

Care and Maintenance of Portable Meters

2018 Meter Technician Training School

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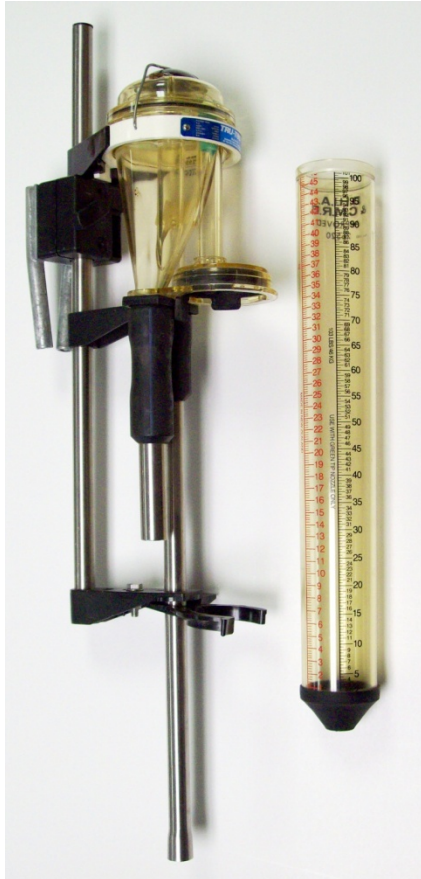
Chair, ICAR Subcommittee for Recording and Sampling Devices

Topics to Cover...

- **Maintenance of Approved Meters**
- **Storage and Transport of Meters**
- **Proper Sampling and Reading**

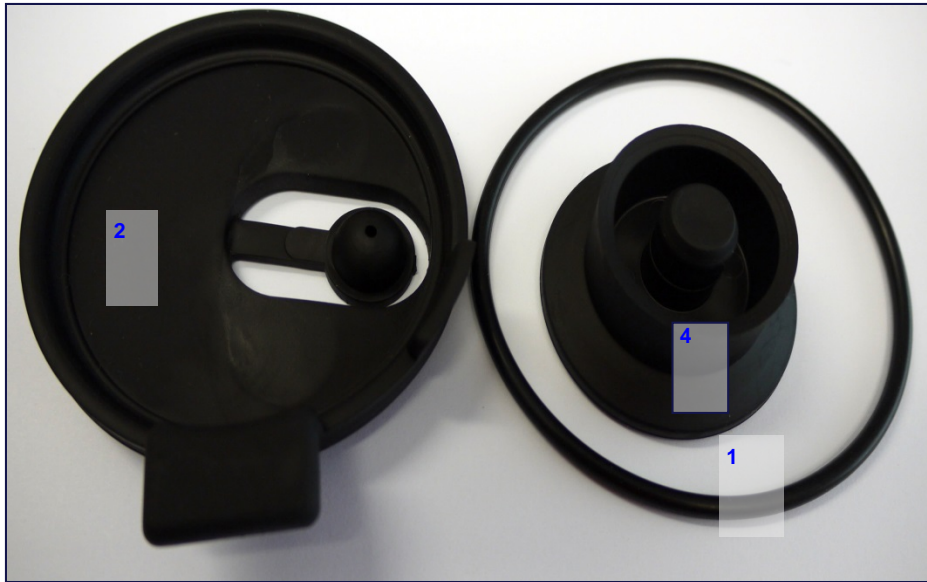
MAINTENANCE OF APPROVED METERS

Tru-Test Pull-Out



- Most popular meter in Northeast and Midwest
- Easy to maintain
- Standard Bore (old) or Wide Bore (new) models
- Labor intensive operation
- Low cost of ownership

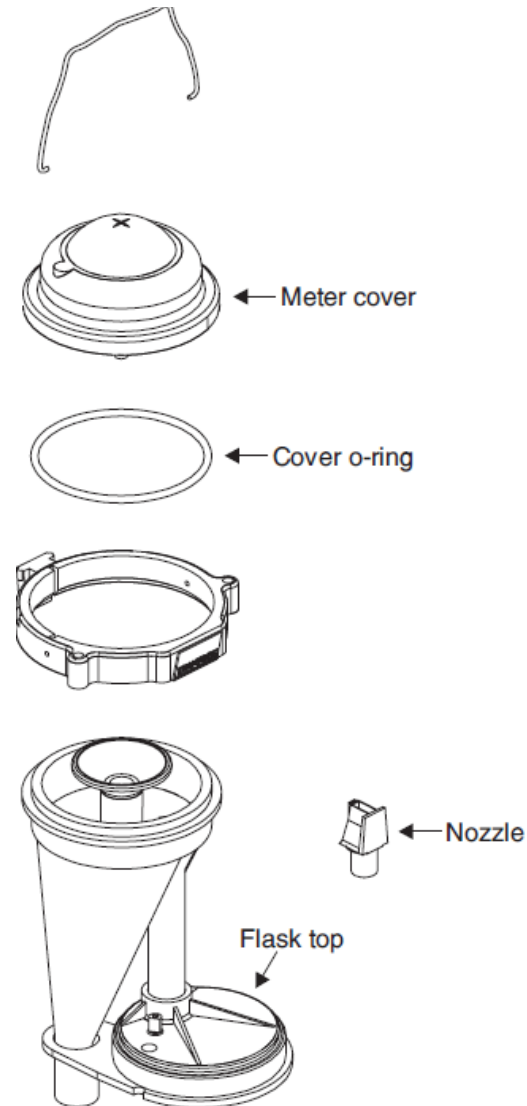
Tru-Test Pull-Out - Maintenance



- Replace VSO at least once per year
- Replace gasket on cap yearly
- Replace the flask plug yearly or when breakdown of rubber is noticeable

Tru-Test Pull-Out - Maintenance

- Inspect nozzle, replace only when meter does not calibrate
- Remove with fingers – not pliers, etc.
- Do not reuse nozzles



