

# **UNIC HYDRAULIC CRANE**

## **OPERATORS MANUAL**

### **ML3A SERIES MOMENT LIMITER**

**FURUKAWA UNIC CORPORATION**

## ***Request to those who operate the crane***

This instruction manual describes the correct operation method, easy maintenance, and service for the MOMENT LIMITER you have purchased.

Before starting operation, we request that you are sure to read the manual together with the separate OPERATOR'S MANUAL OF UNIC CRANE and operate it correctly and safely.

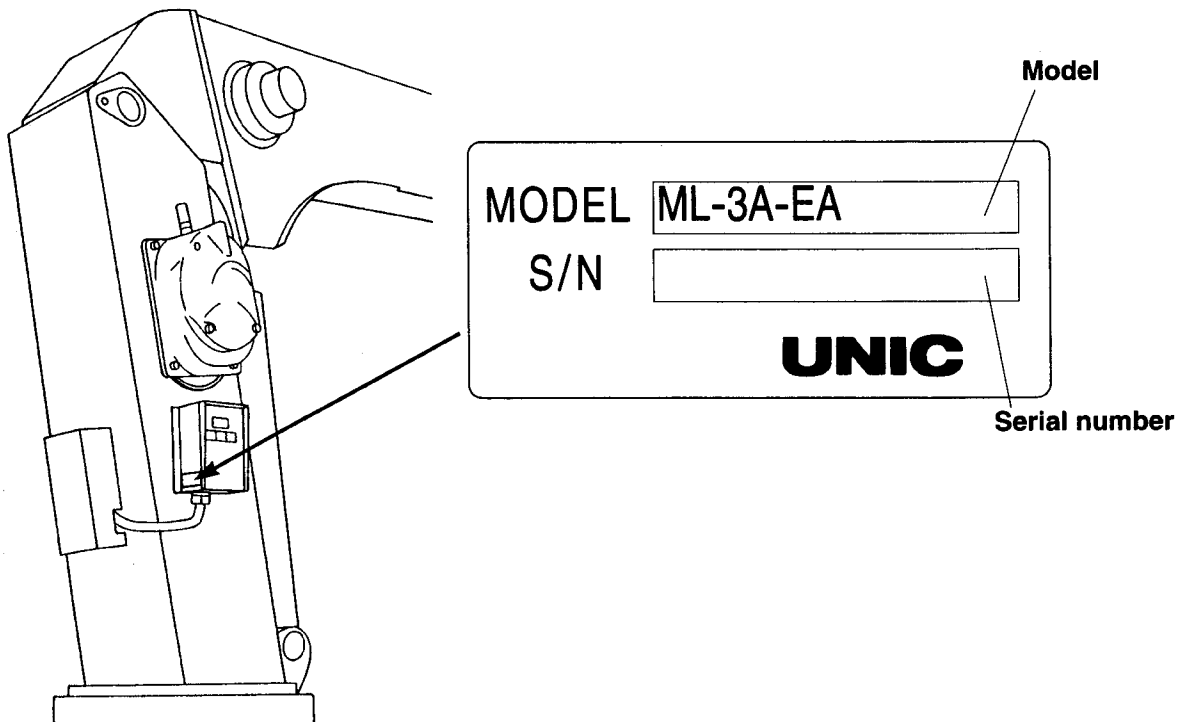
Operate the crane after you have read the manuals carefully to understand them completely.

Although we take all possible measures to ensure quality of the device, you are requested to contact a sales agent or an authorized service shop whenever you have anything you are in doubt for functions of crane and/or its components.

### ◆ **When making inquiries**

Be sure to inform us of your MODEL and its SERIAL NUMBER indicated on the product name plate.

◆ The product name plate is stuck on the side of control box for the moment limiter.



