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:

VDB325
VDB450

(From 5/26/2010)

SMK-0003
January, 2011

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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 appliance. **ALWAYS** read and obey all safety messages. This is a safety alert symbol.

This symbol alerts personnel to hazards that can kill or hurt you and others. All safety messages will be preceded by a safety alert symbol and the word "DANGER", "WARNING" or "CAUTION". These words mean:

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

Professional Series Built-In Dishwasher Warranty

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, improper installation, improper operation or repair or service to the product by anyone other than an authorized Viking Range Corporation service agency or representative. Warranty shall not apply to damage resulting from indoor units being used in outdoor situations. This warranty does not apply to commercial usage. This warranty does not cover any food or medicine loss due to product failure. 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 or 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. Replacement of a component part includes its free installation. 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 there of which gives rise to the claim.

VIKING RANGE CORPORATION
111 Front Street, Greenwood, Mississippi (MS) 38930 USA
662-455-1200

For more product information, call 1-888-VIKING1 (845-4641), or visit our web site at http://www.vikingrange.com

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 product was purchased, an authorized Viking Range Corporation service agent, or Viking Range Corporation. Provide model and serial number and date of original purchase. 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 described halogen elements 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

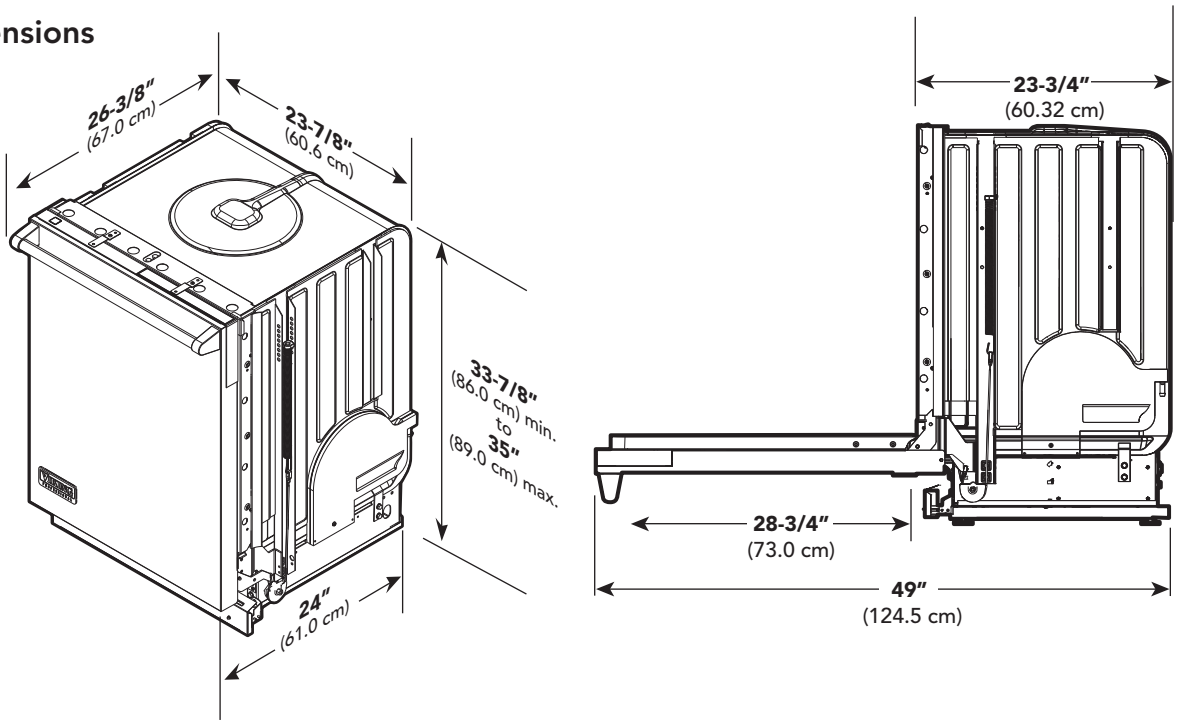
Specification subject to change without notice.

Specifications*

	Built-In Dishwasher
Description	**VDB325**
Overall width	23-7/8" (60.6 cm)
Overall height	33-7/8" (86.0 cm) min. to 35" (89.0 cm) max.
Overall depth from rear	To edge of side—24" (61.0 cm)—includes door panel With door open—49" (124.5 cm)
Cutout width	24" (61.0 cm)
Cutout height	34" (86.4 cm) min. to 35" (89.0 cm) max.
Cutout depth	24" (61.0 cm)
Electrical requirements	15.0 amps, 120 VAC/60 Hz; 3'9" (1.1 m) electrical cord 3-prong plug supplied with unit
Water-heating element rating	1400 watts
Inlet water temperature	120°F (49°C) recommended; Dishwasher will perform properly with cold water ***Note:** Cycle times will vary*
Inlet water pressure operating range	10 to 125 psi (0.69 to 8.62 bar)
Inlet water hose	5' (1.5 m) braided stainless steel water line with 3/8" (0.95 cm) compression fitting connected to dishwasher
Drain hose	7' (2.13 m) 1/2" (1.3 cm) ID "crimp-proof" flexible drain hose attached to dishwasher, connections provided for 5/8" (1.6 cm), 3/4" (1.9 cm) or 1" (2.5 cm), cut as required
Drain hose high loop required	Height from floor—20" (51.0 cm) min
Approximate shipping weight	152 lbs. (68.9 kg)

**Go to vikingrange.com for the latest specifications.*

Dimensions

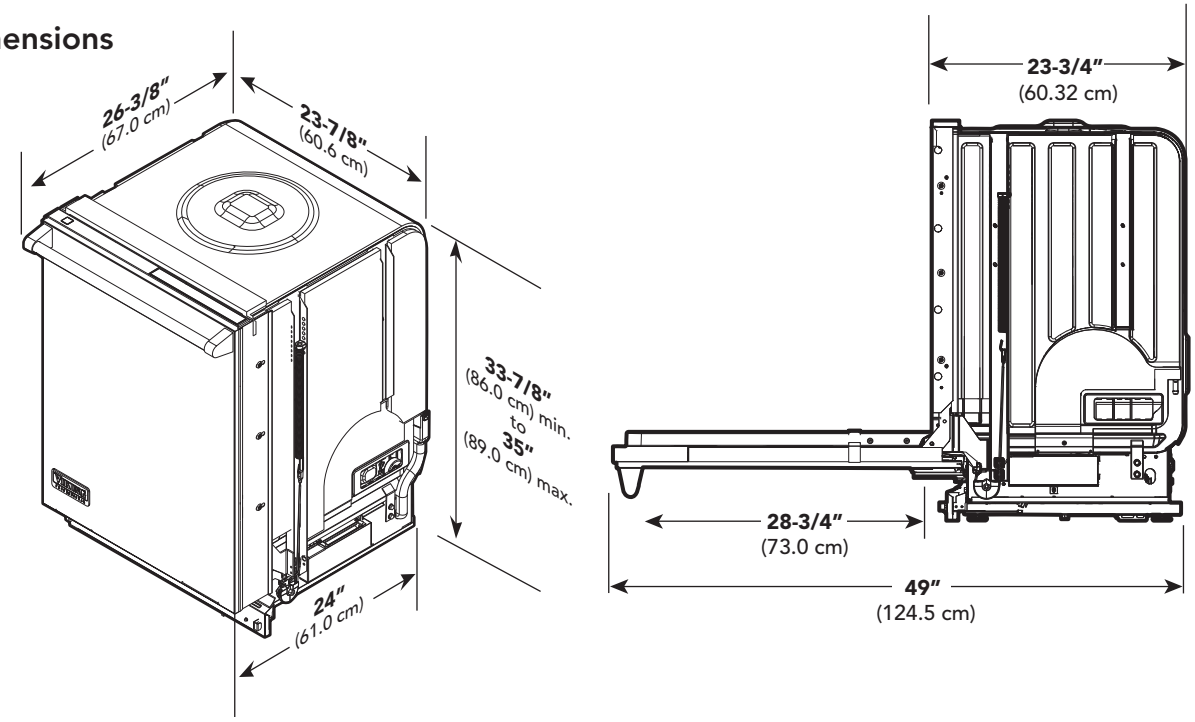


Specifications*

	Built-In Dishwasher
Description	**VDB450**
Overall width	23-7/8" (60.6 cm)
Overall height	33-7/8" (86.0 cm) min. to 35" (89.0 cm) max.
Overall depth from rear	To edge of side—23-3/4" (60.3 cm)—includes door panel With door open—49" (124.5 cm)
Cutout width	24" (61.0 cm)
Cutout height	34" (86.4 cm) min. to 35" (89.0 cm) max.
Cutout depth	24" (61.0 cm)
Electrical requirements	15.0 amps, 120VAC/60 Hz; 3'9" (1.1 m) electrical cord 3-prong plug supplied with unit.
Water-heating element rating	1200 watts
Inlet water temperature	120°F (49°C) recommended; Dishwasher will perform properly with cold water ***Note:** Cycle times will vary*
Inlet water pressure operating range	10 to 125 psi (0.69 to 8.62 bar)
Inlet water hose	5' (1.5 m) braided stainless steel water line with 3/8" (0.95 cm) compression fitting connected to dishwasher
Drain hose	7' (2.13 m) 1/2" (1.3 cm) ID "crimp-proof" flexible drain hose attached to dishwasher, connections provided for 5/8" (1.6 cm), 3/4" (1.9 cm) or 1" (2.5 cm), cut as required
Drain hose high loop required	Height from floor—20" (51.0 cm) min.
Approximate shipping weight	157 lbs. (71.2 kg)

**Go to vikingrange.com for the latest specifications.*

Dimensions



Warnings

Read and follow all instructions before using this appliance to prevent the potential risk of fire, electric shock, personal injury, or damage to the appliance as a result of improper usage of the appliance. Use appliance only for its intended purpose as described in this manual.

To ensure proper and safe operation: Appliance must be properly installed and grounded by a qualified technician. **DO NOT** attempt to adjust, repair, service, or replace any part of your appliance unless it is specifically recommended in this manual. All other servicing should be referred to a qualified servicer.

Water Supply

WARNING

Plumbing connections must comply with applicable sanitary, safety, and plumbing codes.

- Water pressure for the water supply should be a minimum of 10 to 125 psi. The dishwasher is supplied with a 5' (1.5 m) braided stainless steel water line with 3/8" (0.95 cm) compression fitting connected to dishwasher.
- After determining where the water supply line will connect to the dishwasher, provide a 2" (5.1 cm) access hole and run the water supply line to the approximate fill valve location.
- For service convenience, a shut-off valve (not supplied) should be installed in the supply line in a readily accessible location (such as beneath the sink).
- It is recommended that the dishwasher be connected to a hot water supply. If a cold water supply is used, cycle times will vary.
- It is important that the water supply line and the shut-off valve have a sufficient flow volume. Flush the supply line prior to connecting it to the intake line of the dishwasher.

Drain

- The access hole for the drain line should be 2" square (5.1 cm). Locate as low and as near to the back wall as possible.
- **DO NOT** use any fittings anywhere in the drain line that are less than 1/2" (1.3 cm) ID.
- If the drain line is going to be connected to a food waste disposer, be sure to remove the knockout or plug from the fitting before connecting drain line.
- Drain connection should be a minimum of 9" (22.9 cm) from the floor. If connection is lower, siphoning during cycle can occur.

WARNING

The dishwasher has a factory installed back-flow preventer. **DO NOT** add an additional check valve.

Electrical Connections

This appliance must be grounded. In the event of a malfunction or breakdown, grounding will reduce the risk of electric shock by providing a path of least resistance for electric current.

***Note:** For this model, a power cord will have to be purchased separately. The plug must be plugged into an appropriate outlet that is installed and grounded in accordance with all local codes and ordinances.*

WARNING

Be sure electrical power is turned off at circuit breaker or fuse box before servicing unit.
DO NOT use an extension cord for this appliance.

WARNING

Improper connection of the equipment – grounding conductor can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the appliance is properly grounded. **DO NOT** modify the plug if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

Warnings

WARNING

ELECTRICAL SHOCK HAZARD
Electrically ground dishwasher.

Connect ground wire to green ground connector in terminal box.

DO NOT use an extension cord.

Failure to follow these instructions, can result in death, fire or electrical shock.

WARNING

EXCESSIVE WEIGHT HAZARD
Use two or more people to move dishwasher. Failure to do so can result in back or other injury.

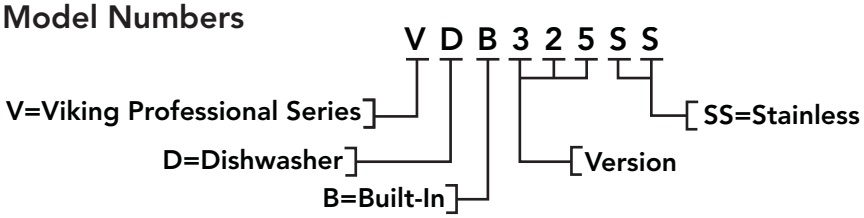
WARNING

TIP OVER HAZARD
DO NOT push down on open door. Doing so can result in serious injury or cuts.

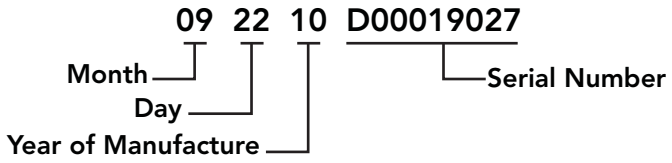
Model–Serial Number Matrix

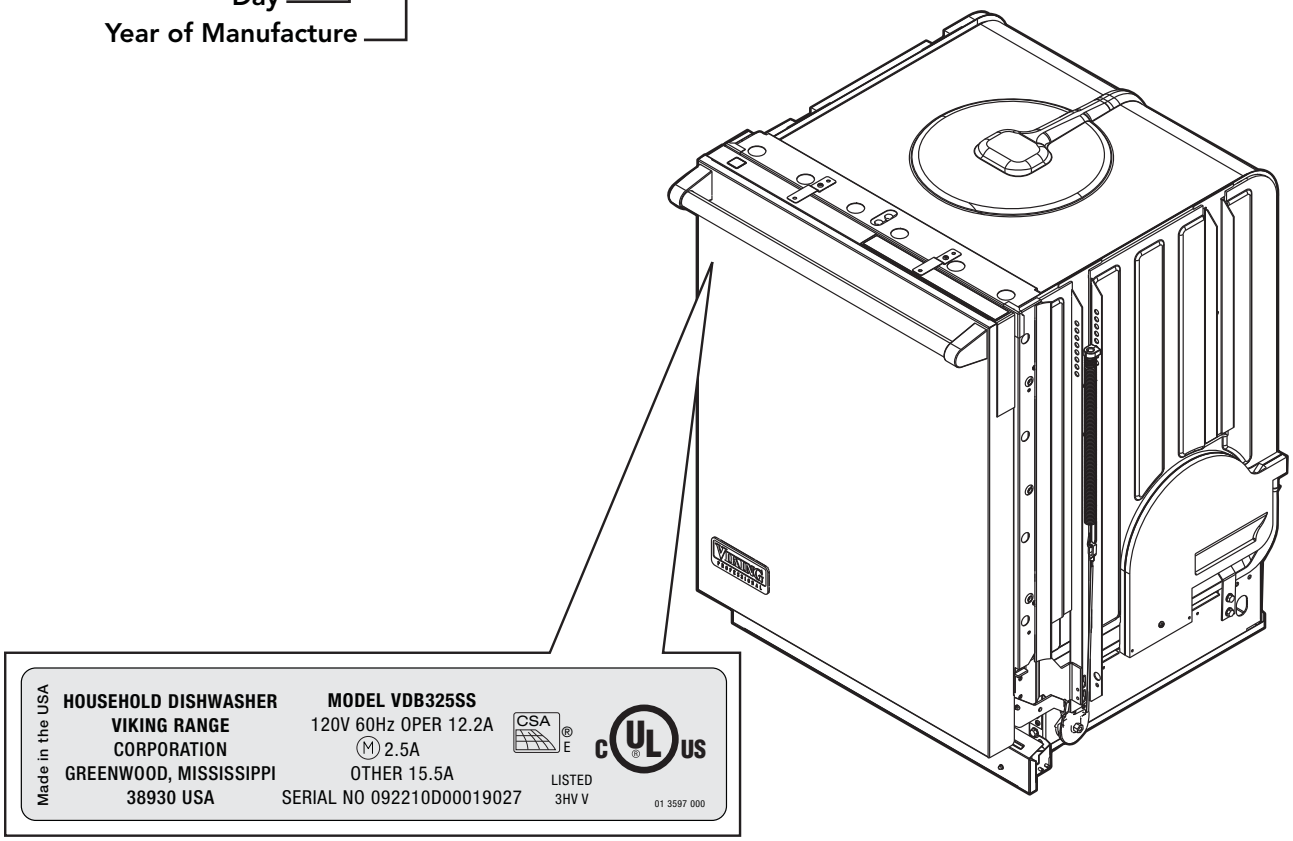
The serial number and model number for your appliance are located on the identification plate mounted on the inside of the unit.

Model Numbers



Serial Numbers

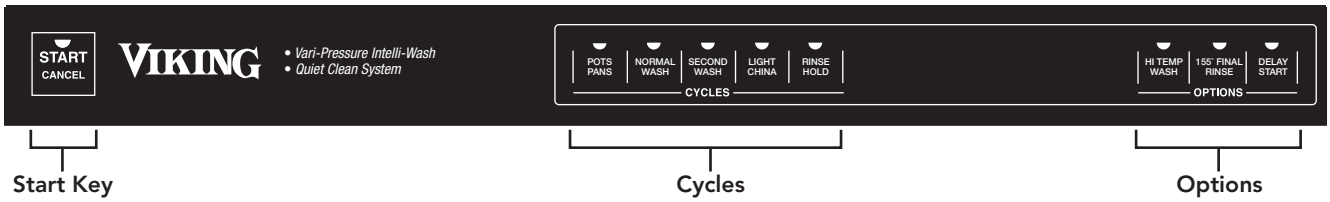




Settings and Functions–325 Model

Control Operation

The following is the basic layout of the control panel and how it is referenced below.



Wash Cycles

Pots/Pans
Heavily soiled pots, pans and casserole dishes. Long heated pre-wash loosens up encrusted food. High temperature main wash and final rinse.

Normal Wash
Normally soiled plates, glasses, bowls, and lightly soiled pots and pans. Normal pre-wash, main wash and rinse. Medium pressure and temperature.

Econo Wash
Normally soiled plates, glasses, bowls, and lightly soiled pots and pans. Lower temperature main wash and rinse. Longer pre-wash and main wash to maximize cleaning performance while using less energy.

Light/China
Lightly soiled dishes or fine china and crystal. Low temperature wash and rinse. Lightest pressure to protect dishes.

Rinse/Hold
All dishware. Short, medium pressure rinse with no heat.

Options

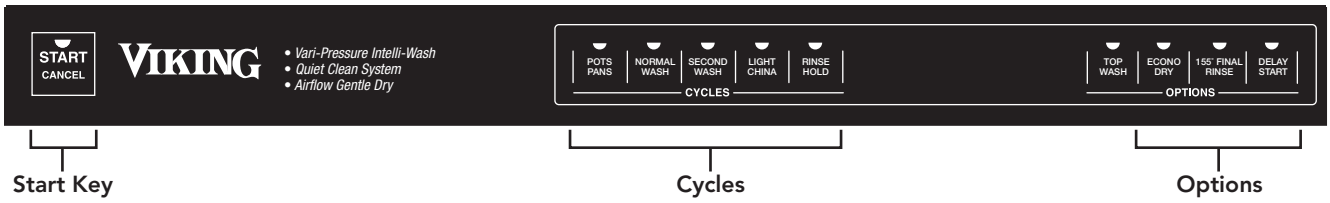
155°F (68°C) Final Rinse
Increases the temperature of final rinse to 155°F (68°C). Available on Pots/Pans and Normal Wash cycle.

Delay Start
Lets you delay running the dishwasher for up to 10 hours. To set DELAY START, select the desired wash cycle and option(s). Press the "DELAY START" button once and the number "2" will light, indicating a two-hour delay. If you desire a longer delay, continue pressing the "DELAY START" button to a four, six, eight or ten hour delay. The corresponding number on the button will light. Once you have set the desired delay time, press the "START" button and close the door. DELAY START is not available with the Rinse/Hold cycle.

Settings and Functions–450 Model

Control Operation

The following is the basic layout of the control panel and how it is referenced below.



Wash Cycles

Pots/Pans
Heavily soiled pots, pans and casserole dishes. Long heated pre-wash loosens up encrusted food. High temperature main wash and final rinse.

Normal Wash
Normally soiled plates, glasses, bowls, and lightly soiled pots and pans. Normal pre-wash, main wash and rinse. Medium pressure and temperature.

Econo Wash
Normally soiled plates, glasses, bowls, and lightly soiled pots and pans. Lower temperature main wash and rinse. Longer pre-wash and main wash to maximize cleaning performance while using less energy.

Light/China
Lightly soiled dishes or fine china and crystal. Low temperature wash and rinse. Lightest pressure to protect dishes.

Rinse/Hold
All dishware. Short, medium pressure rinse with no heat.

Options

Top Wash Only
Washes dishes on top rack only. Uses less water. Conserves energy. Available on Normal Wash cycle.

Econo Dry
Selects a "no heat" dry. Available on Normal Wash, Econo Wash and Light China cycles.

155° F (68° C) Final Rinse
Increases the temperature of final rinse to 155° F (68°C). Available on Pots/Pans and Normal Wash cycle.

