

2008 Dishwasher Training Manual



DMR57



DMR77

This training is composed of 5 modules covering the 2008 Samsung Dishwasher models DMR57 and DMR77.

You may exit and re-enter the training as needed in between modules. When you re-enter the training, you will return where you stopped. You MAY NOT however exit the training in the middle of a module. You will be re-started at the beginning of the last saved module. The "SAVE" button at the bottom of the screen records your progress. If you want certification, you must successfully complete the 2008 Dishwasher Certification exam. To access the 2008 Dishwasher Certification exam, return to your list of assessments and choose that exam.

Total Kitchen Design

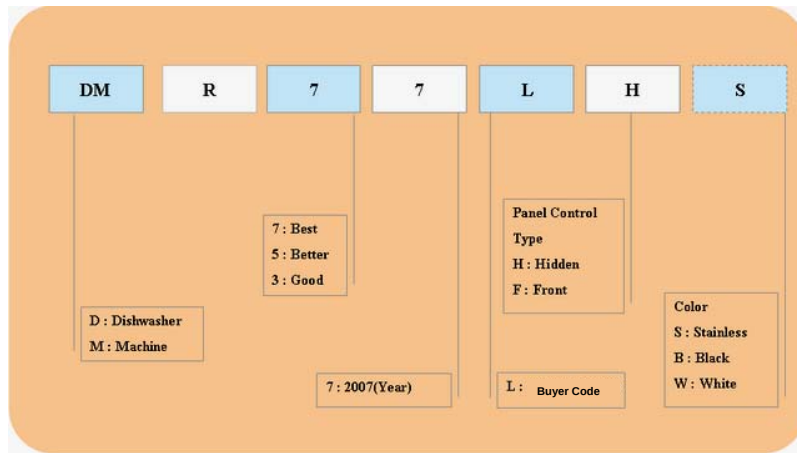
Cleanliness	Safety	Quietness	Design	Flexibility	
1. 3 Wash spray arms 2. Triple filtration & powerful food disposer 3. Half load & Auto cycles	1. Fan driven condensation drying system 2. Digital leak sensor	1. Low DBA noise level 2. Sound insulation	1. Sleek 1 touch sensor display 2. Total kitchen design	1. Adjustable upper rack 2. Adjustable plate angle 3. Flexible upper & lower dish racks	

Total Kitchen Design

Sporting a stylish handle that matches the design of the other Samsung total kitchen solutions products will give any kitchen that "custom built" look



Model Number Nomenclature



For 2008 there are two styles of dishwasher, a sleek front or traditional front design. The units are offered in three different color choices

Quietness

Problem - Washing dishes can be noisy, especially in the evening and when watching TV. Most of the noise is from the motor on the bottom and the water spraying system. Samsung has two technologies for the insulation of those areas.

Solution - Provides one of the lowest noise levels in it's class at 51dBA.

How it Works - Through tight isolation of the pump and a 6-layer Door insulation system

The front door panel has a unique 6-layer insulation system which dampens the noise from water spray. (Stainless Steel inner door-Asphalt-Felt-Air-Felt-Outer Door)



Washing dishes can be noisy, especially in the evening or when watching TV. Most of the noise is from the motor on the bottom and the water spraying system. Samsung employs two technologies to reduce the sound. The water pump is tightly isolated and the door uses a 6 layer insulation system.

Hidden Dryer Element

Problem - Exposed heating elements at the bottom of the tub can directly contact plastics, melting them. Also, potential burn hazard picking up small items right after the cycle is finished.

Solution - The heating element is hidden below the all-stainless tub. This eliminates the possibility of accidentally touching the element when hot. Also, this structure provides a better appearance for the dishwasher.



Exposed heating elements at the bottom of the tub can directly contact plastics, melting them. To reduce this problem the heating element is hidden below the all-stainless tub. This also eliminates the possibility of accidentally touching the element when hot.

Food Residue

- Problem – Some dishwashers leave heavy residue from dishes in a "catch", which must be manually cleaned.
- Solution - Samsung uses a hard food disposer with a triple filtration system, which is connected to the garbage disposal... so no residue builds up in the bottom of the dishwasher.
- How it Works - Conventional models have a two-way filtration system, but Samsung features a triple filtration system. Even tiny food particles can be removed from recirculation and improve our washing performance.

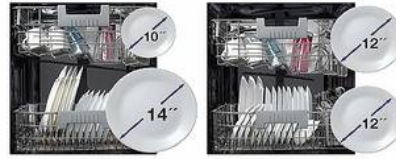
Some dishwashers leave heavy residue from dishes in a "catch", which must be manually cleaned. Samsung uses a hard food disposer with a triple filtration system. This is connected to a built in garbage disposal. This reduces the residue that builds up in the bottom of the dishwasher.

Loading Flexibility

Problem - Afraid to wash delicate items like wine glasses? Can't fit those new larger 14" plates under the top rack?

Solution - Tilted Rack

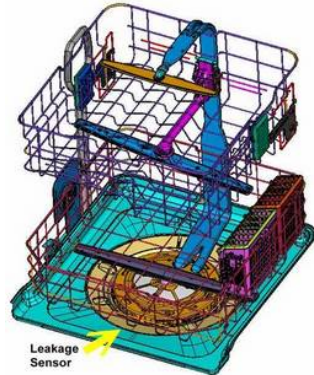
With tilted rack system, more space is provided to give you infinite freedom to load extra, even odd-sized items. It even easily accommodates large 14" plates with just a simple height adjustment. More importantly, the drying performance is enhanced because the water is able to drain off the washed items more easily, resulting in a reduction of water residue.



Afraid to wash delicate items like wine glasses? Can't fit those new larger 14" plates under the top rack? These units incorporate an adjustable tilted rack system which permits loading of small or large size items.

Leakage Detector

- Problem – Slow leaks can do considerable damage before they are discovered.
- Solution – By using a Digital Leakage Sensor, even small amounts of leakage will be detected before extensive floor damage occurs
- How it Works - When the sensor is exposed to water, the electrical poles are shorted, making the electrical connection. This shuts off the inlet valve.



A slow leak around your dishwasher can damage your floor or cabinets well before it is noticed. Samsung has included a leakage detector under the water reservoir that shuts off the water supply when a leak is detected.

3 Wash Arms

Problem - Not getting good washing performance in all rack positions?

Solution - Samsung uses 3 wash arms, top (1), middle (2), and bottom (3).

How it Works - Tilted Nozzle System Our main water spraying arm in the middle is tilted. Its tilted shape sprays the water effectively in all parts of the machine. This is important for washing 14" Plates



Conventional washers use a spray wash pattern that sometimes may not reach all of the dish racks equally. The unique spray arm style distributes water to the entire drum promoting even cleaning.

Condensed Drying

- Problem – Dishes don't get dry enough. Most conventional dishwashers have vent exit openings on the upper part of the machine, which can damage cabinetry, and emit hot vapor.
- Solution – Samsung's drying system is the fan-driven condensation type, which protects your kitchen and children, creating no steam from the machine when drying compared with vent drying system. Faster Drying by having fan compared with condensation-only type
- How it Works - Samsung's drying system is the fan-driven condensation type, while Samsung's system uses residual heat from the warm water inside the tub (creating condensation) and the fan at the same time for efficient drying.



The fan driven condensation system captures the latent heat of the wash heater to promote faster drying. Another benefit of this system is the removal of steam vents which might burn small children.

Convenient Auto Drying

- Problem – It's difficult to choose which cycle to use, but want to wash as efficiently as possible.
- Solution – Samsung's Smart AutoWash cycle make sure dishes get clean, but minimizes water and energy usage.
- How it Works - The turbidity sensor senses dirt particles in the rinse water, and knows to stop when the rinse water is clean.

Product Specifications

Model name	DMR 77LFS DMR 57LFS
Power Supply	Single phase AC 110V / 60Hz
Water Pressure	20 ~ 120 PSI
Wash spray method	Rotating nozzle spray type
Drying method	Fan driven condensing system
Power consumption	Standard cycle: 1.03 KWh $\pm$ 10%
Power	Circulation Motor: 170W $\pm$ 15% or below Heater: 1100W $\pm$ 10% or below Drain Pump: 45W $\pm$ 15% or below Fan Motor: 5.5W $\pm$ 15% or below
Water consumption	5.2 Gallons $\pm$ 15% or below
Main Features	▪ Capacity: 14 place settings ▪ Control panel design - Touch Sensor panel & LED Display - DMR77 : Hidden type - DMR57 : Front type ▪ Dimension (W x D x H) : 23.8 x 24.7 x 33.9 inch

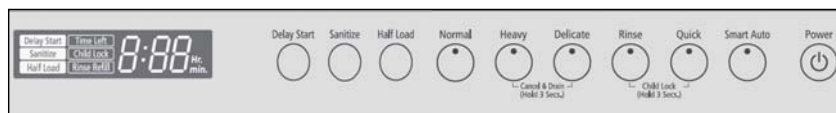
Both models use a unique tub design that uses less water than some other models saving energy and providing the same level of clean.

Product Comparison Specification

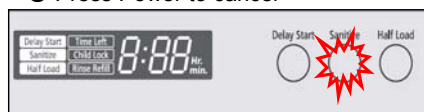
	DMR77LHS	DMR57LFS
Capacity	14 place settings	14 place settings
Display	Graphic LED	Graphic LED
Control Type	Touch Sensor	Touch Sensor
Control height	5.1 inches	5.1 Inches
Front Display	PC 3.5t	-
Washing Program	Normal, Heavy, Delicate, Rinse, Quick, Smart Auto	Normal, Heavy, Delicate, Rinse
	Delay Start, Sanitize, Half Load	Delay Start, Sanitize
Water Supply	Hot water only	Hot Water Only
Basket Color	Gray Color (Nylon Coating)	Gray Color (Nylon Coating)
Basket	Stair Style Basket	Stair Style Basket
Sensor	Inlet/Temp/Water Level/Rinse/Leakage	Inlet/Temp/Water Level/Rinse/Leakage
Rinse Supplement Direction	Yes	Yes
Half Load capable	Yes (Upper)	No
Filter	3-stage (Disposer Type)	3-stage (Disposer Type)
Heater	Internal Type (1100W)	Internal Type (1100W)
Dryer Type	Fan driven condensing system	Fan driven condensing system
Program Lock	Child Lock Button	Child Lock Button
Delay Start	1~ 24hr	1~24hr
SIZE	23.8×24.7×33.9 inch (W×H×D)	23.8×24.7×33.9 inch (W×H×D)

The top of the line DMR77 offers extra features such a auto wash, and quick wash. It also offers a half load cycle which can be used for smaller loads to save energy.

Delay Start / Sanitize Operation



- Maximum Delay Time 24 Hours
- Each button press postpones the start by 1 hour
- Press Power to cancel



- Enables High temperature cycle
- At 3th Rinse step, the water temperature is increased to a maximum temperature of 162°F. When [Sanitize] is not selected, the maximum temperature reaches 140 °F
- When [Rinse] Cycle is selected, you cannot select the [Sanitize] button.
- When the [Sanitize] button is selected, the Cycle time can be extended.

Unique Functions

Half Load



- Selecting this option runs the upper spray arm only, Select this option to wash a small load of dishes.

Child Lock



- [Child Lock] is selected by pressing the [Rinse] Button and [Quick] Button simultaneously for 3 seconds. You must press for 3 seconds again to cancel the selection.

