

LOADMAN®

for Bucket Loaders

Program Version 9.0



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INTRODUCTION

Thank you for purchasing *LoadMan*®, a precision crafted On-Board Vehicle Weighing System. *Creative Microsystems* takes pride bringing to you our knowledge gained over years of designing and applying the latest technology to On-Board Vehicle Weighing Systems. It is our ongoing company goal to manufacture the finest OnBoard Vehicle Weighing Systems available.

LoadMan® is simple to use. As shown in the diagram, *LoadMan*® has a 16 character alphanumeric display and 6 pushbuttons. Momentarily depressing the POWER Key applies or remove Power. The ↑ SELECT Key sequences forward and the ↓ SELECT Key sequences in the reverse order thru the available displays. The PROGRAM Group of keys are used to enter a command like ZERO SHORT TOTAL or PRINT TICKET, or change a programmable number in the SETUP & CALIBRATION MODE. If the selected display is not programmable, the PROGRAM Group Keys have no effect. If the selected display is programmable, depressing the ↑ or ← Key PROGRAM Key will cause a flashing Cursor to appear in the display, signifying the Program Mode has been entered. For programmable Displays, use the ← PROGRAM Key to move the flashing Cursor left to the next programmable Digit or Item in the Display. Once the flashing Cursor is positioned over the item you desire to change, use the ↑ PROGRAM Key to increase the Digit or Item to its next value. Continue to use the ← PROGRAM Key to position the flashing Cursor and the ↑ PROGRAM Key to bump the Digit or Item until the desired Display is shown. Depressing the SET PROGRAM Key enters the change made or performs the command shown on the display. *LoadMan*® takes no action until the SET PROGRAM Key is depressed.

The *LoadMan*® Weighing System documented in this manual supports Bucket Loaders. Sensitive Analog measurements are provided by a precision crafted circuit called a *LoadCoder*™ which connects the Hi and Lo Pressure Transducers to the Weigh In Motion Box mounted on the Arms of the Bucket Loader. A Two Wire Digital connection immune to moisture, dirt, etc, connects the *LoadCoder*™ signals to the Arm Weigh In Motion Assembly.

LoadMan® supports up to 15 unique Products that operators can keep track of by individual customer accounts. Each Product has its own individual Long and Short Load Totals along with a Bucket Counter for the Long and Short Totals. The Short Total is intended as a loading record for each Customer Account by Product. The Long Total is a running total of the Product loaded over an extended period of time. The Short Total is normally zeroed at the start of loading for a Customer. Each subsequent Bucket Load is recording to the active Customer Account and totalized to the Short Total along with incrementing the Short Bucket Load Counter. Every Bucket Load is also recorded to the Long Total for the Active Product along with its associated Bucket Load Counter. The Long Total is typically zeroed over an accounting

INTRODUCTION

Turns power on or off. Also used to enter setup and calibration mode

16 CHARACTER ALPHANUMERIC LIQUID CRYSTAL DISPLAY WITH BACKLITE FOR NIGHT VIEWING



THE PROGRAM GROUP OF KEYS ARE USED TO ENTER A COMMAND or CHANGE A PROGRAMMABLE NUMBER

SWIVEL MOUNTING BRACKET AND KNOBS FOR MOUNTING AND ADJUSTING VIEWING ANGLE.

USE SELECT KEYS TO SELECT A DISPLAY FOR VIEWING. THE \uparrow SELECT KEY ALWAYS SEQUENCES FORWARD TO THE NEXT AVAILABLE DISPLAY IN THE CURRENT OPERATING MODE. THE \downarrow SELECT KEY SEQUENCES IN THE REVERSE ORDER.

INTRODUCTION (cont)

period to keep track of the total Product Weight loaded. It may be zeroed once a day, once a week, once a month, or whatever accounting period desired. If PRODUCTS are programmed to zero in the INSTALL Setup Category, then *LoadMan*® defaults to one product with one Short and Long Total and one Short and Long Bucket Load Counter and does not show any Product Names. If PRODUCTS are programmed to a non zero number (max=15) then a new display showing the name of the currently active product is displayed in the Normal Operating Mode. The Program Keys are active on this display allowing you make a new Product Name Active. When you make a new Product Active, *LoadMan*® stores away the current totals for the Product becoming inactive and retrieves the Totals for the Product Name just made active. The Product Names are loaded with default names by the SET DEFAULTS Setup Category to “PRODUCT ID # 01” to “PRODUCT ID # 15”.

LoadMan® also supplies a Windows based Fleet Management Software Program which downloads custom Product Names a user can define to replace the default Product Names. It can also download a Customer List and a Customers associated Account Numbers that are defined within the Fleet Management Software. The Load Data recorded by *LoadMan*® can be collected by the Fleet Management Software, filtered and manipulated by Date/Time, Customer Account, Bucket Load, Product, serial number of the Meter when multiple units are operating in the same operation,... etc. This data can be exported easily to other programs if desired. *LoadMan*®'s Fleet Management Software can also print Bar Coded Customer Lists , Product Lists, and Problem Codes, to standard Printers in the office. These Bar Coded Lists can be taken to the Wheel Loader and a standard Bar Code Wand can plug into the back of the *LoadMan*® Meter to speed up the process of selecting the Active Customer or the Active Product being Loaded. Demo's of this software can be downloaded from *LoadMan*®'s Website, www.loadman.com (select the Software Category on the Main Page).

INTRODUCTION (Printer Outputs)

LoadMan® supports a small Ticket Printer for those who would like a printed record of Customer's Loads or Long Totals printout right before zeroing. In the INSTALL Setup Category you can program the Baud Rate for the Printer plus setup the desired Print formats in the "SETUP PRINTER—>NO" sub Setup Category in the INSTALL Setup Category. You can program in this setup printer sub category to print the Customer's Account Number, Customer's Name, Product Names,... etc. To print the Customer's Account Number or Name you must have LOADNAMES programmed to ON in the SET DISPLAYS—>NO" sub Setup Category in the INSTALL Setup Category. The following are typical Print Format Samples shown for reference.

BUCKET LOAD PRINTOUT WITH LOADNAMES & PRODUCTS OFF

DATE: 03-31-01
TIME: 2:41:59 PM
BUCKETS 3
LOAD 3345 LB
TOTAL 23334 LB

BUCKET LOAD PRINTOUT WITH LOADNAMES & PRODUCTS ON

DATE: 03-31-01
TIME: 2:41:59 PM
* CUSTOMER NAME *
ACCT # 1237755
BUCKETS 3
* PRODUCT NAME *
LOAD 3345 LB
TOTAL 23334 LB

ZERO SHORT TOTALS PRINTOUT WITH LOAD NAMES & PRODUCTS ON

** ACCT TOTALS **
DATE: 03-31-01
TIME: 2:41:59 PM
* CUSTOMER NAME *
ACCT # 1237755
BUCKETS 3
* PRODUCT NAME *
TOTAL 23334 LB

** END OF JOB **

ZERO LONG TOTAL PRINTOUT FORMAT

*PRODUCT TOTALS *
DATE: 03-31-01
TIME: 2:41:59 PM
BUCKETS 1994
* PRODUCT NAME *
TOTAL 2223334 LB

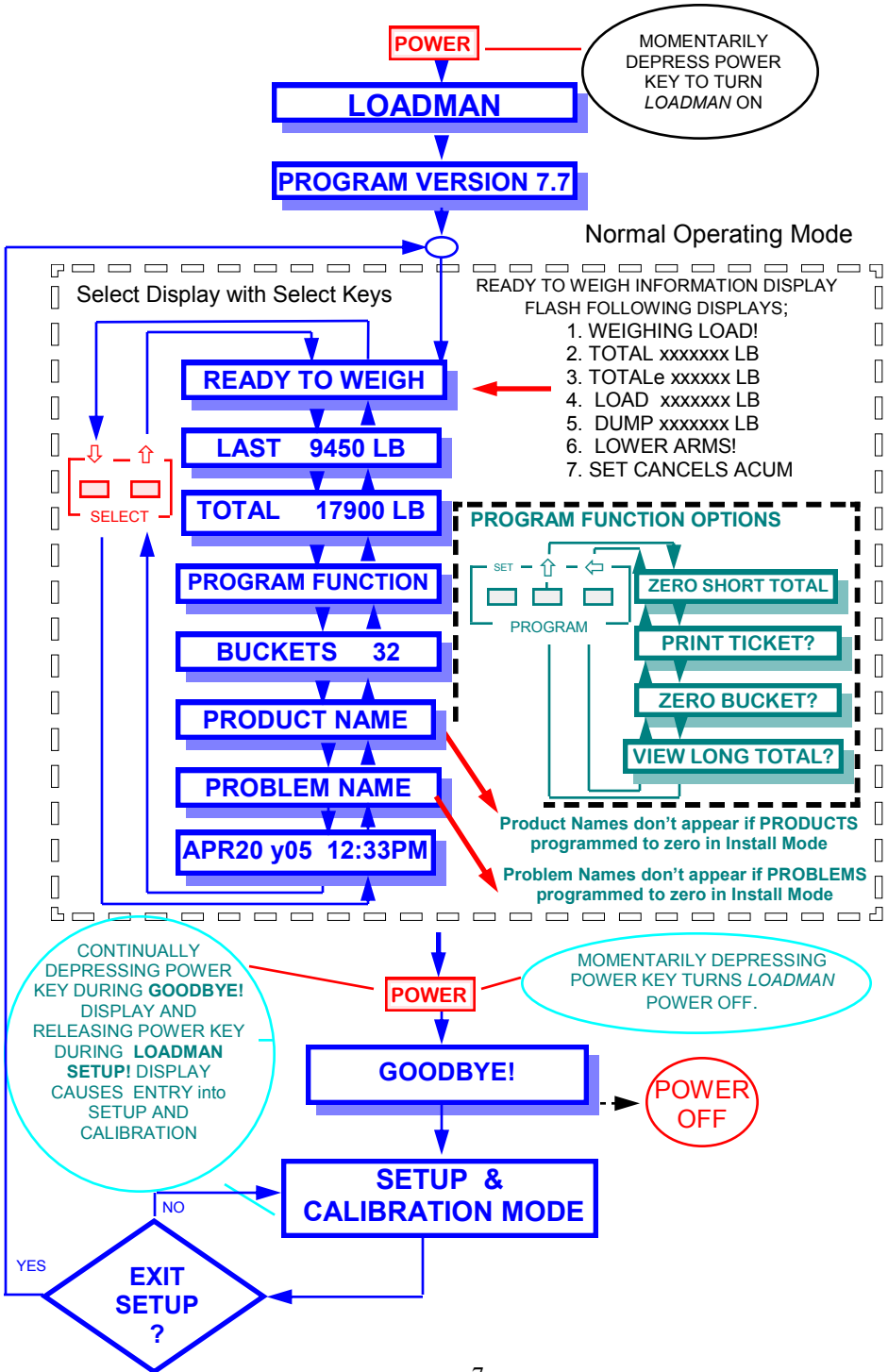
* TOTALS RESET! *

NORMAL OPERATING MODE

LoadMan® has a Normal Operating Mode and a Setup and Calibration Mode. Momentarily depressing the POWER pushbutton with power off, applies Power and causes *LoadMan*® to sign on with the Display Message “**LOADMAN**” then “**PROG VERSION x.x**”. The Version Number, **x.x**, represents the Application Software Version and aids in tracking Software Updates. Once the Sign On Messages has completed, *LoadMan*® enters into the Normal Operating Mode and shows the READY TO WEIGH Information Display. This display is the normal hands off display that will periodically flash weighing information pertinent to the weighing cycle.

