easily pulled. (Fig.6)
- Do not give an impact to the chain hoist. Severe accident may happen, if a load suddenly falls regardless of the height and gives a shock to the chain hoist. (Fig.7)
- Do not perform over-winding, that is, over-lifting or over-lowering. Check whether the chain hoist is overwound or not when the hand chain cannot be easily pulled during operation. (Fig.8)
- Do not apply a bending force to the hook of the chain hoist. Such handling ways as shown in Fig.9 are very dangerous and should be absolutely avoided. The hook clearly deformed as shown in Fig.10 should be scrapped and exchanged with a new and genuine one. Fig.10
- Carry out the routine inspection before use of the chain hoist. Refer to the daily inspection and Fig.11 in the next page.
- Notice about the manipulation of the hand chain: it should be avoided that the hand chain will be abruptly jammed when it is manipulated with or without a load or a load is lifted by means of another power. Otherwise, the hand chain will be partially deformed or damaged, or the pinion shaft will be eventually broken. In an extreme case, such a dangerous accident as falling down of the suspended load can happen.



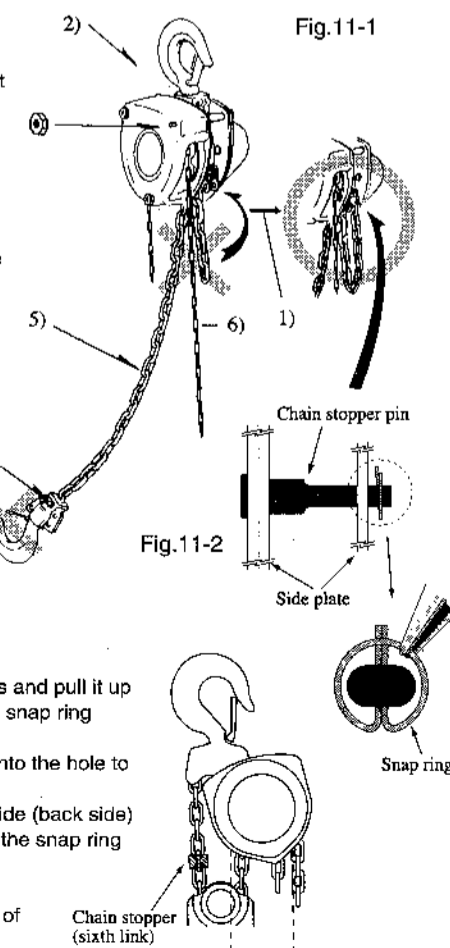
III) MAINTENANCE AND INSPECTION

DAILY INSPECTION

	CAUTION	<ul style="list-style-type: none"> ● For daily operation, be sure to carry out the following check prior to operation. ● *In case of any abnormality, stop operating the hoisting unit and take proper counter-measure by a specialist possessing enough knowledge on the unit or by a dealer of our products. ● *Do not make continuous running under abnormal condition as it is very dangerous and might lead to a severe accident. 	
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- Check if the end of the load chain without hook (chain stopper pin) is fixed correctly. Check also if the chain stopper pin is not deformed or rotates smoothly.
- Are firm connections made between the top hook and the hoist body, the body and the load chain, and the load chain and the bottom hook respectively?
- Are visually no deformations of the top and bottom hooks noticed?
- Are no parts missing? Are no severely deformed portions noticed?
- Is the load chain well lubricated? Does it show any remarkable damages or deformations?
- Check whether the hand chain runs easily and smoothly on operation and smooth ratchet sound is heard during lifting.

- *Immediately stop operating the chain hoist and make repair of it, when such abnormalities as mentioned above (item 1 through 6) are found.
- Inspection of chain stopper pin**
Check if the chain stopper pin (Fig.11-1(1), on the reverse page) is fitted with a genuine snap ring (Fig.11-2). Split pin and the like other than a genuine snap ring should not be used.
*A split pin cannot guarantee smooth rotation of the chain stopper pin and thus the load chain would be tangled at the chain stopper pin. Since this is very dangerous, use only a genuine snap ring of our make.
- How to dismantle the snap ring**
As the Fig.11-2 shows, hold the edge of the snap ring by pincers and pull it up forward (until the ring leaves the pin head). By pulling down, the snap ring comes off the pin.
*When assembling the snap ring, insert the top of the two axes into the hole to push them in.
Note) The two axes of the snap ring should be on the reverse side (back side) and the ring on the front side. Do not turn the other way. When the snap ring is lost, do not use any substitution but only genuine one.
- Chain stopper (used only for 3t type chain hoist)**
Check if the chain stopper is fitted to the sixth link from the arm of the chain hoist for 3t. Check also if any screw is not loose.



PERIODIC INSPECTION

In case of troubles and/or any abnormality stop operating the hoisting unit and take proper counter-measures by a specialist possessing enough knowledge on the unit or by a dealer of our products. It may happen that the load chain and the hooks fall in a dangerous state even if they show no remarkable changes in their function. It is therefore indispensable to make a periodic measuring check based on "the Methods for Maintenance and Inspection" as stated below. The periodic inspection should be normally made once a month. Exchange damaged or deformed parts with new ones.