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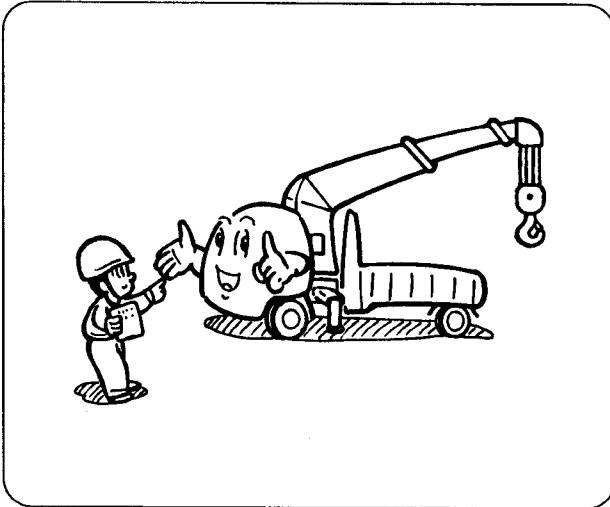
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# 1. SAFETY PRECAUTIONS

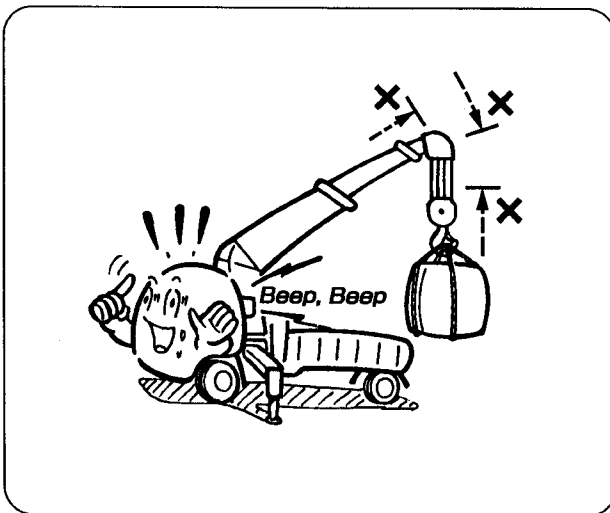
## ! WARNING

★ Observe the cautions for securing safety.  
Failure to observe the cautions may cause trouble or serious accident.



**1** Carry out inspection before operation, daily inspection, and periodical inspection carefully to check that the moment limiter makes normal operation.

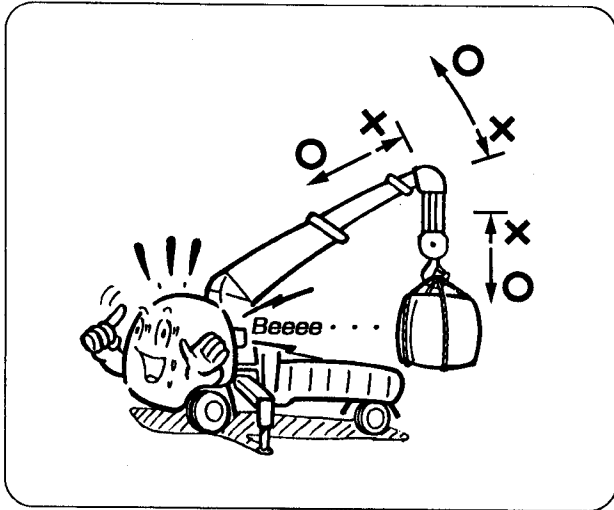
The moment limiter will not function normally if notice for crane operation such as how to set up outriggers written in the operator's manual of the crane fails to be observed.



**2** If the crane comes close to overload condition while being operated such as in hoisting up hook, lowering boom, and extending boom, the moment limiter allows the alarm buzzer to sound intermittently to issue a warning.

When the buzzer makes the intermittent alarm sound, stop the crane operation for a while to prevent the lifted cargo from swinging, check working conditions, and then operate the crane carefully at a lower speed.