Delay Start
Lets you delay running the dishwasher for up to 10 hours. To set DELAY START, select the desired wash cycle and option(s). Press the "DELAY START" button once and the number "2" will light, indicating a two-hour delay. If you desire a longer delay, continue pressing the "DELAY START" button to a four, six, eight or ten hour delay. The corresponding number on the button will light. Once you have set the desired delay time, press the "START" button and close the door. DELAY START is not available with the Rinse/Hold cycle.

Turning Audible Sound On and Off
To turn off, press Rinse/Hold button for 10 seconds. The beep stops and the Rinse/Hold LED will flash two times. To turn on, repeat above instructions. The audible sound beeps two times and the Rinse/Hold LED flashes two times to identify that it is on.

Note: *The audible sound cannot be disabled for error messages.*

Note: *The LED will flash in sync with the audible sound.*

Settings and Functions

Preparing Dishes
It is not necessary to rinse normal food soils off the dishes before putting them in the dishwasher, although larger solid particles, such as bones, seeds, skins, pits, and toothpicks should be removed.

If you are not going to run the dishwasher immediately after loading, it is best to rinse salty and highly acidic foods off stainless steel, silver, and silverplate flatware. Prolonged contact of foods—including lemon juice, salt, vinegar, mustard, mayonnaise, and salad dressings—with stainless steel can cause corrosion (pitting).

Before Operation
1. Load the dishes per recommended loading.
2. Make sure there is rinse agent in the dispenser. Add rinse agent if needed.
3. Add proper amount of detergent and pre-wash.
4. Select the desired cycle and option(s).
5. Push both top and bottom racks in.
6. Press "START". The START symbol will illuminate to indicate the unit is ready.
7. Close the door tightly until you hear a click, otherwise the dishwasher will not start.

Option Restrictions
All options are not available for all cycles.
Please note the following:
- The option HI Temp Wash/155˚F (68˚C) Final Rinse is not available in the ECONO WASH/ECONO CHINA.
- No options are available in the RINSE/HOLD cycle.

After selecting the wash cycle and options, depress "START" button. The START symbol will illuminate. This merely means the machine is ready. Close door securely within four seconds of pressing the START button.

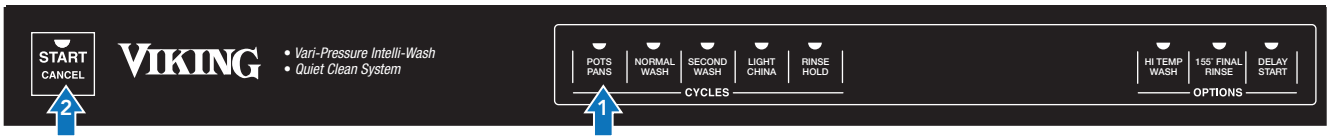
Changing a Program After the Unit Has Started
The dishwasher is programmed to stop operating if the door is opened during a cycle. To change a program or option after starting the machine, open the door slightly to let the spray arms stop rotating and avoid getting sprayed with water. Press and hold "START" for four seconds to cancel the current selection, then press the touchpad(s) for your desired selection.

Press "START" again and close the door. The drain pump will run to remove any dirty water from the dishwasher before starting the newly selected cycle. Check to make sure there is still detergent in the detergent dispenser.

Opening the Door After Cycle Has Started
If the door is opened after the cycle has started, the START button will flash to indicate that the dishwasher is in Standby mode. Press the "START" button and close the door securely within four seconds to restart the cycle. If a cycle is canceled, the dishwasher will drain any remaining water in the unit out.

Entering Diagnostic Mode–325 Model

To enter the Diagnostic mode on model 325, press the left most program button five times (Pots Pans) and then immediately press the "start" button.



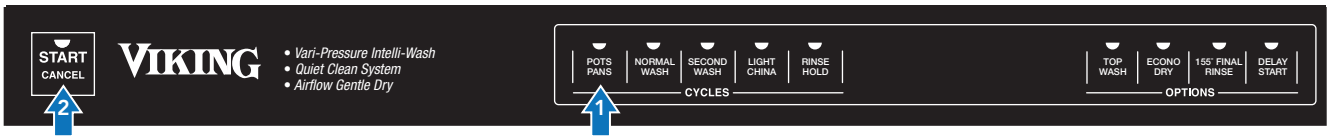
The test cycle will run approximately 6-1/2 minutes and will run each component individually.
Be sure to close the soap dispenser cup as this function will also be energized opening up the cup.

1. Drains any water in the sump (pressure sensor controlled).
2. Fills until pressure sensor is satisfied (about 1 minute).
3. Soap dispenser activates.
4. Wash arm diverter sets to **upper** wash arm.
5. Motor circulates at 2500 RPM's (upper wash arm) with water heater for **10** seconds.
6. Wash arm diverter sets to **lower** wash arm.
7. Motor circulates at 3100 RPM's (lower wash arm) with water heater for **10** seconds.
8. Water drains below primary filter level (pressure sensor controlled).
9. Wash arm diverter sets to **Filter Clean**. Circulate (filter clean) for **10** seconds.
10. Drains all water in the sump (pressure sensor controlled) until empty.
11. **10** second pause–when cycle is complete, you will hear two long beeps. This is the indication that the test cycle has finished.

Note: *During this test cycle, if the Control board senses a failure that it is programmed to monitor, it will display an error code.*

Entering Diagnostic Mode–450 Model

To enter the Diagnostic mode on model 450, press the left most program button five times (Pots Pans) and then immediately press the "start" button.



The test cycle will run approximately 6-1/2 minutes and will run each component individually.
Be sure to close the soap dispenser cup as this function will also be energized opening up the cup.

1. Drains any water in the sump (pressure sensor controlled).
2. Fills until pressure sensor is satisfied (about 1 minute).
3. Soap dispenser activates.
4. Wash arm diverter sets to **upper** wash arm.
5. Motor circulates at 2500 RPM's (upper wash arm) with water heater for **10** seconds.
6. Wash arm diverter sets to **lower** wash arm.
7. Motor circulates at 3100 RPM's (lower wash arm) with water heater for **10** seconds.
8. Water drains below primary filter level (pressure sensor controlled).
9. Wash arm diverter sets to **Filter Clean**. Circulate (filter clean) for **10** seconds.
10. Drains all water in the sump (pressure sensor controlled) until empty.
11. **10** second pause
12. Dryer blower motor and heater will activate for 10 seconds to check amps. When cycle is complete, you will hear 2 long Beeps. This is the indication that the test cycle has finished.

Note: *During this test cycle, if the Control board senses a failure that it is programmed to monitor, it will display an error code.*

Fail Codes

LED 1 Pots & Pans	LED 2 Normal Wash	Service Cycle Only	Error Code	Cause	Action	Note
1	1		Moisture sensor disconnect	Moisture sensor reads out of normal range	1. Wires disconnected to moisture sensor in base pan 2. Defective moisture sensor 3. Defective control board	
1	2		Motor control status error	Motor control communicates a motor operation failure mode that is most likely caused by the motor control	1. Wires disconnected between motor control and motor 2. Defective motor 3. Defective motor control	
1	3		Motor control comms error	Main control cannot succesfully communicate with the motor control	1. Wires disconnected between motor controller and control board 2. Defective Motor control 3. Defective control board	
1	4		Diverter timeout	Main control activates the diverter,but never sees feedback from the diverter that the correct position is eached	1. Wires disconnected between control board and diverter 2. Defective diverter 3. Defective control board	
1	5		Drain error	During a drain, the pressure sensor output never drops to the"empty" level	1. Verify that dishwasher drain hose is not clogged or kinked 2. Verify that plug has been removed from disposal (if so connected) 3. Verify that hose has a high loop per installation guide 4. Verify that dishwasher is level front to back and side to side	
2	1		Pressure Sensor Disconnect Error	Pressure sensor reads out of normal range low	1. Verify the pressure sensor is properly connected 2. Defective pressure sensor 3. Defective sensor harness	
2	2		Fill Error	During a fill, the pressure sensor output does not reach target fill pressure	1. Verify water is turned on to dishwasher 2. Verify that fill line is not kinked 3. Verify that dishwasher is level front to back and side to side 4. Verfiy there has not been a decrease in water pressure 5. Defective pressure sensor 6. Defective control	
2	3		Low Level Error	Pressure sensor indicates a water level lower than the low level thresMotor Undervoltage Error	1. Low water level in sump (check that items are secured in rack) 2. Verify that the drain has the proper high loop 3. Defective pressure sensor 4. Defective main control	
2	4		High Level Error	Pressure sensor indicates a waterlevel higher than the high level threshold	1. Excess water in sump (check that items are secured in rack) 2. Defective pressure sensor 3. Defective main control	

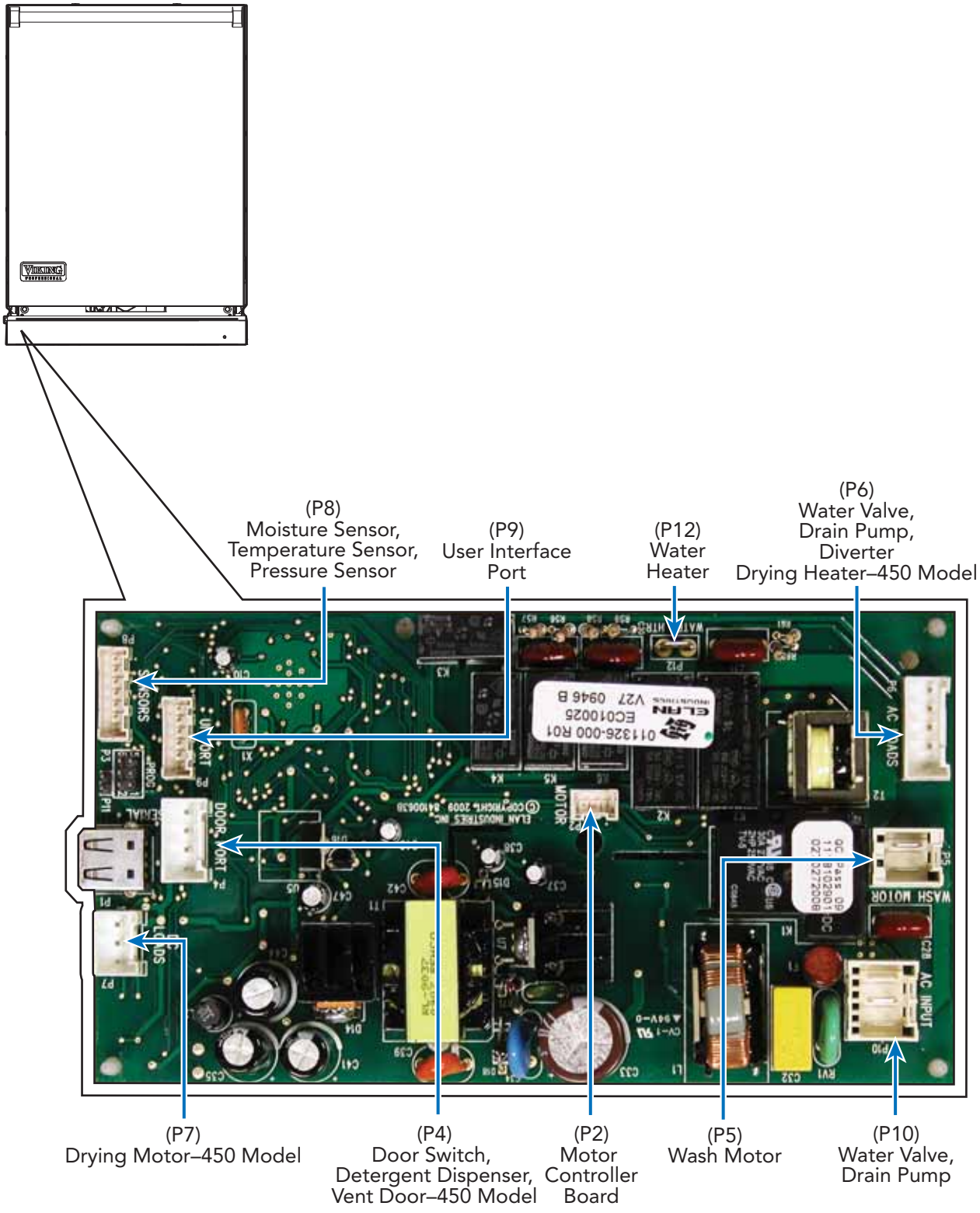
Fail Codes (cont.)

LED 1 Pots & Pans	LED 2 Normal Wash	Service Cycle Only	Error Code	Cause	Action	Note
2	5		Level Sensor Error	Sensor level changes abnormally (drains too fast/ fills to fast)	1. Make sure that unit is level front to back and side to side 2. Verify that the drain line has the proper high loop 3. Defective pressure sensor 4. Defective main control	
3	1		User Interface–Main Control Communication Error	User interface is unable to successfully communicate with the main control	1. Wires disconnected between main control and user interface 2. Defective cable between main control and user interface 3. Defective main control 4. Defective user interface	
3	2	Yes	Pump Flow Error	Control detects insufficient/ inconsistent water flow through the wash system and will not allow the flow through heater to activate	1. Verify water is fully turned on to dishwasher 2. Verify that fill line is not kinked 3. Verify that dishwasher is level front to back and side to side 4. Verify that filters are not clogged 5. Verify that there has not been a decrease in water pressure	
3	3		Drain Pump Error	Drain pump current sense is out of range	1. Wires disconnected between main control and drain pump 2. Defective drain pump 3. Defective main control	
3	4		Motor Status Error	Motor control communicates a motor operation failure mode that is most likely caused by the motor	1. Verify connection between motor controller and motor 2. Defective motor control 3. Defective machine control	
3	5		Motor Under-voltage Error	Motor control communicates a low motor control voltage condition	1. Verify supply voltage is in specification 2. Verify connection at terminal block 3. Verify AC connection to the machine control 4. Verify connection between machine control and motor control 5. Defective machine control 6. Defective motor control	
4	1		Temperature Sensor Error	Temperature sensor reads out of range	1. Wires disconnected to temperature sensor 2. Defective temperature sensor 3. Defective control board	
4	2	Yes	Wash Heater Error	Wash heater current sense is out of range	1. Wires disconnected between main control and wash heater 2. Defective wash heater 3. Defective main control 4. Defective temperature sensor	450 only

Fail Codes (cont.)

LED 1 Pots & Pans	LED 2 Normal Wash	Service Cycle Only	Error Code	Cause	Action	Note
4	3	Yes	Dispenser Error	Dispenser current sense is out of range	1. Wires disconnected between main control and dispenser 2. Defective dispenser 3. Defective main control	
4	4	Yes	Inlet Valve Error	Inlet valve current sense is out of range	1. Wires disconnected between main control and inlet valve 2. Defective inlet valve 3. Defective main control	
4	5					
5	1		Vent Error	Vent current sense is out of range	1. Wires disconnected between main control and vent 2. Defective vent 3. Defective main control	450 only
5	2	Yes	Blower Error	Blower current sense is out of range	1. Wires disconnected between main control and blower 2. Defective blower 3. Defective main control	450 only
5	3	Yes	Dry Heater Error	Dry heater current sense is out of range	1. Wires disconnected between main control and dry heater 2. Defective dry heater 3. Defective main control	450 only
5	4	Yes	Current Sense Error	Main control reads current draw when no loads are active	1. Defective main control 2. Defective wire harness	
5	5		Internal Error	Main control or UI detects a board level failure	1. Defective main control 2. Defective user interface	
Flash both LED1 and LED2 continuously			Moisture Sensor–water detection	Moisture sensor output is equivalent to water in the pan	1. Water in base pan from overflow/leak 2. Defective moisture sensor	
Flash all LEDs but start and run continuously			AC Power Loss	Power loss occurred during a running cycle	1. Power lost during a cycle 2. Reset by pressing and holding start for 3 seconds	

Parts Location–Control Board



Control Board Test Points

The unit has a control board that controls the functions of the dishwasher. Components can be diagnosed via the control board. With the control board accessed (*see Control Board Disassembly procedure, page 43)*, the following can be measured:

Component	Control Board Test Point	Readings (Typical)
Door Switch	P4-1 (Red/White) – P4-2 (Yellow)	0 Ω door closed ∞ Ω door open
Start Switch	Red – Black	Light illuminates blue
Start Switch	Red – White	0 Ω switch pressed ∞ Ω switch not pressed
Dispenser	P4-1 (Red/White) – P4-4 (Orange)	14.8 Ω
Three-Phase Wash Motor	Motor Controller Board	15 Ω between Red and White, Red and Blue and Blue and White.
Water Valve	P6-3 (Blue) – P10-1 (White)	1.1K Ω
Drain Pump	P6-4 (Brown) – P10-1 (White)	30.6 Ω
Diverter (Motor)	P6-2 (Gray) – P10-1 (White)	2.7K Ω
Diverter (Switch)	P6-5 (Yellow) – P10-1 (White)	Switch closed – 0 Ω Switch open – ∞
Moisture Sensor	P8-1 (Red/White) – P8-2 (Purple)	175K Ω
Temperature Sensor	P8-3 (Black/White) – P8-4 (Blue)	47K Ω @ 77˚ (varies based on temp)
Pressure Sensor	P8-6 (Brown) – P8-3 (Black/White)	5 volts DC input 0.5–3.5 volts DC output
Water Heater	P12 (Gray) – P10-1 (White)	12.00 Ω
Drying Motor (450 only)	P7 Red – P7 (Blue)	18.7K Ω
Drying Heater (450 only)	P6-1 (Orange) – P10-1 (White)	125 Ω
Vent Door (450 only)	P4-1 (Red/White) – P4-3 (Brown)	10 Ω
Power On Light	P8-5 (Green) – P8-7 (Brown)	5VDC

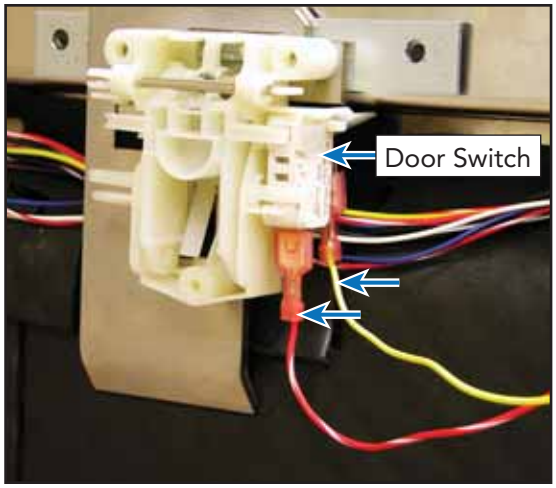
Control Board Diagnosis

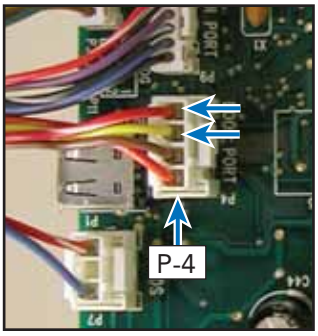
The diagnostic program on the 325 and 450 (when activated) will run all the components and compare the test results to the stored readings in memory. If the results are incorrect, an error code will be displayed. Suggest running the diagnostics program on pages 14-15 before removing unit for testing. (Some measurements require power and others require the unit not to be powered.)

With the unit removed from the cabinet and lying on its side, remove the bottom base pan to gain access to the machine controller. (see page 47 for removal of board).

Door Switch

The door interlock switch controls 12 VDC to the control board. When the door is open, the contact opens and the board stops the operation. To check the switch, unplug the molex connector and check for continuity between P4-1 (red/white) and P4-2 (yellow). With the door closed, the reading should be 0 Ω ohms. Open the door and the reading should be infinity (∞). If the readings are incorrect, check the wiring to the door switch and inspect the door switch.

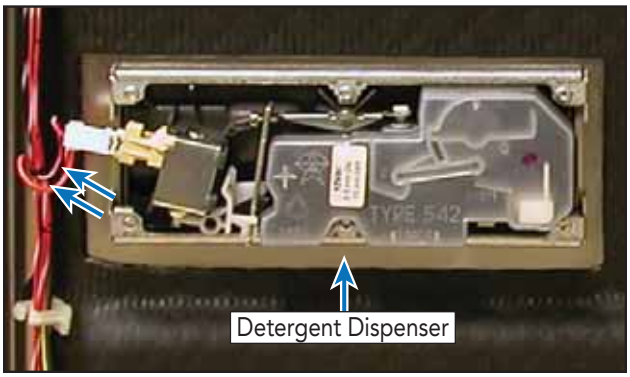


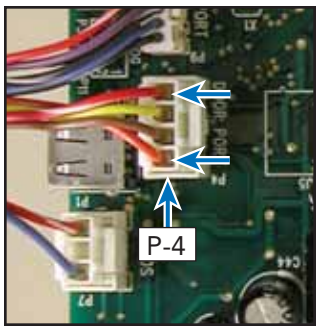


Main Control Board

Detergent Dispenser

The dishwasher uses a detergent dispenser to release detergent into the tub. As voltage is applied, the latch mechanism releases the dispenser door allowing detergent to enter the tub. Voltage between P4-1 and P4-2 should be 12 VDC when the dispenser is activated. If no voltage is measured, verify wiring.





Main Control Board

Note: *Testing the soap cup can be achieved in the diagnostic mode.*

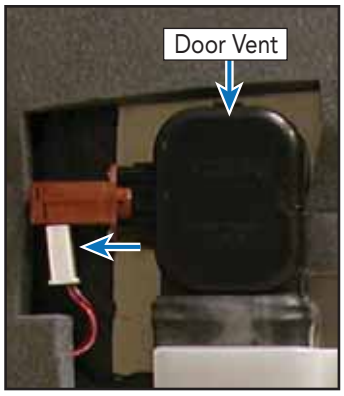
Control Board Diagnosis (continued)

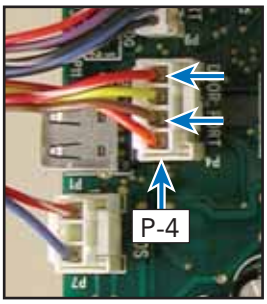
(Some measurements require power and others require the unit not to be powered.)