In the Normal Operating Mode, either SELECT Key will select 1 of 8 possible Displays as shown in the figure. The READY TO WEIGH Information Display, LAST Load, Short TOTAL, PROGRAM FUNCTION, Bucket Count, Product Names, Problem Names and the Time of Day. The LAST Load Display shows the last Bucket Load measured. The TOTAL Display is the Short Total of previously accumulated Bucket Loads. The PROGRAM FUNCTION Display is used to command the meter to ZERO the SHORT TOTAL and the BUCKET Counter, PRINT a TICKET, ZERO the BUCKET Load Reading for an Empty Bucket, or VIEW the LONG TOTAL Display. Once the PROGRAM FUNCTION Display is selected, use either the ↑, or ← to Keys and the Program Option Displays will show. Press the SET Key once the correct command option is on the display to execute the command. The ZERO SHORT TOTAL command will reset the TOTAL Accumulator Display to Zero so another loading operation can be started. It also zeroes the BUCKET Counter. The Short Total Display is used to load individual Trucks which take multiple Bucket Loads to Load up. Another accumulator called the LONG TOTAL can be used to keep track of the total product weight delivered and can be viewed by selecting the VIEW LONG TOTAL command found in the PROGRAM FUNCTION Display. The ZERO BUCKET command will cause instructions to appear on the display asking the operator to RAISE/ LOWER the Empty Bucket at Idle and Full Speed so it can be recalibrated to read zero. After this operation *LoadMan*® will cause the Load Reading to read zero load for an empty bucket. The Product and Problem Displays are normally used with the Fleet Management Software which allows loads to be tied to a Customer Account, plus optionally a Product Account, plus optional a Problem or Pile Account. The Product Name Display allows you to track Short/Long Totals and Buckets for up to 15 different products. The Problem Display allows you to record a particular code to a recorded Load Record. Typically this might be used to identify different piles of a particular product.

NORMAL OPERATING MODE SUMMARY



NORMAL OPERATING MODE (cont)

Normally, most operators will run the Meter with the READY TO WEIGH Information Display selected (see figure on previous page). This display will flash critical weighing information that depends on the position of the Weighing Cycle allowing most operators to view the information required without having to select another display. This allows a hands off operation. The information displayed in this mode depends on the angular position of the Arms as follows;

1. **Angular Position of the Arms are below the Start of the Weighing Window** (Normally Arm Angle reads below Zero Degrees) - *LoadMan*® will alternate between 2 Display's, "READY TO WEIGH" and the current value of the Short Total, for example "TOTAL xxxxxxxx LB".
2. **Angular Position of the Arms are between the START and the END Weigh Setpoint** - Display will show the display "WEIGHING LOAD". This means that *LoadMan*® is in the process of weighing the Load. Operator must continue to raise the arms at a constant speed until the Arms pass the END Weigh Setpoint.
3. **Angular Position of the Arms are Between the END Weigh Setpoint and the DUMP Setpoint** - As soon as the Arms are raised passed the End of the Weighing Window, *LoadMan*® will alternate between 2 displays, the load reading just measured, "LOAD xxxxxxxx LB" and the new estimated Short Total in the format "TOTALe xxxxxxxx LB". The small "e" after the TOTAL means that this is the estimated short total if the operator decides to continue to dump the Load. At this point the operator has a choice. Either he can accept the Load and Dump the entire Bucket Contents into the Truck being loaded, or alternately, if he is not satisfied he can lower the arms back down below the weighing, adjust the weight in the bucket and start another weighing cycle at step 1. The Short Total will not be affected if the bucket is just lowered back below the Start of the Weighing Window. The meter will respond with "IGNORING LOAD" if this is the case. If the new Short Total is agreeable to the operator then he continues to raise the arms till the arms are above the DUMP Setpoint at which time the Accumulator will be armed to Accumulate the Load.
4. **Angular Position of the Arms are above the DUMP Setpoint** - If the operator continues to raise the Arms till the Angular Position of the Arms is higher than the DUMP Setpoint, then the meter will indicate that this is the case by alternating between the displays "LOAD xxxxxxxx LB" and "DUMP xxxxxxxx LB". The operator effectively sees the command "DUMP LOAD". This tells the operator that the Accumulator has been armed and will automatically accumulate the load on the way back down. When the Arms are raised passed the DUMP Setpoint, then *LoadMan*® assumes that the operator intends to dump the entire contents of the bucket into the Truck that is being loaded.

NORMAL OPERATING MODE (cont)

5. **Angular Position of the Arms are returned back below the DUMP Setpoint but higher than the END Setpoint** - As soon as the load is dumped and Angular Position of the Arms are lowered lower than the DUMP Setpoint, the meter will show the display "LOWER ARMS!". This is just a message informing the operator that he is expected to continue to Lower the Arms to complete the weighing cycle.
6. **Angular Position of the Arms are lowered below the END Setpoint but Above the START Setpoint** - As soon as the arms go below the END Setpoint, *LoadMan*® responds with the display "SET CANCELS ACUM". This gives the operator a final chance to cancel the automatic accumulation. If the SET Key is depressed then the measured load will not be added to the Short Total and the load will be ignored. If the operator does not press the SET Key then the measured load will be automatically added to the existing Short Total.
7. **Angular Position of the Arms are lowered below the START Setpoint** - When the Arms are finally lowered below the START Setpoint, then the weighing cycle is completed and *LoadMan*® responds with the new Short Total Display "TOTAL xxxxxx LB" for approximately 2 seconds then it shows "RECORDING LOAD" which means that the data record is being stored into its internal memory and can be later retrieved by the Fleet Management Software running on a standard Microsoft Windows Computer.
8. After the last step is completed, *LoadMan*® returns to step 1 and another weighing cycle can be attempted. Once a Truck has been loaded to the desired Weight, the Operator would Normally ZERO the SHORT TOTAL to begin loading another Truck. This can be done by selecting the PROGRAM FUNCTION display and using the UP Program Key to view the command ZERO SHORT TOTAL then depress the SET Program Key. This command will cause the Short Total to be zeroed. Alternately an external Momentary Switch can be connected to the back of the Meter which when activated will also execute the ZERO SHORT TOTAL command.

NORMAL OPERATION MODE (cont)

Description of Long and Short Totals

LoadMan® will track 2 separate Total Accumulators for each Product used. One is called a Long Total and the other a Short Total. If PRODUCTS are programmed to Zero in the Install Mode then the Product Display will not appear and for this case there is one Long Total and one Short Total. If PRODUCTS are programmed between 1 and 15, then the operator can select the Product Display and use the program keys to make the desired Product Active. After the correct Product is displayed hit the SET Key to activate the Product. When this occurs, *LoadMan*® will load the current Short and Long Totals for the Selected Product. That Product remains active until another one is activated thru the same process. The Short Total is usually used to indicate how much load has been loaded during the current multi-bucket loading cycle. It can be zeroed as described earlier. Every time a loading cycle is completed the load is not only added to the Short Total but another separate Total called the Long Total. The Long Total can be viewed by selecting the PROGRAM FUNCTION Display, depressing the LEFT Arrow Program Key to get the display "VIEW LONG TOTAL?" then depressing the SET Key. *LoadMan*® will respond by showing the Current Long Total for the active Product in the format "NET xxxxxxxx LB". You can now zero the Long Total by selecting the PROGRAM FUNCTION Display again and using the Program Keys to view the command option "ZERO LONG TOTAL?" then depressing the SET Key. This action will cause the Long Total to be reset back to zero.

