

#350020 EWM Electronic Weigh Meter

**Includes 313340 Display Box
and 350015 Flo-Meter
(without Butterfat Sampler)**

- **Compact**
- **Clean-In-Place**
- **Adaptable to Most Parlors**

The Universal solid state Electronic Weigh Meter, EWM, is the answer for today's and future weighing of milk production. With the EWM, there is no more wasted space of large weigh jars, no more fear of breaking glass and no more time-consuming, manual releasing of milk from the jar.

This simple and easy to use weighing device is adaptable to most parlors.

How it Works

The Electronic Weigh Meter is composed of two assemblies. The first assembly is a flow head assembly which is connected to the pipeline and through which the milk from the cow passes on route to the pipeline. The second assembly is a computerized electronic module which processes the flow data from the flow head and displays the result in the correct numeric value.

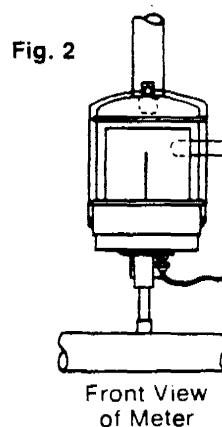
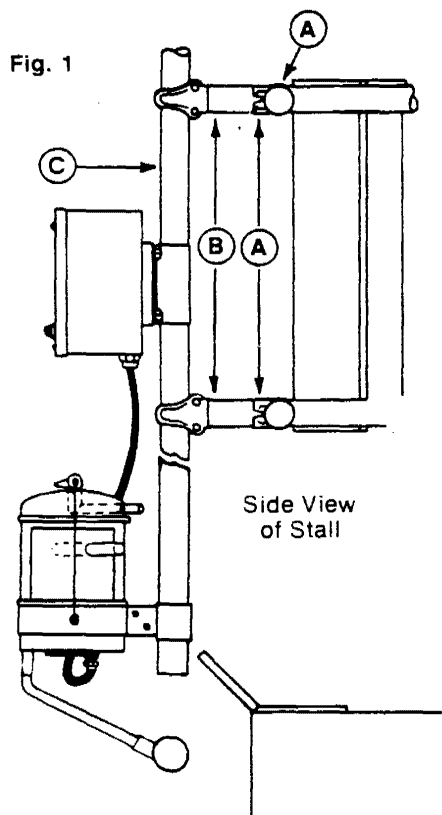
The milk flow head assembly is an electro-mechanical transducer which outputs a variable width on going pulse that is directly proportional to the mass of the fluid passing through the meter at any given time. These pulses, commonly referred to as windows, occur ten times a second and are passed to the electronic module for processing.

Processing of the window pulse in the electronic module is accomplished by counting the computer generated reference pulses which occur during the window pulse time, subtracting out the zero reset pulses, and then dividing this number by a calibration number to obtain the correct units (lbs. or kgs). This process is repeated ten times a second and continues until the unit is reset again.

Installation Instructions

Low Line Milking

Tee clamps and support posts are not included with the EWM and must be ordered separately. An optional 313333 mounting kit can be used. This included (4) 710448 tee clamps and 2 extension pipes.



1. Fasten a 710448 two-bolt tee clamp into the upper and lower rails on the stall (See A, Fig. 1) preferably close to the outer bend radius for S-rail parlors. Install 1/4" support tubes, approximately 4" in length, in tee clamps on S-rail and tighten. (See B, Fig. 1) Position and fasten two more two-bolt tee clamps to each of these support tubes. Cut a piece of 1/4" pipe approximately 54" long. This vertical support post is positioned in the tee clamps on the end of the horizontal support post. (See C, Fig. 1) and secured.
2. Attach the 350015 EWM Flo-Meter in a level position to the bottom of the vertical support post as illustrated in Fig. 2.
3. Position Flo-Meter base so outlet is towards the center of the parlor.
4. Once positioned, tighten the two bolts closest to the support tube first. The two bolts closest to the meter should only be tightened slightly.

IMPORTANT: The Flo-Meter must be installed in a level position, the base of the Flo-Meter is already pre-sloped towards the outlet tube.

5. Attach a 5/8" milk hose, cut to required length, from the bottom outlet nipple of the Flo-Meter to a milk inlet nipple on the milk line. (Figs. 1 and 2) Be sure this hose does not have a loop or kink in it. It is important that this milk hose run in a downward position to the milk line on both low line and high line milking operations.
 6. Remove cover and body of Flo-Meter. Position the impeller on the pin located in the center of the base (see illustrated parts drawing). Replace the body. The impeller rod must fit into the impeller rod support at the top of the meter. The support may be lifted slightly to accommodate the rod of the impeller. Do not bend the rod when inserting. Be sure impeller slides freely in rod support.
 7. With the meter body securely seated in the gasket and the impeller in position, the body may be turned to accommodate the milker unit hose.
 8. Replace the Flo-Meter cover. Position the cover with the water inlet nipple in the direction of the C.I.P. wash line. Secure the meter assembly together with the bail and cam.
- IMPORTANT:** Be sure Flo-Meter body and cover are seated properly into gaskets before securing clamp.
9. The use of a radial arm or tension hanger is highly recommended.
 10. The EWM control box may be mounted on the vertical support post, for which a half clamp is provided. (Fig. 1)

Installation Instructions

High Line Milking

1. It is essential that the EWM Flo-meter be mounted above the milk line (Fig. 3) in a level position.
- IMPORTANT:** Meter should not be mounted over 7' above the milking platform to insure correct operation.
2. Using tee clamps and support posts, mount the Flo-Meter as shown in Figs. 1 and 2.
 3. Follow directions for installation of EWM control box and Flo-Meter for low line milking.
 4. Turn the pipe so the milk inlet nipples of the milk line are pointing straight up. Cut a piece of 5/8" milk hose and attach to the bottom outlet nipple of the Flo-Meter and the milk inlet nipple on the pipeline. Be sure there are no loops or kinks in this hose.

- The EWM control box may be mounted to a support post as described for low level milking, or it may be attached to the S-rail or any other convenient location.

IMPORTANT: Secure the milker unit hose before attaching to the side inlet on the Flo-Meter. This will help eliminate stress to the meter body while milking.

Washing After Milking:

- The EWM may be cleaned-in-place with a few simple adjustments. Place milker units in C.I.P. unit washers. Leave the milker unit hose hooked up to the Flo-Meter.
- Cut a piece of $\frac{5}{8}$ " milk hose 2" to 3" in length and attach to water inlet on cover. (See A, Fig. 3) Attach the 711012 valve, included, to the end of the hose. (See B, Fig. 3) Splice in the 256946 plastic tee in an appropriate location between the 711012 valve and the C.I.P. unit washer. (See C, Fig. 3) With another piece of hose, connect the plastic tee and the valve.

- Open 711012 valve for washing.
- If C.I.P. washer is not used, install a clamp-on-nipple on the underside of a sanitary wash line to the immediate right of the Flo-Meter. (See A, Fig. 4) Attach to the nipple a $\frac{5}{8}$ " ID hose of sufficient length to reach milk inlet on Flo-Meter. (See B, Fig. 4)
- Install the 711012 valve and 256946 plastic tee in this line as described above. (See C, Fig. 4)
- Open 711012 valve for washing and connect line D to milk inlet of Meter. (Fig. 4)
- Insert a 420530 plug in end of hose while milking. (See D, Fig. 4)
- For high line washing, see Figs. 5 and 6.