Door Vent (450 model only)

At rest, the internal vent door is in the open position. When a wash cycle is activated, 12 Volts are sent to the wax motor. As the wax begins to heat, this causes the internal lever to move, closing off the vent door. This way, no steam is allowed to escape drying the wash cycle.

During the dry cycle, the voltage is removed from the wax motor, allowing it to cool. As it cools, the internal lever retracts and allows the door to open. Steam can now travel into the door channel to begin condensing inside the channel.



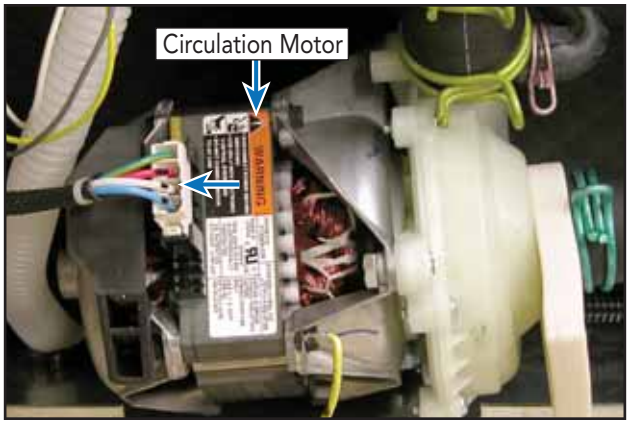


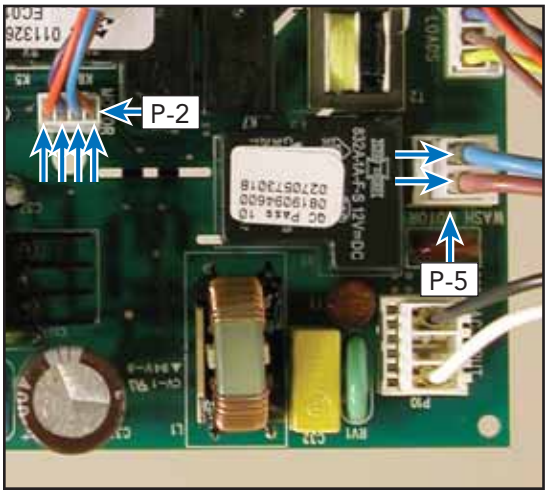
Main Control Board

Circulation Motor

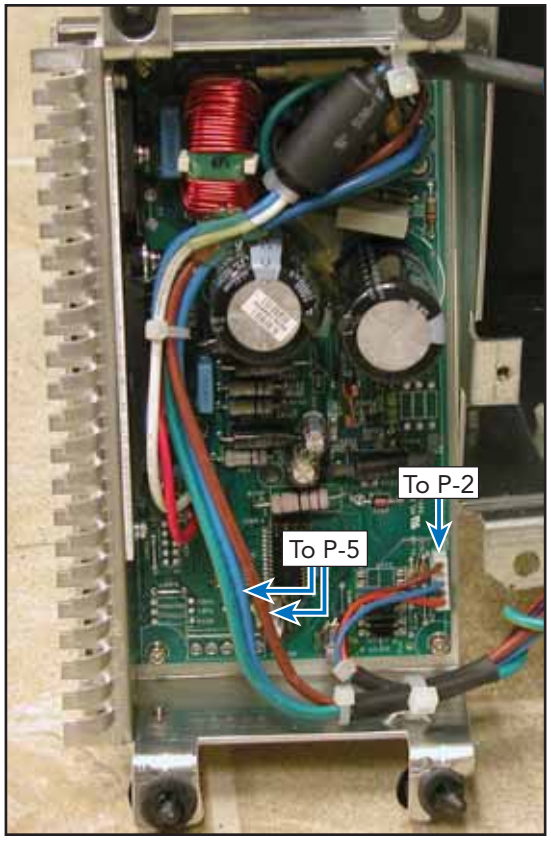
The 325 and 450 series dishwasher utilizes a three-phase AC induction motor with variable speed capabilities. The motor is controlled by the motor controller.

P5-1 and P5-2 sends 120 Volts to the motor controller. The motor controller then coverts the voltage to operate the three-phase motor.





Main Control Board



Motor Controller Board

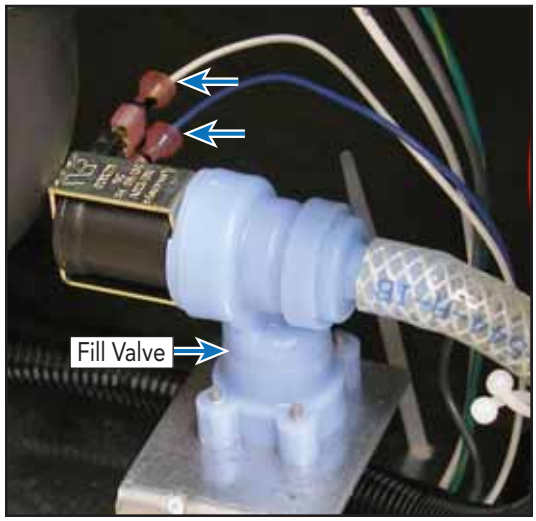
Note: *Testing the circulation motor can be achieved in the diagnostic mode.*

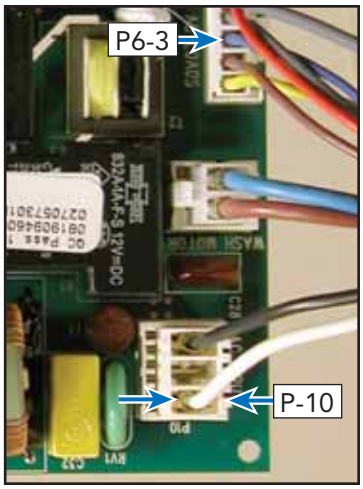
Control Board Diagnosis (continued)

(Some measurements require power and others require the unit not to be powered.)

Fill Valve

The dishwasher uses a fill valve to fill the machine with water. Verify as the valve is energized that 120 VAC is present between P6-3 and P10-1. If voltage is present and no water enters, check the water supply and shut off valve to make sure water is being supplied to the unit. If water is present, unplug the wires to the fill valve and using an ohmmeter, check for approximately 1.1k Ω ohms at the coil. If 0 Ω ohms are read, replace the fill valve (*see Fill Valve Disassembly procedure, page 45*).



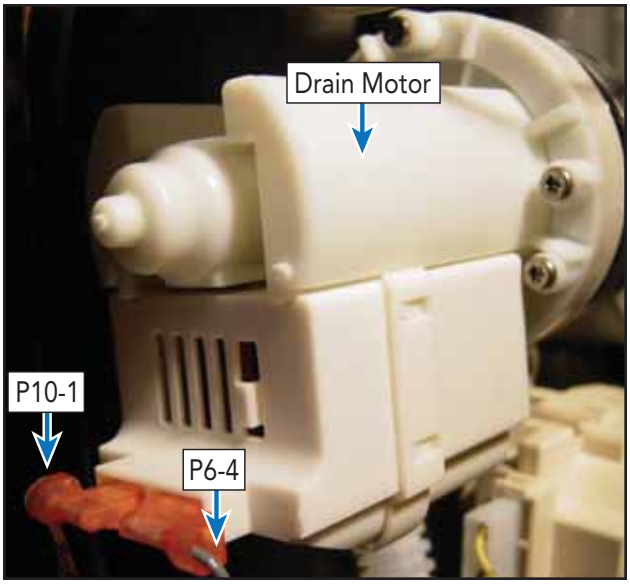


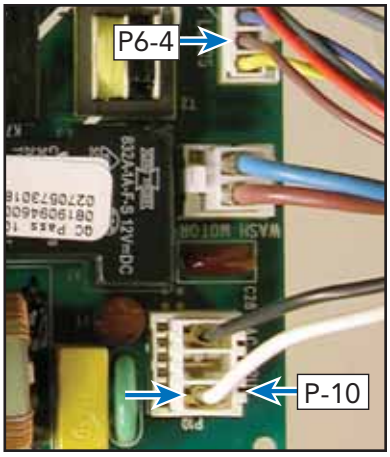
Main Control Board

Note: *Testing the fill valve can be achieved in the diagnostic mode.*

Drain Motor

The dishwasher uses a drain motor to remove water from the tub at timed intervals during the wash cycle. In the drain mode, voltage between P6-4 and neutral should be 120 VAC. If voltage is measured, unplug the wires to the drain motor and using an ohmmeter, check for approximately 30.6 Ω ohms at the valve. If 0 Ω ohms are read, replace the drain pump. If readings are correct, remove pump and check for obstructions in the drain pump *(see Drain Motor Disassembly procedure, page 42).*





Main Control Board

Note: *Testing the drain motor can be achieved in the diagnostic mode*

Control Board Diagnosis (continued)

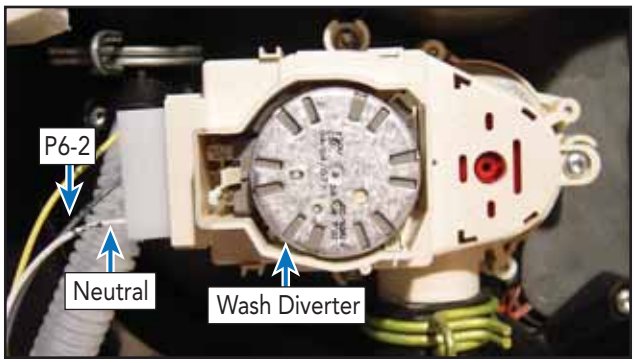
(Some measurements require power and others require the unit not to be powered.)

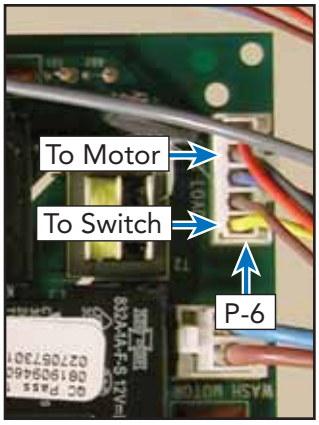
Wash Diverter

The dishwasher uses a wash diverter to divert water to either the upper arm or lower arm during the wash cycle. This allows for low water consumption and a better wash to both upper and lower racks.

At the beginning of each wash cycle, the control board positions the wash diverter to its proper starting position. It is monitored by a built in monitoring switch that sends 120 VAC back to P6-5 (yellow). Depending on how long the switch is closed determines what position it is in.

To check the wash diverter, check the motor with an ohmmeter between P6-2 (gray) and Neutral. It should read approximately 2.7k Ω ohms. If readings are incorrect, verify wiring connections to the diverter. If the wiring is proper, replace the wash diverter *(see Wash Diverter Disassembly procedure, page 42).*



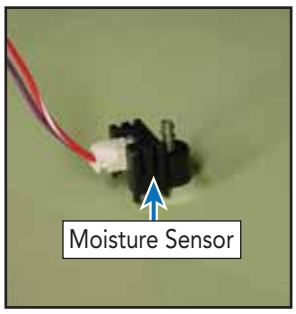


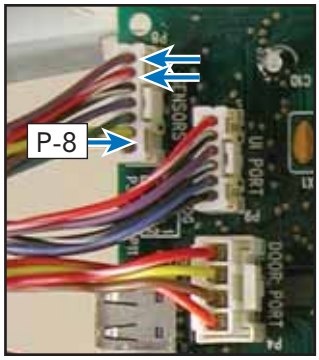
Main Control Board

Note: *If the diverter does not position itself, a diverter time out error will display (see Fail Codes, page 16-18).*

Moisture Sensor

The dishwasher uses a moisture sensor that is mounted in the base pan of the dishwasher. Any moisture that comes in contact with the sensor will cause the unit to stop filling, operate the drain pump, and signal an error code. If the sensor is open, an open fail code will signal *(see Fail Codes, page 16-18)*. Resistance between P8-1 and P8-2 should be 175K Ω ohms.



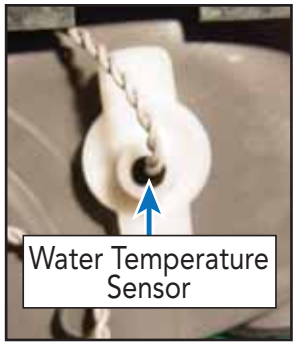


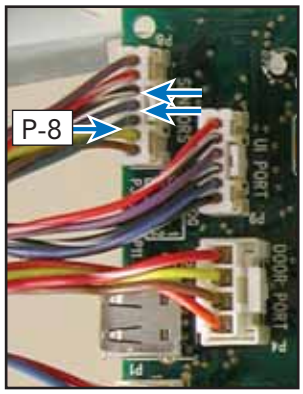
Main Control Board

Water Temperature Sensor

The dishwasher uses a water temperature sensor that is mounted in the sump of the dishwasher. It is an N.T.C (Negative Temperature Coefficient). As the temp of the water rises, the resistance drops (and vice-versa).

The control board monitors P8-3 – P8-4. Resistance should be 47K Ω @ 77˚. If no resistance is found, check wiring. If wiring is OK, replacement of the sensor is necessary.





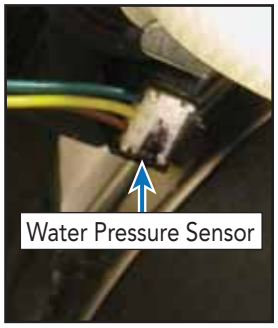
Main Control Board

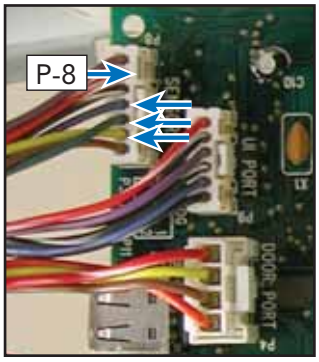
Control Board Diagnosis (continued)

(Some measurements require power and others require the unit not to be powered.)

Washer Pressure Sensor

The sensor is mounted to the sump retainer ring. As the water level increases, the pressure in the 1 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. Forexample, an empty sump should produce a reading of .5 -.8 Volts DC between P8-6 (yellow) and P8-5 (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.

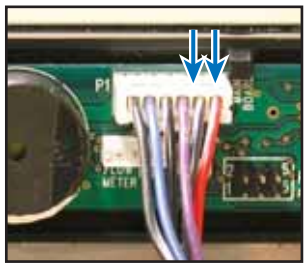




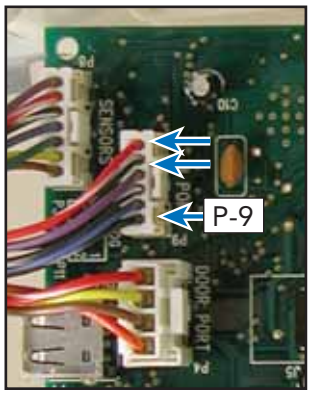
Main Control Board

User Interface Port

The user interface allows the end consumer to make cycle selections. As the selection is made, the signal is sent to the control board via a ribbon connection. Voltage between P9-1 and P9-2 should be 12 VDC. If no voltage is found, check ribbon connector. If connector is OK, replacement of the user interface is necessary *(see Control Panel Removal procedure, page 30)*.



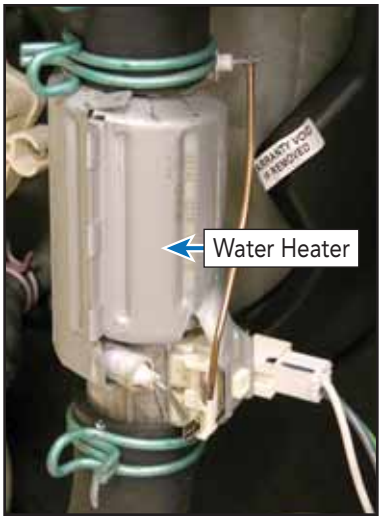
User Interface Board

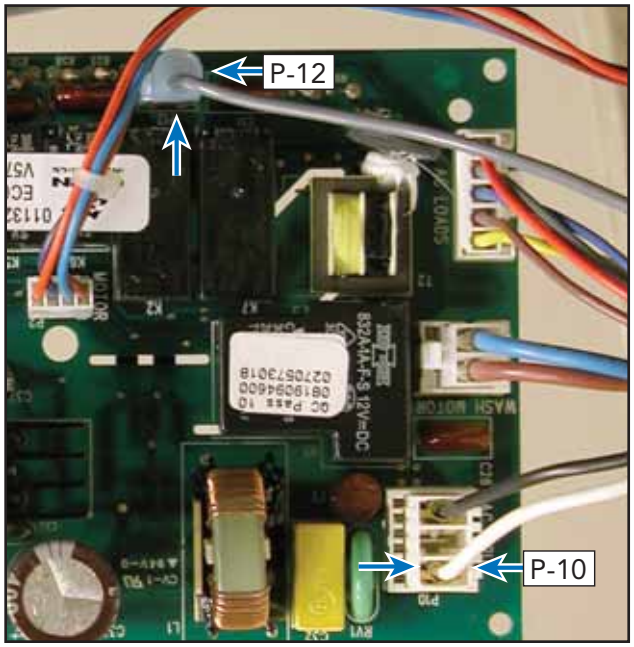


Main Control Board

Water Heater

The unit uses a 120-volt, 1200 watt heater to heat the water during the wash cycle. To check the heater, unplug the gray wire on P12 and using an ohmmeter, check for 12 Ω ohms between the gray wire and Neutral. If 0 Ω ohms are read, check the wiring to the heater. If the wiring is correct, replace the heater. The heater can also be tested in the Diagnostic mode *(see pages 14-15)*.

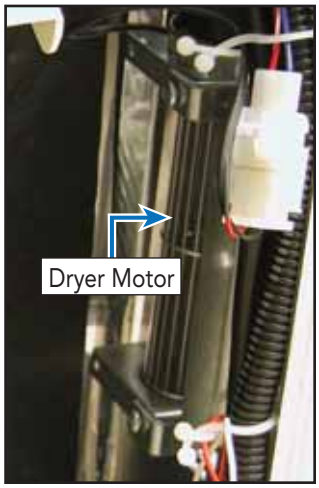


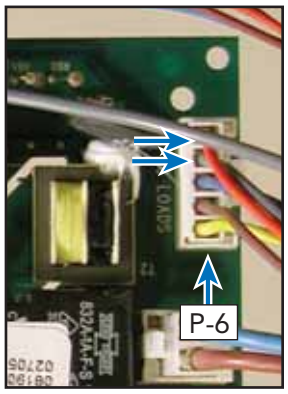


Main Control Board

Control Board Diagnosis *(Some measurements require power and others require the unit not to be powered.)*

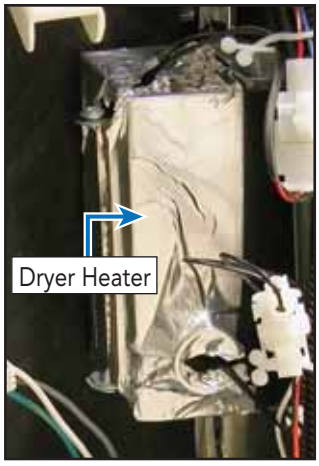
Dryer Motor–450 only
When the dry cycle begins, 12 volts are sent to the dryer motor. The motor forces ambient air into the dishwasher chamber. This fresh air mixes with and helps to evacuate the hot moisture latent air out of the tank and out through the door vent.

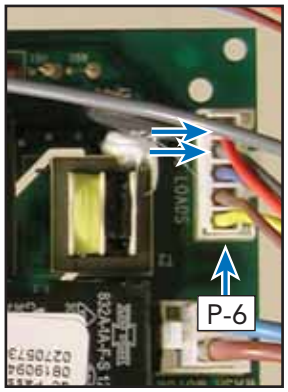




Main Control Board

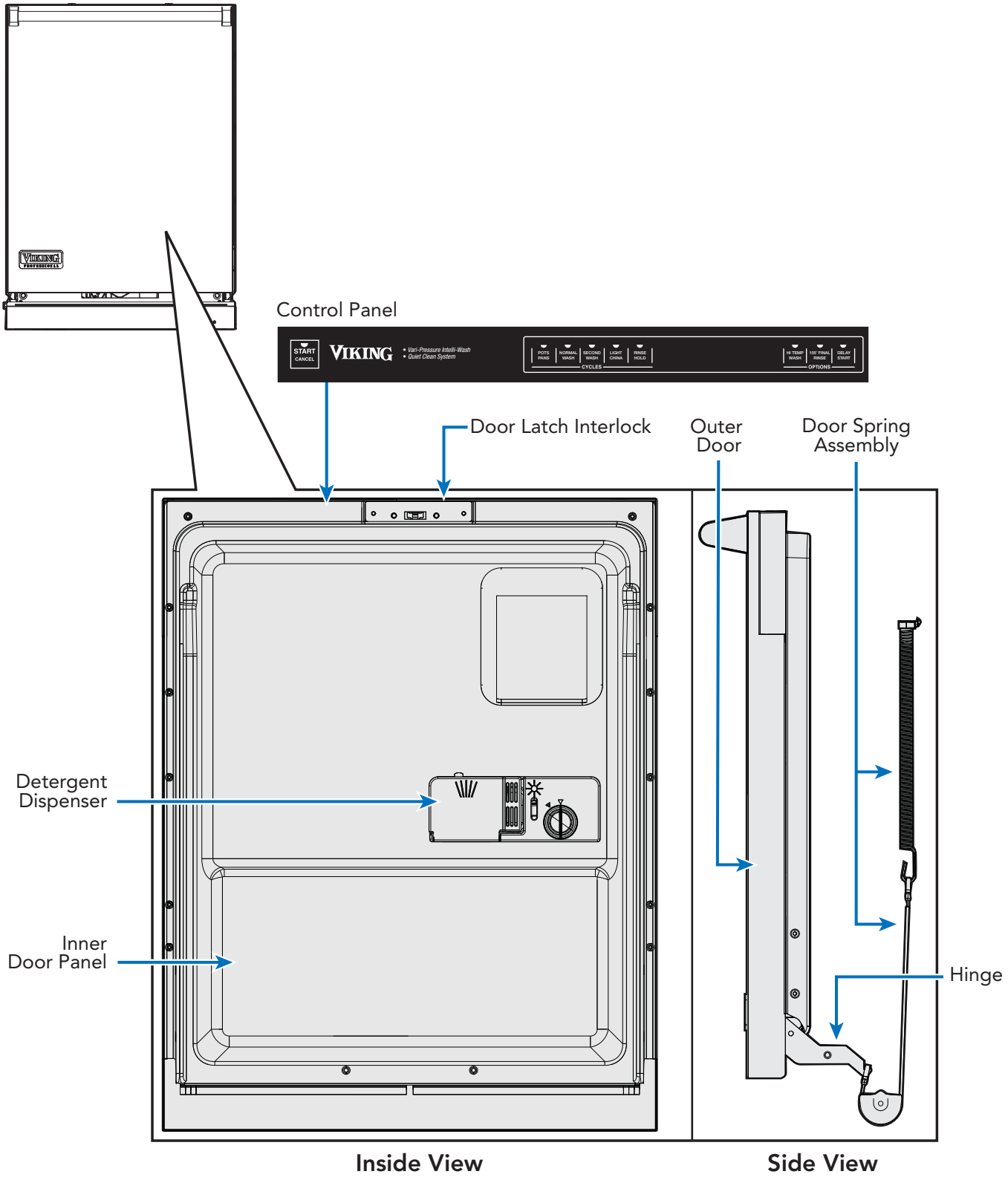
Dryer Heater–450 only
When additional heat is required to help dry the dishes, the control board sends 120 volts to the dry heater. This heat is carried into the dishwasher tank by the dryer motor.



