



Product No.: SMC-500
SMC-1000
SMC-500H
SMC-1000H

Multi Crane Instruction Manual

This manual aims at helping the operator to use the Multi Crane comfortably for a long period of time by providing information regarding right procedure of assembling, and appropriate handling and maintenance method.

- *1. Never fail to read this manual for proper use before using the Multi Crane.
Inappropriate handling of the Multi Crane, not abiding by alarm indications or cautions will lead to an accident.
- *2. Put this manual in a carefully stored place after having read it.

Super Tool Co., Ltd.

◇! Danger 1. Cautions for Safety

Inappropriate or unintended use of the Unit (Multi Crane) will have a danger of causing an accident. If the Unit is not used in such a way as specified as the original purpose of use, claim is not taken as applicable. The original purpose of use mentioned here is that to be realized abiding by the installation, operational, and maintenance methods specified in the instruction manual. For more information on safety, operation and maintenance, please contact our sales dept. or technical dept.

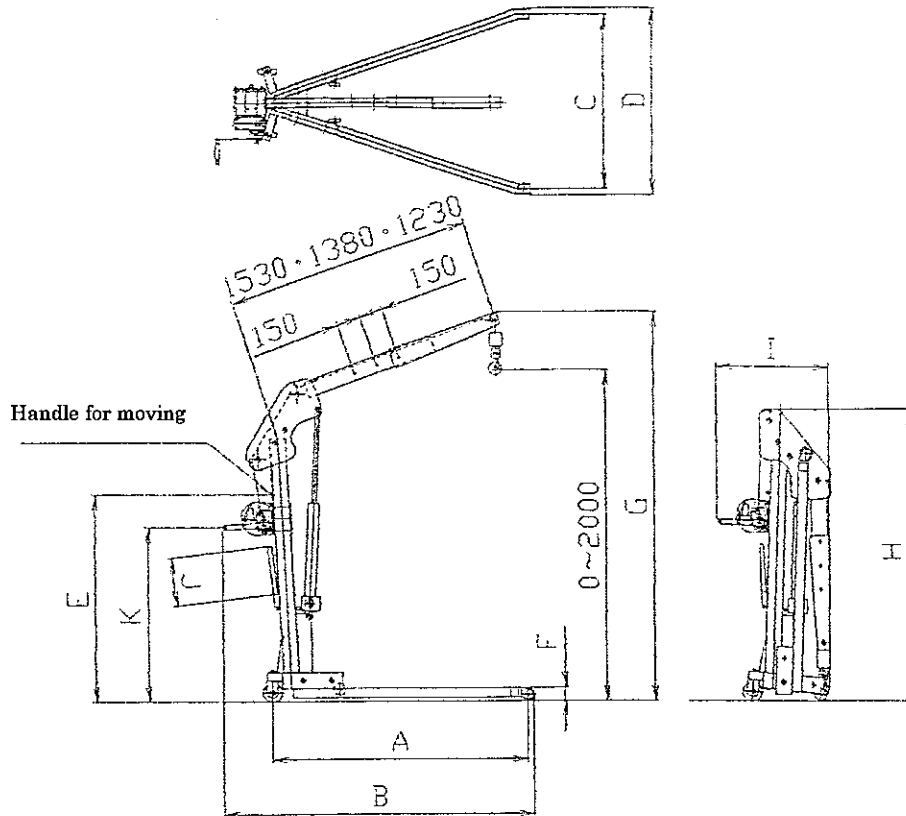
- ① The operation staff and the maintenance staff shall have read all the manuals on this Unit and be well conversed with their contents.
- ② Execute the operation of the Unit, bearing in mind all the dangers, alarms, cautions for safety.
- ③ Never operate the Unit in such a way as to affect the safety of the operator and the Unit.
- ④ Be sure to obtain a full knowledge of the operational method mentioned in the instruction manual.
- ⑤ Never walk in the space under the arm and a hanged work.
- ⑥ When operating the Unit, there must be one operator and one signaler cooperating with each other.
- ⑦ Never use the Unit to an extent of more than the capacity (incl. jig).
- ⑧ Wear a helmet during operation.
- ⑨ Do not swing a hanged work intentionally for no reason.
- ⑩ Confirm that the wire rope is wound up around the drum is a parallel way.
- ⑪ Always use, move, and keep the unit according to 3. Assembly Procedure.
- ⑫ When operating the unit, always use it on the flat place.
- ⑬ Never give the Unit remodeling, modifications or alterations. The outside appearance and the specifications of the Unit are liable to change without notification.

