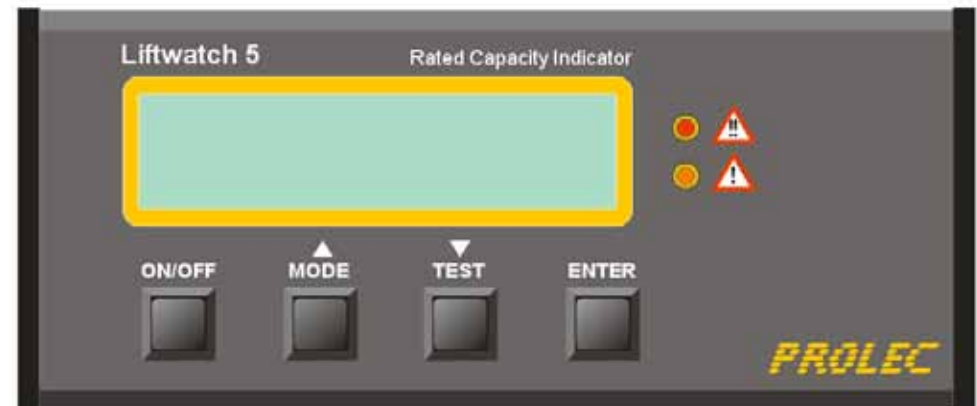




Liftwatch 5 Rated Capacity Indicator Operator Manual



This guide describes operation of the
PROLEC LIFTWATCH 5 RATED CAPACITY INDICATOR HYDRAULIC EXCAVATORS

Model covered : MODEL Ref LW5 Mk1 Material Handling option
PART No. ?

Prolec supports a nationwide network of fully trained service engineers. Warranty claims, service work, technical information and spare parts are available by contacting :

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DURING NORMAL OPERATION THE SWL OF A CRANE SHOULD NOT BE EXCEEDED. THEREFORE THE WARNING OF OVERLOAD SHOULD NOT BE USED AS A NORMAL OPERATING FACILITY. IT SHOULD BE NOTED THAT CERTAIN STATUTORY REQUIREMENTS DO NOT PERMIT THE SAFE WORKING LOAD TO BE EXCEEDED EXCEPT FOR THE PURPOSE OF TESTING.

THIS RCI IS NOT SUITABLE FOR USE IN EXPLOSIVE ATMOSPHERES. ADJUSTMENT BY UNAUTHORISED PERSONS WILL INVALIDATE ANY WARRANTY OR CERTIFICATION SUPPLIED. IF A PROBLEM ARISES WHICH CANNOT BE RECTIFIED USING THIS GUIDE, AUTHORISED SERVICE SHOULD BE SOUGHT.

THIS DEVICE IS CERTIFIED TO MEET CURRENT UK & EC SAFETY REGULATIONS FOR EXCAVATORS USED AS CRANES.

Any alterations or modifications to machine components which affect this system and any system component failure must be reported to Prolec Ltd or via the machine convertor/service agreement holder. This manual must be kept with the product and be passed on to any subsequent user of the product.

Manufacturers original instructions.

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1 Power up

The Liftwatch 5 Rated Capacity Indicator can be configured during installation to operate in one of two ways.

Automatic

If the auto-on link has been fitted to the display PCB, Liftwatch 5 will automatically power up when the machine ignition is switched on.

Manual

If the LCD display remains blank after the machine ignition is switched on, press the ON/OFF button once (circled in red below).



Once powered, Liftwatch 5 will perform an initialising process and system self test. If these processes are successful, normal operation will commence. If a problem is detected, the system will fail to safe and all machine hydraulics will be disabled. The following page describes possible failure states.

1 Power up (continued)



ANG1 no response :

This message indicates the combined boom angle and dual pressure transducer CAN bus sensor is not operating correctly. The error message and 'press [any] key' message will alternate. Press any key to continue.

ANG2 no response :

This message indicates the arm angle CAN bus sensor is not operating correctly. .

COMB no response :

This message indicates the combined input/output CAN bus controller is not operating correctly. .

The unit will now display one or more of the messages shown below. Both the internal and external alarms will operate and the red LED will illuminate.

Boom/Press sense
failed !

Arm angle sensor
failed !

Combi box
failed !

