Preferred Service

Service Manual

This manual is to be used by qualified appliance technicians only. Viking does not assume any responsibility for property damage or personal injury for improper service procedures done by an unqualified person.

Built-in Dishwasher

This Base Manual covers general and specific information including, but not limited to the following models

VDB450
DFB450
(Before 5/26/2010)

SMK-0001D
2010

SAVE THESE INSTRUCTIONS

REVIEW ALL SERVICE INFORMATION IN THE APPROPRIATE SERVICE MANUAL AND TECHNICAL SHEETS BEFORE BEGINNING REPAIRS.

Pride and workmanship go into every product to provide our customers with quality appliances. It is possible, however, that during the lifetime of a product service may be required. Products should be serviced only by a qualified authorized service technician who is familiar with the safety procedures required to perform the repair and is equipped with the proper tools, parts, testing instruments, and the appropriate service manual.

Safety Information

We have provided many important safety messages throughout this manual and on the product. Always read and obey all safety statements. To properly identify a safety statements look for the following safety alert symbol.

This symbol alerts personnel to many hazards. There are different types of alerting messages. All safety messages will be preceded by a safety alert symbol and the word “DANGER”, “WARNING” or “CAUTION”.

DANGER

Immediate hazards which WILL result in severe personal injury or death.

WARNING

Hazards or unsafe practices which COULD result in severe personal injury or death.

CAUTION

Hazards or unsafe practices which COULD result in minor personal injury, product or property damage.

All safety messages will identify the hazard, tell you how to reduce the chance of injury, and inform you what can happen if the instructions are not followed.

WARNING

To avoid risk of serious injury or death, repairs should not be attempted by unauthorized personnel.

CAUTION

VIKING will not be responsible for any injury or property damage from improper service procedures. If performing service on your own product, you must assume responsibility for any personal injury or property damage which may result.

To locate an authorized service agent, call:

Viking Customer Service
Phone No. 1-888-845-4641

Address your written correspondence to:

Viking Preferred Service
1803 HWY 82 West
Greenwood, MS 38930

Warranty Information

One Year Full Warranty

Undercounter dishwashers and all of their component parts, except as detailed below*, are warranted to be free from defective materials or workmanship in normal household use for a period of twelve (12) months from the date of original retail purchase. Viking Range Corporation, warrantor, agrees to repair or replace, at its option, any part which fails or is found to be defective during the warranty period.

*Painted and decorative items are warranted to be free from defective materials or workmanship for a period of ninety (90) days from the date of original retail purchase. ANY DEFECTS MUST BE REPORTED TO THE SELLING DEALER WITHIN NINETY (90) DAYS FROM DATE OF ORIGINAL RETAIL PURCHASE.

Five Year Limited Warranty

Any upper and/or lower nylon rack which rusts due to defective materials or workmanship and any electronic controls which fail due to defective materials or workmanship in normal household use during the second through fifth year from the date of original retail purchase will be repaired or replaced, free of charge for the part itself, with the owner paying all other costs, including labor.

Any motor/pump assembly or water distribution system component as listed below which fails due to defective materials or workmanship in normal household use during the second through fifth year from the date of original retail purchase will be repaired or replaced, free of charge for the part itself, with the owner paying all other costs, including labor.

Motor/Pump and Water Distribution System Components

Circulation motor/pump	Lower wash arm
Drain motor/pump	Tube to upper wash arm
Fill valve	Upper wash arm

Lifetime Limited Warranty

Any stainless steel tank or inner door liner which develops a water leak due to defective materials or workmanship in normal household use during the lifetime of the product will be repaired or replaced, free of charge for the part itself, with the owner paying all other costs, including labor.

NINETY (90) DAY RESIDENTIAL PLUS WARRANTY

This warranty applies to applications where use of the product extends beyond normal residential use. Examples are, but not limited to, bed and breakfasts, fire stations, private clubs, churches, etc. This warranty excludes all commercial locations such as restaurants, food service locations and institutional food service locations. This warranty extends to the original purchaser of the product warranted hereunder and to each transferee owner of the product during the term of the warranty. This warranty shall apply to products purchased and located in the United States and Canada. Products must be purchased in the country where service is requested. Warranty labor shall be performed by an authorized Viking Range Corporation service agency or representative. Warranty shall not apply to damage resulting from abuse, accident, natural disaster, loss of electrical power to the product for any reason, alteration, outdoor use, improper installation, improper operation, or repair or service of the product by anyone other than an authorized Viking Range Corporation service agency or representative. This warranty does not apply to commercial usage. Warrantor is not responsible for consequential or incidental damage whether arising out of breach of warranty, breach of contract, or otherwise. Some jurisdictions do not allow the exclusion or limitation of incidental of consequential damages, so the above limitation or exclusion may not apply to you. Owner shall be responsible for proper installation, providing normal care and maintenance, providing proof of purchase upon request, and making the appliance reasonably accessible for service. If the product or one of its component parts contains a defect or malfunction during the warranty period, after a reasonable number of attempts by the warrantor to remedy the defects or malfunctions, the owner is entitled to either a refund or replacement of the product or its component part or parts. Warrantor's liability on any claim of any kind, with respect to the goods or services covered hereunder, shall in no case exceed the price of the goods or service or part thereof which gives rise to the claim.

WARRANTY SERVICE

Under the terms of this warranty, service must be performed by a factory authorized Viking Range Corporation service agent or representative. Service will be provided during normal business hours, and labor performed at overtime or premium rates shall not be covered by this warranty. To obtain warranty service, contact the dealer from whom the serial number and date were originally purchased. For the name of your nearest authorized Viking Range Corporation service agency, call the dealer from whom the product was purchased or Viking Range Corporation. IMPORTANT: Retain proof of original purchase to establish warranty period

The return of the Owner Registration Card is not a condition of warranty coverage. You should, however, return the Owner Registration Card so that Viking Range Corporation can contact you should any question of safety arise which could affect you. Any implied warranties of merchantability and fitness applicable to the above described nylon racks, motor/pump assembly, water distribution system, stainless steel tank, or stainless steel inner door liner are limited in duration to the period of coverage of the applicable express written limited warranties set forth above. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which may vary from jurisdiction to jurisdiction.

VIKING RANGE CORPORATION
111 Front Street • Greenwood, Mississippi 38930 USA
(662) 455-1200
www.vikingrange.com
Specification subject to change without notice

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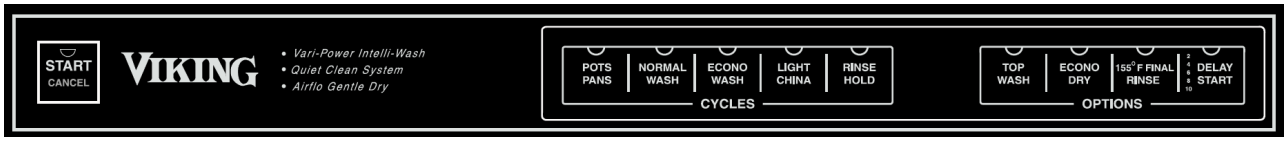


Weight: 150 lbs

Door disassembly

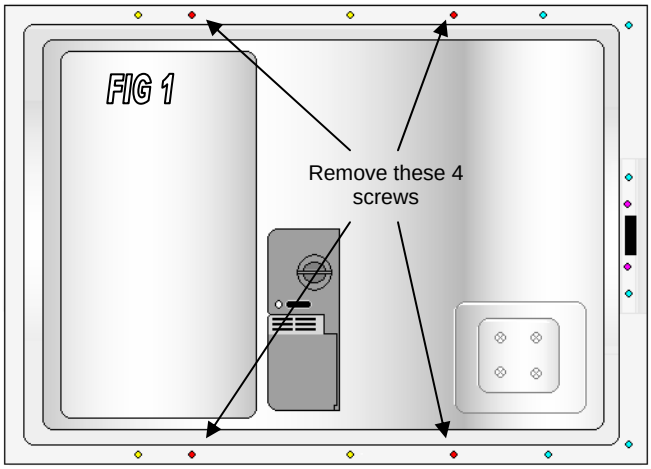
In order to gain access to the internal components of the door, which includes the detergent dispenser, vent assembly, start switch, door interlock and the user interface, you will need to remove the front door panel, control panel and center door panel.

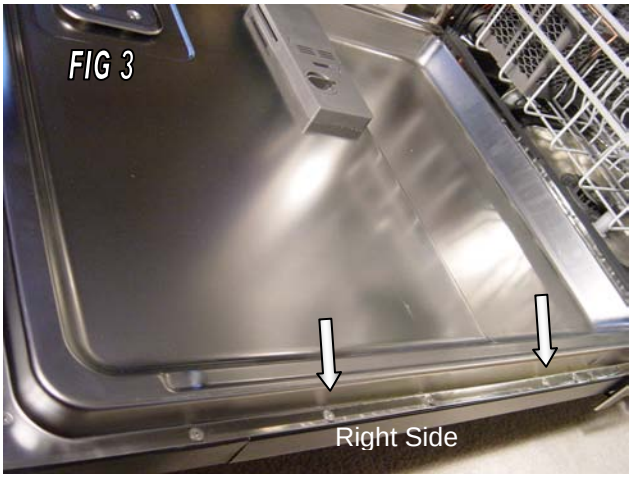
⚠ CAUTION

Make sure that the outer door is held in place while removing the screw so that the door does not fall and become dented or scratched. The inner door assembly is sharp and could result in minor personal injury.

Outer Door Removal

In order to gain access to the inner door assembly, detergent dispenser and vent assembly you must first remove the outer Stainless steel or wood door panel. Open the door to a complete 90˚ angle to expose the securing screws. Using a T15 TORX ® screwdriver, remove the four screws shown in **FIG 1**. **FIG 2** and **FIG 3** show the actual location of the screws .These screws are 1-½ inches in length.



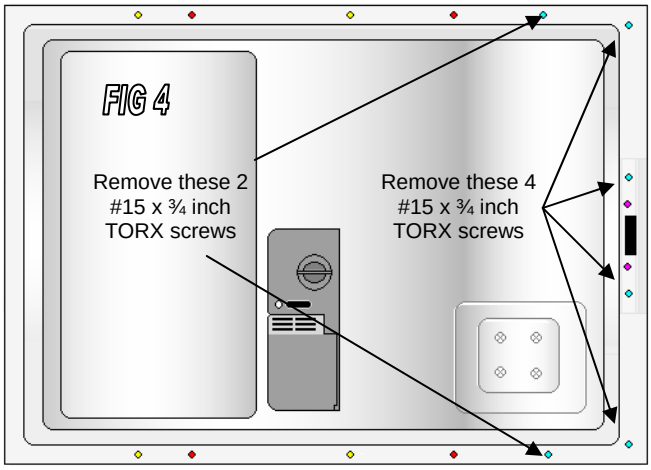


When the outer door has been removed, make sure to store it in a secure area until reassembled so it does not become scratched or damaged.

Control Panel Removal

After removing the outer door panel, the next step is to remove the control panel assembly. There are 6 T15 TORX® screws that hold the control panel in place. All 6 of these screws are ¾ in length. Using a T15 TORX ® screwdriver, remove all the screws shown in **FIG 4**.

FIG 5 and **FIG 6** show the actual location of the screws.