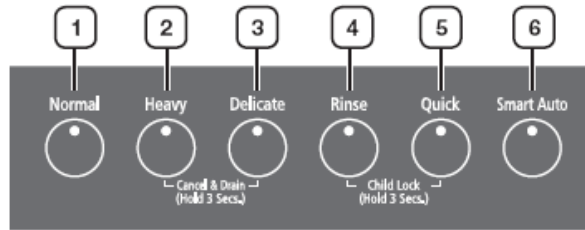
Delay start allows you to load the dishwasher and automatically start the wash operation up to 24 hours later. Each button press postpones start for 1 hour. This feature lets you wash dishes when it best fits your schedule, allowing you to take advantage of reduced electrical rates or avoid busy water usage times

The normal water wash temperature is 142 degrees, activating the sanitize feature increases the third rinse water temperature to 162 degrees. This feature can be used to prevent germs on baby bottles or similar dishes.

The Half Load option runs the upper spray arm only. Use this feature to wash small dish loads.

You can lock out the panel buttons by pressing the Rinse and Quick buttons simultaneously for 3 seconds. Use this feature to prevent accidental wash operation.

Cycle Explanation



1	Normal	Use this cycle for regular dinner dishes.
2	Heavy	Use this cycle for hard-to-clean, heavily soiled dishes, pots, pans, and dishes with heavy oil.
3	Delicate	Use this cycle for normally soiled dishes or fragile items such as glasses.
4	Rinse	Use this cycle for pre-cleaned dishes or glasses. No detergent is dispensed and no dry cycle is initiated.
5	Quick (only DMR77)	Use this cycle for lightly soiled dishes. Detergent is dispensed but no dry cycle is initiated.
6	Smart Auto (only DMR77)	This cycle detects the level of soil and automatically initiates the optimal cycle after a few minutes of operation.

These models offer 6 different wash cycles to handle a wide variety of cleaning needs. The delicate cycle reduces the wash time to prevent damage. The DMR77 offers an automatic wash feature designed to save energy by running the wash system only as long as the dishes are dirty and shutting down once clean water is detected.

Cycle Selection Time Chart

Program	Drain	Pre-wash 1	Pre-wash 2	Pre-wash 3	Main wash	Rinse 1	Rinse 2	Last Rinse	Dry	Total Time
Normal	0:45	16:30	(16:30)	-	32:30	7:30	(7:30)	32:30	20	110~134
Heavy	0:45	17:30	17:30	17:30	46:30	7:30	7:30	46:30	20	181
Delicate	0:45	16:30	-	-	37:30	7:30	-	32:30	20	115
Rinse	0:45	-	-	-	-	9:30	-	-	-	11
Quick	0:45	5:30	-	-	11:30	7:30	-	12:30	-	38
Smart Auto	0:45	5:30 ~17:30	(17:30)	(17:30)	11:30 ~46:30	7:30	(7:30)	12:30 ~46:30	20	58~181

Program	Pre-wash 1,2,3	Main wash	Rinse 1,2	Rinse 3	
				No Sanitize	Sanitize
Normal	-	120°F	-	140°F	162°F
Heavy	-	149°F	-	158°F	162°F
Delicate	-	113°F	-	140°F	162°F
Rinse	-	-	-	-	-
Quick	-	113°F	-	140°F	162°F
Smart Auto	-	113~149°F	-	140~158°F	162°F

•The wash time may vary depending on the water pressure, drain conditions, and temperature of the supplied water

All wash cycles are timed except the auto wash cycle. The auto wash cycle uses a sensor to monitor water cleanliness. Once the water is clear the unit is advanced to the final rinse and dry cycles.

Cycle Time Chart

MICOM cycle

Program chart [time (min), temperature]

Program	Drain	Pre-wash 1	Pre-wash 2	Pre-wash 3	Main wash	Rinse 1	Rinse 2	Rinse 3	Dry	Total Time
Normal	0:45	16:30	(16:30)	-	32:30	7:30	(7:30)	32:30	20	110~134
Heavy	0:45	17:30	17:30	17:30	46:30	7:30	7:30	46:30	20	181
Delicate	0:45	16:30	-	-	37:30	7:30	-	32:30	20	115
Rinse	0:45	-	-	-	-	9:30	-	-	-	11
Quick	0:45	5:30	-	-	11:30	7:30	-	12:30	-	38
Smart Auto	0:45	5:30 ~17:30	(17:30)	(17:30)	11:30 ~46:30	7:30	(7:30)	12:30 ~46:30	20	58~181

Program	Pre-wash 1,2,3	Main wash	Rinse 1,2	Rinse 3		
				No Sanitize	Sanitize	
Normal	-	120°F (49°C)	-	140°F (60°C)	162°F (72°C)	
Heavy	-	149°F (65°C)	-	158°F (70°C)	162°F (72°C)	
Delicate	-	113°F (45°C)	-	140°F (60°C)	162°F (72°C)	
Rinse	-	-	-	-	-	
Quick	-	113 °F (45°C)	-	140°F (60°C)	162°F (72°C)	
Smart Auto	-	113~149°F (45~65°C)	-	140~158°F (60~70°C)	162°F (72°C)	

Cycle Operation Description

Cycle name	Explanation	Comments
Pre- wash	Tub Fills with water	
Water Heating	After the water supply is completed, the heater may turn on to heat the water depending on the selected cycle.	
Detergent Dispensing	3 minutes after the fill operation is complete, the detergent dispenser opens	
Main wash	Circulation Motor Runs Only -	
Rinse	The number of Rinse Cycles (1-3) is determined by cycle selection.	For the [Normal], [Heavy], [Delicate], [Quick] and [Smart Auto] cycles, the last Rinse cycle is a heated rinse. (140°F for Normal, 158°F for Heavy and 162°F for sanitize)
		► The amount of Rinse Agent added can be set by the user. (4 levels)
Dry	20 Minutes – the fan operates for the last two minutes only	Dry cycle is included for all cycles except the [Rinse] & [Quick] cycle.

Rinse Cycle Time						
	Normal	Heavy	Delicate	Rinse	Quick	Smart Auto
Rinse1	7:30	7:30	7:30	9:30	7:30	7:30
Rinse2	(7:30)	7:30	-	-	-	(7:30)
Rinse3	32:30	46:30	32:30	-	12:30	12:30~46:30

Water Supply Operation

Water supply cycle

- A. Water supply function in the cycle starts 3 seconds after the drain function is completed.
- B. When there is no pulse input from the water supply valve after the water supply starts, the ERROR ("4E") will be displayed.
- C. The amount of water supplied is about 1.1 ~ 1.8 gallons. The amount of water supplied depends on the variances of flow meter, water pressure and inlet valve etc.
- D. When Over-flow level is detected, the ERROR ("oE") is displayed.
- E. When the water supply is not completed within 5 minutes, the ERROR ("4E") is displayed.

Drain Cycle Operation

A. Drain cycle operates when the operation button is initially entered or 1 second after the wash and rinse cycle are completed.

B. Drain function is executed as follows.

Remove remaining water (Initially press operation button)	Check float S/W after 45 seconds from the power is turned on
Drain cycle	Check float S/W after 70 seconds from the power is turned on

End function

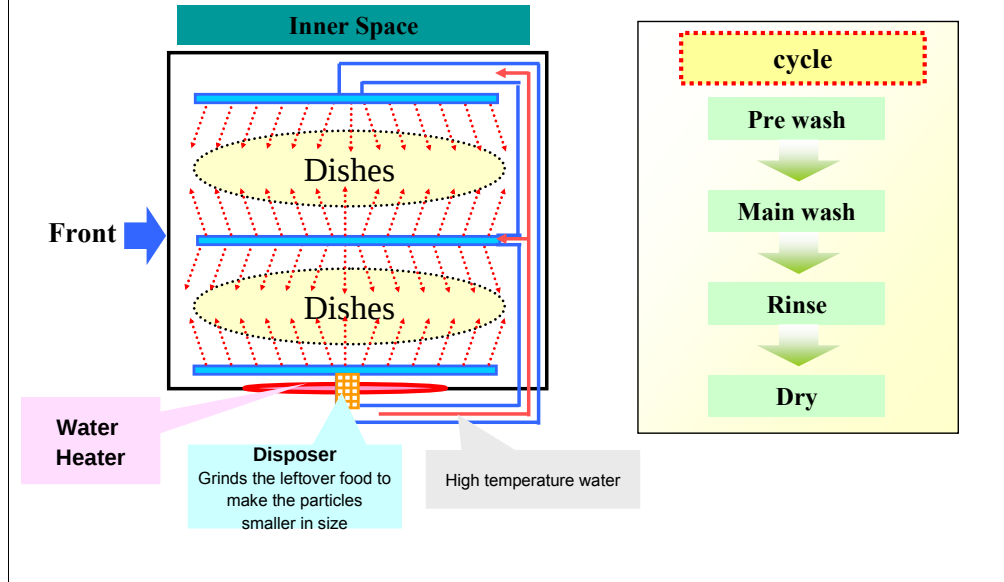
A. When all of the cycles within the selected cycle is executed, this function is executed.

B. During this function, the End sign is displayed with the MELODY generated.

C. After the selected cycle is completed, the power automatically turned OFF.

Operating Principles

Operating principle and order of dish washer



The process starts with the pre-wash cycle filling the tub with water. Step 2 heats the water, Step 3 triggers the detergent dispenser, in Step 4 the heated water is distributed throughout the tub. Step 5 drains the dirty water. Step 6 rinses the dishes with clean water Finally Step 7 Drains the tub and dries the dishes

Typical Drain and Circulation Errors

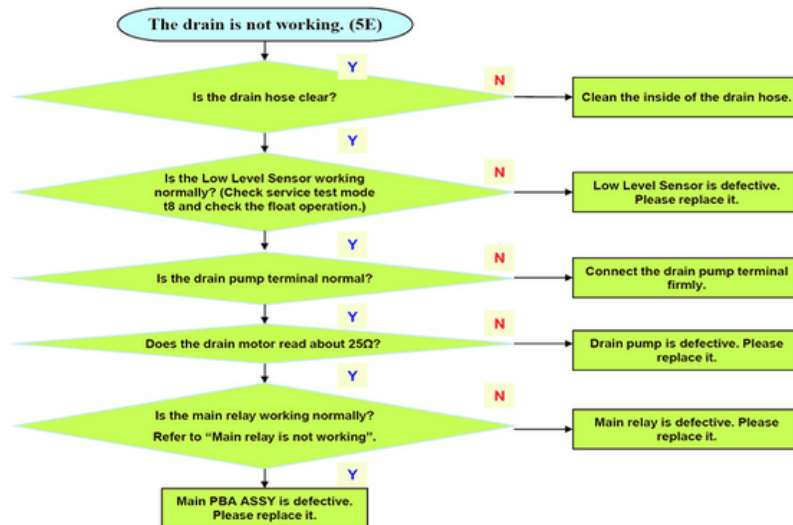
t2 - Circulation Motor Error - Nozzle does not spray

- 1. Press the Delay Start key to start or stop the pump.**
- 2. If a low water level is detected, water is supplied again and the operation continues.**

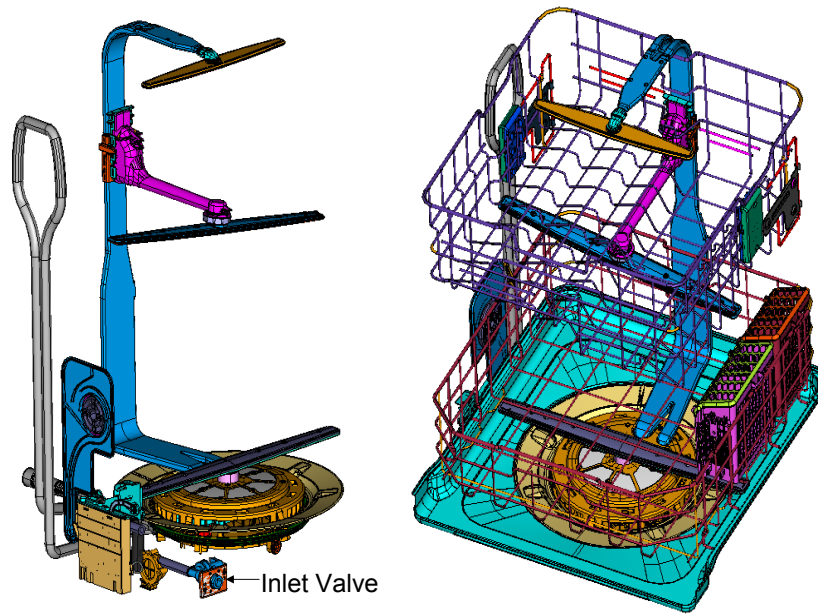
Drain Error - 5E - When OFF status of Low Level Switch is not detected within 3 minutes during the drain:

- Drain pump defect**
- Low Level Sensor defect**
- Particles clogging mater drain hose**
- Drain valve terminal not connected**
- Main board defect**

No Drain Troubleshooting



Water Flow Path



The inlet valve is opened 3 seconds after the initial start time or 3 seconds after the drain function is completed for rinse operation. The amount of water supplied is about 1.1 ~ 1.8 gallons. The amount of water supplied depends on the variances of flow meter, water pressure and inlet valve etc.