2 Operation - general

Radius

Distance in metres from the slew centre line to the lifting point.

SWL*

Maximum safe working load in tonnes for the active lifting duty. The load is assumed to be suspended vertically below the lifting point. The preceding **H** indicates that the maximum safe load is limited by hydraulic capacity, not stability.

Lifting duty

Active lifting duty. Most machine will have a single lifting duty—normally 360° operation. Duty switching, when available, can be either manually controlled or sensed automatically.

Status LED's

These indicate system states and are discussed in the following pages.



Bar Graph

This indicates the lifting capacity currently being utilised.

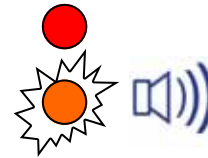
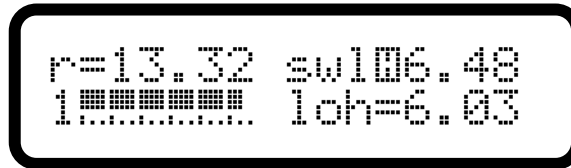
LOH

Load on hook. This is the weight of the currently suspended load in tonnes.

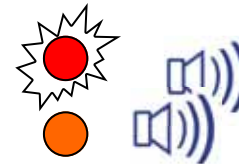
* Any non-permanent attachment (e.g. grab, spreader beam etc) and all lifting accessories (slings & chains etc) are deemed to be part of the suspended load.

2 Operation - overload

Approach to maximum safe working load



When the suspended load constitutes more than 95% of the maximum permissible safe working load the amber LED will illuminate and the internal alarm will sound.



When the suspended load exceeds the maximum permissible safe working load by more than 5% the red LED will illuminate, the internal and external alarms will sound, and all equipment motions that would decrease the SWL further will be disabled. Dangerous equipment motions are those that either raise the load further, or increase the load radius. Examples for a monoboom machine are shown on the following page.

2 Operation - motion control



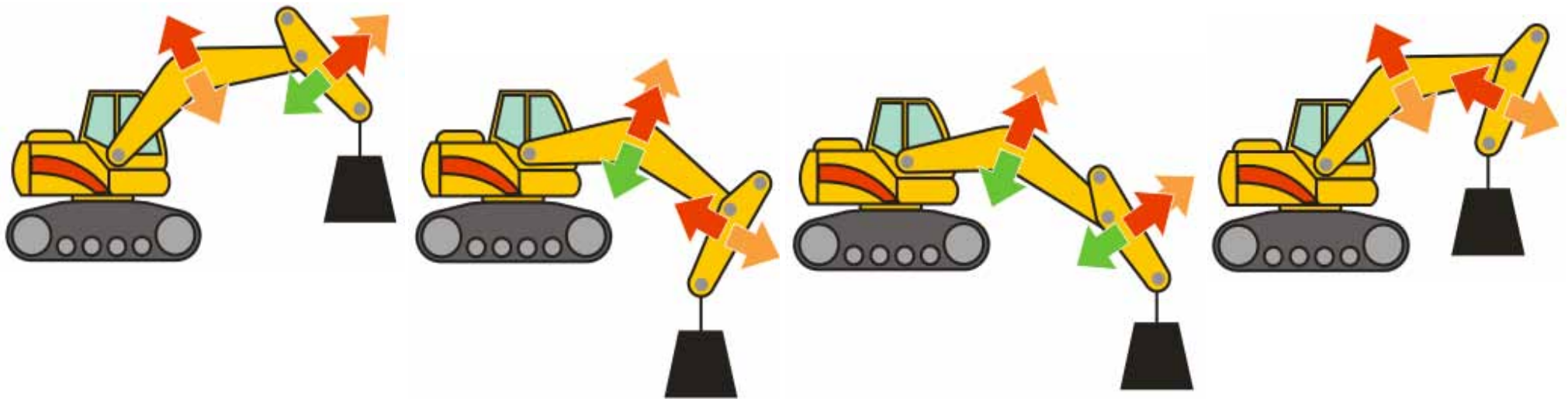
A green arrow indicates that the SWL will be increased if that section of the equipment is moved in the direction of the arrow



An amber arrow indicates that the SWL will decrease (as the radius increases) if the equipment is moved in that direction.