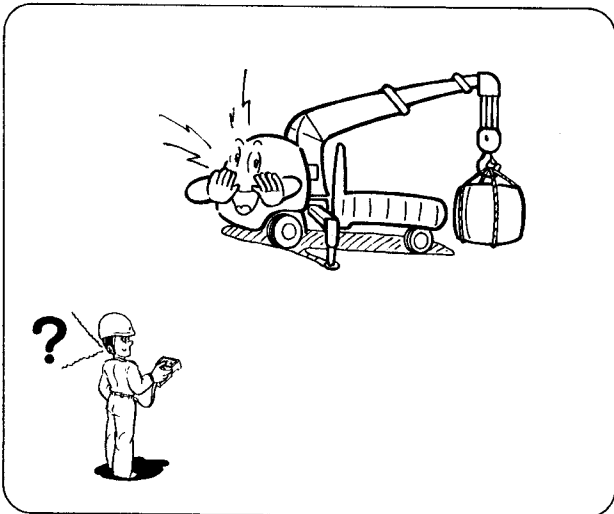
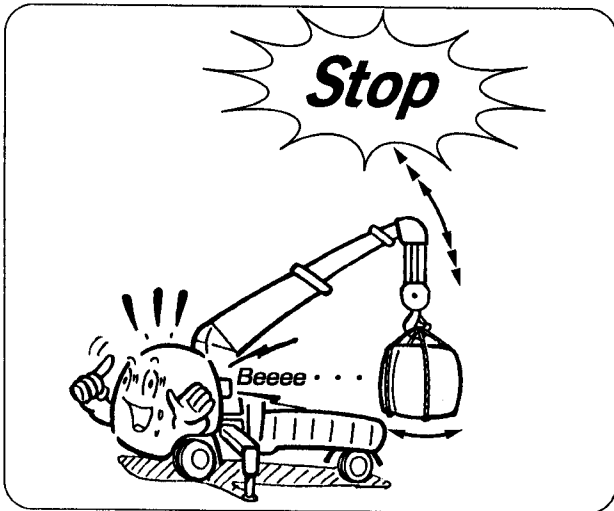
## SAFETY PRECAUTIONS



**3** If the crane is overloaded while being operated such as in hoisting up hook, lowering boom, and extending boom, the moment limiter allows the alarm buzzer to sound continuously and stop the following crane functions which may cause it for the worse.

- Hoisting-up hook
- Extending boom
- Lowering boom

When the buzzer sounds on and off, operate the crane by paying attention to its working speed, because an abrupt stop of the crane may invite dangerous situation as a lifted cargo swings.