ACTIVATING THE SETUP & CALIBRATION MODE

If attempting to perform a Setup and/or Calibration Function then you need to enter the Setup and Calibration Mode. Normally you depress the POWER Key causing *LoadMan*® to display “**GOODBYE!**” for approximately 1 second before Power is removed. Depressing the POWER Key again, applies power again. To enter the Setup and Calibration Mode, continually hold the POWER Key depressed while “**GOODBYE!**” is on the display, then instead of turning the power off, *LoadMan*® displays “**LOADMAN SETUP!**” to signify entry into the SETUP and CALIBRATION Mode. You must release the POWER Key while the “**LOADMAN SETUP!**” Display is displayed to successfully enter the Setup and Calibration Mode. Otherwise Power will be removed. There are several Setup Categories in the Setup and Calibration Mode and are discussed in detail in that section. When the EXIT SETUP Category is activated, *LoadMan*® returns back to the Normal Operating Mode as shown in the Normal Operating Mode figure

SETUP and CALIBRATION OPERATING MODE

Enter the Setup and Calibration Mode from the Normal Operating Mode by holding the POWER Key depressed continually during the “GOODBYE!” Display. Release the POWER Switch when you see “LOADMAN SETUP!” and the Setup and Calibration Mode is entered. *LoadMan*® provides a Security Function that can be enabled or disabled in the INSTALL Setup Category. If enabled, *LoadMan*® prompts ENTER SETUP CODE before it allows access to the Setup and Calibration Mode. In this case, use the Program Group of keys SET, ↑, and ⇐ to enter the preset Setup Code “123”. Use the ⇐ arrow key first and 6 digits appear with a Flashing Box over the Least Significant Digit. Continue to use the ⇐ arrow Key to position the Flashing Box over the Digit that needs to change. Use the ↑ Key to bump the selected digit from 0 to 9 then back to 0. Continue to use these keys until you get the desired number, in this case “123”, then depress the SET Key to enter the Number. When successful, you will see “LOADMAN SETUP!” displayed, then the first display of the Setup and Calibration Mode, “SET ZERO?->NO”. You are now in the Setup and Calibration Mode which is diagrammed on the following page. Use the SELECT Keys to Select the desired Setup Category Display as shown. The ↑ SELECT Key will sequence forward and the ↓ SELECT Key will sequence in the reverse order. Once the desired Setup Category Display is being viewed, use either the ↑ or ⇐ Program Group Keys to change the “NO” in the Display to a “YES”. Depressing the SET Key will allow you to enter the selected Setup Category. The Setup Categories are as follows;

- ◇ **SET ZERO** - Sets Start of Weighing Window and is used to learn hydraulic pressure waveform at Idle and Full Speed for an Empty Bucket in the curled position.
- ◇ **SET SPAN** - Used to learn hydraulic pressure waveform for a Loaded Bucket of known weight at Idle and Full Speed in the curled position or make Span adjustments to a Truck Load.
- ◇ **SET DEFAULTS** - Used to reset all setup and calibration data to a factory default settings and/or reset Product Names to defaults.
- ◇ **INSTALL** - Used to set common operating parameters.
- ◇ **TROUBLESHOOT** - Used to view HiSide and LoSide hydraulic pressures, Arm Angle measurements, and inspect or adjust Calibration parameters for troubleshooting purposes.
- ◇ **EXIT SETUP** - Used to exit the Setup and Calibration mode and return to the Normal Weigh mode of operation.

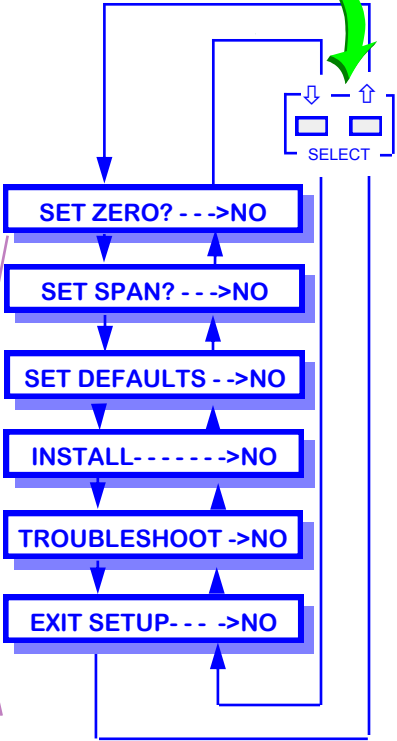
SETUP and CALIBRATION OPERATING MODE



SELECT DISPLAY
 USE ↑ SELECT KEY TO SEQUENCE FORWARD THROUGH DISPLAYS, USE ↓ SELECT KEY TO SEQUENCE IN REVERSE

Activating a Setup Category

- USE SELECT KEYS TO SELECT THE SETUP CATEGORY YOU DESIRE.
- USE THE ↑ OR ← SET KEYS. TO CHANGE THE "NO" TO "YES"
- PRESS THE SET KEY TO ACTIVATE THE SELECTED SETUP CATEGORY.



SETUP and CALIBRATION OPERATING MODE

- **SET ZERO** - Use this Setup Category to teach *LoadMan*® the hydraulic pressure waveform for an Empty Bucket in the Curled Position. Use the ↑ or ← Keys and the Display will change to “**LEARN ZERO?*”, again and it will change to “SET WEIGH START?”. Pressing the SET Key with the correct Zero Option displayed will activate the displayed function. Before you use the Learn Zero Option you must first use SET WEIGH START option to set the arm position where the Weighing Window will start. When you hit the SET Key, with the SET WEIGH START on the display, *LoadMan*® responds with a message telling you this will destroy existing calibration then shows the “PROCEED?—>NO“ display. If this is the start of a new calibration then move the Arms to the desired start of the Weighing Window, usually about 4-6 feet off the ground, then use the Program Keys to change the NO to a YES then press the SET key to proceed. This will set the Start of the Weighing Windows at the current position of the Arms. It might be desirable at this point to Exit the Setup Mode and move the Arms thru a weighing cycle to verify that the start and end of the Weighing Window are acceptable before you go to the next calibration step. Once the start of the Weighing is correct, go back to the SET ZERO option in the Setup and Calibration Mode and use the ↑ or ← Keys to get the display LEARN ZERO then press the SET Key to enter the Learn Zero Mode. *LoadMan*® responds with EMPTY BUCKT LOAD then informs you to lower the Empty Bucket in the Curled Position to 5 degrees less than the start of the Weighing Window. At this point *LoadMan*® responds with “RAISE ARMS” and “AT IDLE SPEED”. Raise the Arms at the Idle Speed of the Wheel Loader until you see the message “ZEROING BUCKET!”. At this point *LoadMan*® zeroes the Differential Pressure measurement then instructs you to lower the Arms to just a few degrees below the start of the Weighing Window. Follow the instructions and *LoadMan*® will respond with “RAISE ARMS ONLY” and flash “AT IDLE SPEED”. At this point follow the instructions and smoothly raise and lower the Arms thru the Weighing Window at the Idle Speed like a normal operator would. As you raise it thru the Weighing Window you will see the message “LEARNING ZERO!”, “RAISE ARMS ONLY”, then “**LOWER ARMS! *”. Lower the Arms back down thru the Weighing Window and you will see the messages “LEARNING ZERO!” then “LOWER

SETTING ZERO (Empty Bucket Calibration)



SELECT

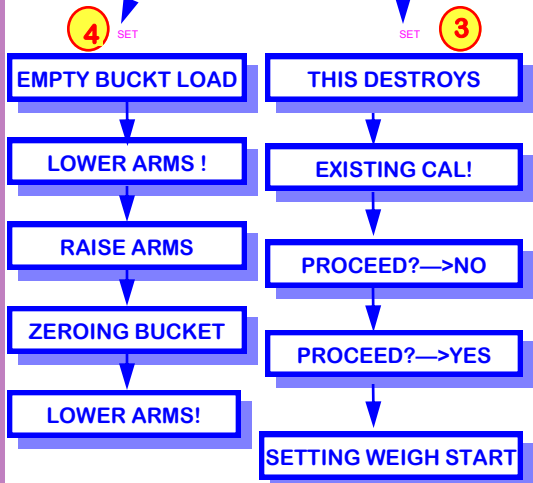
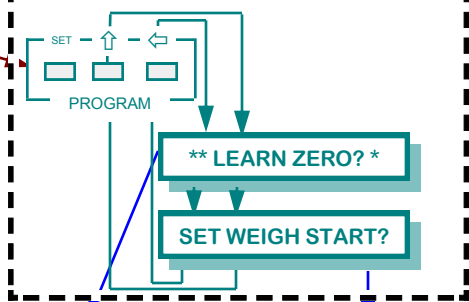
AFTER ENTERING THE SETUP & CALIBRATION MODE, USE THE ↑ SELECT KEY TO SEQUENCE FORWARD THROUGH THE DISPLAYS AND THE ↓ SELECT KEY TO SEQUENCE IN REVERSE ORDER TILL YOU FIND THE "SET ZERO →NO" DISPLAY.

SET ZERO? -->NO

SETTING WEIGH STRT INSTRUCTIONS

- 1 ⇒ In SETUP and CALIBRTION MODE, use SELECT KEYS to Select the **SET ZERO-->NO** DISPLAY.
- 2 ⇒ Use ↑ or ⇐ PROGRAM KEYS to Change **SET ZERO-->NO** Display to "**LEARN ZERO?**" & again to "**SET WEIGH START?**"
- 3 ⇒ Press SET Program Key then move Arm Position to desired Start of Weighing Window then program the NO to a YES in PROCEED>NO Display.
- 4 ⇒ Press SET Key with an Empty Bucket and move the Arms to the desired start of the Weighing Window. The Display PROCEED?—NO Display will then show. Change the NO to a YES then hit the SET key to set the current Arm Position to the Start of the Weighing Window.

SELECT ZERO OPTION



• **SETUP and CALIBRATION OPERATING MODE**

ARMS” then RAISE ARMS ONLY!. Following the instructions for 10 complete lift cycles at Idle Speed while the display is flashing “AT IDLE SPEED”. At this point the display will change the Flashing display to “AT FULL SPEED”. Continue with 10 more lift cycles at full throttle and the display will show “ZERO COMPLETE!” then “EXIT SETUP—>NO”. The Learn Zero Operation has completed successfully at this point. You can continue to do more operations in the Setup and Calibration Mode or Exit the Setup Mode by changing the NO to a YES and and pressing the SET Key. *LoadMan*® should now measure a zero load reading for an empty bucket in the Normal Weigh Mode.

