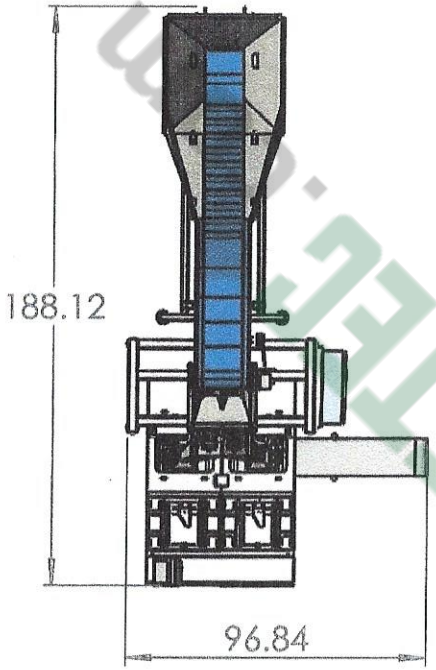
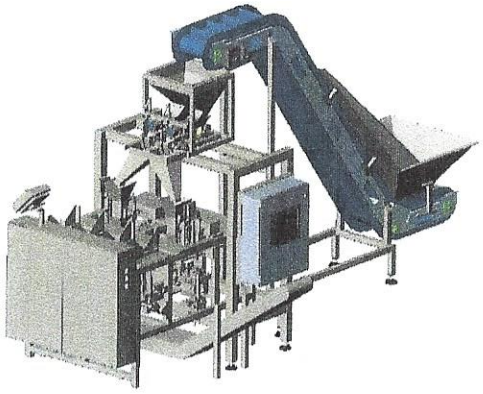
ActionPac
SCALES & AUTOMATION

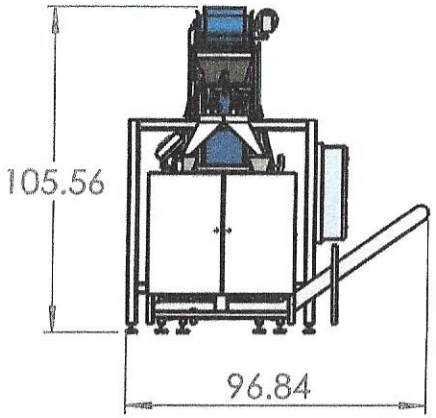
ME109 SERIES MANUAL

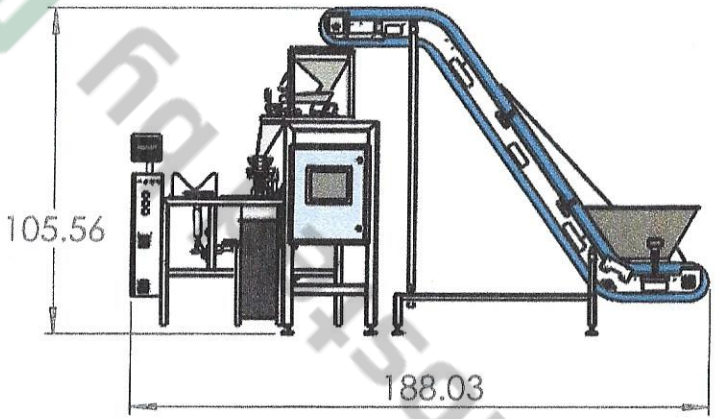
Hosted by COFFEE TEC®.com

REVOLUTIONARY PRECISION AND ECONOMY IN AUTOMATED WEIGH FILLING









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ActionPac SCALES & AUTOMATION

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3/18/2016

Using This Manual

All Actionpac systems are designed to be simple and are custom engineered with your application in mind. This User Manual is intended as a guide, you may find that certain illustrations, diagrams and/or descriptions vary from the equipment with which you have been supplied. But the concepts and operating systems discussed are universal with differences being primarily configurational.

The images and illustrations found in this manual represent features and equipment available on some, but not all, **ME109** model systems. Your particular **ME109** may not have some of these features or you may find some descriptions and directions unapplicable.

We encourage you to contact our Technical Support Team at **(805) 487-0403** with any questions.

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Warranty

All Actionpac systems are covered by a limited parts & labor warranty. Transfer or sale of equipment voids warranty.

All parts (except load cells) are covered from manufacturer defect for a term of one year that shall begin on the original retail ship date from Actionpac's Oxnard facility. Damage as a result of improper use of equipment or operator error is not covered.

Service by an unauthorized Service Technician or after manufacture modifications made by customer or customer's agent(s) may void warranty.

Shop labor shall be covered from manufacturer defect for 90 days from the original retail ship date from Actionpac's Oxnard facility. Travel and onsite labor is not covered.

Courtesy phone support is available for all new, direct equipment sales. All phone or remote support offered solely at the discretion of the Actionpac Technical Support Team. Availability and scheduling is first come, first serve.

Actionpac does not offer courtesy phone support or remote assitance for used equipment. Technical support and assistance for used equipment is subject to pre-pay terms and subject to availability.

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The **ME109** is a linear style, net-weigh scale designed to automatically weigh dry, free flowing, uniform particulates into bags, jars or similar containers supplied either manually or automatically.

The weight range handled by the **ME109** is generally 1 oz to 5 lbs. Your **ME109** will be supplied with a weigh bucket appropriate to the application specifications as defined by you.

The **ME109** is modularly designed for convient upgrades and future expansion with "Quick Disconnect" bucket and funnel mounting systems engineered for maximum system utility.

Actionpac utilizes its sophisticated, proprietary controls, custom built at our Oxnard, CA. factory, in every system shipped. The most important element of every automated packaging system are the controls, allowing us to offer our customers economical replacement components such as load cells, the hard work being done by the system's microprocessor. It is, in short, a computer with robotic capabilities.

The **ME109** is user friendly, designed for decades of use and built to withstand the most demanding environments. All elements are thoughtfully incorporated to complement every customer's budget and the scope of their application. Actionpac never offers "value add"components, instead choosing only those that are right for the job.

Your **ME109** is the culmination of over 35 years of practical experience in the scale and packaging industries and will revolutionize the way you package. There is virtually no limit to how useful a tool the **ME109** will be. Many of our first systems are still in operation - After more than 3 decades!

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Your **ME109** requires both electrical and pneumatic supplies.

Electrical

115 V AC
60 Hz
3 Amps (5 MAX)

Ensure the grounded circuit supplying power is isolated and dedicated.

We recommed you verify the quality of your facility's power supply by checking it with a voltmeter prior to plugging in your ME109 for the first time in order to avoid damage to the electronics.

Pneumatic

1/2" Air Drop @ 60 PSI
1-2 CFM
1/4" NPT, Female Scale Input

You will need to supply all pneumatic adapters and connectors appropriate for your facility's pneumatic supply.

Maintaining a clean air supply free of water and debris will extend the life of your ME109's pneumatics.

*You should refer to the manual supplied with **your** Air Compressor and follow all manufactuerer 's instructions.*

Always follow standard safety procedure and industry regulations with which you must comply as dictated by both local and federal mandates.

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2.1 | ME109 Scale Assembly

This section illustrates all major components and common configurations. Please refer to this section and relavent component names when discussing your system with Actionpac technicians to maintain clarity of discussion and avoid unneccesary confusion.

2.1.A

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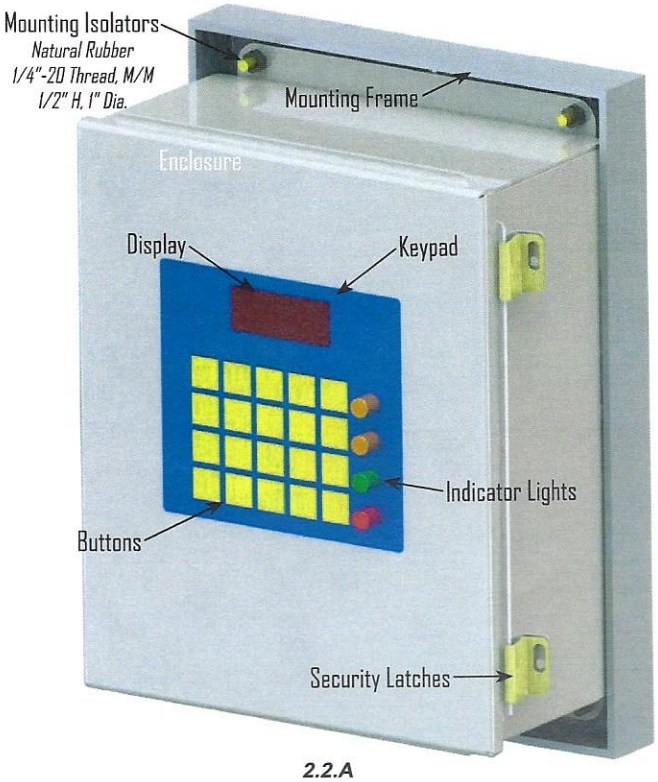
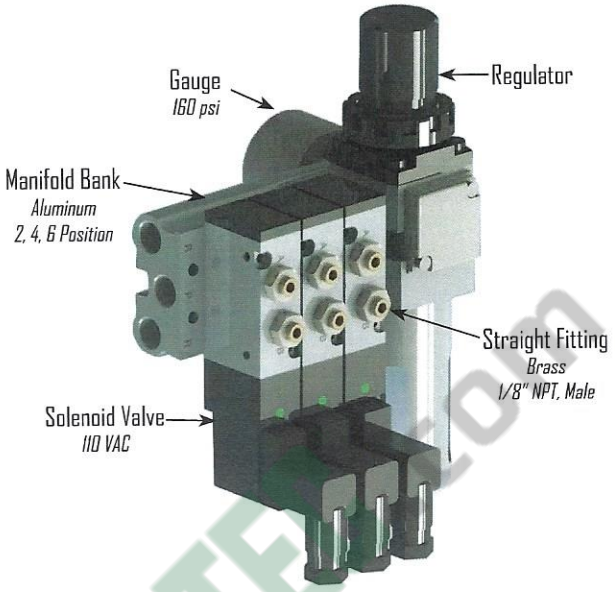
Standard Controller



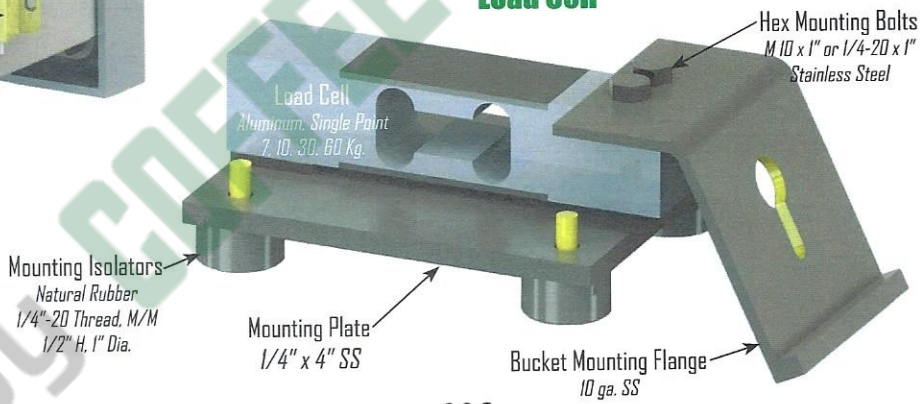
2.2.A

Pneumatic Manifold



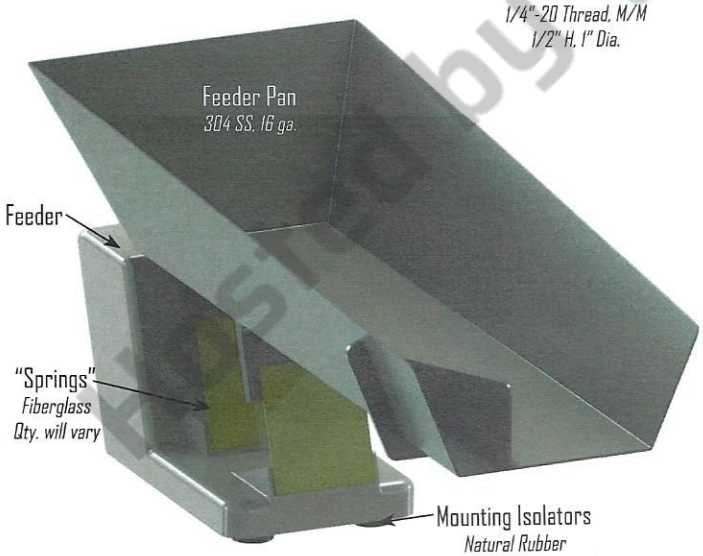
2.2.B

Load Cell



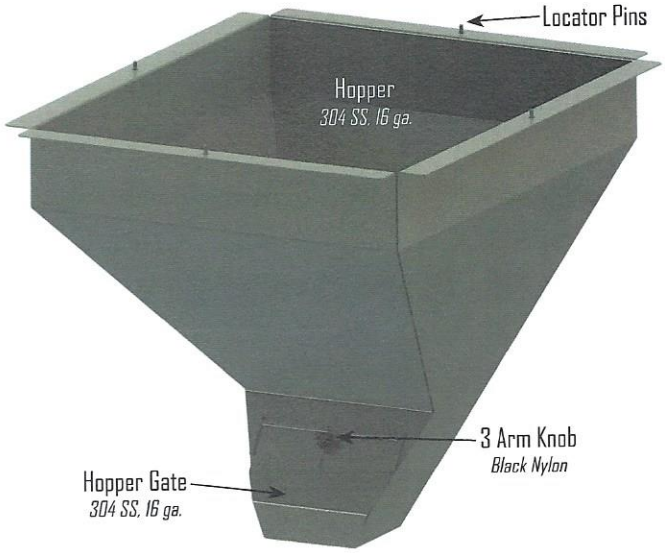
2.2.C

Feeder Pan



2.2.D

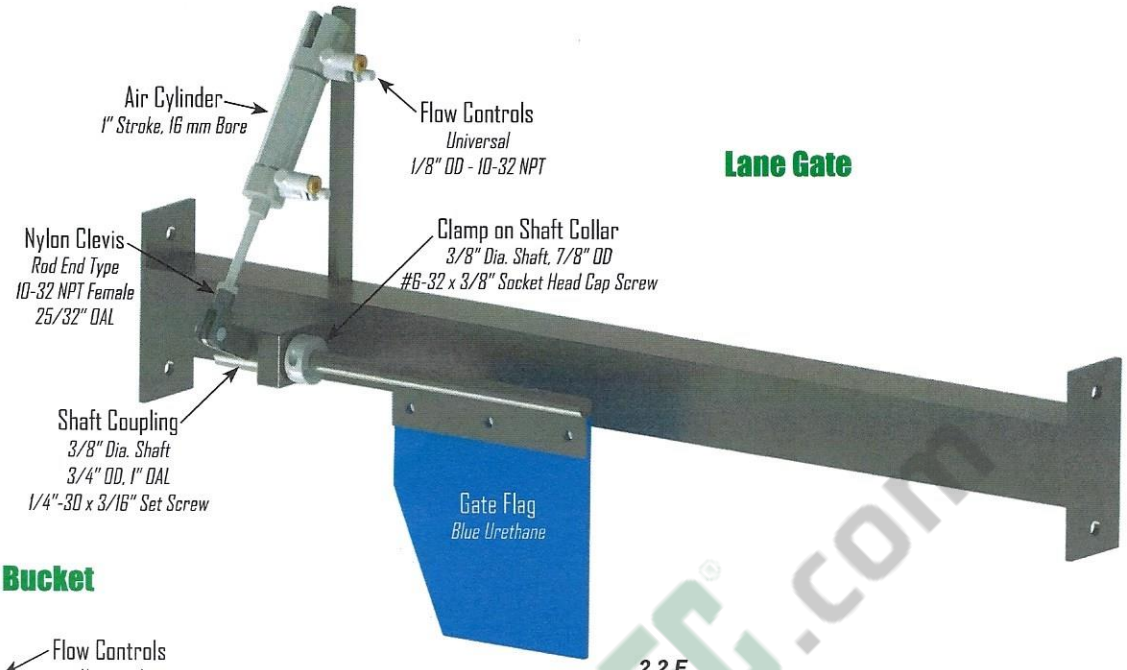
Hopper



2.2.E

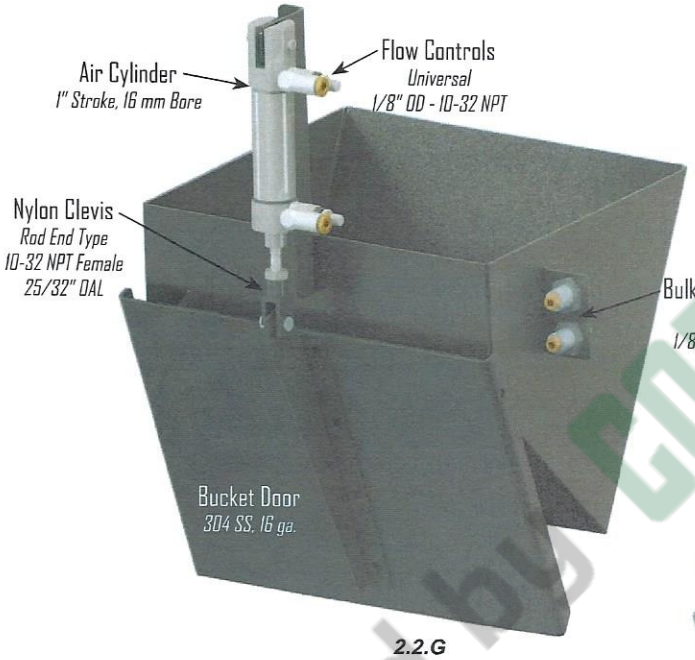
FastenerSolutions.com

Lane Gate



2.2.F

Weigh Bucket

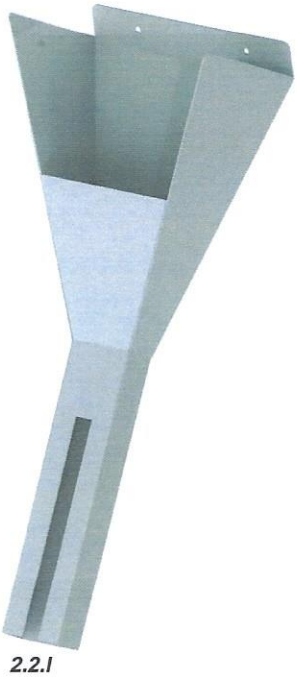


2.2.G

Stand Up Pouch Former

2.2.J

Side Gusset Former



2.2.I

Open Utility Funnel

2.2.H

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3.1 | Location

In the last section we reviewed the standard components and sub-assemblies found on most **ME109** series equipment. Please reference those illustrations when assembling your system. This is merely a guideline and we encourage you to contact us at any point during this initial set-up phase for assistance, we are happy to walk you through this process.