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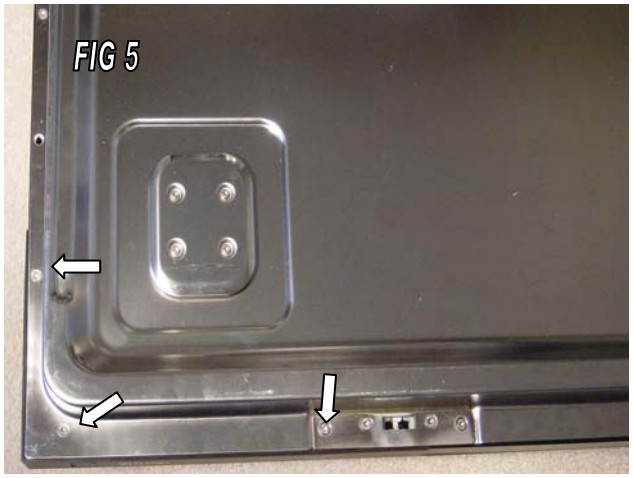
Control Panel Removal *(Continued)*



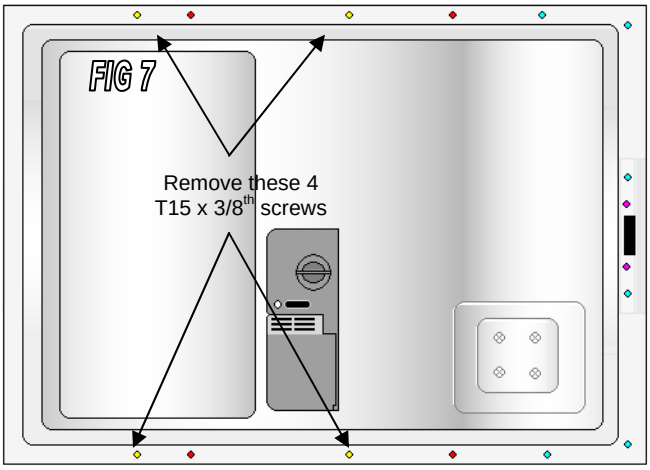
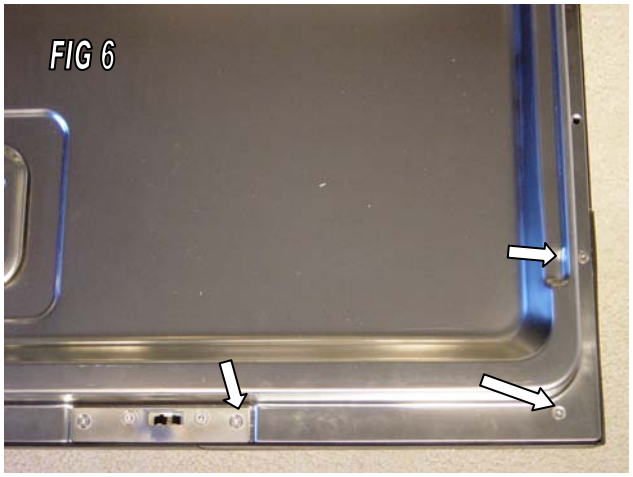
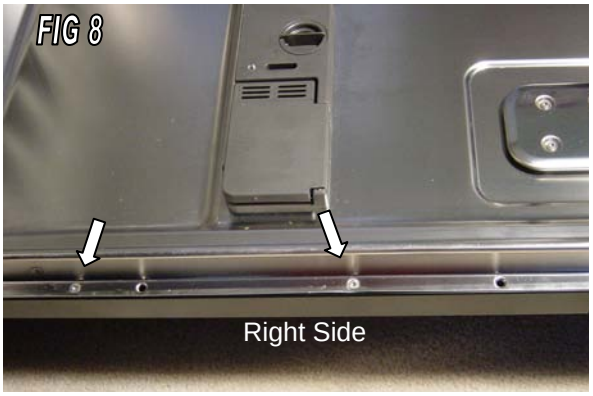
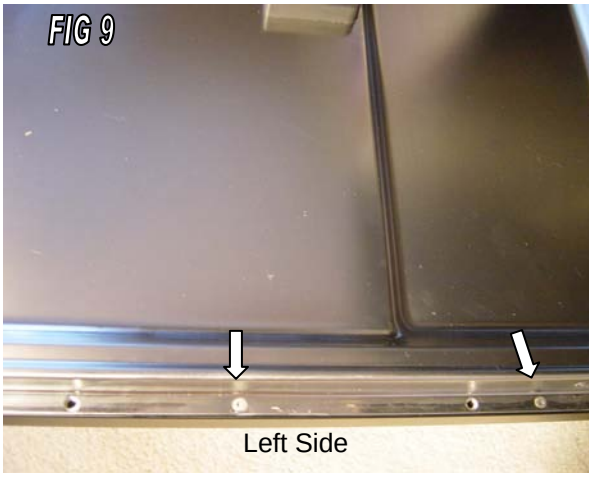


FIG 8 and **FIG 9** show the actual locations of the screws.







Center Door Panel Removal

Now that the outer panel and control panel have been removed, remove the inner door assembly. Open the door to a complete 90˚ angle to expose the securing screws. Using a T15 TORX ® screwdriver, remove the four screws shown in **FIG 7**. These screws are 3/8th inches in length.

⚠ CAUTION

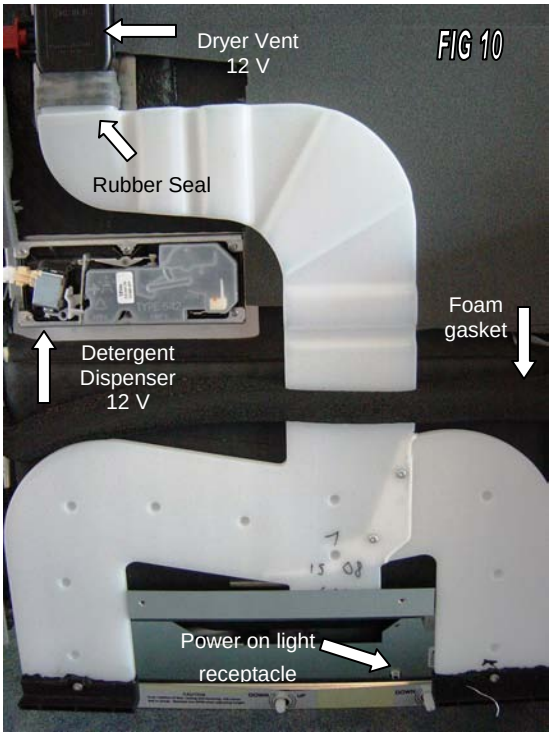
Make sure that the center door panel is held in place while removing the screw so that the door does not fall and become dented or scratched.

The inner door assembly is sharp and could result in minor personal injury.

Inner Door Components

With the center door panel and control panel removed, you now have access to the inner door components. **FIG 10** shows the inner door with all the panels removed.

From here you can test the door interlock switch, the detergent dispenser mechanism and the dryer vent assembly and WAX motor.



CAUTION

Make sure that if the vent tube is removed for any reason that the center foam gasket and the rubber seal that connect the vent tube to the door assembly are securely fastened. Failure to do so may cause steam to escape during the wash and dry cycle

Detergent Dispenser

FIG 11 shows a close-up of the detergent dispenser. In order to remove the dispenser, first remove the 6 T15 x ½ TORX ® screws and the two brackets, which hold the dispenser in place. (Brackets shown in red dotted highlight below).

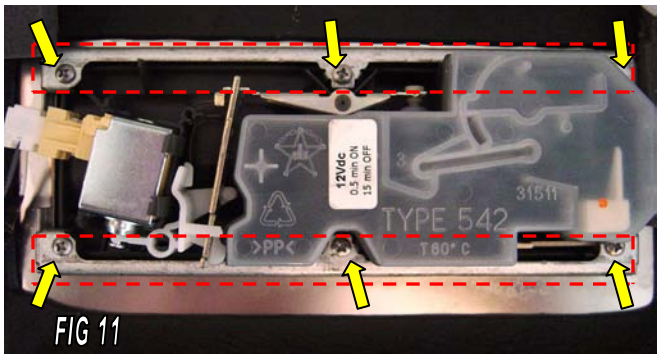
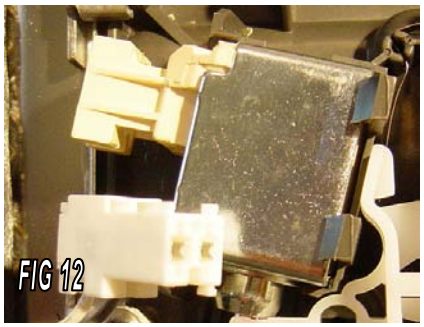
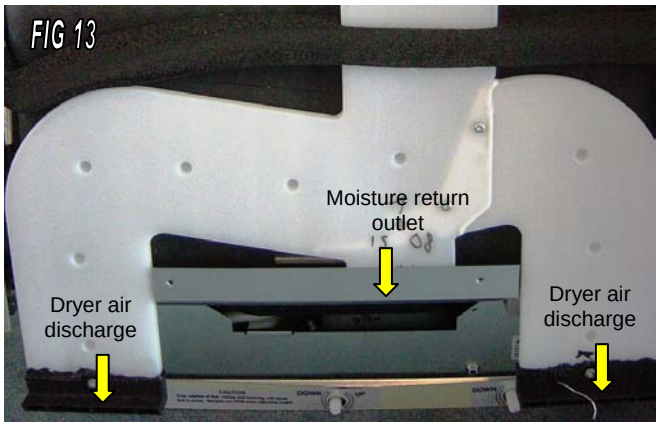


FIG 12 shows the solenoid unplugged to remove the dispenser assembly. Unplug the two wire connector plug in order to remove the dispenser.



Drying Vent Assembly

In order to remove the dryer vent assembly, you must first remove the door vent tube assembly. **FIG 13** shows the lower section of the vent assembly, including the air discharge and moisture return outlet.



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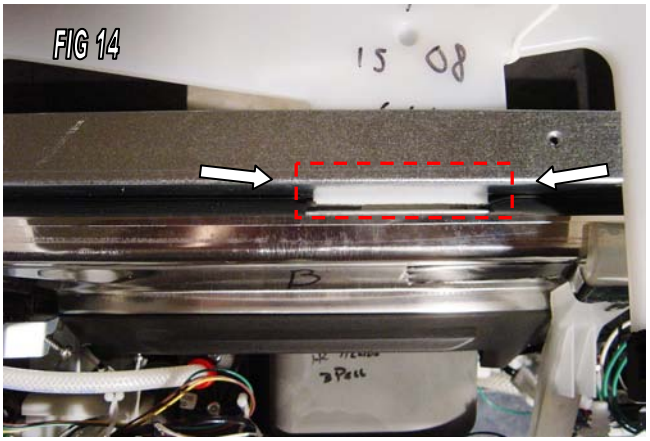
Drying Vent Assembly (Continued)

The moisture return outlet of drying vent assembly is held in a retaining bracket which is secured to the inner door liner. In order to remove from the bracket first grasp onto the vent, carefully bend the bracket (over bending will create a leak) and pull the duct.



The 2 white arrows in **FIG 14** show the vent in position. The rectangular red bracket shows the area where the condensed moisture returns to the sump area.

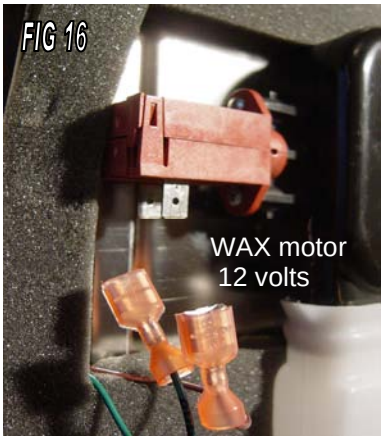
⚠ CAUTION

Make sure that when the vent is reinstalled that the moisture return outlet is snapped back in properly into the bracket. Failure to do so may cause water to leak onto the consumer's floor.

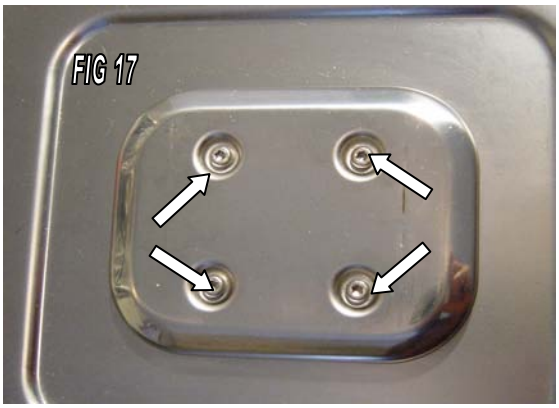
You will now need to remove the vent tube assembly (which snaps together) away from the vent motor door housing. **FIG 15** shows the upper section of the vent assembly attached to the dryer motor housing (Black). ***NOTE:*** The vent door is normally open when the dishwasher is not in use. When switched on, the WAX motor will heat up and close the internal door during a wash cycle and opened during the dry cycle.

Door vent mechanism

In order to remove the dryer door vent mechanism and WAX motor, unplug the WAX motor female spade terminals shown in **FIG 16.**



Open the door and remove the 4 T15 x7/8th TORX® screws shown in **FIG 17** that hold the stainless steel diverter plate in place.



Now with the diverter plate removed you will see a plastic spacer as shown in **FIG 18**. If you look carefully the spacer is marked with the word "UP" on each end. When reassembling, make sure the wider edge (shown with arrow) is facing the top of the door.

