

Pedco Sortaweigh System 400 Maintenance Guide

High Speed Weighing System

Foster Farms Poultry
Livingston, California

Developed by Jim Collins

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Controls and Indicators

Isolator

This is mounted on the side of the Weighing Console. To switch the machine on or off, turn the red part of the isolator through 90°.

Start, Stop and Emergency Stop buttons

The green Start and red Stop buttons are mounted on the front edge of the machine below the lane one scale conveyor. The red Emergency Stop button is mounted on the front edge of the machine near the Start and Stop buttons. Additional Emergency Stop buttons are mounted on the outfeed and infeed conveyors for both lanes one and two.

Keyboard and Display

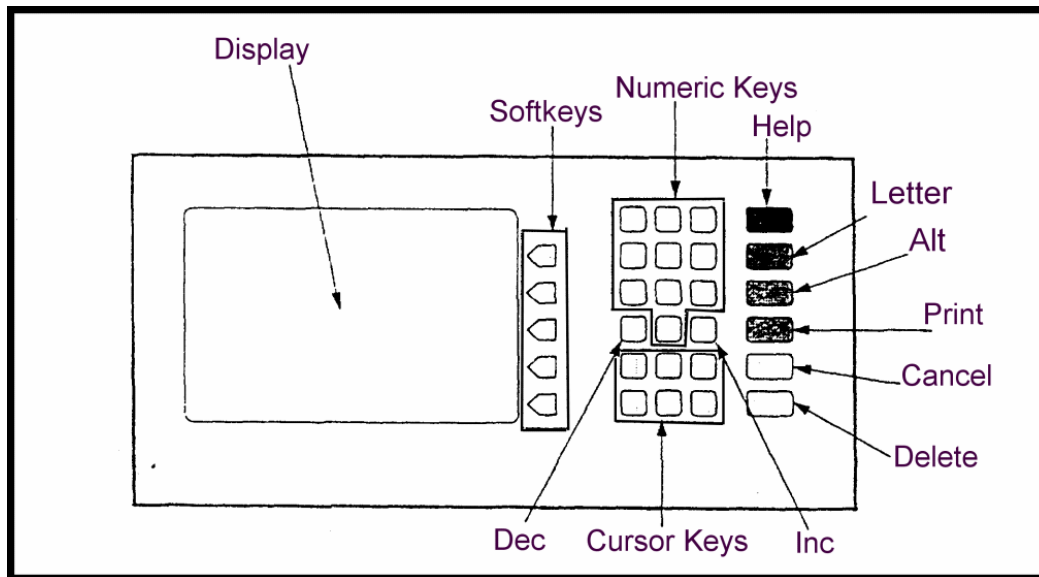


Fig. 1-1

Soft keys	Used to select menu entries.
Numeric Keys	Used to select menu entries and enter numbers.
INC/DEC	Used to increase and decrease numbers and to select alternatives in entries with several choices, such as ON/OFF.
Cursor Keys	Used to move from field to field or to move the flashing cursor within the current field, which is highlighted.
Help	Gives an explanation of the current state of the machine.
Letter	Used to enter alphabetic and punctuation characters.

(Continued on next page)

Alt	Used to access some of the engineering functions; see TEST WINDOW on page 3-3.
Print	Sends information to the attached printer.
Cancel	Returns the current entry to its previous value.
Delete	Wipes out the character under the cursor.

Editing:

- Many screens on the System 400 contain data entry fields. These fields can contain a number, some text, or one of a series of choices, such as ON or OFF. Any data entered on the keyboard will affect the contents of the current field. The current field is highlighted, and the cursor flashes within the current field.
- In order to edit the contents of a field, it must first be highlighted. To move the current field from line to line, use the $\uparrow\downarrow$ keys. To move from column to column, use the $\leftarrow\rightarrow$ cursor keys. To move within a field, use the $\leftarrow\rightarrow$ cursor keys.
- **To enter a number**, use the numeric keys on the keyboard to write over the existing value, or use **INC** and **DEC** to change the digit under the cursor.
- **To select a different choice**, move to the appropriate field and press **INC** or **DEC**. Either key will toggle through the valid choices.
- **To enter text**, use **INC** and **DEC** to alter the character under the cursor. This is actually altering the ASCII character code. As a short-cut, press **LETTER** followed by the ASCII code for the character required. A list of all available character codes is shown on page 51 of the manufacturer's manual.
- When all the fields on the screen are correctly set, press **ACCEPT**. The machine will now use the new values.
- To correct a mistake, press **CANCEL**. The current field will be restored to its original value.
- To discard all the changes to the current screen, press **QUIT**. The machine will discard the new values and use the original ones.

