



DITCHBURN
VENDING
MACHINES

Hotspa Service Manual

DITCHBURN VENDING MACHINES LIMITED
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GENERAL DESCRIPTION

The HOTSPA '460' is designed to give long periods of trouble-free operation but in the event of service being required, the layout assembly is such as to allow preventive maintenance or major repair on site without the use of special equipment.

HS1. CABINET

The cabinet is manufactured from zintec (a zinc coated steel), and is of welded and reinforced construction.

The finish comprises an etch primer, a stoved colour primer, and two coats of wet on wet synthetic stoving enamel.

This gives a high quality, durable, medium gloss finish. Scratches or damage to the finish in service can be rectified by using a matching air drying synthetic enamel which is available from our Service Department, and which can be applied either by spray or brush.

HS2. COMPONENTS

All the components concerned with the storage and dispensing of water and ingredients are of stainless steel, plastic or other non-toxic material, thus conforming to the Water Board and Ministry of Health requirements.

CUP DISPENSER

HS3. CUP MECHANISM

'Dial-a-size' manufactured by National Rejectors, allows, by easy adjustment, the use of various types of cups specifically produced for vending machines.

HS4. ADJUSTMENT (TIMING)

For timing adjustment refer to the installation and set-up instructions supplied with every dispenser. These instructions detail the process of adjustment.

HS5. ADJUSTMENT FOR CUP SIZE

The adjustment for different cups is controlled by two adjustment features on the dispensing unit. One adjustment is by the pointer on the face of the unit which can be rotated by loosening the knurled dial knob, setting the pointer and locking by the same knurled knob. This pointer controls the cams which compensate for varying diameters of cups.

The second adjustment is to allow for varying brim thicknesses and spacing.

Loosen the adjustment knob under the 'dial-a-size' face. This can then be moved horizontally into the desired position and again tightened.

All adjustments are preferably made with the cup dropping mechanism unit removed from the cup dispenser. Removal is effected by the lifting of the two latches at the rear of the cup dropper and disengaging the operating lever. The dropper can then be operated by rotating the top collar clockwise and anti-clockwise when it is possible to observe the operation of the mechanism. Again refer to the instructions issued by National Rejectors which describe the setting accurately.

HS6. CUP STATION ADJUSTMENT

Any change of cup from the type previously used will require adjustment of the cup station stop to allow for the variation in diameter. The cup stop should be positioned to retain the cup when dispensed and at the same time, to allow easy removal.

N.B.—Proper setting should be checked by dropping cups down the cup chute and noting the delivery action on contacting the stop. Securely tighten the stop when located properly.

OPERATION

HS7. DISPENSER

Dispensing the cup at the appropriate moment is only one of the duties performed by the cup dispensing unit. The cup must now be filled with the appropriate quantity of water and ingredients. To do this it is necessary to 'meter' the water and 'weigh' the ingredients. Water is metered by accurate control of time, pressure and valve orifice. Ingredients are 'weighed' by controlled displacement for a known time. Since the cup dispenser always takes exactly the same time to complete one vend cycle, it can also be used to provide the necessary time control for drink dispensing.

HS8. DISPENSER CAMS

Examination of the unit will reveal that situated beneath its base is a shaft driven by a geared motor unit on which are mounted eight cams, each operating a micro-switch. These cams are themselves adjustable since they are formed from two halves, each half having 50 per cent. of its circumference approximately $\frac{3}{16}$ in. higher than the remaining 50 per cent. Positioning of the one half against the other will, therefore, determine the amount of 'high side' of the cam to 'low side' presented to the micro-switch during its complete cycle, thus rendering it possible to adjust the length of time for which the switch is held open on each vend cycle. All cams can be individually adjusted for their particular duty.

On no account must the cams be rotated in a backwards direction, (clockwise when viewed from the dispenser connecting plug) or the micro-switch operating lever will be damaged. See Fig. 1a for circuit diagram.

HS9. WATER CAM OPERATION

The cam nearest the dispenser motor is the 'water cam'. This operates on the high side only and controls the duration of water flow, whether this water be for 'tea', coffee or 'soup'. Thus it will be seen that the cup dispenser provides the serving pulse and the customer's choice determines which valve operates.

HS10. VEND CAM OPERATION

The second cam, or 'vend cam', performs a two-fold duty:—

- (1) When the low side of the cam is opposite the switch operating lever (dispenser at standstill), it supplies electricity to one end of the vend relay energising coil.
- (2) When the high side of the cam is opposite the switch operating lever (dispenser in motion), it supplies power to the vend motor, thus maintaining the vend cycle for one complete revolution and at the same time removing the electrical supply from the vend relay coil, permitting this relay to return to its static position in readiness to initiate the next vend cycle. See Figs. 1a, 1b, 2, 3 and 4a for circuit diagrams.

HS11. INGREDIENT CAMS

The six remaining cams each operate an individual ingredient and are positioned in the following order:—

3rd cam from motor end	—Soup I
4th " " " "	—Soup II
5th " " " "	—Sugar
6th " " " "	—Chocolate
7th " " " "	—Milk
8th " " " "	—Coffee (or tea)

HS12. CAM ADJUSTMENT

All cams are adjusted at the factory to deliver the quantity of ingredients recommended by the ingredient manufacturer when serving a 6-ounce drink.

All cams are normally wired to operate at the 'high-side'. When a dispenser is specifically set up for 'Tea', the 'milk and tea' cams operate on the low side.

HS13. SOLD OUT FEATURE

The final function of the cup dispenser is to prevent the customer from losing his money if the machine has sold out. This is achieved by the use of a coin 'block-out solenoid' situated in the coin actuator channel, which, when it is de-energised, places an obstruction in the coin passage of the mechanism, deflecting coins to the rejected path and returning them to the customer via the rejected coin cup. The block-out relay receives its electricity supply via the 'cup empty' or 'sold out' switch situated in the cup dropping portion of the dispenser, the switch being held closed when cups are present, but falling to the open position when all cups have been used. This feature is also operated by the 'motor switch' during each serving cycle, thus preventing a second coin being accepted by the machine whilst a drink is being served. (See Fig. 4a for circuit diagram.)

HS14. CUP TURRET OPERATION

The turret of the cup dispenser rotates in a clockwise direction, and moves one column only when the previous column is exhausted.

COIN MECHANISM

HS15. GENERAL DESCRIPTION

The coin mechanism normally supplied with the machine is of the National Rejector Series '600' operating with a single coin, although it is possible to equip the machine with mechanisms which will operate on combinations of similar or dissimilar coins to meet most requirements. Such mechanisms normally give long service and need little attention, but on some locations it may be found that greasy or dirty coins are used and this can give rise to the need for regular cleaning of the mechanism.

HS16. REMOVAL OF UNIT FROM MACHINE

1. Rejector

The rejector is removed from the actuating channel by lifting the two hinged retaining plates at either side of the channel, at the same time depressing the rejector bar and so releasing the rejector button mechanism. This permits the unit to be drawn upwards and towards you and freed from the machine.

2. Actuating Channel

To remove, this unit should be grasped firmly, lifted upwards and toward you, when it will be freed from the machine. (See also sections HS13, HS41 and HS42 for operation of this unit and Fig. 4a.)

HS17. CLEANING AND ADJUSTMENT

1. Cleaning

The following simple procedure should be adopted to clean the rejector.

- (a) **SOAK.** Place rejector in boiling water and allow to soak for about ten minutes.
- (b) **SCRUB.** Use a stiffish paint brush with a detergent to clean foreign matter off the rejector. Take care not to damage delicate parts such as the spring on the 6d. rejector scavenger plate.
- (c) **RINSE.** Rinse in clean boiling water.
- (d) **DRY.** Dry thoroughly by shaking or by applying filtered compressed air.
- (e) **LUBRICATION.** Remove any cradles, clean cradle bushing and pins with a piece of pegwood, a matchstick or similar non-metallic tool, and apply silicone solution sparingly. Apply a touch only of white grease to the coils of the wiper blade spring and the scavenger spring of the 6d. rejector. Otherwise do NOT lubricate.
- (f) **PRECAUTIONS.** Care should be taken not to lose delicate pins, clips, etc., and as all components removed for cleaning are easily replaced, force must not be applied during re-assembly.

2. Adjustment

- (a) Rejectors are carefully adjusted at the Works to accept as wide a range of coins as possible, consistent with maximum slug rejection, but it may be found desirable, after a considerable period of service, to check and re-adjust the unit. To do this, it is recommended that a simple bench fixture be produced to hold the mechanism in a level and vertical position and allow access from either side. The mechanism must be held accurately but firmly so as not to subject it to strain or force which can detract from its efficiency or even render it inoperative. The magnets and coin path should be visually inspected to ensure that the unit is free from foreign matter prior to carrying out any adjustment; if dirty, the standard cleaning procedure should be adopted and the mechanism re-checked to ensure that adjustment is really necessary. All screws should be tight and a little white grease should be present on the coils of the wiper blade springs, etc.

