

ArchWeigh 2000

Conveyor Belt Scale Weigh Idler
For Single or Multiple Scale Bases

Installation & Operation Manual

Rev. 4/01

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Recommended Tools for Installation

Butt Splice Crimpers

Utility Knife or Wire Strippers

½” Drill for drilling and mounting conduit or wire grips to the scale and Integrator

Socket set and wrenches for mounting Scale and Integrator

Small flat tipped screwdriver for connecting conductors in Integrator

Mechanical Installation:

Definitions: (See Figure 1)

Load Area: Any area covered by skirtboard material.

Scale Area: Area from the minus three approach idler to the plus three retreat idler.

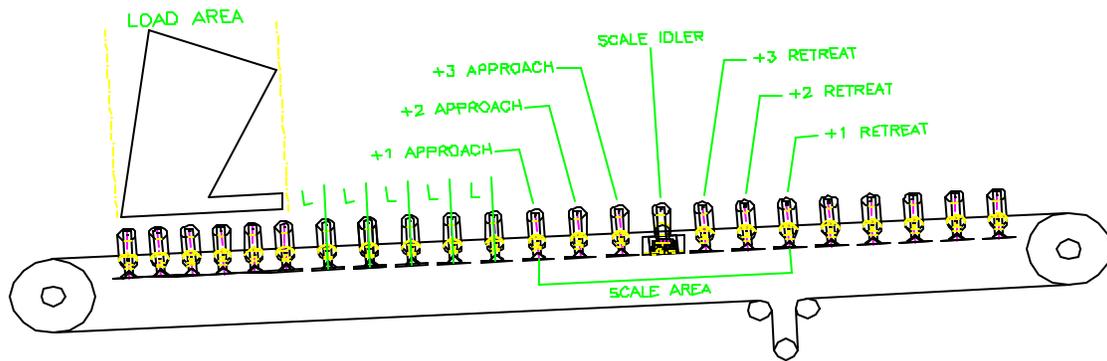


Figure 1

Location:

- The weigh idler should be installed at a point where material speed and belt speed match; generally within 50 feet of the load point, but no closer than 5 idlers of the load area.
- If the scale assembly is to be mounted on a conveyor containing a curve, the weigh idler should not be installed within 40 feet of the curve.
- The conveyor should be rigid, or bracing must be added to strengthen the framework.
- Scale assemblies should be located in areas with minimum vibration.
- Training idlers should not be located within 60 feet of the scale area.
- All idlers within the scale area must be in good condition and of the same make and model. In addition, T.I.R. must not exceed +/- 0.015 inch.

- The entire scale area should be protected from the elements as much as possible.
- Idler spacing within the scale area should conform to CEMA standards based on material conveyed, speed, etc.

Installation: (See Figure 2)

Scale Assembly:

- 1) If necessary, strengthen the conveyor framework.
- 2) Any separations (expansion joints) of the conveyor stringers near the scale must be rigidly welded together.
- 3) Insure that the conveyor is level from the minus 3 approach idler to the plus 3 retreat idler.
- 4) Raise or remove the belt over the entire scale area (from minus 3 approach to plus 3 retreat).
- 5) Remove the idler located in the scale position and replace with the ArchWeigh scale assembly.

WARNING: Remove the shipping pins when the scale is sitting in place. (The idler will drop approximately 1/4 inch when the shipping pins are removed. It will be impossible to correctly shim the idler until the shipping pins are removed.)

- 6) Locate and mark the mid point of the wing rolls of each idler assembly located in the scale area.
- 7) Square the minus two approach and the plus two retreat idlers with the conveyor structure.
- 8) Raise the minus three approach and the plus three retreat idlers 1/4 inch above the belt line.
- 9) Evenly space all idlers (including scale assembly) located between the minus three approach and the plus three retreat idlers.
- 10) Tie four lines (a piano wire or equivalent) to the base of the minus three approach idler; one line running across the center marks of each wing roll and

two lines evenly spaced and running across the center roll. Each line should then be tied tightly to the base of the plus three retreat idler. (Note: On scale systems over 54 inches, an additional string line should be placed on each wing roll for a total of 6 lines.) Refer to figure 2.

