Innovation In and
Out of Parlour

Milk Meter Service Manual

Version - 1.2

Date - February 2022

Part Number - 39-0080

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Milk Meter Fault Finding Scheme

Manual Versions

Version 1.0 - March 2006.....FirstVersion of Manual

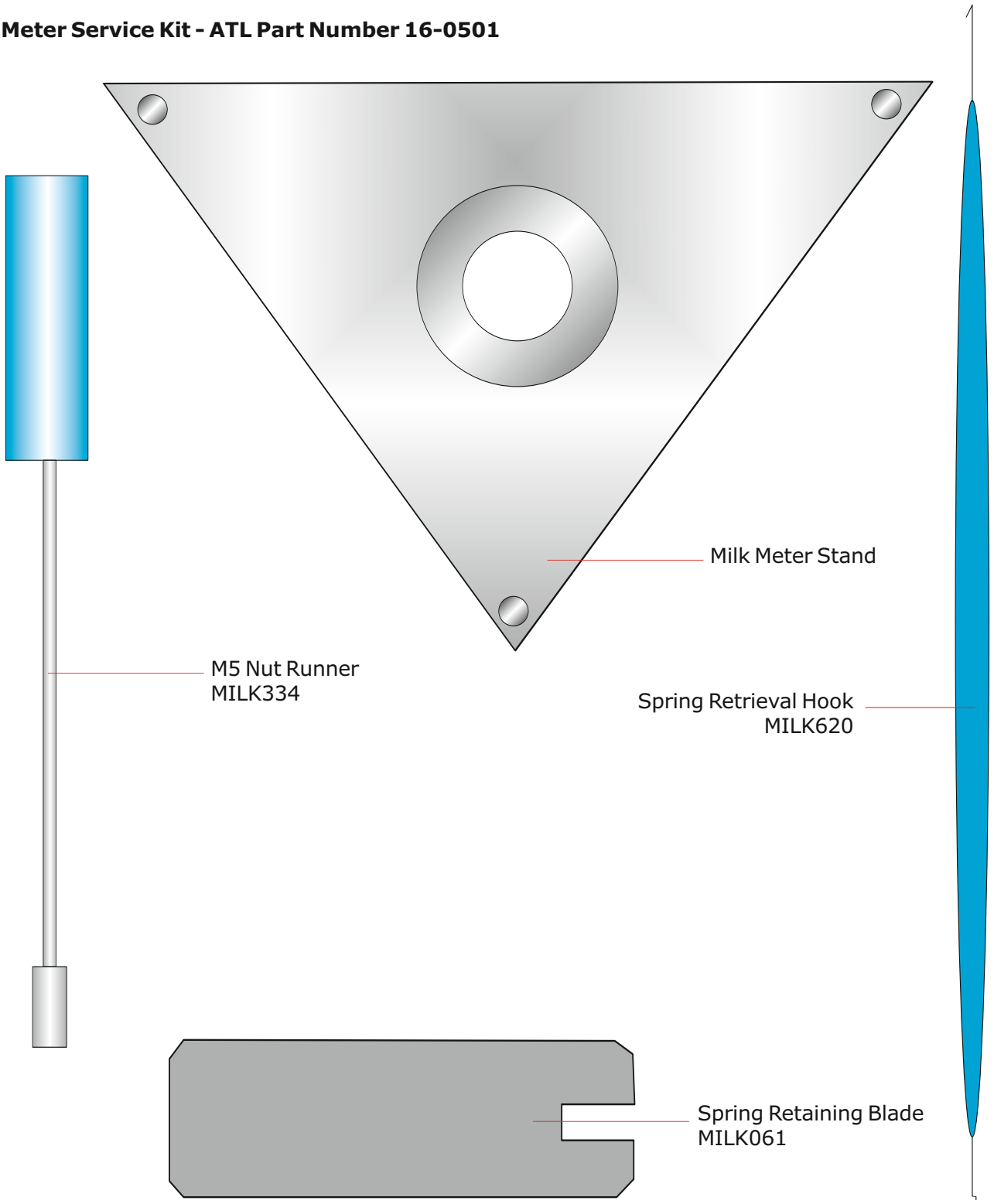
Version 1.1 - December 2013.....Updated

Version 1.2 - February 2022.....Updated

The Milk Meter Service Kit

The Milk Meter is easy to assemble and/or dismantle. ATL recommends the use of five special tools (shown below); a Milk Meter stand, a