WEIGH-TRONIX

PC-220 Counting Scale
Service Manual

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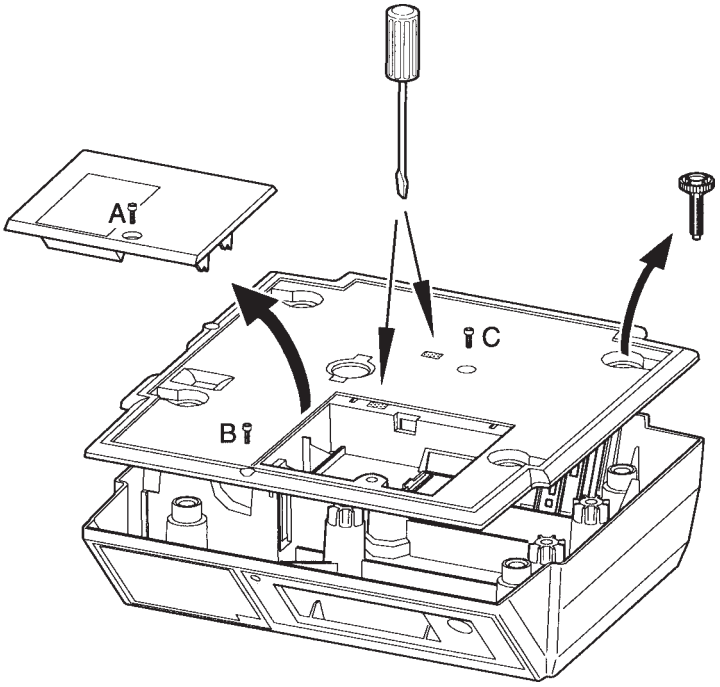
Removing the Covers



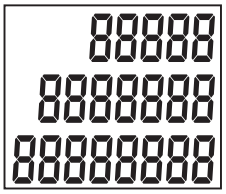
When replacing the cover, if either of the clips are damaged an M6 or self-tapping screw (C) can be used to hold the cover in place.

1. Disconnect the power supply from the scale.
2. Remove the scale platter.
3. Break the tamper seal.
4. Remove screw A and remove the expansion board cover.
5. Remove the feet (and the springs if the scale is a 30kg machine).
6. Remove screw B at the front edge of the scale.
7. Lever the clips holding the cover using a flat-blade screwdriver.

Status Display

= ***ON/OFF*** *key*

The status display shows some basic information about the scale. To view this information, press the **ON/OFF** key twice. A sample display is shown below as well as a reference table.



Top Row	Middle Row	Bottom Row
0	Boot block product code	Boot block version number
1	Application block product code	Application block version number
2	Configuration block product code	Configuration block version number
3	Product configuration checksum status: 0 = OK 1 = Checksum failed	Product configuration edit counter
4	Mains/battery voltage	Blank
5	Secondary calibration counter	Blank
6	Cause of last reset: 0 = Power down 1 = Watchdog 2 = Clock monitor	Blank

If you need to contact your authorized Weigh-Tronix distributor, make a note of all these settings.

Error Messages

Temporary error | *Weight unsteady* | *Balance failed* | *Under range* | *Over range*

E5 Disconnect then reconnect the power supply.

E10 Battery failure - replace the batteries (do not use NiCad batteries).

E11 Power supply voltage too high. Make sure the correct power supply is being used.

E15 Disconnect then reconnect the power supply.

E19 Software download tool error. Try downloading the application again.

E20 Disconnect then reconnect the power supply. If the error reappears, you will need to replace the load cell.

E21 This could be caused by excessive vibration or an incorrect service calibration. Either adjust the filters or recalibrate the scale.

E30 Management/Service mode not exited correctly. Re-enter service mode, select the value to be changed, change the value and go to the next branch or sub-branch to accept the change.

E35 An invalid configuration for the scale has been given in branch 5. Re-enter the configurations.

E36 An invalid capacity for the scale has been given in branch 5. Re-enter the configurations.

E40 The weight used for user calibration is unsteady. Recalibrate the scale.

E41 An incorrect weight is being used for user calibration. Use the correct weights.

E42 User calibration is not available for this scale.

E100 Invalid PLU contents. Reprogram the PLU.