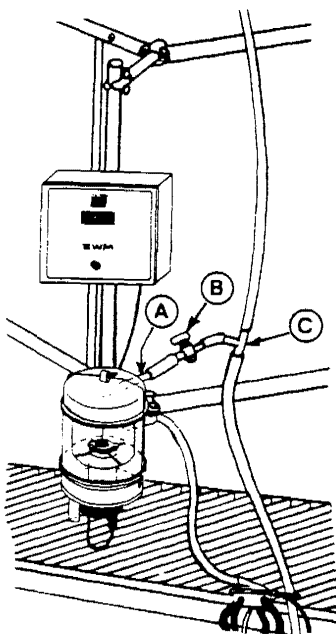


Fig. 3

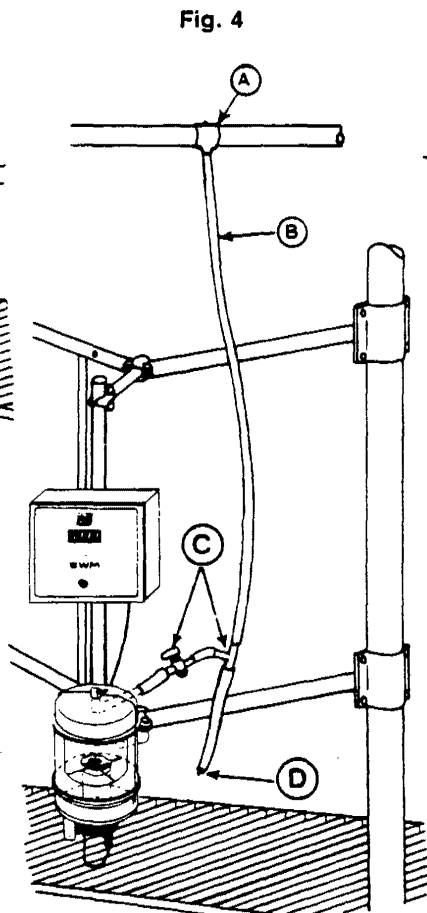


Fig. 4

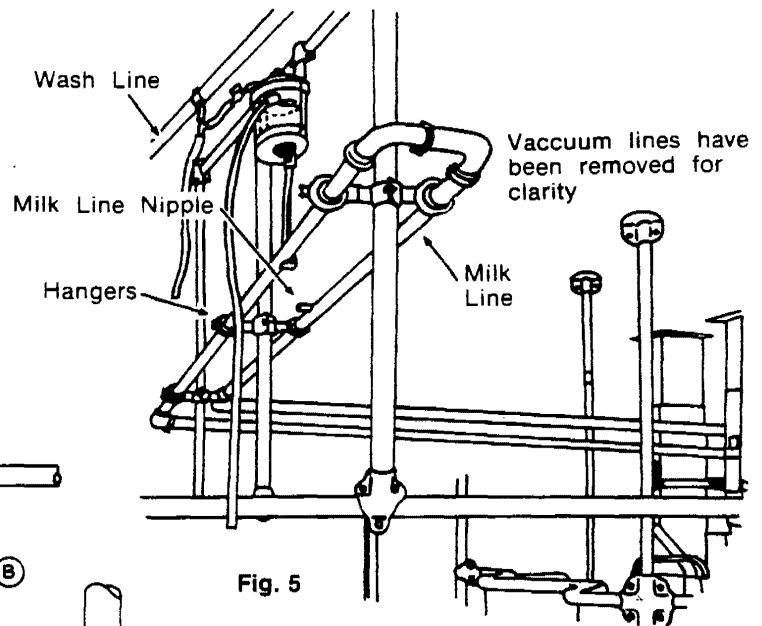


Fig. 5

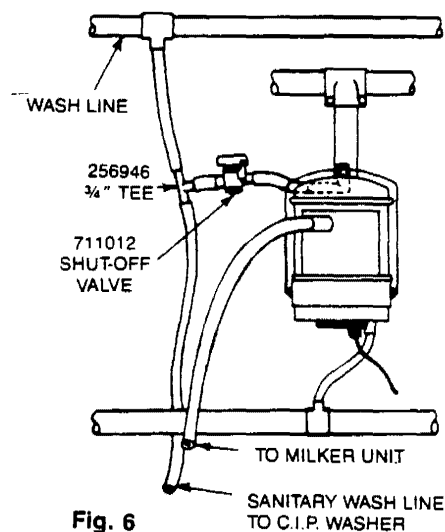


Fig. 6

Electrical Installation

1. Place meter cable through right hand cord grip in bottom of control box. Insert wires from meter cable into pin connector according to Fig. 7 and 8. Use a small screwdriver to secure wires into place. Note each wire except the red is paired with a black. Be sure to secure the properly paired black wire in the correct position.
2. Run 412369 electrical cord into left-hand grommet on control box and attach to male terminals of P.C. board labeled 24V AC. (Fig. 7)

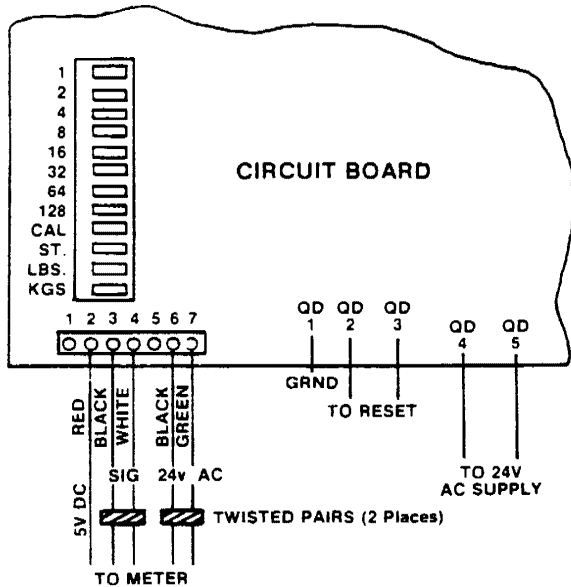


Fig. 7

3. Mount a 24V power supply in a clean and dry location, preferably in a utility room. (A 313370 power supply is shown in Fig. 9.) Run 110V from electrical supply to L1, N and G in power supply, preferably in conduit. (Fig. 9)
4. Run one (1) wire from 24-1 and Common to one side of the parlor, and 24-2 and Common to the other side of the parlor.

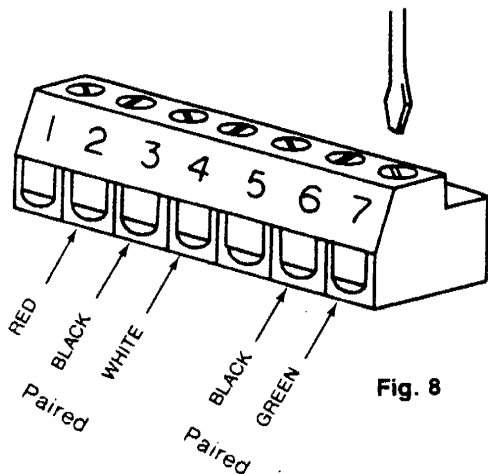


Fig. 8

5. Connect wires of EWM control box to appropriate wires running from the power supply. (Figs. 7 and 9)
6. One power supply may be hooked up to eight (8) EWM control boxes. If additional units are required, additional 313370 power supplies must be added or a 313296 multi-circuit transformer.
7. **Wiring must be done by an authorized electrician and must comply with local and national electrical codes.**

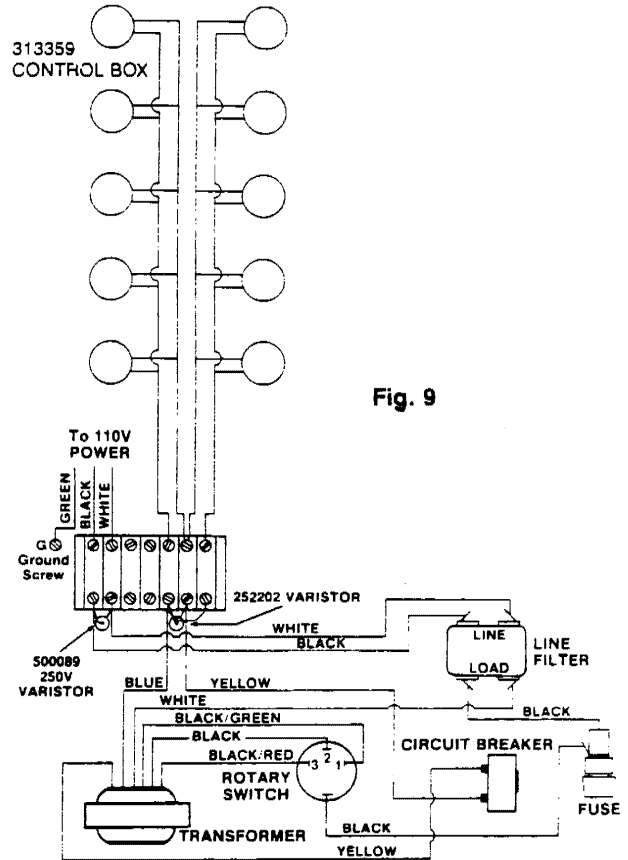


Fig. 9

Operation of the Unit

NOTE: It is important to allow the EWM a warm-up period of 3-5 minutes. Start the system and allow the units to warm up before starting to milk.

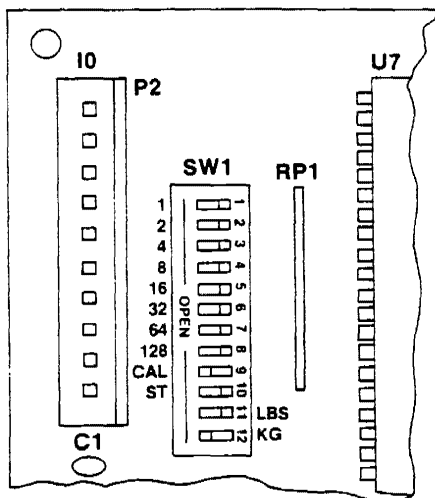
1. Close the 711012 valve.
2. **If C.I.P. washers are not used**, attach the milker unit hose to the milk inlet of the meter. Insert a 420530 plug in the end of the hose while milking. (See D, Fig. 4)
3. Push the reset button located on the front of the control box. Wait for the unit to clear (about 2 seconds). Place the milker unit on the cow and continue with milking procedure as normal.

Electronic Weigh Meter Operation Guide

A. Internal Controls

Operation of the EWM is controlled by internal switches S1 through S12 located in the upper left-hand corner of the P.C. board assembly. (Fig. 10)

Each of these switches has a specific purpose. The explanation of these purposes follows so that a better understanding can be gained of the actual way in which the EWM operates. This is particularly important in diagnosing malfunctions/problems which may occur.



S1 through S8: Calibrate Divisor

The numbers set in these switches are used by the microprocessor as the divisor in the weight measurement formula. This number is Flowhead (drive assembly and shutter assembly) dependent and therefore must be obtained by calibrating the Flowhead assembly.

The value of each switch is indicated to the left of the switch. To set a calibration divisor, turn on the switches that when added together will equal the desired value.

EXAMPLE: If a calibration of 185 is desired, it can be determined that $185 = 128 + 32 + 16 + 8 + 1$. So for a calibration of 185, switches 8, 6, 5, 4, and 1 must be set in the on position.

Verification of the correct number is accomplished by pressing the reset switch on the front panel of the EWM. The calibration divisor is automatically displayed for 2 seconds when the reset triggers the Auto Zero cycle. In this example, C. 185 would be shown on the display for the 2 seconds, then the display would revert to 00.00 and be ready to process flow data.



Display shows calibration divisor for 2 seconds, then reverts to 00.00 and is ready for input.