You should scout out an appropriate location for your system. While we can't tell you how to organize your facility or where to place your system there are several factors you should consider when evaluating potential locations:

Your location should meet the following criteria |

Power

Your location should be supplied with the appropriate power for your equipment, see *Sec. # 1.3*. For best results plug directly into a grounded, isolated and dedicated circuit. A proper third wire ground is essential. Most dry products generate large amounts of static; if this cannot be dissipated it may interfere with your controls and/or do serious damage to the electronics. We recommend you check your power output with a voltmeter.

Tip If a dedicated circuit is not available you may want to consider a 500-600 watt Ferro Resonant Line Conditioner.

Air

Ensure your location is equipped compressed air, see *Sec. # 1.3*. The actual air pressure required to operate a semi-automated **ME109** series system is negligible, almost any size will be sufficient. The "size" of the compressor is capacitive, how much air can be stored in the tank, and not indicative of its ability to supply air.

Note Horsepower, CFM and other ratings are unimportant for semi-automated systems. For such systems we recommend making your selection based on how large the storage tank is (at least 5 gallons).

Floor

Choose a location where the floor is relatively flat and stable. Your stand, have your purchased one, will come with levelers to correct for minor level issues.

Things to Consider |

Space

Your location should have enough space to accommodate the system and adequate space for the operator to comfortably work. Check that there is sufficient clearance from scale input to ceiling in order to load the Hopper. Consider the means by which you intend to load bulk product. Is there enough clearance?

Supply

Consider the proximity of your packaging area to your bulk product supply as well as the logistics of supplying product day to day. You now have the ability to process a great deal more product an hour than you had been prior to introducing automation. In many cases 8-15 times more per minute, you will therefore need a requisite amount of bulk product. Depending on your hopper capacity and the weights you are running you could be filling your hopper multiple times an hour.

Tip Various Elevator systems are available as options. If you are interested in automating your means of supply contact you Actionpac Sales Associate.

Note Standard **ME109** series equipment has a hopper capacity of 2.4 cu. ft.

Internet

For touchscreen equipped systems take advantage of our remote assistance capabilities by supplying a broadband internet connection. An ethernet cable can be inserted directly into the ethernet port inside the controller on the rear of the door mounted touchscreen.

Tip If your facility has a wireless internet connection there is an USB port located at the front of the screen where you can insert your own wireless internet device.

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Things to Avoid

Fans Avoid areas prone to disturbed or rotating air such as in front of open doors. Point any wind generating equipment, like a fan, AWAY from the scale as this disturbs the weighing process.

Inductive Loads All heat generating or inductive equipment should be powered seperately from the scale circuit this includes: Heaters, Sealers, Microwaves, Refrigerators, etc. To minimize inductive loads refrain from sharing your scale's circuit this will protect system electronics from damage as well as ensure optimal performance and functionality.

Tip Isolating your scale's circuit, maintaining appropriate power and supplying clean power will help minimize the rate at which electronic components such as boards and load cells will need replacement.

Vibration Avoid areas prone to vibration and other such environmental disturbances.

Basically, the more controlled the environment is at your intended location the better your equipment will perform and the easier it will be for you to work in.

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3.2 | Set-up & Assembly

You will need the following tools. We recommend you gather them before begining set-up and assembly. We also encourage you to recruit some help, it will make the process easier, not to mention faster.

- Hand Tools *(e.g. screw drivers, wrenches)*
- Electric Drill w/Drill Bits
- Spirit Level
- Voltmeter

---

1. Remove all exterior crating materials, mind construction hardware such as staples, nails, etc., reserve for future transit.
2. Carefully remove Controller strapping with a knife or similar tool.

   Gently place Controller aside, leaving it wrapped for later in assembly.

   ⚠ Bear in mind controller is leashed to Frame.
3. Remove the screws securing the stand and frame to bottom pallet skid, use an electric drill to expedite this process.

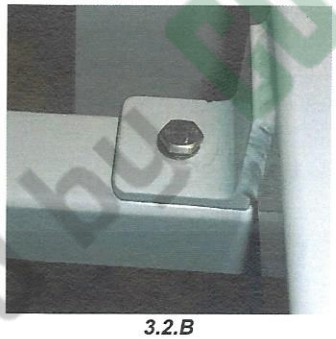
   Lift the Stand up and over the Frame.
4. Place the Stand in your designated location, adjust leveling Leveling Feet as needed for stability.
5. Un-pack the contents of the Hopper which has been used to hold all non-secured components including: contact surfaces, mounting hardware, miscellaneous fittings in small pouches/bags, controller frame, etc.

   The Magnetic Vibratory Feeder Assembly has been secured in a seperate box, up-pack that as well.

3.2.A

6. Mount the Controller Frame to the Scale Frame with the supplied hardware, *Fig. # 3.2.A.*
7. Place the Scale Frame onto the stand, align the Scale Frame mounting tabs with the corresponding through holes on the Stand, *Fig. # 3.2.B.*

   Tip Have one person hold the controller while one or more individuals lift the Frame in place.



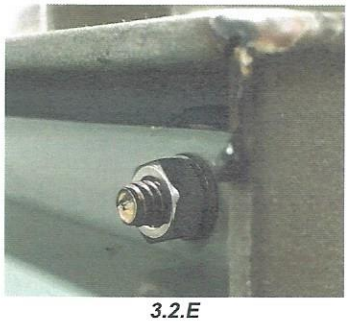
3.2.B

8. Secure the Scale Frame to the Stand using the supplied hardware, 1/4-20 Bolts, Lock & Flat Washers, *Fig # 3.2.C.*

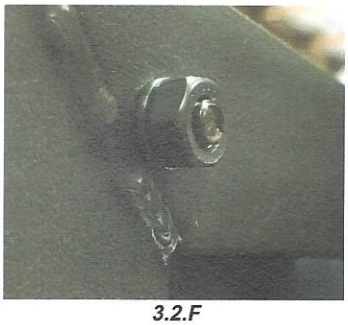
3.2.C

3.2.D

9. Un-wrap the Controller and mount into Controller Frame with the supplied hardware: 1/4-20 Hex Nuts, Lock Washers, Flat Washers and Male/Male Rubber Mounting Isolators, *Fig. # 3.2.D;* secured at the front and back, *Figs. # 3.2. E & 3.2.F.*



3.2.E



3.2.F

⚠ Do NOT attempt to lift the Frame by any of the Sub-Assemblies such as the Pneumatic Manifold, Hopper or Load Cell Assembly.

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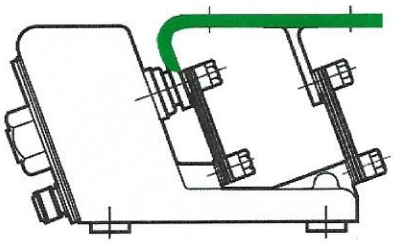
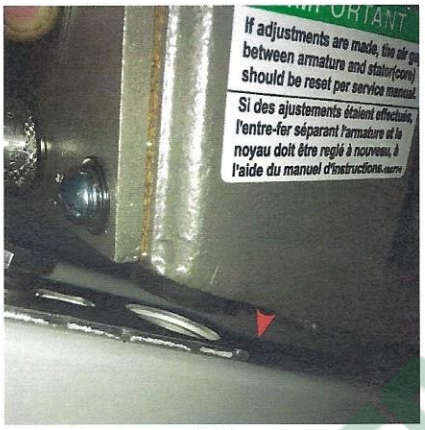
10 Locate Feeder Pan onto Vibratory Feeder's Armature, detailed in green *Fig. # 3.2.G*.

Align the threaded mounting plate holes on the bottom of the Pan with the Armature through holes and fasten with supplied hardware, ½" Hex Bolts, *Fig. # 3.2.H.*.

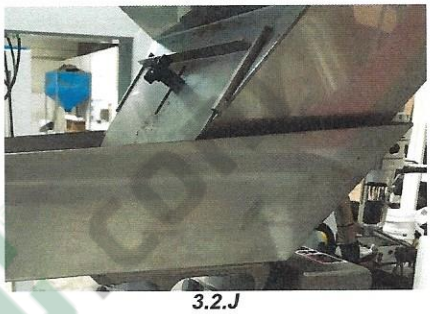


3.2.G

3.2.H



3.2.I



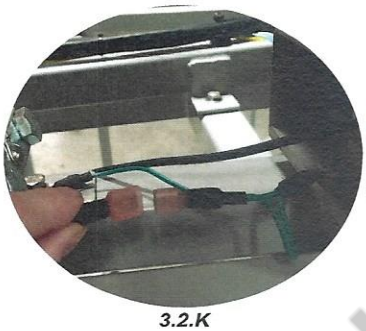
3.2.J

11 Place Feeder Assembly into Locator Brackets on Scale Frame, *Fig. # 3.2.I.*

You will need to lift up the Hopper slightly to allow enough clearance for the Feeder Pan, once properly placed gently let the Hopper back down.

Feeder Pan sides should overlap bottom of Hopper, *Fig. # 3.2.J.*

Note Due to the nature of magnetic vibratory harmonics feeder units are not bolted to a frame but "located" with brackets to allow freedom of movement.



3.2.K

3.2.L

3.2.M

3.2.N

3.2.O

12 Connect Ground Straps see *Fig. # 3.2.K*.

13 Plug in Feeder with 3 Pin Connector, *Fig. # 3.2.L*.

14 Carefully remove the Load Cell Cover, *Fig. # 3.2.M.*

3.2.P

3.2.Q

15 Secure the Bucket Bracket directly to the Load Cell as shown, using the supplied M6 Bolts, *Fig. # 3.2.N, 3.2.O & 3.2.P*.

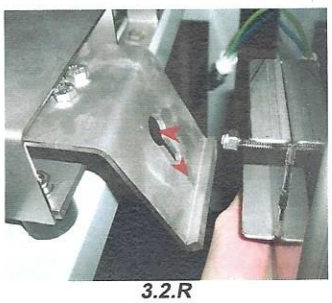
Take care not to damage the Load Cell, avoid scratching or marring the white material, "potting", along the top.

⚠ NEVER use the Bucket Bracket as a handle, grip or for leverage, NEVER apply any other load to the Load Cell or Bucket Bracket other than an Actionpac supplied Weigh Bucket.

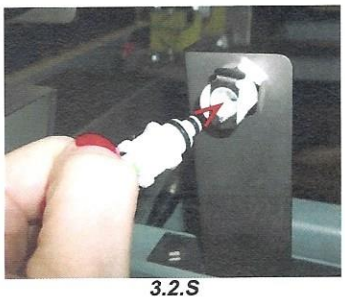
16 Mount Funnel to Frame with the protruding bolts located directly below the Weigh Bucket as shown, *Fig. # 3.2.Q.*

17 Mount Bucket by sliding it into the keyhole slot, *Fig. # 3.2.R.*

18 With the Weigh Bucket in place insert the white nylon male fitting on the Weigh Bucket into the corresponding female fitting mounted adjacent on the Frame, *Fig. # 3.2.S.*



3.2.R



3.2.S

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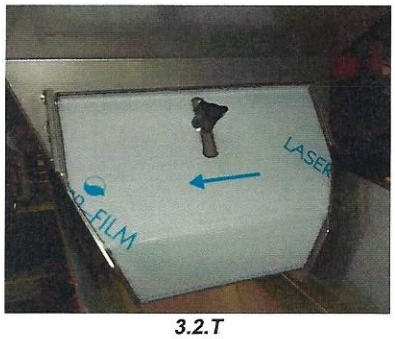
19 Fix Hopper Gate into position with three arm nylon mounting knob , *Fig. # 3.2.T.*

20 Check that the Feeder, Load Cell and Hopper Vibrator (if equipped) connectors are engaged, *Fig. # 3.2.U.*

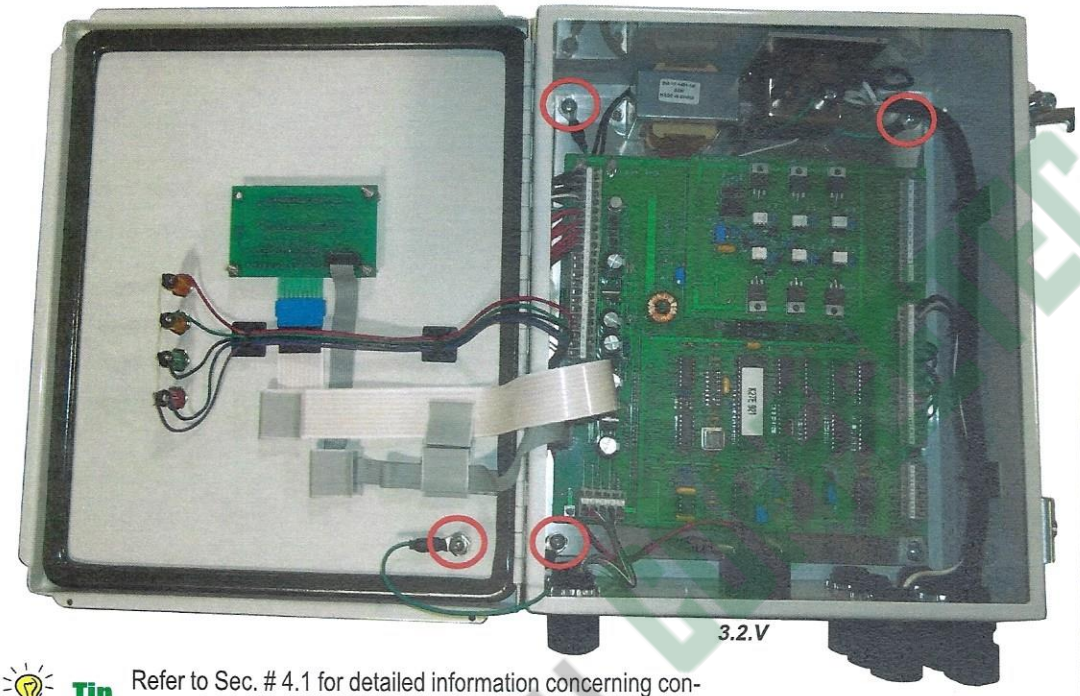
21 Open the Controller and remove any packaging materials.

22 Verify that all Boards are present and seated correctly, *Fig. # 3.2.V.*

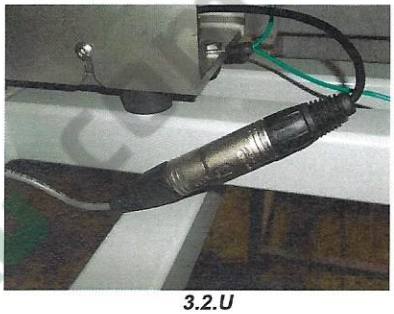
23 Check that inside grounding straps are secure, *Fig. # 3.2.W.*



3.2.T



3.2.V



3.2.U

3.2.W

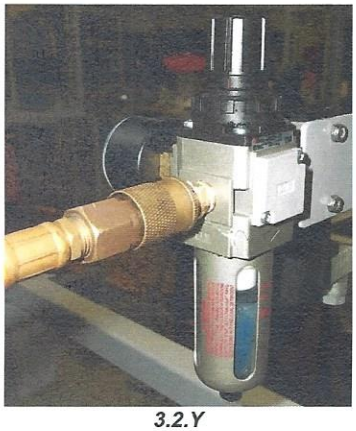
Tip Refer to Sec. # 4.1 for detailed information concerning contents of the Controller to verify presence of components.

24 Check Load Cell/Feeder ground straps are secure, *Fig. # 3.2.W.*

25 The Power Cord and Foot Pedal have been bundled and secured with zip ties for shipping. Carefully free these, make sure to support the weight of the Foot Pedal when un-bundling to avoid damage *Fig. # 3.2.X.*

26 With your **ME109** assembled and all components in place we strongly encourage you to check your power one more time prior to plugging it in. If your power is within the appropriate range you may plug it in and hook up the air, *Fig. # 3.2.Y.*

3.2.X



3.2.Y

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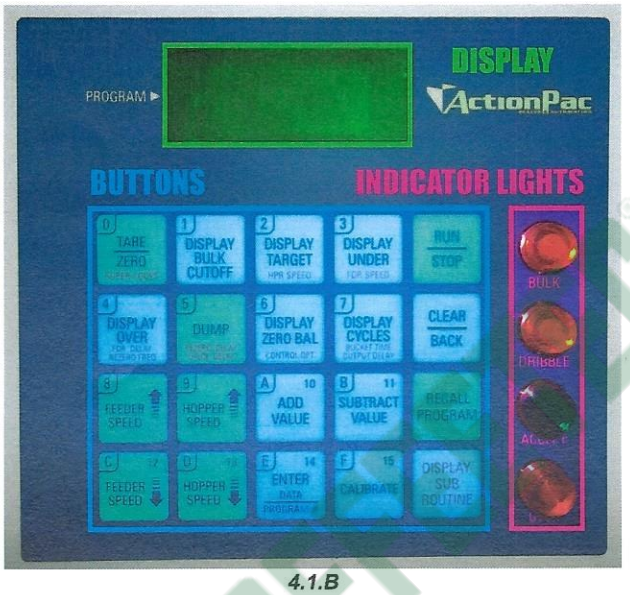
4.1 | Understanding the Controller

Please read everything in this section. It is a review of system logic and fundamentals as well as operational procedures.

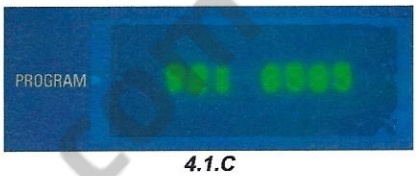
Before running your scale we should review the controller.

