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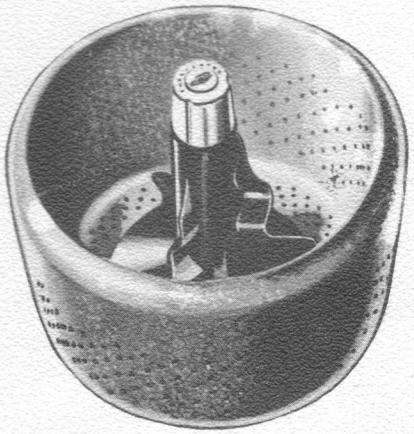

AUTOMATIC WASHING MACHINE SERVICE MANUAL

1968/69

MODELS

1500-1491-1493-1494-1390-1396-1397-1381-1382

Part Nº Aus 191

AUGUST 1968

Whirlpool

WASHER SERVICE MANUAL

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INTRODUCTION

The nine new model WHIRLPOOL WASHERS for 1968–69 include seven automatics, 1500 – 1491 – 1493 – 1494 – 1390 – 1396 – 1397 and two semi-automatics 1381 – 1382.

In keeping with Malley's policy of engineering the WHIRLPOOL range of products to lead the field both in quality and performance, the new range of AUTOMATIC WASHERS, are the first to feature a Super-wash cycle incorporating a special soak period in the wash programme, introducing a cycle which is ideally suited for use with the controlled suds detergents or the enzyme powders. This cycle, is fully endorsed by all washing powder manufacturers.

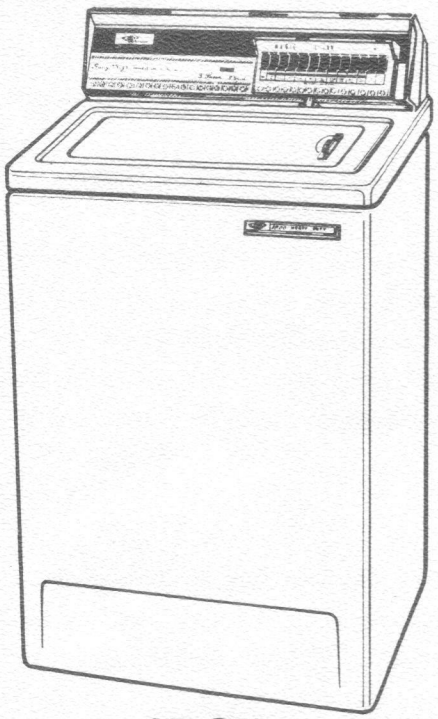
Cabinet styling remains unaltered, except for the Escutcheons which are of one piece, full width design, finished in wood grain trim and incorporating coloured cycle bands. They are designed in two heights to suit the high Console on the 15 and 1400 series and the low Console on the 1300 series.

A new feature on all models is provision for optional opening lids. All models will be supplied with lids fitted for left hand opening, which can be readily converted to suit individual customer requirements on installation.

The heater models 1500 – 1491 – 1493 – 1390 – 1396, all allow for cancellation of the heating period, if desired. Only two heat settings are available, either HI or LO, and the 115°F thermostat is not used in the new models.

This manual is designed to cover service information, related to the changes introduced on the new range of models, including Controls, Timers, Cycle Charts, Timer Sequence Charts, Continuity Guides, Wiring Diagrams and Descriptions of Operation. For general service information or fault finding on assemblies common to previous models, refer to the appropriate service manual.

MODEL RECOGNITION



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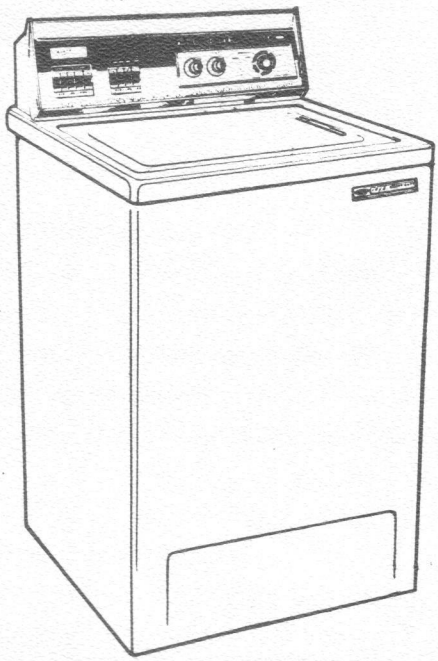

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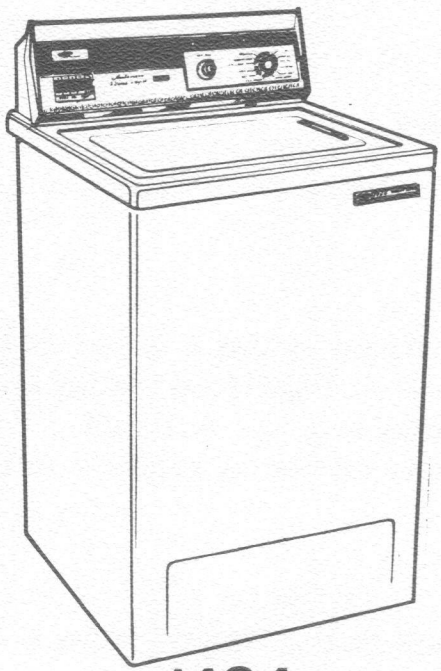

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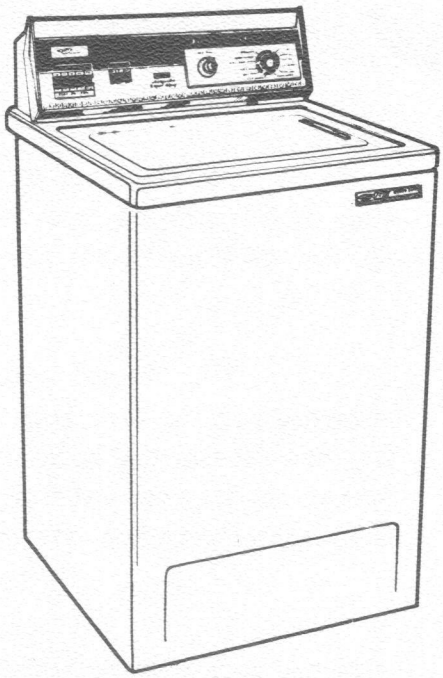

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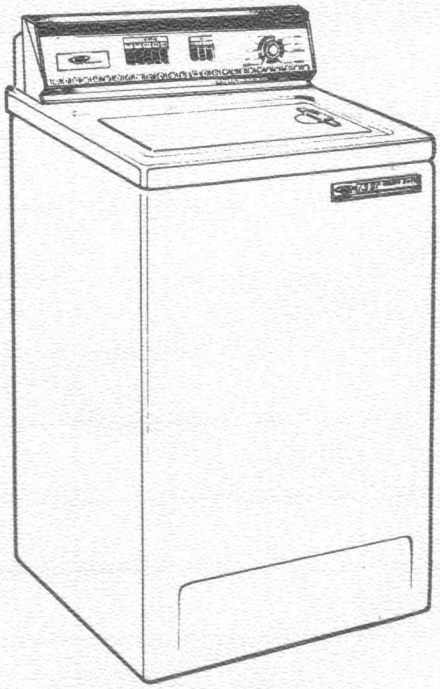

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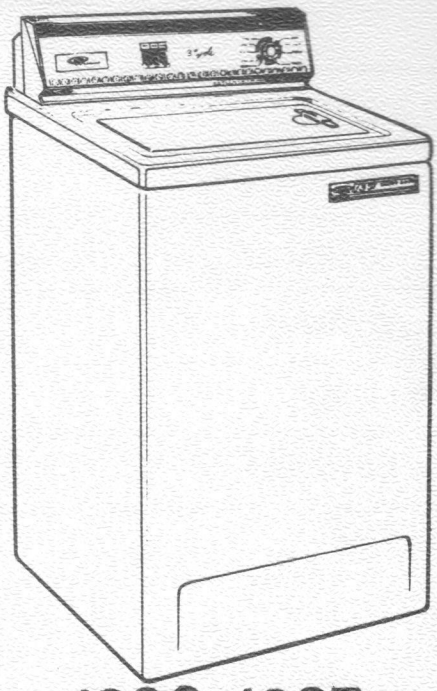
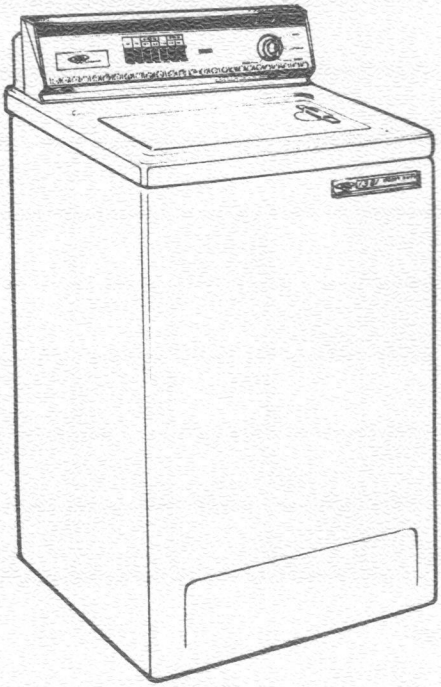


1396·1397



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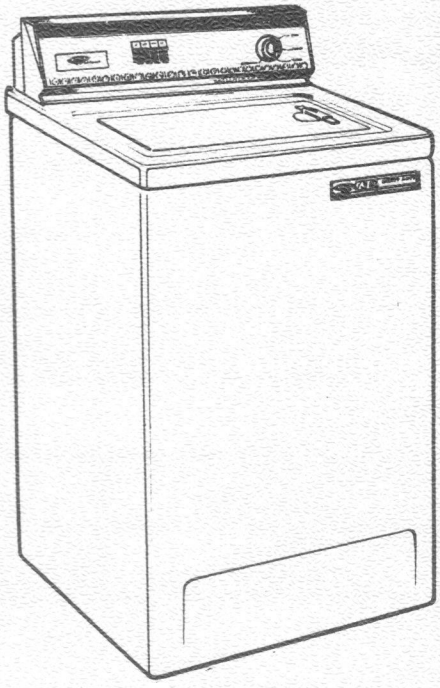


1382

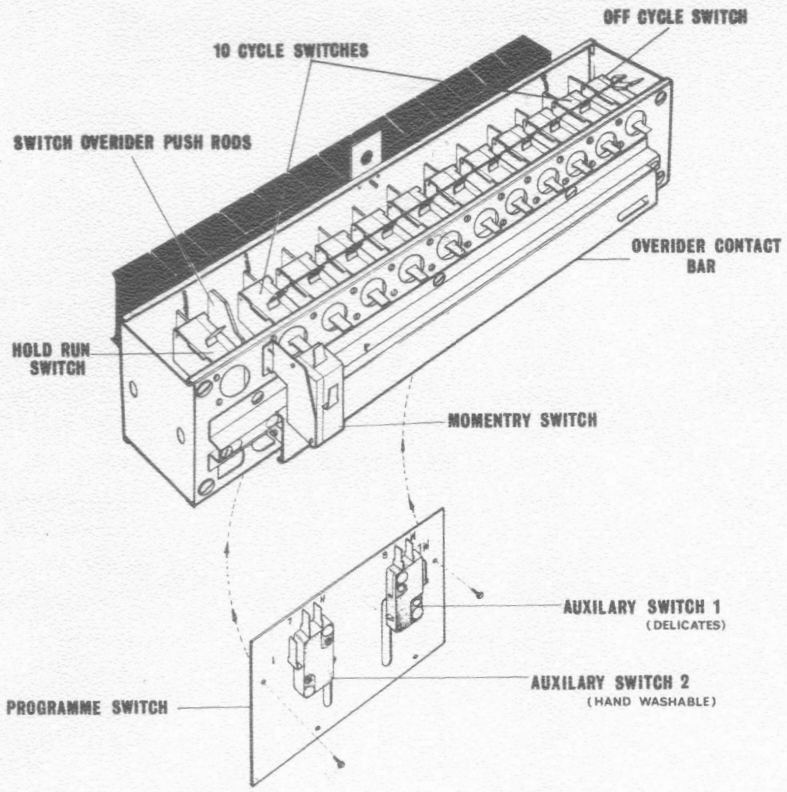
FEATURE CHART

	1500	1491	1493	1494	1390	1396	1397	1381	1382
TIMER									
RAPID ADVANCE	▨								
THREE CYCLE			▨	▨					
TWO CYCLE		▨			▨	▨	▨		
20 MINUTE								▨	▨
SUDS MISER	▨	▨	▨	▨	▨	▨	▨		
FILTER									
SELF CLEANING	▨	▨	▨	▨	▨				
AGITATOR						▨	▨	▨	
MOTOR									
THREE SPEED	▨	▨							
TWO SPEED			▨	▨	▨			▨	
SINGLE SPEED						▨	▨		▨
BLEACH DISPENSER	▨								
HEATER	▨	▨	▨		▨	▨		▨	
INLET VALVES									
HOT	▨	▨	▨	▨	▨		▨		
COLD	▨	▨	▨	▨	▨	▨	▨		
DIRECT								▨	▨
CHROME LID HANDLE	▨	▨	▨	▨	▨	▨	▨	▨	▨
ALTERNATE OPENING LID	▨	▨	▨	▨	▨	▨	▨	▨	▨