A red arrow indicates that the load will be RAISED if the equipment is moved in that direction.

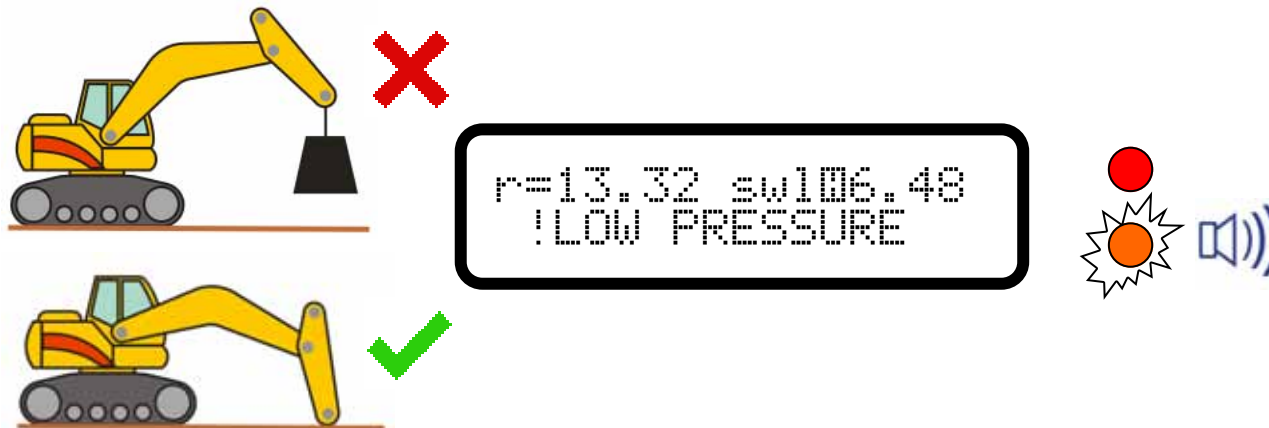


2 Operation - override



When the system is in a overload condition certain equipment motions will be disabled. Condition No 4 shown on the previous page has all motions disabled. To allow the machine to be moved to a safe position the motion control can be cancelled. To override the system press the MODE button. The red LED and the internal and external alarms will still operate, but hydraulic control will be released. The system will automatically cancel the override function when the machine reaches a safe position.

2 Operation - low pressure



The measurement of hydraulic oil pressure in the boom lift cylinder is crucial to the operation of the RCI. In the event of low pressure being detected the message shown here will appear, the amber LED will illuminate, and the internal alarm will sound.

This condition can be ignored if the equipment is resting on the ground as low pressure under this circumstance is normal.

3 System test

If there is a suspected fault with the Liftwatch 5 system, basic diagnostics are available via the TEST button. The test function can be accessed at any time other than when in an overload condition.

Press TEST to access this feature. Press TEST again to scroll through the available displays. Press MODE at any time to exit back to normal operation.

A brief description of each display is given on the right.

Software version number (1.08). This number should be quoted in any communication with Prolec or their appointed agents.

```
LW5 (1.08) TEST  
[TEST] to cycle
```

Programmed boom length. This is the boom pivot pin to arm pivot pin straight line distance in metres. Equipment lengths can only be altered by Prolec or their appointed agents.

```
Boom len = 9.70  
EST] to cycle
```

Programmed arm length. This is the arm pivot pin to lifting tool pin straight line distance in metres. Equipment lengths can only be altered by Prolec or their appointed agents.

```
Arm len = 7.80  
T] to cycle [
```

When this display is shown the cab roof mounted rotating beacon should operate (if fitted).

```
Beacon ON check  
to cycle [MO
```

When this display is shown the external alarm should operate.

```
Alarm ON check  
o cycle [MODE
```

When this display is shown the internal alarm should operate.

```
Buzzer ON check  
cycle [MODE]
```

When this display is shown the display amber LED should operate.

```
Amber LED check  
cle [MODE] to
```

3 System test (continued)

When this display is shown the display red LED should operate.

```
RED LED check  
e [MODE] to e
```

Pressure is shown in bars. The pressure should increase with additional load, or increased load radius. Pressure should fall to zero when the equipment rests on the ground.

```
Pressure = 234.6  
[MODE] to exit
```