Meanings of Cautious Indications:

- ◇ Danger: This signifies the supposed possibility of death or serious damage occurring in case of a mistaken operation of the Unit far beyond the extent of danger.
- ◇ Warning: This signifies the supposed possibility of death or serious damage occurring in case of a mistaken operation of the Unit.
- ◇ Caution: This signifies the supposed possibility of medium-sized or light damage, or physical trouble only occurring in case of a mistaken operation of the Unit.

To add to this, even the situations referred to as ◇Caution may cause a serious accident. Whichever level of danger, never fail to abide by the cautious instructions as important.

Multi Crane (with winding winch)



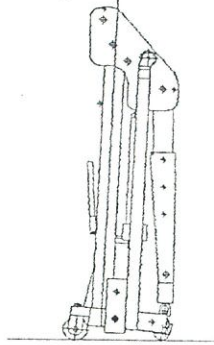
SMC-H Dimensions table

Product No.	A	B	C	D	E	F	G	H	I	J	K	Weight
SMC 500H	1630	2000	1070	1130	1300	90	2430	1825	750	300	1100	135kg
SMC 1000H	1815	2180	1090	1165	1350	110	2450	1870	1000	280	1100	200kg

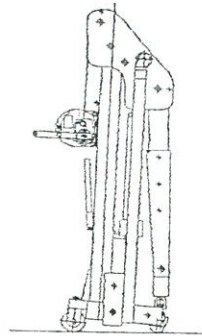
Cautions: 3. Assembly procedure

- (1) When shipping, arm and leg are folded as blow.
Be sure to execute assembly by more than two persons.
First, don't put up the arm.

Multi Crane (Simple type)
SMC-500, SMC-1000



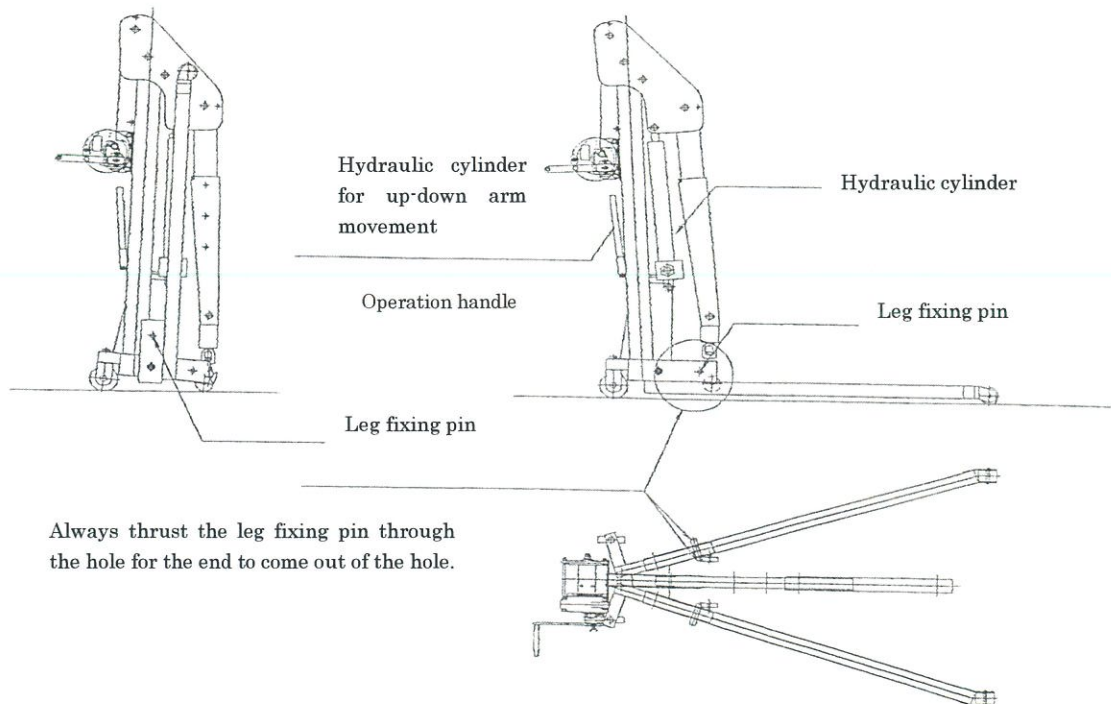
Multi Crane (with winding winch)
SMC-500H, SMC-1000H

