

# HP Designjet 3D Removal System



**Service Guide**

## *Legal Notice*

© 2012 Hewlett-Packard Development  
Company, L.P.

The information contained herein is subject  
to change without notice.

The only warranties for HP Products and services  
are set forth in the express warranty statement  
accompanying such products and services.  
Nothing herein should be construed as  
constituting an additional warranty.

HP shall not be liable for technical or editorial  
errors or omissions contained herein.



Conforms to ANSI/UL std. 60950-1-2003  
Certified to CAN/CSA C22.2 no. 60950-1-03  
HP Designjet 3D Removal System  
conform with the following standards, in accordance with the  
EU Machinery, Low Voltage and Electromagnetic  
Compatibility Directives.

# *Introduction*

The HP Designjet 3D Removal System is specifically developed to provide efficient removal of support material from a model. The system removes support material by immersing models in a bath of water with a specific amount of cleaning agent bags added to the cleaning agent receptacle.

*Welcome to the new dimension of HP Designjet 3D Removal System!*

## **How to use this guide**

This Service Guide is laid out in easy to follow sections that cover Set-up, Operation, Maintenance, and Troubleshooting. Read each section carefully so that you will get the best performance from your HP Designjet 3D Removal System.

## Safety

The following classifications are used throughout this guide.



**CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



**WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in serious injury.



**Recycle:** Use proper recycling techniques for materials and packaging.



**ESD  
Sensitive!**

**ESD:** Use standard electrostatic discharge (ESD) precautions when working on or near electrical components.

# *Table of Contents*

## **Introduction**

How to use this guide .....	page 3
Safety .....	page 4

## **System Overview**

How the system works .....	page 7
----------------------------	--------

## **Setup**

Connecting the system .....	page 9
-----------------------------	--------

## **Operation**

Cleaning Models .....	page 11
Other information .....	page 15

## **Maintenance**

Inspecting and cleaning the strainer .....	page 17
Cleaning .....	page 17
Model bag .....	page 17

## **Troubleshooting**

Troubleshooting .....	page 19
Non-Coded Error Conditions .....	page 19
Error Detection .....	page 21
Diagnostic and Test Specifications .....	page 25
Functional Description .....	page 25
Subtest details .....	page 29

## **Service Procedures**

Maintenance Preparation .....	page 32
Cabinet Components .....	page 34

System Lid .....	page 34
Lower Housing Assembly .....	page 36
Upper Housing Assembly .....	page 38
<b>Hardware Components .....</b>	<b>page 39</b>
Back Panel .....	page 39
Line Filter .....	page 44
Thermostat .....	page 45
Thermometer Board .....	page 47
User Interface Board .....	page 49
Power Entry Module .....	page 52
Main Control Board .....	page 54
Cleaning Tank Assembly .....	page 60
Agitation Assembly .....	page 65
Drive Belt .....	page 68
Induction Motor Assembly .....	page 70
Float Level Sensor Assembly .....	page 72
Lid Switch Assembly .....	page 74
Lid Lock Assembly .....	page 76

## **Appendix**

System Components .....	page 80
Upper Components .....	page 81
Internal Components .....	page 82

# System Overview

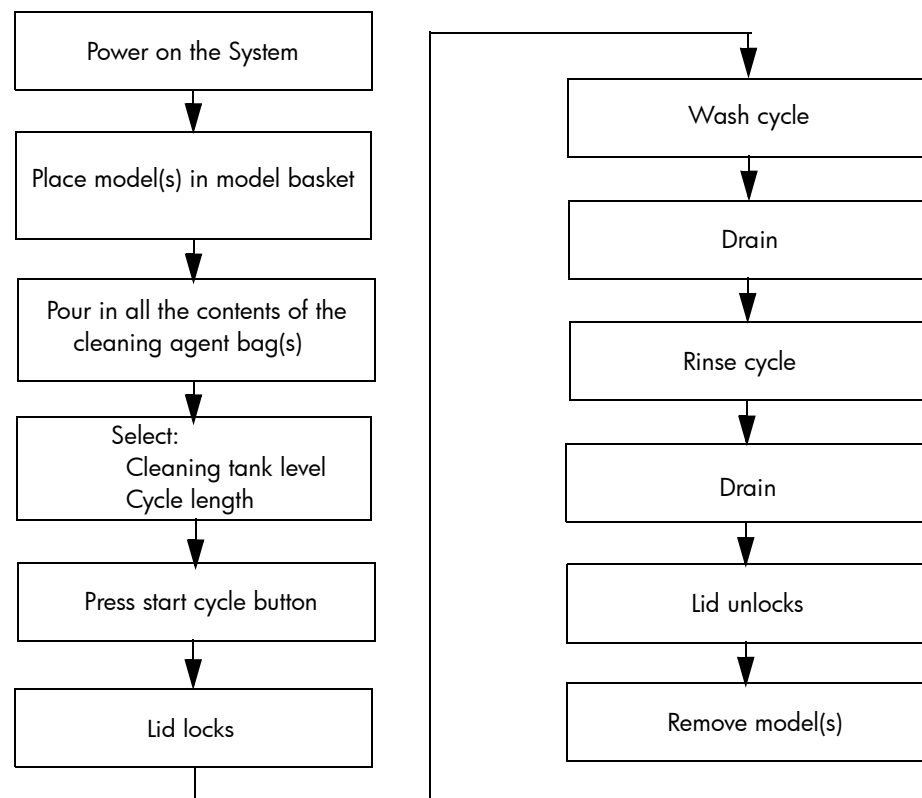
## How the system works

The system removes support material by immersing models in a bath of water with a specific amount of cleaning agent bags added to the cleaning agent receptacle. The system heats and circulates solution around the models in the cleaning tank. The solution dissolves the support material without harming the underlying model material. Over time, depending on geometry and the amount of support material, all the support material is dissolved and the models are ready to be removed, dried and used for their intended purpose.

The system incorporates the following functions:

- Automatic water fill
- User selectable cleaning tank level (half or full)
- Automatic water drain
- Automatic timing device for user selectable short, medium, or long cycles
- Automatic lock/unlock before and after cycling
- Automatic rinse and drain cycle

Figure 1: Sequence of Operation







# Setup

## Connecting the system

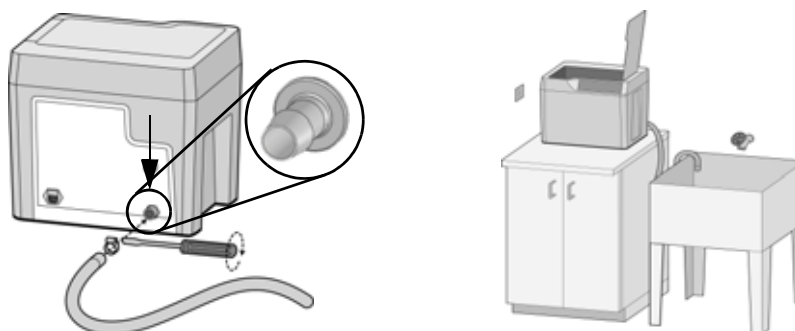
Make sure the following preparations of the physical site are met:

- The system must be placed on a flat and stable surface able to support 36 kg (80 lbs.) to avoid the risk of falling.
- The work area for unpacking the system should be 76.2 cm (30 in.) high, 76.39 cm (28.5 in.) wide and 69.95 cm (27 in.) deep.
- The system must be located at least 20 cm (8 in.) higher than the wastewater drain.
- The drain facility must accept a drain pH level between 6.5 and 10.0.
- The drain must accept a wastewater temperature of at least 75°C (167°F).
- The water source connection must have a 3/4 in. hose thread.
- The water source temperature must be  $\geq 15^{\circ}\text{C}$  (59°F).  
A hot water connection is highly recommended to speed up heating, but is not required.
- The water pressure must be between 0.5 bars and 10 bars (7.25 psi and 145 psi).
- The water source hardness should be  $\leq 300$  ppm.
- The grounded electrical outlet (220–240V~ 9A 50 Hz 1200W) must connect to either a Euro or a UK power cord plug provided and must be located within 2 m (5 ft.) of the system.
- The operating environmental temperature must be between 15°C to 30°C (59°F to 86°F).
- The operating environmental humidity must be between 20% to 80%, non condensing.
- Consult your area's requirements regarding the disposal of the HP Designjet 3D Removal System effluent prior to use. A permit or form of pre-treatment may be required in your area.

## Connect the drain hose

Make sure the drain hose is attached by pushing the end of the drain hose onto the barbed connection on the back panel of the system. Secure the hose with the hose clamp using a flat bladed screwdriver. Route the free end of the drain hose to the wastewater location. Make sure the system is at least 20 cm (8 in.) above the drain hose discharge and there are no kinks in the hose. The system relies on gravity to drain the wastewater from the cleaning tank.

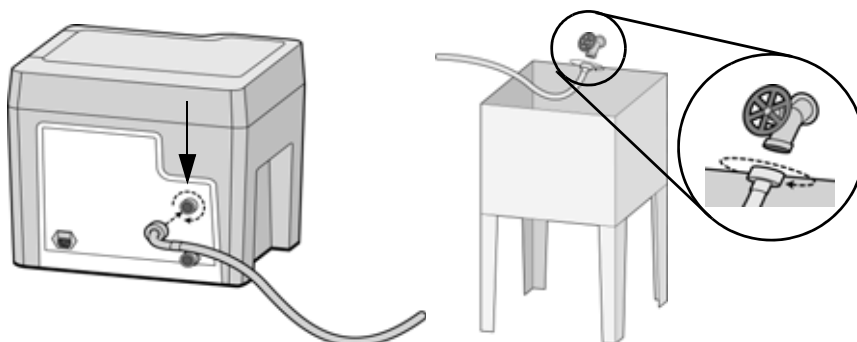
Figure 2: Drain hose connections



## Connect the water hose

Screw on the end of the water supply hose to the back panel of the system. Securely tighten the fitting clockwise. Turn on the water and make sure there are no leaks.

Figure 3: Water hose connections



## Plug in the system

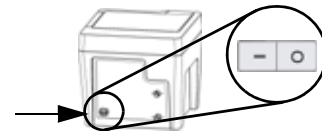
Securely plug one end of the supplied power cord into the receptacle at the back of the system and the other end of the power cord into a grounded receptacle. Only use the power cord provided.

