

# AccuWeight Calibration

## Reading The Water Line

How is the water line of an AccuWeight properly read, taking into account the meniscus? First, the meniscus is the concave upward curvature of water where it meets the surface of the acrylic, due to the fact that water "wets" or adheres to a properly cleaned AccuWeight window. Second, care must be exercised to read the surface of the water in the container (not the upper edge of the meniscus) as the meniscus may or may not be evident depending on lighting conditions from each side of the AccuWeight. Volumetric calibration when checking with water depends on this distinction. It is important to have the center of the eye at the water level in the container. We suggest it is easiest to find the level of the surface by bringing the line of vision "up" to the surface rather than "down" to the "disappearing point" (where sight of the surface disappears). This is because the water appears grey until (as your line of sight comes upward) the beginning of the concave meniscus causes light diffraction and a thin "shiny" line appears at the bottom of the meniscus. To train the eye to visualize this, it is helpful sometimes to shine a flashlight beam angled upward into the opposite window--and the distinction will become strongly evident.

## Leveling The AccuWeight

First, remove all hoses and obstructions from the AccuWeight. Plug the outlet of the container and fill with water to about the 35# mark. Read the liquid level carefully on both windows. The installation is considered correct when:

- The water line appears level from front to back, or left to right when viewing along the horizontal graduation lines.
- The water level observed on each window agrees within one-half of the finest graduation; one-quarter pound for AccuWeight I.

If adjustment is required, the leveling tabs must be loosened to the point of lightly securing the container. They can now be moved about until the AccuWeight is level, and then secured.

## Calibrating the AccuWeight

The AccuWeight is manufactured to exceedingly tight tolerances. The stainless parts are all machine formed with highly accurate tooling. As a result, the internal volume in containers is more uniform than any other vessel available. The graduation marks on AccuWeight windows were computed from the absolute dimensions.

The window, therefore, has absolute accurate graduations with regard to the distance between lines, and the index of refraction for acrylic was computed for the incident angle when the eye is at the liquid level. When the bottom edge of the window nests firmly against the bottom edge of the opening in the stainless container, we have a properly assembled Accuweight.

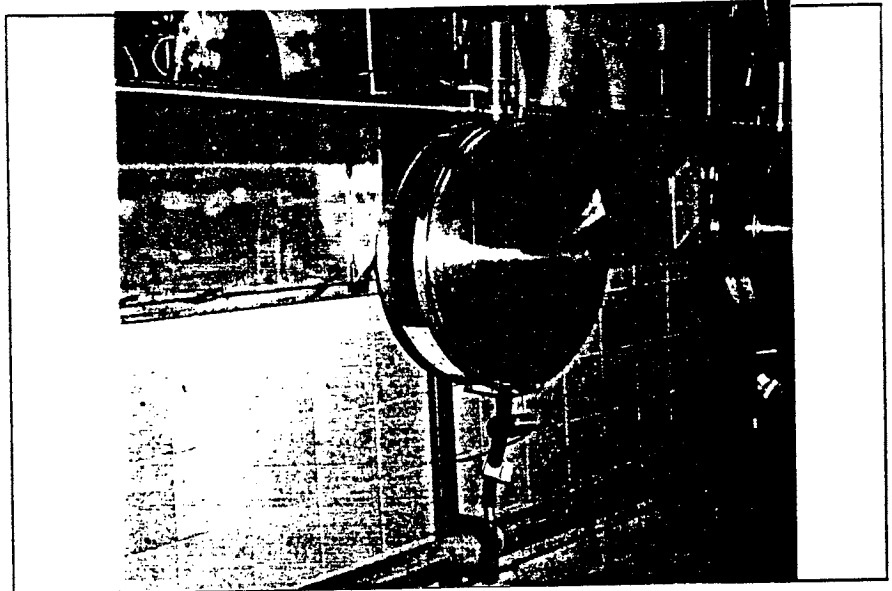
The volumetric calibration of the container also allows for the hose and shutoff valve attached to the AccuWeight outlet nipple. The proper amount of outlet nipple and hose volume is obtained when the point of closure is six inches from the inside bottom of the container.

Because the graduations are so accurate, we feel any single point measurement of liquid volume is sufficient to verify correctness of assembly and installation. Our procedure uses any volumetric container that accurately delivers a repeatable weight of water. That weight is multiplied by the density conversion factor 1.0312 to generate the equivalent volume observed on milk graduations. Additionally, the volume equivalent should be between 35 to 45 pounds, and the reading tolerance should be  $\pm 1/2$  pound when examining both windows to accommodate for slight differences. The preferred procedure is to use DHIA guidelines for 16 liters of water, as follows:

- 16 liters weighs 35.27 lbs. multiplied by 1.0312 gives 36.37
- Accepted tolerance shall be readings between 35.9 and 36.9 lbs.