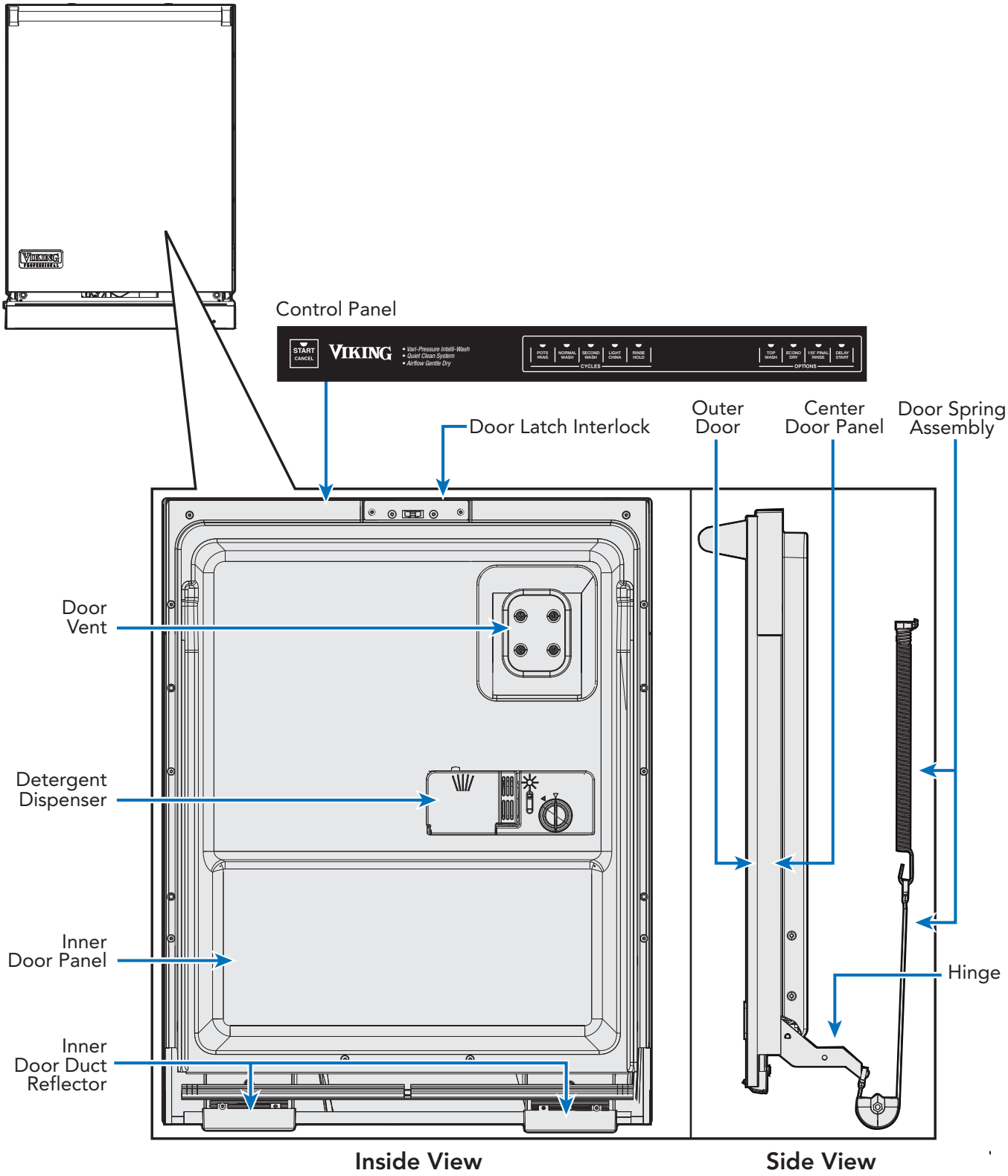


Main Control Board

Parts Location–Door 325 Model



Parts Location–Door 450 Model



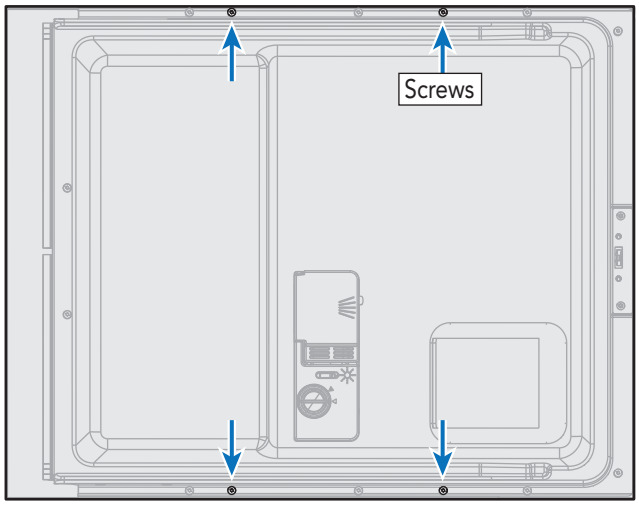
Door Disassembly

In order to gain access to the internal components of the door, which includes the detergent dispenser, start switch, door interlock, user interface and the vent door (450 only), you will need to remove the front door panel and the control 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 (325 and 450)
In order to gain access to the inner door components 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. These screws are 1”
(2.5 cm) long.



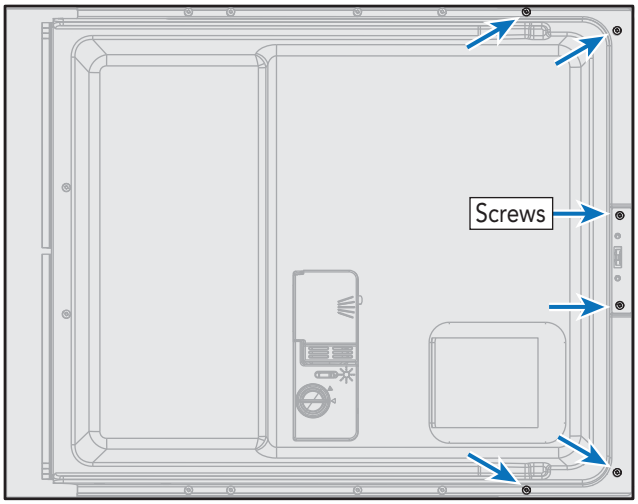
The following images show the actual location of the screws.

Note: *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.*

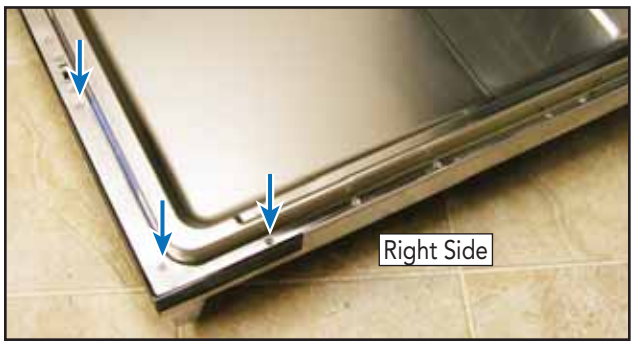
Note: *325 Model shown.*

Door Disassembly (cont.)

Control Panel Removal
After removing the outer door panel, the next step is to remove the control panel assembly. There are six T15 TORX® screws that hold the control panel in place. Using a T15 TORX® screwdriver, remove the screws shown.



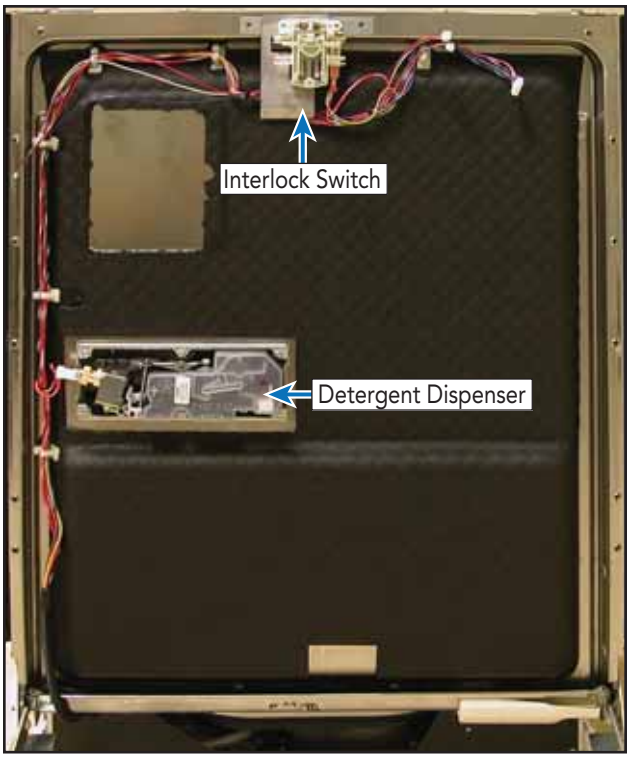
The following images show the actual location of the screws.



Note: *With the outer door panel and the control panel removed, access to the user interface is gained.*

Inner Door Components–325 model
With the center door panel and control panel removed, you now have access to the inner door components.

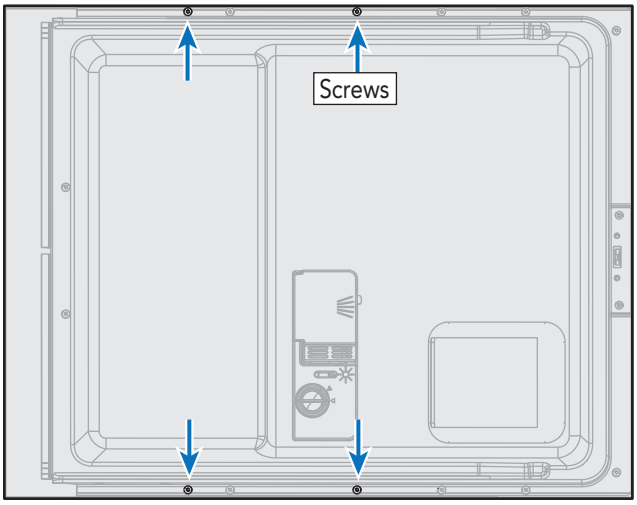
The following image shows the inner door with all the panels removed.



From here you can test the door interlock switch and the detergent dispenser.

Door Disassembly (cont.)

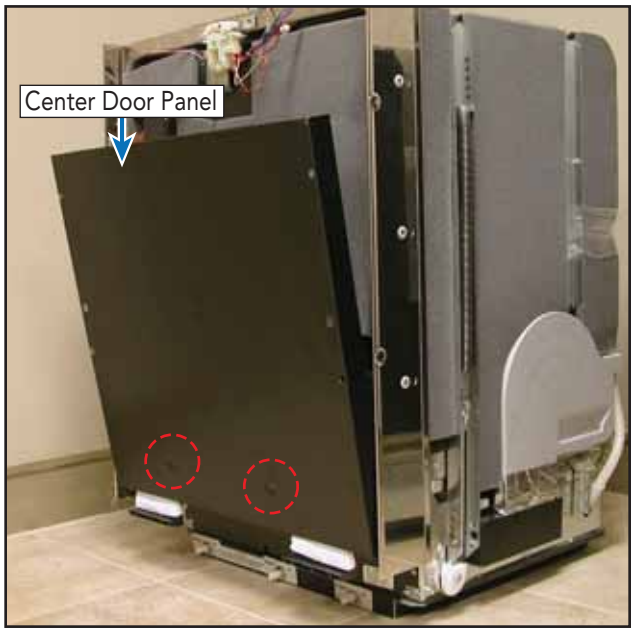
Center Door Panel Removal (450 only)
Now that the outer panel and control panel have been removed, remove the center door panel. Open the door to a complete 90˚ angle to expose the securing screws. Using a T15 TORX ® screwdriver, remove the four screws shown. These screws are 3/8" (1 cm) long.



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.

The following images show the actual location of the screws.

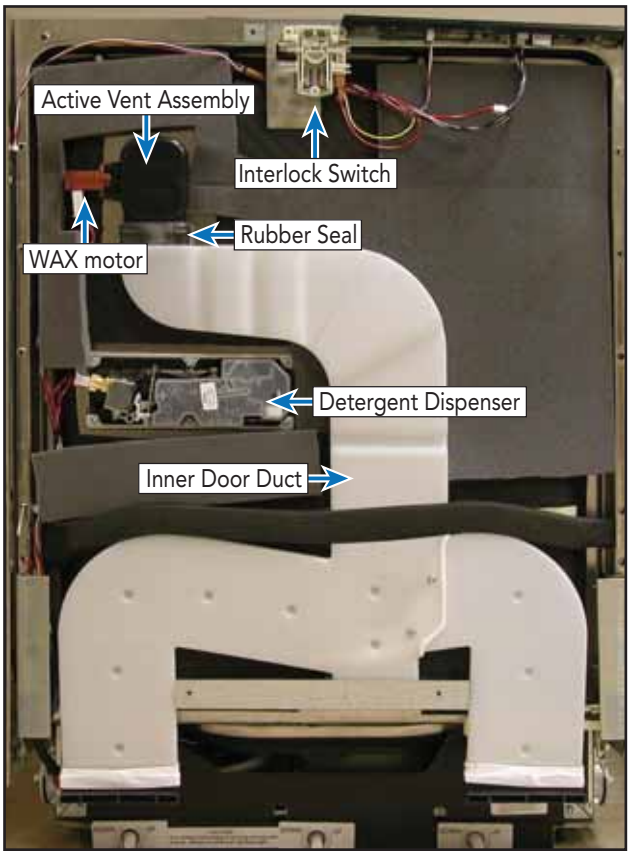


Remove the two remaining T20 TOX screws (circled), then remove the inner door panel.

Door Disassembly (cont.)

Inner Door Components–450 Model
With the inner door panel removed you now have access to the inner door components.

The following image shows the inner door with all the panels removed.

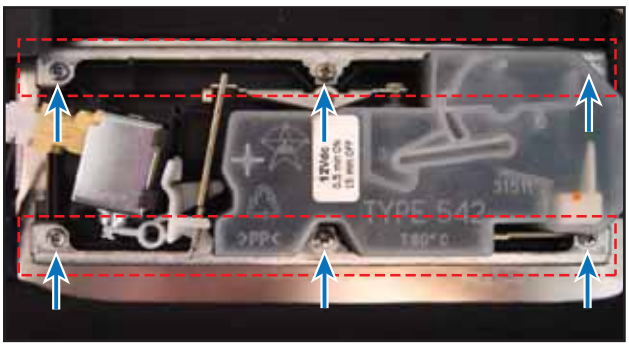


From here you can test the door interlock switch, the detergent dispenser mechanism, the dryer vent assembly, and WAX motor.

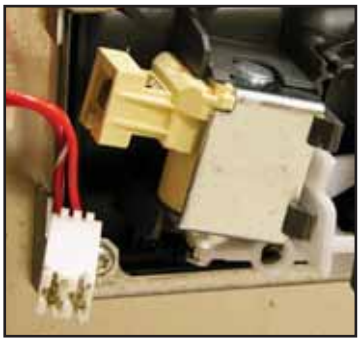
CAUTION

Make sure that if the vent tube is removed for any reason, the rubber seal that connects the vent tube to the door assembly is securely fastened. Failure to do so may cause steam to escape during the wash and dry cycles.

Detergent Dispenser
The image below shows a close-up of the detergent dispenser. In order to remove the dispenser, first remove the six T15 TORX® 1/2" (1.7 cm) screws and the two brackets, which hold the dispenser in place (brackets indicated by the red dotted line below).

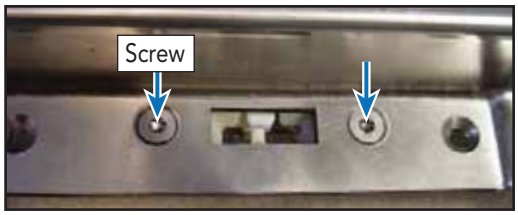


The image below shows the solenoid unplugged to remove the dispenser assembly. Unplug the two-wire connector plug in order to remove the dispenser.

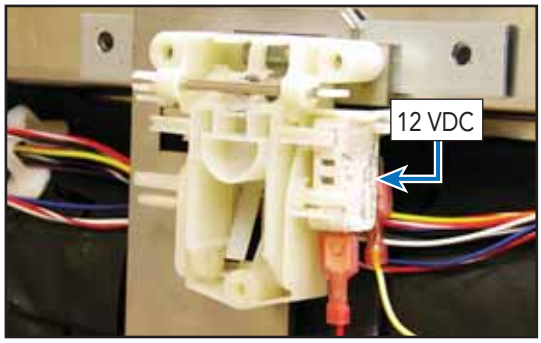


Door Disassembly (cont.)

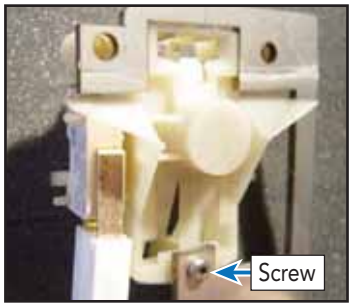
Door Latch Interlock
The door latch mechanism is secured to the inner door panel by two T20 TORX® 3/4" (1.9 cm) screws. With the control panel removed, remove the two screws.



Remove the latch mechanism and unplug the 2-wire connector plug from the micro switch shown below.



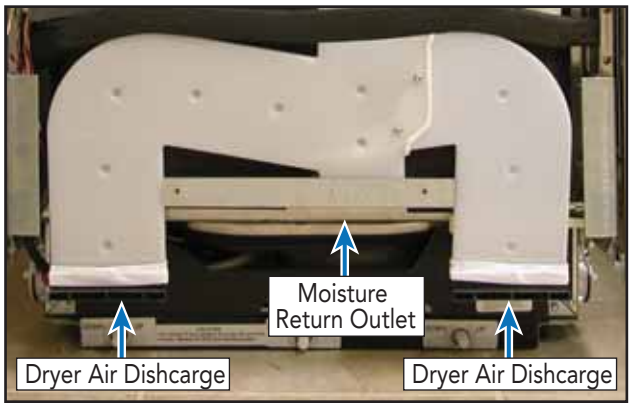
If replacing the switch, remove the bracket from the old switch and reinstall on the replacement latch assembly. Remove the TORX® screw shown below.



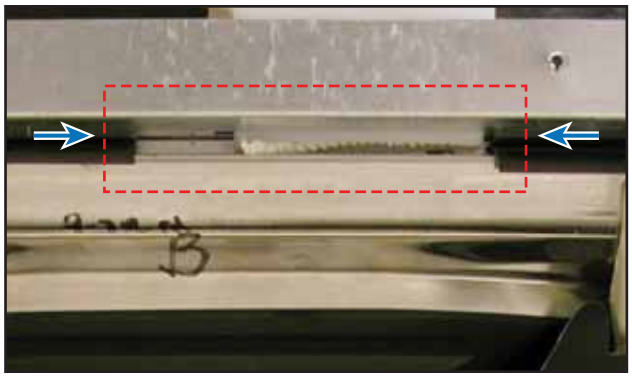
DANGER

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

Inner Door Duct Assembly–450 model
The image below shows the lower section of the vent assembly, including the air discharge and moisture return outlet.



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.



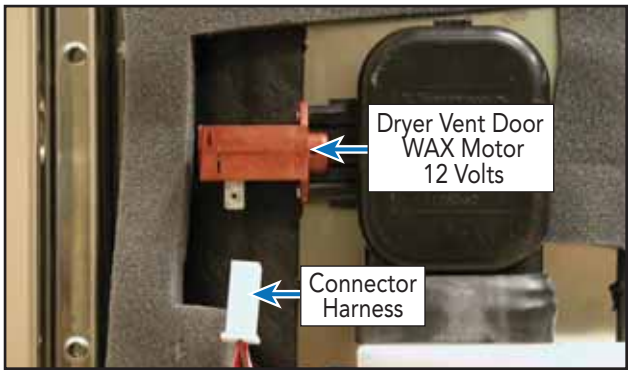
The two arrows above show the vent in position. The rectangular red lines shows the area where the condensed moisture returns to the sump area.

