MILK-o-METER AND SAMPLER

Instruction And Service Manual

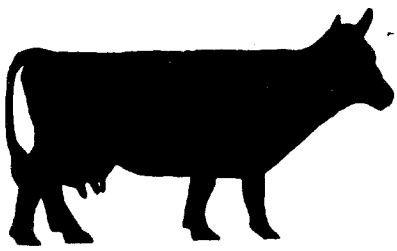
The Milk-o-Meter will give long and satisfactory service if properly installed and reasonable care is exercised in operation and maintenance.

Guessing how to install and operate the Milk-o-Meter may cause unnecessary inconvenience or failure to receive the fine performance that has been engineered and built into it.

A few moments of your time to study the nomenclature and read the instructions will be most rewarding.

IMPORTANT!!!

THE MILK-o-METER MUST BE DISASSEMBLED AND THE PACKING MATERIAL REMOVED FROM BAFFLE PLATE BEFORE USE!



TESA.

8 - 3 P.M.
EASTERN TIME

TESA METERS, INC. • Box 21519, Fort Lauderdale, Florida 33335 • 305-525-6688

MILK-o-METER FRAME AND COUNTER MECHANISM INSPECTION

It is a statistical fact that over 50% of the Milk-o-Meters returned to the Factory require no more than a good cleaning, excluding of course inadvertant external damage as from dropping, etc. It is important, therefore to properly clean the Meter Frame and Counter before attempting inspection and calibration check.

#030231 BRACKET GAGE

It is important that all pipe clamp Mounting Brackets in the barn be level. Drop the Bracket Gage into the "V" of the Mounting Bracket and note the bubble in the gage glass. If more than half the bubble is inside the ring, the Bracket is sufficiently level but the closer to the center the more accurate the setting. Make such adjustments to the Bracket as may be indicated. Seat the gage firmly in the "V" but do not force. Bent Brackets will be detected when gage is not held securely. If necessary, bend the V clip inward or outward as may be required to fit the gage.

FIELD REPAIR AND RECALIBRATION

The Milk-o-Meter Mechanism cannot be repaired or disassembled without affecting calibration. The Milk-o-Meter cannot be calibrated in the field without the required equipment and training of personnel.

The reason is that the components of the Mechanism must be fabricated with oversize mounting holes. Special assembly fixtures are used to hold the relative alignment of the components to maintain their correct relative alignment and position without regard to the normal differences between components due to material and processing tolerances. While you could as example remove the outer bracket, or the frame and reassemble so it would visually appear the same, the part would in fact have shifted within the limits of the hole clearances and disrupted the calibration. Except for Factory Authorized Service Centers, no repair or recalibration should be attempted in the field. All Milk-o-Meter Mechanisms are sealed at the Factory so any such attempt is immediately evident. Any indication of disassembly, tampering or attempted recalibration automatically voids the remaining Warranty.

MILK-o-METER ASSEMBLY

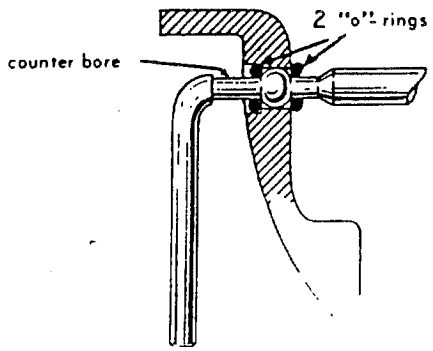
With any instrument.....the cleaner they are the more accurate they are likely to be. This is especially so when talking about a precision instrument such as the Milk-o-Meter. The inspection prior to repair or service must include adequate cleaning.

Check all plastics for cracks, chips or dirt. Hairline surface marks or crazing do not effect the Milk-o-Meter accuracy, but may cause a sanitation problem.

In addition to inspection for the usual checking and cracking, the Baffle Tray should be checked for warpage, in that the Baffle Box should fit properly inside the Tray, and the Tray itself should fit snugly inside the slots of a new Upper Shell. If the Baffle Tray fits loosely inside the slots in the boss of the opposite sides of the Upper Shell it should be discarded, as a loose Tray can become dislodged in operation and hang up the Rocker below.

Check the Upper or Lower Shell for excessive warpage by placing each Shell against an ordinary window pane or piece of glass. Run a dime around the outside perimeter of the Shell. The dime (Approx 1/32" thick) should not pass between the glass and flange of the Shell at any point. If it does, the Shell is warped beyond tolerance and will adversely affect the Milk-o-Meter operation and should be replaced.

On the #031622 Unitized Lower Shell, the outside "O" ring is solely for the purpose of air seal. The inside "O" ring is only a mechanical means of holding the Rocker and Rocker Shaft in place during installation of the Lower Shell into the frame. The inside "O" Ring has no function as a seal or relationship to the accuracy of the Meter.



LIMITED 5 YEAR WARRANTY
MILK-o-METER

Subject to applicable portions of published Limited Warranty in Terms and Conditions of Sale.

"TeSa products are warranted to be free of defects in material or workmanship. TeSa Meters, Inc. will promptly replace or repair, free of charge, a Milk-o-Meter Frame and Counter Mechanism returned prepaid and found defective in original material or workmanship by TeSa within a period of 5 years from the date of shipment from the factory on new, or 1 Year on repaired and recalibrated Milk-o-Meter Frame and Counter Mechanisms. TeSa Meters, Inc., will assume responsibility only for the part or parts as may be determined defective by the factory, excluding transportation or labor requirements, if any, outside the factory. Because it is impractical to date or establish serial number identification on plastic or other parts, these are not covered by the Warranty.

If errors are found in the Milk-o-Meter exceeding 3%, recalibration will be done by the factory free of charge for a period of 1 year from the original purchase date."

TESA METERS, INC. Revised September 1, 1986

PRINCIPLE OF OPERATION

The Milk-o-Meter consists of the upper and lower shells which are held together by the frame and counter-mechanism. The upper shell contains the baffle assembly which consists of the baffle box, baffle plate, and baffle tray. The lower shell contains the rocker and rocker shaft, one end of which is connected to the magnet arm fork which extends from the back of the counter-mechanism.

During operation, vacuum from the milker system holds the shells tightly together forming a vacuum sealed chamber inside. Milk enters the upper shell through an inlet connection directly from the milking machine, and, after being weighed and registered, is discharged into the pipeline through an outlet in the lower shell.

Before the milk can be weighed it must be deaerated to assure precise accuracy of measurement. This is accomplished by passing it through the baffle assembly located in the upper shell. It leaves the baffle assembly through a row of holes in the bottom of the baffle tray. From here it drops into the two compartment rocker which is mounted on the rocker shaft in the lower shell. Each compartment of the rocker has a liquid capacity of four ounces. Milk flows into one compartment of the rocker unit which is automatically tripped at four ounces and the milk discharged into the lower shell to be drawn by vacuum into the pipeline. This procedure is then repeated in the opposite compartment of the rocker and continues to alternate between the two compartments.

Each time the rocker unit is tripped, the four ounce unit of weight is registered on the dial of the counter mechanism.

The standard Milk-o-Meter dial is graduated to 40 pounds in ¼ pound increments, however, with the Dual Dial Pointer it is possible to read up to 76 pounds. In areas where the metric system is used, the Milk-o-Meter is graduated in 16 kilos in 1/10 increments. The rocker and mechanism is calibrated to the 1/10 kilo measurement.

Each Milk-o-Meter will normally require approximately one half C.F.M. of vacuum for operation. Thus it is important that the vacuum supply be adequate to operate the milker system with enough reserve to handle the number of meters being used. If milker units tend to drop off the vacuum supply may be inadequate. Dealer should be consulted.

INSTALLATION INSTRUCTIONS

LOCATION

The Milk-o-Meter should be installed as near as possible to the milk inlet in the pipeline and still permit ease of accessibility for reading of the dial and operation of the Sampler.

