EZ 400

OPERATORS MANUAL

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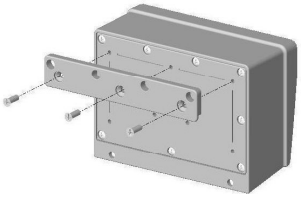
GETTING STARTED

The Digi-Star EZ 400 indicator is a highly reliable scale designed for mobile weighing. This indicator can be connected to various load cell systems.

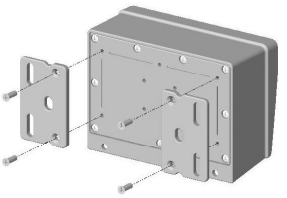
INSTALLING EZ 400 INDICATOR

INDICATOR MOUNTING

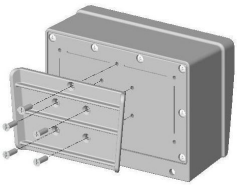
The EZ 400 has three standard methods of mounting the indicator plus the optional RAM mount is available.



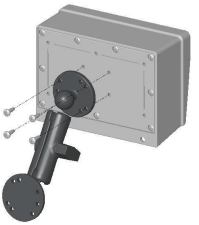
Rail Mount (Included)



Wing Mount (Included)



Wedge Mount (Included)



Ram Mount (Optional)

POWER CONNECTION

Power can be obtained directly from a 12VDC battery or from a 120V or 220V AC power cube that plugs into a wall outlet. Attach the power cable to the POWER connector located on the bottom panel of the scale.

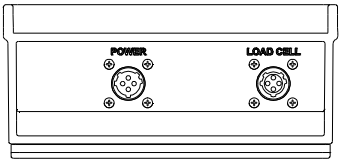
Connect the RED wire from the power cable to +12VDC and the BLACK wire to GROUND. The indicator is fused internally at two amps.

Warning! Disconnect the indicator power cord before jump-starting or fast charging a battery.

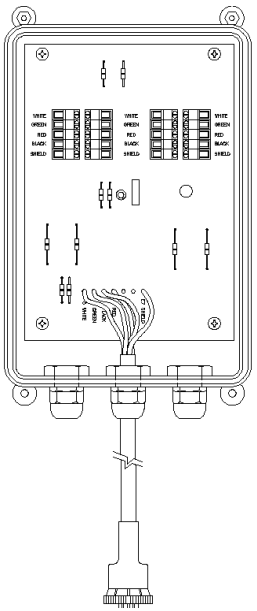
Disconnect all indicator leads before welding on equipment. Damage may occur to the indicator and load cells.

INDICATOR BOTTOM PANEL

Wire Color	Wire Function
RED	Battery (+12Vdc)
BLACK	GROUND
ORANGE	Not Used
BLUE	Not Used



LOAD CELL CONNECTION



The indicator operates with strain gage load cells. The system is normally supplied with a J-BOX cable going from the scale indicator to the load cell J-box. Extension Kits are available from your dealer in various lengths. To connect the load cells, attach the J-box cable to the LOAD CELL connector on the bottom panel of the scale. Connect the load cell cables to the J-box. Follow color key on circuit board to insure proper connection of load cell wires.

Terminal	Description
WHITE	SIGNAL +
GREEN	SIGNAL -
RED	EXCITATION +
BLACK	EXICTATION –
SHIELD	SHIELD

OTHER LOAD CELLS

If connecting to load cells other than those that were provided with your system, the indicator must be calibrated. Refer to calibration procedures (page 10-11) or contact your Digi-Star representative for assistance.

LIGHTNING PROTECTION

Stationary systems should use “Lightning-Protected” J-boxes that allow you to install ground rods. This provides protection to the scale when lightning strikes nearby. Please call your Digi-Star representative to request Form F3050.

STANDARD OPERATION

TURNING ON THE SCALE

Press [On/Off].

A brief “HELLO” message will be displayed. The scale enters the GROSS weighing mode.

GROSS mode displays the weight change since the unit was last ZERO/BALANCED.

ZERO BALANCE THE SCALE

Press [Gross/Net] and within three seconds, press the [Zero] key.

“0” is displayed to show completion of the step and the scale is put in the GROSS mode.

GROSS AND NET MODES

GROSS mode displays the weight change since the unit was last ZERO/BALANCED.

The scale is in GROSS mode if there is a flashing arrow pointing toward the GROSS text just above the [On/Off] key.

