

Hydraulic Mobile Cranes

Product knowledge guidebook



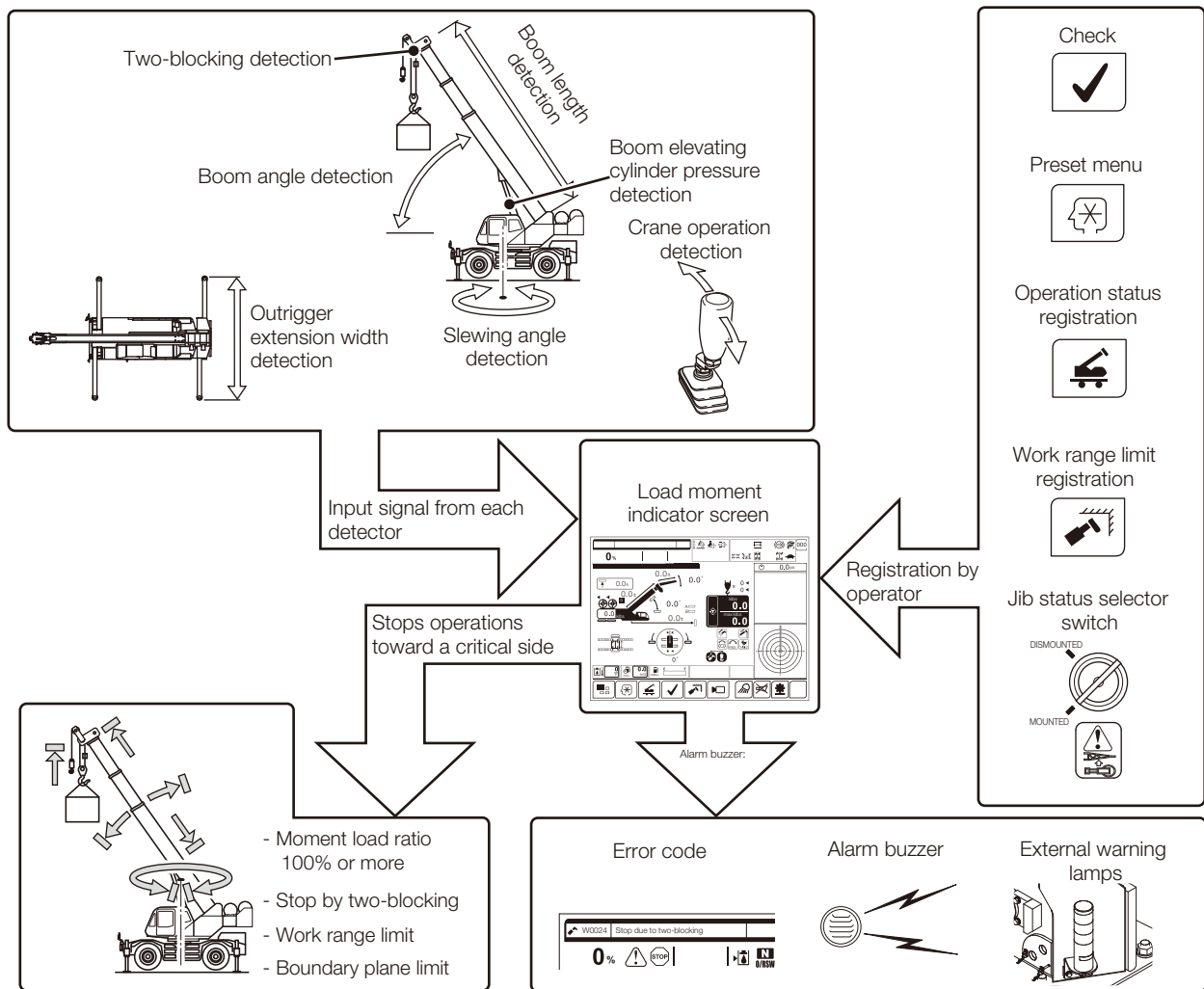
1 SAFETY DEVICES

Explanations on safety devices

(1) Load Moment Indicator (AML)

① Configuration

The Load Moment Indicator calculates the working moment and rated moment on the operation status registered by the operator and input signal from each detector and displays them on the display as moment load ratio. When the load ratio exceeds 100%, the Load Moment Indicator stops the crane operations toward the critical sides and warns with error codes and buzzer.