- **SET SPAN** - Use this setup category to calibrate a Bucket Load of known weight, or a known Truck Load loaded with multiple Bucket Loads. You must perform the LEARN SPAN calibration for a Single Bucket Load prior to attempting the SPAN TRUCK LOAD command. Prior to doing this step, *LoadMan*® must measure a zero Bucket Load Reading for a empty Bucket (or a zero TOTAL Reading prior to loading the Truck if doing the SPAN TRUCK mode). If not, first perform the ZERO BUCKET command in PROGRAM FUNCTION of the Normal Operating Mode. If this causes an empty Bucket Load to read Zero then continue on here with either the LEARN SPAN or SPAN TRUCK Load Command. If not, then you must perform the LEARN ZERO command discussed earlier prior to attempting the SET SPAN Calibration. With the SET SPAN-->NO Display Selected, use the **↑** or **↶** Key once and the display will change to “ ** LEARN SPAN? * ”. Press the same key once more and the display will change to “SPAN TRUCK LOAD?”. Press the SET Key when the desired Set Span Mode is displayed. Each Span Mode is described in further detail below;
- **LEARN SPAN** – Use this mode when you know the Bucket Load and you want the Meter to measure the same Bucket Load Reading. Start this process with the known load in the Bucket and resting on the ground. After pressing the SET Key with SPAN BUCKET LOAD showing, *LoadMan*® displays ENTER BUCKETLOAD then shows “BUCKET 0 LB”. At this point use the **↑** or **↶** Program Group of keys as described earlier to program the known Bucket Load Weight in the Bucket. When the correct weight is displayed depress the **SET** Key to enter the desired Bucket Load Weight Reading. Press the **↑** SELECT, & *LoadMan*® responds with “DO AUTOCAL?—>NO”. When ready to start use the **↑** or **↶** Program Keys to change the NO to a YES then

SETTING SPAN (Loaded Calibration)



SELECT

AFTER ENTERING THE SETUP & CALIBRATION MODE, USE THE \uparrow SELECT KEY TO SEQUENCE FORWARD THROUGH THE DISPLAYS AND THE \downarrow SELECT KEY TO SEQUENCE IN REVERSE ORDER TILL YOU FIND THE "SET SPAN \rightarrow NO" DISPLAY.

SET SPAN? -->NO

SETTING SPAN INSTRUCTIONS

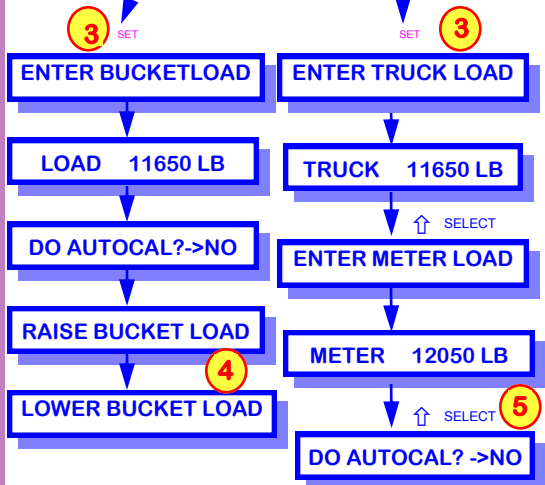
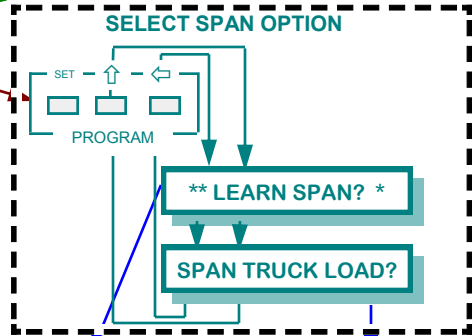
1 \Rightarrow In SETUP and CALIBRTION MODE Use SELECT KEYS to Select the SET SPAN-->NO DISPLAY.

2 \Rightarrow Use \uparrow or \downarrow PROGRAM KEYS to Change SET SPAN-->NO Display to "SPAN BUCKET LOAD" or "SPAN TRUCK LOAD" then press SET KEY.

3 \Rightarrow Enter the desired Bucket or Truck Load Weight your are attempting to calibrate with the \uparrow , \downarrow , then the SET Program Keys then press the \uparrow Select Key.

4 \Rightarrow For SPAN BUCKET LOAD, follow Display Instructions Raising and Lowering Bucket Load thru the weighing window.

5 \Rightarrow For SPAN TRUCK LOAD, Program the Truck Load. Press the \uparrow Select Key. Program the Meter Truck Load measured by LoadMan. Press the \uparrow Select Key. Use Program keys to change the "DO AUTOCAL?-->NO" display to "DO AUTOCAL?>YES" Display then press SET Key



SETUP and CALIBRATION OPERATING MODE

press the SET Key. *LoadMan*® will then displays instructions to Lower the Loaded Bucket to a few degrees below the start of the Weighing Window. The Bucket must be fully curled back at all times during all calibration procedures. Raise the Bucket thru the weighing window in a smooth constant motion like you normally run the machine at Idle Speed. After passing thru the weighing window, *LoadMan*® responds with “LOWER BUCKT LOAD”. Lower the Bucket thru the weighing window in a smooth constant motion as you normally run the machine while using the weighing system. Continue this process at an Idle Speed for 10 Lift cycles while *LoadMan*® is flashing “AT IDLE SPEED”. At the point *LoadMan*® will change the flashing display to “AT FULL SPEED” at which time you should go at full throttle for another 10 Lift Cycles. *LoadMan*® learns the Hydraulic Pressure Transducer Response to the load at Idle and Full Speed whicle passing thru the weighing window and performs the calibration to make the Transducer read the desired weight. *LoadMan*® responds with SPAN COMPLETE then “EXIT SETUP->NO” display signifying calibration is complete (assumming no errors occurred). A 500 LB NET Bucket Load must exist in your Bucket before attempting the calibration. *LoadMan*® displays “BUCKT NOT LOADED” then “**ABORTING AUTOCAL.**” if the load is less than 500 LB. If *LoadMan*® is not receiveing the *LoadCoder*TM signal then it will respond with “**NO TRK CODER**” then “**ABORTING AUTOCAL**” (You must Learn Span using this procedure at least once).

- **SPAN TRUCK LOAD**– Use this mode only after you have performed the Learn Zero and Learn Span discussed earlier. After loading the Truck with several Bucket Loads, weigh the Truck on a Truck Scale to find out exactly how much payload is in the Truck. Prior to loading, make sure the TOTAL Accumulator on the meter has been zeroed and also an empty Bucket reads Zero when passing thru the weighing window. Load the Truck with several Bucket Loads accumulating each load to the TOTAL Accumulator. Once the Truck has been loaded, write down what the meter says the Truck was loaded to (TOTAL Accumulator Display), then write down what the Truck Scale said the payload weighed. Once these 2 numbers are known, go into the Setup and Calibration Mode and using the Program Keys select SPAN TRUCK LOAD then hit set. *LoadMan*® responds with ENTER TRUCK LOAD then TRUCK 0 LB. Use the Program Keys and program what the scale said the Truck weighed then press the SET Key. Press the ⬆ SELECT Key, and *LoadMan*® responds with “ENTER METER LOAD” then “METER 0 LB”. Use the Program Keys again to program what the Meter said the Truck Weighed then press the SET Key. . Press the ⬆ SELECT Key, and *LoadMan*® responds the “DO AUTOCAL—>NO” Display. Use the Program Keys to change the “NO” to a “YES” then press the SET Key

SETUP and CALIBRATION OPERATING MODE

and *LoadMan*® responds with DOIING SPAN ADJUST then EXIT SETUP. You can then exit the setup and check the calibration results.

- **INSTALL** - Use the Install Setup Category when you need to setup or change the operating configuration of *LoadMan*®. The INSTALL SETUP CATEGORY Diagram on the following page shows how to access, or change the current settings in the INSTALL Setup Category. Once you have entered the INSTALL Setup Category, use the SELECT Keys to select the desired Install Option. If the Displayed Option is incorrect, continued use of the ↑ or ⇐ PROGRAM Key will sequentially show all of the available options. When the desired option is displayed, use the SET PROGRAM Key to make the entry. The following list describes each of the displays in this Setup Category.

- ◇ **PRODUCTS** - *LoadMan*® supports up to 15 separate Products. When Products are programmed to Zero, *LoadMan*® defaults to a single Product which has 1 Short and Long Total and 1 Short and Long Bucket Counter. Program this field to the number of Products you intend to keep track of. Once you do this, *LoadMan*® will keep track of a Short and Long Total and a Short and Long Bucket Counter for each product separately. In the normal operating mode you can select the Product display (assuming it is programmed to non zero), then use the Program Keys to activate a new Product. When you hit the SET Key, *LoadMan*® stores the current Totals and Bucket Counters away and retrieves the last contents of the Short and Long Totals and Bucket Counters for the current Product you activate. This Product now becomes the active product and you can Zero the Short or Long Totals in the PROGRAM FUNCTION Display. As you accumulate loads the Short and Long Totals will be updated. Usually the Long Total would be a running counter over a period of time to track the total amount of Product Weight Loaded. The Short Total is usually used to keep track of individual loads by customer account.
- ◇ **DISPLAY UNITS = LB** - Selects the Load Unit your system will display Weights in. You can select either LB or KG.
- ◇ **AUTO ACCUM—→ON** - This lets you select whether you would prefer *LoadMan*® to automatically Accumulate the measured Load as you return the bucket back thru the Weighing Window or alternately only accumulate the measured load only if you manually press the SET key to accumulate the Load.
- ◇ **COUNT BY** - This programs the resolution of the Weight Displays in the Normal Operating Modes where "xx" shows the minimum weight step displayed. You can set the Count By to 1,, 10, 20, 50, or 100.