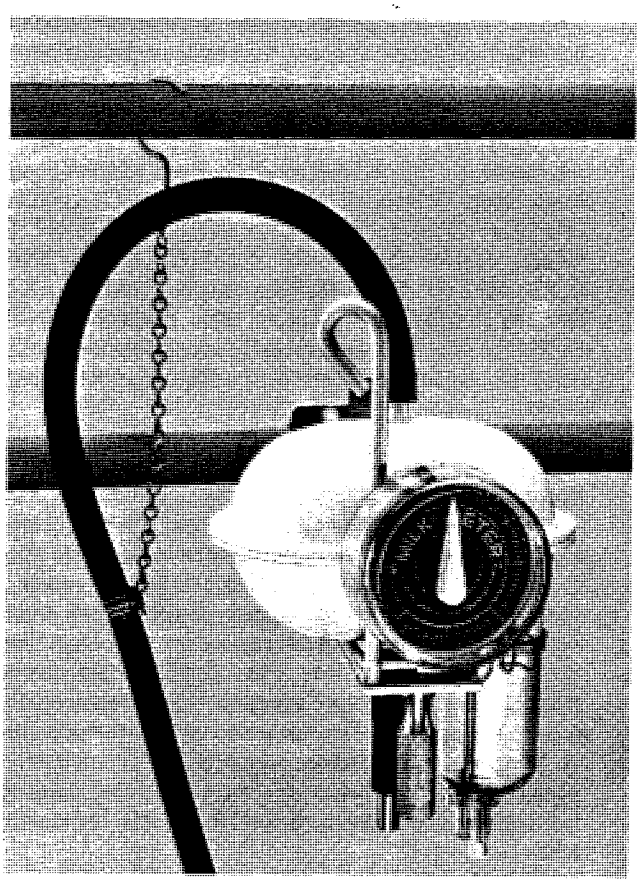
We recommend the Milk-o-Meter be positioned so the outlet spout is as nearly above and as close to the pipeline inlet as practical. USE THE SHORTEST HOSE POSSIBLE to eliminate vacuum fluctuation. Tests show that when the Milk-o-Meter is correctly positioned it acts as a stabilizer and there is LESS vacuum fluctuation.

It should be well removed from contact or interference by the cow.

In some installations, most particularly those using high pipelines and long hoses, the shaking and vibration imparted to the Milk-o-Meter may be severe. This could affect accuracy and should be minimized. While the recommended solid pipe clamp bracket mounting will help, we have seen some "homemade" remedies that work well, one is illustrated. (fig. 1) This is made up of a hose clamp, a short length of bath tub chain and a hook provided out of 3/16" welding rod. By securing the hook over a pipe or stanchion header, other than the one holding the Meter, and leaving the hose out of the Meter Frame loop, the excessive vibration is snubbed by the chain/hook instead of being transmitted to the Meter.

THE ACCURACY OF THE MILK-o-METER DEPENDS ON ADEQUATE MOUNTING.

The use of mounting brackets other than the #032101 Pipe Clamp Bracket is NOT SATISFACTORY. Milk-o-Meter frames may not fit snugly in substitute brackets and induce error in weights.



INSTALLATION INSTRUCTIONS
continued

MOUNTING BRACKETS

The # 032101 Pipe Clamp Bracket should be mounted on a pipe or other surface which is solid and free from vibration. Excessive vibration may cause error.

1. The # 032101 Pipe Clamp Bracket is designed for mounting the meter on either vertical or horizontal pipeline. (fig. 1 & 2) It consists of a Base, two U-Bolts and a Clip. The Clip may be used for mounting on flat wall surfaces. (fig. 3)

2. The mounting bracket must be installed so that the Milk-o-Meter will be in a level position when in place. The # 030115 Bracket Gage should be used to level the mounting bracket during installation. Place the Gage in the bracket as illustrated, (fig. 4), adjust bracket to level position, then tighten bracket securely. CAUTION: DO NOT OVER TIGHTEN U-BOLTS. TIGHTEN NUTS ONLY ENOUGH TO HOLD ON PIPE. TOO MUCH PRESSURE CAN CAUSE CLIP EMBRITTLEMENT AND BE SUBJECT TO BREAKAGE. If pipe or wall are out of plumb, it may be necessary to shim the clip to make it level.

3. Place an assembled Milk-o-Meter into the mounting bracket. BE SURE METER IS SEATED FIRMLY IN THE BRACKET. Insert the milk hose from milker unit through the hose support loop at the top of the meter frame, then connect it to the inlet spout on the upper shell. Allow sufficient slack in the hose between the loop and the spout to prevent the shells from being pulled apart. Connect a short hose between the outlet spout in the lower shell and the milk inlet in the pipeline. Hose should be as short as practicable to prevent pulling off spout. Set dial pointer on zero and meter is ready for operation.

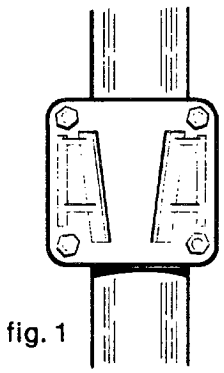


fig. 1

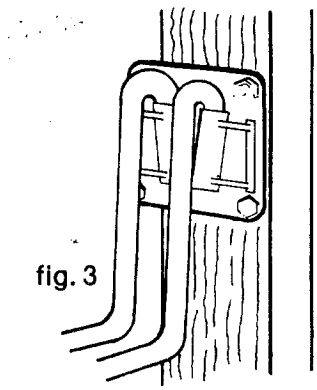


fig. 3

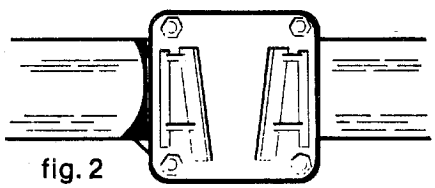


fig. 2

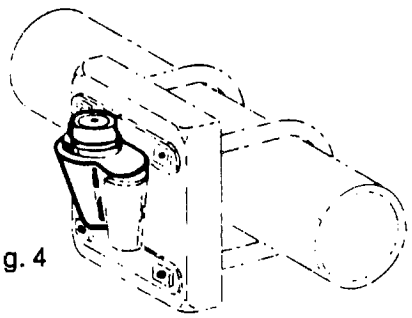


fig. 4

PREPARING FOR OPERATION

USE CARE IN WITHDRAWING OR INSERTING SHAFT TO AVOID COCKING OR BINDING IN BEARING HOLES IN SHELL WHICH WOULD SCORE THIS BEARING AREA. FOR MAXIMUM AND CONSISTENT ACCURACY, BEARING SURFACES ON SHAFT AND IN SHELLS SHOULD REMAIN SMOOTH, CLEAN AND FREE FROM MILK RESIDUE.

DISASSEMBLY

The Milk-o-Meter must be dissassembled and the packing material removed from around the baffle plate before it is put in operation. The plastic components and the rocker shaft should also be washed and sanitized at this time. (See cleaning instructions.)

1. Hang the meter on one of the convenient wash up or assembly stands. (fig. 1)

2. With meter dial facing you, place right hand on top rear portion of upper shell and with left hand hold back retainer spring at back of frame.

3. Pull right hand firmly forward springing retainer open enough to allow upper shell to clear frame. (fig. 2)

4. When upper shell is clear of frame, tilt shell up at rear and when clear of frame, lift out of assembly — away from slots in front of frame.

5. Lower shell assembly is removed in approximately the same way. Lift rear of shell first, then back in — out away from front of frame.