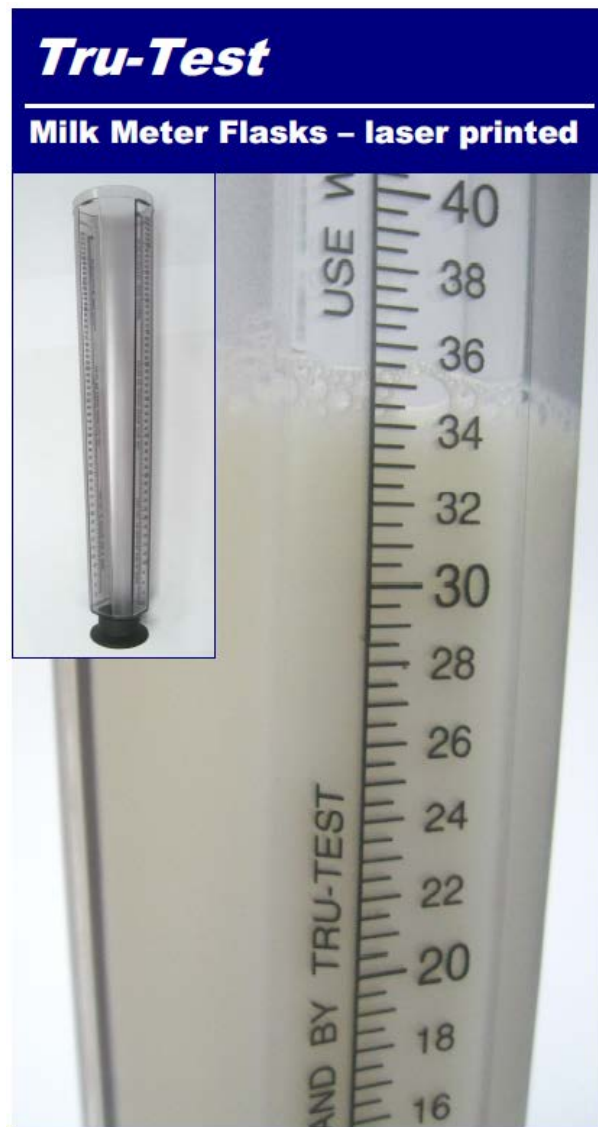
Tru-Test Pull-Out - Maintenance



- **Flask plug improvements have been made**
- **Thicker base**
- **Tolerances changed to fit & seal better to flask**
- **Look for 3 dot pips under the base for the improved flask plugs**

Tru-Test Pull-Out - Maintenance

- New laser-etched flasks – do not use flask tapes on flasks for WB meters



Tru-Test Ezi-Test



- Most popular meter in the world
- Milk, Wash/Mix and Sample positions
- Standard Bore (old) or Wide Bore (new) models
- Self-contained (closed system)

Tru-Test Ezi-Test - Maintenance

- Replace gasket on cap yearly
- Inspect nozzle, replace only when meter does not calibrate
 - **Remove with fingers – not pliers, etc.**
 - **Do not reuse nozzles**

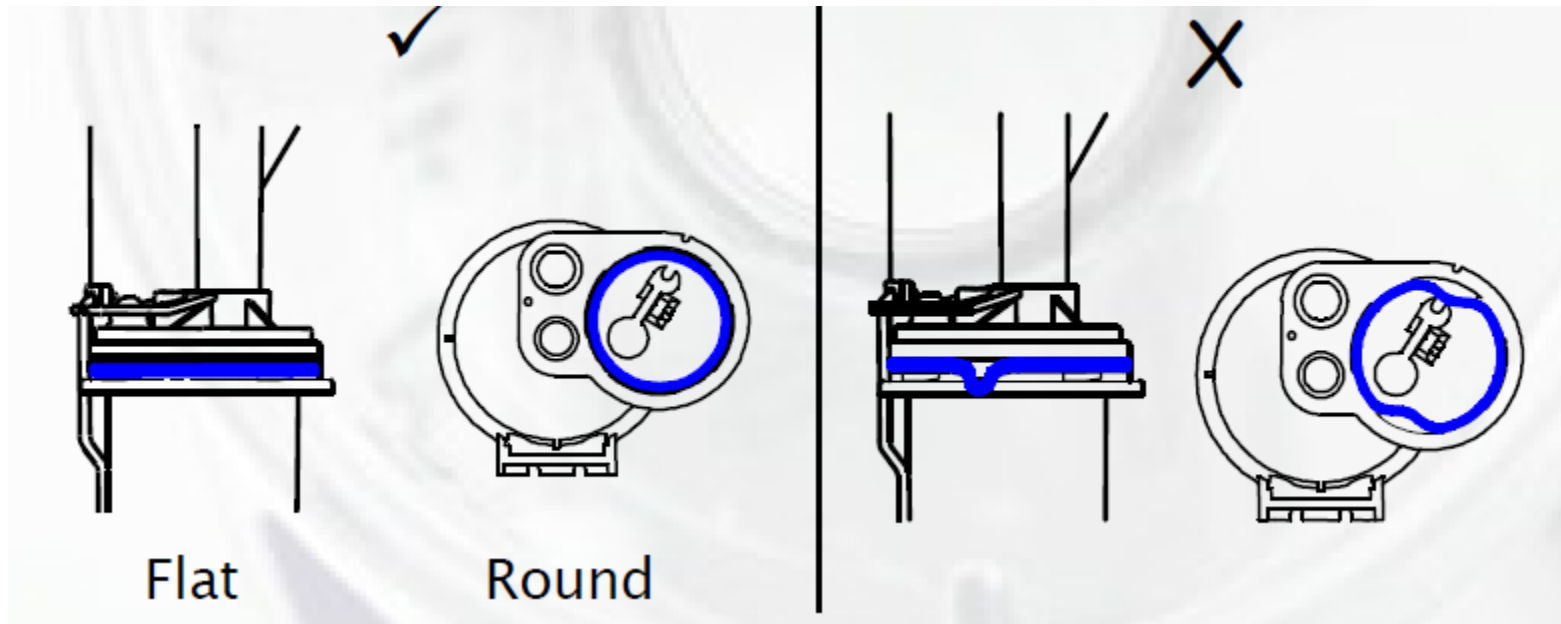


Tru-Test Ezi-Test – Annual Service Kits



Tru-Test Ezi-Test – Flask Seal

- Replace flask seal



Tru-Test Ezi-Test - Maintenance

- Replace rocker and seal assembly
- Check and replace air admission valve seal when necessary
- **Do not over tighten screw**



