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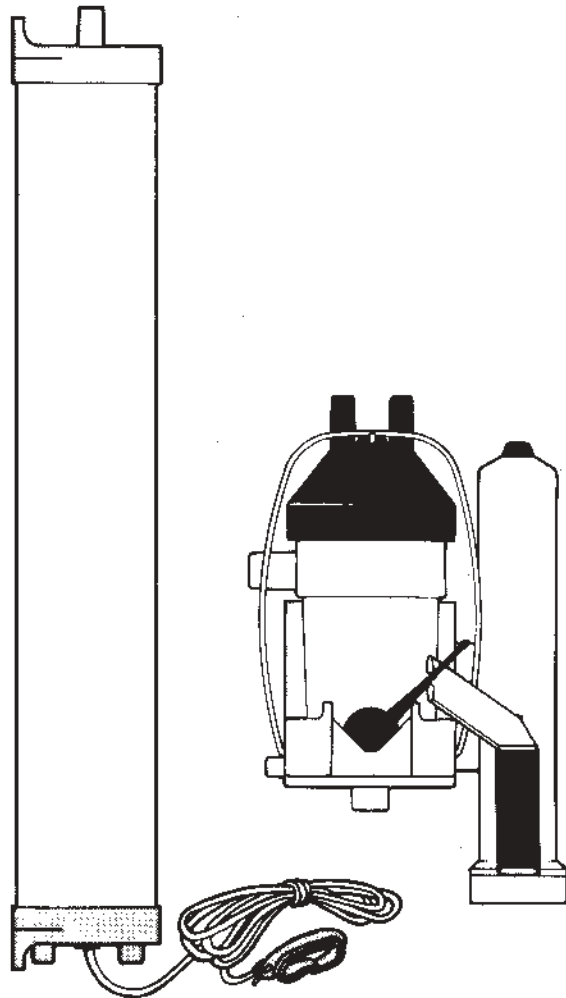
AUTOMATIC TEAT CUP REMOVER

Teat Cup Remover System

The Waikato Milking Systems Teat Cup Remover (Detacher) System, designed and manufactured in New Zealand, has now been proved in many parts of the world to be a safe, simple, reliable and valuable addition to a milking installation.

- Cups are removed from the cow when the "Milk Flow" has reached a pre-determined "End Point". This helps to eliminate udder damage due to over-milking.
- No electrics or electronics is involved, the only power source needed is the normal machine Vacuum Supply and consumption is minimal. Just enough for the ram to withdraw the cups at the end of milking.
- The Initiator does not "use" vacuum, but is operated by changes in vacuum level.
- Two compact units, the initiator and vacuum ram give flexibility in installation.
- The Waikato Milking Systems Automator is simply fitted to the initiator mounting bracket to give fully automatic operation, without the need for manual resetting.
- The ram incorporates a floating piston which with a cord and pulley system eliminates protruding piston rods and gives 910mm (36in.) cord travel for a ram length of only 635mm (25in.)
- The Initiator is designed to offer very little restriction to milk flow and the Tangential inlet port aids in-place washing.
- A valuable "designed in" feature is a time delay which occurs after milk flow has dropped to 0.25 litre/minute (1/2lb/minute) and before the float operated valve shuts off the vacuum supply to the cups.
- This delay allows for further milk "let down" or for minor interruptions in milk flow.
- When the float valve closes, the vacuum level in the cups drops rapidly to about 13 kPa or 4in. Hg (normal milking level 45 to 50 kPa or 14in.-15in. Hg) at which level the diaphragm operated valve in the initiator head connects vacuum to the ram to draw the cups from the cow.

- The system is completely safe in use. The maximum pull from the vacuum ram is unlikely to cause damage or injury.
- Cup withdrawal is smooth and steady and will not frighten cows.
- In the event of cups being kicked off, vacuum drop will operate the T.C.R. Initiator and cups will be lifted clear.