Before making any adjustment, be certain that the reason for such action is understood and the adjustment intended will remedy the error. Guesswork is seldom successful and usually increases the difficulties and degree of error. If good coins are hanging up or not being accepted, or certain types of slugs or foreign coins are being passed, carefully consider their size, weight, metal composition and magnetic properties, etc., before making any adjustment. Visualise the path of the coin or slug through the rejector and determine at what point in its travel deviation from the normal path occurs, and what adjustment is necessary *at that point* to remedy the error.

Remember, *OVER ADJUSTMENT* may remedy the acceptance of one undesirable coin or slug, but may cause others to be accepted or good coins to be rejected. After stand adjustments are made, finally test in machine and correct if necessary—be sure to test as many types of coins and slugs as possible to make certain that the intricate balancing of the rejection and acceptance mechanism has not been disturbed for the coin concerned.

- (b) **3d. REJECTOR AND OTHERS** having a 'deflector' and 'separator'. The deflector is so set that good coins just miss striking it; they then drop on to the separator where good coins fall with their centres of gravity on the 'string catcher' side; slugs and bad coins fall on to the separator with their centres of gravity on the other side and so are diverted to the reject outlet. To widen the

adjustment, loosen its locking screw and move separator slightly towards the reject outlet side and then tighten up locking screw (warning—do not overtighten). Move the separator in the opposite direction to increase selectivity. If other adjustments are found necessary, return rejector to the service division.

- (c) 6d. **REJECTORS.** If coins hang up at the 'washer retainer' pin—it may be necessary to give the pin a slight inclination towards the magnet. To do this, a slight set should be given to the flat spring by twisting it with the fingers.

WARNING: Do not bring spring away from bracket and do not over-twist, as this will interfere with the function of the spring in holding up washers and pushing undersize slugs and coins through the gap in the main plate. Normally, the runway should NOT be altered—it is set to deal with undersize slugs and coins and also oversize diameter slugs and coins. If necessary, adjust the separator as for 3d. rejectors. If other adjustments are found necessary, return rejector to the service division.

HS18. CHANGING PRICE AT WHICH MACHINE VENDS

When it is felt desirable to change the price at which drinks are vended, it must be remembered that it is not only necessary to change the mechanism and channel but also the warning lamp legends and other price indications on the face of the machine. When replacing the mechanism, care must be taken to ensure that the entire unit is again sitting correctly in position on the three mounting spigots and that the hinged flap of the coin guide funnel at the top of the mechanism is sitting correctly behind the rejector plate of the mechanism itself. Mispositioning of this flap will lead to coins being thrown back into the body of the machine and consequent loss to the customer of both money and drink.

HS19. WATER SYSTEM

Water, normally obtained from the supply authorities mains is directed via a filter and inlet solenoid to a stainless steel storage tank. The water level is controlled by a ball valve assembly manufactured to the appropriate British Standard Specification. The tank is situated at the rear of the cabinet and immediately above a booster pump to which it is connected. (See Fig. 6.)

HS20. BOOSTER PUMP

The booster pump is of the centrifugal type and is coupled to the water heating unit via a non-return valve which is embodied to prevent hot water returning to the tank and to ensure accurate water delivery at each serving. (See Fig. 6.)

HS21. WATER HEATING UNIT

The water heating unit is of 2.96 gallon capacity and embodies a 2 k.w. immersion type heating element. (See Fig. 4c.)

HS22. TEMPERATURE CONTROL

The temperature of the system is controlled by a special unit designed by D.V.M. Ltd. *It is non-adjustable* and will give long service without attention. Should the temperature of the system change appreciably, a replacement unit must be fitted.

HS23. SERVING SOLENOIDS

The serving solenoids form part of a circulating system. They require no attention other than periodic cleaning and replacement of the rubber plunger seats and sealing washers. (See HS42 and Fig. 8.)

HS24. SAFETY DEVICES

A pressure/temperature relief unit of the dead weight/eutectic type is fitted. It is normal for this unit to drip water into a waste can when pressure of approximately 80 lbs. per sq. in. has been reached in the system.

No attempt must be made to prevent this dripping, since failure to relieve pressure can lead to erratic action or failure of the solenoid valve to operate or even damage to the system.

The eutectic section of this unit is designed to melt at approximately 200°F. but this will only occur due to the failure of another component, such as the temperature control unit or the immersion heater developing a short circuit. Should this device operate, a replacement stem must be fitted.

No attempt must be made by the field service engineer to fit a eutectic washer, since this material is pressure as well as temperature sensitive and the washer can easily be damaged in fitting. When removing or

refitting the stem, care should be taken to grip the body of the stem below the lock nut, otherwise the unit will be damaged. A little sealing compound such as 'Hermatite' may be used between the sealing faces of the stem, tray and machine fitment—care must be taken not to permit ingress of the sealing compound to the stem. (See Fig. 7.) The true cause of the failure must first be located and rectified. Failure to do this can only lead to the blowing of another eutectic unit.

HS25. WATER DELIVERY

Water is delivered by the soup water solenoid or coffee water solenoid, dependant upon the customer's choice. The quantity of water delivered by either valve can be individually increased or decreased by adjusting the restrictor bar in the base of the valves—'screwing in' to decrease and 'screwing out' to increase. (See Fig. 8.) $5\frac{1}{4}$ fluid ounces of water is delivered when serving a 6-ounce drink.

The quantity of water delivered may increase slightly after a few days service either on a new installation, or after replacement of the rubber valve seat in a W.H.A. valve. This is due to initial shrinkage of the valve seat material. Any increase in water dispensed can be corrected by adjusting the valve in the manner described above. No further adjustment should be required. (See HS43 and Fig. 8.)

The timing of the water flow in relation to the ingredient delivery is particularly important in the case of the coffee bowl, and is preferably as follows:—

Ingredients and water should contact at the same time in the bowl. The flow of ingredients must stop before the flow of water.

The action of the water mix will be as follows:—

When the ingredients and water meet at the same time in the bowl, the ingredients do not have a chance to solidify and prevent mixing at the start of the mixing cycle. The ingredients stopping before the water flow ensures a clean bowl by the action of the water swirling at the end of its cycle.

On chocolate products, due to the large quantity of powder to be dispensed at each serving, the powder flow can be a little ahead of the water. The powder will flow directly into the outlet opening of the bowl, ahead of the water. Contact with hot water will immediately melt this powder and still wash out the bowl preventing any build-ups.

HS26. INGREDIENT CANISTERS

The six ingredient canisters, each with its own motor, are situated towards the rear centre and right-hand side of the cabinet. Looking from left to right, they are positioned as follows:—

- (1) Soup I
- (2) Soup II
- (3) Sugar
- (4) Chocolate
- (5) Milk
- (6) Coffee/Tea.

These canisters are easily removed for filling after detaching their lids, by simply tilting them slightly backwards, at the same time drawing them towards you individually. This releases the canister drive from its motor. Each canister contains an agitator paddle driven by the ingredient worm as it rotates during the serving cycle. This ensures that the worm thread is always full of ingredients, thus providing accurate measurements at each serving. The canister should be regularly cleaned to ensure their perfect freedom in operating. Care must be taken when replacing the canister to see that the drive clip is correctly positioned over the motor drive pin.

The ingredient chutes when detached for cleaning, must be replaced so as to direct the powders towards the centre of the bowl.

HS27. INGREDIENT NOZZLE

The nylon ingredient nozzle must be fitted so as not to impede the flow of ingredients, i.e. with its centre bearing rising from the bottom of the canister and hidden by the ingredient chute when in position.

HS28. INGREDIENT DELIVERY MOTORS AND GEAR BOXES

Six geared motor units are embodied, all of which are similar in appearance. Four of these units (soup I and II, milk and coffee) are low speed units (48 r.p.m.) and are known as 'ingredient motors'. These units can be identified by the presence of a large fibre gear wheel at the top of the gear box.

The two remaining units, chocolate and sugar, are high speed units (120 r.p.m.). These units can be identified by the presence of a small fibre gear wheel at the top of the gear box. Greater power is required to deliver sugar than any other ingredient and for this reason a more powerful motor is embodied. It is exactly similar in appearance to all other motors, but can be identified by a blue mark

near to the connecting tags of the motor. A few drops of thin machine oil should be applied to the oiling holes on the motor bearings at about three monthly intervals.