Test Program Modes

PCB TEST MODE

- 1) Press [Delicate] + [Rinse] + [Power] simultaneously to access this mode
- 2) All LED's will illuminate then the EEPROM is tested
 - If there is no issue with EEPROM, "EPA" will be displayed. If there is any issue, "Epn" will be displayed.
- 3) Press the "Normal" Key, to access the test modes
 - Note: be sure the door is closed
- 4) Every time you press the "Normal" Key, it changes from P1 -> P2 -> P3 -> P4.

P1 Mode : Operating part test mode. Every time you press the Delay Start Key, it toggles between run and stop. (Cold water->Circulation Motor->Fan Motor->Drain->Dispenser-> Half Load)

P2 Mode – Not Used

P3 Mode – Not Use

P4 Mode - Touch Key, LED, Display-LED test mode.

Press each button the corresponding LED illuminates after all buttons are pressed all LED's illuminate momentarily.

AGING TEST MODE – Continuous Wash Mode

- 1) Entry method: Press the "Sanitize+Normal" Key simultaneously when the power is turned on
- 2) After entering the mode, the display toggles between the total cycle time and total progress time repeatedly every 1 second.
 - To cancel: Turn the power off or press the Sanitize+Normal keys simultaneously

Test Modes Part 1

Mode	Related parts	Possible Error Codes	Activate Mode	Test Notes
t1	Inlet valve, Flow Meter, Low Level Sensor	4E error 9E error	If you press the Delay Start key, water is drained for 45 seconds and then the water supply starts. If the pulse count is more than 660, change the mode. Make sure to change the mode when the pulse count is more than 660 in t1 mode.	Water fill in approximately 70 seconds average water pressure, fills to about 1 inch past heater shield (very little water showing in unit)
t2	Circulation Motor	Nozzle does not spray	1. Press the Delay Start key to start or stop the pump. 2. If a low water level is detected, water is supplied again and the operation continues.	Place some cups on racks and run circulation pump to verify water distribution in tub.
t3	Circulation Motor, Heater, Thermistor	HE error	1. Press the Delay Start key to start or stop the heater and the circulation pump. 2. If a low water level is sensed, water is supplied again and the operation continues. 3. The current temperature is shown on the display. 4. It operates up to 158°F.	After temp increases 2 degrees F, time is about 50 seconds for each degree F increase
t4	Fan Motor	Fan Motor not working	Press the Delay Start key to start or stop the fan motor.	Listen for fan running

Test Modes Part 2

Mode	Related parts	Possible Error Codes	Activate Mode	Test Notes
t5	Drain Pump, Low Level Sensor	5E error	1. Press the Delay Start key to start the 2 parts. 2. "t5" starts blinking on the display while water is being drained. 3. When draining is finished, "t5" is displayed without blinking.	pump out is approximately 30 seconds
t6	Low Level Sensor	Display error when turning Micro S/W on/off	1. MICRO SWITCH On → The sensing state is displayed as 'On' on the 88 segment display. 2. MICRO SWITCH Off → The sensing state is displayed as 'OFF' on the 88 segment display.	t6 to OFF with no water – t6 to ON with water
t7	Thermistor	No change in water temperature	The current temperature is displayed.	Actual temp C of water in sump
t8	Synchronous Motor, Micro S/W	PE Error	1. If you press the Delay Start key, the parts operate just once. 2. There is no stop function. 3. While the synchronous motor is operating, its sensing state is displayed as On/OFF on the 88 segment display. 4. When the synchronous motor stops, the sensing state (On/OFF) of the micro switch is displayed.	ON 8 seconds, OFF 4 seconds

Line Test Mode

LINE TEST MODE

➤ TEST mode entry selection button : Heavy + Delicate + Power Button

→ After all-LED indication about 2 second, "Micom-Ver." and "Software-Ver." will be indicated.

Press the "Normal" button to test the cycle in order

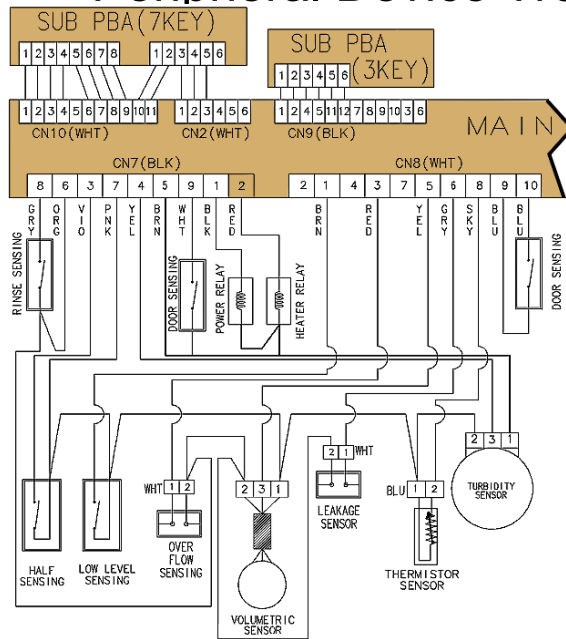
Mode	Display	Note
1 time		Water supply is executed after low level S/W is detected. If water is not supplied it will display the water supply error. When low level is detected after water is supplied, the "9E" error will be displayed
2 times		Operate Circulation Motor.
3 times		Operate Circulation Motor. When the temperature is 60℃ or above, the heater is turned "off". Continuous dispenser operation.
4 times	Sn	Skip to dr in the Better Model. Operate the Circulation Motor after initializing the Synchronous motor to Half Load location.
5 times	dr	Operate Vent Motor and check whether Rinse is refilled.
6 times	L	Supply water.
7 times	S	Supply water. Drain until low level is detected.
8 times	FL	Generate buzzer sound when the Synchronous Motor is initialized to full load location, and the "FL" display flashes.
9 times	Temperature	Display the temperature. Operate each operating part when the key is pressed. (See the below) When the 'Rinse' Key is pressed, it toggles between cold water On-Off. When 'Delicate' Key is pressed, it toggles between heat On-Off. When the 'Half Load' Key is pressed, it toggles between Synchronous Motor On-Off. When a different key is pressed during individual operation of the operating part, operating part is stopped and the applicable operation for the pressed key will start.

Service Test Modes

- 1) Entry method: Press the "Delay Start+Normal+Power" Key simultaneously for 3 seconds.
- 2) Display: "t1" is displayed 3 seconds after everything is displayed.
- 3) It switches to t1->t2->t3->t4->t5->t6->t7->t8 mode depending on the Normal Key entry
 - When operating each mode, the door must be kept closed.
 - If an "oE", "LE" or "tE1" error occur, make sure to enter Service Inspection Mode after resolving it.

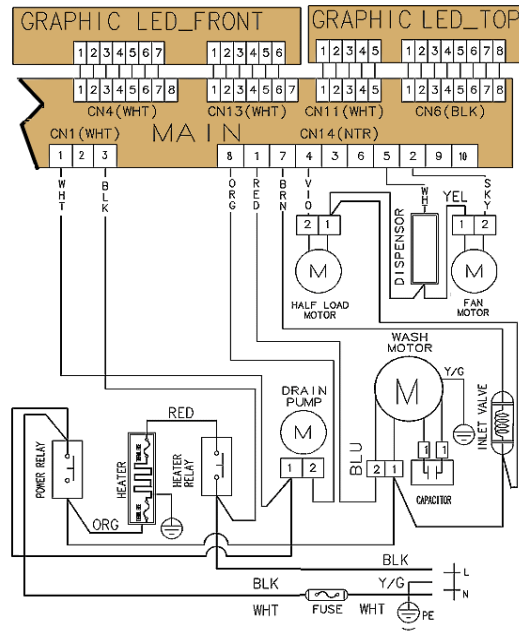
Mode	Related part	Symptoms (Error)	Note
t1	Inlet valve, Flow Meter, Low Level Sensor	4E error 9E error	If you press the Delay Start key, water is drained for 45 seconds and then the water supply starts. If the pulse count is more than 660, change the mode. Make sure to change the mode when the pulse count is more than 660 in t1 mode.
t2	Circulation Motor	Nozzle does not spray	1. Press the Delay Start key to start or stop the pump. 2. If a low water level is detected, water is supplied again and the operation continues.
t3	Circulation Motor, Heater, Thermistor	HE error	1. Press the Delay Start key to start or stop the heater and the circulation pump. 2. If a low water level is sensed, water is supplied again and the operation continues. 3. The current temperature is shown on the display. 4. It operates up to 70°C.
t4	Fan Motor	Fan Motor not working	Press the Delay Start key to start or stop the fan motor.
t5	Drain Pump, Low Level Sensor	5E error	1. Press the Delay Start key to start the 2 parts. 2. "t5" starts blinking on the display while water is being drained. 3. When draining is finished, "t5" is displayed without blinking.
t6	Low Level Sensor	Display error when turning Micro S/W on/off	1. MICRO SWITCH On → The sensing state is displayed as 'On' on the 88 segment display. 2. MICRO SWITCH Off → The sensing state is displayed as 'OFF' on the 88 segment display.
t7	Thermistor	No change in water temperature	The current temperature is displayed.
t8	Distributor Motor, Micro S/W (only DMR77)	PE error	1. If you press the Delay Start key, the parts operate just once. 2. There is no stop function. 3. While the Distributor motor is operating, its sensing state is displayed as On/OFF on the 88 segment display. 4. When the Distributor motor stops, the sensing state (On/OFF) of the micro switch is displayed.

Peripheral Device Troubleshooting



Temp. (°F)	Temp. (°C)	Resistance (k Ω)
41	5	125.780
50	10	98.323
59	15	77.454
68	20	61.465
77	25	49.120
86	30	39.517
95	35	31.996
104	40	26.065
113	45	21.385
122	50	17.599
131	55	14.579
140	60	12.140
149	65	10.159
158	70	8.542

Peripheral Device Troubleshooting Part 2

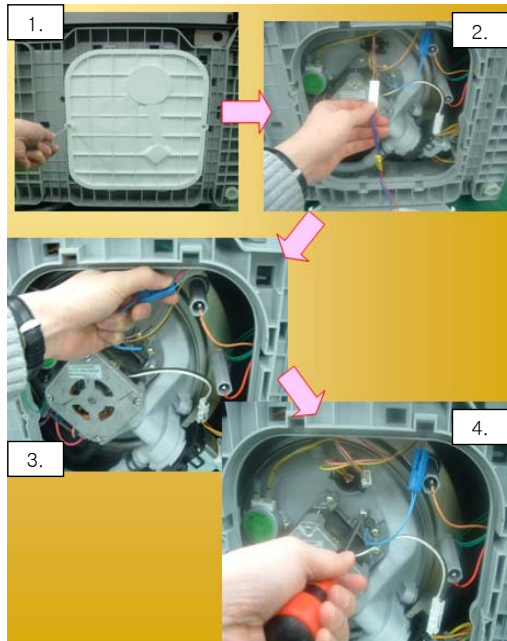


Disassembly Preparation

Preparation for parts replacement

1. Take out the residual water inside the product.
(Drain the water by operating the drain pump if possible)
2. Close the water supply valve.
3. Turn off the power.
You must turn off the circuit breaker connected to the product.
4. Pull out the unit from the sink and lay it on the floor.
Be careful of the drain hose when pulling out the unit.

