

Installation and calibration Manual Slim Master 01-02-04



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Index	Date	SW compatibility	Notes
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01	20/11/2012	WS06_12	"Machine Setting" menu update "Advanced Menu" update

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Introduction

The information on this document could be subject to change without notice.

The constructor is not responsible for possible content mistakes or misprints that could be present in this manual. Any reproduction, translation or copy of parts of this manual is forbidden without prior written authorization by the constructor.

WARNING:

Modifications not expressly approved by COBO Division 3B6 cause the loss of authorization to operate the system.

WARNING:

Λ

Before starting operations, the user should read and understand this manual and follow the contained instructions.

2

Installation

2.1 IMPORTANT INFORMATION

IMPORTANT INFORMATION CONCERNING SAFETY IN THE VICINITY OF MOVING MACHINERY

Protective gear

Always wear safety goggles, as required by safety conditions, when welding or grinding. Never wear loose clothing or jewellery, which may get caught in the machine.

Hydraulic parts

Discharge all pressure from the hydraulic circuit before disconnecting or removing any pipe, connector, or relative component.

Always make sure that all moving parts have been locked and check for any residual pressure, when disconnecting any hydraulic pipe.

Always let the bucket or other similar parts down to ground level before carrying out any work on the machine.

If this cannot be done, make sure that bucket, forks, etc. are locked so they cannot come suddenly and unexpectedly down.

Damaged or detached fuel and lubricant lines can cause fire. Never bend or strike high pressure lines, nor put damaged or twisted ones back on. Always check pipes and ducts.

Repairs

Detach the battery and let any remaining charge out before carrying out any work on the vehicle.

If possible, have the vehicle brought into a shed or onto a hard, clean floor.

To make installing of your 3B6 weighing system easier, make sure you have the following before you start:

- Electric or arc welder
- Usual mechanical and electrical tools
- Set of different-sized spanners
- Set of different-sized screwdrivers
- Grinding wheel
- Electronic Tester
- Assorted hydraulic joints

Open the box your unit arrived in, and check off the main components against the inventory.

Make sure no damages have occurred during shipping.

With the aid of the inventory, make sure all the components have arrived.

2.3 COMPONENTS LIST

1 Main Unit with wiring (Cod.: SLIM-XXX/XX)



1 Pressure transducer (Code :Y11 4745-300) + Pressure transducer cable (Code :CV MT29-01/XX)



2 Proximity sensors (Code Y11KIBM18PS/5-C02) + Proximity sensor extension-cables (Code CV MT30-01/XX)



2 ASC2 sensors (Code :45.10.1101XX.01) + ASC sensors cable (Code :CV MT30-01/XX)



2.4 COMPONENTS POSITIONING

2.4.1 Main Unit



When placing the various parts, use the appropriate brackets supplied. These can be mounted onto the bars inside the cab.

Make sure the two units do not restrict vision when the vehicle is being driven, if the above is not possible. Always seek a solution which does not make the use of the instruments more difficult.

It is not a good idea to mount the brackets directly onto dashboards or non-metallic parts. This is because vibrations could break them.

For greater safety, ask the driver where he/she would like the instruments to be placed.

On fork-lift trucks, the units are mounted directly under the roof. You will need to make threaded holes in the frame.

The various brackets can be modified according to the requirements of the particular vehicle so that the driver can use the equipment with greater ease. This also means that the unit should not be placed where it is going to interfere with bodily movements.

2.4.2 **Pressure transducer**

For the unit to work properly, the transducer must be only mounted in such a way that it can measure the pressure inside the bucket raising cylinder in the lower chamber

When used, the second transducer has to measure the high chamber pressure of the same cylinder.

Position of the transducer

Therefore work out where the possible connection point ought to be as follows:

- Installing a tee •
- Welding a pawl to the rigid pipe •
- Drilling a hole and threading the connector ٠
- Using pressure outlets already present on the vehicle (these are generally present where pressure is • measured with a manometer gauge)

Note:

if you mount the unit in another place, it may not work so well.



Making a hole for the valve and threading





Installation Procedure

Before the pressure transducer, place the hydraulic connector holder with a 0.6 mm dowel.

Inject the vehicle's own hydraulic oil through the nipple of the same holder to avoid forming air locks.

Partially tighten the transducer and pressurise the cylinder until an air-oil emulsion starts coming out.