NET mode displays the weight change after a TARE has been performed. TARE is a temporary “zero” point. The scale is in NET mode if there is a flashing arrow near the NET text in the lower left corner of the display.

TARE & PRINT BUTTON:

On EZ 400 indicators with “Print” feature, press and hold the [print/tare] button for 3 seconds to “Tare” the scale. Press the button momentarily for “Print”.

TO SELECT NET AND GROSS MODES:

[Gross/Net] is an alternating-action key. If the scale is in the GROSS mode, press [Gross/Net] to place it in the NET mode. If the scale is in the NET mode, press [Gross/Net] to place it in the GROSS mode.

STORING DATA TO THE DDL (SERIAL Option Only)

The SERIAL option allows “Print “ data from the EZ 400 to be transferred to a Data-Down-Loader (DDL). This data can then be transferred to a PC using a data cable and Data Transfer Utilities (DTU) software provided with your DDL. See the DDL manual (PN D3564) for further details.

1. Connect the DDL to the SERIAL port on the bottom panel of the EZ 400.
2. Press [Print] while the DDL is connected to the SERIAL port.

TURNING OFF THE SCALE

Press [On/Off] until “BYE” is displayed.

APPENDIX A

OPTIONAL SETTINGS

The Indicator has optional settings that allow flexibility in the way that the scale is used and data is collected.

CHANGING OPTIONS USING LONG FORM SETUP

Enter the Long Form Setup by holding [Gross-Net] and pushing [On/Off] for three seconds.

1. Press [On/Off] to advance to the desired parameter.
2. Press [Net/Gross] to advance to the proper setting.
3. Press [On/Off] to save setting and advance to the next parameter.
4. Hold [Tare] and press [On/Off] to return to indicator operation.

Default settings from the factory vary with options and due to customer preferences. Default settings for the EZ 400 with Cab Control option are found in the Cab Control 400 Operators manual PN D3674.

STANDARD EZ 400 DEFAULT SETTINGS

MENU 1	
LANGAG	ENGLSH
ID RATE	2
ZTRACK	OFF
W MTHD	1
LOCKON	B
SCALID	NEW EZ
LKNHLD	ON
AUTOFF	OFF
I ZERO	OFF
WMA2-3	4000

MENU 2	
EST WT	0

MENU 3	
COUNT	10
ARANGE	OFF
LB-KG	LB
CAP	40000
WMA 1-1	10
WMA 1-2	4
WMA 1-3	4000
WMA2-1	30
WMA2-2	10

MENU 4

Menu #4 is not used.

EZ 400 WITH SERIAL DEFAULT SETTINGS

MENU 1	
LANGAG	ENGLSH
ID RATE	2
ZTRACK	OFF
W MTHD	1
LOCKON	8
SCALID	NEW EZ
LKNHLD	ON
AUTOFF	OFF
LSTORE	OFF
LSEND	OFF
I ZERO	OFF

MENU 2	
TIME F	AM/PM
TIME	SET TIME
DATE F	1
DATE	SET DATE
TAREAP	OFF
IL PRT	ON
SCOREM	0
APRINT	OFF
COM IN	DOWNLD
PRTFMT	AUTO
C1 DLY	.10
C2 DLY	OFF
EST WT	0

MENU 3	
COUNT	10
ARANGE	OFF
LB-KG	LB
CAP	40000
WMA1-1	10
WMA1-2	4
WMA1-3	4000
WMA2-1	30
WMA2-2	10
WMA2-3	4000

MENU 4

Menu #4 is not used.

MENU 1

LANGAG — Language

Select from the list of languages.

ENGLSH	English
NEDERL	Netherlands
FRANCS	French
DEUTSH	German
ITAL	Italian
PORT	Portuguese
ESPAN	Spanish
DANSK	Danish
MAGYAR	Hungarian
VESTA	Custom

D RATE — Display Rate

Select 1, 2, 3 or 4. Display updates once, twice, three times or four times per second.

ZTRACK — Zero Tracking

Select ON or OFF. If set to on, the scale will adjust for small weight variances. The maximum instantaneous weight that zero tracking can remove is approximately 0.05% of the scales capacity limit value on the EZ400 or up to 5lbs in the Lock-On weigh method

W MTHD — Weigh Method

Select 1, 2, 3 or 4. Weigh method allows the operator to adjust how much processing or number-crunching the scale processor does to the load cell data before displaying the weight. See Appendix “C” for details.