Gear Box

All gear boxes will give long periods of trouble-free service with a minimum of attention. All that is required is to ensure that the gear train is free from ingredient dust or other foreign matter and that the intermediate gear pivots and final drive shaft are well oiled. Any thin machine oil is suitable for this purpose, but if an oil containing molybdenum di-sulphide is used, then care must be taken to ensure that this does not reach the gear teeth or damage will result. The periods between oiling will depend to some extent upon the volume of business which the machine enjoys, but four weeks will be an average period. An oiling hole is provided for the final drive shaft immediately behind the drive pin. The front bearing of the intermediate drive is equipped with an oilite bush. The rear bearing should be lubricated by the application of a drop of oil on the end of a stout wire or thin screwdriver. (See Fig. 5.)

MIXING BOWLS

HS29. BOWL HEATER

A sheathed type of heating element (175 watts loading) is employed to maintain the coffee bowl at serving temperature and also to assist in keeping the ingredients in perfect condition. (See Fig. 5.)

HS30. EXTRACTOR FAN

A centrifugal type of extractor fan is fitted at the rear of, and immediately below, the mixing bowls. This draws a constant stream of warm air over the ingredient delivery chutes, etc., thus preventing moisture released during a serving cycle, or which may be present in the atmosphere, from being absorbed by the dry ingredients which would otherwise 'build up' on the chutes. This unit should be cleaned at regular intervals for which purpose it can be unplugged and completely withdrawn from the machine. The following procedure should be adopted:—

- (a) Switch off electricity by lifting float ball and chain from drip can micro-switch.
- (b) Swing out cup dispenser.
- (c) Uncouple and remove large mixing bowl.
- (d) Unplug extractor fan connecting lead from socket at rear left-hand side of ingredient motor tray.
- (e) Remove fan unit from its mounting by drawing towards you.

Cleaning can normally be effected by brushing away dry powders with a stiff paint brush. In severe cases, it may be necessary to wash the impellor which can be removed from the housing by slackening the allen screw in the boss of the impellor. Re-assemble and replace by reversing the foregoing procedure. (See Fig. 5.)

HS31. BOWL FLUSH

The bowl flush switch on the control box above the coin mechanism operates either solenoid dependant upon the position of the drink selection switch. (See Fig. 3.)

HS32. INGREDIENT SWITCH

An ingredient 'on/off' switch is embodied next to the bowl flush switch to enable adjustments to be made to the machine without wastage of ingredients and care must be taken to ensure that this switch is in the 'on' position when leaving the machine after service. (See Fig. 3.)

ELECTRICAL SYSTEM

HS33. SUPPLY REQUIREMENTS

The HOTSPA '460' is designed to operate on 50-cycle A.C. current only and as it leaves the factory will operate satisfactorily on supplies of from 220/250 volts.

HS34. BOOSTER UNIT

Installations with alternating current outside these voltages can normally be dealt with by an additional unit which plugs into the main electrical panel on the left-hand side of the machine. (See Fig. 1b).

HS35. COMPONENT CONNECTION

All major components are equipped with plugs and sockets thus ensuring easy component changing in the field. (See Figs. 1, 2, 3, 4 and 5.)

HS36. RELAY PANEL

Hotspa operates on one relay only. This is situated on the plug-in panel on the main electrical box at the left-hand side of the machine. The pins on multi-plugs and sockets are identified on wiring diagrams included with the manual. (See Fig. 2.)

HS37. FUSES

The machine in its standard form is equipped with a solid neutral link housed in a white carrier within the main electrical box at the left-hand side of the machine, as is the 15-amp HRC type fuse mounted alongside it in a Slydelock type carrier. (See Fig. 1b.)

HS38. CONNECTION TO MAIN

Standard British colour coding is observed, i.e. Black—Neutral. Red—Live. Green—Earth, and it is absolutely essential that this sequence be observed when connecting to the mains. (See Fig. 1b.)

HS39. EARTHING

It is essential that the machine is *efficiently earthed*.

HS40. OVERFLOW DRIP CONTROL

A drip-tank is provided within the machine to collect any liquid which may be spilled when the customer takes his drink or to accept water if, through any failure, this should continue to flow. When the drip-tank is approximately three quarters full, a ball float operates the drip can micro-switch, turning off all electricity and water supplies to the machine. (See Fig. 1b.)

HS41. OPERATING CYCLE

The coin, on insertion, passes through the rejector mechanism, and if accepted, is then directed into the cash box. As it passes to the cash box, it strikes the operating lever of the coin actuating switch situated in the coin actuator channel. This provides a momentary pulse to the vend relay which immediately closes. This provides power to the cup dispenser motor which then completes one cycle. (See Figs. 1a, 1b, 2, 3 and 4a.)

HS42. ANTI-JACKPOT FEATURE

The electricity supply to one side of the vend motor is made via the normally closed contacts of the coin operating switch. This ensures that the motor does not run if the switch is held open and that the coin must pass into the cash box before vending can commence. Only one drink per coin can be served. (See Figs. 1a, 1b, 3 and 4a.)

HS43. SOLENOID VALVES

A solenoid valve is, in effect, an electrically operated remotely controlled tap, and as such, will require periodic cleaning and replacement of washers, etc. The construction of the valve will readily be understood from the section diagram at the end of this manual. (See Fig. 8.)

When it becomes necessary to service the valve, all that is required, after turning off the electricity and water supply to the machine, is:—

- (1) Remove the nut and identification plate at the top of the coil cover.
- (2) Lift coil and cover clear of bonnet stem.
- (3) Remove bonnet by turning in an anti-clockwise direction by the use of either a special key which will locate in the hole which exists on the bonnet face, or by very carefully gripping the bonnet stem as near as possible to the top, without damaging the thread. It will be obvious from the diagram that to grip the bonnet low down will cause the tube to collapse and render the valve inoperative. Examination of the valve seating plug will determine whether it is fit for further service, or whether it needs replacing. The face of the seating should be flush with the surrounding metal of the plunger stem.

If the plug is distorted or damaged, it can be removed by prising it out of the plunger with a small screwdriver. A replacement plug can most easily be pressed into position by first wetting it. It must finally sit in position with its face level with the face of the valve plunger. The rubber sealing washer for the bonnet should also be examined whilst the valve is open and replaced if this shows the slightest sign of deterioration. Re-assembly of the valve is achieved by reversing the above procedure. (See Fig. 8.)

W.H.A. valves embody a flow control which screws in and out of the valve body. Leakage of water at this point is prevented by the presence of a rubber 'O' ring which sits in a recess on the control

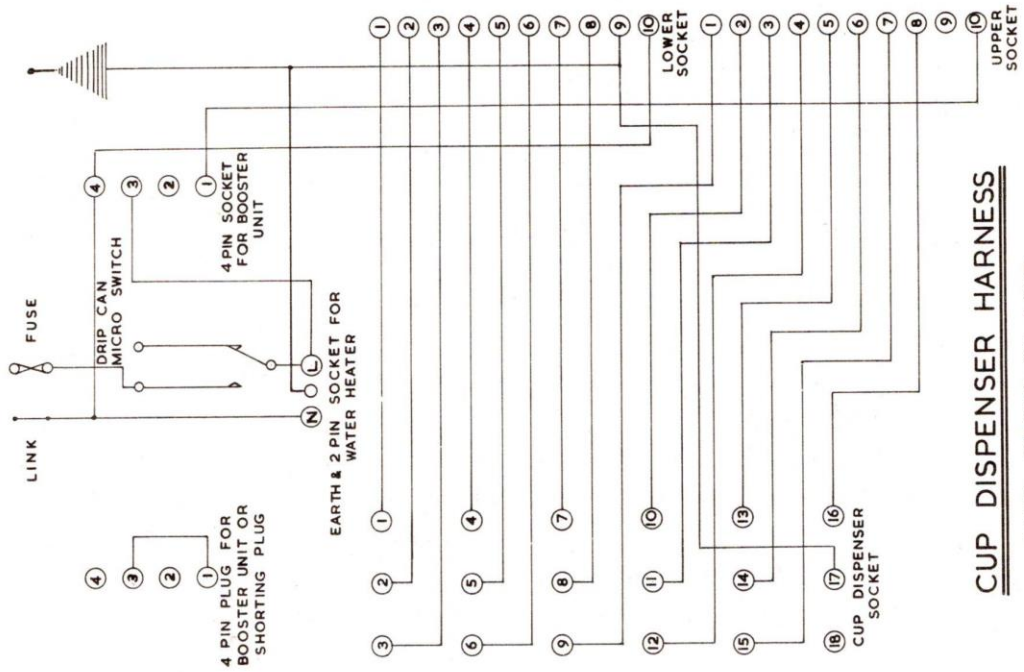
screw. Should it prove necessary to replace this seal, the procedure is to remove the stop screw (the head of which prevents the body of the control screw being withdrawn too far), the control screw is then turned in an anti-clockwise direction until it can be completely withdrawn. The damaged 'O' ring should then be removed and a new one 'rolled' into position. Again, this should be fitted WET and extreme care should be exercised when refitting the control screw to the body of the valve. *Careless fitting will result in a sliver of rubber being removed from the 'O' ring which will then leak.*

Bone fibre washers are used at each pipe junction to valve body, and these should be replaced every time a joint is broken. Failure to do so may lead to a small fragment of the washer being carried into the valve body which may either block the passage through the valve or hold the plunger open.