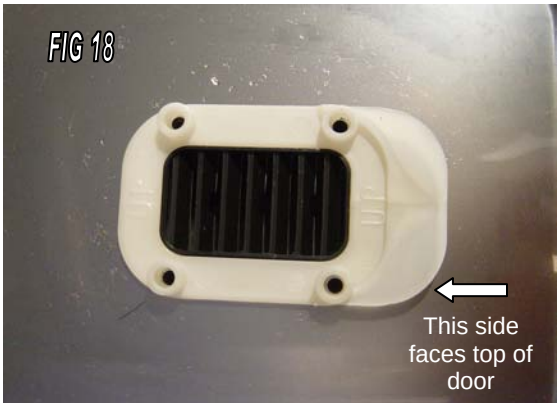


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FIG 19 shows the vent spacer removed

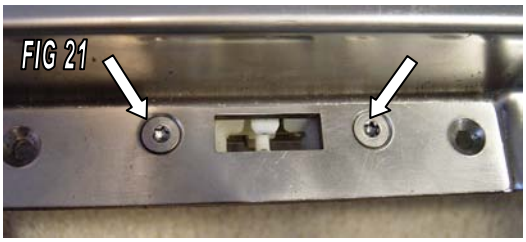
Now close the door and you can now remove the dryer door vent mechanism as shown in **FIG 20**. Be sure that when reassembling the vent that the lip edge of the vent is positioned properly in the opening of the door liner. Failure to do so could cause a water leak inside the door.

⚠ CAUTION

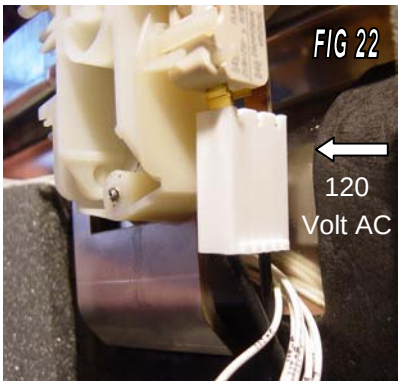
Make sure that when reinstalling the dryer door vent mechanism that the o-ring gasket is in place as shown above. Failure to do so may cause water to leak inside the door and then onto the consumer's floor.

Door latch interlock

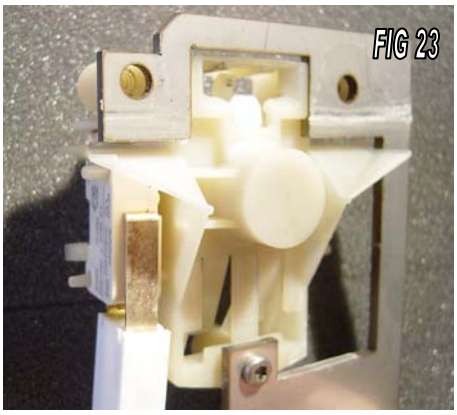
The door latch mechanism is secured to the inner door panel by 2 T15 x ¾ TORX® screws. With the control panel removed, remove the two screws shown in **FIG 21**



Remove the latch mechanism and unplug the 2 wire connector plug from the micro switch as shown in **FIG 22**



If replacing the switch, remove the bracket from the old switch and reinstall on the replacement latch assembly. Remove the TORX® screw shown in **FIG 23**.



⚠ CAUTION

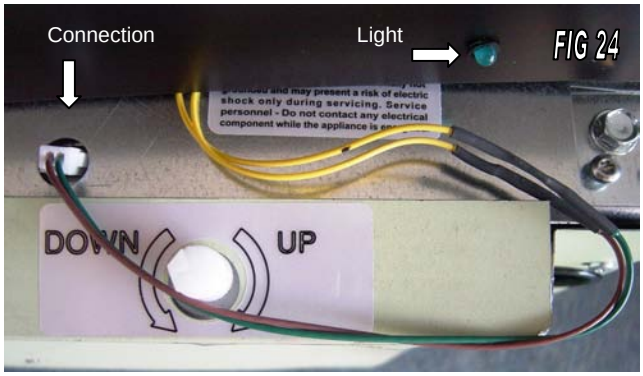
The Door interlock is the only component within the door assembly that carries 120 Volt AC.

⚠ DANGER

Failure to observe caution could result in electric shock, resulting in permanent injury or DEATH

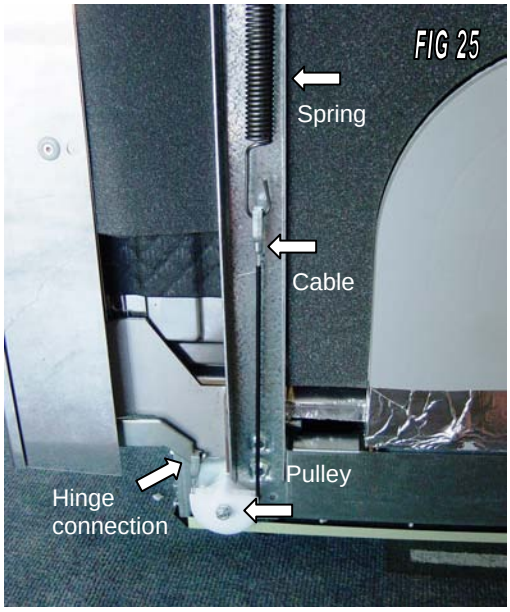
Power ON Light

FIG 24 shows the connection of the blue colored power ON light to the toe kick via a 2-wire connector. Whenever the machine is turned on the LED will shine a bluish. *Make sure wires are properly tucked behind panel after reassembly!*



Door spring and cable assembly

FIG 25 shows the right side door hinge cable, spring and pulley. It is the same on the left side.



CAUTION

Make sure that when removing or adjusting the door spring tension that you are wearing protective gloves and eye wear. Injury can occur should the spring or cable comes loose or slips during assembly.

FIG 26 shows a close-up view of the cable wrapped around the pulley. As the door opens or closes the cable will ride along the roller creating a smooth movement in the door operation.

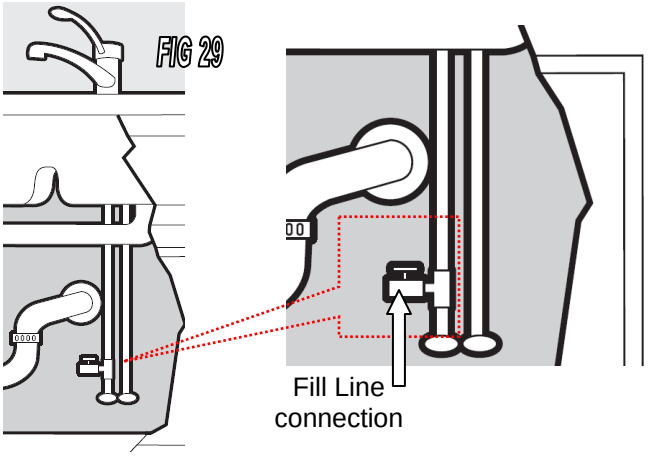
FIG 27 shows the spring and the channel it rides in. The connection is secured in mounting holes in the channel frame.

FIG 28 shows the spring in its default location (sixth hole from the top)

Preparation

Water Connection

In order to gain access to the base components, you must first remove the dishwasher from the cabinet. First, locate the water shut off valve (typically under the sink enclosure) and fully rotate the water shut off to the OFF or closed position. **FIG 29** shows a typical water connection



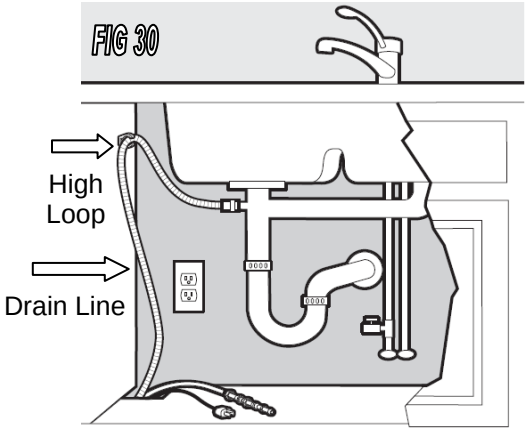
Disconnect the water fill line from the house supply water shut off valve. Make sure the water shut off valve is not leaking. Failure to do so could result in property damage

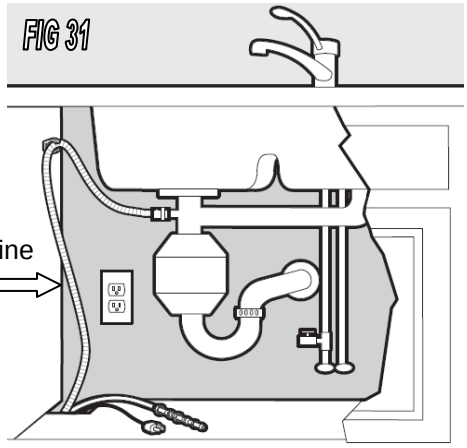
⚠ CAUTION

Care should be taken while removing the unit from the cabinet. Make sure all exposed surfaces are protected from possible damage.

Drain Connection

Next, locate the drain hose and disconnect from the house drainage system. This may be either a stand alone PVC drain, or in some applications the drain may be connected to a garbage disposal. **FIG 30** shows a standard connection and **FIG 31** shows a drain connection to a garbage disposal.



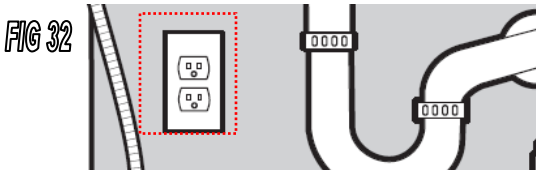


⚠ DANGER

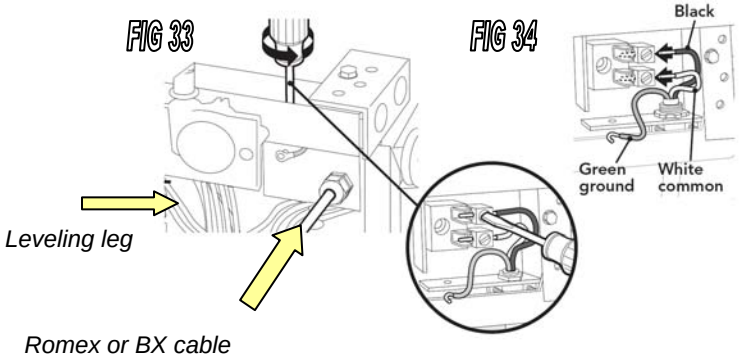
Make sure that electric power to the machine is switched off before servicing or removal. Failure to observe caution could result in electric shock, resulting in permanent injury or DEATH

Electrical Connection

The 450 series dishwasher comes with a three-prong grounded plug which is designed to be connected to a standard 120 volt, 15 amp wall outlet. **FIG 32** shows a standard electrical connection.



This unit is designed to be retrofitted to a hard wired connection. If the unit is hard wired, locate the house circuit breaker panel and disconnect the power to the dishwasher prior to removal. With the toe kick panel removed, locate the main wiring terminal on the right side of the machine. **FIG 33** shows the lower right area of the dishwasher lying on its back. If the unit was hard wired during installation, you will see either a Romex or BX cable connected into the base. **FIG 34** shows the wiring connections.



Romex or BX cable connected through base in this area.

Base pan – Front View

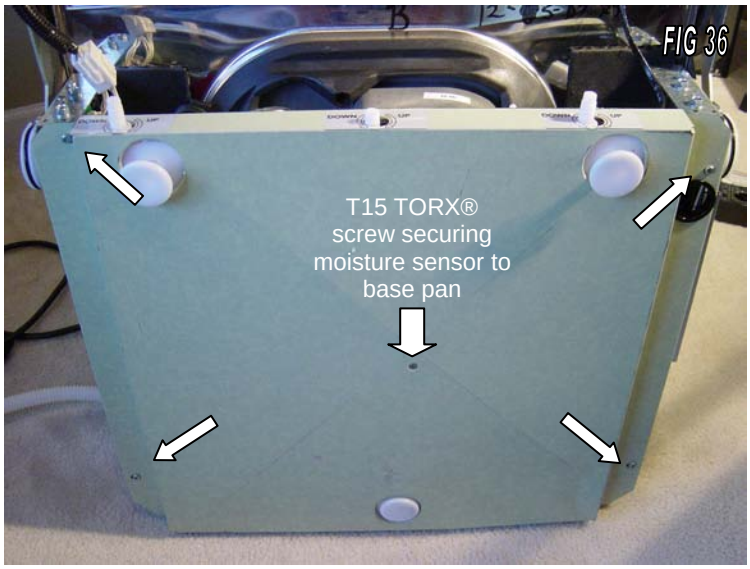
With the machine lying on its back, toe kick removed, you can look into the base assembly of the dishwasher and check several points before requiring the removal of the unit for service.

In **FIG 35 and 35A** you can see the sump assembly (1), water level sensor (2), 12-Pin disconnect pin (3) and the leveling leg adjustment screws (4). In order to access and service the remaining components will be to remove the base cover to gain access. This includes the drain motor, circulation motor, control board, motor controller, flow-through water heater, wash temp sensor, water valve, front levelers and the rear leveler.