SPECIFICATIONS

WEIGHT CRATED	ALL MODELS	250 LBS. APPROX.
OVERALL HEIGHT	1500–1491–93–94	44"
	1381–82–90–96–97	42"
WIDTH	ALL MODELS	24¼"
DEPTH	ALL MODELS	27½"
CAPACITY WASH	ALL MODELS	12 LBS.
WATER SELECTION	1500–1491–93–94	HI 14½ GALLS–12 INS. LO 10 GALLS. – 8¾ INS.
	1396–97	HI ONLY 14½ GALLS. – 12 INS.
	1390	HI 14½ GALLS. – 12 INS.
	1381–82	MANUAL FILL
LOW LEVEL PRESSURE SWITCH	1500	CONSTANT 7½ GALLS. – 6 INS.
	1390	LO 10 GALLS. – 8¾ INS.
FILL TEMPERATURE SELECTION	1500	PER PROGRAMMED CYCLE
	1390–97–1493–91–94	PUSH BUTTON
HEATING ELEMENT	1381–90–96–1491–93–1500	240V.–A/C.–2.4 K.W.
HEAT SELECTION	1500	PROGRAMMED SELECTION (toggle switch cancel)
	1491	ROTARY SWITCH
	1493–1390–96–81	PUSH BUTTON
THERMOSTATS	1500–1491–93–1390–96	HI–135°F. LO–100°F.
AUTOMATIC TIMER	1500	PROGRAMMED SELECTION
	1491	–2–CYCLE ROTARY SELECTION – EXTRA RINSE
	1493–94	3–CYCLE ROTARY SELECTION
	1390–96–97	2–CYCLE ROTARY SELECTION
MANUAL	1381–1382	20-MINUTE CYCLE
MOTOR	1500–1491	1/3 H.P. CAPACITOR START 240V.–50 CYCLE HI 1425 RPM LO 930 RPM EXTRA LO 710 RPM
	1493–1381–90	1/3 HP CAPACITOR START 240V.–50 CYCLE HI 1425 RPM–LO 930 RPM
	1396–97–1382	1/3 HP CAPACITOR START 240V.–50 CYCLE HO ONLY 1425 RPM
SPEED SPIN	1500–1491	HI 525 RPM – LO 325 RPM
	1493–94–1381–90	HI 525 RPM – LO 325 RPM
	1396–97–82	HI ONLY 525 RPM
AGITATOR SPEED	1500–1491	HI 68–LO 45–EX. LO 34 OSCILLATORS P.M.
	1493–94–1381–90	HI 68–LO 45 OSCILLATORS P.M.
	1396–97–82	HI ONLY 68 OSCILLATORS P.M.
TRANSMISSION	ALL MODELS	V-BELT DRIVE FROM MOTOR TO GEAR BOX . DIRECT GEAR DRIVE AGITATOR SHAFT. TRANSMISSION SPIN IS BY MECHANICAL FRICTION CLUTCH TO BASKET ASSY.
FUSE	ALL MODELS	15 AMPS.

PROGRAMME SWITCH ASSEMBLY



1500 MODEL TIMER AND PROGRAMME SELECTOR:

The Timer is a conventional cam-operated impulse type to which are mounted the following additional components:-

1. Rapid Advance Motor & Gear Train.
2. Snap Action Switch.
3. Printed Circuit and sweeping arm contacts.

Push button control of the timer in all functions is per a separately mounted programme switch assembly which allows selection of RUN, HOLD, or OFF positions, or one of the ten inbuilt machine cycles.

Following selection the rapid advance mechanism rotates the timer to the cycle selected, and at this point the conventional function at the timer progresses the cycle to completion at two minute increments.

DESCRIPTION OF SUB-ASSEMBLIES AND COMPONENTS:

1. TIMER:

The 1500 Timer in addition to providing a choice of ten fully-programmed cycles, incorporates an additional special cam, which makes and breaks a circuit to the rapid advance motor as the cam rotates under rapid advance function. It is important to remember that this timer cam STOPS rapid advance function at the selected cycle point.

The timer has been re-organised on all cycles except HANDWASHABLES and WOOLLENS to allow the machine to fill with water and agitate for one increment, irrespective of water temperature, before energising the heating element via the appropriate thermostat. This pre-soak agitation ensures even distribution of washing powders before heating or soak periods.

The HANDWASHABLES and WOOLLENS cycles are almost identical to Model 1400, the only change being that the second increment of WOOLLENS cycle is SUDS STORE instead of DRAIN.

An alteration to the DELICATES cycle is in the first increment which is a positive fill increment. This means the machine will pause after fill for one increment, before commencing agitation.

All deep rinses have been altered to eliminate the possibility of agitation occurring at change-over from SPIN to RINSE FILL, by de-energising the agitator coil until the second increment of DEEP RINSE. This means that the first increment will be FILL only.

The soak period in the SUPERWASH cycle follows the heating cycle (when selected) thus; in the event of water temperature failing to satisfy the thermostat, the machine will not proceed into the SOAK period until such time as the water is brought up to temperature. When this occurs the SOAK period will be extended by the length of time taken to raise the water temperature and it is important that this extended SOAK period is not mistaken for a service fault when first encountered.

The agitation speed change previously employed in the PERMANENT-PRESS cycle is no longer used, the entire wash is now done at high speed. Reference to the cycle chart on Page18 will show these points more clearly.

2. PROGRAMME SWITCH ASSEMBLY:

This assembly comprises a frame into which are assembled fifteen (15) micro switches, a bank of switch push rods fitted with push buttons, 2 separate latching mechanisms and an overider contact bar.

MICRO SWITCHES:

All fifteen (15) micro switches are single throw type. One (1) is normally open and fourteen (14) are normally closed. They are identified as follows:-

(a) Programme Switches:

These comprise a bank of 11 switches mounted in line horizontally, the one on the extreme left representing the OFF position, and the next 10 switches representing available cycles. Each switch is wired in series with a segment of the printed circuit and the R.A. Motor. With selection of a cycle button its programme switch is latched and held in the OPEN position, thus open-circuiting the corresponding segment of the printed circuit.

(b) RUN/HOLD Switch:

On the extreme right of the assembly is mounted the RUN/HOLD or main line switch. Selection of HOLD button latches this switch in the OPEN position, thus open-circuiting the main active line to the machine. Selection of RUN button simply cancels HOLD selection to close the switch and restore power to the machine.

(c) Momentary Switch:

This switch mounted at the rear of the main frame is closed momentarily by the overider bar action whenever any cycle button or the OFF button is depressed. Its function is to initiate the R.A. Motor.

(d) Auxiliary Programme Switches:

These are mounted on the underside of the main frame. One switch is actuated on the selection of HANDWASHABLES to bring into operation the low level water switch. The other switch is operated on the selection of DELICATES to select the appropriate motor speed.

LATCHING MECHANISM:

The programme switch assembly incorporates two latching mechanisms of similar design, one being common to the OFF switch and the 10 programme switches and the second operating independently from the first to control the RUN/HOLD main line switch.

The latching mechanism consists of a pressed metal plate hinged to the rear frame and held under spring tension against the underside of the switch push rods. A ramp and step formed into each push rod forces the hinged plate down against spring tension whenever any cycle button or the OFF button is depressed until it travels far enough to allow spring tension to latch the plate into the step. This design automatically allows for cancellation of a previously selected cycle button. The same principle applies to RUN/HOLD selection.

OVERIDER CONTACT BAR:

This bar is hinged to the rear of the assembly and extends the full length of the frame. Upon full depression of the OFF button or any cycle button the switch push rod contacts the overider bar which closes the momentary switch long enough to start the R.A. Motor.

3. PRINTED CIRCUIT:

This assembly is fixed to the front of the timer box over the timer spindle. It consists of a 4" square piece of con-conductive material to which has been bonded 12 contact segments. Eleven segments form a broken circle around the twelfth inner common segment which takes the form of a continuous circle. Rivetted to the outer end of each segment is a spade terminal that provides external connection, each wired in series with a programme selection switch and the R.A. Motor.

4. SWEEPING ARM CONTACT:

This arm fixed by a boss to the timer spindle is also made of a non-conductive material to which are rivetted two trailing contacts which are bridged together. One trailing contact runs on the continuous inner common segment, whilst the other connects with each of the outer segments, giving a continuous circuit between the segments as the contacts pass over them.

5. RAPID ADVANCE MOTOR:

Mounted behind the timer face plate the motor incorporates a sliding rotor which is held out of alignment to the field windings by the spring pressure of the snap action switch whenever the motor is at rest. The extended rotor shaft acts as a push rod to operate the snap action switch lever. Also located on the shaft is a nylon pinion gear. When the motor is energised the magnetic field generated pulls the rotor forward into field alignment, tripping the snap action switch, and engaging the gear train which rapidly advances the timer to the cycle selected.

6. SNAP ACTION SWITCH:

Mounted adjacent to the R.A. Motor this switch controls the neutral circuits of the washing machine and the R.A. Motor. With the motor operative this switch completes the circuit to maintain motor operation. When the motor stops, as controlled by a cam in the timer, the switch by reverse action, restores the neutral line to the machine circuit.

DESCRIPTION OF OPERATION 1500 MODEL:

The selection of a cycle and subsequent rapid advance function of the timer on the 1500 model remains the same as the 1400 or 1300 models. For description of operation and general fault finding refer to the 1967-68 service manual covering 1300 model. Motor speed selection on the DELICATES cycle and waterlevel selection on the HANDWASHABLES cycle is covered in the 1400 manual.

HEATER CANCELLATION:

A Two-way toggle switch mounted on top of the Console, adjacent to the HOT RINSE Switch, utilising the hole previously used to mount the console light switch, enables the cancelling of the heating cycle if desired.

The console light and cycle indicator are not used on Model 1500 and the extra space gained as a result, enables both pressure switches to be located inside the console.

The 1500 model has the jumper lead fitted between Terminals H & C on the Timer, for cold water installation. This wire should be removed when machine is connected to hot and cold water.

THREE SPEED MOTOR:

The motor used in model 1500 is rated at 1/2 H.P. with capacitor assisted start and employs run winding of:-

4-pole for high speed	1425 R.P.M
6-pole for low speed	930 "
8-pole for extra low speed	710 "

WIRING CONNECTIONS G.M.F. THREE SPEED MOTOR:

The terminal block of motor is numbered from 1 to 7 and external wires to motor are connected as follows:-

1. M.H. (Motor High) connects to Terminal 4.

2. M.M. (Motor Low) connects to Terminal 3.

3. M.L. (Motor Extra Low) connects to Terminal 1.

4. Neutral connects to Terminal 5.

1491 TIMER & PROGRAMME SELECTION:

1. TIMER:

This model utilises a conventional cam-operated 2 cycle rotary timer, with 75 sec. duration increments and introduces an extra rinse. It also provides for suds storage and return and is designed for PULL ON - PUSH OFF operation.