Your standard **ME109** Controller is operated with a digital keypad, *Fig. # 4.1.A,* consisting of an **LED Display**, twenty (20) alpha/numeric **Buttons**, and four (4) **Indicator Lights** *Fig. # 4.1.B.*

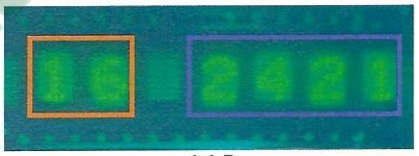
4.1.A



4.1.B



4.1.C



4.1.D

The **LED Display** is a real time reflection of the scale's status, *Fig. # 4.1.C.*

During regular operation the **two digits** at left denote the program being run. While the **four digits** to the right reflect the state of the load cell, going up and sometimes down or fluctuating in response to applied weight and other disturbances, *Fig. # 4.1.D.*

The display also registers inputs while you are programming, modifying, tuning, etc.

4.1.E

The twenty alpha/numeric **Buttons** are used to run your system, program, adjust and tune. The buttons have a coordinating beeper that sounds with each stroke. These buttons will be referenced and explained in greater detail in ***Sec. # 4.2.***

The four **Indicator Lights** reflect the run status of the cycle in progress, *Fig. # 4.1.E.*

The first and second orange lights indicate what stage of the cycle you are in, either Bulk or Dribble.

The bottom two lights, green and red, indicate whether or not the weight is acceptable based on the set points of the program being run with the green light denoting a pass and the red light indicating and over.

Note "Unders" are not possible in the program logic.

Tip If any Indicator Light is lit you are in **Run** mode.

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4.1 | Understanding the Controller

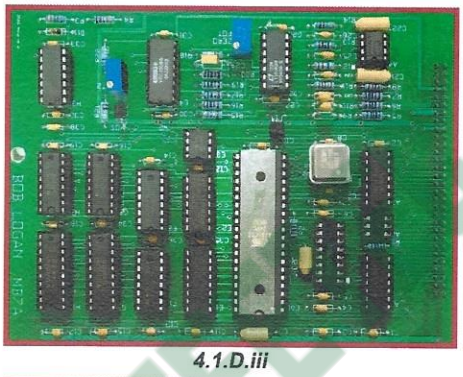
Inside the enclosure are the brains of the system which is microprocessor based. The controls are assembled using boards developed and manufactured in the US by Actionpac and programmed with proprietary software and weighing technology.

The controls consist of a set of three boards *Fig. #4.1.D* which are the: **Mother Board** (*Fig. #4.1.D.i*), **Triac Board** (*Fig. #4.1.D.ii*) and **Main Board** (*Fig. #4.1.D.iii*).

The Processor, containing the operating system, is located on the Main Board.

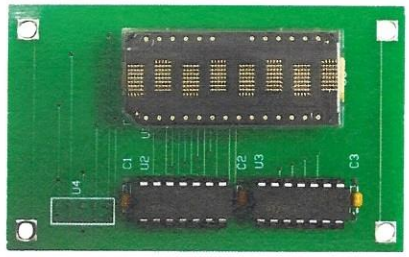
Fig. 4.1.D

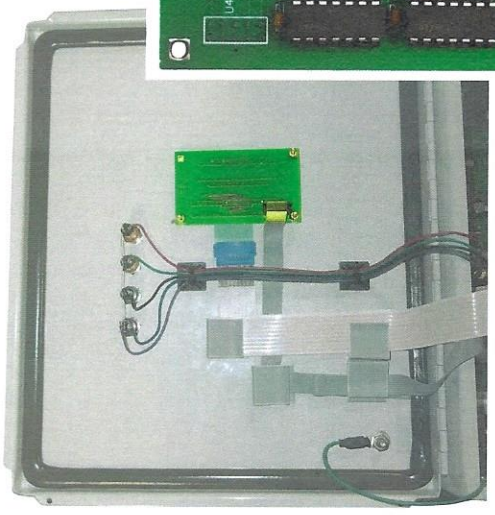
4.1.D.i



4.1.D.iii

4.1.D.ii





You will also find the Display assembly, consisting of the Display Board and LED Display, mounted to left on the enclosure door, *Fig. #4.1.E*

The system's Foot Pedal and Power Cord come out through the bottom of the controller. Use care when moving equipment around so that these do not drag along the ground or become snagged.

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4.2 | The Standard Keypad

Sec. # 4.1 touched lightly on the Keypad as an element of the controller; in this section the Keypad is explored in greater detail.

As mentioned earlier the **Keypad** is composed of twenty alpha/numeric buttons. Most buttons have two or more functions depending on what mode you are in.

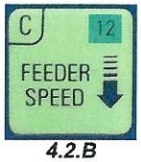
Note

For the purposes of message clarity all keypad commands in this section and throughout this manual with be styled in the following manner: ***RUN*** , ***DISPLAY*** , ***BULK*** (i.e. caps, bold, italics and underlined).

All information, inputs, to be entered other than keypad commands will be styled as ***2*** , ***digit***, ***code*** (i.e. lower case, bold, italics and underlined).

The buttons perform not only operational functions but also serve as numeric inputs, ***0*** - ***9*** (top left of button) & ***10*** - ***15*** (top right), *Fig. # 4.2.A & 4.2.B*.

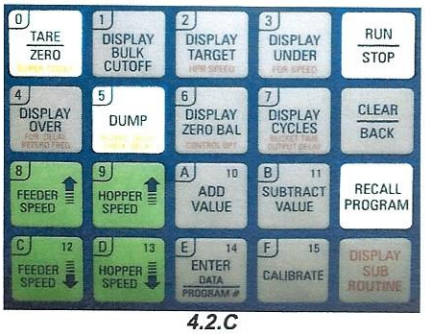
4.2.A



4.2.B

There are five basic button categories: Main Command Buttons, Incremental Speed Control Buttons, Miscellaneous Command Buttons, Subroutine Command Sequence Buttons & Setpoint Buttons.

Note Some buttons may fall into multiple categories depending on what mode you are in.



4.2.C

| Main Command Buttons

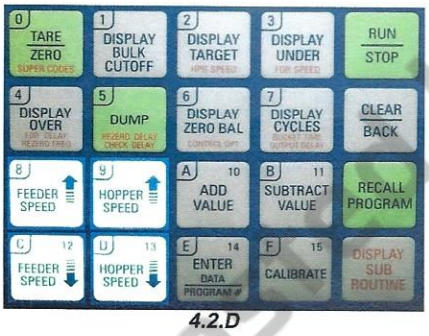
Main Command Buttons, *Fig. #4.2.C*, are used to execute the most basic performance functions and used most often day to day. We will work with them shortly in ***Sec. # 4.4***.

RECALL PROGRAM
Program selection

RUN | STOP
Starts and stops scale

0] TARE | ZERO
Zero, Tare function

5] DUMP
Opens/Empties weigh bucket (unless in "Run" mode)



4.2.D

| Incremental Speed Control Buttons

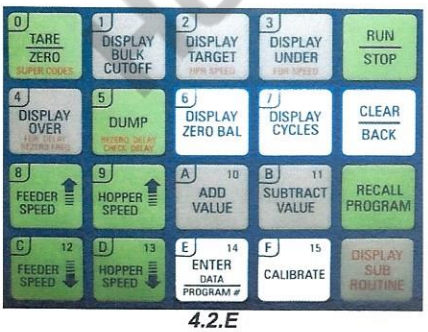
Must be in "**Run**" mode to register, arrows affect operating mode only. Keep in mind that increasing the feeder speed(s) will not necessarily increase your rate of operation or overall throughput, see **Sec. # 5** for tips on tuning your scale.

8] FEEDER SPEED ↑
Increases feeder speed

C] FEEDER SPEED ↓
Decreases feeder speed

9] HOPPER SPEED ↑
Increases back feeder speed, if system equipped

D] HOPPER SPEED ↓
Decreases back feeder speed, if system equipped



4.2.E

| Misc. Command Buttons

These buttons, *Fig. # 4.2.E*, are used for a variety of functions and modes.

6] DISPLAY ZERO BAL
Displays zero balance, No Tare

7] DISPLAY CYCLES
Displays # of cycles left

CLEAR | BACK
Clear, Back

E] ENTER DATA
Use to enter numerical inputs

F] CALIBRATE
Calibration function

Tip If Dribble is too quick to make adjustments press down on the Weigh Bucket quickly. This will force the logic to go to Dribble mode and give you plenty of time to experiment

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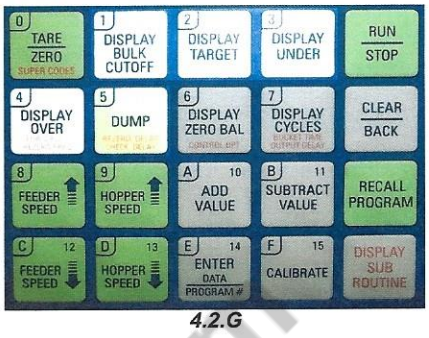
Setpoint Buttons

These buttons are also used for adjusting or creating programs, a set point is the weight at which a specific sub-routine is activated, *Fig. # 4.2.G*.



4.2.G

1] DISPLAY BULK CUTOFF
Weight at which bulk feeding ceases and dribble begins

2] DISPLAY TARGET
A program's target weight, green indicator light activates

3] DISPLAY UNDER
Least amount of weight the program will accept

4] DISPLAY OVER
Weight at which a cycle is "Over", red indicator light activates

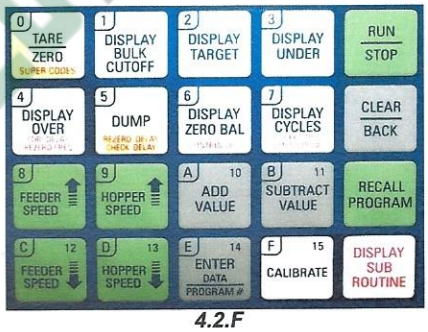
A] ADD VALUE
Change setpoint by adding to it

B] SUBTRACT VALUE
Change setpoint by subtracting from it

Note These functions are printed in blue text on gray buttons.

Subroutine Command Sequence Buttons

You will use these buttons for programming and modifying programs, *Fig. # 4.2.F.* As mentioned earlier sub-routines are the individual instructions that comprise a program.



4.2.F

0] SUPER CODES
Input supervisor code

1] DISPLAY BULK CUTOFF
Weight that BULK ends and DRIBBLE begins

2] HPR SPEED
Front Feeder speeds

3] FDR SPEED
Back Feeder speeds (if system equipped)

4] FDR DELAY|REZERO FREQ
Fdr Delay & Rezero Freq

5] REZERO DELAY|CHECK DELAY
Rezero Delay & Check Delay

6] CONTROL OPT
Control Options

7] BUCKET TIME|OUTPUT DELAY
Duration bucket door will stay open

F] CALIBRATE
Calibration Code

DISPLAY SUB ROUTINE
Display a program's Subroutines

Note These functions are denoted with red print. To activate that function select ***DISPLAY SUB ROUTINE*** first, also printed in red.

Tip When using the alpha/numeric buttons watch the LED display and listen for the beeper to verify the commands and inputs are registering. If the commands or inputs do not display you are either in "RUN" mode of you are entering numbers too quickly.

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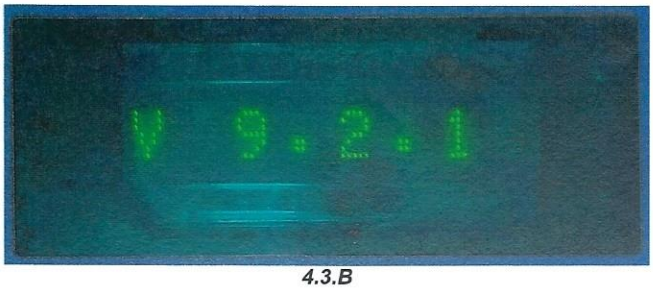
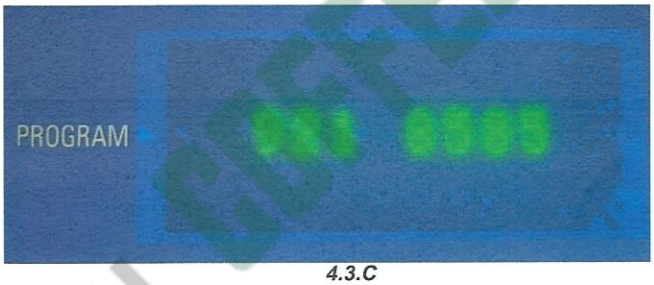
Your standard **ME109** series system with standard controller does not come equipped with an "On/Off" switch. Your system will be "on" or "off" with the insertion and removal of the 3-prong plug, *Fig. # 4.3.A*, into an appropriate outlet. When referencing the scale being "on" or "off" we are basically saying it is plugged in or un-plugged.

4.3.A



4.3.B

When you turn the scale on the Display will read Actionpac followed by our phone number **(805) 487-0403** then flash V 9.2.1 (the operating system's version) *Fig. # 4.3.B.*



4.3.C

Once the start-up sequence has finished the display will register its normal "**Ready**" configuration with 921 at the left (or whichever version is loaded in your processor) where the program "Memory Location" registers. The load cell status will be reflected in the four digits at the right, *Fig. # 4.3.C*. It is normal if that number, especially the two right most digits, move slightly up and down as the load cell is affected by environmental factors and is always reading.

Once your display has stabilized your scale is "On" and "**Ready**."

To turn your scale "Off" simply unplug it, the display and indicator lights will flash and you will hear an audible fade away , this is normal.

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4.4 | Recall a Program

In order to run and use your scale in production day to day you will need to know how to recall a program This procedure is necessary for modifying an existing program as well but first let's quickly review what a "program" is.

As previously defined: A **Program** is the complete set of instructions the scale needs to do its job.
A **Subroutine** is an individual instruction within a program.
A **Setpoint** is the weight at which specific subroutines are activated.

Remember these for later.

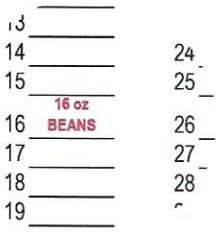
TARGET WEIGHT:		16 OZ	
PRODUCT: COFFEE BEANS			
SETPOINTS:			
1	1500	BULK CUTOFF	
2	1599	TARGET WEIGHT	
3	1597	UNDR TLERANCE	
4	1605	OVER WEIGHT	
SUBROUTINES:			
0	80	00	
1	00	0F	SET
2	FF	FF	LANE
3			GATE:
4	04	0F	N/A
5	16	16	SET
6	80	00	HOPPER
7	12	01	GATE:
8	01	01	DOWN
9	50	00	
F			
PROGRAM		16	
SET FOR (MODE)		oz	
BY (RESOLUTION)		.01 (1/100)	

4.4.A

Your **ME109** series system has been pre-programed and tuned based on the weights you provided us and the bulk sample product you supplied. These programs and their entry codes (aka "Memory Locations") are listed at the back of this manual in **Sec. # 7** titled "Available Program Memory Locations." In this same section you will find "Program Data Sheets", aka PDS, for the factory installed programs along with blank sheets for future programs, *Fig. # 4.4.A*.

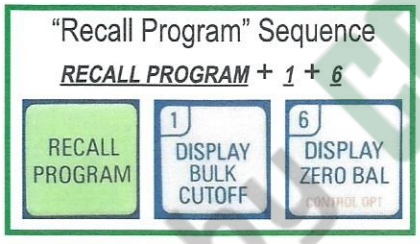
These sheets are used to record the specific data which a program consists of such as the set points, subroutines, resolution, etc and will be discussed in great detail in the next section.

To recall a program you will need to have the two digit "code", aka "Program Memory Location." You can find these in **Sec. # 7** as described above.



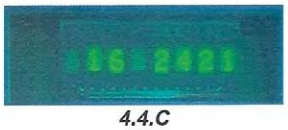
4.4.B

For our purposes in this section we will use program **16** , *Fig. # 4.4.B*.



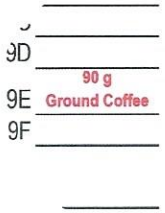
That's it, push ***RECALL PROGRAM***, followed by the two digit code.

Display left should reflect the two digit code, in this case **16**, *Fig. # 4.4.C*.

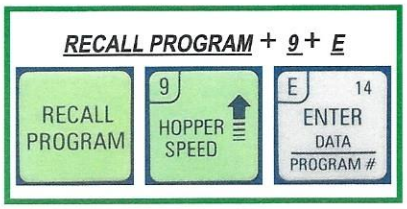


4.4.C

Another example, using **9E**:



4.4.D



The scale is now ready and waiting for further instruction, from here you can run the scale, modify or change programs, etc.

Before running though there is one last thing, we need to "Empty The Bucket"....

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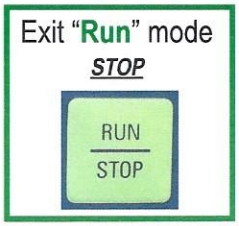
4.5 I Emptying the Bucket

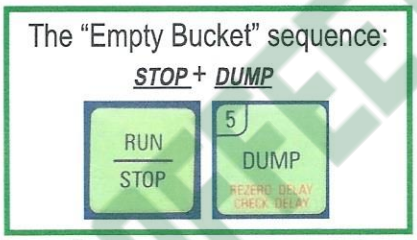
Before you start running the scale you must empty the weigh bucket(s). If you fail to do this the scale will tare itself with any product that may have accumulated in the bucket(s) which will result in over weight cycles.

You must stop the scale before attempting to empty the bucket as the scale will not respond to commands while in "**Run**" mode, other than the incremental speed controls

If any status lights are on press ***STOP***



If you are not in "**Run**" mode you do not have to press ***STOP*** first but we recommend you include it in the "Empty Bucket" sequence as best practice S.O.P.



Tip Have a box, tote or some other container under the funnel output to catch product. From time to time, especially as you are familiarizing yourself with the scale, you will have missed dumps and you will always have controlled bucket empties; a catch pan below will reduce mess and prevent un-necessary product/material loss.