In the unlikely event of a solenoid valve coil failure, it must be remembered when replacing this unit that two coils which look exactly similar, exist. The one, MVP.18 which is of approximately 1,000 ohms D.C. resistance, is intermittently rated and is used on W.H.A. valves only. The other, an MVP.19 which is of approximately 2,000 ohms D.C. resistance, and which is continuously rated, is used for the 'M' valve only.

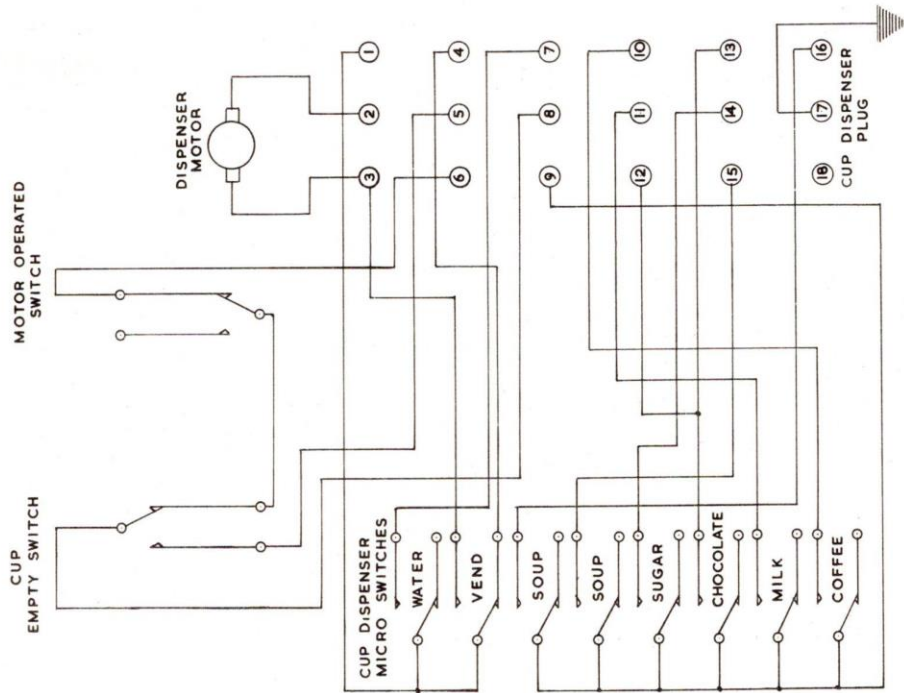
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CUP DISPENSER HARNESS
AND FUSE PLATE
HOT-SPA 460

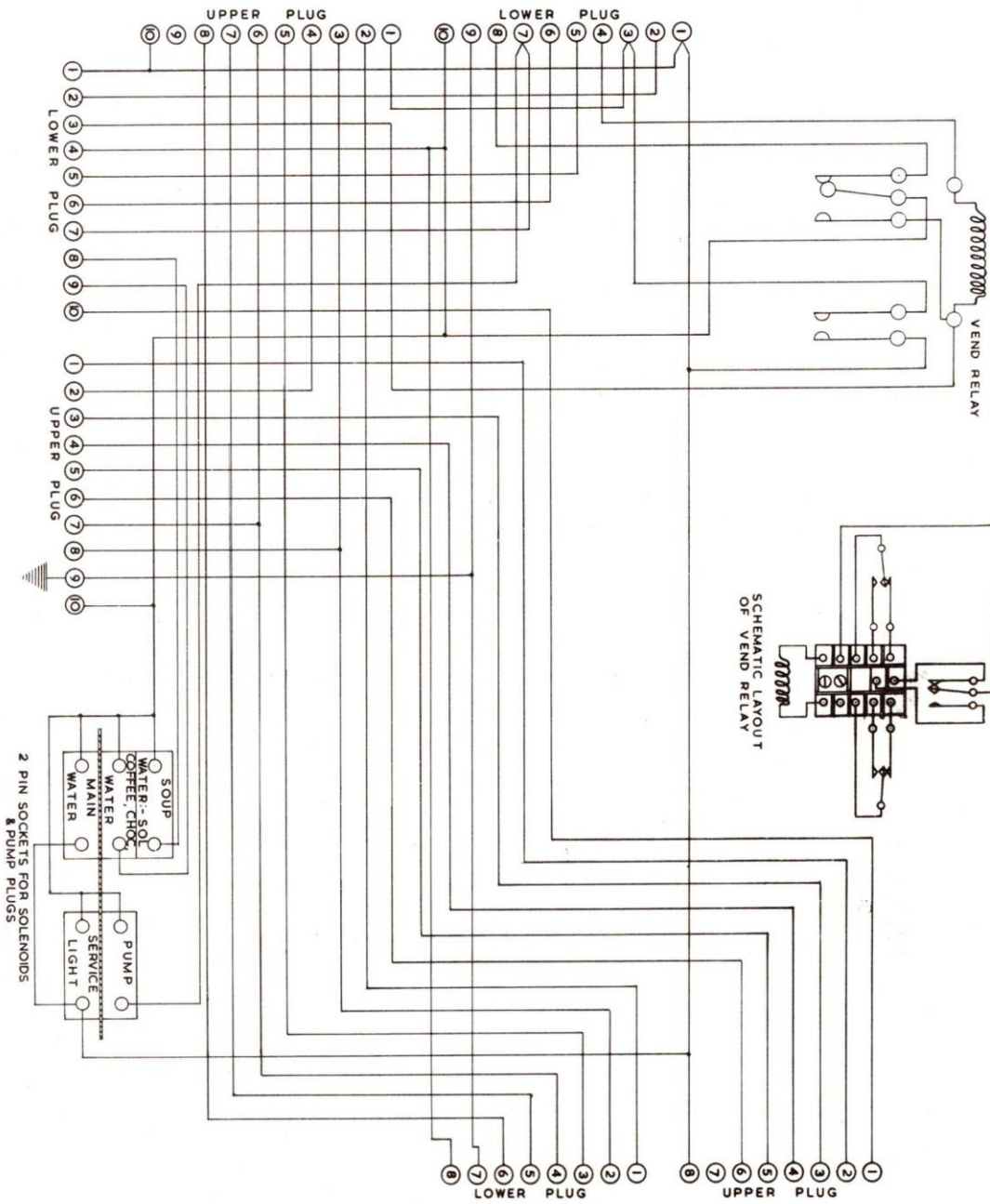
I.B.



CUP DISPENSER WIRING
DIAGRAM
HOT-SPA 460

I.A.