S9: Calibrate or Test Flowhead

Setting this switch on causes the microprocessor to perform a head quality calibration test. The flowhead is monitored for ten seconds (100 samples) and the average number of reference pulses in each head window pulse is displayed in the three left-hand display positions. Another 10 second sample is taken and the deviation from the average is displayed in the right most digit of the display. If the deviation is greater than 3, this indicates a faulty flowhead assembly.

S10: Self Test (ST)

Setting this switch to on connects an internally generated head signal to the input signal conditioning circuitry. This allows the electronic module to be tested without a flowhead present. The flowhead must be disconnected in order to utilize this test. Running this test whenever error displays occur will allow the user to identify which of the two assemblies is malfunctioning.

S11: Display Pounds (Lbs)

Setting S11 to on will connect the proper internal reference pulse frequency needed for calculation results to be displayed in pounds.

S12: Display Kilograms (Kgs)

Setting S12 to on will connect the proper internal reference pulse frequency needed for the calibration result to be displayed in kilograms.

NOTE: If neither S11 or S12 are set to on or both are set on, the display will show an error message (ERR), display C001 for a calibration number, or no display.

B. Flowhead Calibrating Procedure

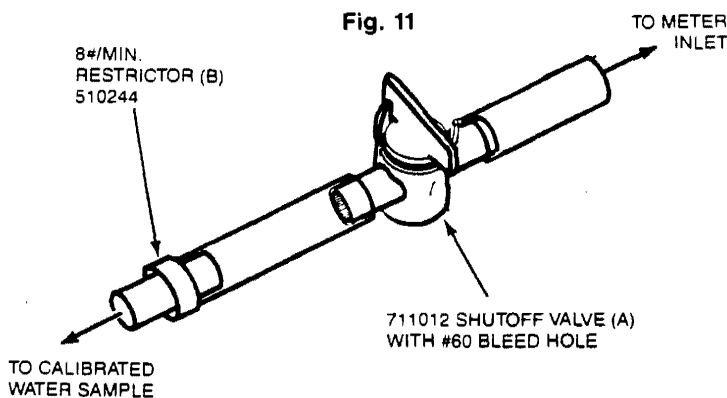
The flow meter assembly 350015 has been tested at the factory. A calibration number is located on the base of the flowhead and should be used. If a calibration is required in the field, the following procedure should be used.

1. Connect flowhead to electronic module, mating the numbers on the module to the number on the connector pin. (See Figs. 7 and 8) Check wiring to insure that the connections match that of the guide printed on the P.C. card.
2. Set the control switches (S1-S12) in the following manner:
S1-S8: Set to calibrated weight
S9: Set on
S10: Set off
S11: Set on (for display in lbs.)
S12: Set off

NOTE: It is recommended that 20 lbs. of fluid be used as the calibration weight. Therefore switches S3 and S5 should be set "on" since their values ($S3 = 4$ and $S5 = 16$) add up to 20.

3. Apply power to unit (24V AC) and allow to run for the 3-5 minute warm-up period.

4. Press reset switch. "CAL." should appear in the display. After a 10 second delay, a 3 digit number will appear in the left most portion of the display. After another 10 second delay, a fourth number will appear in the right hand display position. If this last number is not below 4, the flowhead assembly is faulty (See Replacement Guidelines).
5. If the flowhead passes the above test, continue with the following check test. Set switch S9 to off and press the reset. The unit should display the divisor for which it has been set. in this example 20 (C.020) for 2 seconds. Then the display will revert to 00.00 for a flow value.
6. Assemble the Test Kit 313365 as shown in Fig. 11. Water run through the meter should be circulated into a test bucket. Turn Valve A to off, place Restrictor B into the water sample and apply vacuum to the unit. Reset as per number 5 and open Valve A after display reverts to 00.00.



After the fluid flow stops, the display will show a reading between 160 and 185. Record the reading, then repeat the test. After the second test is complete, average the two readings and enter that average as the calibration divisor on switches S1 through S8 (See S1-S8: Calibrate Divisor).

7. Reset the unit after the divisor has been entered and run the sample through again. If the reading is significantly different from the weighed sample, adjustment must be made. If reading is significantly low (greater than -1.5%), subtract 1 divisor for every .4% off. If the reading is significantly high (greater than +1.5%), add 1 divisor for every .4% off.
8. Reset and repeat test to verify new divisor.

NOTE: If test is run to calibrate for kilograms, turn switch S11 to off and S12 to on. Repeat test with calibration sample of 10 kg as listed in 1 through 8.

C. Diagnostic Software

The EWM has built-in diagnostic software to analyze the operation of the weighing system and display an error message in the event that abnormal operation is detected. When an error is detected, the microprocessor freezes the present display value and alternates it and the error message on two 1 second intervals.

1. Time out of sample



The microprocessor did not see a head window pulse in half a second. Since head pulses should occur every 1/10 second, either a head malfunction has occurred or the wiring from the head to the module is incorrect.

Corrective Action:

Check wiring diagram on P.C. board for correct wiring.

See Diagnostic and Replacement Guidelines for information on replacing drive or shutter assembly.

2. Cumulative count out of range

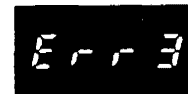


The display data has exceeded the maximum capacity of the unit (653.8 units of measure). Usually this means the unit has been running for a long time without being reset. Usually no malfunction has occurred.

Corrective Action:

Press reset button and resume normal operation.

3. Divisor is zero



Microprocessor senses that no divisor has been set, therefore the weight calculation formula cannot be processed.

Corrective Action:

Check proper switch values.

If all switches are set properly, check the pounds or kilograms switches (S11 and S12). They may not be making proper contact. Rock the switch several times, then set in correct position.

If error condition is still displayed, replace P.C. board.

4. Zero flow reset pulses exceeds 999 counts.



The head window pulse is greater than 999 reference pulse counts while in a no-milk-flow condition. This can result from a shutter that sticks or a faulty drive assembly.

Corrective Action:

See the Diagnostic and Replacement Guidelines.

5. Sample count is zero



Corrective Action:

The head window pulse has become very narrow and no reference pulses were counted. This could be the result of either a drive or shutter assembly malfunction or an electrical transient on the head window signal generating a false signal.

See Diagnostic and Replacement Guidelines for drive and shutter assembly.

If electrical transient is creating the error condition, see D, supplemental.

D. Diagnostic and Replacement Guidelines

When an error condition occurs, it is necessary to isolate the mechanical problem. Many times it will be in the head assembly and could require replacement of either the shutter or drive assembly or both.

To gain access to the components which should be checked, remove the three 6-32 screws on the base of the Flo-Meter assembly and slide the flowhead assembly from the base.

1. Drive Assembly

To check the drive assembly you will need an LCD volt meter or similar instrument.

NOTE: Check all solder and pin connections before further testing to verify operation.

- a. With power on, check rotation of shutter assembly. It should be clockwise. If rotation is jerky or counterclockwise, replace drive assembly.
- b. Set LCD meter to low voltage DC. Place negative lead of meter on black wire connection on top P.C. board. (Fig. 12) Place the positive lead to the blue connection on either the top or bottom P.C. board. The reading should be between 1.05 and 1.20 V DC. If reading is zero or erratic, check connections or replace drive assembly.

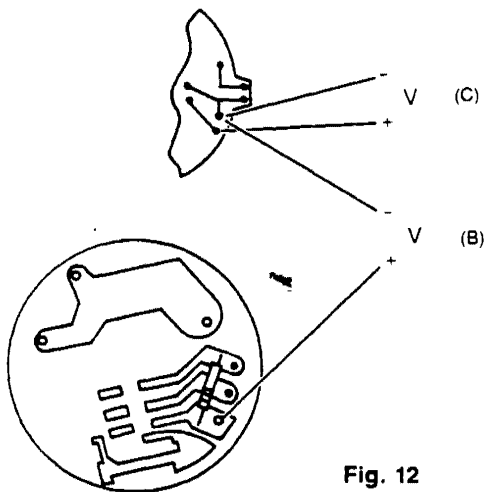


Fig. 12

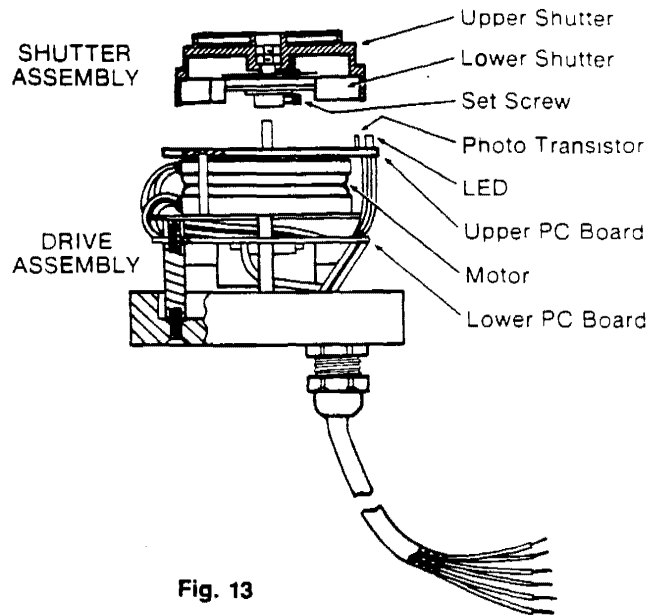


Fig. 13

- c. Place negative lead of voltmeter to black wire connection on top P.C. board and positive lead to white wire connection also on top P.C. board. Meter reading should be between 0.00 and 1.6V DC. Replace drive assembly if reading is above 1.6V DC.