# Operation

## Cleaning Models

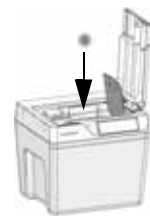
### Power on the system

Power on the system using the On/Off switch above the power cord receptacle on the back of the system.



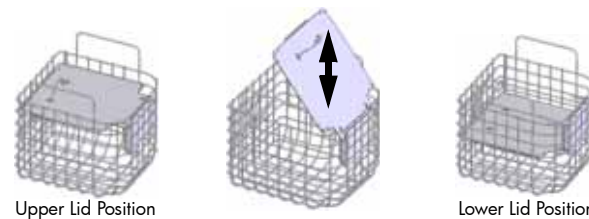
### Add models

All models must be placed in the model basket and the model lid adjusted.



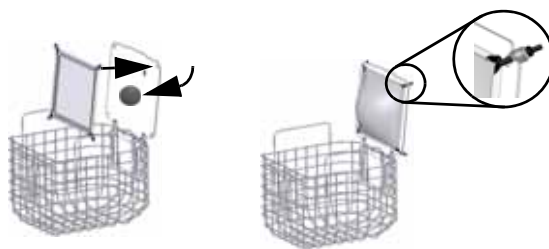
The model basket lid ensures the models remain submerged during the cleaning process. The lid can be adjusted to two heights.

- Use the upper lid position for larger models > 8.89 cm (3.5 in.).
- Use the lower lid position for smaller size models ≤ 8.89 cm (3.5 in.).
- Many models may be cleaned at one time as long as they are submerged during the cleaning process with the model basket lid in either position.



Delicate and flat models should be placed in the model bag on the model basket lid. When using the model bag, always select the lower lid position and do not add other models to the model basket.

- Delicate models have features with a cross sectional areas under 19 sq. mm (0.03 sq. in.).
- Flat models have large flat areas that are greater than 64 mm x 64 mm (2.5 in x 2.5 in) and less than 3 mm (1/8 in) thick).



### Cleaning tank level

Based on the model lid position, select either a full (upper lid position) or half (lower lid position) cleaning tank level by pressing the cleaning tank level button. A full cleaning tank level is approximately 15.14 L (4 gals.) and a half cleaning tank level is approximately 7.57 L (2 gals.).



### Cleaning agent bag(s)

Select the number of cleaning agent bag(s) to be used based on [Table 1](#) below.

**Table 1: Cleaning Tank Level and Cleaning Agent Bags**

Cleaning Tank Level	Cleaning Agent Bag
Half cleaning tank level	1 cleaning agent bag
Full cleaning tank level	2 cleaning agent bags

**Note:**

Do not use more than the specified amount of cleaning agent bags. Doing so will exceed pH levels for wastewater disposal.

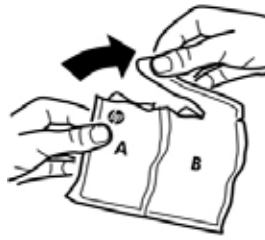
### Add cleaning agent bag

Follow the instructions below for adding the contents of the cleaning agent bag(s) to the cleaning agent receptacle.

1. Dry hands before opening the cleaning agent bag.



2. Open the cleaning agent bag as shown.



3. Empty all the contents of the specified number of cleaning agent bag into the cleaning agent receptacle as directed (see <Reference>Table 1).

**Note:**

Do not use more than the specified amount of cleaning agent bags. Doing so will exceed pH levels for wastewater disposal.



4. Avoid handling the contents of the cleaning agent bag.



After adding all the contents of the cleaning agent bag(s), properly dispose of bag(s) and close the system lid.



## Cycle Length

Select one of the three cycle lengths by pressing the cycle length button.



Each press of the cycle length button increases from a short cycle to a medium cycle or to a long cycle length. Pressing the cycle length button once more returns to the short cycle length.

Table 2 should also be used as a general guideline for selecting cycle lengths for most models. There are some factors that cause the support removal process to take longer such as model geometry, small support filled crevices, small blind holes, or low water temperature coming into the system.

**Table 2: Cycle Length Settings**

Combined Build Times	Cycle Selection	Approximate Cycle Times
≤ 4 hrs.	Short	3 hrs.
4 to 12 hrs.	Medium	6 hrs.
> 12 hrs.	Long	12 hrs.

### Note:

When placing more than one model in the same cleaning cycle, use the combined build times of all the models to determine the correct cycle length setting. Combined build time means the sum of the individual build times of each model put into the model basket.

## Start cycle

When the proper cleaning tank level and cycle length are set, press the start cycle button. The system locks the lid and begins the process of filling the cleaning tank, heating the solution, and starts the cleaning of models inside the cleaning tank.



After the initial cleaning of the models, the system drains and then refills with clean water for a final rinse and drain cycle. When the cleaning cycle completes, the left-hand progress LED will turn from yellow to green and the lid unlocks.

## Remove the models

Let the solution drain off of the models for a few minutes then remove the models, wash off any remaining solution and dry with a clean cloth or paper towel.

## Other information

### Progress LEDs

When the cleaning cycle is started, all the progress LEDs are illuminated in yellow. Each progress LED from right to left will turn off as the cycle time progresses. When the cleaning cycle is complete, the left-hand progress LED will turn from yellow to green.



Cycle complete 

### Canceling the cleaning cycle

To cancel the cleaning cycle at anytime, press the cancel button on the control panel. The system will stop and drain the cleaning tank. Before the system completely turns off, the cleaning tank may refill with water for a final rinse (depending on where the system is in the cleaning cycle) and then drains again. After the cleaning tank has drained, the lid unlocks so the model basket can be removed. The drained solution cannot be reused. Models may not be fully cleaned if you cancel the operation.



### Process error LED

A flashing yellow process error LED indicates a warning. See [“Troubleshooting” on page 19](#) for details.

A red process error LED indicates that the system is experiencing a system error. See [“Troubleshooting” on page 19](#) for details.



### Turning the system off

Once the cleaning cycle is complete and the models have been removed, the system should be turned off by toggling the power switch on the back panel to the OFF position. If the system is not going to be used for an extended period of time, remove all models from the model basket, make sure the system is completely dry, and the power cord is disconnected from the power cord receptacle.



# *Maintenance*

## **Inspecting and cleaning the strainer**

The strainer at the bottom of the cleaning tank should be cleaned before every use of the system to maintain optimal system performance. Remove the strainer from the cleaning tank and rinse under water until the strainer is clean. Place the strainer back in the cleaning tank after cleaning.

## **Cleaning**

The system should be cleaned once a month or sooner as needed. Clean the exterior and the interior of the cleaning tank with mild soap and water using a sponge or cloth only. Hard to remove residue can be cleaned with isopropyl alcohol. Never immerse the system or use a spray nozzle or hose to clean it. Any liquid in the electronics area behind the back panel of the system may damage the system and void the warranty.

## **Model bag**

The model bag should be replaced after 40 cycles. Replace the bag if the elastic cord starts to droop or the bag shows signs of wear.



# Troubleshooting



In the presence of unusual electromagnet phenomena, such as strong electromagnetic fields or severe electrical disturbances, the system might behave strangely, or even stop working. In this case, turn off the system, wait until the electromagnetic environment has returned to normal and then turn it on again.

The HP Designjet 3D Removal System has been designed to allow the end user to resolve most operating problems. When a problem is encountered, read through this troubleshooting section for possible solutions.

## Troubleshooting

### Non-Coded Error Conditions

Table 3: Non-Coded Error Conditions

Problem	Recommendation	Replacement Parts * Part most likely to resolve issue ** Part less likely to resolve issue
No power	Verify that the power cord is securely plugged in.	* Main controller board ** Line filter ** Thermostat
	Verify that the power switch is in the ON position.	
	Verify that AC power is present at the power outlet.	

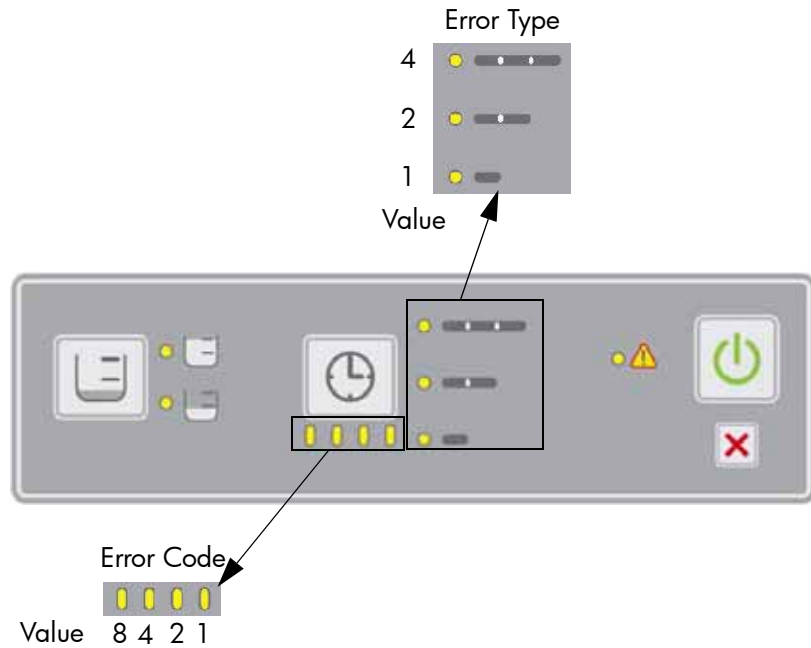
Problem	Recommendation	Replacement Parts * Part most likely to resolve issue ** Part less likely to resolve issue
Water has not fully drained from the cleaning tank assembly	Verify that the strainer and cleaning tank drain are not clogged.	
	Verify that the drain hose is not clogged.	
	Verify that there are no kinks in the drain hoses.	
	Make sure the system is at least 20 cm (8 in.) above the drain hose discharge.	
	Make sure that no section of the drain hose is higher than the system discharge.	
	Verify that the power cord is securely plugged in.	
	Verify that the power switch is in the ON position.	
	Verify that AC power is present at the power outlet.	
Models not clean	Make sure all the contents of the specified number of cleaning agent bag(s) is used.	* Agitation drive belt ** Induction motor ** Agitation assembly ** Cleaning tank assembly
	Make sure the correct cleaning tank assembly level is selected.	
	Make sure the correct cycle length is selected.	
	Repeat the cleaning cycle.	
	Make sure the model basket is used to submerge models in the cleaning solution and the correct system lid position is selected.	
	Cleaning tank assembly not heating.	Note: Verify that the tank has failed to heat before replacing the cleaning tank assembly, by touching the tank during unit operation.
The system is leaking	Verify that the inlet and drain hose connections are tight.	
Yellow flashing process error LED	Open and close the system lid and then make sure the lid is fully closed.	* System lid ** System lid sensor ** Cleaning tank assembly
	If recovering from a power loss, press the cancel button.	

