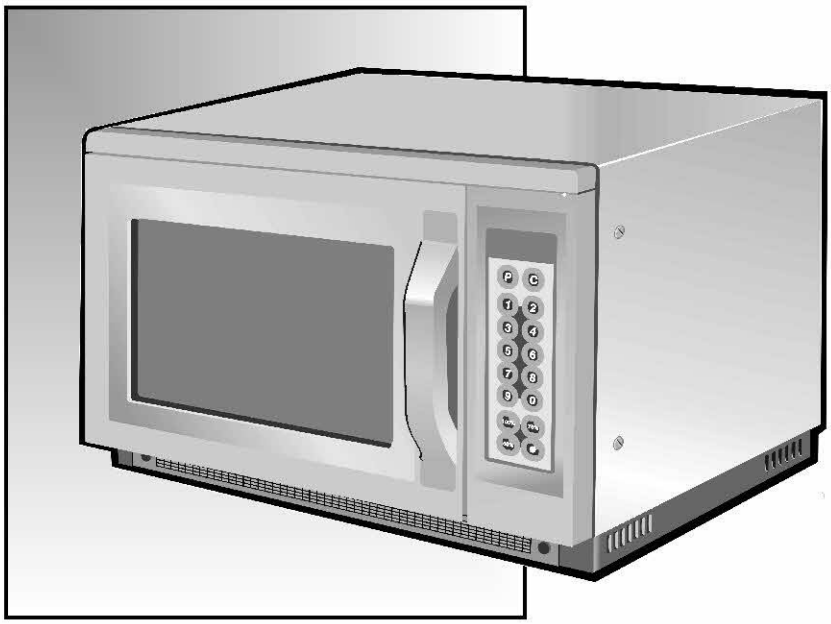
SERVICE MANUAL



merrychef

# MC-SERIES

## SERVICE MANUAL

For all MC-Series models manufactured from January 2001

Part No. 32Z3329e Issue No. 5

**CAUTION MICROWAVE EMISSIONS**

**DO NOT BECOME EXPOSED TO EMISSIONS FROM THE MICROWAVE GENERATOR OR PARTS CONDUCTING MICROWAVE ENERGY**

## Table of Contents

## SAFETY CODE

This manual is designed to assist engineers who have been on a recognised product familiarisation and training course run by Merrychef Limited. It has been prepared to offer technical guidance for the Merrychef MC Series Commercial Microwave Ovens.

Please remember that it is wiser **not** to attempt a service task if you are unsure of being able to complete it competently, quickly, and above all **safely**.

To avoid injury to yourself, and to protect the appliance from possible damage, please follow this Safety Code when servicing these ovens.

**Before attempting to repair the oven, check it for microwave leakage.**

**Check that the oven is not emitting microwaves, even when supposedly not in operation.**

**Check that the oven is not operating continuously, whether the display indicates cooking or not.**

**Always discharge the HT capacitors before working on the oven using a suitably insulated 10 MΩ Resistor**

Before removing the rear cover from the oven, do all of the following:

- Switch off the mains supply and remove the plug from the wall socket.

  or
- If the oven is hard wired, ensure that the power is turned off at the isolator switch.

**Note:** the oven does NOT have an On/Off switch.

Upon completion of a service on an MC Series oven, or before reconnecting the appliance to the mains supply for testing, check all of the following points:

- All internal electrical connections are correct.
- All wiring insulation is correct and is not touching a sharp edge.
- All Earth connections are electrically and mechanically secure.
- All four door safety interlocks are secure and mechanically sound.
- The door operation is smooth.
- The door activates all four of the door interlock switches **in the correct order**.
- All fuse-holder safety covers are correctly fitted.

Before finishing the service call, recheck the following points:

- All of the electronics are functioning correctly, and all of the touch pads are working.
- The power output of the oven is correct (see pages 7 & 8 ).
- Microwave emission is below permissible limit - 5 mW/cm² (see BS EN 60335-2-90:1998).
- Oven has correct 50 mm air gap all round. Air flow should not be restricted.

## PRODUCT SPECIFICATIONS

**Model N°. MC-Seies**

Model Number Specification: Model N°. + Voltage + Frequency + Country

| | | | | |
|---|---|---|---|---|
| Voltage | 2 = | 220-230V a.c. | 4 = | 230-240V a.c. |
| Frequency | 5 = | 50 Hz | 6 = | 60 Hz |
| Country | UK = | United Kingdom | EX = | Export |

| | | |
|---|---|---|
| Power Requirements | MC1000C45UK<br>MC1000C25EX<br>MC1400C45UK<br>MC1400C25EX<br>MC1800C45UK<br>MC1800C25EX | 230-240V ac 50 Hz 13.0A Single Phase 2 Wire + Earth<br>220-230V ac 50 Hz 14.2A Single Phase 2 Wire + Earth<br>230-240V ac 50 Hz 13.0A Single Phase 2 Wire + Earth<br>220-230V ac 50 Hz 14.2A Single Phase 2 Wire + Earth<br>230-240V ac 50 Hz 13.0A Single Phase 2 Wire + Earth<br>220-230V ac 50 Hz 14.2A Single Phase 2 Wire + Earth |
| Power Output<br>Microwave 100% | MC1000<br>MC1400<br>MC1800 | 1000W ( IEC 705 )<br>1400W ( IEC 705 )<br>1800W ( IEC 705 ) |
| External Dimensions | Height<br>Width<br>Depth | 335 mm ( Plus 50 mm minimum clearance above )<br>510 mm ( Plus 50 mm minimum clearance each side )<br>415 mm ( Plus 50 mm clearance behind ) |
| Internal Dimensions | Height<br>Width<br>Depth<br>Capacity | 210 mm<br>330 mm<br>330 mm<br>23 litres (0.81 $ft^3$) |
| Weight | Nett<br>Gross packed | 30 kg<br>35 kg |
| Construction | Cavity & Case- | 304 Stainless Steel |
| Settings | Microwave<br>Timer | 100%, 75%, 50%, progressive Defrost<br>Up to 9 minutes 59 seconds<br>Up to 3 cooking stages of up to 9 minutes 59 seconds each (Programmed) |

| | |
|---|---|
| Control System | Wipe-clean touch pad operating microprocessor based control system.<br>Direct readout of time and power set.<br>10 Pre-programmed cooking sequences accessed by just two key presses. |
| Safety Features | Four door interlock switches.<br>Cavity Overheat Sensor.<br>Magnetron Overheat Sensor. |
| Additional Features | • Easy-to-use multistage programming.<br>• Manual and Pre-programmed mode always available<br>• Magnetron soft-start circuit for increased life and faster activation.<br>• Multiple product facility. |