Tru-Test Ezi-Test - Maintenance

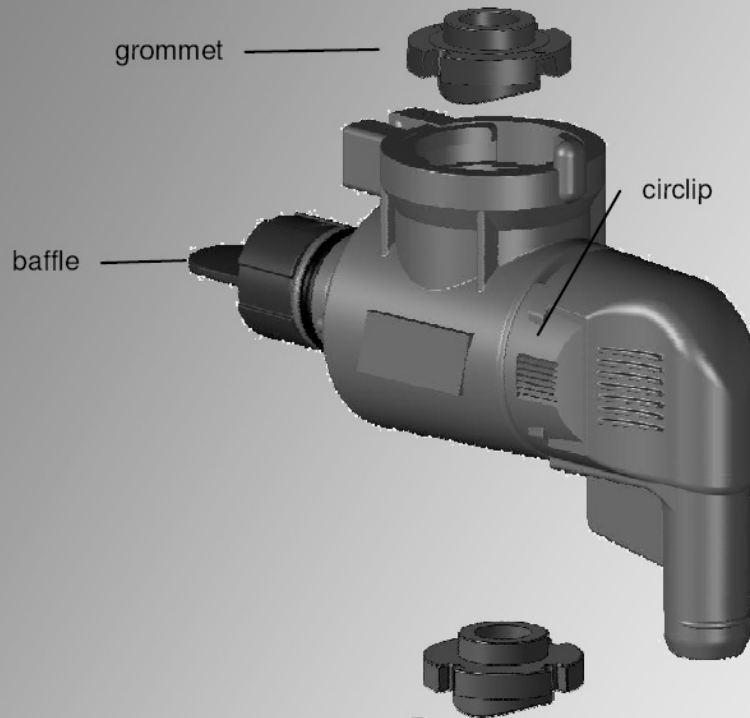


- Plastic T-Piece
- Easily broken
- \$20+ repair cost
- Store with valve in Milk Position

Tru-Test Ezi-Test - Maintenance

Tru-Test

Improved WB Ezi-Test / Mini-Test Sampling Valve



- **Must replace entire valve**
- **Dark charcoal in color**
- **Should reduce broken wash baffle issue**

Tru-Test Ezi-Test - Grommets

Details of Grommet Change

Raised flask sealing land

The sealing land has been increased to improve the seal between the flask, grommet and valve outer, as well as enhancing the seal between the grommet and valve inner. This has been raised 0.20 mm above the existing sealing land on the grommet.

Added a raised sealing lip

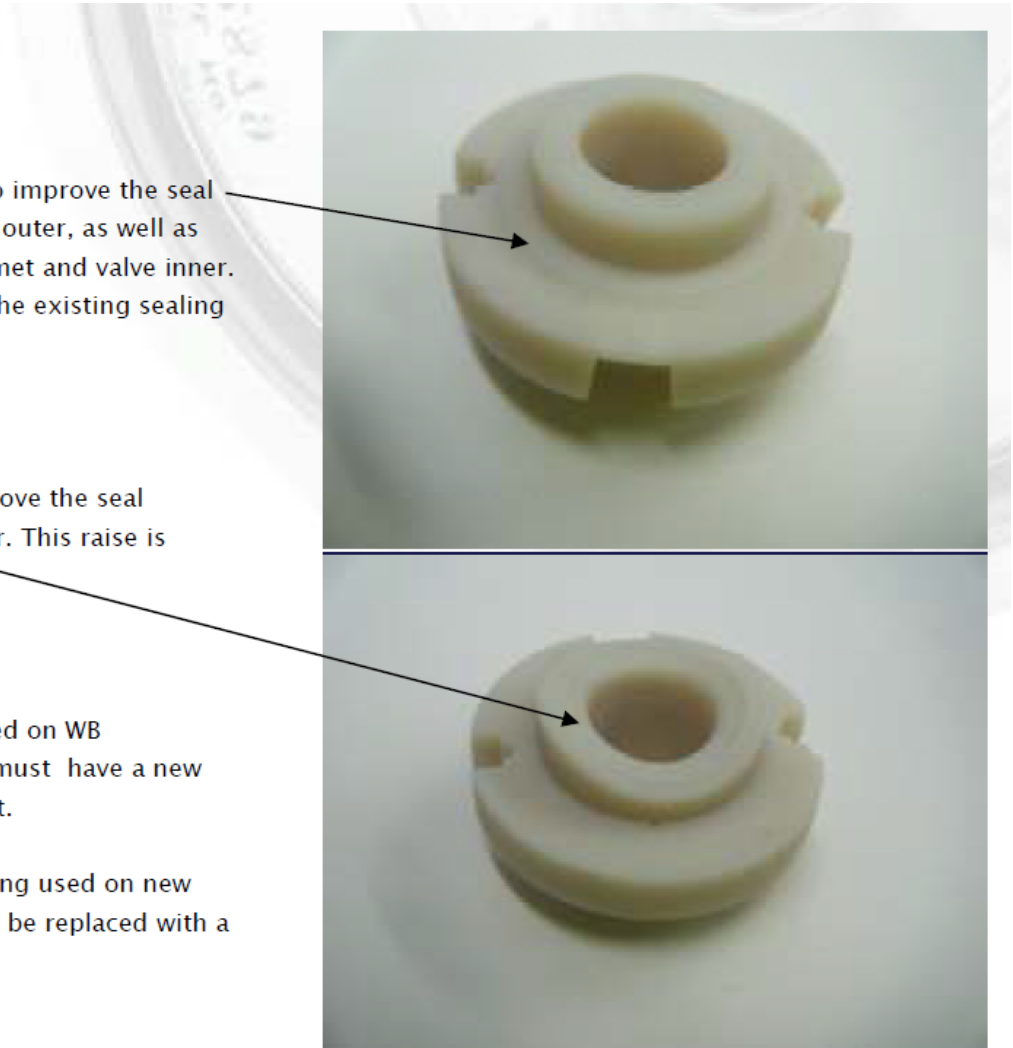
This raised lip has been added to improve the seal between the grommet and valve inner. This raise is 0.25mm high on the sealing surface.

