

This guide describes operation of the

PROLEC PME LIFTING AND MACHINE ENVELOPE SAFETY SYSTEM FOR CONSTRUCTION PLANT

Model covered :	PART No.	MODEL Ref
	562070-101	PME700

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 SAFE WORKING LOAD 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 RATED CAPACITY INDICATOR / CONTROLLER (RCI, RCC) 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 LIFTING OPERATIONS.

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.

Whilst every effort has been made to ensure the accuracy of the information supplied in this manual, Prolec Ltd cannot be held responsible for any errors or omissions.

Manufacturers original instructions.

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1 Use of this Document

This user guide is intended for persons familiar with the use of demolition equipment.



WARNING denotes information about particular risks which may be generated by certain applications, by using certain fittings, and about additional protective measures which are necessary for such applications.

Caution, care, risk situation



HAZARD Actions that can lead to serious injury or death

2 Notices



Adjustment by unauthorised persons will invalidate any warranty or certification supplied. If an error condition is displayed which cannot be rectified using this guide, halt any operation, seek authorised service immediately and do not continue operation until the fault has been remedied.

3 Operating Instructions

3.1 Power Up

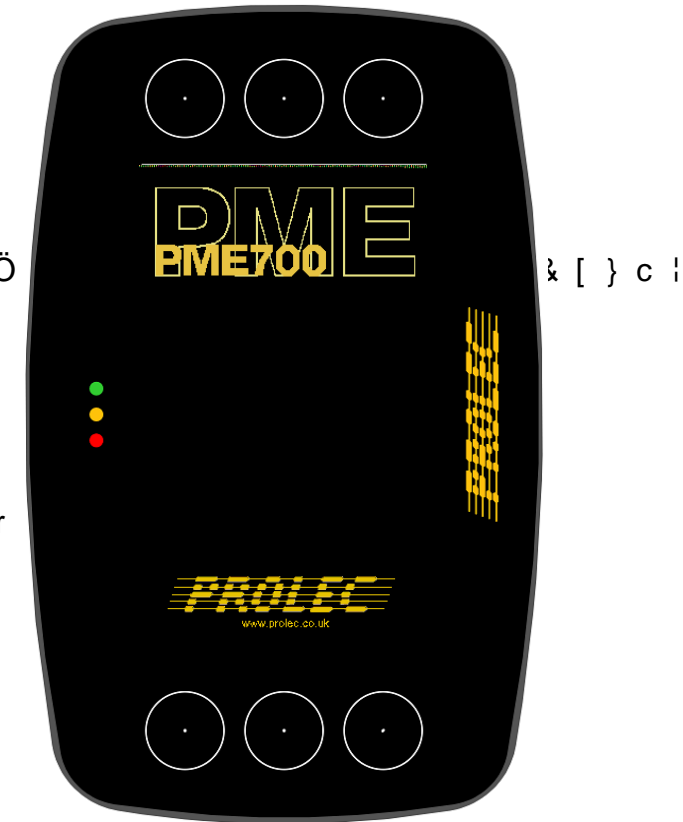
The PME system automatically powers up when the machines ignition is switched on. The in-cab display is located on the top and bottom side. Three status LEDs and an internal alarm provide further information.

The system will perform a self check at start up:

1. All LEDs will flash, the internal display alarm and the external alarm will sound.
2. The RED LED will light indicating the system is starting and performing a self test.
3. Once the self test is complete, the GREEN LED will light and the system will become active. A safety warning message is displayed, please read and proceed only if you are fully familiar with your PME system. Lifting Mode is activated by pressing any key and any previous limits set will be enabled. The system is now ready for use.
4. The system can be configured to require a user login - if this is enabled, see section 5.5.



If the RED LED remains lit, a fault has been detected, halt any operation, seek authorised service immediately and do not continue operation until the fault has been remedied.

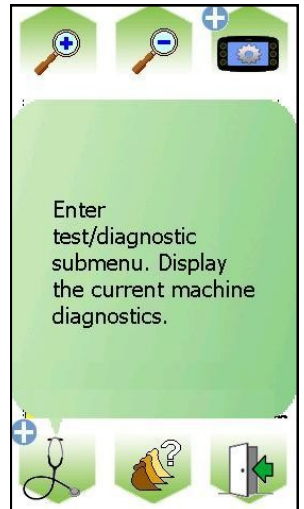
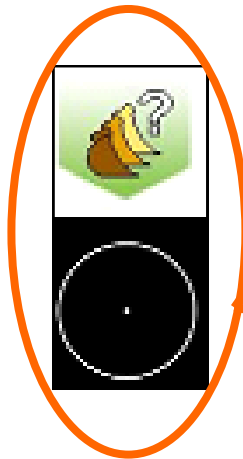


The display is secured to the machine using a flexible ball mounting allowing easy adjustment for personal viewing preference.

3.2 Using the Display

The display is operated by using the buttons adjacent to a function icon. The buttons can open a sub menu, turn a function ON or OFF, set a value, toggle through multiple screens, no one button has a single function. The button icon will turn black/purple when the button has been activated. Note that the image of the machine is fixed and does not follow the movement of the machine.

Multifunction buttons:
The action of the button is indicated by the adjacent icon.



A secondary symbol can appear in the top left corner of an icon, these mean :
The plus symbol indicates a sub menu will be opened if selected.

The cycle symbol indicates that multiple features are available.

The on / off symbols indicate if a feature is ON or OFF. Red is ON and grey is OFF.

Help is available for each button. To access the help, push and hold the button for three seconds. The help message can be cleared by pressing any of the six buttons. PME is still active when displaying help messages, if the Lifting Mode is active and or a height limit is set, any alarm or warning condition will be indicated.

3.3 User Login

If PME has been configured to work with the built-in user list, the system will prompt for a user login pass code. Select the user name required and the login code screen will appear.

Cancel without change

Moves highlighter to left / Hold to delete number

Moves highlighter to right / Hold to delete digit

Accept displayed value

Increases highlighted digit

Decreases highlighted digit

Use the up and down arrow buttons to increase or decrease the value of the currently selected digit.
 Use the left and right arrow buttons to select an adjacent digit.
 Press and hold the left arrow button to delete the currently selected digit.
 Press the tick button to proceed or the cross button to cancel.

Using the arrow buttons to enter a valid pass code. The previous number will be replaced with a star as the code is entered. Press the TICK button to confirm the login pass code. If a valid pass code is entered the system will commence normal operation.

Moves highlighter UP

Select highlighted name, opens Enter Login Code screen below

Moves highlighter DOWN

Exit to enter calibration area

Select User

Fred Smith [OPERATOR]
 Steve Higgins [OPERATOR]
 Artie Tate [OPERATOR]

Warning

Login Code not recognised.

If an incorrect login code is entered, a failure screen will be displayed. Press the TICK button to return to the Select User screen.

3.4 User Logout

If a user is logged in as the current user, they can select the logout screen by holding an exit key down for three seconds.