IV) THE METHODS FOR MAINTENANCE AND INSPECTION

WARNING

- Do not use parts and the chain hoist over the limit of use.
- If any wearing parts are found in excess of the standard limit of use as stated below in carrying out the daily and periodic voluntary inspections, they should be replaced for sure.
- It is very dangerous to use parts over the standard limit of use.
- When replacing load chains, be sure to use the load chain manufactured by us. Load chains manufactured by any others are not applicable.

1. Checking the load chain and its lifetime

Table 1 Limitation of the deformed load chain for use

Rated load-Number of falls	Link diameter-P×5mm (new chain)	Limitation of P×5mm for use
0.5t-1	φ 4.3- 60.5	61.7
1 t-1	φ 5.6- 85.7	87.4
1.5t-1	φ 6.5- 95.7	97.6
2 t-1	φ 7.5-105.4	107.5
3 t-2	φ 6.5- 95.7	97.6
5 t-3	φ 7.5-105.4	107.5

The load chain begins to be broken from even one piece of weak chain links and thus it is important to carefully inspect the whole chain.

For checking the elongation, measure the inner length of 5 links with a vernier caliper as the above sketch shows. It is normally sufficient to check the links in a distance of approx. every 50cm but check them by making the measuring distance shorter when the elongation of the chain is close to the limitation for use stated in Table 1 so that none of them will exceed the limitation for use. Exchange the load chain with a new one which is found by visual check to be clearly influenced by higher temperatures or to be clearly deformed. Furthermore, do not weld a load chain to the original one by users themselves.

2. Checking the hook and its lifetime

- When the dimension shown by "A" in the sketch has exceeded the limitation as specified in Table 2, the hook should be replaced with a new genuine one. It is very dangerous to use such a deformed hook by making repair by heating and/or welding.
- Disassemble the chain stop bolt on the bottom hook and replace with a new one when it shows wear, bend or cracks.
- Do not forget to set the split pin on re-assembling the stop bolt.

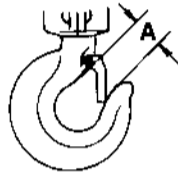


Table 2 Limitation of deformed hook for use

Rated load(t)-Number of falls	0.5t-1	1t-1	1.5t-1	2t-1	3t-2	5t-3
value A(mm) on new hook	30	34.8	35	43	43	58
Limit value A' (mm)	31.5	36.5	36.8	45.2	45.2	60.9

V) CRITERIA FOR USING AND CHECKING CHAIN HOISTS(BASED ON JIS B 8802)

WARNING

(1.Criteria for use)
The following shall be observed in using the chain hoist.

- Make sure that the class of the chain hoist is fit for conditions of its use.
- The chain hoist should not be used to lift a load exceeding the rated load except for testing purpose.
- For our chain hoists, never use load chains made by any other manufacturers than us.
- Do not use the chain hoist of which range of lift is not sufficient.
- Do not use a bottom hook which is not equipped with a safety latch or of which latch has no safety effect.
- Do not use chain block on which chain stoppers are missing.
- Do not wind the load chain directly around a load.
- Do not hang a load on the tip of the hook.
- Do not quickly pull the hand chain on lifting and lowering operation.
- Do not perform over-lifting and over-lowering.
- Do not walk below a suspended load.
- Avoid to pull a load in oblique direction.
- Avoid an operation of so-called earth lifting.
- Before operation, check the load chain for twisting or tangling. The chain hoist can be used only after such twisting and tangling are corrected.
- When the chain hoist is used in special conditions such as lower or higher temperatures, or corrosive atmosphere, etc., consult us before use.
- The chain hoist should not be modified by the users. If any modification is required, it should be done by us.
- Do not leave the chain hoist for many hours with a load suspended.

CAUTION

(1.Criteria for use)

- Make a routine inspection before use.
- Immediately stop operating the chain hoist when an abnormally big pulling force for the hand chain is required.
- Do not drop the chain hoist from a higher place.
- Apply a lubricant to the load chain before use.
- Use the chain hoist, applying lubricants to its gears, bearings and points which are liable to wear.
- The chain hoist should be applied with antirust to be kept for a long period.
- Consult us whenever special usage of the chain hoist is required.

2. Criteria for check

- Use the chain hoist by checking it daily(1) and periodically(2).
- Refer to Table 1(3) which gives check items, check methods and check criteria to be used in the daily check. However, items other than those specified should be also checked, when the chain hoist is frequently used, or in special cases.
- The periodic inspection should be made in accordance with the table 1(3).
- When the chain hoist is repaired, check it on periodic check items given in Table 1(3) after its repair, and make sure that it works in a normal state. Use spare parts only made by us.

- Notes
(1)Refer to checking before use.
(2)Periodic check is usually made at intervals of six months or one year depending on the frequency of use.
(3)Check the items with the mark "O" in Table 1.