Place a black tube over the photo transistor on the top P.C. board. Meter reading should range from 4.80 to 5.10V DC. If reading is below 4.8V or erratic, replace drive assembly. (See Fig. 13)

NOTE: This should be done away from direct light.

2. Shutter Assembly

A visual inspection of the shutter assembly should be sufficient. The following are things to check as this is conducted:

- a. Check to see if set screw is loose.
- b. Retract shutter assembly to see if spring oscillates and dampens properly.
- c. Turn EWM power on and check for wobble or off-center rotation of shutter.

NOTE: Shutter should rotate in a clockwise direction.

Replace shutter if malfunction occurs. To re-insert a new shutter assembly back onto the motor shaft, align set screw on shutter to the flat on motor shaft. Press firmly down and tighten set screw. Check for proper rotation.

Upon completion of Diagnostics and Replacement, carefully insert the Flowhead assembly into the Flo-Meter base aligning the protruding port of upper P.C. board to the recessed port of the Flo-Meter base.

Secure the three 6-32 screws through the base plate of the head into the inserts of the Flo-Meter base. Tighten screws so that only a slight compression of the gasket occurs. Be sure each screw is tightened uniformly.

3. Impeller

Although typically rare, a malfunctioning impeller may cause error conditions. It is recommended that an impeller inspection be done prior to the diagnostic tests. The following are things to check for improper impeller operation:

- a. Impeller shows noticeable wobble. This may be due to misseating of impeller or improper factory assembly.
- b. Impeller shaft is bent or binds at the point of insertion into the body splash ring (See 350015 parts list for reference).
- c. Insufficient magnetic coupling.
- d. Step on impeller shaft is rubbing on splashing ring or point on shaft is touching C.I.P. tube.

In all three cases, it will be necessary to replace the impeller assembly.

Failure due to these conditions typically results in erratic meter readings and are not sometimes visually evident as part of the malfunction. It is advised that these areas be checked upon initial installation.

NOTE: Upon replacement of any of the previously discussed component parts (with the exception of the P.C. board) a recalibration of the unit is necessary. Refer to B Calibration Procedure.

4. Supplemental

Electrical transients can occur when arcing is present in switches that operate gate or door openers, feeder motors, crowd gates, etc. This usually occurs from switches that are located in a close radius to the EWM and may not effect all of the units.

NOTE: Before searching for electrical transients, be sure to determine that the Err 5 condition is NOT DUE to Flowhead malfunctioning.

Isolate the switch that is causing the problem by operating all possible switches in the parlor in rotation while observing the EWM display for an Err 5 condition readout.

Once the switch(es) causing the problem have been isolated, it will be necessary to suppress the transient with a transient suppressor. A MOV (Metal Oxide Varistor) is the least expensive and can do a good job in low level transients of this type. Ratings on MOV are as follows:

RMS Voltage: Should be typically between 20-30% above the switching voltage.

Clamping Voltage: Is typically 2.8 times the RMS voltage.

EXAMPLE: Switch activating the entrance gate solenoid creates sufficient transient to create Err 5 on EWM next to switch.

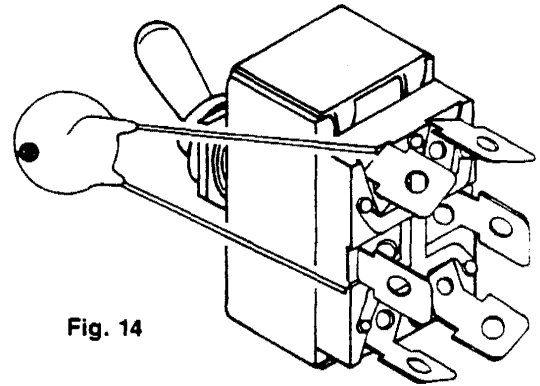


Fig. 14

SELECTED MOV (Metal Oxide Varistor)
150VRMS 420V CLAMP VOLTAGE

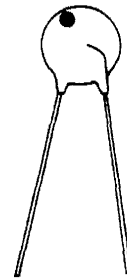


Fig. 15

TYPICAL EXAMPLE:
GE TYPE V150PA20A

- a. Connect one lead (they are bi-directional) to the 120V AC side of the switch and the other lead to the solenoid side (see Fig. 14).
- b. Transient suppressors are readily available at any electronics supply center.
- c. If problem persists, contact Universal for corrective action.

Installation of 350015 Electronic Weigh Meter to Flex-O-Matic

(A 313324 Meter to Flex-O-Matic Kit is not included. This must be ordered separately.)

Low Line Milking:

1. Mount the EWM Control Box on the upper vertical support post immediately above the Flex-O-Matic Control Box. A half clamp is provided for this purpose. (See A, Fig. 1)

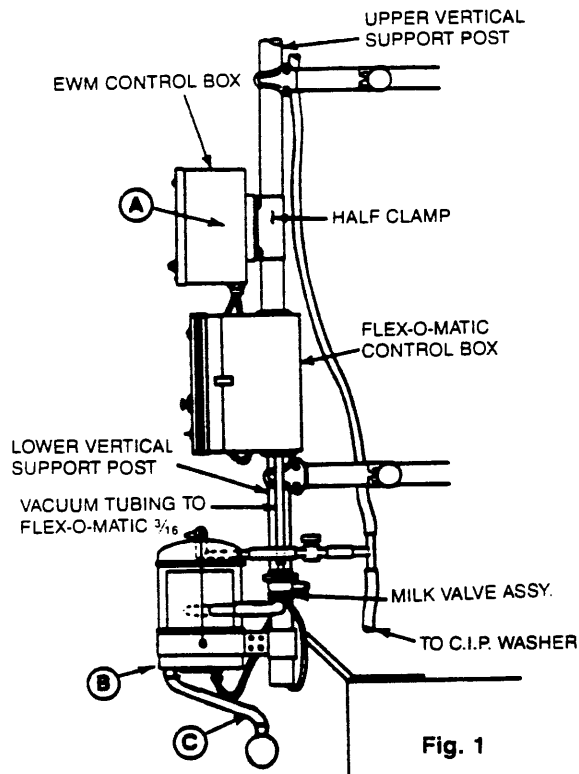


Fig. 1

2. Attach the 350015 Flo-Meter in a level position to the bottom of the lower portion of the Flex-O-Matic vertical support post as illustrated. (See B, Fig. 1)

IMPORTANT: The Flo-Meter must be installed in as level a position as possible with the outlet toward center of the parlor, as the base of the meter is already pre-sloped towards the outlet tube.

3. Attach milk hose from the bottom outlet nipple of the Flo-Meter to a milk inlet nipple on the milk line. Be sure that this hose does not have a loop or kink in it. It is important that this milk tube run in a downward position. (See Fig. 2 and C, Fig. 1)

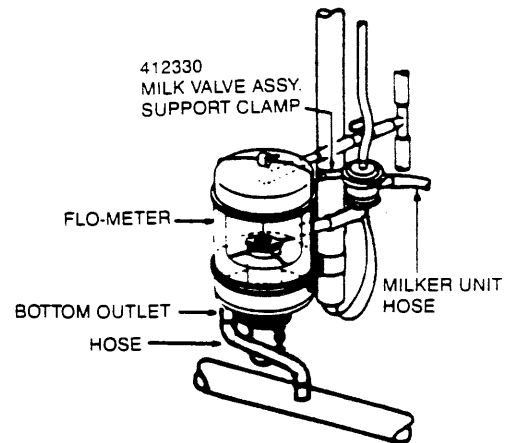


Fig. 2

4. Attach milk valve assembly, 412332, included with 313324 Kit to the lower support post so that the milk valve outlet is in line with the milk inlet of the Flo-Meter. Secure with milk valve clamp, also included in 313324 Kit. (See Fig. 3)

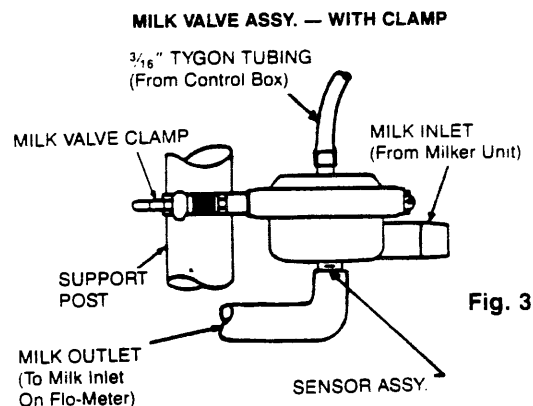


Fig. 3

5. If a hole is not already provided, drill (1) 1/2" hole in a convenient location to the right or left side, (depending on location of milk valve) of the lower support pipe hole in the bottom of the Flex-O-Matic Control Box. Slide the 908368 grommet on to 3/16" tygon tube and install in hole. Attach one end of tubing to the male elbow, 909260, connected to the bottom of the double valve in the Flex-O-Matic Control Box, then attach other end to the top of the milk valve assembly. (See Fig. 3 and Fig. 4)

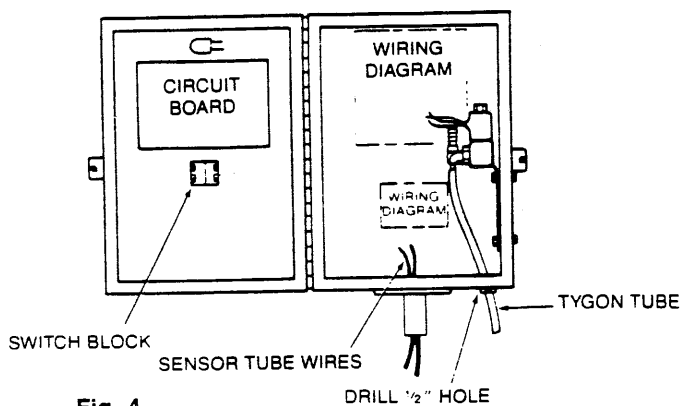


Fig. 4

6. The body and cover of the Flo-meter may be turned to accommodate milk hose from the milk valve assembly and hose from the wash line.
7. Milk hose from the milker unit may be connected to milk inlet tube of the milk valve.