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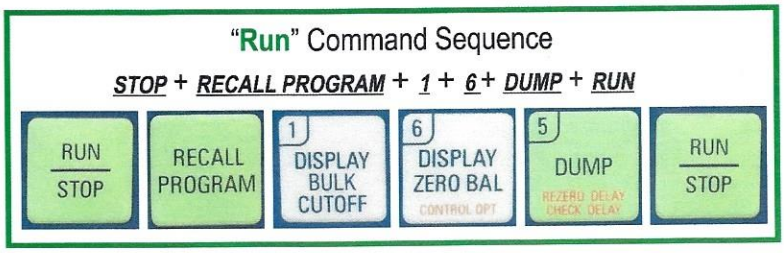
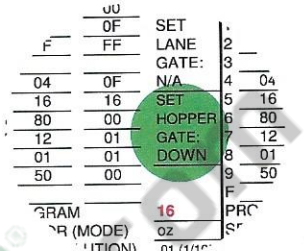
4.6 | "RUN" Mode

You should now be relatively familiar with your scale and ready to get your production on, finally.

Now would be a good time for you to fill the Hopper with product if you have not already done so, refer to the program's PDS to ascertain the correct height at which to set the Hopper Gate, *Fig # 4.6.A*.

Check that you have the appropriate Weigh Bucket and Funnel installed on the scale for your program and bags.





4.6.A

Pressing ***RUN*** starts operation, when the bucket has filled to the program's target weight the scale will stop. Throughout the filling process the Indicator Lights will change in reflection of the cycle's progress and the 4 digits at display right will increase until reaching target.

While the scale is filling arrange a bag onto the Funnel, see ***Sec.# 4.7*** for instructions.

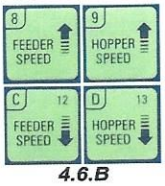
Once the scale has stopped filling the green or red Indicator Light will confirm whether they cycle has passed or is over.

With a bag in place step on the Foot Pedal. The Weigh Bucket will open releasing the product through the funnel and into the bag. While the product is transitioning into the bag the Weigh Bucket door will close and a new cycle will begin.

Note It is not necessary to watch the Display or wait for the scale to finish its cycle you only have to have a bag/container in place to activate the foot pedal. The scale will not release product until it finishes the cycle.

Tip You can keep your foot on the Foot Pedal, as long as you have a bag in place.

While you are in "**Run**" mode, which you currently are, the scale will continue this process of filling in accordance with the program selected until you exit "**Run**" mode. As a reminder while you are in "**Run**" you can't issue commands as the scale will not respond to them with the exception of the Incremental Speed Controls, *Fig. # 4.6.B* .



4.6.B

If you would like to switch the program to run another weight, press ***STOP*** to exit "**Run**" mode. You can then commence the "Run Command Sequence" as previously instructed but with another two digit program code.

Check that your Weigh Bucket and Funnel are still appropriate for the newly selected program. If you purchased additional Weigh Buckets and Funnels they would have been included with the scale.

For factory installed programs speeds have been pre-set to a conservative 8-12 cycles per minute for accuracy depending on the product sample you supplied. You can speed this up with little to no accuracy loss but programming changes will be required, see **Sec. # 5** for details. You may also call and speak to a Technician who can walk you through that.

Tip Set your Hopper Gate all the way down when fillilng an empty hopper to avoid product bouncing out of Feeder Pan.

Note If you want to expand your range of application and now require a larger bucket volume or a specialty funnel for new bag formats contact your sales associate for pricing and availability.

Note If any of the indicator lights are on you are in "**Run**" mode. The scale will not respond to commands while in "**Run**" mode. Always stop the scale before beginning any command sequence.

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4.7 | Funneling Instructions

Actionpac has a variety of standard specialty funnels of which you will have received at least one unless you commissioned a custom funnel designed for an un-conventional bag. If you do have a custom funnel these instructions will more than likely still be relevant enough to apply.

Open Utility Funnel

Primarily for open flat bags that do not need to be formed or open prior to filling, coordinated with Weigh Bucket.

Insert both fingers into bag opening to open bag.

Slip bag onto funnel end, tip only.

Hold bag out with two fingers for max opening.

After Bucket dumps tap funnel back for any residual product, if necessary.

Tip Avoid sliding bag onto funnel up as far as it will go to prevent spill over.

Side Gusset Former Funnel

Used for quad seal bags, bags with side gussets and bags with square or flat bottoms that require forming/opening prior to filling. Two standard sizes available, larger size equipped with front slot to accommodate valve.

Insert both fingers into bag opening to open bag.

Slip bag opening onto end of funnel.

Slide bag up the funnel as far as it will go and square the bottom with the palm of one hand.

Hold bag in place with both hands until product has settled and is no longer moving.

Tip Pull bag all the way down and clear of Funnel before removing it to allow product to transition fully.

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Stand Up Pouch Former Funnel

Designed and used specifically for stand up pouches, doy pouches and bags with bottom gussets that need to be opened prior to filling, two standard sizes available.

Insert both fingers into bag opening to open bag.

Slip bag opening onto end of funnel.

Slide bag up the funnel as far as it will go and square the bottom with the palm of one hand.

Hold bag in place with both hands until product has settled and is no longer moving.

Tip Pull bag all the way down and clear of Funnel before removing it to allow product to transition fully.

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5.1 | Program Fundamentals

Section # 5 is dedicated to the control system of your **ME109** and reviews general programming matters.

A few things to keep in mind as we move through this section:

Your **ME109** series net weigh has been programmed to run with the sample product you provided at regulated 115 VAC power. **Increases or decreases in voltage will cause ratiometric speed changes** and may result in loss of accuracy since electromagnetic feeders are voltage driven.

Generally you will be able to create new programs by modifying the programs with which your **ME109** was supplied..

Products that look the same may have slightly different flow characteristics that will necessitate mechanical and/or electronic adjustments. Sec. # 6 is devoted to evaluating and accommodating this.

You can always call us if you get stuck, confused, need help or a friend.

Before we get into the mechanics of programming, let's establish what a program is.

Remember those definitions back in *Sec. 4.4*? We need them now, let's review:

A **PROGRAM** is the complete series of instructions the scale needs to do its job.
A **SUBROUTINE** is an individual instruction within a program.
A **SETPOINT** is the weight at which specific subroutines are activated.

As discussed in *Sec. # 4.4* the Program Data Sheet is an expression of the specific data of which it is comprised with the program data seperated into 5 main sectors which are:

PROGRAM ID, GATE SETTINGS, PROGRAM DETAILS, SETPOINTS and SUBROUTINES.

Let's use our example program, 16, to look at these sectors individually, *Fig. # 5.1.A*.

TARGET WEIGHT:	16 OZ
PRODUCT:	COFFEE BEANS

SETPOINTS:		
1	1500	BULK CUTOFF
2	1599	TARGET WEIGHT
3	1597	UNDR TLERANCE
4	1605	OVER WEIGHT

SUBROUTINES:		
0	80	00
1	00	0F
2	FF	FF
3		
4	04	0F
5	16	16
6	80	00
7	12	01
8	01	01
9	50	00
F		

SET LANE GATE: N/A
SET HOPPER GATE: DOWN

PROGRAM	16
SET FOR (MODE)	oz
BY (RESOLUTION)	.01 (1/100)

5.1.A

Program ID | Located at the top of each PDS, you can think of this as the "Program." This information is descriptive and used to identify the program; it includes the target weight and the product type.

TARGET WEIGHT:	16 OZ
PRODUCT:	COFFEE BEANS

5.1.B

"TARGET WEIGHT" The program is set to run to 16 oz.

"PRODUCT" The program will run COFFEE BEANS

Program Details | Located at the very bottom are details that define the program.

PROGRAM	16
SET FOR (MODE)	oz
BY (RESOLUTION)	.01 (1/100)

5.1.C

"PROGRAM" This is the Memory Location Code, it is always 2 digits. Keep in mind that it will not always directly correspond to the weight you are running as in this case 16.

"SET FOR (MODE)" The unit of measurein which the program is weighing, in this case ounces.

"BY (RESOLUTION)" The program's accuracy setting which is .01 (1/100) of an ounce here.

Tip You can store up to 256 programs.

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Gate Settings

The Gate settings, located to the right, are the vertical heights at which the gates are set.

"SET LANE GATE:" Not all systems have a Lane Gate, if not equipped you will see N/A

"SET HOPPER GATE:" Indicates at which level you should set your Hopper Gate, in this case you should set it DOWN as far as it will go, *Fig. # 5.1.D*. Depending on the product, weight and speed variables you may need to set it "UP" or "MID" and in some cases it would be "OFF".

SET LANE GATE:
N/A
SET HOPPER GATE:
DOWN

5.1.D

Setpoints

These are the weigh "parameters" that a program operates within. Located directly beneath the Program ID info they essentially dictate your speeds and accuracies and are numbered 1 - 4. Setpoints are highly variable based on the nature of you product and the scope of your application.

SETPOINTS:

1	1500	BULK CUTOFF
2	1599	TARGET WEIGHT
3	1597	UNDR TLERANCE
4	1605	OVER WEIGHT

5.1.E

"BULK CUTOFF" at 1500 means bulk filling ceases at 15.00 oz. at which point Dribble Filling will begin.

"TARGET WEIGHT" of 1599 means that you are aiming for 15.99 oz. of product. The process speed of the dribble action to that set point is based on your "UNDER TLERANCE" and "OVER WEIGHT".

"UNDER TLERANCE" The least amount of product you will tolerate, in this case 15.97 oz.

"OVER WEIGHT" The maximum amount of product you will allow which is 16.05 oz.

If the range between your under and over is fairly broad the cycle will process faster. While a more limited spread will process more slowly relative to the difference as it has less "room for error". This is something to consider when making your calculus on speed vs. accuracy and evaluating your product flow characteristics.

Subroutines

Highly variable as well as interactive each Subroutine controls specific action(s). A variety of results may be achieved depending on how they are set in relation to each other as well as the Setpoints.

There are a total of 11 Subroutines, numbered 0 - F. The majority of these produce tangible results affecting performance which can be observed by an operator like Bucket Duration at Sub 7 and Check Delay at Sub 5. Other less tangible subroutines are set at the factory to ensure proper machine functionality such as divisors and multipliers of the Load Cell input at Sub 8, Sub 9, Sub F, and Sub 0.

0	80	00
1	00	0F

5.1.F

Each Subroutine is expressed as a pair of two digit bits, BIT # 1 & BIT # 2, *Fig. # 5.1.F.*

Each bit is comprised of two digits positioned, starting from the left, as the 1st, 2nd, 3rd and 4th digit, *Fig. # 5.1.F.*

Each position is categorized, respectively, as Most Significant Digit aka MSD, 2nd MSD, 3rd MSD and Least Significant Digit aka LSD.

Those bit expressions issue instructions to the system for the performance of their respective maneuvers, see *Table I* for easy reference.

Additional Subroutine information that may further illustrate these variables can be found in ***Sec. # 7.3*** as a supplement to *Table I*.

⚠ We recommend you not make changes to those labeled "Factory Set" in *Table I*, below, without consulting an Actionpac technician.

SUBROUTINES:

	BIT # 1	BIT # 2
0	Supervisor Codes	Factory Set
1	Periph Out Freq Display Setpoint 1	Future Zero Verify Tolerance
2	Dribble Hopper (+ to -)	Bulk Hopper (+ to -)
3	Dribble Feeder (+ to -)	Bulk Feeder (+ to -)
4	Feeder Delay	Rezero Frequency
5	Rezero Delay	Check Delay
6	Misc. Options Print Options	Peripheral Options Operational Options
7	Bucket Duration	Peripheral Delay
8	# of Divisions Factory Set	# of Accumulations Factory Set
9	Factory Set	Factory Set
F	Calibration Codes	

Table I

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5.2 | Setpoints & Subroutines

When modifying or creating programs the easiest changes to make are to the Setpoints. In fact when creating programs of differing weights and accuracies using the same product adjusting the Setpoints may be all that is necessary.

If you think of the Setpoints as being goals with the Target Wieght the ultimate goal the Subroutines are the means by which the scale achieves those consecutive goals.

Setpoints | View & Change

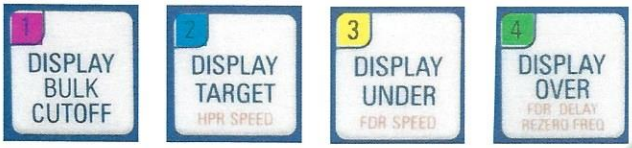
You can determine a program's Setpoints in two ways. You can look and find them on that proram's PDS, as discussed previously in ***Sec. # 5.1***, or you can view them manually using the controller's Keypad. This same manual procedure is the basis for changing the Setpoints as well.

As previously explained the Setpoints are the Program's parameters, they are numbered **1-4**, *Fig. # 5.2.A*, and each have a designated button on the Keypad, *Fig. # 5.2.B*.

SETPOINTS:

1	1500	BULK CUTOFF
2	1599	TARGET WEIGHT
3	1597	UNDR TLERANCE
4	1605	OVER WEIGHT

5.2.A



5.2.B

View Command
2

To view a program's Setpoint merely press the corresponding button.

Exit Command
CLEAR

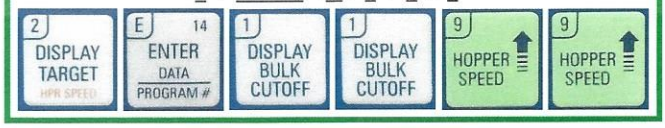
While viewing the Setpoints or Subroutines you are in "**Display**" mode.

To escape, press any numeric key or ***CLEAR***.

If you want to change that displayed setpoint, **SETPOINT 2** which is the Target Weight, from **1599** to **1199** for say a 12 oz. program you would use the applicable button sequence such as that shown at right.

Change Setpoint Sequence

2 + ENTER + 1 + 1 + 9 + 9



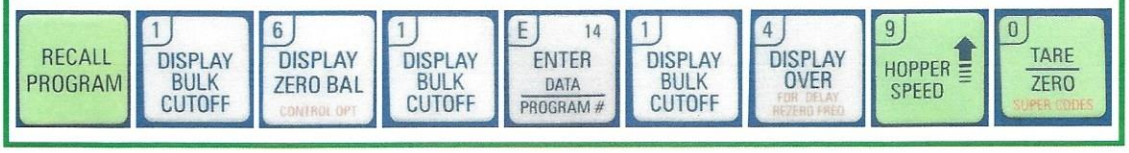
Note Remember that you are in display mode when you begin the sequence so there is no need to enter the original value which is **1599** in this case.

Let's review what we've learned, from recalling the program to changing a setpoint as a button sequence before we move on.

The below sequence demonstrates recalling our program, **16**, so that we may view **SETPOINT 1** and change it to **1490**.

Button Sequence Review

RECALL PROGRAM + 1 + 6 + 1 + E + 1 + 4 + 9 + 0



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Subroutines | View & Change

5.2.C

Subroutines may also be determined by referencing your PDS or viewed manually though, unlike setpoints with dedicated command buttons, individual subroutine commands are auxiliary functions noted in orange on the corresponding buttons, *Fig. # 5.2.C*. They are engaged by first pressing the Subroutine Command Button.

View Subroutine Sequence

DISPLAY SUBROUTINE + ***0] SUPER CODES***

To view a program's s subroutine you first press the Subroutine Command Button, ***DISPLAY SUBROUTINE***, followed by the corresponding numeric button you want to view.

Change displayed Subroutine Sequence

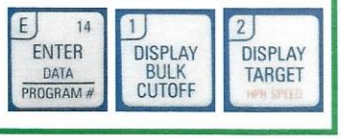
ENTER + ***8*** + ***1*** + ***0*** + ***0***

Say you wanted to change displayed **Sub 0**, of program **16**, from **80 00** to **81 00**:

Your change is merely temporary at this point, you can save it to either the program you are engaged in or to another. If you save it to the program you are in, **16** in this case, that program will be permenantly changed.

Save Subroutine Command

ENTER + ***1*** + ***2***



To store these changes you will need to save it to a memory location, like **12**

Note You may use any of the available 256 two digit hexi-decimal codes, aka Program Memory Locations; see Page 46 for code tables.

When making changes to the Subroutines keep in mind that your ability to do this is contingent upon any Supervisor Codes that have been stored into the program and the level of access granted. This is done to avoid accidental changes or modifications by unqualified personnel, see *Sec. #5.3* for more on Supervisor Codes.

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5.3 | Supervisor Codes

One of the most common problems encountered by users of weigh fill/counting equipment is the alteration, inadvertent or not, of supervisor or factory settings of all fourteen interactive variables controlling speed and accuracy so the following information is meant for the supervisor only.

The level of access to any given program is controlled by the "Most Significant Digit" of SUB 0 which is the digit farthest to the left. Ascertain a program's access level by viewing SUB 0 as described in the previous section.

There are four primary restrictions, each assigned a numeric value:

- 8 = No access to ***ENTER*** feature (Cannot change any displayed information, cannot store programs)
- 4 = No access to incremental speed controls (*8*, *9*, *C*, *D*)
- 2 = No access to setpoints ADD VALUE/SUBTRACT VALUE feature (*A* & *B*)
- 1 = No access to display cycles (*7*)

To determine how to set this digit to achieve the appropriate restriction level you want simply add the values of those restrictions and enter that into the MSD position of SUB 0.

If you want no access restrictions with the ability to make changes without any overrides you would set the MSD to 0.

You can place as few or as many restrictions you like, tailoring the program's access level to your needs.

For example if you want to allow access only to the Speed Controls you would add 1 + 2 + 8 giving you 11.

To express two digits in a single position we use Hex Codes, see *Sec. # 7.3*. Basically for numbers 10-15 you will use a corresponding letter of the alphabet starting with A, thus A:10, B:11, C:12, and so forth with F:15. Therefore you will use B to express your restriction level of 11. The maximum is 15 expressed as F.

If the access code is set at anything other than 0 in the MSD position, you will need to use the Supervisor Override Code, **DD**, before any changes can be made or entered into the program. Essentially you have to eliminate the Supervisor Code before you can change the program; **DD** is pre-loaded at the factory.

Of the four digit positions that SUB 0 consists of only the 1st is relevant here as only that digit position controls the restriction level and represents the Supervisor Code. You have to enter the other three digits exactly the same, only change the MSD to 0.