# INSTALLATION INSTRUCTIONS

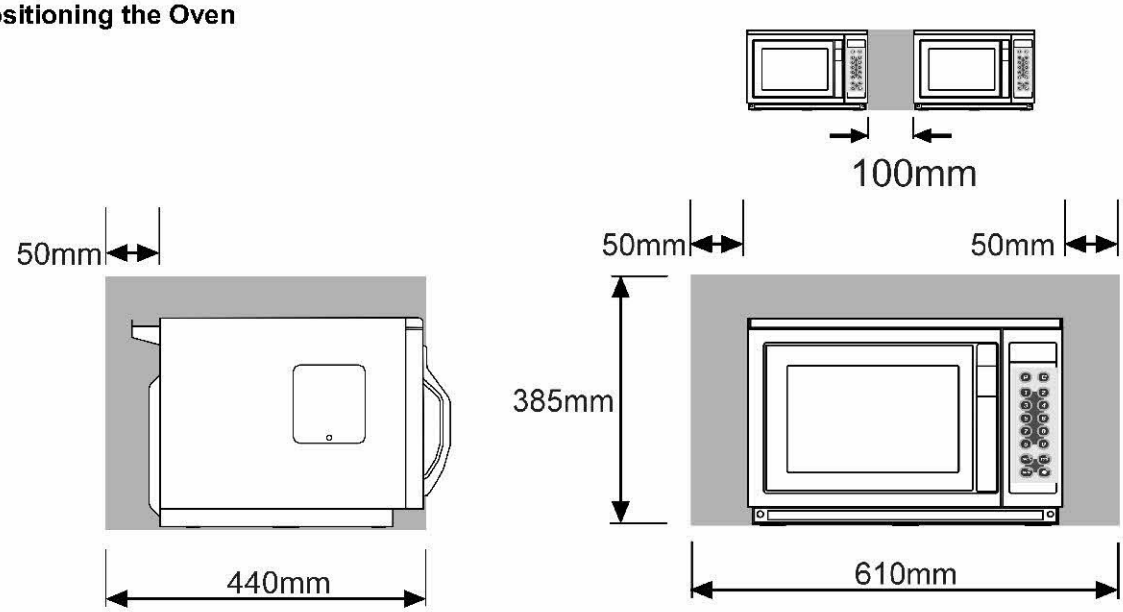
## MC Series Ovens

### Power Supply Requirements

The MC–Series oven should be connected to a suitable electricity supply, which can cope with the switching-on surge that occurs with certain types of catering equipment, such as microwaves. Because of this requirement, we strongly recommend that a separate, suitably rated supply is installed for the oven.

The supply for the oven should be fitted with a **Type "C"** circuit breaker, rated at 16A.

### Positioning the Oven

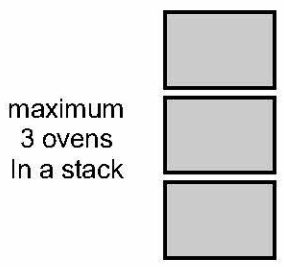



In order to maintain adequate ventilation for air intake and exhaust, and to allow access for cleaning filters, you must allow a minimum of 50 mm clearance all around the oven. Air intake temperature should not exceed 35°C - excessive temperature can lead to reduced operating duty cycle or premature ageing of internal components.

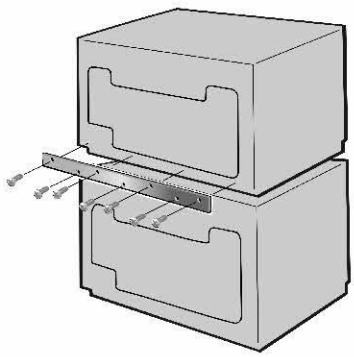
**ALWAYS** Place containers in the cavity carefully - impact damage may chip the oven shelf

**NEVER** Install an oven above fryers, grills, griddles or any other major heat source

**NEVER** Stack machines on top of each other without using the stacking adapter provided.



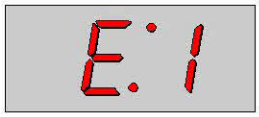

Stacking Adapter



## Error Codes and Diagnostics

The MC–Series oven will identify some of the most common problems by flashing an error message code in the time display window.

These are the error messages, and suggestions for repairing them.

| | | | |
|---|---|---|---|
|  | 1<br>2 | Door not fully shut.<br>Possible electrical fault | Close door fully.<br>Door switch inoperative. |
|  | 1<br>2<br>3 | No time has been set.<br>Invalid time has been set.<br>Invalid program has been set. | Set a time.<br>Set a valid time.<br>Use call-back to check program. |

## Procedure A - Power Output Test in accordance with BS EN 60335-2-25:1996 Annex AA

This test is given in the BSI test standard for microwave ovens. It is reproduced below - not so that you can follow it, but to show you why it is impractical in normal conditions. A simplified procedure, which gives a good approximation to the BSI power output, is given in Procedure B which follows.

**Note:** This test can only be carried out on a **COLD** oven. If the oven has been operating, even for only a few seconds, the power given will be lower than the oven rating. This test must also be carried out at a stable voltage - the voltage in most kitchens varies considerably even within the period of the test. If the oven has been operating, go to **Procedure B.**

**You will need:**

A thermometer capable of reading to ±0.1°C.
A cylindrical borosilicate glass container, 190 mm diameter, with a wall thickness of 3 mm or less.
A calculator.
A set of scales capable of reading 1 kg to an accuracy of ± 1 g.
A glass or plastic stirrer.
A jug capable of holding over 1 litre of water.
Drinkable water which is at a temperature of 10°C ± 1°C.
A "Variac" or similar variable transformer capable of supplying the oven to ensure a stable voltage.

**WARNING:** *The Borosilicate Glass container has thin walls and is therefore fragile - take care not to break it during use.*

### Method

A cylindrical container of borosilicate glass is used for the test. It has a maximum thickness of 3 mm, an external diameter of approximately 190 mm and a height of approximately 90 mm. The mass of the container is determined.

At the start of the test, the oven and the empty container are at ambient temperature. Potable water having an initial temperature of 10°C ± 1°C is used for the test. The temperature of the water is measured immediately before it is poured into the container.

A quantity of 1000 g ± 5g of water is added to the container and its actual mass obtained. The container is then immediately placed in the middle of the oven shelf which is in its lowest normal position. The appliance is supplied at rated voltage and operated at the maximum power setting. The time for the water temperature to attain 20°C ± 2°C is measured. The oven is then switched off and the final water temperature is measured within 60's.

NOTES:

1 The water is stirred before its temperature is measured.
2 Stirring and measuring devices are to have a low heat capacity.

The microwave power output is calculated from the formula:

$$P = \frac{4.187\, M_W\, (T_2-T_1) + 0.55\, M_C\, (T_2-T_0)}{t}$$

where

P is the microwave power output, in watts;
$M_W$ is the mass of the water, in grams;
$M_C$ is the mass of the container, in grams;
$T_0$ is the ambient temperature, in °C;
$T_1$ is the initial temperature of the water, in °C;
$T_2$ is the final temperature of the water, in °C;
t is the heating time in seconds, excluding the magnetron filament heat-up time.

## Procedure B - Simplified Power Test

**You will need:**

A thermometer capable of reading to ±0.1°C.
A Polypropylene tray approximately 200 mm x 200 mm.
A measuring jug.
A calculator.
Water which is at a temperature of 10°C ± 2°C.