AccuWeight I  
Left hand (52830)  
Right hand (52831)

Drawing  
#01100-21B



## DESCRIPTION

The AccuWeight I is a stainless steel hold-all weighing device. The unit is DHIA approved, compact, holds 85 lbs., and is consistently accurate.

Butterfat samples are taken with a unique sampler fastened to the top of the AccuWeight on test day.

## INSTALLATION

### MOUNTING BRACKET

1 Location - AccuWeight I units are left and right hand. Installation planning is required to locate the units so they are most convenient for the milker. Usually they are located below the curb, but installation above the curb is possible with the use of special mounting hardware (consult Germania before mounting units high - in special cases adjustable height brackets can be special).

- 2 Mounting brackets are standard for both left hand and right hand AccuWeights.
- 3 Secure the brackets, with stainless steel bolts and nuts, through holes in the mounting bracket. In some installations the entire mounting bracket may be welded to the stall curb. (Note - mounting bracket can be attached to any style curbing but the type of anchor required must be determined by installer. Always use stainless steel fasteners through the bracket).
- 4 Make sure the bracket top is level from side to side and front to back. This is critical for the unit to suspend correctly.

### ACCUWEIGHT I CONTAINER (MANUAL MILK MEASURING)

- 1 Complete the assembly by installing the load cell cover kit onto the container.
- 2 Mount the container assembly on the mounting bracket using the spacer, bolt, and large flat nut provided.

- 3 Loosely secure the container with the leveling tabs.
- 4 Cap the outlet of the container and fill with water to about the 30# mark. Adjust the container so it reads the same on each window and is level front to back. Secure the tabs and load cell cover bolt.
- 5 Connect the necessary wash, milk inlet, and milk outlet hoses.
- 6 Install the necessary valves and hoses for vacuum, wash, and draining. A manual dumping system will have only manual valves, an automated dumping system will have the manual valves plus an automatic milk hose valves on the outlet hose and vacuum supply.

#### ACCUWEIGHT I CONTAINER (AUTOMATIC MILK MEASURING)

When automatic milk measuring is added to AccuWeights there are a number of other special considerations.

- 1 The hose connection between the AccuWeight outlet and the milk line is critical.
  - The nipple in the milk line must be offset from the AccuWeight outlet by 12".
  - Use a 90 degree inlet on the milk line. If the inlet is a clamp-on type make sure the elbow runs parallel to the milk line.
  - The pipeline nipple must be on the opposite side of the AccuWeight from the milk inlet line. This is to prevent side forces on the AccuWeight.
  - The milk line should be rotated so the inlets are between 45 and 90 degrees out from the top of the line.

The hose connection from the AccuWeight to the milk line has to be lateral to prevent lateral forces on the AccuWeight.

- The hose from the take-off sensor to the milk inlet of the AccuWeight should be flexible, preferably rubber, with a gentle "S" curve to provide a free connection.
- Measure and cut all hoses to fit the same. Leave an installation chart with hose length data so replacement hoses will be cut correctly.
- Use the stripe on the hose when installing to make sure the connection is straight.
- Make sure the hose path of the vacuum/wash hose does not interfere with the AccuWeight balance.

#### Special Notes:

- 1 On ProTime I stalls the milk inlet to the AccuWeight and the vacuum/wash hose are both on the same side of the AccuWeight. This is to allow the hoses to be run conveniently. Normal installations have these hoses on opposite sides of the AccuWeight.

#### OPERATION

If the system is manually dumped, the operator will have to close the lower and open the upper valve to milk, and reverse the valves to dump the containers. The valve above the container is vented to allow an atmospheric vent into the AccuWeight when this valve is in the off position.

If the system has automatic dump controls the milker will only have to release the cows from the

parlor. This release will start the dump cycle which will time out automatically and reset for milking operation.

## SERVICE

### MAINTENANCE

- 1 Retighten the window clamps 90 days after installation. This is critical to prevent gasket damage.
- 2 Check the wash action on the window to be sure the spray deflector is adjusted properly.
- 3 Tighten the top 1-1/2" v-clamp after 90 days.
- 4 Check the gaskets for signs of deterioration from chemicals or damage due to loose clamps.

### TROUBLE SHOOTING

- 1 The AccuWeight is not washing properly.
  - Check the spray deflector for proper adjustment of wash solution to all sides of the AccuWeight.
  - Check the gaskets for signs of interfering with the flow of wash solution.
- 2 The AccuWeights are not dumping correctly.
  - Make sure the air bleed vents are not plugged.
  - Check to see that the milk hose valves have not punctured the milk hose. This will not allow the valve to open and close the hose properly.
  - Check the timing circuits to be sure they are working correctly, and draining is complete between cows.