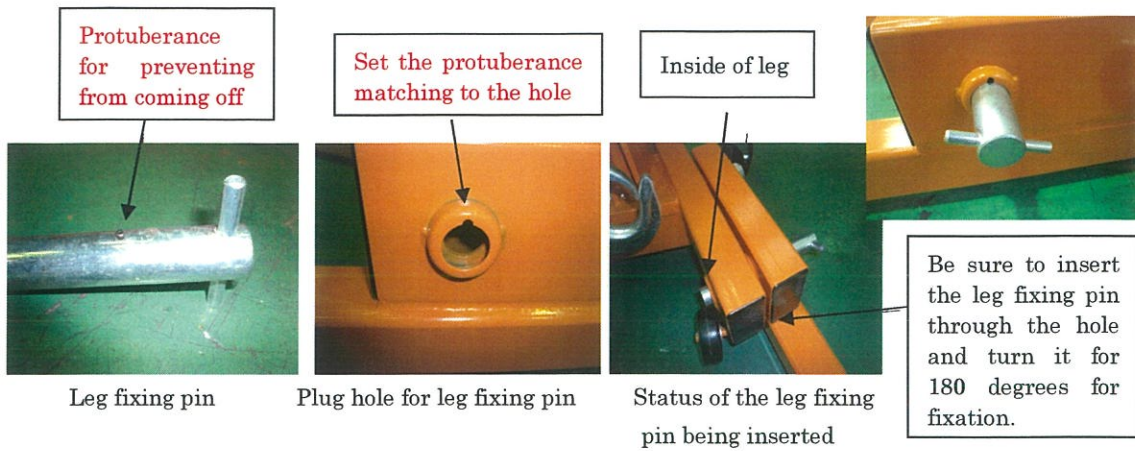


- (2) Remove the leg fixing pin of both legs, extend the legs down to the floor and fix the unit with inserting back each leg fix pin thoroughly, matching the upward positioned protuberance into the each plug hole (refer to the explanatory photos).

For that, make sure the leg fixing pin is inserted thoroughly into the hole. After that, turn the pin for 180 degrees to prevent the leg fixing pin from coming off. The position of protuberance of the leg fixing pin is designated with the red tape at the leg fixing pin.

Danger: Failure or insufficiency of inserting the leg fixing pin and of turning 180° may lead to an accident during the use.



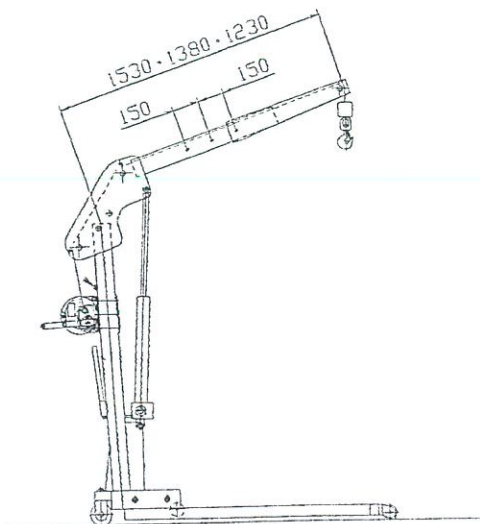
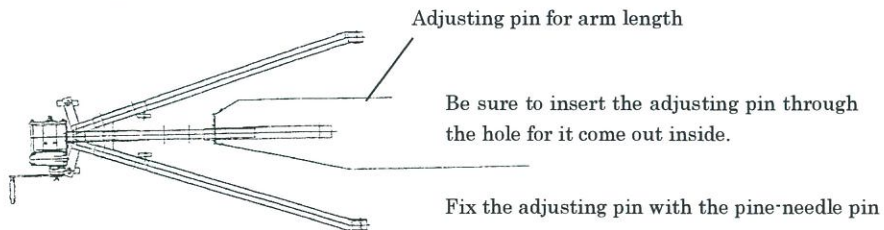


(3) Next, after the legs are securely fixed, raise the arm with the operation handle for up-down arms movement to an appropriate height for use.