6. To remove baffle assembly from upper shell, hold upper shell in left hand, grasp baffle assembly with fingers of right hand along the side of the baffle tray. Snap tray toward you, then lift tray up and out of shell. Remove and discard packing around baffle plate. (fig. 3)

7. The lower shell assembly is composed of the lower shell, the rocker, rocker shaft, thrust pin and neoprene "o" ring. The rocker is removed by removing the two rocker spring clips and lifting it off the flat part of the shaft. The shaft is then removed from the shell by removing the neoprene "o" ring, allowing the shaft to be withdrawn from the shell as the "o" ring is pulled off the opposite end. Lift thrust pin out of shell flange at small end of shaft.

fig. 1

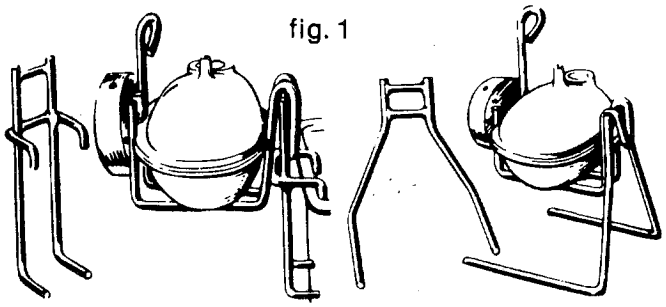


fig. 2

fig. 3

REASSEMBLY

1. Replace thrust pin and rocker shaft in lower shell. Care should be taken to properly locate the neoprene "o" rings on the shaft. One is located just inside the front of the shell. This serves as a retainer to hold the shaft in position. Another fits on the shaft just outside the shell. This ring is pulled into a counterbored recess in the shell by vacuum and acts as a seal. Both rings must be used for satisfactory performance.

2. Replace rocker unit on shaft being careful to center it on flat portion of shaft. Rocker should fit firmly on shaft. Place a stainless steel rocker clip on each side of rocker to hold it on shaft.

3. Replace lower shell in frame by tilting back of shell up and engaging front slots first. As this is being done the arm of the rocker shaft should also be engaged in the magnet arm fork. Press lightly against the retainer spring at the back of the frame and position back of shell.

4. Turn upper shell upside down. Place baffle box in shell with open or square side facing up. Place baffle plate in box. Place baffle tray over the baffle box and engage the ridge on one side into the slot in the upper shell. Press inward on the opposite side of the tray and snap it into place.

5. Place the upper shell into the frame by tilting upward at the back and slipping the front lip of shell under the roller catch on the back of the counter mechanism. At the same time, position notches on shell into the slots in the frame, then press retainer spring and position back of shell into slots. Check to be sure both shells are properly aligned with slots in frame.

6. Where applicable, remove two plug buttons on upper dial. Snap plastic dial cover over meter dial with drain slot down.

CLEANING INSTRUCTIONS

The following procedure should be used to connect Milk-o-Meter into the system for washing in the milk room:

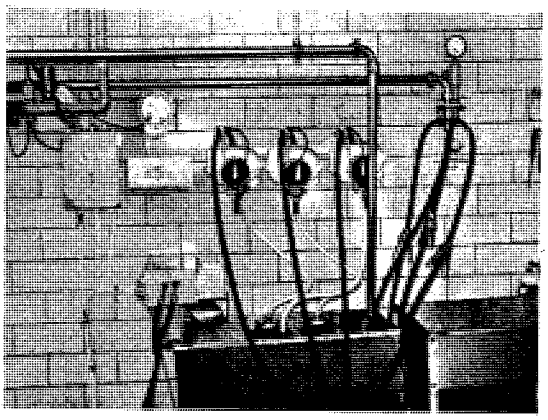
Fasten # 032103 Clips immediately above the wash vat and position meters in them.

Connect hose from milker unit to bottom spout of meter. Connect hose from top shell spout to cleaner system manifold. Jumper hoses may be utilized for these connections.

In-place-cleaning in the milking parlor or barn may very likely require changes in the pipeline to the extent of having a double line system with outlet nipples on the wash line. This will permit flow of cleaner from the wash line through the bottom of the meter then into the milk line. Correct adjustment of the air bleed/injection into the wash system is also necessary to secure the right amount of turbulence for proper washing action. If milker washers/jetters are used it is recommended that the cleaning/sanitizing solution go through the meter first, then to the jetter.

For these reasons it is suggested that the milker dealer be consulted regarding necessary changes before attempting in-place-cleaning.

NOTE: The Milk-o-Meter has been designed with C.I.P. in mind. TeSa does not manufacture nor install the pipeline or C.I.P. equipment, therefore, we cannot blanketly say all systems will clean the Milk-o-Meter to the satisfaction of the local Sanitarian. The effectiveness of the C.I.P. washing equipment is up to its manufacturer and supplier, and its acceptability is up to the local Sanitarian. Adequate waterflow, (for volume) air injection, (for turbulence) and temperature at each Meter should attain satisfactory results.



COUNTER MECHANISMS - ALL MODELS

Periodically, the entire Milk-o-Meter counter-mechanism should be completely submerged and thoroughly flushed with Stoddard solvent, or white mineral spirits. This will remove all milk, fat or dirt buildup with no harm to the mechanism. As a general rule, such cleaning would be required two or three times per year under normal conditions. It is suggested that the mechanism be soaked overnight in the solutions and operated by hand a few times to remove the hardened material.

In extreme cases it may be desirable to remove the dial pointer and the dial and use a small brush to clean the inside of the counter-mechanism. The recommended solvents will not affect the pointer or dial.

NOTE: *When the frame and counter mechanism may be subjected to a sanitizing solution such as sodium hypochlorate, it should immediately thereafter be submerged in clean rinsewater. Sanitizer solution residue when dry can adversely affect the operation of the Meter mechanism, clear water will not.*

CLEANING IN PLACE INSTRUCTIONS

THE CLEANING OF THE MILK-o-METER WITH CIP INSTALLATIONS IS SUBJECT TO ACCEPTANCE BY THE LOCAL SANITARIAN AND APPLICABILITY OF CIP INSTALLATION.

ON COMPLETION OF MILKING:

1. Reverse inlet and outlet milk hose to meter . . . To reverse direction of cleaning and sanitizing flow for best scrubbing action.

2. Flush exterior of Meter . . . When hosing down milk barn, thoroughly wash exterior of Meter plastics and mechanism to remove milk residue, dust, etc.

   As the milking machines are washed, the Meters will also be washed, rinsed and sanitized.

3. Rinse circulate warm (approx. 95°) water, 3 min. @ 0.6 gpm per meter . . . To flush out milk and fat residue.

4. Rinse circulate hot water 3 min. @ 0.6 gpm per Meter at 140°F . . . To flush out warm water and preheat system.

5. Circulate cleaning solution 7 min. @ 0.6 gpm per Meter maintaining 140°F, while alternating air injection, closing vacuum supply after first 40 seconds, reopening vacuum supply 20 seconds thereafter . . . During first cleaning cycle, the closing of vacuum supply will permit cleaning fluid to run out by gravity between Meter shell flanges, removing residue that may have been lodged there by vacuum operation.

6. Circulate hot water rinse 3 min. @ 0.6 gpm per Meter while alternating air injection, maintaining 140°F . . . To flush out cleaning solution and free residue.

7. Circulate sanitizing solution 7 min. @ 0.6 gpm per Meter, while alternating air injection, maintaining room temperature.

8. Reverse inlet and outlet milk hose to Meter . . . To be ready for next milking.

CLEANING IN PLACE INSTRUCTIONS
continued

NOTES AND SUGGESTIONS

1. 0.6 gpm is the minimum recommended per Meter but greater volume may be beneficial.

2. 140°F is the minimum, 170°F the maximum recommended for effective cleaning and rinsing of the Meter and should be measured at the first Meter for maximum, the last Meter for minimum from the wash vat.

3. The cleaning and rinsing times are representative and dependent on the cleaning and sanitizing solutions and procedures approved by the local Sanitarian. It should be noted that washing times greater than 7 min. or temperature below 140°F may permit a redeposition of residue on the inside surfaces of the Meter.

4. Alternating air injection rate is flexible but must be sufficient to provide a clean break between air and fluid. Seven cycles per min. with 30 cfm capacity may be representative.

5. Air bleed at the milk claw will vary, but if less than 0.66 cfm at 15" mercury may indicate a blockage and deter effective scrubbing action at the Meter.

6. Automatic drain valves should be provided at the lowest point of the hose to the lower shell of the Meter for free draining between wash and rinse cycles.

