

SERVICE CODES

There are only two service codes that are accessible in a “Users Mode”. These are C4 (Unbalance Compensation) and C12 (Display Counter Indication). To access these service code in “Users Mode”:

1. Press the <F> and the <FINE> key for 3 seconds, “SEL ECT” will be displayed for 2 seconds and than “BAL SHT” will be displayed (Indicating C4)
2. Press the plus or minus key “Count” (C12) will be displayed and then changed between C12 and C4.
3. Press the <F> key to select the displayed item.
4. To exit the C4 or C12 function press the <FINE> or the <STOP> key.

NOTE: THESE PROCEDURES ARE THE SAME AS BEING IN THE “SERVICE MODE”.
NOTE: ONCE THE UNIT IS POWERED DOWN THE VALUES FOR C4 WILL BE GONE.

ACCESSING THE SERVICE CODES

NOTE: IF A SERVICE CODE IS TO BE ACCESSED WHICH WILL REQUIRE THE USE OF THE PRUEFROTOR OR A WHEEL AND TIRE, IT MUST BE MOUNTED AND PROPER DIMENSIONS ENTERED BEFORE TURNING THE BALANCER OFF TO ENTER THE SERVICE PROGRAM.

With the unit in the “OFF” position press and hold the <FINE> and the <CAL> buttons simultaneously and switch the power to the “ON” position. After approximately 7 to 8 seconds the unit will sound a tone and the display will go blank and then display “CAL FAC”, release the keys at this time. The display will then show “DIS 115” at which time the technician should press the <F> button. Failure to press the “F” button within 5 seconds will abort the service entry procedure and the technician must start from the beginning. The first service code to appear is C4. Press the Distance <±> key to the desired service code, once the desired code is displayed press the <F> key to activate that service code. After the service code is performed the technician will either press the <F> button to store the data or the <STOP> button to exit the code and enter into another service code or press the <FINE> key to exit the service menu. If the “FINE” key is pressed at any time the technician must re-enter in the service menu from the beginning.

C CODE DESCRIPTIONS

C4 UNBALANCE COMPENSATION (ALL MODELS)

“C4” in left display, “0” or “1” in right display. Factory setting is “0”.

- Spin wheel to compensate for adapter unbalance.

Lower the hood to commence a spin. After the spin is complete the machine will store the new compensation values and exit to the service menu. C4 is then active (independent from the choice 0 or 1).

- If C4 is already active when the service code is selected, the “+ - Keys” will toggle the status of the code between 0 and 1. Pressing the <FINE> with 0 displayed cancels the code and if 1 is displayed the code remains active still. Press the <FINE> key exits the code.

C7 VOLUME AND AUDIBLE TONES

“C7” in left display, “10” - “100” in right display. Factory setting is “50”.

Select the required volume using the <±> keys. Press the <F> to confirm the value.

Pressing the <FINE> key at any stage will act like an Escape key and exit the code without changing anything.

C11 STOP AT TOP (ONLY 1400 AND 1500)

“C11” in left display, current setting is in right display (1 = Yes, 0 = No, Factory setting is “1”).

- Press <±> key to change between 1 and 0.
- Press the <F> key to accept the displayed item and exit the code.
- Press the <FINE> key to exit the code without any change.

C12 COUNTER INDICATION

A 6-digit number is displayed across both displays (0 – 999,999). This number indicates the total number of measurement runs performed.

Pressing the <±> keys displays another counter. The five counters that are available:

- C1: Total for all spins
 - C2: Spins with OK
 - C3: Spins with Optimisation / Minimisation
 - C4: Spins in service mode
 - C5: Spins since last calibration
- Pressing the <FINE> Key will exit the code

C14 USER CALIBRATION

When doing a User Calibration it is not necessary to use a tire and wheel assembly. Use factory Calibration Weight supplied with the balancer.

1. Turn balancer **OFF**. Enter in the calibration mode by holding down the “**CAL**” key 7 seconds and restarting the machine. Hold the key until the display flashes “**Cal Usr**”.
2. Press and hold **CAL** button, then turn balancer ON.
3. After approximately seven seconds “**CAL USR**” will flash on the display followed by “**dis 115**”. Release **CAL** button.
4. Press **F-OPT** button and the number one (1) will be displayed on right LED. Lower wheel guard and spin shaft assembly with no wheel, adapters or wing nut on shaft. (Figure 3-4)
5. When rotation stops, the number two (2) will be displayed on right LED. Lift wheel guard and, using the threaded hole, attach factory Calibration Weight on inside of flange plate, (Figure 3-5)
6. Lower wheel guard and spin shaft assembly. After the shaft stops, display will be blank for about 4 seconds then **DNE** will be displayed. Remove Calibration Weight and place in holder. Turn balancer off and back on. Balance tire and wheel assembly to check for proper operation.