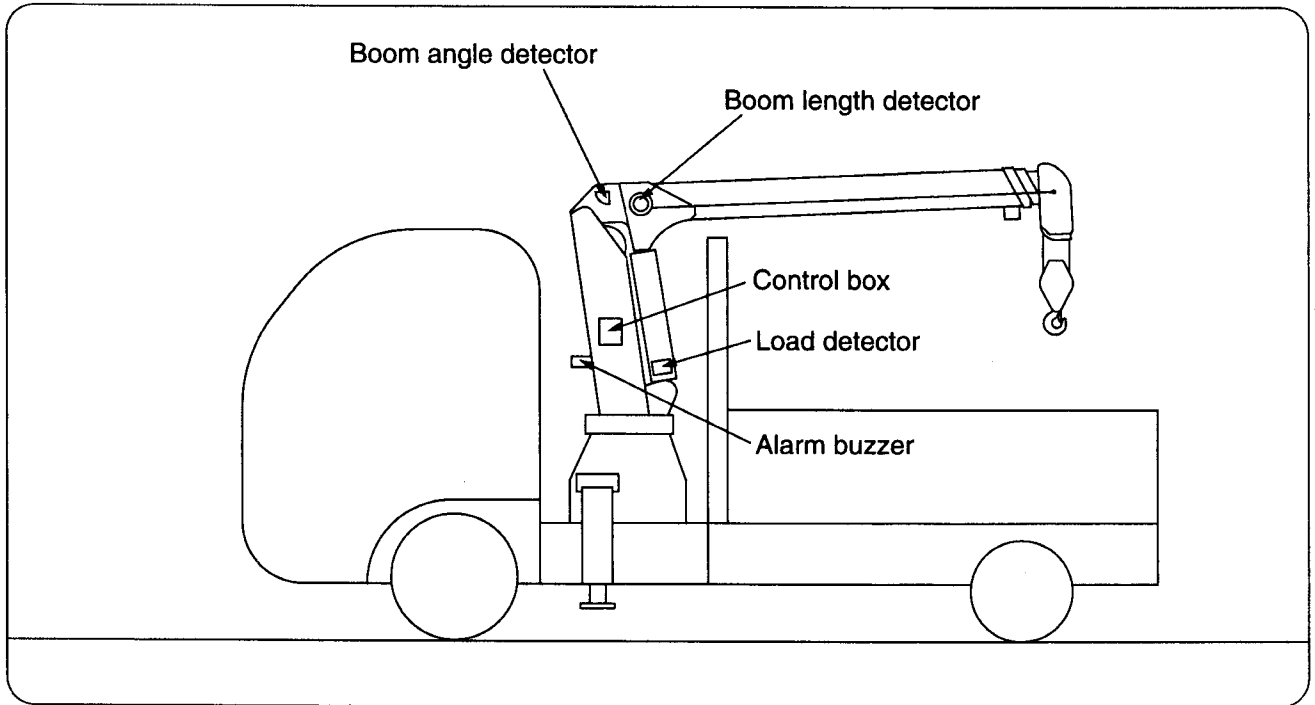


**4** When operating the crane by using a cable/radio remote control device, operate it within an area where the alarm sound can be heard.

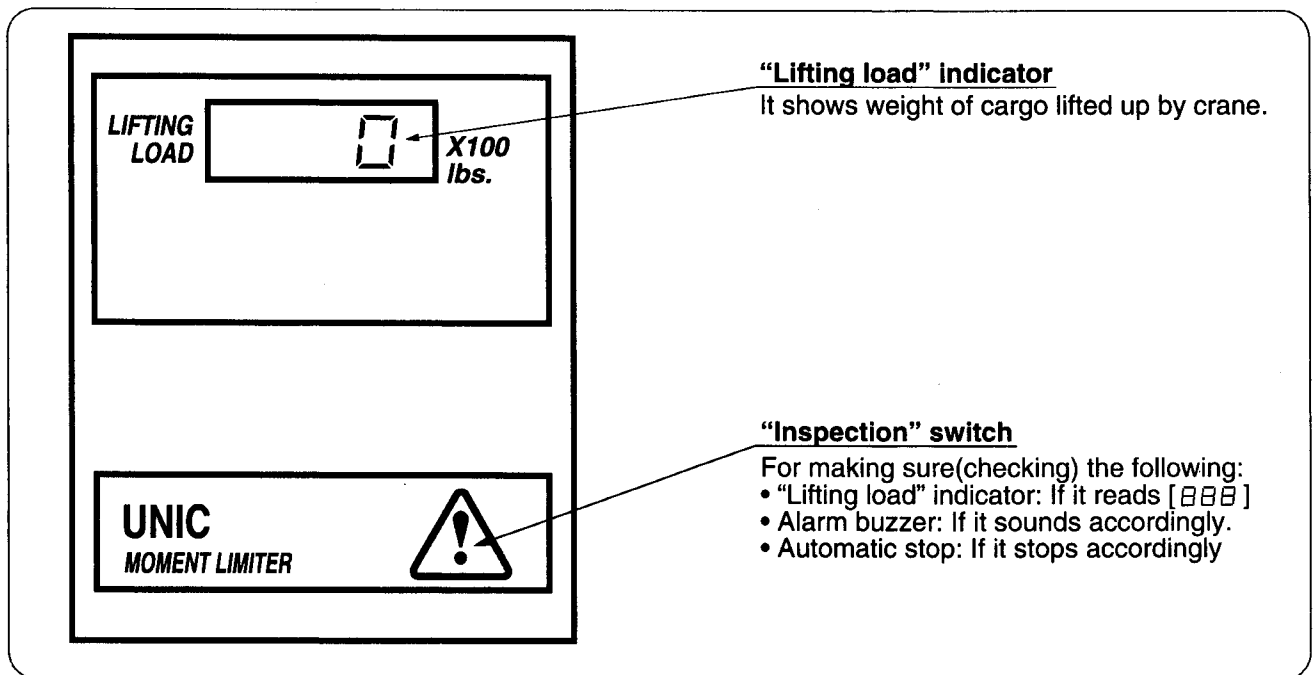
## 2. DESCRIPTION OF EACH EQUIPMENT

### 1 Structure of moment limiter

(Figure shows an example of standard mounting.)