(4) The arm length is adjustable at three steps with the arm length adjusting pin (1530/1380/1230). Be sure to insert the arm-length adjusting pin through, and stop it with a pine-needle pin. Be sure to check that the adjusting pin has been inserted through.



Danger: There is a fear of an accident occurring during operating if the arm-length adjusting pin is not inserted through and fix with a pine-needle pin.

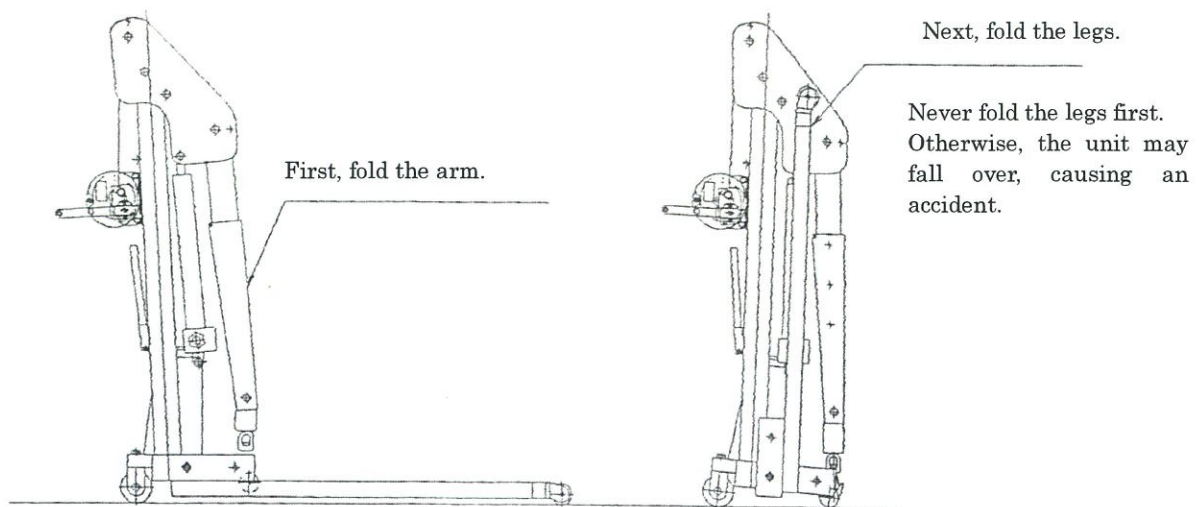


⚠ Danger:

(5) Execute the storage procedure with safety in the reverse order of assembly procedure.

Also, be sure to minimize the arm length first and lower the arm using hydraulic cylinder.

If the legs are folded first, the unit may fall over.



Next, pull off the leg fixing pins, fold the legs upward, and insert the leg fixing pins completely at the leg fixing position and turn each pin 180°. Make sure the protuberance is firmly engaged inside the hole so as the leg fixing pins will not come off.

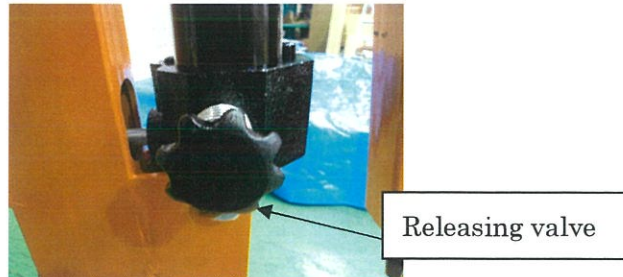
Danger - Failure or insufficiency of inserting the leg fixing pin and of turning 180° may lead to an accident due to the coming off or disengagement of the pin during the transportation.

