

J-STAR INDUSTRIES, INC.

MODEL 10 AND MODEL 20 ELECTRONIC SCALE SYSTEMS

INSTALLATION INSTRUCTIONS OPERATION MANUAL AND SERVICE PARTS

J-STAR INDUSTRIES, INC.

SCALE SYSTEMS
801 JANESVILLE AVENUE
FORT ATKINSON, WISCONSIN, U.S.A. 53538

TABLE OF CONTENTS

	Page
Registration Certificate	3
Guarantee	4
Table of Contents	5
OMP 10 and 20 Indicator System	6
Description And Principle of Operation	6
Operating Instructions	6
Weighing Methods and Procedures	8
Trouble Shooting	12
Installation Requirements	13
Setup and Calibration	14
Specifications	16
Repair Parts	16

MODEL 10 AND 20 INDICATOR SYSTEM

DESCRIPTION AND PRINCIPLE OF OPERATION

The Electronic Scale System, consisting of one or more load cells and an indicator, is a precision device which will provide many years of accurate weighing if used properly and treated with reasonable care.

The Electronic Scale System has been designed for use in severe environments and can be used outside with no additional protection. Operator interaction with the instrument is via a membrane switch keyboard which is an integral part of the front panel. Audible feedback is provided to verify switch closure. The liquid crystal displays allow excellent readability in direct sunlight.

The weight being measured by the indicator is displayed on the weight display and is visible from 20 feet. The weight display also presents messages (annunciators) which indicate the mode of operation and aid the operator in proper use of the instrument.

The indicator is designed to run from a 12 VDC power source, such as a truck battery. Pushbutton balance is accomplished from the front panel of the indicator and is remembered by the microprocessor as long as power is available at the indicator power connector. If power is lost and the balance value is no longer present, the operator is prompted by a flashing annunciator on the weight display.

The indicator has four main modes of operation; inventory mode which displays the weight above the balance value; load mode which displays the weight remaining until the preset is satisfied; net off mode which displays the weight added or removed since the last preset was entered; and remote zero which is used with an external pushbutton or relay to zero the weight display and allow loading or unloading without the preset feature. DON'T GIVE UP! This will be much clearer after the following examples.

Provisions have been included in the Model 20 for a remote display using a large LCD display and for a remote 12 VDC alarm on both Models 10 and 20.

OPERATING INSTRUCTIONS

Definitions:

Weighing Display: A large display located on the left-hand side of the indicator. Used to display weight and provide operator prompting with built in visual annunciators.

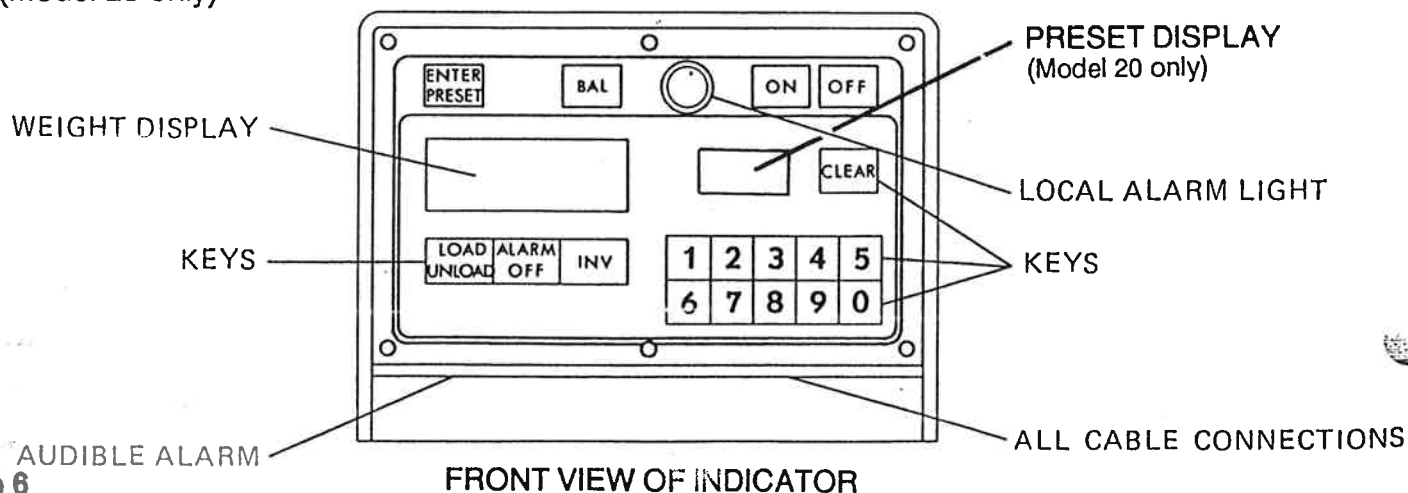
Preset Display: The smaller of the two displays located on the right-hand side of the indicator. Used to display the preset amount for loading and unloading entered using the number keys. (Model 20 only)

Keys or Switches: The areas of the front panel membrane switch which are pressed to modify the operation of the indicator.

Text Conventions:

Display Indications: Values or messages presented on either the weight or preset display will be enclosed in single quotes i.e. ' '.

Annunciator Indications: Operation of annunciators will be described with the annun-



ciator capitalized and in single quotes, i.e. 'INV'.