When only oil starts coming out, completely tighten the transducer.

Make sure you do not place the transducer in such a way that it will receive knocks while the machine is running. If necessary, use elbow joints to keep the transducer out of the way.

The installation of the transducer is a very important stage, and you should take all possible care while doing it, as the readings may not be accurate if you do not.

Once you have made your installation, make sure there are no oil leaks from the circuit.





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2.4.3 Proximity Sensors

Positioning the proximity sensors is extremely important for the accuracy of weighing during the lifting stage.

Positioning on the bucket

You must therefore make sure you install them in such a way that the lifting reference notch activates the first proximity switch, and that it remains active even when the second has been activated.

If the weighing system is running properly, the acoustic indicator will go off after the second proximity has been reached. This means a measurement has been made.

On the other hand, when the vehicle arm is coming down, it must first activate the second proximity, and then the first. This is so weighing takes place only during lifting and not lowering.



In order to have the system properly operate, it is recommended to enable the weighing phase when the points A and B are aligned as per the picture here below.



Positioning on the forklift

In fork-lift trucks, the distance between the two must be about 20 cm, given the speed at which the forks rise. This means a parameter has to be set, which we shall explain further on (see programming below).

This layout has been tested on many different models, and has been seen to be the best, because hydraulic pressure tends to remain more stable and give a greater proportional increase. For fork.-lifts, we suggest you place the first switch 40–50 cm above the lowest point.

Please remember that the proximity switch can not read if positioned more than 5 mm away from the reading plate. You should always try to place them about 2–3 mm apart.





2.4.4 ASC2 Angle Sensors

As shown on the following drawing place the chassis ASC sensor in horizontal way with the connector in the cabin direction with the two fixing point on the bottom side and the single fixing point on the high side.

Again in horizontal way place the boom ASC sensor, the boom itself should be placed more or less horizontal to place the ASC sensor in the right way.

Attention!

With sensor connected, the tab on the connector should be turned to the left side of the sensor.



2.5 PASSING AND PROTECTING CABLES

Cables should, if possible, pass along the same route as the electrics cables of your vehicle, or at least where the hydraulic circuitry passes.

This means that there are basically two cables to protect:

- proximity cables
- transducer cables.

You should always leave some leeway for the cables. When giving full-lock steering to the left and right, the cables should not become too tight or too slack.



Do not mount the cables too close to the motor, unless they are well insulated.

If you use clips to fix the cables down, remember not to tighten them too much. Very often, cable breakage is due to over-tightened clips.



English

3

Calibration

3.1 CALIBRATION STEPS

The calibration is protected by password.

The calibration steps depend on the weighing mode active.

Static Weighing Mode

- Machine Setting
- Static Calibration

Dynamic Weighing Modes (on fork lift and front loader)

- Machine Setting
- Dynamic Calibration:

Empty

Loaded

• Angle setting (for front loader with angular sensors ASC)

Calibration hints

Slim allows to memorize 2 machine calibrations:

- Calibration 1
- Calibration 2

The machine calibration selection (1 or 2) to use in weighing is set from the User Menu under the "Machine" function (refer to the User Manual).

Before starting the pressure calibration (with empty and loaded bucket) we suggest to perform some booms movements to bring the machine hydraulics to the working (constant) temperature.

On the major part of machines is also better to disable all power saving functions (usually marked by hare/turtle or auto rpm lower) and to keep the engine rpm at constant value (usually at the maximum).

Machine must be also levelled and stable.

All the calibration operations are performed with the bucket closed if possible or the blame should be kept at the same pivot height when before to start a lift.

3.2 ENTER THE CALIBRATION

• From the Operating screen to keep pressed the 堡 key to enter the User Menu



Scroll the User Menu with , keys and select the "Setting Menu" and confirm.



The system will prompt for the calibration pin.

• Confirm to enable the setting.



• Enter the password (described in the paragraph "Password") and confirm.