② Overload control

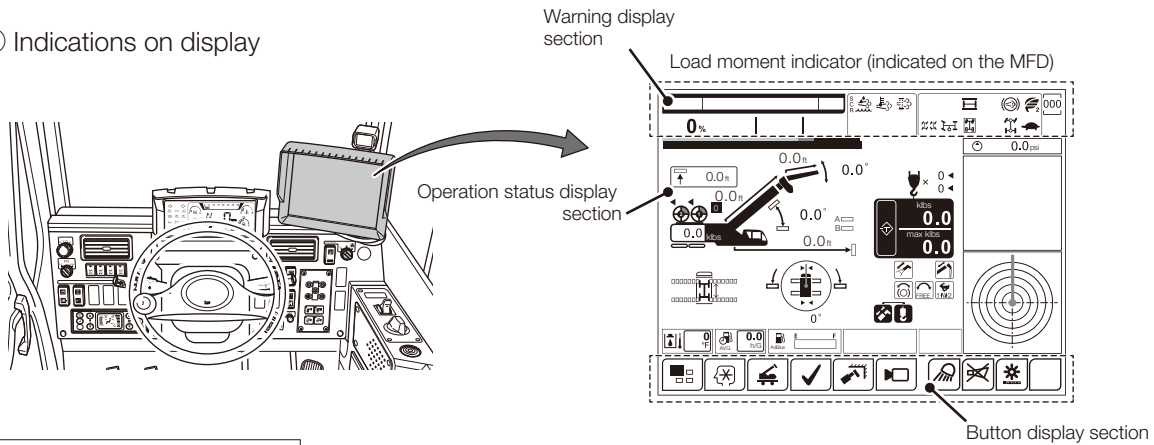
The Load Moment Indicator (AML) controls an overload status (with alarm or automatic stop) in reference to the moment load ratio (not the load value) in the three categories shown in the table below, interlocking with the AML external warning lamps. *Note that, in the regions where EN13000 is applied, the control is made in reference to the load application ratio.

Moment load ratio	Load Moment Indicator (AML) control (alarm or automatic stop)	AML external warning lamps (optional equipment)	Explanation
100% or more	- Automatic stop of an operation toward a critical side - Alarm buzzer (continuous sound)	Red lamp lights up.*	It is a critical status. Hoist down the winch, retract the boom, raise the boom, raise the jib, or slew the crane toward a safe side.
90% or more and less than 100%	- Alarm buzzer (intermittent sound)	Yellow lamp lights up.	It is not a critical status, but requires cautions.
Less than 90%	_____	Green lamp lights up.	It is a safe status with some extent of margin. Working in this range is recommended.

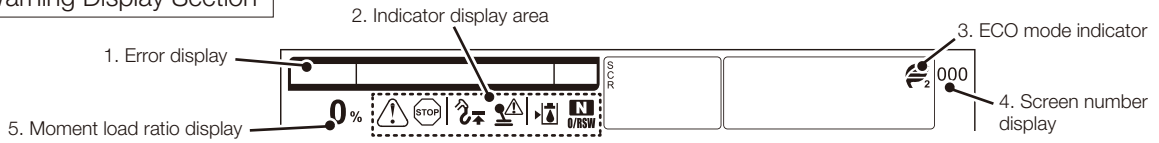
*The red lamp also lights up when the anti-two-block device is canceled, or the emergency operation switch is set to "Emergency".