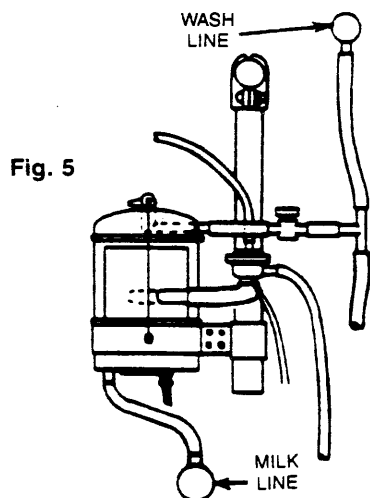


Fig. 5

High Line Milking:

1. Install EWM Control Box. (See Low Line Milking, Item 1)
2. Mounting of the Flo-Meter must be above the milk line. By using the tee clamps and support posts, mount the Flo-Meter in a level position as shown in Fig. 5.
3. Installation of the milk valve assembly must be above the milk line on high line milking operations. Using a milk valve assembly clamp, included in 313324 Kit, install the milk valve as directed on Low Line Milking, Item 4. Hoses may be attached.

NOTE: All milk nipples must be in upward position.

4. Drill a 1/2" hole for tygon tubing in the Flex-O-Matic Control Box and complete installation as directed on Low Line Milking, Item 5. Tygon tubing will have to be cut to a greater length to allow for attachment to top of milk valve.
5. Milker unit hose may be attached to milk valve assembly.

Electrical Installation

IMPORTANT NOTE: Do not run meter cable through the Flex-O-Matic enclosure. Electrical transients may cause meter to read inaccurately.

1. Begin installation by disconnecting the black and white wire of the 2 stranded power cord from the terminal on the transformer of the EWM Control Box. Remove cord and replace with 4 conductor cable (510220) included with the kit. (The end with the 4-terminal connectors should be located in the EWM enclosure.)
2. Remove the 2 wires of the reset switch from the EWM P.C. Board and insert the two 710106 dual terminal connectors onto terminals labeled "RST." Reinsert the two wires of the reset switch onto the two dual terminal connectors.
3. Connect the black and white wire of the cable (510220) to the terminals marked "24VAC" (See QD4 and QD5, Fig. 6) on the EWM Board.

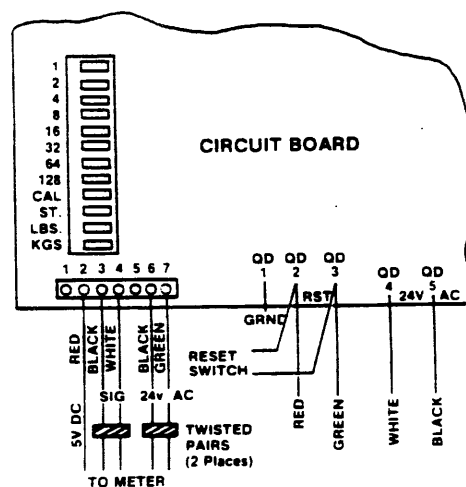


Fig. 6

4. Connect the red and green wire to the terminals labeled "RST," for Reset. (See QD2 and QD3, Fig. 6)
5. Connect the meter to the EWM Board as per Fig. 6 and Fig. 7.

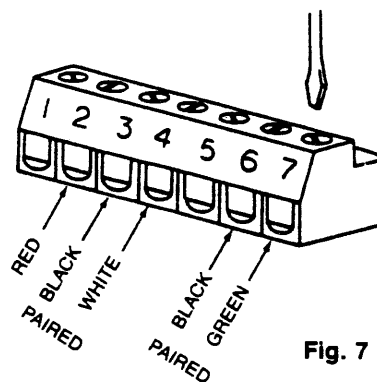


Fig. 7

6. Secure Cable (510220) by tightening the cord grip.

- On the bottom right-hand side of the Flex-O-Matic Control Box, drill a $\frac{7}{8}$ " hole, next to the $\frac{1}{2}$ " hole drilled for tygon tubing. (See Fig. 8 for location.)

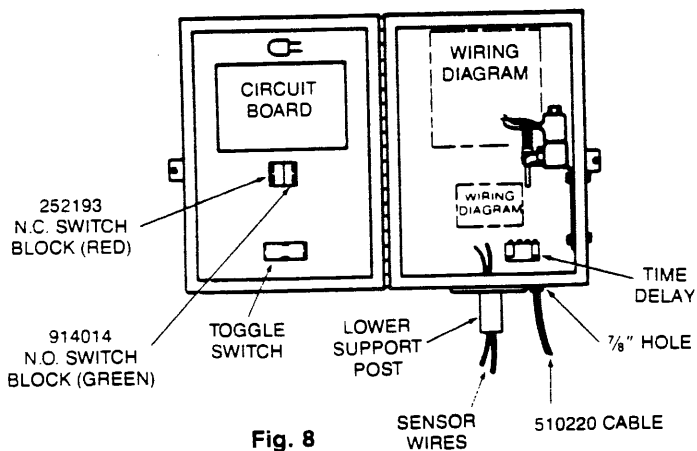


Fig. 8

NOTE: Be sure that when drilled, the hole is free of any obstruction from inside the control box. Place cord grip (908155) in hole.

- Run the opposite end of the 510220 Cable Assembly through the cord grip of the Flex-O-Matic.
- Secure the 3 fork connectors (908705), provided in the kit, to the black, green and red wires of the cable assembly.
- Secure the $\frac{1}{4}$ " Waldom Socket Terminal (500012) to the white wire of the cable assembly.
- With 2 of the T-Tap connectors (252196) included, secure one to the black wire of the 24V AC power cord and the second to the white/red wire lead from the circuit board.
- Position and attach the N.O. green switch block (914014) to the existing switch block just below the circuit board on the inside cover of the Flex-O-matic Control Box. The switch block will snap into position when attached and can be added over existing blocks. (See Figs. 8 and 9)

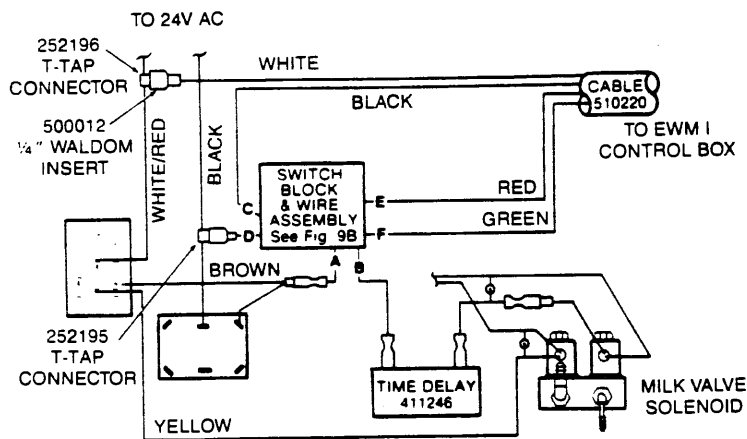


Fig. 9

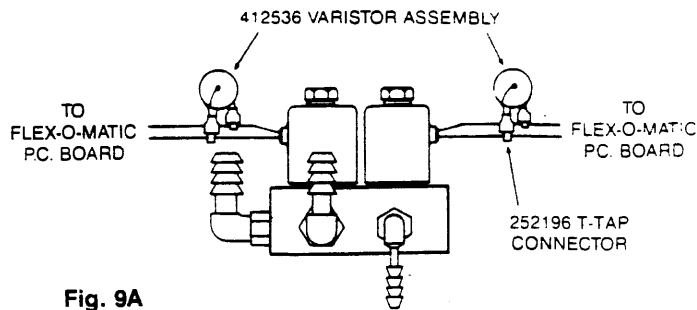
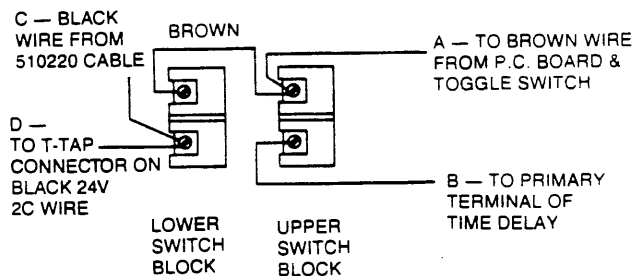


Fig. 9A

510212 N.C. Red Switch Block and Wire Assembly



914014 N.O. Green Switch Block

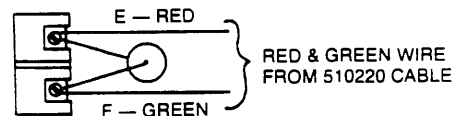


Fig. 9B

- Attach the N.C. red switch block and wire assembly, included, opposite the green switch block just installed. (See Figs. 8, 9 and 9A)
- Attach the green and red wires from the cable assembly (510220) to the two screw terminals on the green switch block (914014). Attach the 252202 47V Varistor across the same two terminals as shown in Fig. 9B.
- Attach the white wire from the cable assembly to the T-Tap connector located on the white/red wire.
- Secure 4 T-Tap connectors across the 4 wire leads of the solenoid valves and attach the 412536 varistor assemblies as per Fig. 9A.
- Attach the black wire (D) from one of the N.C. red switch block screw terminals to the T-Tap connector located on the black wire from the toggle switch. From the same position on the red switch block, secure the black wire (C) from the cable assembly (510220).
- Remove adhesive cover on back of Time Delay Switch (411246). Press Time Delay to the back and bottom of the Flex-O-Matic Control Box. (Fig. 8)