1 Measure 1 litre of cold water into the tray using the measuring jug.
2 Measure the water temperature, and record it as T[s].
3 Place the tray in the oven and close the door.
4 Turn the oven on.
5 Set the timer to 1:02.
6 Press the "100%" pad.
7 When the oven bleeps, open the door and remove the tray.
8 Stir the water thoroughly, and measure its temperature. Record this as T[e].

**Calculation:**

1 T[r] = T[s] - T[e].
2 Power = 78.5 x T[r]. Power is in Watts.

The power given by the above test should be within ±15% of the rated power.

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## Procedure C - Power Transformer Test

**You will need:**
A Digital Multi-meter (D.M.M.)
A Megger or similar resistance meter using 500V d.c.

1 Isolate the oven from the mains supply.

| | |
|---|---|
| WARNING: | *High voltages and large currents are present at the secondary winding and filament winding of the Power Transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements at the High Voltage circuits, including the magnetron filament.* |
| WARNING: | *Even when the oven is not cooking, the Power Transformer has High Voltages present because of the Soft Start circuit. Isolate the oven before testing.* |

2 Ensure that the High Voltage Capacitor is discharged before commencing work.
3 Remove all connections from the Power Transformer.
4 Using a D.M.M., check the continuity of the windings. Results should be as follows:

| | |
|---|---|
| Mains winding (between tags) | Approximately 1.3 Ω |
| High Voltage winding (between tag & chassis) | Approximately 82 Ω |
| Filament winding (between terminals) | Less than 1 Ω |

5 Using a Megger, test the insulation resistance between:

| | |
|---|---|
| Primary winding and chassis | Pass if over 10 MΩ |
| Filament winding and chassis | Pass if over 10 MΩ |

One end of the High Voltage winding is connected to the chassis, so this is not tested.

## Procedure D - High Voltage Capacitor Test

**You will need:**

A Digital Multi-meter (D.M.M.)
A Megger or similar resistance meter using 500V d.c.

1 Isolate the oven from the mains supply.

*WARNING: High voltages and large currents are present at the High Voltage Capacitor. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements at the High Voltage circuits, including the magnetron filament .*

*WARNING: Even when the oven is not cooking, the High Voltage Capacitor has High Voltages present because of the Soft Start circuit. Isolate the oven before testing.*

2 Ensure that the High Voltage Capacitor is discharged before commencing work.
3 Remove all connections from the High Voltage Capacitor.
4 Using a D.M.M., check for continuity between the terminals & compare results with table.
5 Using a Megger, test the insulation resistance between the terminals and the case.

| | |
|---|---|
| Between Terminals | Pass if approximately 10 MΩ |
| Between Terminals and Case | Pass if open circuit |

## Procedure E - High Voltage Rectifier Test

**You will need:**

A Megger or similar resistance meter using 500V d.c.

WARNING: *High voltages and large currents are present at the High Voltage Rectifier. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements at the High Voltage circuits, including the magnetron filament .*

WARNING*: Even when the oven is not cooking, the High Voltage Rectifier has High Voltages present because of the Soft Start circuit. Isolate the oven before testing.*

1 Isolate the oven from the mains supply.
2 Ensure that the High Voltage Capacitor is discharged before commencing work.
3 Remove all connections from the High Voltage Rectifier.

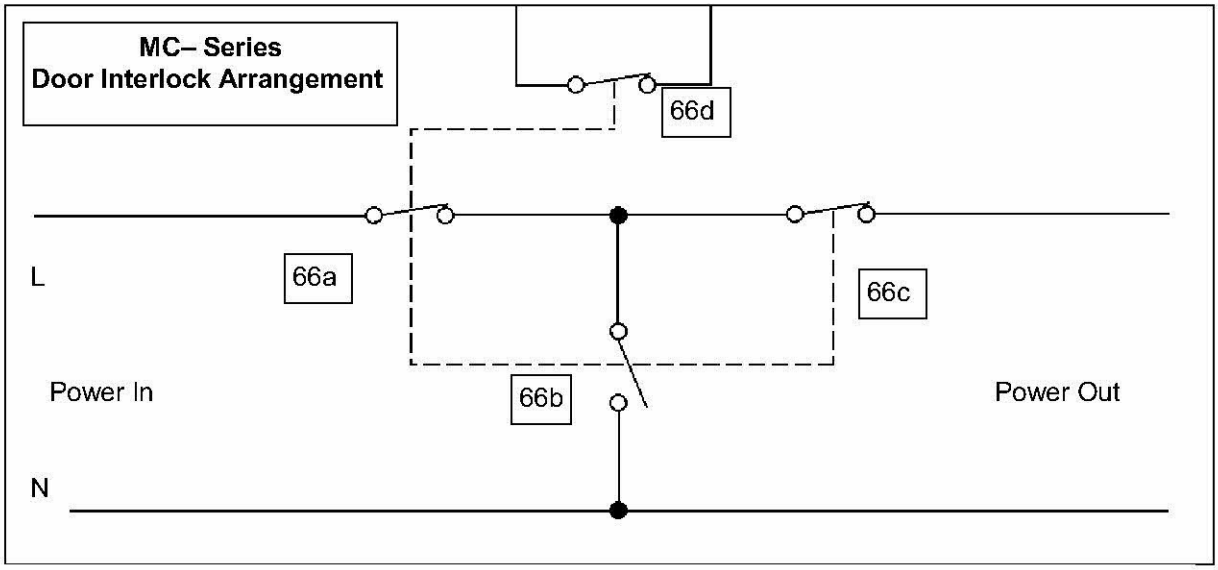
4

| | |
|---|---|
| Open Circuit both ways | FAIL |
| Conducts one way only | **PASS** |
| Short Circuit both ways | FAIL |
| Conducts one way, leaks the other | FAIL |

## DOOR INTERLOCK OPERATION

### Door Interlock Operation

The door on the oven is monitored by four microswitches. Three of these are used in the conventional "Primary, Secondary and Monitor" switch arrangement shown below, while the fourth is a low-voltage switch linked directly to the control circuitry.