LOCKON — Lock-On

Select 1 thru 9. A low value, such as a 1 or 2, allows the system to be more sensitive to animal motion. A high value, such as an 8 or 9, allows the scale to lock on faster. Use the lowest setting that still allows the system to lock on consistently.

SCALID — Scale Identification

Identity of scale location (Truck ID or Mixer Number).

LKNHLD — Lock-N-Hold

This feature continues to hold the weight on the display after the animal has stepped off the platform.

AUTOFF — Auto Off

Select 15, 30, 45, 60 or OFF. This feature allows the operator to have the indicator automatically shut itself OFF after either 15, 30, 45 or 60 minutes of inactivity.

This feature will extend battery life on battery powered scales. Prior to the scale shutting off, the message "GOODBYE" will scroll across the display for approximately 15 seconds. Pressing a key on the indicator at any time restart the internal shut-off timer.

MENU 2

LSTORE — Lock-On Store

This feature for animal weighing only

LSSEND — Lock-On-Store Send

This feature for animal weighing only

1 ZERO — One-Touch Zero

Operator can "ZERO" scale by pressing only [Zero].

TIMEF — Select time format - AM/PM or 24 hour

TIME — [Gross/Net] changes time, [Print/Tare] chooses HH:MM:SS.

DATEF — Select date format 1-mm-dd 2-mm/dd/yy 3-mm/dd/yyyy 4-dd-mm 5-dd/mm/yy 6-dd/mm/yyyy 7-ddmoyy 8-ddmoyyyy.

DATE — [Gross/Net] changes date - [Print/Tare] chooses MM/DD/YY

TAREAP — If ON - tare will automatically send data to the SERIAL connector.

1L PRT — If ON - scale data will be printed on one line.

SCOREM — Select scoreboard output mode 1-1/sec 2-2/sec 3-3/sec 4-every conversion 5-display rate 6-display weight change 7-send status 1/sec, 8-send status1/5sec, 9-Reserved & 10-send EID 1/2 sec.

APRINT — If ON - pressing keys will auto-print weight values.

COM IN — Interface selections, DOWNLD = Data Down Loader, EZ CMD = Original EZ Commands & EZ2CMD = EZII Escape Commands.

PRTFMT — Select alternate & comma (CSV) formats.

C1 DLY — Select seconds to delay before advancing to next line.

C2 DLY — Select seconds to delay before advancing to next line.

EST WT	Allows operator to adjust Gross weight of scale by changing the zero/balance.

MENU 3

COUNT	Display Count Select .01, .02, .05, .1, .2, .5, 1, 2, 5, 10, 20, 50, or 100. Indicator displays weight in selected increment. If the count is set too small, the readings will be unstable and the indicator will not be accurate.
ARANGE	Auto-Range Select ON or OFF. If "ON" the scale increases display count size for weights over 300 and again at 600 lbs/kgs. If set to "OFF" display counts are set and do not vary. For example: 0 to 300 lbs (1 lb Increment), 300 to 600lbs. (2 lbs Increments), 600 and up (5 lbs. Increments).
LB-KG	Display Unit Select LB or KG to determine unit of measure. When changing weight unit using the long form, the calibration is adjusted so the scale displays accurately in the new display unit.
CAP	Enter MAXIMUM weight measurable on scale.
WMA 1-1	Increase this number to smoothen weighing.
WMA 1-2	0=OFF. Use values less than WMA1-1 for quick weight response.
WMA 1-3	Enter the weight to activate quick weight response.
WMA2-1	Increase this number to smoothen weighing.
WMA2-2	0=OFF. Use values less than WMA2-1 for quick weight response.
WMA2-3	Enter the weight to activate quick weight response.

MENU 4

Menu 4 is not used.

APPENDIX B

SHORT FORM CALIBRATION

The Short Form Setup & Calibration procedure allows you to change the “SETUP” and “CAL” numbers of the indicator. Setup and calibration numbers are displayed during the self-test.

Do not attempt to calibrate the scale if the indicator is not reading stable weights. The calibration procedure will not fix instability, inconsistencies, or flashing "RANGE" messages.

OBTAIN CURRENT SETUP AND CALIBRATION NUMBER

To run the self test with the indicator already ON:

1. Press [Gross/Net} and then [On/Off] to start the Self Test.
2. Press [On/Off] to "pause" the Self-Test while numbers are displayed.
3. Press [On/Off] again to allow the self-test to complete normally.