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Maintenance

No maintenance should be required except for normal cleaning of the system and lubrication of the piston in the vacuum ram.

All components and sub-assemblies are readily available and fully inter-changeable without the use of tools.

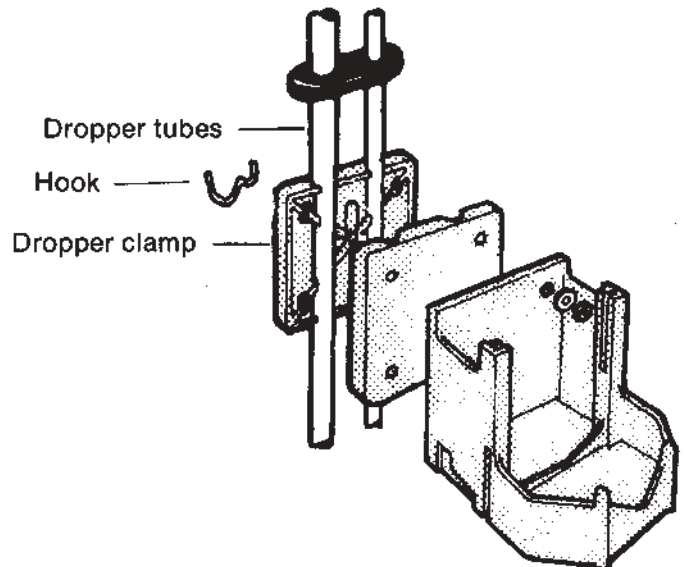
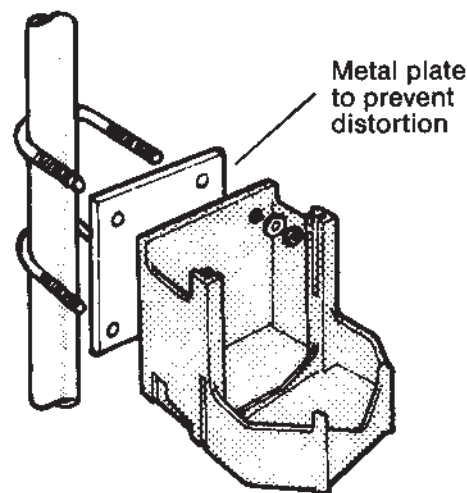
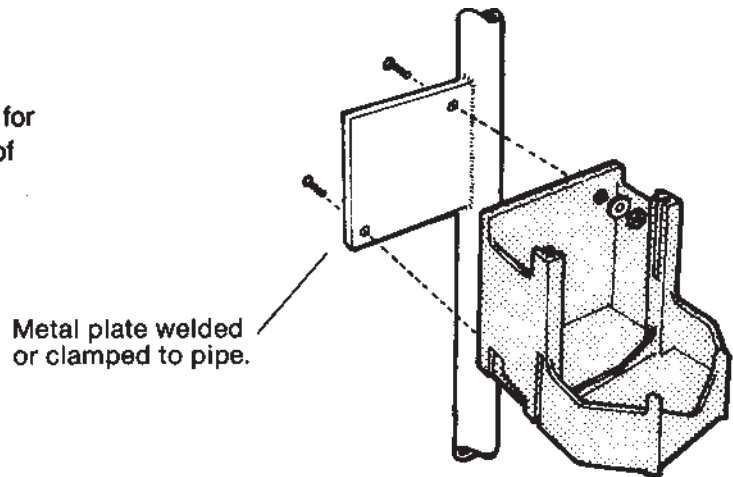
T.C.R. System – Installation

INITIATOR

The methods used for mounting the T.C.R. Initiator and Vacuum Ram will be dictated by the type and design of the milking installation.