CAUTION

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

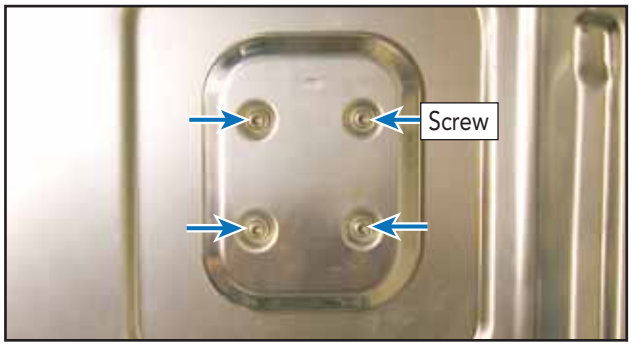
Door Disassembly (cont.)

Door Vent Mechanism–450 model
In order to remove the dryer door vent mechanism and WAX motor, unplug the WAX connector harness.



***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 open during the dry cycle.*

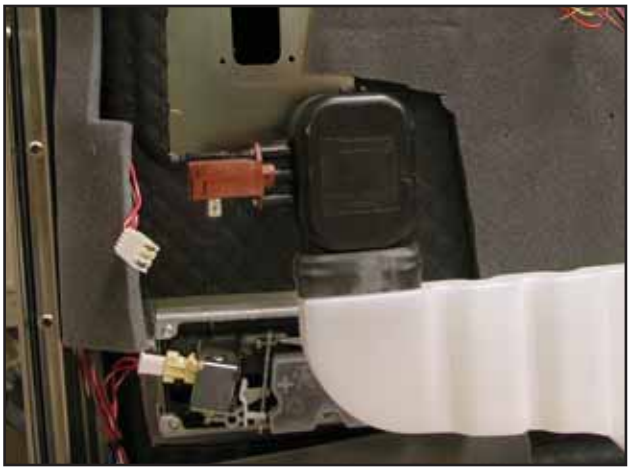
Open the door and remove the four T15 x 7/8" (2.2 cm) TORX ® screws that hold the stainless steel diverter plate in place.



With the diverter plate removed you will see a plastic spacer. The spacer is marked with the word "UP" on each end. When reassembling, make sure the wider edge is facing the top of the door.

The image below shows the vent spacer removed.

Now close the door and you can now remove the dryer door vent mechanism as shown below.
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.

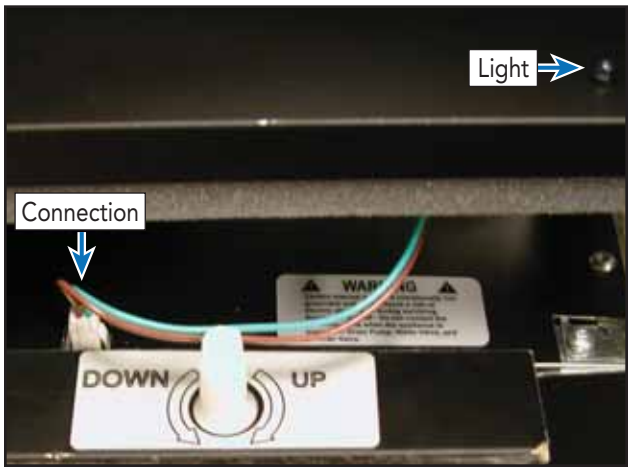


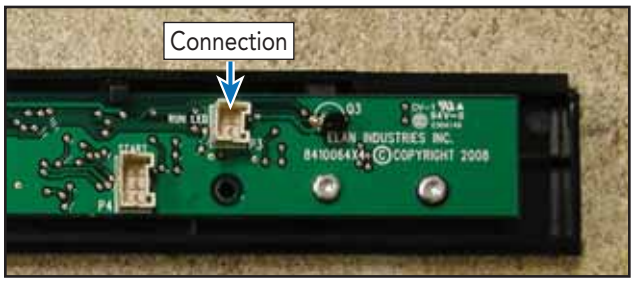
⚠ CAUTION

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 Disassembly (cont.)

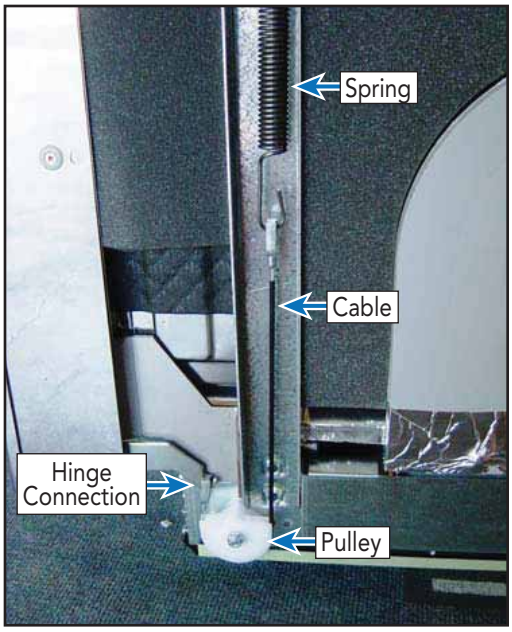
Power ON Light
The image below shows the connection of the blue colored power ON light to the toe kick via a 2-wire connector. Whenever the dishwasher is turned on, the LED will shine a bluish. Make sure wires are properly tucked behind panel after reassembly!





User Interface Board

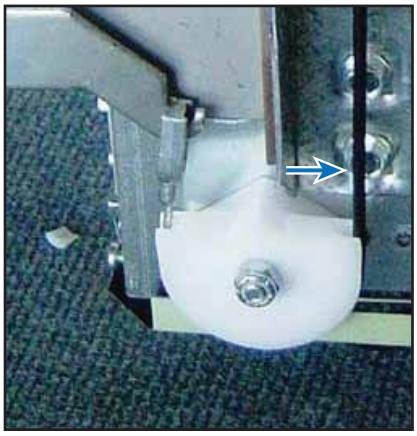
Door Spring and Cable Assembly
The image below shows the right side door hinge cable, spring, and pulley. The left side is the same.



CAUTION

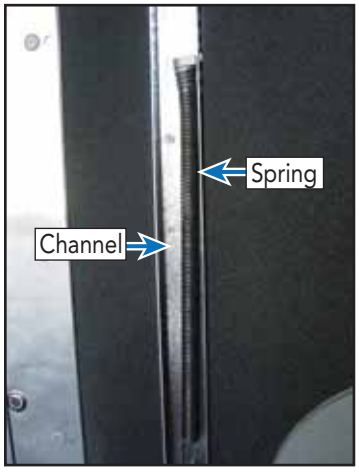
Make sure that when removing or adjusting the door spring tension that you are wearing protective gloves and eye wear. Injury can occur should the spring or cable come loose or slip during assembly.

Below is 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.



Door Disassembly (cont.)

Door Spring and Cable Assembly
The image below shows the spring and the channel it rides in. The connection is secured in mounting holes in the channel frame.

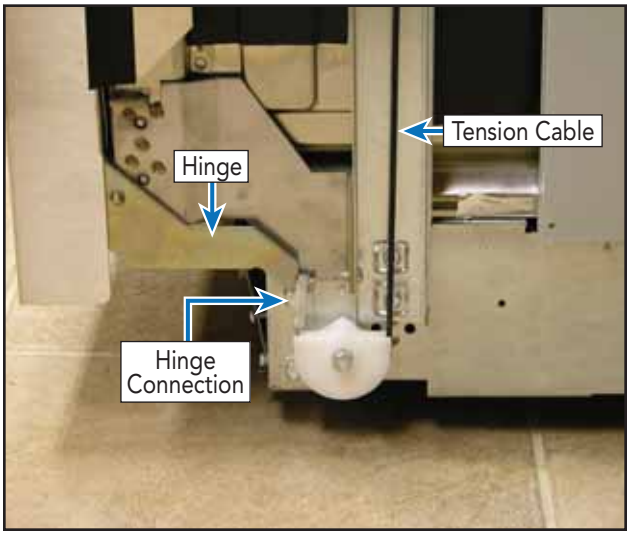


The image below shows the spring in its default location (sixth hole from the top).

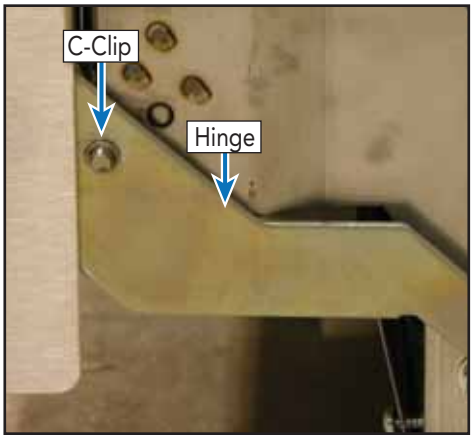
Door Hinge Disassembly

To access door hinge, slide unit out of the installation. Next remove the outer door panel *(see Outer Door Removal section, page 25).*

Disconnect tension cable from hinge.



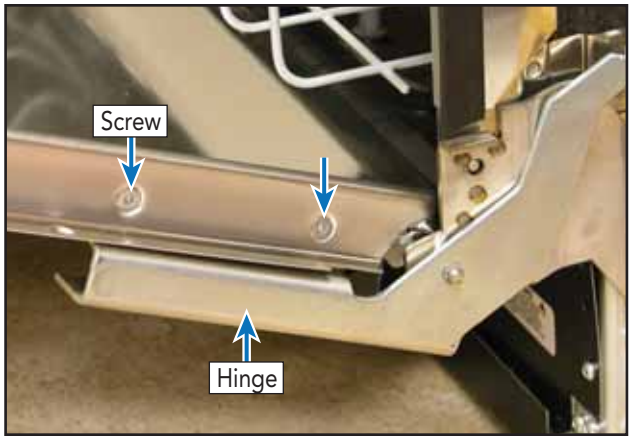
Remove C-Clip securing hinge.



Note: *Remove C-Clip slowly (clip has spring and can dislodge).*

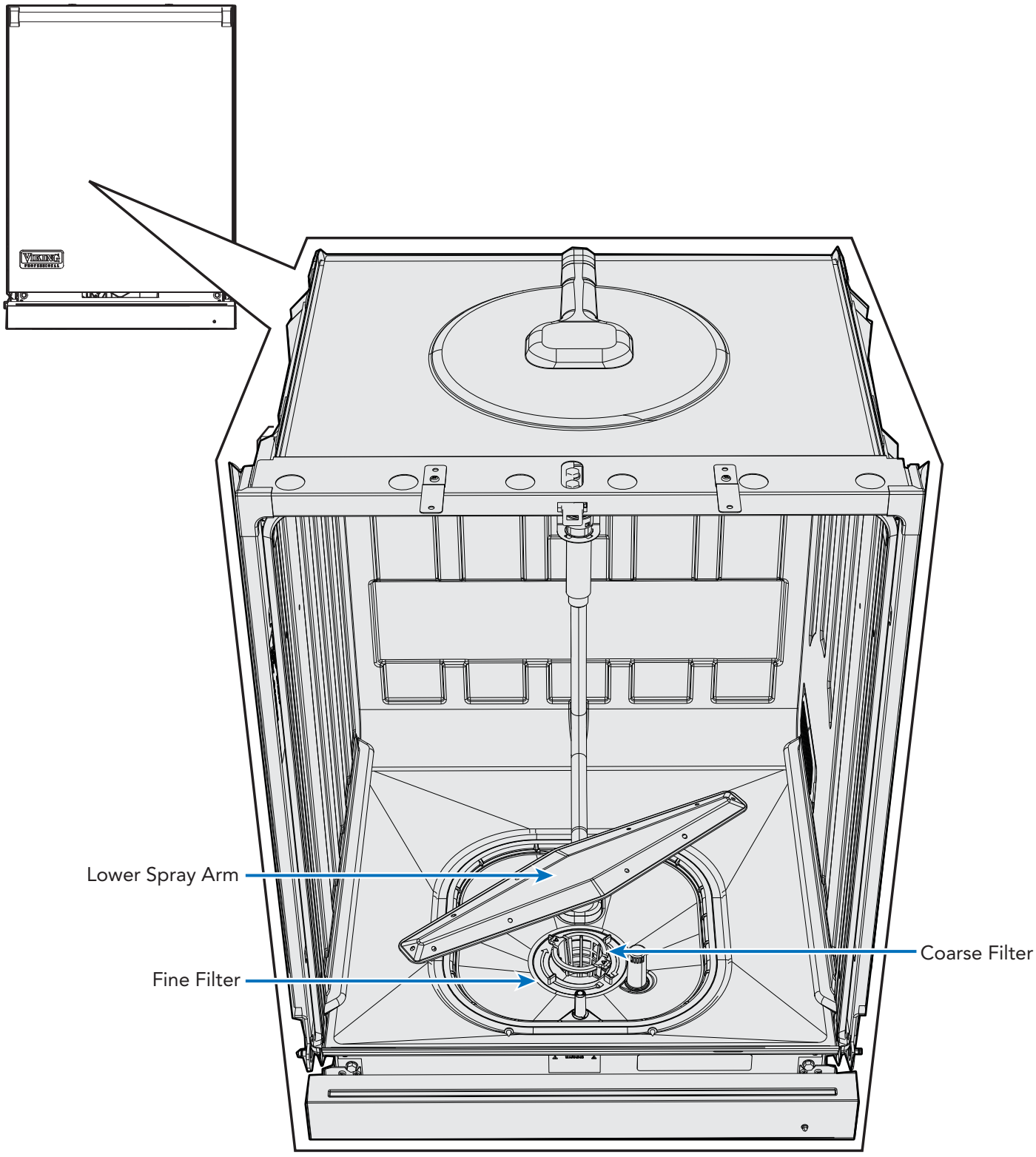
Door Hinge Disassembly (cont.)

Remove two screws that hold each hinge to the inner door. Repair or replace the hinge as necessary.



Reverse the procedure to reinstall the hinge.

Parts Location–Interior



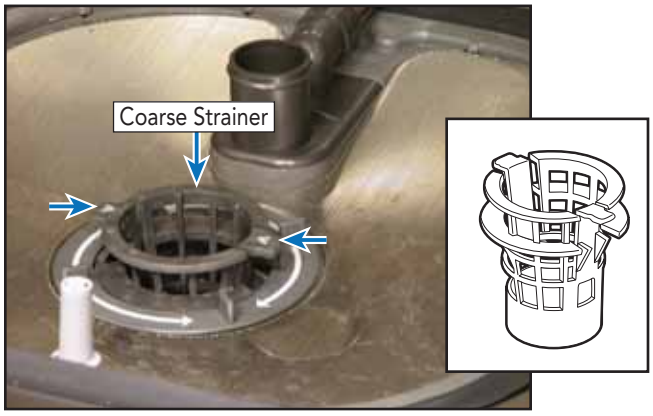
Lower Spray Arm Removal

To access lower spray arm, open the door and remove lower rack. Next, unsnap lower spray arm (shown below).

Repair or replace as necessary. Reverse the procedure to reinstall the spray arm.

Coarse Strainer Removal

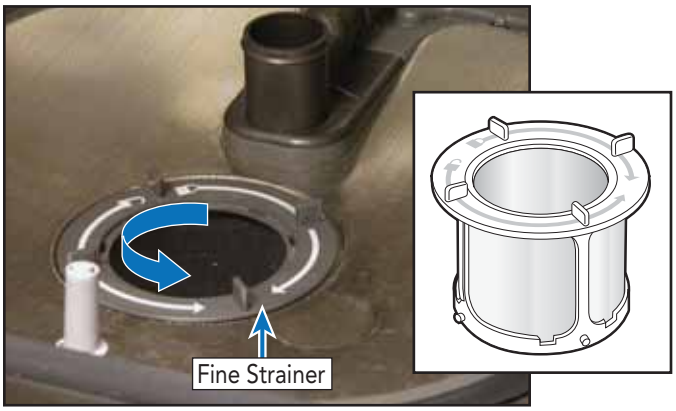
To access coarse strainer, open door and remove lower rack. Next, remove lower spray arm (*see Lower Spray Arm Removal procedure, above*). Squeeze tabs on coarse strainer to release (shown below).



Lift coarse strainer out and repair or replace as necessary. Reverse the procedure to reinstall the coarse strainer.

Fine Strainer Removal

To access fine strainer, open door and remove lower rack. Next, remove coarse strainer *(see Coarse Strainer Removal procedure, lower left)*. Slide fine strainer counterclockwise to disengage.

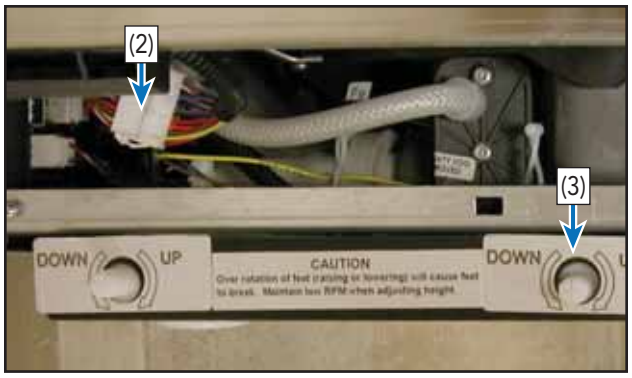


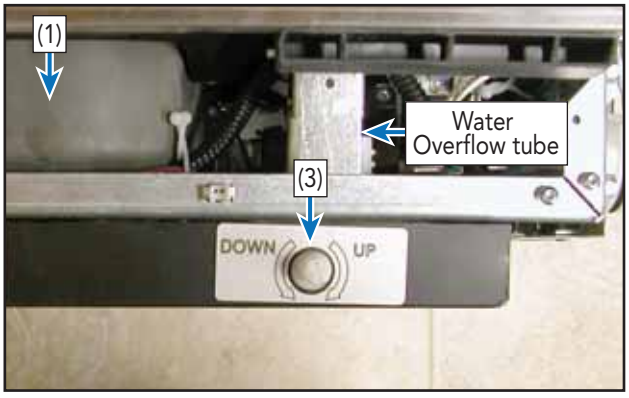
Lift fine strainer out and repair or replace as necessary. Reverse the procedure to reinstall the fine strainer.

Base Pan–Front View

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

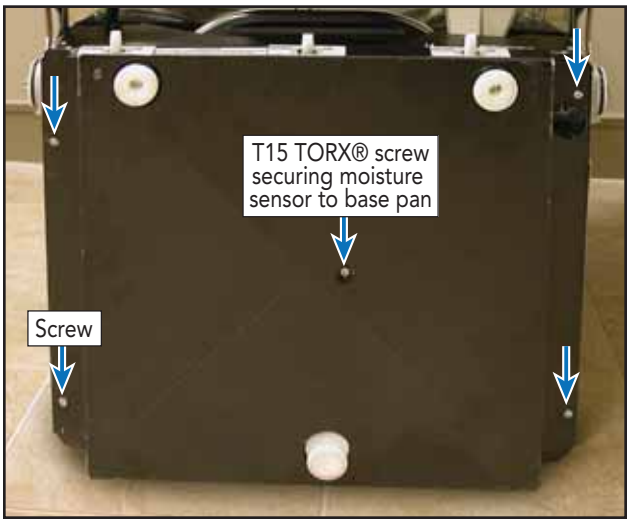
In the images below, you can see the sump assembly (1),12-Pin disconnect pin (2), and the rear leveling leg adjustment screw (3). In order to access and service the remaining components, the base cover will need to be removed to gain access. This includes the drain motor, circulation motor, control board, flow-through water heater, wash temp sensor, water valve, front levelers, and the rear leveler (motor controller, dryer heater and dryer motor on the 450 model).





Base Cover Disassembly

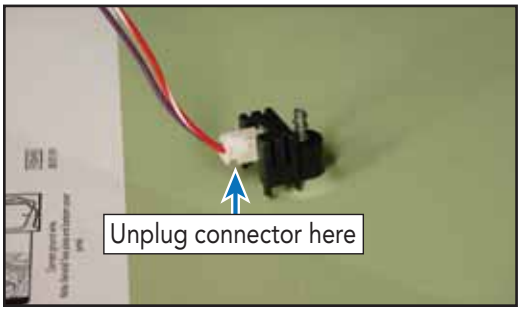
Remove the four T20 TORX® screws that hold the bottom base to the dishwasher superstructure. The image below shows the location of these screws. With the panel removed, locate the moisture sensor and unplug, leaving the moisture sensor attached to the base pan.



CAUTION

After the four screws that secure the pan to the frame are removed, be careful because the moisture sensor is mounted to the pan and the wiring could be damaged.