Start-up and Self Checks

How to start the machine

1. Turn the red isolator on the side of the cabinet.
2. Wait for the machine to carry out its self checks.
 - Checks are carried out on the non-volatile memory to ensure that the values stored are reasonable.
 - The results of these checks are shown in the startup window.
 - The checks can return OK, strange or bad
 - If the self checks fail, a message appears explaining how the fault can be fixed. This may prevent the machine from running. See **FIX MENU** below.
 - If either the **Config Data** or **Access Level Data** returns strange or bad, there is a serious error in the Setup Data which will require either correcting faulty SAW (page 2-15) data or contacting a Sortaweigh engineer for assistance.
 - If an error is detected in the **Calibration** or **Outfeed Setup**, it can be fixed by a scale technician.

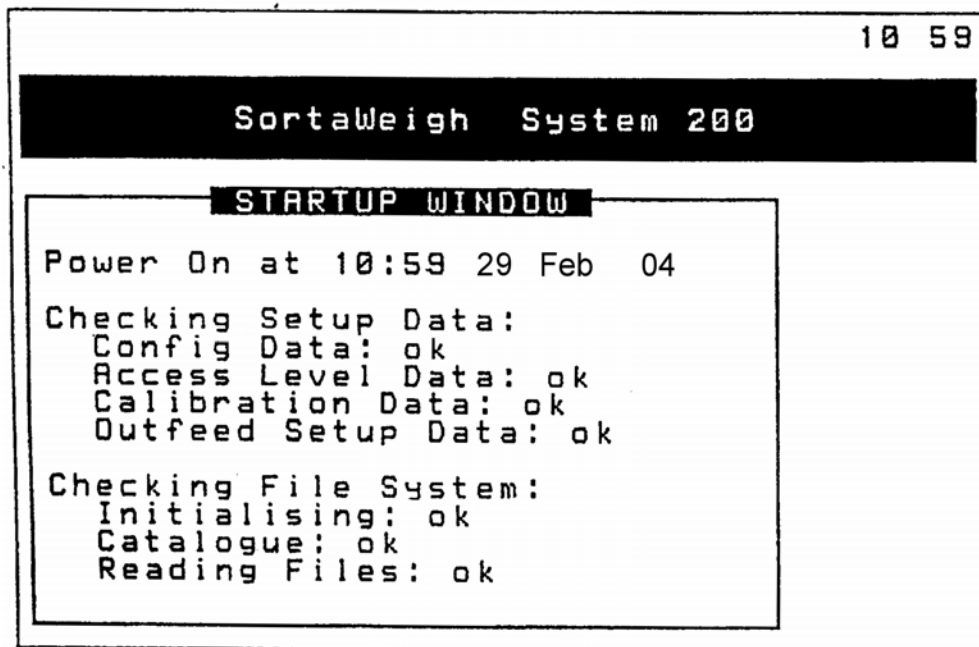


Fig. 1-2

3. Wait for the machine to warm up.

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4. Select a program.

- The procedure for selecting a program is described on page 21 of the manufacturer's manual. For maintenance checks, unless troubleshooting a specific program problem (very rare), use program **No. 1 G&B**.
- Once the self checks and warm-up are complete, the machine will offer a choice of programs.
- **NOTE:** If the machine has not been switched off for long, it will not go through the warm-up procedure and will immediately load the last program in use.