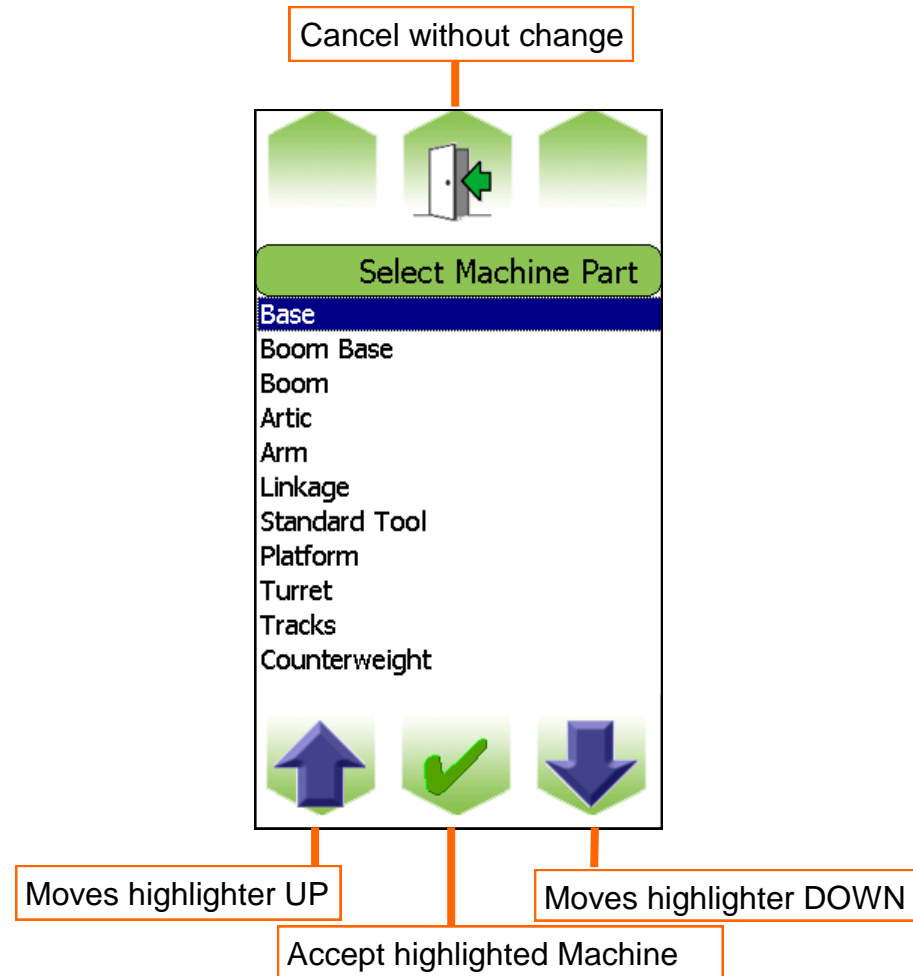


Once logout has been confirmed the login screen will be automatically displayed.

Press the CROSS button to stay logged in, the screen will return to that previously shown.

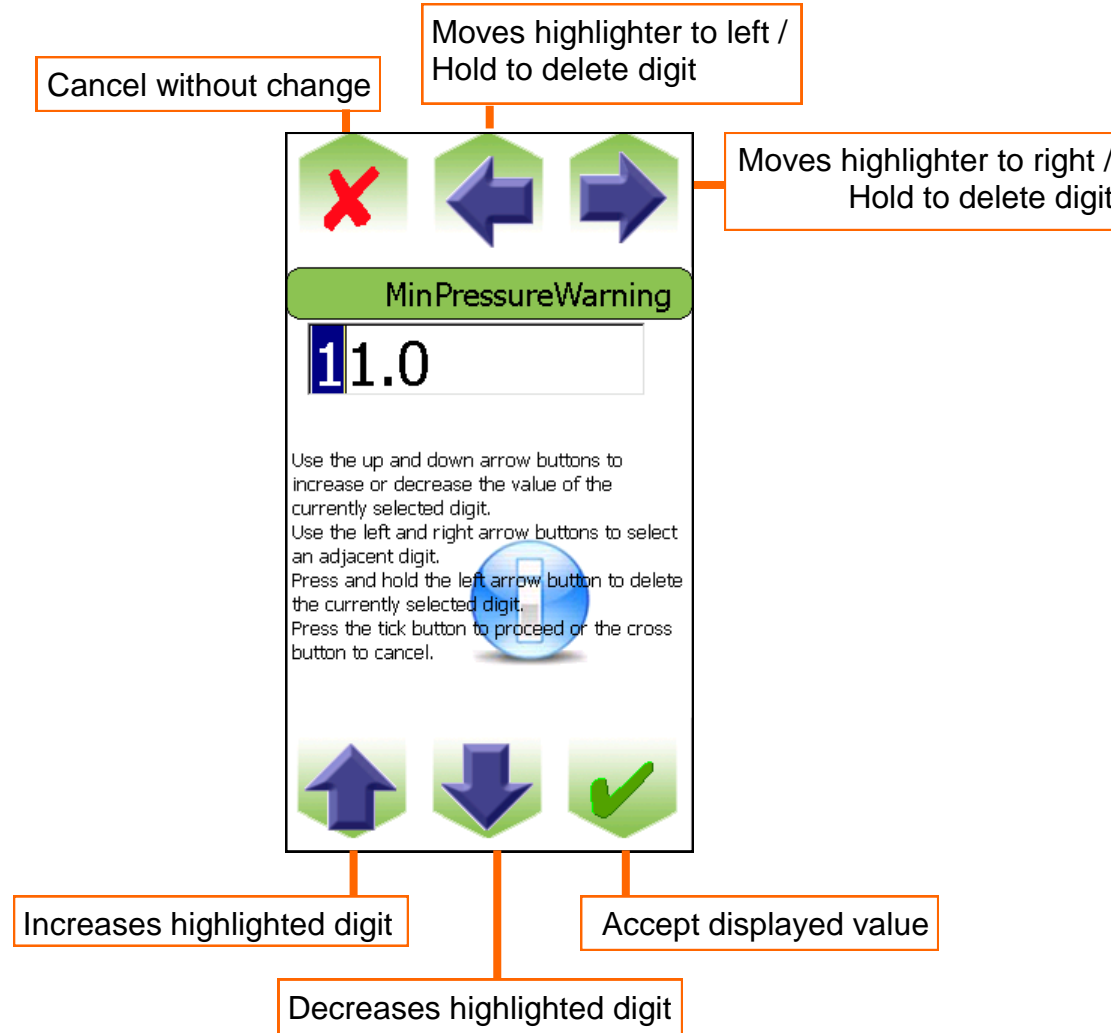
3.5 Selecting from a list using the Arrow Buttons

To make a selection from a list such as Users, Machine Parts (shown here), use the UP and DOWN buttons to move the highlighter up and down. Press the TICK button to select the highlighted entry. Press the CROSS button to exit without making a change.



3.6 Editing Values using the Arrow Buttons

Editing values such as login codes (or eg: Minimum pressure warning) can easily be achieved using the number editor screen. The digit highlighted in blue is increased or decreased between 0 and 9 by pressing the UP and DOWN buttons - use the LEFT and RIGHT buttons to move the highlighter to the left and to the right. Press the tick button to apply the value displayed.