Four main cycle programmes are available per timer selection, with variations controlled by the cycle switch, or by the wash speed selector.

The SUPERWASH or NORMAL cycles are both programmed in the same timer segment and are manually selected at the timer. The second timer segment is basically a GENTLE cycle which is altered to PERMANENT-PRESS when the PERMANENT-PRESS cycle button is depressed.

2. CYCLE SWITCH:

This switch incorporates four push buttons, which are interlocked to allow the depressi of one button to cancel the other three.

(a) NORMAL RINSE:

This button is used only in the SUPERWASH or NORMAL cycles and it ensures either of these two cycles only have standard rinses.

(b) EXTRA RINSE:

Depressing this button ensures that after completion of a SUPERWASH or NORMAL cycle, the timer progresses into the additio al increments incorporated for the extra rins (Refer increments 31 to 37 Timer Sequence Chart - Page 21).

(c) GENTLE BUTTON:

This button should be depressed when using the GENTLE cycle.

(d) PERMANENT PRESS:

Depressing this button turns the first increment of SUDS STORE in the GENTLE cycle into a cooldown. By re-introducing the pressure switch into circuit, it open-circuits the hot solenoid coil, thus ensurin only cold water enters the machine irrespec ive of rinse temperature selection, and it open-circuits the timer by-pass circuit, placing the timer motor under the control of a special timer cam in that increment. (Refe increment 47 timer sequence chart - Page 21

3. WASH & RINSE TEMPERATURES:

Five combinations of WASH and RINSE FILL temperatures, giving HOT-WARM, HOT-COLD, WARM-WARM, WARM-COLD, COLD-COLD are individually selected by depressing the appropriate button.

4. WASH SPEED SELECTION:

One of three agitation speeds for washing or rinsing are available in any cycle, individually selected by a rotary wash speed switch mounted on the escutcheon. All SPIN and DRAIN speeds are timer controlled.

5. HEATER TEMPERATURE SELECTION:

A three position rotary heat switch provides for cancellation of the heating cycle if desired, or alternative heat selection of HI or LO, controlled by separate fixed thermostats, with settings of 125°F and 100°F.

THREE SPEED MOTOR:

This motor is identical to the motor used in Model 1500.

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DESCRIPTION OF OPERATION 1491 MODEL

COLD WATER ONLY TO MACHINE:

For a cold water installation the machine will fill with cold water in all cycles and the heater, when selected, will boost to desired temperature on WASH cycle only.

HOT & COLD WATER TO MACHINE:

The mixing of hot and cold water entering machine is push-button controlled, giving HOT - WARM - COLD for wash and WARM or COLD for rinse.

If on WASH FILL for any cycle, water temperature does not satisfy the appropriate thermostat according to heat selection, the heater will be energised at the appropriate time (after three increments of agitation) as shown in the cycle chart - Page 21 , to boost water temperature to the desired setting under the control of the thermostat selected.

IMPORTANT:

The machine comes from the factory correctly wired for a cold water installation. For a hot and cold water installation it is necessary to remove the external bridge from Terminals "C" and "H" at the timer.

WATER LEVEL SELECTION:

Water level selection is via a lever with infinite control between LO and HI. A reset position is provided by sliding the lever to the extreme right.

TO OPERATE WASHER:

1. Plug in power cord - turn on taps.

2. Load clothes, add washing powder and other laundry aids (bleach, Calgon, etc.)

3. Select WASH and RINSE FILL temperature combination.

4. Select the appropriate cycle button (it should be noted that GENTLE or PERM-PRESS are only effective in either of these two cycles, whilst normal rinse or extra rinse only apply to the SUPERWASH or NORMAL cycles.)

5. Select heat setting (WASH only).

6. Select wash speed, as advised on label inside lid, according to fabric being washed.

7. Select water level.

8. PUSH timer knob in and turn clockwise to desired cycle - PULL knob out to START.

TO STOP MACHINE:

To stop the washer at any time, PUSH timer knob IN.

TO ADVANCE CYCLE:

Cycle can be shortened by turning control knob clockwise (while in the out position) slowly, one increment at a time, until the desired setting is reached.

Do not advance control knob to spin until all water has drained, as spinning with a full or partially full tub of water places an unnecessary strain on the motor.

TO CHANGE CYCLE:

To skip, lengthen or repeat any cycle, PUSH control knob IN, and rotate clockwise to select new point of cycle, PULL knob OUT to re-start timer.

DESCRIPTION OF OPERATION 1494 MODEL -NON HEATER

TIMER:

This model has a conventional three cycle rotary Timer with two minute duration increments. The Timer also provides for suds storage and return and is designed for PULL ON - PUSH OFF operation.

COLD WATER ONLY TO MACHINE:

For a cold water installation the machine will fill with cold water only on all cycles.

HOT & COLD WATER TO MACHINE:

The mixing of hot and cold water entering machine is push button controlled giving HOT - WARM - COLD for wash and WARM or COLD for Rinse.

IMPORTANT:

The machine comes from the factory correctly wired for cold water installation. For a HOT and COLD water installation it is necessary to remove the external bridge from the terminals "H" and "C" at the timer.

WATER LEVEL SELECTION:

Water level selection is per rotary switch with infinite control between LO and HI.

TO OPERATE WASHER:

1. Plug in power cord and turn taps on.

2. Load clothes, add washing powder and other layndry aids (bleach, Calgon, etc.)

3. Select WASH and RINSE FILL temperature combination.

4. Select water level.

5. PUSH timer knob IN. Turn clockwise to the desired cycle and PULL timer knob OUT to START.

TO STOP MACHINE:

TO STOP the washer at any time, PUSH timer knob IN.

TO ADVANCE CYCLE:

Cycle can be shortened by turning the control knob clockwise (while in the OUT position) SLOWLY, one increment at a time, until the desired setting is reached

DO NOT advance Control Knob to SPIN until all water has drained - as spinning with a full or partially full tub of water places an unnecessary strain on the moto

TO CHANGE CYCLE:

To skip, repeat or lengthen any cycle, PUSH control knob IN and rotate clockwi to select new point of cycle. PULL knob OUT to re-start timer.

DESCRIPTION OF OPERATION 1390 - 1396 MODELS

Both these models are fitted with a heater. Model 1396 with fixed water level is intended for cold water installation, as only a cold water inlet is supplied and all reference to Hot and Cold water mixing should be ignored. Model 1390 features two pressure switches for controlling water levels, either HI or LO, which are individually selected by means of a two-way toggle switch, mounted on the top of the console.

TIMER:

These models have a two cycle rotary timer with 75 sec. duration increments. The timer also provides for suds storage and return and is designed for PULL ON - PUSH OFF operation.

COLD WATER ONLY TO MACHINE 1390 & 1396:

For a cold water installation, the machine will fill with cold water on all cycles and the heater when selected will boost to desired temperature on WASH cycle only.

HOT & COLD WATER TO MACHINE 1390 only:

The mixing of hot and cold water entering machine is push-button controlled, giving HOT - WARM - COLD for wash and WARM or COLD for rinse.

1390 - 1396:

If on WASH FILL for any cycle, water temperature does not satisfy the appropriate thermostat (according to heat selection), the heater will be energised at the appropriate time (after three increments of agitation), as shown in the cycle chart - Page 27 , to boost water temperature to the desired setting under the control of the thermostat selected.

IMPORTANT:

The machine comes from the factory correctly wired for a cold water installation. For a hot and cold water installation it is necessary to remove the external bridge from Terminal "W" and "C" at the timer.

HEATER TEMPERATURE SELECTION:

A push button heat switch which has three buttons provides for cancellation of the heating cycle if desired, or alternative heat selection of HI or LO, controlled by separate fixed thermostats, with settings of 125° and 100°F.

TO OPERATE WASHER:

1. Plug in power cord - turn on taps.

2. Load clothes, add washing powder and other laundry aids (bleach, Calgon, etc.)

3. Select WASH and RINSE FILL temperature combination (1390 only).

4. Select heater temperature (WASH only).

5. Select water level (not applicable to 1396).

6. PUSH timer knob IN and turn clockwise to desired cycle, PULL timer knob OUT to start cycle.

TO STOP MACHINE:

TO STOP timer at any time, PUSH timer knob IN.

TO ADVANCE CYCLE:

Cycle can be shortened by turning the control knob clockwise (while in the OUT position) SLOWLY, one increment at a time, until the desired setting is reached.

Do not advance control knob to spin until all water has drained, as spinning with a full or partially full tub of water places an unnecessary strain on the motor.

TO CHANGE CYCLE:

To skip, lengthen or repeat any cycle, PUSH in control knob and rotate clockwise to select new point of cycle. PULL knob out to re-start timer.

NOTE:

The external bridge wire between timer terminals "ML" and "MH" should be removed when timer is fitted to Model 1390 to allow for two-speed operation.

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DESCRIPTION OF OPERATION - 1397 MODEL

This model is not fitted with a heater and is intended for both hot and cold water installation.

TIMER:

This model has a two cycle rotary timer with 75 sec. duration increments. The timer also provides for suds storage and return and is designed for PULL ON - PUSH OFF operation.

HOT & COLD WATER TO MACHINE:

The mixing of hot and cold water entering the machine is push button controlled giving HOT - WARM - COLD for wash, WARM or COLD for rinse.

TO OPERATE WASHER:

1. Plug in power cord, turn on taps.

2. Load clothes, add washing powder and other laundry aids - (bleach, Calgon, etc.).

3. Select WASH and RINSE FILL temperatures.

4. PUSH timer knob IN and turn clockwise to desired cycle. PULL timer knob OUT to start cycle.

TO STOP MACHINE:

TO STOP washer at any time, PUSH timer knob IN.

TO ADVANCE CYCLE:

Cycle can be shortened by turning the control knob clockwise (while in the OUT position) SLOWLY, one increment at a time, until the desired setting is reached.

Do not advance control knob to spin until all water has drained, as spinning with a full or partially full tub of water places an unnecessary strain on the motor.

TO CHANGE CYCLE:

To skip, lengthen or repeat any cycle, PUSH in control knob and rotate clockwise to select new point of cycle, PULL knob out to re-start timer.

MODEL 1381

As this model is identical in operation to Model 1281, it will not be covered in this manual. All relevant information will be found in 1966-67 service manual.

MODEL 1382

A description of operation has not been included on this new model as it is a non-heater version of a 1381 using a single speed motor and has no filter agitator.

TIMER SEQUENCE CHARTS

Below is listed an operation procedure which will assist in reading the timer sequence charts, illustrated on the following pages. The machine functions are shown across the top of the charts, whilst in the left hand column the machine components are listed together with the timer terminals.

By using the timer sequence chart in conjunction with the wiring diagram in the following way, it is possible to determine what electrical functions will take place at any part of the cycle.

As an example we have selected the 1500 timer Sequence Chart - Page 18 and taken several increments, explaining what function should be occurring in the increment selected.

NOTE: In all cases where Cam 1 opens Terminal IT the start of a cycle will be indicated in the machine function. The master cam (Cam 2) controls the main line switch and automatically terminates all cycles.

In timer increment 1 it will be seen that the following cams are closed:-

Cam 2 closed on bottom to Terminal 1
Cam 4 " " top " Terminal A
Cam 6 " " Bottom " Terminal MH
Cam 7 " " top " Terminal T2
Cam 10 " " top " Terminal H
Cam 11 " " top " Terminal 2

By closing these contacts on the wiring diagram it will be observed that the machine is filling with hot water and although Terminals T2, MH and A are closed, the components supplied with power from these terminals, will not be energised until water reaches the correct level to satisfy the pressure switch. At this time the machine will commence agitation.