7. Pre-mixing of cleaner in a bucket of hot water will assure its effective solution. Cleaner residue in the wash vat won't clean your equipment.

8. The Meters will withstand any solution that is normally used to wash, rinse and acidify. CAUTION: Do NOT use Caustic Soda. (Sodium Hydroxide).

9. Sanitize before using again.

10. DO NOT USE BOILING WATER IN METERS. This may cause the plastic shells to warp.

SERVICE INSTRUCTIONS

With reasonable care and proper cleaning of the counter mechanism, the service requirements can be held to a minimum.

Since the Milk-o-Meter is a precision weighing apparatus, special equipment and training is required for servicing the counter-mechanism. It is very important, therefore, that the counter-mechanism NEVER be removed from the frame, nor any changes or adjustments made to the internal components except by authorized factory personnel. Any such adjustments or changes by unauthorized persons will void the warranty and DHIA approval. Meters requiring repair or recalibration should be returned to the factory or Authorized Service Center for such service. Meters returned for service should include the plastic parts.

THE FOLLOWING SERVICES AND CHECKS MAY BE PERFORMED BY THE USER:

REPLACEMENT OR ADJUSTMENT OF DIAL POINTER

In the event the Dial Pointer becomes broken or jammed into the dial by accident, use 5/64 allen wrench to loosen set screws, then replace or reset as necessary. The Dial Pointer should be set so that it will just clear the screw heads in the dial. If a grinding or ratcheting occurs when resetting the Dial Pointer, hold the rocker shaft arm to one side. If this is a constant problem with any particular meter, it should be sent to the factory or Authorized Service Center for adjustment.

INSTALLATION OF DUAL DIAL POINTER

To install Dual Dial Pointer, first remove existing plastic dial pointer using allen wrench at base of pointer, and then the Dial Face. Remove existing Pin Stop and replace by Pin Stop # 031233. Carefully align # 031233 Pin Stop with edge of Indicator at zero when tightening 4/40 nut. Remove Indicator. Replace Dial Face, aligning center hold of Dial Face with shaft and replace 2 screws.

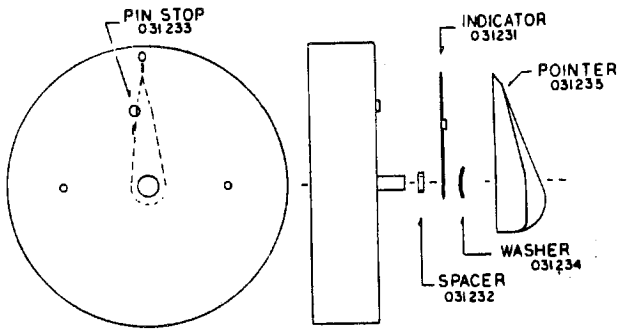
Slip Brass Spacer over shaft, deburr shaft if rough. Verify that Brass Spacer does not rub on center hole of Dial Face. Place Indicator over shaft with tab out. Slip Washer over shaft, replace Dial Pointer. Install the # 031234 Stainless Spring Washer with crowned outer edge toward plastic dial pointer.

Using allen wrench on Dial Pointer, press Dial Pointer in against Meter shaft with approximately 2 lb. force while tightening allen wrench. Indicator drag should only be enough to assure Indicator moves with Dial Pointer without slipping. Too much pressure will induce drag, too little will permit Indicator to slip during use.

In operation, Indicator will stop at Pin Stop while Dial Pointer will continue clockwise. Turning Dial Indicator counterclockwise will automatically stop both at the zero mark.

CAUTION! Dual Dial Pointer is not to be used with cows exceeding 76 lbs., as this is the maximum the Dual Dial Pointer can accommodate.

Excessive wear on old Milk-o-Meter dial shafts may permit binding, as will mis-aligned outer bracket. Such meters should be sent to your nearest Service Center for repair.



REPLACEMENT OR ADJUSTMENT OF ROLLER CATCH ON THE BACK OF THE COUNTER-MECHANISM

This is designed to hold the shells together with slight tension. To adjust tension, loosen the two screws and slide catch up and down as required.

SERVICE INSTRUCTIONS
continued

ROCKER CLIP

Rocker Clips should have a slight amount of tension when in place. If too loose it will not hold properly — if there is too much tension it may distort the rocker and cause inaccuracy. To check tension, hook one end of the clip over the edge of the rocker as though preparing for assembly. Hold the clip as though ready to snap over opposite edge of rocker. In this position the top of the clip should be about 1/32" below the edge of the rocker to provide proper tension. Bend as necessary to attain desired tension.

PLASTICS

Cracked or warped plastics may cause a loss of vacuum and should be replaced as needed. Warpage of shells or rocker may also cause inaccuracy. Therefore, the plastic components and rocker shaft should be returned for checking when factory serviced. The **Baffle Plate** should drop easily into the Baffle Box which in turn should fit loosely into the Baffle Tray. The **Baffle Tray** should snap firmly into the grooves provided inside the upper shell. If the Baffle Tray fits too loosely into the upper shell because of warpage, it should be discarded and replaced.

ROCKER SHAFT

Excessive wear in either the shaft bearing hole in the front of the lower shell or the rounded bearing surface at the bent end of the rocker shaft may cause excess vacuum loss and possible inaccuracy. If an air leak is present in this area with the outer "o" ring in place, either the lower shell or rocker shaft or possibly both, should be replaced.

FRAME & COUNTER MECHANISM

A bent or sprung meter frame can cause an error in reading.

The hooked part of the frame should fit snugly into the clip on the mounting bracket. If it does not, either the clip or the frame hook may be sprung. The Clip should be checked with the # 030115 Bracket Gage. The Gage should fit snugly into the Clip. If it does not, replace it. The frame may then be adjusted to fit solidly into the clip by opening or closing the spread at the top of the "V" in the hooked part.

Meters found to be out of tolerance should have the counter-mechanism cleaned according to the instruction under "Cleaning" and then be rechecked. If still out of tolerance the meter, with plastics, should be sent to the factory or Authorized Service Center for repair.

AGE OF MILK-o-METER

To check the approximate age of your Milk-o-Meter . . . note the serial number stamped on the back plate of the dial mechanism and compare with the following:

1956 - 1960	1100 to 2-0455
1961 - 1965	2-0456 to 3-1041
1966 - 1970	3-1042 to 4-1149
1971 - 1974	4-1150 to 4-4217
1975 - 1982	4-4218 to 4-8999
1983 - 1985	4-4900 to 5-0016
1986 - 1987	5-0017 to 6-0000
1988 - 1989	6-0000 to 8-0000

SERVICE INSTRUCTIONS
continued

SERVICE CENTERS

While Meter service will always be available at the Factory, it may be more convenient for you to send your Milk-o-Meter to one of the following Authorized Milk-o-Meter Repair and Recalibration Service Centers. These Service Centers maintain Factory trained technicians and Factory furnished tools and parts. No other organization is equipped to offer Milk-o-Meter repair and recalibration which meet the rigid accuracy requirements of the DHIA.

Arizona D.H.I.A.
3414 South 48th St.,Unit 3
Phoenix, AZ 95040
Phone (602) 243-7059

Central Colorado DHIC
2752 S.E. Frontage Rd.
Johnsons Corner
Loveland, CO 80537
(303)669-3730

Minnesota State DHIA
134 Lake Blvd.,
Buffalo, MN 55313
(612) 682-1091

Dairy Herd Improvement, Inc.
9550 Liberty Rd. Box E,
Powell, OH 43065-0505
1-800-344-6446 or (614)888-5925

Missouri DHIA
c/o Livestock Nutrition Lab.
Rt. 5. Hwy 40,
Columbia, Missouri 65205
(314)445-4476

Ga./So. Carolina DHIA Inc.,
Richard Culbreth,
Route 4, Box 131,
Abbeville, SC 29620
(803)446-2671

Vermont DHIA-Meter Lab
Gillman Office Complex Bldg.3
Holiday Drive
White River Junction, VT 05001
(802)295-3379

Washington State DHIA
105 South Pine
Burlington, WA 98233
(206)755-0375

Western Service Co.
284 Monrovia Ave.,
Long Beach, CA 90803
(213)438-9091

Wisconsin DHIC
890 South Westland Drive
Appleton, WI 54911
(414) 731-5484

Texas DHIA
Dennis Carr
Rt. 1. Box 116D
Princeton. TX 75077

SAMPLERS

TWIST VALVE
BALL VALVE

AUTOMATIC
DRAIN

PRINCIPLE OF OPERATION

A Sampler is available for attachment to the Milk-o-Meter for Butterfat Test samples. The Sampler is an automatic device to obtain a true proportionate sample in relation to the total milking volume.