- ❑ 11) At this point in the setup process the lines should only touch the plus three and minus three idlers. The other idlers should be below the lines. If the line touches any roll located in the scale area, additional 1/16 inch shims should be evenly added to the minus three and plus three idlers until a clearance exists.
- ❑ 12) **Shim all idlers between the plus three and minus three idler including the scale idler to within 1/32 inch of the lines but not touching the lines.**
- ❑ 13) Insure that all idlers are squared, leveled, and bolted tightly in place.
- ❑ 14) *See Figure 3* - Tighten the load cells to the weight transfer bars.
- ❑ 15) *See Figure 3* - Loosen the Pivot Pin one (1) turn, loosen the Positioning Bolts two (2) turns. Tighten the Positioning Bolts and then tighten the Pivot Bolt. This procedure removes any torsion strain placed on the assembly during installation.
- ❑ 16) Remove all alignment strings.

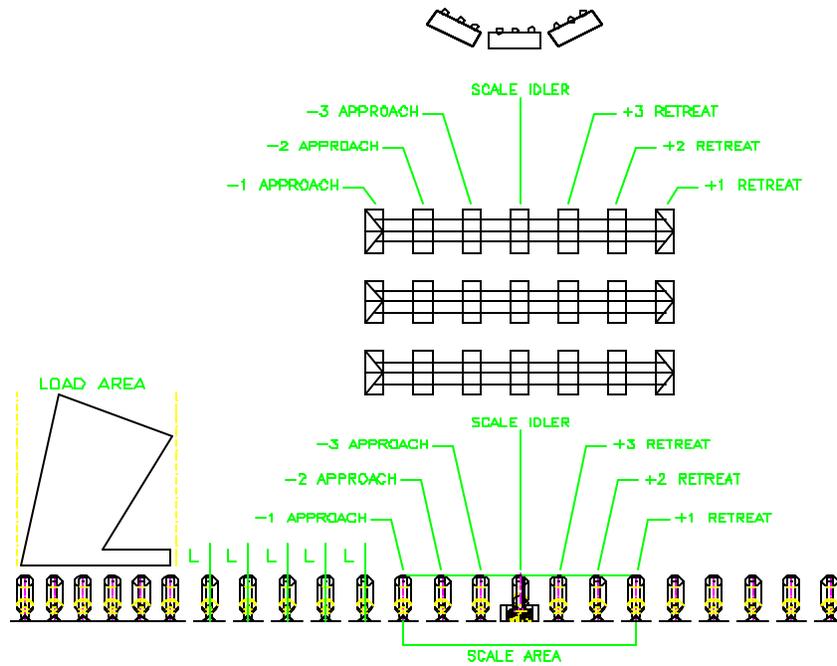


Figure 2

After the scale is in place and the shipping pins have been removed tighten the weight transfer, mounting plate, and positioning bolts inside the loadcell enclosures on each end of the scale.

WARNING: Ensure that the scale shipping pins have been removed before tightening the bolts mentioned above or the loadcells may become damaged and/or the scale will not function properly.