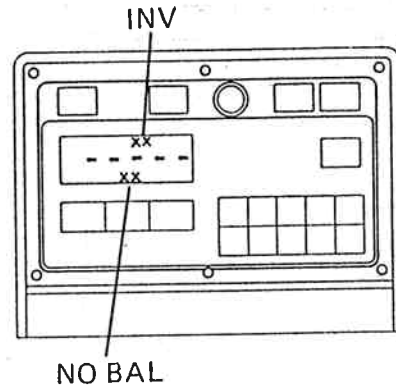
Switch or Key Names: Front panel switches will be designated by capital letters and no quotes, i.e. INVENTORY.

Audible Key Feedback:

In general when a key is pressed the internal audible alarm will beep. In some cases, no beep will be heard when a key is pressed. This indicates that the key was not enabled when it was pressed. For instance, BALANCE will only produce a beep if it has been enabled by pressing INVENTORY first.

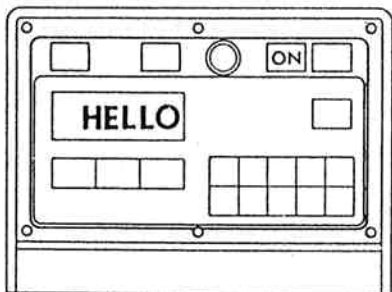
This beeper also functions as a local audible alarm for the preset amount.

- 3) If the indicator is not zeroed, 'NO BAL' will flash and the weight display will indicate '— — — —' after the beep. To display inventory weight, the indicator must be zeroed. See Inventory and Balance Instructions (Page 8).

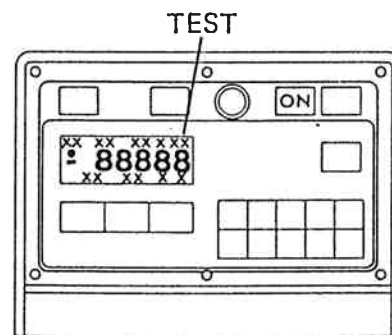


Power On: (Model 10 illustrated)

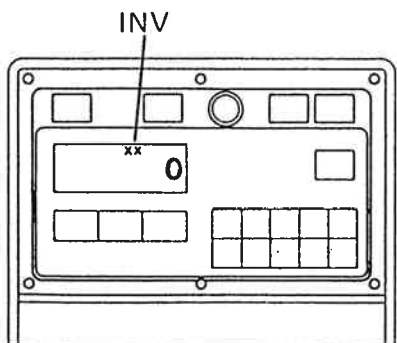
- 1) To turn on the indicator press ON. The weight display will display the message 'HELLO'.



- 4) If ON is pressed after the warm up period, the indicator will perform a display test by turning on all display elements. During the self test, 'TEST' will flash. Immediately after the display test, the indicator will automatically display the basic range, counts increment, time constant (filter speed), alarm: off/on, net off: hold/no hold, inventory: hold/no hold. Test may be canceled at anytime by pressing any switch other than ON.



- 2) After an approximate 4 second warm up a beep will be heard. The weight display will indicate 'INV' and inventory weight will be displayed.

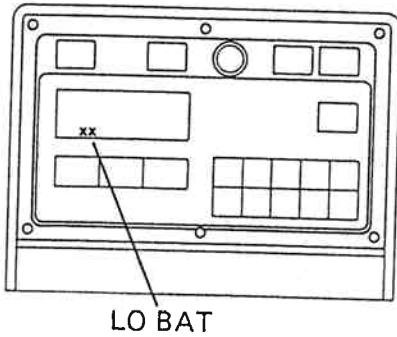


Power Off:

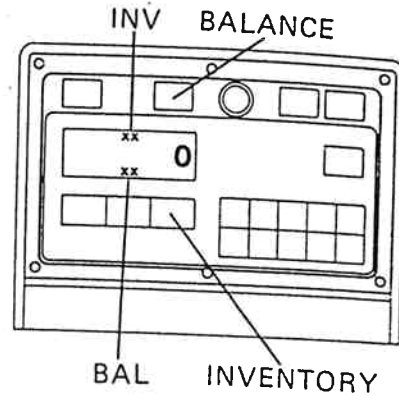
To turn off the indicator, press OFF. The main power to the indicator will be cut off, but a small amount will still be supplied for remembering the balance or 'zero' value.

Low Battery:

A low battery is indicated by a 'LOBAT' warning on the weight display. The balance switch is not functional if a low battery condition exists. (Less than 10½ volts).



BALANCE is pressed within the 2 seconds allowed, the indicator will re-zero the inventory display and cause 'BAL' to flash for a short time.



Inventory and Balance

Pressing INVENTORY will cause the indicator to enter the inventory or weighing mode, but will also turn on the BALANCE switch. The BALANCE switch is protected against accidental use until it is turned on for 2 seconds by pressing the INVENTORY switch. If

To obtain a satisfactory balance value, the inventory display should be stable. Although the indicator may be balanced at any inventory weight, it is important to balance the indicator with the scale empty, and if a mobile application with the vehicle stopped and on level ground.