3.2.1 Passwords

CALIBRATION PIN		
Display	Туре	Description
		Calibration
USER MENU Setting Menu	HEADING Menu	Press key to enter the calibration function.
		The system will prompt for the calibration pin.
		Calibration pin
CAL PIN 0	setting	Press the key to enable the setting.
*		The asterisk displayed shows the digit to be modified.
CAL PIN 2		Use the (\textcircled{I}) , \textcircled{I} keys to modify (+/-) the value of the digit.
* CAL PIN 02		Use key to scroll the asterisk above the next digit.
* CAL PIN 4482		Once you have entered all digits, confirm with
CAL PIN 4482		Press key to exit the setting.
		Press key to enter the Setting Menu.
Enter to Confirm	command	If the code is correct the "Setting Menu" will be displayed.
		Wrong Pin
Access Denied!	message	This message will be displayed if the PIN is wrong.
		Press&hold

ADVANCED PIN

Display	Туре	Description
		Advanced Setting
SETTING MENU Advanced Setting	HEADING Menu	Press key to enter the Advanced Setting function. The system will prompt for the advanced pin.
ADV PIN 28053	setting	Advanced pin Insert the advanced pin as described for the calibration pin. If the code is correct the "Advanced Setting" menu will be displayed.

3.3 SETTING MENU



Key / Ref.	Description
	To scroll the menu list
	To enable setting, commands (ON/OFF) or access to sub-menu
2000 2000	Press&hold (3 sec): exit from the menu. The machine turns on the operating screen.
1	1 st line: Menu Header
2	2 nd line: Menu List

3.3.1 Setting Menu

Display	Туре	Description
SETTING MENU Machine Setting	HEADING Sub-Menu	Use , keys to scroll the menu. Press key to enter a setting or activate a command.
Machine Setting	Sub-Menu	Access to Machine Setting menu, to set weighing system main parameters.
StaticCal	Sub-Menu	Access to static calibration menu. (enabled with Static Weighing Mode active)
DynamicCal	Sub-Menu	Access to dynamic calibration menu, subdivided in two sections: empty & loaded. <i>(enabled with Dynamic Weighing Modes active)</i>
AngleSetting	Sub-Menu	Access to angles setting menu. (used in Dynamic Weighing Mode with sensors ASC2)
AdvanceSetting	Sub-Menu	Access to Advanced Setting menu. (under advanced code: ADV PIN)
AccessDenied!!!	Viewing	Access denied to chosen calibration if not activated

3.4 MACHINE SETTING

Prior to performing the empty and/or loaded calibration on both Dynamic and Static weighing systems, it will be necessary to set the machine's and the system's general parameters in the "Machine Setting" menu.

• From the "Setting Menu" with , keys select the "Machine Setting" and enter by pressing keys.



Key / Ref.	Description
	To scroll the menu list
	To enable setting, commands (ON/OFF) or access to sub-menu
	Press&hold (3 sec): exit from the menu. The machine turns on the operating screen.
1	1 st line: Menu Header
2	2 nd line: Menu List

3.4.1 Machine Setting Menu

Display	Туре	Description
MACHINE SETTING Cylinder xxxx	HEADING	Use , keys to scroll the menu. Press key to enter a setting or activate a command. To set a value refer to "Set value" paragraph (X=current value)
Cylinder 1 xxxx	setting	For the settings description refer to the paragraph "Machine
Rod 1 xxxx	setting	Setting Parameters".
Thickness1 xxxx	setting	
Cylinder 2 xxxx	setting	
Rod 2 xxxx	setting	
Thickness2 xxxx	setting	
Round Val. Xxxx	setting	
n.Decimals x	setting	
Unit Print	setting	
Del Ticket Num.	command	
Use Reg. x	setting	
Th. Reg. xxxx	setting	
Use print x	setting	
Save	command	

3.4.2 Machine Setting Parameters

Cylinder 1:	Lift cylinder circumference in centimetres for calibration 1
Rod 1:	Cylinder rod circumference in centimetres for calibration 1
Thickness1:	Setting lifting cylinder's thickness in centimetres for calibration 1
Cylinder 2:	Lift cylinder's circumference for calibration 2
Rod 2:	Cylinder rod circumference for calibration 2
Thickness2:	Setting lifting cylinder's thickness in centimetres for calibration 2

Note: "Cylinder/Rod/Thickness" settings must be set in case two transducers are being used (only to calculate the differential pressure).

Round Val: Rounding off value of the partial weight. To be set of the same magnitude as the known weight.

n. Decimal: Number of decimals for both partial and total weight; up to a maximum of 3 figures can be set in Weigh Mode.

Unit Print: Units of measure to be printed on the ticket (optional).