### 2 Designation of indicator panel of control box

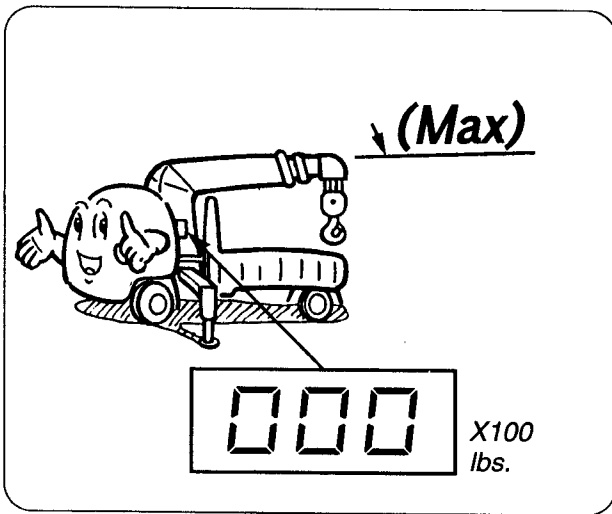


### 3. INSPECTION BEFORE STARTING CRANE OPERATION

After the outrigger has set up right, inspect the following before starting crane operation. If found anything unusual in the inspection below, refer to section 5 "Daily inspection, trouble inspection".

#### 1 Inspection by confirming the alarm with the boom lowered

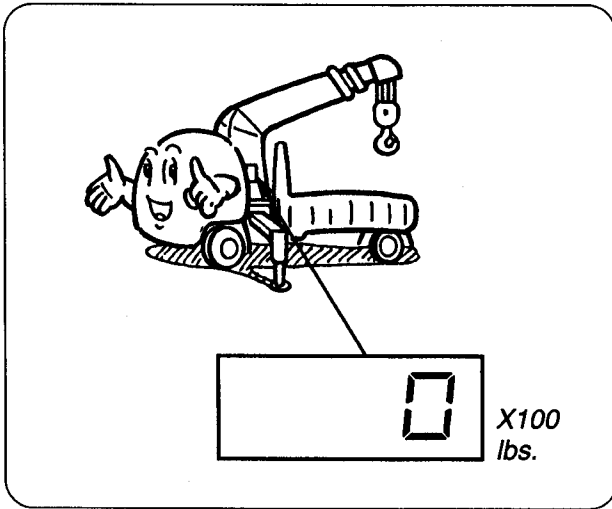
When the boom is retracted to the shortest (boom ①) then extended to the specified length as shown below with the boom lowered to its extreme, check the condition as follows:



|                                 |  |  |
|---------------------------------|--|--|
|                                 | Boom is retracted to the shortest (boom ①) | Boom is extended by more than approx. 0.3ft from the retracted to the shortest |
| "Lifting load" indicator reads: | 000  | 000  |
| Alarm buzzer makes:             | No sound                                   | Intermittent sound (beep, beep)  |
| Automatic stop:                 | No stop                                    | Stops when hook is lifted up and boom is stopped extending                     |

★The above indication is to be confirmed because the moment limiter does not function normally with the boom lowered to its extreme.

**2** *Inspection by reading the lifting load indicator*



Check, with lifted no cargo, that the "lifting load" indicator reads as follows:

★This applies except for the boom lowered and raised to its extreme.

[0]~[3] (× 100lbs.)



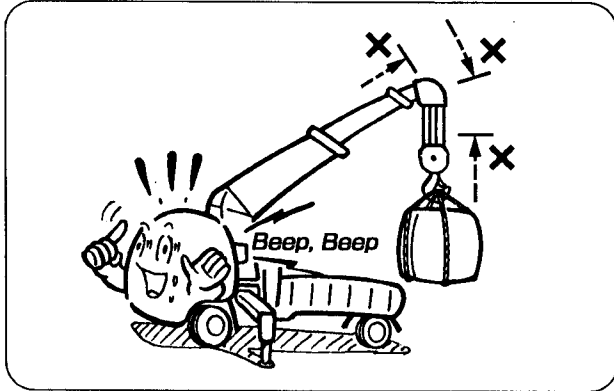
## 4. FUNCTIONS OF MOMENT LIMITER

Carry out normal crane operation after completion of section 3, "inspection before starting crane operation".

The moment limiter is a safety device which automatically warns overloaded condition of the crane when works of lifting up hook, lowering boom, and extending boom are carried out.

In addition, the "lifting load" indicator on the control box shows the weight of cargo the crane is actually lifting up.