spring retreival hook, M5 nut runner, a spring retaining blade nad a 13mm spanner.

Milk Meter Service Kit - ATL Part Number 16-0501

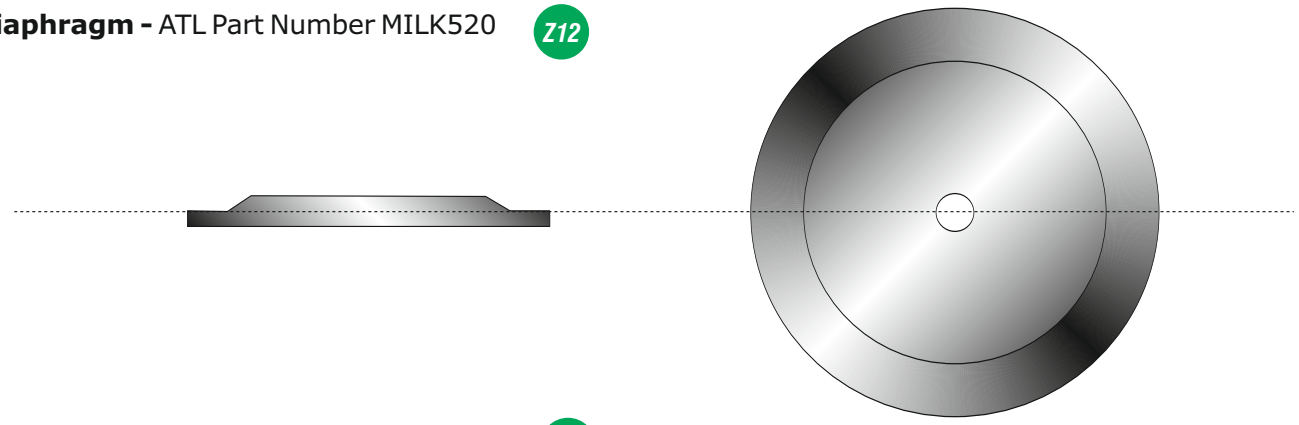


The Milk Meter Diaphragm and Seal Kit

Maintenance of the Milk Meter needs to be carried out according to the service interval described on page 6; the following diagrams illustrate the service parts that are available in the diaphragm and seal kit: ATL part number 16-0500.

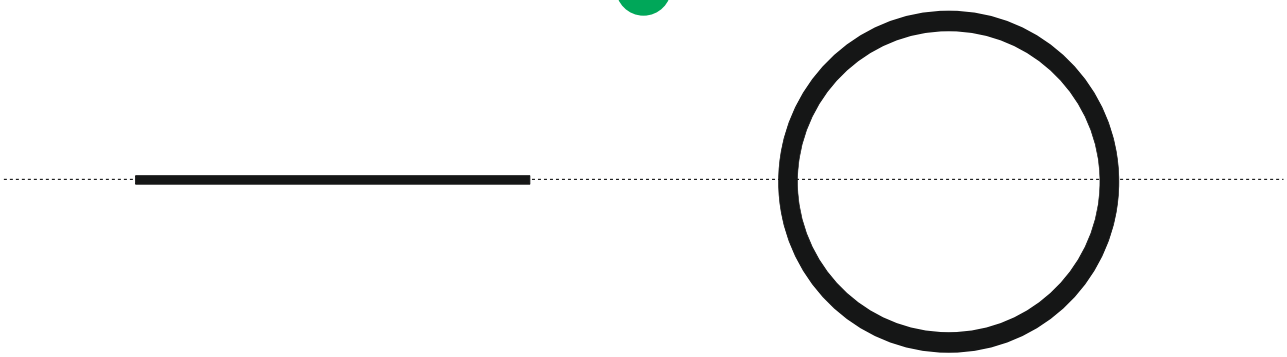
NB - All the parts shown on this page are available individually.