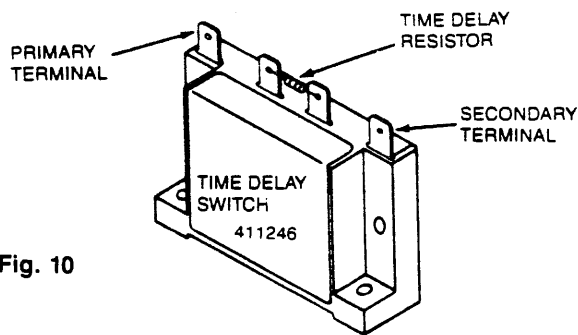


Fig. 10

19. Attach the 3" black jumper wire (411247) to the secondary (right) terminal on the Time Delay Switch. Attach the long brown wire lead (B) from N.C. red switch block to the primary (left) terminal of the Time Delay. Disconnect the wire leading from the air valve to the brown wires which lead from the Flex-O-Matic circuit board and the toggle switch. Connect the lead from the air valve to the 3" wire lead attached to the secondary of the Time Delay. Attach the short brown wire (A) from the N.C. switch block to the two brown wires from the switch and Flex-O-Matic P.C. board.
20. Sensor wires, (blue and yellow), should be run to the sensor assembly on the milk valve and connected. For proper operation of the new sensors assembly, disconnect the two wires from the ground lug and wire nut together.
21. One power supply (313370) is required for each four (4) Flex-O-Matics with EWM units. If additional Flex-O-Matics with EWM units are used, additional 313370 power supplies or a 313296 multi-circuit transformer must be added.
22. **Wiring must be done by an authorized electrician and must comply with local and national electrical codes.**

Washing After Milking:

Installation for washing operations with or without C.I.P. Washers would be the same as guidelines and illustrations given for EWM and Flo-Meter installation.

Operation Of The Unit:

NOTE: The EWM I requires a warm up period of 3 to 5 minutes. Start the system and allow the units to warm up before starting to milk.

1. Close the 711012 Shut-Off Valve.
2. If C.I.P. Washers are not used, attach the milker unit hose to the milk inlet of the Flo-meter. Insert a 420530 Plug in the end of the wash line hose during the milking.
3. Push the START button on the Flex-O-Matic Control Box. Wait for the unit to clear, about 2 seconds. Place the unit on the cow and continue with milking procedure as normal.

IMPORTANT NOTE: Be sure that the EWM display clears to zero before the milk valve opens.

4. If premature removal or fall-off occurs, **DO NOT** use the start button to reattach. To reattach, place milk/wash switch to the wash position. Place the unit back on the cow, and switch back to milk position. A circuit, installed in the kit, overrides the milk valve delay when using the milk/wash switch only.

Installation of the EWM to Parlor A.T.O. Using the 313385 Conversion Kit

Low Line Milking

1. Mount the EWM Control Box on the upper vertical support post immediately above the A.T.O. Control Box. A half clamp is provided for this purpose. (See Fig. 1, item A)

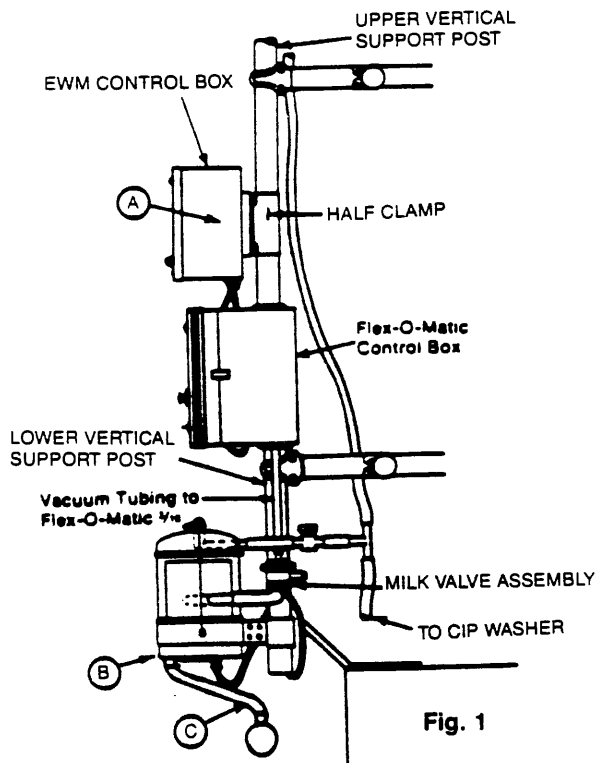


Fig. 1

2. Attach the 350015 Flo-Meter in a level position to the bottom of the lower portion of the A.T.O. vertical support post as illustrated. (See Fig. 1, item B)

IMPORTANT: The Flo-Meter must be installed in as level a position as possible with the outlet toward the center of the parlor, as the base of the meter is already presloped towards the outlet tube.

3. Attach milk hose from the bottom outlet nipple of the Flo-Meter to a milk inlet nipple on the milk line. Be sure that this hose does not have a loop or kink in it. It is important that this milk tube run in a downward position. (See Fig. 2 and Fig. 1, item C)

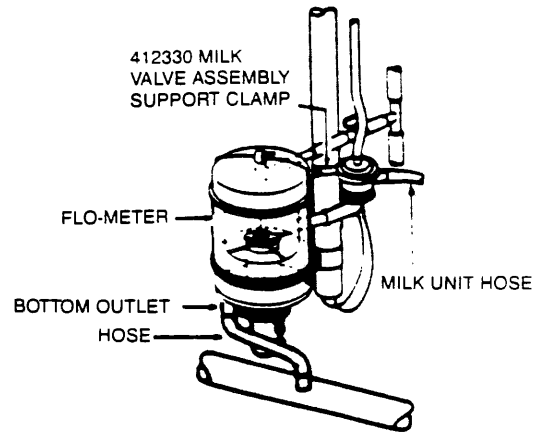


Fig. 2

4. Attach 412332 Milk Valve Assembly, included with 313324 Kit, to the lower support post so that the milk valve outlet is in line with the milk inlet of the Flo-Meter. Secure with milk valve clamp, also included in kit. (See Fig. 3)

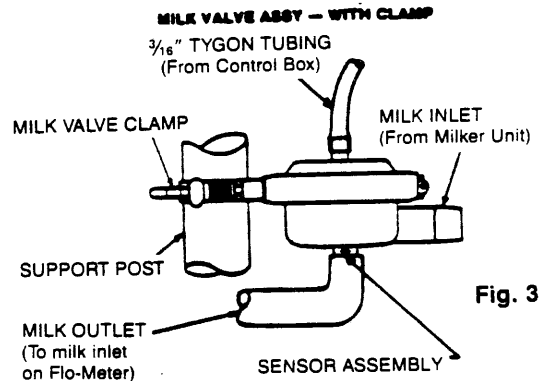


Fig. 3

5. Slide the 908368 Grommet on to 3/16" tygon tube and install in the 1/2" diameter hole in the bottom of the control box. Attach one end of tubing to the 909620 Male Elbow, connected to the bottom of the double valve in the A.T.O. Control Box, then attach other end to the top of the milk valve assembly. (See Figs. 3 and 4)
6. The body and cover of the Flo-Meter may be turned to accommodate milk hose from the milk valve assembly and hose from the wash line.
7. Milk hose from the milker unit may be connected to milk inlet tube of the milk valve.

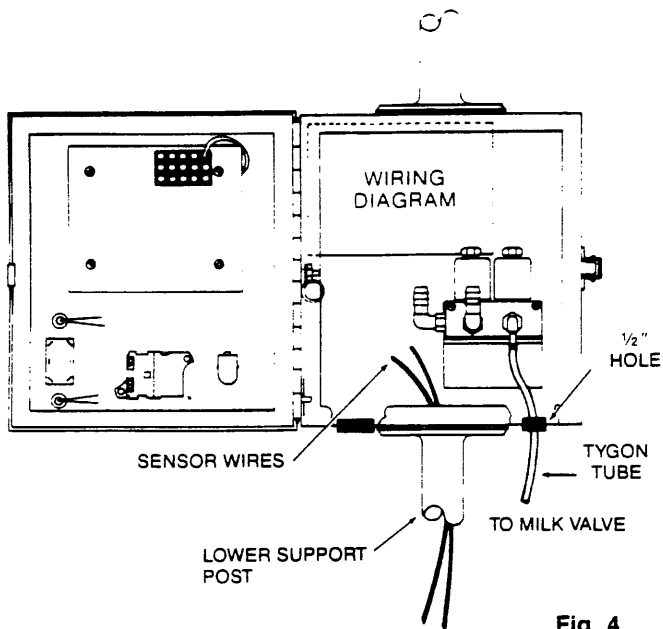


Fig. 4

Electrical Installation

IMPORTANT NOTE: Do not run meter cable through the A.T.O. enclosure. Electrical transients may cause the meter to read inaccurately.

1. Begin installation by disconnecting the black and white wire of the two stranded power cord from the terminal of the EWM Control Box. Remove cord and replace with 510220 4-Conductor Cable. The end with the 4-terminal connectors should be located in the EWM enclosure.
2. Remove the two wires of the reset switch from the EWM P.C. board and insert the two 710106 dual terminal connectors onto terminals labeled "RST." Reinsert the two wires of the reset switch onto the two dual terminal connectors.
3. Connect the black and white wire of the 510220 Cable to the terminals marked "24V AC" (See Fig. 6, QD4 and QD5) on the EWM board.