The following information is based on practical field experience:

1. Mount the Initiator in a position where it is convenient to operate and protected from accidental damage.
2. In Herringbone installations the Initiator may be mounted on the stainless steel milk and air-line dropper tubes by using the Waikato Milking Systems Dropper clamp with cluster hook.
3. Where the Initiator is to be mounted on pipe framework, a 3mm flat steel plate 90 x 90mm should be welded or clamped to the pipework and the Initiator bolted to that plate. **DO NOT USE "U" bolts into the Initiator Mounting Bracket as pressure from the "U" bolts could distort or fracture the bracket.**
4. On Rotary Installations the Initiator may be mounted on a metal plate, clipped or welded to, and protected from damage by, the uprights on the "dummy" or between-bail spacer. A simple "finger" made from a short length of rubber milk tube and clipped to the breech rail in a suitable position may be used to return the Float-lifting lever to the "Automatic" or "Cluster Removal" position.



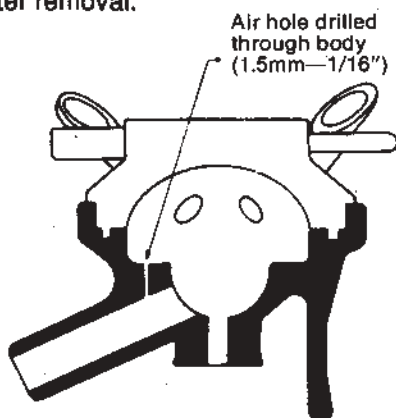


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Installation *(continued)*

5.
 - a. The Vacuum Ram may be mounted in any convenient position.
 - b. The preferred installation is with the ram mounted vertically and directly above that point to which the cluster will be lifted.
 - c. This avoids taking the cord from the ram around unnecessary angles which may dissipate some of the available effort from the Vacuum Ram.
 - d. Ensure that the ram cord does not rub against rubber-ware or other parts of the installation.
 - e. If the cord must be deflected through an angle of greater than say 10°, the use of a suitable pulley such as nylon and stainless marine pulleys, is recommended.
6. Vacuum connections to the Initiator valve head and the Vacuum Ram should be made with 9mm bore rubber or PVC tubing.
 - a. Ensure that P.V.C. tubing is not laid into small radius bends which may collapse and "kink" or close-off the tubing during hot weather.
7. Ensure that the air admission hole to the claw is free and unobstructed and of at least 0.8mm (1/32in.) in diameter.
8. If the system is to be used with an Automatic Shut-off claw, it is necessary to drill a small hole (1.5mm dia) through the body of the claw to by-pass the shut-off valve and allow entry of air to operate the T.C.R. Initiator diaphragm valve which controls the ram and cluster removal.



9. Ensure that the bleed hole at the base of the float chamber in the Initiator is unobstructed and suitably sized to give the correct end-point of milking for cluster removal – (see label on Initiator body).

This bleed hole is normally drilled at 2.5mm (3/32in.) diameter and may be opened out to 3.1mm (1/8in.) is necessary.
10. It is recommended that the Waikato Milking Systems Milk Line Filter be installed in the long milk tube between the claw and the Initiator inlet, to prevent blockage of the drain hole and to screen out mastitis curds.

T.C.R. Operation

- With the milking machine running, the claw and teat cups will be supported in the lifted or retracted position. (See Fig 1).
- To fit the cups, they are folded on the claw and the Initiator operating lever rotated to lift the float and disc valve. (No milk line shut-off valve is required). This cuts vacuum off the ram, releasing the support cord and opens the cluster milk line to allow placement of the teat cups. (See Fig 2).
- After sufficient time has elapsed to ensure milk let-down the milk in the Initiator will lift the float and hold the float valve open. The operating lever is then rotated to the automatic removal position.
- When milk output falls below 0.25 litre (half a pound) per minute, the float lowers, closing the float valve and shutting the vacuum supply from the milk line.
- This removal of vacuum releases the cups from the teats and permits the rubber diaphragm in the Initiator head to lift, operating the valve to connect vacuum to the claw lifting ram.