Base cover

Remove the 4 T20 TORX® screws that hold the bottom base to the dishwasher superstructure. **FIG 36** shows the location of these screws. With the panel removed, locate the moisture sensor and unplug, leaving the moisture sensor attached to the base pan. **FIG 37** shows the attached sensor. The sensor is secured in place by one T15 TORX® screw.

Place base pan in a secured area. Take care not to damage the sensor.

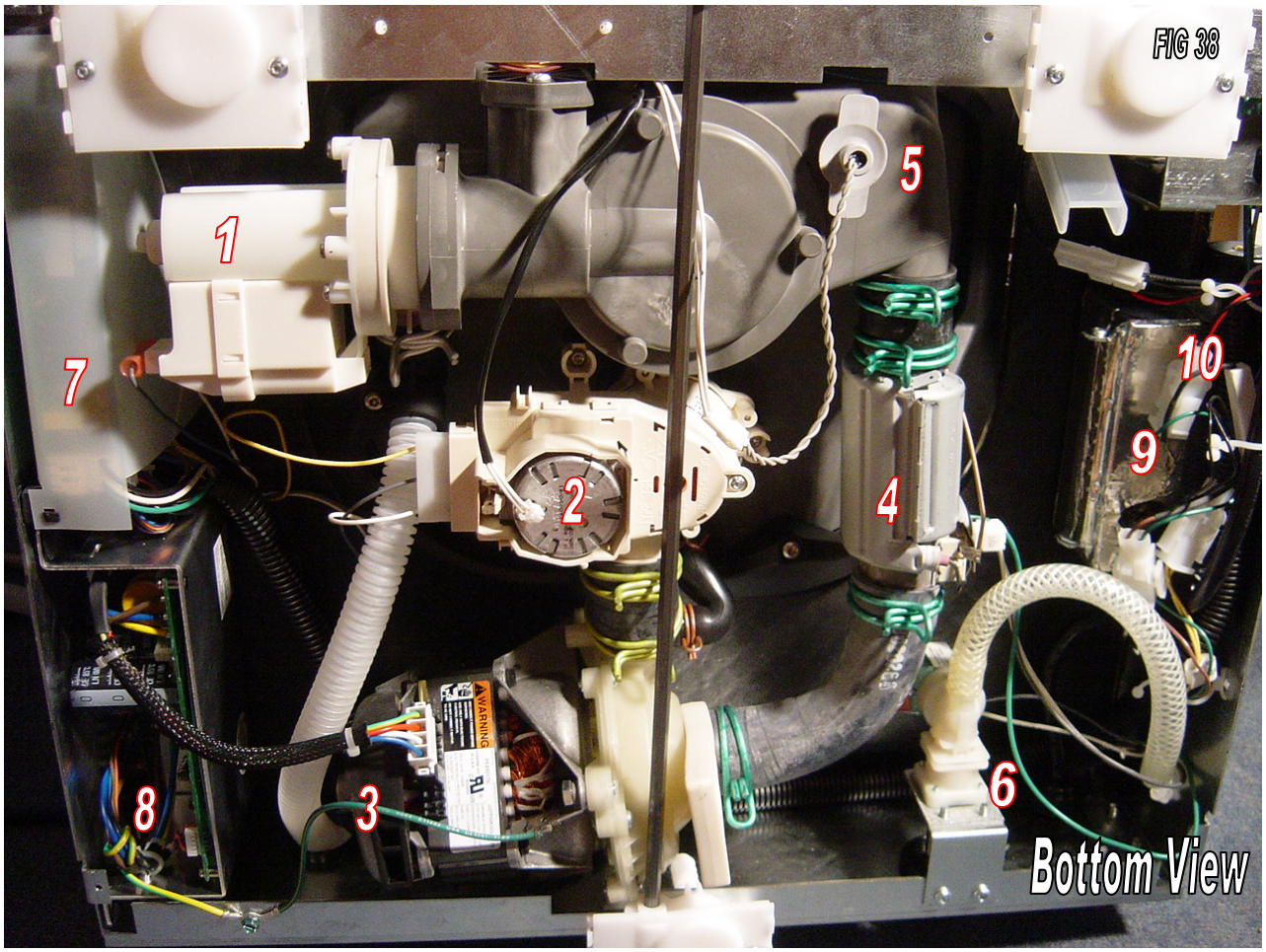


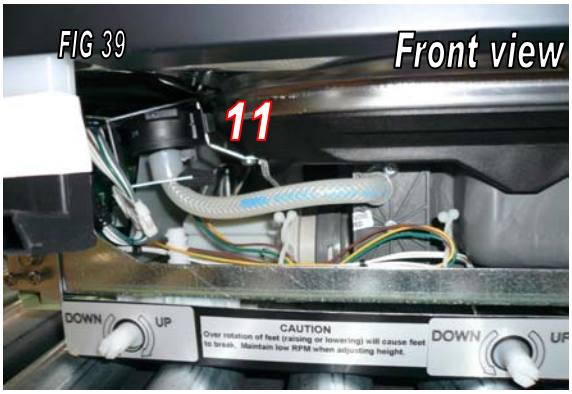
With the base pan removed, you now have access to locate, diagnosis and service all the components in the base of the dishwasher.

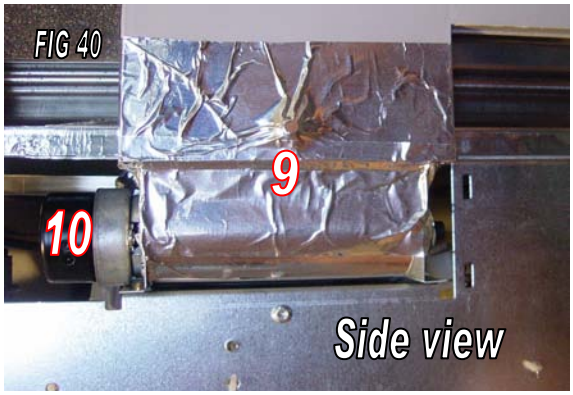
Base unit overview

FIG 38, 39 and **40** below is a general overview of the main operating components in the base of the 450 series dishwasher. The following parts are shown below and identified by number on each component.

Component Name	Item #		Component Name	Item #
Drain motor	1		Wash diverter	2
Circulation motor	3		Water heater	4
Water temp sensor	5		Fill valve	6
Main control	7		Motor controller	8
Dryer heater – 120 volt	9		Dryer motor -12volt	10
Water level Sensor	11			

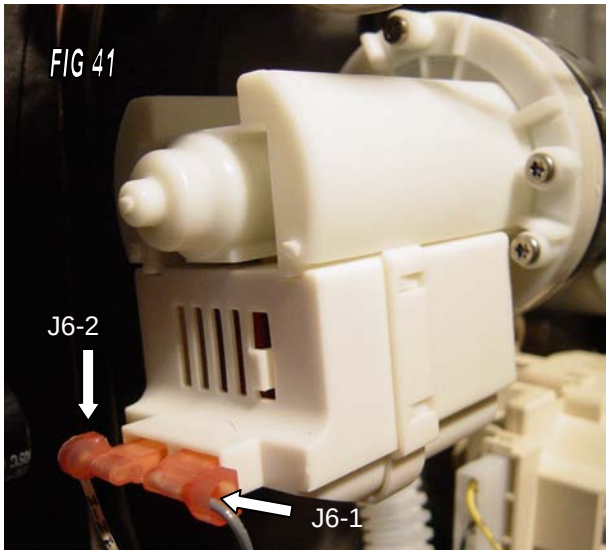




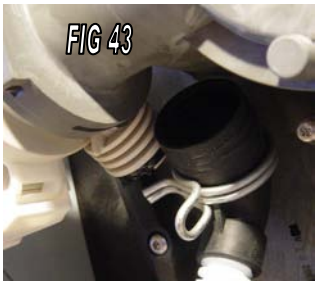


Drain Motor (1)

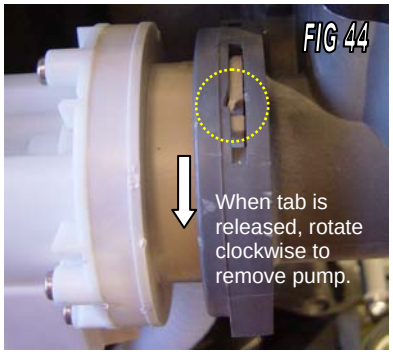
FIG 41 shows the drain motor. When required, the main control sends 120 volts from terminal J6-1 (Line out-gray wire) and terminal J6-2 (neutral-white wire). Unplug the wires to the motor.

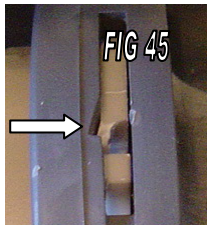


Locate the drain hose on the rear of the pump. Using a pair of pliers, disconnect the hose. **FIG 42** shows the hose connected and **FIG 43** shows the hose disconnected.



Next, release the drain motor from the sump assembly. Locate the release tab (Circled in Yellow) shown in **FIG 44.** Using a flat blade screwdriver, bend the tap in the direction shown by the arrow in **FIG 45** to release the pump from the main housing. Grasp the pump and rotate clockwise and the pump can be removed.



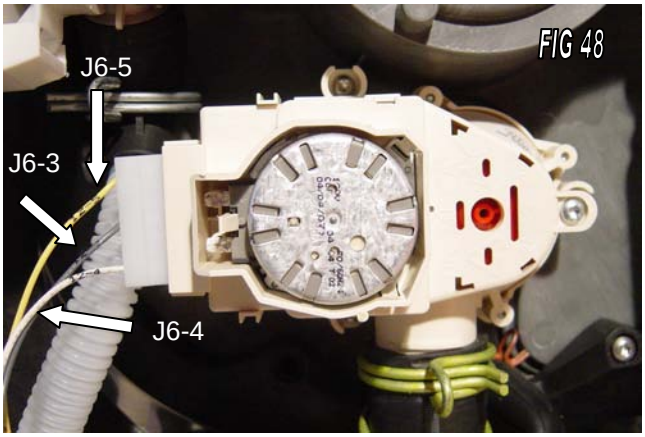


When reinstalling pump, make sure to bend the tab back in place to lock the pump in the sump housing.

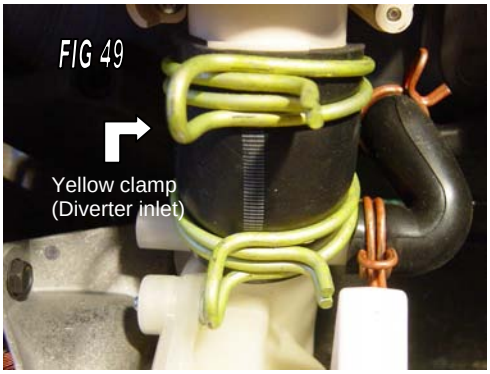
FIG 46 shows the pump removed. **FIG 47** shows sump area with pump removed. Note the location of the o-ring gasket in the sump. Make sure the gasket is in place when reinstalling the pump or the unit will leak water into the base pan.

Wash Diverter (2)

FIG 48 shows the wash diverter. It is designed to direct the water flow to the upper arm, lower arm or both. When required, the main control sends 120 Volts AC from terminal J6-3 (line out-gray wire) and terminal J6-4 (neutral-white wire) to activate the motor. The yellow wire on the diverter sends line voltage back to the control board to J6-5 (Line in-yellow wire) and tells the controller the position of the diverter.



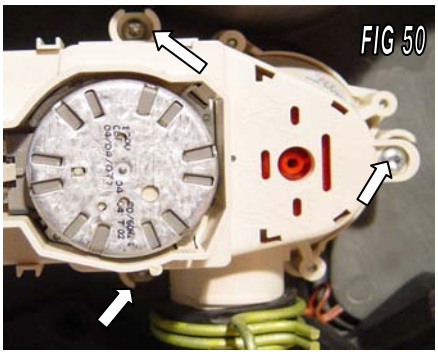
Disconnect the yellow hose clamp connection from the diverter inlet as shown in **FIG 49**.



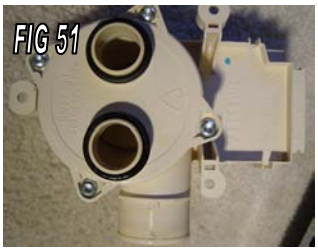
Continued on Page 16

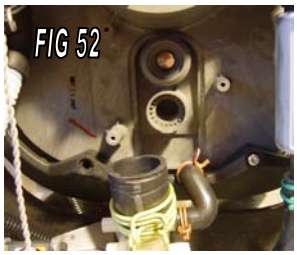
Wash Diverter (continued)

The wash diverter is attached to the sump by the use of 3 T20 TORX® screws. Remove all three screws as shown in **FIG 50**



Remove the diverter from the sump assembly. **FIG 51** shows the rear of the diverter and **FIG 52** shows the sump area with the diverter removed.