- 0 = No unit selected
- 1 = Kg (Kilograms)
- 2 = Ton (Metric Tonnes)
- 3 = Lbs (Pounds)
- 4 = sTon (Short Ton)
- 5 = mc (cubic metres)
- *Use Reg.* Function of management for the regenerative valve
 - 0 = disabled.
 - 1 = enable.
- *Th. Reg.* Threshold to know the status of the generative valve. It's defined as the maximum difference between the pressure on the two cylinder sides.
 - Valve OFF = actual pressure difference > Th. Reg.
 - Valve ON = actual pressure difference < Th. Reg.
- Del Ticket Num Command for zeroing the progressive number on the printed ticket (optional)
- Save: To save permanently the new values set.

3.5 STATIC CALIBRATION

Perform this calibration only if the Static Weighing Mode has been activated on your Slim-Master.

If the Slim-Master has been set with dynamic weighing mode, access to static calibration will be denied.



Key / Ref.	Description
	To scroll the menu list
	To enable setting, commands (ON/OFF) or access to sub-menu
	Press&hold (3 sec): exit from the menu. The machine turns on the operating screen.
1	1 st line: Menu Header
2	2 nd line: Menu List

3.5.1 Static Calibration Menu

Display	Туре	Description
		Static Cal Menu
STATIC SETTING	HEADING	Use 🖳, 🐻 keys to scroll the Static Cal. Menu.
Acq Number xxxx	setting	Press key to enter a setting or activate a command.
		To set a value refer to "Set value" paragraph (X=current value)
		Settings for Calibration 1 & Calibration 2
Acq Number xxxx	setting	Number of readings to calculate the weight
Threshold xxxx	setting	> Maximum variation allowed in reading the pressures to
		complete "Acq Number" acquisition (only in Static Weighing
		Mode: "continuous")
Use Input x	setting	Setting of the Static Weighing Mode
		 0 = weighing without input (continuous) 1 = weighing with input
Sum Read x	setting	Sum of the two sensors readings to calculate load
	5	• 0 = disabled sum
		 1 = enabled sum
		Calibration 1 (Machine1)
M1 Known 1 xxxx	setting	Minimum load in Kg for Calibration1
M1 Read 1 xxxx	viewing	> Pressure reading corresponding to the actual min. weight
		of calibration 1
M1 Get Reading 1	command	Command to acquire "M1 Read 1" reading
M1 Known 2 xxxx	setting	Maximum load in Kg for Calibration1
M1 Read 2 xxxx	viewing	> Pressure reading corresponding to the actual max. weight
		of calibration 1
M1 Get Reading 2	command	Command to acquire "M1 Read 2" reading
		Calibration 2 (Machine2)
M2 Known 1 xxxx	setting	Minimum load in Kg for Calibration2
M2 Read 1 xxxx	viewing	> Pressure reading corresponding to the actual min. weight
	_	of calibration 2
M2 Get Reading 1	command	Command to acquire "M2 Read 1" reading
M2 Known 2 xxxx	setting	Maximum load in Kg for Calibration2

M2 Read 2 xxxx	viewing	> Pressure reading corresponding to the actual max. weight
		of calibration 2
M2 Get Reading 2	command	Command to acquire " <i>M2 Read 2</i> " reading
		Save Calibration
Save	command	To save permanently the new values set.

3.5.2 Static Calibration Procedure

The static calibration occurs by creating a relationship between pressure reading and actual weight in two points:



Calibration Steps

- Settings for Calibration 1/2
- M1 Calibration / M2 Calibration
- Save

Settings for Calibration 1&2

- Set the number of readings required by the Slim to calculate a valid weight (the average value): Acq Number
- Set the type of the Static Weighing Mode (continuous or with input): Use Input
- Only in "continuous" weighing (without input):
 Set the maximum variation of pressure readings to complete the acquisition of a valid weight: Threshold
- Set the type of load calculation, using or not the sum of the two sensor reading. *Sum Read* Note: If the sum is enabled is necessary also perform the Calibration2

"M1" Calibration (Machine1)

M1 Known:

• Set the value of the weight used like minimum load (typical value = 0)

M1 Read 1: Pressure reading corresponding to the actual min. weight of calibration 1

M1 Get Reading 1:

- Position the machine at the weighing point with actual minimum load (M1 Known 1) and wait for the pressure to stabilize.
- Select the command and press 🥑 key to acquire the point. So the value M1 Read 1 will be memorized.
- Check the "M1 Read 1" value before passing to the next calibration if necessary