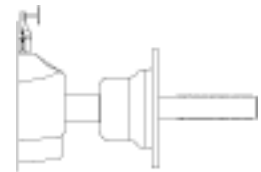


Figure 3-4

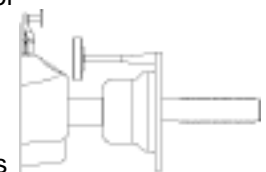


Figure 3-5

Possible messages during calibration;

- E6 Calibration tool was not attached in both runs, calibration tool was attached in both runs
- E16 Calibration weight attached erroneously to flange
- E50 Factory calibration was not completed.
- E51 Calibration failed.
- E52 Calibration weight on opposite side to factory calibration.

Any operator wheel spin errors occurring during user calibration or minimisation cause the functions to exit.

C15 STICKY AT TOP (ONLY 1400, 1500)

“C15” in left display, current setting is in right display (1 = Yes, 0 = No, Factory setting is “1”).

- Press <±> key to change between 1 and 0.
- Press the <F> key to accept the displayed item and exit the code.
- Press the <FINE> key to exit the code without any change.

C28 LAST 10 KERNEL ERROR MESSAGES

A 6 hex-digit error number is displayed across both displays. At two second intervals this number is switched

with a number from 1 – 10 (1 being the most recent) indicating which error message is currently displayed.

- Pressing the <±> key cycles through the list of error codes.
- Pressing the <FINE> Key will exit the code
- Pressing the <F> key exits the code.

C43 RESET SPIN COUNTERS

“C43” in left display, “0” or “1” in right display. 0 will do nothing, 1 resets all of the counters.

Pressing the <±> key will toggle the status of the code between 0 and 1. Pressing <F> with “0” displayed exits the code without resetting the counters. If “1” is displayed and <F> is held down for 10 seconds the code is exited and the counters are reset. Pressing the <FINE> key at any stage will act like an Escape key and exit the code without changing anything.

C47 CONFIGURE THE FLASH

“1100” or “1200” “1400” “1401” and “1500” in displays.

Pressing the <±> keys will toggle the selected machine model. Pressing <F> will program the flash for the appropriate machine. The machine will then reset. Pressing the <FINE> key at any stage will act like an Escape key and exit the code without changing anything.

C66 - C67 ENGINEERING AND MANUFACTURING PURPOSES

C72 MECHANICAL PHASE SHIFT OF VIBRATORY SYSTEM

- Enter C72 by pressing the <±> keys; “1” will be displayed in the left window indicating the step number.
- Mount the Pruefrotor on the balancer and perform a measuring run. A number “2” will be displayed to indicate the step number. (Figure 3-6)

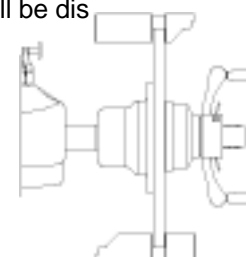


Figure 3-6

- Mount the calibration weight (100 gram) on the left side of the calibration rotor. Perform a measuring run. (Figure 3-7)
- The digit “3” in the left display to indicate the step number.

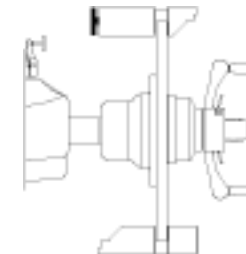


Figure 3-7

- Remove the calibration weight and mount the calibration weight on the right side of the calibration rotor. Perform a measuring run. (Figure 3-8)

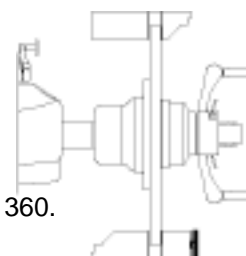


Figure 3-8

The phase shift of the left hand plane is shown as a floating point number in degrees from 0 – 360.

Pressing the <±> keys displays the phase shift of the right hand plane.