Beige Valve Outer Grommet

All new dark grey valve assembly's used on WB AutoSampler and WB Ezi-Test Meters must have a new BEIGE coloured Valve Outer Grommet.

If a BLACK Valve Outer Grommet is being used on new dark grey valve assembly's this should be replaced with a new BEIGE coloured one.

Material remains Santoprene.



Tru-Test Auto-Sampler



- **Mixing and sampling with push of button**
- **Labor-efficient**
- **Standard Bore (old) or Wide Bore (new) models**
- **High cost of ownership**
 - **Multiple service kits**
 - **Cap, sampler, valve and body damage**

Tru-Test Auto Sampler - Maintenance

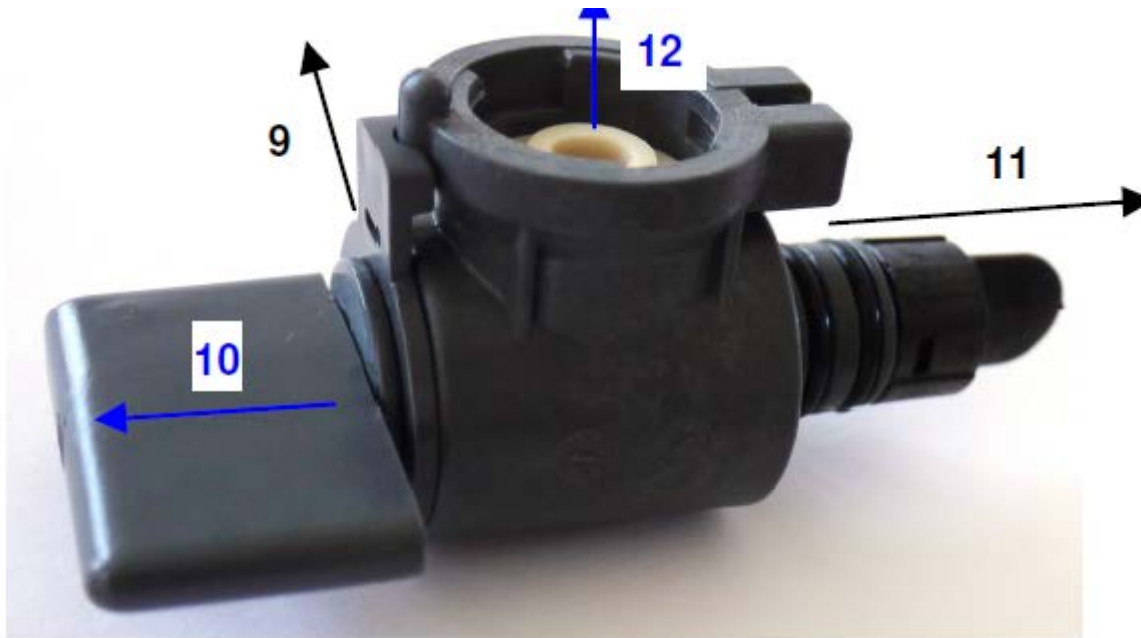
- Replace gasket on cap yearly
- Inspect nozzle, replace only when meter does not calibrate
 - **Remove with fingers – not pliers, etc.**
 - **Do not reuse nozzles**