INSTALLING LoadMan®



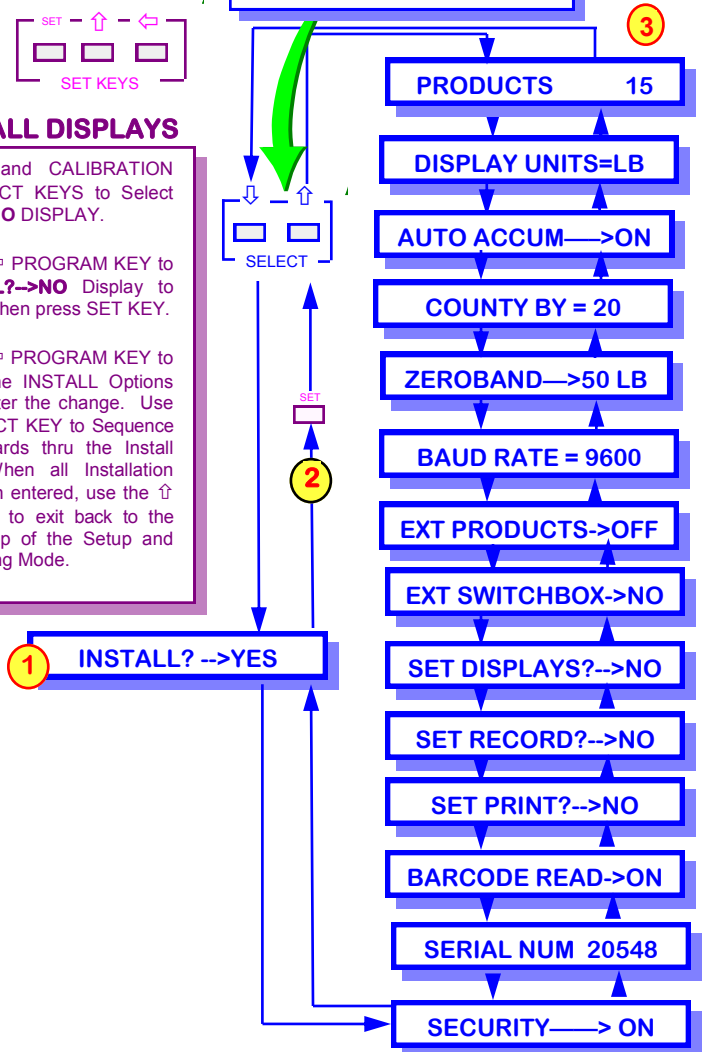
SELECT DISPLAY

USE ↑ SELECT KEY TO SEQUENCE FORWARD THROUGH DISPLAYS, USE ↓ SELECT KEY TO SEQUENCE



SETTING INSTALL DISPLAYS

- 1 ⇒ In SETUP and CALIBRATION MODE Use SELECT KEYS to Select the **INSTALL?-->NO** DISPLAY.
- 2 ⇒ Use ↑ or ⇐ PROGRAM KEY to Change **INSTALL?-->NO** Display to **INSTALL?-->YES** then press SET KEY.
- 3 ⇒ Use ↑ or ⇐ PROGRAM KEY to Change one of the INSTALL Options then hit SET to enter the change. Use the ↑ or ↓ SELECT KEY to Sequence forward or backwards thru the Install Setup Options. When all Installation Options have been entered, use the ↑ or ↓ Select Key to exit back to the main operating loop of the Setup and Calibration Operating Mode.



SETUP and CALIBRATION OPERATING MODE

- ◇ **ZEROBAND** - This is a programmable setting to cause any reading within this band, plus or minus, to read zero on the display.
- ◇ **BAUD RATE = 2400** - This programs the Baud Rate used to communicate on the RS232 Port. The available options are 110, 300, 600, 1200, 2400, 4800, and 9600.
- ◇ **EXT PRODUCTS→OFF** - *LoadMan*® supports 15 Products. The active product can be automatically selected by using external switches. Programming this option to YES will cause *LoadMan*® to look at the status of up to 4 external switches to determine the desired active product.
- ◇ **EXT SWITCHBOX→ON** - *LoadMan*® supports externally switch activated Print, Zero, and/or Record Data Options. If programmed to the on position then these switch inputs are activated.
- ◇ **SET DISPLAYS→NO** - This is a sub Setup Category that has several Display Options. Use the Program Keys to change the NO to a YES to enter this setup category. The programming in this sub category allows you to flash a Text Customer Name, a customer's account number, the Bucket Count, the Product Name being loaded, and / or an Overload Setpoint Alarm in the Normal Operating Mode.
- ◇ **SET PRINT→NO** - This is a sub Setup Category that has several printer setup options. You can cause to print the Customer Name, Product name, Customer Account Number, and Bucket Number.
- ◇ **SECURITY** - Programming Security ON will force the operator to enter the Security Access code of "123" before allowing access to the Setup and Calibration Mode. Programming Security to OFF will bypass the need to enter the Security Access code.
- **TROUBLESHOOT Setup Category** - The Troubleshoot Setup Category is useful when you are having a problem and you need to look at the readings and/or Calibration Settings for the Hydraulic Pressure Transducers or the status of the Arm Angle Position Sensor. In this mode you can see how the Transducers are responding to the Load. The TROUBLESHOOTING Diagram shows how to display the Transducer readings, and their current Calibration Settings for the LO-SIDE and HI-SIDE pressure Transducers plus all the current status and calibration settings of the Arm Angle Sensor. After entering the Setup Mode, use the ↑ or ↓ SELECT Keys to Select the TROUBLESHOOT>NO Display. Use the ↑ or ⇐ Program Keys to change the Display to "TROUBLE PRESSURE?", or "TROUBLE POSITION", or "TROUBLE CAL?" then press the SET Key when the desired option is displayed. The Troubleshooting displays are discussed in greater detail below.

SETUP and CALIBRATION OPERATING MODE

TROUBLESHOOTING (cont)

- **TROUBLE PRESSURE** - Use this option to show the current status of the HI-SIDE and LO_SIDE Hydraulic Pressure Measurements.
 - ◇ **HI SPAN** – This display shows the current SPAN or sensitivity setting for the Hi Side Hydraulic Pressure. This setting should always be 20000.
 - ◇ **HISIDE** – This display shows the current reading from the Hi Side Pressure Transducer. Display shows LB or KG but is not calibrated to these units. The readings shown here are merely counts that are proportional to the hydraulic pressure being measured.
 - ◇ **HI ZERO** – Every time the operator uses the ZERO Command in the PROGRAM FUNCTION of the Normal Operating Mode or alternately the LEARN ZERO option of SET ZERO in the Setup and Calibration Mode, *LoadMan*® will record what the Load Cell reads when passing thru the start of the Weighing Window and stores it at this location. This number represents the Zero Offset of the Load Cell.
 - ◇ **LO SPAN** – This display shows the current SPAN Number or sensitivity setting for the Li Side Hydraulic Pressure. This setting should always be 20000. However it is programmable to as low as zero. When programmed to zero, the Lo Side Pressure will be ignored. Normally it is left at 20000.
 - ◇ **LOSIDE Reading** – This display shows the current reading from the LO Side Pressure Transducer. Display shows LB or KG but is not calibrated to these units. The readings shown here are merely counts that are proportional to the hydraulic pressure being measured.
 - ◇ **LO ZERO** – Every time the operator uses the ZERO LOAD Command in the PROGRAM FUNCTION of the Normal Operating Mode or alternately the SET ZERO in the Setup and Calibration Mode, *LoadMan*® will record what the Load Cell reads when passing thru the Weighing Window and store it at this location. This number represents the Zero Offset of the Load Cell.
 - ◇ **FILTER** – You can Program a Digital Filter from “NONE”, “LIGHT”, “MEDIUM”, and “HEAVY”. The normal default setting is “LIGHT”. Typically you will get best results with “NONE” and “LIGHT”.

The SPAN and ZERO Settings are manually programmable using the PROGRAM Group of Keys but it is highly recommended that you always leave them at the factory default settings of 20,000. The PROGRAM Keys have no effect when viewing HISIDE or LOSIDE Load Cell Readings. Normally you would not program the Zero and Span Numbers because the meter does this automatically for you in the SET

TROUBLESHOOTING

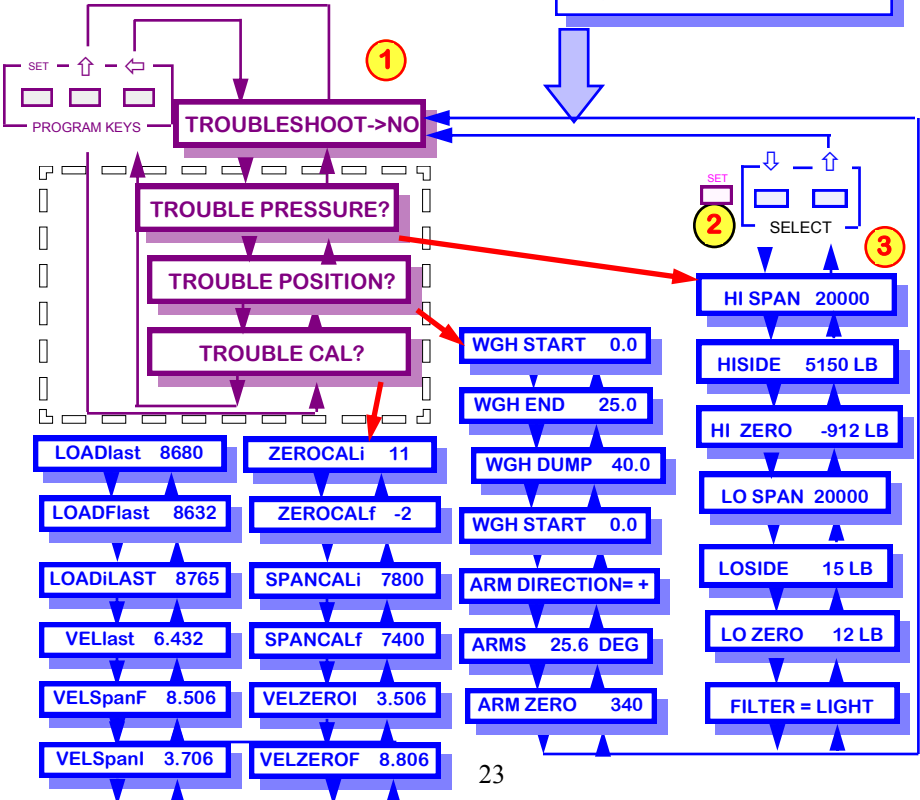


ACTIVATING TROUBLESHOOT MODE

- 1 ⇒ ENTER SETUP and CALIBRATION OPERATING MODE then use SELECT KEYS to SELECT TROUBLESHOOT->NO DISPLAY
- 2 ⇒ Use ↑ or ⇐ PROGRAM KEY to change the "TROUBLE->NO?" to "TROUBLESHOOT->HISIDE", "TROUBLE LOSIDE?" or "TROUBLE POSITION?" then press the SET Key.
- 3 ⇒ Use the Select Keys to select the Trouble Shooting Parameter desired.

SELECT DISPLAY

USE ↑ SELECT KEY TO SEQUENCE FORWARD THROUGH TROUBLESHOOTING DISPLAYS, USE ↓ SELECT KEY TO SEQUENCE IN REVERSE ORDER.