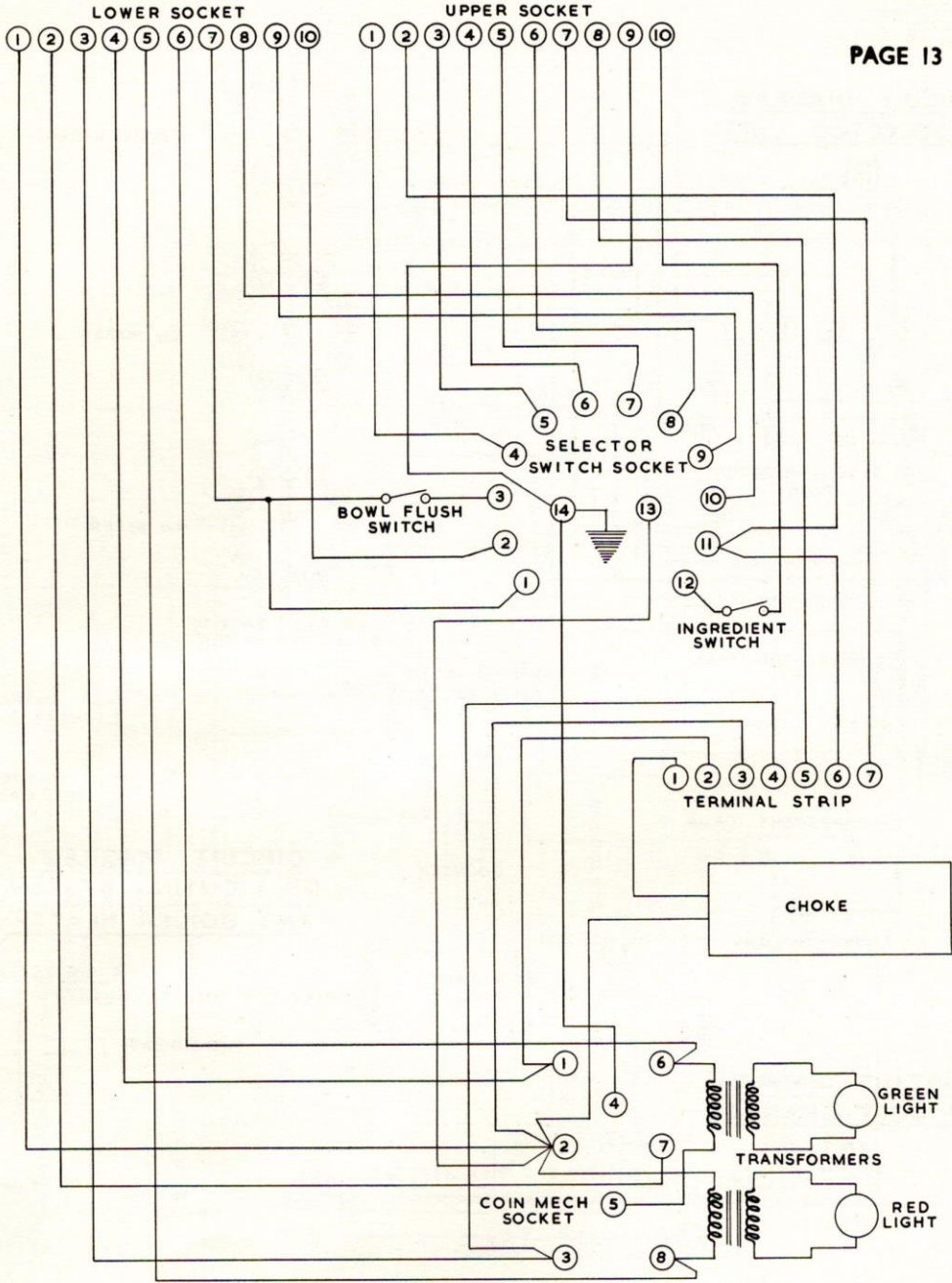
FIG. 1



CONTROL PANEL

HOT-SPA 460

FIG. 2.



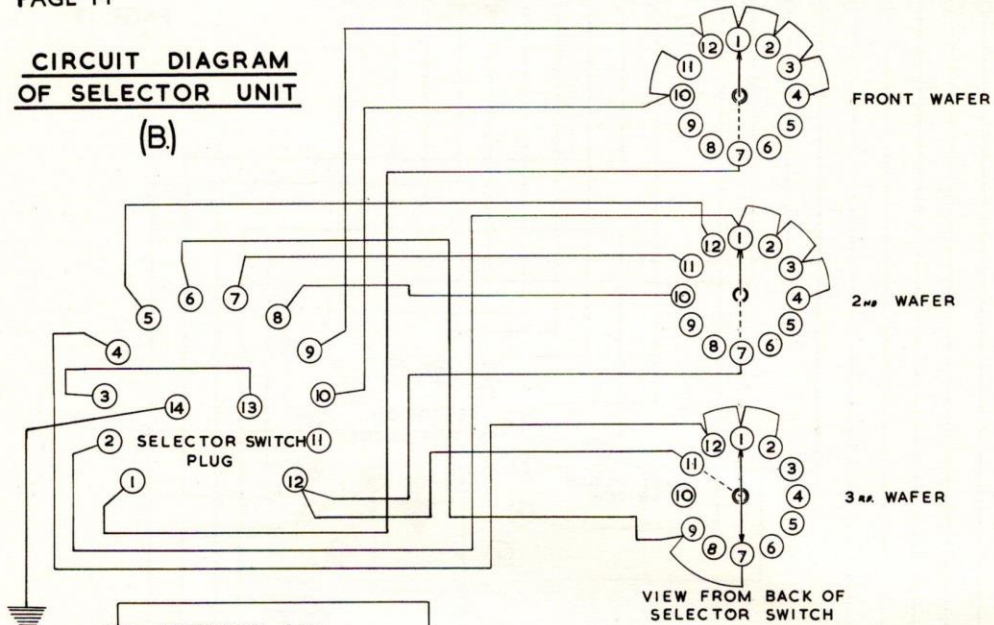
CROSS-OVER HARNESS

HOT-SPA 460

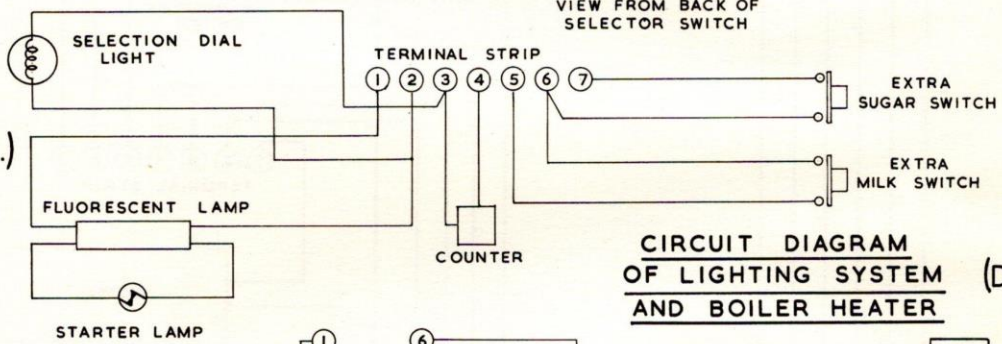
FIG. 3.

CIRCUIT DIAGRAM
OF SELECTOR UNIT

(B)



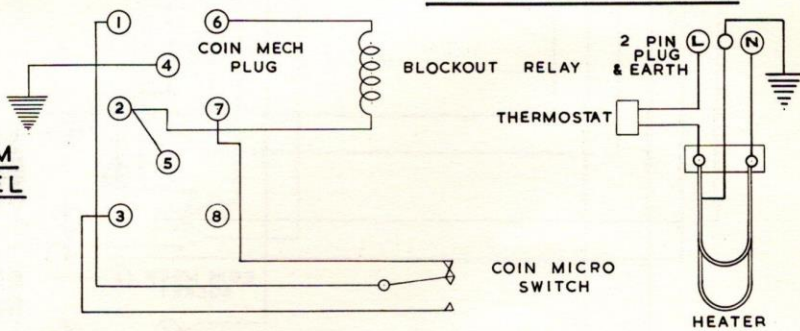
(C)



CIRCUIT DIAGRAM
OF LIGHTING SYSTEM (D)
AND BOILER HEATER

CIRCUIT DIAGRAM
OF COIN CHANNEL

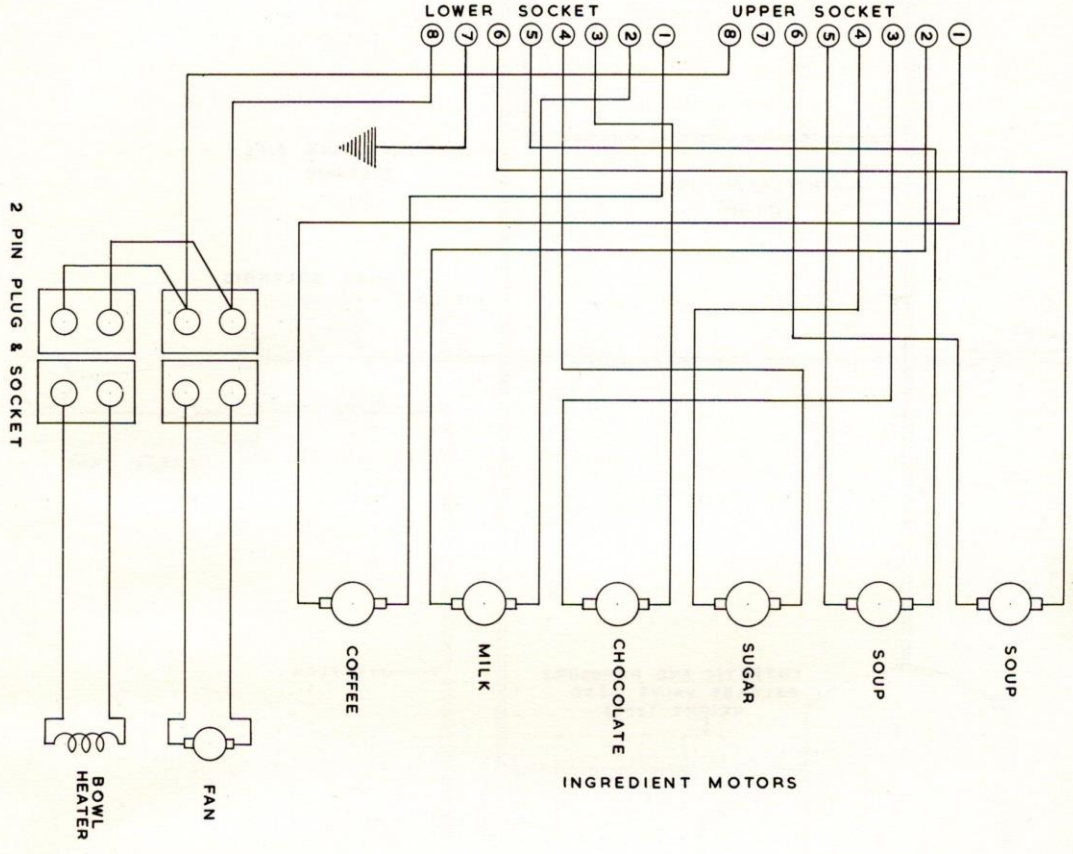
(A)