Pressing the <FINE> or <F> key will exit the code

C74 INDICATION OF POSITION COUNTER (ENCODER INSPECTION)

A 3 – 6 digit floating point number in degrees from 0 – 511. This represents the angular wheel position. If the wheel position subsystem is not initialised (possibly because the machine has just been turned on) a “buSY” indication is displayed until a value is available. Rotate the shaft one complete revolution to initialize the encoder. Pressing the <FINE> or <F> key will exit the code

C75 ENGINEERING AND MANUFACTURING PURPOSES

C76 INDICATION OF ALL ADAPTED VOLTAGES AFTER CALIBRATION WITH C83

Press the <F> during the display of C76 adapted voltages will be displayed. Eight voltages are available. Press <←> to change the display. This could be requested for a check in case E24 or E27 is displayed in order for comparison to the below table.

LEFT DISPLAY	RIGHT DISPLAY	MEANING
L5b	42	low speed 50Hz bottom voltage
L5t	47	low speed 50Hz top voltage
H5b	49	high speed 50Hz bottom voltage
H5t	55	high speed 50Hz top voltage
L6b	48	low speed 60Hz bottom voltage
L6t	52	low speed 60Hz top voltage
H6b	60	high speed 60Hz bottom voltage
H6t	64	high speed 60Hz top voltage

Press the <FINE> key to exit the code.

C80 2D SAPE ARM CALIBRATION

The Model 1200 does not have an automatic SAPE so it does not require any adjustments. Both the model 1400 and 1500 have an automatic SAPE that requires periodic adjustment and/or calibration.

After entering in the C80 calibration the display window will display a “1” in the left display and the raw SAPE voltage in the right hand display. The value should be +4.30VDC ± .10 volts. If the value is not correct adjustment to the distance (offset) potentiometer must be adjusted. This can be done by removing the weight tray and with the SAPE rod in the home position, loosen the 10mm nut holding the wheel to the potentiometer and adjusting the potentiometer using a flat blade screw driver (Figure 3-9) Once the correct voltage has been obtained, securely tighten the 10mm nut and press the <F> key to store the value in the HOME position and continue. The display will change to “2”



Figure 3-9

Fully extend the distance gauge, the value cannot be any lower than 0 ±.05. Press the <F> key to store the fully extended value. (Figure 3-10)

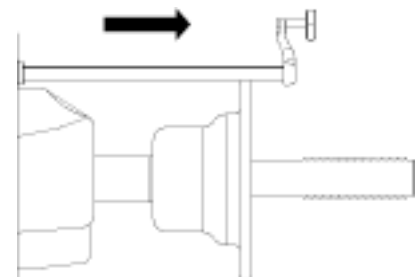


Figure 3-10

Place the flat portion of the calibration weight against the face plate. Extend the SAPE and touch the tip to the calibration weight and rest the bottom portion of the weight applicator on the bell housing (Figure 3-11). The value should be +3.57VDC \pm .05 adjust the diameter potentiometer if the value is not correct adjust the diameter potentiometer.

Press the <F> key to store the value and proceed to the next step.

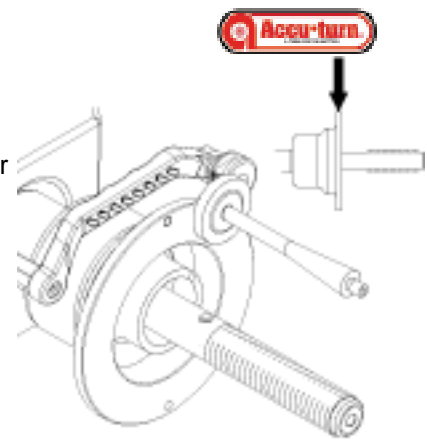


Figure 3-11

Place the large pancake portion of the calibration slug down on the bell housing and pull the distance arm out and rest it on the pancake portion of the calibration slug. Press the <F> key to store the value and proceed to the next step. (Figure 3-12)

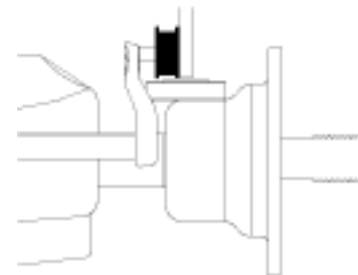


Figure 3-12

Place the SAPE on top of calibration slug weight by keeping the slug thread in the centre of the SAPE plastic round part (Figure 3-13). Press the F key and display will show C80 and enter the value.

CALIBRATION COMPLETE



Figure 3-13

C81 SAPE ARM ZERO

Place the flat portion of the calibration weight against the face of the flange plate. Extend the SAPE arm and touch the tip to the calibration weight. Press the <F> key to store the value (Figure 3-14).