NOTE

It is recommended that the diverter be taken out before removing the circulation motor. It makes it easier to handle the motor assembly

Circulation Motor (3)

The 450 series dishwasher utilizes a 3-phase AC induction motor with variable speed capabilities. The motor is controlled by the motor controller. **FIG 53** shows the circulation motor. When required, the main control sends signal voltage to the motor controller to operate the circulation motor. Voltage to all three windings is in the 150 – 160 volt range, measured from each leg to ground. The speed is varied by frequency control. **FIG 53** shows the 4-wire connector plug from the controller to the motor. Unplug the connector to test or remove the motor.

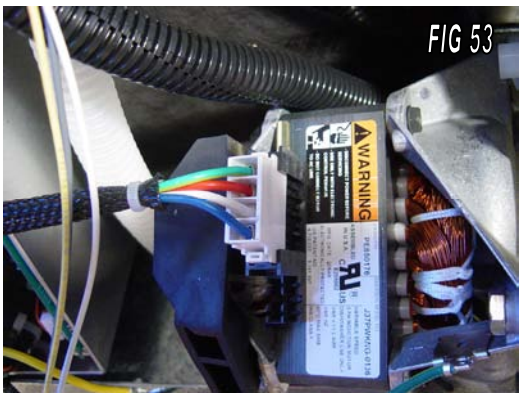
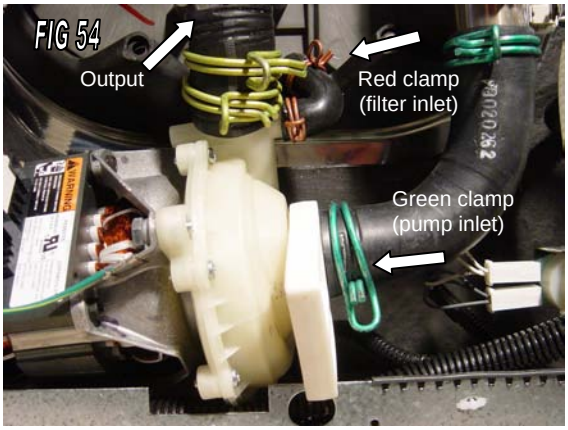


FIG 54 (*with diverter removed*) shows the hose connections to the circulation motor inlet, output and the filter clean sump inlet.

Disconnect the green hose clamp from the heater tube to pump inlet as well as the hose clamp from the filter inlet tube on the pump assembly.



Disconnect the pump inlet hose from the pump assembly. **FIG 55** shows the filter inlet hose to the sump disconnected. The arrow points to the “Filter Clean” inlet in the sump. Regardless of the position of the diverter, water is directed to this tube.

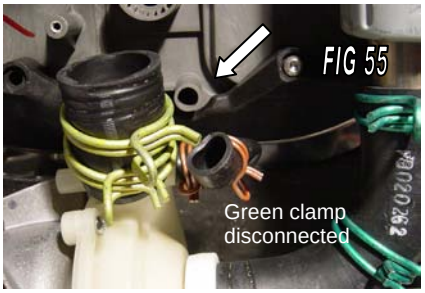
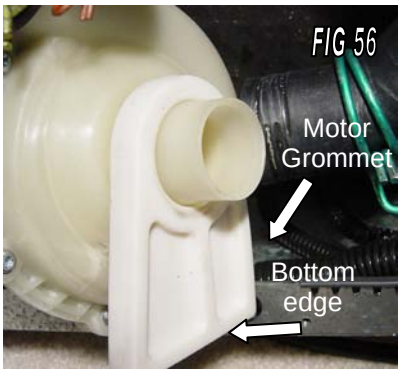


FIG 56 shows the hose disconnected from the pump. Notice that there is a white motor grommet over the pump opening. Make sure it is back in place and bottom edge is facing base pan before reassembly.

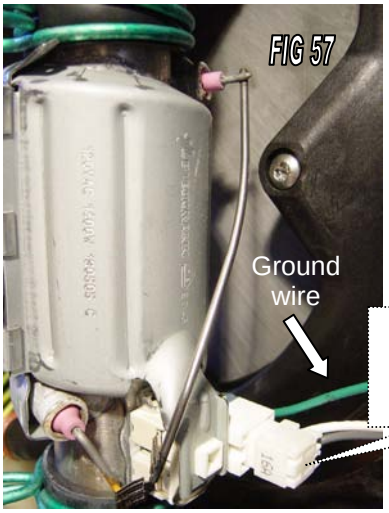
(FIG 54 above shows proper position of grommet).



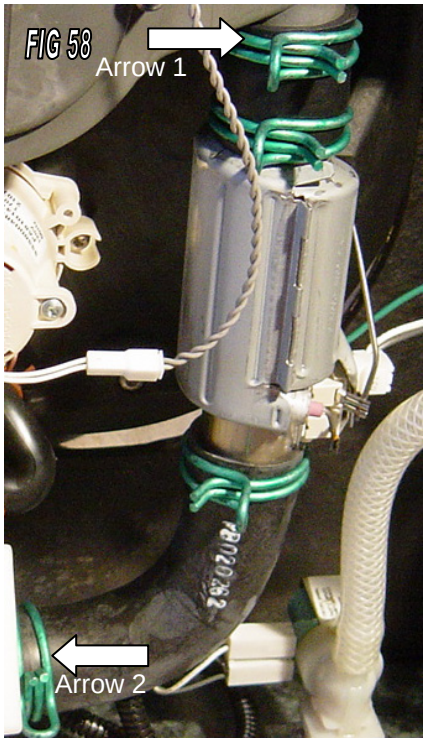
The motor assembly can now be removed for service.

Water Heater (4)

The 450 series dishwasher uses a flow through heater that will heat the water as it passes though the center of the heater. In order to remove, unplug the 2-wire connector that supplies power to the heating element and the ground wire which connects to a spade terminal on the heater housing. **FIG 57** shows the connections.



Next, disconnect the two clamps that hold the heater assembly to both the sump outlet (Arrow 1) and circulation pump inlet (Arrow 2) as shown in **FIG 58**



The heater can now be removed for service. You will need to transfer the two 1 ½ OD hoses to the new heater assembly. The element is a 120-volt, 10.5 ohm, 11.4 amp, 1400 watt draw. It is controlled from J4-1 and J4-2 on the Control Board.

Water Temperature Sensor (5)

The water temperature sensor will sense the water temperature of the water throughout the wash cycle. It is an N.T.C (**N**egative **T**emperature **C**ontrol) sensor which reads approximately 47k ohms at 80° ambient. As the water temperature rises, the resistance drops.

In order to remove, unplug the 2-wire connector, and then twist the sensor counter-clockwise to release from the sump assembly. **FIG 59** shows the temp sensor in the locked position. Grasp the sensor tabs and twist counter-clockwise to release.

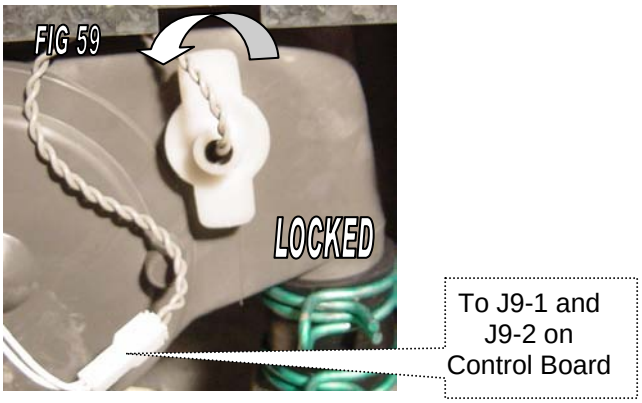
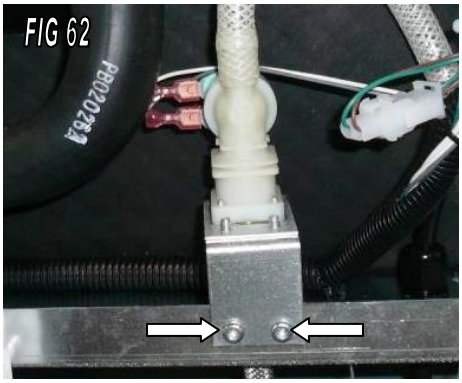


FIG 60 shows the temp sensor in the unlocked position.

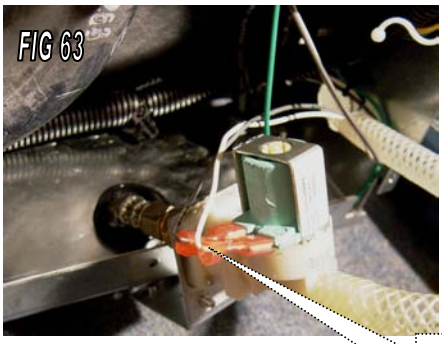
While grasping the tabs, pull the sensor out of the sump assembly as shown in **FIG 61.**

Fill Valve (6)

In order to access the fill valve, you will need to lay the unit on its back. Remove the base pan and moisture sensor. The valve is secured to the rear frame with 2 TORX® screws as shown in **FIG 62**



Remove the 2 shown above and remove the fill valve from the base as shown in **FIG 63**



To J6-7 (White wire)
and J6-6 (Gray wire)
on Control Board

Unplug the white and gray wires from the coil, and then disconnect the fill tube from the valve outlet. The fill valve is a 120 Volt valve. The coil is a 1000 ohm coil and is controlled from J6-6 (line voltage - gray) and J6-7 (neutral - white) on the Control Board.

Control Board (7)

The Control Board is secured to the inner left support structure of the dishwasher. Please exercise caution when removing in order to avoid any damage to the board and its components

⚠ CAUTION

In order to protect the electronic circuits on the board and avoid any damage caused by static discharge, Viking Range Corp recommends the use of a ground strap.

The two arrows in **FIG 64** show the plastic protector sheet which is connected to the board support grommets. Remove the sheet from the tabs and place aside. **FIG 65** shows the protective sheet removed.

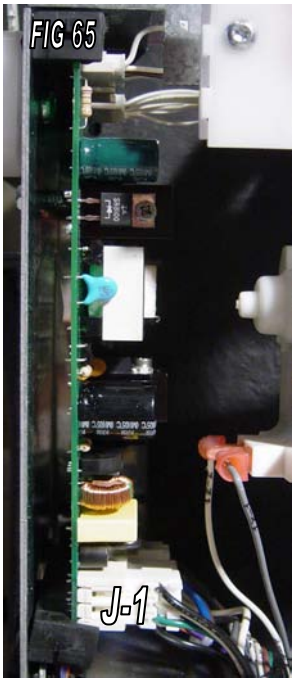


FIG 66 shows the J7, J8 and J9 connections on the board. Disconnect the J7, J8 and the J9 connectors from the board.

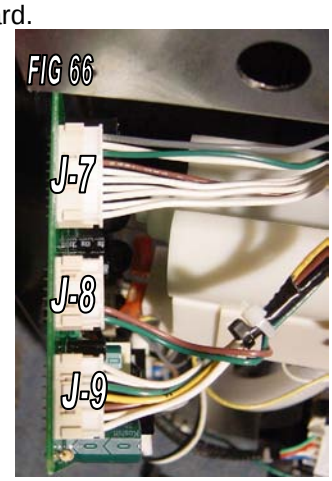
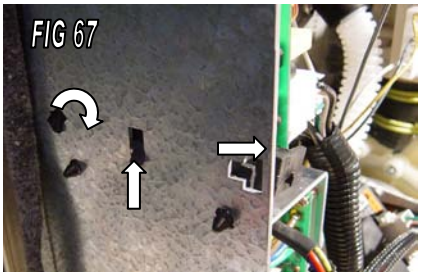


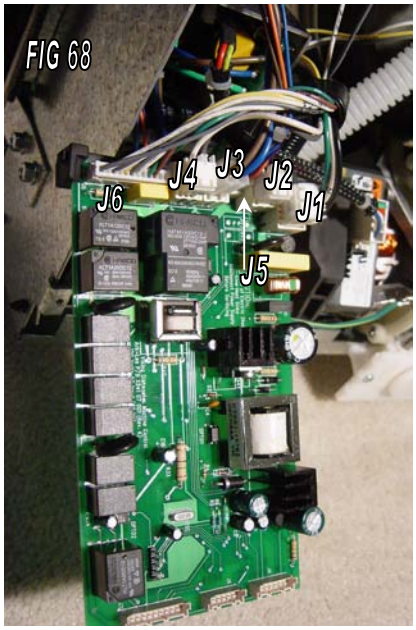
FIG 67 shows the locking tabs that hold the rear board support to the dishwasher frame. Release these tabs in the directions shown by the arrows. Now carefully pull the board down and release from the front.