High Line Milking

1. Install EWM Control Box.
2. Mounting of the Flo-Meter must be above the milk line. By using the tee clamps and support posts, mount the Flo-Meter in as level a position as shown in Fig. 5.

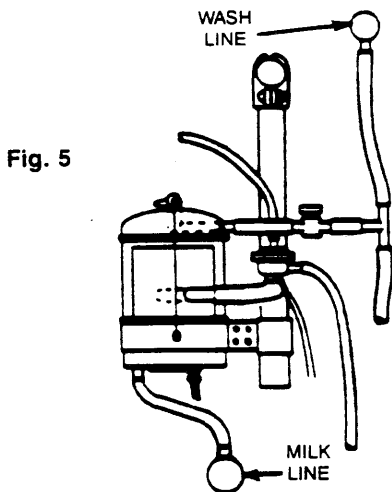


Fig. 5

3. Installation of the milk valve assembly must be above the milk line on high line milking operations. Using a milk valve assembly clamp, included with 313385 Conversion Kit.

NOTE: All milk nipples must be in upward position.

4. Tygon tubing will have to be cut to a greater length to allow for attachment to top of milk valve.
5. Milker unit hose may be attached to milk valve assembly.

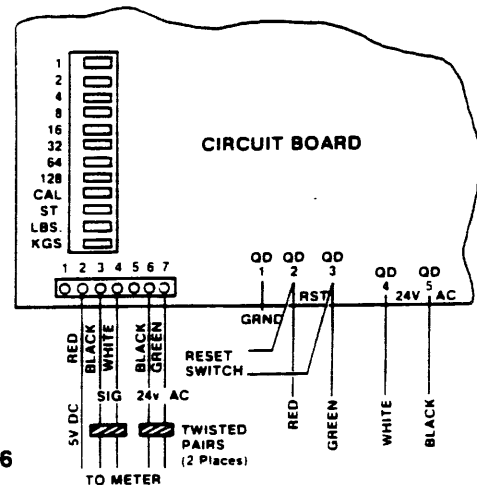


Fig. 6

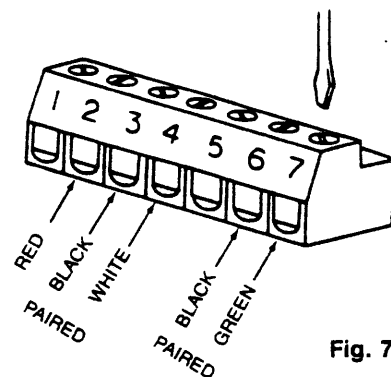


Fig. 7

4. Connect the red and green wire to the terminals labeled "RST" for Reset. (See Fig. 6, QD2 and QD3)
5. Connect the meter to the EWM Board as per Figs. 6 and 7.
6. Secure 510220 Cable by tightening the cord grip.

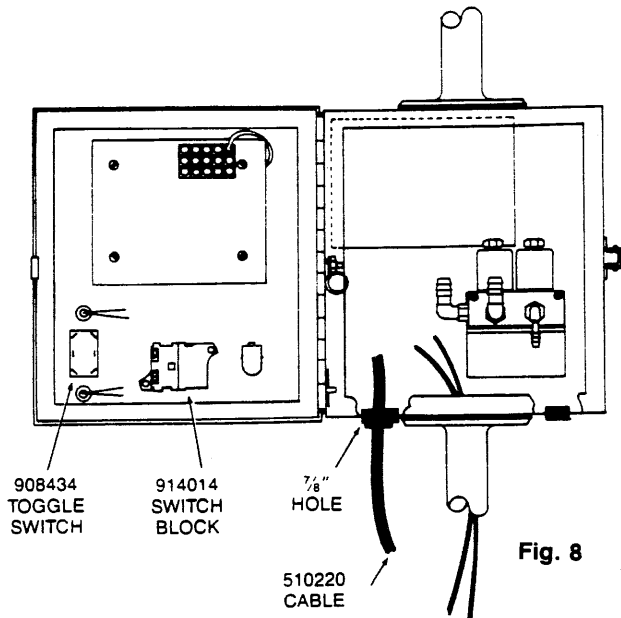


Fig. 8

NOTE: Place 908155 Cord Grip through the 7/8" hole provided.

7. Run the opposite end of the 510220 Cable Assembly through the cord grip of the A.T.O.
8. Secure the 908705 Fork Connectors, provided in the kit, to the green and red wires of the cable assembly.
9. Secure the 500012 1/4" Waldom Socket Terminal to the white wire and black wire of the cable assembly.
10. With two 252196 T-Tap Connectors included, secure one to the black wire of the 24V AC power cord and the second to the white/red wire lead from the circuit board. (See Fig. 9)

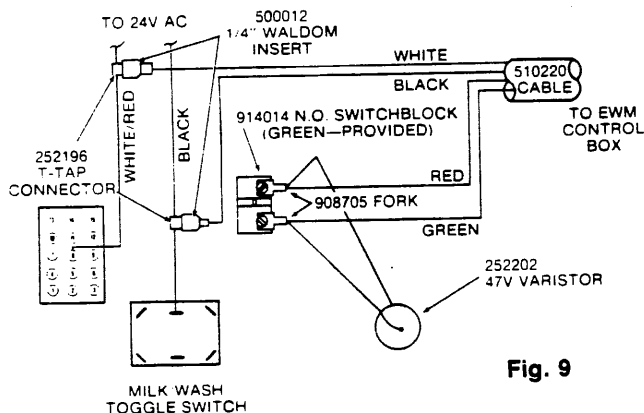


Fig. 9

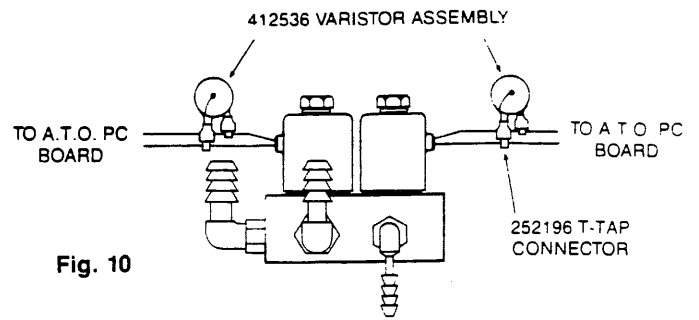


Fig. 10

11. Attach the green and red wires from the 510220 Cable Assembly to the two screw terminals on the 914014 Green Switch Block. Attach the 252202 47V Varistor across the same two terminals as shown in Fig. 9.
12. Attach the white wire from the cable assembly to the T-Tap connector located on the white/red wire.
13. Attach the black wire to the T-Tap connector located on the black wire.
14. Adjust the "DELAY" potentiometer on the A.T.O. PC. board to a milk valve delay of 2 1/2 seconds.
15. Blue and yellow sensor wires should be run to the sensor assembly on the milk valve and connected.
16. Secure 4 T-Tap connectors to the 4 wires from the air valve solenoids. (Fig. 10) Secure the two 412536 varistor assemblies to the T-Tap connectors as shown in Fig. 10.
17. One 313370 Power Supply is required for each four A.T.O.s with EWM units. If additional A.T.O.s with EWM units are used, additional 313370 Power Supplies or a 313296 Multi-Circuit Transformer must be added.
18. **Wiring must be done by an authorized electrician and must comply with local and national electrical codes.**

Washing After Milking

Installation for washing operations with or without C.I.P. Washers would be the same as guidelines and illustrations given for EWM and Flo-Meter installation.

Operation of the Unit

NOTE: The EWM requires a warm up period of 3 to 5 minutes. Start the system and allow the units to warm up before starting to milk.

1. Close the 711012 Shut-Off Valve.
2. If C.I.P. Washers are not used, attach the milk unit hose to the milk inlet of the Flo-Meter. Insert a 420530 Plug in the end of the wash line hose during the milking.
3. Push the "START" button on the A.T.O. Control Box. Wait for the unit to clear, about 2 seconds. Place the unit on the cow and continue with milking procedure as normal.

IMPORTANT NOTE: Be certain that the EWM clears to zero before milk valve opens.

4. If premature removal or fall-off occurs, **DO NOT** use the start button to reattach. To reattach, place milk/wash switch to the wash position. Place the unit back on the cow, and switch back to the milk position.

#350024 Butterfat Sampler

For Use With #350015 Flo-Meter

DHIA Approved

Installing Sampler to Flo-Meter:

1. Sanitize Sampler before using.
2. Disconnect milk hose from Flo-Meter outlet and connect to the outlet located on the top cover of the sampler. (See Fig. 1)
3. Install Sampler inlet to Flo-Meter outlet. Be sure that Sampler is fully inserted before attaching bail hold down. Lift the bail hold down upward and attach to top edge of the Flo-Meter base. (See Fig. 1) Sampler is now ready for use.