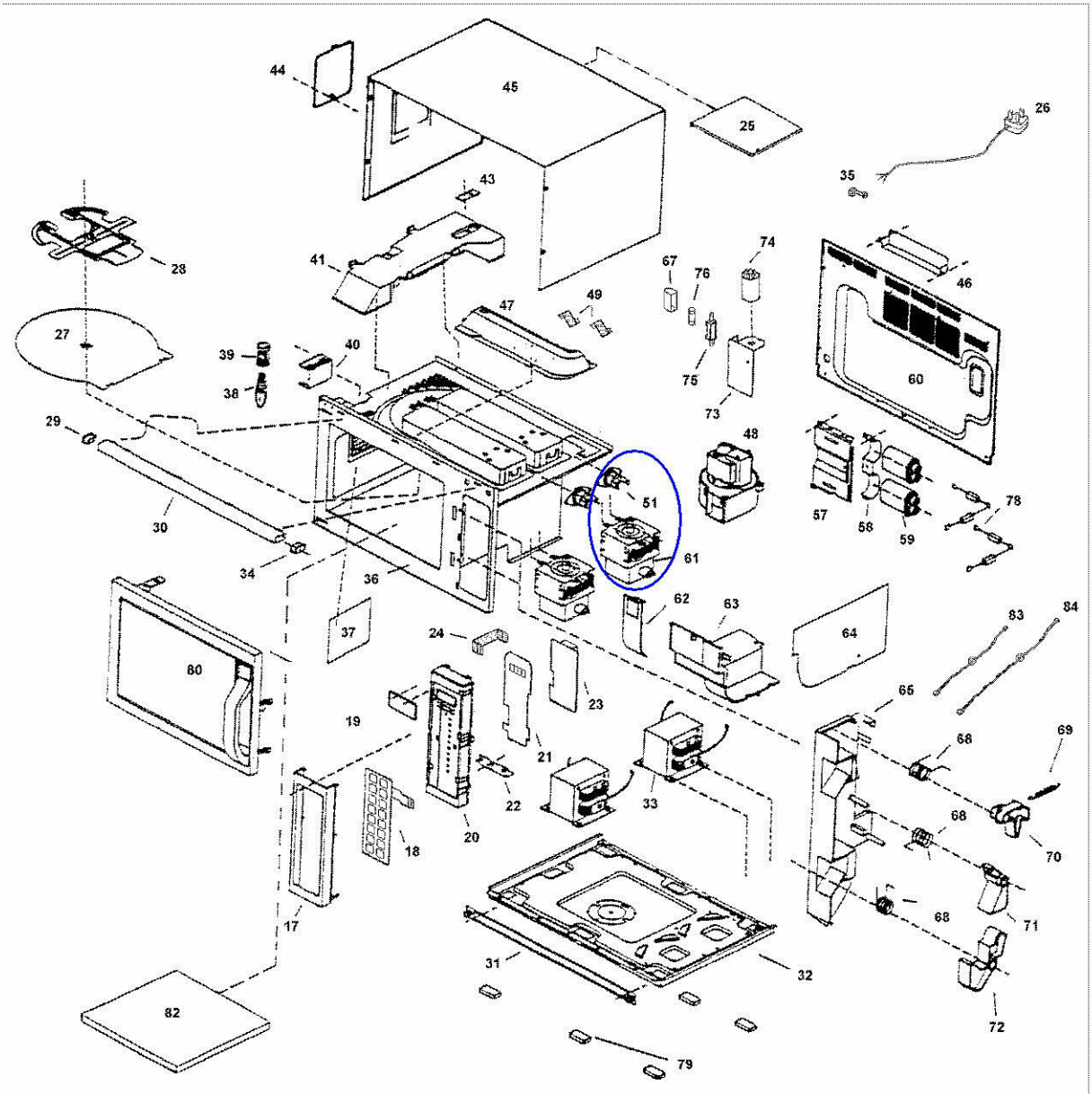



The switches operate as follows:

1. Monitor Switch [66b , Top ]. As the door is closed, the monitor switch is opened.
2. Primary Interlock Switch [ 66a , Lower Middle ]. The Primary switch is then closed.
3. Secondary Interlock Switch [ 66c , Upper Middle ]. The Secondary Switch then closes.
4. Low voltage Switch [ 66d , Bottom ]. The Low voltage switch operates concurrently with the Primary and Secondary switches.

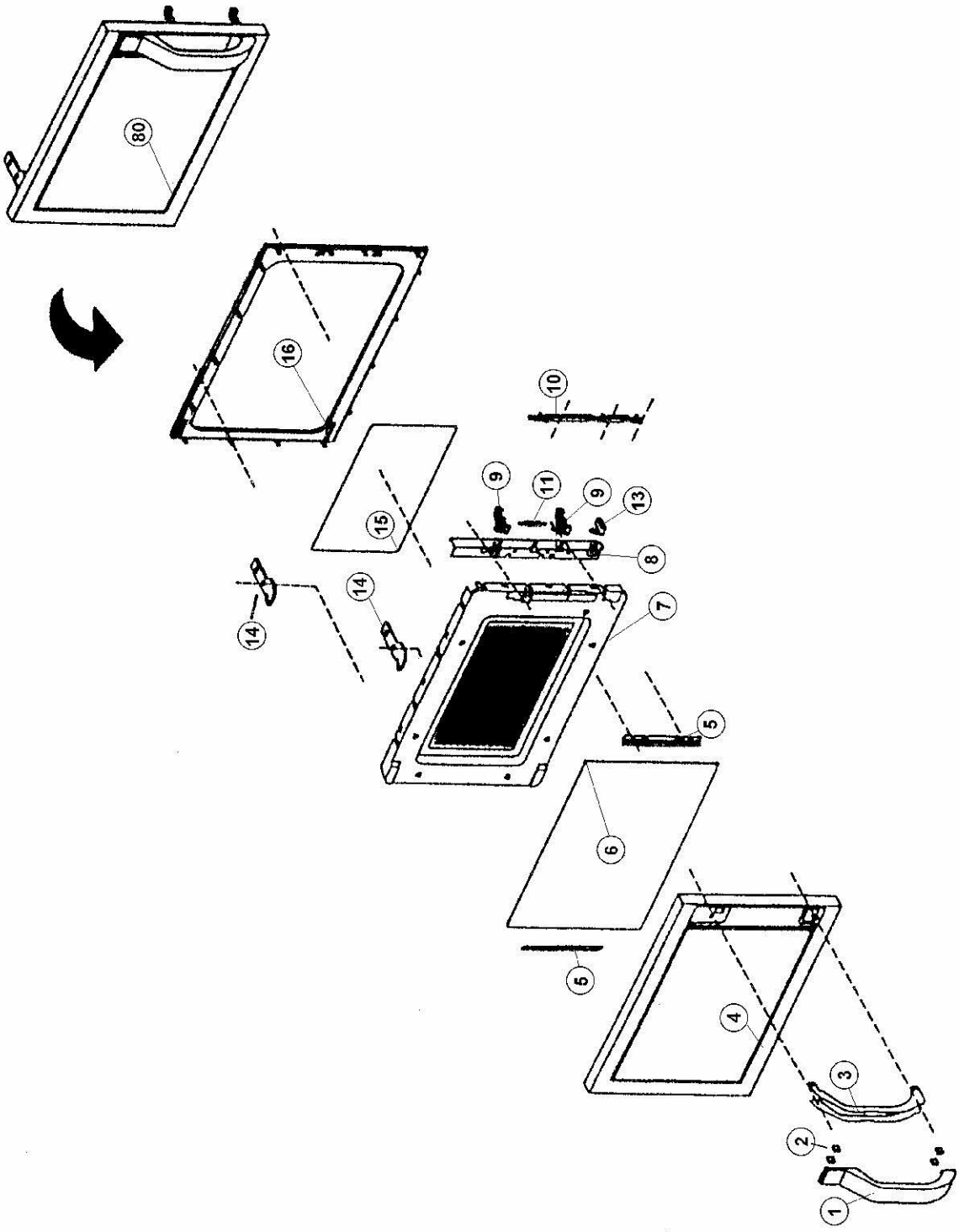
When the door is opened, the switches operate in the reverse order.