Let's have an example, A5 *(Fig. # 5.3.A)*:

TARGET WEIGHT:		500 G	
PRODUCT: COFFEE BEANS			
SETPOINTS:			
1	0470	BULK CUTOFF	
2	0499	TARGET WEIGHT	
3	0498	UNDR TLERANCE	
4	0503	OVER WEIGHT	
SUBROUTINES:			
0	81	00	
1	00	0F	SET
2	FF	FF	LANE
3			GATE:
4	04	0F	N/A
5	16	16	SET
6	80	00	HOPPER
7	12	01	GATE:
8	01	01	DOWN
9	50	00	
F			
PROGRAM			A5
SET FOR (MODE)			g
BY (RESOLUTION)			1g

5.3.A

As you can see from SUB 0 your MSD is 8. This level prevents an operator from saving or storing anything so we need to set it at 0.

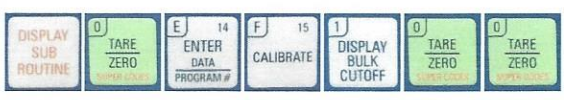
Reset SUB 0 Command Sequence:

DISPLAY SUBROUTINE + *0* + *E* + *D* + *D* + *0* + *1* + *0* + *0*

You may now change it to another level but once you do that you have set restrictions and will be unable to make subsequent changes to that program. Most commonly people set SUB 0 MSD at 8.

To set SUB 0 from 0 to F:

DISPLAY SUBROUTINE + *0* + *E* + *F* + *1* + *0* + *0*



Tip Make sure to note permanent changes to a program in the PDS so you can easily refer to them.

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5.4 | To Make a New Program-Add/Subtract Value

The simplist way to make a new program based on an old program with the same product is by using the Add/Subtract Command Sequence. This adds or subtracts the difference between an old and new target weight.

Remember to check the Supervisor Code and set SUB 0 MSD to 0 if necessary.

TARGET WEIGHT:	4 OZ	
PRODUCT: COFFEE BEANS		
SETPOINTS:		
1	0360	BULK CUTOFF
2	0400	TARGET WEIGHT
3	0399	UNDR TLERANCE
4	0403	OVER WEIGHT
SUBROUTINES:		
0	80 00	
1	00 0F	SET
2	FF FF	LANE
3		GATE:
4	04 0F	N/A
5	16 16	SET
6	80 00	HOPPER
7	08 01	GATE:
8	01 01	DOWN
9	50 00	
F		
PROGRAM		04
SET FOR (MODE)		oz
BY (RESOLUTION)		.01 (1/100)

5.4.A

Subtract Value Command Sequence

Suppose you have a 4 oz. coffee bean program, located at 04 *(Fig. 5.4.A)*, and you need a 2 oz.

1 Assign a two digit code, check the Available Program Memory Locations, say 02 is available.

2 Establish the weight difference between old and new target weights.
Make sure you refer to Setpoint 2, TARGET WEIGHT.

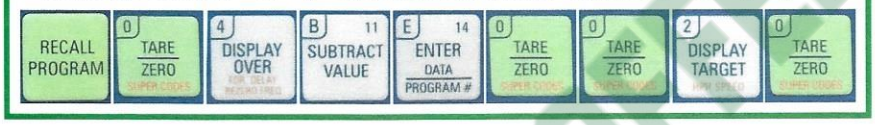
The difference here will be 0200 since:

0400 (old program) - 0200 (new program) = 0200

3 "Make a New Program" using the Subtract Value Command Sequence shown below.

Subtract Value Command Sequence

RECALL PROGRAM + 0 + 4 + B] SUBTRACT VALUE + E] ENTER + 0 + 0 + 2 + 0



Save Command

+ E] ENTER + 0 + 2

TARGET WEIGHT:	2 OZ	
PRODUCT: COFFEE BEANS		
SETPOINTS:		
1	0175	BULK CUTOFF
2	0200	TARGET WEIGHT
3	0200	
4	0202	OVER WEIGHT
SUBROUTINES:		
0	80 00	
1	00 0F	SET
2	FF FF	LANE
3		GATE:
4	04 0F	N/A
5	16 16	SET
6	80 00	HOPPER
7	08 01	GATE:
8	01 01	DOWN
9	50 00	
F		
PROGRAM		02
SET FOR (MODE)		oz
BY (RESOLUTION)		.01 (1/100)

5.4.B

4 Save to new memory location 02 as shown to right.

01	11
02 2 oz BEANS	12
03	13
04 4 oz BEANS	14
05	15

5.4.C

5 Fill out another PDS *(Fig. # 5.4.B)* and update your Available Memory Location Log *(Fig. # 5.4.C)*.

The controller makes all the necessary adjustments automatically so you may transcribe all the Subroutines from the original as they will have remained the same. The Setpoints however will have to be changed accordingly to reflect the new program *(Fig. # 5.4.B)*.

The original program 04 will not be affected as long as you correctly store the new program in a different location. Therefore it is extremely important when programming that you are clear on what memory locations are available and which are in use, making record keeping worthwhile.

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Add Value Command Sequence

Use the Add Value Command Sequence to make a new program with a larger Target Weight.

Now suppose you have a 125g program for ground coffee, located at 1A (*Fig. # 5.4.D*), and you want to use it to make a program for 250g.

1 Determine which two digit code to use for your new program by refering to the Available Program Memory Locations, let's use **2A**.

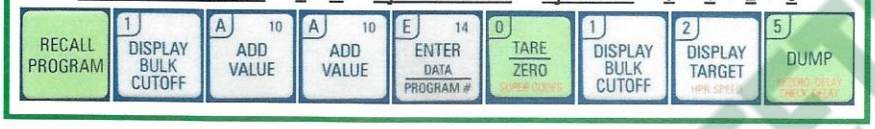
2 Establish the weight difference between the old and new target weights, **Setpoint 2.**

0250 (new) - 0125 (old) = 0125

3 "Make a New Program" using the **Add Value Command Sequence**

Add Value Command Sequence

RECALL PROGRAM + 1+ A + A] ADD VALUE + E] ENTER + 0 + 1 + 2 + 5



4 Save to the memory location **2A**

5 Update your records, *Fig. # 5.4.E* & *5.4.F.*

And one more for practice...

Save Command

+ E] ENTER + 2 + A

TARGET WEIGHT:	125 G	
PRODUCT: GROUND COFFEE		
SETPOINTS:		
1	0100	BULK CUTOFF
2	0125	TARGET WEIGHT
3	0125	UNDR TLERANCE
4	0127	OVER WEIGHT
SUBROUTINES:		
0	81	00
1	00	0F SET
2	50	00 LANE
3		GATE:
4	04	0F N/A
5	16	16 SET
6	80	00 HOPPER
7	08	01 GATE:
8	01	01 DOWN
9	50	00
F		
PROGRAM		1A
SET FOR (MODE)		g
BY (RESOLUTION)		1 g

5.4.D

18		28	
19		29	
1A	125g GROUND	2A	250g GROUND
1B		2B	

5.4.E

TARGET WEIGHT:	250 G	
PRODUCT: GROUND COFFEE		
SETPOINTS:		
1	0230	BULK CUTOFF
2	0250	TARGET WEIGHT
3	0249	UNDR TLERANCE
4	0252	OVER WEIGHT
SUBROUTINES:		
0	81	00
1	00	0F SET
2	50	00 LANE
3		GATE:
4	04	0F N/A
5	16	16 SET
6	80	00 HOPPER
7	08	01 GATE:
8	01	01 DOWN
9	50	00
F		
PROGRAM		2A
SET FOR (MODE)		g
BY (RESOLUTION)		1 g

5.4.F

Example

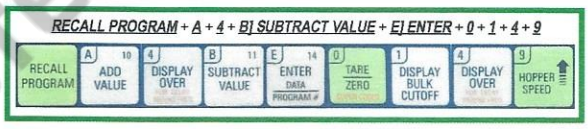
A 250g program from an existing 400g program (*Fig. # 5.4.G*).

1 New Program Location: **A2**

2 Target Weight Value Difference: 0399 (old) - 0250 (new) = 0149

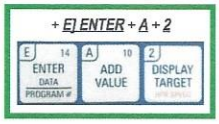
3 Apply **Subtract Value Command Sequence.**

RECALL PROGRAM + A + 4 + B] SUBTRACT VALUE + E] ENTER + 0 + 1 + 4 + 9



4 Save to new location:

+ E] ENTER + A + 2



5 Update your records, *Fig. # 5.4.H* & *5.4.I.*

TARGET WEIGHT:	400 G	
PRODUCT: COFFEE BEANS		
SETPOINTS:		
1	0370	BULK CUTOFF
2	0399	TARGET WEIGHT
3	0398	UNDR TLERANCE
4	0403	OVER WEIGHT
SUBROUTINES:		
0	80	00
1	00	0F SET
2	FF	FF LANE
3		GATE:
4	04	0F N/A
5	16	16 SET
6	80	00 HOPPER
7	12	01 GATE:
8	01	01 DOWN
9	50	00
F		
PROGRAM		A4
SET FOR (MODE)		g
BY (RESOLUTION)		1g

5.4.G

A0	
A1	
A2	250g BEANS
A3	
A4	400g BEANS
A5	

5.4.H

TARGET WEIGHT:	250 G	
PRODUCT: COFFEE BEANS		
SETPOINTS:		
1	0230	BULK CUTOFF
2	0250	TARGET WEIGHT
3	0249	UNDR TLERANCE
4	0252	OVER WEIGHT
SUBROUTINES:		
0	80	00
1	00	0F SET
2	FF	FF LANE
3		GATE:
4	04	0F N/A
5	16	16 SET
6	80	00 HOPPER
7	12	01 GATE:
8	01	01 DOWN
9	50	00
F		
PROGRAM		A2
SET FOR (MODE)		g
BY (RESOLUTION)		1g

5.4.I

Notice that program **A4** (*Fig. # 5.4.G*) has a value of 0399 in **Setpoint 2** though the program is for 400 g. Conversely **A2** (*Fig. # 5.4.I*) has corresponding values of 0250 and 250 g respectively.

This is done to account for product fall. While the feeder may cease when a program hits target there may still be product in transition. Therefore **Setpoint 2** may be set at a value less than the "true" target to mitigate overweights yet maintain speed. This strategy is applied in program **A4** yet not in **A2** because the potential weight of any product in transition for 250 g is negligible. You should consider the potential for overweights based on the true target and set your values accordingly.

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5.4 | To Make a New Program-Add/Subtract Value

Lastly, below are several things to consider when using the Add/Subtract Value approach when making a new program.

Notes

This method is best applied to weights within the same mode, i.e. ounces or grams.

Notice that the Setpoint Target Weight (D399) is not the same as the Program Name (400 G) or available Memory Location (A4).

Supervisor Codes may be embedded in programs requiring an Override Command before any changes can be attempted. Remember that these restrictions will be copied into any new programs created, see ***Sec. # 5.3***.

This approach works best for the same or like products with the same flow characteristics. If your products are different you can still use this method to begin creating a new program but you may need to make further modifications and adjustments to accomodate divergent flow characteristics.

Tips

For best results stay within +/- 25%

If you've misplaced your PDS you can always display the Setpoints individually, see ***Sec. # 5.2*** for instructions.

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5.5 | Scale Calibration

Before beginning locate a "Known Weight," something that you have independently verified as a specific weight. Most standard **ME109** units (shipped after 10/2014) come with a supplied Calibration Weight. If your system did not come with that or if you've misplaced it you can use anything which is convenient and verifiable. Make sure it is a minimum of 50% capacity and that you check the weight with a reliable table top scale (the more accurate the better) keeping track of the exact weight.

Prior to beginning the Calibration process designate an existing program with your desired mode and resolution, e.g. oz. by .01 or grams by 1.0 or lbs. by .01, etc.

Allow your system to warm up prior to begining this process, ≥ 15 minutes should suffice.

Let's walk through this process with an example.

9	50	00
F		
PROGRAM		04
SET FOR (MODE)		oz
BY (RESOLUTION)		.01 (1/100)

5.4.A

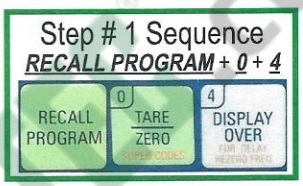
Example

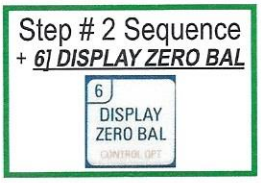
The calibration program we will use is **04**, it is in ounces, *Fig. # 5.5.A.*

The known weight we will use is 2.58 lbs.

Our program is in oz. so we must convert it for that mode, giving us 41.28 oz.

Note There are 16 oz in 1 lbs. so here you would multiply: 2.58 x 16 = 41.28.





1. Recall your calibration program, **04** in this case.
2. Display true (analog) Zero Balance

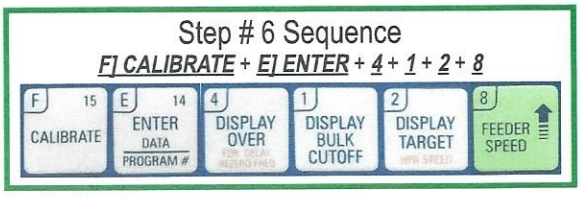
   This should be above +0100 for Calibration purposes as the scale will not display negative weight in the "gross" mode.
3. Adjust Zero Potentiometer if displayed value is not between 0100 and 1000

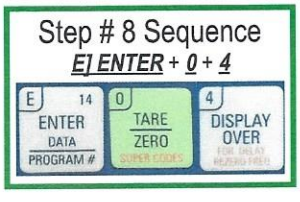
   Use a small flat head screwdriver and turn the small brass screw clockwise as needed until the displayed value falls within range.
4. Once in range put the scale in "Net" mode.
5. Place your known weight on/in the Weigh Bucket then re-calibrate the scale.
6. Gently enter the weight, using four digits, which you noted earlier: 41 28

   Wait until the scale has settled and stabilized to within ± 2 counts
7. Remove the weight, the display should return to 0 ± 2 counts
8. Save calibration to your program **04**

   The display should read STRP??
   If you do not see this press D + D to overide

5.5.B





Note Calibration will not be successful unless the same program is used as at the start.

Tips

When entering the weight during Calibration be as gentle as possible to minimize movement and vibration, the scale may register it and affect your calibration.

If you are going to use a household item or something in your shop bear in mind that it will need to sit in the weigh bucket without touching anything around it.

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6.1 | Speed & Flow

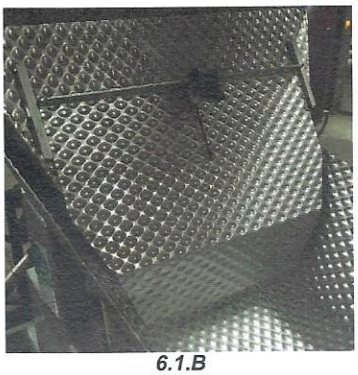
As already mentioned products that look the same do not always act the same and may have different flow characteristics.

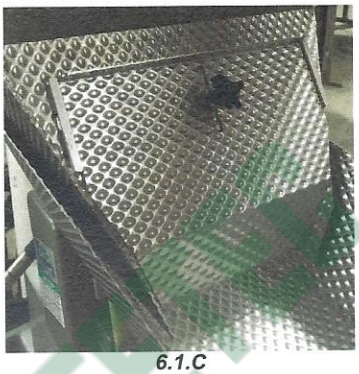
Products with different flow characteristics must be handled as such and may require both mechanical and electronic adjustments for optimal performance. What is good for one product may be very wrong for another.

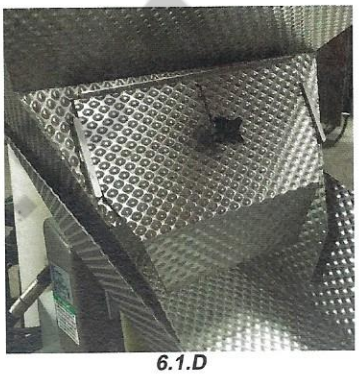
Hopper Gate

If you find the scale is not reacting as expected to a product you might first try adjusting the **Hopper Gate** setting.


6.1.A


6.1.B


6.1.C

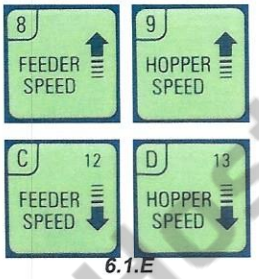

6.1.D

If the product is "bridging", becoming clogged at the Hopper output, you should raise the gate or remove it completely for bulky, fluffy products, *Fig. # 6.1.A* & *6.1.B*. Lower the gate as needed to restrict free flowing products, *Fig. 6.1.C* & *6.1.D*.

Removing the gate will cause control problems. Always keep the gate as low as practical for best control.

Feeder Speeds

Adjusting the **Feeder Speeds** will further control the flow of products that do not respond to the mechanical adjustments of the Hopper Gate. To adjust the feeder speeds use the Incremental Speed Controls, *Fig. # 6.1.E*.



6.1.E

The Incremental Speed Controls only affect operating mode therefore your scale must be running to register these adjustments. Remember that this approach is just temporary and the speeds will revert back to the stored setting once you exit Run mode.

To make permanent changes to a program's speeds you will need to adjust **Sub 3**, see ***Sec. # 5.1*** for instructions on changing subroutines.

Note When it comes to feeder speeds **+/ -** do not imply up and down respectively, it is actually reversed in this instance. **0** is as fast as possible and **9** slow with "**F**" set as off, essentially **+** to go slow and **-** to go fast.

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6.2 | Bucket Adjustments

It is very important for the Weigh Bucket to open and close properly. If, for example, the Bucket door opens too slowly product accrual may occur. While a slamming door could result in altered or inconsistent weights not to mention Load Cell damage.

There are four elements of bucket performance: mechanical force, door aperature, bucket duration & check delay.