# AccuWeight Butterfat Sampler

## Description

The AccuWeight Butterfat Sampler is supported by a bracket which slips over the Load Cell Housing at the top of the AccuWeight Mounting Bracket, and is held in place with plastic thumb screws. There are two stainless milk hose tee's which are inserted into the vacuum supply and milk outlet hoses, and are connected to the sampler by tygon tubing. The sampler itself is a valve which is set into one of three functions by rotating the lower black disc, and the function is indicated by an index pin. At the bottom of the black disc a 14 Dram straight walled vial (holds 1.75 fl.oz) snaps up into a recess which has an o-ring seal.

## Installation

The Sampler is installed for test day by slipping the mounting ring over the Load Cell Housing and firmly tightening the screws by hand or with a plier (not using too much torque). The milk draw tee is inserted at the outlet nipple of the AccuWeight with a short 2 inch rubber hose splice, and is connected with clear tubing to the sampler nipple near the index mark "B" for bottom or bubble. The vacuum supply tee is inserted above the manual quarter-turn vented shutoff valve on the AccuWeight vacuum inlet, with another hose splice, and is connected with clear tubing to the sampler nipple near the index mark "S" for supply or sample.

## SPECIAL NOTES

The function of the Butterfat Sampler can be affected by the position and condition of the manual quarter-turn vented shutoff valve for the vacuum supply hose. It must be installed to vent downward into the AccuWeight when it is in the off position, and it must be vacuum tight but easy to operate.

The optional installation of the vacuum supply tee is beneath the Automatic Hose Valve (or non-vented manual valve in some installations). Tygon Twin tubing can be used in this case.

## Operation

- A. MILKING--The index pin must be in the "M" position, and the manual vented vacuum supply shutoff valve is open.

- B. BUBBLING--After milking is complete, agitate the milk by turning the black plastic sampler disc into the position marked "B." Atmospheric air is drawn through the sampler top vent, down the clear tubing, and into the bottom of the AccuWeight. Allow approximately 2 seconds for each 5 pounds of milk, to a maximum of 20 seconds, then turn back to "M."
- C. SAMPLING--Closing the manual vented vacuum supply valve allows atmospheric air into the AccuWeight. Next turning the sampler to the "S" position allows the vacuum supply for the sampler valve to draw milk upward from the bottom of the AccuWeight into the 14 Dram straight walled vial snapped into the bottom of the Butterfat Sampler. When the vial is 3/4 full, turn the valve back to "M" and remove the vial, pouring its contents into the container with preservative marked for the cow at this position. Repeat this procedure if more milk is required for the sample. After replacing the vial, make sure the sampler is in the "M" position for milk and open the manual vented shut off valve. Once all samples are taken, the AccuWeights can be drained.

## SPECIAL NOTES

Most AccuWeight systems use the Automatic Weigh Jar Dump Controller. This means when cows are exited from a parlor side, an open gate signal automatically begins AccuWeight draining--either all at once, or half the side at a time. This can be prevented without holding up cow traffic by the use of the "Test Day Shutoff Valve." The valve is located inside all but the oldest AWJD Controllers, and the local GERMANIA dealer can explain its use. This allows sampling to continue after cows are allowed to exit, and the "Dump" button on the control box is used to drain AccuWeights.