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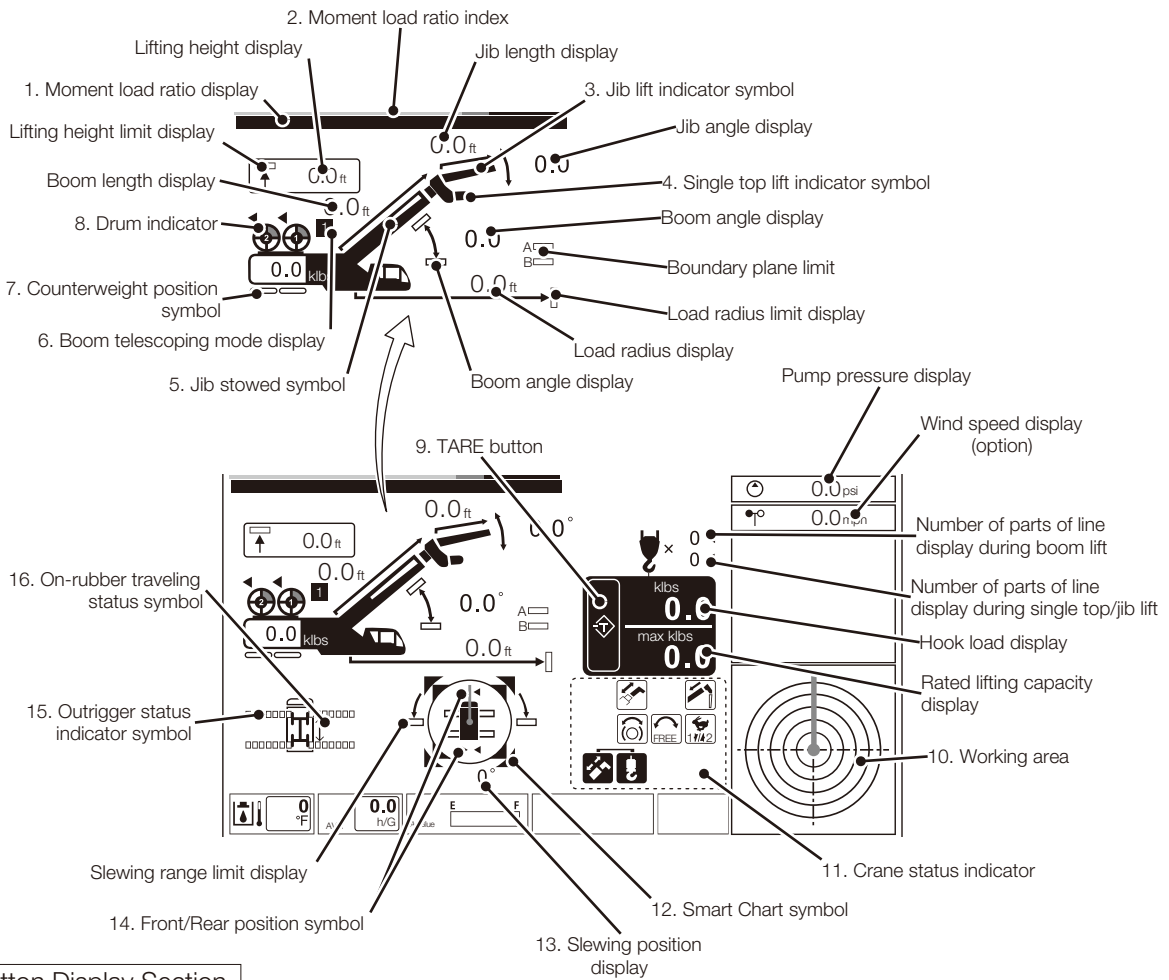
③ Indications on display