Each time the rocker unit of the Milk-o-Meter trips on the Sampler side, an identical volume of milk enters the inlet tube of the Lower Shell above the Sampler.

The resultant accumulated sample is thoroughly mixed by the air inrush through the two lower vent tube holes when the valve is opened. The air inrush also raises the vent tube upward forcing the top flange against the inlet. This restricts the flow of air and causes the vacuum to draw the excess of milk not required for the sampler through the upper holes in the vent tube and back into the lower shell of the Milk-o-Meter.

The milk retained in the Sampler, between the bottom of the Sampler cup and the upper vent tube holes is a true proportionate sample in relation to total milking volume. Shutting off the vacuum between meter and pipeline permits the vent tube to drop into its normal down position permitting the sample to drain out the lower holes in the vent tube into the sample cup. The # 031626 Lower Shell includes the PBV Pushrod which is a built-in vacuum shutoff valve for this purpose.

ASSEMBLY AND OPERATION
TWIST VALVE - BALL VALVE

ASSEMBLY

1. Insert vent plug halfway through center hole of vent tube. (E)
2. Place vent tube in Sampler spigot. (D)
3. Place gasket on top of Sampler Cup. (B)
4. Place Sampler cup and gasket on lower shell of Milk-o-Meter, aligning notch on Sampler cup with locating lug on lower shell. (A)
5. Snap retainer springs over pins in lower shell. (C)

OPERATION — USING STANDARD LOWER SHELL #031622

1. After recording weight reading from meter dial — and with vacuum still on — open the twist valve or ball valve, depending on style of sampler, until milk is mixed and excess removed. (approx. 3 to 5 seconds). The sound from air inrush will change tone when excess milk is removed.
2. Hold sample bottle under spigot.
3. Shut off vacuum between meter and pipe line with shut off valve or clamp.
4. After milk is completely drained from Sampler Cup, reset valve over spigot.

OPERATION — USING PBV (PUSH BUTTON VALVE) LOWER SHELL #031626. STEPS 1 AND 2 ARE THE SAME FOR PBV AS FOR STANDARD LOWER SHELL

3. Shut off vacuum by pulling out pushrod of PBV Shell.
4. After milk is completely drained from Sampler cup, reset twist valve or ball valve over spigot.
5. Release vacuum by pushing in pushrod of PBV Shell and proceed with next milking.

CAUTION: DO NOT SHUT OFF VACUUM OR WITHDRAW SAMPLE UNTIL MILK HAS BEEN MIXED PER STEP NO. 1

FOLLOWING INSTRUCTIONS EXACTLY WILL RESULT IN ACCURATE SAMPLES.

NOTE: See Page 21-22 for Complete Illustrations and Part Numbers

ASSEMBLY AND OPERATION
AUTOMATIC DRAIN SAMPLER

ASSEMBLY

1. Place gasket on top of Sampler Cup (D)
2. Place Sampler cup and gasket on lower shell of Milk-o-Meter, aligning notch on Sampler cup with locating lug on lower shell. (A)
3. Snap retainer springs over pins in lower shell (E)
4. Slide wire loop over sampler cup discharge boss and snap wire hooks at top of hanger over retainer spring.

Note: While the Automatic Drain Sampler can be used with the standard lower shell #031622, operations are much more effective when used with the PBV lower shell #031626.

OPERATION

WITH PBV LOWER SHELL

Verify Hanger and Collection Cup is in place. Push in the PBV pushbutton which cuts the vacuum, releasing all of the collected sample into your cup in seconds. Pull out the PBV pushbutton and the vacuum seals the check valve and you are ready to start milking the next cow.

WITH STANDARD LOWER SHELL

Shut vacuum off manually and follow procedure above.

After completion of the above, when convenient for you, slip the collection cup out of the hanger, mix as required and take as much as needed for your regular sample bottle or bag, discarding the balance.

REPAIR AND SERVICE

For trouble free and accurate operation, the following points should be adhered to:

1. The Sampler should always be removed from the Milk-o-Meter and disassembled for cleaning. It may be washed and sanitized with any approved dairy cleaner and sanitizers. Clean spigot with brush provided to prevent build-up of fat or milkstone.

2. The Vent Tube should move up and down freely in the spigot. If it does not, check for burrs on the end of the tube or milkstone build-up in spigot.

3. Vent Plug should fit tight when halfway through tube. If it does not, it should be replaced.

4. Rubber parts should be replaced periodically to prevent air leaks.

The Sampler extracts an identical amount of milk from each ½ pound which passes through the Milk-o-Meter. Based upon the amount extracted, it requires a minimum of approximately 16 lbs. of milk to accumulate a one ounce sample. If recorded milk weight is over 16 lbs. and the Sampler delivers less than approximately 1 ounce of milk, the following procedures should be followed:

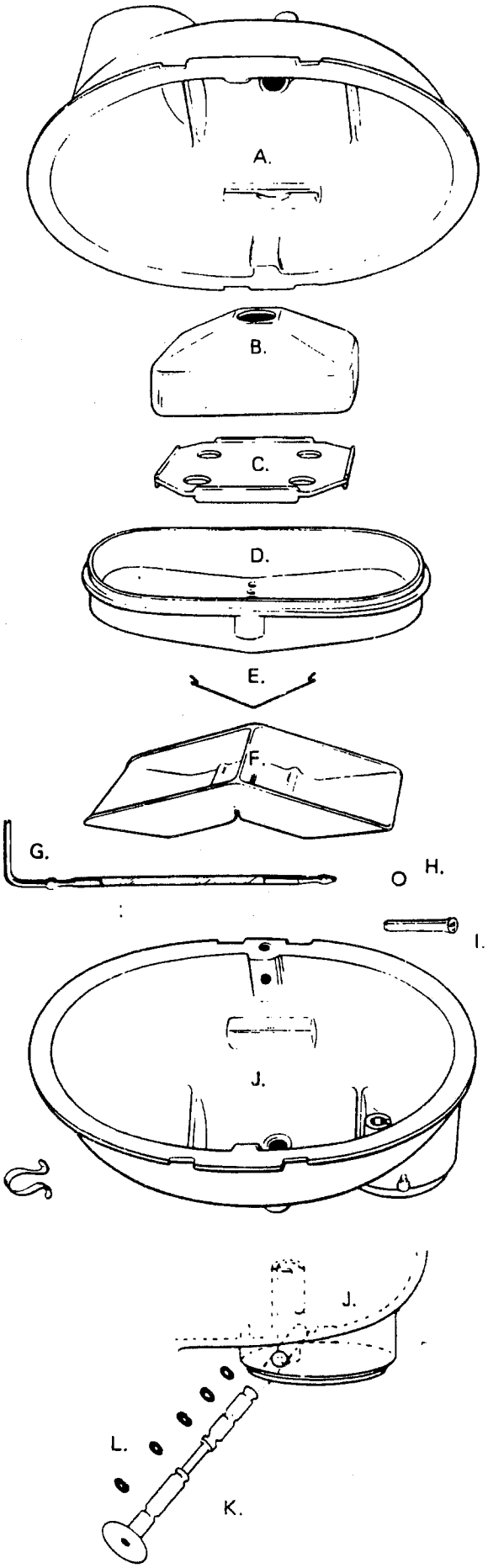
1. If the problem occurs intermittently it indicates a leaking valve. Check and, if necessary, replace.