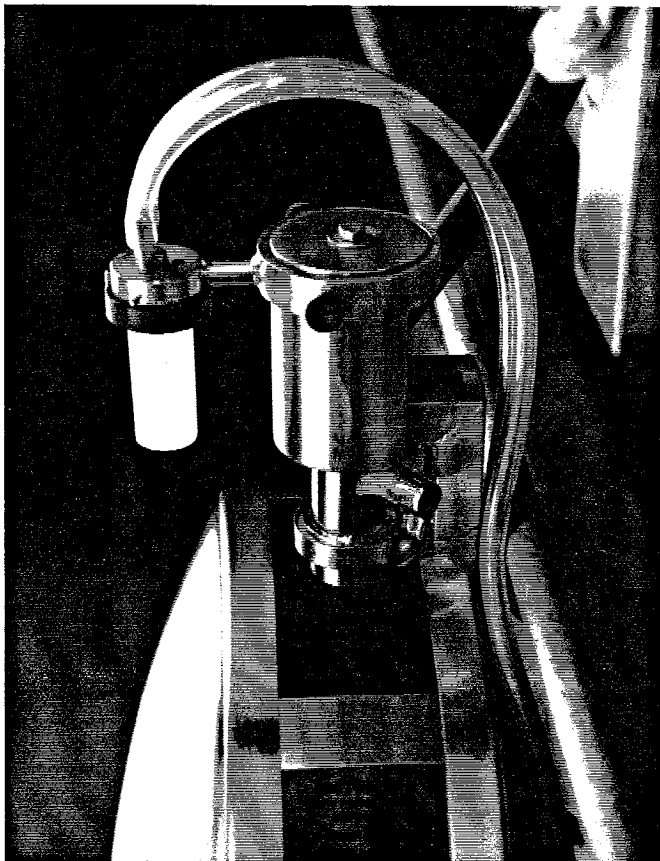
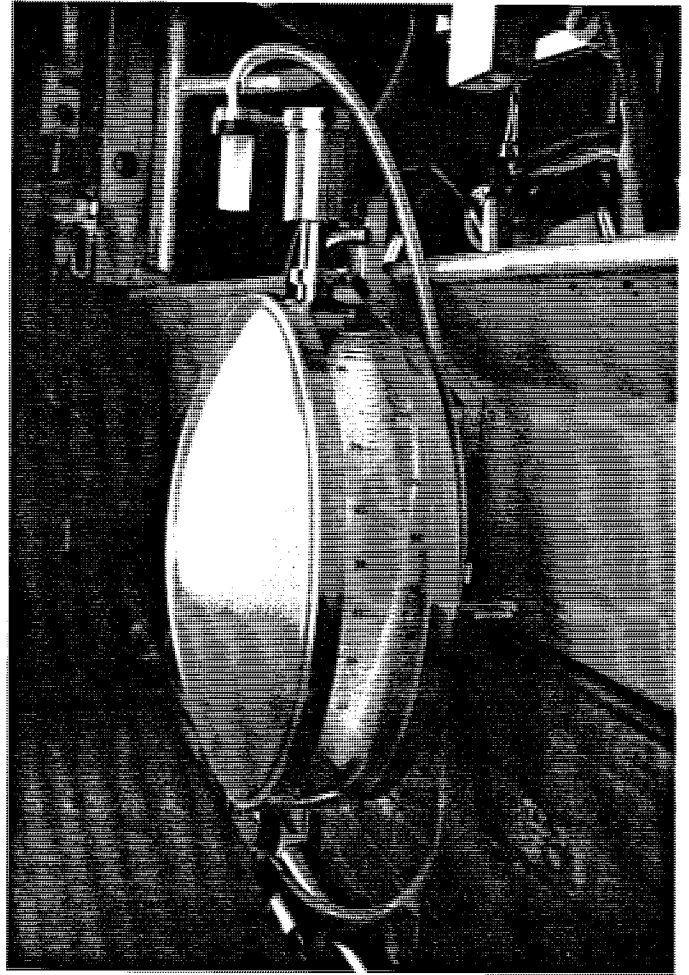
## Cleaning

After a milk session is completed, the Butterfat Samplers must be set to the "S" position, and all vials in place. Enough vacuum differential exists to draw wash water from the tee above the AccuWeight, through the sampler and out the tee at the AccuWeight outlet. Before the next sampling session begins, the Butterfat Sampler must be set back to "M" for milk, and the sample vials manually removed to pour out any residual rinse water.

The Butterfat Sampler is not intended for permanent installation, and for this reason the optional placement of the vacuum supply tee below the AccuWeight is popular when used with tygon twin tubing. In this case, the vacuum differential is quite weak and the cleaning is insufficient for permanent installation. The Butterfat Samplers should be sink washed, and hung to dry before storage for the next test day.

# An Ingenius Sampler . . .

. . . Comfortably installed at working height, makes bending down a thing of the past.



On test day the sampler installs with a couple of simple thumbscrews at the top of the AccuWeight.



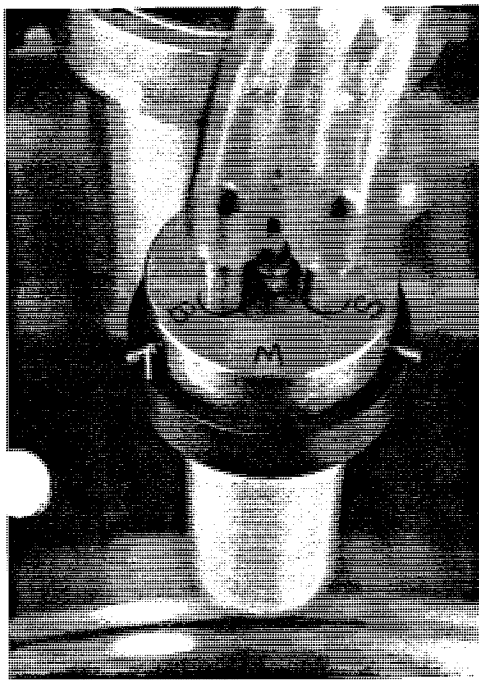
## Taking Butterfat Samples

Samples are taken similarly to glass weigh jars.