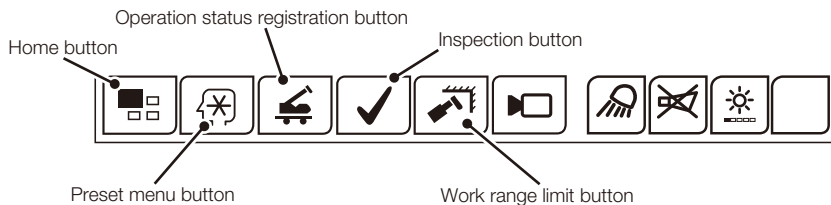
Warning Display Section



Operation Status Display Section



Button Display Section



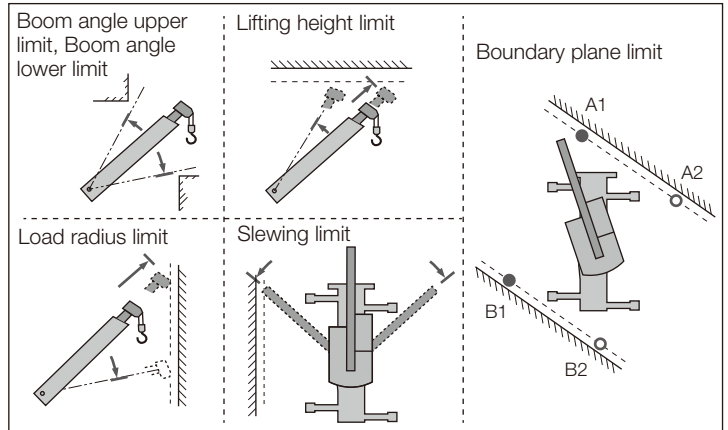
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(2) Work range limit function

The work range limit function restricts the operation of the crane to the pre-registered boom angle (upper and lower limits), lifting height, load radius, slewing angle (left and right), and boundary planes (inside the straight lines that pass through 2 points [A1 and A2] and other 2 points [B1 and B2]). Use this function when the machine is operated in a place where there are obstacles around, or when you want to restrict the work range of the boom.

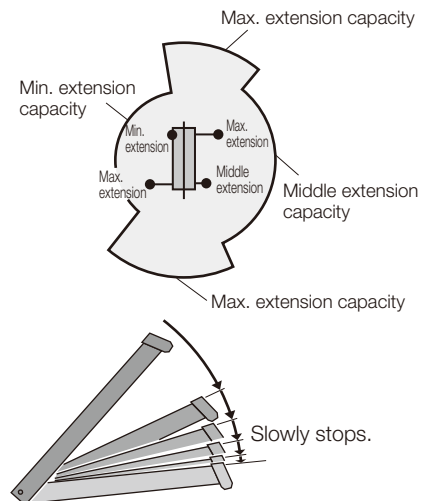
When the crane reaches the registered work range limit, the limit function works as follows.

Work range limit function	Condition
Boom angle upper limit	<ul style="list-style-type: none"> Crane stops automatically. MFD built-in buzzer sounds (Short beeps repeat for 5 seconds.)
Boom angle lower limit	
Lifting height limit	
Load radius limit	
Left slewing limit	
Right slewing limit	
Boundary plane limit	



(3) Slewing automatic stop device

In some case such as unavoidably setting different extension widths for the outriggers (front, rear, right, and left) because of a narrow site, the 360-degree capacity cannot be attained because the stability is greatly different depending on the position where the crane is slewed. When the crane is slewed from a position with a high rated lifting capacity to another position with a smaller rated lifting capacity, this function automatically stops slewing before an overload status is detected. This function also works when the slewing range limit position set by the work range limit device is reached.