In timer increment 10 it will be seen that the following cams are closed:-

Cam 1 closed on top to Terminal IT
Cam 2 " " bottom " Terminal I
Cam 3 " " bottom " Terminal T
Cam 5 " " bottom " Terminal Ml
Cam 6 " " bottom " Terminal MH
Cam 8 " " top " Terminal SM
Cam 11 " " bottom " Terminal unmarked

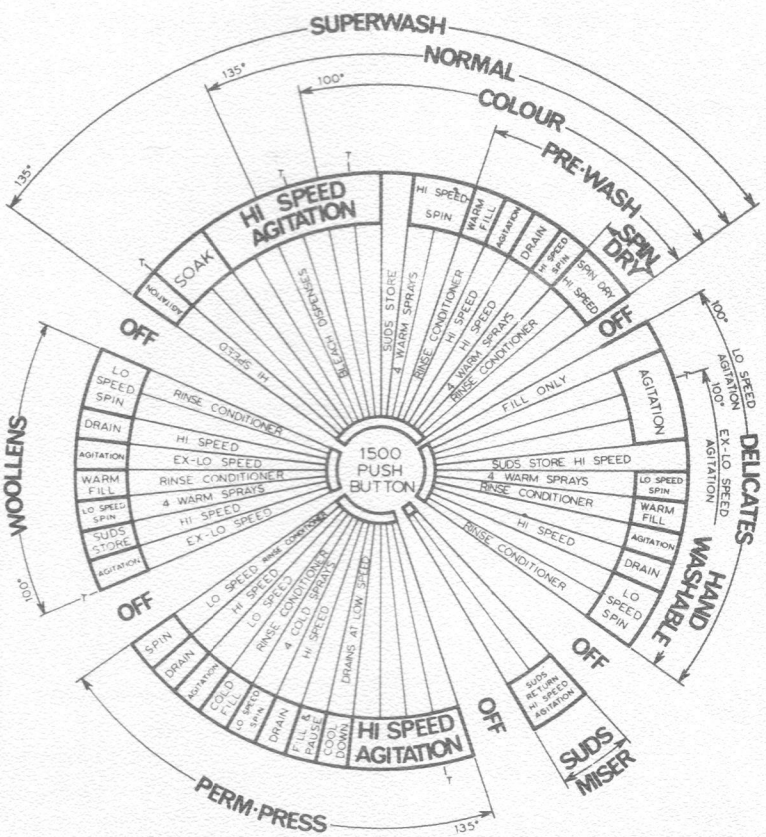
By closing these switches on the wiring diagram, it will be observed that the machine will be storing suds, water, as the motor and two-way valve coil are energised. Terminal Ml will energise the 100°F Thermostat and the heating element if the thermostat is dissatisfied, but this circuit will be broken when the pressure switch resets. The spray fill contact being closed, will have no effect as the wiring diagram will show that Cam 10 must be closed to allow water to enter the machine at this point of the cycle.

In timer increment 41 it will be seen that the following cams are closed:-

Cam 1 closed on top to Terminal IT
Cam 2 " " bottom " Terminal I
Cam 7 " " top " Terminal T2
Cam 8 " " bottom " Terminal MM
Cam 9 " " bottom " Terminal C
Cam 11 " " top " Terminal 2

By closing these switches on the wiring diagram, it will be observed that the machine will be on a low speed drain under the control of the pressure switch. When the water level drops to a level allowing the pressure switch to reset, the motor and two-way valve coil will be de-energised and power will be supplied to timer Terminal 2. As Cam 9 and 11 are closed, cold water will enter the tub re-filling it. This operation will repeat itself until the timer escapement advances the timer into the next increment.

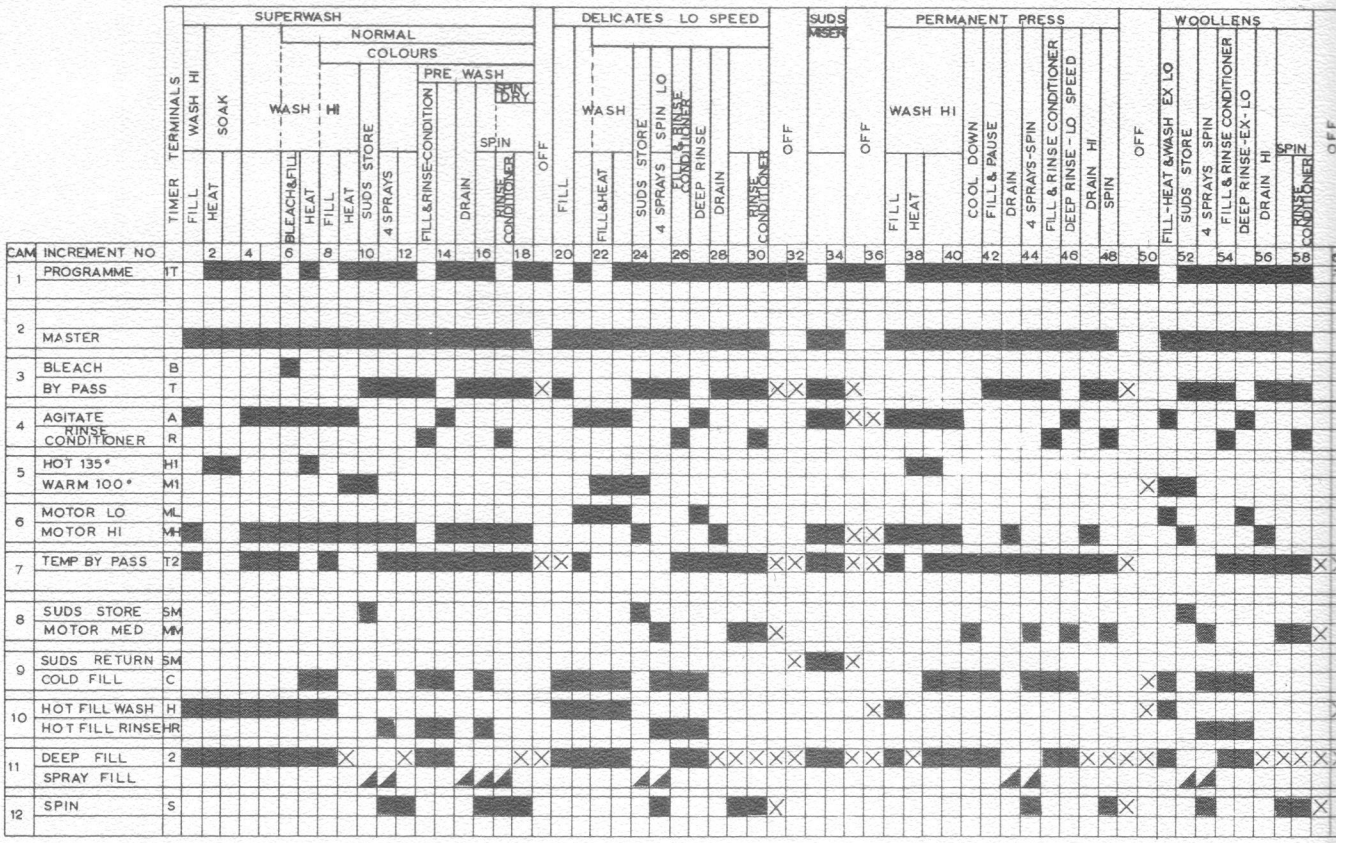
CYCLE CHART 1500



INCREMENTS 2 min. DURATION.

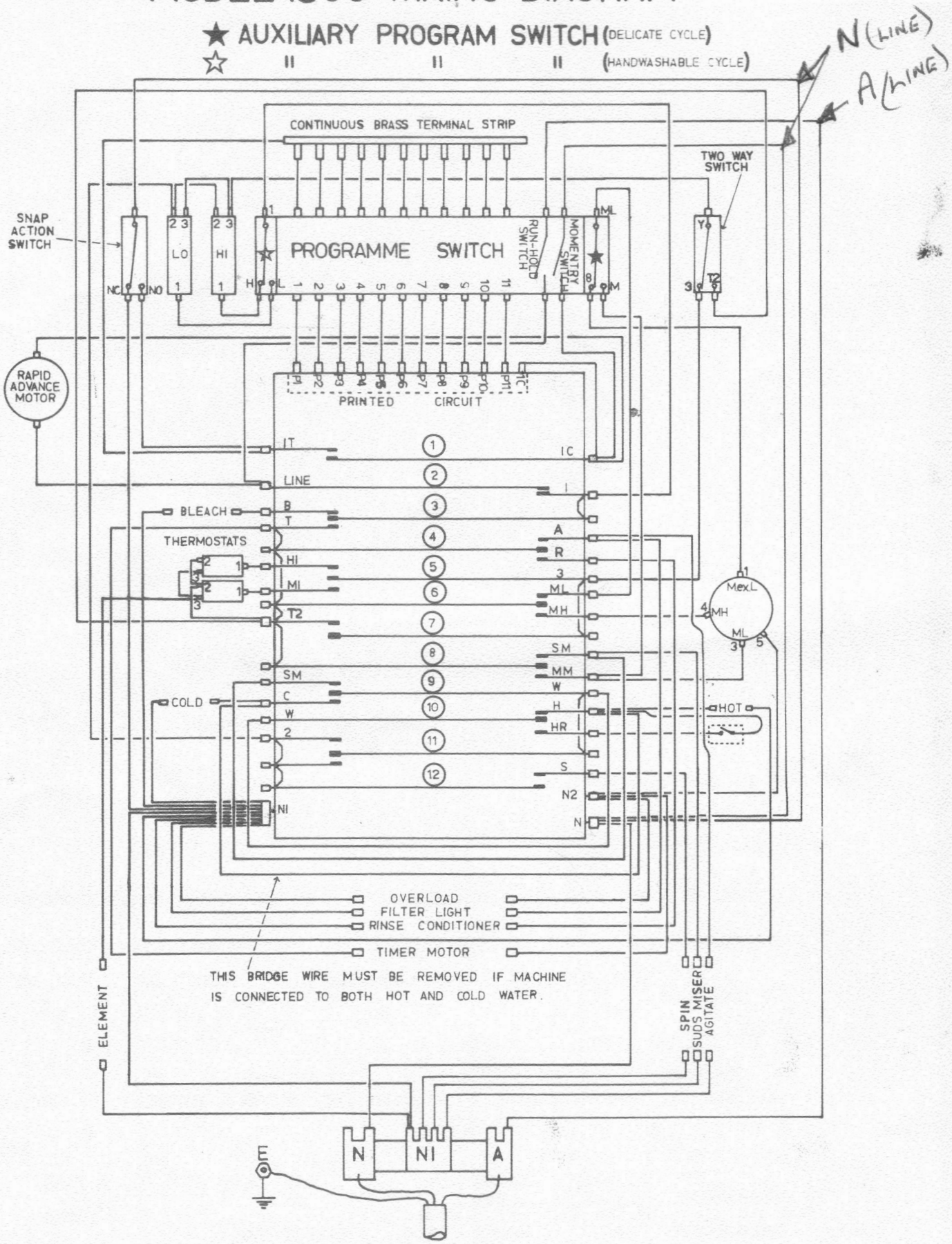
NOTE T DENOTES POSITION IN CYCLE WHERE MACHINE COMES UNDER THE CONTROL OF THE THERMOSTAT

1500 TIMER SEQUENCE CHART



■ CONTACTS ELECTRICALLY CONNECTED X CONACTS CLOSED NOT ELECTRICALLY CONNECTED ◢ 4 CLOSINGS IN 1 INCREMENT

MODEL 1500 WIRING DIAGRAM



CONTINUITY GUIDE 1500 MODEL

NOTE: POLARITY MUST BE CORRECT FOR USE OF THIS CHART.

TIMER TERMINALS ONLY ARE LISTED AND ARE IN SEQUENCE OF OPERATION.

All circuits shown on Continuity Guide represent a circuit after the completion of cycle selection and subsequent rapid advance operation.