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- The claw and cups will then be lifted to the retracted position in readiness for the next milking.
- Movement of the operating lever to the "automatic removal" position may be carried out manually, by the Waikato Milking Systems Automator or by contact with a suitably placed rubber "finger" in the case of rotary sheds.
- With back-flush washing, the lever must be placed in the "manual" position and the rubber lever bung withdrawn from the Initiator body as far as the mounting bracket will allow to permit washing solution to escape, so causing a washing flow below the float.
- Washing is effected with the lever in the "manual" position and passing 5 litres of washing solution through the cups.
- Failure of cups to be removed from the cow is usually attributable to a blocked air bleed hole in the milking claw, or a blocked drain hole in the Initiator body.
- This hole can be easily cleaned by removal of the rubber bung and by use of a suitable probe to remove the obstruction.
- This is an added feature for automatic systems as it aids the detection of udder infection which may otherwise pass unnoticed.
- The Waikato Milking Systems Milk Line Filter, should be installed in the long milk tube between the claw and the Initiator inlet, to prevent blockage of the drain hole and to screen out mastitis curds.

TEAT CUP REMOVER SYSTEM

Fig. 1

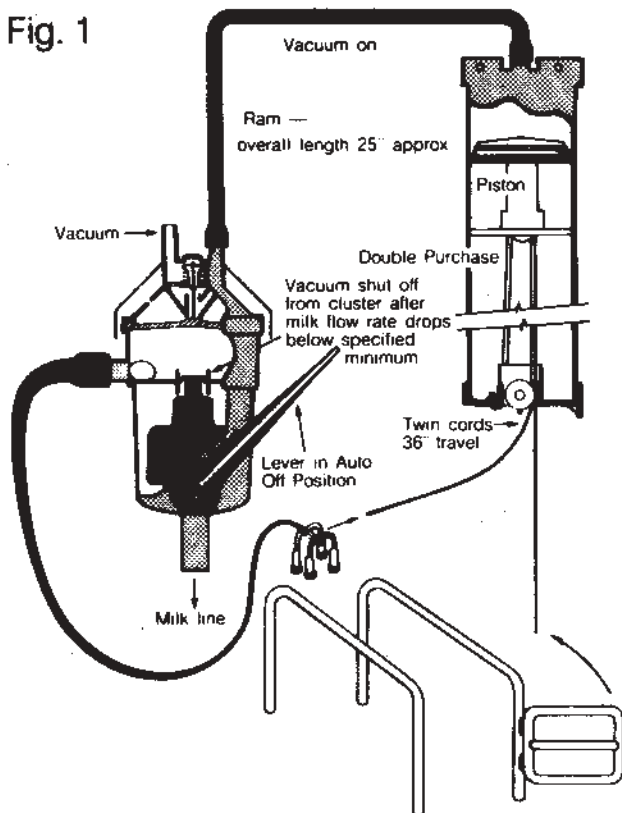
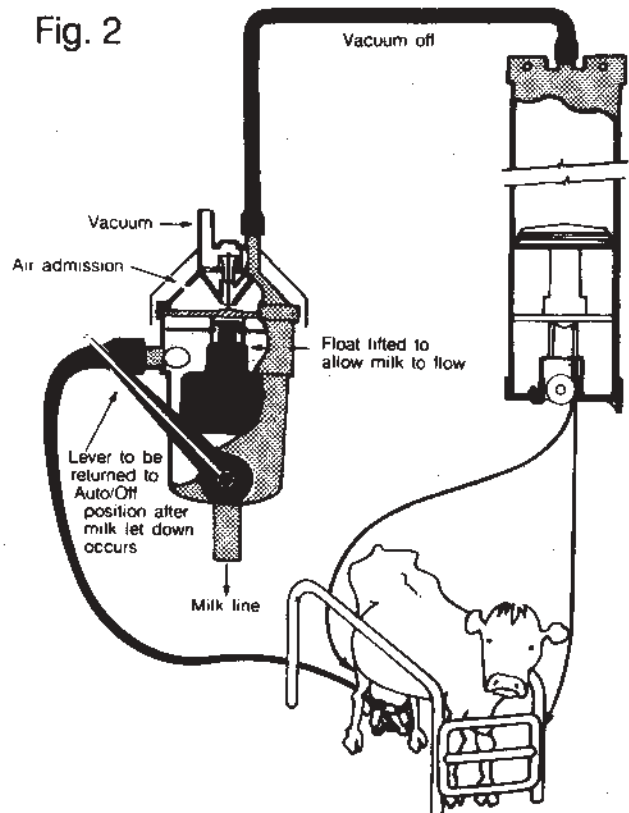