2. If the problem is consistent with every milking, it indicates an air leak at the sampler gasket or through a crack in the sampler cup. It may also indicate a vent tube stuck in the down position. To isolate the problem, as soon as the milker is removed from the cow, shut off the vacuum and carefully remove the entire Sampler from the Milk-o-Meter. If cup contains the proper amount of milk, based upon total weight as shown on dial (approximately 1 oz. at 16 lbs., 3 oz. at 48, etc.) it indicates a stuck vent tube. This should be removed and checked for burrs and Sampler spigot checked for possible fat or milkstone build-up.

If there is not enough or no milk at all in the cup, it indicates an air leak in the Sampler gasket or cup. This causes a column of air to go up the inlet tube which prevents part or all of the milk from entering the sampler cup. In such cases, the gasket should be checked for cracks or deterioration and if necessary, replaced. NOTE: *Use only "O" Rings supplied by TeSa — other types may look the same but are not manufactured to the required close tolerance and will cause problems.*

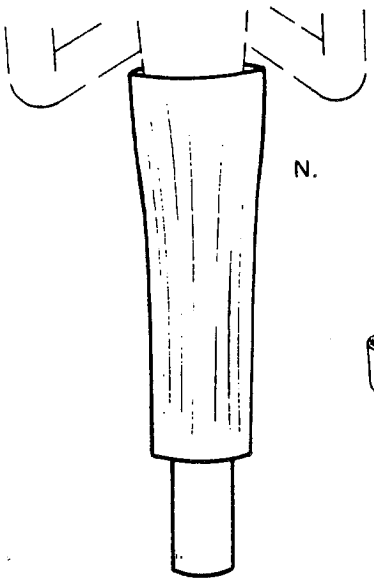
MILK-o-METER

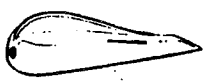
PARTS LIST



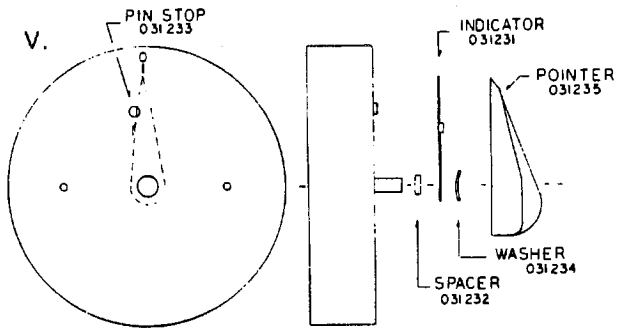
Key	No.	Description
A.	031601	Upper Shell, Std. White
B.	031602	Baffle Box
C.	031604	Baffle Plate
D.	032080	Baffle Tray
E.	031650	Rocker Clip
F.	031605	Rocker
G.	031607	Rocker Shaft
H.	031608	Shaft "O" Ring
I.	031606	Thrust Pin
J.	031622	Standard 1" Lower Shell
	031626	Push Button Valve (PBV) Lower Shell
K.	031627	Pushrod Only for PBV Lower Shell
L.	031631	"O" Ring for Pushrod (5 Required)
M.	032108	Shell Clip

PARTS LIST
continued





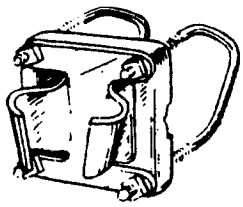
Key	No.	Description
N.	032086	1" to 9/16" Flex-Adapter
O.	032085	1" to 9/16" Stainless Steel Adapter
Q.	036505	Vent Plug
R.	037021	Small Shell Stopper
S.	031500	Brush for Milk-o-Meter
T.	031130	Dial Pointer (Old Style)
U.	031235	Dial Pointer (New Style) used with Dual Dial Pointer Kit
V.	031230	Dual Dial Pointer Kit



031231	Indicator	4-40	Hex Nut
031232	Brass Spacer	031234	Spring Washer
031233	Pin Stop	8-32	Allen Wrench

MILK-o-METER

ACCESSORIES

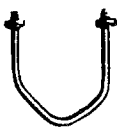


PIPE CLAMP BRACKET — 032101

Rigid molded, complete with U-bolts, nuts, clip and base. For universal application, either horizontal or vertical pipe mounting. Use one at each milk valve or inlet on line.

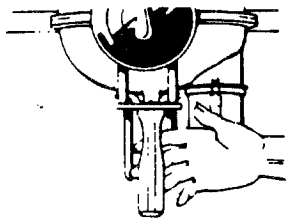
CLIP — 032103 (Steel), CLIP — 032109 (Molded)

Only, for mounting on wood stanchions, or on wall for Milk-o-Meter washup and storage.



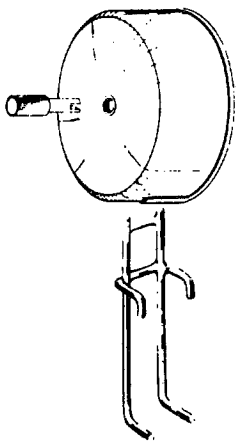
U-BOLTS and 2 NUTS — 032104

Spare for Pipe Clamp Bracket



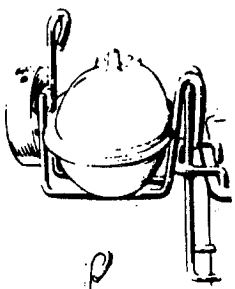
HANDLE FOR MILK-o-METER — 032105

Easily attached and removable. A big help in moving the meter in stanchion barns or other installations.



PLASTIC DIAL COVER — 032106

Required in some states for Official Testing, helpful in preventing accidental movement of dial pointer during usage, reset to zero with key.



PLASTIC DIAL RING — 032206

Same as cover, but open faced. No key required.

VAT EDGE STAND — 030060

A "must" for the washup room. Hang over the edge inside the wash vat for ease of disassembly and handling. One per installation.

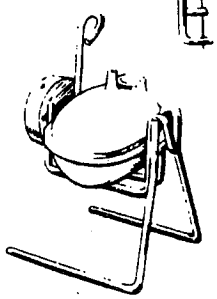
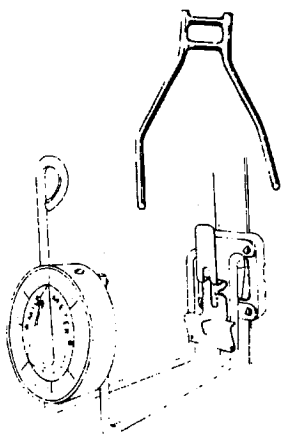


TABLE MODEL STAND — 030070

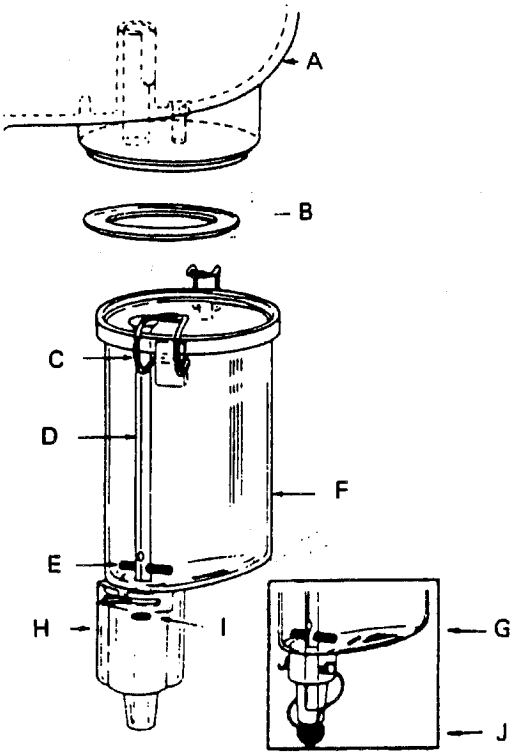
A great convenience for table top storage, demonstrations and displays.



HI-FLO FRAME AND COUNTER MECHANISM — 033200

Sold without plastics. Every user should own one as a spare for any contingency.