Thermistor Replacement



- 1) Lay the product down so that you can see the BASE, and unscrew the 2 screws securing the BASE and the SHUTTER.
- 2) Separate the terminal of Leakage Sensor terminal of the Shutter.
- 3) After checking the THERMISTOR location, unscrew 2 screws securing the CASE SUMP.
- 4) Disassemble the wire connected to the THERMISTOR.

※ CHECK LIST

- ▶ Be careful of the residual water inside the unit
- ▶ The resistance of THERMISTOR at 77 °F should be 49Ω (Refer to table by temperature)
- ▶ The voltage between THERMISTOR connecting wires should be 0.2V~4.5V

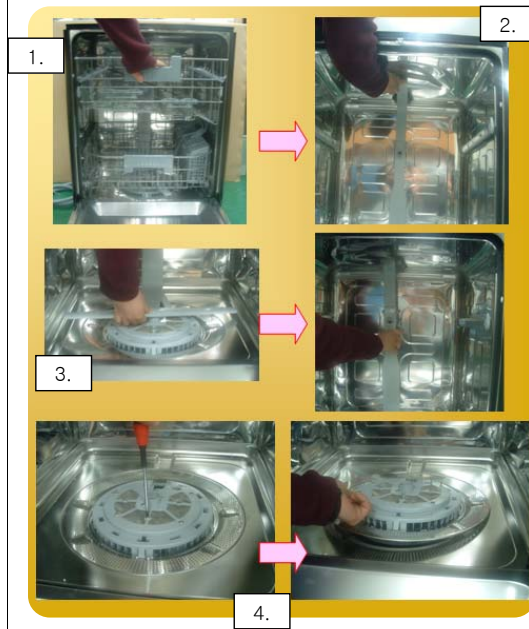
Lay the product down so that you can see the BASE, and unscrew the 2 screws securing the BASE and the SHUTTER. Separate the connector of Leakage Sensor. After checking the THERMISTOR location, unscrew 2 screws securing the CASE SUMP. Disassemble the wire connected to the THERMISTOR.

Thermistor Temperature / Voltage Chart

Temp. (°F)	Temp. (°C)	Resistance (k Ω)
41	5	125.780
50	10	98.323
59	15	77.454
68	20	61.465
77	25	49.120
86	30	39.517
95	35	31.996
104	40	26.065
113	45	21.385
122	50	17.599
131	55	14.579
140	60	12.140
149	65	10.159
158	70	8.542

This chart can be used to accurately measure the thermistor resistance according to the ambient temperature surrounding the device. These measurements must match this chart with a 5% tolerance for the thermistor to be considered good. Outside that range the device is defective.

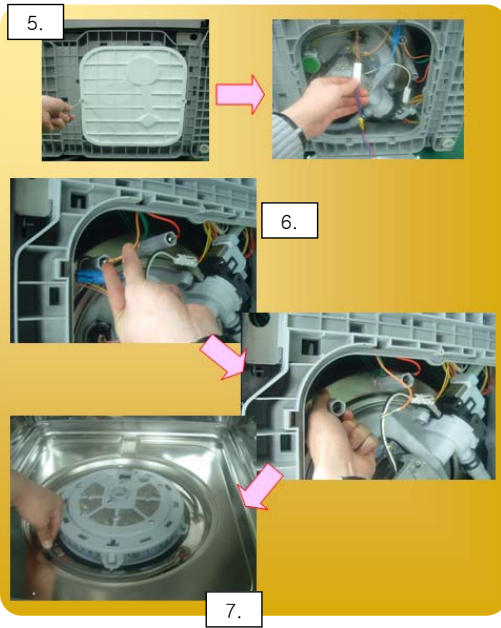
Heater Replacement part 1



- 1) Open the door and separate the upper and lower rack from the dish washer.
- 2) Separate the nozzle bottom.
- 3) Separate the nozzle duct.
- 4) Disassemble the Sump assembly and separate the Cover Sump & cover Heater.

Heater replacement starts with 1. Open the door and separate the upper and lower rack from the dish washer. 2. Separate the nozzle bottom. 3. Separate the nozzle duct. 4. Disassemble the Sump assembly and separate the Cover Sump & cover Heater.

Heater Replacement Part 2



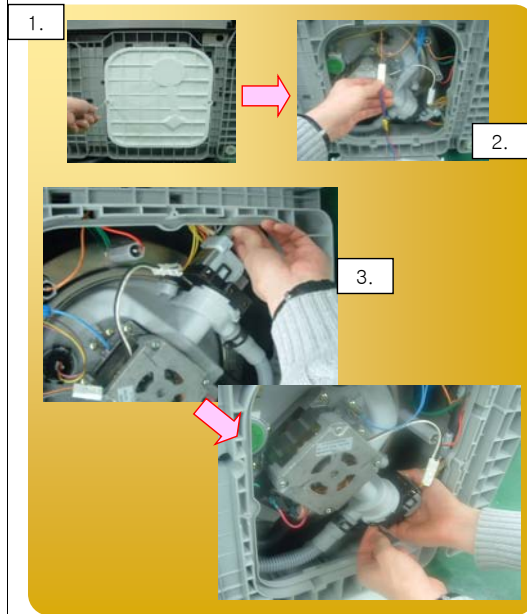
- 5) Lay the product down, and unscrew the 2 screws securing the BASE and the Shutter. Separate the terminal of Leakage Sensor terminal of the Shutter.
- 6) After disassembling the terminal inserted to the Heater, turn the Holder Heater in CCW direction to disassemble it.
- 7) Set the product upright and open the door to pull out the heater. Be careful of the interference with the Heater Bracket.

※ CHECK LIST

- ▶ Measure the resistance of the heater ends: 12Ω (Measure after removing the connecting terminal)
- ▶ Check the relay connecting terminal and check the operating signal

5) Lay the product down, Protect the washer and the customer's floor and cabinets with a blanket, and unscrew the 2 screws securing the Base and the Shutter. Disconnect the Leakage Sensor terminal 6) After disconnecting the terminal to the Heater, turn the Heater Holder in CCW direction to remove it. 7) Set the product upright and open the door to pull out the heater from the inside. Be careful of the interference with the Heater Bracket.

Drain Pump Disassembly



- 1) Lay the product down, and unscrew the 2 screws securing the BASE and the Shutter. Separate the terminal of Leakage Sensor terminal of the Shutter.
- 2) Separate the terminals (2 units) of the PUMP DRAIN.
- 3) Turn the PUMP DRAIN in CCW direction to pull it out.

※ CHECK LIST

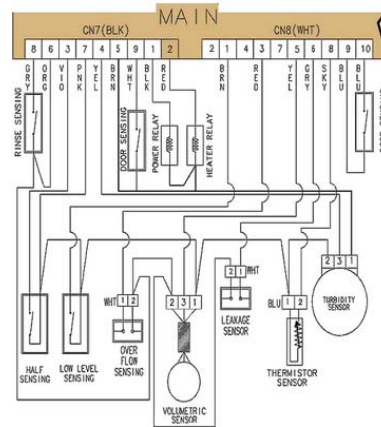
- ▶ Be careful of the residual water inside the unit from prior wash
- ▶ Check the drain motor coil resistance (25Ω): Measure product condition
- ▶ Check the voltage between the drain motor terminals of 120V
- ▶ PCB: Check CN1 – CN14 (120V)

Lay the product down, Protect the washer and the customer's floor and cabinets with a blanket, and unscrew the 2 screws securing the BASE and the Shutter. Separate the terminal of Leakage Sensor terminal of the Shutter. Separate the 2 terminals of the PUMP DRAIN. Turn the PUMP DRAIN in CCW direction to pull it out. Care must be taken as there most likely will be some water still in the pump and the dishwasher sump.

Drain Pump Operation



The Drain pump operates when the operation button is initially entered or one second after the wash and rinse cycles are completed. Normally the drain pump operates for 30 to 45 seconds. 70 seconds after the cycle ends the float switch is monitored. The float switch feeds back to the main CPU that the tub is empty. Error 5E indicates the tub is not empty. Error 5E can be a restricted drain hose or a defective drain pump. The drain pump should measure approximately 25 ohms.



The Drain pump starts when the operation button is initially entered or one second after the wash and rinse cycles are completed. Normally the drain pump operates for 30 to 45 seconds. 70 seconds after the cycle ends the float switch is monitored. The float switch feeds back to the main CPU that the tub is empty. Error 5E indicates the tub is not empty. Error 5E can be a restricted drain hose or a defective drain pump. The drain pump should measure approximately 25 ohms.

No Drain Troubleshooting - Error 5E

A good drain motor should measure $\sim 25\Omega$



Check to make sure the drain hose is not clogged and that the low level sensor is good.

Check the operation of the Drain Pump Relay: Check the operating voltage between the White wire of CN1 Pin 1 on the Main board and the Orange wire of CN14 Pin 8.

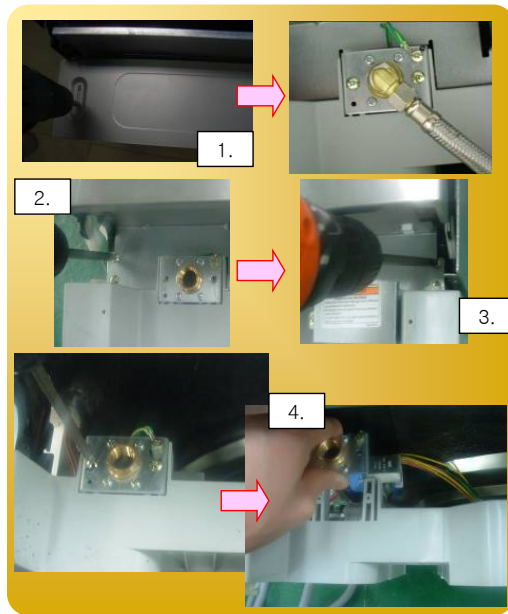
Normal: 120VAC (while operating)

- Faulty: Replace the Main PCB ASSY.

- Normal: Replace the Drain Pump.

For drain problems, never assume that the drain pump is defective without checking other items first. Make sure the drain is clear, check the drive voltage is being sent to the pump motor. If the voltage is present at the board, check it at the pump, there might be a wiring harness problem that ranges from an open wire to nothing more than a loose connector. Use the service and test procedures to manually turn on this device.

Water Valve Disassembly



- 1) Disassemble the front lower Cover. Check before disassembly that the water supply valve connected to the water supply line is turned off.
- 2) Disassemble the front lower Frame .
- 3) After separating the water supply hose connected to the water supply valve, disassemble the water supply valve. (2 screws)
- 4) Hold the water supply valve and pull it up to separate the clamp.