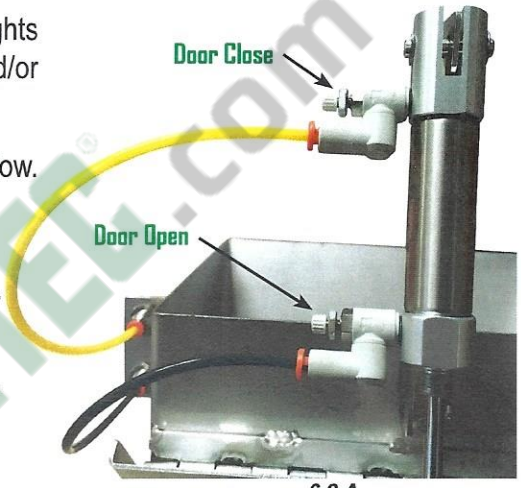
Mechanical Force

The physical force of the door's open/close action is determined by the amount of air supplied to the Bucket's Air Cylinder. This air supply is regulated by a pair of Flow Controls, *Fig. 6.2.A,* that maintain the force/speed of the door's open/close action.

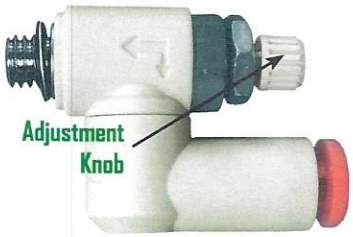
Too much air can interfere with the load cell producing weight spikes, altered weights and general inconsistencies. It may also result in damage to the Load Cell and/or Weigh Bucket as well as pose a hazard with potential for bodily injury.

Too little air may result in reduced system throughput, bridging and/or overflow.

Consider adjusting the flow controls if you experience:



6.2.A



6.2.B

Door open and/or close action is too slow or too fast.

Door is slamming open and/or closed.

Door failing to open or close after checking program.

Tip The more air the greater the force of the action.

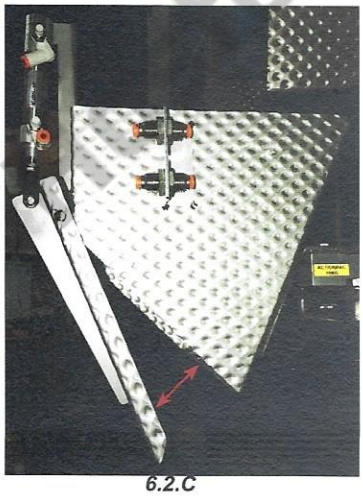
Note Btm Flow Control→Door Open
Top Flow Control→Door Close

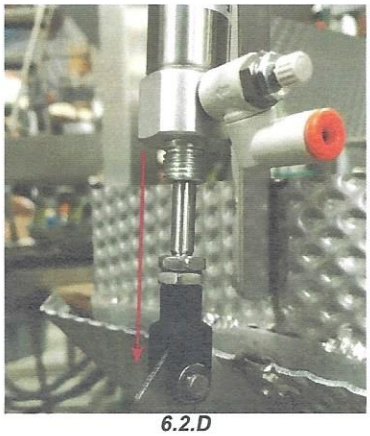
Door Aperature

The distance that the door opens is ultimately set at the time of production based on the product(s) for which the system is intended, *Fig. # 6.2.C*. There is however some room for adjustment with the Cylinder Clevis.

Adjust the cylinder clevis to moderate the Bucket Door aperature depending on your product requirements, *Fig. # 6.2.D.*

Set clevis position relative to cyliner rod length by using the threaded end, use the hex nuts to fix the position, *Fig. # 6.2.E.*


6.2.C


6.2.D


6.2.E

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6.2 | Bucket Adjustments

Bucket Duration

Bucket Duration is the length of time the door remains open and is set at **Sub 7**, refer to **Section # 5** for subroutine instructions.

Bucket Duration "time" is dictated by a two digit Hex value in the first and second positions.

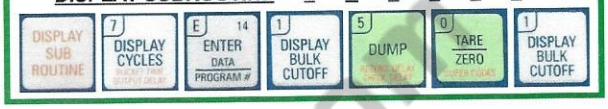
Value **10** = .8 Seconds — Shortest suggested Duration
Value **32** = 2 Seconds — Longest suggested Duration

Let's say **Sub 7** is set at **10 01**, an .8 second duration (value **10**), and you want to increase it slightly to a value of **15**.

Remember you need to preserve the last two digits so your new sub-routine value would be **15 01**.

Set Bucket Duration

DISPLAY SUBROUTINE + *7* + *E* + *1* + *5* + *0* + *1*



Check Delay

Check Delay is the time lapse between weighing completion and bucket door open, set at **Sub 5**.

In order to make sure the Bucket Door doesn't open prematurely you can set the lengthen of time between reaching the Target Weight and having the door open. This protects the cycle from weight disturbances resulting from inertia.

Tip Test Bucket performance without product in the scale to prevent mess and waste.

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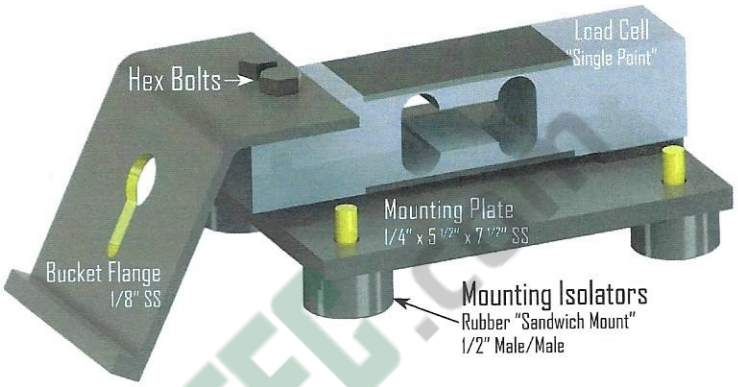
7.1 | Load Cell Info

Each load cell has 5 colored wires; each wire transmits a specific piece of information to the controller where they are combined to result in an output weight. For the Load Cell to communicate correctly with the controller and produce an accurately displayed reading the wires mustconnect to the appropriate terminal(s). These terminals are located on the Motherboard, *Fig 7.1.B*; Actionpac's standard controller wiring pattern for load cell inputs, as of January 2016, is set out in *Table II*.

Load Cell Wiring
Color Codes & Terminal Locations

+EXC	-SIG	+SIG	-EXC	GND
57	58	59	60	61
Red	White	Green	Black	Shield

Table II



7.1.A

While Actionpac might use red for **+EXC**, white for **–SIG**, green for **+SIG** and so on this is not necessarily the same color coding for all load cell manufacturers. One of the most common tech calls we get is the Load Cell "not working" more often than not this is a result of ill wiring.

If you are experiencing negatively displayed weights, all zeros when a load is applied, no displayed weight at all, etc. or if you have received a new Load Cell from either Actionpac or an alternate source and it doesn't work when you connect it then checking the wiring is the first course of action you should take.

How to Verify Wiring

A black wire is always **-EXC** and a bare wire (shield) is always **GND**.

Establish the pattern by locating the other three color wires.

Set your voltimeter to "RESISTANCE" (ohms signal)

Touch the Voltimeter's black lead to the Load Cell's black wire

With the black lead to the black wire touch the red lead to the red, green and white wires sequentially

4. The wire that reads the highest resistance is **+EXC**, note the color for your reference
5. Insert that wire into the **+EXC** terminal (#57) on the Motherboard
6. Insert the black wire into **-EXC** terminal and Shield (bare wire) into the **GND** terminal
7. Plug remaining two wires into the open terminals
8. Gently press down directly on the load cell, if the weight registers negatively swap the two wires for the correct terminal locations

Tip Note the correct color pattern of load cell for later reference

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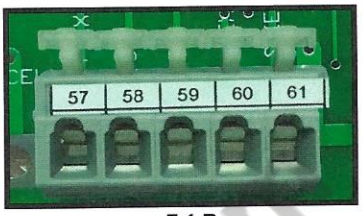
How to Check Voltage Input/Output

To check the DC voltage the Load Cell is recieveing and putting out you will need to locate the wiring terminals located on the Mother Board, *Fig. # 7.1.B*. You will also need a voltmeter to check the voltage.

Check Excitation Input

1. Remove wires from **+EXC** *(#57)* & **-EXC** *(#60)* terminals on the Motherboard.
2. Insert voltimeter leads into terminals, measure readings.
3. The voltage between them should be approximately 10-12 volts.



7.1.B

Check Load Cell Output

The DC millivots must be measured incrementally with increasing loads (known weights) applied directly to the Load Cell.

1. Remove Weigh Bucket and Mounting Flange from Load Cell.
2. Remove wires from **+SIG** *(#59)* & **-SIG** *(#58)* terminals on the Motherboard.
3. Measure the DC millivots between the two:

   5% on end of load cell should measure 1 mV
   10% on end of load cell should measure 2 mV
   50% on end of load cell should measure 10 mV
   ....100% on end of load cell should measure 20 mV

⚠ NO load should measure close to Zero.

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Actionpac's proprietary controls are based in Hex Code allowing more programming options and expands system capabilities.

Hex Codes [Base 16]

Numbers composed of two digits are expressed as a letter;.

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A (10), B (11), C (12), D (13), E (14), F (15)

Linear Sequence

If no Hex Codes are used for program memory, you will have 100 available locations, **000-009** (10 x 10 = 100).

If Hex Codes utilized 256 memory locations will be available, **000-0FF** (16 X16 = 256).

If controller is equipped with expanded memory 1024 locations possible, **000-3FF** (256 x 4 = 1024).

000, 001, 002, 003, 004, 005, 006, 007, 008, 009, 00A, 00B, 00C, 00D, 00E, 00F...
...010 (decimal 16), 011 (decimal 17), 012, 013, 014, 015, 016, 017, 018, 019, 01A, 01B, 01C, 01D, 01E, 01F...
...020, 021, 022, 023, 024...02A, 02B...02F...030, 031, 032...03C, 03D, 03E, 03F...090, 091, 092...09D, 09E, 09F...
0A0, 0A1, 0A2, 0A3, 0A4, 0A5, 0A6, 0A7, 0A8, 0A9, 0AA, 0AB, 0AC, 0AD, 0AE, 0AF....0F1, 0F2, 0F3, 0F4, 0F5, 0F6, 0F7, 0F8, 0F9, 0FA, 0FB, 0FC, 0FD, 0FE, 0FF.

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7.3 | Subroutine Assignments

SUB 0, **SUB 1** and **SUB 6** are used to maintain the control options for any given program such as Supervisor Codes, peripheral equipment options and other miscellaneous variables not associated with a specific numeric value.

Each digit position can be set to a particular Hex Code for the performance of certain functions. Below is a list of these functions with their corresponding Hex Codes and requisite digit position.

Digit Positions

MSD: Most Significant Digit
2MSD: 2nd Most Significant Digit
3MSD: 3rd Most Significant Digit
LSD: Least Significant Digit

SUB 0

Digit Pos.	Hex Code	Bit	Function	Default
MSD	8	F	No access to *EJ ENTER*	1
	4	E	No access to Incremental Speed Controls	0
	2	D	No access to Setpoints, Add/ Subtract	0
	1	C	No access to cycle count register	0
2MSD	8	B	Resolution/Count by "5"	1
	4	A	Resolution/Count by "2"	1
	2	9	1/2 piece offset	0
	1	8	Select alternate Zero Pot	0
3MSD	8	7	Internal Flag	0
	4	6	Internal Flag	
	2	5	Internal Flag	
	1	4	Internal Flag	
LSD	8	3	Internal Flag	0
	4	2	Internal Flag	0
	2	1	Internal Flag	0
	1	0	Internal Flag	0

Table III

SUB 1

Digit Pos.	Hex Code	Function	Default	Comments
MSD	0-F	Peripheral Out Freq	0	0 or 1 Periph. Out on every weighment
2MSD	0-F	SP1 Check Delay	0	Undersized Load Dribble
3MSD	0-F	Future	0	
LSD	0-F	Zero Verify Tolerance	F	# of Raw Counts (+/-) Trigger

Table IV

SUB 6

Digit Pos.	Hex Code	Bit	Function	Default	Comments
MSD	8	F	Soft Restart Enable	0	
	4	E	Future	0	
	2	D	Allow "under" (chw)	0	
	1	C	Enable Audible Alarm	0	Zero Verify Default Alarm
2MSD	8	B	Future	0	
	4	A	Enable & Print Format	0	For A&D Analytical Only
	2	9	No Print on Over	0	
	1	8	Enable Print Output	0	Seq #, 4 digit weight, "*" for Over
3MSD	8	7	Auto Taper Enable	0	
	4	6	Peripheral out during Ready	0	
	2	5	Peripheral out during Bucket	0	Leading Edge Bucket Signal
	1	4	No peripheral out when Over	0	
LSD	8	3	Future	0	
	4	2	Delay Bucket for Reject	0	
	2	1	Soft Start	0	
	1	0	Zero Verify	0	

Table V

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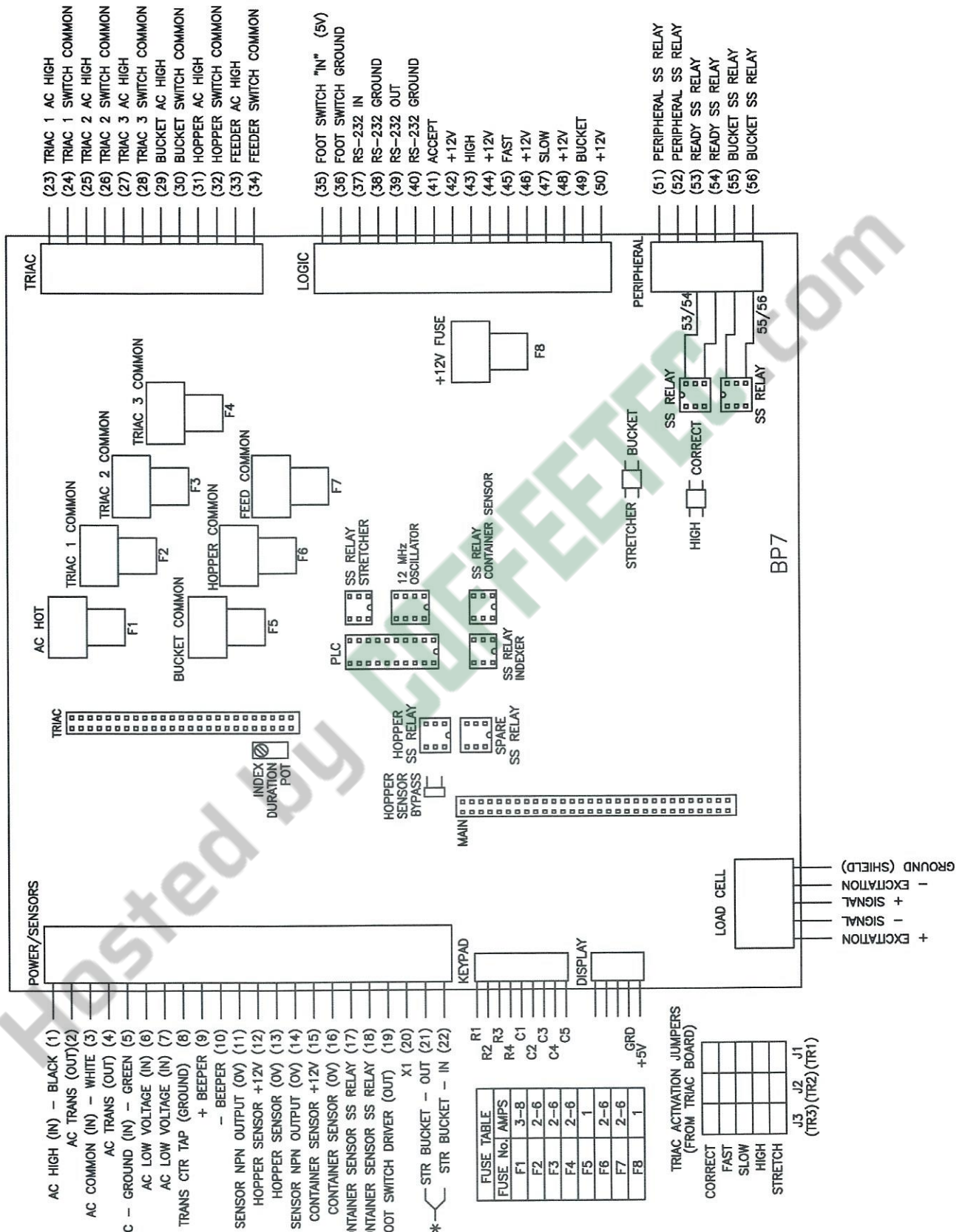

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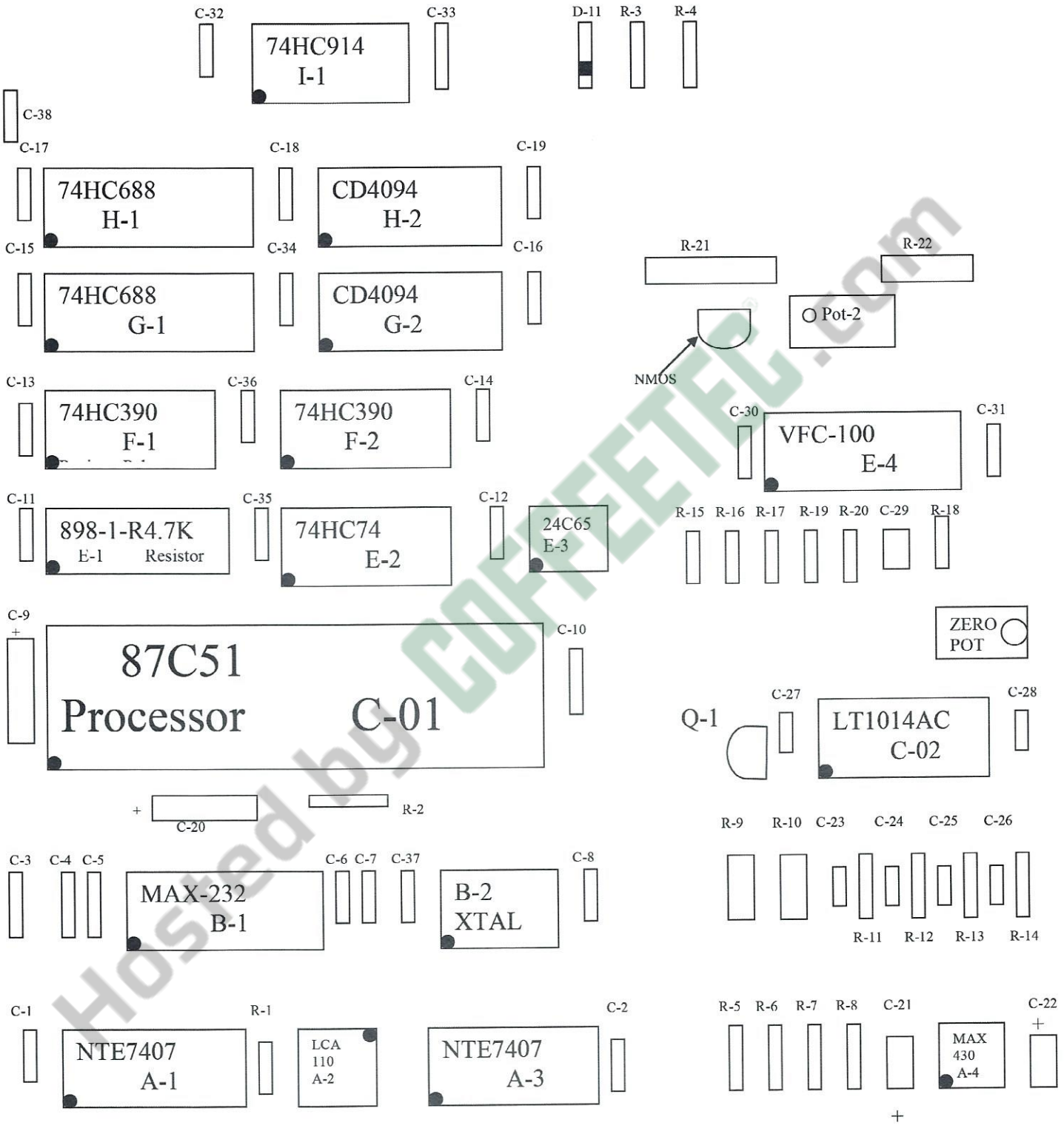