TWIST VALVE
BALL VALVE



PARTS LIST

UNITIZED LOWER SHELL -- 031622

A.	031622	Unitized Lower Shell 1" outlet

Complete Sampler assemblies

037002	Twist Valve Smpler, 1 oz. Standard
038051	Ball Valve, 1 oz. Standard

Parts only

B.	037029	Flat Gasket
C.	037012	Retainer spring (2)
D.	036006	Vent tube 1 oz. (Length 5 5/8")
E.	036505	Vent plug
F.	037011	Cup only for twist valve
G.	036770L	Cup only for ball valve
H.	037015	Twist valve only
I.	037020	Twist valve "O" ring
J.	036015	Ball valve assembly only
K.	038200	Twist valve Sampler LESS VENT TUBE & PLUG
L.	038300	Ball valve Sampler LESS VENT TUBE & PLUG

PUSH BUTTON VALVING — 031626 LOWER SHELL (PBV)

A.	031626	PBV Lower Shell only 1" outlet
B.	031627	Push rod only for PBV Lower Shell
C.	031631	"O" ring for Push rod (5 required)

(It is essential to order the above parts for operation of the PBV Shell)

Complete Sampler assemblies

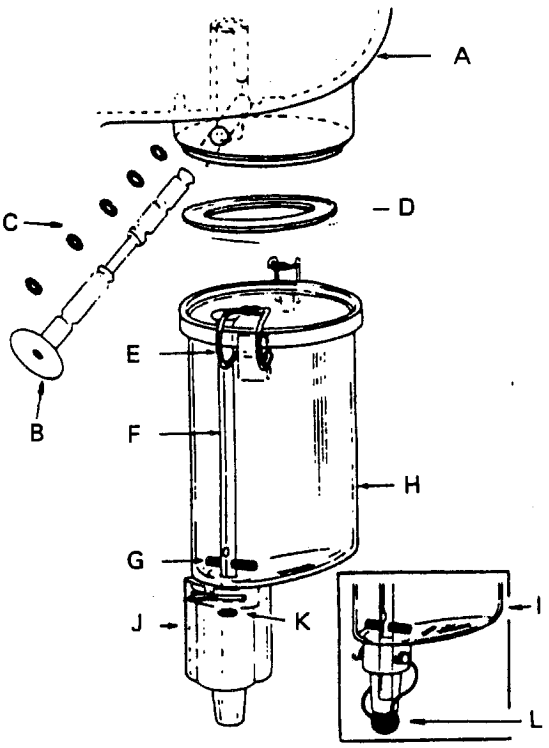
037002	Twist Valve Sampler, 1 oz. Standard
038051	Ball Valve Sampler, 1 oz. Standard

Parts only

D.	037029	Flat Gasket
E.	037012	Retainer spring (2)
F.	036006	Vent tube 1 oz. (Length 5 5/8")
G.	036505	Vent plug
H.	037011	Cup only for twist valve
I.	036770L	Cup only for ball valve
J.	037015	Twist valve only
K.	037020	Twist valve "O" ring
L.	036015	Ball valve only

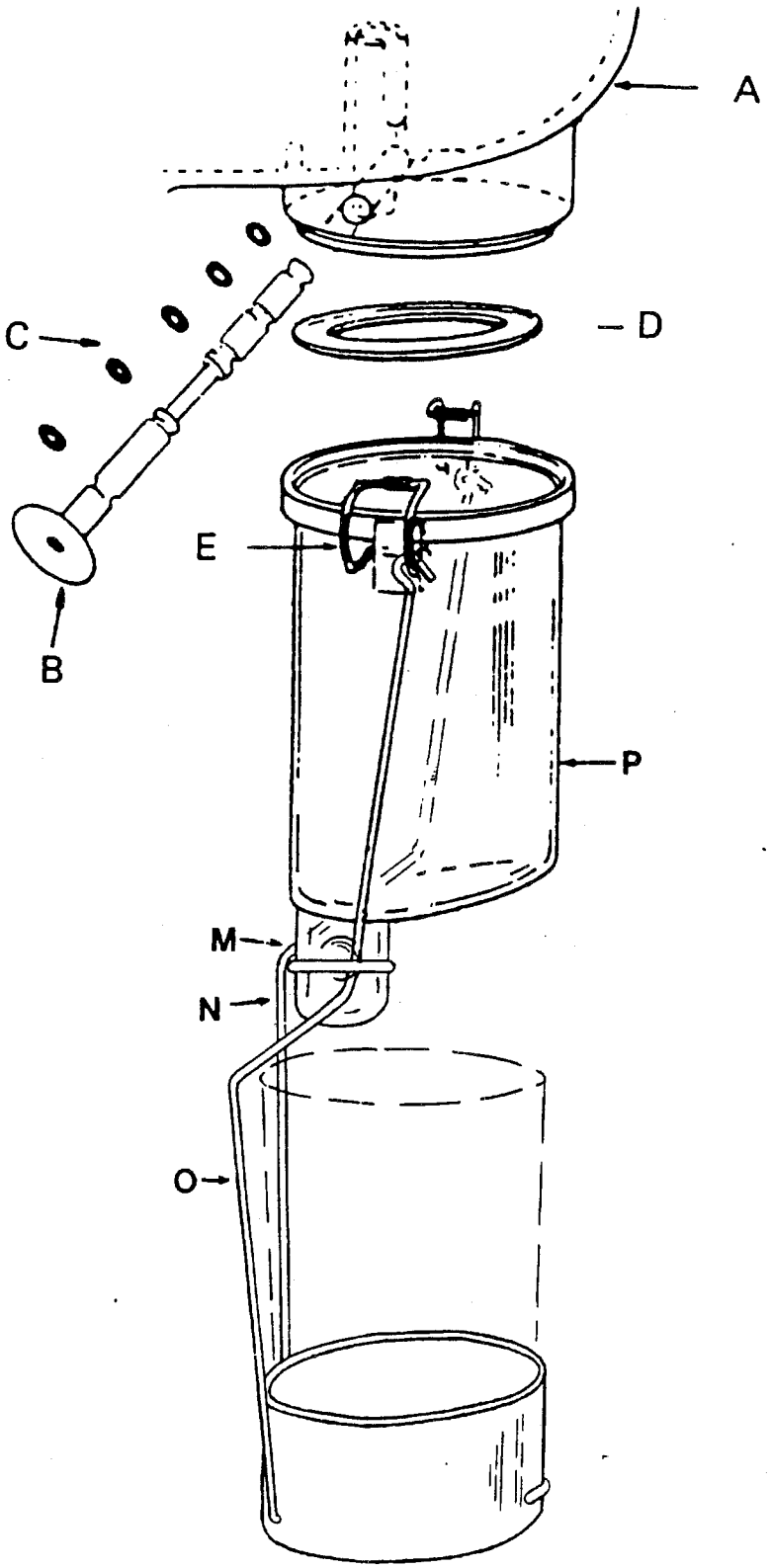
Patent Numbers:

United States	2917926
Great Britain	860043
Canada	597187
United States	4030356



SAMPLER
AUTOMATIC DRAIN

PARTS LIST



AUTOMATIC DRAIN SAMPLER #038100

A.	#031626	PBV Lower Shell 1" outlet
B.	#031627	Push Rod only for PBV Lower Shell
C.	#031631	"O" Ring for Push Rod (five required)
D.	#037029	Flat Gasket
E.	#037012	Retainer Spring (2)
M.	#038105	A/D Ball
N.	#038104	A/D Rivet
O.	#038103	Collection Cup Hanger
P.	#038101	A/D Cup Only

ASSEMBLY

1. Place gasket on top of Sampler Cup (D)
2. Place Sampler cup and gasket on lower shell of Milk-o-Meter, aligning notch on Sampler cup with locating lug on lower shell.
3. Snap retainer springs over pins in lower shell (E)
4. Slide wire loop over sampler cup discharge boss and snap wire hooks at top of hanger over retainer spring.