Tru-Test Auto Sampler – Service Kits



Tru-Test Auto Sampler – Maintenance



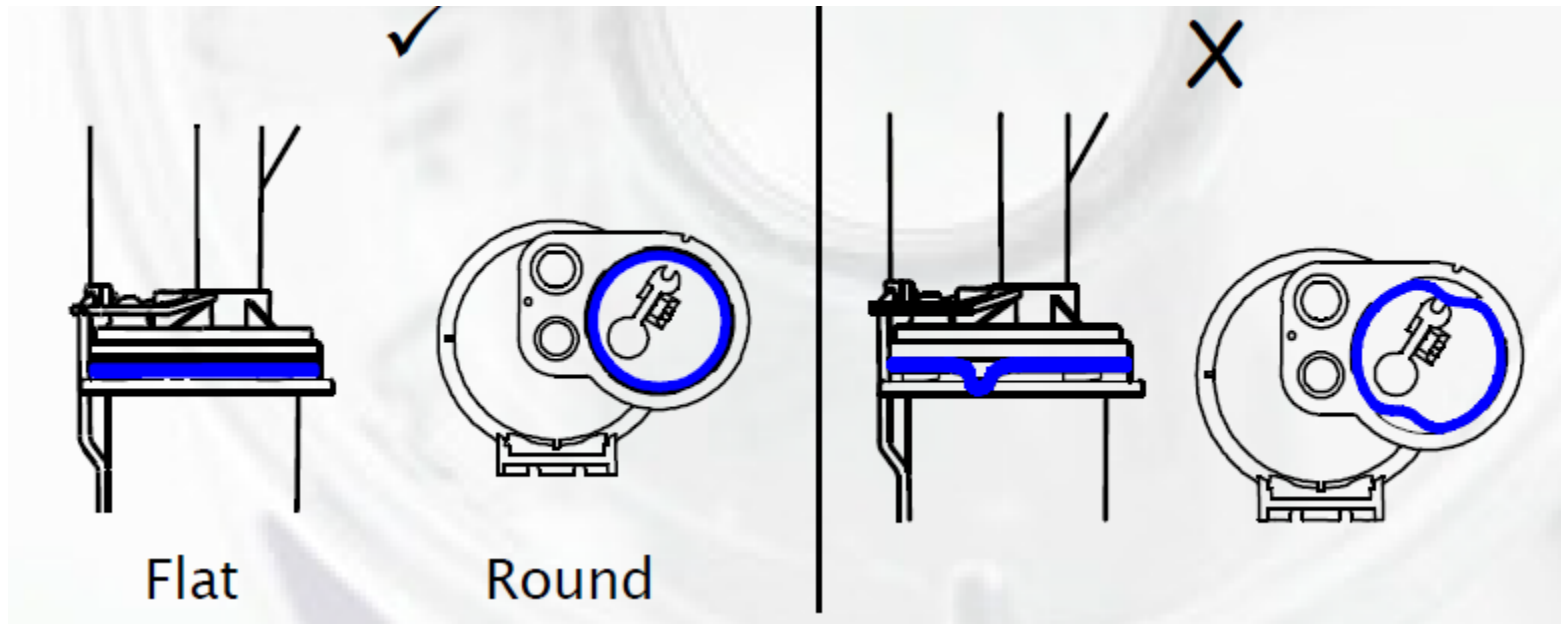
Tru-Test Auto Sampler - Maintenance

- Replace rocker and seal assembly
- Replace push button and O-ring



Tru-Test Auto Sampler – Flask Seal

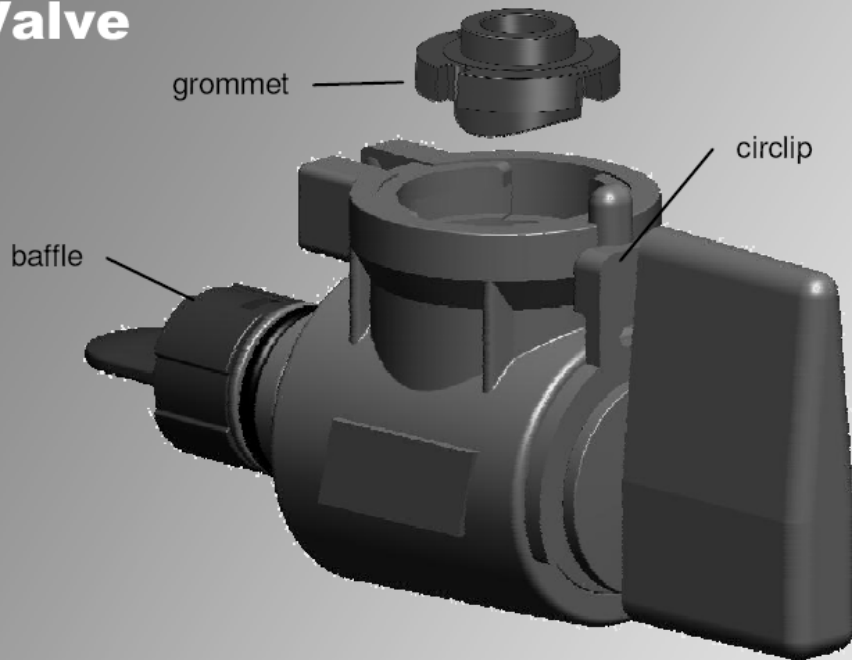
- Replace flask seal



Tru-Test Auto Sampler - Maintenance

Tru-Test

**Improved WB Auto Sampler
Valve**



- **Must replace entire valve**
- **Dark charcoal in color**
- **Should reduce broken wash baffle issue**