## Exploded View – MC Series




Note: Model MC1000 has only one Magnetron assembly parts 51, 61

## Door Assembly

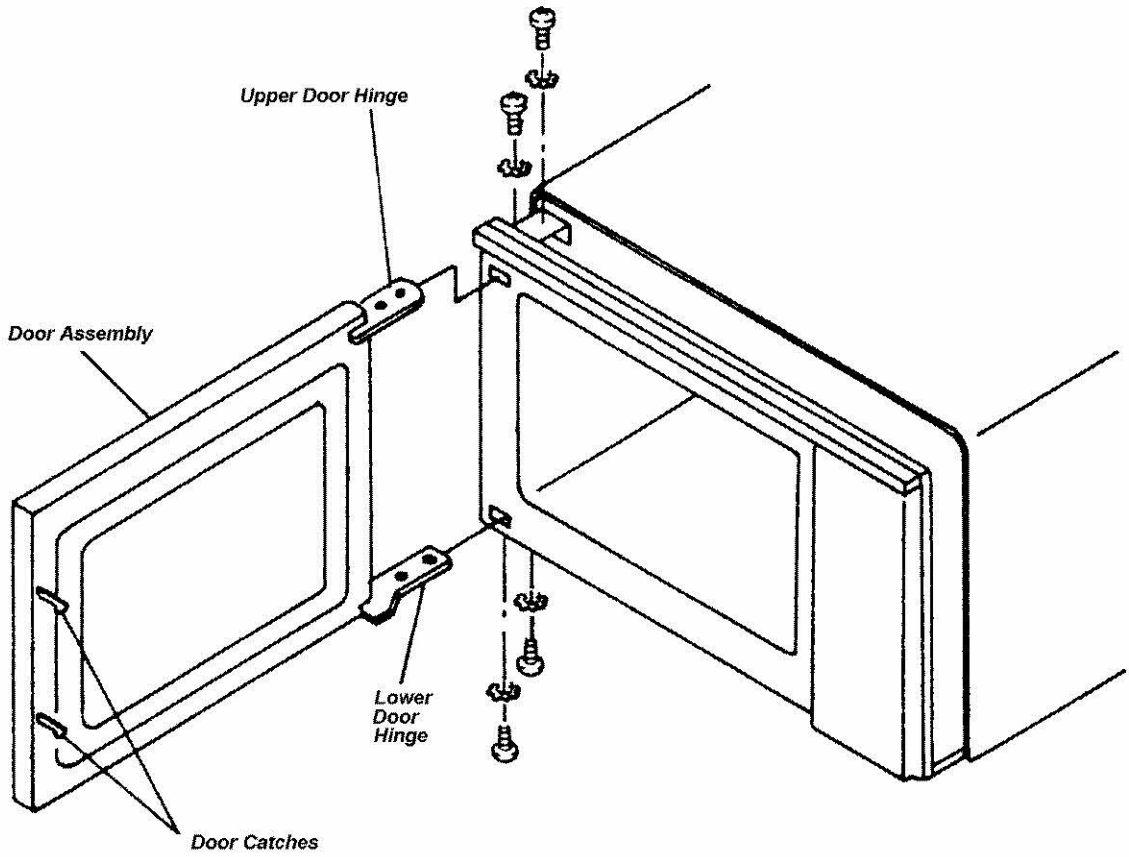


## Door Replacement and Door Adjustment

### DOOR REPLACEMENT

1. Remove four screws holding the Upper and Lower Hinge Plate [14] to the oven cavity.
2. Remove Door Assembly [80] by pulling it forward.
3. On re-installing new door assembly, secure the upper and lower oven hinges with the four mounting screws to the oven cavity. Make sure the door is parallel with the bottom line of the oven cavity face and the catches pass through the catch holes correctly.

Note: After any service to the door, the oven should be checked for leakage.

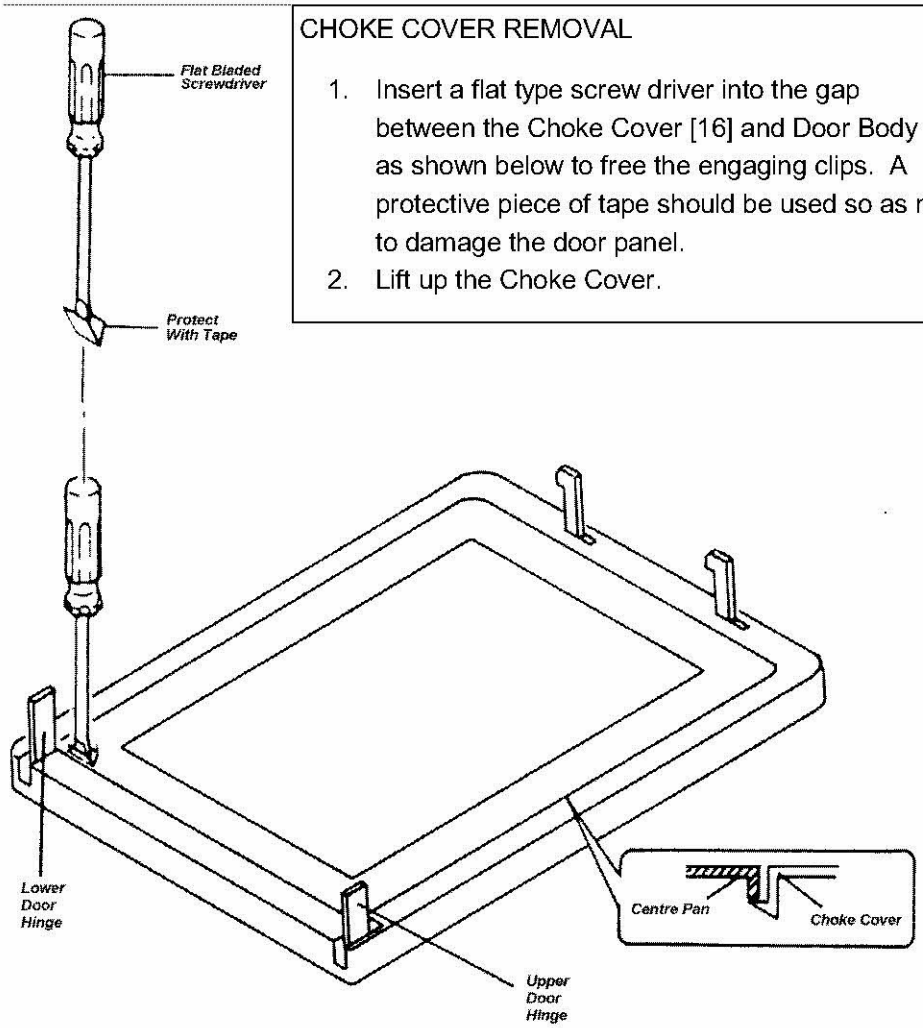



### DOOR ADJUSTMENT

When removing and/or loosening hinges during door adjustment or replacement, the following adjustment criteria must be met. The door is adjusted to meet the following three conditions by keeping the hinge screws slack.