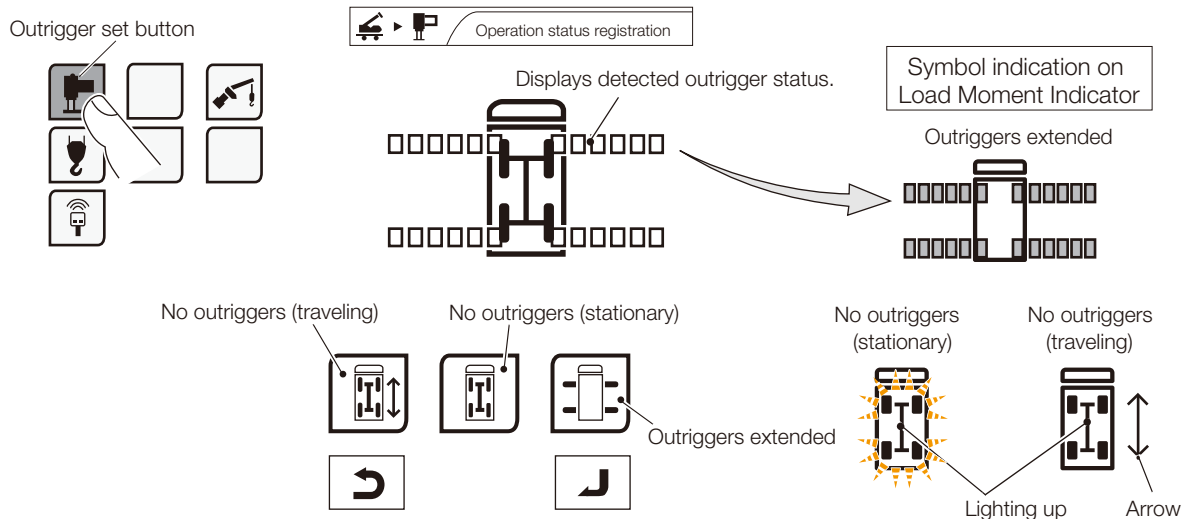


(4) Boom elevation slow stop function

When a boom elevating operation is stopped, this function controls swaying of the load by decreasing the boom elevating speed. This function works at automatic stop made by the Load Moment Indicator and at the stroke end of the boom elevating cylinder.

(5) Outrigger extension width detecting device

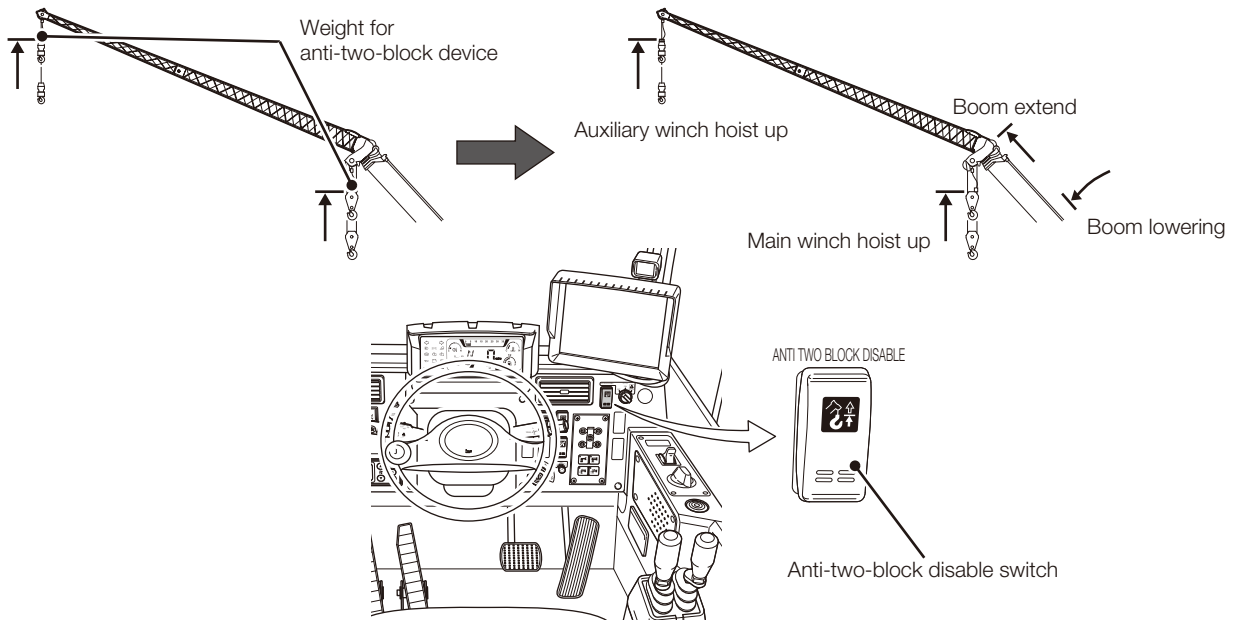
This device detects the outrigger extension widths and displays them on the Load Moment Indicator. The operator checks the displayed values with the actual outrigger extension widths, and when the values are matched, registers the outrigger status by pressing the SET key.