## Error Detection

### Error Type

Each error type LED carries a weight value (4, 2, or 1). To obtain the error type number, add up the weight value associated with the illuminated LED. For example; if the top LED (4) and the bottom LED (1) are both illuminated, the value equals 5 ( $4+1=5$ ).

Figure 4: Error Type



## Error Code

Each error code LED carries a weight value (8, 4, 2, or 1). To obtain the error code number, add up the weight value associated with the illuminated LED. For example; if the right LED (1) and the third from the right LED (4) are both illuminated, the value equals 5 (1+4=5).



**Note:** To obtain error codes, see “Entering Diagnostic Mode” on page 25 for details.

Table 4: Error Code Chart

Error Type-Code	Description	Replacement Parts * Part most likely to resolve issue ** Part less likely to resolve issue
1-1	Failed or open thermometer	* Thermometer board ** Main controller board
1-8	Set point temperature not reached	* Cleaning Tank Assembly * Main controller board ** Thermometer board ** User interface board
2-1	Ambient temperature error	* Thermometer board ** User interface board ** Main controller board
2-2	Wait for high temperature failed	* Cleaning Tank Assembly * Main controller board ** Thermometer board ** User interface board
2-3	Wait for low temperature failed	* Thermometer board ** Main controller board
2-4	Wait for the system lid to close failed 1. Check to see if the system lid is closed 2. Check to see if magnet is present in system lid	CRU: * System lid FRU: * Lid switch assembly ** User interface board
2-5	User interface to main controller communication error	* User interface board * Main controller board
2-6	Thermometer communication error	* Thermometer board * User interface board
2-7	Float level sensor assembly not empty 1. Check for drain hose blocked or mis-routed 2. Check to see if drain screen is clean	* Float level sensor assembly ** Cleaning tank assembly
3-1	System lid open while washing • Check if magnet is secure in system lid	* System lid lock assembly ** System lid switch assembly ** User interface board ** Main controller board

Error Type-Code	Description	Replacement Parts * Part most likely to resolve issue ** Part less likely to resolve issue
3-2	System lid open while rinsing • Check if magnet is secure in system lid	* System lid lock assembly ** System switch assembly ** User interface board ** Main controller board
3-3	Power module fault detected	* Main controller board
3-4	User interface to main controller communication error	* User interface board * Main control board
3-10	Invalid float level sensor assembly state	* Float level sensor assembly ** Main controller board
4-1	Invalid float level sensor assembly state	* Float level sensor assembly ** Main controller board
4-2	Timeout waiting for low water level 1. Check for water available at inlet 2. Check water pressure at inlet	* Cleaning tank assembly ** Inlet hose ** Main controller board ** Float level sensor assembly
4-3	Timeout waiting for mid water level 1. Check for water available at inlet 2. Check water pressure at inlet	* Cleaning tank assembly ** Float level sensor assembly ** Main controller board
4-4	Unexpected transition to overfill condition	* Float level sensor assembly ** Cleaning tank assembly ** Main controller board
4-5	Timeout waiting for full water level 1. Check for water available at inlet 2. Check water pressure at inlet	* Float level sensor assembly * Cleaning tank assembly ** Main controller board
4-6	Float level sensor assembly error - empty switch stuck closed	* Float level sensor assembly ** Main controller board
4-7	Timeout waiting for full water level 1. Check for water available at inlet 2. Check water pressure at inlet	* Float level sensor assembly * Cleaning tank assembly ** Main controller board
4-8	Overfill: Float level sensor assembly error - mid switch stuck open	* Float level sensor assembly ** Main controller board
4-9	Float level sensor assembly error - mid switch stuck open	* Float level sensor assembly ** Main controller board
4-10	Float level sensor assembly error - empty switch stuck closed	* Float level sensor assembly ** Main controller board
4-11	Not empty at start of fill	* Float level sensor assembly ** Main controller board
4-12	Float level sensor assembly error (full before mid)	* Float level sensor assembly ** Main controller board
4-13	Not at target level at the end of fill	* Float level sensor assembly ** Main controller board
5-1	Invalid float level sensor assembly state	* Float level sensor assembly ** Main controller board

Error Type-Code	Description	Replacement Parts * Part most likely to resolve issue ** Part less likely to resolve issue
5-2	Unexpected loss of fluid	* Cleaning tank assembly ** Float level board ** Main controller board
5-3	Overfill	* Cleaning tank assembly ** Float level board ** Main controller board
5-4	Unexpected loss of fluid and invalid sensor transition	* Float level sensor assembly ** Main controller board ** Cleaning tank assembly
6-1	Invalid float level sensor assembly state	* Float level sensor assembly ** Main controller board
6-2	Timeout waiting for empty 1. Check for drain hose blocked or mis-routed 2. Check drain screen clean	* Float level sensor assembly * Cleaning tank assembly
6-3	Unexpected addition of fluid	* Cleaning tank assembly ** Float level sensor assembly ** Main controller board



# Diagnostic and Test Specifications

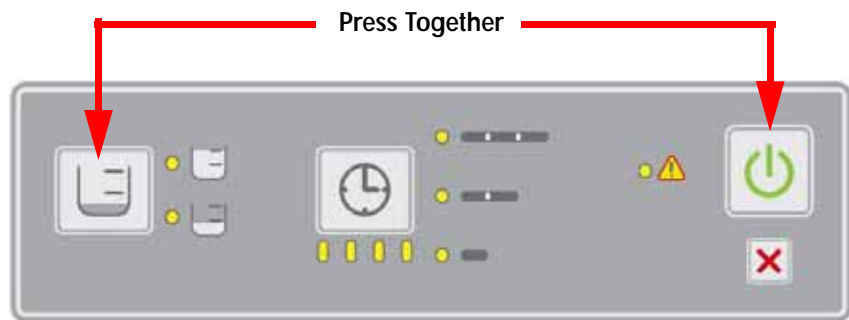
## Functional Description

### Overview

The diagnostic test feature is intended to allow the support engineer to confirm correct operation of a majority of the system's hardware. Diagnostic testing does not require water be connected to the cleaning tank assembly for the test sequence to complete successfully. The support engineer will be required to verify certain hardware is operating properly where the cleaning tank assembly itself is not capable of detecting it automatically.

### Entering Diagnostic Mode

Diagnostic mode can only be entered when the system is initially powered off. To enter diagnostic mode, the support engineer must simultaneously hold down only the 'start' and 'load select' buttons (farthest apart) when power is turned on. The system is now in diagnostic mode (indicated by both 'cycle load' LEDs being ON simultaneously and all 'cycle length' and 'progress status' LEDs OFF, neither of which should ever occur during normal operating mode). Normal operation cannot be resumed until this mode is exited. Note that the input buttons have different functions when in diagnostic mode.



### Input functions in Diagnostic Mode

The affect of pressing the interface panel buttons changes when diagnostic mode is active.

Button	Normal mode (for reference only)	Diagnostic model
Cycle 'Load Select'	Rotate though water level options (Full→Half→Full→...)	Select subtest (sequential
Cycle 'Length Select'	Rotate though cycle length options (Long→ Med→ Short→ Long→...)	Run selected subtest
'Start'	Begin selected cleaning operation	Run all diagnostic subtests (run remaining subtests)
'Cancel'	Abort any operation in progress	Exit diagnostic mode(abort current subtest)

## Exiting Diagnostic Mode

As long as no errors have been detected, diagnostic mode can be exited simply by pressing the 'cancel' button. If a test sequence is in progress when the 'cancel' button is pressed, the current subtest sequence is aborted, but the system remains in diagnostic mode. Pressing 'cancel' a second time would then exit diagnostic mode. LEDs should return to their default state for normal operating mode. Diagnostic mode can also be exited by powering the system off and on again (without holding down any input buttons).

## Initiating the Diagnostic Sequence

The diagnostic subtests can be initiated in one of two ways: 1) "Run all": run all subtests with a single button press (with only a short delay between each subtest), or 2) "Interactive mode": run one subtest at a time, allowing the user control over individual subtests. All 'cycle length', 'progress status', and 'warning' LEDs are OFF when diagnostics mode is ready to initiate subtesting.

### Run all (entire sequence, no pausing)

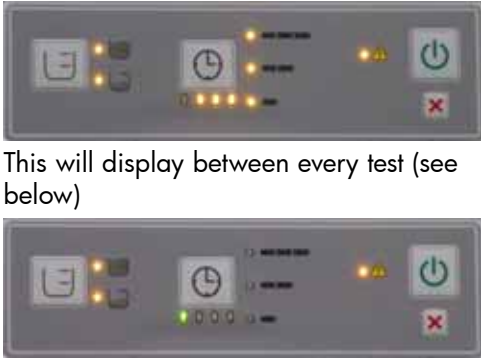



To initiate the entire diagnostic test sequence, simply press the 'start' button while in diagnostic mode. This starts a predetermined sequence of subtests that exercise the system's hardware. The entire test sequence runs until completion, an error has been detected, or the 'cancel' button is pressed. Pressing the 'load select' or 'length select' button has no affect once the 'start' button has initiated the sequence. Note that only a short delay occurs between subtests; no other input is required to complete the sequence. It may be helpful to note that diagnostics are best run with the system lid open.