1. Adjust door interlock block to a position where it smoothly locates with the catches through the catch holes. Refer to Door Catch Adjustment.
2. Deviation of door alignment from horizontal line of cavity front is to be less than 1.0 mm.
3. The door is positioned so that it touches the cavity front.
4. Reinstall outer case and check for microwave leakage around the door with an approved microwave leakage meter

## Door Servicing




CHOKE COVER REMOVAL

1. Insert a flat type screw driver into the gap between the Choke Cover [16] and Door Body [7] as shown below to free the engaging clips. A protective piece of tape should be used so as not to damage the door panel.
2. Lift up the Choke Cover.

### DOOR COMPONENTS REMOVAL

Place the Door Assembly [80] on a soft cloth with the Choke Cover [16] facing up.

UPPER AND LOWER OVEN HINGE REMOVAL

1. Remove the Choke Cover, referring to "CHOKE COVER REMOVAL".
2. Release the Door Hinges [14] from the door panel.

DOOR HANDLE REMOVAL

1. Remove the two screws holding the Door Handle [1] to door.
2. Remove the Door Handle from the Door Body.

UPPER AND LOWER DOOR CATCH REMOVAL

1. Remove the Inner Handle [3] from the door assembly.
2. Remove the three screws holding the Door Catch Bracket [8] to the Door Body.
3. Release the Door Spring [11] from the tab of the Door Catch Link Rod [10] and Door Catch Bracket.
4. Release the Catches [9] from Door Catch Link Rod and Door Catch Bracket.