※ Check List

- ▶ The Solenoid coil should read 1.2K Ω
- ▶ Check the voltage at the water supply valve terminals of 120V.
- ▶ Check PCB RELAY: Check CN1 – CN14 120VAC

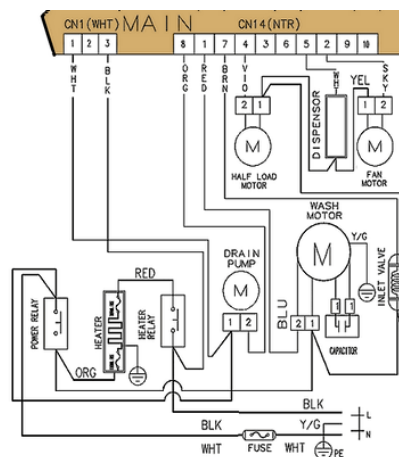
Disassemble the front lower Cover. Check before disassembly that the water supply valve connected to the water supply line is turned off. Disassemble the front lower Frame. After separating the water supply hose connected to the water supply valve, disassemble the water supply valve. (2 screws) Hold the water supply valve and pull it up to separate the clamp. Care should be taken as there will be a small amount of water still in the water supply line. If disconnecting the right angle fitting make sure Teflon tape is used to reseal the fitting and always check for leaks before attaching the front covers.

Water Valve error Codes



Error Code ("oE") is displayed when the case sensor is triggered. (oE) is usually caused by a defective fill valve.

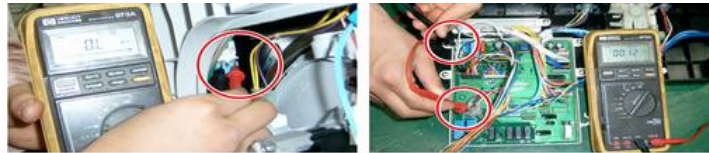
Error Code 4E is displayed if there is no pulse input from the water supply valve after the water supply starts. 4E may also be displayed if the fill time exceeds 5 minutes. 4E can be a problem with the external water supply, a restricted hose or a defective water valve.



No Water Fill Troubleshooting - Error 4E



Measure the coil in the Inlet Valve. Remove the connector before measuring. A good valve winding measures $\sim 1200 \Omega$

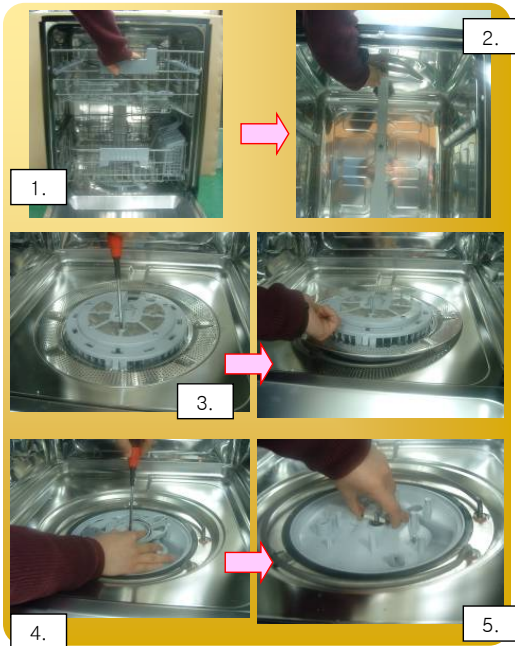


Check whether the Inlet Valve is operating normally. Check the operation of the Inlet Valve by measuring 120VAC across it while it is operating. Check the Inlet Valve Relay for 120VAC. Check the voltage between the white wire of the Main board CN1 Pin 1 and the brown wire of CN14 Pin 7.

For a no water fill problem check the obvious first. Make sure the water supply is turned on. Check the drive voltage to the water inlet valve from the main board. This should be 120VAC so care must be taken. If the voltage is present at the board check it at the valve. Check the resistance of the valve windings which should be $\sim 1.2K \Omega$ if normal, check the wiring harness and also check for loose connections.

Use the service and test procedures to manually turn on this device.

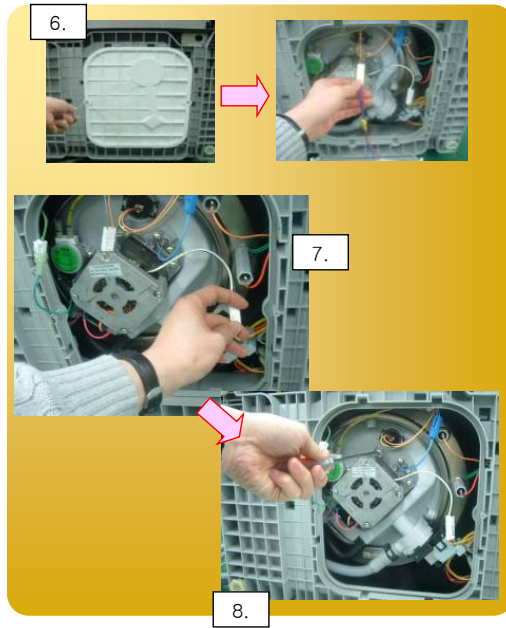
Circulation Pump Disassembly Part 1



- 1) Open the door and pull out the Upper and Lower Basket.
- 2) Separate the Top, Bottom and Duct Nozzle.
- 3) Disassemble the Sump assembly and separate the Sump & Heater covers.
- 4) Disassemble the Circulation Impeller and separate the Case Scroll.
- 5) Separate the Disposer Cutter.

Open the door and pull out the Upper and Lower Basket. Separate the Top, Bottom and Duct Nozzle. Disassemble the Sump assembly and separate the Sump & Heater covers. Disassemble the Circulation Impeller and separate the Case Scroll. Separate the Disposer Cutter.

Circulation Pump Disassembly Part 2



- 6) After laying the product down and disassembling the Shutter, separate the Leakage Sensor terminal assembled on the Shutter.
- 7) Separate the terminal of Circulation Motor.
- 8) Disassemble the Circulation Motor and separate it from the Sump assembly.

※ Check List

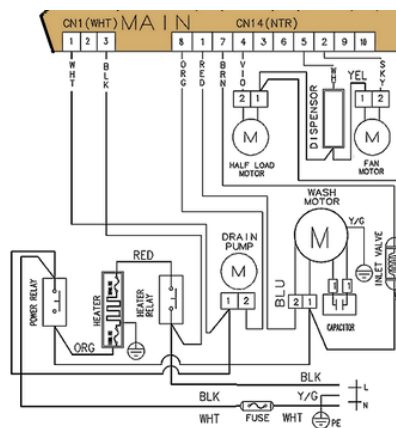
- ▶ Be careful of the residual water inside the unit from prior wash
- ▶ Check the voltage at the connectors: 120VAC
- ▶ Check coil resistance: 16.5Ω (Measure after removing connectors)
- ▶ PCB : Check CN1 -CN14 (120VAC)

6) After laying the product down and disassembling the Shutter, separate the Leakage Sensor terminal assembled on the Shutter. 7) Separate the terminal of Circulation Motor. 8) Disassemble the Circulation Motor and separate it from the Sump assembly.

Circulation Pump Error Code

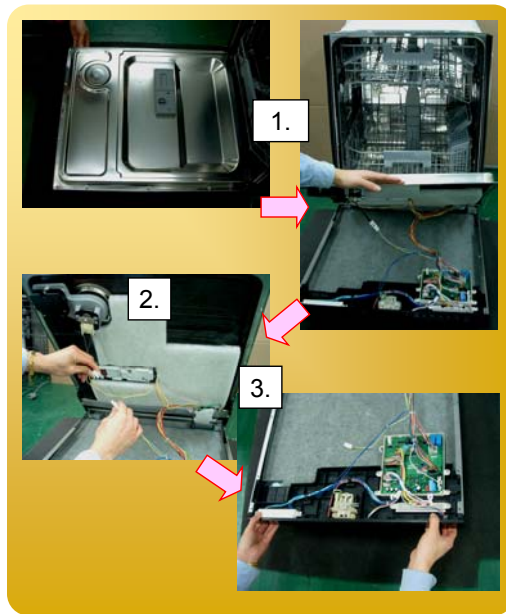


"t2" is displayed if there is a circulation pump error. This can be a low water condition or a problem with the pump. Verify the drive signal is reaching the pump prior to replacing the circulation pump.



"t2" is displayed if there is a circulation pump error. This can be a low water condition or a problem with the pump. Verify the drive signal is reaching the pump prior to replacing the circulation pump. The wash motor should read 16.5 ohms normally.

Control Panel Disassembly Part 1



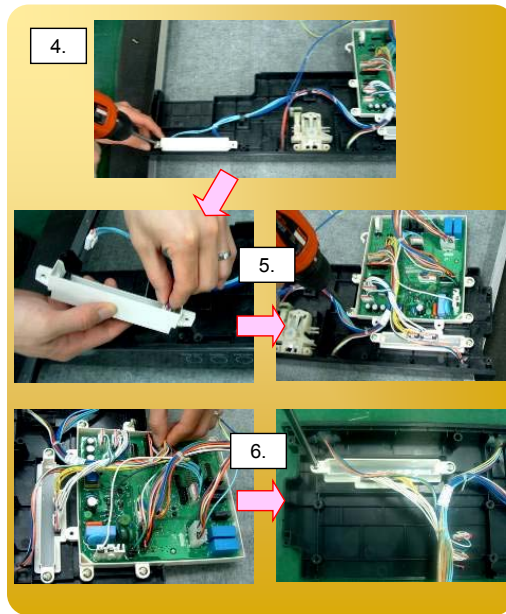
- 1) Open the door and unscrew the Front Frame, Front Tub and Panel Control. (12 screws)
[Caution]
 - Always set a mat on the floor so that the front of the Frame does not get damaged during the work.
 - When you remove all the screws, the Front Tub may spring closed, be careful.
- 2) After separating the Fan Motor terminal, put the Front Frame assembly down on the floor.
- 3) Pull out the terminal of the Door Switch and then you can replace the Door Switch if needed.
[Proceed to 4) when disassembling Display LED, Display LED Front or PCB assembly.]

※ Check List

- ▶ Check the voltage between Door S/W ends
 - When open: ~5VDC
 - When closed: 1VDC or below

Open the door and unscrew the Front Frame, Front Tub and Panel Control. (12 screws) [Caution] - Always set a mat on the floor so that the front of the Frame or the customer's floor does not get damaged during the work. - When you remove all the screws, the Front door may spring closed, be careful. After separating the Fan Motor terminal, put the Front Frame assembly down on the floor. Pull out the terminal of the Door Switch and then you can replace the Door Switch if needed. [Proceed to 4) when disassembling Display LED, Display LED Front or PCB assembly.]

Control Panel Disassembly Part 2



* Display LED removal

- 4) Disassemble the Display LED by removing the 2 screws that hold it and disconnect the wiring harness.
[Caution]
Be careful not to reuse the O-ring seal when reassembling the unit.

* PCB removal

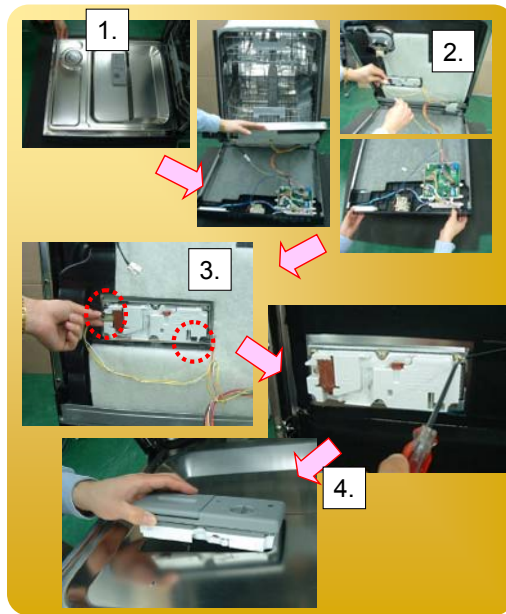
- 5) Remove the 4 screws that hold the PCB assembly in place and disconnect the wiring harness of PCB.
[Caution]
- When separating the connectors, always turn the power off before working.