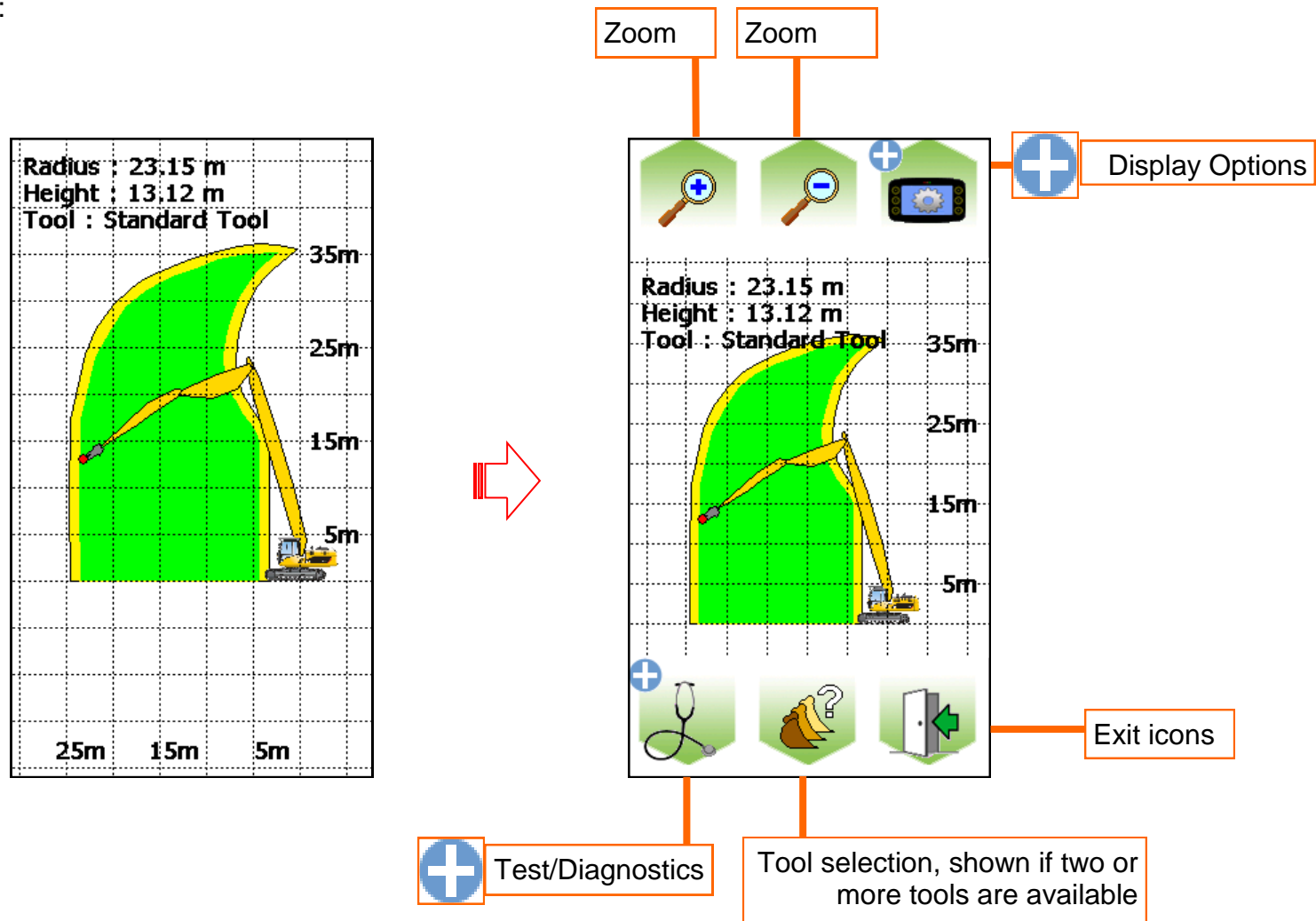


4 Top Menu

The Top Menu screen allows access to all the system functions. To reveal the icons, if hidden, press any button. To return to the Top Menu from a sub menu press the EXIT button until the Top Menu is displayed. To hide the icons when at the Top Menu, press the EXIT button once more.

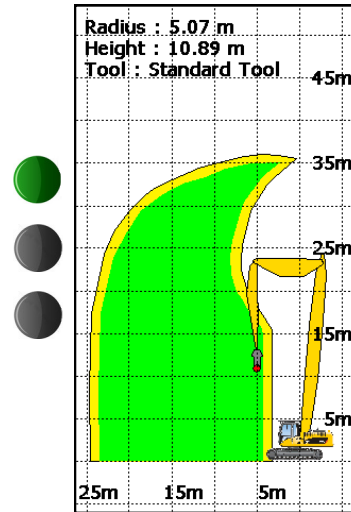
Top Menu button functions:

- < Zoom In
- < Zoom Out
- < Display Options
- < Test / Diagnostics
- < Tool Selection
- < Hide icons



4.1 Operation within the Safe Working Envelope

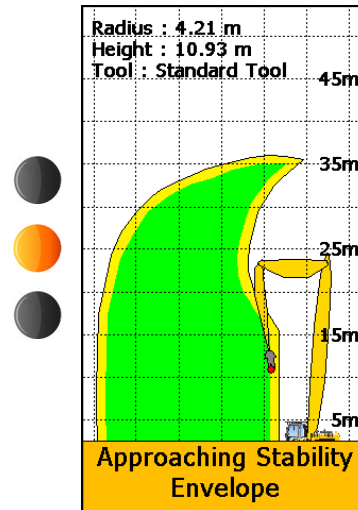
When the tool point is within green region of the envelope that means the machine is operating in the safe working region of the envelope as shown below.



If the tool is within the stability envelope:
◁ The green LED will be lit

4.2 Approach to Stability Envelope

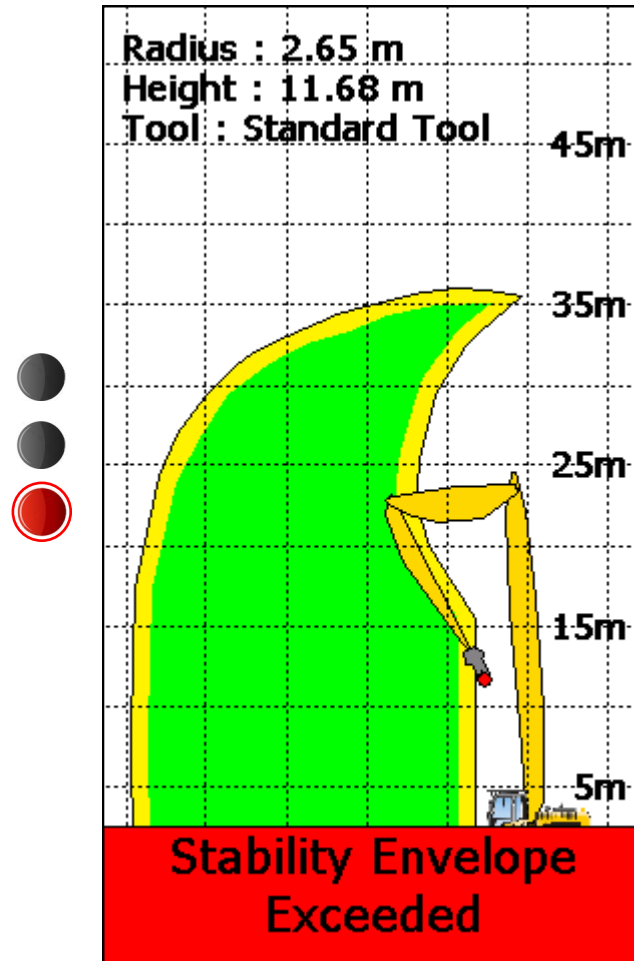
When the tool point is in the yellow region of the envelope, it means that the machine is approaching the stability envelope.



If the tool is approaching the stability envelope:
◁ The amber LED will be lit
◁ The internal alarm will sound
◁ The message shown here will be displayed.

4.3 Stability Envelope Exceeded

When the tool is moved beyond the approach region, this indicates that the machine has exceeded beyond the stability envelope

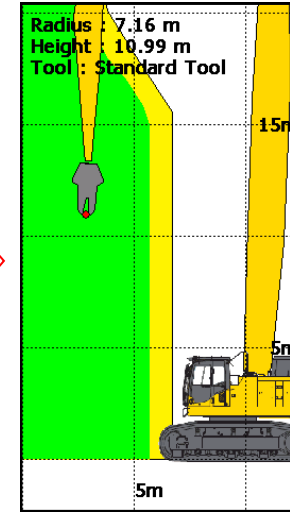
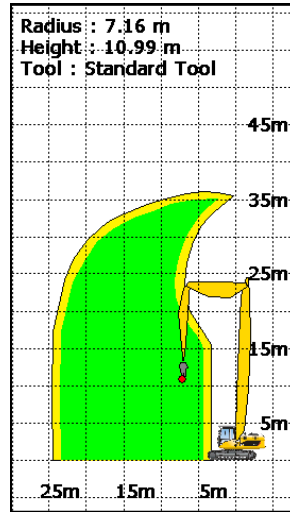


- the stability envelope:
- < The red LED will flash
 - < The internal and external alarm will sound
 - < The message shown here will be displayed

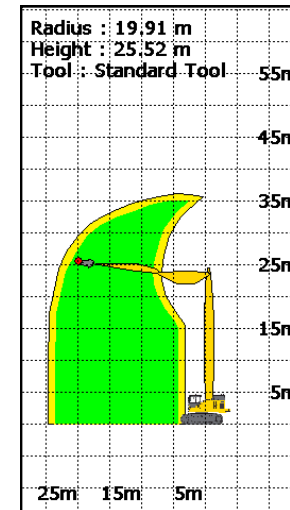
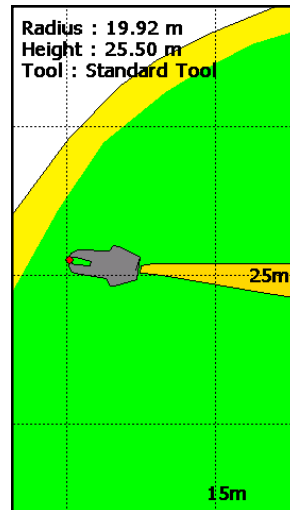
4.4 Zooming In and Out



The Zoom In button allows you to Zoom into the Stability envelope.