Continued on Page 19

Control Board (continued)

Now disconnect the remaining connectors to the control board. J1 – J6 shown in **FIG 68**

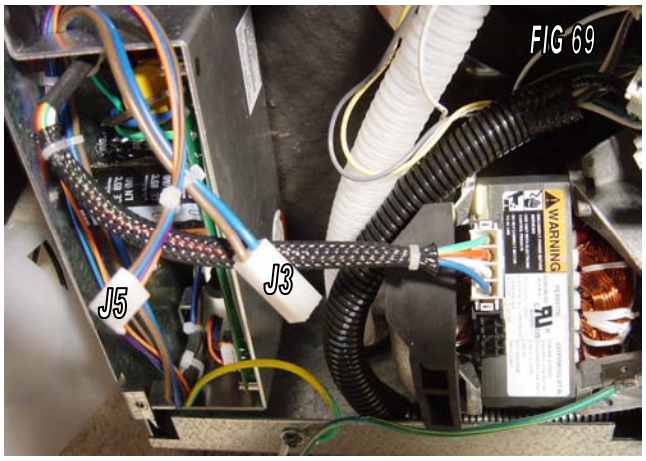


NOTE

It is recommended that the Control be taken out before removing the Motor Control Board. It makes it easier to handle the removal.

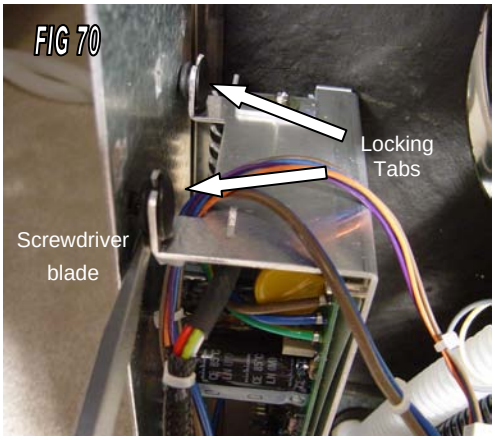
Motor controller (8)

With the control board removed, you can now remove the motor controller for service. **FIG 69** shows the motor controller with the J5 and J3 connectors disconnected from the control board. The 4-wire connector to the motor is still connected.

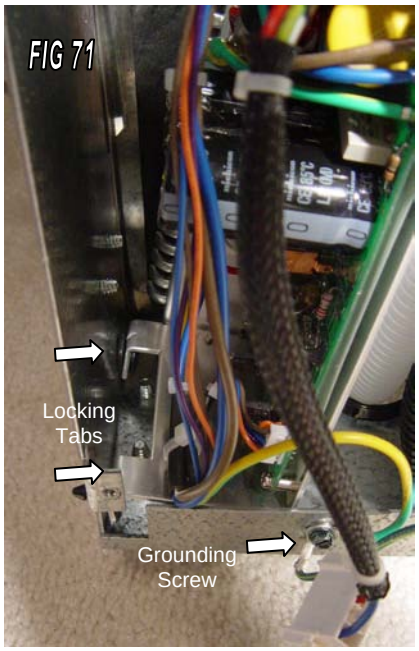


J3 provides 120 Volt AC power to the motor controller. J5 provides the control signal voltage between the control board and the motor controller.

The motor controller is secured the left side support frame by 4 plastic locking plugs. Using a flat blade screwdriver as shown in **FIG 70**, carefully extend the bracket away from the dishwasher frame. This will release the locking tabs

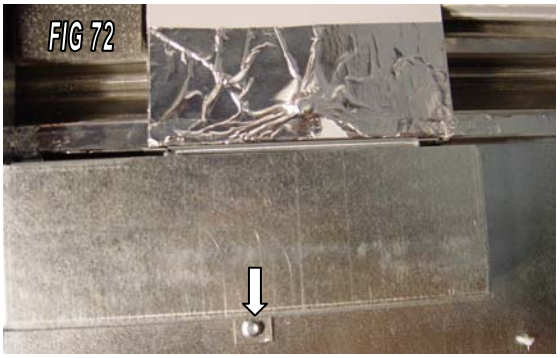


The motor controller and circulation motor grounding wires are attached to the dishwasher frame using a ¼" hex head screw. Remove the screw shown in **FIG 71**. After removing the screw, release the lower 2 locking tabs. You can now remove the motor controller.

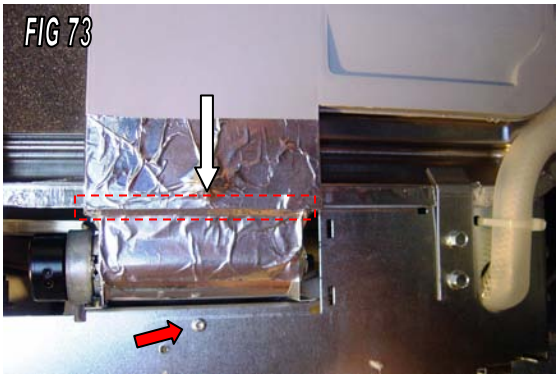


Heater Assembly (9)

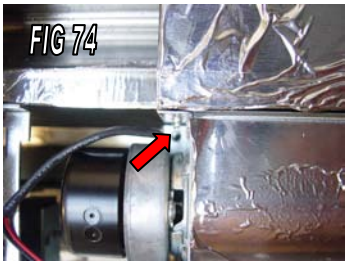
In order to remove the dryer motor and heater, you will need to first have the unit lying on its back with the base pan removed. The heater assembly will need to be removed first before removing the blower motor. First, remove the cover shown in **FIG 72** by removing the screw indicated by the white arrow.

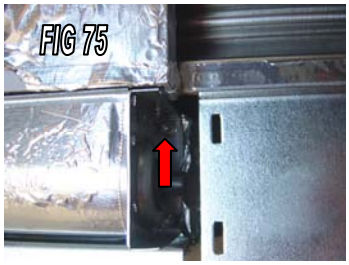


With the cover removed, you will notice there is a piece of aluminum tape that must be cut and removed before the heater can be removed (Shown in red brackets)



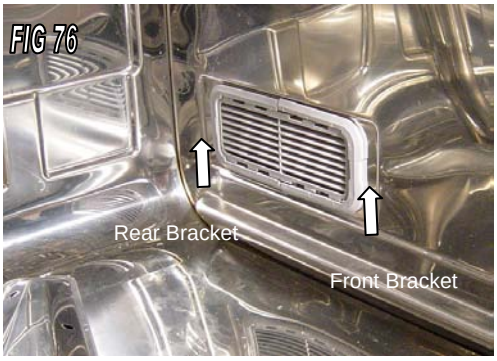
There are 5 screws (*Shown with RED arrows in **FIG 73-79***) in total that need to be removed in order to remove the heater. With the tape cut and removed, locate the front and rear T20 TORX® screws as shown in **Fig 74** (Front) *screw already removed in photo* and **FIG 75** (Rear).



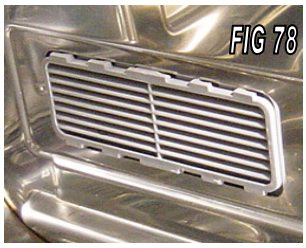


With these screws removed, you will now need to remove the right side fill chamber in order to access the 2 top screws that hold the heater housing in place.

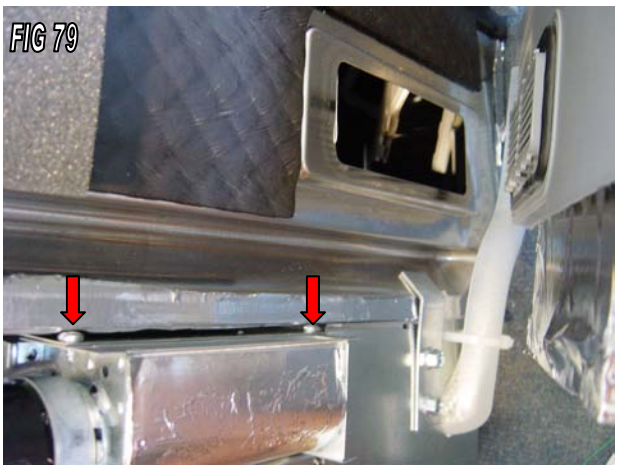
Open the dishwasher door to locate the water inlet assembly. This assembly is held in place by a front and rear locking bracket. **FIG 76** shows the inlet with both brackets attached.



Using a flat blade screwdriver, gently pry the locking brackets off the inlet assembly. Both the front and rear brackets are the same. The rear bracket must slide backwards to remove and the front bracket slid forward to remove. **Fig 77** shows the rear bracket removed and **FIG 78** shows the front bracket removed.

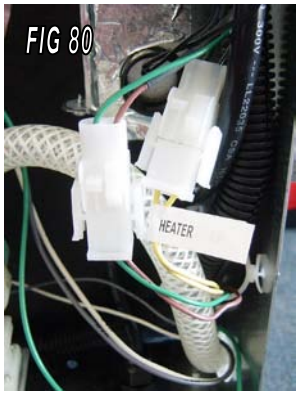


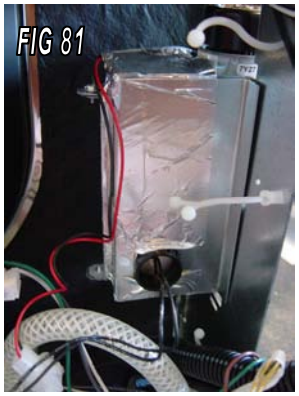
With the locking brackets removed, pull the fill chamber away from the right side of the unit. **FIG 79** shows the fill chamber detached from the machine. Remove the 2 TORX® screws indicated below. You can now remove the heater assembly.



Continued on Page 21

Now disconnect the connector to the Heater (2 yellow wires) to the supply plug. **FIG 80** shows the plug which is labeled HEATER.





In **FIG 81** above you can see the complete heater housing. The Red and black wires in the photo are the 12 volt DC supply to the blower motor. Remove the heater to expose the blower motor.

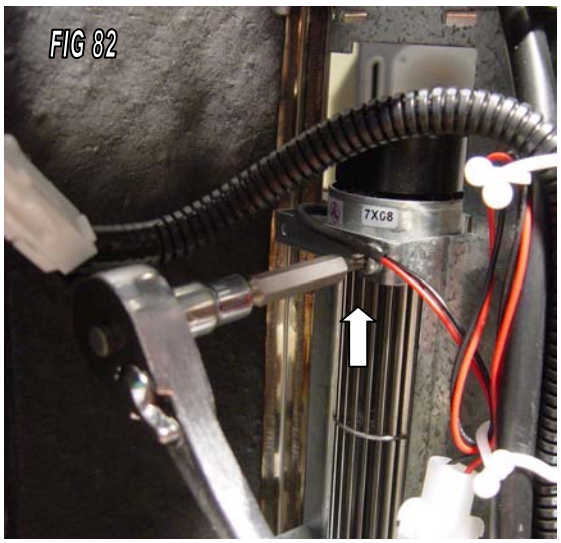
NOTE

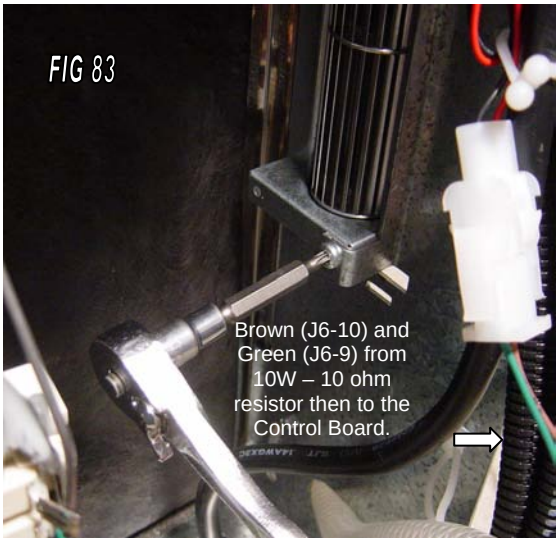
When reassembling the heater housing you must replace the aluminum tape that was removed during disassembly. Failure to do so may cause improper air flow across the heater.