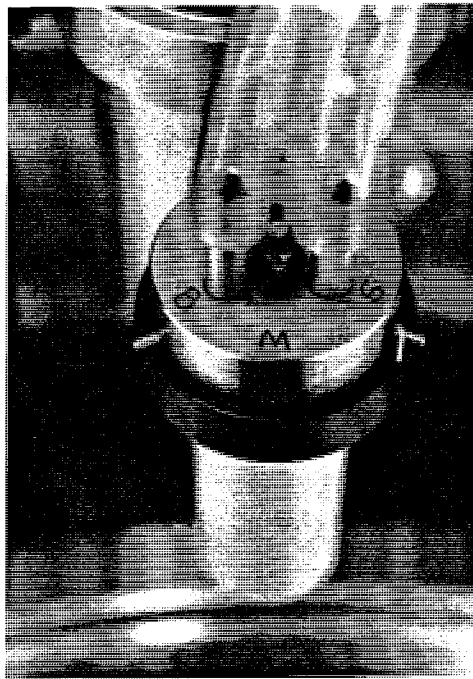
A pair of sampling tees are permanently installed below the AccuWeight. On test day you'd bring the sampler itself into the parlor, clamp it to the top of the Accu-Weight and connect two hoses to the

sampling tees.

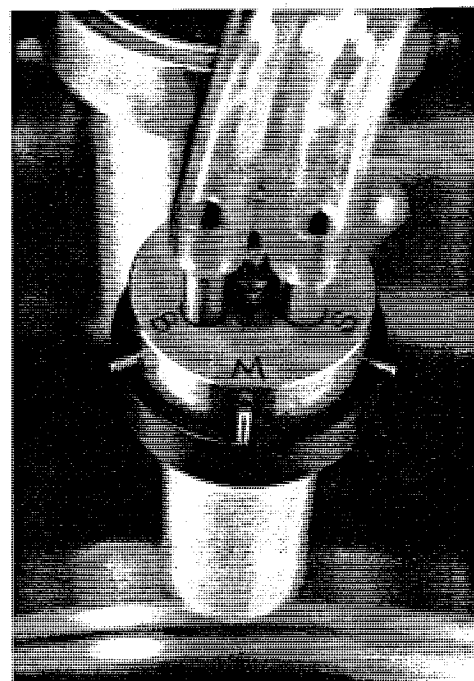
At the end of milking bubble the milk in the container for maybe 10 seconds to mix the early and late-high fat-milk. Draw the sample in another 3 seconds.



Bubbling . . .

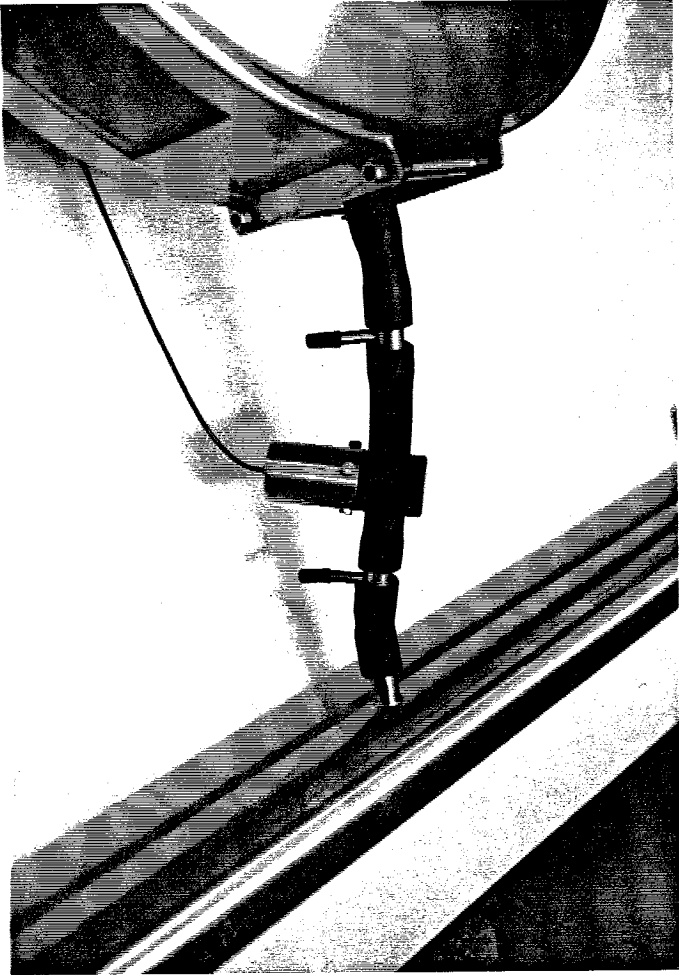


Drawing the Sample . . .