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Main Board | Major Component Functions

I-1	Buffer/Driver, affects display, foot pedal, feeder speed, memory retention
H-1	Feeder Speed Control, affects feeder speed
H-2	Feeder Speed Control affects feeder speed
G-1	Feeder Speed Control affects feeder speed
G-2	Feeder Speed Control affects feeder speed
F-1	Hopper Speed Control affects hopper speed
F-2	Hopper Speed Control affects hopper speed
E-1	Resistor Pack, pulls up resistors, affects foot pedal, lamp and peripheral outputs, memory retention, and displayed information
E-2	Feeder Speed Control affects feeder speed, load cell amplification
E-3	Program Memory affects retention of data
E-4	Analog to Frequency Converter, affects stability and accuracy of weight Measurement
C-01	CPU affects all functions
C-02	Linear Amplifier affects stability and accuracy of weight measurement
B-1	Serial Interface, affects communication between multi-head units and Ancillary units such as printers
B-2	Crystal, system master clock, affects all functions
A-1	Lamp and Peripheral Driver, affects lamps and related lamp functions
A-2	Opto-coupler, affects peripheral output contact closure (baggers, etc.)
A-3	Lamp and Peripheral Driver, affects lamps and related lamp functions
A-4	Linear Amp affects gain, accuracy and stability of weight measurements
Zero Pot	Sets true zero, affects stability and accuracy of weight measurements

Table Vi

Main Board | Minor Component Values

Capacitors

C1	.1uF	**C20**	10uF
C2	.1uF	**C21**	4.7uF
C3	.1uF	**C22**	4.7uF
C4	.33uF	**C23**	.47uF
C5	.33uF	**C24**	.33uF
C6	.33uF	**C25**	.47uF
C7	.33uF	**C26**	.33uF
C8	.33uf	**C27**	.1uF
C9	10uf	**C28**	.1uF
C10	.1uF	**C29**	2200pF
C11	.1uF	**C30**	.1uF
C12	.1uF	**C31**	.1uF
C13	.1uF	**C32**	.1uF
C14	.1uF	**C33**	.1uF
C15	.1uF	**C34**	.1uF
C16	.1uF	**C35**	.1uF
C17	.1uF	**C36**	.1uF
C18	.1uF	**C37**	.1uF
C19	.1uF	**C38**	.33uF

Table Vii

Resistors Values

OHMS(1%, 1/4 WATT)

R1	100	**R16**	10K
R2	10K	**R17**	10K
R3	33K	**R18**	3.99K
R4	33K	**Zero Pot**	20K, 20 TURN CERMET
R5	100	**R19**	10K
R6	100	**R20**	10K
R7	10K	**R21**	4.7K
R8	51.1K	**R22**	4.99K
R9	2.5-4.0 *(Reset Fuse)*	**Pot 2**	100K
R10	2.5-4.0 *(Reset Fuse)*	**MMOS**	ECG490
R11	18.2K	**Q-1**	2N4401
R12	46.4K	**D11**	5.1 V Zener diode 1N-751A
R13	30K	**D12**	1N914
R14	35.7K	**D13**	1N914
R15	47		

Table Viii

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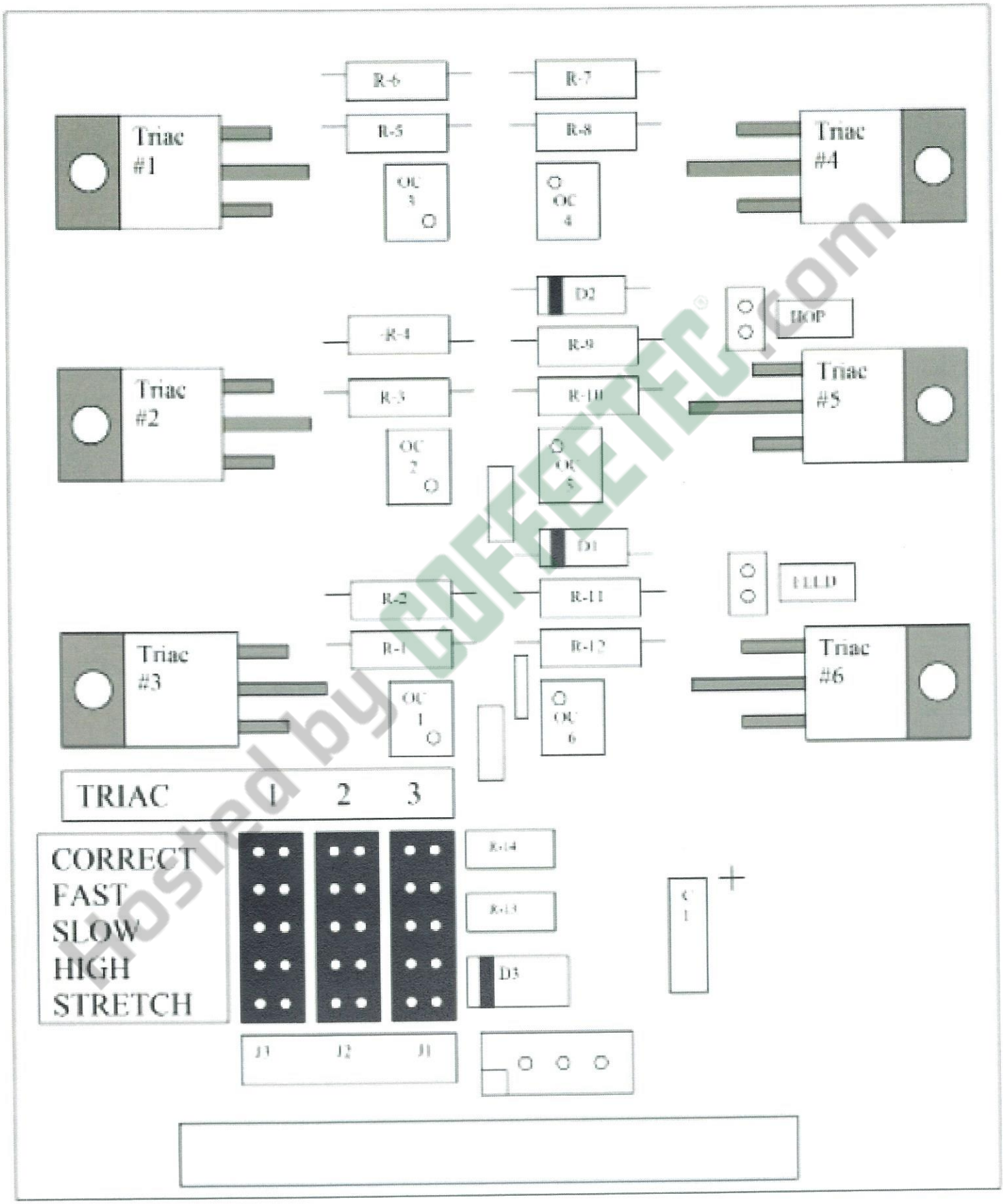

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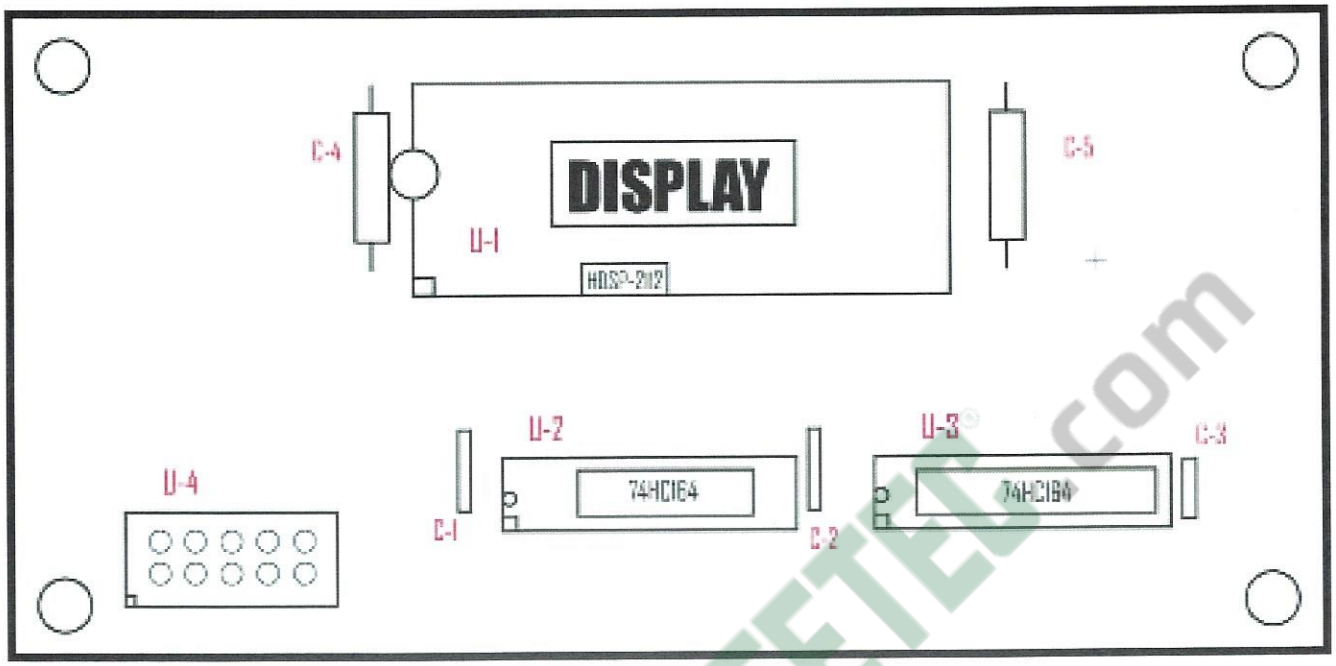

Display Board | Component Functions

U-1 Display *(shows data)*
U-2 Display Driver *(affects displayed data)*
U-3 Display Driver *(affects displayed data)*

Table IX

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Read the Mass Unit Conversion Chart horizontally.

Mass Unit Conversion Chart

TROY				AVOIRDUPOIS			METRIC					TROY				AVOIR		METRIC				
1 POUND	1 OUNCE	WEIGHT	1 GRAIN	1 TON	1 POUND	1 OUNCE	1 TON	1 KILOGRAM	1 GRAM	1 MILLIGRAM	1 CARAT	1 POINT		POUND	OUNCE	DWT.	GRAIN	TON	POUND	OUNCE	TON	KILOGRAM	GRAM	MILLIGRAM	CARAT	POINT
EQUALS	EQUALS	EQUALS	EQUALS	EQUALS	EQUALS	EQUALS	EQUALS	EQUALS	EQUALS	EQUALS	EQUALS	EQUALS														
-	0.083333	0.004167	0.000174	2430.56	1.21528	0.075955	2679.23	2.67923	0.002679	-	0.0053	-		-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	0.05	0.002208	-	14.5833	0.911458	32150.8	32.1508	0.032151	0.000032	0.00643	-		12	-	-	-	-	-	-	-	-	-	-	-	-
240	20	-	0.041667	-	291.667	18.229	-	643.015	0.643015	0.000643	0.128603	0.001286		240	20	-	-	-	-	-	-	-	-	-	-	-
5760	480	24	-	-	7000	437.5	-	15321.4	15.4324	0.015432	3.08648	0.03865		5760	480	24	-	-	-	-	-	-	-	-	-	-
0.000411	-	-	-	-	0.0005	0.000031	1.10231	0.001023	-	-	-	-		0.000411	-	-	-	-	-	-	-	-	-	-	-	-
0.822857	0.068571	0.003429	0.000143	2000	-	0.0625	2204.62	2.20462	0.002246	-	-	-		0.822857	0.068571	0.003429	0.000143	2000	-	0.0625	-	-	-	-	-	-
13.1657	1.09714	0.054857	0.002286	3200	16	-	35273.9	35.2739	0.035274	0.000034	0.007055	0.000071		13.1657	1.09714	0.054857	0.002286	3200	16	-	-	-	-	-	-	-
0.00373	-	-	-	0.907185	0.000454	-	-	0.001	-	-	-	-		0.00373	-	-	-	0.907185	0.000454	-	-	-	-	-	-	-
0.373242	0.031104	0.001552	0.000065	907.185	0.453592	0.028352	1000	-	0.001	-	-	-		0.373242	0.031104	0.001552	0.000065	907.185	0.453592	0.028352	1000	-	0.001	-	-	-
373.242	31.1034	1.5517	0.064799	-	453.592	28.3495	1 MILLION	1000	-	0.001	0.2	0.002		373.242	31.1034	1.5517	0.064799	-	453.592	28.3495	1 MILLION	1000	-	0.001	0.2	0.002
373242	31103.5	1555.17	64.7989	-	-	283495	-	1 MILLION	1000	-	200	2		373242	31103.5	1555.17	64.7989	-	-	283495	-	1 MILLION	1000	-	200	2
1866.21	155.517	7.7759	0.323995	-	-	141.748	-	5000	5	0.005	-	0.01		1866.21	155.517	7.7759	0.323995	-	-	141.748	-	5000	5	0.005	-	0.01
186621	15551.7	777.59	32.3995	-	-	-	-	-	500	0.5	100	-		186621	15551.7	777.59	32.3995	-	-	-	-	-	500	0.5	100	-

Table X

Quick Conversion Reference

1 lbs.	=	16 oz.
1 Kg	=	2.204 lbs.
1 Kg	=	1,000 g
1 oz.	=	28.3495 g
1 g	=	.001 Kg
1 g	=	100 cg
1 cg	=	.01 g
1 g	=	1,000 mg
1 mg	=	.001 g

Abbreviations

Pounds	=	lbs.
Ounces	=	oz.
Kilograms	=	Kg
Grams	=	g
Milligrams	=	mg
Centigram	=	cg

Definitions

Avoirdupois: American & English system of weights based on a pound of 16 oz.

Troy Weight: Used for gold, silver and other precious metals.
Based on 12 troy ounces to the troy pound.

Metric: A decimal system in which the gram *(.0022046 pound)* is the basic unit.
Prefixed:

deca-10, hecto-100, kilo -1000,
deci-1/10, centi-1/100, milli-1/1000.

Grain: Same for Avoirdupois, Troy & Apothecary
(pharmaceuticals, not shown)

Carat: A unit of weight for precious stones.
Equal to 200 mg, weight of 4 grains.
(from the Arabic "girat" meaning pod, husk)

Point: Basic unit of weight for precious stones equal to 1/100 carat.

Example

To convert from one unit to another, multiply known units *(top of chart)* by the appropriate factor *(right of chart)*.