E101 Transaction failed.

E102 Transaction failed.

E103 Tare failed. Reprogram the tare.

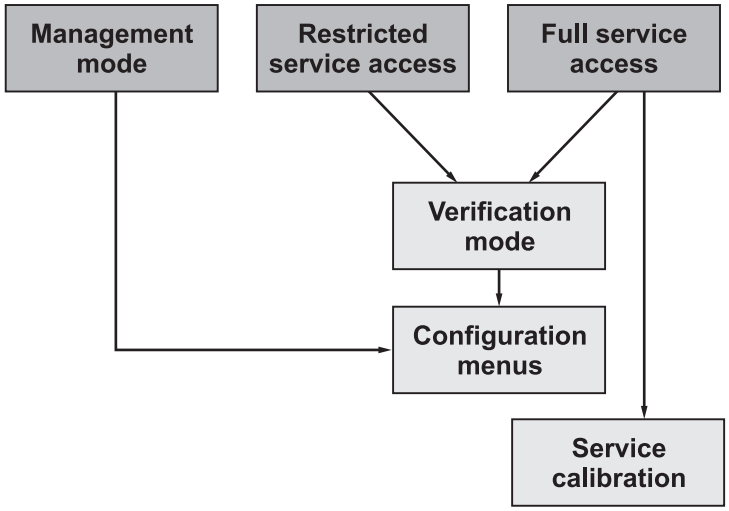
E110 The counting piece weight is greater than 10% of the capacity of the scale.

E151 A change to the configuration has failed. Reprogram the configuration.

E152 The user does not have access to this item (in management mode).

Configuring the Scale

There are 3 ways to configure the scale:



Management Mode

This mode allows you to configure a few branches of the scale. Because the configurations can be different for each scale, refer to the User's Manual for details on the branches available.

To enter the management mode, press the **ON/OFF** key, then key in 6231 on the numeric keypad.

To exit management mode, press the **ON/OFF** key, then the **Zero** key.

Restricted Service Access

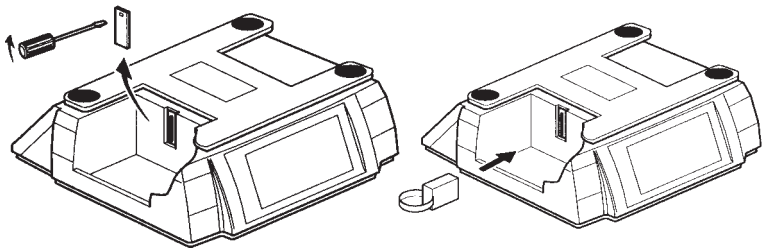
This mode allows you to see all of the scale's configuration. You will not be able to alter the branches that are marked as *Full service access only*. If you attempt to change these configurations you will see an error message (E152).

To enter restricted service access, press the **ON/OFF** key, then the **Tare** key, **Zero** key, **Tare** key, **Zero** key, **Tare** key, **Zero** key. The scale is now in verification mode. (see *Verification Mode*)

Full Service Access

This will give full access to the scale's configuration.

1. Unplug the scale from the power supply.
2. Break the security seal and remove the blanking plate.



3. Plug the service tool (PN 18165-140) into the side of the scale.
4. Replace the scale platter and reconnect the power supply. The scale will now be in verification mode. (see *Verification Mode*)

Verification Mode

= *Left arrow key*

= *Up arrow key*

Verification mode will display the weight to four decimal places, and zero tracking will be disabled.

To go to the configuration menus, press the **ON/OFF** key, then the left arrow key. See note at left.

If you need to return to verification mode at any time, press the **ON/OFF** key, then the up arrow key. See note at left.

Exiting from Full or Restricted Service Access

To exit, long press the **ON/OFF** key. The display will show E 5. You will need to disconnect the power supply, remove the service tool if you are in full service access, and reconnect the power supply.

If you do not exit service mode correctly you will se an E 30 error message.