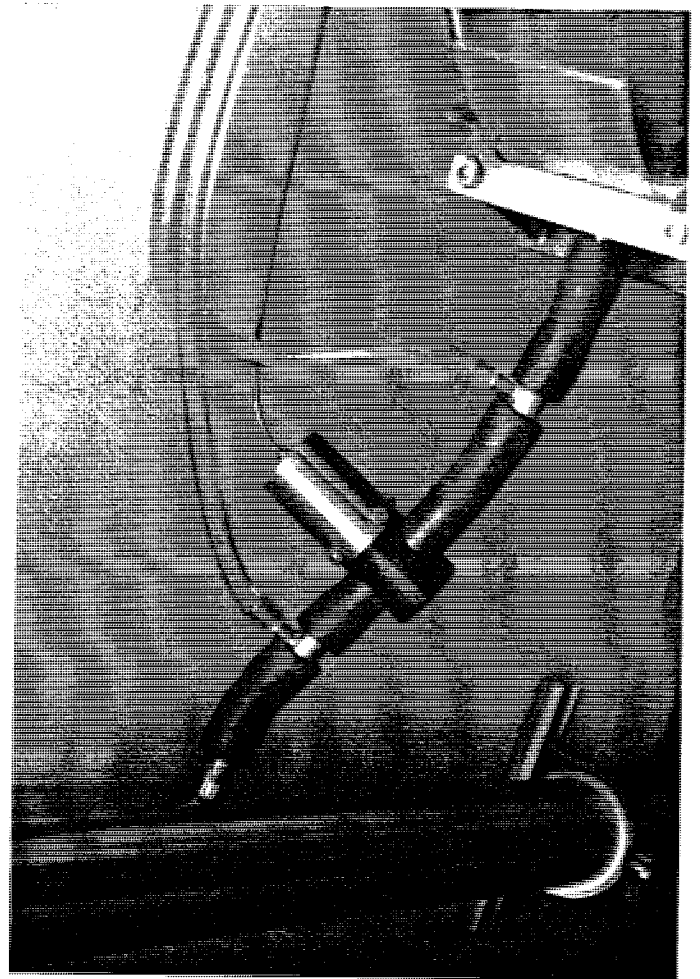
and back to Milk.

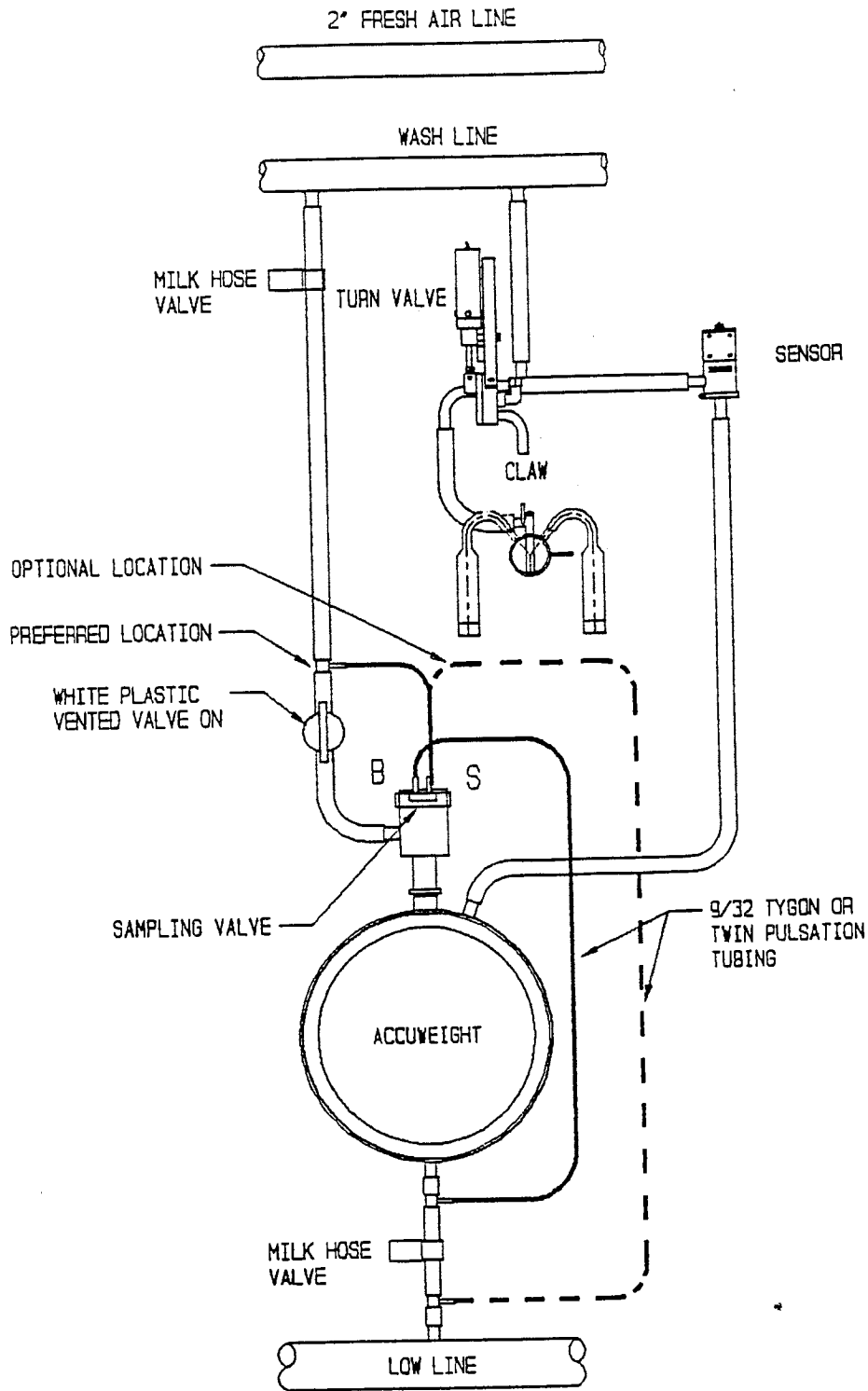
## Sample Tees



Two stainless steel sampling tees are permanently installed in the drain hose of the AccuWeight.