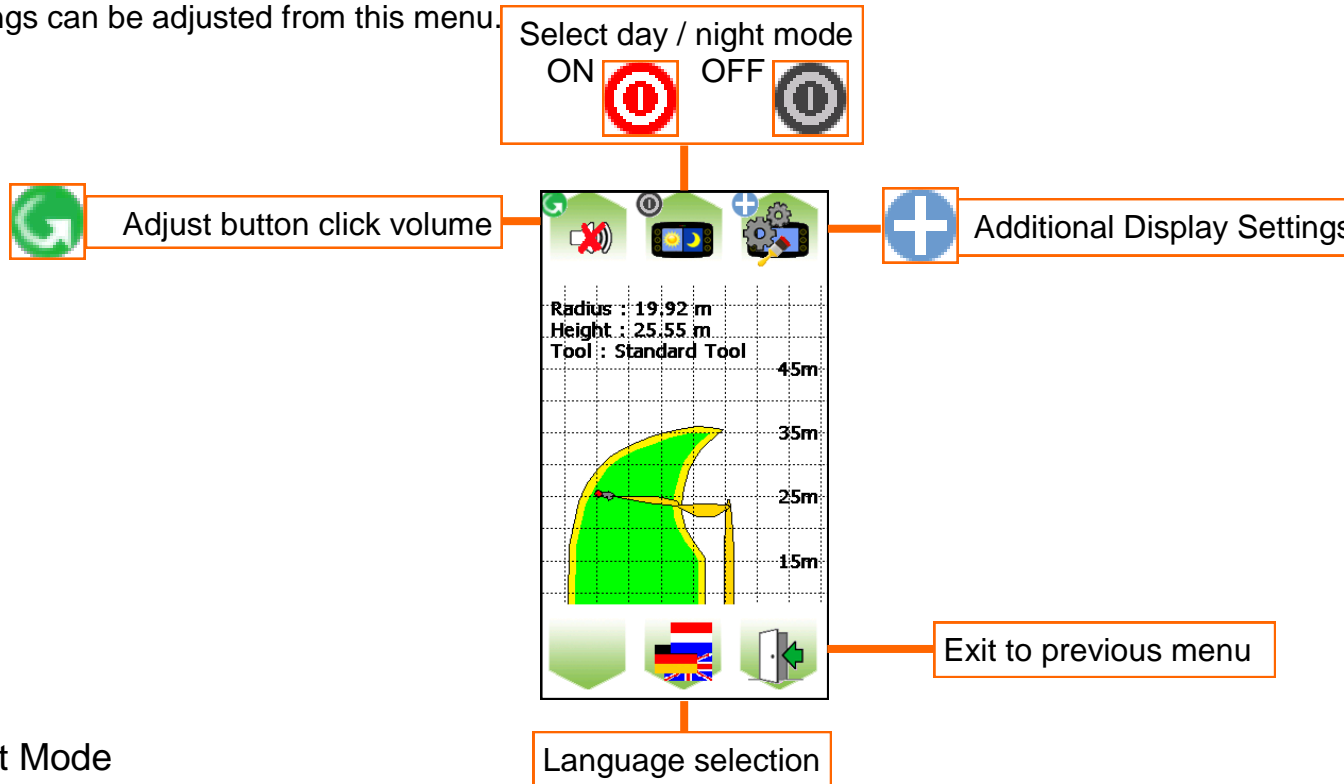
The Zoom Out button allows you to Zoom out of the Stability envelope.



5 Display Options



The Display Options button shows the display brightness, button click volume, language and the additional display settings can be adjusted from this menu.



5.1 Day / Night Mode



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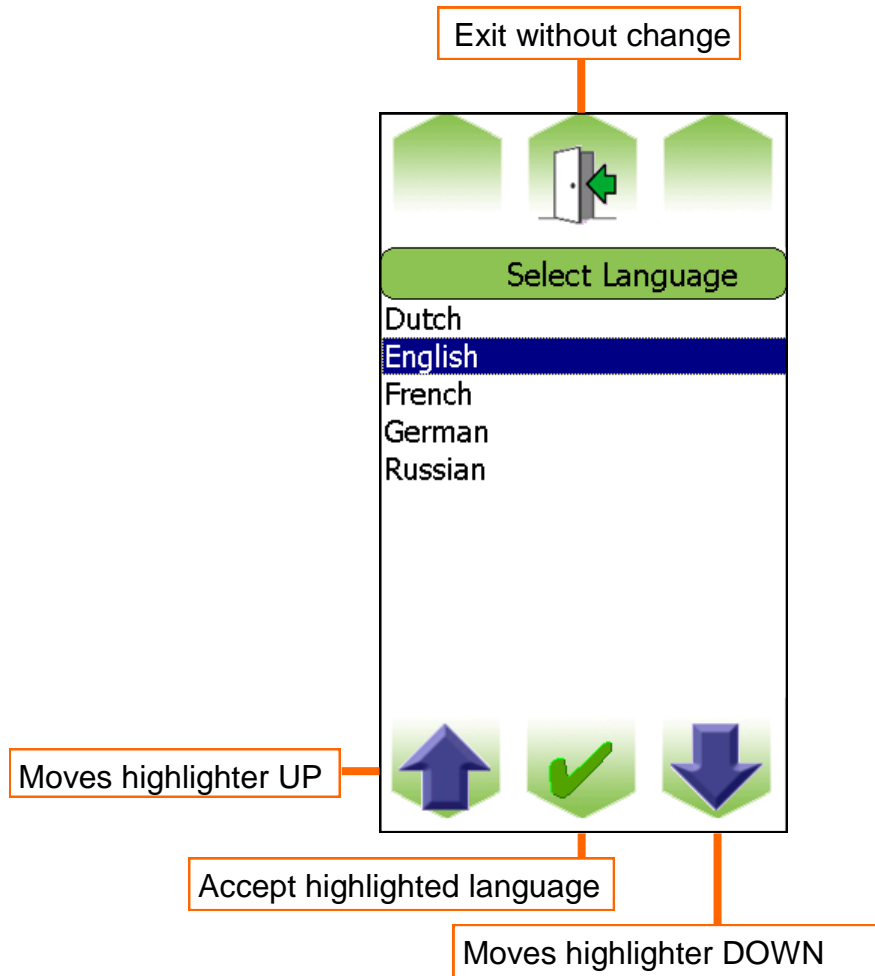
Select day / night mode:

Day mode ON Full display brightness		Night mode ON Reduced display brightness	
--	--	---	--

5.2 Select Language



An appropriate language for the operator can be selected from this list.



5.3 Additional Display Settings

This submenu display some more additional display settings like Change machine colour, Change background, Auto-zoom On/Off, Tool Lock On/Off and Working proximity Indicator On/Off.



Change background colour

Select machine colour / type

Radius : 19.92 m
Height : 25.55 m
Tool : Standard Tool

45m
35m
25m
15m

Select Tool Lock
ON OFF

Working Proximity Indicator
ON OFF

Select Auto Zoom
ON OFF

Exit without change

Select Auto Zoom
ON OFF



Select Tool Lock
ON OFF



Working Proximity Indicator

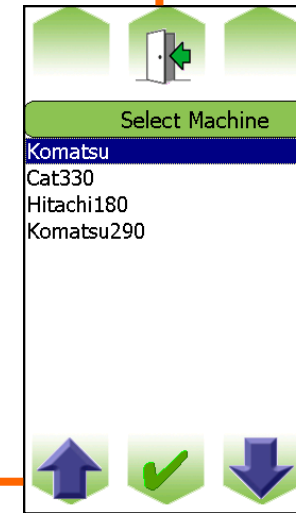


5.4 Select Machine Type



An appropriate machine type for the display can be selected from this list.