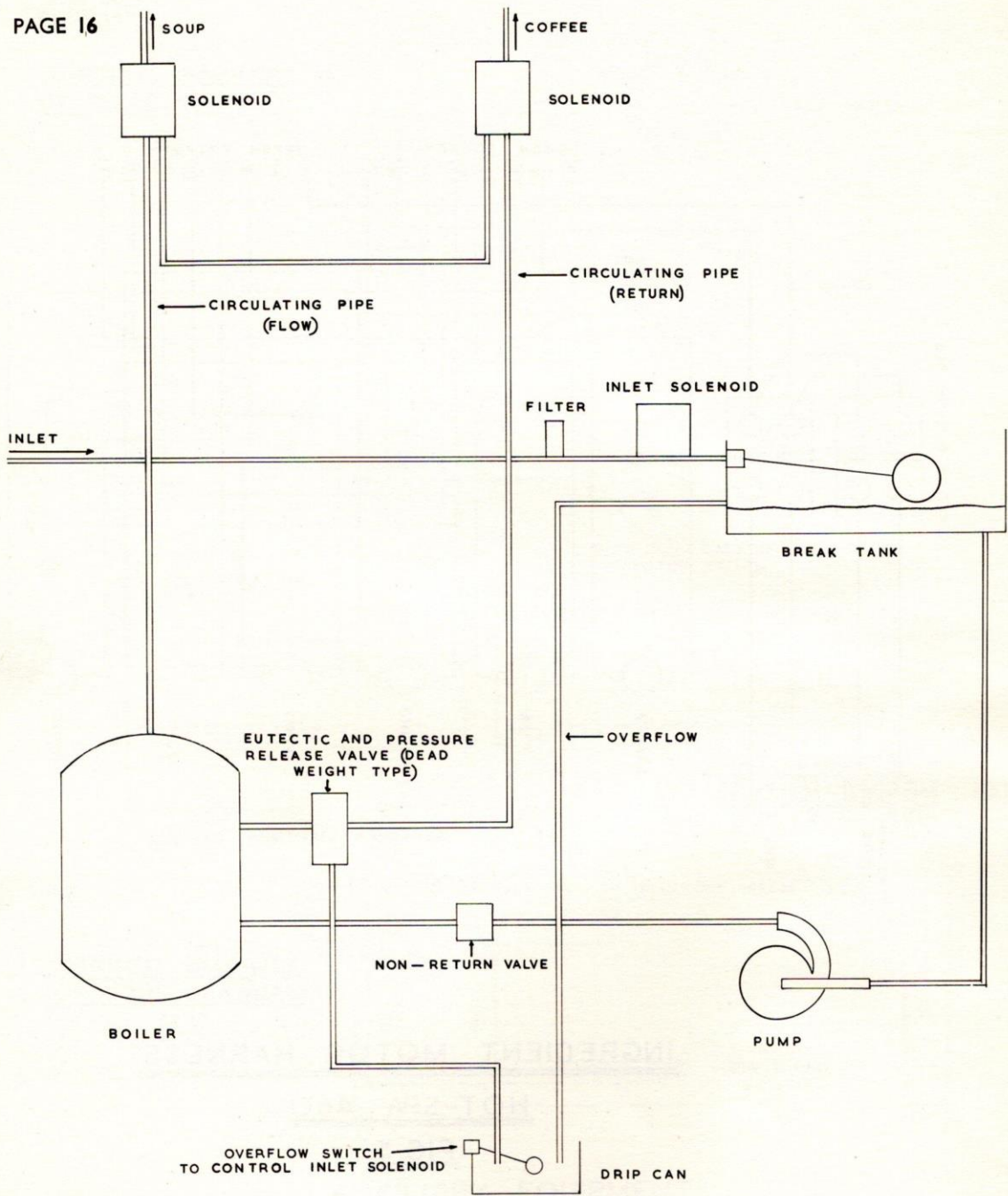
AUXILIARY EQUIPMENT

HOT-SPA 460

FIG. 4.

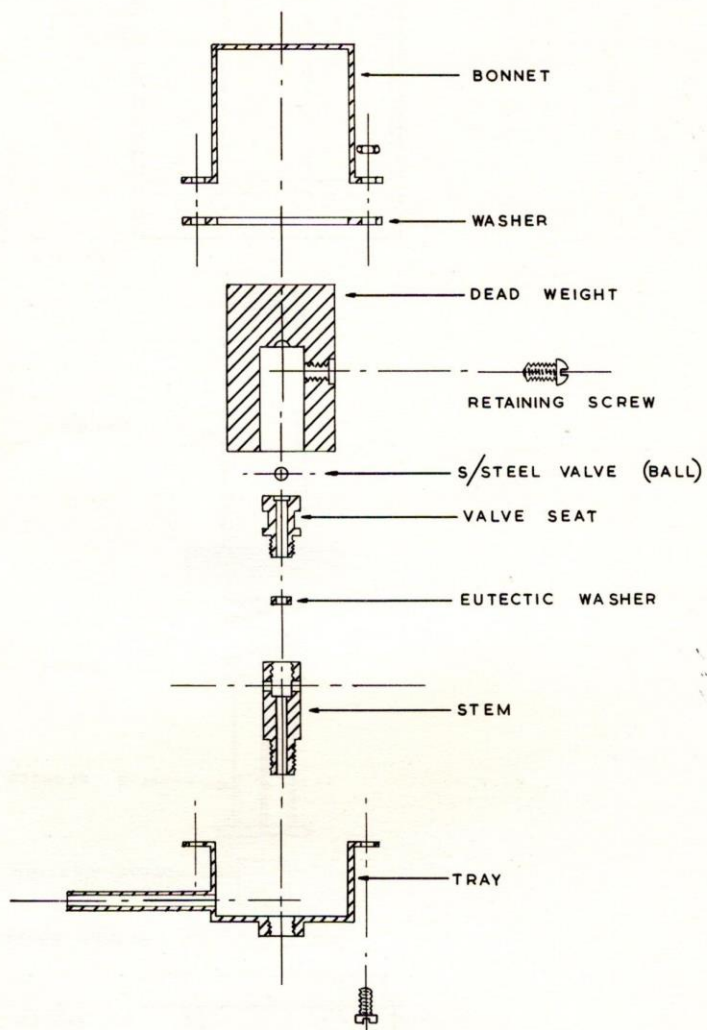


INGREDIENT MOTOR HARNESS
HOT-SPA 460
FIG. 5.