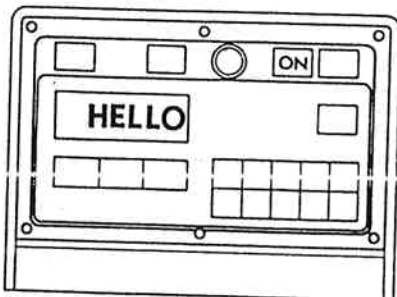
WEIGHING METHODS AND PROCEDURES

All weighing should be done with the scale in a level position.

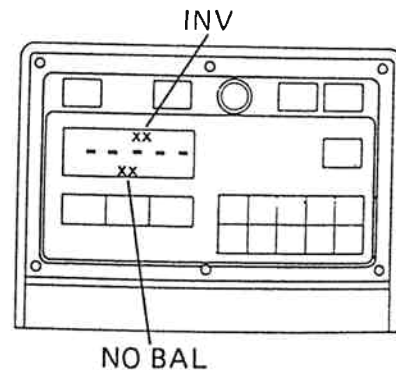
The balance setting of the indicator should be periodically checked to compensate for possible changing tare weight or significant ambient temperature changes. The amount will vary with changes to the scale or with the magnitude of temperature changes. Large temperature change can result in up to 50 pound zero shifts. Correct by using the balance procedure.

Typical Weighing Sequence in a Mixing Application:

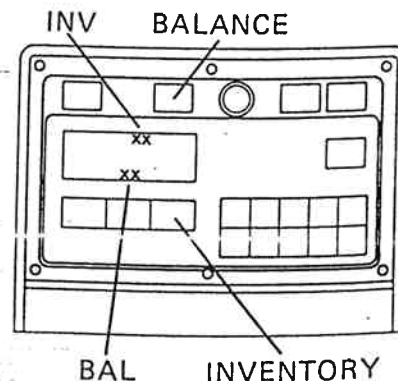
- 1) Press ON.



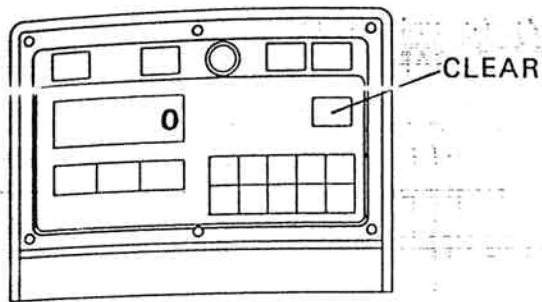
- 2) After the warm up period.



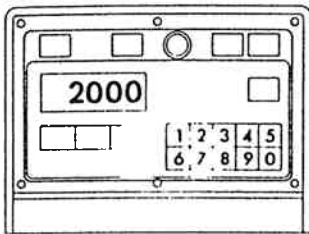
- 3) Press INVENTORY then BALANCE within 2 seconds. 'BAL' will be displayed for a short time.



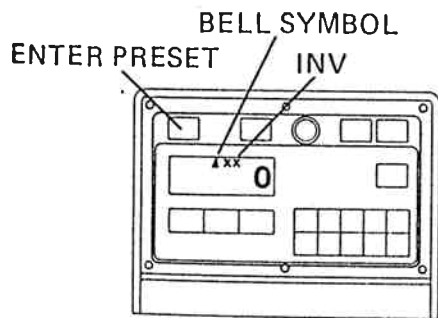
- 4) Push clear to clear the display and enter the preset mode.



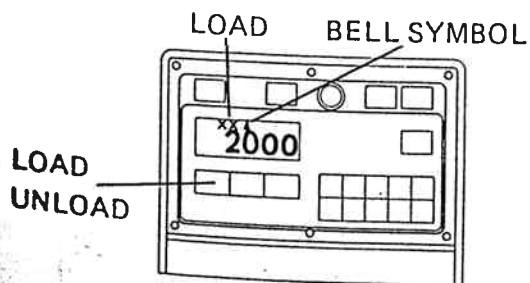
- 5) To load the first ingredient of 2000 lbs. key in 2 0 0 0.



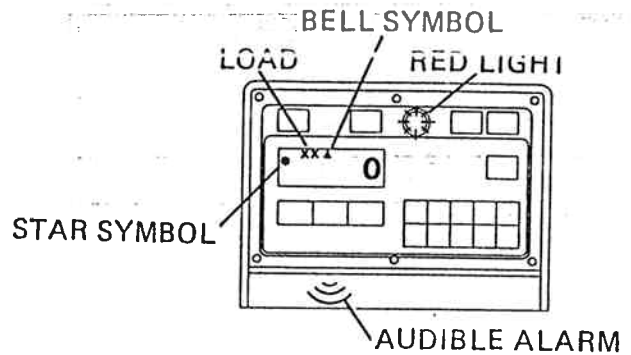
- 6) Push ENTER PRESET to preset the alarm at 2000 lbs. Display automatically returns to mode last used before clear was pushed. In this case the inventory mode.



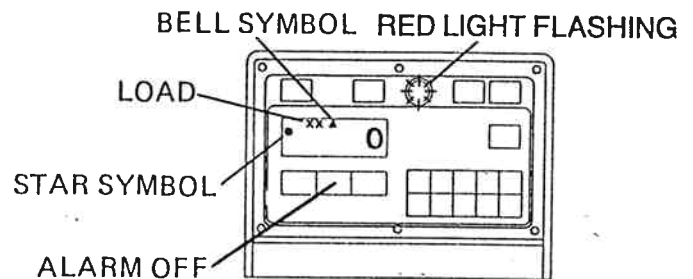
- 7) Push LOAD/UNLOAD to enter load mode.