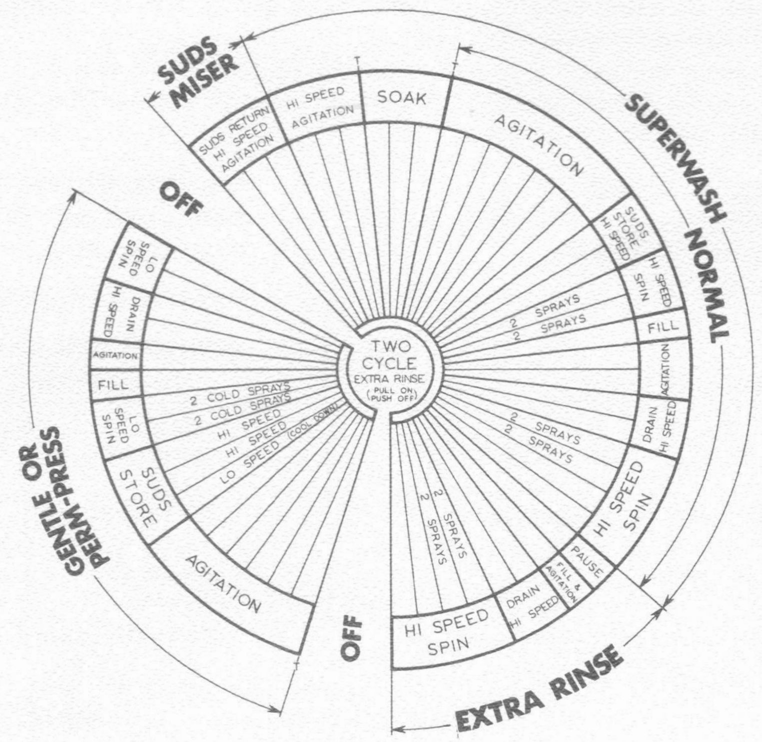
If any timer terminal is "dead" the prefix will pinpoint the fault between the last active terminal tested and the "dead" one. By this method it can be established if the fault is in the timer of one of the machine components.

PREFIX GUIDE:

∩	THRU EXTERNAL BRIDGE	ϕ	THRU TWO WAY SWITCH
–	THRU TIMER	‡	THRU AUXILIARY PROGRAMME SWITCH
.	THRU PRESSURE SWITCH	;	THRU LOW LEVEL PRESSURE SWITCH
+	THRU THERMOSTAT	(	THRU DUAL CIRCUITS
		/	THRU INTERNAL BRANCH IN TIMER

MACHINE ACTION	TIMER TERMINALS ENERGISED	
	FILL	HEAT
SUPERWASH – NORMAL – PERMPRESS 135°	L – 1 ‡ . 2 – W ∩ W – H – C	L – 1 ‡ . ϕ 3 – H1
DELICATES – COLOUREDS – WOOLLENS 100°	L – 1 ‡ . 2/ – W ∩ W – H – C	L – 1 ‡ . ϕ 3 – M1
HANDWASHABLES 100°	L – 1 ‡ ; 2/ – W ∩ W – H	L – 1 ‡ ; ϕ 3 – M1
SOAK	L – 1 ‡ . ϕ 3 – H1 + T2 – T	
PRE SOAK AGITATION	– T L – 1 ‡ . ϕ 3 – T2/ – A – MH	
WASH HI 135°	– T L – 1 ‡ . ϕ 3 – H1 + T2 / – A – MH	
WASH HI 100°	– T L – 1 ‡ . ϕ 3 – M1 + T2 / – A – MH	
WASH LO – DELICATES	– T L – 1 ‡ . ϕ 3 – T2 / – A – ML ‡ Motor M	
WASH LO – 100°	– T L – 1 ‡ . ϕ 3 – M1 + T2 / – A – ML ‡ Motor M	
WASH EXTRA LO 100° – WOOLLENS	– T L – 1 ‡ . ϕ 3 – M1 + T2 / – A – ML	
WASH EXTRA LO 100° – HANDWASHABLES	– T L – 1 ‡ ; ϕ 3 – M1 + T2 / – A – ML	
SUDS STORAGE	– SM ∩ SM L – 1 – T / – MH	
DRAIN	L – 1 – T / – MH	
SPIN HI	(‡ . 2 – S L – 1 ((– T – MH	
SPIN LO	(‡ . 2 – S L – 1 ((– T – MH	
DEEP RINSE WARM FILL	(– T / – R L – 1 ((‡ . 2 / – W ∩ W – HR	
DEEP RINSE COLD FILL	(– T / – R L – 1 ((‡ . 2 / – C	
	DRAIN	FILL
COOL DOWN	– T L – 1 ‡ . ϕ 3 – T2/ – MM	L – 1 ‡ . 2 – C
	SUDS RETURN	SUDS RETURN SATISFIED
SUDS MISER	(‡ . 2 – SM L – 1 ((– T/ – A	– MH L – 1 – T / – A

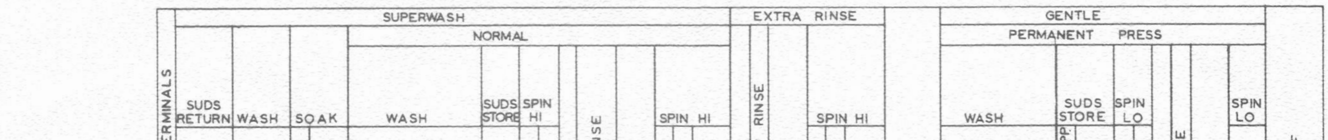
CYCLE CHART 1491



INCREMENTS 75 sec. DURATION.

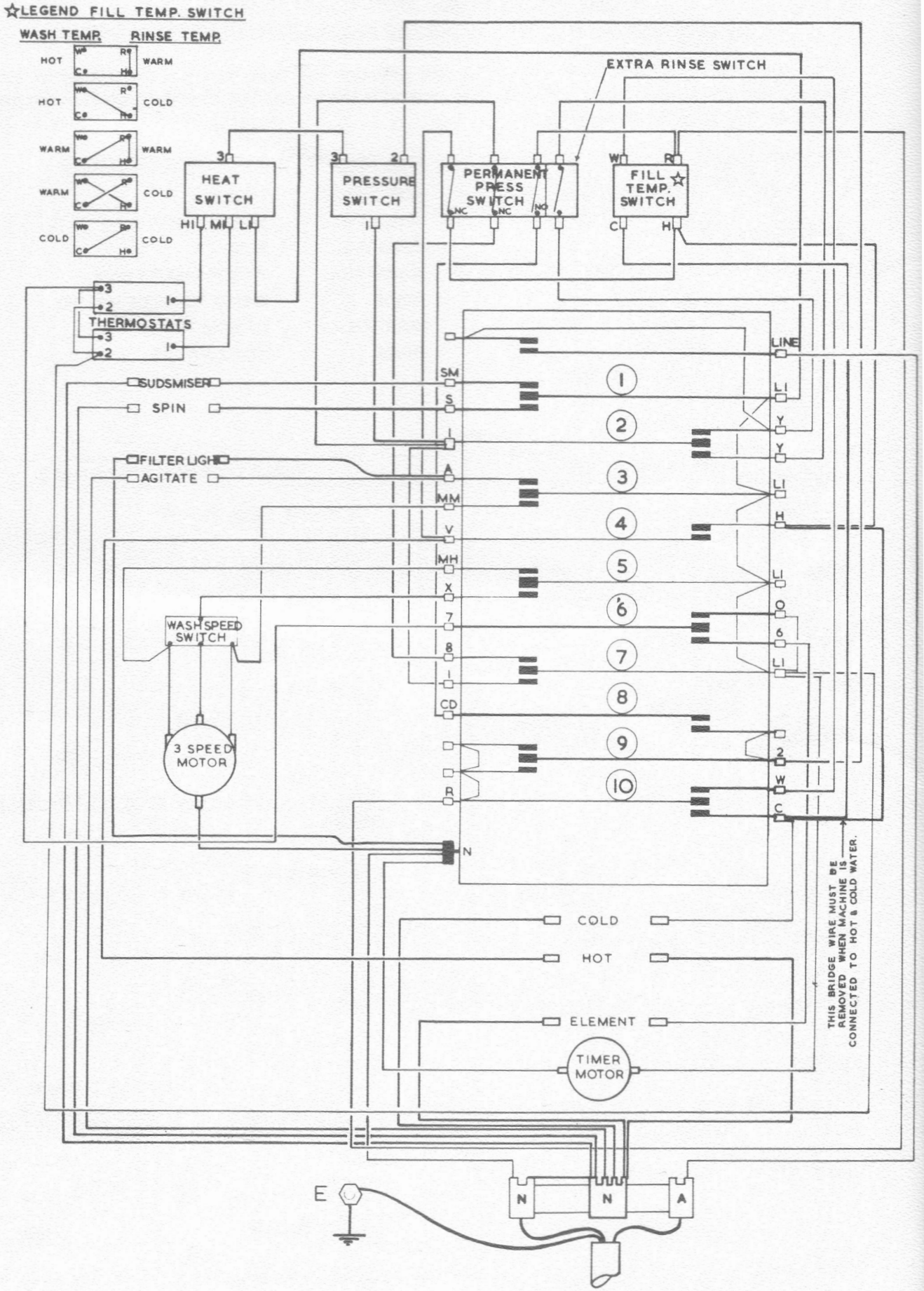
NOTE: T DENOTES POSITION IN CYCLE WHERE MACHINE COMES UNDER THE CONTROL OF THE THERMOSTAT.

1491 TIMER SEQUENCE CHART



■ CONTACTS ELECTRICALLY CONNECTED   X CONTACTS CLOSED NOT ELECTRICALLY CONNECTED   ◢ 2 CLOSINGS IN 1 INCREMENT

MODEL 1491 WIRING DIAGRAM



CONTINUITY GUIDE 1491 MODEL

NOTE: POLARITY MUST BE CORRECT FOR USE OF THIS CHART.

FILL RINSE AND HEAT SWITCHES SET TO COLD.

TIMER TERMINALS ONLY ARE LISTED AND ARE IN SEQUENCE OF OPERATION.

If any timer terminal is "dead" the prefix will pinpoint the fault between the last active timer terminal tested and the "dead" one. By this method it can be established if the fault is in the timer or one of the machine components.

PREFIX GUIDE :

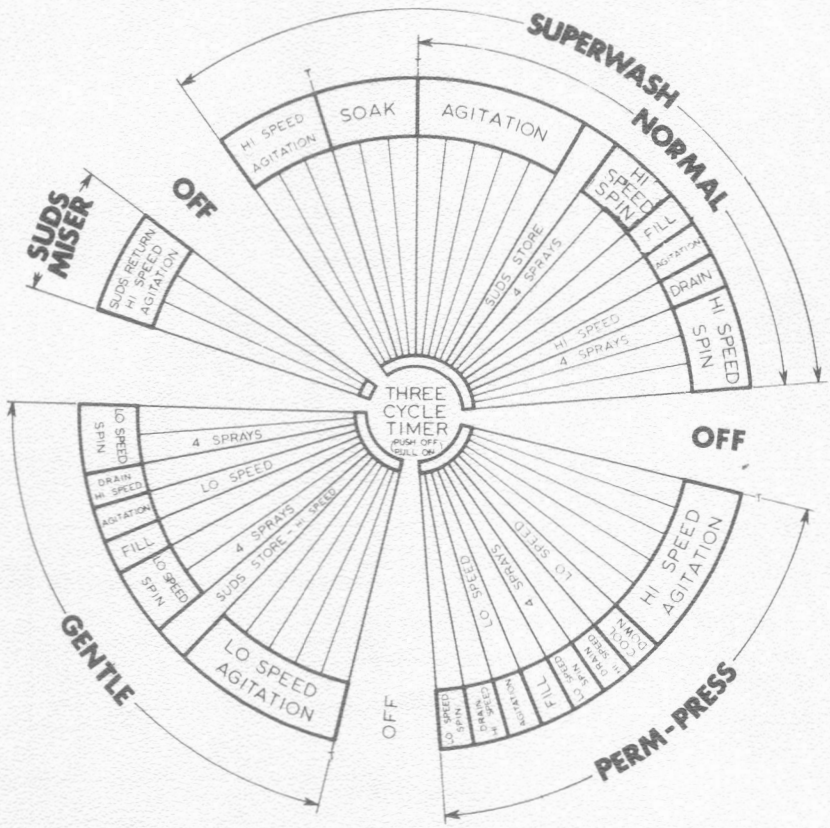
/	THRU INTERNAL BRANCH IN TIMER
∩	THRU EXTERNAL "JUMPER" WIRE
–	THRU TIMER
.	THRU PRESSURE SWITCH
(((	THRU DUAL CIRCUITS
+	THRU THERMOSTAT
¤	THRU EXTRA RINSE SWITCH
↔	THRU PERM. PRESS SWITCH
:	THRU HEAT SWITCH