### Interactive mode (select subtest to run)

This mode allows individual tests to be selected and executed. To select a particular test use the 'load select' button. Pressing this button selects the next subtest which is displayed on the 'cycle length', 'progress status', and the 'warning' LEDs. Once the desired subtest is selected the 'length select' button is used to execute that subtest. Pressing the 'start' button runs the currently selected subtest as well as all the remaining subtests from that point on stopping at the final subtest (not looping back to run the first subtest). After successful completion of any subtest, another subtest can be selected using the 'load select' button or that same subtest can be run again by pressing the 'length select' button. When in the interactive mode, the operator must wait 30 seconds after powering on the system before running the heater subtest.

## Test Sequence

The test sequence has been designed to exercise the hardware one component at a time. Wherever possible, the system automatically detects proper component operation. Where the system cannot detect component operation, the support engineer is required to confirm component operation (visually or audibly). The test sequence is described below along with a brief description of each subtest. The sequence runs each subtest in order, unless an error is detected, in which case the system jumps to the reporting phase at the end of the test sequence, which displays the code for that error. The 'cycle length' and 'progress status' LEDs are used to indicate progress through the test sequence. They should turn on one at a time, from top to bottom, left to right, one for each subtest.

Sub-test #	Subtest Name	Error Detection	Subtest Summary	Status Display
1	LEDs	Visual	<p>Turn all LEDs ON, then OFF and repeat once more. Return LEDs to their initial state.</p>  <p>This will display between every test (see below)</p>	All LEDs blink
2	Electronics self-test	Automatic	<p>Perform at any power-up, not just diagnostic mode. The 'warning' LED is ON after power-up if this subtest ever fails.</p> 	Topmost 'cycle length' LED (long) ON and 'warning' LED is ON.
3	Inlet Valve	Audible	<p>Open and close valve multiple times.</p> 	2 'cycle length' LEDs (long + medium) ON and 'warning' LED is ON.
4	Drain Valve	Audible	<p>Open and close valve multiple times.</p> 	All 3 'cycle length' LEDs ON and 'warning' LED is ON.

Sub-test #	Subtest Name	Error Detection	Subtest Summary	Status Display
5	Motor/Propeller	Visual	Enable motor (propeller should rotate), then disable motor. 	All 3 'cycle length' and rightmost 'progress status' LEDs ON. 'Warning' LED is ON.
6	Float Level Sensor Assemblies	Visual	Verify all float level sensor assemblies can change state. 	All 3 'cycle length' and right 2 'progress status' LEDs ON. 'Warning' LED is ON.
7	Door Lock	Visual	The system lid can be either open or shut for this subtest. Door lock is activated 4 times. 	All 3 'cycle length' and right 3 'progress status' LEDs ON. 'Warning' LED is ON.
8	Door Switch	Automatic	Blink 'warning' LED until the support engineer opens and closes the system lid to verify both switch states. 	All 3 'cycle length' and all 4 'progress status' LEDs ON. 'Warning' LED is blinking.
9	Heater	Automatic	Enable heater until test temperature is reached (or timeout occurs), then disable heater. 	All 3 'cycle length', all 4 'progress status', and 'warning' LEDs ON

### Sequence Reporting

While the 'cycle load' LEDs indicate whether the system is in normal or diagnostic mode, the 'cycle length', 'progress status', and 'warning' LEDs (all yellow) indicate diagnostic status. Reporting is very similar for the "entire sequence" and "interactive" modes, but subtest completion and error status are handled differently. For either mode, while a subtest is in progress, the 'cycle length', 'progress status', and 'warning' LEDs indicate which subtest is active.

## Run all

Once the test sequence is complete, the 'cycle complete' LED turns ON. If no errors were detected, then all 'cycle length', 'progress status', and 'warning' LEDs are OFF, as is the 'error' LED. If an error was detected, then the 'cycle length', 'progress status', and 'warning' LEDs display an error code. The 'cycle complete' LED is OFF while the 'error' LED blinks.

## Interactive mode

After each subtest completes, the 'cycle length', 'progress status', and 'warning' LEDs momentarily turn OFF while the 'cycle complete' LED turns ON. Note that the 'cycle complete' LED is green, but is co-located with the left most 'progress status' LED (yellow). The 'cycle length', 'progress status', and 'warning' LEDs continue to indicate the subtest that is selected; they do not update unless the 'load select' (or 'start') button is pressed. After the last subtest, pressing 'load select' returns the 'cycle length', 'progress status', and 'warning' LEDs to all OFF.

If a failure was detected in interactive mode, then the 'error' LED blinks and the 'cycle complete' LED is OFF while the 'cycle length' and 'progress status' LEDs display an error code. Note that the 'error' LED is red, but is co-located with the 'warning' LED (yellow).

## Subtest details

### LED subtest

Two of the LED locations are bi-color LEDs. These two are easiest to verify if only one of each pair of LEDs within the package is turned on at a time during testing. The LED test sequence is as follows: first, turn on all yellow LEDs ('cycle length', 'progress status', and 'warning') ON for ~2 seconds, turn those OFF while simultaneously turning the green and red LEDs ('cycle complete' and 'error') ON for ~2 seconds, then all LEDs OFF for ~2 seconds. Repeat that ON/OFF cycle once more. Return LEDs to proper state for next subtest (both 'cycle load' LEDs ON, etc.).

This should allow support engineers sufficient time to verify that all LEDs can turn both ON and OFF.

### Electronics Selftest

This subtest is performed at any power-up to normal mode as well as during the diagnostic test sequence. This subtest should perform an internal check of any and all possible electronic circuits than can be verified automatically.

### Inlet Valve subtest

This subtest opens (default state is closed) and then closes the water inlet valve at a 2 Hz. rate for a total of 5 cycles. This should allow support engineers an opportunity to hear the valve functioning. The valve must be left in the default state at the end of the subtest. If the system is connected to a water source, some water will enter the cleaning tank assembly during this subtest.

### **Drain Valve subtest**

This subtest opens (default state is closed) and then closes the drain valve at a 2 Hz. rate for a total of 5 cycles. This should allow support engineers an opportunity to hear the valve functioning. The valve must be left in the default state at the end of the subtest.

### **Motor/Propeller subtest**

This subtest enables the agitation motor for a total of approximately 5 seconds, and then disables the motor. The support engineer should be able to see the propeller rotating during this time.

### **Float Level Sensor Assemblies subtest**

Since there is currently no manual or automatic way of activating the float level sensor assemblies, this subtest simply checks that the sensors are in their default state for an empty cleaning tank assembly.

### **System Lid Lock subtest**

This subtest enables (default state is disabled) and then disables the system lid lock at a 2 Hz. rate for a total of 5 cycles. This should allow support engineers an opportunity to both see (if the system lid is open) and hear the lock functioning. The lock must be left disabled at the end of this subtest.

### **System Lid Switch subtest**

This subtest necessarily involves support engineer interaction. The support engineer must open and close the system lid so that the system can verify that the system lid switch assembly can reach both states. The support engineer must do this within a specified time limit (10 seconds) or the test fails. Once both states have been verified, the subtest is complete. In order to help prompt the support engineer to move the system lid, the 'warning' LED should be blinked at a 2 Hz. rate for the duration of this subtest.

### **Heater subtest**

This subtest starts by verifying that the cleaning tank assembly temperature is within normal operating limits ( $T_{\text{env-min}}^{\circ\text{C}}$  to  $T_{\text{env-max}}^{\circ\text{C}}$ ). If so, it enables the cleaning tank assembly heater (at ~10% duty cycle) until either the temperature rises  $T_{\text{subtest-limit}}$  above the subtest's starting temperature or a time-out occurs – whichever comes first. If the temperature limit is reached first, then the heater is disabled. It is an error if the time limit expires before the temperature limit is reached. The heater should be immediately disabled in case of an error. During this subtest, the support engineer is allowed to keep the system lid open in order to touch the inside of the sink for manual verification. Therefore, the subtest temperature limit ( $T_{\text{subtest-limit}}$ ) should be kept  $< 50^{\circ\text{C}}$ . There is no delay to wait for the system to cool back down after this subtest, so repeated execution of this subtest will eventually cause a failure due to the starting temperature being above  $T_{\text{env-max}}^{\circ\text{C}}$ . The heater subtest will fail if run within 30 seconds of powering on the system.

# *Service Procedures*

<b>Maintenance Preparation .....</b>	<b>page 32</b>
<b>Cabinet Components .....</b>	<b>page 34</b>
System Lid .....	page 34
Lower Housing Assembly.....	page 36
Upper Housing Assembly .....	page 38
<b>Hardware Components .....</b>	<b>page 39</b>
Back Panel .....	page 39
Line Filter.....	page 44
Thermostat.....	page 45
Thermometer Board .....	page 47
User Interface Board.....	page 49
Power Entry Module .....	page 52
Main Control Board.....	page 54
Cleaning Tank Assembly .....	page 60
Agitation Assembly.....	page 65
Drive Belt .....	page 68
Induction Motor Assembly .....	page 70
Float Level Sensor Assembly .....	page 72
Lid Switch Assembly .....	page 74
Lid Lock Assembly .....	page 76

## Maintenance Preparation

Read these warnings before performing service on the HP Designjet 3D Remove System!



**WARNING:** Make sure the power is disconnected when performing any of the disassembly or assembly instructions in this section. Failure to do so can cause severe personal injury or damage to the electronics.



**WARNING:** Servicing instructions outlined in this section are intended for use by qualified personnel only. Failure to follow these guidelines can cause severe injury.



**WARNING:** The Power Switch located on the rear of the HP Designjet 3D Removal System **MUST** be off before service is performed on the system. It is recommended that the AC power cord be disconnected before performing maintenance outlined in this section.



**NOTE:** All references within this procedure to 'Left' or 'Right' are made assuming that the system is being viewed from the 'Front' of the system.



**NOTE:** Before disassembling, make sure all liquid is removed from the system to prevent trapped liquid from dripping on the system electronics.



## Required Tool List

1. #1 standard screwdriver
2. #2 standard screwdriver
3. #1 phillips screwdriver
4. #2 phillips screwdriver
5. Pliers
6. Small wire cutters
7. Grounding strap
8. 11/32" box wrench (PN 208853-0001)
9. Box wrenches

## Prerequisite procedures

1. Cancel any pending jobs and wait for the system to drain. If the system is inoperable, see ["Inoperable system" on page 33](#).
2. After the system has drained toggle the On/Off switch at the back of the system to Off.
3. Remove the AC power cord from the system.
4. Remove the inlet hose and the drain hose from the system.
5. Open the lid and make sure there is no liquid in the cleaning tank. Drain any liquid from the system making sure that all trapped liquid is removed from the cleaning tank.