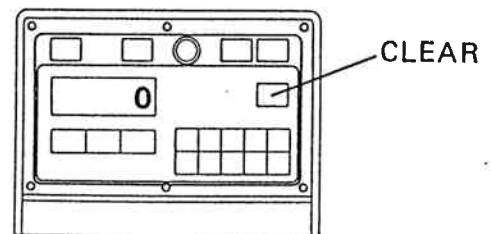
- 8) As first ingredient is added weight display counts down to zero. At zero the red warning light and the audible alarm come on.



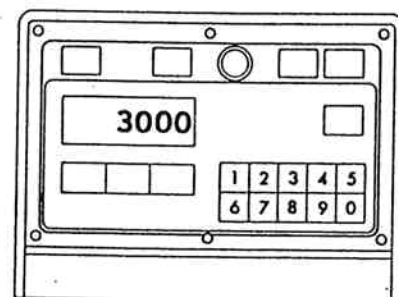
- 9) Pushing ALARM OFF will turn off only the audible alarm.



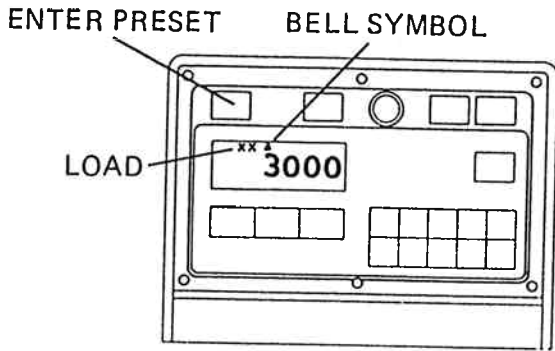
- 10) To load the second ingredient of 3000 lbs. push CLEAR. All Alarms are turned off.



- 11) Then key in 3 0 0 0.

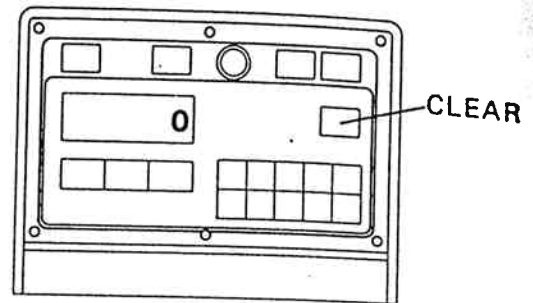


12) Push ENTER PRESET to preset the alarm at 3000 lbs.

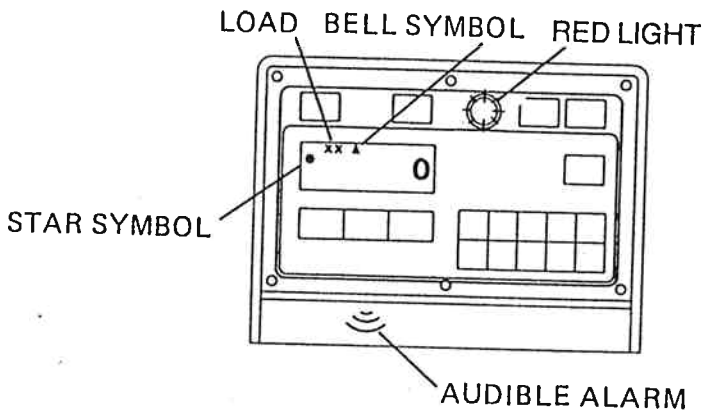


16) Mix or process as required, leave indicator on.

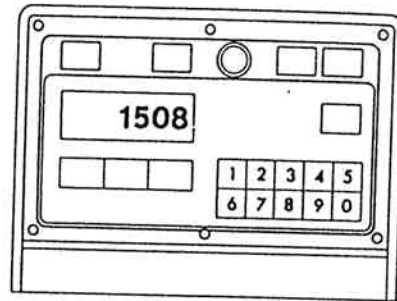
17) To unload 1508 lbs. of mixture push CLEAR.



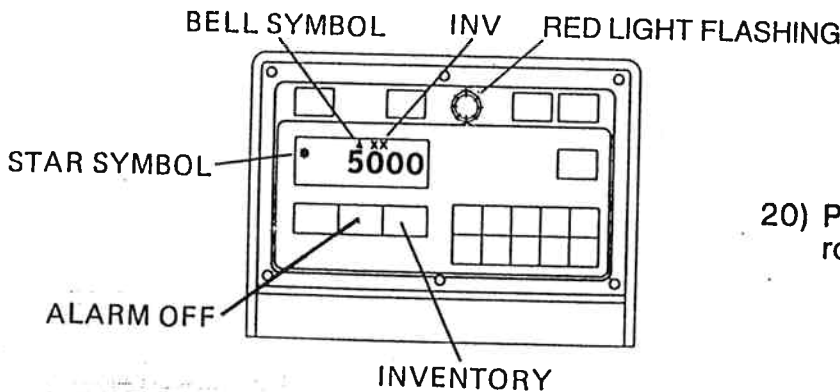
13) As second ingredient is added weight display counts down to zero. At zero the warnings turn on.