SETUP and CALIBRATION OPERATING MODE

TROUBLESHOOTING (cont)

SPAN or SET ZERO Setup Categories or by using the ZERO LOAD command in the Normal Operating Mode. The Zero Offset is useful in determining the health of the Load Cell. A healthy Load Cell will normally have a Zero Offset within plus or minus 25% of the Load Cell's capacity and remain relatively stable over the Long Term. However, when a Load Cell starts to fail, the Zero Offset will move continually (usually in the same direction) over a period of time and eventually cause the Load Cell to fail. The SPAN Setting sets the sensitivity or counts per volt of signal. The higher this number the higher the sensitivity to signal changes from the Load Cell.

TROUBLE POSITION – This mode lets you inspect the Position Setpoint Settings for the Weighing Window and the current status of the Arm Angle Sensor and its calibration settings.

WGH START – This setting is the Arm Angle Setpoint where the Weighing Window starts. It should be left at 0.0 Degrees.

WGH END – This is the Arm Angle Setpoint where the Weighing Window ends. It must be set higher than the WGH START Setpoint for proper operation. The factory default setting is 25.0 Degrees. If you desire the Weighing Window to be more narrow then you would lower this setpoint closer to the WGH START Setpoint. Likewise to widen it you would increase this setpoint. The wider the weighing window the more stable the weight measurement becomes. However, it is desirable to keep the Weighing Window narrow to decrease the measurement time during normal operation

WGH DUMP – This is the Arm Angle Setpoint that arms the automatic or manual accumulation to take place. This setpoint must be higher than the WGH END Setpoint for proper operation. The factory default setting is 40.0 Degrees. The Accumlator will be armed to accumulate only if the Arm Angle exceeds this setpoint setting. If you do not raise the Arms past this setpoint then the measurement will be ignored on the way back down to the READY TO WEIGH state. The message "IGNORING LOAD" will appear momentarily to let the operator know that the measurement was thrown away.

ARM DIRECTION = + – The measured Arm Angle must increase when raising the Bucket Loader Arms. After installation, look at the Arm Angle when raising the Arms and verify that the angle increases when raising the Arms and decreases when lower the Arms. If not you can change the sign of this parameter to correct the problem. Use the Program keys until you see "ARM DIRECTION = -" then hit the SET Key. You must come out of the Troubleshooting mode for this change to take effect.

ARMS xx.x DEG – This is the current Arm angle measured. On initial power on the Arm Angle is loaded with 2500.0 Degrees. You will notice on the Arm Weigh In Motion Box an arrow labeled INDEX direction. When this arrow points to the ground

SETUP and CALIBRATION OPERATING MODE

TROUBLESHOOTING (cont)

the Arm Angle is Set to 0.0 Degree (plus the Angle Zero Offset). The meter will show CYCLE ARMS until this happens. Once the Arm Index Angle is achieved the Arm Angle measurement is correct. Before this happens it is not.

ARMS ZERO xxx – This is the zero offset calibration constant that is automatically set when you perform the “SET WEIGH START” function in the SET ZERO Setup Category.

TROUBLE CAL – This mode lets you manually make fine tuning adjustments to the Calibration previously learned thru Learn Zero and Span.

- ◇ **ZEROCALi** - After the Learn Zero Calibration or also after the “ZERO BUCKET” in the Program Function Display, *LoadMan*® does a weight measurement at Idle Speed. The reading at Idle Speed is stored as an offset in this parameter. Every weigh cycle at Idle speed will be corrected by the number in this location. If after calibration you find that the zero is +10 counts high at Idle speed, then you can go into this mode and program the ZeroUpCal setting to 10 counts smaller and this will bring the zero measurement back to zero.
- ◇ **ZEROCALf** - The only difference between this parameter and the ZEROCALi described above, is this one is determined at Full Speed instead of Idle Speed. Likewise, if you are reading off zero a little at Full Speed, you can adjust this offset to correct the Full Speed Zero Reading.
- ◇ **SPANCALi** - After the Learn Span Calibration, *LoadMan*® does a weight measurement at Idle Speed with the Loaded Bucket. The reading at Idle Speed is stored as a Span Calibration Setting at Idle Speed in this parameter. If you increase this setting by 10% then each Bucket Load Measurement taken at Idle Speed will increase 10%. Likewise decreasing it 10% will decrease each Bucket Load by 10% at Idle Speed.
- ◇ **SPANCALf** - The only difference between this parameter and the SPANCALi described above, is this one is determined at Full Speed instead of Idle Speed. Likewise, if you are reading Lo 10% at Full Speed, you can increase this number by 10% and cause each Bucket Load Measurement taken at Full Speed to increase 10%.

SETUP and CALIBRATION OPERATING MODE

TROUBLESHOOTING (cont)

- ◇ **VELZeroI** - This is the average speed used when teaching *LoadMan*® Zero at Idle Speed during the LEARN ZERO Operation. Normally you would not make any adjustments to this parameter unless directed by the factory.
- ◇ **VELZeroF** - This is the average speed used when teaching *LoadMan*® Zero at Full Speed during the LEARN ZERO Operation. Normally you would not make any adjustments to this parameter unless directed by the factory.
- ◇ **VELSpan I** - This is the average speed used when teaching *LoadMan*® the Hydraulic Pressure response at Idle Speed during the LEARN SPAN Operation. Normally you would not make any adjustments to this parameter unless directed by the factory.
- ◇ **VELSpan F** - This is the average speed used when teaching *LoadMan*® the Hydraulic Pressure response at Full Speed during the LEARN SPAN Operation. Normally you would not make any adjustments to this parameter unless directed by the factory.
- ◇ **VELlast** - This is the average speed when passing thru the weighing window during the last weighing cycle. *LoadMan*® uses this measurement to interpolate between Idle and Full Speed to determine an accurate weight reading regardless of the speed used by the operator.
- ◇ **LOADIlast** - This is the Load Measured during the last weighing cycle using the Zero and Span Curves learned at Idle Speed. *LoadMan*® uses this information to interpolate between Idle and Full Speed to determine an accurate weight reading regardless of the speed used by the operator.
- ◇ **LOADFlast** - This is the Load Measured during the last weighing cycle using the Zero and Span Curves learned at Full Speed. *LoadMan*® uses this information to interpolate between Idle and Full Speed to determine an accurate weight reading regardless of the speed used by the operator.

SETUP and CALIBRATION OPERATING MODE

TROUBLESHOOTING (cont)

- ◇ **LOADFlast** - This is the final Load Measured during the last weighing cycle using the Zero and Span Curves learned at Idle and Full Speed. It will always fall somewhere between “LOADILast” and “LOADFlast” described above.
- **SETTING DEFAULTS** - Activating this Setup Command will cause *LoadMan*® to set all its Calibration and Setup values to the defaults settings outlined below. Only use this if you want to go back to the Factory Default Settings. There are 2 options available. You can either set all Factory Defaults (“FACTORY DEFAULT”), or alternately the Product Default Names only (“PRODUCT DEFAULT?”). Once you enter this Setup Category *LoadMan*® responds with “THIS WILL RESET” then “ALL SETTINGS TO” then “FACTORY DEFAULTS” then “PROCEED->NO”. You must use the Program Group of Keys to change the “NO” to a “YES” then press the “SET” Key to proceed. The Product Names are set to “PRODUCT ID #xx” , where “xx” is 01 thru 15. The Product Names can also be created and downloaded on any PC running *LoadMan*®_s Fleet Management Software.
- **SAVING CAL DATA-** *LoadMan*® keeps a permanent record of all the program settings used in the Install Setup Category. When you make a change to the settings in the Install Mode, then use the Program Keys to change the No to a Yes then press the SET Key. This will cause *LoadMan*® to permanently keep a copy of all settings that will be restored on power on.
- **EXIT SETUP** - Activating this Setup Command will cause *LoadMan*® to exit the SETUP and CALIBRATION OPERATING Mode and return you to the Normal Operating Mode.

CALIBRATION PROCEDURE

- 1. VERIFY INSTALLATION** - Install the system and wire per the Wiring Diagram at the rear of this manual. Verify you have the HI-SIDE Pressure Transducer plumbed into the HI-SIDE Hydraulic Pressure Line and the LO-SIDE Pressure Transducer plumbed into the LO-SIDE Hydraulic Pressure Line. Make sure the cable marked HI-SIDE HYDRAULIC PRESSURE is connected to the HI-SIDE Pressure Transducer and likewise LO-SIDE HYDRAULIC PRESSURE cable is connected to the LO-SIDE Pressure Transducer.

IMPORTANT—Input Voltage must be 10-15VDC. Unit will be destroyed if connected to a voltage greater than 17VDC.

- 2. TURN POWER ON** - When you first depress the Power Switch you should see “LOADMAN” then “PROGRAM VERSION x.x” then “CYCLE ARMS! ”. If the display does not end up on “CYCLE ARMS! ” display, then you are not communicating with the Arm Weigh In Motion Assembly. Stop here and check all wiring again. You must see CYCLE ARMS Display before you proceed to the next step!