**NOTE: Before disassembling, make sure all liquid is removed from the system to prevent trapped liquid from dripping on the system electronics.**

## Inoperable system

If the system lid is in the locked position and cannot be opened, do the following:

1. Using a #1 standard screwdriver, place the blade of the screwdriver on the solenoid latch and then force the latch back into the upper housing. See [Figure 10](#).
2. After the solenoid latch has been moved back into the upper housing, the lid will be free to open.

Figure 10: Door lock solenoid latch



3. After the lid has been opened, drain any liquid from the system making sure that all trapped liquid is removed from the cleaning tank.

## Cabinet Components

### System Lid

#### Removing the system lid

1. Open the system lid and then move the lid beyond its natural stopping point. Continue to move the lid until the lid snaps off the housing hinges. See [Figure 11](#).
2. Set the lid aside.

*Figure 11: System Lid*



#### Installing the system lid

1. Make sure that both lid hinge pins are centered in the hinges. See [Figure 12](#).

*Figure 12: Center hinge pins*



Center hinge pin

2. Position the lid so the lid hinges and the housing hinges line up. See [Figure 13](#).

*Figure 13: Attaching the lid*



Snap lid hinges  
onto housing hinges

3. Firmly press the lid hinges onto the housing hinges so the hinges snap together. A sharp blow with the heel of your hand is sufficient to snap the hinges into place. See [Figure 14](#).

*Figure 14: Snapping the lid in place*



4. Close the lid.

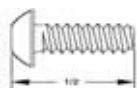
## Lower Housing Assembly

### Required Tools

- #2 phillips screwdriver

### Hardware

- 10-32 x  $\frac{1}{2}$ " phillips screw (x5)



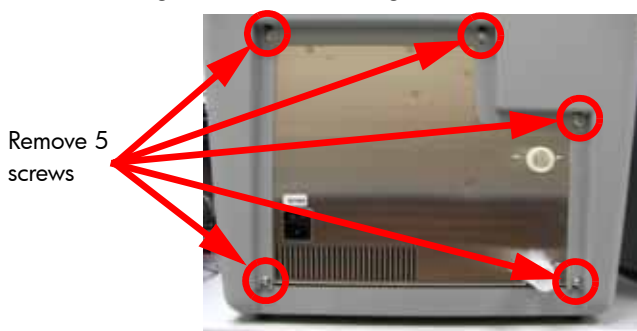
### Removing the lower housing assembly



**NOTE:** Before disassembling, make sure all liquid is removed from the system to prevent trapped liquid from dripping on the system electronics.

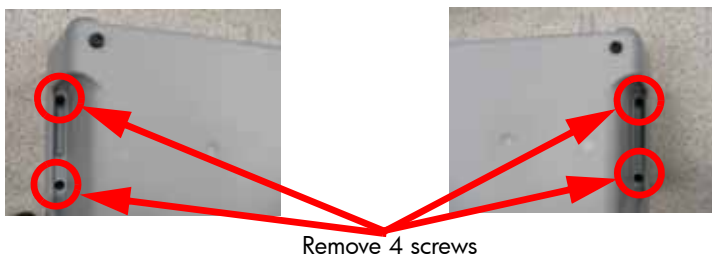
1. Using a #2 phillips screwdriver, remove the 5 screws that attach the lower housing to back panel as shown in [Figure 15](#).

Figure 15: Lower Housing screw locations



2. Remove the system lid so it won't get in the way when servicing the system. See ["Removing the system lid"](#) on page 34.
3. Flip the system upside down to gain access to the bottom of the system.
4. Using a magnetized #2 phillips screwdriver, remove 4 screws from the left side and right side of the lower housing. See [Figure 16](#).

Figure 16: Lower Housing screw locations



5. Lift up the lower housing and set the housing aside.

## Installing the lower housing assembly



**NOTE:** Prior to reassembling the system, check that there is no liquid on the system electronics.

1. Place the lower housing in position and attach using 4 screws.
2. Flip the system right-side up.
3. Using a #2 phillips screwdriver, attach 5 screws to the back of the housing. See [Figure 15](#).
4. Attach the lid to the system. See [“Installing the system lid” on page 34](#).

## Upper Housing Assembly

### Removing the upper housing assembly

1. Remove the back panel. See ["Removing the back panel" on page 39.](#)
2. Remove the user interface board. See ["Removing the user interface board" on page 49.](#)
3. Remove the cleaning tank assembly. See ["Removing the cleaning tank assembly" on page 60.](#)
4. Remove the agitation assembly. See ["Removing the agitation assembly" on page 65.](#)

*Figure 17: Upper housing assembly*



### Installing the upper housing assembly

1. Install the agitation assembly. See ["Installing the agitation assembly" on page 67.](#)
2. Install the cleaning tank assembly. See ["Installing the cleaning tank assembly" on page 61.](#)
3. Install the user interface board. See ["Installing the user interface board" on page 51.](#)
4. Install the back panel. See ["Installing the back panel" on page 42.](#)

## Hardware Components

### Back Panel

#### Required Tools

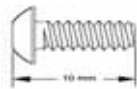
- #2 phillips screwdriver
- Grounding strap

#### Hardware

- 8-32 x 3/8" phillips screw (x3)



- 4-0.7 x 10 mm screw (x4)

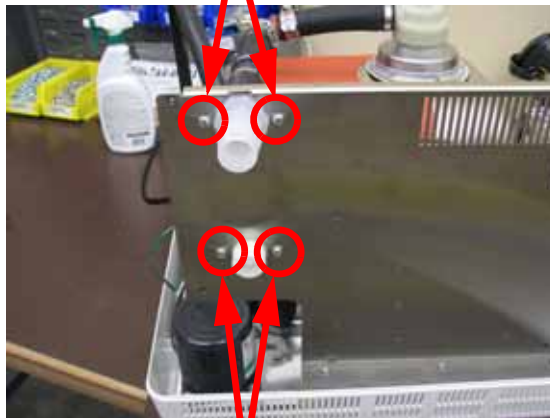


#### Removing the back panel

1. Remove the lower housing. See ["Removing the lower housing assembly" on page 36](#).
2. Using a #2 screwdriver, remove 2 mounting screws that attach the wastewater drain components to the back panel. See [Figure 18](#).
3. Using a #2 screwdriver, remove 2 mounting screws that attach the water inlet components to the back panel.

*Figure 18: Back panel screw location*

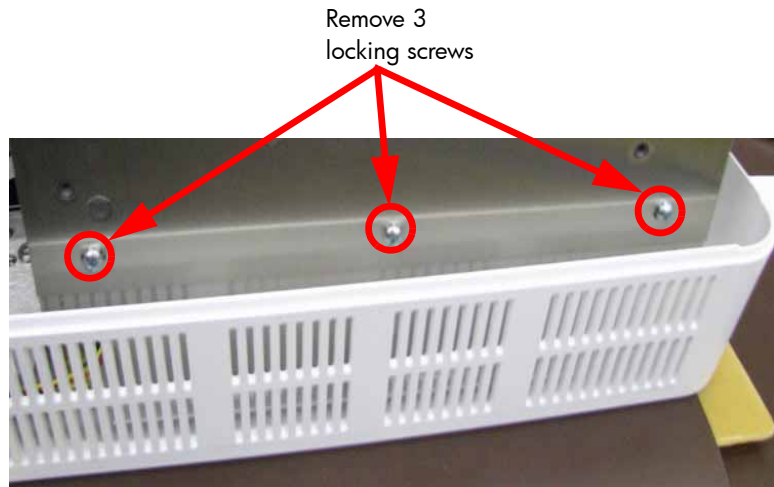
Remove 2  
mounting screws



Remove 2  
mounting screws

4. Using a #2 phillips screwdriver, remove 3 locking screws that attach the back panel to the upper housing See [Figure 19](#).

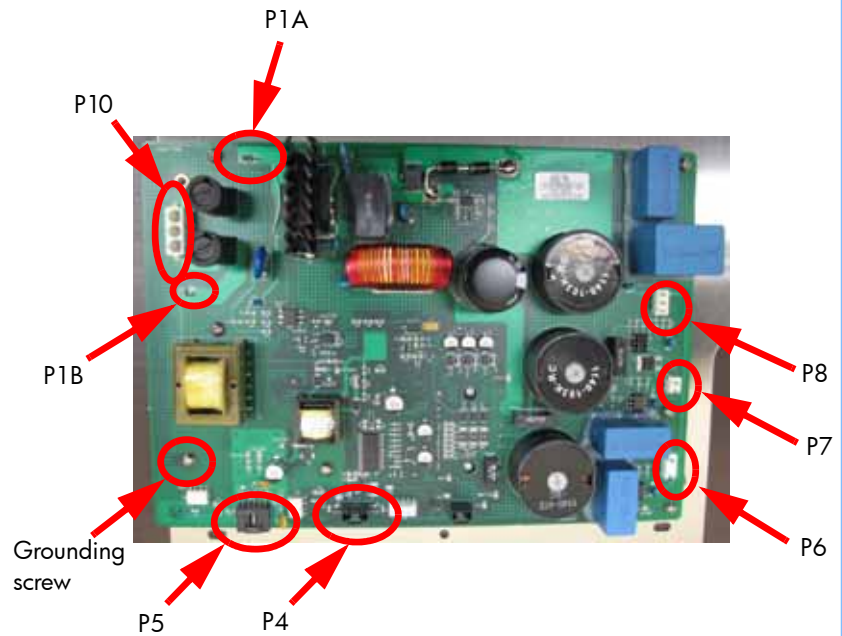
*Figure 19: Back panel screw locations*



5. Tilt the back panel to gain access the connectors. Be careful not to put stress on any wire cables.
6. Disconnect the following cable connectors from the main control board: (see [Figure 20](#))
  - P10 Power Cable (PN 208700)
  - P8 Motor Power (PN 208709)
  - P7 Inlet Valve (PN 208701)
  - P6 Drain Valve (PN 208702)
  - P1A Heater (PN 208723) (black wire)
  - P1B Heater (PN 208723) (white wire)
  - P5 Data Cable (PN 208726)
  - P4 Level Sensor (PN 208725)
7. Remove 1 grounding screw and remove 2 green grounding wires. See [Figure 20](#).

