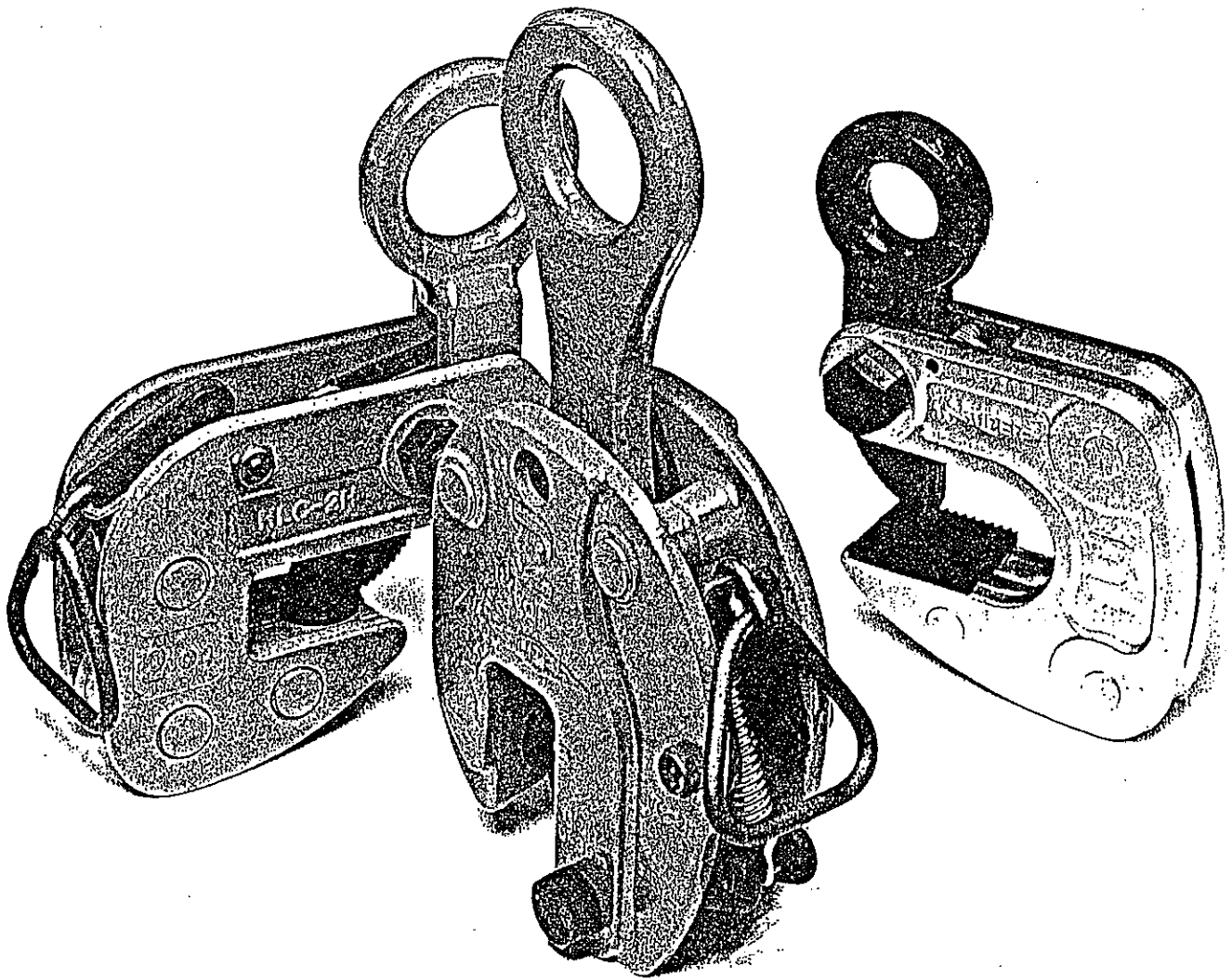


SAFETY LIFTING CLAMPS



INSTRUCTION FOR OPERATION
OF
"SUPER" BRAND
LIFTING CLAMPS



SUPER TOOL CO., LTD.

OSAKA, JAPAN

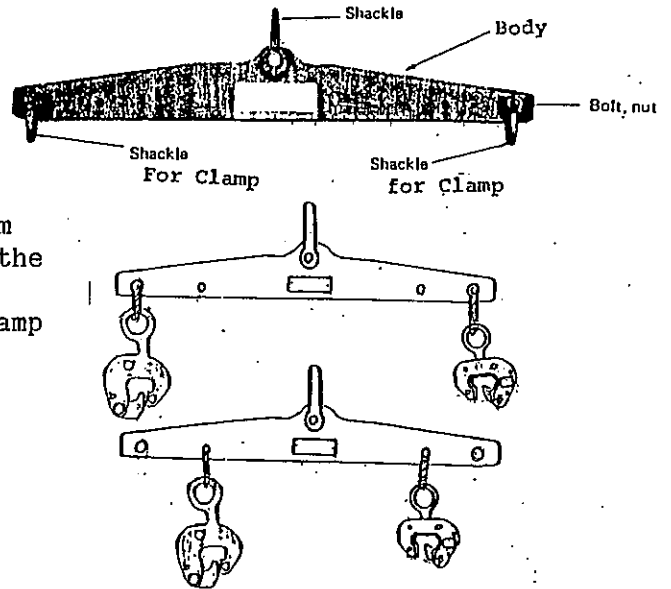
OPERATING INSTRUCTION FOR " SUPER " BRAND LIFTING CLAMPS