Set Clock

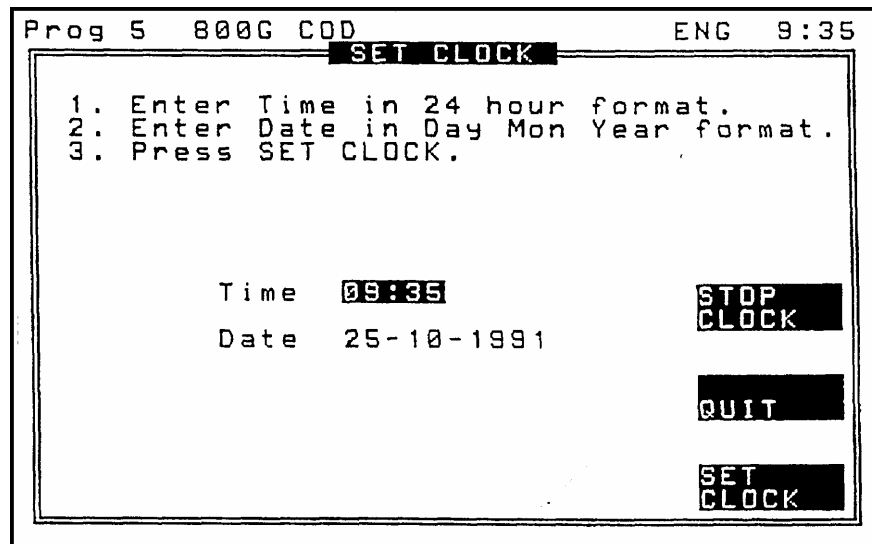


Fig. 2-7

NOTE: Can be accessed only when machine is stopped.

Displays the present time in 24 hour format and provides instructions for resetting the time and date.

Use the numeric keys to reset the time and/or date and press **SET CLOCK** immediately to return to the Engineer's Menu or **QUIT** to return without changing.

STOP CLOCK is used to save the clock backup battery while the machine is in storage for any length of time. Once selected, the clock stops and the display returns to the Engineer's Menu. **NOTE:** This function should never be required at Foster Farms, Livingston.

Set Access Levels

The Set Access Levels screen allows changing the access levels for many of the machine features. Access level options include: Operator (OPR), Supervisor (SVR), and Engineer (ENG).

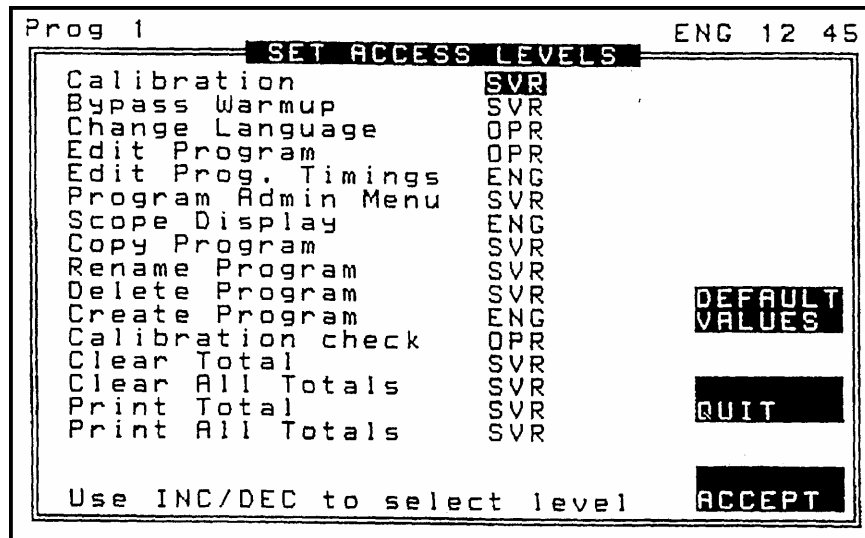


Fig. 2-8

NOTE: Can be accessed only when machine is stopped.

To change an Access Level

- Use the direction soft keys to move to the required position on the screen and then use the **INC** or **DEC** soft keys to cycle through the options.
- When all desired changes are complete, press the **ACCEPT** soft key and a prompt to **UNPROTECT MEMORY** will appear.
- To Unprotect Memory, open the rear door of the weighing console cabinet

! WARNING: Make sure no water gets inside while the cabinet door is open.

- Following this action the prompt **PROTECT MEMORY** will appear.

CAUTION: Failure to ... could result in program corruption and subsequent system crash.

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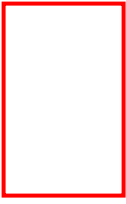
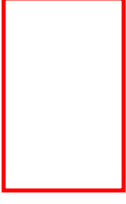
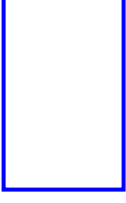
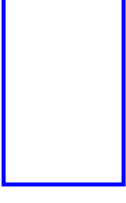
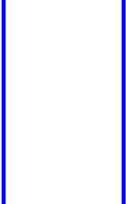
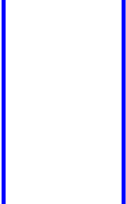
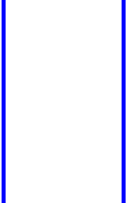
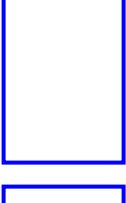
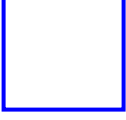
Individual Machine Access Levels (as of 2/16/02)