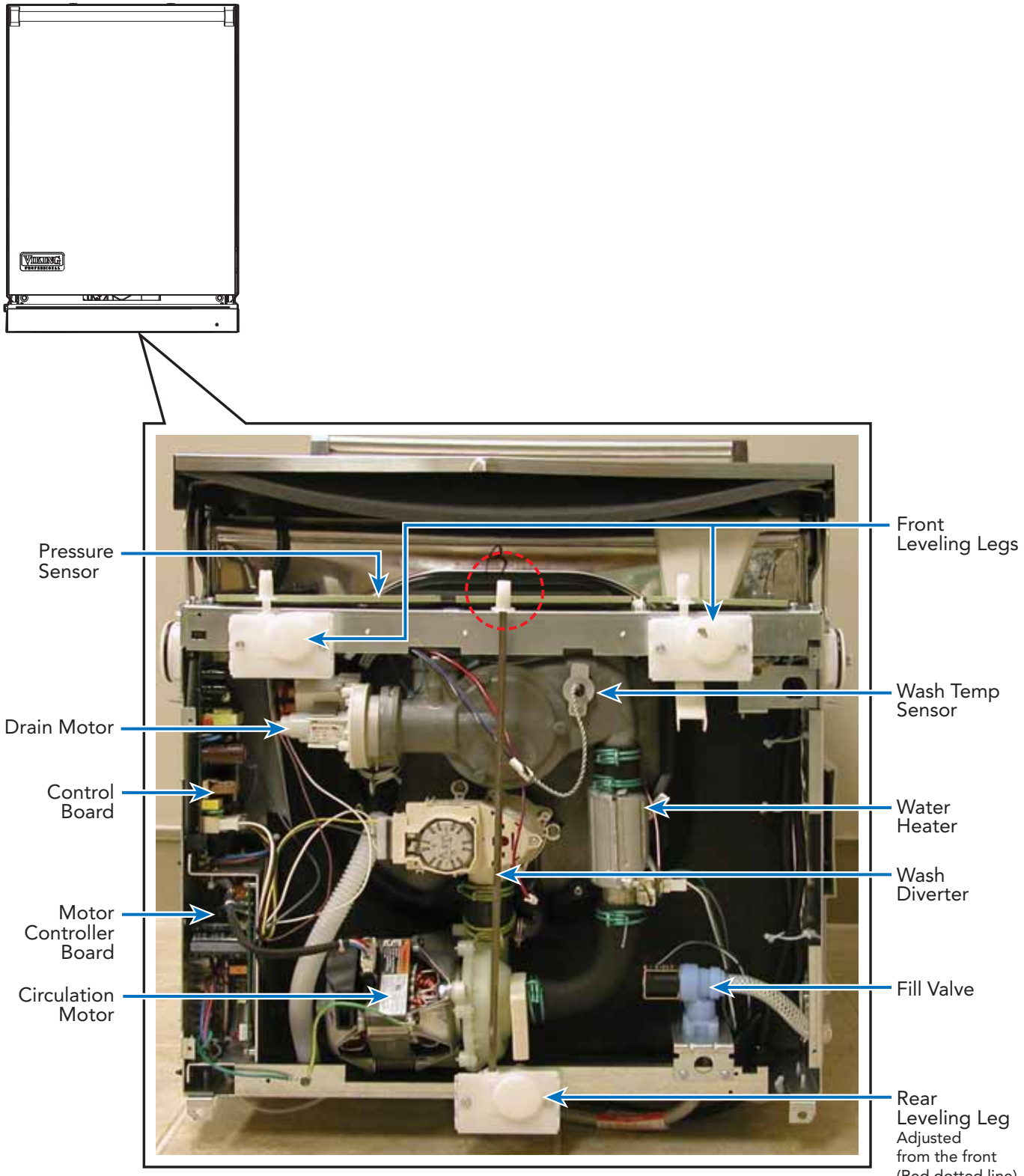
The image below shows the moisture sensor secured to base pan. The sensor is secured in place by one T15 TORX® screw (shown above).



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

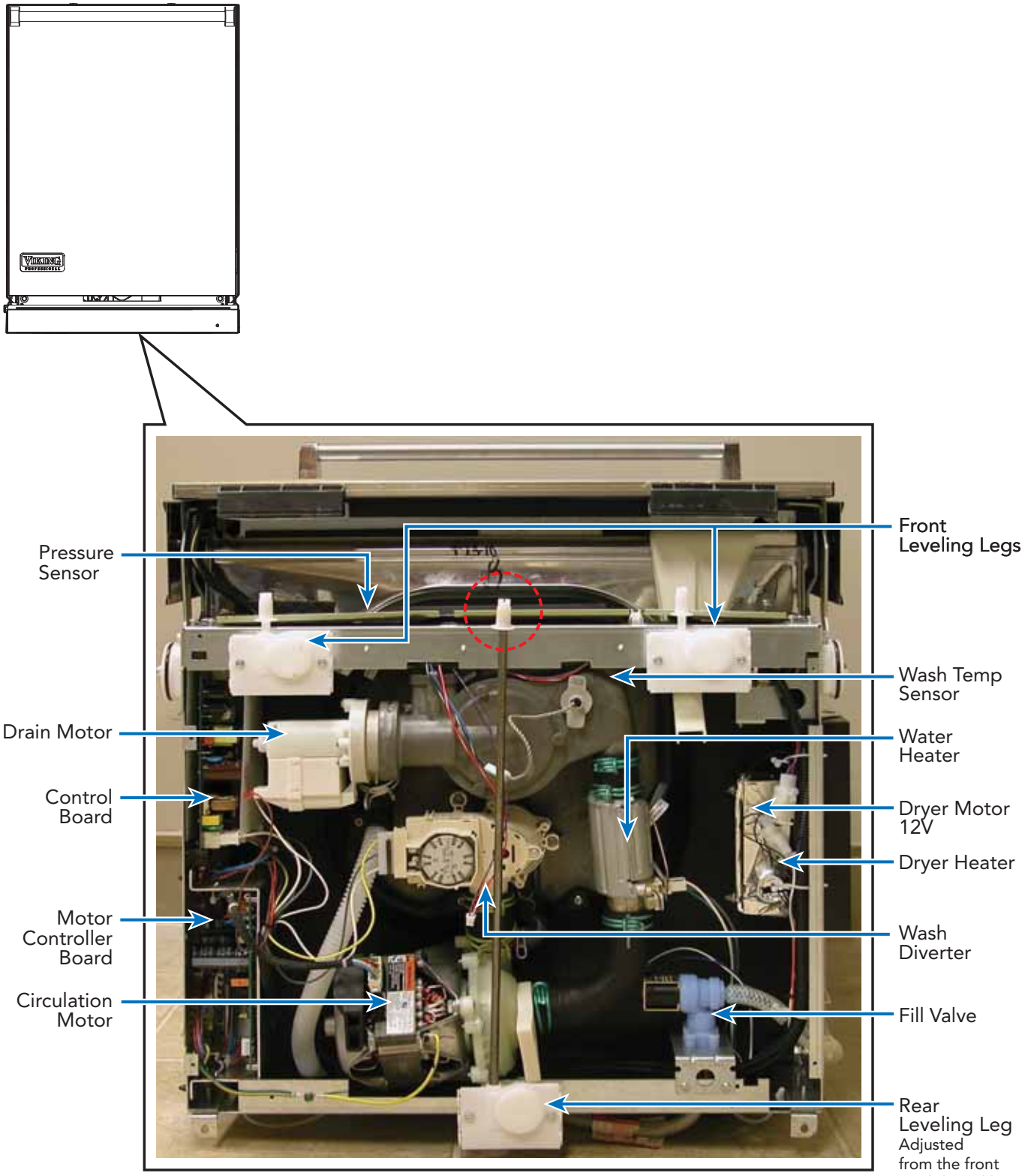
With the base pan removed, you now have access to locate, diagnose, and service all the components in the base of the dishwasher.

Parts Location–Base Unit–325 Model



Bottom View

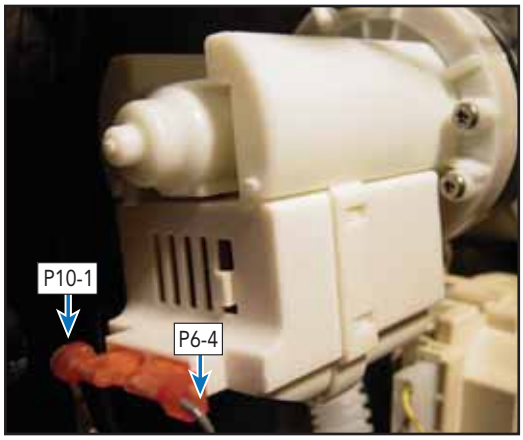
Parts Location–Base Unit–450 Model



Bottom View

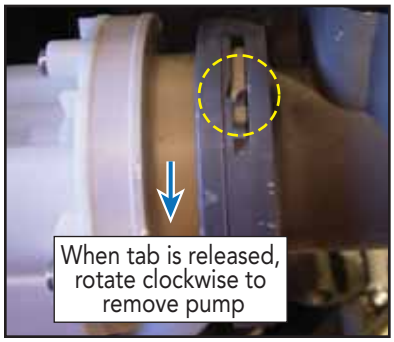
Drain Motor Disassembly

The image below shows the drain motor. When required, the main control sends 120-volts from terminal P6-4 (brown) wire on the control board and Neutral. Unplug the wires to the motor.



Locate the drain hose on the rear of the pump. Using a pair of pliers, disconnect the hose. Images below (left) show the hose connected and (right) shows the hose disconnected.

Next, release the drain motor from the sump assembly. Locate the release tab (indicated by the yellow dotted line, below left). Using a flat blade screwdriver, bend the tab in the direction shown by the arrow (below right) to release the pump from the main housing. Grasp the pump and rotate clockwise and the pump can be removed.

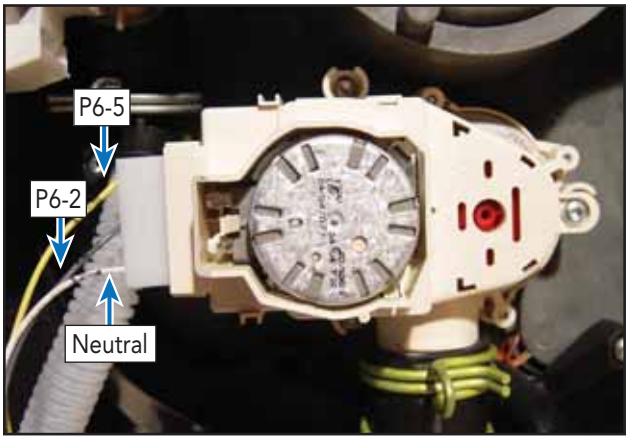


When reinstalling pump, make sure to bend the tab back in place to lock the pump into the sump housing.

The image below (left) shows the pump removed. The image below (right) 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.

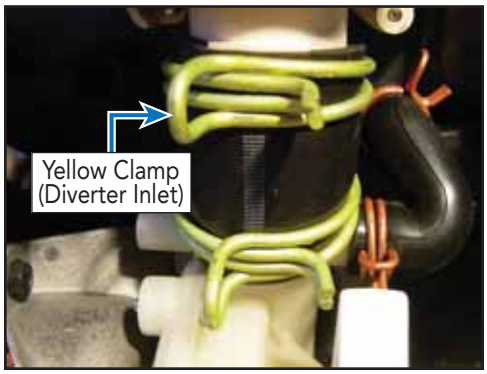
Wash Diverter Disassembly

The wash diverter 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 P6-2 (gray) wire on the control board and Neutral to activate the motor. The yellow wire on the diverter sends line voltage back to the control board to P6-5 (line in-yellow wire) and tells the controller the position of the diverter.

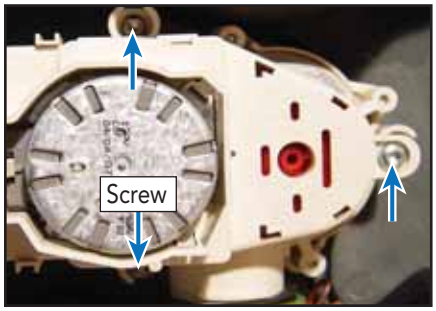


Wash Diverter Disassembly (cont.)

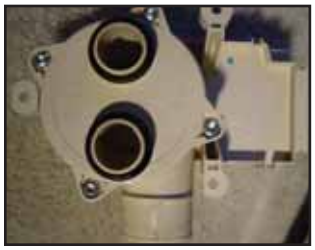
Disconnect the yellow hose clamp connection from the diverter inlet as shown.



The wash diverter is attached to the sump by the use of three T20 TORX® screws. Remove all three screws.



Remove the diverter from the sump assembly. The image below (left) shows the rear of the diverter and below (right) shows the sump area with the diverter removed.



Note: *There are two O-rings that must be put back. Failure to do so will result in a water leak.*

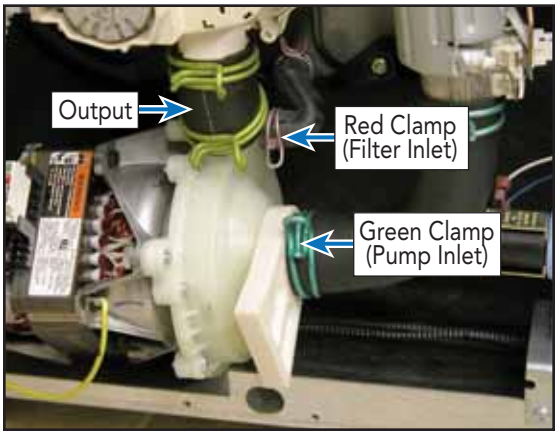
⚠ CAUTION

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 Disassembly

The 325 and 450 Series Dishwasher utilizes a three-phase AC induction motor with variable speed capabilities. The motor is controlled by the motor controller. 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 image below shows the 4-wire connector plug from the controller to the motor. Unplug the connector to test or remove the motor.

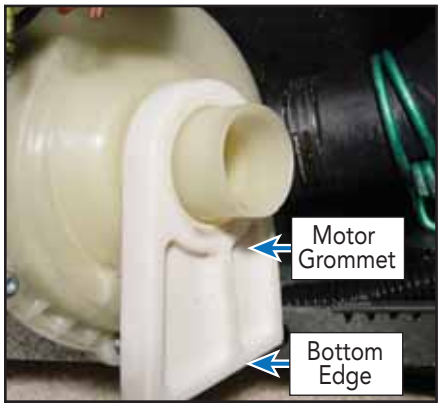
The image below shows the hose connections to the circulation motor inlet, output, and the filter clean sump inlet. Disconnect the green hose clamp from the heater tube to pump inlet as well as the red hose clamp from the filter inlet tube on the pump assembly. Disconnect the pump inlet hose from the pump assembly.



Circulation Motor Disassembly (cont.)

The image below 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.

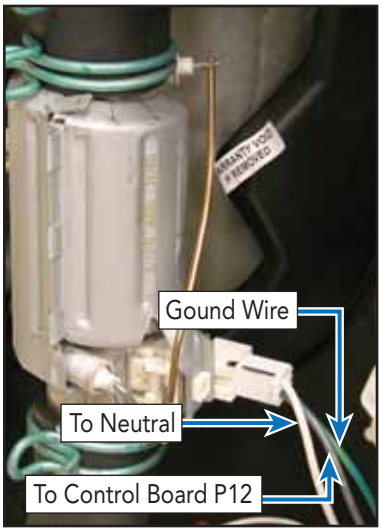
The image below shows the hose disconnected from the pump.



***Note:** 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. (The second right image on page 40 shows proper position of grommet).*

Water Heater Disassembly

The 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. Image to left shows the connections.

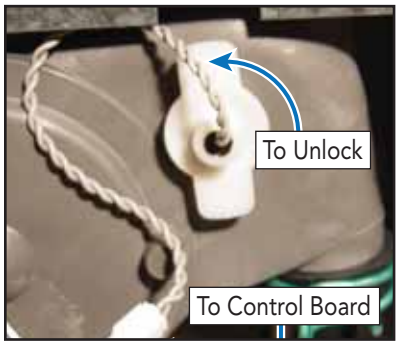


Next, disconnect the two clamps that hold the heater assembly to both the sump outlet (Arrow 1) and circulation pump inlet (Arrow 2) shown below. The heater can now be removed for service. You will need to transfer the two 1-1/2" (3.8 cm) OD hoses to the new heater assembly. The element is a 120-volt,12 ohm, 10 amp, 1200 watt draw. It is controlled from P12 (gray) to Neutral on the main terminal block.

Water Temperature Sensor Disassembly

The water temperature sensor will sense the temperature of the water throughout the wash cycle. It is an N.T.C (Negative Temperature Control) sensor which reads approximately 47k Ω ohms at 77° ambient. As the water temperature rises, the resistance drops.

In order to remove, unplug the 2-wire connector and then twist the sensor counterclockwise to release from the sump assembly. The image below shows the temp sensor in the locked position. Grasp the sensor tabs and twist counterclockwise to release.

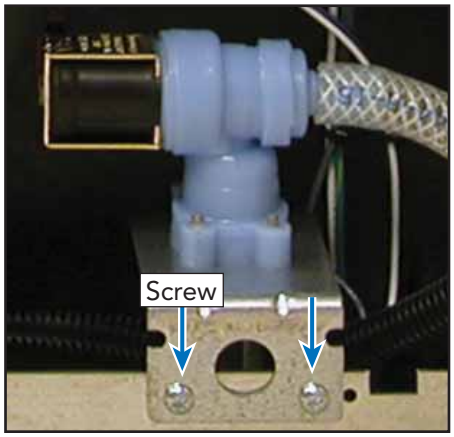


The image below shows the temp sensor in the unlocked position.

While grasping the tabs, pull the sensor out of the sump assembly as shown.

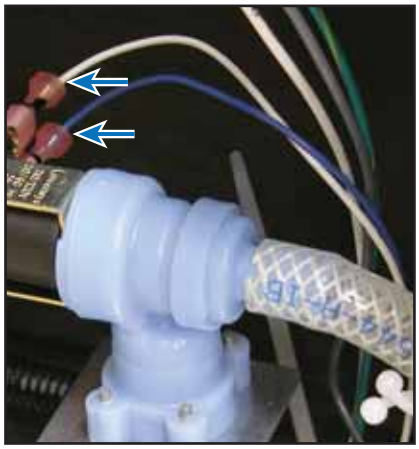
Fill Valve Disassembly

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 two TORX® screws as shown.



Remove the two screws shown above and remove the fill valve from the base.

Unplug the white and blue 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 1.1K Ω ohm coil and is controlled from P6-6 (line voltage-blue) and P6-7 (Neutral–White) on the main terminal block.



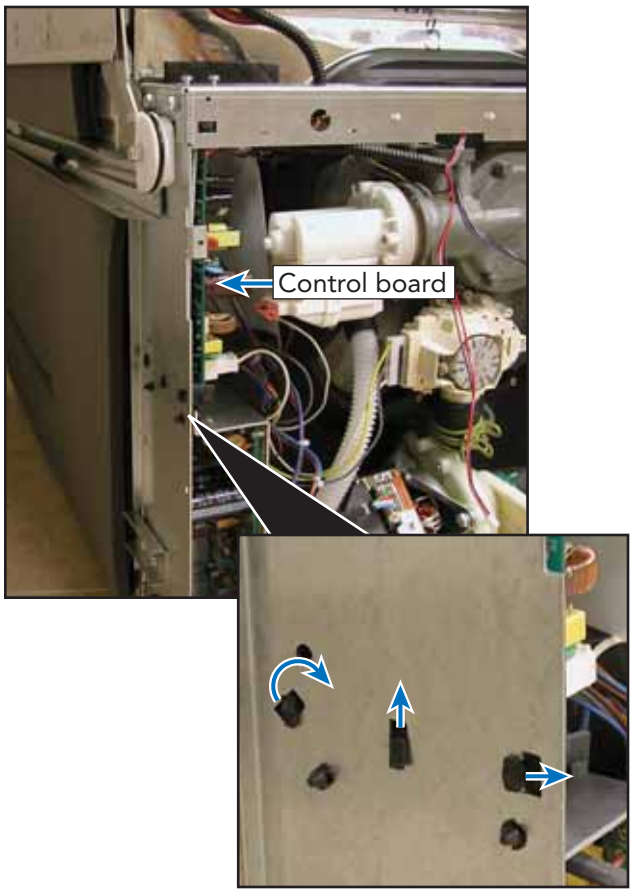
Control Board Disassembly

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

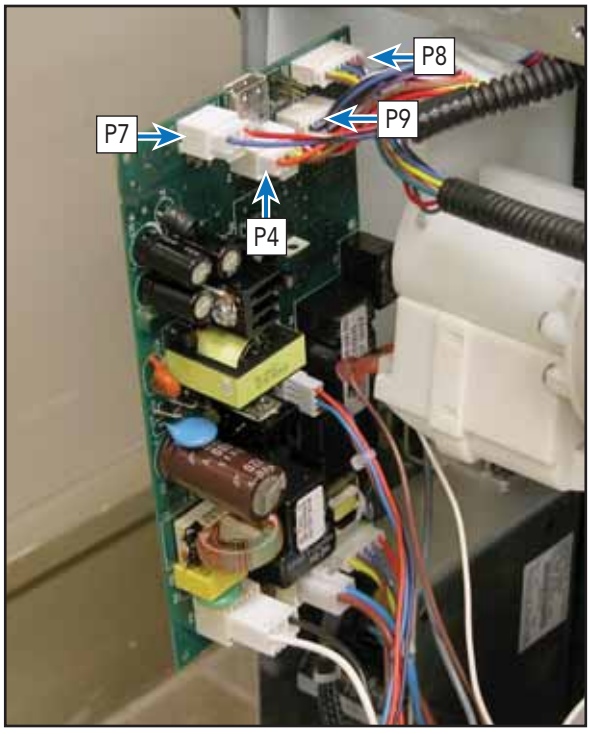
In order to protect the electronic circuits on the board and avoid any damage caused by static discharge, Viking Range Corporation recommends the use of a ground strap.

The image below shows the locking tabs that hold the rear board support to the dishwasher frame. Release these tabs in the directions shown by the arrows.