SETUP # _____ CAL # _____

SETUP NUMBER

Following is a list of functions that are controlled by the “SETUP” number:

Weigh Method (W MTHD)	Gain
Display Units (LB-KG)	Scale Capacity
Display Counts (COUNT)	

CALIBRATION NUMBER

The “CAL” number is adjusted to make the scale read the proper weight for different load cells and to make accuracy adjustments on a scale system. Systems should be checked with known weights and adjusted if necessary to insure accuracy. Both the setup and calibration numbers are changed to convert a scale from lbs to kgs.

CALIBRATING THE SCALE FOR MAXIMUM ACCURACY

Write down the current SETUP and CAL numbers of your EZ indicator. These numbers are displayed during the Self Test. . Press [On/Off] to "pause" the Self-Test while setup and calibration numbers are displayed. Press [On/Off] again, to "resume"

SETUP # _____ CAL # _____

To accurately calibrate the scale, you will need a large amount of weight that has a known value. For best results you should have at least as much weight as the largest load you plan to weigh.

DETERMINING THE NEW SETUP AND CALIBRATION NUMBERS

1. Zero-Balance the scale so the display reads zero.
2. Put the KNOWN WEIGHT on the scale platform and write down the WEIGHT DISPLAY.

Perform the following equation to find the ACCURATE CAL #.

Example:

The KNOWN WEIGHT is 2000lbs, but the WEIGHT DISPLAY is 2080lbs. The EXISTING CAL # is 32500.

2000 / 2080 X 32800 = 31538

31538 is the ACCURATE CAL #. The setup number does not change.

ENTER A NEW SETUP AND CALIBRATION NUMBER

The Short Form Setup & Calibration procedure allows you to change the “SETUP” and “CAL” numbers of the indicator.

1. Press and hold [Zero], and then press [On/Off] for 3 seconds to enter the short form calibration.
2. The display will flash “SETUP” and then display the 6-digit setup number with the right digit flashing. To modify the setup number:
3. Press [Gross/Net] several times to increment the digit to it proper value.
4. Press [Tare] to advance the blinking digit to the left.
5. Repeat steps 1 and 2 for each digit as required.
6. Press [On/Off] to enter the new setup number and display the calibration number.
7. Repeat steps 1 and 2 to modify the calibration number.
8. Press [On/Off] to enter the new calibration number and the display will go back to normal.
9. Verify the accuracy of the scale.

APPENDIX C

WEIGH METHODS

Select Weigh Method #1 for general weighing.

GENERAL - WEIGH METHOD #1

The General weigh method is an all-purpose weigh method for weighing dead loads. It is used for most applications.

SLOW - WEIGH METHOD #2

The Slow weigh method attempts to provide higher accuracy by filtering many weight samples over a longer period of time. Small, instantaneous weight changes have less effect on the displayed weight using this technique. This method is for weighing dead loads.

FAST - WEIGH METHOD #3

The Fast weigh method is more sensitive to weight changes than the other weigh methods. When a weight changes quickly, the Fast method tries to determine the new weight as quickly as possible. This is done by providing less filtering during the actual "weight change." When the weight begins to stabilize, filtering is increased to provide an accurate weight display. This method is for weighing dead loads.

LOCK-ON - WEIGH METHOD #4

Set to “LOCKON” for animal weighing, this allows scale to weigh active animals and display an accurate weight that does not fluctuate. Set to “OFF” for weighing dead weights. Lock-On sensitivity can be adjusted using the “LOCKON” menu.

Once the actual weight is displayed, the scale “Locks-On” to the displayed. Weight does not change, even if the motion never stops. A small ‘L’ appears on the left side of the display indicating the weight is “Locked-On.” The “Locked-On” weight can be “rechecked” by pressing [Zero] on the front panel. This breaks the “lock” and the scale recalculates the weight.

NOTES: Setting the Weigh Method in the Long Form does not affect the Display Unit LB-KG.

In Weigh Method #1, #2 and #3 the ZTRACK (zero-tracking) removes up to 0.05% of the scale capacity (as shown in setup). In Weigh Method #4 the weight that can be removed is set to 5lbs(2.2kg).

APPENDIX D

WEIGHING ERRORS

OVRCAP — OVER CAPACITY LIMIT

The display shows the message "OVRCAP" if the weight on the scale system exceeds the capacity limit. The capacity value is entered in SETUP to warn of overloading the scale system.