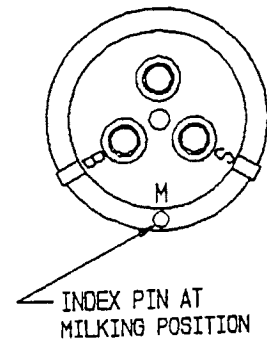
On test day you remove the two rubber caps and connect the twin sampling hose.

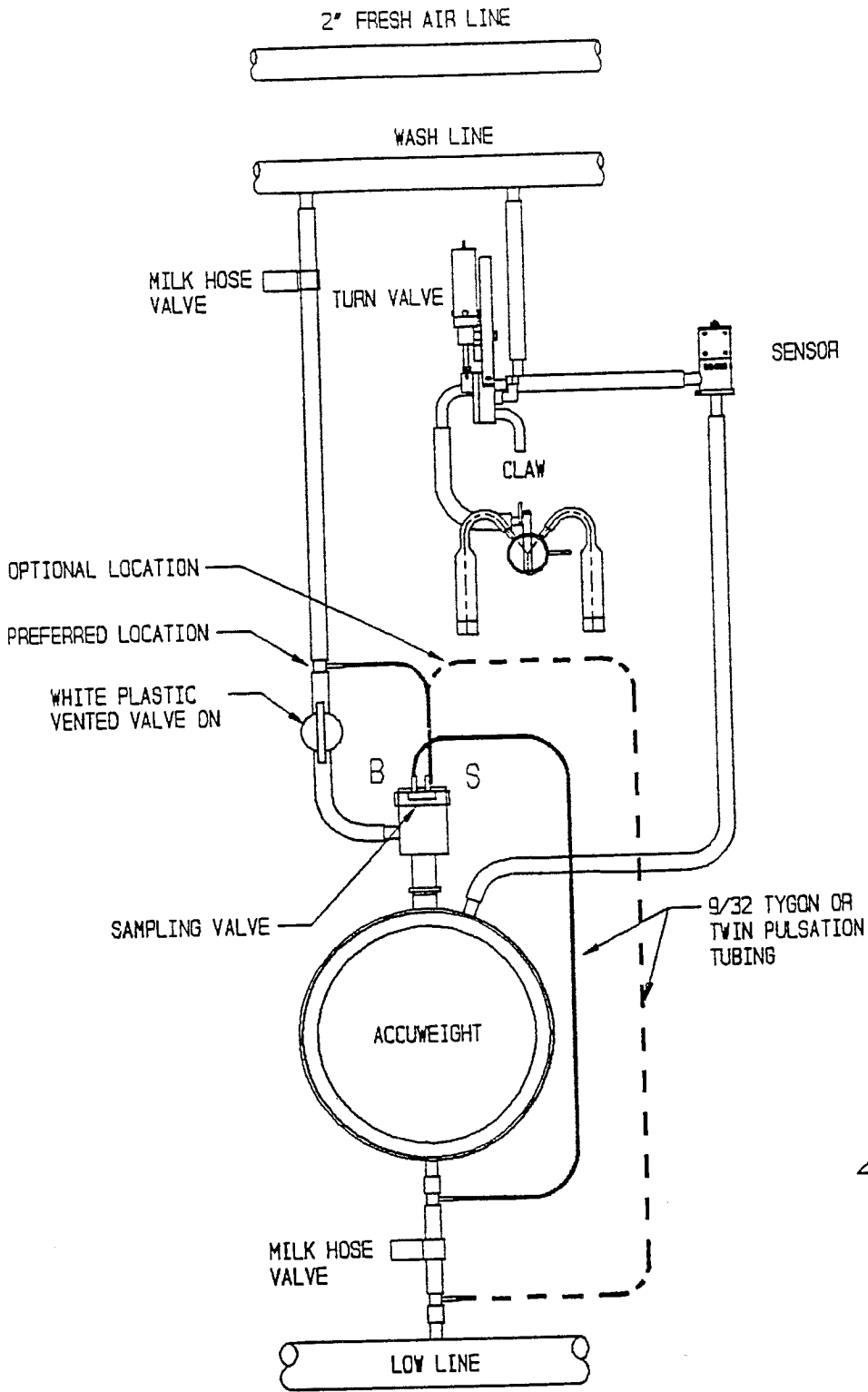




- A -

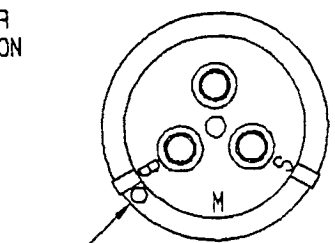
TOP VIEW OF SAMPLING VALVE



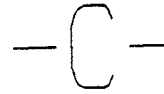