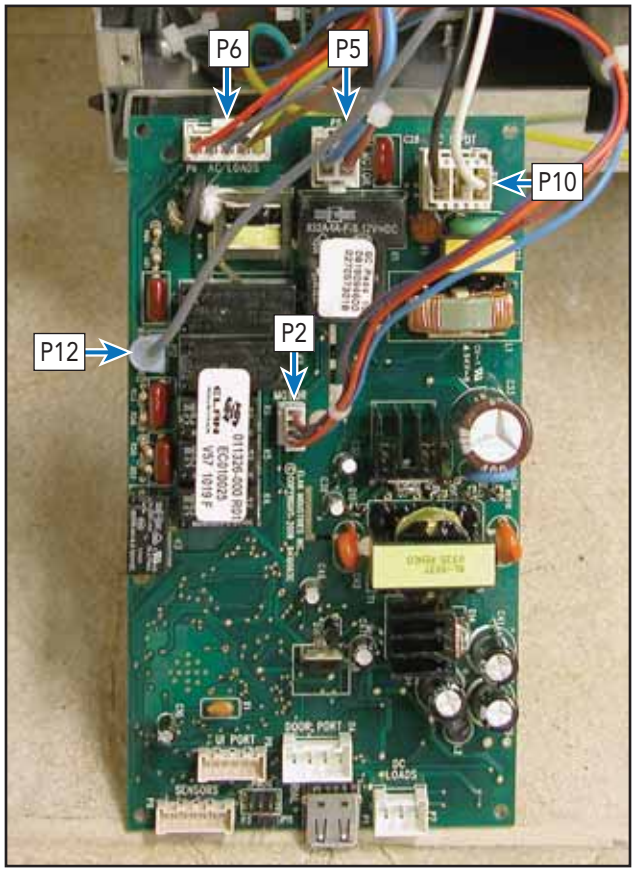
Now carefully pull the board down and release from the front.

Disconnect the P7, P4, P8 and the P9 connectors from the board.



Control Board Disassembly (cont.)

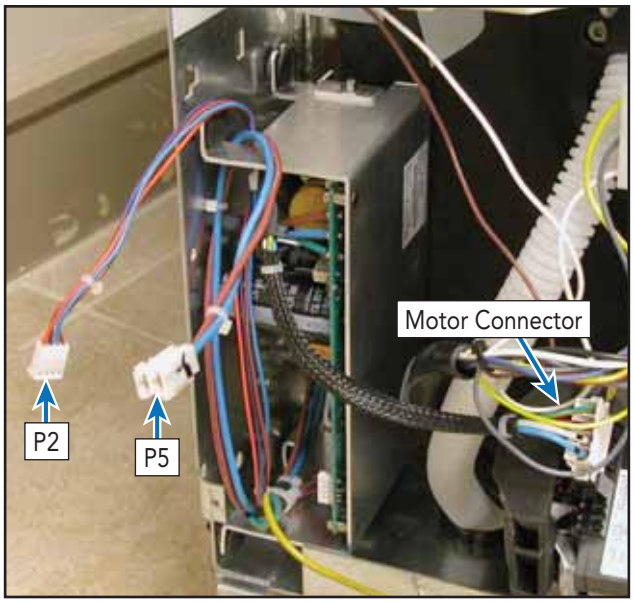
Disconnect the P2, P5, P6, P10, and P12 connectors from the board.



Note: *It is recommended that the control be taken out before removing the motor control board. It makes it easier to handle removal.*

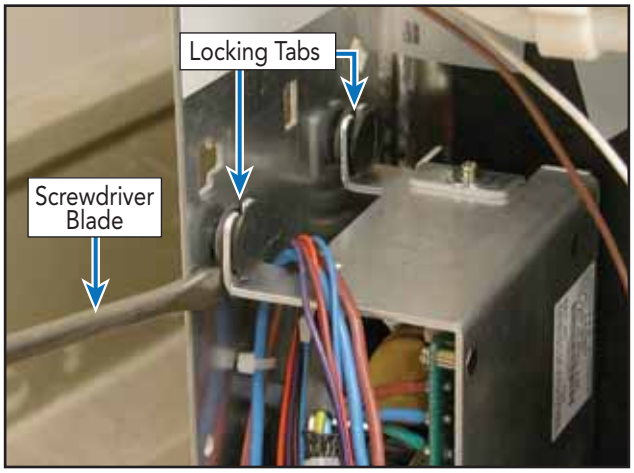
Motor Controller Board Disassembly

With the control board removed, you can now remove the motor controller for service. The image below shows the motor controller with the P5 and P2 connectors disconnected from the control board. The 4-wire connector to the motor is still connected.



P5 provides 120-volt AC power to the motor controller. P2 provides the control signal voltage between the control board and the motor controller.

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

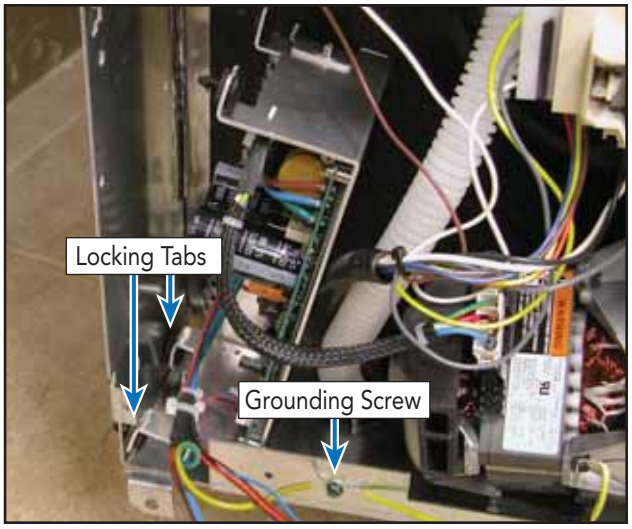


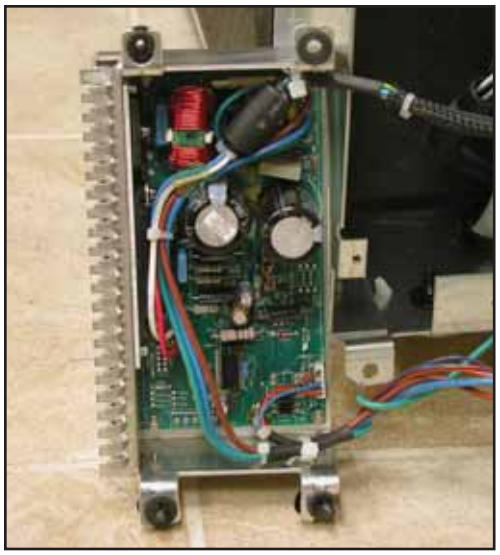
Motor Controller Board Disassembly (cont.)

The motor controller and circulation motor grounding wires are attached to the dishwasher frame using a ¼" (,63 cm) hex head screw. Remove the screw shown below. After removing the screw, release the lower two locking tabs. You can now remove the motor controller.

WARNING

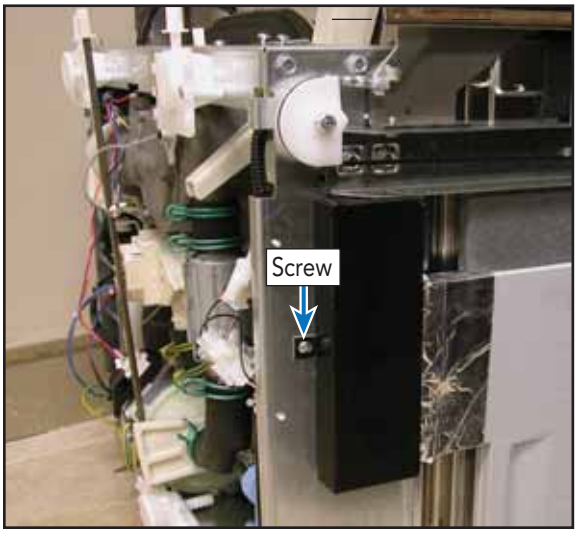
All ground connections MUST be connected when removing and installing components that have ground connections. Failure to do so may cause electrical shock or death along with possible damage to the dishwasher controls.



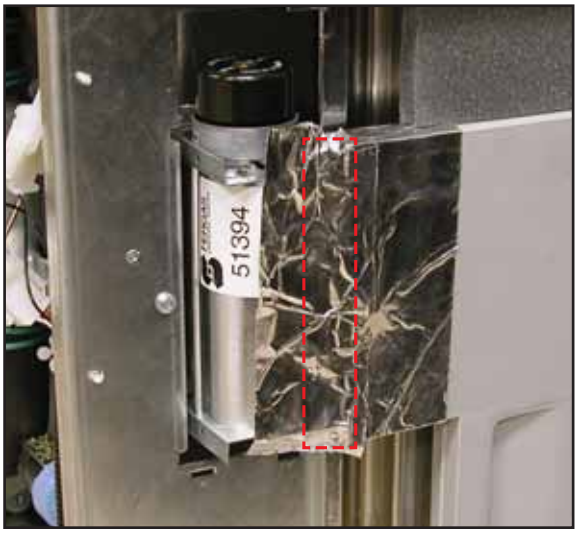


Dryer Motor and Heater Assembly–450 model

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 before removing the blower motor. Remove the cover by removing the screw indicated.



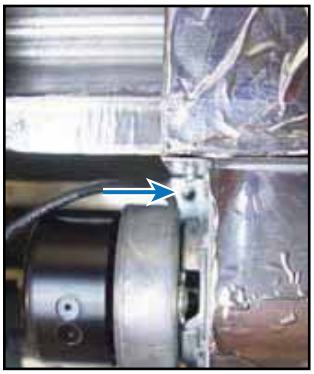
With the cover removed, you will notice there is a piece of aluminum tape that must be cut and removed before the heater can be removed (Indicated by the red dotted line below)



There are four screws in total that need to be removed in order to remove the heater. The following images will their locations.

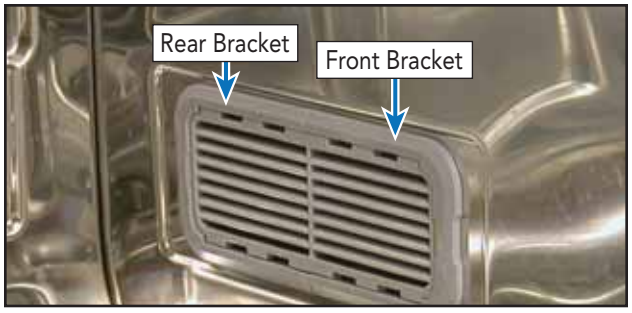
Dryer Motor and Heater Assembly–450 model (cont.)

With the tape cut and removed, locate the front and rear T20 TORX® screws that hold the heater assembly in place,(shown already removed below).



To access the remaining two screws, the right side air/water Inlet assembly will need to be removed.

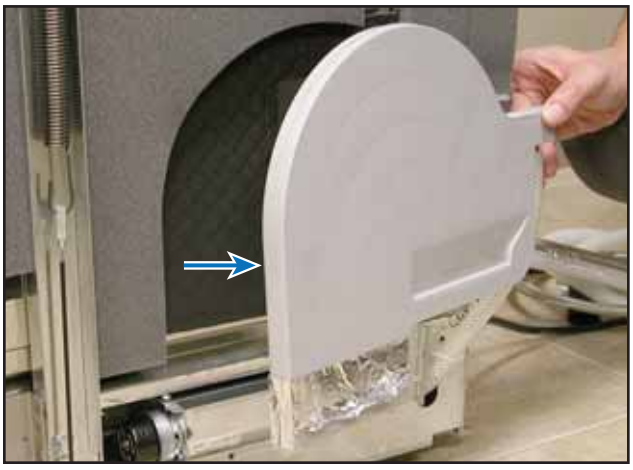
Open the dishwasher door to locate the air/water Inlet assembly. This assembly is held in place by a front and rear locking bracket. The image below shows the inlet with both brackets attached.



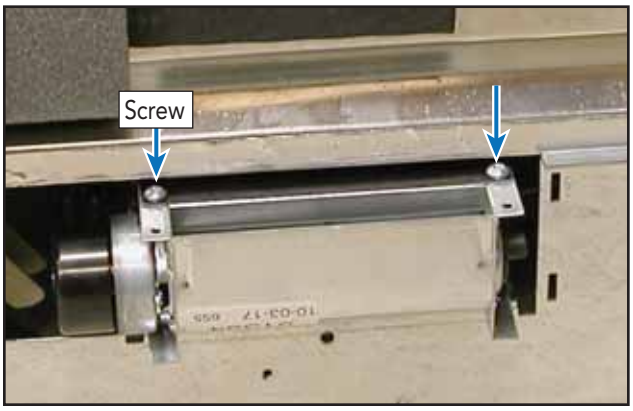
Using a flat blade screwdriver, gently pry the locking brackets off the inlet assembly. Both the front and rear brackets are the same. The rear bracket must slide backwards to remove and the front bracket slid forward to remove.

The images below shows the rear bracket removed (left) and front bracket removed (right).

With the locking brackets removed, pull the fill chamber away from the right side of the unit.

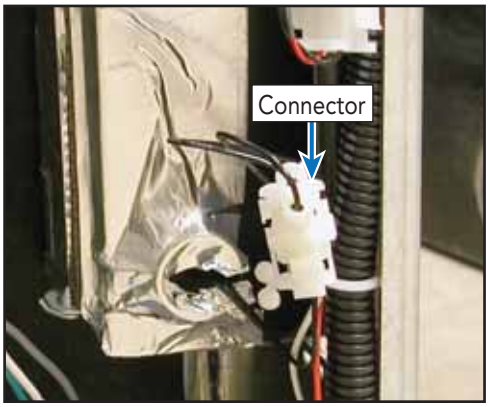


Remove the two remaining TORX® screws that are indicated below. Now remove the heater assembly.



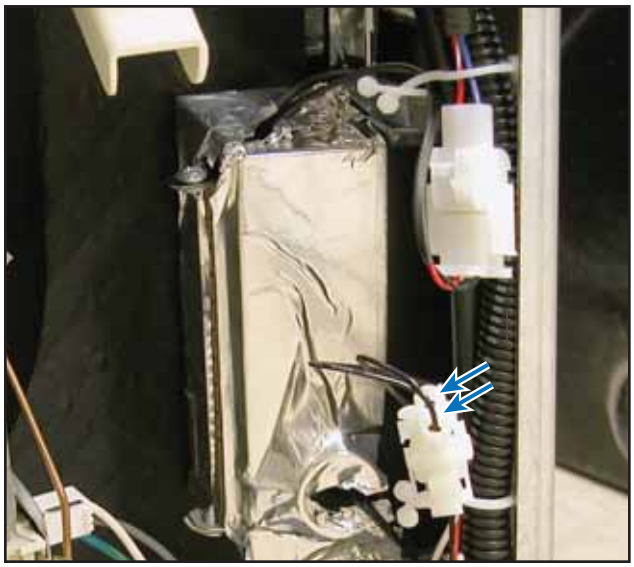
Note: *In the image above, the air/water Inlet assembly is detached from the machine.*

Disconnect the connector to the heater.

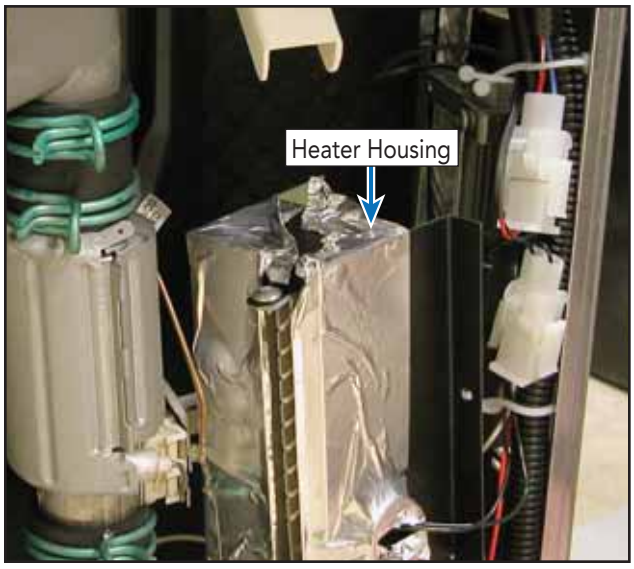


Heater Assembly–450 model (cont.)

The image below shows the complete heater housing. The two black wires in the photo go to the 120 drying heater. The power is sent from the P6-1 (orange) on the control board.



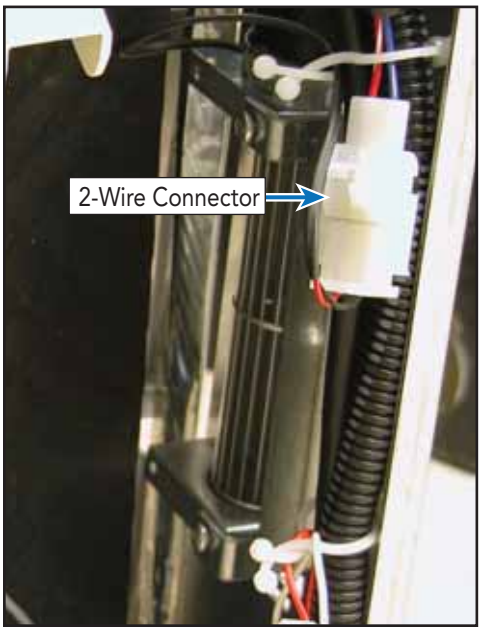
Remove the heater housing to expose the blower motor.



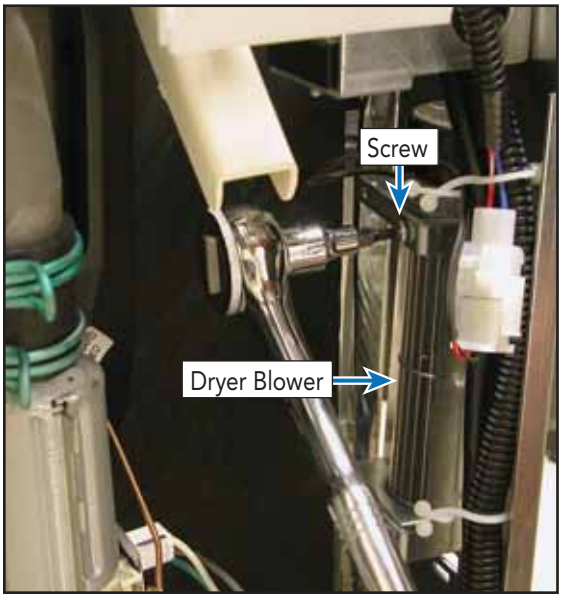
Note: *When reassembling the heater housing, you must replace the aluminum tape that was removed during disassembly. Failure to do so may cause improper air flow across the heater.*

Dryer Motor–450 model

With the dryer heating element removed you now have access to the dryer blower motor. Remove the 2-wire connector shown below. The blue (P7-3) and red with white tracer (P7-1) supply 12 volts to the dryer motor.

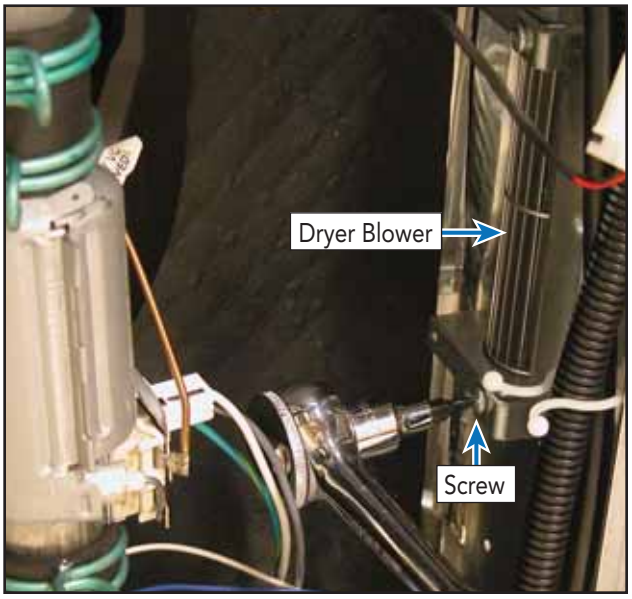


Remove the outer T-20 TORX® screw shown below.



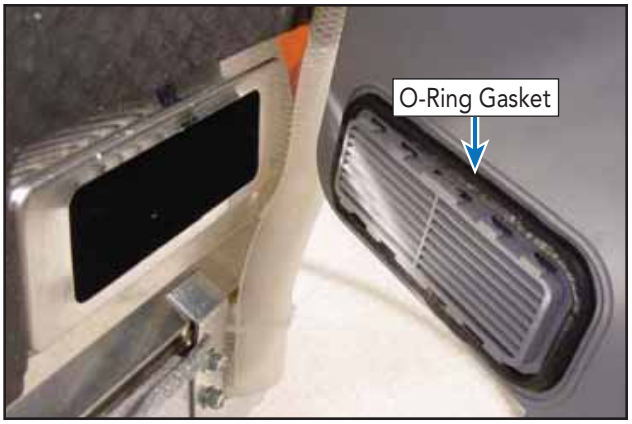
Dryer Motor–450 model (cont.)

Remove the inner T-20 TORX® screw.



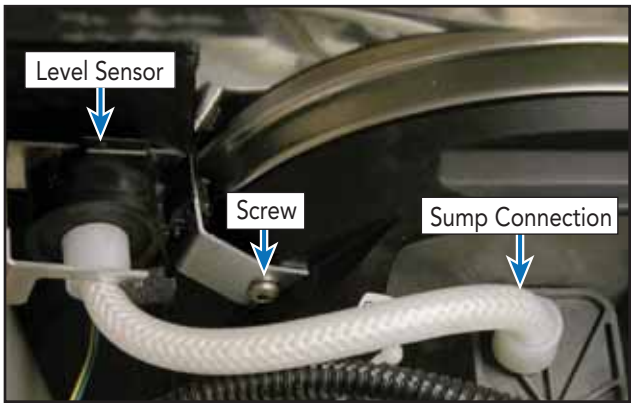
CAUTION

When reinstalling the air/water 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) or water can leak out of the unit and cause damage to the unit and the kitchen area.