Tru-Test Auto Sampler - Grommets

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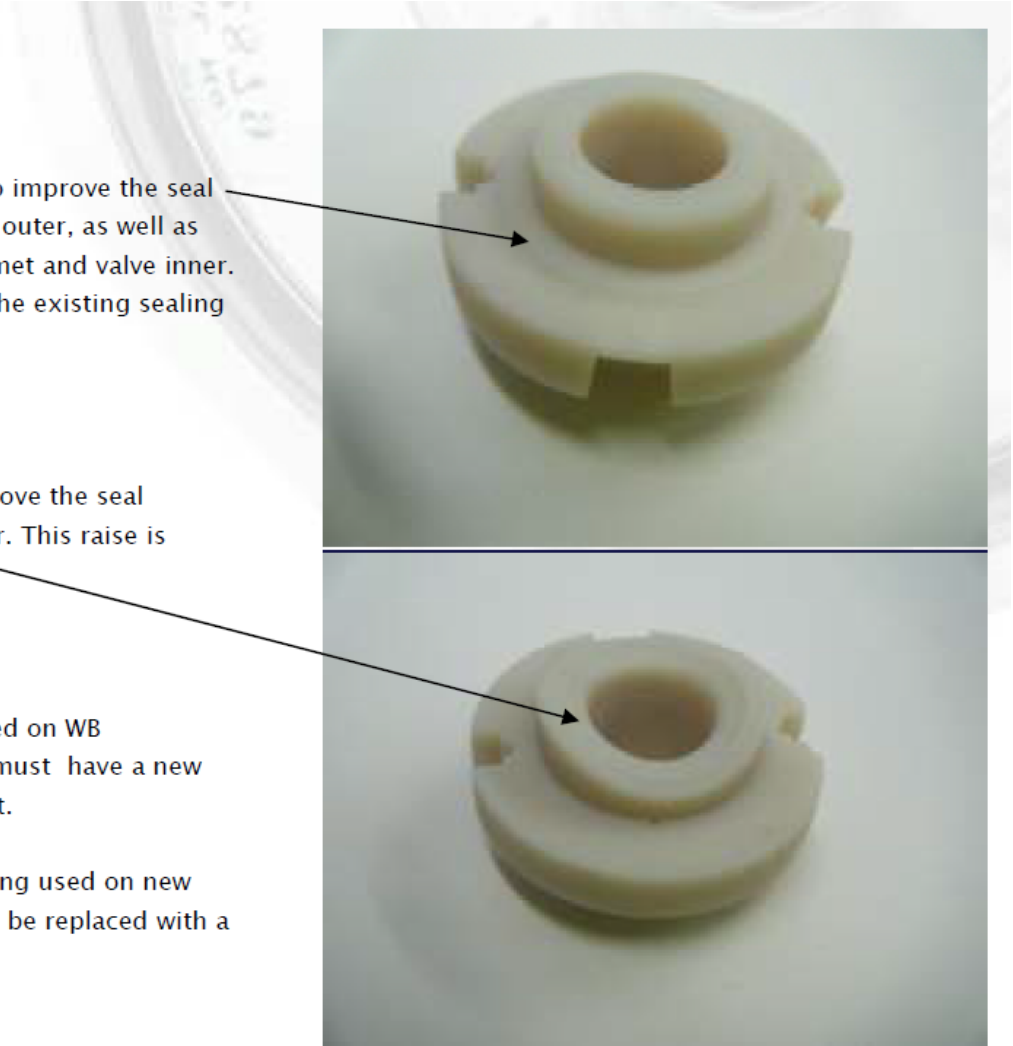
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Tru-Test Auto-Sampler – Sampler Dial



- **New Calibration Label**
 - **Weight Levels**
 - **Zones – Low/Med/High**
- **New Ring**
 - **Snap Fit**
- **Dark Grey in Color**

Tru-Test Auto-Sampler – Sampler



- **Replace O-ring on Sampler**

SAMPLER SERVICING

New service kits for the Tru-Test Sampler

Improvements

The Tru-Test Sampler has been further developed to make the Calibration Ring and Label more robust.

The change has the following benefits:

- A stronger Calibration Ring achieved by including a return at the top of the ring and by removal of the indexing notches from the internal surface of the ring.
- Improved protection of the Calibration Ring by providing a flange on the bottom edge of the Dial to prevent accidental contact from dislodging the ring.
- Improved label materials attaining greater adhesion to the Calibration Ring.
- New label graphics with coloured bands to enable rapid setting of the Dial position.

Backwards Compatibility

This change has required modification of the tooling that moulds the Calibration Dial and the Calibration Ring; meaning that the old and the new Dial and Ring parts are not interchangeable.

Kits

To enable servicing of all new and existing Samplers, new service kits have been set up.

SAMPLER CAL RING KIT (LABEL SCALE) consists of a new Calibration Ring and Label. This kit is used to service Samplers that have the new Dial part.

SAMPLER UPGRADE KIT (LABEL SCALE) consists of a new Dial, Calibration Ring and Label. This kit can be retrofitted onto any existing Sampler using the method described in this info sheet.

Sampler Dial Servicing Procedure

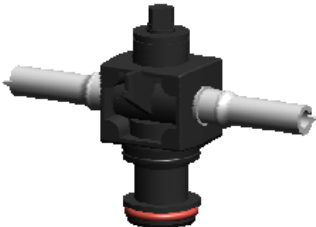
If the Calibration Ring becomes damaged on an old Sampler it must now be replaced using a Sampler Upgrade Kit. The existing Dial must be removed before fitting this kit.

Removal of the existing Dial

With the Calibration Ring removed from the Dial, rotate the Dial so that the notch in the Dial faces towards the front of the Sampler.



Using a large flat-head screw driver, lever the Dial upwards from the Sampler body. The Dial is held onto the Sampler with a bump feature. The Dial will bump off this feature and will slide off the inner axle with no damage to the Sampler.



Care must be taken to maintain the axle in the same orientation as when the old Dial was removed. This will ensure that the new Dial, once assembled, will be in the right position for correct operation of the Sampler.



Assembly of the new Dial

The new Dial can now be assembled onto the Sampler.

Check the underside of the Dial for the 'D' shaped hole.

This feature mounts onto the inverse feature on the axle and will need to be correctly aligned before the Dial will go on. Push the Dial onto the axle.

When the Dial reaches the bump feature an additional force will be required to lock it in place. This may be done by pushing harder by hand, or a rubber mallet may be used to provide a quick impact force.

Once the Dial has bumped into place you will not be able to pull it off the axle without using leverage from a flat head screw driver.



Assembly of the new Calibration Ring

The new Calibration Ring has an indexing feature that slides into one of the calibration slots on the Dial. Before final assembly of the new Ring, the Sampler should be calibrated to ensure that the label is in the correct position with respect to the Dial.

Sampler Kit Product Details

SAMPLER CAL RING KIT (819236)

| | |
|-------------------|--|
| Components | <ul style="list-style-type: none"> • Calibration Ring • Label |
| Use | For samplers with the new dial |
| 819236 for | 26655 30ml Sampler for 29.5mm Vial & 110lb WB Milk Meter 26656 80ml Sampler for FC Vial & 110lb WB Milk Meter |

SAMPLER UPGRADE KIT (819231)

| | |
|-------------------|--|
| Components | <ul style="list-style-type: none"> • Dial • Calibration Ring • Label |
| Use | For samplers with the old dial |
| 819231 for | 26655 30ml Sampler for 29.5mm Vial & 110lb WB Milk Meter 26656 80ml Sampler for FC Vial & 110lb WB Milk Meter |

Once the calibration has been determined the Calibration Ring can be pushed down onto the Dial and it will bump securely into place.