M1 Known 2:

- Set the value of the weight used like maximum load
- M1 Read 2: Pressure reading corresponding to the actual maximum weight of calibration 1

M1 Get Reading 2:

- Position the machine at the weighing point with actual maximum load (*M1 Known 2*) and wait for the pressure to stabilize.
- Select the command "and press 🤒 key to acquire the point. So the value "M1 Read 2" will be memorized.
- Check the "M1 Read 2" value before passing to the next calibration if necessary

"M2" Calibration (Machine 2)

Set the values "M2" as described for Calibration 1:

- M2 Known 1
- M2 Read 1
- M2 Get Reading 1
- M2 Known 2
- M2 Read 2

M2 Get Reading 2

Save

To save permanently the new values set.

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DYNAMIC CALIBRATION 3.6

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Perform this calibration only if the Dynamic (1/2) Weighing Mode has been activated on your Slim-Master.

If the Slim-Master has been set with static weighing mode, access to dynamic calibration will be denied.

P keys to select the "DynamicCal" and enter by pressing From the "Setting Menu" use key. • T

SETTING MENU

DynamicCal



Key / Ref.	Description
	To scroll the menu list
	To enable setting, commands (ON/OFF) or access to sub-menu
9000 388	Press&hold (3 sec): exit from the menu. The machine turns on the operating screen.
1	1 st line: Menu Header
2	2 nd line: Menu list

Once selected, it will be necessary to chose between an empty or loaded calibration (Empty Cal. or Loaded Cal.).

DYNAMIC SETTING MENU

Display	Туре	Description
		Dynamic Cal Menu
DYNAMIC SETTING	HEADING	
Empty Cal.	SubMenu	Access to empty calibration menu
Loaded Cal.	SubMenu	Access to loaded calibration menu
		Use , keys to scroll the menu.
		Press 🥌 key to enter sub-menu, setting or activate
		command

Dynamic Calibration Steps

- Empty Calibration1/2
- Loaded Calibration1/2

3.6.1 Empty Calibration Menu

Display	Туре	Description
		Empty Dynamic Cal Menu
EMPTY CAL. MENU	HEADING	Use , keys to scroll the menu.
Time: XXX	viewing	Press key to enter a setting or activate a command.
		To set a value refer to "Set value" paragraph (X= current value)
		Readings from machine
Time: xxx	viewing	Time elapsed during the lift (sec)
		(lower value = greater speed of the lift)
TP1 value	viewing	Piston's pressure transducer (1) reading
TP2 value	viewing	Rod's pressure transducer (2) reading (if installed).
		Empty Calibration1 (Machine 1)
EmptyLoad1	setting	Real load in Tons for Calibration1 (usually set to 0)
ET1 point	viewing	Number of lifts performed in empty Calibration1
ET1 xxxx: xxxxx	view/set	Empty Calibration 1 Table
		Empty Calibration2 (Machine 2)
EmptyLoad2	setting	Real load in Tons for Calibration1 (usually set to 0)
ET2 point	viewing	Number of lifts performed in empty Calibration2
ET2 xxxx: xxxxx	view/set	Empty Calibration2 Table
		Delete Calibration
Delete Cal. 1	command	Deleting of the Calibration1 data.
Delete Cal. 2	command	Deleting of the Calibration2 data.
		Save Calibration
Save	command	To save permanently the new values set.

3.6.2 Empty Calibration Procedure

Calibration Steps

- "ET1" Calibration / "ET2" Calibration
- Save

"ET1" Calibration (Machine1)

Usually, this calibration is performed with the machine empty.

EmptyLoad 1:

- Set the real load for Calibration 1, usually is set to "0". If different, insert the value according to the machine's capacity, keeping in mind the decimals to be displayed, and the resolution preferred (this value can also be set at the end of the calibration).
- Perform up to 20 empty lifts at ever decreasing speed (rpm), which will correspond to the number of points recorded in empty calibration 1 table (the accuracy of the system will depend on the number of lifts performed). At every lift the system automatically acquire a value of time and of pressure associated to the point.

ET1 point : Displays the number of lifts performed at decreasing speed

ET1 xxxx: -xxxxx : Allows viewing the complete calibration 1 table, it is possible to set two values: the left value corresponds the index table, whereas the value on the right corresponds the acquired value of the table (*ET1 xxxx: - xxxxx - refer to "Calibration Tables"*).