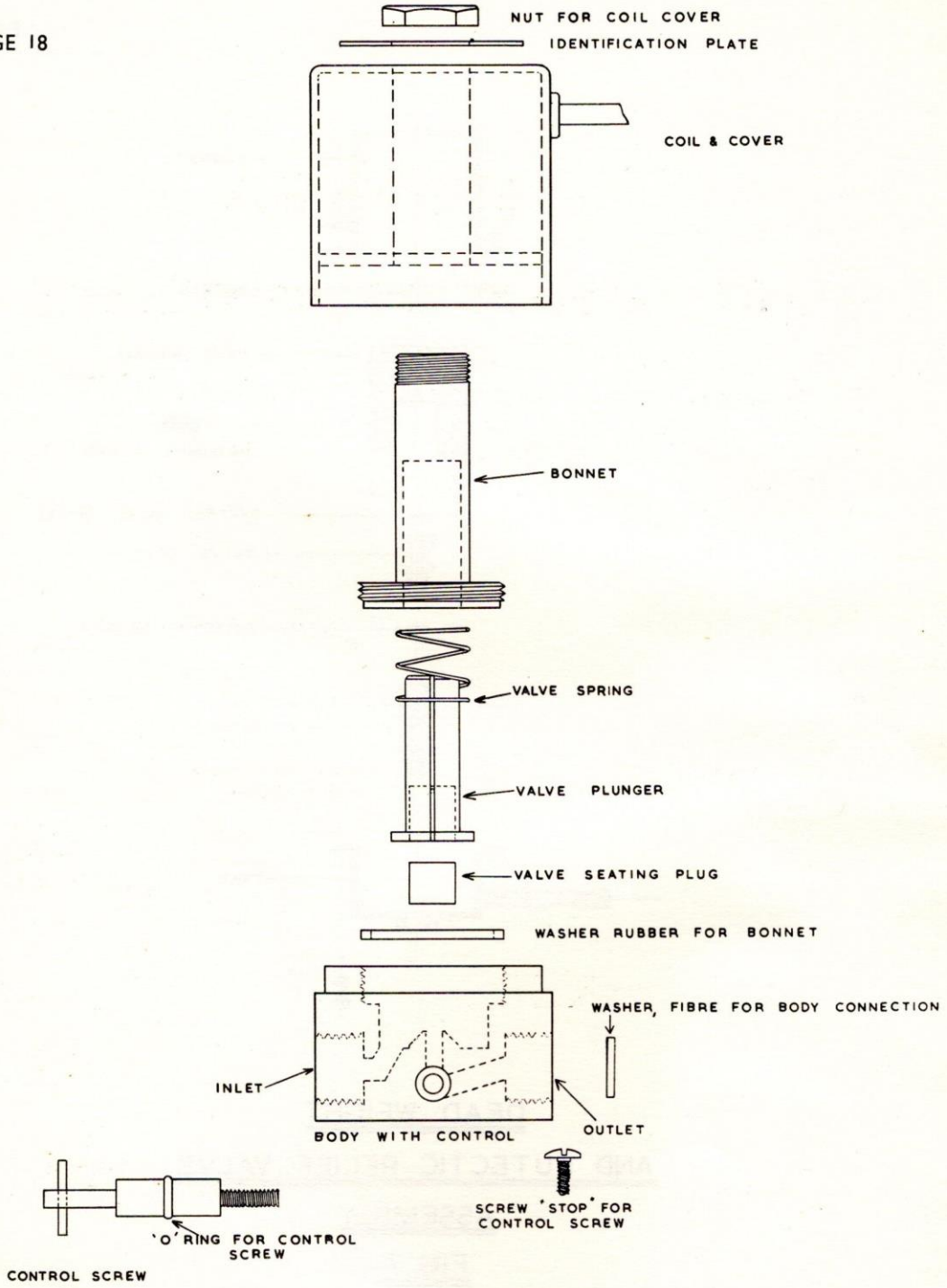


SCHEMATIC LAYOUT OF
HOT-SPA 460.
WATER SYSTEM

FIG. 6.



DEAD WEIGHT
AND EUTECTIC RELIEF VALVE
ASSEMBLY
FIG. 7.



MAGNETIC VALVE
FIG. 8.

HOTSPA

SERVICE PROBLEMS AND MAINTENANCE CHART

SYMPTOM	POSSIBLE CAUSE	REASON	REMEDY ACTION
1. Machine rejects all coins. (No lights.)	Coin blockout relay de-energised.	Electricity supply off.	Check supply point.
"		Machine fuse blown.	Locate cause and replace fuse.
"		Drip Can full.	Empty.
"		Float and ball assembly omitted.	Place in position.
"		Coin mech. plug left out of control box.	Place in position.
"		Vend relay contacts dirty.	Clean.
Machine rejects all coins.		Faulty cup empty switch on dispenser.	Replace switch.
Green light on.		Blockout relay coil open circuit.	Replace.
"		Supply voltage below 220V.	Fit booster unit.
"	Reject button mal-adjusted.	Rejector bar held down.	Re-adjust pin.
Red light on.	" Anti-Jackpot " feature operating.	Damaged coin holding coin switch closed.	Remove.
"	" Sold Out."	Cup dispenser—no cups. <i>(If foregoing does not reveal cause, check continuity of electrical harness by reference to wiring diagram).</i>	Refill.
2. Machine will not accept coin.	Defective coin passage.	Chute damaged or blocked with foreign matter.	Clean or replace.
3. Machine accepts coin but does not vend. Green light on. Coin rejected but not returned to rejected coin cup. Green light on.	Coin not entering mechanism.	Chute mal-aligned.	Re-adjust.
		Rejector coin chute mal-aligned.	Re-align.

SYMPTOM	POSSIBLE CAUSE	REASON	REMEDY	ACTION
4. Coin accepted, cup and water only served.	No electricity supply to ingredient motors.	Ingredients not switched on or switch defective.	Switch on, or replace switch.	
"	"	Selector switch damaged.	Replace.	
5. One particular ingredient fails to deliver.	No electricity supply to ingredient motor.	Faulty selector switch. Faulty dispensing switch.	Replace switch. Replace switch.	
"	Electricity present at motor, but motor not running.	Faulty ingredient motor.	Replace motor.	
"		Ingredient motor unit seized.	Rectify or replace.	
"	Cannister seized.	Defective canister or moist ingredients.	Rectify or replace.	
6. Ingredients but no water delivered.	No water input to boiler.	Blockage in water inlet system.	Locate and rectify.	
Coffee selection no water served.	Faulty coffee valve	Faulty valve seat. Open circuit coil.	Replace seat. Replace coil.	
Soup solenoid no water served.	Faulty soup valve	Blockage in valve. Blockage in serving pipe.	Clean or replace. Clean or replace.	
7. No water served from either solenoid.	Pump fails to start.	Faulty pump. No electricity supply to pump.	Repair or replace. Locate and remedy.	
"	Pump runs normally.	No water in break tank.	Check filter, inlet solenoid and ball float system.	
"	"	Excessive pressure in boiler.	Replace dead weight valve.	
		Foreign matter in water system.	Clean system.	

SYMPTOM	POSSIBLE CAUSE	REASON	REMEDY ACTION
8. Water served but temperature incorrect.	Control unit unserviceable.		Replace control unit.
First drink temperature too low.	Bowl heater element in-operative.	Faulty element.	Replace element.
"	"	No electricity to element.	Check supply.
9. Poor quality drink.	Incorrect ingredient delivery.	Cams wrongly adjusted.	Re-adjust.
"	"	Nozzles or canisters require cleaning.	Clean and replace as necessary.
"	Ingredient build up in bowl.	Water flow incorrectly adjusted.	Re-adjust.
"	Ingredient build up to nozzles and chutes.	Faulty bowl heater element.	Replace element.
"	"	Extractor inoperative.	Clean or replace fan.
10. Machine accepts coin but does not vend. All further coins rejected.	Cup dispenser motor does not start.	Cup dispenser motor unserviceable.	Replace motor.
		Coin switch unserviceable on motor circuit.	Replace switch.
		Vend Relay contacts dirty or out of adjustment.	Clean and re-adjust.
11. Machine accepts coin serves drink but no cup.	Sold out of cups.	Cup empty switch unserviceable.	Replace switch.
	Faulty cups.	Examine cups for defects.	Change cups and restart machine.
12. Water and ingredients 'flow on.'	Faulty cups.	Dispenser stalled by jammed cup.	Remove cups and re-start machine.

	SYMPTOM	POSSIBLE CAUSE	REASON	REMEDY ACTION
13.	Water does not enter storage tank.	Faulty inlet water solenoid. Faulty Ball Valve.	Coil open circuit. Faulty seat, etc. Plunger stuck—corrosion.	Replace coil or solenoid. Clean, etc.
14.	Water overflows from storage tank.	Faulty Ball Valve. Faulty seating.	Plunger stuck—corrosion. " " "	Replace unit. " "



The foregoing faults table assumes that the Engineer will have made sure that supplies to the machine are present and that the drip can is empty and plug and socket connections are properly made.

PART REQUIREMENTS

When ordering parts, please refer to the spare parts list and order by the current part number. It is essential that the serial number of the machine be quoted, together with the date of purchase, if a component is to be returned under our Warranty.

Spare parts are available on an advance replacement basis and are invoiced in full on despatch.

Consideration for credit will only be given if the suspect component is returned to our Service Department **within 14 days** from the date of despatch of the advance replacement. Credit will only be given if the component has failed within the terms of our Warranty and has not been the subject of misuse, accident or damage, and the acceptance of a returned component by our Service Department does not imply that credit either in full or in part will be given.

When a returned component is a bought item from an external supplier, credit can only be given if such credit is obtained by ourselves from the external supplier.