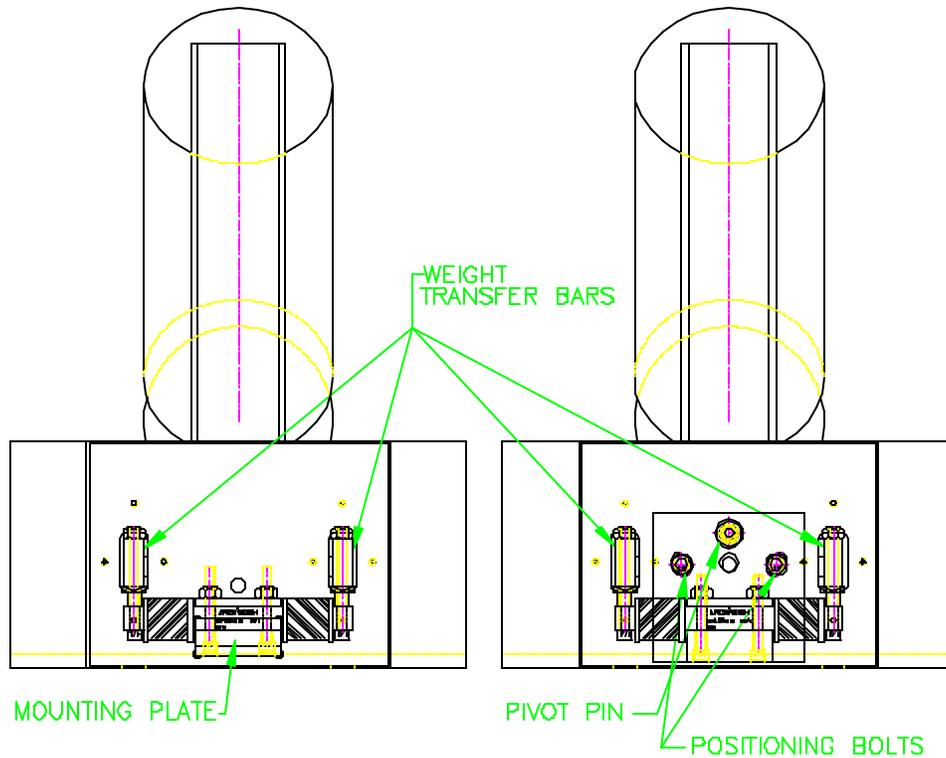


Figure 3

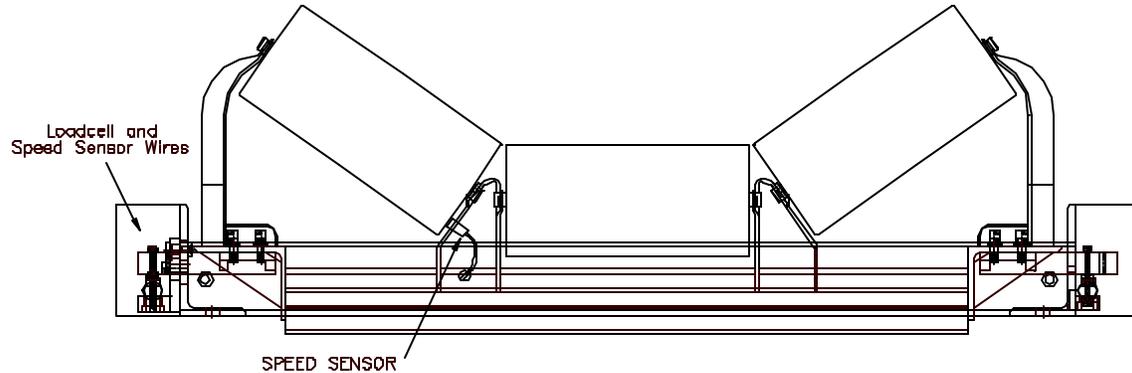
Electrical Connections

Once the Scale has been installed and the integrator mounted in its desired location, the electrical connections can be made. All ArchWeigh Scales are shipped with 25 feet of loadcell cable (Belden Cable P/N 8723, 22 AWG Individually Shielded Pairs).

The loadcells use four conductors and a shield, while the Speed Sensor uses 3 conductors. This will allow you to mount the Integrator 10–12 feet from the Scale. If you require the Integrator to be located farther from the scale ARCH can provide you extra cable, at an additional cost, or you may wish to use the above part number to buy it locally in your area.

Starting at the Scale

You will find the two loadcell wires and one speed sensor wire coiled up in the loadcell enclosure closest to the speed sensor. See diagram below:



Remove the loadcell enclosure cover and uncoil the wires.

WARNING: Do not cut the loadcell wires, they have been manufactured to compensate for temperature variances.

1. Match the (5) conductors from the loadcells, by color, and crimp them to the cable that goes to the control integrator.
2. Match the (3) conductors from the speed sensor cable, by color, and crimp them to the cable that goes to the control integrator.
3. Run the Cable to the integrator and make final electrical connections. See Diagram at the back of the manual.

Note:

Make sure that the Belt is off of the scale and clear of material before starting the calibration part of the scale setup.

Scale Calibration:

Once the ArchWeigh Conveyor Belt Scale has been mechanically installed and all electrical connections have been terminated, as specified in the previous section, there are four basic steps which must be performed to calibrate the Belt Scale and the electronic integrator.