4. Operation method

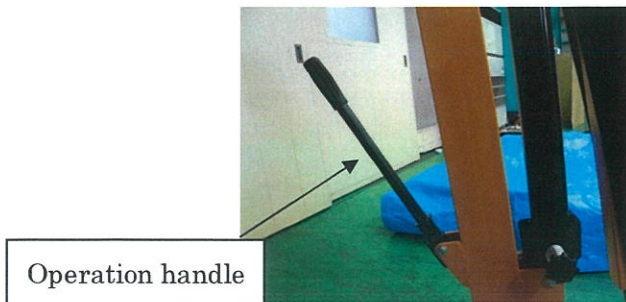
1) Operation (SMC simple type)

(1) Operation of lifting the work / Operation of raising the arm with the work lifted.

① Raise the arm with the hydraulic cylinder.



Check to be sure that the releasing valve is completely closed.



Raise the arm with the work lifted by up-down movement of the operation handle.

② Execute operation as slowly as possible.

(2) Operation of lowering the arm with the work unit

① Lower the arm with the hydraulic cylinder.



Loosen the releasing valve slowly to the last. If the valve is loosened abruptly to the last, the arm may fall down suddenly, causing an accident.

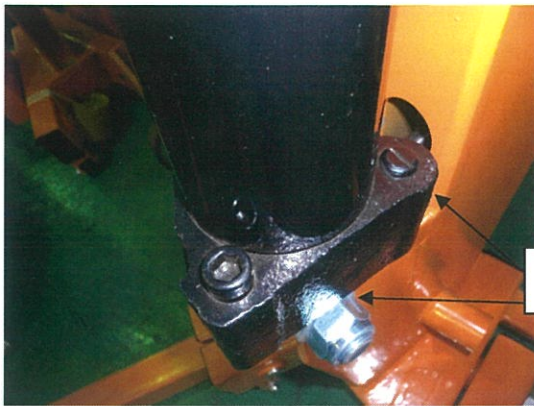
(3) When lifting the work, be sure to hang it on the hook part of the arm end.

- 2) Operation (SMC-H with a winding winch)
 - (1) As for the up-down movement of the arm, follow the same procedure described in Item 1) Operation (SMC simple type)
 - (2) After adjusting the arm height with the hydraulic cylinder, lift the work with the winding winch.
 - 1) Hang the work on the hook part and be sure to check that there is no obstacle to collide with when winding the winch.
 - 2) Exact the winding process slowly, be sure to have a signaler stationed them.
 - 3) The arm may be bent a little during up-down movement of the work. Be careful enough.
 - (3) Be sure to have the work not turned around.



Danger

- Never enter the space under a lifted work.
- Never operate the safety values etc.



Safety values, etc

⚠ Danger 5. Guarantee and Items of Maintenance during Wire Rope Exchange

◇ Danger 1) When to Exchange the Wire Rope for a New One

It is normally expected that the following abnormalities from (1) to (6) will not occur if the Unit is operated in a proper way with the wire rope exchanged once a year.

However, if an abnormality has been detected during your daily maintenance, confirm the following and exchange the wire rope for a new one.

Standard for Scrapping the Wire Rope

(1) Breakage of Wire Threads

10% of the twisted threads composing the wire rope within a length of one twist are cut off.

In case of SMC-500H, the diameter of the wire rope applied is 6 mm (6x37 in scale).

When a visual check of the rope on the drum winding part and the rollers has revealed that 10% of the twisted thread composing the wire rope within a length of one twist are cut off. $37 \times 0.1 = 3.7$

The Breakage of 4 lines of wire threads will be a standard for exchange of wire ropes. (The wire rope consists of 6 blocks made up of braided 37 wire threads).

In case of SMC-1000, the diameter of the wire rope applied is 8mm (6x37 in scale). When a visual check of the rope on the drum winding part and the rollers has revealed that 10% of the twisted thread composing the wire rope within a length of one twist are cut off. $37 \times 0.1 = 3.7$

The Breakage of 4 lines of wire threads will be a standard for exchange of wire ropes.

(The wire rope consists of 6 blocks made up of braided 37 wire threads).

(2) The Diameter has decreased more than 7% of the Nominal Diameter.

In case of SMC-500H, rope diameter 6 mm $6 \times 0.07 = 0.42$ mm

The diameter is less than 5.58 mm when it is measured with a vernier micrometer.

Whether the exchange of wire ropes is required or not is judged by measuring of the rope on the drum winding part and the rollers.