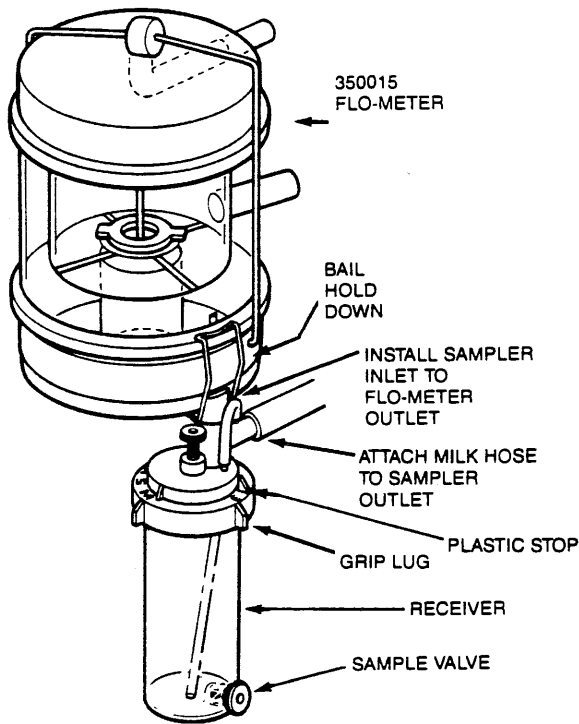
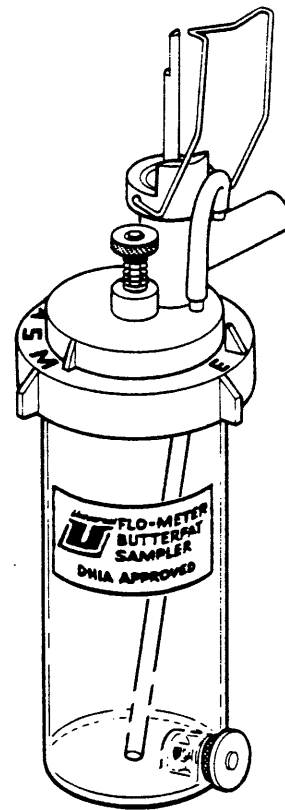
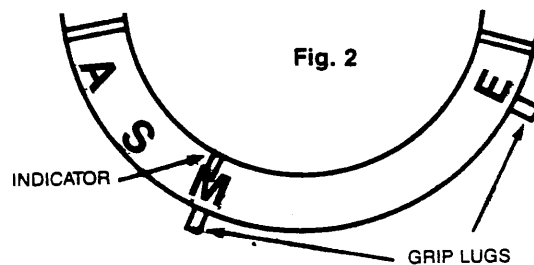


Fig. 1

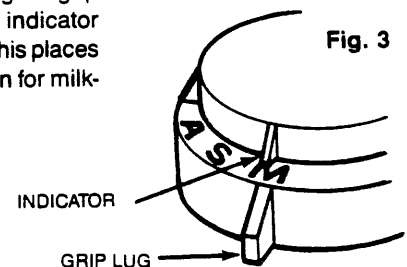
A plastic stop, located on the outer perimeter of the top cover, serves as an indicator for the location of each position. (See Fig. 1)

To place unit to setting required, turn jar cover left or right. Grip lugs on the sides of the jar cover. Provide a secure hold when turning.



Operation for Taking Samples:

1. Turn jar cover using the grip lugs and align the indicator with the letter M. This places Sampler in position for milking. (See Fig. 3)

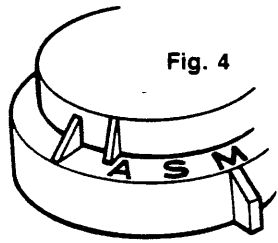


Description of Sampler

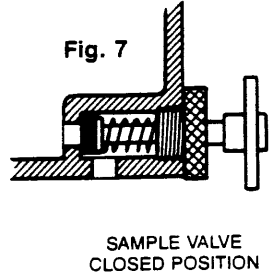
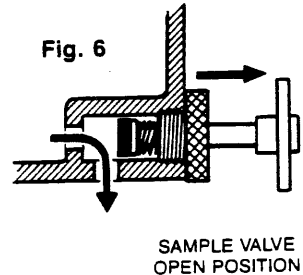
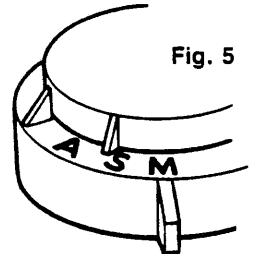
Sampler must be placed through a series of four (4) separate settings which are indicated by 4 individual letters imprinted on the top outer edge of the jar cover. These settings are:

- M — Milk Position
- A — Agitate Position
- S — Sample Removal Position
- E — Empty Position

2. On completion of milking, turn jar cover and align indicator with the letter A. Sampler has been placed in agitate position. Unit should be left in the agitate position for a total of 5 seconds before turning to next setting. (See Fig. 4)



3. On completion of agitation, turn jar cover and align the indicator with the letter S. (See Fig. 5) This places unit in position so sample may be removed. To receive sample, place sample bag or bottle below the receiver jar and pull out on the sampler valve. (See Fig. 6)



4. Turn jar cover and align indicator with the letter E. (See Fig. 8) Milk remaining in jar will be emptied into the milk line by means of the clear plastic tube located within the jar.

5. On emptying receiver jar, return indicator to the letter M for next milking.

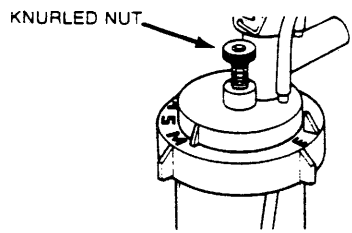
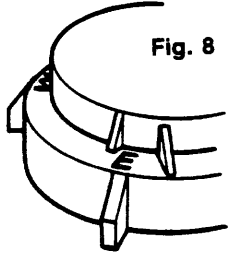
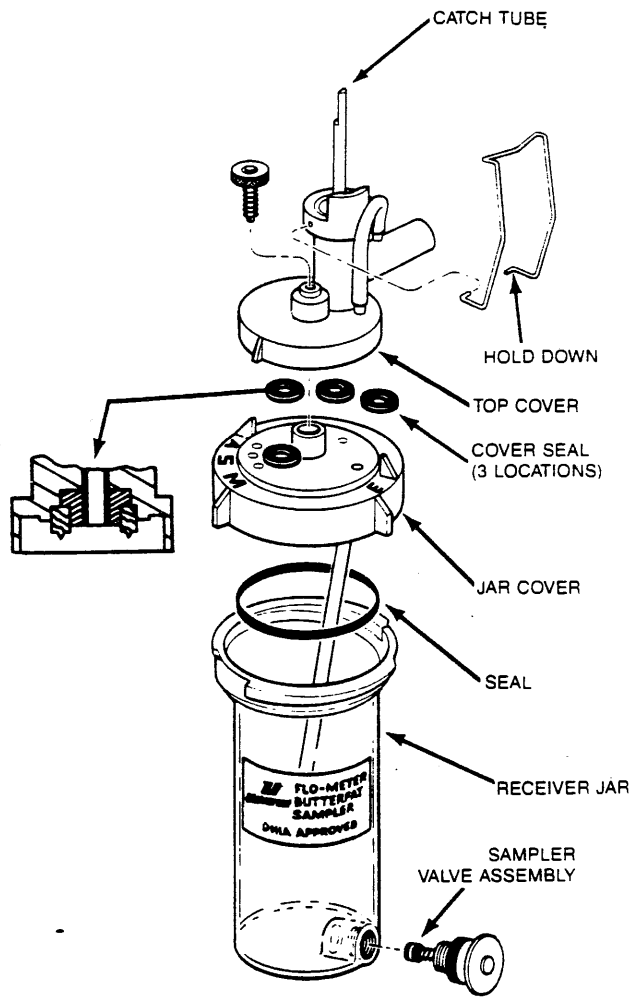


Fig. 9

3. Other cleaning and maintenance procedures are:
- Sampler may be stored assembled.
 - Store in a clean, cool area preferably away from direct sunlight.
 - When cleaning, do not use abrasive materials.



Cleaning and Storage:

- On completion of sampler use, disconnect hose from sampler outlet. Remove sample from Flo-Meter and reconnect milk hose to Flo-Meter.
- Disassemble milk sampler and clean thoroughly.
 - To remove jar cover from receiver jar, turn cover clockwise.
 - To remove top cover from jar cover, push down on knurled nut, (See Fig. 9) and turn a 1/4 turn.
 - Remove sample valve.
 - Reassemble in reverse.

Electronic Weigh Meter

Features & Benefits

1. **Accurate** - The EWM is DHIA approved and has been since 1984. ROP approved for Canada as well as FDA approved.
2. **Extremely Long Life** - The impeller runs on a hardened carbide pin. On the base of the impeller is a jeweled surface which rides on the carbide pin to provide for a long service life.
3. **Vacuum Reserve** - Additional air reserve line to the meter provides additional vacuum reserve.
4. **Excellent Cleaning** - The EWM does not need to be flooded to be cleaned like many of our competitors. It cleans in place with dual wash inlets.
5. **Butter Fat Sampler Available** - Portions of milk can be taken for testing and sampling with an extremely short agitation period.
6. **Flexibility** - This unit can be used with the EWM box, the QuadTrac I or the QuadTrac II control.
7. **Has Self Diagnostics** - The systems has codes from 1 to 5 for easy service.
8. **Dual Chambers** - The number 1 chamber breaks down the energy. Number 2 removes the air. This allows for more stable vacuum.
9. **Capacity** - Known capacity to over 30# per minute. This is ranked as one of the highest capacities on the market. The impeller resets to a zero for every cow. The weighing accuracy is extremely good due to this feature.
10. **Low Power Requirement** - .98 m.a. of power or .024 kilowatts on 10 units. Power is not on very large parlors.
11. **Isolated Motor** - The motor device is completely isolated from the top chambers. There is no shaft or protrusions into the chamber minimizing any possibility of moisture on the motor. Impeller is magnetically driven. The sapphire jewel at the bottom of the impeller makes for very smooth running and long life.