Diaphragm - ATL Part Number MILK520 Z12

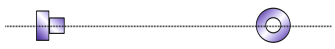


Plunger Seal - ATL Part Number MILK501 Z14

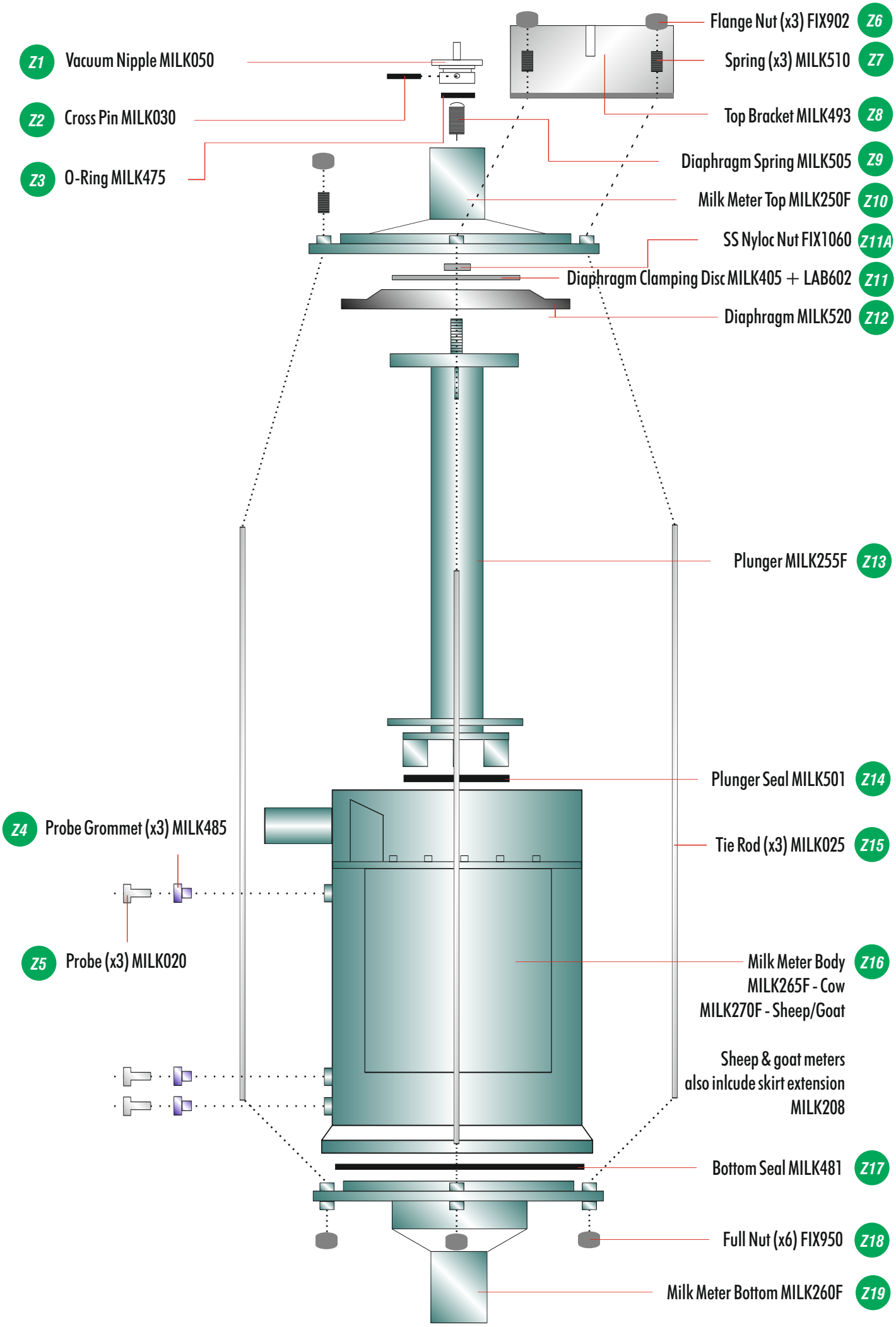
Bottom Seal - ATL Part Number MILK481 Z17