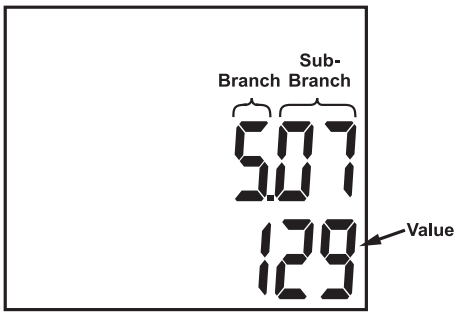
Navigating the Service Mode

Attention

You MUST press the* Clear *key to clear a value before keying in a new one.

*After changing a value, you **must** go to the next branch or sub-branch to accept the change.*

Each configuration setting consists of a value and a location. The location consists of a Branch number and a Sub-branch number. See note at left.



For example shown at left:
Branch 5 = Weighing capacity
Sub-branch 05 = Primary
Capacity units value 129 = lb

Function	Key
Go to next branch.	► Long press
Go to the next sub-branch.	► Short press
Go to the previous branch.*	◄ Long press
Go to the previous sub-branch.*	◄ Short press
Go to branch 00	Clear Long press
Select value to be changed	Clear Short press
Change the value. (see note at left)	7 8 9 / 4 5 6 / 1 2 3 / 0 · Enter a value* **or** ▲ Short press
Increment the value X10.	▲ Long press
Exit service mode. If you are using the service tool, disconnect the power supply and remove the tool before repowering the scale.	I/⏻ Long press E 5

Product Configuration Branches

For older application block versions (0-5-0 or earlier) some branches or sub-branches are not available.

Branch 0 - Edit Counter

Sub-branch	Value
00 - default user mode	This counter is automatically incremented whenever the product configuration has been altered.

Branch 5 - Typical Configurations

If you enter an incorrect value for these configurations, you will see an E 30 or E 35 error. Re-enter the correct values.

Full service access only.

	Sub-branch Numbers												
Capacity	**00**	**01**	**02**	**03**	**04**	**05**	**06**	**07**	**08**	**09**	**10**	**11**	**12**
15lb x 0.0005	150000	0	0	2	4	129	0	0	0	0	0	0	100
30lb x 0.001	30000	0	0	0	3	129	0	0	0	0	0	0	200
60lb x 0.002	60000	0	0	1	3	129	0	0	0	0	0	0	200
6kg x 0.2g	600000	0	0	1	4	1	0	0	0	0	0	0	200
15kg x 0.5g	150000	0	0	2	4	1	0	0	0	0	0	0	200
30kg x 1g	30000	0	0	0	3	1	0	0	0	0	0	0	200

Branch 6 - Weighing Functionality

Full service access only. **Bold** values are factory default settings.

Sub-branch	Value
00 - **Zero Indicator.** This determines when the gross zero indicator appears on the display.	0 - Gross zero appears when the range is between ±0.25 divisions. **1 - Gross zero appears when the range is between ±0.5 divisions.**
01 - **Zero tracking.** This is used to account for minor weight changes over time. For example when weighing in dusty environments.	0 - Disabled. **1 - Enabled**
02 - **Balance on power up.** When powered up, the scale determines if it is within its previous balance range. If it is, it looks at sub-branch 03. If it is not, a balance failed indicator will appear. A typical example of an error is if the scale is powered up without the scale platform on the scale.	0 - Disabled. No test performed. **1 - -5 to 15%** 3 - -2 to 2%