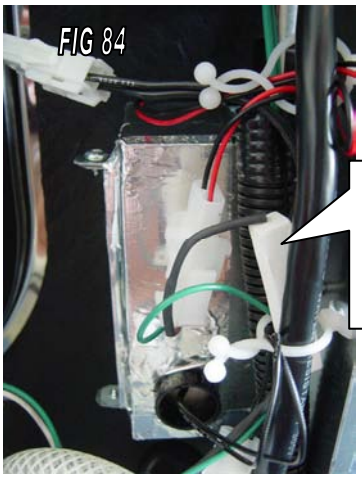
Dryer Motor (10)

With the dryer heating element removed you now have access to the dryer blower motor. Remove the 2 T-20 TORX® screws shown in **FIG 82** and **83**, as well as the 2-wire connector.

FIB 83 also shows the connector. The brown wire supplies12 volts DC from J6-10 on the control board to the in-line 10 ohm resistor (**FIG 84**) then to the motor. The green wire comes from J6-9 on the control board to supply ground to the blower motor. The motor wires are Black and Red in color

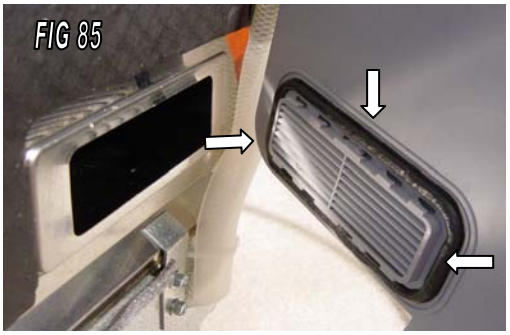






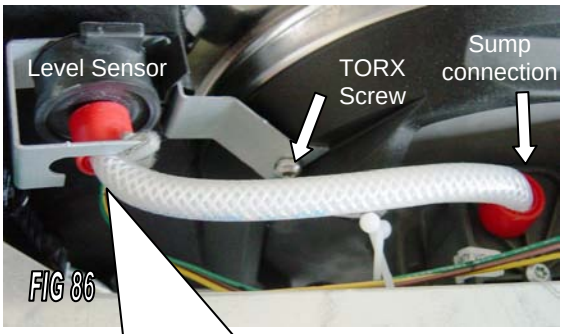
CAUTION

When reinstalling the inlet assembly, make sure that both the front and rear brackets are snapped back into their proper positions Failure to do so may cause water to leak through and then onto the consumer's floor. The o-ring gasket MUST be undamaged (shown below in FIG 85) or water can leak out of the unit and cause damage to the unit and the kitchen area.



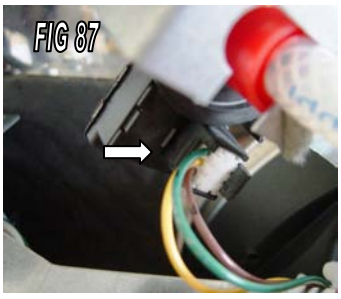
Water Level Sensor (11)

The level sensor is mounted to the sump retainer ring with 1 - T20 TORX® screw (Shown below in **FIG 86**). Removing the level sensor does NOT require the removal of the dishwasher from the cabinet. With the toe kick removed, locate the level sensor as shown in **FIG 86.**



J9-3 Brown wire – 5 volts DC in
J9-4 Yellow wire – 0.5 – 3.5 volts DC out
J9-5 Green Wire – Ground in

FIG 87 shows the 3 wire connector to the level sensor.



As the water level increases, the pressure in the ¼ pressure tube, connected to the level sensor input, increases as well. This pressure causes an internal amplifier to vary the output voltage to the board. For example, an empty sump should produce a reading of .5 -.8 Volts DC between J9-4 and ground while a full sump should read approximately 3.5 volts DC.

Depending on the water level, the output voltage to the Control Board changes and is processed in the board.

Drying System

When the unit has advanced to the dry cycle, the control board sends 12 Volts DC to both the blower motor and /or to the door wax motor. At selected intervals, 120 volts AC is also sent to the drying heater coil. As the heated air enters the wash chamber, it is mixed with the hot, moisture laden air and is vented out through the open assembly in the upper section of the door.

As the air is moving through the drying vent assembly, the hot air cools and moisture begins to condense into the tube. The water then flows down the chamber and flows back into the sump of the machine. **FIG 88** shows the air flow inside the tube

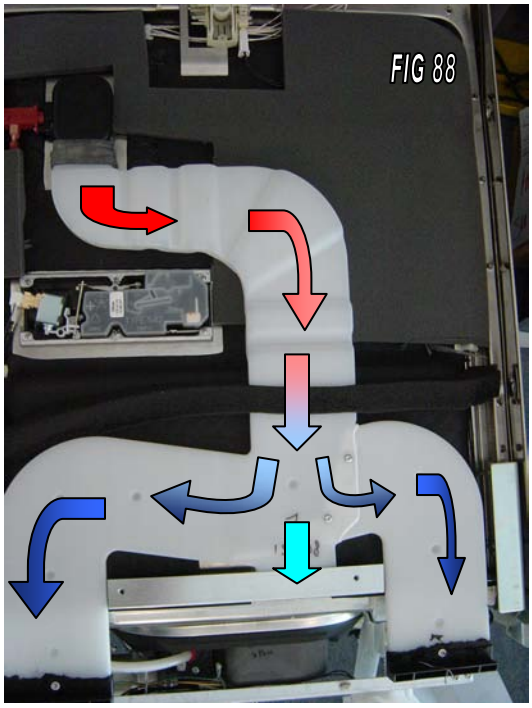
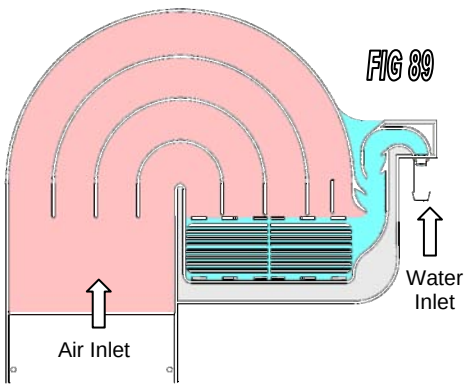


FIG 89 shows a diagram of the water inlet / dryer inlet tube assembly. During a fill cycle, water enters the chamber (shown in blue) and fills the dishwasher. During a dry cycle, ambient air is blown into the chamber (shown in pink), then into the dishwasher tank from the blower motor.



FAULT CODE

The 450 series dishwasher incorporates several faults codes to identify when an error is detected. By the use of the 5 program indicators, the unit will flash a pattern based on the error. Below is a listing of the codes. There are 22 total.

Error codes starting with *POTS PANS* LED

Drain Error 	• If water is still in the tub – Check for drain hose kinking • Check for drain plug removal if connected to a garbage disposal • Check house drainage system • Check the drain pump
Fill Error 	• Check water shut off. Check inlet connection for kinked hose • Check for the minimum drain high loop • Check the water fill valve • Check the HUBA sensor output.
Moisture Sensor Disconnect 	• Check for open moisture sensor • Check connection to moisture sensor.
Temperature Sensor Disconnect 	• Check for open temperature sensor • Check connection to temperature sensor.
Cycle Error - Motor Controller Data processor 	• Internal control processor error • Power reset and test
Motor Control Communication Error 	• Check the harness connection between the motor controller and the main control board • Check the machine control board and motor controller
Motor Control Status Error 	• Check the main connection to the wash motor • Check for 15 Ω on all three windings • Check the motor rotor and see if it is bound or restricted • Check the motor controller
Cycle Error – Error handler 	• Reset the Start button and test
Diverter Error 	• Check for diverter motor operation (Clicking of diverter motor) and motor not circulating • Check diverter assembly

Fault Codes *(continued)*

Error codes starting with *NORMAL WASH* LED

Moisture Sensor Activated 	• Check for water in the base pan • Check for water leaks
Pressure Sensor Disconnect 	• Check the pressure sensor (HUBA) harness connection • Check the harness • Check the sensor
Cycle Error – Circulation 	• Power reset and test
User Interface – Machine Control Communication Error 	• Check the harness connection between the UI and the machine control • Check the Machine Control • Check the UI
Cycle Error – Fill 	• Power reset and test
Sensor Error 	• Check the pressure (HUBA) sensor