	Plant One	Plant Two	Rotisserie Room
Calibration	ENG	ENG	ENG
Bypass Warm-up	ENG	OPR	ENG
Change Language	ENG	OPR	ENG
Edit Program	OPR	OPR	OPR
Edit Program Timings	ENG	ENG	ENG
Program Admin Menu	ENG	OPR	ENG
Scope Display	ENG	ENG	ENG
Copy Program	ENG	OPR	ENG
Rename Program	ENG	OPR	ENG
Delete Program	ENG	OPR	ENG
Create program	ENG	OPR	ENG
Calibration Check	ENG	OPR	ENG
Clear Total	OPR	OPR	OPR
Clara All Totals	OPR	OPR	OPR
Print Total	ENG	OPR	ENG
Print All Totals	ENG	OPR	OPR

Fig. 2-9

Belt Speeds/VFD Settings for Plant One

(As of 3/12004)

Lane One			Lane Two	
<u>No VFD</u>		Outfeed Belts	<u>No VFD</u>	
	<u>561 fpm</u> Belt Speed			<u>559 fpm</u> Belt Speed
<u>No VFD</u>		Scale Belts	<u>No VFD</u>	
	<u>602 fpm</u> Belt Speed			<u>618 fpm</u> Belt Speed
<u>73.2 Hz</u> VFD		Infeed Belts	<u>75.1 Hz</u> VFD	
	<u>595 fpm</u> Belt Speed			<u>605 fpm</u> Belt Speed
<u>73.9 Hz</u> VFD			<u>69.2 Hz</u> VFD	
	<u>385 fpm</u> Belt Speed			<u>408 fpm</u> Belt Speed
<u>No VFD</u>			<u>90.0 Hz</u> VFD	
	<u>135 fpm</u> Belt Speed			<u>185 fpm</u> Belt Speed
			<u>42.3 Hz</u> VFD	
				<u>104 fpm</u> Belt Speed













In Plant One, the speed of most infeed belts is controlled by a Variable Frequency Drive (VFD). Refer to page 3-23 to 3-26 for adjustment procedures. Those infeed belts with no VFD setting listed have set speeds based on the type of motor installed.

The scale belts have individual speed control modules with associated potentiometers to control their speed.

The speed of the outfeed belts is based on the type of motor installed and is not adjustable.

Belt Speeds/VFD Settings for Plant Two

(As of 11/1/03)

Lane One			Lane Two			
<u>63.0 Hz</u> VFD		<u>577 fpm</u> Belt Speed	Outfeed Belts	<u>59.3 Hz</u> VFD		<u>574 fpm</u> Belt Speed
<u>No VFD</u>		<u>574 fpm</u> Belt Speed	Scale Belts	<u>No VFD</u>		<u>574 fpm</u> Belt Speed
<u>66.0 Hz</u> VFD		<u>570 fpm</u> Belt Speed	Infeed Belts	<u>60.3 Hz</u> VFD		<u>574 fpm</u> Belt Speed
<u>55.4 Hz</u> VFD		<u>540 fpm</u> Belt Speed		<u>58.8 Hz</u> VFD		<u>557 fpm</u> Belt Speed
<u>53.2 Hz</u> VFD		<u>431 fpm</u> Belt Speed		<u>90.5 Hz</u> VFD		<u>430 fpm</u> Belt Speed
<u>21.8 Hz</u> VFD		<u>185 fpm</u> Belt Speed		<u>18.4 Hz</u> VFD		<u>179 fpm</u> Belt Speed

In Plant Two, the speed of the infeed and outfeed belts is controlled by a Variable Frequency Drive (VFD). Refer to page 3-23 to 3-24 for adjustment procedures.

The scale belts have individual speed control modules with associated potentiometers to control their speed.