Sub-branch	Value
03 - **Automatic zero self balance.** If enabled, the scale will automatically perform a balance.	0 - Disabled. **1 - Enabled**
05 - **Weight return to zero.** When a weight has been removed from the scale, this determines how near to zero the scale must be before displaying the zero indicator.	**0 - Gross zero division** 1 - Between 0 and 20 divisions
06 - **Hysteresis.** This is used to prevent the weight display from flickering between the top of one weight increment and the bottom of the next.	0 - Disabled **1 - Enabled**
07 - **Normal balance range.** This is percentage of the capacity that the zero can move away from the power up balance due to zero tracking, automatic or manual balance.	0 - 200 Primary capacity (%) multiplied by 2 **Default is 4** For example: 200 = 100% 50 = 25%
08 - **Filters.** If the scale is in an environment where there is vibration, filters can be applied so that the weight display remains steady. The stronger the filter the longer the display will take to display a weight.	0 - Default filter (3) 1-8 1 = Slight filter, 8 = Strong filter **Default is 4**
09 - **Minimum test weight for customer calibration.** Not available.	0 - 200 Primary capacity (%) multiplied by 2 **Default is 24**
10- **Maximum correction from customer calibration.**	0 - 255 divisions **Default is 60**
11 - **Alternate Units.** This will convert the displayed weight into the selected units.	0 - disable alternate units 1 - USA decimal Pounds 2 - Grams
12- **Weight steady.** The weight must remain within the given ± range for a set amount of time before the weight is displayed.	0 - ± 0.1 divisions **1 - ± 0.25 divisions** 2 - ± 0.5 divisions 3 - ± 1 divisions 4 - ± 1.5 divisions 5 - ± 2 divisions 6 - ± 3 divisions 7 - ± 5 divisions
13 - **Tare increment.** This sets the tare value that can be accepted by the scale. For example, on a 15kg x 5g scale, if the tare increment is set to 1, then the tare weight must be a multiple of 5g. If the tare weight is not a multiple, then the scale will not accept the tare.	**0 - Allow any tare increment** 1 - Tare increment must be a multiple of the weight increment
14 - **Automatic re-tare.** This sets the percentage of a tare within which subsequent tares will also be allowed without having to press the tare key. This is generally used where there is minor weight variation between containers. For example, cardboard boxes.	0 - Disable automatic re-tare 1-200 tare range (%) multiplied by 2 **Default is 2** For example: 200 = 100% 50 = 25%

Branch 7 - Weighing Limits

Full service access only.

Sub-branch	Value
00 - **Minimum weight.** This restricts the weight display so that it remains blank until the minimum weight has been exceeded.	0 - 65535 divisions This is the minimum weight (shown on the overlay) divided by the minimum weight increment (e).
01 - **Under range limit.** If the scale is set to display negative values (Branch 9 sub-branch 00) the weight display remains blank until the negative weight has been exceeded.	0 - 65535 divisions

Branch 08 - Gravity Compensation

Full service access only.

Sub-branch	Value
00 - **Calibration gravity factor.** This is the gravity factor of the location where the scale has been calibrated.	As published by the support office of your national distributor. Minimum value = 975,000 Maximum value = 985,000 You must enter a six digit value as the gravity factors are automatically set to five decimal places.
01 - **Site gravity factor.** This is the gravity factor of the location where the scale is to be used.	

Once the calibration and site gravity factors have been entered, the scale may not weigh correctly until the scale is at the site.

If the scale is to be calibrated and used in the same gravity zone, then both gravity factors should be set to 0.

If you intend to calibrate the scale and then send the scale to a different gravity zone, you must enter the calibration and site gravity factors.

If you do not know the site gravity factor, you must enter the calibration gravity factor and send a note with the scale stating that the site gravity factor is to be entered and needs to be reverified and stamped before being sold to the customer.

Branch 09 - Weight Display

Full service access only.

Sub-branch	Value
00 - **Blank net weight display.** This sets the display to either show a negative net weight or to blank the display when a tare is created and then removed from the scale.	**0 - Negative weight display.**
01 - **Weight decimal marker type.**	0 - Comma **1 - Decimal point**

Branch 19 - Weight Display

Sub-branch	Value
00 - **Beep when below zero.**	0 - Disabled **1 - Enabled**
01 - **Keyboard beep.**	0 - Disabled **1 - Enabled**
02 - **Target beep.**	0 - Disabled **1 - Enabled**
03 - **Error beep.**	0 - Disabled **1 - Enabled**
04 - **Beeper volume.**	**0 - Quiet** 1 - Loud

Branch 20- Power Saving

Sub-branch	Value
00 - **Backlight timeout.** This is the length of time between the last scale activity and the backlight being activated.	**0 - Permanently off** 1 - 5 seconds 2 - 1 minute 3 - 5 minutes 4 - Permanently on
01 - **Sleep timeout.** This is the length of time between the last scale activity and the scale going into SLEEP mode.	**0 - No sleep timeout** 1 - 1 minute 2 - 5 minutes 3 - 30 minutes

Branch 29- Key Press Duration

Sub-branch	Value
00 - **Long key press duration.**	1 - 255 milliseconds X 10 (E.g. 200 = 2 sec.) **Default is 50**

Branch 60- Tares

See also branch 6 sub-branch 13 - tare increment, and branch 6 sub-branch 14 - automatic re-tare.