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(6) Anti-two-block Device

This device prevents the hook block from colliding with the boom, jib, or single top as a result of winch overwinding. If the hook block touches the weight for anti-two-block device (a two-blocking status), operations toward the critical side stop.



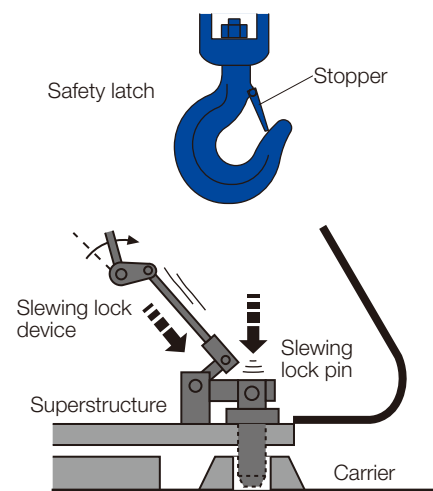
(7) Safety latch

This prevents the rigging wire rope from slipping off from the hook.

(8) Slewing lock device

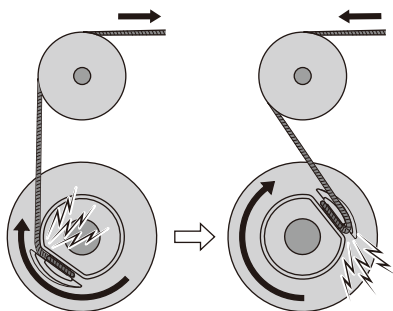
This device fixes the superstructure onto the carrier with the slewing lock pin to prevent the superstructure from slewing. This device is used at the end of work, during traveling on a road and in a work site. For some cranes, this is used during the boom, superstructure, or counterweight dismount or mount work.

There are two types of the lock devices; one can fix the superstructure in any direction of 360°, and the other can fix it only in some specified directions such as over front.

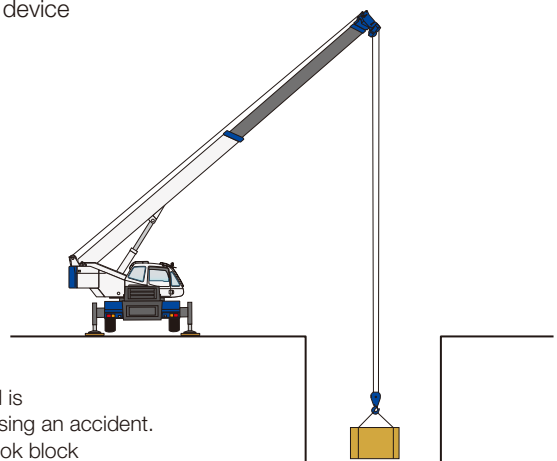


(9) Over-unwinding cutout device

This device prevents the wire rope from being damaged or disorderly wound due to excessive hoisting down of the hook block. When the wire rope remaining on the winch drum reaches approximately three turns, this device automatically stops the hoist-down operation of the winch.



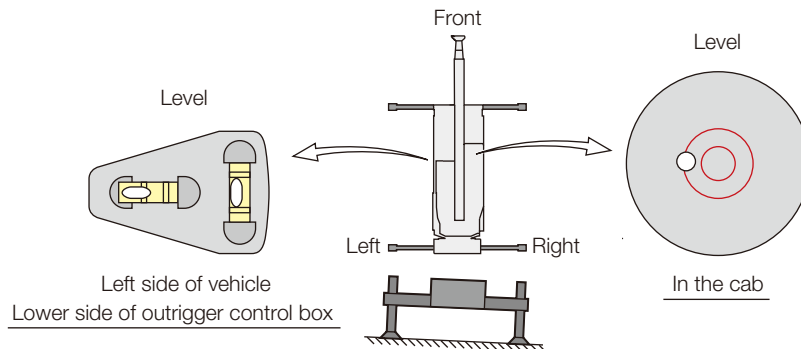
When the wire rope has been entirely unwound from the winch drum, a load is applied to the wire rope end section, and the wire rope may be broken, causing an accident. In addition, the wire rope may be wound in the reverse direction, and the hook block may be hoisted up during a hoist-down operation of the winch, causing an accident.