Probe Grommet - ATL Part Number MILK485 Z4



O-Ring - ATL Part Number MILK475 Z3



Milk Meter Dis-Assembly

The Milk Meter can be disassembled almost totally by hand, although the more complicated components require the use of the tools shown on page 1. Loosening and fastening the connections should be done with care.

- Note positions/orientation of plunger, outlet and top bracket.
- As the meter is dismantled, place each part removed in a safe and clean container to ensure no part is lost or damaged.
- Place the meter into the Milk Meter Stand.
- Loosen and remove the three top M6 flanged nuts and three compression springs.
- Remove the Top Bracket.
- Pull the top of the meter upwards to remove the top and plunger assembly (complete) from the main meter body.
- With the top/plunger assembly on the desk, gently prise the vacuum nipple out of the meter top breaking the seal made by the 'o' ring.
- Gently pull the vacuum nipple away from the meter top taking care not to over-stretch the spring and slide the spring retaining blade between the coils of the spring.
- With the spring tension now removed from the vacuum nipple use the spring retrieval hook to push out the cross pin; remove the spring retaining blade.
- The vacuum nipple and cross pin are now free. Remove the 'o' ring from the vacuum nipple.
- Gently pull the plunger down from the meter top piece to break the seal around the outside edge of the meter diaphragm.
- Unhook the spring from the top of the plunger assembly using the spring retrieval tool if necessary.
- Loosen and then unscrew nyloc nut and clamping disk – The diaphragm can then be removed.
- Remove the plunger seal from the bottom of the plunger.
- Remove the main meter body from the meter base by guiding it upwards between the tie rods.
- The meter bottom seal can now be removed.
- The probes and probe grommets are removed from the body by pulling the probes from the grommets and then pulling the grommets from the meter body.
- The meter is now completely dismantled.

IMPORTANT

The relevant service parts should be examined and then exchanged for new ones before the meter is reassembled.

Milk Meter Re-Assembly

The Milk Meter can be assembled almost totally by hand, although the more complicated components require the use of the tools shown on page 1. Loosening and fastening the connections should be done with care.