"ET2" Calibration (Machine2)

Usually, this calibration is performed with the machine empty.

EmptyLoad 2:

- Set the real load for calibration 2, usually is set to "0", because the calibration is performed with the machine empty : if different, insert the value according to the machine's capacity, keeping in mind the decimals to be displayed, and the resolution preferred (this value can also be set at the end of the calibration).
- Perform up to 20 empty lifts at ever decreasing speed (rpm), which will correspond to the number of points recorded in empty calibration 2 table (the accuracy of the system will depend on the number of lifts performed). At every lift the system automatically acquire a value of time and of pressure associated to the point.

ET2 point : Displays the number of lifts performed at decreasing speed

ET2 xxxx: -xxxxx: Allows viewing the complete calibration 2 table. It is possible to scroll through the table by selecting the index number. It is also possible to set the acquired values displayed on the right (however this operation is not recommended – refer to "Calibration Tables").

Save

To save permanently all modifications to the empty calibration.

3.6.3 Loaded Calibration Menu

Display	Туре	Description
		Loaded Dynamic Cal Menu
LOADED CAL. MENU	HEADING	Use 🖳, 🖲 keys to scroll the menu.
Time: XXX	viewing	Press key to enter a setting or activate a command.
		To set a value refer to "Set value" paragraph (X= current value)
		Readings from machine
Time: xxx	viewing	Time elapsed during the lift (sec)
		(lower value = greater speed of the lift)
TP1 value	viewing	Piston's pressure transducer (1) reading
TP2 value	viewing	Rod's pressure transducer (2) reading (if installed).
		Loaded Calibration1 (Machine1)
KnowLoad1	setting	Known load in Tons for Calibration 1
LT1 point	viewing	Number of lifts performed in loaded Calibration 1
LT1 XXXX: XXXXX	set/view	Loaded Calibration 1 Table
		Loaded Calibration2 (Machine2)
KnowLoad2	setting	Known load in Tons for loaded Calibration2
LT2 point	viewing	Number of lifts performed in loaded Calibration2
LT2 XXXX: XXXXX	set/view	Loaded Calibration 2 Table
DeleteCal. 1	command	Deleting of the Calibration1 data.
DeleteCal. 2	command	Deleting of the Calibration2 data.
		Save Calibration
Save	command	To save permanently the new values set.

3.6.4 Loaded Calibration Procedure

This calibration is performed with a known load.

The loaded calibration has to be performed with the bucket full of material in order to obtain good results (at least ³/₄ it's recommended; we also recommend to use a material like gravel or sand that easily fill the bucket instead of a big concrete block).

Be careful to don't exceed the bucket maximum capacity (you don't have to lose important quantity of material during the calibration!).

Calibration Steps

- "LT1" Calibration / "LT2" Calibration
- Save

"LT1" Calibration (Machine1)

KnowLoad 1

- Set the known load used. If different, insert the value according to the machine's capacity, keeping in mind the decimals to be displayed and the resolution preferred (this value can also be set at the end of the calibration)
- Perform up to 20 loaded lifts at ever decreasing speed (rpm) at ever decreasing speed lifting the maximum load (the accuracy of the system will depend on the number of lifts performed). At every lift the system automatically acquire a value of time and of pressure associated to the point.

LT1 point. Displays the number of lifts performed at decreasing speed, which will correspond to the number of points recorded in loaded calibration 1 table.

LT1 xxxx: -xxxxx : Allows viewing the complete calibration table. It is possible to scroll through the table by selecting the index number. It is also possible to set the acquired values displayed on the right (however this operation is not recommended – refer to "Calibration Tables").

"LT2" Calibration (Machine2)

KnowLoad 2:

- Set the known load for calibration 2: insert the value according to the machine's capacity, keeping in mind the decimals to be displayed, and the resolution preferred (this value can also be set at the completion of the calibration).
- Perform up to 20 empty lifts at ever decreasing speed (rpm), which will correspond to the number of points recorded in empty calibration 2 table (the accuracy of the system will depend on the number of lifts performed). At every lift the system automatically acquire a value of time and of pressure associated to the point.

LT2 point: Displays the number of lifts performed at decreasing speed, which will correspond to the number of points recorded in loaded calibration 2 table.