Sub-branch	Value
00 - **Manual balance while tare is active.**	0 - Manual balance disabled while any tare is active **1 - Manual balance clears the tare after a successful balance.**
01 - **Minimum piece weight.**	Weight in grams/lb - depends on scale unit of measure
02 - **Minimum sample size.**	Weight in grams/lb - depends on scale unit of measure
03 - **Item count thousands separator.**	0 - Disabled **1 - Enabled**
04 - **Keyboard entered (graduated) tare.**	0 - Disabled **1 - Enabled**
05 - **Cumulative tare.**	0 - Disabled **1 - Enabled**
06 - **Stored tare.**	0 - Disabled **1 - Enabled**

Branch 61- Application Configuration

Full service access for all sub-branches.

Sub-branch	Value
00 - **Minimum Sample Weight**	0 - 655535 Value in grams or 0.001 lb **1 - 1 g or 0.001 lb**
01 - **Manual resample range**	0 - 99 Disable manual resampling. 100 - 65535 Sampling when item count is >= sample size. Item count must be <= 100 to 65535% of the sample size to automatically resample **Default is 200**

Sub-branch	Value
02 - **Auto resample range**	**0 - 99** **Disable auto resampling.** 100 - 65535 Enable auto resampling when item count is >= sample size. Item count must be <= 100 to 65535% of the sample size to automatically resample.
03 - **Count thousands separator**	**0 - Disabled** 1 - Enabled
04 - **Enable PLUs**	0 - Disabled **1 - Enabled**
05 - **Piece Weight Units**	0 - Calculate piece weight in grams **1 - Calculate piece weight in the current units**
06 - **Piece Weight Decimal Places**	0. . 6 Number of decimal places **4 is default for Kg/g configurations** **6 is default for Lb configurations**

Branch 100 - PLUs

The branch number for a PLU = 100 plus the PLU number. For example: PLU 5 = 105, PLU 19 = 119.

Sub-branch	Value
00 - **Write protect.**	0 - Write enabled **1 - Write protected**
01 - **Piece weight.**	Weight in grams/lb - depends on scale unit of measure
02 - **Stored tare.**	Weight in grams/lb - depends on scale unit of measure

Calibration

Simple Calibration

Follow these procedures to perform a simple, one weight calibration.

1. Press the **On/Off** key then press the **Clear** key. . .

   Display shows ***CAL*** in top line with weight displayed on middle line.

2. Place calibration weight on the scale and press the **Clear** key. . .

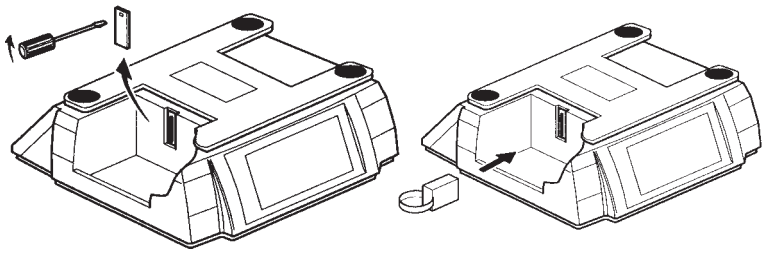
   If the weight is acceptable and stable, the display will show ***DONE*** in the middle line for two seconds.

3. To exit the calibration mode, press the **On/Off** key then press the **Zero** key.

Full Service Calibration

You will only be allowed to perform a full calibration of the scale when using full service access.

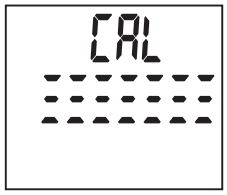
1. Unplug the scale from the power supply.
2. Break the tamper seal, remove the blanking plate and plug the service tool into the side of the scale.



3. Replace the scale platform and reconnect the power supply.
4. Check that the gravity factors are correct.
5. Place a full load on the scale and remove it several times to exercise the scale.
6. Enter calibration mode: Press **ON/OFF** key, then the **right arrow** key, then the **Clear** key.
7. Make sure there is not load on the scale and press the **Clear** key.
8. Place 1/2 of capacity on the scale and press the **Clear** key.
9. Place a full capacity load on the scale and press the **Clear** key.
10. Remove half the weight and press the **Clear** key.
11. Remove all the weight and press the **Clear** key.
12. Calibration is now complete.
13. Disconnect the scale from the power supply.
14. Remove the service tool and reconnect the power supply.