Fig. 2





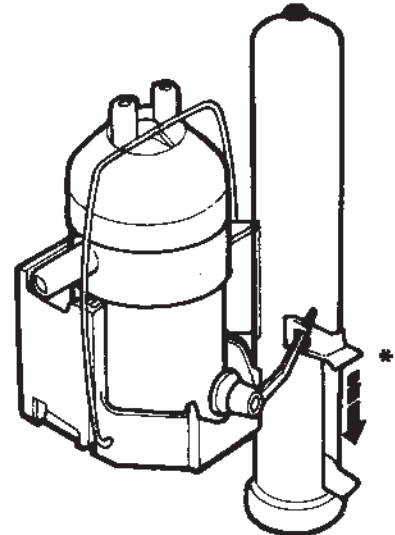
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T.C.R. System – Automator

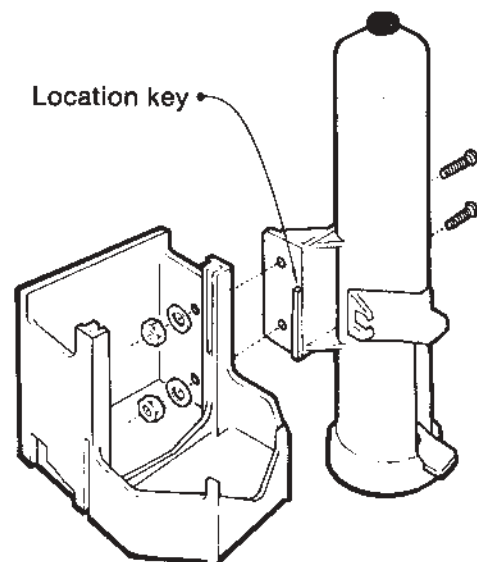
Depress trigger by squeezing towards base plate – this will rotate lever clockwise to lift float and disc valve, so cups may be placed on the cow. The Automator spring will then lift the trigger at a controlled rate, thus returning lever to the “automatic removal” position.

To extend let-down time, at any stage before actual cup removal the Automator may be re-depressed or the lever may be disengaged to override Automator.



Installation

1. Position Automator mounting plate against the right hand side of the blue T.C.R. mounting bracket with the location key located at the top of the groove in the mounting bracket.
2. Ensure that the stainless steel T.C.R. retaining clip is mounted to the T.C.R. bracket – not to T.C.R. body.
3. Remove and discard the existing rubber bung and float lifting lever.
4. Fit new lever and bung supplied with Automator kit.
5. Replace T.C.R. in mounting bracket and latch wire clip to T.C.R. cap.
6. Engage the new operating lever in slot on Automator trigger. Ready to operate.





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T.C.R. Performance Check List

1. Ensure that Ram is cleaned and lubricated regularly.
2. Ensure that Ram cord is not affected by friction or unnecessary angular deflections.
3. Ideally, the Ram should be placed vertically above the cluster to lift as nearly straight up as possible.
4. Check that vacuum connecting lines are properly sized and unobstructed.
5. Ensure that air admission hole in claw is unobstructed.
6. Ensure that the float operated disc valve does not leak. A simple check may be carried out by removing the T.C.R. Valve head, pinching off the claw-milk line and placing the palm of the hand over the open top of the Initiator body. Leakage will cause the hand to be drawn into the Initiator body.
7. Check that air bleed holes in the conical valve head of the Initiator, under the removable dust shroud, are unobstructed.
8. Ensure that the T.C.R. Initiator Unit is located correctly in its bracket and that the operating lever is not fouling the float, to prevent correct seating of the disc-valve.
9. Check that the bleed hole at the base of the float chamber is unobstructed and of a suitable size to give correct "end-point" of milking.