CALIBRATION COMPLETE

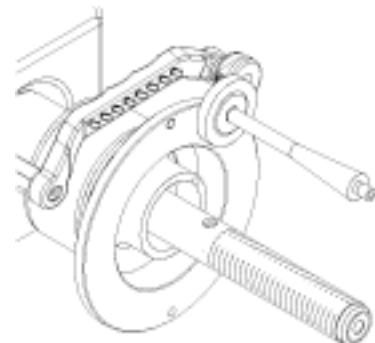
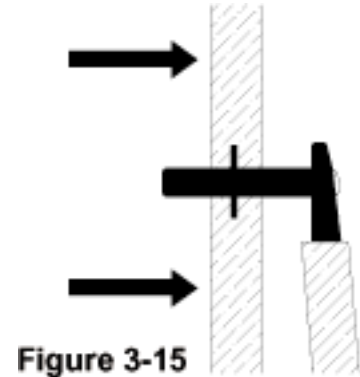


Figure 3-14

C82 3D SAPE CALIBRATION

The model 1500 is the only balancer that requires this procedure, both the 1200 and 1400 do not have the "Width Arm".

Make sure that the width arm is in the home position, (Figure 3-15) enter C82 and verify that the voltage reading from the SAPE is 4.25 - 4.30VPC. If the voltage is correct press the <F> key to enter the value, if it is incorrect adjustments must be made before continuing.

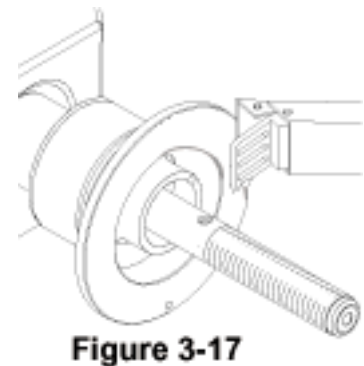


If the values are not correct adjustment to the 3D potentiometer must be made. Remove the three philip screws from the 3D SAPE potentiometer that is mounted on the wheel guard. Holding the SAPE arm in the home position adjust the potentiometer to correct voltage. (Figure 3-16)



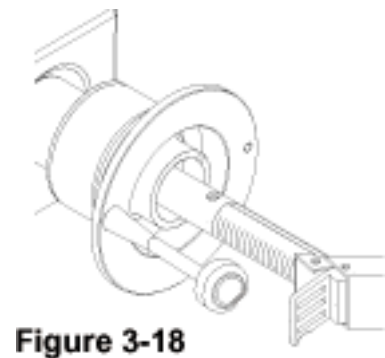
Figure 3-16

Move the SAPE arm and touch the tip to the Flange Plate (Figure 3-17) and press the <F> key to enter the value.



Screw the Calibration weight into the threaded hole on the Flange Plate and touch the tip of the 3D SAPE to the tip of the calibration weight (Figure 3-18) and press the <F> key to store the value.

CALIBRATION COMPLETE



C83 FACTORY CALIBRATION PROCEDURE

NOTE: THE C80 CALIBRATION MUST BE DONE BEFORE THIS OPERATION.

A balanced tire and wheel assembly can be substituted if a Pruefrotor is not available. The calibration procedures are the same and can easily be performed. The correct dimensions of the Pruefrotor or tire and wheel assembly must be entered before proceeding with this procedure. After the correct dimensions have been entered recycle the power using the procedures for entering into the service menu. This written procedure is done using the Pruefrotor.

1. Enter C83 using the <±> keys and press the <F> key. Mount the Pruefrotor on the balancer shaft and lower the wheel guard to perform a measuring run. (Figure 3-19)
2. After the first measuring run the display will change to "2" in the left display and "100" in the right display. If a tire and wheel assembly is used and a 100 gram weight (3.5oz) is not available, press the <±> keys until the exact weight in grams is displayed and press the <F> to accept this value. The display will change to "3".

NOTE: IF USING PRUEFROTOR, PRESS <F> AND GO TO STEP 3 BELOW.

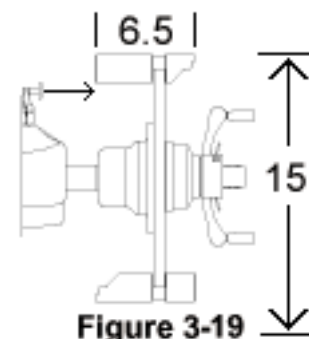


Figure 3-19

3. Screw the 100gram (3.5oz) weight on the left side of the Pruefrotor (Figure 3-20) and lower the wheel guard to begin the measuring run. After the shaft comes to a stop the display will change to "4".