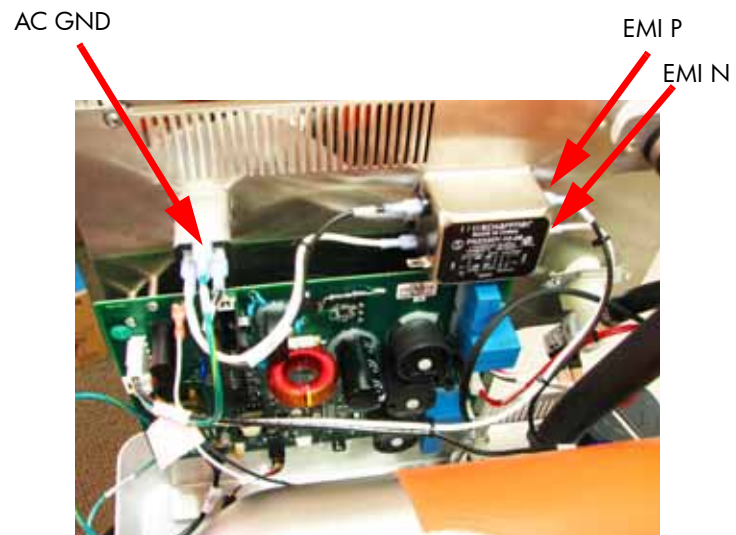


Figure 20: Main board connector locations



8. Disconnect 1 ground wire from the power entry module (AC GND). See [Figure 21](#).
9. Disconnect 2 wires from the line filter. (EMI P and EMI N).
10. Remove the back panel from the system.

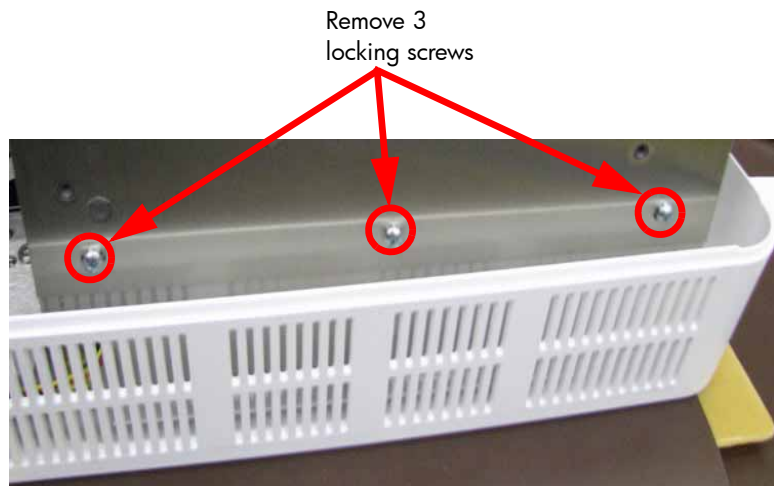
Figure 21: Main control board connections



## Installing the back panel

1. Place the back panel in position.
2. Using a #2 phillips screwdriver, attach 2 green grounding wires using 1 grounding screw. See [Figure 20](#).
3. Connect the following cables to the main control board: (see [Figure 20](#))
  - P10 Power Cable (PN 208700)
  - P8 Motor Power (PN 208709)
  - P7 Inlet Valve (PN 208701)
  - P6 Drain Valve (PN 208702)
  - P1A Heater (PN 208723) (black wire)
  - P1B Heater (PN 208723) (white wire)
  - P5 Data Cable (PN 208726)
  - P4 Level Sensor (PN 208725)
4. Connect 1 ground wire to the power entry module (AC GND). See [Figure 21](#).
5. Connect 2 wires to the line filter. (EMI P and EMI N).
6. Using a #2 phillips screwdriver, attach the back panel to the upper housing using 3 screws.

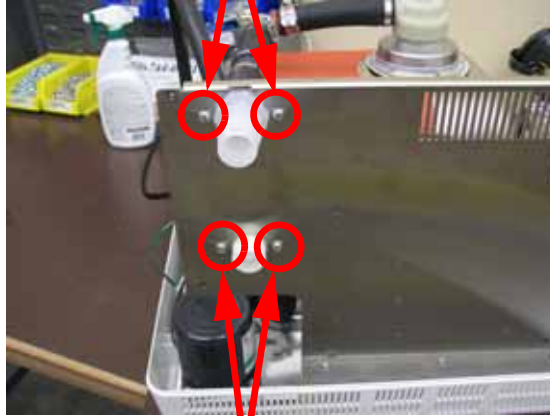
*Figure 22: Back panel screw locations*



7. Using a #2 screwdriver, attach wastewater drain components to the back panel using 2 screws. See [Figure 23](#).
8. Using a #2 screwdriver, attach the water inlet components to the back panel using 2 screws. See [Figure 23](#)

*Figure 23: Back panel screw location*

Remove 2  
mounting screws



Remove 2  
mounting screws

9. Install the lower housing. See [“Installing the lower housing assembly” on page 37](#).

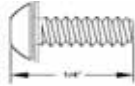
## Line Filter

### Required Tools

- #2 phillips screwdriver

### Hardware

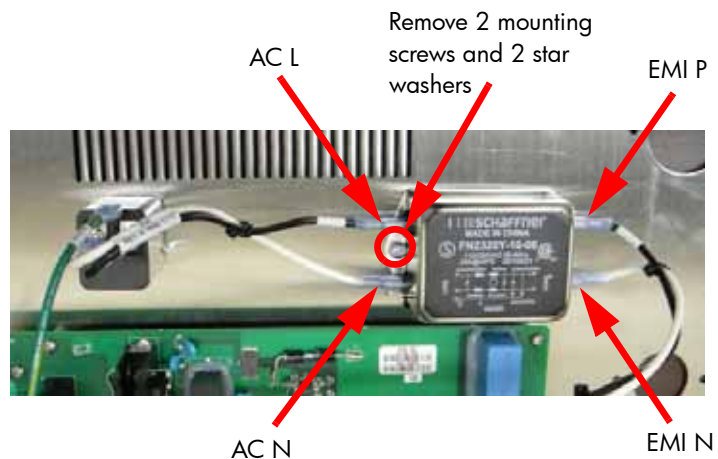
- 8-32 x 1/4" phillips screw (x2)



### Removing the line filter

1. Remove the lower housing. See ["Removing the lower housing assembly" on page 36](#).
2. Disconnect 2 input wires from the line filter. See [Figure 24](#).
3. Disconnect 2 output wires from the line filter.
4. Using a #2 phillips screwdriver, remove 2 mounting screws that attach the line filter to the back panel.
5. Remove the line filter from the back panel.

Figure 24: Line filter



### Installing the line filter

1. Place the line filter in position and attach the filter to the back panel using 2 mounting screws.
2. Attach the AC L and the AC N wires to the input of the line filter.
3. Attach the EMI P and the EMI N wires to output of the line filter.
4. Install the lower housing. See ["Installing the lower housing assembly" on page 37](#).

## Thermostat

### Required Tools

- 11/32" box wrench (PN 208853-0001)

### Hardware

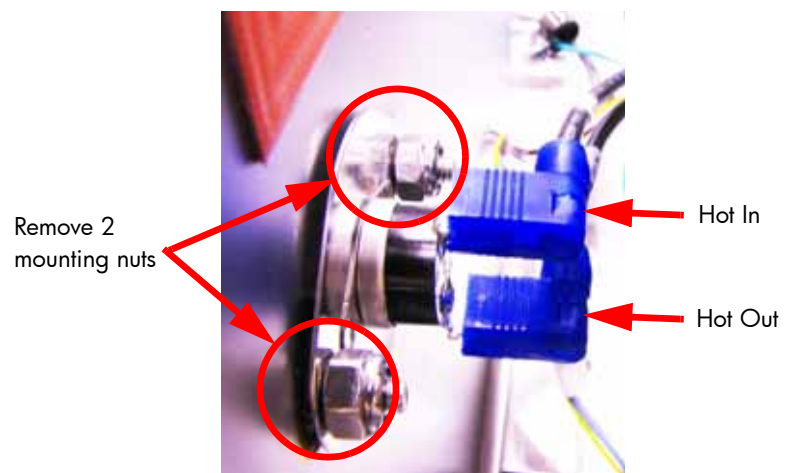
- 6-32" nut (x2)



### Removing the thermostat

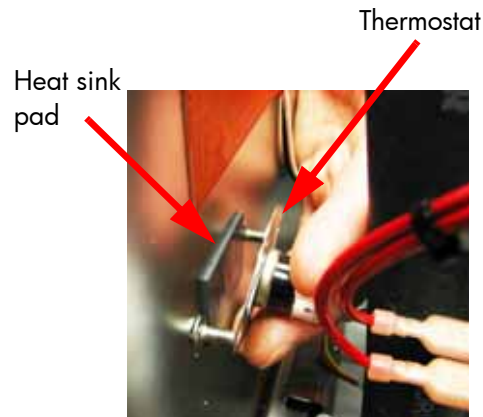
1. Remove the lower housing. See ["Removing the lower housing assembly" on page 36](#).
2. Disconnect 2 wires from the thermostat. See [Figure 25](#).
3. Using the 11/32" box wrench (PN 208853-0001), remove 2 11/32" mounting nuts that attach the thermostat to the cleaning tank.

*Figure 25: Thermostat nut location*



4. Remove the thermostat and the thermal heat sink pad from the system. See [Figure 26](#).

*Figure 26: Thermostat removal*



### Installing the thermostat

1. Place the heat sink pad in position on the cleaning tank.
2. Place the thermostat in position over the heat sink pad.
3. Using the 11/32" box wrench (PN 208853-0001), attach the thermostat to the cleaning tank using 2 11/32" mounting nuts. Make sure the thermal heat sink pad is between the thermostat and the cleaning tank and has not shifted.
4. Connect 2 wires on the thermostat. See [Figure 25](#).
5. Install the lower housing. See ["Installing the lower housing assembly" on page 37](#).