3. VERIFY ARM ANGLE SENSOR IS RESPONDING CORRECTLY -

Normally you depress the Power Key and *LoadMan*[®] displays GOODBYE then removes the power. Holding the Power Key down continually while the display is showing GOODBYE, causes *LoadMan*[®] to display “LOADMAN SETUP!”. Immediately release the Power Key when you see the LOADMAN SETUP! Display. Within 1 second the display should show “SET ZERO? ->NO”. You are now in the Setup and Calibration Mode. Use the Select Key to select the “TROUBLESHOOT->NO” Display. Use the ← PROGRAM Key and the Display shows “TROUBLE PRESSURE?”. Hit the same Key again and the Display shows “TROUBLE POSITION”. Press the SET Key to enter the TROUBLE POSITION Setup Category. *LoadMan*[®] then displays the “WGH START” Setpoint which should be 0.0 degrees. Press the ↑ SELECT Key till *LoadMan*[®] displays the “WGH END” Setpoint. This is the Arm Angle where the Weighing Window ends. Press the ↑ SELECT Key till *LoadMan*[®] displays the “WGH DUMP” Setpoint. This is the Arm Angle where lifting the Arms past this angle will arm the automatic Accumulator function when coming back down thru the weighing window. If you don't raise the Arms to at least this programmable angle, then the load will be ignored on the way back down thru the weighing

CALIBRATION PROCEDURE (cont)

window. Press the \uparrow SELECT Key till *LoadMan*[®] displays the "ARM DIRECTION". This programmable item lets you account for whether the Arm Weigh in Motion Box is rotating Clockwise or Counter Clockwise. Press the \uparrow SELECT Key till *LoadMan*[®] displays the current Arm Angle. On initial power up *LoadMan*[®]'s Arm Angle Sensor is undefined. The Angle Sensor must pass thru what is called an Index Point where the Angle Sensor inside the Weigh In Motion Box points directly to the Ground. Every time the Angle Sensor passes thru this index point it is set to zero degrees and thereafter the angle is measured to a tenth of a degree. On power up *LoadMan*[®] sets the Arm Angle measurement to 2500.0 degrees. *LoadMan*[®] displays the message CYCLE ARMS in the normal weigh mode whenever the angle sensor reads more than 500 degrees. Therefore if you enter the Trouble Position setup without moving the arms right after power on, you should see the reading of 2500.0 degrees or there about. Raise the Arms thru a complete cycle and somewhere in this movement you should see the 2500.0 degrees take a sharp dip to somewhere within 100.0 degrees of zero. If this does not happen then you must reinstall the Weigh In Motion box by rotating it 180 degrees so that somewhere in the Arm movement the Weigh In Motion Box passes thru its index Position. Once you verify the Arm Angle is registering within 100.0 degrees of zero, view the Arm Angle again to insure that the Arm Angle gets larger when you raise the Arms and smaller when you lower the Arms. If it does not then you must use the \downarrow SELECT Key to select the ARM DIRECTION display and reprogram the Direction sign to the opposite sign. If you reprogram the ARM DIRECTION Sign, you must use the \uparrow SELECT Key to exit the Trouble Position Setup Category which causes the changes made to be reprogrammed into the Arm Angle Sensor. Go back into the TROUBLE POSITION Setup category and verify the Arm Angle increases when you raise the Arms and likewise decrease when you lower the them. Once this has been verified then proceed to the next Step.

CALIBRATION PROCEDURE (cont)

4. VERIFY PRESSURE SENSORS ARE RESPONDING CORRECTLY -Go into the Troubleshooting mode and program the TROUBLE PRESSURE option then hit the SET Key. The display will show you "HI SPAN 20000 ". Press the Up Select Key so you can read the HISIDE Pressure Transducer Reading. Raise the Arms from the Ground and make sure the HISIDE Pressure reading goes up at least 2000 LB. The pressure reading should increase as you raise the Arms and decrease as you lower the arms. The main thing is that it should increase substantially with the load in the Bucket. Use the ↑ SELECT Key to inspect the LOSIDE Pressure Reading. This pressure reading should vary just a few 100 counts as you move the Arms up and down. The LO-SIDE Pressure reading should increase dramatically if you hit the stops of the Arm movement and continue to move the arms against the stops. If this is the case then you are getting the HISIDE and LOSIDE Pressure readings correctly and you can proceed to the next step.

5. SET THE START OF THE WEIGHING WINDOW - Use the ↑ SELECT Key till you find the "SET ZERO->NO" Display. Use the ← PROGRAM Key till the Display shows "SET WEIGH START?" then press the SET Key. The display then shows some sequential displays which give the message "THIS DESTROYS EXISTING CAL! IF YOU PROCEED YOU MUST REDO LEARN ZERO/SPAN! PROCEED?->NO". Once you do this step the existing calibration data is invalidated since it will be done at a different start angle. Before proceeding, position the Arms to the desired start of the Weighing Window. Under normal conditions the Arm Position should be approximately 4-6 feet off the ground at this point. Once the Arms are in this position use the ← PROGRAM Key till the display shows "PROCEED? ->YES" then press the SET key. *LoadMan*[®] displays "SETTING WGH START!" while it is reprogramming the Start of the Weigh In Motion Window.

6. VERIFY WEIGH IN MOTION RESPONSE — Once the above has been completed exit the Setup Mode and move the Arms thru the Weighing Window. You should see "WEIGHING LOAD" then a "NET xxx LB" Reading as you lift the Bucket up and thru the weighing window. It is not important at this point what the NET reading shows, but rather the fact that it shows a NET Reading. Shortly after that the display should show DUMP LOAD expecting you to dump the Bucket Load and return the Empty Bucket back thru the Weighing Window. When you do this the display should show WEIGHING TARE, then "TOTAL xxx LB" Accumulator is displayed. Shortly after that the Meter should show "READY TO WEIGH". If this is the case, then the unit is ready to start calibrating.

CALIBRATION PROCEDURE (cont)

7. SET INSTALL SETUP DATA - Go back into the Setup and Calibration mode and use the the \uparrow or \downarrow SELECT Keys to select the Display INSTALL—>NO Display. Depress the \uparrow or \leftarrow Program Keys and the Display will change to INSTALL—>YES. Depress the SET Key and you will enter the INSTALL Setup Category. Use the \uparrow or \downarrow SELECT Keys to go forward or backwards through the Install Display Setup Options. If necessary use the Program Group of Keys to change an Install Setting to fit your application. Make sure you hit the SET Program Key to enter the change. Refer to the INSTALL Section for a description of each setting. After setting Units, CountBy and the like exit the INSTALL setup category and select “SAVE CALDATA—>NO” display. Change the NO to a YES then press the SET key to permanently remember the program changes made.

8. PERFORM LEARN ZERO CALIBRATION - This step teaches *LoadMan*® the Hydraulic Pressure Response as a curled bucket traverses thru the Weighing Window. When you do this step or whenever you use the scale remember that the Bucket must be in the full curled back position. Otherwise your accuracy will be degraded. With the Meter showing “READY TO WEIGH”, enter the Setup and Calibration Mode (make sure you do not remove the power accidentally else you must recycle the Arms to get the READY TO WEIGH message). With the display showing “SET ZERO—>NO”, use the Program Keys till you see the display “LEARN ZERO?” then press the SET Key. *LoadMan*® responds with “EMPTY BUCKT LOAD then instructs you to Lower the Arms to a few degrees less than the Start of the Weighing Window. Follow the instructions and *LoadMan*® responds with “RAISE ARMS” and then flashes “AT IDLE SPEED”. Follow the instructions and raise the Arms at Idle smoothly thru the weighing window. When you pass the start of the weighing window *LoadMan*® will display “ZEROING BUCKET!”. *LoadMan*® zeroes the Pressure Reading at the start of the Weighing Window. Eventually *LoadMan*® responds with an instruction to Lower the Arms below the Weighing Window. Once there *LoadMan*® continues to display “RAISE ARMS!” then flash at “AT IDLE SPEED”. Just follow the instructions in a smooth movement at idle speed thru the weighing window. The instructions will ask you to raise and lower the empty bucket 10 complete cycles at Idle Speed while it learns the hydraulic pressure response to an empty bucket at this slow speed. At this point the flashing message will change to “AT FULL SPEED”. Continue to follow the instructions until 10 complete Lift Cycles are completed at Full Speed. After this is complete, *LoadMan*® responds with “ZERO COMPLETE” then “EXIT SETUP—>NO”. Exit the Setup and Calibration mode and verify an Empty Bucket reads Zero weight when passed thru the Weighing window. MAKE SURE THE BUCKET IS ALWAYS IN THE FULLY CURLED POSITION when using or calibrating the Scale.

CALIBRATION PROCEDURE (cont)

9. PERFORM LEARN SPAN - *LoadMan*® must previously measured a Zero Load Reading when an empty, fully curled Bucket, passes thru the Weighing Window else this step will not operate properly. Make sure this was the case before you attempt this step. For best results calibrate the system with the maximum load capacity of the Wheel Loader. Make sure you get the Bucket loaded so that you don't spill any of the load out as you raise and lower the load thru the Weigh In Motion Window as required to teach the system the Hydraulic Pressure response under load. It is desirable to know the exact load in the Bucket so *LoadMan*® can calibrate to the known load (however this is not required since you can estimate the bucket load and come back later to make a Span Adjustment). Take the Loader to an accurate scale and weigh it empty then weigh it with the maximum Bucket Load so you can determine the exact weight in the Bucket. Enter this weight into *LoadMan*® during this process so it knows what weight it is picking up to learn. You do not absolutely have to know the exact weight in the Bucket because you can later load a Truck (or several Trucks) and make adjustments to the calibration by entering what the Truck actually weighed and what *LoadMan*® measured the Truck load to be. This is explained further in the SPAN TRUCK LOAD step. Once ready, go back into the Setup and Calibration Mode as described earlier and select the SET SPAN->NO Setup Category. Use the ← PROGRAM Key till the display shows "LEARN SPAN?" then press the SET Key to enter the SPAN Calibration Mode. *LoadMan*® responds with "ENTER NET LOAD" then "NET xxxx LB". Use the Program Keys to enter the weight of the Bucket contents. When correct press the SET key to enter the weight (load should at least be 75% of the Wheel Loader's capacity). At this point the correct weight should be displayed with no flashing box. Press the ↑ SELECT Key and the display will show "DO AUTOCAL->NO". Change the NO to a YES with the Program Keys and press the SET Key. *LoadMan*® instructs you to Lower the Arms to at least 5 degrees below the start of the Weighing Window.. Eventually the display will change to "RAISE ARMS!" then flash "AT IDLE SPEED". Follow the instructions and Raise the Arms smoothly at Idle Speed. *LoadMan*® responds with "LEARNING SPAN" then "RAISE ARMS ONLY" then "LOWER ARMS". Follow the display instructions and *LoadMan*® responds with "LEARNING SPAN" then "LOWER ARMS" then "RAISE ARMS ONLY". All the while you will see "AT IDLE SPEED" being flashed on the Display. Follow the instructions at Idle Speed for 10 complete Lift Cycles and the display will eventually change the flashing display to "AT FULL SPEED". Change to Full Throttle and continue the instructions for 10 more complete Lift Cycles. When process is complete you will see the display say SPAN COMPLETE. Exit the Setup & Calibration Mode and verify the load measures at the same weight (or close to it) you entered earlier. If so then you are ready to go to the next step.