In case of SMC-1000H, rope diameter 8 mm $8 \times 0.07 = 0.56$ mm


The diameter is less than 7.44 mm when it is measured with a vernier micrometer.

Whether the exchange of wire ropes is required or not is judged by measuring of the rope on the drum winding part and the rollers.

(3) Wire rope is twisted or warped.

- (4) Wire rope is largely deformed.
 - Wire rope is depressed.
 - Blocks of wire threads are loosened.
 - Wire rope has a dent in it.

- (5) Checking of the Wire Rope on the Swivel and Lock Parts
 - The wire rope off the swivel
 - The lock part which has a crack

 Danger 6. Cautions during Operation

Breakage of wire threads composing wire rope can be prevented by abiding by the following instructions.

(1) Do not operate the Unit by hanging more than the allowable weight.
Max. Load : 500 kg for SMC-500 and SMC-500H/1000 kg for SMC-1000 and SMC-1000H (incl. Jig weight).

(2) Wire rope is not to be loosened.

When you lower the hook by the winding handle, the wire is always to be drawn by a load.

Visually confirm that when winding down the wire rope, the rope is released from the drum.

In case the hook cannot be lowered by rotating the handle to release it, there is a possibility of the hook being stuck in the middle.

In such a case, the hook is to be drawn down to tighten it. Thereafter, confirm whether the wire rope is off the rollers or not.

(3) Proper Way of Winding up around the Drum

Wind up the wire rope around the drum in a parallel way, abiding by the instructions (1) and (2).

7. Daily and Periodical Maintenance

(1) Preliminary Checking before Use

- ① Visual check of the wire rope (only for SMC-H with winding winch)
 - To check whether the wire rope is not cut off or not wound up in a less uniform manner.
 - To check whether the rope is not dirtied.
 - To check whether the rope is not largely deformed.
- ② Checking of the tightness of the bolts and nuts
 - Visually confirm by the meeting of marks whether the bolts are securely tightened.
- ③ Whether there is no abnormality with the up-down movement of hook or not
 - Check the direction of movement without lifting a work.
- ④ Visual check of the welded part
 - Confirm whether there is no cracks and flaws in the welding bead.
- ⑤ Whether there is no abnormality with the movement of hydraulic cylinder or not
 - Check the movement.
- ⑥ Confirm whether the leg fixing pin is completely inserted through
Confirm whether the adjusting pin for arm length with a pine-needle pin is completely inserted through.

8. Periodical Maintenance (execute it more than once a year)

- ① Ensure that wire rope is to be changed for a new one once a year. (only for SMC-H with winding winch) (monthly)

Visual check of the wire rope connection / lock part / swivel part for abnormality such as deformities or cracks.

- ② Further tightening of bolts or changing them for new ones (monthly)

- All the bolts are to be fastened once again and more tightly. (After that, execute the indication of making)
- The bolts which have their screw ridges broken or which are extended are to be replaced for new ones.

- ③ Checking of Bearings (six monthly)

- Confirm if there is an abnormal sound from the bearings in the rotation part.
- Confirm if there is a leakage of grease from bearings.
- Confirm if there are cracks on the bearing housing.

- ④ Checking of Roller Part (only for SMC-H with winding winch) (six monthly)

- Checking of the status of the abrasion of rollers' gutters
- Visual checking of the rollers for deformity
- Checking of the bearing parts
- Visual checking of holes and pins for abnormalities

- ⑤ Checking of Welded Parts (six monthly)

- Visual checking of welded parts for cracks
 - Checking of welded parts by hammering
- Checking of welded parts for trembling sound by hammering the place near to welded parts

- ⑥ Checking of Flanges (six monthly)

- Visual checking of flanges for deformities

- ⑦ Checking of Hydraulic cylinder (six monthly)

- Visual checking of the hydraulic cylinder for abnormal movement.
- Visual checking of the wire rope connections (lock part, swivel part) for abnormalities such as deformities or cracks

- ⑧ Checking of Winch

- Checking of the winch for abnormal movement
- Confirm that the stopping screw is securely tightened to fix the wire rope.
- Visual checking of the winch for abnormality or deformity

As a result of the above checking, if there is any abnormality, stop using it and check immediately.