Exit without change



Moves highlighter UP

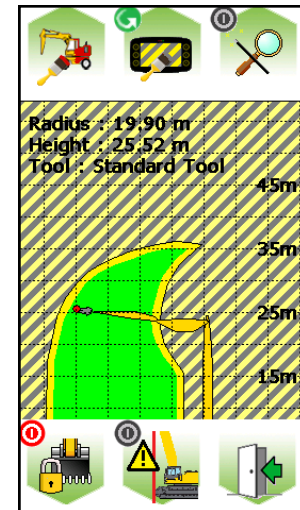
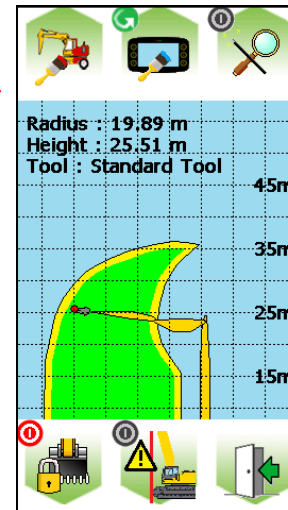
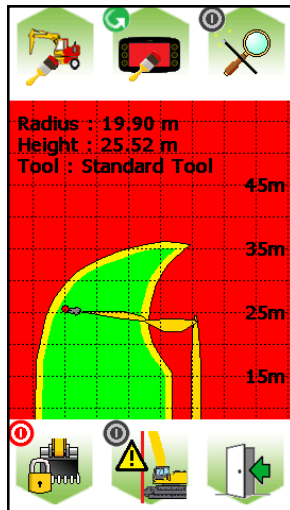
Moves highlighter DOWN

Accept highlighted machine

5.5 Change background colour



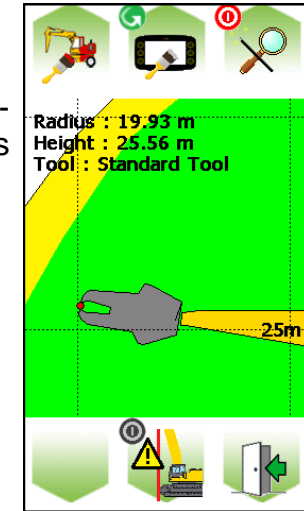
Change the background colour of the envelope.



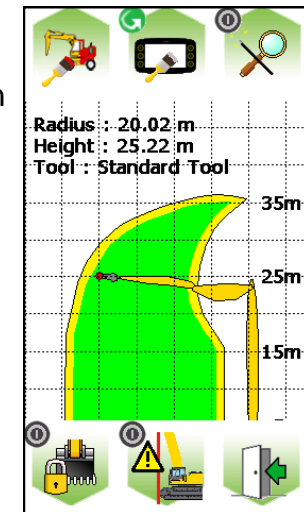
5.6 Auto Zoom



When the Auto Zoom function is switched on, it automatically moves the camera along with the tool point position and zooms in when the tool pin approaches the stability envelope. Please note when the auto zoom function is on, the Tool Lock button disappears.



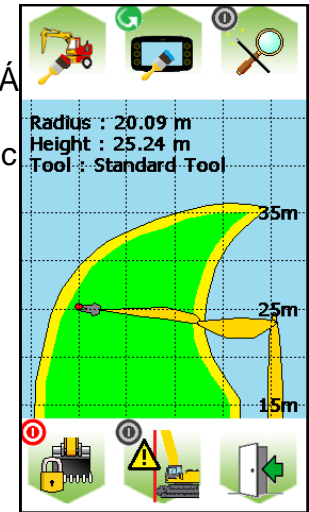
When the Auto Zoom function is switched off, it automatically moves the camera back to the original position. The Tool Lock button appears back in this case.



5.7 Tool Lock On/Off



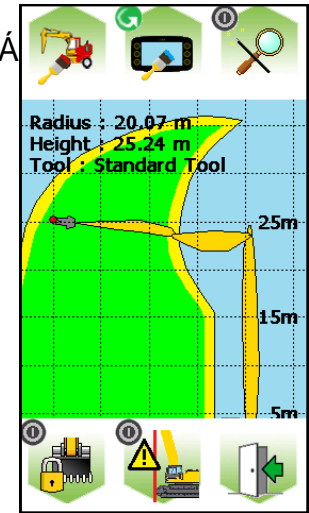
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 display. The tool will remain centrally positioned on the screen regardless of
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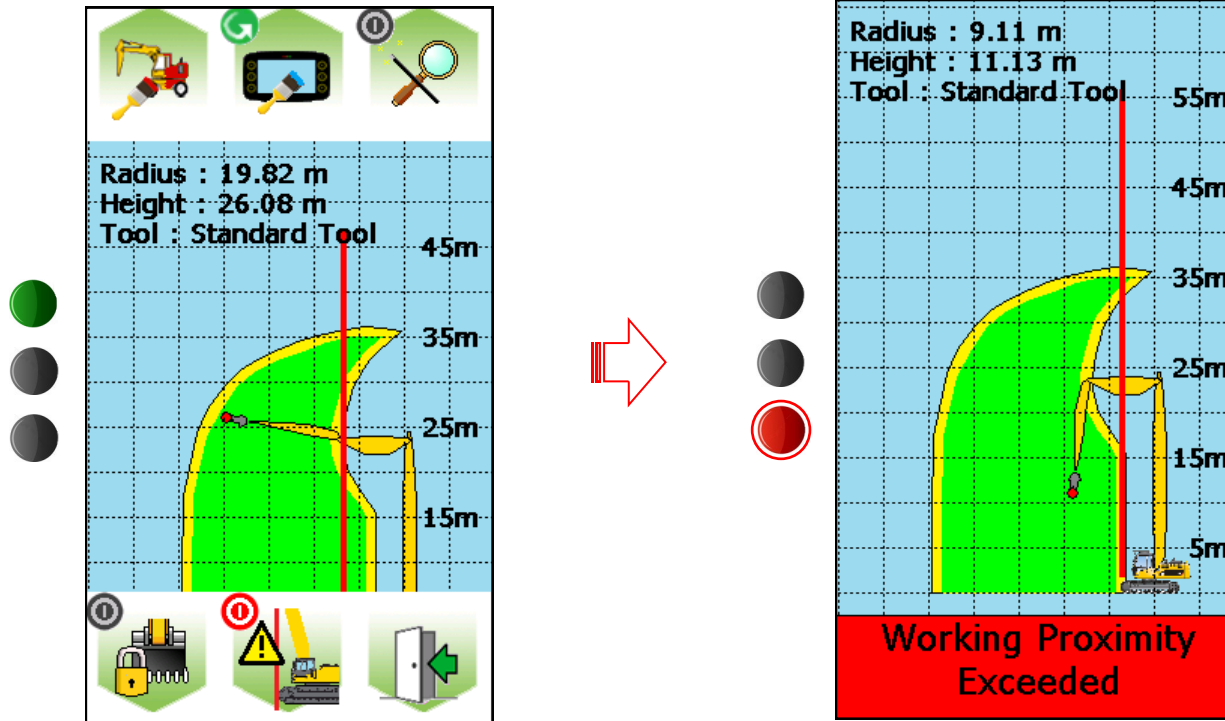
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5.8 Working Proximity Indicator On/Off



Pressing the Working Proximity Indicator button will draw a line to warn if the machine cab is situated too close to the tool point in order to protect against falling debris. A warning message is shown if the machine cab is within the debris hazard area based on the height of the tool as given below. Press the button again to turn the working proximity indicator Off.