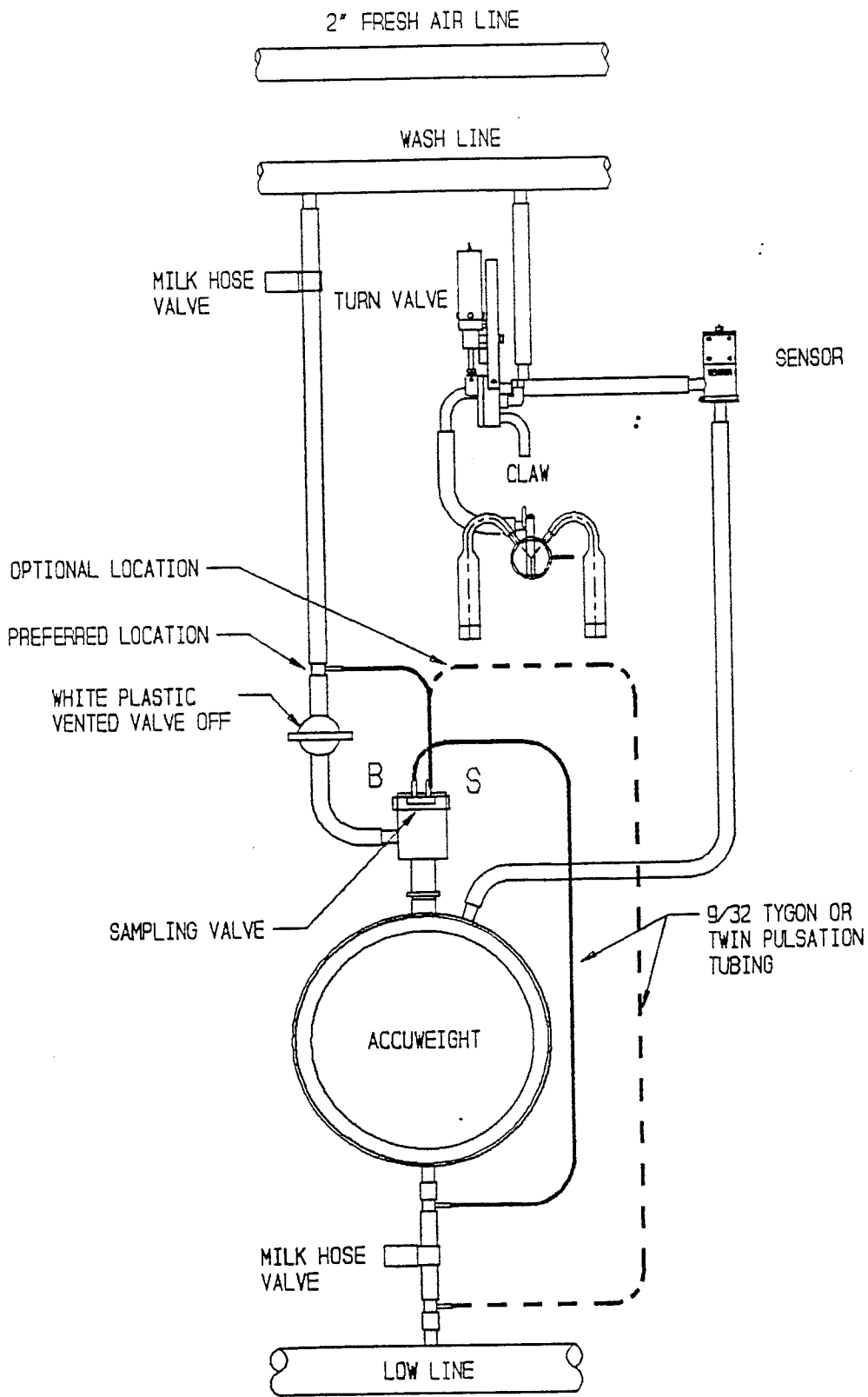


-B-

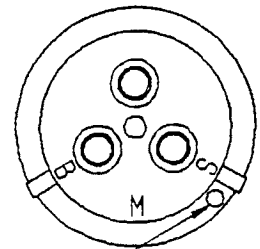
TOP VIEW OF SAMPLING VALVE



INDEX PIN AT BUBBLE POSITION. BUBBLE 2 SECONDS FOR EVERY 5 LBS OF MILK.



TOP VIEW OF SAMPLING VALVE



INDEX PIN AT SAMPLE POSITION