- Gently push the new probe grommets into the meter body ensuring they are fully seated
- Push the probes into the probe grommets
- Turn the meter body upside down and place the bottom seal into the recess around the inside edge of the meter body. Ensure it is seated evenly
- Remove the meter base from the Milk Meter stand and turn it upside-down before placing it over the upturned meter body. This ensures that the bottom seal does not fall from the meter body.
- Bring the base and body together ensuring the seal is not disturbed. Once together turn the whole assembly the right way up and replace in the stand
- Place the diaphragm over the stud on the top of the plunger and screw the diaphragm clamping disc onto the stud.
- Use a spanner to tighten the clamping disc and nyloc nut down tight on the diaphragm. The disc must be tight enough to ensure the diaphragm cannot be pulled around (although the clamping disc must be tight, it must not be over-tightened). Fit the plunger seal onto the bottom of the plunger.
- Take the plunger spring and hook it back onto the top of the diaphragm ensuring that the correct end of the spring is used. (The hook on this end of the spring has a gap allowing easy insertion into the hole in the top of the plunger stud)
- Turn the plunger upside down allowing the spring to hang down and bring the inverted meter top up to meet the plunger and diaphragm
- Ensure that the plunger vacuum bypass hole is aligned to point between two of the tie rod holes in the meter top
- Whilst holding the plunger and top together in this position use the spring retrieval hook to hook the spring and pull it gently out of the top of the assembly.
- Slide the spring retaining blade into the spring about 3 coils down. During this procedure ensure the spring is not stretched
- Replace the 'o'ring on the vacuum nipple and sit it on top of the spring and spring retaining blade
- Push the cross pin through the vacuum nipple ensuring that the pin passes through the loop on the end of the spring. The spring retaining blade can now be removed
- Ensure that the spring is hooked cleanly onto the top of the plunger stud. Push the vacuum nipple into the top of the meter ensuring a tight seal is made at the 'o'ring and the nipple is fully seated
- Use the rounded end of the spring retrieval hook to gently ease the outer edge of the diaphragm into the recess in the meter top piece. The meter diaphragm must be fully seated around its entire circumference. This can be tested by placing a thumb over the top of the vacuum nipple and gently pulling the plunger down from the meter top piece. The diaphragm should be sealed air tight and not move around its outer edge.
- Orientate the plunger assembly so that the vacuum bypass hole faces the meter inlet pipe (this ensures that the vacuum bypass hole is behind the milk inlet shield) and gently place the plunger into the meter body on the stand allowing the tie rods to pass through the holes in the meter top. Holding the meter by the top and bottom to ensure it does not come apart, remove it completely from the stand and rotate it slowly checking alignment of the diaphragm, bottom seal and vacuum bypass hole.
- Place the meter back in the stand and replace the top bracket in its original position over two of the tie rods
- Place the three springs over the three tie rod ends
- Screw the three flanged nuts onto the three tie rods.

Service Interval For The Milk Meter

During the maintenance of the Milk Meter the following checks/changes have to be carried out:

Every Week or 32 Hours

- Check the general standard of Milk Meter cleanliness
- Check the bleed hole is clear
- Check the sensors and make sure there is no milk build up on the probes

Every Month or 125 Hours

- Check the general standard of Milk Meter cleanliness
- Check the bleed hole is clear
- Check the sensors and make sure there is no milk build up on the probes

Every 6 Months or 750 Hours

- In addition to the monthly checks, check the tightness of the cable glands and lids on all electrical and electronic boxes
- Check the seals on all boxes are in good shape and not damaged or broken
- Check the ACR ram and make sure it operates smoothly

Every Year or 1500 Hours

- In addition to the monthly and six monthly checks, calibrate the Milk Meter
- Change the diaphragm
- Change the plunger seal
- Change the bottom seal
- Change the 3 sensor grommets
- Examine the Milk Meter plastic mouldings
- Change the shut-off valve diaphragm

Milk Meter Fault Finding Scheme

ACR Faults		
Symptom	**Possible Cause**	**Solution**
ACR ram does not raise/lower cluster	PCB output fault	Check bottom LED on control unit. Change control unit lid
	Solenoid valve fault	Check solenoid. Check vacuum supply.
	Wiring connection fault	Check wiring in connection box. Check wiring in solenoid box.
	Water in connection box	Check cable glands and lid seal. Check internal connectors for water damage. Change connectors.
No vacuum/vacuum always on at clawpiece	PCB output fault	Check top LED on control unit. If light on vacuum should be on. If light off vacuum should be off. If faulty, change control lid.
	Solenoid valve fault	Check solenoid. Check vacuum supply.
	Wiring connection fault	Check wiring in connection box. Check wiring in solenoid box.
	Shut-off valve always closed	Check shut-off valve
	Milk tube disconnected	Reconnect milk tube
	Milk tube or milk meter blockage	Clear blockage
Premature ACR operation	ACR setting incorrect See 'Meter Not Metering' section	Check ACR setting
Cluster removed at end of milking too soon or too late	ACR setting incorrect	Check ACR setting
	Vacuum delay setting incorrect	Check vacuum delay setting