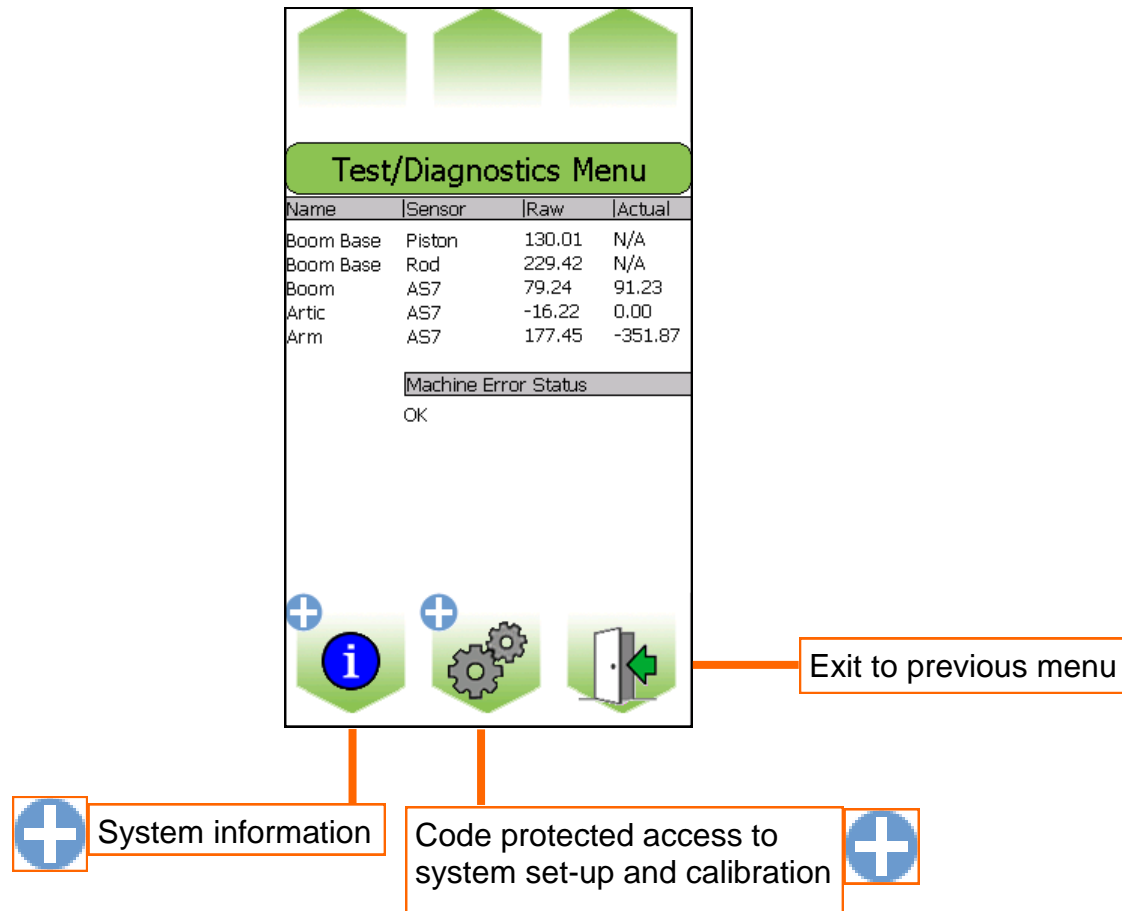


6 Test / Diagnostics



The system test function is available from the main operating screen. This option allows the functionality of the system to be verified, and basic trouble-shooting to be performed. In this mode, the amber LED will flash to indicate that the system is in maintenance mode. The system will continue to monitor any machine safety status. Alarm conditions and warnings / controls will be issued as normal.

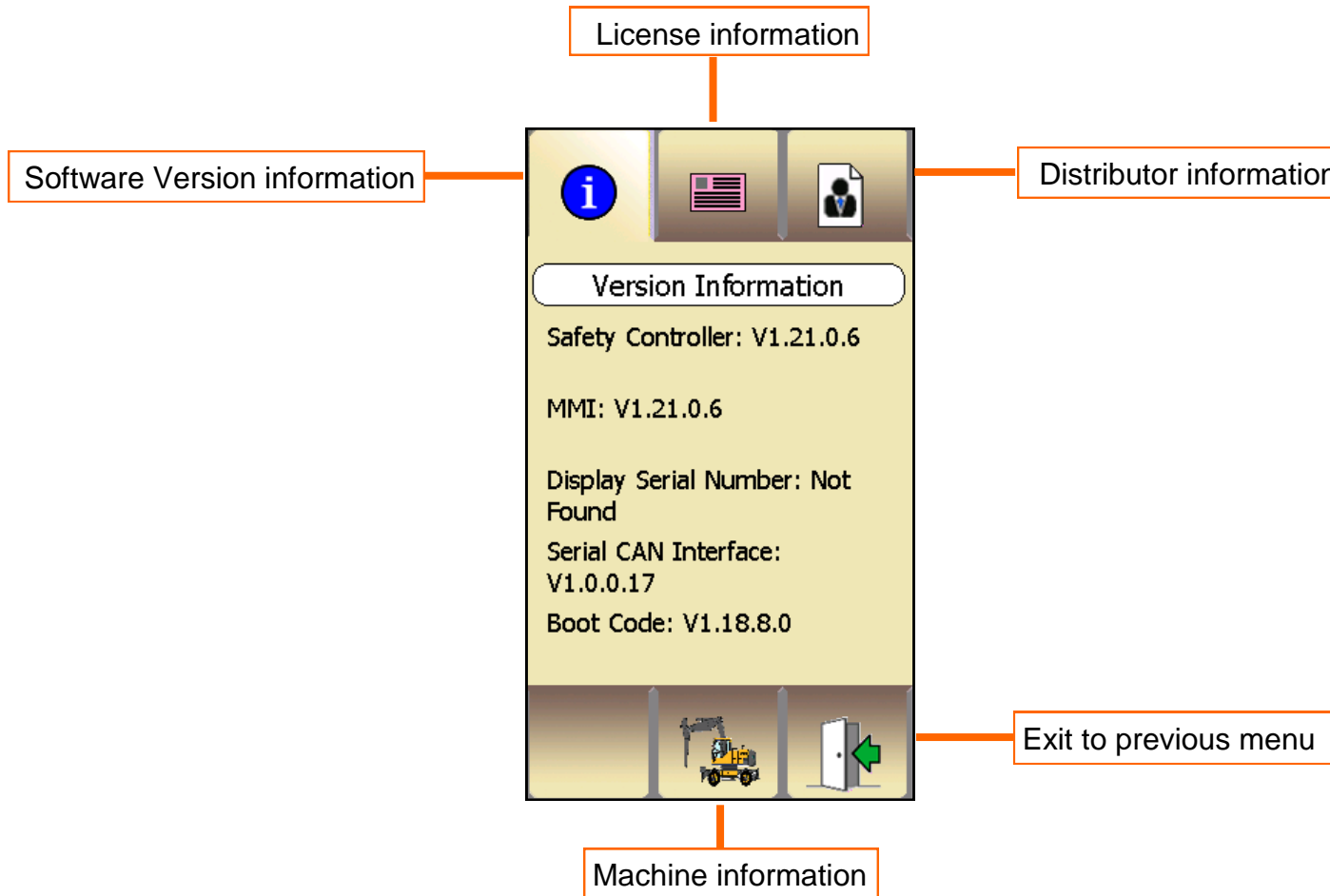
The image shown is an example only. The exact contents of the sensor list will depend on machine type and PME specification.



6.1 System Information



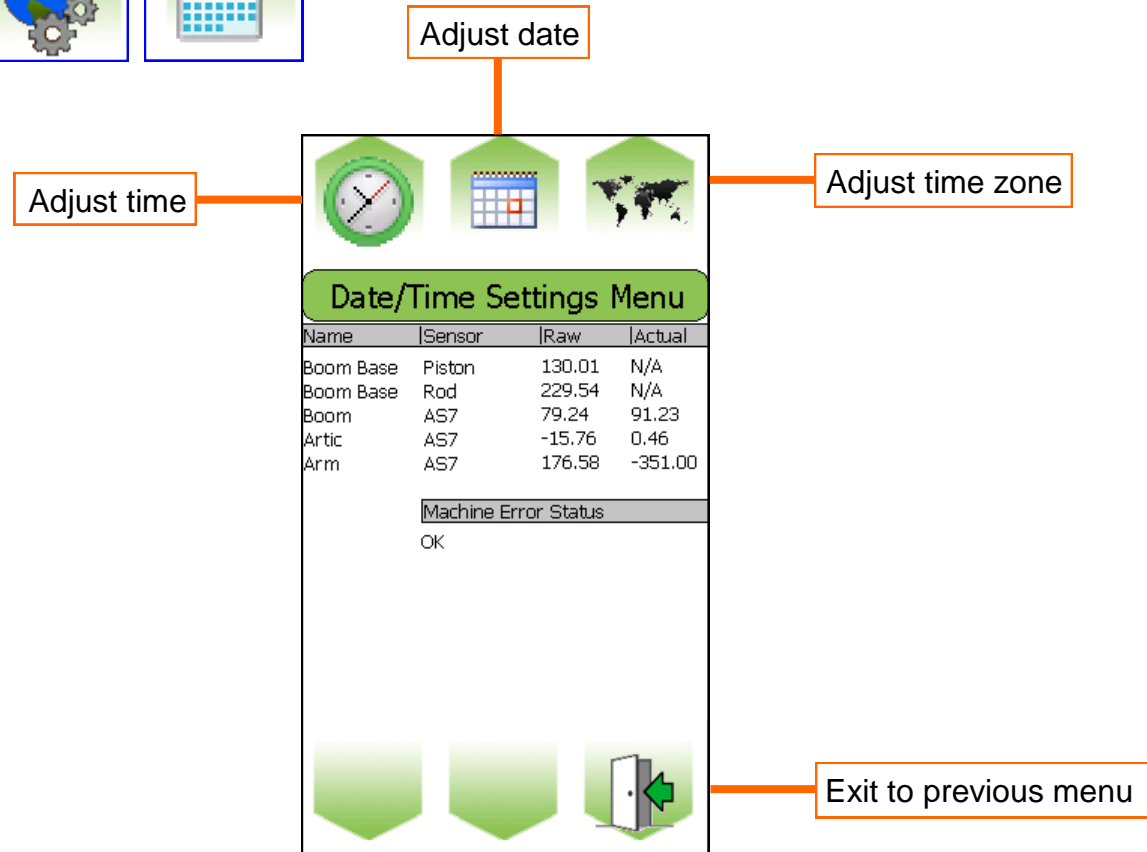
Information regarding the system can be found from this menu.