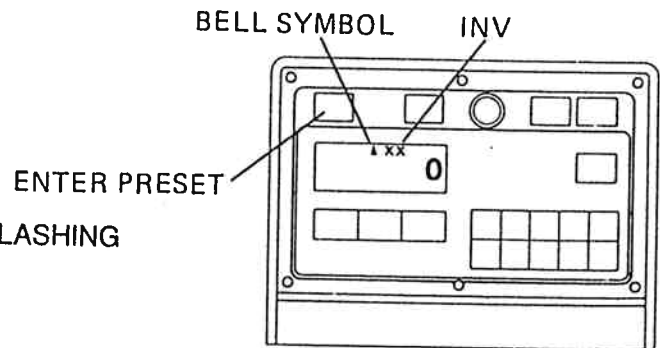
18) Key in 1508.



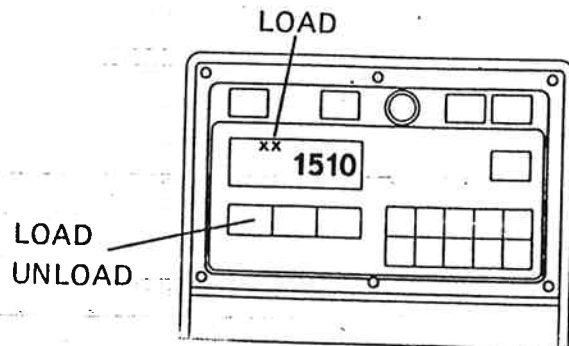
14) Loading is complete. To check total inventory push INVENTORY.



19) Push ENTER PRESET.

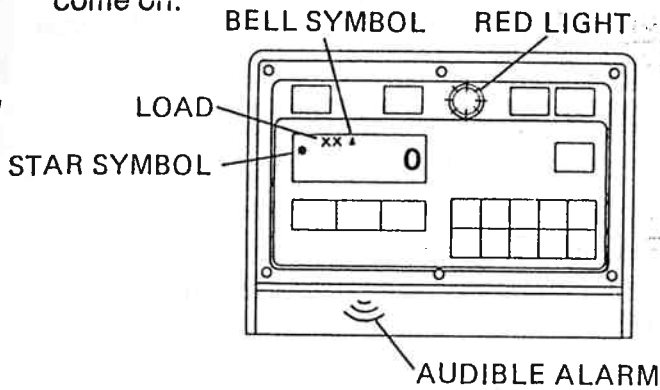


20) Push LOAD/UNLOAD switch, display rounds off to the nearest 10 lbs.



15) Push ALARM OFF to silence audible alarm. See above illustration.

21) As mixture is dispensed, weight display counts down to zero. At zero the warnings come on.

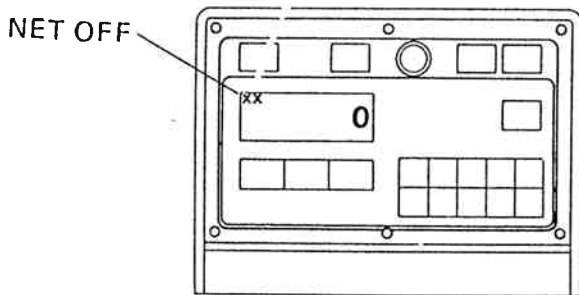


22) Repeat 16 through 21 until mixer is empty. Remaining inventory may be checked at anytime by pushing INVENTORY.

NET OFF MODE

The net off mode of operation causes the weight display to indicate the net change in the weight in the scale since the last ENTER PRESET. A negative value indicates that feed was removed and a positive value indicates that an ingredient was added.

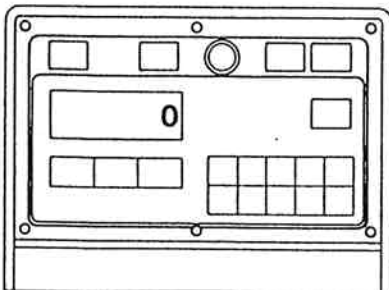
To enter the net off mode, press and hold LOAD/UNLOAD for 2 seconds or press LOAD/UNLOAD twice.



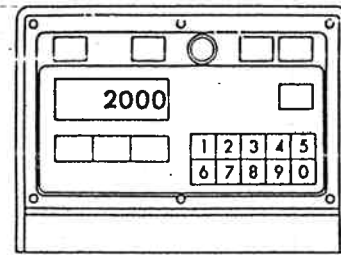
In normal operation, the net off mode will be on for only 2 seconds and then revert to the load mode. Typically this mode will be utilized to avoid operator arithmetic, such as after an unloading operation to record the actual amount unloaded.

To Illustrate using a Dispensing Application:

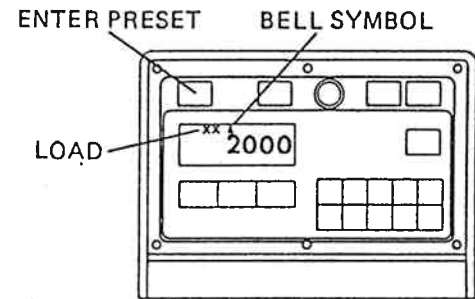
1) Push CLEAR.