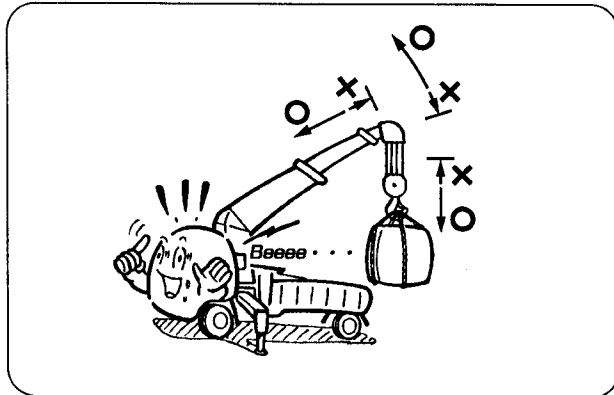
### 1 Warning of overload prediction



If the crane comes close to overload condition, it allows the alarm buzzer to sound intermittently to issue a warning.

When the alarm buzzer makes the intermittent sound, stop the crane operation for a while to prevent the lifted cargo from swinging, and check working conditions, then operate the crane carefully at a lower speed.

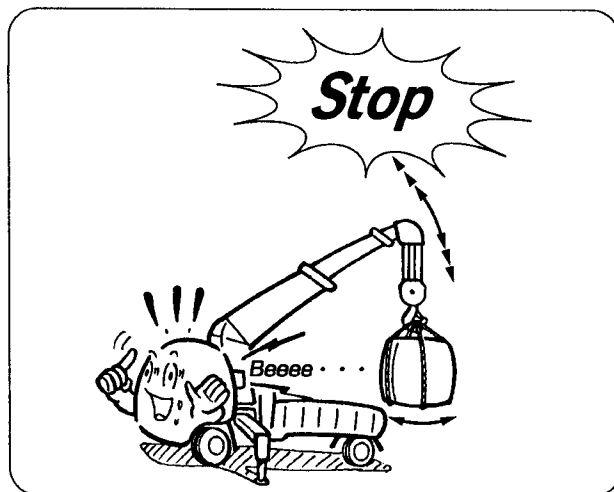
### 2 Warning of overload limit



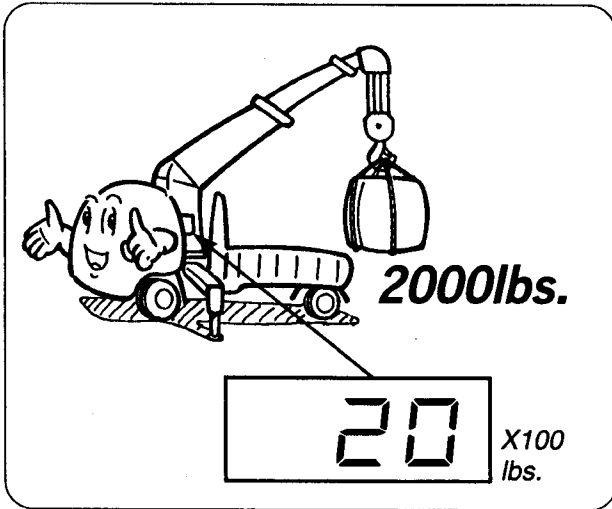
If the crane has been overloaded, it allows the alarm buzzer to sound continuously and automatically stop the following crane functions which may cause it for the worse.

- Hoisting-up hook
- Extending boom
- Lowering boom

When the buzzer gives intermittent alarm sound, operate the crane by paying attention to its working speed, because an abrupt stop of the crane may invite dangerous situation as the lifted cargo swings.



**3** Lifting load indicator

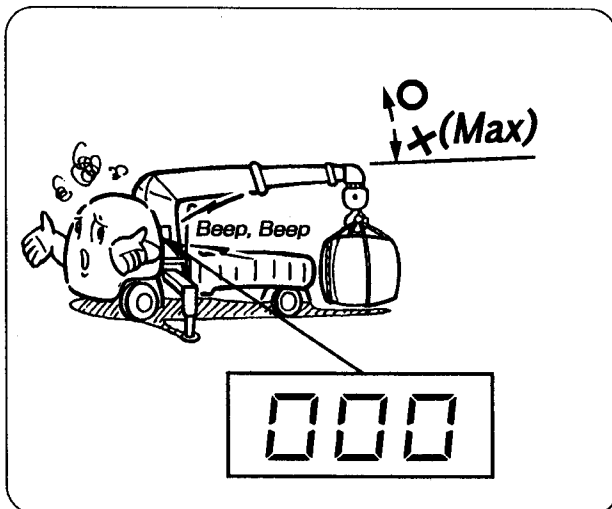


Weight of the cargo lifted up by crane is shown on the "lifting load" indicator mounted on the control box.