Milk Meter Fault Finding Scheme

Milking Faults		
Symptom	**Possible Cause**	**Solution**
Meter not metering	Diaphragm jammed	Check diaphragm and plunger.
	No vacuum supply	Check 6mm vacuum line into nipple.
	Solenoid valve fault	Check centre LED on control unit.
		Check solenoid.
		Check vacuum supply.
	Wiring connection fault	Check wiring in connection box.
		Check wiring in solenoid box.
	Water in connection box	Check cable glands and lid seal.
		Check internal connectors for water damage.
		Change connectors.
	Probe fault	Check probe and probe wiring.
	Probe dirty	Clean or de-scale probes.
		Improve cleaning.
Milk meter yield result too low	Calibration incorrect	Check calibration.
	Probe fault	Check probe and probe wiring.
	Probe dirty	Clean or de-scale probes.
		Improve cleaning.
	Vacuum tube disconnected	Connect vacuum tube.
	Wiring connection fault	Check wiring in connection box.
		Check wiring in solenoid box.
Milk meter yield result to high	Calibration incorrect	Check calibration.
	Probe fault	Check probe and probe wiring.
	Probe dirty	Clean or de-scale probes.

Milk Meter Fault Finding Scheme

Control Unit Faults		
Symptom	**Possible Cause**	**Solution**
Milk meter control lid fault	Display fault	Change control lid.
	Keyboard fault	Change control lid.
	Individual LCD dead	Check wiring in connection box. Check wiring in control box.
	Wiring connection fault	Check power supply, mains fuse, plug fuse and output fuse.
	Software Crash	Un-plug lid; then plug in again.

Milk Meter Fault Finding Scheme

Data Communication Faults		
Symptom	**Possible Cause**	**Solution**
No Data Communication/No Cow Number Displayed On LCD	Control address setting incorrect	Check control address setting.
	Micro M3S setting incorrect	Check subroutine 311 and 312.
	Micro M5 setting incorrect	Check settings
		Check all data cable connections in connections box and Micro M3S or Micro M5.
	Wiring connection fault	Check connections in control lid.
		Check connections in connections box.
		Check all data cable connections in connections box 'daisy-chain'- into and out of all connection boxes.
		Check for duplicate control address settings.

Milk Meter Fault Finding Scheme

Power Supply Faults	*DISCONNECT MAINS SUPPLY BEFORE REMOVING POWER SUPPLY COVER*	
Symptom	**Possible Cause**	**Solution**
No output	Output fuse faulty	Check wiring. Change fuse.
	Input fuse faulty	Check wiring. Change fuse.

Milk Meter Fault Finding Scheme

Micro Wash / MM Hub Control Faults		
Symptom	**Possible Cause**	**Solution**
Micro wash control lid / MM Hub fault	Display fault	Change control lid.
	Keyboard fault	Change control lid.
	Individual LCD dead	Check wiring in connection box. Check wiring in control box.
	Wiring connection fault	Check power supply, mains fuse, plug fuse and output fuse.
	Software Crash	Un-plug lid; then plug in again.
Stand-alone/Master wash control not putting milk meters into wash mode	Master/slave setting incorrect	Check master/slave setting correct.
	Wiring connection fault	Check wiring connections in wash control lid. Check wiring connections in connections box.
	Control address setting incorrect	Check control address settings. Check for duplicate control addresses.
Slave wash control / MM Hub not putting milk meters into wash mode	Master/slave setting incorrect	Check master/slave setting correct.
	Wiring connection fault	Check wiring connections in wash control lid. Check wiring connections in connections box.
	Micro M3S / M5 not communicating	Check connections to Micro M3S / Micro M5. Check all milk meter controls communicating.
Wash cycle too long/too short	Wash time set too long/too short	Change wash time.