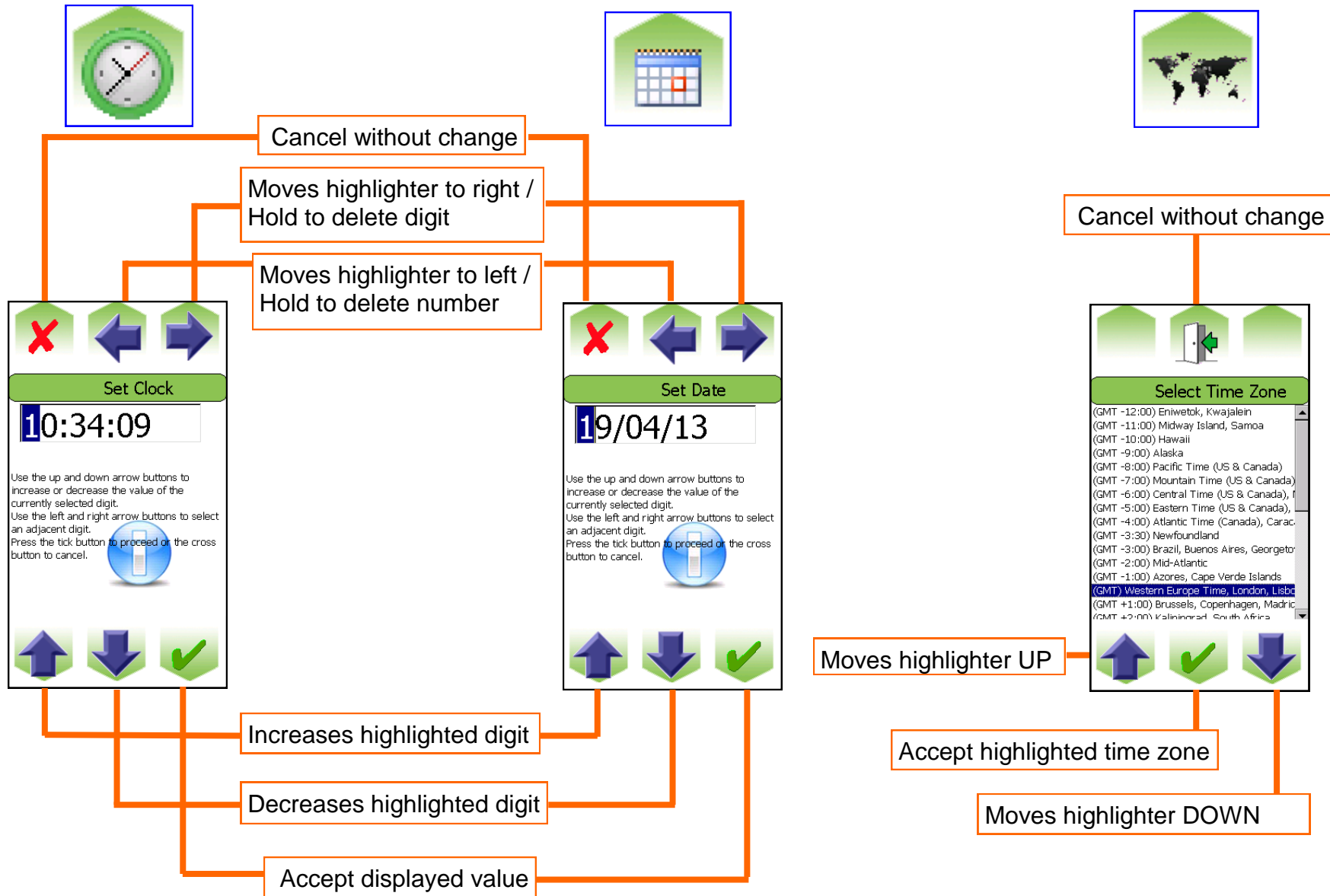
6.2 Time / Date Adjustment



Time / date adjustment requires supervisor access rights.



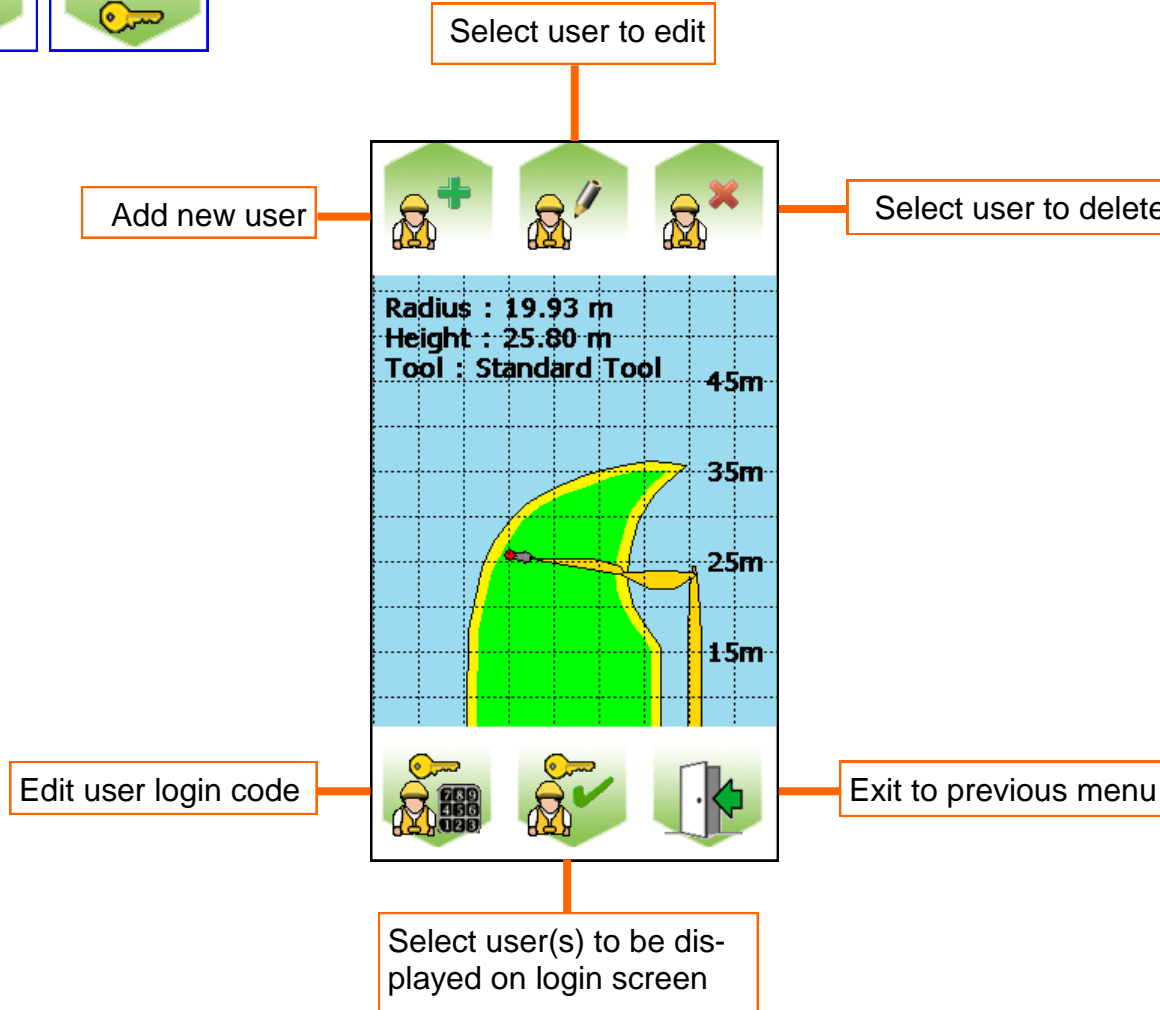
Time / Date Adjustment continued



6.3 User Login User Login Setup



Requires supervisor access rights.