* Front Display LED removal

- 6) Remove the 2 screws that hold the LED Display in place and disconnect the wiring harness of the LED Display.

Once the front door and inside panel are separated the fan, LED display and board can be removed and replaced.

Dispenser Replacement



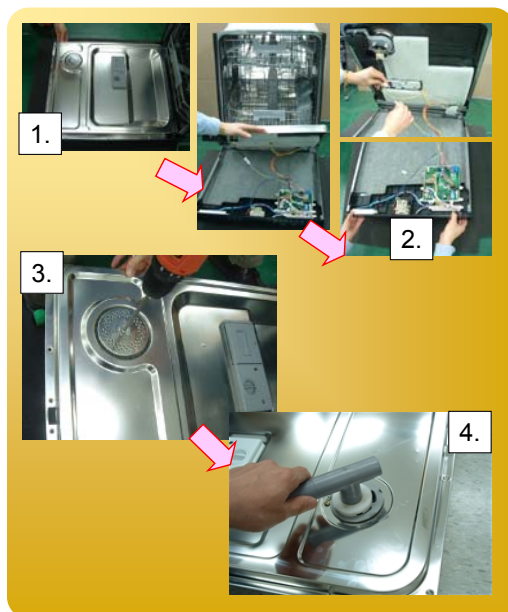
- 1) Open the door and unscrew the screws of Front Frame and Front Tub (12 screws)
[Caution]
- When you unscrew all the screws, the Front Tub may spring closed, be careful.
- 2) After separating the Fan Motor terminal, put the Front Frame assembly down on the floor.
- 3) Disassemble the terminal connected to the DISPENSER. You must disassemble both the left and right terminals.
- 4) Unscrew 6 screws securing the DISPENSER. It is fixed to the tub front with a hook. Use a flat screwdriver to remove it from the tub front.

※ Check List

- Because there is a risk of leakage after replacement, check whether it is sealed properly.
- The voltage on the terminals should measure 120VAC or a resistance of $\sim 2.3\Omega$

Open the door and unscrew the screws of Front Frame and Front Tub (12 screws)
[Caution] - When you unscrew all the screws, the Front Door may spring closed, be careful. After separating the Fan Motor terminal, put the Front Frame assembly down onto the floor. Disassemble the wiring connected to the DISPENSER. You must disassemble both the left and right terminals. Unscrew 6 screws securing the DISPENSER. It is fixed to the tub front with a hook. Use a flat screwdriver to remove it from the tub front.

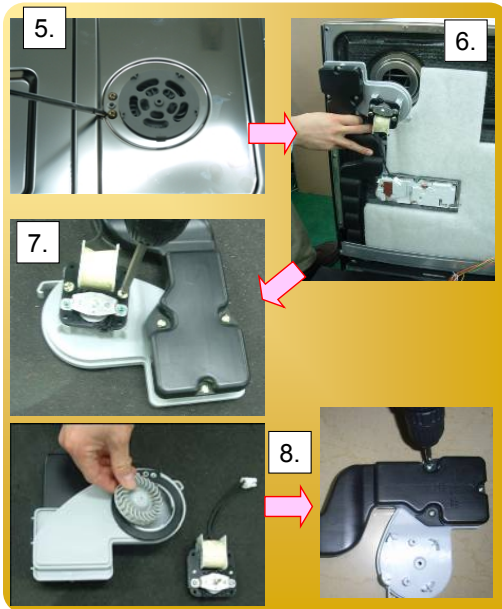
Fan Vent Disassembly Part 1



1. Open the door and unscrew the screws of Front Frame and Front Tub (12 screws)
[Caution]
- When you unscrew all the screws, the Front Tub can close up injuring the worker.
2. After separating the Fan Motor terminal, put the Front Frame assembly down on the floor.
3. Disassemble the Bracket Cover Fan. (1 Screw)
4. Disassemble the Cover Fan by rotating it counterclockwise with a jig or long nose pliers.

Open the door and unscrew the screws of Front Frame and Front Tub (12 screws)
[Caution] - When you unscrew all the screws, the Front Door can snap closed injuring the worker. After separating the Fan Motor terminal, put the Front Frame assembly down on the floor. Disassemble the Bracket Cover Fan. (1 Screw)
Disassemble the Cover Fan by rotating it counterclockwise with a jig or long nose pliers. (the insulated end) When working on the front cover careful not to dent or scratch the stainless steel sheet metal.

Fan Vent Disassembly Part 2



- 5) Remove the 2 screws holding the cover fan in place.
- 6) Hold and remove both the case vent ASSY and the duct condenser ASSY.
[Caution]
- Be careful while removing them as the duct condenser is touching the bracket door link.
- 7) Remove the 2 screws holding the fan motor from the case vent ASSY. And carefully pull out the fan motor.
- 8) Remove the duct condenser from the case vent ASSY (3 screws).
※ Check List
 - ▶ Because there is a risk of leakage after replacement, check whether it is sealed properly.
 - ▶ Check the voltage of Fan Vent ends: 120V
 - ▶ PCB RELAY : Check CN1 ~ CN14(120V)
 - ▶ Measure coil resistance of both ends: 150Ω

5. Remove the 2 screws holding the cover fan in place. 6. Hold and remove both the case vent ASSY. and the duct condenser ASSY. [Caution] - Be careful while removing them as the duct condenser is touching the bracket door link. 7. Remove the 2 screws holding the fan motor from the case vent ASSY. And carefully pull out the fan motor. 8. Remove the duct condenser from the case vent ASSY (3 screws). Careful not to scratch or dent the stainless steel covers or the damage the customer's floor or cabinets.

No Dry Operation Troubleshooting



Check the resistance of the Fan Motor coil.
(Remove the connector before measuring.) Normal measurement ~ 150 Ω

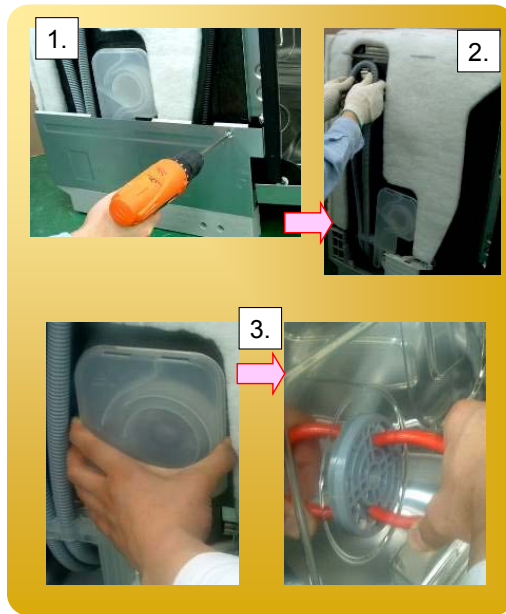


Check the operation of the Fan Motor Relay:
Check the operating voltage between the white wire of the CN 1 Pin 1 and the sky blue wire of the CN14 Pin 2.
Normal measurement will be 120VAC (while operating)
NOTE: The power relay must be good for the fan to operate

The fan is no different from testing any other device in the washer. There should be a drive voltage of 120VAC going to it when energized. However the fan motor itself can be checked for resistance of the windings which should be ~150 Ohms if normal. Check the wiring harness and connections. Also in the case of the fan make sure nothing is blocking it or impeding the fan blades.

Use the service and test procedures to manually turn on this device.

Case Sensor Disassembly Part 1



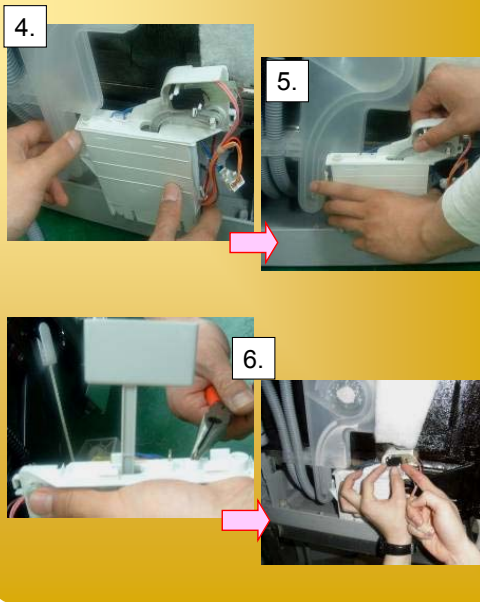
- 1) Unscrew the screws (2 Screws) connecting the Frame L.
- When you separate the Frame L, you can check the Case Sensor, and replace the Micro S/W on the Cover Sensor part.
- 2) Separate the Drain Hose from the Bracket Hose Drain.
- 3) Separate the Case Brake and Cover Brake.
[Caution]
- When disassembling, you must use the jig for the Cover Brake. If you have no jig, you can use a pair of long nose pliers.

※ Check List

- ▶ The voltage at the Micro Switch terminals should measure 4.5~5.25V after drain completion
- ▶ Measuring the continuity of the Micro Switch should measure:
 - When pulling the lever up: Short
 - When pulling the lever down: Open

Unscrew the screws (2 Screws) connecting the Frame L. - When you separate the Frame L, you can check the Case Sensor, and replace the Micro S/switch on the Cover Sensor part. Separate the Drain Hose from the Bracket Hose Drain. Separate the Case Brake and Cover Brake. [Caution] - When disassembling, you must use the jig for the Cover Brake. If you have no jig, you can use a pair of long nose pliers. (the insulated end only)

Case Sensor Disassembly Part 2



4) Separate the Case Sensor from the Case Brake.

[Caution]

- Be careful not to break the Hook.

5) Separate the Case Sensor and Cover Sensor.

[Caution]

- Be careful not to break the Hook.

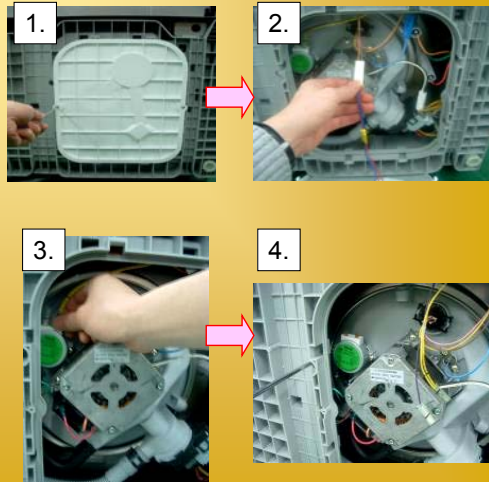
6) Separate the Pole Sensor (2 units) from the Cover Sensor. Separate the terminal of the Pole Sensor.

※ Check List

- ▶ Measure the voltage of Micro S/W ends
: It is normal when the voltage is 0.5V or below after water supply is completed and 4.5~5.25V after water drain is completed.
- ▶ Measure the Micro S/W product
: Short when the lever is pulled up and open when pulled down

4) Separate the Case Sensor from the Case Brake. [Caution] - Be careful not to break the Hook. 5) Separate the Case Sensor and Cover Sensor. [Caution] - Be careful not to break the Hook. 6) Separate the Pole Sensor (2 units) from the Cover Sensor. Separate the terminal of the Pole Sensor.