Aborting Calibration

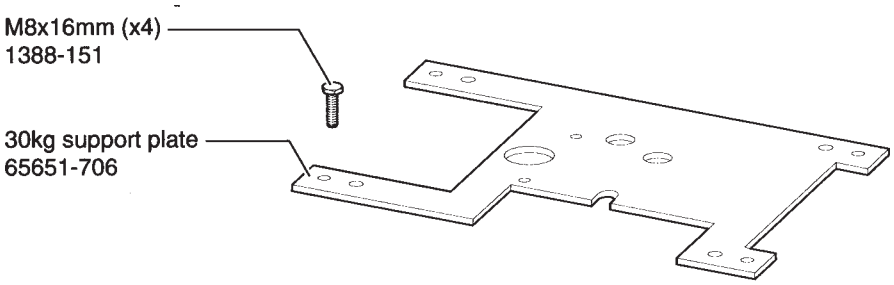
If you attempt to abandon the calibration procedure you will see the following display:



You must start the calibration procedure again.

30kg/60lb Scales

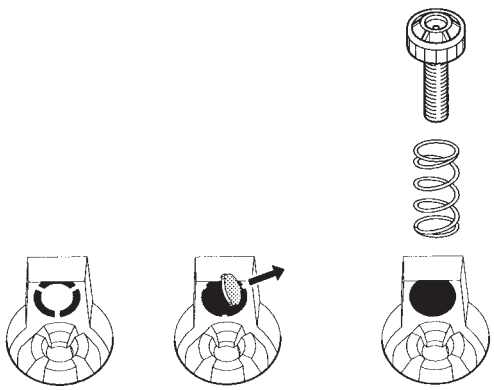
For 30kg scales, a stiffener plate must be used. See illustration below.