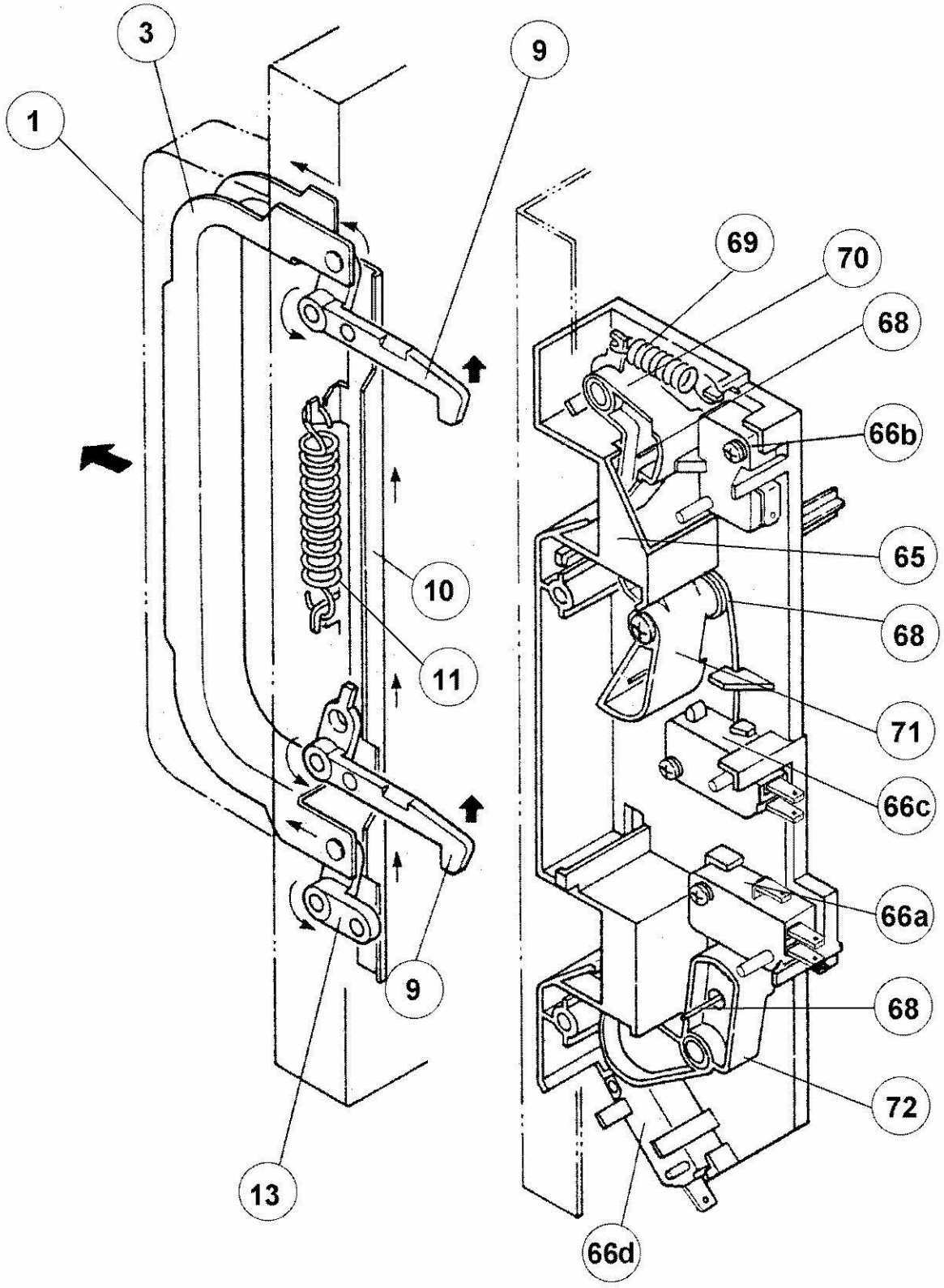
DOOR OUTER SKIN REMOVAL

1. Set the four tabs of the Door Outer Skin [4] upright.
2. Remove the Door Outer Skin from the Door Body [7].

DOOR GLASS REMOVAL

1. Remove the four screws holding the two Glass Locators [5] to the Door Body [7].

## Door Interlock Details



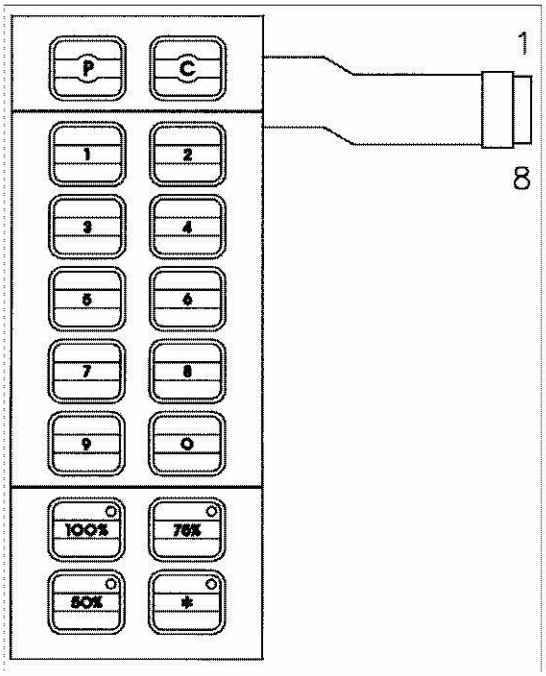
## Membrane Panel Circuit

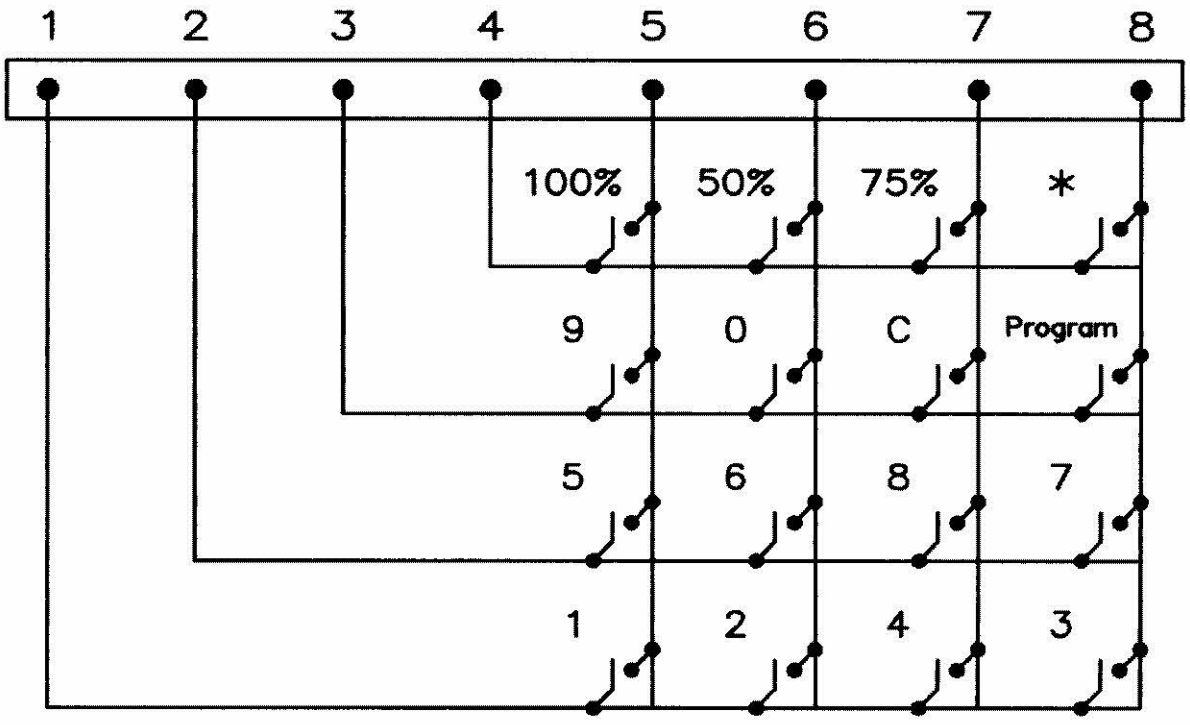
**You will need:**

A Digital Multi-meter (D.M.M.)

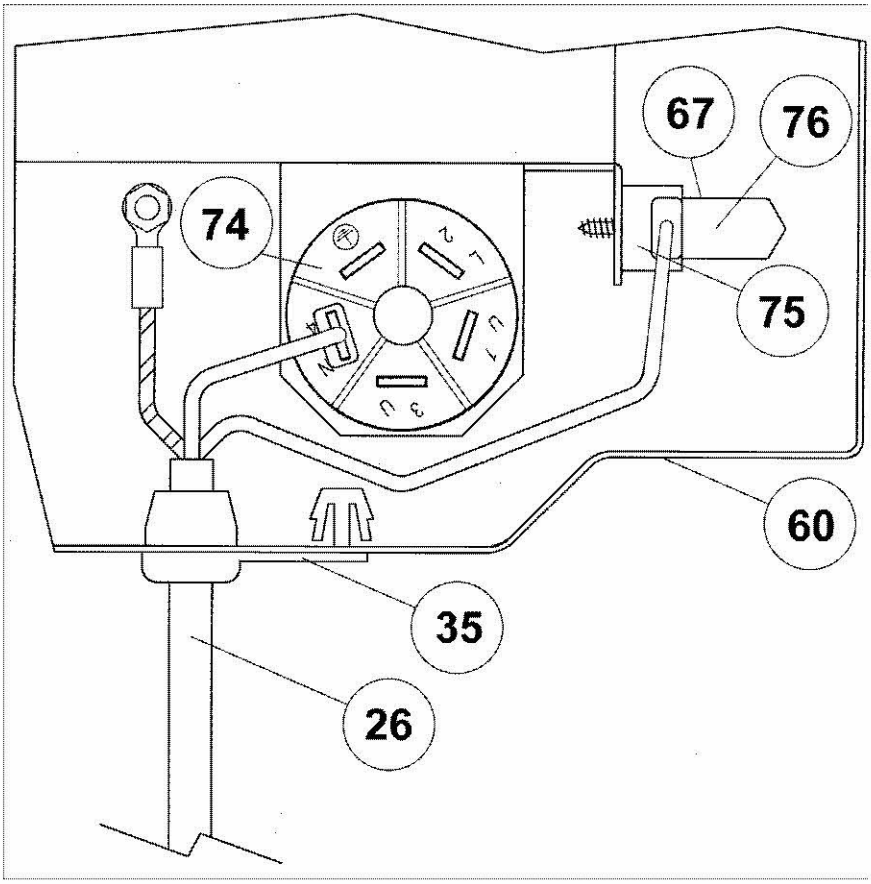
Procedure:

1. *Isolate the oven from the mains supply.*
2. *Remove the Logic Assembly from the Control Panel Housing.*
3. *Unplug the membrane "tail" from the Logic PCB Assembly.*
4. *Using a D.M.M., check for continuity between the correct terminals when the pads are pressed.*
5. *When the panel has been tested, re-assemble and re-test the control housing.*