1. Pre-Scale Calibration: Verify that SCALE ROLL DIAMETER, NUMBER OF SPEED TARGET PICK-UPS, and SPAN VALUE (from -1 approach to +1 retreat) values are correct.
2. Dead weight must be calculated: Dead weight provides the scale with a reference point to zero.
3. Test weight must be calculated: The value entered as test weight is specified and that value serves a true static weight reference point.
4. Tare weight must be calculated: Tare value provides the average weight of the belt as seen by the integrator.

Setup and Operation:

When the scale is powered and operational, the LCD display should be as in figure 4. Choose 1 for normal operation or 2 for scale setup and calibration.

Figure 4



ARCHWEIGH 2000
1=MAIN 2=SETUP

For initial setup of multiple scales, choose 1 from the initial screen (figure 4). The scale selection screen is then displayed (figure 4a). Enter the scale number you wish to calibrate and press enter, then push the menu button to return to the main screen.

Figure 4a



SELECT SCALE
CURRENT: _ NEW: _

After pressing 2 for setup, you will have three choices: SETUP, RESET and CALIBRATE (see figure 5). During SETUP, general information is given to the scale to help with calibration and with the actual operation of the scale i.e. belt length, span width, roll diameter, etc. RESET will reset totals and the system. CALIBRATE will guide you through calibration of the scale, setting of dead weight, test weight, tare weight, calibration constant, etc.

Figure 5

SETUP=1 RESET=2 CALIB=3 TROUB= 4

SETUP – PRESS 1

Anytime a SETUP, RESET, or CALIBRATE of the scale is selected, the operator interface will automatically ask for a pass code (see figure 6). The pass code is by default **1234**; however, it may be changed through the factory if desired. Press enter when finished.

Figure 6

LIMITED ACCESS CODE: _ _ _ _

Once a correct pass code is entered, the operator will be permitted to enter the scale's parameters (see figure 7).

Figure 7

Valid Code Access Permitted

Enter the length of the conveyor in feet (see figure 8). This value is used in performing the tare weight calculation. The value does not have to be precise; therefore, an estimate will be adequate.

Figure 8

Conveyor Length? (# _) _ _ _ _ FT

Enter the idler roll diameter in inches (see figure 9) followed by enter. This value must be correct. The scale will **NOT** be accurate if it is not.

Figure 9

Enter Roll Dia. (# _) <u>5</u> in.

Enter the number of speed targets (see figure 10) followed by enter. The speed targets are the number of magnets threaded into the speed roll. The speed sensor will count these targets as they pass.

Figure 10

Speed Targets? (# _) <u>2</u>

Enter the span width (see figure 11) followed by enter. The span width is the distance from the idler before the scale to the idler after the scale divided by 2. This distance will be measured in inches.

Figure 11

Enter Span Width (# _) _ _ _ in.

Set the tonnage units that you want to use. The choices are: 1- long ton, 2- short ton, and 3- metric ton, then press enter. For long and short tons, the scale will automatically compensate. For metric tons, please consult factory.

Figure 12

Tonnage Measure? 1=LT 2=ST 3=MT <u>2</u>

The weight filter is to block variances in the belt and stray material that could affect the totalizers. This is generally set after some operation of the scale and does not affect the weight variable displayed on figure 38.

Figure 13

Weight Filter Less than <u>10</u> #

If the scale is equipped with a 4-20 mA output option, the value entered here will be the rate @ 20 mA.

Figure 14

Max Output Rate (# _) _ _ _ _ TPH

If all of the previous settings are correct and you are ready to download the information on the scale, press 1. Otherwise, press 0 to cancel the setup procedure.

Figure 15

Download Settings?
(# _) 1 = YES 0 = NO _

The following screen enables the pulse output feature of the scale. If enabled, a ½ second pulse will fire once for every ton of material totalized. To enable the output, press 1, otherwise press 0.

Figure 15a

Enable Pulse Out
(# _) 1 = YES 0 = NO _

RESET – PRESS 2

After completing the step associated with figure 15, the interface will return to the screen in figure 5.

Pressing 2 will go through the step to reset or default the scale. Once again you will be asked for a pass code followed by the enter key.

Figure 16

SETUP = 1 RESET = 2
CALIBRATE = 3

Figure 17

Limited Access
Code:

Figure 18

Valid Code
Access Permitted

The following screen will load default values into the system. Press 1 to default system or press 0 to skip.