+RANGE — OVER RANGE

The display shows the message "+RANGE" if the weight on the scale system exceeds the maximum weight measurable by the scale system. The over range value is always the system's maximum A/D counts multiplied by the scaling factor. The actual weight at which over range occurs depends on the calibration, zero, and display count size.

-RANGE — UNDER RANGE

The display shows the message "-RANGE" if the weight on the scale system is less than the minimum weight measurable by the scale system. The under range value is always the system's minimum A/D counts multiplied by the scaling factor. The actual weight at which under range occurs will depend on the; calibration, zero, and display count size.

LO BAT — LOW BATTERY INDICATION

If the supply voltage drops below the (10.5 Volts), the message "RECHARGE BATTERY - TURNING OFF" and "LO BAT" will periodically show on the display to alert the operator of the low battery condition.

Warning! Disconnect the indicator power cord before jump-starting or fast charging a battery.

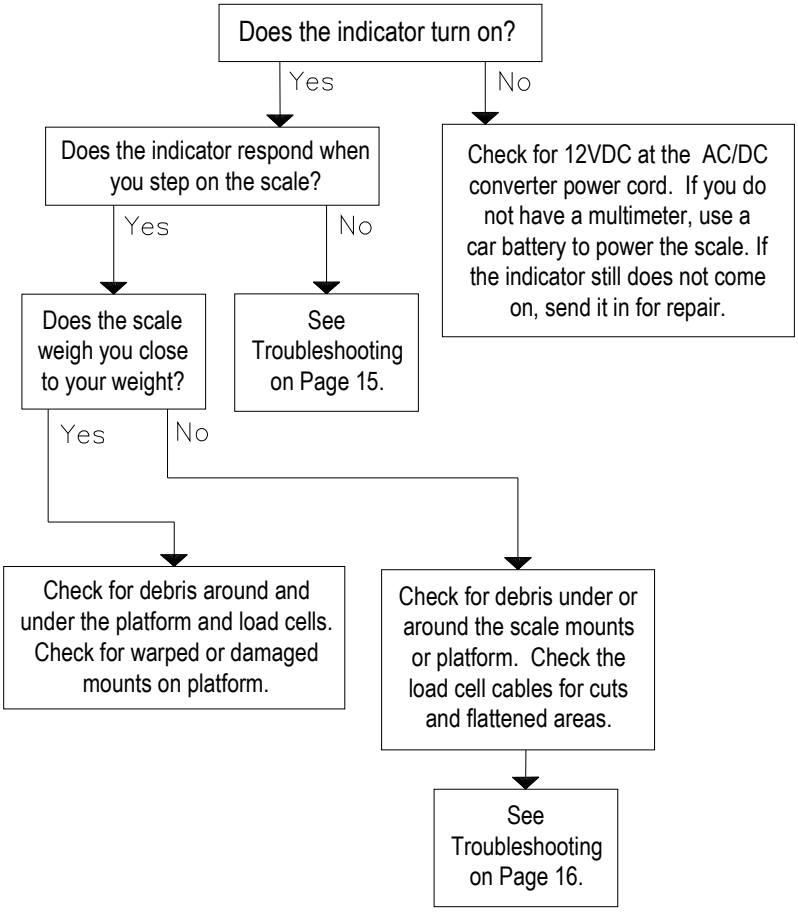
Disconnect all indicator leads before welding on equipment. Damage may occur to the indicator and load cells.

SELF TEST

Press [Gross/Net] then [On/Off] during normal system operation to start the self-test.