## INPUT WIRING DETAILS



## Part Number Identification Chart: MC series ovens

| No | Description | MC1000 | MC1400 | MC1800 |
|---|---|---|---|---|
| | | Part No. | Part No. | Part No. |
| 1 | Outer Handle | 30M0001 | 30M0001 | 30M0001 |
| 2 | Handle Bearing (4) | 30M0002 | 30M0002 | 30M0002 |
| 3 | Inner Handle | 30M0003 | 30M0003 | 30M0003 |
| 4 | Door Outer Skin | 30M0004 | 30M0004 | 30M0004 |
| 5 | Glass Locator | 30M0005 | 30M0005 | 30M0005 |
| 6 | Outer Door Glass | 30M0006 | 30M0006 | 30M0006 |
| 7 | Door Body | 30M0007 | 30M0007 | 30M0007 |
| 8 | Door Catch Bracket | 30M0008 | 30M0008 | 30M0008 |
| 9 | Door Catch (2) | 30M0009 | 30M0009 | 30M0009 |
| 10 | Door Catch Link Rod | 30M0010 | 30M0010 | 30M0010 |
| 11 | Door Spring | 30M0011 | 30M0011 | 30M0011 |
| 12 | Oven Cavity MC-1000 | 30M0012 | 30M0036 | 30M0036 |
| 13 | Door Catch Crank | 30M0013 | 30M0013 | 30M0013 |
| 14 | Upper / Lower Hinge Plate | 30M0014 | 30M0014 | 30M0014 |
| 15 | Inner Door Film | 30M0015 | 30M0015 | 30M0015 |
| 16 | Choke Cover | 30M0016 | 30M0016 | 30M0016 |
| 17 | Control Pnl Cover ( see note 1.) | 30M0017 | 30M0017 | 30M0017 |
| 18 | MC-Series Membrane | 40M0956 | 40M0956 | 40M0956 |
| 19 | Display Screen | 30M0019 | 30M0019 | 30M0019 |
| 20 | Control Housing Moulding | 30M0020 | 30M0020 | 30M0020 |
| 21 | MC Series Logic PCB Assy | 11M0326 | 11M0326 | 11M0326 |
| 22 | Housing Support Bracket | 30M0022 | 30M0022 | 30M0022 |
| 23 | MC Series Relay PCB Assy | 11M0327 | 11M0327 | 11M0327 |
| 24 | 10 Way Ribbon Cable Assy | 11E0051 | 11E0051 | 11E0051 |
| 25 | Insulating Sheet | 30M0025 | 30M0025 | 30M0025 |
| 26 | Mains Cable Assy | 31Z0220 | 31Z0220 | 31Z0220 |
| 27 | Mica Plate | 30M0027 | 30M0027 | 30M0027 |
| 28 | Stirrer | 30M0028 | 30M0028 | 30M0028 |
| 29 | Decorative Trim LH | 30M0029 | 30M0029 | 30M0029 |
| 30 | Decorative Trim Top | 30M0030 | 30M0030 | 30M0030 |
| 31 | Air Inlet Filter | 30M0031 | 30M0031 | 30M0031 |
| 32 | Chassis | 30M0032 | 30M0032 | 30M0032 |
| 33 | HV Transformer J1342 | 30M0035 | ——— | ——— |
| | HV Transformer J1338 | ——— | 30M0033 | 30M0033 |
| 34 | Decorative Trim RH | 30M0034 | 30M0034 | 30M0034 |
| 35 | Strain Relief Bush | 31Z1036 | 31Z1036 | 31Z1036 |
| 36 | Oven Cavity MC1400/1800 | 30M0036 | 30M0036 | 30M0036 |
| 37 | Lamp Cover Film | 30M0037 | 30M0037 | 30M0037 |
| 38 | Lamp | 30M0038 | 30M0038 | 30M0038 |
| 39 | Lamp Holder | 30M0039 | 30M0039 | 30M0039 |
| 40 | Lamp Bracket | 30M0040 | 30M0040 | 30M0040 |
| 41 | Air Outlet Duct | 30M0041 | 30M0041 | 30M0041 |
| 42 | Temp Sensor | 30M0042 | 30M0042 | 30M0042 |
| 43 | Thermal Fuse | 30M0043 | 30M0043 | 30M0043 |
| 44 | Lamp Cover | 30M0044 | 30M0044 | 30M0044 |
| 45 | Back Case | 30M0045 | 30M0045 | 30M0045 |

Note 1.
Part 17 supplied as MC 1800, remove label for MC1000 & MC1400

## Part Number Identification Chart: MC series ovens

| No | Description | MC1000 | MC1400 | MC1800 |
|---|---|---|---|---|
| | | Part No | Part No | Part No |
| 46 | Rear Air Guide | 30M0046 | 30M0046 | 30M0046 |
| 47 | Upper Air Duct | 30M0047 | 30M0047 | 30M0047 |
| 48 | Cooling Fan Assembly | 30M0048 | 30M0048 | 30M0048 |
| 49 | Gold Resistor | 30Z0283 | 30Z0283 | 30Z0283 |
| 51 | Magnetron Thermostat | 30M0051 | 30M0051 | 30M0051 |
| 52 | 10A Fuse In-line Assembly | 11M0330 | 11M0330 | 11M0330 |
| 56 | Fan Scroll | 30M0056 | 30M0056 | 30M0056 |
| 57 | Main Capacitor Bracket | 30M0057 | 30M0057 | 30M0057 |
| 58 | Capacitor Clamp | 30M0058 | 30M0058 | 30M0058 |
| 59 | HV Capacitor 0.74uF | ——— | 30Z0377 | ——— |
| | HV Capacitor 0.88uF | ——— | 30Z0987 | ——— |
| | HV Capacitor 1.0uF | 30M0059 | ——— | 30M0059 |
| | HV Capacitor 1.1uF | ——— | ——— | 30Z0989 |
| 60 | Rear Panel | 30M0060 | 30M0060 | 30M0060 |
| 61 | Magnetron | 30M0061 | 30M0061 | 30M0061 |
| 62 | Magnetron Air Splitter | 30M0062 | 30M0062 | 30M0062 |
| 63 | Magnetron Cooling Duct | 30M0063 | 30M0063 | 30M0063 |
| 64 | Cooling Duct Cover | 30M0064 | 30M0064 | 30M0064 |
| 65 | Interlock Holder | 30M0065 | 30M0065 | 30M0065 |
| 66 a-d | Microswitch V5A010CB (4) | 30Z0233 | 30Z0233 | 30Z0233 |
| 67 | Fuse Cover | 30Z1080 | 30Z1080 | 30Z1080 |
| 68 | Spring 1 | 30M0068 | 30M0068 | 30M0068 |
| 69 | Spring 2 | 30M0069 | 30M0069 | 30M0069 |
| 70 | Top Lever | 30M0070 | 30M0070 | 30M0070 |
| 71 | Middle Lever | 30M0071 | 30M0071 | 30M0071 |
| 72 | Bottom Lever | 30M0072 | 30M0072 | 30M0072 |
| 73 | Filter Bracket | 40M0961 | 40M0961 | 40M0961 |
| 74 | 16A Mains Filter | 30Z0997 | 30Z0997 | 30Z0997 |
| 75 | Fuse Holder | 30Z0231 | 30Z0231 | 30Z0231 |
| 76 | Fuse 13A Anti surge | 30Z0168 | 30Z0168 | 30Z0168 |
| 77 | ——— | ——— | | |
| 78 | HV Diode Assy | 30M0078 | 30M0078 | 30M0078 |
| 79 | Self-Adhesive Foot | 30M0079 | 30M0079 | 30M0079 |
| 80 | Door Assembly | 11M0334 | 11M0334 | 11M0334 |
| 81 | Power Relay | 30M0081 | 30M0081 | 30M0081 |
| 82 | Oven Shelf | 30M0082 | 30M0082 | 30M0082 |
| 83 | HT Lead 1 | 30M0083 | 30M0083 | 30M0083 |
| 84 | HT Lead 2 | ——— | 30M0084 | 30M0084 |
| 91 | Mains Filter Bracket | 30M0091 | 30M0091 | 30M0091 |

## CIRCUIT DIAGRAM: MC Series ovens