●Remarks

★Although the "lifting load" indicator reads [ 000 ] with the boom lowered to its extreme and the crane is automatically stops with the alarm sound from the buzzer when the boom is extended by more than approx. 0.3ft from the position where the boom is retracted to a minimum, it is not a trouble.

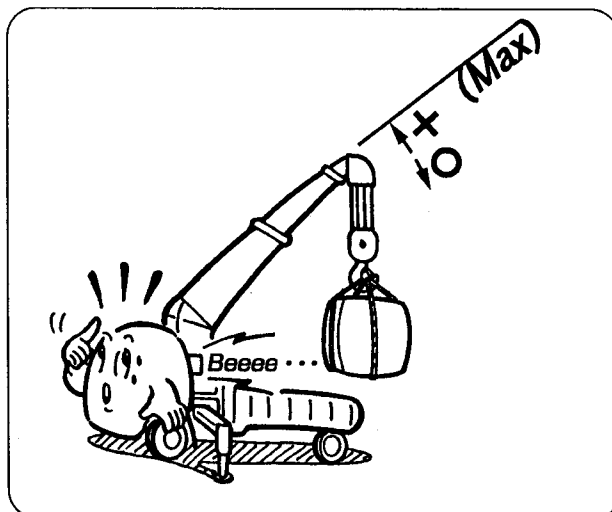
Since the above is a warning that the moment limiter can not make a normal operation, do not operate the crane with the boom lowered to its extreme.



★When operating the crane to raise it further vertically from where the boom is raised to its maximum, reading on the "lifting load" indicator may increase to issue an overlord alarm which is not a trouble.

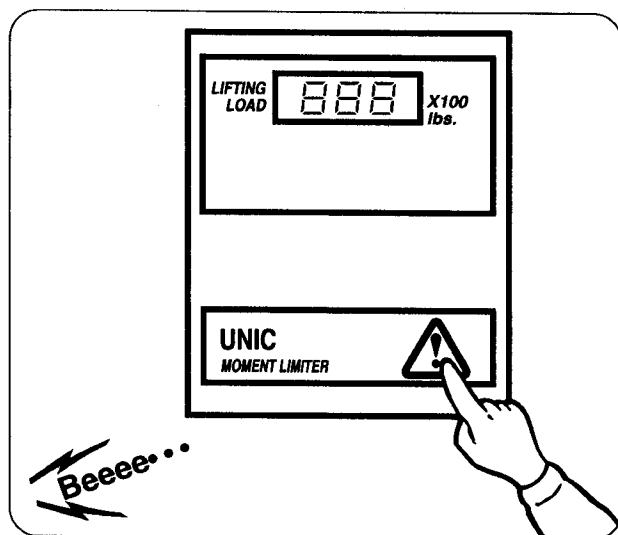
Lower the boom to some extent to operate the crane if the alarm mentioned above is actuated.

If the alarm mentioned above is issued and it comes to a condition that the boom can not be lowered, operate the crane to raise the boom once then lower the boom.



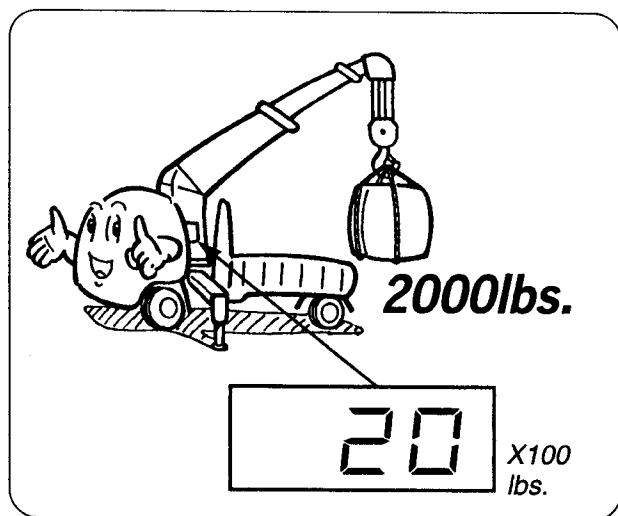
## 5. DAILY INSPECTION, TROUBLE INSPECTION

In addition to carrying out daily inspection on the crane (read carefully the operator's manual of UNIC crane), inspect the following for the cranes with moment limiter.  
If you found anything wrong with your moment limiter, contact the nearest UNIC authorized service shop as soon as possible because it will not function normally as a safety device.