Diameter of bleed hole may be from 2.5mm to 3.2mm.

Fault Finding

There is very little to go wrong with a correctly installed Waikato Milking Systems T.C.R. System.

If problems do arise, they should be easily rectified as follows:

FAILURE TO OPERATE:

- a. Check that installation is correct.
 - b. Check that Vacuum lines to T.C.R. Initiator head and vacuum Ram are clear and unobstructed.
 - c. Check that Initiator float is in good order (does not contain fluid).
 - d. Check that vacuum Ram is free to operate and that the piston seal is in good condition.
- NOTE: The Ram must be lubricated occasionally with a light (short fibre) grease, with or without molybdenum disulphide and must operate freely at all times.

SLOW REMOVAL OF CUPS AT END OF MILKING OR DIFFICULTY IN WITHDRAWING CORD FROM RAM MAY BE DUE TO:

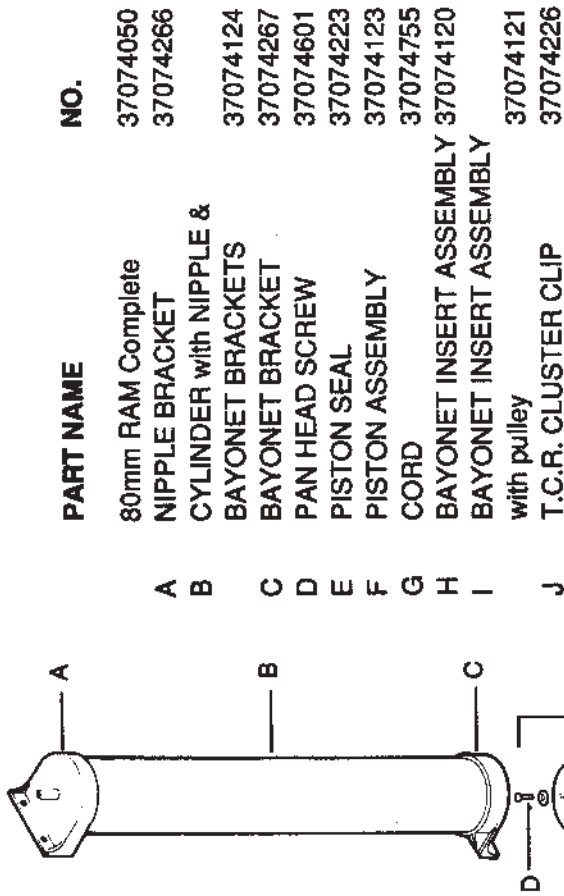
- a. Restriction in vacuum connections between Initiator head and vacuum Ram.
- b. Inadequate or blocked air admission hole in claw assembly.
- c. Leakage past the float operated disc valve. This leakage tends to maintain a partial vacuum below the diaphragm of the Initiator valve head and this vacuum may hold the diaphragm operated valve partly open.

LEAKAGE past the Disc Valve may be caused by:

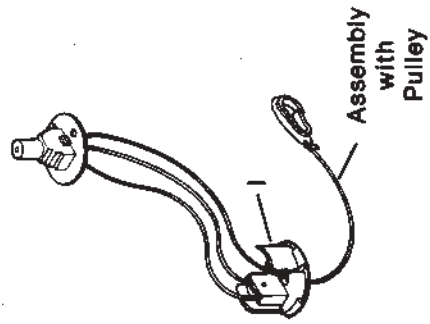
- a. Dirt or foreign matter between the disc valve and valve seat. Correct by cleaning both valve and valve seat.
- b. Contact between float lifting lever and the bottom of the float, particularly when vacuum is on.