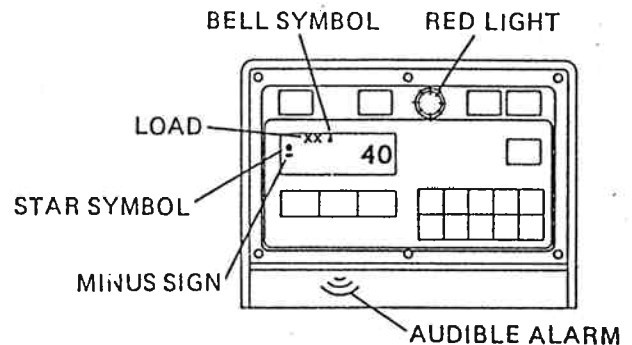
2) Key in 2000 lbs.



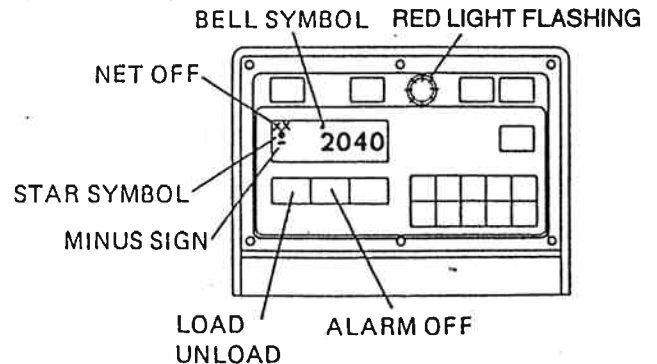
3) Push ENTER PRESET. (Was previously in load mode so display returns to load mode.)



4) Unload feed, but operator over feeds by 40 lbs.



5) Push ALARM OFF and push LOAD/UNLOAD to view actual amount unloaded of 2040 lbs.



An internal option switch can be set to allow continuous net off operation. Contact your dealer for this adjustment. If this option has been selected, the load mode can be re-entered by pressing LOAD/UNLOAD. Continuous NET OFF operation causes the weight display to count up to the preset value amount instead of down to zero as in the LOAD MODE. Alarms are functional in the NET OFF MODE.

TROUBLE SHOOTING

SYSTEM	CIRCUIT CONDITION	CORRECTIVE ACTION
System Dead	Power Switch On	<p>Check fuses. Replace blown fuse.</p> <p>Check input cable for loose connections to Ignition switch or battery.</p>
Inventory display is not stable. (Varies more than 5 counts when mixer is stationary).	Power On	<p>(1) Remove junction box cable from bottom of indicator. If display is still not stable, then indicator needs repair. (A number other than the correct weight will be displayed.) Contact your dealer or return to Butler for repair.</p> <p>(2) If the indicator is stable, then disconnect load cells from junction box one at a time until the defective load cell is located.</p> <p>If all load cells check out O.K., then the junction box is defective. Check for loose or dirty connections, if none, contact your dealer or return to Butler for repair or replacement.</p>
System inaccurate, small error.	Power Switch On And Circuit Balanced	<p>Check all load cell mounts for proper operation.</p> <p>If an error still exists, contact your dealer or Butler for calibration instructions.</p>
System inaccurate, 20% or more error.	Power Switch On And Circuit Balanced	<p>Check all load cell mounts for proper operation.</p> <p>If an error still exists, run a weight test to determine dead load cell or use an ohmmeter to check load cell at cable. Red to black resistance should be approximately equal to white to green. (700 OHMS \pm 10% for Model CTH & CT, 350 OHMS \pm 10% for all weighbeam and weigh axles. In addition red to green, green to black, black to white and white to red should be approximately equal. (525 OHMS \pm 10% for Model CTH&CT, 262 OHMS \pm 10% for all weighbeam and weigh axles.</p>

INSTALLATION REQUIREMENTS

Indicator Mounting:

Various mounting plates are available. The indicator is easily attached to the plate by hooking the top over the plate and securing with two bolts # 10x24 x 3/4 and nuts.

Power Connection:

The power cable should be connected directly to a vehicle battery or regulated power supply. The scale end of the power cable is connected to the indicator as shown in Figure 1. Connect +12 VDC to red wire and GROUND to white wire. The indicator is fused at 10 amps.

NOTE: For the indicator to remember the balance setting the 12 VDC power to the indicator must be uninterrupted. However, there is no need to be concerned with battery drain since the indicator uses very little power in the off condition.

Table 1: Power Cable Connections:

Wire Color	Wire Function
Red	Battery (+12 VDC)
White	GROUND
Black	Remote Alarm Out +
*Green	Remote Zero

*Green wire is optional. Contact your dealer if required.

Remote Alarm Connection:

If a remote 12 VDC alarm is to be used, connect the +12 VDC side of the alarm to the power cable black wire, and the GROUND side (or white wire) to the frame. The alarm output is fused for a maximum drain of 10 amps.

The remote alarm connection may be also used for motor control purposes when used with a relay.