1.75 lbs. AVOIR *(known)* **X** 453.592 *(from chart)* = 793.79 g METRIC

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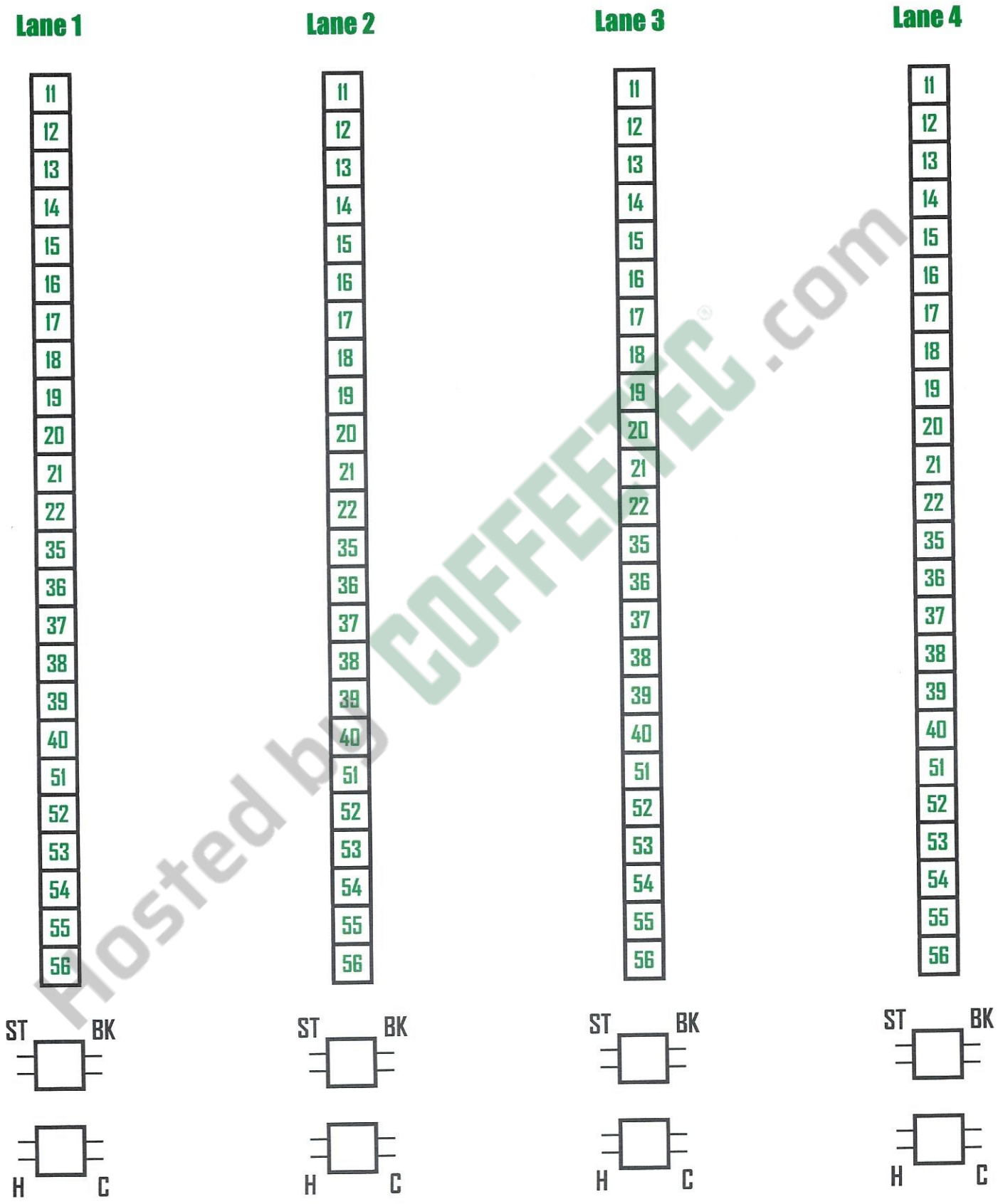

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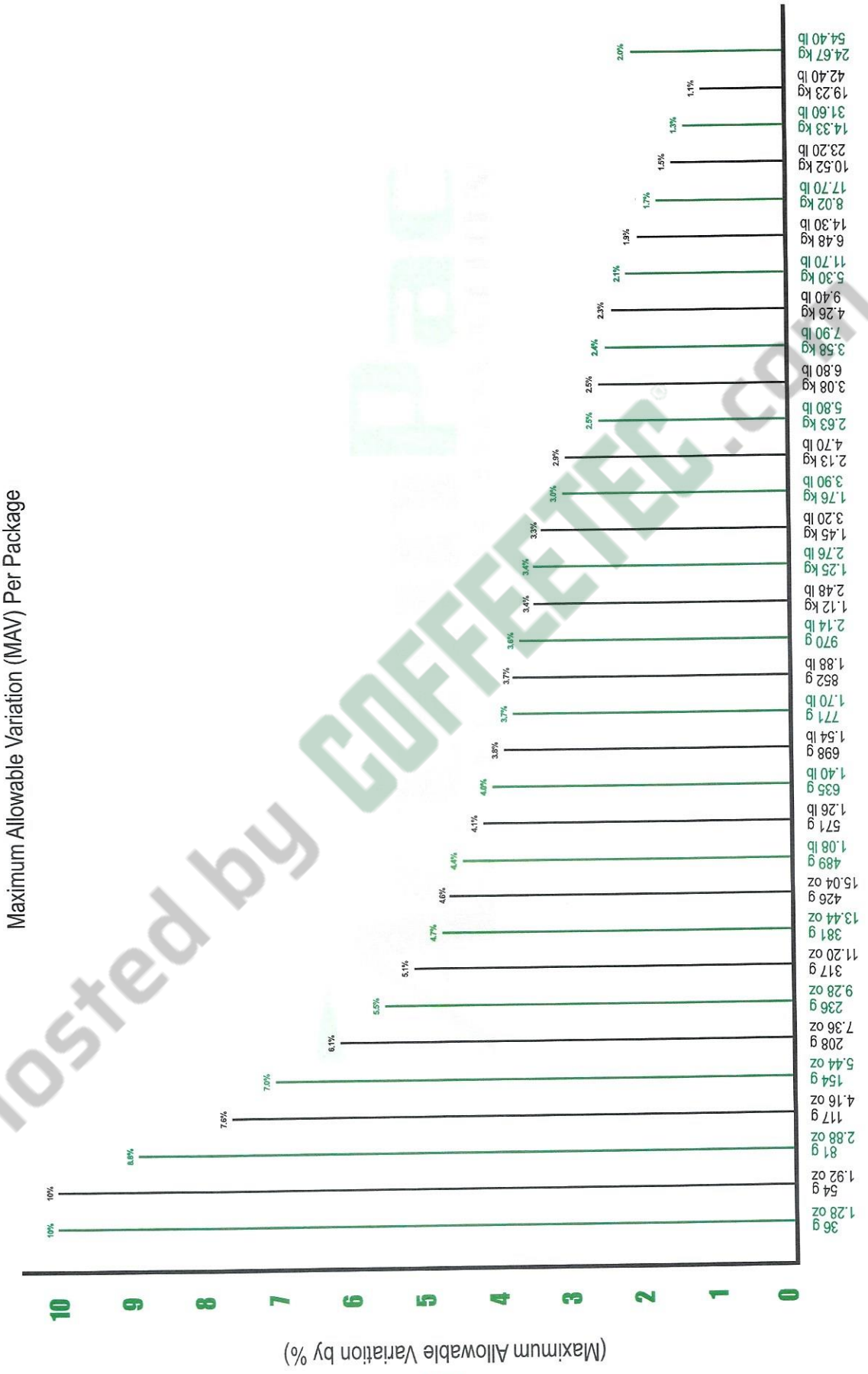

Note: Average Lot Error MAV is now Zero (Average Net Weigh Error Tolerance)

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00		10		20		30	
01		11		21		31	
02		12		22		32	
03		13		23		33	
04		14		24		34	
05		15		25		35	
06		16		26		36	
07		17		27		37	
08		18		28		38	
09		19		29		39	
0A		1A		2A		3A	
0B		1B		2B		3B	
0C		1C		2C		3C	
0D		1D		2D		3D	
0E		1E		2E		3E	
0F		1F		2F		3F	

40		50		60		70	
41		51		61		71	
42		52		62		72	
43		53		63		73	
44		54		64		74	
45		55		65		75	
46		56		66		76	
47		57		67		77	
48		58		68		78	
49		59		69		79	
4A		5A		6A		7A	
4B		5B		6B		7B	
4C		5C		6C		7C	
4D		5D		6D		7D	
4E		5E		6E		7E	
4F		5F		6F		7F	

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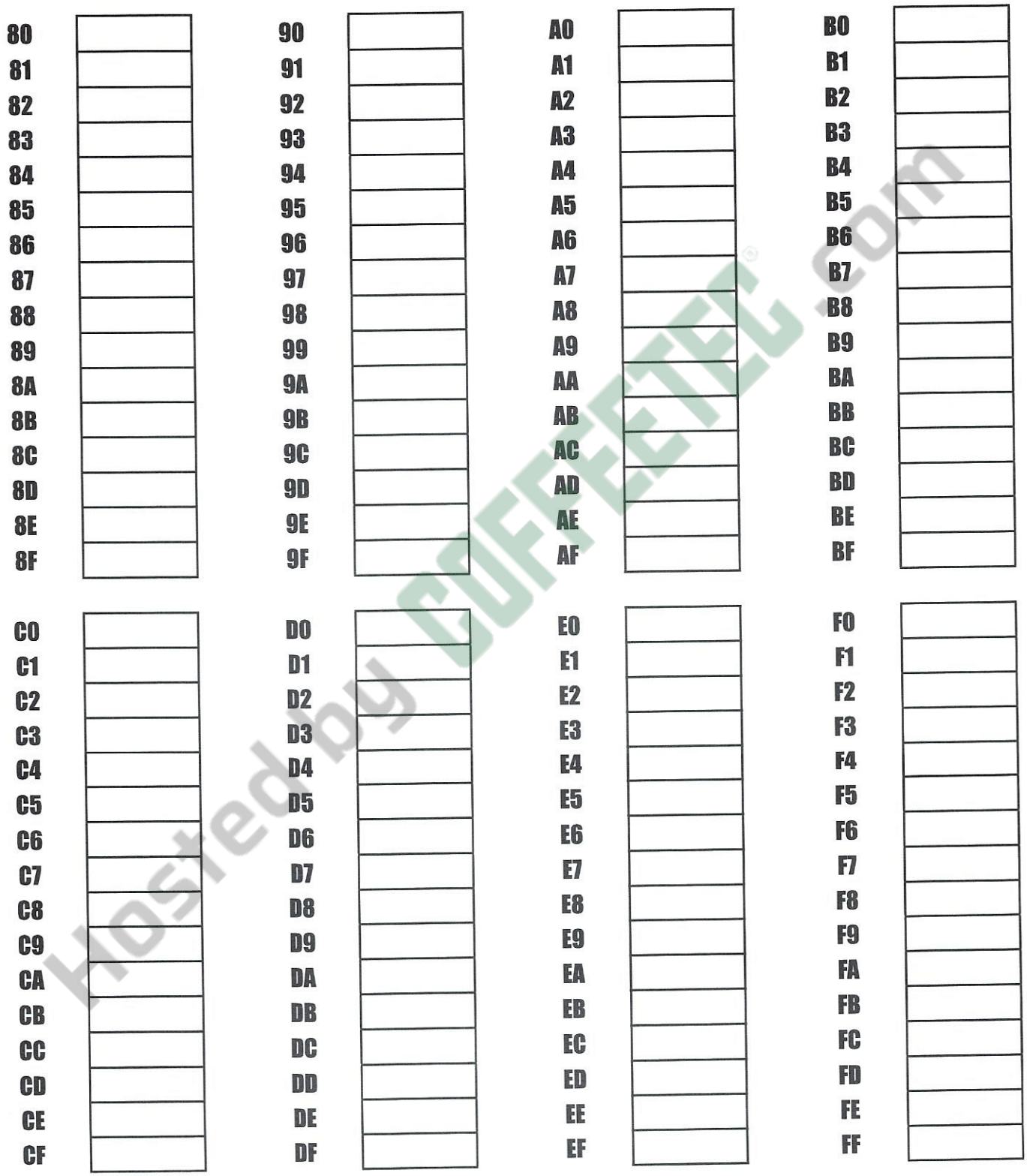

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TARGET WEIGHT: _____ PRODUCT: SETPOINTS: 1 _____ BULK CUTOFF 2 _____ TARGET WEIGHT 3 _____ UNDR TLERANCE 4 _____ OVER WEIGHT SUBROUTINES: 0 _____ _____ 1 _____ _____ SET 2 _____ _____ LANE 3 _____ _____ GATE: 4 _____ _____ _____ 5 _____ _____ SET 6 _____ _____ HOPPER 7 _____ _____ GATE: 8 _____ _____ _____ 9 _____ _____ F _____ _____ PROGRAM _____ SET FOR (MODE) _____ BY (RESOLUTION) _____	TARGET WEIGHT: _____ PRODUCT: SETPOINTS: 1 _____ BULK CUTOFF 2 _____ TARGET WEIGHT 3 _____ UNDR TLERANCE 4 _____ OVER WEIGHT SUBROUTINES: 0 _____ _____ 1 _____ _____ SET 2 _____ _____ 3 _____ _____ GATE: 4 _____ _____ _____ 5 _____ _____ SET 6 _____ _____ HOPPER 7 _____ _____ GATE: 8 _____ _____ _____ 9 _____ _____ F _____ _____ PROGRAM _____ SET FOR (MODE) _____ BY (RESOLUTION) _____	TARGET WEIGHT: _____ PRODUCT: SETPOINTS: 1 _____ BULK CUTOFF 2 _____ TARGET WEIGHT 3 _____ UNDR TLERANCE 4 _____ OVER WEIGHT SUBROUTINES: 0 _____ _____ 1 _____ _____ SET 2 _____ _____ LANE 3 _____ _____ GATE: 4 _____ _____ _____ 5 _____ _____ SET 6 _____ _____ HOPPER 7 _____ _____ GATE: 8 _____ _____ _____ 9 _____ _____ F _____ _____ PROGRAM _____ SET FOR (MODE) _____ BY (RESOLUTION) _____
TARGET WEIGHT: _____ PRODUCT: SETPOINTS: 1 _____ BULK CUTOFF 2 _____ TARGET WEIGHT 3 _____ UNDR TLERANCE 4 _____ OVER WEIGHT SUBROUTINES: 0 _____ _____ 1 _____ _____ SET 2 _____ _____ LANE 3 _____ _____ GATE: 4 _____ _____ _____ 5 _____ _____ SET 6 _____ _____ HOPPER 7 _____ _____ GATE: 8 _____ _____ _____ 9 _____ _____ F _____ _____ PROGRAM _____ SET FOR (MODE) _____ BY (RESOLUTION) _____	TARGET WEIGHT: _____ PRODUCT: SETPOINTS: 1 _____ BULK CUTOFF 2 _____ TARGET WEIGHT 3 _____ UNDR TLERANCE 4 _____ OVER WEIGHT SUBROUTINES: 0 _____ _____ 1 _____ _____ SET 2 _____ _____ LANE 3 _____ _____ GATE: 4 _____ _____ _____ 5 _____ _____ SET 6 _____ _____ HOPPER 7 _____ _____ GATE: 8 _____ _____ _____ 9 _____ _____ F _____ _____ PROGRAM _____ SET FOR (MODE) _____ BY (RESOLUTION) _____	TARGET WEIGHT: _____ PRODUCT: SETPOINTS: 1 _____ BULK CUTOFF 2 _____ TARGET WEIGHT 3 _____ UNDR TLERANCE 4 _____ OVER WEIGHT SUBROUTINES: 0 _____ _____ 1 _____ _____ SET 2 _____ _____ LANE 3 _____ _____ GATE: 4 _____ _____ _____ 5 _____ _____ SET 6 _____ _____ HOPPER 7 _____ _____ GATE: 8 _____ _____ _____ 9 _____ _____ F _____ _____ PROGRAM _____ SET FOR (MODE) _____ BY (RESOLUTION) _____

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TARGET WEIGHT: _____	TARGET WEIGHT: _____	TARGET WEIGHT: _____
PRODUCT:	PRODUCT:	PRODUCT:
SETPOINTS:	SETPOINTS:	SETPOINTS:
1 _____ BULK CUTOFF	1 _____ BULK CUTOFF	1 _____ BULK CUTOFF
2 _____ TARGET WEIGHT	2 _____ TARGET WEIGHT	2 _____ TARGET WEIGHT
3 _____ UNDR TLERANCE	3 _____ UNDR TLERANCE	3 _____ UNDR TLERANCE
4 _____ OVER WEIGHT	4 _____ OVER WEIGHT	4 _____ OVER WEIGHT
SUBROUTINES:	SUBROUTINES:	SUBROUTINES:
0 _____ _____	0 _____ _____	0 _____ _____
1 _____ _____ SET	1 _____ _____ SET	1 _____ _____ SET
2 _____ _____ LANE	2 _____ _____	2 _____ _____ LANE
3 _____ _____ GATE:	3 _____ _____ GATE:	3 _____ _____ GATE:
4 _____ _____ _____	4 _____ _____ _____	4 _____ _____ _____
5 _____ _____ SET	5 _____ _____ SET	5 _____ _____ SET
6 _____ _____ HOPPER	6 _____ _____ HOPPER	6 _____ _____ HOPPER
7 _____ _____ GATE:	7 _____ _____ GATE:	7 _____ _____ GATE:
8 _____ _____ _____	8 _____ _____ _____	8 _____ _____ _____
9 _____ _____	9 _____ _____	9 _____ _____
F _____ _____	F _____ _____	F _____ _____
PROGRAM _____	PROGRAM _____	PROGRAM _____
SET FOR (MODE) _____	SET FOR (MODE) _____	SET FOR (MODE) _____
BY (RESOLUTION) _____	BY (RESOLUTION) _____	BY (RESOLUTION) _____
TARGET WEIGHT: _____	TARGET WEIGHT: _____	TARGET WEIGHT: _____
PRODUCT:	PRODUCT:	PRODUCT:
SETPOINTS:	SETPOINTS:	SETPOINTS:
1 _____ BULK CUTOFF	1 _____ BULK CUTOFF	1 _____ BULK CUTOFF
2 _____ TARGET WEIGHT	2 _____ TARGET WEIGHT	2 _____ TARGET WEIGHT
3 _____ UNDR TLERANCE	3 _____ UNDR TLERANCE	3 _____ UNDR TLERANCE
4 _____ OVER WEIGHT	4 _____ OVER WEIGHT	4 _____ OVER WEIGHT
SUBROUTINES:	SUBROUTINES:	SUBROUTINES:
0 _____ _____	0 _____ _____	0 _____
1 _____ _____ SET	1 _____ _____ SET	1 _____ _____ SET
2 _____ _____ LANE	2 _____ _____ LANE	2 _____ _____ LANE
3 _____ _____ GATE:	3 _____ _____ GATE:	3 _____ _____ GATE:
4 _____ _____ _____	4 _____ _____ _____	4 _____ _____ _____
5 _____ _____ SET	5 _____ _____ SET	5 _____ _____ SET
6 _____ _____ HOPPER	6 _____ _____ HOPPER	6 _____ _____ HOPPER
7 _____ _____ GATE:	7 _____ _____ GATE:	7 _____ _____ GATE:
8 _____ _____ _____	8 _____ _____ _____	8 _____ _____ _____
9 _____ _____	9 _____ _____	9 _____ _____
F _____ _____	F _____ _____	F _____ _____
PROGRAM _____	PROGRAM _____	PROGRAM _____
SET FOR (MODE) _____	SET FOR (MODE) _____	SET FOR (MODE) _____
BY (RESOLUTION)	BY (RESOLUTION)	BY (RESOLUTION)

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