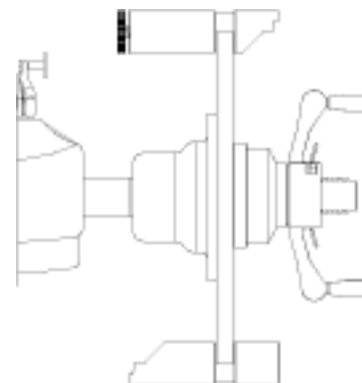


Figure 3-20

4. Remove the 100gr (3.50oz) weight from the left side and screw it into the right side of the Pruefrotor. (Figure 3-21)

NOTE: IF A TIRE AND WHEEL ASSEMBLY IS USED THE TEST WEIGHT MUST BE ATTACHED ON THE OUTSIDE OF THE WHEEL EXACTLY 180° FROM THE WHERE THE INNER WEIGHT WAS ATTACHED.

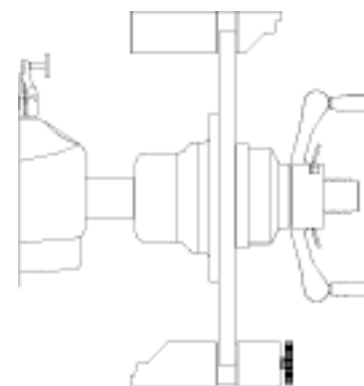


Figure 3-21

Lower the wheel guard to begin the spin cycle. After the shaft comes to a stop the display will change to "5".

- Remove the Pruefrotor from the shaft.

NOTE: IF USING WHEEL AND TIRE, LEAVE ON SHAFT

NOTE: FOR A MOTORIZED UNIT THE TECHNICIAN CAN EITHER REMOVE THE PRUEFROTOR FROM THE SHAFT OR LEAVE IT ON THE SHAFT.

Spin the shaft by lowering the wheel guard. After the shaft comes to a stop the display “6”.

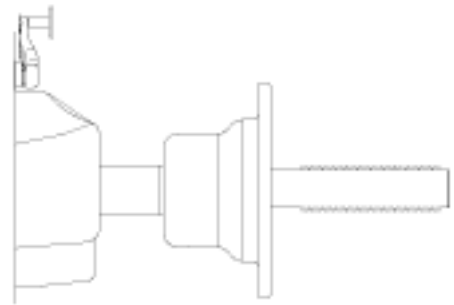


Figure 3-22

- Attach the calibration weight to the inside of the flange plate and lower the wheel guard to begin the spin cycle. After the balancer comes to a stop the new calibration factors are stored into memory.

CALIBRATION COMPLETE

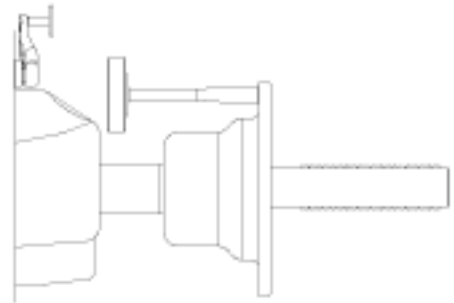


Figure 3-23

C84 COMPENSATION OF THE RESIDUAL MAIN SHAFT UNBALANCE

NOTE: THIS CODE MUST BE USED AFTER C83 IS PERFORMED. THE VALUES PRODUCED ARE STORED AND USED FOR EVERY SUBSEQUENT UNBALANCE MEASUREMENT WHERE C4 IS DISABLED.

- The digit “1” in the left display to indicate the step number. All adaptors, cones and wheels must be removed from the machine shaft. (Figure 3-
- Lower the hood to begin a spin cycle. After the spin is complete the machine will sound a tone and the function will exit. The machine stores the new compensation values and exits to the service menu.

CALIBRATION COMPLETE

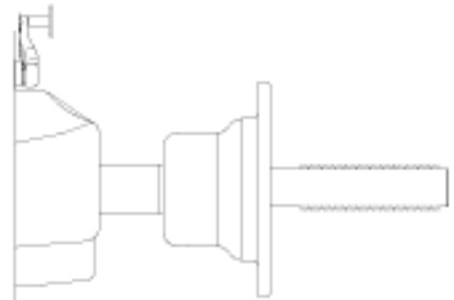


Figure 3-24

C85 CALIBRATION DATA TRANSFER FROM CPU PCB TO ENCODER PCB

Turn on the machine after the encoder replacement and C85 will be displayed. Press the <F> button and some beeps will be emitted, an auto test and a power on will automatically be performed. Data is now transferred from the CPU to the Encoder.