FILL TEMP. SWITCH INTERNAL SWITCHING

HOT FILL	W TO H
WARM FILL	W TO H AND R TO C
COLD FILL	R TO C
WARM FILL	X TO H AND C FROM
RINSE	TIMER TO INLET VALVE
COLD FILL	C FROM TIMER TO
RINSE	INLET VALVE

MACHINE ACTION	TIMER TERMINALS ENERGISED
FILL FOR WASH	L – Y – 1 . 2 – R – W
FILL FOR RINSE	L – Y – 1 . 2 – R – C
HEATING	L – Y – 1 . : + 7 – 6
SOAK	L – Y – 1 . : + L1
PRE-SOAK AGITATION	L – Y – 1 . : + 7 – 0 ∩ L1 / – X (– A)
WASH 135° & 100°	L – Y – 1 . : + L1 / – X (– A)
SUDS STORAGE	L – Y – 1 { ∩ 1 – L1 ; . : + 7 – 0 ∩ L1/– SM (– MH)
	Note : Circuit from + will be direct to L1 if + is in satisfied position.
EXTRA RINSE	L – Y ¤ Y – 1 { ∩ L – L1 ; . : + 7 – 0 ∩ L1 / – X (– A)
SPIN HI	L – Y – 1 { ∩ 1 – L1 ; . : + 7 – 0 ∩ L1 / – MH (– S)
SPIN LO	L – Y – 1 { ∩ 1 – L1 ; . : + 7 – 0 / – MM (– S)
DRAIN	L – Y – 1 { ∩ 1 – L1 ; . : + 7 – 0 ∩ L1 / – MH
SUDS MISER	SUDS RETURN: L–Y–1 { ∩ 1 – L1 ; . : + 7 – 0 / – SM (– A, – MH)
	SUDS RETURN SATISFIED: L–Y–1 { ∩ 1 – L1 ; . : + 7 – 0 ∩ L1/–X (–A)
COOL DOWN	DRAIN: L–Y–1 . : + 7 – 0 ∩ L1/–MM (–SM)
	FILL: L–Y–1 . 2 – CD↔ R – C

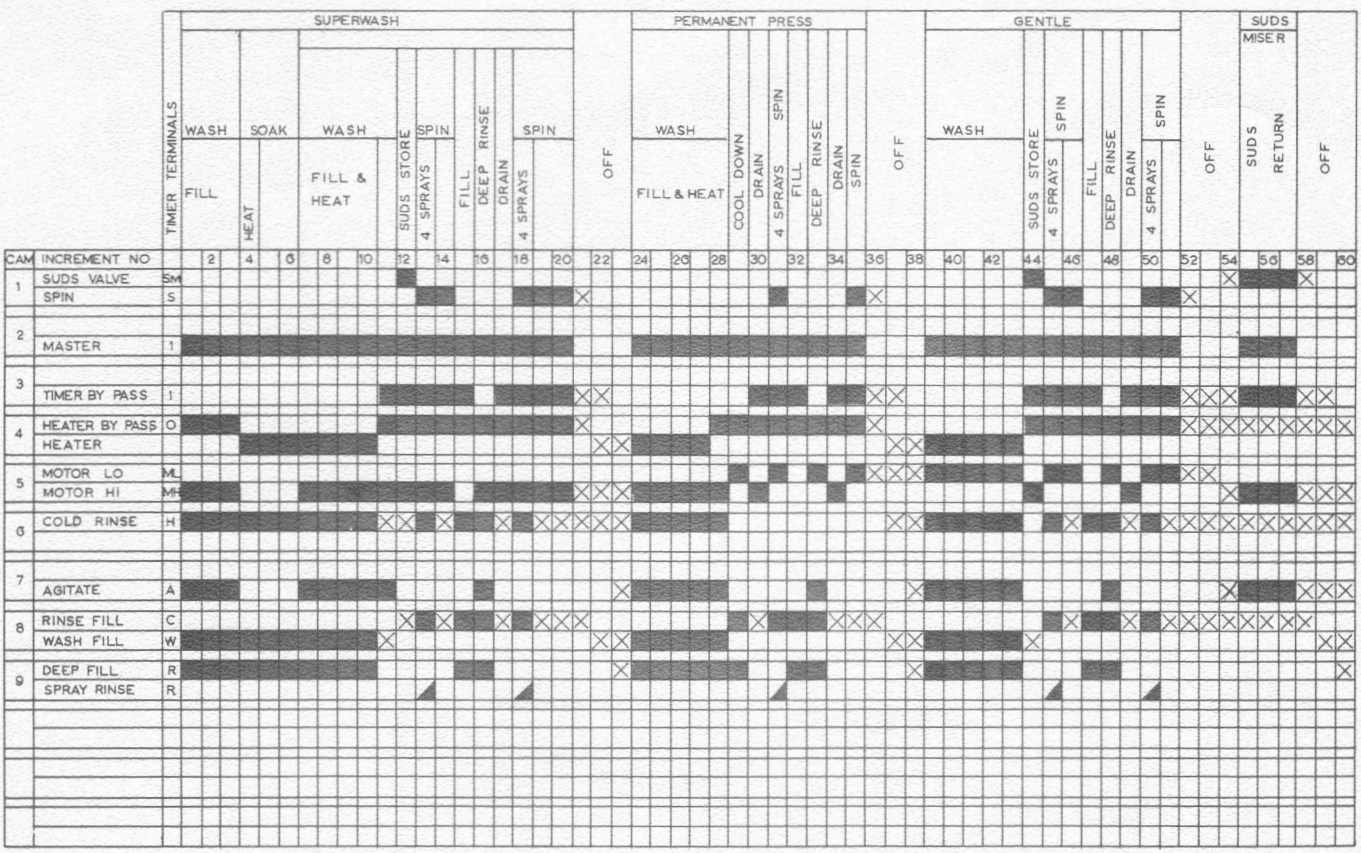
CYCLE CHART 1493-94



INCREMENTS 2 mins DURATION

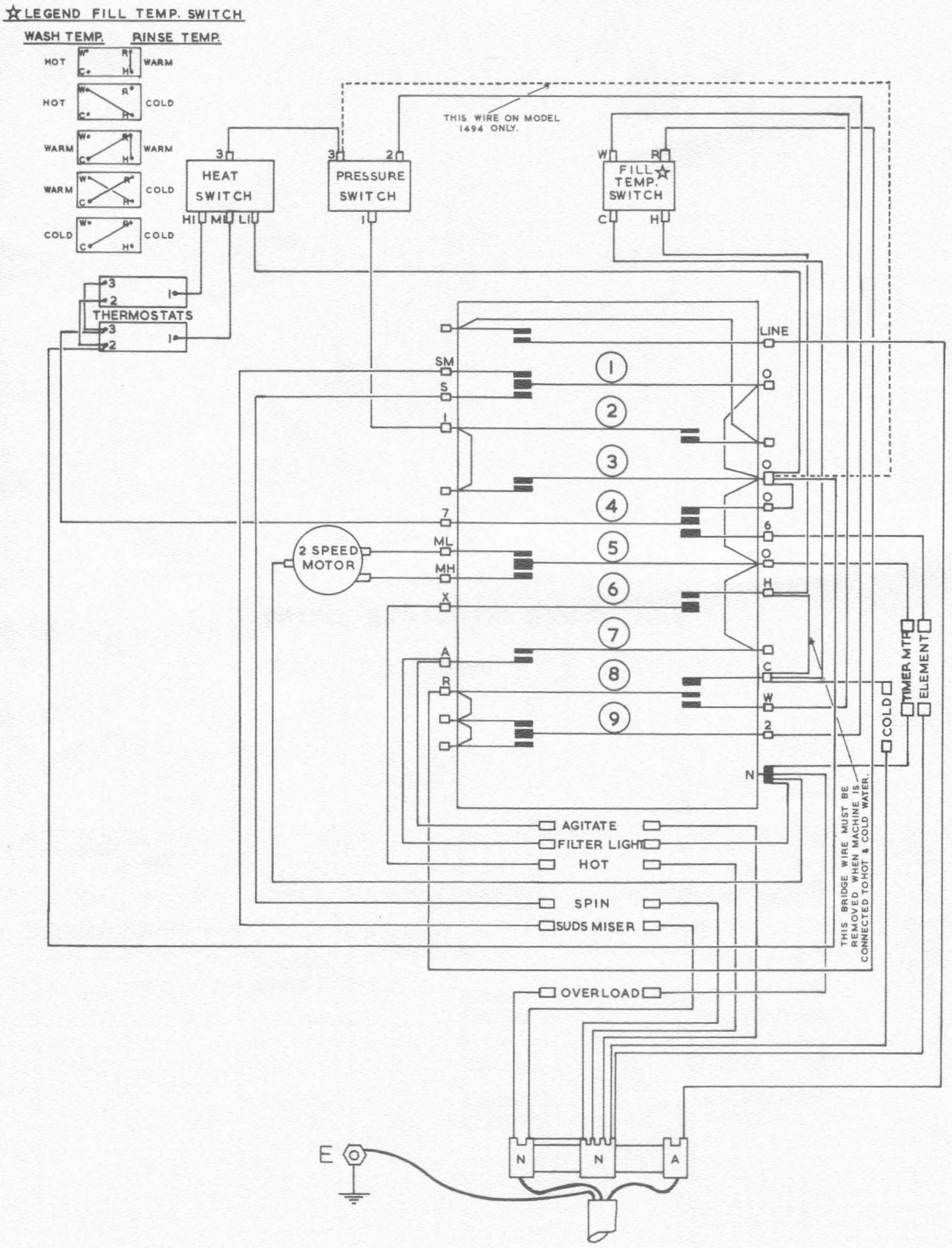
NOTE: T DENOTES POSITION IN CYCLE WHERE MACHINE COMES UNDER THE CONTROL OF THE THERMOSTAT

1493-94 TIMER SEQUENCE CHART



■ CONTACTS ELECTRICALLY CONNECTED X CONTACTS CLOSED NOT ELECTRICALLY CONNECTED ◢ 4 CLOSING IN 1 INCREMENT

1493-94 WIRING DIAGRAM



CONTINUITY GUIDE 1493 – 94 MODEL

NOTE: POLARITY MUST BE CORRECT FOR USE OF THIS CHART.

FILL RINSE AND HEAT SWITCHES SET TO COLD.

TIMER TERMINALS ONLY ARE LISTED AND ARE IN SEQUENCE OF OPERATION.

If any timer terminal is "dead" the prefix will pinpoint the fault between the last active timer terminal tested and the "dead" one. By this method it can be established if the fault is in the timer or one of the machine components.