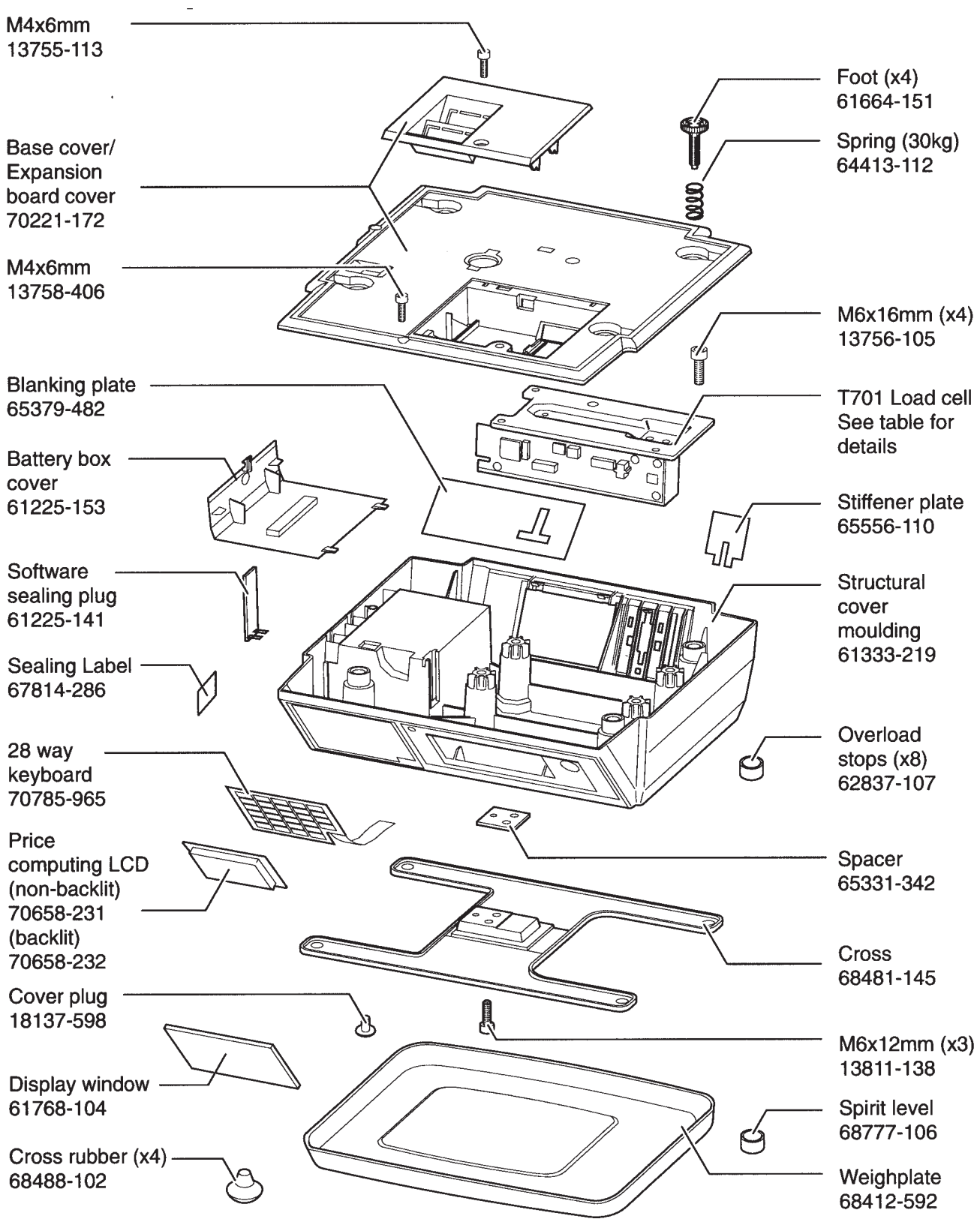
Stiffener plate

Replacing Base Covers

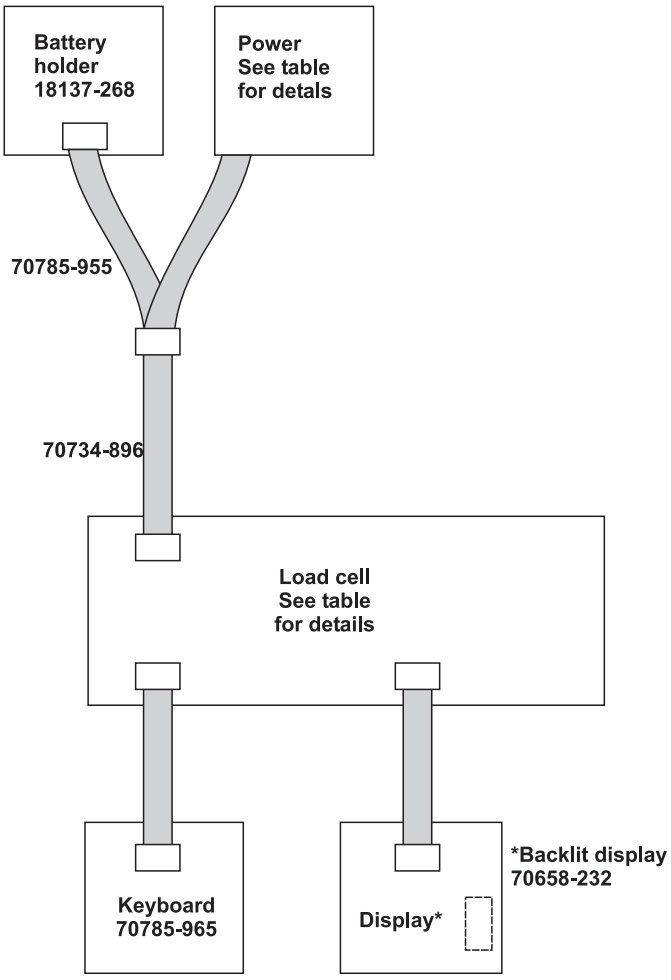
If you need to replace a damaged base cover, break off all four cut-outs from the new cover before replacing.



Illustrated Parts List



Wiring Diagram



Display board settings

Power Supplies

PN	Note
70682-260	High current AC adapter
70682-277	Universal In-line

Load Cells

Country	PN	Note
Blank	70718-623	Blank 15kg - No software
Blank	70718-385	Blank 30kg - No software

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