Boom angle is shown in degrees. When a line between the boom pivot pin and the arm pivot pin is horizontal, this should show 0°. The angle will increase as the boom is raised.

```
Boom ang = 37°  
[MODE] to exit
```

Arm angle is shown in degrees. When a line between the arm pivot pin and the lifting tool pin is vertical, this should show 90°. The angle will decrease as the arm is moved outwards.

```
Arm ang = 55°  
[MODE] to exit
```

This display shows the time and date when the system was initially commissioned.

```
14:46 23/10/12  
[MODE] to exit [
```

4 Load charts

Machine Type		Equipment	12.50m + 10.00m
Issue Date	31/10/2012	Serial No.	
FIRST of CLASS	N/A	Safety Factor	75%

RADIUS

	0.00	1.50	3.00	4.50	6.00	7.50	9.00	10.50	12.00	13.50	15.00	16.50	18.00	19.50	21.00	22.50
21.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.50	-	-	-	-	-	-	-	-	-	5.97a	-	-	-	-	-	-
18.00	-	-	-	-	-	-	-	-	-	7.22a	5.83a	-	-	-	-	-
16.50	-	-	-	-	-	-	-	-	-	7.70b	7.03a	5.44a	-	-	-	-
15.00	-	-	-	-	-	-	-	-	-	7.72b	7.26b	6.64a	-	-	-	-
13.50	-	-	-	-	-	-	-	-	-	7.81b	7.32b	6.88b	5.93a	-	-	-
12.00	-	-	-	-	-	-	-	-	8.83b	7.96b	7.43b	6.96b	6.57b	-	-	-
10.50	-	-	-	-	-	-	-	-	8.93b	8.20b	7.58b	7.07b	6.63b	5.74a	-	-
9.00	-	-	-	-	-	-	-	10.37b	9.31b	8.47b	7.78b	7.21b	6.72b	6.30b	-	-
7.50	-	-	-	-	-	14.91b	12.62b	10.98b	9.74b	8.78b	8.00b	7.36b	6.83b	6.36b	-	-
6.00	-	-	-	29.14b	20.88b	16.38b	13.56b	11.61b	10.19b	9.10b	8.23b	7.53b	6.94b	6.43b	-	-
4.50	-	-	-	6.86a	21.35a	17.78b	14.46b	12.23b	10.62b	9.40b	8.45b	7.68b	7.04b	6.48b	-	-
3.00	-	-	-	4.16a	9.39a	18.87b	15.22b	12.76b	11.00b	9.68b	8.65b	7.81b	7.12b	6.52b	-	-
1.50	-	-	2.28a	3.97a	7.10a	13.13a	15.74b	13.15b	11.29b	9.89b	8.79b	7.91b	7.16b	6.51b	-	-
0.00	-	-	-	4.33a	6.57a	10.55a	15.99b	13.38b	11.47b	10.02b	8.87b	7.94b	7.16b	6.46b	-	-
-1.50	-	-	-	4.83a	6.60a	9.83a	15.36a	13.40b	11.50b	10.03b	8.88b	7.90b	7.08b	6.32b	-	-
-3.00	-	-	-	5.34a	6.95a	9.37a	13.90a	13.21b	11.37b	9.92b	8.74b	7.78b	6.89b	-	-	-
-4.50	-	-	-	-	7.18a	9.41a	13.34a	12.79b	11.04b	9.83b	8.47b	7.47b	6.58b	-	-	-
-6.00	-	-	-	-	-	8.64a	13.28a	12.09b	10.48b	9.16b	8.02b	7.00b	6.02b	-	-	-
-7.50	-	-	-	-	-	-	-	11.08b	9.85b	8.41b	7.30b	-	-	-	-	-
-9.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Each Liftwatch 5 system will have one or more load charts similar to the **EXAMPLE** above. Maximum safe working loads are given in tonnes at suitable height and radius increments. Radius is given in metres and is the distance from the slew centre line to the lifting tool pin. Height is given in metres and is from ground level to the lifting tool pin. If a particular load is limited by hydraulic capacity rather than stability, it will have a letter appended. **b** = limited by boom cylinder hydraulics, **a** = limited by arm cylinder hydraulics.

The machine is assumed to be positioned on firm and level ground.



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