Correct by ensuring that the Initiator is correctly located in the mounting bracket and that the bracket does not foul the lever in the "manual" or "automatic" position.

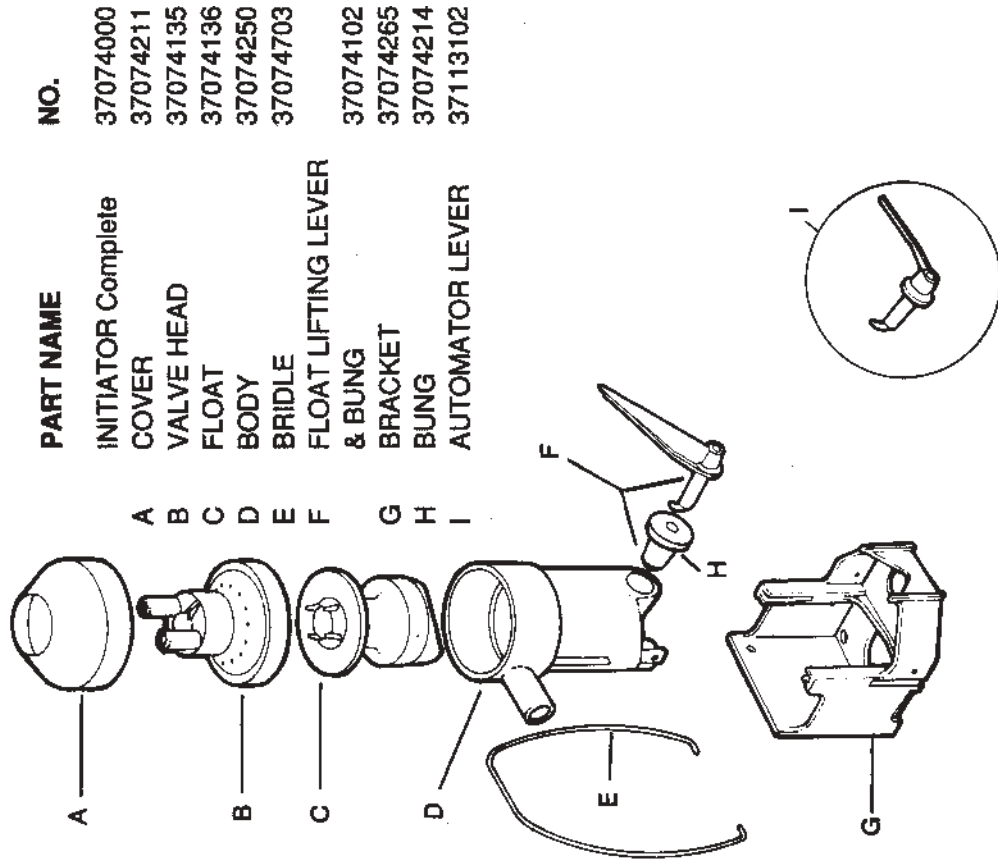
Teat Cup Remover: 80mm Ram



PART NAME	NO.
80mm RAM Complete	37074050
NIPPLE BRACKET	37074266
CYLINDER with NIPPLE & BAYONET BRACKETS	37074124
BAYONET BRACKET	37074267
PAN HEAD SCREW	37074601
PISTON SEAL	37074223
PISTON ASSEMBLY	37074123
CORD	37074755
BAYONET INSERT ASSEMBLY	37074120
BAYONET INSERT ASSEMBLY with pulley	37074121
T.C.R. CLUSTER CLIP	37074226



Teat Cup Remover: Initiator



PART NAME	NO.
INITIATOR Complete	37074000
COVER	37074211
VALVE HEAD	37074135
FLOAT	37074136
BODY	37074250
BRIDLE	37074703
FLOAT LIFTING LEVER & BUNG	37074102
BRACKET	37074265
BUNG	37074214
AUTOMATOR LEVER	37113102