Product Histogram

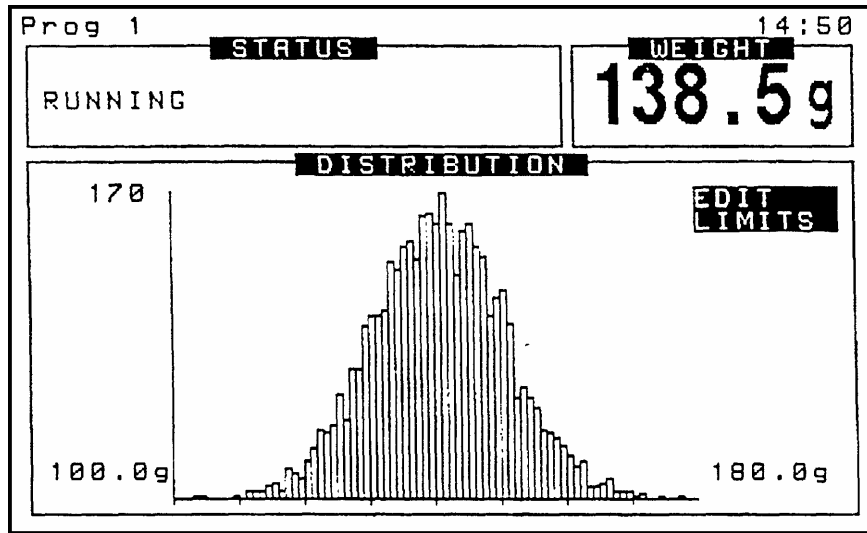


Fig. 3-1

Provides a graphic display of the distribution of product weights processed by the machine. The weights of all pieces processed by the machine are recorded and will be retained until machine is turned off, thus allowing graph data to be collected from more than one program.

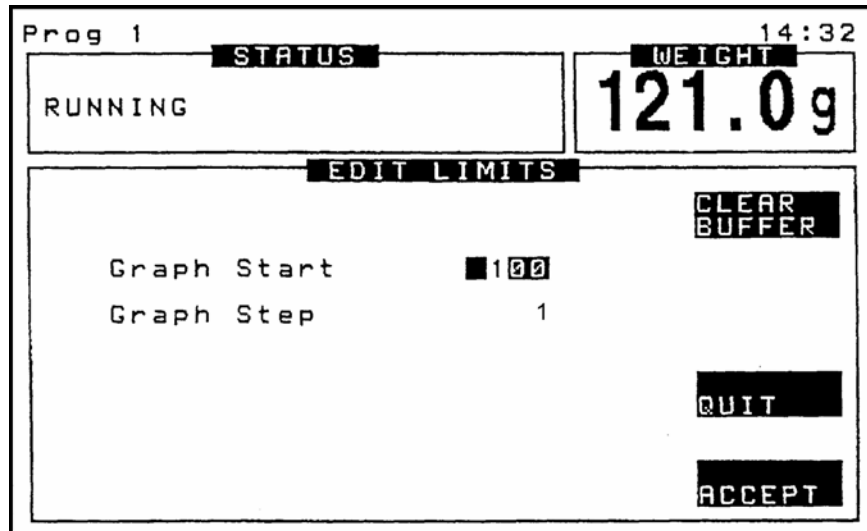


Fig. 3-2

The **EDIT LIMITS** screen allows graph data to be cleared at any time by pressing the **CLEAR BUFFER** soft key.

“**Graph Start**” and “**Graph Step**” set the starting point and step size of the displayed graph. **NOTE:** The graph is 80 bars wide so if Graph Step is set to 1, the graph will span 80 grams.

Fine Calibration Procedures

The machine is most easily calibrated using the Test & Calibrations (**TST**) program rather than using the Engineer's Menu. If no such program exists it must be created. See Create Program in the Program Admin. Menu on page 49 of the manufacturer's manual.

NOTE: A test weight is required to perform the calibration. For Plant's One and Two, the 1380g weight is normally used; for the Rotisserie Room, the 1000g weight is used.

CAUTION: Per USDA instructions, be sure the test weight is wrapped in a plastic bag to prevent contamination.

1. Select the Test and Calibration program
2. Start the conveyors.
3. Weigh the test weight. Be careful to let the weight fully clear the scale before catching/picking it up.
4. Run the test weight over the scale a minimum of ten times.

The screen shows the number of pieces that have been run across the weighhead and an analysis of the weights. The standard deviation is a measure of the dispersion of the weights. If the standard deviation exceeds the increment size, there may be an error in the General Setup (page 2-11) or a mechanical problem with the weighhead. The weighing parameters in General Setup must be set correctly before an attempt is made to calibrate the machine.