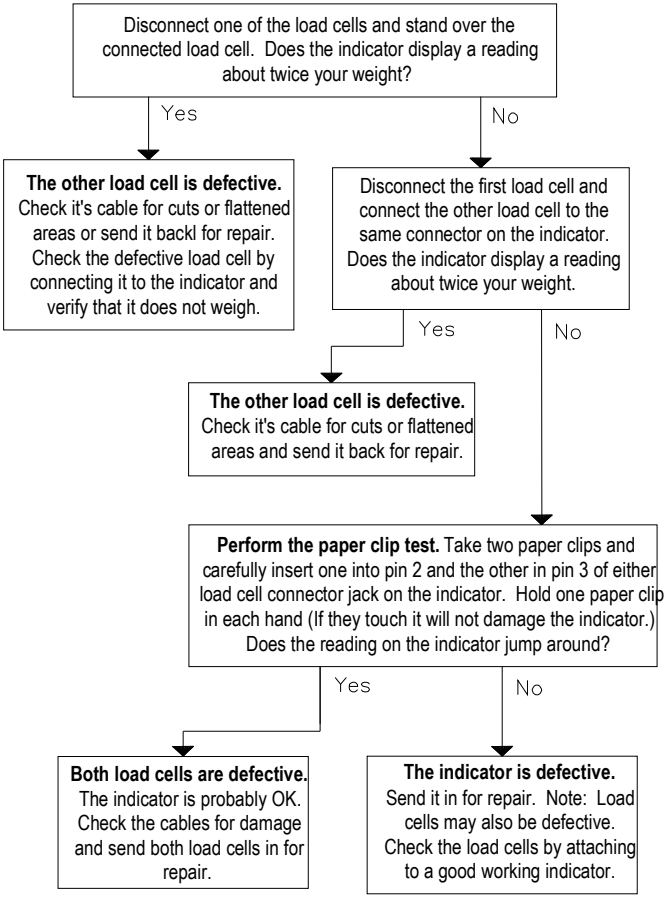
APPENDIX E

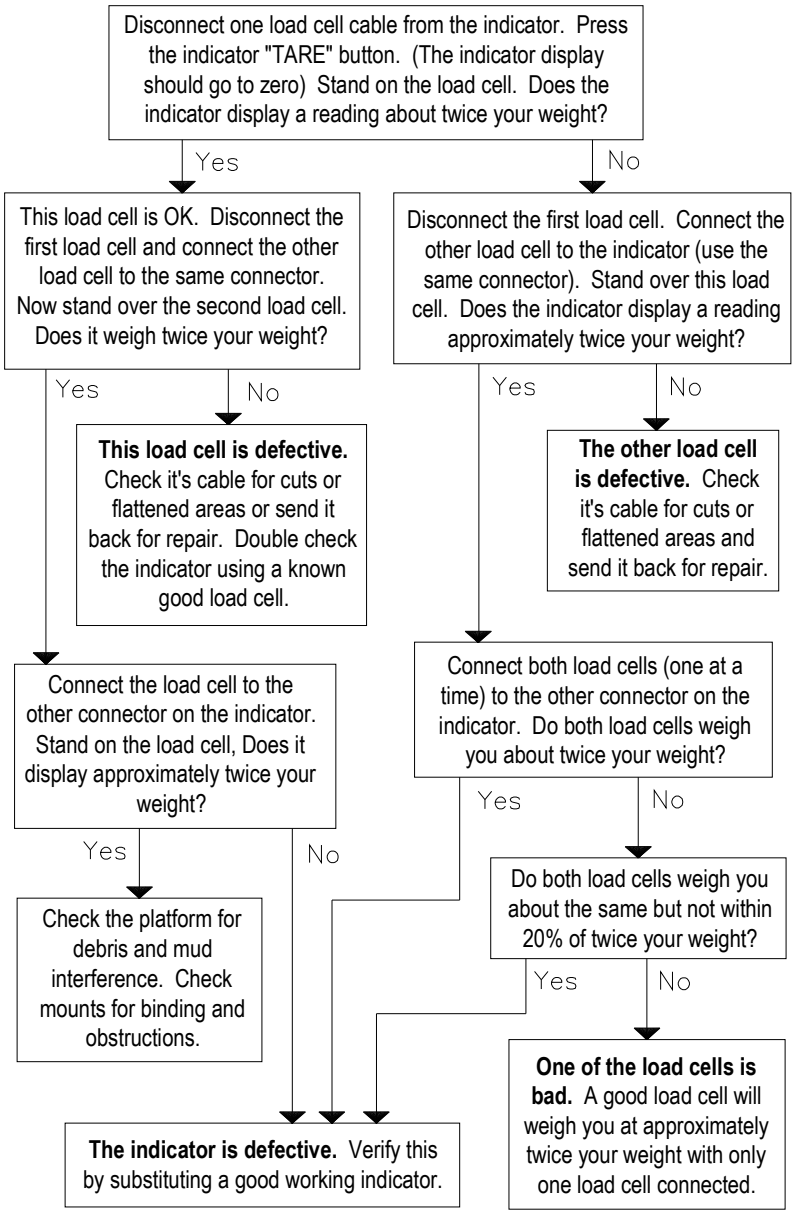
TROUBLESHOOTING GUIDE



Troubleshooting Guide

Indicator Does Not Respond When You Step on the Scale



Troubleshooting Guide

The Scale Weighs Close to Your Weight