At the next calibration the Calibration Ring can easily be removed from the Dial by levering it off with a small flat-head screw driver. There is a notch in the bottom edge of the Calibration Ring to aid this.



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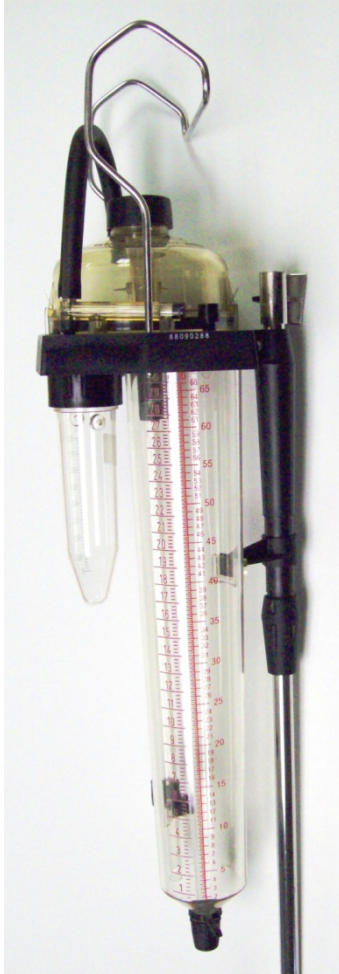


Tru-Test Farmer and Econo-Valve



- Only Standard Bore models
- Over 30 years old
- No parts available
- Dated image of DHI
- Still approved but should be removed from service?

Foss Milko-Scope



- Volumetric Meter
- No longer manufactured but DeLaval owns patent
- Reliable and accurate
- Durable except for bracket
- Larger vacuum drop
 - Larger dome
 - Small inlet (similar to SB)

Waikato MK V



- Same mode of operation as Ezi-Test
- Annual Service Kit
- Don't forget to replace inlet hoses
- Durable
- Larger vacuum drop
 - Larger dome
 - More prevalent in large parlors

Waikato SpeedSampler



- Annual Service Kit
- Sampler Service Kit
- Don't forget to replace inlet hoses
- Check all hoses for cracks or leaks
- Check bungs for wear and ensure lifter arm is properly positioned

Unapproved DHI Meters – Mini-Test



- **Not ICAR Approved**
- **Weighing and sampling accuracy does not meet tolerances**
- **Farmer Use only**
 - **SCC checks between test days**
 - **Does not matter what test plan – cannot use for DHI**

Unapproved DHI Meters - TeSa



- **Never ICAR Approved**
- **Weight principle – not volumetric principle**
- **No parts available**
- **National DHIA/QCS acceptance expired on December 31, 2010**

Unapproved DHI Meters - Bodmin



- **Never ICAR Approved**
- **Significant sampling issues**
 - **Milk fat variance as high as 52%**
 - **SCC variance as high as 34%**

Unapproved DHI Meters - Flaco



PROPORTIONAL
MILK-METER

- Imitation Waikato meter manufactured in China
- **Not ICAR approved**
- **Accuracy and parts quality questionable**