6.4 Radius/ Height



Requires supervisor access rights.

Boom = Boom pivot pin
 Artic = Artic pivot pin
 Arm = Arm pivot pin
 Tool Pin = Not used
 Tool Point = Current Tool Point
 Lift Point = Current lifting point

	Radius	Height
Boom	0.000	2.750
Artic	0.424	23.746
Arm	7.325	23.808
Tool Pin	17.709	25.453
Tool Point	19.931	25.805
Lift Point	17.709	25.453

Machine Error Status
OK

6.5 Pressure Transducers

Boom Base PISTON - Full side
 Boom Base ROD - Rod side

Name	Sensor	Raw	Actual
Boom Base	Piston	130.01	N/A
Boom Base	Rod	229.54	N/A
Boom	AS7	79.14	91.13
Artic	AS7	-15.75	0.48
Arm	AS7	176.55	-350.96

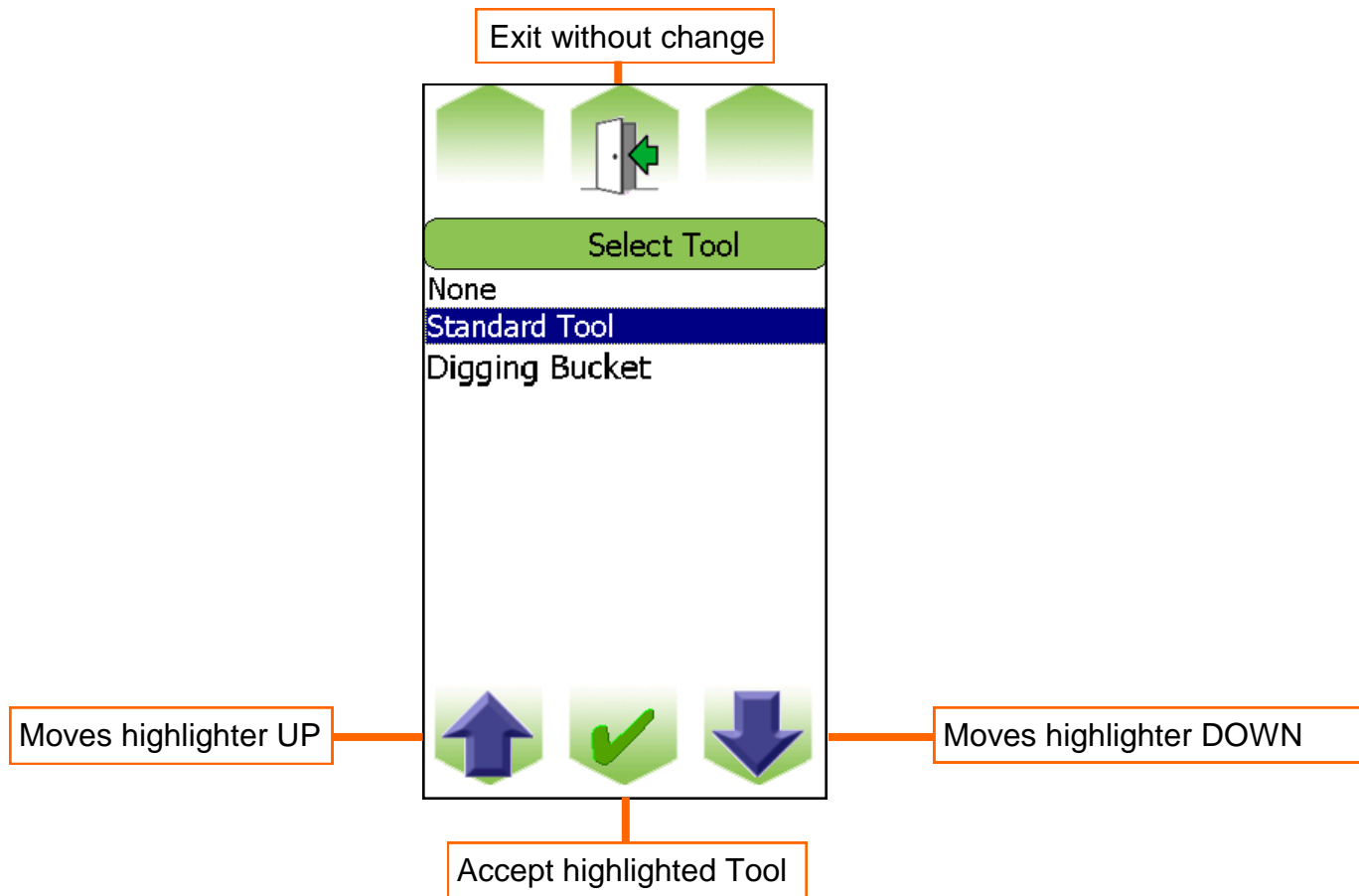
Machine Error Status
OK

Exit to previous menu

7 Tool Selection Menu



The system can be calibrated with no tools, one or multiple tools for use in any duty. If more than one tool has been calibrated, it will be manually selected via the Select tool selection screen shown below. Use the arrow buttons to select the required tool and confirm using the TICK button. Example tools are shown in the listing.



8 Warning Messages

8.1 On Screen Messages

Approaching Stability Envelope	When the tool point approaches the stability envelope
Stability Envelope Exceeded	When the tool point reaches out of the stability envelope
Maximum pressure exceeded	Furthest point of equipment has reached/exceeded set limit
Minimum pressure exceeded	Pressure has reached/exceeded minimum set limit

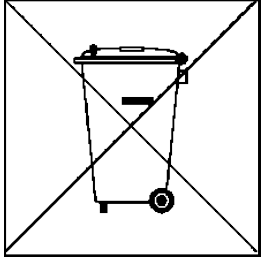
*The approach limit is configurable at point of calibration, check system operation before commencing work.

PME continuously monitors the presence and condition of the safety controller and sensors. If the safety controller or any sensor fails an error message box will appear at the bottom of the display. In the event of a failure, the cab mounted beacon (if fitted) will indicate that the system is NOT active, the display red LED will flash and the internal and external alarms will sound.

9 Taking Product out of Operation

Prolec Limited is committed to complying with the upcoming European Directive of RoHS (Restriction of Certain Hazardous Substances) and WEEE (Waste from Electrical and Electronic Equipment). PME is subject to the WEEE directive, therefore PME or any component must be returned to Prolec Ltd for correct disposal or recycling.

The display and safety controller are fitted with internal batteries and must not be disposed of in landfill.



10 Service and Repair

PME has very few user serviceable parts. The safety controller has internal fuses that, in the event of a blown fuse, can be replaced. The service section describes daily, monthly and yearly checks that must be carried out to ensure safe operation of the system.

10.1 Maintenance Review

Due to nature of the PME system operating environment, changes in usage can occur. Prolec Ltd must be notified of any changes in the pattern of use of the system for consideration.

Any alterations or modifications to machine components which affect the system must be reported to Prolec Ltd or via the service agreement holder.

To aid in the use of PME, all appropriate technical bulletins relating to PME are to be assessed and implemented as appropriate. This information is available from Prolec Ltd.

Prolec Ltd must be informed of any Prolec system component failure via the service agreement holder.

Technical consultation is available to the user, contact Prolec Ltd or the service agreement holder.

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Poole Dorset BH17 0GB		

11 Definitions / Glossary

Pitch	Longitudinal base machine angle (fore / aft)
Roll	Lateral base machine angle (side to side)
Boom	First articulation connected to turret
Arm	Second articulation
Artic	Second articulation of a hydraulically adjustable boom (luffing boom, knuckle boom, two piece boom)
Pivot pin	Point at which the articulations rotate about
Pressure transducer	Device to measure pressure within an hydraulic cylinder
Full side	Internal section below the cylinder rod face
Rod side	Internal section above the cylinder rod face