5. Stop the conveyors and press **CALIBRATION**.
6. Enter the actual weight of the test weight.
7. Press **RECALL AVG WT**. This will automatically enter the average of the ten test weights taken in step 4.

NOTE: If, after pressing **RECALL AVG WT**, the screen shows: **WARNING – TOO MUCH SCATTER IN AVG**, this implies that the weights taken were not sufficiently consistent and should be taken again or the weighhead or General Setup values need attention.

8. Press **COMPUTE NEW CF**. This will compute the new calibration factor. If after pressing this, the screen reads **VALUE OUT OF RANGE**, the test weight was not in the range required for calibration.
9. Press **ACCEPT** to store the new calibration factor. (Pressing **QUIT** will return you to the Run mode without saving the calibration factor.)

Load Cell Electronics Calibration

CAUTION: This procedure **MUST** be performed whenever a V-F module or load cell is changed.

The weighing electronics uses a Voltage to Frequency Converter. The output of this is a pulse train whose frequency is proportional to the applied weight. The purpose of the setup is to set the frequency corresponding to an empty weigh head to approximately 10 kHz and to set the frequency/weight scaling ratio to 40 kHz/kg.

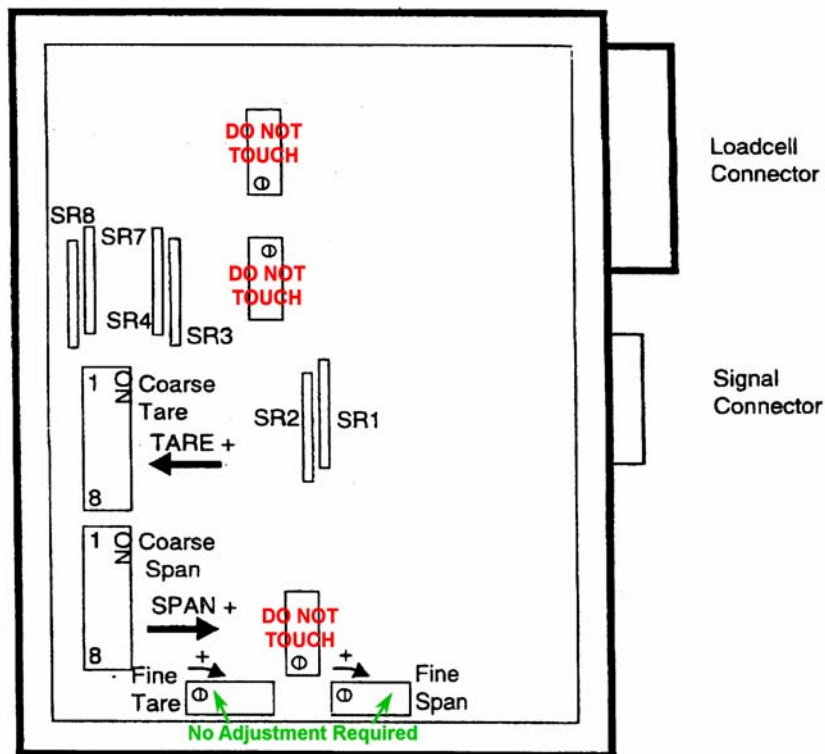


Fig. 3-13

NOTE: This procedure is most efficiently performed by two technicians; one to perform the switch adjustments on the V-F module and one to observe the screen and report changes.

1. Turn the machine on. It needs to warm up for a minimum of 20 minutes.
2. Enter the Run mode and bring up the Test Window for the applicable lane by pressing **ALT 2** the appropriate number of times (refer to page 3-3). Observe the **V/F** value and confirm that the load cell is live (clock arm [\] after the **RAW** value is rotating clockwise). **Do not run the conveyors.**
3. In the electronics cabinet, drop the cage assembly down and remove the applicable V-F module's cover.