Fault Codes *(continued)*

Error codes starting with *ECONO WASH* LED

Counter Error – User Interface

- Normal reset and test
- Check the UI

High Water Level

- Normal reset and test
- Check the pressure (HUBA) sensor

Cycle Error – Drain

- Normal reset and test

Circulate Time Out

- Check the heater harness connection

Error codes starting with *LIGHT CHINA* LED

State Error – User interface

- Normal reset and test

State Error – Main Control

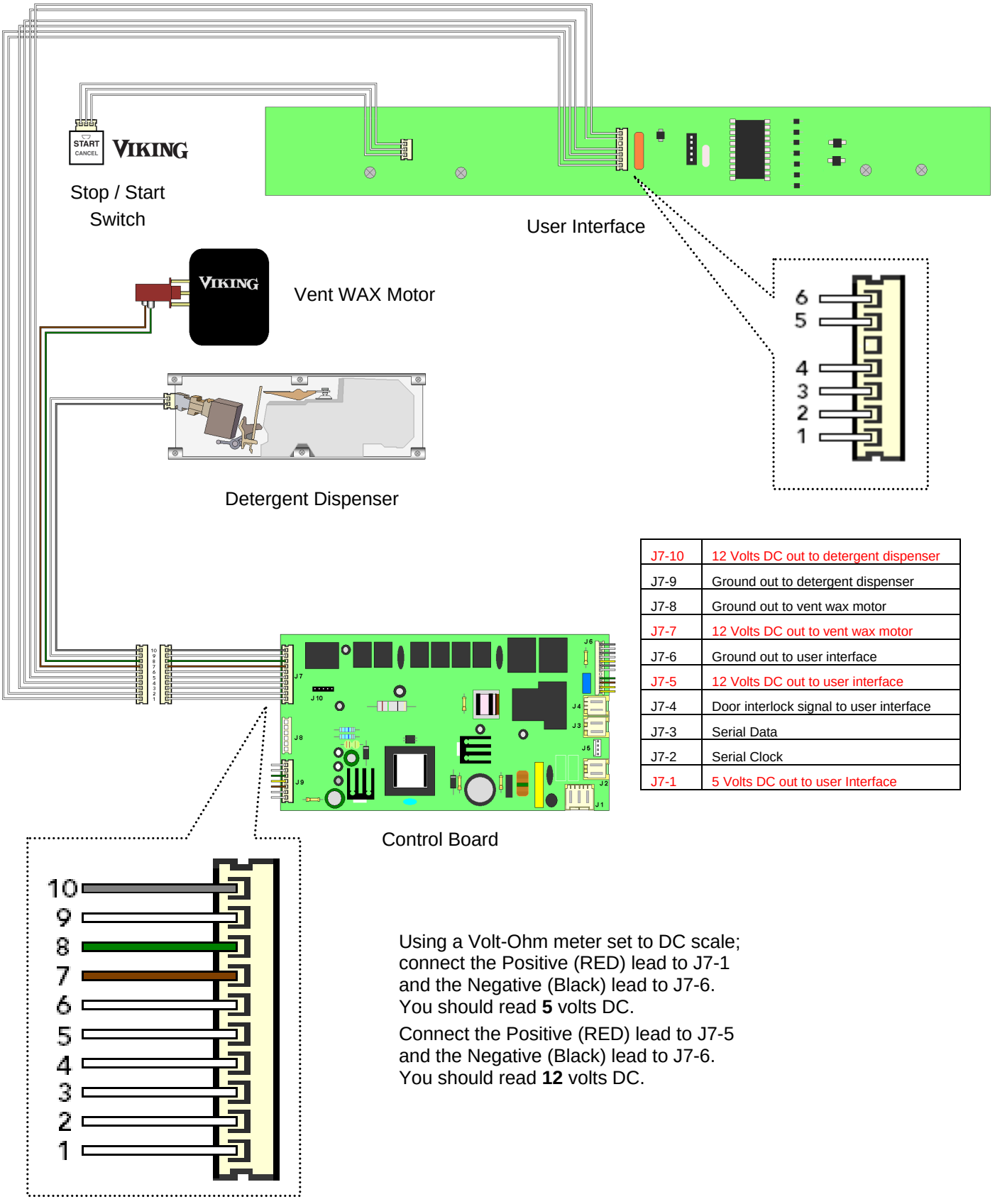
- Normal reset and test

Error codes starting with *RINSE HOLD* LED

Low Level Error

- Reset and test

Low Voltage - door circuit to main Controller



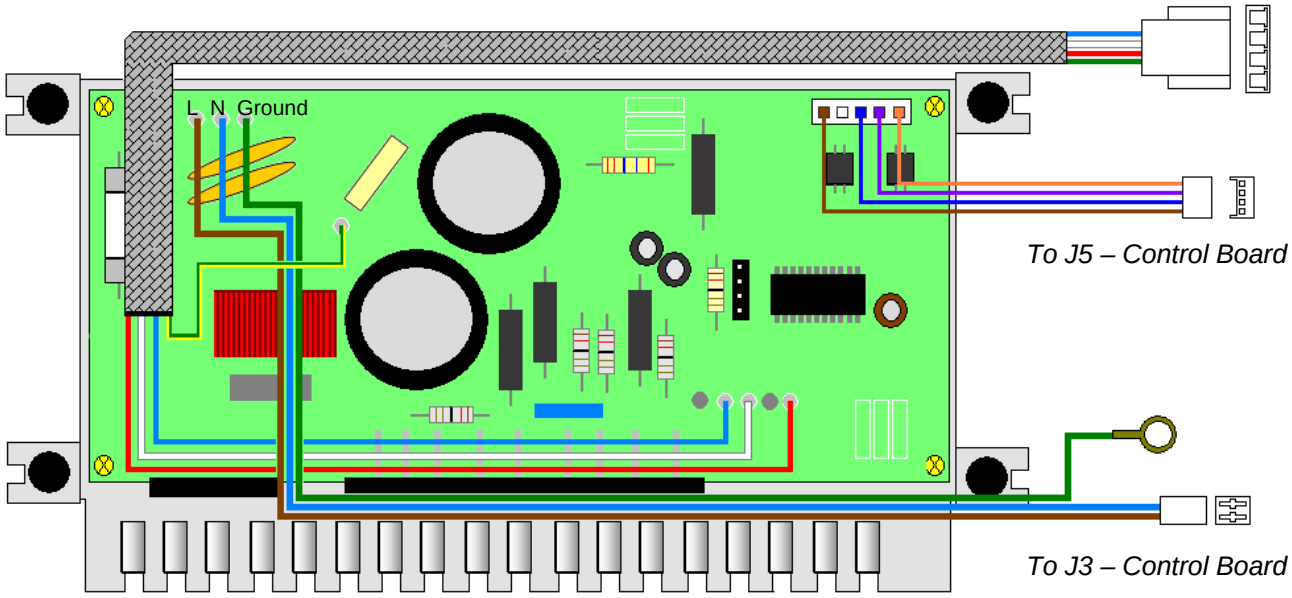
J7-10	12 Volts DC out to detergent dispenser
J7-9	Ground out to detergent dispenser
J7-8	Ground out to vent wax motor
J7-7	12 Volts DC out to vent wax motor
J7-6	Ground out to user interface
J7-5	12 Volts DC out to user interface
J7-4	Door interlock signal to user interface
J7-3	Serial Data
J7-2	Serial Clock
J7-1	5 Volts DC out to user Interface

Using a Volt-Ohm meter set to DC scale; connect the Positive (RED) lead to J7-1 and the Negative (Black) lead to J7-6. You should read **5** volts DC.

Connect the Positive (RED) lead to J7-5 and the Negative (Black) lead to J7-6. You should read **12** volts DC.

Motor Controller – Wiring connections

To Circulation motor

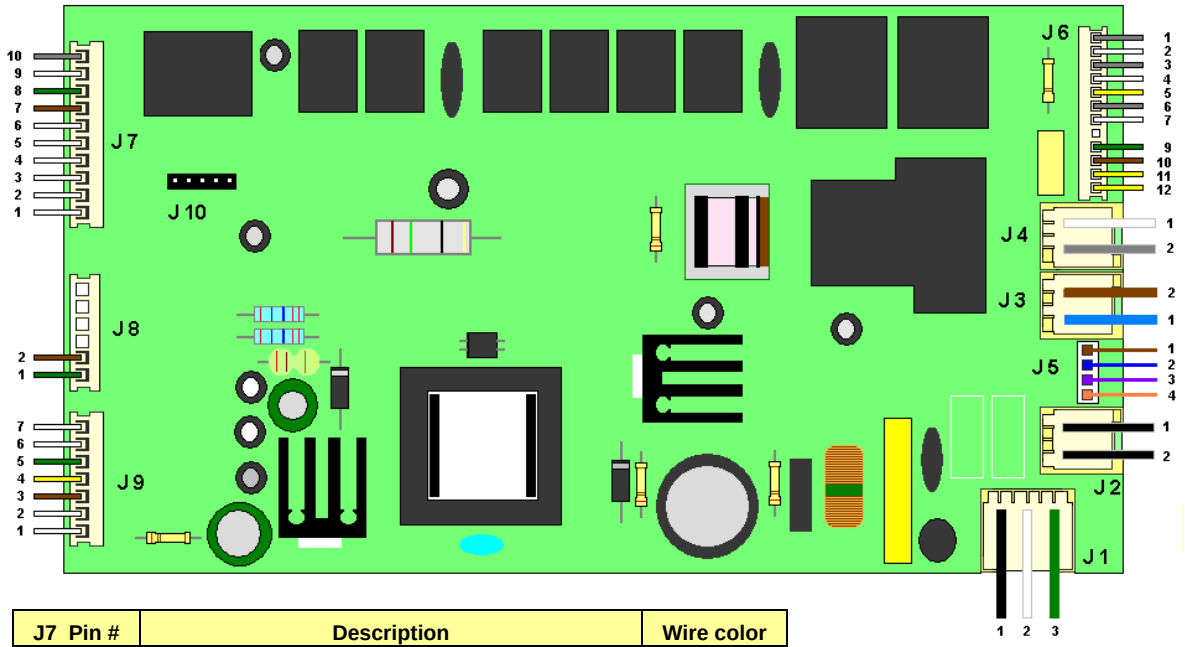


Wash Motor Plug	**Description**	**Wire Color**
To Circulation motor	Chassis Ground	Blue
To Circulation motor	0-160 Volts AC to motor	White
To Circulation motor	0-160 Volts AC to motor	Red
To Circulation motor	0-160 Volts AC to motor	Green

J5 Pin	**Description**	**Wire Color**
From Main control J5-4	Serial transmit to Main control	Orange
From Main control J5-3	Ground to Main control	Purple
From Main control J5-2	Serial receive to motor control	Blue
From Main control J5-1	5 Volts DC to motor control	Brown

J3 Pin	**Description**	**Wire Color**
From Main control J3-1	Neutral from Main control	Blue
From Main control J3-2	120 Volts from Main control	Brown

Main Control Board – wiring connections



J7 Pin #	Description	Wire color
J7-10	12 Volts DC out to detergent dispenser	Gray
J7-9	Ground out to detergent dispenser	White
J7-8	Ground out to vent wax motor	Green
J7-7	12 Volts DC out to vent wax motor	Brown
J7-6	Ground out to user interface	White
J7-5	12 Volts DC out to user interface	White
J7-4	Door interlock signal to user interface	White
J7-3	Serial Data	White
J7-2	Serial Clock	White
J7-1	5 Volts DC out to user interface	White

J8 Pin #	Description	Wire color
J8-2	5 volts out to Power ON light	Brown
J8-1	Ground out to Power ON light	Green
J9 Pin #	**Description**	**Wire color**
J9-7	5 Volts DC out to moisture sensor	White
J9-6	5 V DC Analog temp signal from moisture sensor	White
J9-5	Ground out to water level sensor	Green
J9-4	0.5 - 3.5 DC signal from water level sensor	Yellow
J9-3	5 Volts DC out to water level sensor	Brown
J9-2	5 Volts DC Analog temp signal from temp sensor	White
J9-1	Ground out to temp sensor	White

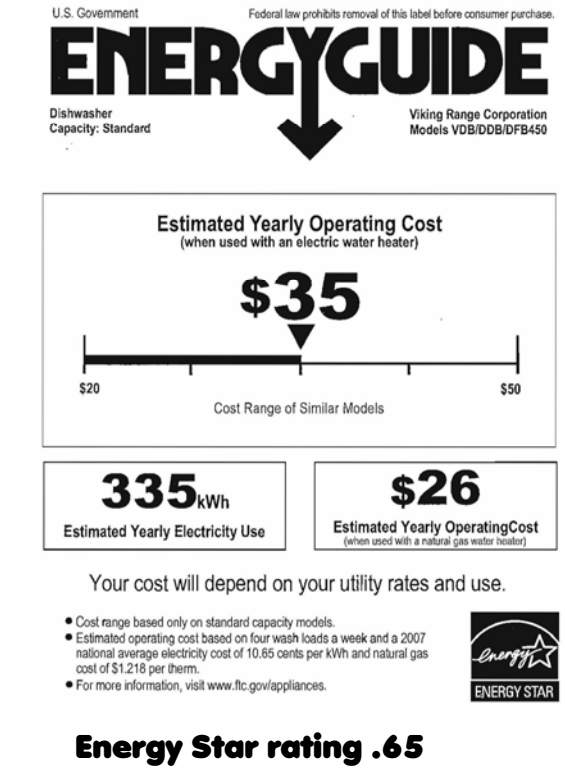
J2 Pin #	Description	Wire color
J2-1	120 Volts to door interlock switch	Black
J2-2	Neutral to door interlock switch	Black
J1 Pin #	**Description**	**Wire Color**
J1-1	Neutral in from main supply	White
J1-2	120 Volts in from main supply	Black
J1-3	Chassis ground	Green

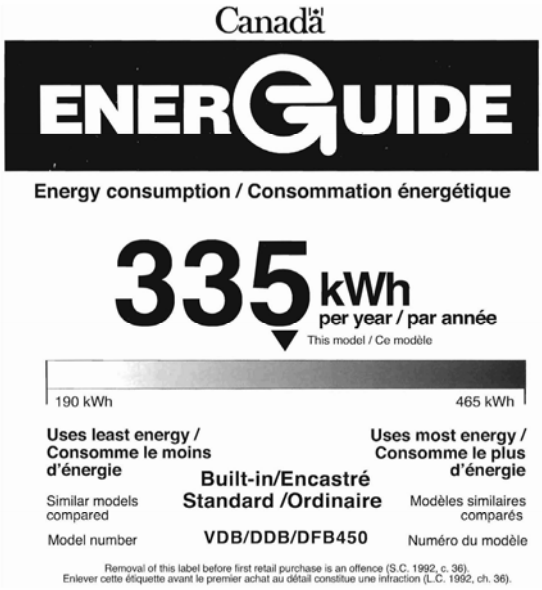
J6 Pin #	Description	Wire color
J6-1	120 Volts to drain motor	Gray
J6-2	Neutral to drain motor	White
J6-3	120 Volts to diverter	Gray
J6-4	Neutral to diverter	White
J6-5	120 volts return diverter	Yellow
J6-6	120 Volts to fill valve	Gray
J6-7	Neutral to fill valve	White
J6-8	OPEN	
J6-9	Ground to blower	Green
J6-10	12 Volts DC to blower	Brown
J6-11	120 volt to drying heater	Yellow
J6-12	Neutral to drying heater	Yellow

J4 Pin #	Description	Wire color
J4-1	Neutral to water heater	White
J4-2	120 Volts to water heater	Gray
J3 Pin #	**Description**	**Wire Color**
J3-1	Neutral to motor control	Brown
J3-2	120 Volts to motor control	Blue
J5 Pin #	**Description**	**Wire Color**
J5-1	5 Volts DC to motor control	Brown
J5-2	Serial transmit to motor control	Blue
J5-3	Ground to motor control	Purple
J5-4	Serial receive from motor control	Orange

Component information – Electrical Specifications

Component Name	Volts	Ohms	Amps	Watts	Input/load
Drain motor	120 Volts - AC	14-15 ohm	0.8	45	Load
Wash diverter	120 Volts - AC	27,000 ohms (27k ohms)	0.01	4	Load
Circulation motor	120 - 155 Volts - AC	15.0 ohm	1.2	150	Load
Water heater	120 Volts - AC	10.5 ohm	11.4	1400	Load
Water temp sensor	12 Volts DC	46k - 49k ohm @ Ambiant	N/A	N/A	Input
Fill valve	120 Volts - AC	1000 ohms (1k ohm)	0.12	14.4	Load
Drying motor	12 Volts DC	1750 Ohms (17.5k ohms)	0.7	8.4	Load
Moisture sensor	12 Volts DC	* 180,000 Ohms (180k ohms)	N/A	N/A	Input
Detergent dispensor	12 Volts DC	N/A	1.2	N/A	Load
Active vent wax motor	12 Volts DC	N/A	1.2	N/A	Load
Dryer heating element	120 Volts - AC	133.3	0.9	115	Load
Water level sensor	5 Volts DC				Input
		* When sensor is dry and no corrosion.			





Energy Star rating .65