LT2 xxxx: -xxxxx: Allows viewing the complete calibration table. It is possible to scroll through the table by selecting the index number. It is also possible to set the acquired values displayed on the right (however this operation is not recommended – refer to "Calibration Tables").

Save

To save permanently all modifications to the empty calibration.

3.6.5 Calibration Tables



Calibration Table Viewing

It is possible to scroll through the table by selecting the index number (e.g. "Empty calibration, ET1 table):

• Use the • Use the • Use the table.

Calibration Tables: ET1, ET2

Display	Туре	Description
		Empty Table Setting
EMPTY CAL. MENU	HEADING	1. Table ID:
ETx xx: xxxxx	viewing	ET1: Table empty calibration1
1 2 3		ET2: Table empty calibration2
		2. Table index (Range 0 ÷ 59)
		3. Acquired Value (time or pressure)

Calibration Tables: LT1, LT2

Display	Туре	Description
		Loaded Table Setting
LOADED CAL. MENU	HEADING	1. Table ID:
ETX XX: XXXXX	viewing	LT1: Table loaded calibration1
1 2 3		LT2: Table loaded calibration2
		2. Table index (Range 0 ÷ 59)
		3. Acquired Value (time or pressure)

Calibration Table Setting

Note: Operation not recommended

It is also possible to modify the acquired values (e.g. "ET1" table, Table Index1)



To set a value refer to "Set value" paragraph

Calibration Points

Points 1÷20	Cal Table Index 0÷59	Description
1	0	Time
1	1	Back side cylinder pressure or Differential pressure
2	3	Time
2	4	Back side cylinder pressure or Differential pressure
3	5	Time
3	6	Back side cylinder pressure or Differential pressure
4	7	Time
4	8	Back side cylinder pressure or Differential pressure

* if Cylinder and Rod circumferences set

3.6.6 Regenerative Valve

To perform the calibration when the regenerative valve management is enable keep attention to the following points:

- Two pressure sensors must be installed.
- Before start the calibration set the following parameters of the "Machine Setting" menu:
 "Use Reg." must be set to "1". This setting disable/enable the management of the valve.

Th. Reg. : This setting permit to the system to understand automatically if the valve is ON or OFF looking the pressure difference between the two chamber of the cylinder. If the actual difference is lower that this set value means regenerative valve ON, else if the difference is bigger means regenerative valve OFF.

The value is in Adc point like the pressure values that are visible inside the "ANALOGUE VALUE" menu (see the Operator's Manual). This value must be a little bit bigger than the maximum difference present when the regenerative value is for sure ON and must be lower than the minimum difference present when the value is surely OFF. To understand the correct value some pressure measurement must be done

- The two calibrations available will be used for only one machine, because one calibration is needed when the regenerative valve is ON and the other calibration is needed when the regenerative valve is OFF.
 - The system will use different calibration tables based on the valve status:
 - Calibration 1 when the valve is ON
 - Calibration 2 when the valve is OFF

The selection will be automatic.

Example: The machine can lift maximum 10 ton and that the regenerative valve change status at 5 ton.

The 1st calibration, should be performed as follow:

- Empty calibration at 0 ton ("EmptyLoad1");
- Loaded calibration at 4 ton ("KnownLoad1");

In this way the regenerative valve should be always ON.

The 2nd calibration should be done as follow:

- Empty calibration at 6 ton ("EmptyLoad2");
- Loaded calibration at 10 ton ("KnownLoad2");

In this way the regenerative valve should be always OFF.

The system automatically detect which Calibration Table has to be used and will show which calibration is use:

- Yellow LED is ON for Calibration 1;
- Red LED is ON for Calibration 2;

This must be kept under control during the calibration to be sure that every point will go inside the correct table.

3.7 ANGLE SETTING

Perform this setting only if the Dynamic Weighing Mode for bucket has been activated with the angle sensors ASC using in weighing ("Weighing Mode" parameter set to 3 and "ASC Sensor" parameter set to 1 - refer to Advanced Menu)



Key / Ref.	Description
	To scroll the menu list
	To enable setting, commands (ON/OFF) or access to sub-menu
SHO	Press&hold (3 sec): exit from the menu. The machine turns on the operating screen.
1	1 st line: Menu Header
2	2 nd line: Menu List

3.7.1 Angle Setting Menu

This menu has 2 different settings depending the number of machine selected.