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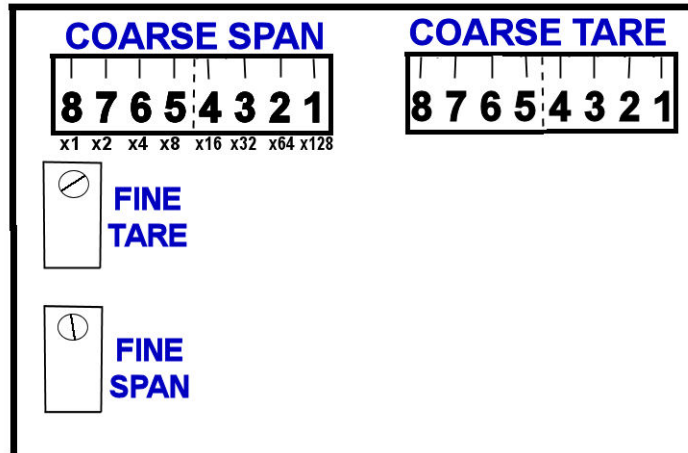


Fig. 3-14

Fig. 3-13 shows the position of the DIP switches and their location in the V-F module in relation to the Fine Tare and Span potentiometers. Fig 3-14 is an expanded view of the Coarse Span and Tare DIP switches. Note that each pole of the DIP switch has a binary weighting from x1 to x128.

4. After ensuring there is no weight on the scale conveyor, use the TARE DIP switches to set the frequency to between 10 and 50 kHz. Also, confirm that the load cell is still live (clock arm is still rotating clockwise).
5. Place the 1000g test weight on the scale and allow the weight to settle.
6. Using the Span DIP switches, set the frequency to either a 40 or 60 kHz difference (refer to Fig. 3-15) from the zero frequency value set in step 4.

Load Cell Capacity	Frequency Diff.
15 Kg	60 kHz
20 Kg	40 kHz
30 Kg	*

Fig. 3-15

* Per Delford (Pedco), do not use a 30 Kg load cell in this machine.

7. Remove the test weight and observe that the zero weight frequency has probably changed from the value set in step 4. Reset to 10 kHz using the TARE DIP switches.
8. Repeat steps 3 – 5 until the zero frequency is between 9 and 11 kHz and the 1000g test weight frequency difference is correct within 3 kHz.
9. Replace the V-F module cover plate and then calibrate the machine.

Troubleshooting: Reference Changing Condition

If the display shows “**REFERENCE CHANGING**” constantly or frequently, check for the following:

1. Load cell is loose.
2. Bad scale conveyor rollers causing excessive vibration.
3. Worn scale conveyor belt; check that the V-guide is not broken or badly cracked. Also check that the belt is tracking correctly.
4. Too much air blowing on scale or too much ice or water crossing it.
5. Scale conveyor motor drive belt loose.
6. Infeed or scale belt speeds very erratic – check all belt speeds.
7. Photo eye aimed too high so that the part of the bird is already on the scale before the photo eye beam is broken.
8. Bad load cell connections (wire nuts or other connections loose or corroded).

Troubleshooting: No Reference Condition

If the display indicates “**NO REFERENCE,**” check the following:

1. Load cell is dead. Check that the raw and reference values change slightly during operation, and the indicator (/) after the raw value is rotating clockwise. (Refer to Test Window on page 3-3).
2. Load cell excitation voltages are correct. You should read -4 to -6V between the shield and the black wire and +4 to +6V between the shield and the blue wire. If any of these voltages are missing: for Lane 1, the V-F adapter board is bad; for Lane 2, the limba board is bad.
3. Load cell output is correct. You should read between +1mv and +100mv **STABLE** between the red and white wires. If this value is not stable (either increasing or decreasing), 90% of the time it's a bad load cell; the other 10% is a mechanical fault. If this value is 0, check for broken wires; if none, the load cell is dead.
4. Check for corroded connections or broken wires, especially at wire nuts and terminals.
5. Bad V/F module.