Table 1 Criteria for check

Type of check	Check items	Check method	WARNING Check criteria (devices and parts out of the following criteria should be replaced or disposed as waste.)
Daily check	Marking (nameplates)	Visual	Presence of marking(nameplate)
Periodic check			
	Grade of the load chain	Visual	Check for the grade of the load chain

MARKING AND THE LIKE

O	O	Marking (nameplates)	Visual	Presence of marking(nameplate)
-	O	Grade of the load chain	Visual	Check for the grade of the load chain

FUNCTION

O	O	Lifting and lowering function	Lifting and lowering without a load	(1) Lifting and lowering function can be smoothly carried out. (2) Smooth ratchet sound must be heard in lifting. (3) The brake shows no abnormality in lowering.
-	O	Function (4)	Rated load	No slippage occurs.

Note(4) The check for the function in the periodic inspection should be performed after checking of the chain hoist body etc.

HOOK

O	O	Opening of hook	Check visually in daily check and by measurement in periodic check.	No deformation should be found when its dimensions are compared with standard dimensions.(A list of major dimensions of hooks should be prepared before their use.)
O	O	Deformation	Visual	Free from bend and distortion.
O	O	Deformation of shank	Check visually in daily check and by measurement in periodic check.	There should be no big clearance between hook fitting and shank.
O	O	Wear and corrosion	Check visually in daily check and by measurement in periodic check.	Free from severe wear and corrosion.
O	O	Flaws and other harmful defects	Visual(5)	Free from cracks and other harmful defects.
O	O	Latch	Visual Function	Free from severe wear or deformation and operates properly.

Note(5) In periodic check, the magnetic particle test prescribed in JIS G0565 or the liquid penetrant test in JIS Z2343 should be carried out when necessary.

LOAD CHAIN

O	O	Pitch elongation	Check visually in daily check and by measurement in periodic check.	Don't use load chains with pitch elongation of 2% minimum (Prepare a list of standard dimensions before use.)
O	O	Wear	Check visually in daily check.	Don't use load chains which are worn in diameter by 10% or more.
O	O	Deformation	Visual	Free from deformation.
O	O	Flaws and other harmful defects	Visual(5)	Free from cracks and other harmful defects.
O	O	Corrosion	Visual	Free from serious rust.

HAND CHAIN

O	O	Hand chain	Visual or by measurement	Free from serious deformation and pitch elongation
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BODY

O	O	Frame	Visual	Free from deformation and severe corrosion.
O	O	Gear case	Visual	Free from severe deformation and corrosion.
-	O	Gears	After dismantling check them visually or by measurement.	(1) Free from severe wear (2) Free from breakage.
-	O	Load sheave and idle sheave	After dismantling check them visually or by measurement.	(1) Free from severe wear and deformation. (2) Free from cracks and breakage.
-	O	Hand chain wheel	Visually or by measurement	(1) Free from severe wear and deformation (2) Free from flaws and breakage.
-	O	Bearings	Visually or by measurement	Free from harmful defects such as wear, cracks, breakage, etc.
O	O	Chain stopper pin	Check visually after dismantling	Free from deformation and loose snap ring.
			Function(rotation)	Smooth rotation over 270° degrees.

BOLTS AND NUTS

O	O	Bolts, nuts, revets, split pins, snap rings, etc. at all the components	Visual	(1) In daily check, the presence of nuts, rivets, split pins, etc. which can be seen from outside should be checked, and nuts, rivets, snap rings, etc. should not get loose. (2) In periodic check, abnormality of the said parts should be checked internally and externally.
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BRAKE

-	O	Wear of brake linings	By measurement	Free from severe wear (based on the maker's instructions)
-	O	Brake screws	Visually or by measurement	Free from severe wear
-	O	Ratchet and ratchet wheel	Visually or by measurement	Free from severe wear

OTHERS

-	O	Others	Visually or by measurement	Free from other harmful defects in operation
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EC declaration of conformity

in compliance with the EC Machinery Directive 89/392/EEC, Annex II A

We hereby confirm that due to its design and construction and in the type marketed by us the machine designated below conforms with the pertinent essential safety and health requirements of the relevant EC Directive.

In case of a modification of the machine which is not agreed with us, this declaration is no longer valid.

Designation of the machine : Manual chain hoist
Types : C-21-0.5, C-21-1, C-21-1.5, C-21-2, C-21-3, C-21-5
Pertinent EC Directives : EC Machinery Directive(89/392/EEC) version 91/368/EEC, 93/44/EEC, 93/68/EEC
Used harmonized standards, especially : ISO 9001-1994(Certificate Number JQA-1547) JIS B 8802, JIS B 8812

Date/signature of manufacturer : 10.4.1998

Information on the signer : *K. Tsuda*
(K. TSUDA)
Director, Technical division

INSPECTION CERTIFICATE

The goods have passed rigid inspection by us ahead of delivery in accordance with our standard in terms of test load and all other respects in good and satisfactory condition.

INSPECTOR *T. Uesugi*



ELEPHANT CHAIN BLOCK CO., LTD.
Elephant Lifting Products
http://www.elephantlifting.com