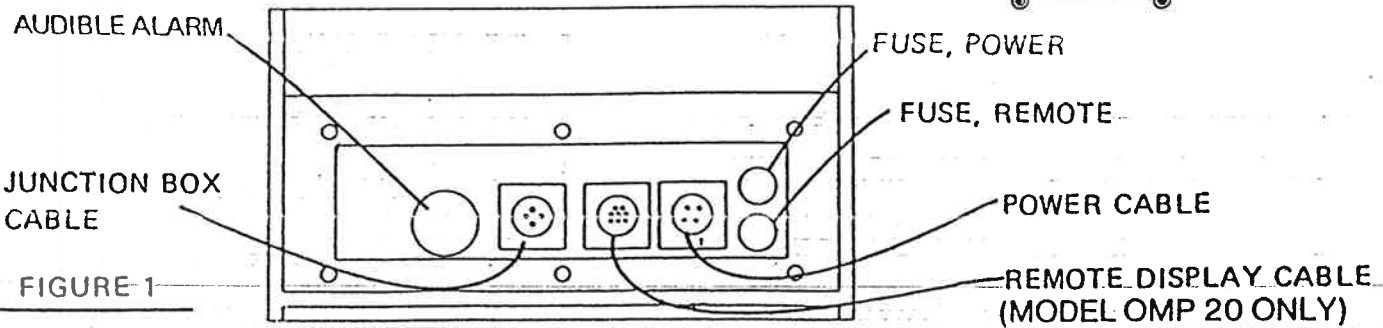


FIGURE 1

BOTTOM VIEW OF INDICATOR

Remote Zero Switch Connection:

If the remote zero is to be used, connect one side of a normally open momentary switch or relay contact to the power cable green wire, and the other side to frame or other GROUND connection. If your power cord does not contain a green wire and you desire to use this feature, contact your dealer for a special cord.

Load Cell Connection:

The indicator is designed to operate with strain gage load cells. The indicator will normally be supplied with a pre-assembled interconnection cable going to the load cell junction box. If a new cable is required or if a custom installation dictates that a cable be made on site, consult your Butler dealer for required parts.

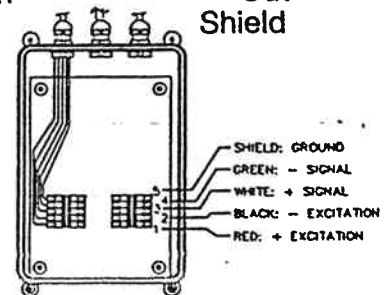
To connect the load cells, plug the Butler supplied interconnect cable from the load cell junction box into connector located on the bottom of the scale. (See Figure 1)

Junction Box Connections:

Connect the cables from the load cells to the junction box terminals as follows:

Table 2: Load Cell Connections In Junction Box:

Terminal Color	Description
A) Red	+ Excitation
B) Black	- Excitation
C) White	+ Out
D) Green	- Out
E) Blue	Shield



SETUP AND CALIBRATION

**TABLE 1: RANGE AND OUTPUT COUNTS SELECTION
SEE FIG. 2**

RANGE JUMPERS JP9 - JP12	S6	PRIMARY RANGE	OUTPUT CNTS JP7 - JP8				S6	ALTERNATE RANGE	OUTPUT CNTS JP7 - JP8			
			00/10/01/11						00/10/01/11			
0000	0	1600 LB	.2	.5	1	2	1	726 KG	.1	.2	.5	1
1000	0	2000 LB	.5	1	2	5	1	907 KG	.1	.2	.5	1
0100	0	4000 LB	.5	1	2	5	1	1814 KG	.2	.5	1	2
1100	0	8000 LB	1	2	5	10	1	3629 KG	.5	1	2	5
0010	0	16000 LB	2	5	10	20	1	7257 KG	1	2	5	10
1010	0	20000 LB	5	10	20	50	1	9072 KG	1	2	5	10
0110	0	40000 LB	5	10	20	50	1	18144 KG	2	5	10	20
1110	0	80000 LB	10	20	50	100	1	36287 KG	5	10	20	50
0001	1	800 KG	.1	.2	.5	1	0	1764 LB	.2	.5	1	2
1001	1	1600 KG	.2	.5	1	2	0	3527 LB	.5	1	2	5
0101	1	2000 KB	.5	1	2	5	0	4409 LB	.5	1	2	5
1101	1	4000 KG	.5	1	2	5	0	8818 LB	1	2	5	10
0011	1	8000 KG	1	2	5	10	0	17637 LB	2	5	10	20
1011	1	16000 KG	2	5	10	20	0	35274 LB	5	10	20	50
0111	1	20000 KG	5	10	20	50	0	44092 LB	5	10	20	50
1111	1	40000 KG	5	10	20	50	0	88185 LB	10	20	50	100

NOTE 1: A "1" IN THE ABOVE TABLE SIGNIFIES AN INSTALLED JUMPER OR "ON" SWITCH. A "0" SIGNIFIES A MISSING JUMPER OR "OFF" SWITCH.

NOTE 2: CHANGING THE RANGE JUMPERS REQUIRES THAT SPAN RESISTORS BE CHANGED ALSO. HIGH PRECISION RESISTORS ARE REQUIRED - CONTACT J-STAR BEFORE ATTEMPTING.

MODE SWITCHES

TEST MODE EXAMPLE

Time constant filter	S1 and S2	Both off = 2 fast S 1 on only = 4 S 2 on only = 8 Both on = 16 slow	rng cnt Ec Pr gna ↑	Range of Indicator Count by Time constant Audible Alarm	40,000 10 4 ON
Net Off	S3	Switch position Off On No Hold Hold	Net Off	Able to count up or down in load/unload	NO HOLD
Audible alarm	S4	On Off	Inv.	Able to view INV. for 3 sec. or hold permanent with TR option	NO HOLD
Inv.	S5 S6	No Hold LB Hold KG		The program that the Indicator has	P 20-b

Load cell selection switch S14 is used to select 3 or 4 load cell system configuration. Use of switch may require recalibration of scale.