V to F Module & Load Cell to Mother Board Block

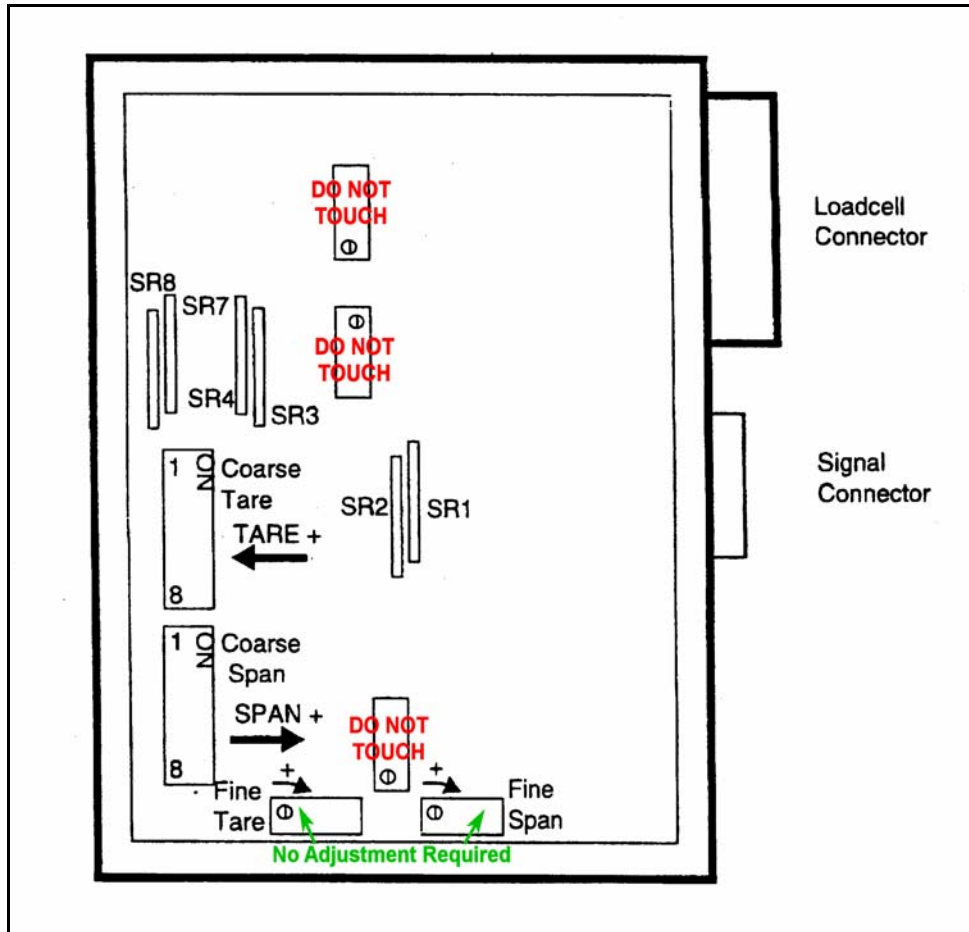


Fig. 4-7

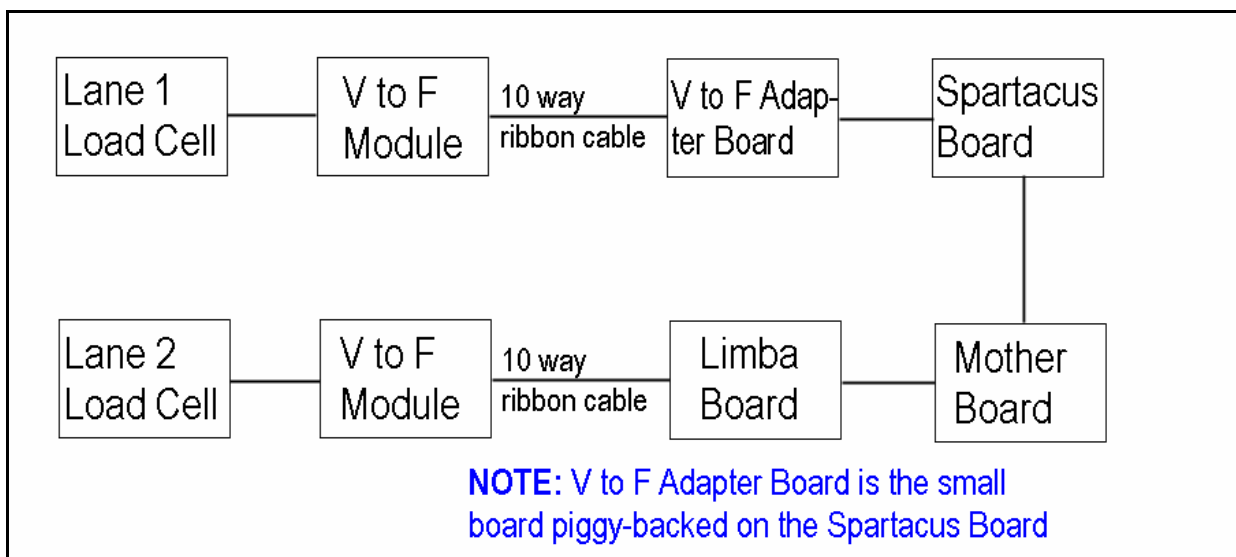


Fig. 4-8