NOTE: IF THE ENCODER PCB MEMORY IS EMPTY OR THE SOFTWARE RELEASE LOADED ON THE CPU MATCH WITH THE DATA OF THE ENCODER, CALIBRATION DATA WILL BE AUTOMATICALLY STORED IN THE ENCODER BOARD MEMORY; IF THE ENCODER BOARD HAS ANOTHER RELEASE MEMORIZED, FACTORY CALIBRATION IS REQUIRED.

C86 CALIBRATION DATA TRANSFER FROM ENCODER PCB TO MAIN CPU PCB

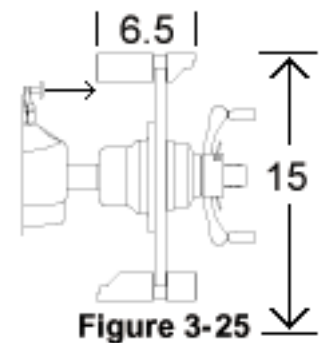
Turn on the machine after the CPU replacement and C85 will be displayed. Press any <+> button to change the display to read C86 and press the <F> button. Some beeps will be emitted, an auto test and a power on will automatically be performed. Data is now transferred from the Encoder PCB to the Main CPU

NOTE: IF THE CPU BOARD MEMORY IS EMPTY OR THE SOFTWARE RELEASE LOADED ON THE CPU MATCH WITH THE ONE OF THE ENCODER, CALIBRATION DATA WILL BE AUTOMATICALLY STORED IN THE CPU BOARD MEMORY; IF THE ENCODER BOARD HAS ANOTHER RELEASE MEMORIZED, FACTORY CALIBRATION IS REQUIRED.

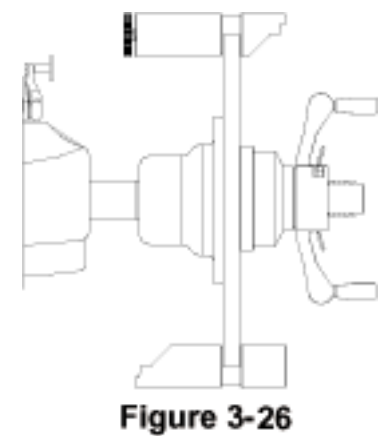
C88 ANGULAR UNBALANCE POSITION

NOTE: A TIRE AND WHEEL ASSEMBLY MAY BE SUBSTITUED IN PLACE OF THE PRUEFROTOR. THE ASSEMBLY MUST BE BALANCED BELOW 10 GRAMS IN THE NORMAL WEIGHT PLACEMENT MODE BEFORE CONTINUING.

1. Mount the Pruefrotor on the balancer shaft and enter in the parameters of the Pruefrotor using the balance screen. Activate the service code C88 from the service menu. Press the "F" button to begin the measurement run. (Figure 3-25)



2. Attach the 100 gram weight to inside of the Pruefrotor and press the "START" button. (Figure 3-26)



3. After the shaft comes to a complete stop rotate the shaft to locate the 100 gram weight at "**BOTTOM DEAD CENTER**" position. Press the <F> key to save the data. (Figure 3-27)

CALIBRATION COMPLETE

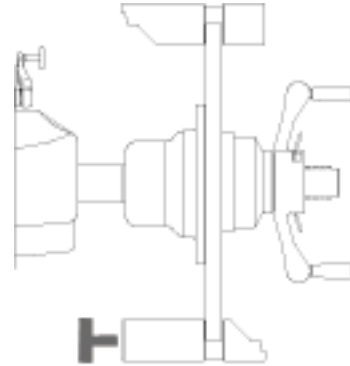


Figure 3-27

C111 MEASURING THE BELT TENSION

Displays: **C.11**

Lift the belt for 1cm (half a inch) and release it. The measuring will start and a moving — in the left seven segment display will appear. After measuring, the belt tension in Hz. will be shown in the right display. Right adjustment value is 193 Hz (tolerance is + 8 / - 15 Hz).

FACTORY CALIBRATION SEQUENCE

If major service is required it is recommended that a complete factory calibration be performed on the balancer.

Perform service codes in the following order;

1. C80 (only 1400-1500).
2. C81
3. C82 (only 1500)
4. C83
5. C84
6. C88

The machine is now ready for use.