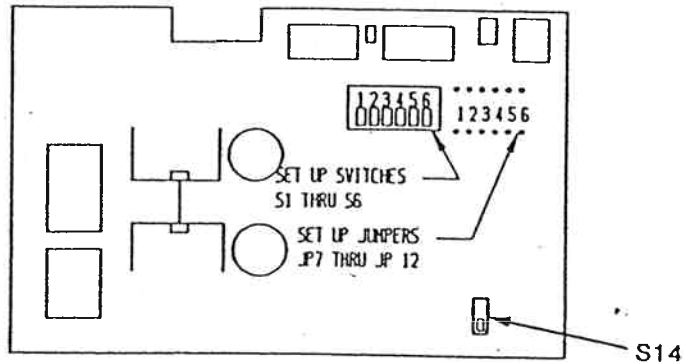


FIGURE 2

MAIN PRINTED CIRCUIT BOARD

INDICATOR CALIBRATION PROCEDURE

WHAT TO DO:

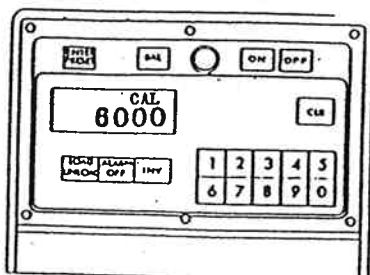
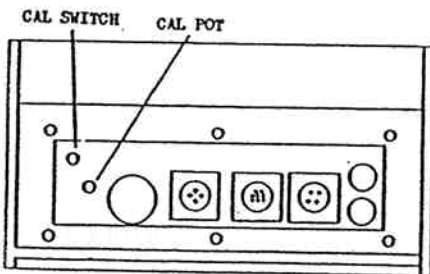
Turn On Indicator

Balance Indicator

Put On Known Weight

Compare Readout With
Known Weight

To Calibrate Scale



HOW TO DO IT:

Push ON

Allow warm up time 5 to 10 minutes (30 minutes in cold weather).

Push INVENTORY then BALANCE within 2 seconds.

This can be done by using Dead Weights or by comparison to a known good Platform

EXAMPLE: 6000# known weight

5850# readout

ERROR 150# If over .25% off it needs calibration.

Push CLEAR

Then key in known weight on keyboard which will appear on the LCD display then push calibration switch. Indicator will beep and flash CAL on upper portion of Display.

Push ENTER PRESET then LOAD/UNLOAD

A number will appear on display, this represents the error.

Turn calibration pot until the readout reads (0) zero.

Push calibration switch. Indicator will beep and flashing CAL will disappear and return to the normal weighing condition.

Model 20 is the same other than when keying in the known weight it will appear on the preset display.

Calibrated weight should appear on the main display \pm ONE COUNT
Calibration is now complete.

Unload scale and check for zero, if off more than one count run weight test and calibrate again.

SPECIFICATIONS

SYSTEM

Operating Characteristics

Load Range	up to 80,000 lbs. depending upon application
Accuracy	System $\pm .25\%$ or $\pm .5\%$ depending on load cell used
Power Requirements	10½ - 16 VDC
Temperature Range	-20 to 140 degrees F
Remote Display Feature	Model 20 Only
Remote Zero Feature	Model 20 Only

JUNCTION BOX

Cable	5/16" dia. x 15' long (30' long on Platform)
Capacity	4 Load Cell Connectors
Weight	2 pounds

LOAD CELLS

Operating Characteristics

Capacity	Depends on load cell
Overload Safety Factor	200% typical

REPAIR PARTS

ELECTRIC COMPONENTS

KEY	SYMBOL	DESCRIPTION
1	824186	Scale Indicator - Model 10 (standard version)
	143899	Scale Indicator - Model 10 (used w/process controller)
	824194	Scale Indicator - Model 20 (standard version)
	143900	Scale Indicator - Model 20 (used w/process controller)
2	141880	Junction Box - OMP 30'
	141879	Junction Box - OMP 15'
3	824190	Power Cord (old style 3 wire)
	824461	Power Cord (new style 4 wire)
4	824352	Cable, Trailer Extension
5	824198	Remote Indicator - Model 20R
6	824232	Cable, 20' Model 20R
	141835	Duplex Kit, allows use of 5 to 8 Load Cells

LOAD CELLS

7	824303	CTH -- 11' Cable
	824304	CTH -- 21' Cable
	824180	CT -- 11'
	824181	CT -- 21'
8	824324	2 1/8-DB-11' Long
	824458	2 1/8-DB-11' (Short)
	140708	2 1/8-DB-16' (Short)
	143861	2 1/8-DB-16TC (Temperature Compensated Scales)
9	824322	1-DB-16' Cable (115 Stationary & Universal Scales)
	143860	1-DB-16TC Cable (Temperature Compensated Scales)
	824323	1-DB-5' Cable (115 Stationary & Universal Scales)
10	824353	2½-DA-11' Axle Not Shown
	143862	2½-DB-16TC (Temperature Compensated Scales)
	143870	2½-DB-21TC (Temperature Compensated Scales)