## Thermometer Board

### Required Tools

- 5/16" wrench
- Grounding strap

### Hardware

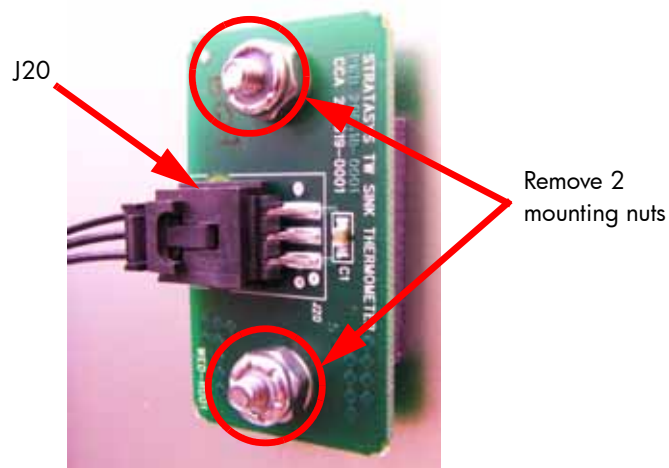
- 6-32" nut (x2)



### Removing the thermometer board

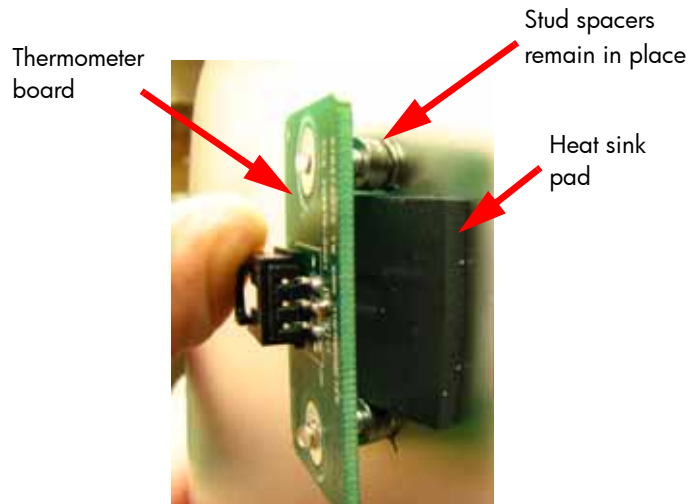
1. Remove the lower housing. See ["Removing the lower housing assembly" on page 36](#).
2. Disconnect J20 from the thermometer board. See [Figure 27](#).
3. Using a 5/16" wrench, remove the 2 mounting nuts that secure the thermometer board to the cleaning tank.

Figure 27: Thermometer board



4. Remove the thermometer board and the heat sink pad from the cleaning tank. Make sure the stud spacers remain in place. See [Figure 28](#).

*Figure 28: Thermometer board removal*



### Installing the thermometer

1. Place the heat sink pad between the thermometer board and the cleaning tank.
2. Using the 5/16" box wrench, attach the thermometer board to the cleaning tank using 2 5/16" nuts. Make sure the heat sink pad is positioned properly between the board and the cleaning tank. Do not over tighten the 5/16" nuts.
3. Connect J20 to the thermometer board. See [Figure 27](#)
4. Install the lower housing. See ["Installing the lower housing assembly" on page 37](#).



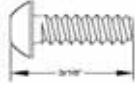
## User Interface Board

### Required Tools

- #2 phillips screwdriver
- Ground strap

### Hardware

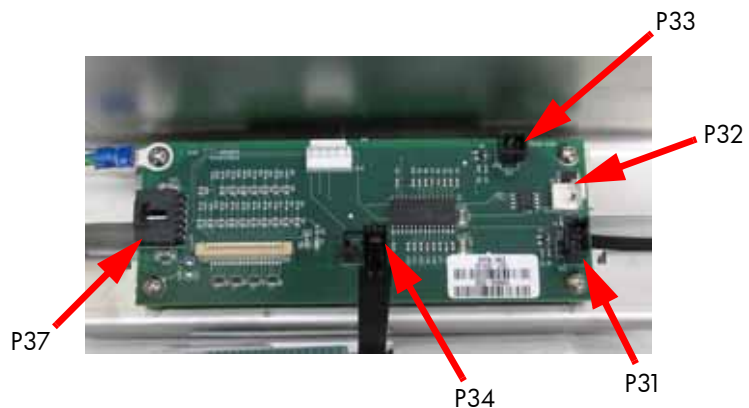
- 6-32 3/16" phillips screw (x4)



### Removing the user interface board

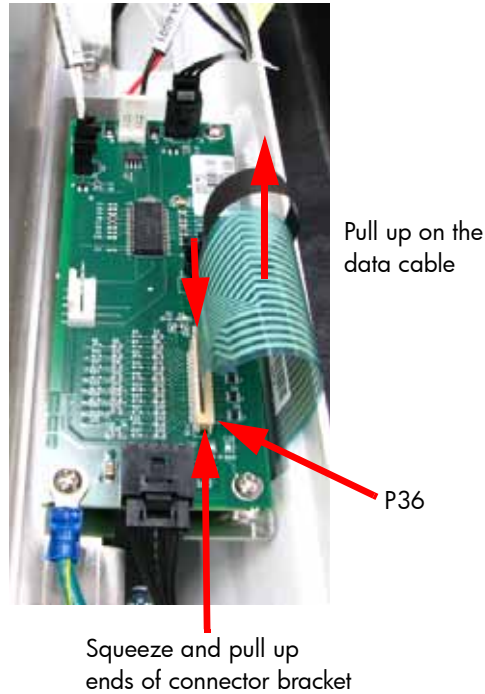
1. Remove the lower housing. See ["Removing the lower housing assembly" on page 36](#).
2. Disconnect the following cable connectors (see [Figure 32](#)) from the user interface board:
  - P33 Door sensor (PN 208705)
  - P32 Door solenoid (PN 208704)
  - P31 Thermal sensor (208706-0001)
  - P34 Power strip
  - P37 Data and power (PN 208726)

*Figure 29: Connector locations*



3. To unlock connector bracket on P36, squeeze and pull up on the ends of the connector bracket. See [Figure 30](#).
4. Disconnect the flexible data cable by pulling the cable out of connector P36. See [Figure 30](#).

*Figure 30: Flexible data cable removal*

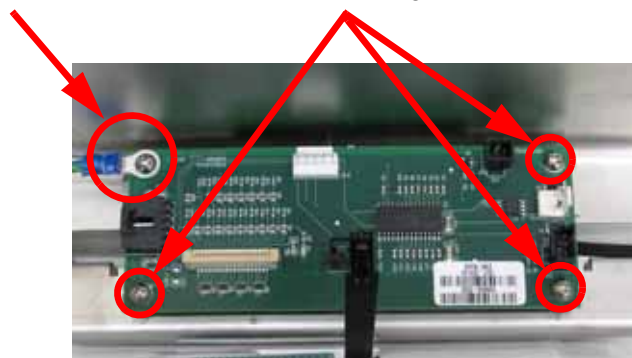


5. Using a #2 phillips screwdriver, remove 3 mounting screws that attach the user interface board to the board mounting bracket. See [Figure 31](#).
6. Using a #2 phillips screwdriver, remove 1 mounting screw along with 1 grounding wire. See [Figure 31](#).

*Figure 31: User interface board screw locations*

Remove 1 mounting screw and 1 grounding wire

Remove 3 mounting screws



7. Remove the user interface board.

## Installing the user interface board

1. Place the user interface board in position over the standoffs.
2. Using a #2 phillips screwdriver, attach the board to the stand-offs using 3 mounting screws.
3. Using a #2 phillips screwdriver, attach 1 grounding wire and 1 mounting screw to secure the board to the system.
4. Connect the flexible data cable (P36) to the interface board. Make sure to securely lock the connector bracket in position by pushing down on the bracket.
5. Connect the following cable connectors to the interface board: (see [Figure 29](#))
  - P33 Door sensor (PN 208705)
  - P32 Door solenoid ( 208704)
  - P31 Thermal sensor (208706-0001)
  - P34 Power strip
  - P37 Data and power (PN 208726)
6. Install the lower housing. See ["Installing the lower housing assembly" on page 37](#).

## Power Entry Module

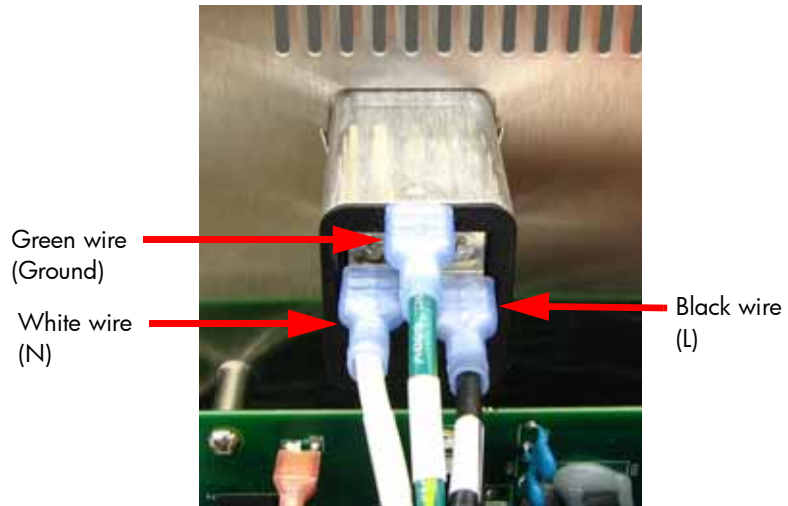
### Required Tools

- #2 standard screwdriver

### Removing the power entry module

1. Remove the lower housing. See ["Removing the lower housing assembly" on page 36](#).
2. Disconnect 3 wires from the back of the power entry module. See [Figure 32](#).

*Figure 32: Power Entry Module Wires*



3. Using a #2 standard screwdriver, press the metal tabs on the power entry module in and remove the module from the back panel. See [Figure 33](#).