Display	Туре	Description
ANGLE SETTING ActAngleN xxx	HEADING viewing	Angle Setting Menu Use , keys to scroll the menu. Press key to enter a setting or activate a command.
ActAngleN xxx	viewing	 Actual value of relative angle (or the difference between the angles of boom and chassis) N = number of selected machine (1 or 2) <u>Weighing Start Angle</u>
StartAng.N xxx	viewing	Value of relative angle to start the weighing
GetStartAngleN	command	Acquiring of the actual angle value as Weighing Start Angle
		Weighing Stop Angle
EndAng.N xxx	viewing	Value of the relative angle to end the weighing.
GetEndAngleN	command	Acquiring of the actual angle value as Weighing Stop Angle.
		Weighing Reset Angle
ResetAngN xxx	viewing	Value of the angle to start a new weighing process (below this angle the system will be ready again)
GetResetAngleN	command	Acquiring of the actual angle value as Weighing Reset Angle
DelateAngles	command	Reset all values weighing angles of the selected machine: StartAng.N, EndAngN., ResetAng.N
		Save Calibration
Save	command	To save permanently the new values set.

3.7.2 Angle Sensor Setting procedure

Steps of the angle sensors setting

- Weighing Starting Angle
- Weighing Stopping Angle
- Weighing Reset Angle

Weighing Start Angle

- Position the boom in the point (angle) of weighing start
- Select the command "**Acq Angle Start**" and press key to acquire the point. So the value of weighing start angle (StartAng.N) will be memorized.

Weighing Stop Angle

- Position the boom in the point (angle) of weighing end
- Select the command "**Acq Angle Stop**" and press key to acquire the point. So the value of weighing stop angle (EndAng.N) will be memorized.

Weighing Reset Angle

- Position the boom in the point (angle) of weighing reset
- Select the command "**Acq Angle Reset**" and press key to acquire the point. So the value of weighing reset angle (ResetAng.N) will be memorized.

Save

To save permanently the new values set.

3.8 ADVANCED SETTING

It will be necessary to insert the advanced pin to enable the Advanced Setting menu.





Keys / Ref.	Description
	To scroll the menu list
Enter	To enable setting, commands (ON/OFF) or access to sub-menu
	Press&hold (3 sec): exit from the menu. The machine turns on the operating screen.
1	1 st line: Menu Header
2	2 nd line: Menu list

3.8.1 Advanced Menu

Display	Туре	Description
ADVANCED MENU Use Print x	HEADING viewing	Advanced Menu Use , keys to scroll the menu. Press key to enter a setting or activate a command. To set a value refer to "Set value" paragraph (X= current value)
Use Print	setting	 Parameter for enable/disable the print: 0 = disabled printer 1 = enabled printer (default)
Weighing Mode	setting	 Parameter for define the Weighing Mode: 1 = Static Weighing Mode (continuous/with input) 2 = Dynamic Weighing Mode for forklift 3 = Dynamic Weighing Mode for bucket (default)
ASC Sensor	setting	 Parameter for define the Sensors type used in Dynamic Weighing Mode for bucket 0 = Proximity 1 = Angular Sensor ASC2
VisualBuc	setting	 Displaying on the screen of the bucket icon (weighing mode in use) or the buckets number 0 = Weighing mode icon 1 = Number of buckets
Time B/I	setting	Time of buzzer sound and icon displaying in the static weighing
Parameters	sub-menu	Access to menu of the list of all parameters (only 3B6)
Load Default Val	command	Command for reset all the system settings to default values (calibration deleted).
Save	command	Command for save all modify

3.9 SET VALUE

Set a new value, for example Cylinder 1.

MACHINE SETTING Cylinder 1 xxxx	TPI

Display	Description
MACHINE SETTING Cylinder 1 000	With , keys select the function to set (Cylinder 1") and press to enter the setting.
Cylinder 1 000	Press the key to enable the setting.
*	The asterisk displayed shows the digit to be modified. Use very to scroll
Cylinder I 000	the asterisk above the digit to change.
* Cylinder 1 100	Use the , keys to modify (increase/decrease) the value of the
	digit. Press 🥗 key to confirm the changes.
Cylinder 1 100	The asterisk disappears.
	Press&hold () to exit the setting.

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