N.B.—All returned components must bear a label indicating the suspected fault, the serial number of the machine from which it has been removed, and the date of purchase.

Compliance with these instructions will ensure a speedy spare part replacement.

SPARE PARTS AND PRICE LIST FOR HOTSPA "460"

Part Name	Part No.	Retail Price		
		£	s.	d.
Agitator Shafts/Steel	461		2	6
Ally, Door Trim	462	2	10	0
Ballast	61		18	8
Ball Float	62		7	6
Barrier Strip, 7 way	63		4	0
Batten Lamp Holder	64		3	6
Bezel	65	1	15	0
Boiler Casing	463	2	0	0
Boiler, Copper, with heater	464	8	0	0
Bowl Heater	66	2	0	0
Bowl Heater Clips	67			6
Bowl Shelf	465	4	0	0
Bowl Swirls (large)	68	1	1	0
Bowl Swirls (small)	466		7	6
Bright Metal Door Strips	69		10	0
Cabinet	610	60	0	0
Cable Cover	611		8	0
Cable Trim L/hand	612		2	0
Cable Trim R/hand	613		1	6
Cable Trim Top	614		1	9
Canopy	615	1	15	0
Chain	616		1	0
Coil, Potted for MVP 18	617	1	11	0
Coil, Potted for MVP 19	618	1	11	0
Coin Box	619		12	6
Coin Escutcheon	620		1	0
Coin Chute Extension	621		6	0
Coin Chute Assembly	622		6	6
Coin Chute Support	623		2	0
Coin Guide	624		5	3
Coin Insert Assembly	625		5	0
Coin Mechanism + Channel 6d.	626	14	3	6
Coin Mechanism + Channel 3d.	627	14	3	6
Coin Mechanism Only 6d.	628	6	1	0
Coin Mechanism Only 3d.	629	6	1	0
Coin Mechanism + Channel 2d.	630	24	3	6
Control Box Door Cover	631		9	0
Control Panel	467	7	10	0
Coupling Straight 42w	632		3	6
Counter	633	2	10	0
Crossover Harness	634	8	5	0
Crossover Harness—liquid milk	468	8	15	0
Cup Chute Assembly	635	7	10	0
Cup Chute MT6 Bracket	469		15	0
Cup Dispenser	4610	70	0	0
Turret only	636	5	0	0
Cup Dispenser Harness	637	7	15	0
Cup Dropper	6124	20	0	0
Cup Stop	638		6	0
Delivery Tube Assembly	4611	3	2	6
Delivery Tube PVC 3/4"	4612		3	6
Dispenser Bracket	639		18	9
Drive Clip and Drive Shaft, S/steel	640		6	6
Electric Control Box Cover	641		11	0
Emblem	4613		7	6
"Extra Milk & Sugar" Plate	4614		2	9
Facia—Coffee	4615	4	0	0
Facia—Coffee, Tea, Soup	4616	6	4	0
Facia—Coffee, Tea, Chocolate	4617	6	4	0

Part Name	Part No.	Retail Price		
		£	s.	d.
Facia—Tea, Coffee, Chocolate, Soup	4618	6	4	0
Facia—Tea, Chocolate, Soup	4619	6	4	0
Fan Casing & Impellor	4620	5	0	0
Fan Motor	4621	4	0	0
Feet	642		3	6
Fluorescent Harness	643		13	0
Fluorescent Tube 18"	644		9	9
Foamophrene, per cabinet set	645		6	0
Fuse Link 15 amp	646		1	0
Gearbox—chocolate	647	1	18	0
Gearbox—ingredient	648	1	15	0
Grid, Cup Chute	649		15	0
Gutter	650		10	0
Ingredient Cover, Large	4622	1	7	6
Ingredient Cover, Small	4623		19	0
Ingredient Container Assembly	4624	5	15	0
Ingredient Chute	4625		4	0
Knurled Nuts	651			6
Kopex Tube	652		5	0
Lamp 6 watt/12 volt	653		1	8
Lamp 100 watt	4626		1	9
Lamp 40 watt	654		3	0
Mini Micro Switch Drip Can	655		8	6
Mixer Bowl Cover	4627	1	10	0
Mixing Bowl, Small	4628	1	1	0
Mixing Bowl, Large	656	1	12	0
Motor Cover	4629		10	6
Motor & Chocolate Gearbox	657	5	3	0
Motor, High Torque & Gearbox	658	5	3	0
Motor, High Torque, only	659	3	5	0
Motor & Ingredient Gearbox	660	5	0	0
Motor only	661	3	5	0
Motor Mounting Frame	4630	4	5	0
Muff, Travelling	662	15	0	0
Nylon Bearing	663		1	0
Nylon Nozzle	664		2	6
"P" Clips $\frac{1}{4}$ "	665			5
"P" Clips $\frac{3}{4}$ "	666			9
Paddle Agitator	667	1	2	6
Panel Clips	668		1	6
Perspex Door	669	15	0	0
Perspex Selector Panel	670		17	6
Pipe, Water Connecting	4631		10	0
Pipe, Flow	4632		19	6
Pipe, Main Water Inlet	4633	1	10	0
Pipe, Overflow	4634	1	0	6
Pipe, Pump to Boiler	4635		19	0
Pipe, Return	4636		16	0
Pipe, Tank to Pump	4637		16	0
Pipe, Valve to Bowl	4638		8	6
Plug, Baby Domina	671		2	1
Plug, Metal Clad, Domina	672		2	9
Push Button, Extra Milk & Sugar	4639	1	0	0
Plug, Octal 14 pin (selector)	673		3	0
Plug, PP8 (relay plate)	4640		4	0
Plug, PP10 " "	674		4	0
Plug, XP4 (transformer link)	675		3	9
Plug, XP8 (coin mechanism)	676		4	6
Polythene Bucket	677		8	6
Pump	4641	20	0	0

Part Name	Part No.	Retail Price		
		£	s.	d.
Ring "O" for Control Screw	678		1	0
Reject Button Assembly	679		6	6
Reject Coin Assembly	680		3	6
Reject Coin Box Assembly	681	1	10	0
"Reject Coin" Plate	682		2	9
Relay	683	1	1	0
Rubber Cover, Metal Clad, Domina Plug	684		1	3
Selector Knob	685		9	6
Selector Switch Assembly	4642	2	0	0
Selector Switch, Tea and liquid milk	4643	2	5	0
Selector Switch Stops	686		1	0
Selector Switch—Tea Assy.	4644	2	5	0
Serial Number Plate	4645		3	6
Screw Control for "WHA" Valve	4646		12	6
Signal Lamp Green	687		12	6
Signal Lamp Red	688		12	6
Slydlok Fuse Holder	689		4	10
Slydlock Neutral Link	690		10	6
Socket, Baby Domina	691		2	4
Socket, Metal Clad, Domina	692		3	0
Socket, Octal 14 pin	693		3	0
Socket PS8	4647		3	6
Socket PS10	694		3	6
Socket XS4	695		3	0
Socket XS8	696		4	0
Socket 18 way and Cover	697	1	15	0
Soda Water Pipe, Black	698		2	6
Spring Coin Mechanism, Magnetic Scavenger	699		2	0
Spring Coin Mechanism Operating Lever	6100		1	9
Starter 2 pin	6101		2	0
Starter Holder	6102		1	3
Soda Pipe Fittings per set	6103		3	0
Switch Cover	6104		5	0
Terryclip 3/4" Boiler Pipe	4648			4
Terryclip 1" Light fitting	6105			6
Thermostat Assembly	4649	1	15	0
Thermostat	4650	1	5	0
Toggle Switch SP/ST	6106		5	6
Transformer Auto.	6107	6	0	0
Transformer 9 1/2 volt	6108		15	0
Tube End Fitting	6109		1	3
Tube PVC Nontoxic 1/4" x 3/8" Drain Tube	6110		12	0
Valve, Dead Weight	4651	2	10	0
Valve, Dead Weight, Stem & Core	6111		6	0
Valve "M" with Filter	6112	6	15	0
Valve, Non-return	6113	1	10	0
Valve, "WHA"	4652	5	10	0
Valve Seat Rubber	6114		3	0
Valve Spring	6115		1	0
Valve Only	6116		15	0
Vent Mesh	4653		3	0
Wade Coupling (Elbow)	4654		5	0
Wafer, Selector Switch, Mk. I	6117		2	6
Wafer, Selector Switch, Mk. II	6118		3	0
Washer, Copper Asbestos	4655		2	6
Washer, Valve Bonnet	6119		1	0
Washer, Fibre, Body Connecting	6120			4
Washer, Non-return Valve	6121		2	0
Worms, Agitator	6122	1	2	0
Yale Lock & 2 Keys	6123		12	6