Distributor Disassembly



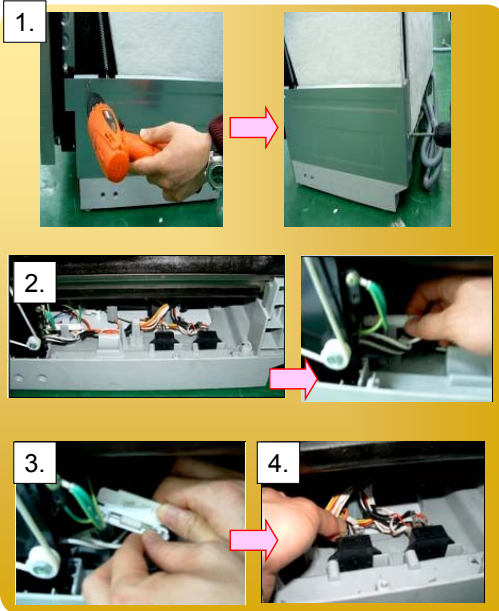
- 1) Place the dishwasher on its back so that you can see the base. Remove the two (2) screws that hold the base and the shutter in place.
- 2) Remove the leakage sensor connector (white) inside the shutter.
- 3) Remove the two (2) distributor motor connectors.
- 4) Remove the two (2) screws that hold the distributor motor in place.
(You can remove one of the two screws through the hole in the base.)
Pull the distributor motor out.

※ Check List

- ▶ Check PCB: Check CN1-CN14 voltage: (120VAC)
- ▶ Check the voltage of Synchronous Motor: (120VAC)
- ▶ Check the resistance of Synchronous Motor: (2.6k Ω)

Place the dishwasher on its back so that you can see the base. Remove the two (2) screws that hold the base and the shutter in place. Remove the leakage sensor connector (white) inside the shutter. Remove the two (2) distributor motor connectors. Remove the two (2) screws that hold the distributor motor in place. (You can remove one of the two screws through the hole in the base.) Pull the distributor motor out.

Relay and Fuse Replacement



- 1) Unscrew the screws (2 Screws) connecting the Frame R.
- 2) When you separate the Frame R, you can check the Fuse & Relay.
- 3) Pull out Fuse case that be fixed on hook of Base.
- 4) Open the Fuse case.
Check the fuse. & It can replacement.
- 5) Separate the terminal of Relay.
Unscrew the screws of relay using short-body screwdriver.

※ Check List

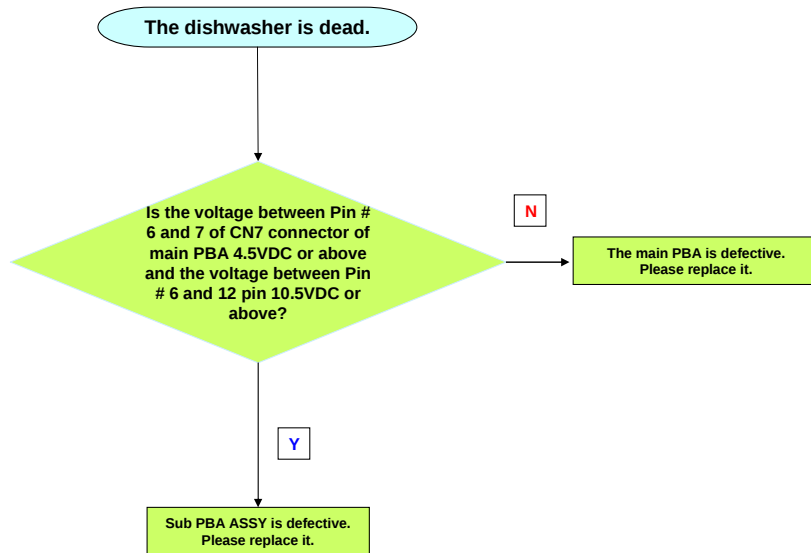
- ▶ When reconnecting the relay terminals after check or replacement, you must be careful not to switch the connectors to the wrong relay.

Unscrew the screws (2) connecting the right frame. When you separate the right frame, you can check the Fuse & Relay. Pull out Fuse case that is attached to the base. Open the Fuse case. Check the fuse & replace if defective. Separate the Relay terminals. Remove the screws of the relays using short-body screwdriver.

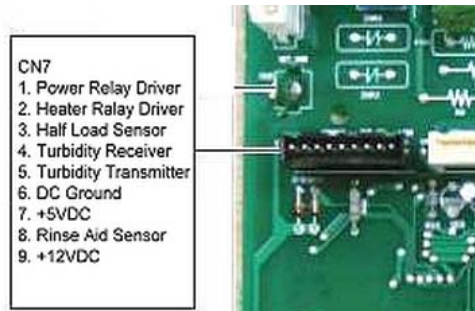
When reconnecting the relay terminals after check or replacement, you must be careful not to switch the connectors to the wrong relay.

No Power Troubleshooting

1. When the power does not come on



No Power Troubleshooting

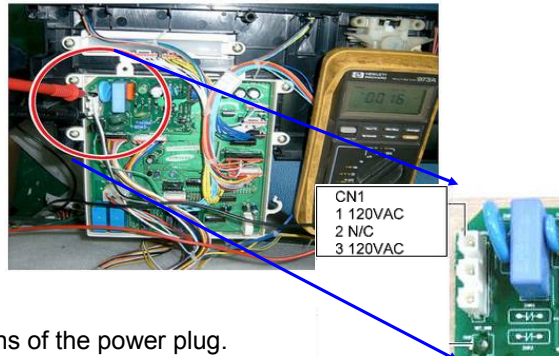


Is the voltage between Pin 6 and 7 of connector CN7 on the main board measure +5VDC and the voltage between Pin 6 and 12 measure +12VDC? If not replace the Main board. If the voltage is present replace the Sub board.

Troubleshooting the dishwasher follows the same logical troubleshooting procedures as other appliances. Always start by checking the voltages that are always on such as the 5 and 12 volt lines. These voltages are always there as long as the power is applied to the machine. When measuring these voltages never assume that the chassis is the reference ground. Use the ground connection from the connector. Always consult the service manual for the model under repair for the correct connections.

To check the individual motors and valves, the service mode can be used to manually turn on these devices. This procedure is covered in a different module or consult the service manual for the model under repair for the proper procedure.

No Power Troubleshooting Continued

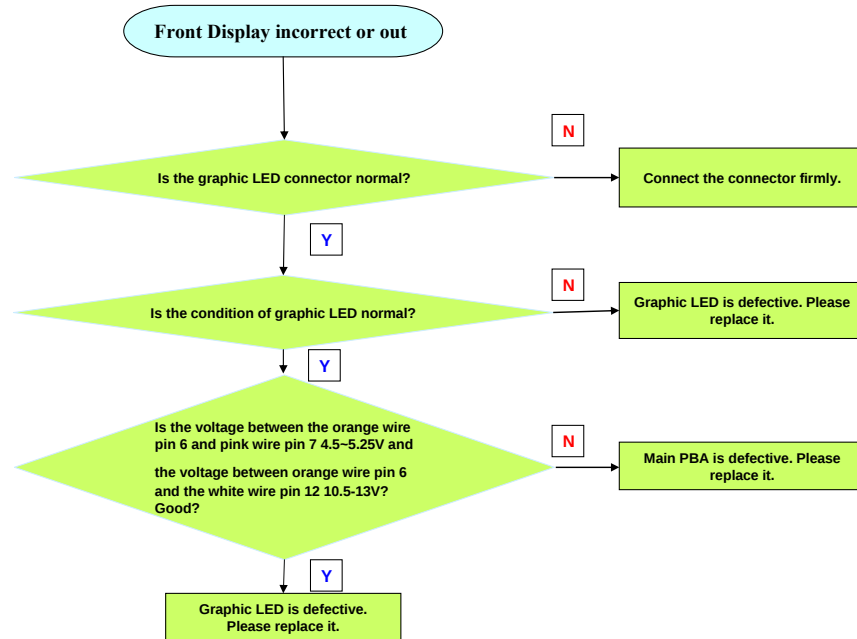


1. Check the connections of the power plug.
2. Check the voltage of the power outlet. Normal: AC 120V
3. Check whether the fuse is open.
4. Check the wires of the Main board power supply.
 - Measure the voltage between the black wire and the white wire of CN1. Normal: AC 120V

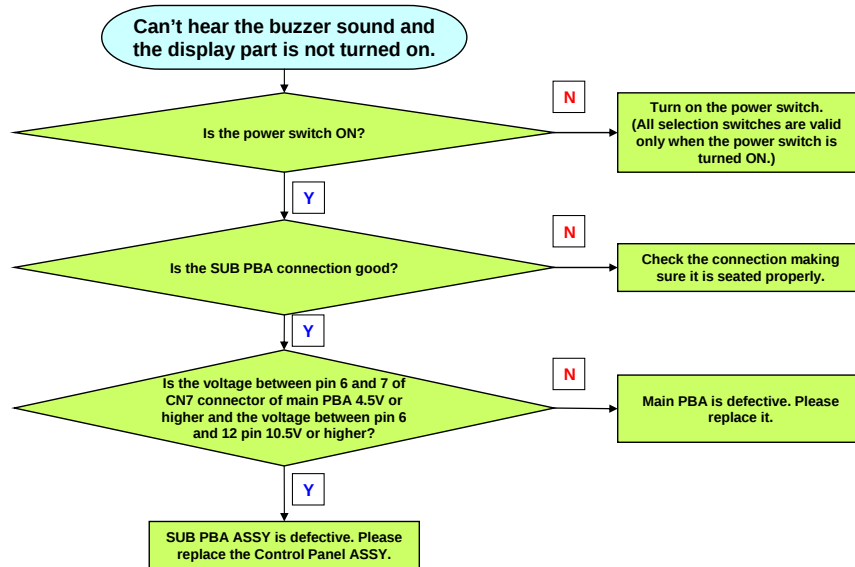
To test for a no power condition start by: 1. Check the connections of the power plug. 2. Check the voltage of the power outlet. Normal: AC 120V 3. Check whether the fuse is open. 4. Check the wires of the Main board power supply. - Measure the voltage between the black wire and the white wire of CN1. Normal: AC 120V

CAUTION: This is 120VAC line voltage.