PREFIX GUIDE :

/	THRU INTERNAL BRANCH IN TIMER
∩	THRU EXTERNAL "JUMPER" WIRE
–	THRU TIMER
.	THRU PRESSURE SWITCH
(((	THRU DUAL CIRCUITS
:	THRU HEAT SWITCH
+	THRU THERMOSTAT

FILL TEMP. SWITCH INTERNAL SWITCHING

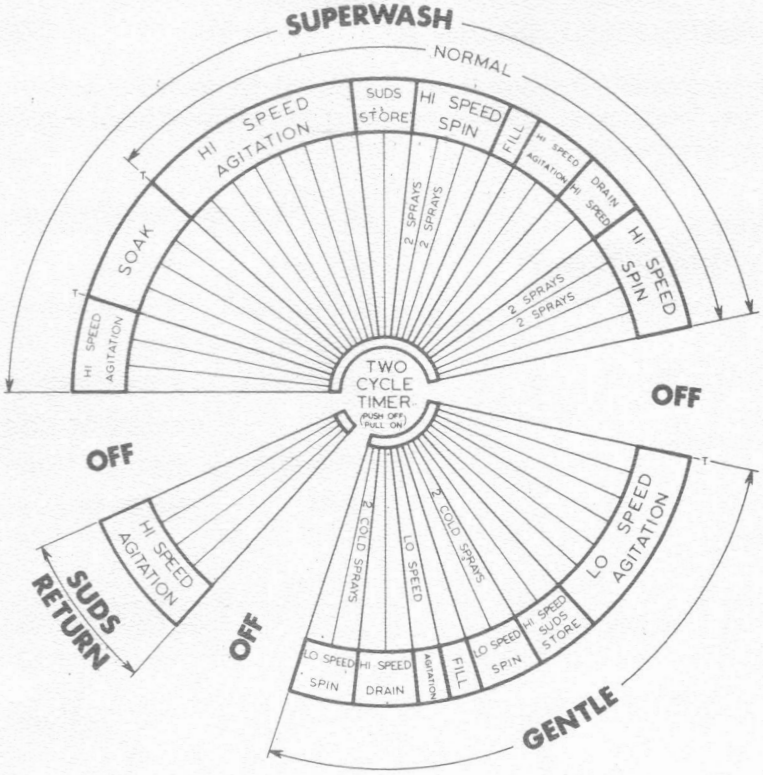
HOT FILL	W TO H
WARM FILL	W TO H AND R TO C
COLD FILL	R TO C
WARM FILL	X TO H AND C FROM
RINSE	TIMER TO INLET VALVE
COLD FILL	C FROM TIMER TO
RINSE	INLET VALVE

MACHINE ACTION	TIMER TERMINALS ENERGISED
FILL FOR WASH	L – 1 . 2 – R – W
FILL FOR RINSE	L – 1 . 2 – R – C
HEATING	L – 1 . : + 7 – 6
SOAK	L – 1 . : + 0 ∩ 0
PRE-SOAK AGITATION	L – 1 . : + 7 – 0 ∩ 0 / – A / – MH
WASH HI 135° & 100°	L – 1 . : + 0 ∩ 0 / – A / – MH
WASH LO 135° & 100°	L – 1 . : + 0 ∩ 0 / – A / – ML
SUDS STORAGE	L – 1 (/ – 0 (. : + 7 – 0 ∩ 0 / – MH / – SM
	Note: Circuit from + will be direct to 0 if + is in satisfied position.
SPIN HI	L – 1 (/ – 0 (. : + 7 – 0 ∩ 0 / – S / – MH
SPIN LO	L – 1 (/ – 0 (. : + 7 – 0 ∩ 0 / – S / – ML
DRAIN	L – 1 (/ – 0 (. : + 7 – 0 ∩ 0 / – MH

SUDS RETURN	
SUDS MISER	L – 1 / – 0 / – A / – MH / – SM

	DRAIN	FILL
COOL DOWN	L – 1 . : + 7 – 0 ∩ 0 / – ML	L – 1 . 2 – R – C

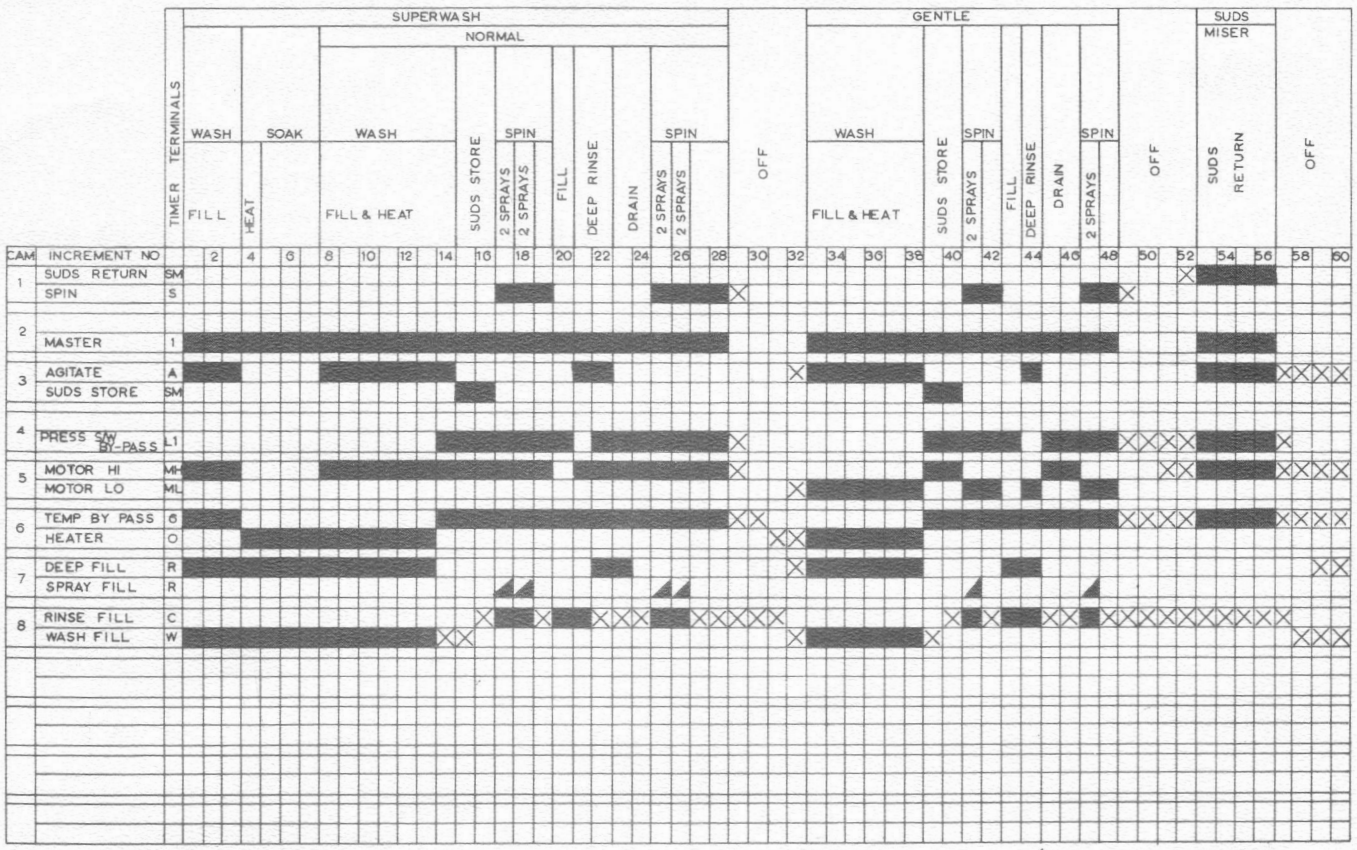
CYCLE CHART 1390-96-97.



INCREMENTS 75 sec. DURATION

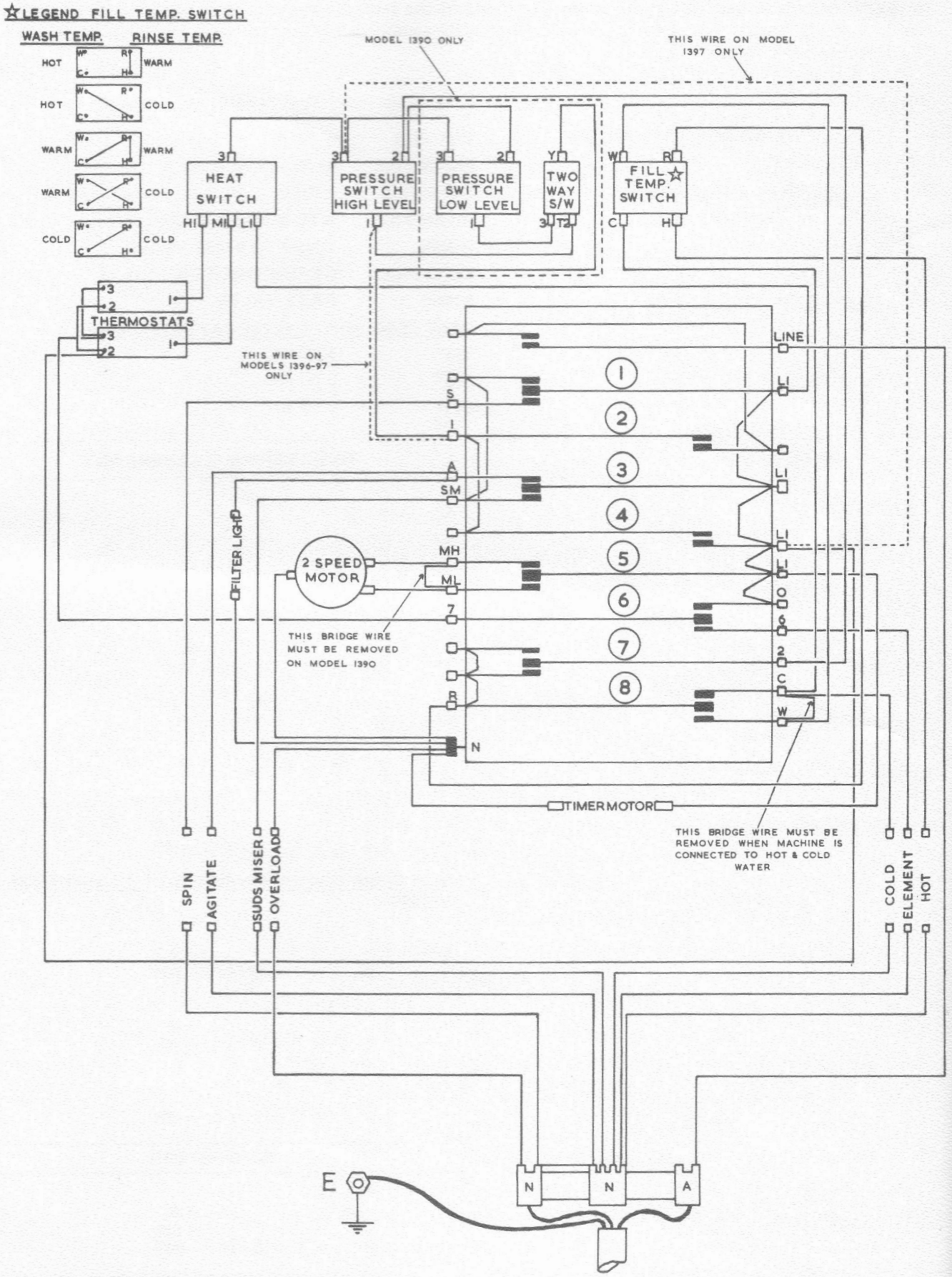
NOTE T DENOTES POSITION IN CYCLE WHERE MACHINE COMES UNDER THE CONTROL OF THE THERMOSTAT MOTOR SPEED ON GENTLE CYCLE IN MODELS 1396-97 WILL ALL BE HIGH.

1390-96-97 TIMER SEQUENCE CHART



■ CONTACTS ELECTRICALLY CONNECTED X CONTACTS CLOSED NOT ELECTRICALLY CONNECTED ◢ 2 CLOSING IN 1 INCREMENT

1390-96-97 WIRING DIAGRAM



CONTINUITY GUIDE 1390 MODEL

NOTE: POLARITY MUST BE CORRECT FOR USE OF THIS CHART.

FILL RINSE AND HEAT SWITCHES SET TO COLD.

TIMER TERMINALS ONLY ARE LISTED AND ARE IN SEQUENCE OF OPERATION.

If any timer terminal is "dead" the prefix will pinpoint the fault between the last active timer terminal tested and the "dead" one. By this method it can be established if the fault is in the timer or one of the machine components.