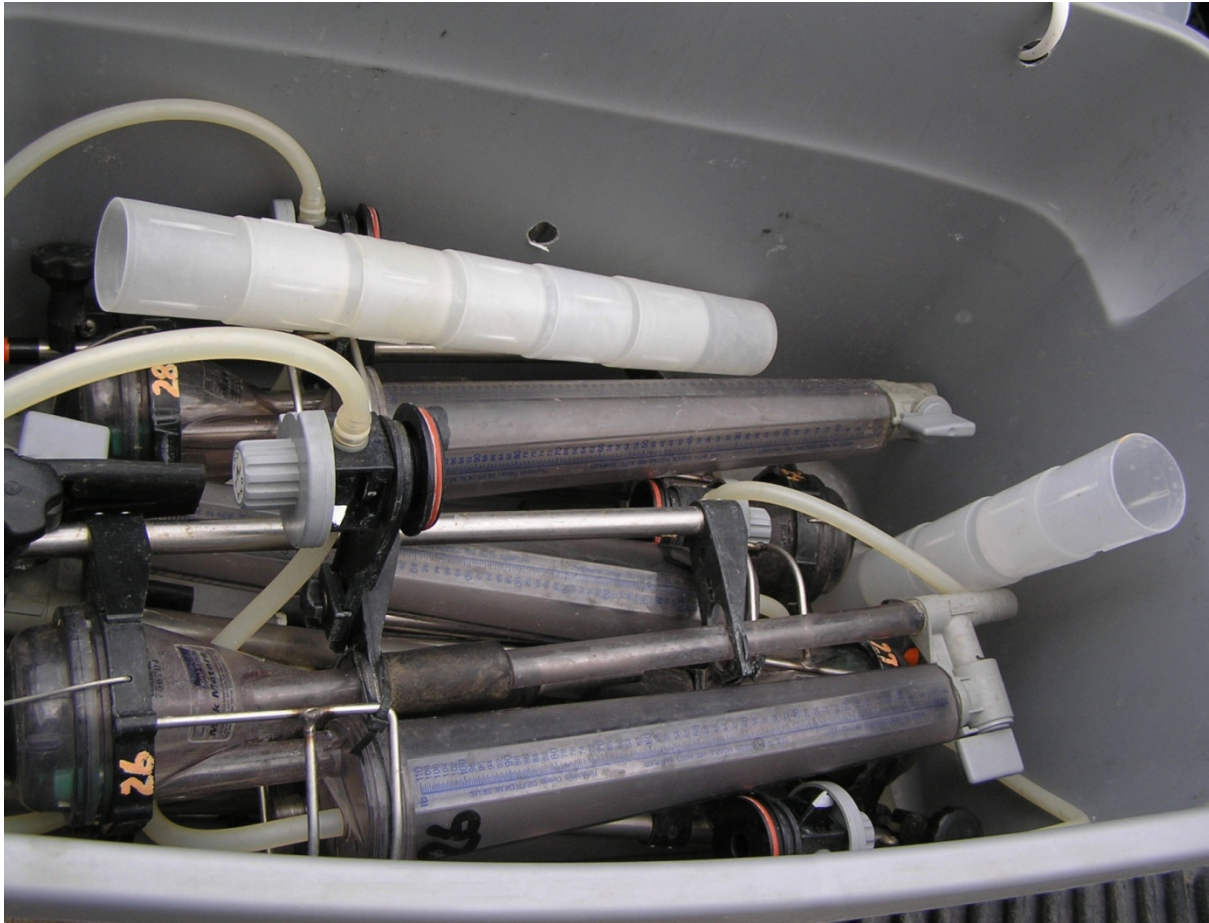
Meter Repair Tags

- Space for Tester Name, Date & Problem
- Quick ID of the problem
- Reduces down time
- Trace back and accountability



METER STORAGE AND TRANSPORT

Meter Storage



**Plastic totes provide convenient storage
of up to 10 meters**

Meter Storage & Transportation



- Totes are easily carried into milk barn for setup
- Totes cost approximately \$10-\$12
- One replacement meter costs approximately \$400

Meter Storage & Transportation



**Truck bed cover keeps everything
secure**

Truck cover=\$900

30 stolen meters=\$10,500



Trailer transport for large herds

Meter Storage & Transportation



PVC pipe racks

Holds 8 meters with Super Clamps
Plans in Meter Technician Manual

Meter Storage & Transportation



PVC pipe racks

Holds 10 meters with Dovetail Brackets
Easy transport and minimal damage (if any)
Plans in Meter Technician Manual

Meter Mask



Protects against meter body damage from teat cups
and premature meter draining

Meter Mask= \$20.00

Meter Body=\$190.00

Heavy Duty Meter Cleaning



PROPER SAMPLING AND READING

Sample Mixing Research

- Minnesota DHIA Trial
- Used Tru-Test Pull-Out meters with 68# & 102# meters
- Removed flasks during milking, mixing thirds before sampling
- Simply poured milk without mixing



Minnesota
DHIA

58# milk in 102# Tru-Test Pullout Meter

poured without mixing

| | <u>Fat %</u> | <u>MUN</u> | <u>Prot %</u> |
|--------|--------------|------------|---------------|
| Top | 7.1 | 14 | 2.6 |
| Middle | 2.9 | 18 | 2.7 |
| Bottom | 2.6 | 19 | 2.7 |

51# of milk in 68# Tru-Test Pullout Meter

| | <u>Fat%</u> | <u>MUN</u> | <u>Prot %</u> |
|------------|-------------|------------|---------------|
| Last 8# | 9.9 | 16 | 3.0 |
| Middle 22# | 4.0 | 18 | 3.5 |
| First 21# | 2.4 | 22 | 3.6 |

65# milk in 102# Tru-Test Pullout Meter

| | <u>Fat %</u> | <u>MUN</u> | <u>SCC</u> |
|------------|--------------|------------|------------|
| Last 21# | 6.03 | 14 | 722,000 |
| Middle 29# | 3.63 | 15 | 252,000 |
| First 15# | 1.65 | 21 | 188,000 |

37# of milk in 68# Tru-Test Meter

| <u>Poured 2x</u> | <u>Fat %</u> | <u>MUN</u> | <u>SCC</u> | <u>Prot %</u> |
|------------------|--------------|------------|------------|---------------|
| Top | 3.76 | 15.3 | 62,000 | 3.19 |
| Middle | 3.75 | 15.5 | 63,000 | 3.19 |
| Bottom | 3.76 | 15.1 | 57,000 | 3.18 |

Findings on Sample Mixing

- **Employ proper mixing of flask milk for every cow**
 - Pull-Out Flasks – minimum of 2x (4x recommended)
 - Ezi-Test Meters – 10 seconds if flask is more than ½ full
 - Ezi-Test Meters – 5 seconds if flask is less than ½ full
 - Waikato Meters – 10 seconds
 - May need to be twice as long in cold weather/cold parlors
- **Fill sample vials immediately and shake to disperse preservative**
- **DHIA laboratories have protocols in place for sample handling and mixing before analysis**

Reading the Flask Volume



- Read the **BOTTOM** of the meniscus
- Foam does **NOT** count
- Read between the lines
 - 1 lb marks – read to $\frac{1}{2}$ lb
 - $\frac{1}{2}$ lb marks – read to $\frac{1}{4}$ lb
- Consistent reading from start to finish
- Replace worn flasks

Some Final Thoughts on Meters

EQUIPMENT PERFORMANCE

- **Start with clean, sanitized meters**
- **Minimize hose length**
 - Reduce vacuum loss
 - May have to have different hoses for different dairies
- **Clean the outside as well as the inside**
 - CIP is NOT enough!
 - Protect meters – wax, etc.

FIELD TECHNICIAN PERFORMANCE

- **Service and repair meters often**
 - Share what is going on!
 - Replace VSO & gaskets
- **Read the meters properly without any influence from dairy owner**
- **Use proper sampling and mixing techniques**

Your Challenge is...

You control your image...

- *Professional appearance*
- *Properly operating equipment*
- *Proper technique*
- *Exceed the minimum requirements*
- *Communicate your needs with management*

• Resulting in...

- *Accurate and consistent results*
- *Fewer concerns and/or complaints from dairymen*
- *Customer retention and satisfaction*