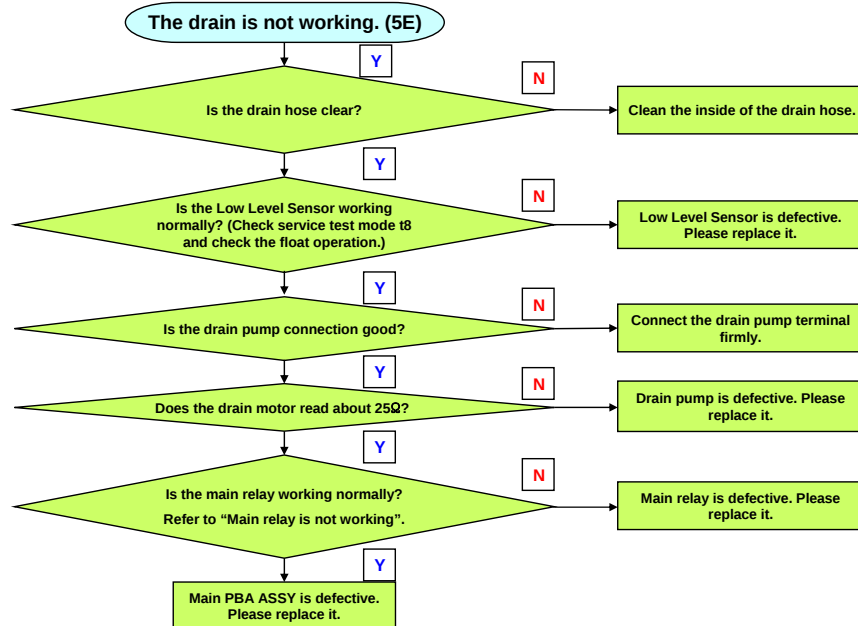
Incorrect LED Display



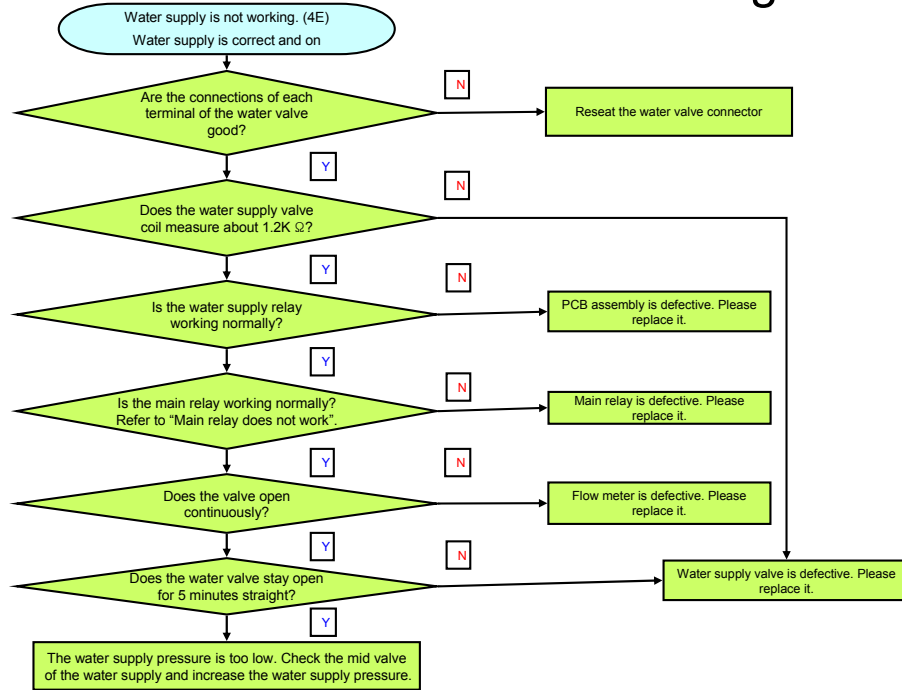
No Buzzer Troubleshooting



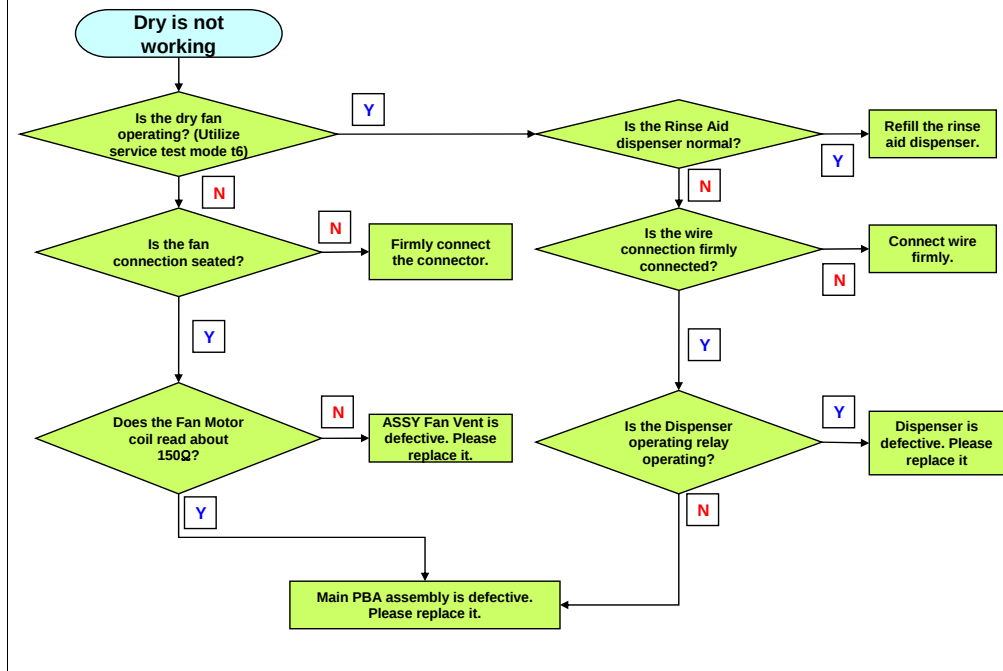
No Drain Troubleshooting



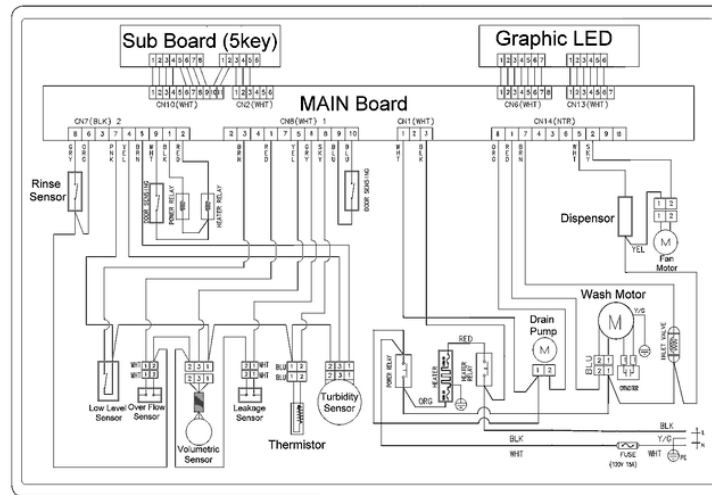
No Water Fill Troubleshooting



No Dry Operation Troubleshooting

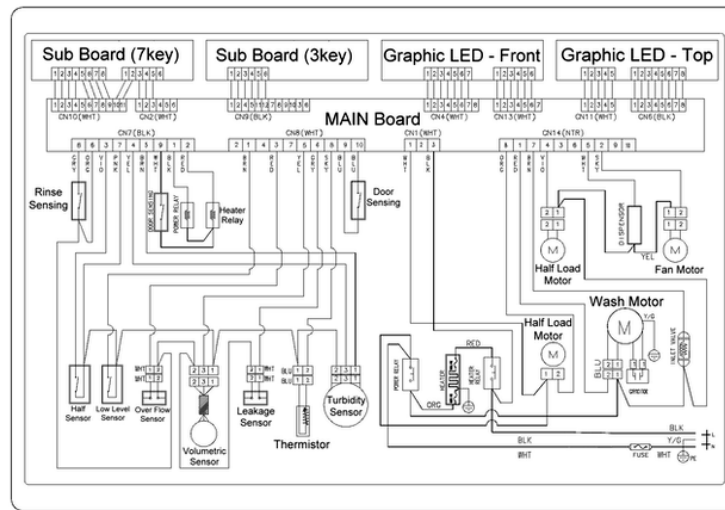


DMR57 Wiring Diagram



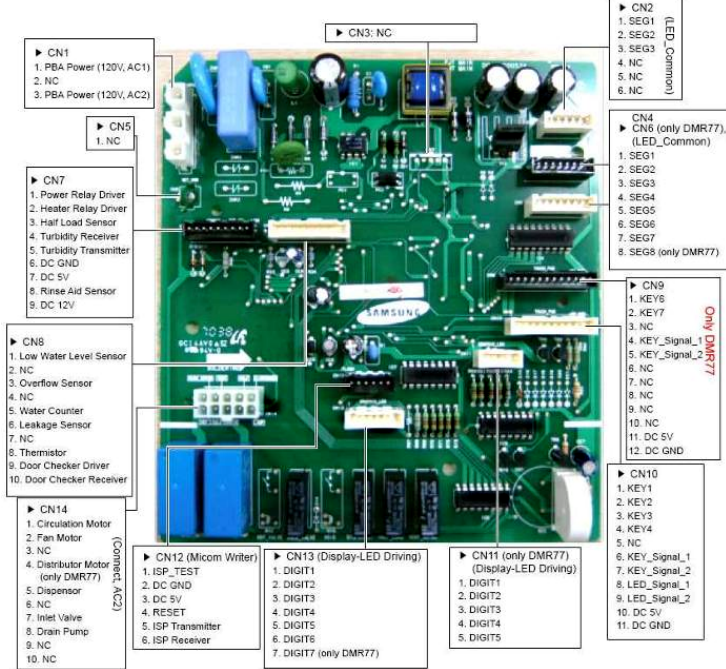
Included in the DMR57 and 77 is an auto wash cycle which will wash the contents of the machine until the internal water reaches a certain level of clarity. The sensor which determines this is the "Turbidity" sensor. If this sensor fails a possible symptom might be very long wash and rinse cycles if the auto wash mode is used. A check if this is the case might be to place the washer into a time determined cycle such as normal wash.

DMR77 Wiring Diagram



The wiring diagrams for the DMR 77 and the DMR 57 differ only in that the 77 has a half load feature which means that on the 57 model the half load motor and half load sensor are not included. Note that the motors and the heater are not directly connected to the main board but all go through a power relay. This is the reason why the device can not be measured for resistance directly from the main board. Also it may be possible for the display to light up but there are no functions if the drive for the power relay is not working.

Main PCB Connector Layout



Thermistor Resistance vs. Temperature Chart

°F	°C	Resistance in K Ω
41	5	125.780
50	10	98.323
59	15	77.454
68	20	61.465
77	25	49.120
86	30	39.517
95	35	31.996
104	40	26.065
113	45	21.358
122	50	17.599
131	55	14.579
140	60	12.140
149	65	10.159
158	70	8.542

Error Code List Part 1

Error type	Error Mode	Occurring condition	Expected condition
Water supply Error	4E	1. When the pulse of 100 or less is detected even 1 minute after the water supply 2. When flow meter pulse is 5 or less 5 seconds after the water supply starts 3. When the water supply does not occur 5 minutes after the water supply starts	Water supply valve defect - a normally operating water valve should measure ~ 1200 Ω out of the circuit. Also verify the 120VAC supply from the main PCB is present Flow Meter defect Foreign particles within water supply valve Water supply valve terminal not connected Main PBA defect
	4E1	When 176 °F or above is detected during water supply	Thermistor Defect Water supply temperature of 176 °F or above Main PBA defect
Drain Error	5E	When OFF status of Low Level switch is not detected within 3 minutes during the drain	Drain pump defect – a normally operating drain pump should measure ~ 25 Ω out of the circuit, also verify the 120VAC supply from the main PCB is present Low Level Sensor defect Foreign particles clogging mater drain hose Drain valve terminal not connected Main PBA defect
Overflow Error	oE	When overflow detection AD data is 4.0V or below for 3 seconds (When leakage sensor detects 4.0V or below for 1 seconds during water supply)	Foreign particles within water supply valve Case Sensor part leakage Flow Meter defect Main PBA defect
Leakage Error	LE	When leakage sensor detects 4.5V or below for 1 seconds	Base part hose connection defect Sump and Tub assembly defect Drain Pump assembly defect Main PBA defect

Error Code List Part 2

Error type	Error Mode	Occurring condition	Expected cause
Heater Error	HE	When the temperature change is 39 °F or less within the first 10 minutes after the heating starts	Heater defect Heater Relay defect Heater terminal not connected Main Wire-Harness defect Main PBA defect
	HE1	When the temperature of the Thermistor is 176 °F or above for more than 3 seconds	Heater Relay defect Normal: ~ 13Ω Thermistor defect Main PBA defect
Temperature sensor Error	tE1	When 0.2V or below, or 4.5V or above is maintained for over 3 seconds	Thermistor terminal not connected Thermistor Defect Main PBA defect
Low water level Error	9E	When Low Level is detected to cause Error even after the water supply resumes after Low Level is detected for the 1 st time	Low Level Sensor defect – 0.5V when the switch is closed Low Level Sensor terminal not connected Main PBA defect
Button Error	bE2	When the button is pressed continuously for over 30 seconds	Sub PBA defect Main PBA defect
Half load function error	PE	When micro switch is not detected for over 30 seconds after the Distributor motor starts	Distributor motor defect Micro switch terminal not connected Main PBA defect

The End