PREFIX GUIDE :

/	THRU INTERNAL BRANCH IN TIMER
–	THRU TIMER
.	THRU PRESSURE SWITCH
ϕ	THRU TWO WAY SWITCH
:	THRU HEAT SWITCH
+	THRU THERMOSTAT
(((	THRU DUAL CIRCUITS

FILL TEMP. SWITCH INTERNAL SWITCHING

HOT FILL	W TO H
WARM FILL	W TO H AND R TO C
COLD FILL	R TO C
WARM FILL	X TO H AND C FROM
RINSE	TIMER TO INLET VALVE
COLD FILL	C FROM TIMER TO
RINSE	INLET VALVE

HEAT TEMP. SWITCH INTERNAL SWITCHING

135°	3 TO H1
100°	3 TO M1
OFF	3 TO L1

MACHINE ACTION	TIMER TERMINALS ENERGISED
FILL FOR WASH	L – 1 ϕ . 2 – R – W
FILL FOR RINSE	L – 1 ϕ . 2 – R – C
HEATING	L – 1 ϕ . : + 7 – 6
SOAK	L – 1 ϕ . : + L1
PRE-SOAK AGITATION	L – 1 ϕ . : + 7 – 0 / L1 / – A / – MH
WASH HI 135° & 100°	L – 1 ϕ . : + L1 / – A / – MH
WASH LO 135° & 100°	L – 1 ϕ . : + L1 / – A / – ML
SUDS STORAGE	L – 1 ((/ – L1 (ϕ . : + 7 – 0 / L1 / – MH / – SM **Note: Circuit from + will be direct to L1 if + is in satisfied position.**
SPIN HI	L – 1 ((/ – L1 (ϕ . : + 7 – 0 / L1 / – MH / – S
SPIN LO	L – 1 ((/ – L1 (ϕ . : + 7 – 0 / L1 / – ML / – S
DRAIN	L – 1 ((/ – L1 (ϕ . : + 7 – 0 / L1 / – MH
	SUDS RETURN
SUDS MISER	L – 1 ((/ – L1 (ϕ . : + 7 – 0 / L1 / – MH / – A / – SM

CONTINUITY GUIDE 1396 MODEL

NOTE: POLARITY MUST BE CORRECT FOR USE OF THIS CHART – HEAT SWITCH SET TO LO.
TIMER TERMINALS ONLY ARE LISTED AND ARE IN SEQUENCE OF OPERATION.

If any timer terminal is "dead" the prefix will pinpoint the fault between the last active timer terminal tested and the "dead" one. By this method it can be established if the fault is in the timer, or one of the machine components.

PREFIX GUIDE :

/	THRU INTERNAL BRANCH IN TIMER
.	THRU PRESSURE SWITCH
–	THRU TIMER
:	THRU HEAT SWITCH
(((	THRU DUAL CIRCUITS
∩	THRU EXTERNAL "JUMPER" WIRE
+	THRU THERMOSTAT

HEAT TEMP. SWITCH INTERNAL SWITCHING

135°	3 TO HI
100°	3 TO MI
OFF	3 TO L1

MACHINE ACTION	TIMER TERMINALS ENERGISED
FILL FOR WASH & RINSE	L – 1 . 2 – R
HEATING	L – 1 . : + 7 – 6
SOAK	L – 1 . : + L1
PRE–SOAK AGITATION	L – 1 . : + 7 – 0 / L1 / – A / – MH
WASH HI 135° & 100°	L – 1 . : + L1 / – A / – MH
SUDS STORAGE	L – 1 (/ – L1 (. : + 7 – 0 / L1 / – MH (– SM Note: Circuit from + will be direct to L1 if + is in satisfied position.
SPIN HI	L – 1 (/ – L1 (. : + 7 – 0 / L1 / – MH (– S
DRAIN	L – 1 (/ – L1 (. : + 7 – 0 / L1 / – MH
SUDS MISER	L – 1 (/ – L1 (. : + 7 – 0 / L1 / – MH (– A / – SM
WASH – GENTLE CYCLE	L – 1 . : + L1 / – A / – ML ∩ MH
SPIN – GENTLE CYCLE	L – 1 (/ – L1 (. : + 7 – 0 / L1 / – ML ∩ MH (– S

CONTINUITY GUIDE 1397 MODEL

NOTE: POLARITY MUST BE CORRECT FOR USE OF THIS CHART.

FILL RINSE AND HEAT SWITCHES SET TO COLD.

TIMER TERMINALS ONLY ARE LISTED AND ARE IN SEQUENCE OF OPERATION.

If any timer terminal is "dead" the prefix will pinpoint the fault between the last active timer terminal tested and the "dead" one. By this method it can be established if the fault is in the timer or one of the machine components.

PREFIX GUIDE :

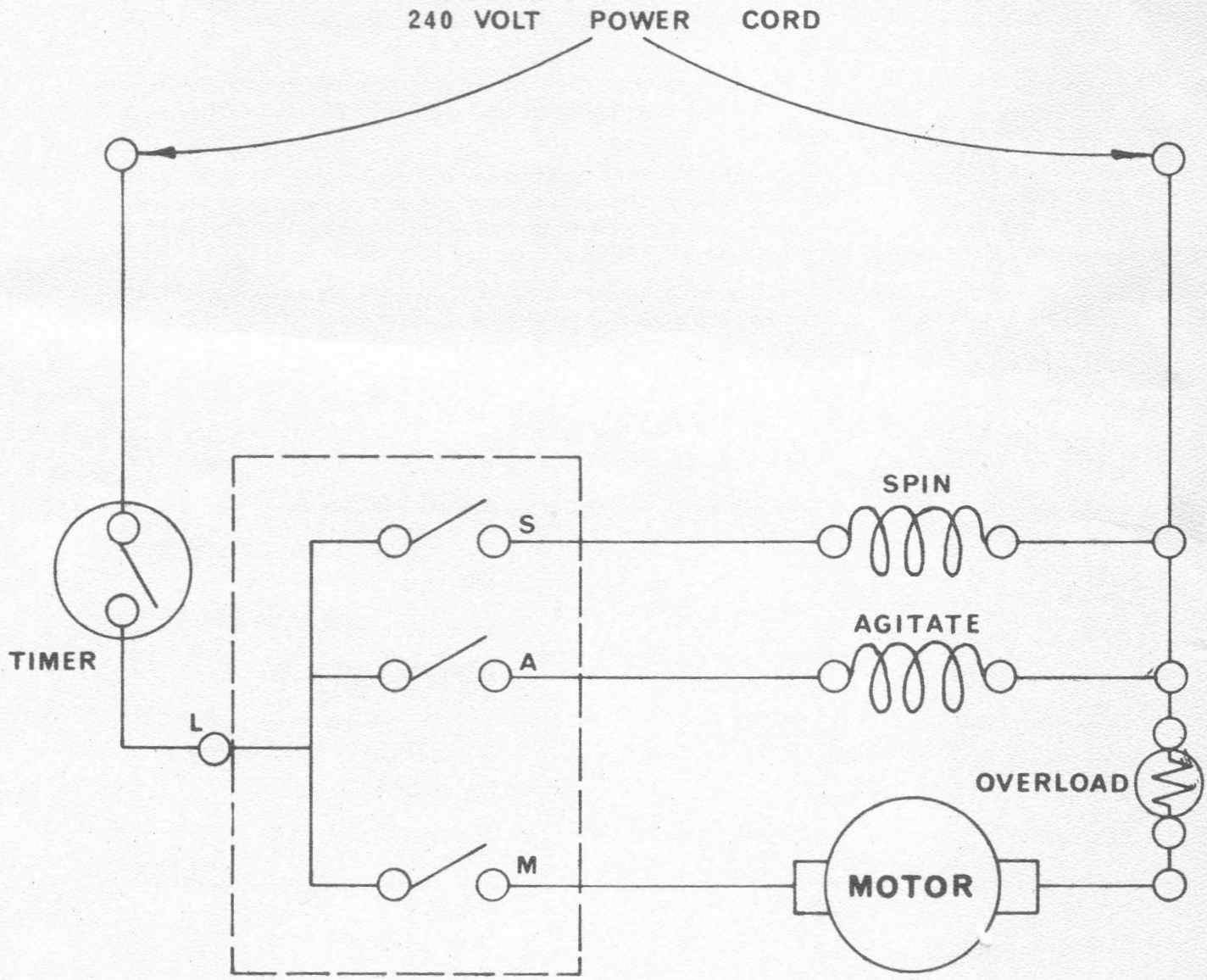
/	THRU INTERNAL BRANCH IN TIMER
∩	THRU EXTERNAL "JUMPER" WIRE
–	THRU TIMER
.	THRU PRESSURE SWITCH

FILL TEMP. SWITCH INTERNAL SWITCHING

HOT FILL	W TO H
WARM FILL	W TO H AND R TO C
COLD FILL	R TO C
WARM FILL	X TO H AND C FROM
RINSE	TIMER TO INLET VALVE
COLD FILL	C FROM TIMER TO
RINSE	INLET VALVE

MACHINE ACTION	TIMER TERMINALS ENERGISED
FILL FOR WASH	L – 1 . 2 – R – W
FILL FOR RINSE	L – 1 . 2 – R – C
SOAK	L – 1 / – L1
PRE-SOAK AGITATION	L – 1 . L1 / – A – MH
WASH	L – 1 . L1 / – A – MH
SUDS STORAGE	L – 1 / – L1 / – SM – MH
SPIN	L – 1 / – L1 / – S – MH
DRAIN	L – 1 / – L1 / – MH
SUDS MISER	L – 1 / – L1 / – SM – A – MH
WASH – GENTLE CYCLE	L – 1 . L1 / – A – ML ∩ MH
SPIN – GENTLE CYCLE	L – 1 / – L1 / – SM – ML ∩ MH

1382 WIRING DIAGRAM



GENERAL INFORMATION

Due to constant changes in material costs, all prices are subject to alteration without notice, and price ruling at date of delivery will apply.

SPARE PARTS ORDERING AND SUPPLY : To facilitate prompt supply when ordering parts, please quote part number and description as shown in the parts list, and use an official order number at all times. Where parts are ordered by telephone, quote ORDER NUMBER and post your order from mark 'CONFIRMATION.

Parts will normally be forwarded and charged to your 'Open Account' and, where applicable, a credit will be raised on return of faulty parts claimed under guarantee, or in the case of an 'Exchange' part, credit will be allowed less cost of repair.

FREIGHT CHARGES : Malleys Limited pay freight on all goods forwarded, and reserve the right to nominate the means of transport, usually by rail or post. Where an agent requests delivery by special means, such as road express, or air freight, freight charges will be the responsibility of the agent and will show on the invoice.

DAMAGE IN TRANSIT : Parts are guaranteed by Malleys against faulty workmanship and/or materials, but not against misuse or mishandling. No claim for damage in transit can be recognised by Malleys Limited.

Where goods arrive damaged, a claim must be made by the recipient against the transporting contractor i.e., road hauler, Department of Railways etc., DO NOT RETURN FOR CREDIT OR REPLACEMENT UNDER GUARANTEE.

CREDIT RETURNS : All parts returned for credit must be tagged with a Malleys spare parts tag and show serial number, date of purchase, part number and description, date serviced and nature of fault. Spare parts tags are forwarded with all spare parts and are readily available by request to Malleys Service Branches.

IMPORTANT : All parts claimed under guarantee must be returned within 21 days from the date serviced and care must be taken to ensure no part is spoiled by use of packing materials such a sawdust shavings, etc.

MALLEYS LIMITED

SPARE PARTS DISTRIBUTION CENTRES

NEW SOUTH WALES.
Malleys Limited,
75 Violet Street,
REVESBY. N.S.W. 2212.
P.O. Box 58, Revesby.

Phone 771-2233

QUEENSLAND.
Malleys Limited,
Deshon Street,
WOOLLOONGABBA. Q'LD. 4102.

Phone 91-0101

VICTORIA.
Malleys Limited,
Cnr. Allen & Cameron Streets,
MORELAND. VIC. 3058.

Phone 36-9911

SOUTH AUSTRALIA.
Malleys Limited,
Cnr. Cromwell Rd. & Blackburn St.,
KILBURN. S.A. 5084.

Phone 62-5511.

WESTERN AUSTRALIA.
Malleys Limited,
150 Claisebrook Road,
EAST PERTH. W.A. 6000.

Phone 28-5766

TASMANIA.
Malleys Limited,
Cnr. Allen & Cameron Streets,
MORELAND. VIC. 3058.

Phone 36-9911

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