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(10) Level

Place the crane horizontally so that the bubble in each level will stay in the range between the reference lines (circles).

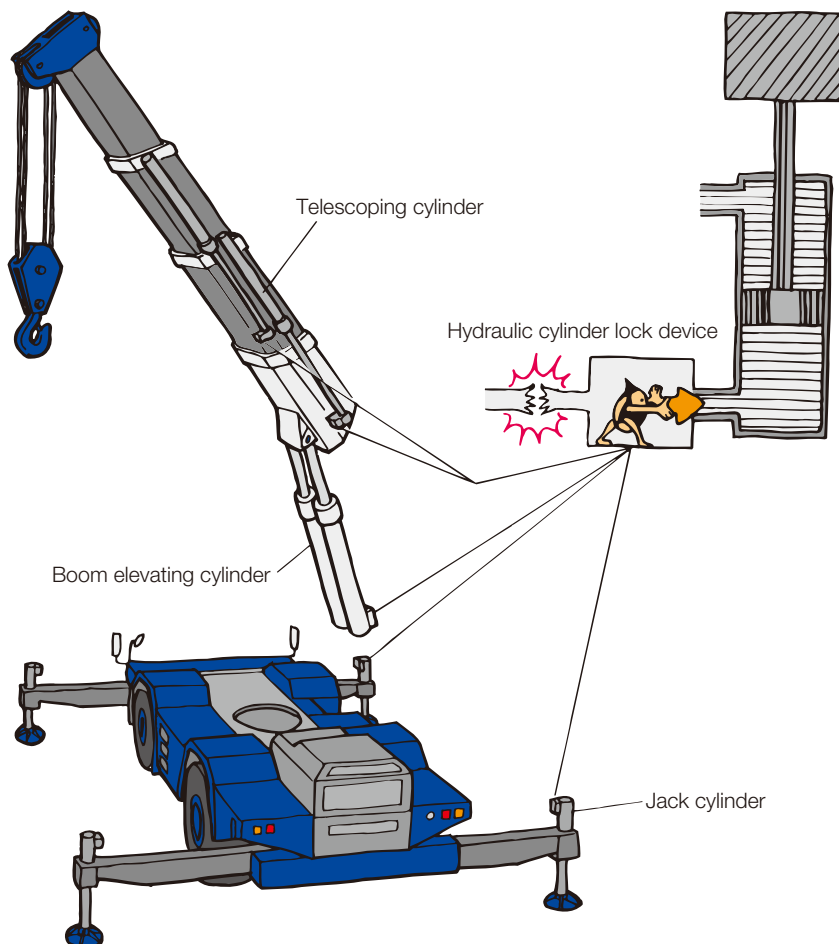


(11) Hydraulic safety valve

When the hydraulic oil continuously discharged from the hydraulic pump can no longer be flown out anywhere, the oil pressure will be extremely high, destroying the hydraulic circuit. When the specified pressure is exceeded, the hydraulic safety valve is responsible for releasing the hydraulic oil in the hydraulic circuit to the tank.

(12) Hydraulic cylinder lock device

If any pipe or hose of the hydraulic cylinders is damaged, the hydraulic oil will leak from there, retracting or extending the corresponding cylinder. This may cause a serious accident. As a countermeasure, hydraulic lock devices such as the counter balance valve and pilot check valve are installed to the boom elevating cylinders, boom telescoping cylinders, and jack cylinders to prevent the cylinders from being retracted or extended in an emergency case.





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