Figure 19

Default System?
(# _) 1=YES 0=NO 0

The following screen will reset either totalizer 1 or 2. To reset totalizer 1, press 1 followed by the enter key. To reset totalizer 2, press 2 followed by the enter key. To skip this step, press zero followed by the enter key.

Figure 20

Reset T(1) / T(2)
1=T(1)
2=T(2) 0

CALIBRATE - PRESS 3

After completing the step in figure 20, the interface will return to the screen in figure 5. During calibration, you will set the dead, test and tare weights. As always, with all setup screens you are required to enter a password.

Figure 21

SETUP = 1 RESET = 2
CALIBRATE = 3

Figure 22

Limited Access
Code:

Figure 23

Valid Code
Access Permitted

Figure 24

CAUTION! SETTINGS
MAY CHANGE

For the next two steps, the belt will need to be lifted from the scale base to insure accuracy. To set the dead weight, clear all material and tools from the scale base. The dead weight will be the zero point reference for the scale integrator. Press 1 if you are ready to set the dead weight, or press 2 if you wish to skip this step (see figure 25).

Figure 25

Set Dead Weight?
1=Yes 2=NO

Press 1 if you are sure that you want to set the dead weight, or press 0 if you wish to cancel.

Figure 26

Are You Sure?
(# _) 1=Yes 0=NO 0

The test weight is the upper threshold for the scale to reference weight on your scale. Press 1 if you wish to set the test weight, or press 2 if you wish to skip this step.

Figure 27

Set Test Weight?
1=YES 2=NO

Enter the weight of the calibration test weight followed by the enter key. This number will be a whole number.

Figure 28

Enter Test Weight:
(# _) _ _ _ _ #

Press 1 if you ready to set the test weight, or press 0 if you wish to cancel.

Figure 29

Set Test Now?
(# _) 1=YES 0=NO 0

The tare weight is the weight that the scale will see when the belt is empty. The belt needs to be on the scale when performing the tare. Press 1 if you are ready to perform the tare, or press 2 if you wish to skip this step.

Figure 30

Perform
Tare?
1=YES 2=NO

Press 1 if you ready to perform the scale tare, or press 0 if you wish to cancel.

Figure 31

Are You Sure?
(# _) 1=YES 0=NO <u>0</u>

The tare average is the amount of weight that the integrator will see; this number will increase during the tare calculation. Percent complete is the percentage of the tare completed on the length of belt. The tare will be three complete revolutions of the belts. When the tare is complete, press the next key.

Figure 32

TARE AVG. _ _ _ _ #
% COMPLETE _ _ _ %

The Calibration constant is a number that can adjust the value of the scale to a known certified scale. To figure the calibration constant, see Appendix A. Press 1 to change the calibration constant, or press 2 if you wish to skip this step.

Figure 33

Change Cal, Const
1 = YES 2 = NO

Enter the new Calibration Constant and press the enter key (the current Calibration constant is also displayed).

Figure 34

Old Const. _ . _____
New Const. _ . _____

If you are ready to save the calibration constant, press 1. Otherwise, press 0 to cancel.

Figure 35

```
Download Value?  
(# _) 1 = YES  0 = NO  0
```

The following screen allows the resetting of the master totalizer ONLY. This is the totalizer in figure 37. Press 1 to reset, or press 0 to skip.

Figure 36

```
Reset Master TTL  
1 = YES  0 = NO  0
```

MAIN SCREEN

Figure 37 displays the main totalizer and the rate. The number to the left of the rate value displays the current scale selected.

Figure 37

```
Total  _ _ _ _ _ . _ _ T  
Rate  _  _ _ _ _ . _ TPH
```

Figure 38 displays the speed of the belt in feet per minute and the actual weight on the scale.

Figure 38

```
Speed  _ _ _ _ _ . _ FPM  
Weight  _ _ _ _ _ . _ #
```

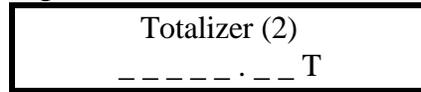
Figure 39 displays totalizer 1, which is resetable in the reset menu.