DRUM LIFT CLAMP BALANCE

Model: DSB-1S

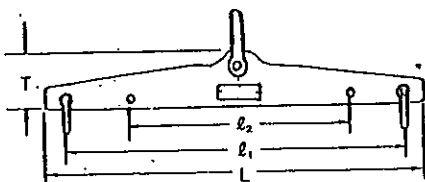
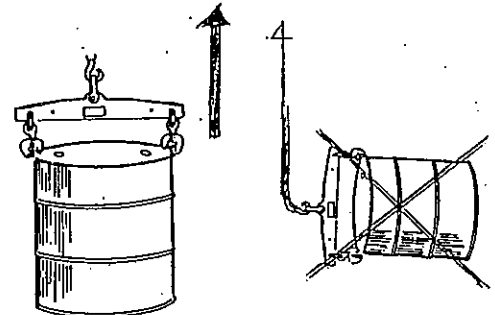
Operating method

- 1) Take out bolts and nuts by removing split pins of the shackle for clamps
- 2) Insert each shackle, which was taken out from the body, into the shackle of the drum lift clamp and set the shackles installed the clamps to the body by fastening the bolts, nuts and split pins. In this case, the clamp should be installed to the shackles by turning the cam side of the clamp to the outside.
- 3) In case of lifting a small drum (for 50 to 100 liters), use the inside holes of the body.



Caution

- 1) Do not load to an object to be lifted excessive safety working load of the balance.
- 2) Do not re-model the balance by welding, cutting with a burner, or with other methods.
- 3) Lift the drum at the center of drum without fail by taking care of the position of center of the gravity.
- 4) Lift the balance vertically.

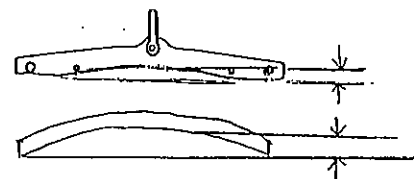


ITEM NO.	Capacity (tons)	Applicable drum		Unit:mm				Weight (kg)
		When set at l_2	When set at l_1	T	L	l_1	l_2	
DSB-1S	1	For 50-100 liters	For 200 liters	100	675	615	446	6

Safety check

Please check the following points periodically:

- 1) Crack or flaw of the body and shackles
Discard ----- When above is observed by eyes or by the method of color check.
- 2) Deformation or bent of the body
Discard ----- over 3 mm



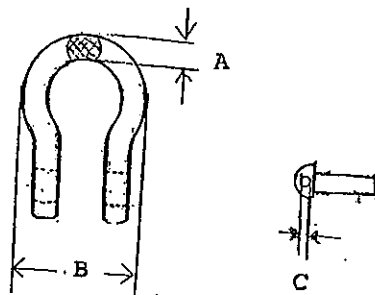
- to be continued -

- 3) Deformation or wear of the shackles
Discard

A part; exceeding 10 % in the wear ratio

B part; exceeding 85 % in the deformation ratio

C part; in case of 1 mm bigger



- 4) Shackle pin and Bolt

Discard

As shown in left.

When the sprit pin was missed, broaken or came off

In case of worn or broaken thread of bolts and nuts.



In case of exceeding 0.5 mm

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 the table below refers to No.4, 6 x 24A class of JIS G 3525.))

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

D Wire rope dia (mm)	σ Breakage load (tons)	W Safe load (on one rope) W=σ/S (safety factor S=6) (tons)						
			(Changes in lifting efficiency due to lifting angle. %)					
			100%	96%	92%	86%	70%	50%
Max. allowable load (safe load) on two wire ropes (tons)								
8	3.21	0.54	1.08	1.04	0.99	0.93	0.76	0.54
9	4.06	0.68	1.36	1.31	1.25	1.17	0.95	0.68
10	5.02	0.84	1.68	1.61	1.55	1.44	1.18	0.84
11.2	6.29	1.05	2.1	2.02	1.93	1.81	1.47	1.05
12.5	7.84	1.31	2.62	2.52	2.41	2.25	1.83	1.31
14	9.83	1.64	3.28	3.15	3.02	2.82	2.3	1.64
16	12.8	2.13	4.26	4.09	3.92	3.66	2.98	2.13
18	16.2	2.7	5.4	5.18	4.97	4.64	3.78	2.7
20	20.1	3.35	6.7	6.43	6.16	5.76	4.69	3.35
22.4	25.2	4.2	8.4	8.06	7.73	7.22	5.88	4.2
25	31.3	5.22	10.44	10.02	9.6	8.98	7.31	5.22
28	39.3	6.55	13.1	12.58	12.05	11.27	9.17	6.55
30	45.1	7.52	15.04	14.44	13.84	12.93	10.53	7.52
31.5	49.8	8.3	16.6	15.94	15.27	14.28	11.62	8.3
33.5	56.3	9.38	18.76	18.01	17.26	16.13	13.13	9.38
35.5	63.2	10.53	21.06	20.22	19.38	18.11	14.74	10.53

Note: For four-point lifting, multiply the corresponding figure in the table by 2 to find the maximum allowable load (safe load).

Simplified calculation method of wire rope diameter and safe load (one-point lifting)

1) $D = \sqrt{W \times C}$

2) $W = \frac{D^2}{C}$

Where D : wire rope diameter(mm)

W: safe load (tons)

C : constant=120

(safety factor S=6)

★To find the diameter of wire rope for 3 tons:

① $D = \sqrt{W \times C}$

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

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

② $W = \frac{D^2}{C}$

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