Note: While the Automatic Drain Sampler can be used with the standard lower shell #031622, operations are much more effective when used with the PBV lower shell #031626

OPERATION

With PBV Lower Shell

Verify Hanger and Collection Cup is in place. Push in the PBV pushbutton which cuts the vacuum, releasing all of the collected sample into your cup in seconds. Pull out the PBV pushbutton and the vacuum seals the check valve and you are ready to start milking the next cow.

With Standard Lower Shell

Shut vacuum off manually and follow procedure above.

After completion of the above, when convenient for you, slip the collection cup out of the hanger, mix as required and take as much as needed for your regular sample bottle or bag, discarding the balance.

TESA METERS, INC. • Box 21519, Fort Lauderdale, Florida 33335

• 305-525-6688

PRICE LIST August 15, 1989

MILK-o-METER COMPLETE ASSEMBLY

[Sampler not included and must be ordered separately]

Part No.	Description	Price ea.
033020	Milk-o-Meter, includes 031626 PBV Lower Shell, Pushrod and "O" Rings	$205.00
033000	Milk-o-Meter, includes 031622 Unitized Lower Shell	$189.00
033010	Milk-o-Meter, includes 031622 Unitized Lower Shell, with KILO Dial	$222.00
033011	Milk-o-Meter, includes 031626 PBV Lower Shell, Pushrod, "O" Rings, with KILO Dial	$237.00
034000	Milk-o-Meter, same as 033000 plus electronic provisions for computer application	$308.00
034020	Milk-o-Meter, same as 034000 except including PBV Lower Shell, Pushrod and "O" Rings	$323.00
033200	Milk-o-Meter Frame & Counter Mechanism only	$126.00
	MOLDED METER HOUSING MODIFIED FOR LOW LINE INCLUDING CLEAR DIAL RING OR CLEAR DIAL COVER [SPECIFY WHICH]:	
033050	PBV Milk-o-Meter, with clear Dial Ring or Cover	$215.00
033060	STD Milk-o-Meter, with clear Dial Ring or Cover	$200.00
033150	Milk-o-Meter Frame & Counter Mechanism only, with dial ring or cover for low line installation	$139.00

MILK-o-METER ACCESSORIES

Part No.	Description	Quantity- 1-24	25-499	500 up
032101	Pipe Clamp Bracket, molded	4.50	4.30	4.10
032102	Base only for Pipe Clamp Bracket	2.30	2.00	1.90
032109	Clip only for wall mounting	2.30	2.00	1.90
032110	Pipe Clamp Bracket, with steel Clip	5.00	4.80	4.35

Part No.	Description	Price ea.
032103	Steel Clip only, PCB, for welding	3.30
032104	U-Bolt for Pipe Clamp Bracket, with 2 nuts	.60
032105	Handle for Milk-o-Meter	10.65

Part No.	Description	Price ea.
032106	Clear Plastic Dial Cover, closed, less key, for aluminum and molded dial.....	6.60
032206	Clear Plastic Dial Ring, Open faced, no key required, for aluminum and molded dial.....	6.60
033106	Clear Plastic Dial Cover, or 033206 ring, for molded Meter Mechanism [Low line installation only].....	6.60
032107	Key, for Clear Plastic Dial Cover.....	3.50
030060	Vat Edge Stand, for Meter washup at vat.....	14.00
030070	Table Model Stand, for Meter support.....	13.20
031500	Brush for Meter Lower Shell Shaft cleaning.....	.90
032108	Shell Clips for holding Meter shells together.....	1.10
MILK-o-METER PARTS		
031601	Upper Shell.....	$23.20
031626	Lower Shell, 1", Push Button Valving, PBV.....	37.95
031622	Lower Shell, 1", Std.	34.10
032086	Flex-Adapter Assembly.....	6.90
032087	Stainless tube, for Flex-Adapter.....	3.40
032088	Flex-Adapter less stainless tube.....	3.40
031627	Pushrod for PBV Lower Shell.....	17.50
031631	"0" Ring for PBV Pushrod, [5 req'd.][bulk 100-.37]..	.55
031602	Baffle Box.....	9.90
031604	Baffle Plate.....	6.60
032080	Baffle Tray.....	12.75
031605	Rocker.....	14.50
031607	Rocker Shaft.....	21.55
031650	Rocker Clip [2 required per Rocker].....	.70
031608	"0" Ring for Rocker Shaft [Bulk 100- .26].....	.40
031606	Thrust Pin for Lower Shell.....	1.40
031005	Kilo Dial Face Assembly.....	16.15
031007	Molded Dial Face Assembly, with 031242 Spacer.....	14.00
031006	Adhesive Backed Dial Face	5.95
031130	Dial Pointer Assembly with spring stop.....	7.25
031235	Dial Pointer Assembly, [new style].....	3.60
031230	Dual Dial Pointer Kit [update old style, alum.face].	6.60
031240	Dual Dial Pointer Kit for Molded Dial Face.....	6.60
033416	Dual Dial Pointer Kit for Molded Housing.....	6.60
031231	Stainless Indicator only, for Dual Dial Pointer.....	3.85
031233	Pin Stop, Dual Dial Pointer.....	1.65
031234	Spring Washer, Dual Dial Pointer.....	.55
037021	Small Shell Stopper,[bulk 100-.22].....	.35

MILK-o-METER INSPECTION TOOLS

Part No.	Description	Price ea.
030115	Bracket Gage for levelling Pipe Clamp Brackets.....	28.60

SAMPLER, COMPLETE ASSEMBLIES

[Sampler not included in Milk-o-Meter price and must be ordered separately]

037002	Twist Valve Sampler.....	$23.65
038051	Ball Valve Sampler.....	29.15
038100	A/D Sampler [Automatic Drain].....	17.25
038200	Twist Valve Sampler, less vent tube and plug.....	19.45
038300	Ball Valve Sampler, less vent tube and plug.....	19.70

SAMPLER PARTS

037011	Twist Valve, Cup only.....	$17.05
036770	Ball Valve, Cup only.....	14.20
038101	A/D, Cup only.....	12.65
038103	A/D Collection Cup Hanger.....	16.10
036015	Loop Ball Valve.....	3.00
037015	Twist Valve.....	2.75
036006	Vent Tube.....	15.05
037029	Sampler Gasket.....	1.55
036505	Vent Tube Plug.....	.40
037012	Retainer Spring, Sampler Cup.....	4.20
037020	Twist Valve "O" Ring [Bulk 100-.33].....	.50
038104	A/D Cup Ball Rivet.....	.75
038105	A/D Ball [Stainless].....	1.10
038106	A/D "O" Ring Seal.....	.35

RECORDERS

Part No.	Description	Price ea.
061000	AM/PM Standard Interval Recorder, Toggle Switch.....	$145.00
063000	AM/PM Standard Interval Recorder, Key Switch.....	138.00
062000	AM/PM Portable Interval Recorder, Toggle Switch.....	161.00
064000	AM/PM Portable Interval Recorder, Key Switch.....	155.00

Recorders are furnished with a standard 10 minute time delay setting, but are available in 20 minute, 30 minute or 60 minute time delay setting upon request at no extra charge, where required.

RECORDER ACCESSORIES AND PARTS

061020	AM/PM Field Tester Unit.....	$ 92.00
060158	Wall Receptacle for Portable Model use.....	21.00
061006	Replacement Electronic Module, Toggle Switch.....	121.00
063006	Replacement Electronic Module, Key Switch.....	114.00

TERMS AND CONDITIONS OF SALE

MINIMUM ORDER IS $15.00 NET, excluding shipping charges. Please add additional supply items to reach this total, or if you would prefer us to do so, we will use our best judgement.

ALL SALES ARE MADE NET FOB Fort Lauderdale, Florida with prices in effect at the time of shipment. Advance authorization will be requested of any increase exceeding 10% above the most recent published price list.

Ground UPS shipping cost will be prepaid when payment is received with orders over $50.00. Please add $3.00 on prepaid orders under $50.00 to cover shipping charges.

August 15,1989