Figure 39

```
Totalizer (1)  
_ _ _ _ _ . _ _ T
```

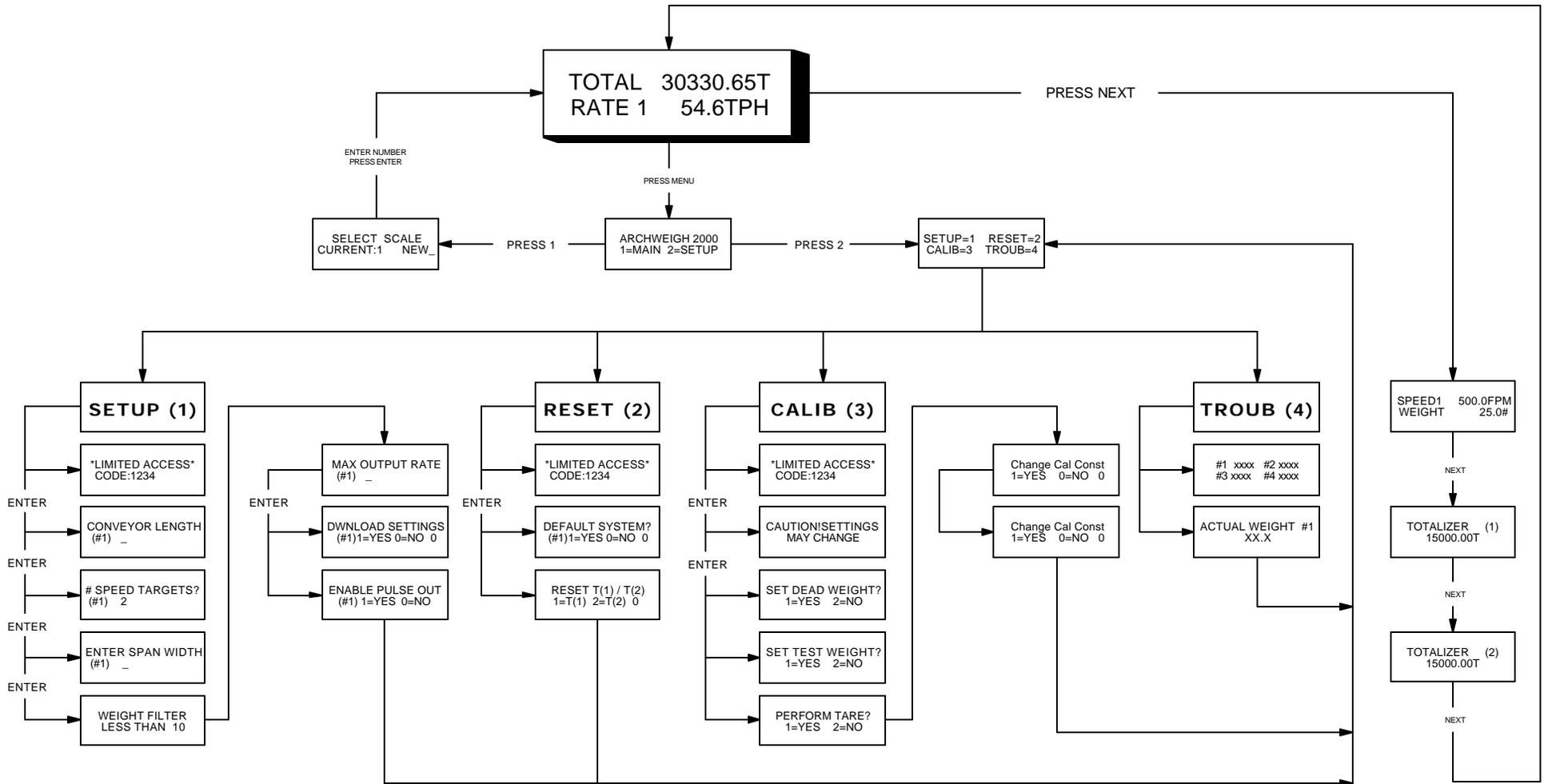
Figure 40 displays totalizer 2, which is resettable in the reset menu.

Figure 40



Once calibration is completed on scale 1, the procedure must be completed for scale 2 or multiple scales systems (beginning on page 10).

ArchWeigh 2000 Menu Flow Diagram



ARCHWEIGH BASIC WIRING SCHEMATIC