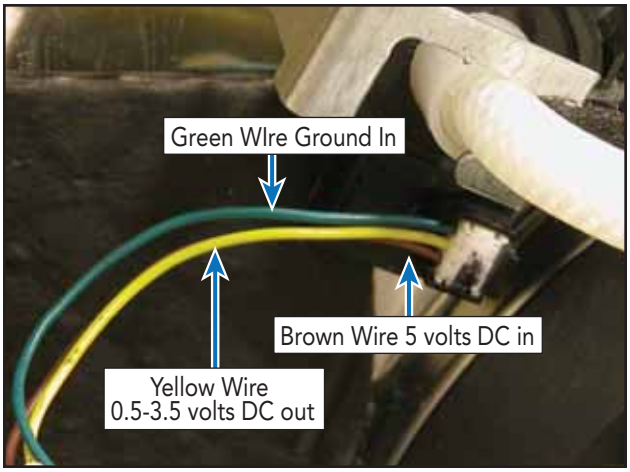


Water Level Sensor

The level sensor is mounted to the sump retainer ring with a T-25 TORX® screw. Removing the level sensor **DOES NOT** require the removal of the dishwasher from the cabinet. With the toe kick removed, locate the level sensor shown below.



The image below shows the three wire connector to the level sensor.

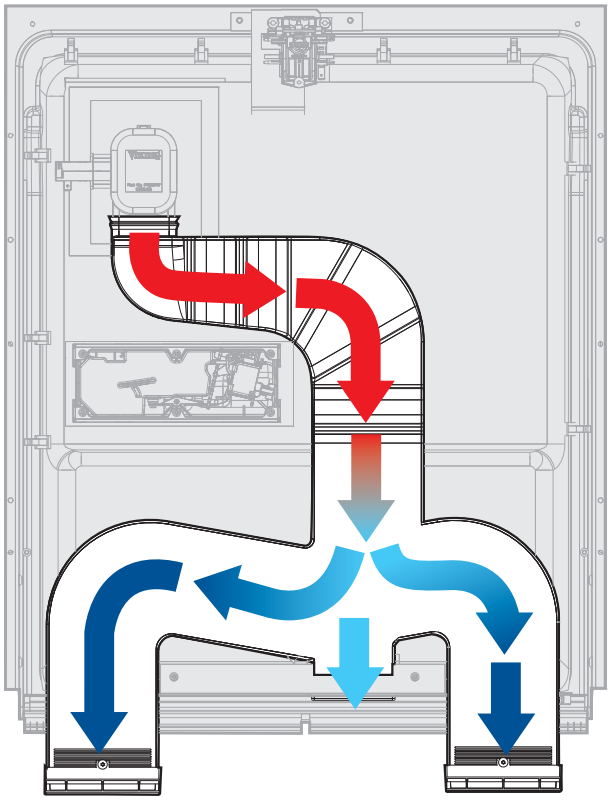


As the water level increases, the pressure in the 1/4" (.63 cm) pressure tube, connected to the level sensor input, increases as well. This pressure causes an internal amplifier to vary the output voltage to the board. An empty sump should produce a reading of .5 - .8 VDC between J9 – 4 and ground while a full sump should read approximately 3.5 VDC. Depending on the water level, the output voltage to the control board changes and is processed in the board.

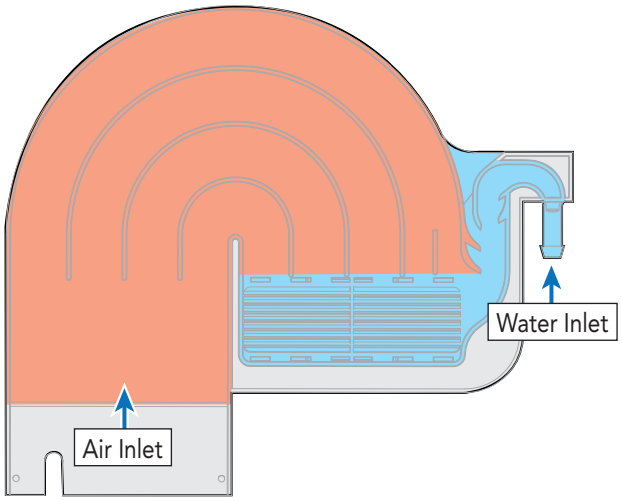
Drying System

At the beginning of the wash cycle, 12 volts is sent to the door wax motor to close the damper during the wash cycle. When the unit has advanced to the dry cycle, the voltage is removed from the door wax motor and the door opens to allow the drying to take place. The control board then sends 12 VDC to blowermotor to operate. At selected intervals, 120 VAC 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. The image below shows the air flow inside the tube.



The image below is 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.

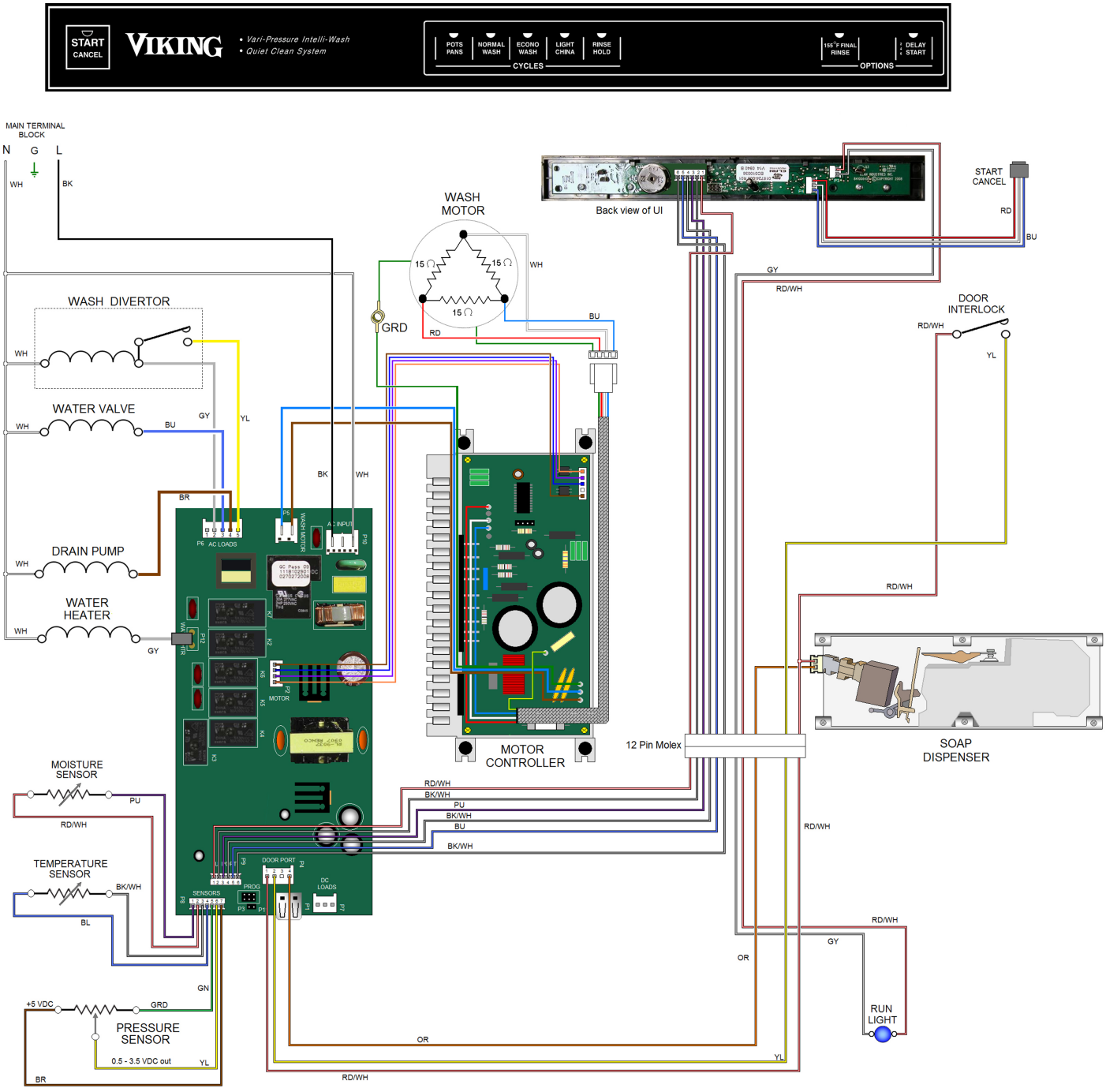


Troubleshooting Guide

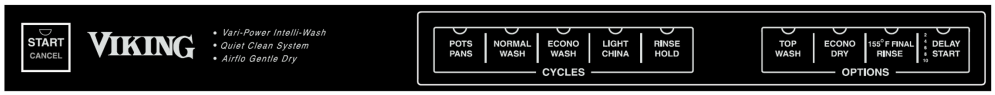
Below are some general guides should a problem be detected. Please refer to the test procedures in this manual to determine the defective component.

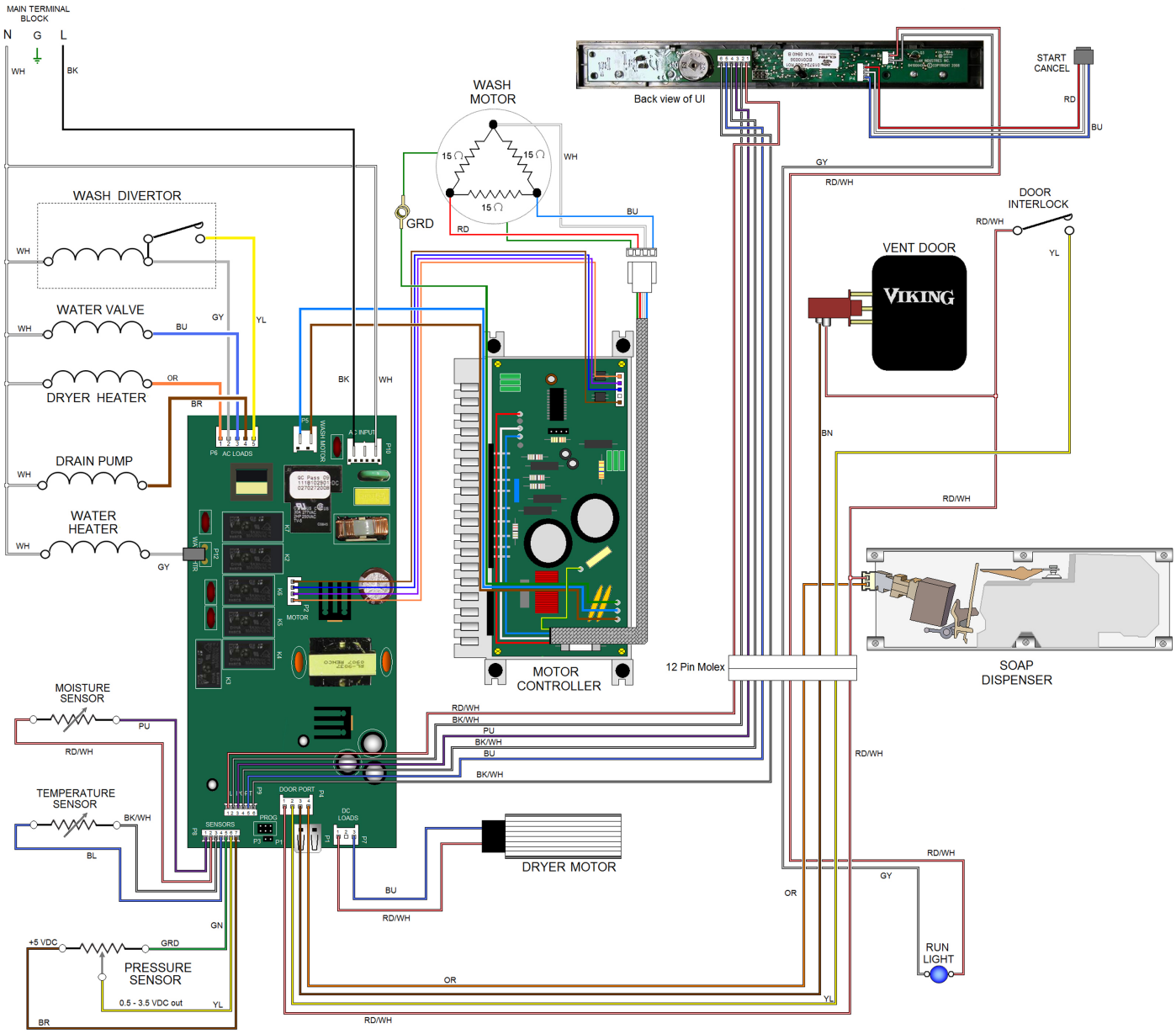
Problem	Probable Cause	Correction
The dishwasher does not start	Door is open	Make sure door is closed and check door switch
	"Delay Start" option is ON	Turn option OFF
	Water supply is disconnected	Verify supply and check water valve
	Power cord is disconnected	Verify power supply and connection
	Fuse is blown	Check breaker
Spotting and filming	Hard water	Check water hardness
	Filter block	Check filters for obstructions
	No rinse aid	Add rinse aid and check dispenser
	Dishwasher detergent	Check amount of detergent and verify it is not old and caked
Wash arms not rotating freely	Obstruction	Remove obstruction
	Low water pressure	Check water pressure
Strainer blocked	Obstruction	Remove obstruction
Excessive foam in machine	Improper detergent	Use only dishwasher detergent
Small particles deposited on items	Detergent	Use fresh detergent
	Improper loading	Make sure wash arm turns freely
	Filter clogged	Verify filters are free of obstructions
Detergent left in detergent compartment	Compartment blocked	Verify no obstructions
	Old detergent	Use new detergent
	Dispenser	Verify dispenser is opening properly
Dishes not dry	Rinse aid	Verify rinse aid in dispenser
	Improper loading	Verify proper loading
	Water temperature	Verify proper water temperature
	Heater	Verify heater is working
Dishwasher will not fill	Door open	Verify door is closed and check door switch (must press START and shut door within four seconds)
	Water valve	Check water valve and check for obstructions
	Water supply	Verify water supply and check supply line
Water backs up in sink when dishwasher drains	Food waste disposer	Verify no obstructions in trap at sink
Water left in bottom near filters	Normal	Some water in bottom is normal
Dishwasher will not drain	Drain hose	Verify hose is not obstructed or kinked
	Drain pump	Verify no obstructions in pump

Wiring Diagram–325 Model

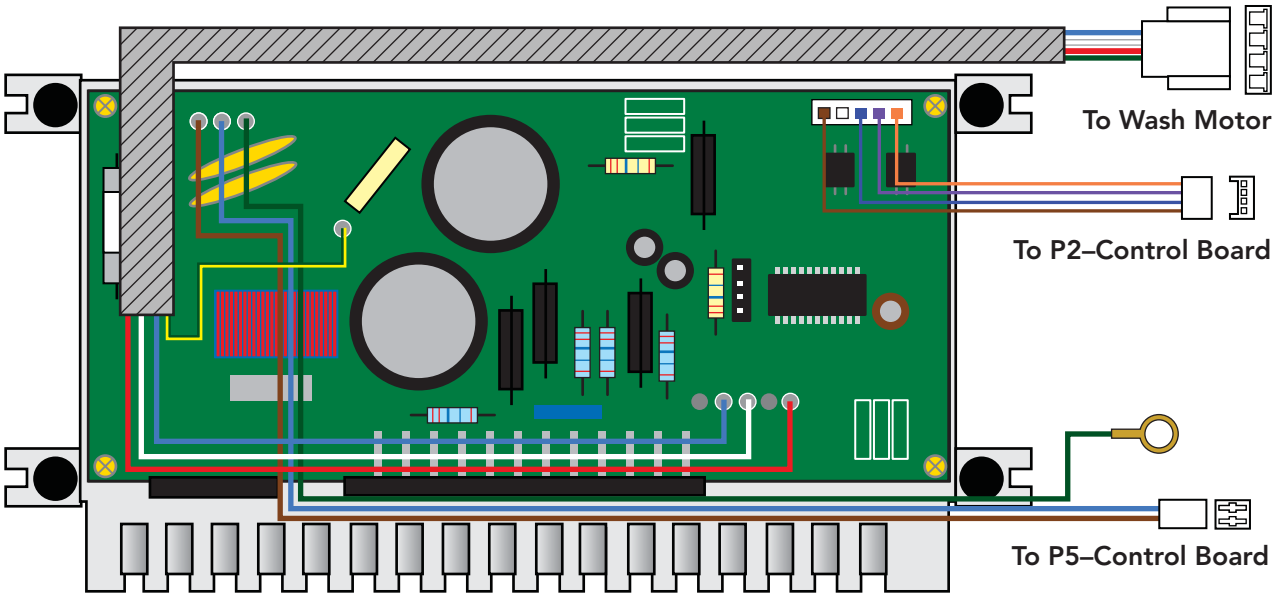


Wiring Diagram–450 Model





Motor Controller Board Wiring Connections

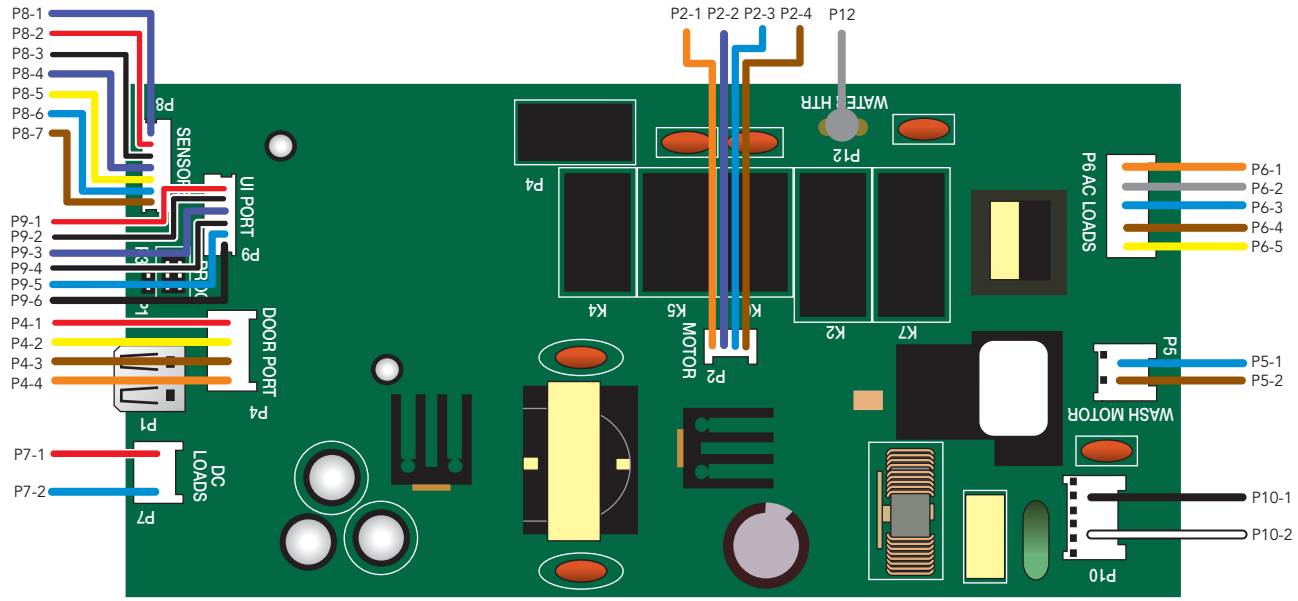


To Wash Motor Plug	Description	Wire Color
To circulation motor	Chassis Ground	Blue
To circulation motor	0-160-volts AC to motor	White
To circulation motor	0-160-volts AC to motor	Red
To circulation motor	0-160-volts AC to motor	Green

P2 to Control Board	Description	Wire Color
From main control P2-4	Serial transmit to main control	Orange
From main control P2-3	Ground to main control	Purple
From main control P2-2	Serial receive to motor control	Blue
From main control P2-1	5-volts DC to motor control	Brown

P5 to Control Board	Description	Wire Color
From main control P5-1	Neutral from main control	Blue
From main control P5-2	120-volts from main control	Brown

Control Board Wiring Connections



Pin Number	Description	Wire Color
P8-1	Moisture sensor	Purple
P8-2	Moisture sensor	Red/White
P8-3	Temperature sensor	Black/White
P8-4	Temperature sensor	Blue
P8-5	Pressure sensor–ground	Green
P8-6	Pressure Sensor–.5 to 3.5 volts input	Yellow
P8-7	Pressure Sensor–5 volts iutput	Brown
P9-1	User interface	Red/White
P9-2	User interface	Black/White
P9-3	User interface	Purple
P9-4	User interface	Black/White
P9-5	User Interface	Blue
P9-6	User interface	Black/White
P4-1	Common to door switch, detergent dispenser and wax motor (450 series)	Red/White
P4-2	Door switch	Yellow
P4-3	Vent Motor (450 series)	Brown
P4-4	Dispenser	Orange
P7-1	Drying motor–12 volts (450 series)	Red/White
P7-2	Drying motor–12 volts (450 series)	Blue

Pin Number	Description	Wire Color
P2-1	5 volts DC to motor controller	Brown
P2-2	Serial send to motor controller	Blue
P2-3	Ground from motor controller	Purple
P2-4	Serial receive from motor controller	Orange
P12	Water heater	Gray
P6-1	Drying heater (450 series)	Orange
P6-2	Diverter–motor	Gray
P6-3	Water valve	Blue
P6-4	Drain motor	Brown
P6-5	Diverter–switch	Yellow
P5-1	Neutral to motor controller board	Blue
P5-2	120 volts to motor controller board	Brown
P10-1	Line in	Black
P10-2	Neutral	White

Component information–Electrical Specifications

Component Name	Volts	Ohms	Amps	Watts	Input/Load
Drain motor	120-Volts AC	14-15 ohm		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-Three-phase	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 dispenser	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	1120-Volts AC	133.3 ohm	0.9	115	Load
Water level sensor	5-Volts DC				Input

* When sensor is dry and no corrosion.