CALIBRATION PROCEDURE (cont)

9. ZERO FINE TUNE ADJUST (optional) - Once you have successfully done the LEARN ZERO and LEARN SPAN but find that when weighing an empty bucket you are consistently off zero a little, then you can go to the TroubleShooting mode and using the Program Group of keys find the "TROUBLE CAL" option and depress the SET Key. You will see a "ZEROCALi" and right after that a "ZEROCALf" calibration constant. These constants are automatically set after you do the LEARN ZERO or alternately perform the "ZERO BUCKET" command in the PROGRAM FUNCTION Display of the Normal Operating Mode. The ZEROCALi is the Zero Offset Number learned at IDLE Speed and the ZEROCALf is the Zero Offset Number learned at FULL Speed. If you reprogram this the Idle constant to +25 more than it is currently then the measured empty bucket load at idle speed will increase 25 LB. Likewise if you program a -25 setting you will decrease each empty bucket load measurement at Idle Speed by 25 LB. Likewise the "ZEROCAL" is the zero offset at Full Speed. Use these fine tune adjust to make small adjustments to each measured load reading.

NOTE: These parameters are automatically set by *LoadMan*[®] during any Zero Calibration and are normally not required to be reprogrammed. These numbers are provided here so the operator can have ultimate full control over the calibration.

11. SPAN TRUCK LOAD or FINE TUNE SPAN ADJUST - Once you have successfully done the LEARN ZERO, LEARN SPAN and the ZERO FINE TUNE ADJUST (if required at all), but find that the weighing accuracy is off a little under load, then you can use this step to make a small fine tuning span adjustment. Usually this is done by weighing several Truck Loads and comparing the Truck Loads with an accurate platform scale. Once you know what the actual scale reading was and also what the corresponding *LoadMan*[®] reading was for that load (or loads), then enter the Setup and Calibration Mode as described earlier. Select the SET SPAN->NO Setup Category and use the Program Keys a couple of times till you see the display "*** SPAN TRUCK? *" then hit the SET Key. *LoadMan*[®] responds with ENTER METER LOAD then METER 0 LB. Use the Program key to program what the *LoadMan*[®] Meter Reading showed for the Load in question. Depress the SET Key when entered correctly then press the ⬆ SELECT Key and *LoadMan*[®] responds with TRUCK 0 LB. Enter the corresponding weight that the scale you calibrating to read using the Program Keys. Depress the SET Key when correctly entered. Press the ⬆ SELECT Key and *LoadMan*[®] responds with DO AUTOCAL->NO. Change the NO to a YES with the Program Keys and hit SET.

CALIBRATION PROCEDURE (cont)

LoadMan[®] responds with DOING SPAN ADJUST then EXIT SETUP->NO. Exit the Setup Mode with the Program Keys and you should notice that the Load Readings go Up or Down by the same percentage that you entered the METER and TRUCK readings earlier. All this procedure does is change the number you entered in the LEARN SPAN CALIBRATION described earlier by multiplying it by the ratio of (TRUCK / METER) that you entered in this step.

11. SPAN FINE TUNE ADJUST - Once you have successfully done the previous steps but find that when weighing an loaded bucket you are consistently reading High or Lo be a constant percentage, then you can go to the TroubleShooting mode and using the Program Group of keys find the "TROUBLE CAL" option and depress the SET Key. You will see a "SPANCALi" and right after that a "SPANCALf" calibration constant. These constants are automatically set after you do the LEARN SPAN or alternately perform the "SPAN TRUCK LOAD" command in the "SET SPAN—>NO" Display in the Setup & Calibration Operating Mode. The SPANCALi is the Span Number learned at IDLE Speed and the SPANCALf is the Span Number learned at FULL Speed. If you increase the SPANCALi number by 1%, then each bucket load at Idle Speed will weigh 1% more. Likewise, if you increase the SPANCALf number by 1%, then each bucket load at Full Speed will weigh 1% more.

NOTE: These parameters are automatically set by *LoadMan*[®] during any Span Calibration and are normally not required to be reprogrammed. These numbers are provided here so the operator can have ultimate full control over the calibration.

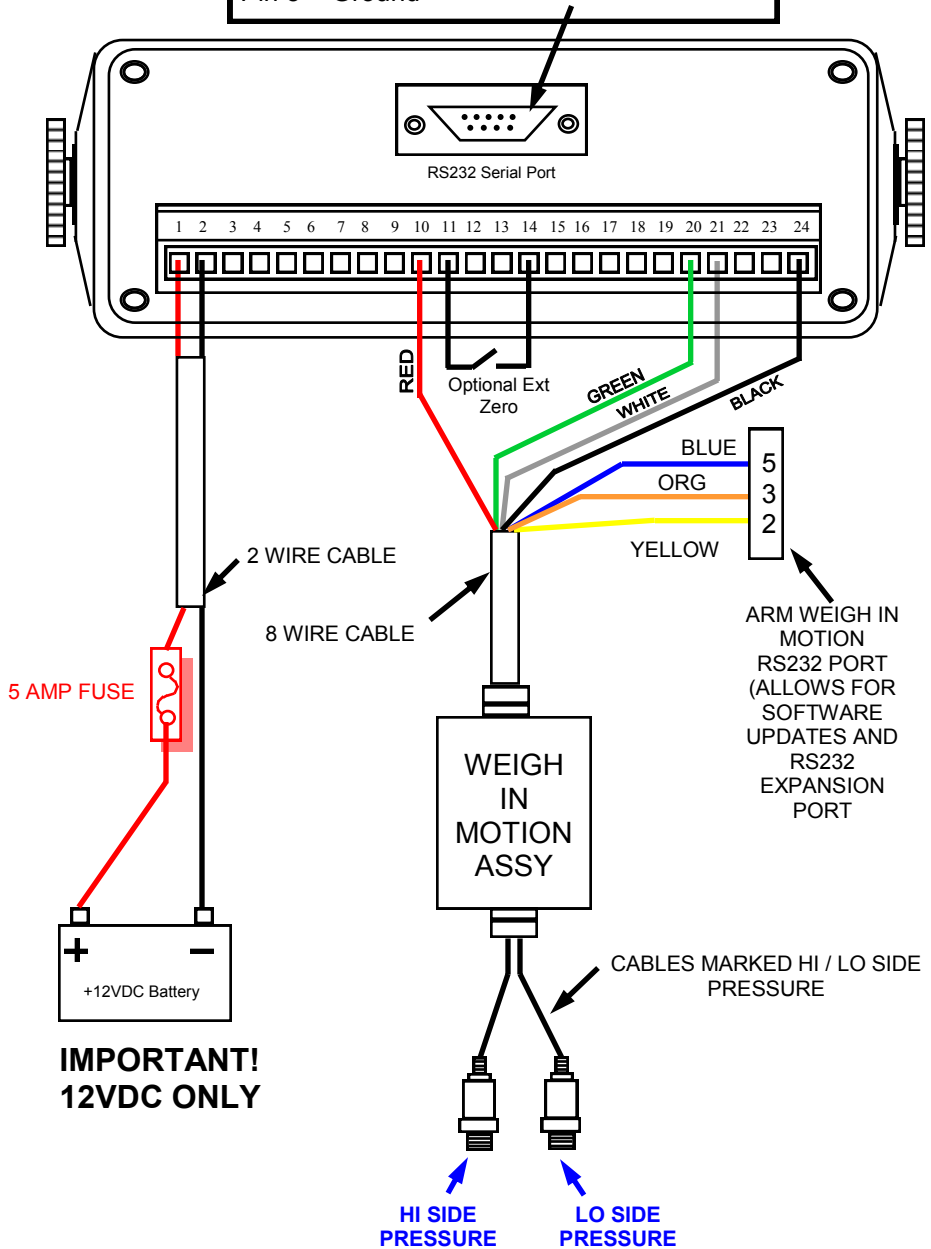
Installing LoadMan on the Bucket Loader

Refer to the Wiring Diagram on the next page. Mount the Meter inside the Cab protected from the environment as much as possible. Wire 12VDC Battery Power to Pins 1 and 2 on the rear Terminal Block of the Meter. Pin1 is +12VDC and Pin 2 is Ground. Plumb one Hydraulic Pressure Transducer into the Hi Side Hydraulic Pressure Line of the Truck as near as possible to the Lift Cylinder. Plumb the other Hydraulic Pressure Transducer into the LO Side Hydraulic Pressure Line (the line where the Hydraulic Fluid returns to the tank). Screw the Cable with the connector end marked HISIDE HYDRAULIC PRESSURE to the HISIDE Pressure Transducer and connect the connector end marked LOSIDE HYDRAULIC PRESSURE to the LOSIDE Pressure Transducer. Connect the 7 Pin Connector to the Weigh in Motion Assembly and run the 7 wire cable up to the Meter. Connect the Red Wire to Pin 10, the Green Wire to Pin 20, the White Wire goes to pin 21, and the Black Wire to pin 24 to the back of the *LoadMan*® Meter as shown on the next page. The RS232 Connector coming out near the Meter is left open. It is intended to download Computer Update Programs to the Weigh IN Motion Assembly or alternately as an RS232 expansion port. FOR HIGHEST ACCURACY PLUMB THE HYDRAULIC PRESSURE TRANSDUCERS AS CLOSE TO ONE OF THE HYDRAULIC CYLINDERS AS POSSIBLE.

INSTALLING THE WEIGH IN MOTION ASSEMBLY: Mount the Weigh in Motion Assembly near the Pivot Point of the Arms that lift the Bucket. It is preferred to mount this assembly fairly close to where the arms pivot so it will be protected from damage as much as possible. This box detects the Angular Position, Velocity, and acceleration of the Bucket which is attached to the Arms. Note that this box is marked on the back side with an INDEX Direction and a Positive Rotation Direction. Mount the Box so that the Index Direction points vertically downward toward the ground at some point in the Arm Movement. Also when the Bucket is being raised, it is desirable for the box to rotate in the same direction as the Positive Rotation Direction marked on the Rear of the Box (although if this is not the case it can be corrected in the software).

WIRING DIAGRAM

Pin 2 = Serial Data Output from *LoadMan*®
Pin 3 = Serial Data Input to *LoadMan*®
Pin 5 = Ground



IMPORTANT!
12VDC ONLY