**1** Depress "inspection" switch on the control box to confirm that each indicates as illustrated below while the switch is being depressed,:

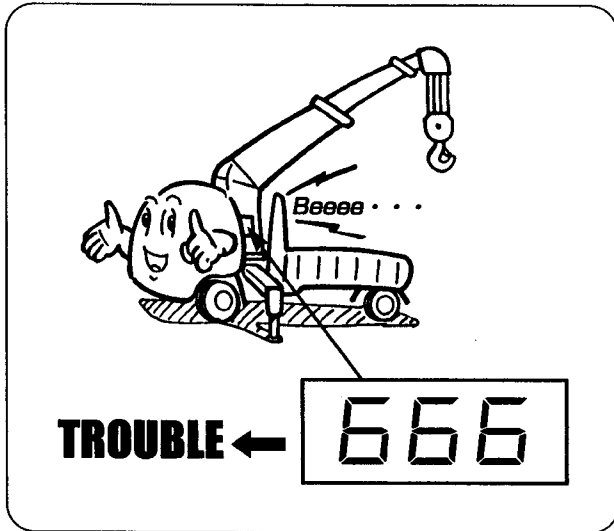
- 1) "Lifting load" indicator reads [ 888 ]
- 2) Alarm buzzer gives alarm sound, and
- 3) Automatic stop halts crane functions of:
  - Hoisting-up hook
  - Extending boom
  - Lowering boom



**2** Hoist up a load of which weight is already known by the crane and check that the "lifting load" indicator on the control box reads as follows:

Lifted load  $\pm 3$  (  $\times 100$  lbs. )

Lifted load + ( 0 ~ 10% ) (  $\times 100$  lbs. )



### 3 Other trouble indication

If the alarm buzzer makes continuous sound and the “lifting load” indicator reads as illustrated below, it indicates that the detector of moment limiter or the cable to detector is something wrong.

If the trouble is still persists after checking connection of cables and connectors in question, contact a service shop as soon as possible.

- Blinking [ 555 ]: Boom length detector
- Blinking [ 777 ]: Boom angle detector
- Blinking [ 888 ]: Load detector
- Blinking [ 999 ]: Load detector

Furthermore, when in alarm stated above, like in the overload alarm, it stops crane functions of:

- Hoisting-up hook
- Extending boom
- Lowering boom

## 6. MAJOR SPECIFICATIONS

|  |   |
|--|---|
| Model Designation  | ML-3A-EA Moment limiter   |
| Power supply   | Vehicle battery(DC 12V)   |
| Operating temperature range  | - 20°C ~ + 60°C   |
| Control box  |   |
| 〈Control circuit〉  | Digital processing by micro-computer  |
| 〈Indicator〉<br>Lifting load indicator  | Digital display   |
| 〈Functions〉<br>Alarm for overload prediction<br>Alarm for overload limit       | Buzzer gives intermittent alarm sound<br>( Buzzer gives continuous alarm sound<br>Automatic stop of:<br>(Hoisting-up hook, extending boom, and lowering boom) |
| 〈Rated load performance〉<br>Rated load performance<br>Selection of performance | Applied crane performance<br>Automatic selection (number of boom section)   |
| Alarm buzzer   | Electronic buzzer   |
| Load detector  |   |
| 〈Detection〉  | Detection of oil pressure inside of boom derricking cylinder  |
| 〈Detector〉   | Pressure sensor   |
| Boom length detection  |   |
| 〈Detection〉  | Cord reel type detection  |
| 〈Detector〉   | Potentiometer   |
| Boom angle detection   |   |
| 〈Detection〉  | Pendulum type angle detection to ground   |
| 〈Detector〉   | Potentiometer   |

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