*Figure 33: Power Entry Module*



### Installing the power entry module

1. Press the power entry module into the back panel making sure the metal tabs lock in place.
2. Attach 3 wires to the back of the power entry module. See [Figure 32](#) for wiring details.
3. Install the lower housing. See [“Installing the system lid” on page 34](#).

## Main Control Board

### Required Tools

- #2 phillips screwdriver
- Grounding strap

### Hardware

- 8-32 x 1-3/8" nylon phillips screw (x3)



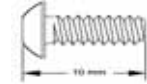
- 6-32 x 3/16" phillips screw (x7)



- 8-32 x 3/8" phillips screw (x3)



- 4-0.7 x 10 mm screw (x4)

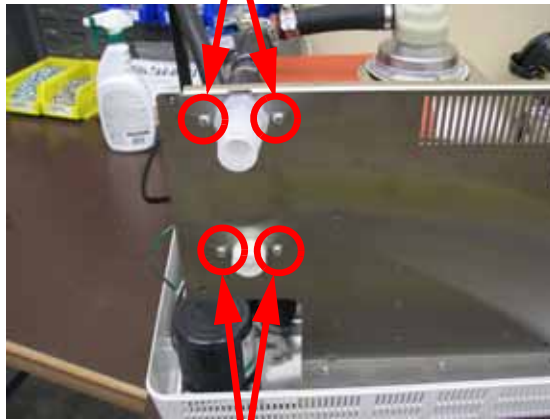


### Removing the main control board

1. Remove the lower housing. See ["Removing the lower housing assembly" on page 36](#).
2. Using a #2 screwdriver, remove 2 mounting screws that attach the wastewater drain components to the back panel. See [Figure 34](#).
3. Using a #2 screwdriver, remove 2 mounting screws that attach the water inlet components to the back panel.

*Figure 34: Back panel screw location*

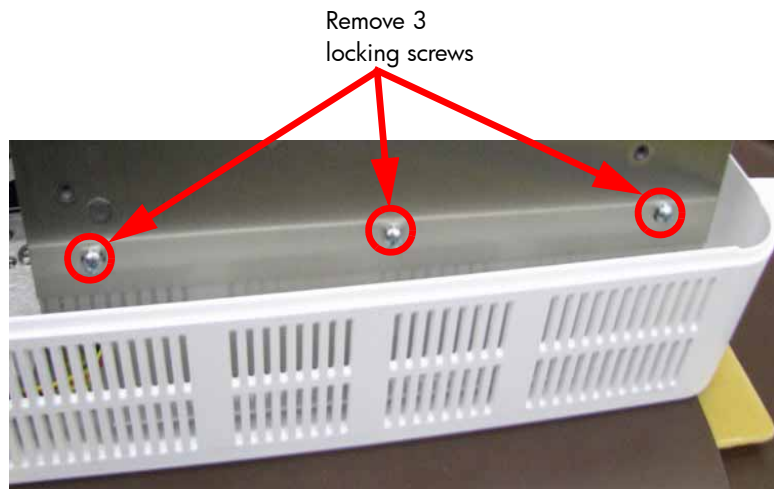
Remove 2  
mounting screws



Remove 2  
mounting screws

4. Using a #2 phillips screwdriver, remove 3 locking screws that attach the back panel to the upper housing.

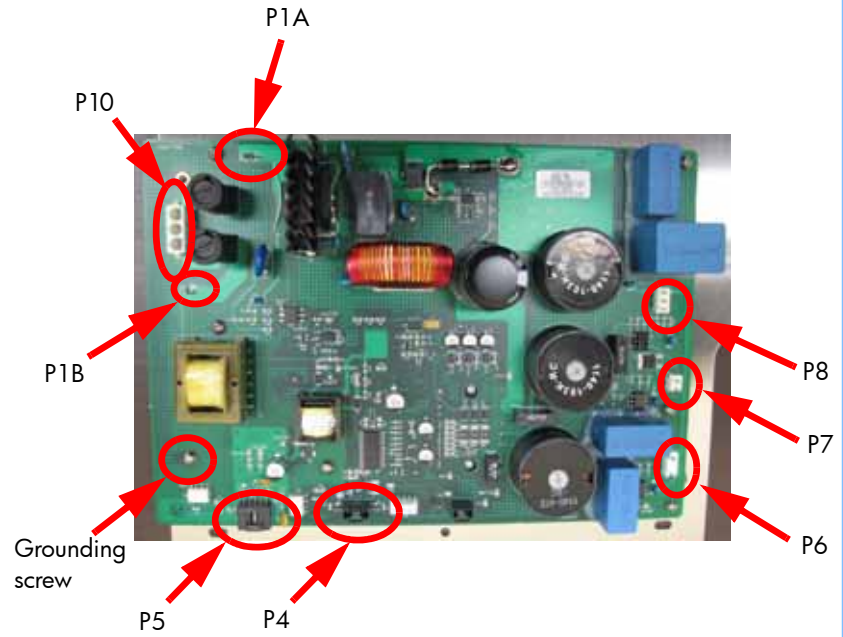
*Figure 35: Back panel screw locations*



5. Tilt the back panel to gain access the connectors. Be careful not to put stress on any wire cables.
6. Disconnect the following cable connectors from the main control board: (see [Figure 36](#))
  - P10 Power Cable (PN 208700)
  - P8 Motor Power (PN 208709)
  - P7 Inlet Valve (PN 208701)
  - P6 Drain Valve (PN 208702)
  - P1A Heater (PN 208723) (black wire)
  - P1B Heater (PN 208723) (white wire)
  - P5 Data Cable (PN 208726)
  - P4 Level Sensor (PN 208725)
7. Remove 1 grounding screw and remove 2 green grounding wires. See [Figure 36](#).

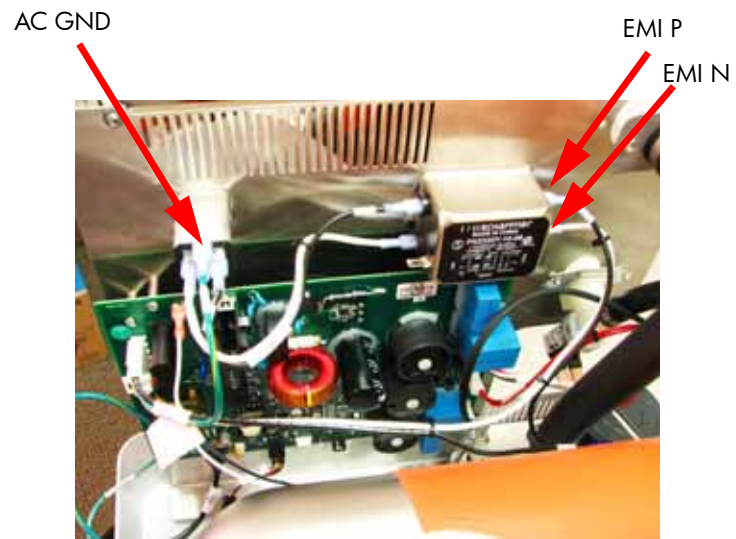


Figure 36: Main board connector locations



8. Disconnect 1 ground wire from the power entry module (AC GND). See [Figure 37](#).
9. Disconnect 2 wires from the line filter. (EMI P and EMI N).

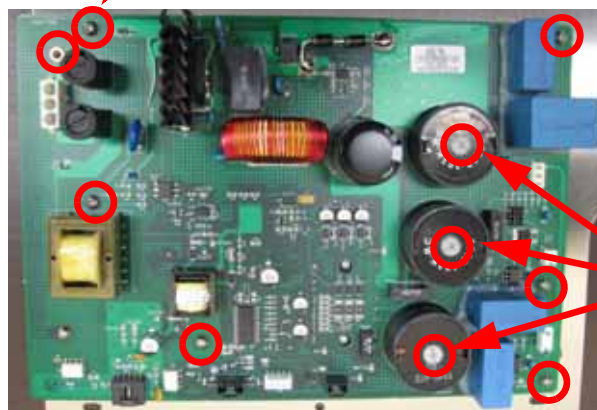
Figure 37: Main control board connections



10. Remove 7 mounting screws that attach the main control board to the back panel. See [Figure 38](#).
11. Remove 3 nylon screw that attach the main control board to the back panel.

*Figure 38: Main control board mounting screws*

Remove 7 mounting screws



Remove 3  
nylon screws

12. Remove the main control board from the back panel.

### Installing the main control board

1. Remove the 3 shipping wing nuts and 3 nylon screws before installing the control board.



Remove 3 wing  
nuts and 3 nylon  
screws

2. Place the main control board in position and using a #2 phillips screwdriver, attach but do not tighten 7 mounting screws that attach the main control board to the back panel.
3. Using a #2 phillips screwdriver, attach but do not tighten 3 nylon mounting screws to secure the main control board to the back panel.
4. After all 7 screws and the 3 nylon screws are installed, go back and tighten all the screws.

5. Using a #2 phillips screwdriver, attach 2 green grounding wires using 1 grounding screw. See [Figure 36](#).
6. Connect the following cables to the main control board: (see [Figure 36](#))
  - P10 Power Cable (PN 208700)
  - P8 Motor Power (PN 208709)
  - P7 Inlet Valve (PN 208701)
  - P6 Drain Valve (PN 208702)
  - P1A Heater (PN 208723) (black wire)
  - P1B Heater (PN 208723) (white wire)
  - P5 Data Cable (PN 208726)
  - P4 Level Sensor (PN 208725)
7. Connect 1 ground wire to the power entry module (AC GND). See [Figure 37](#).
8. Connect 2 wires to the line filter. (EMI P and EMI N).
9. Install the lower housing. See ["Installing the lower housing assembly" on page 37](#).

## Cleaning Tank Assembly

### Required Tools

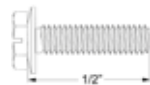
- #2 phillips screwdriver
- Anti-seize compound
- Tank chassis seal
- Alcohol wipes

### Hardware

- 8-32 x 3/8" phillips screw (x12)



### Removing the cleaning tank assembly



1. Remove the back panel. See ["Removing the back panel" on page 39](#).
2. Remove the user interface board. See ["Removing the user interface board" on page 49](#).
3. Using a #2 phillips screwdriver, remove the 4 tank holding clamps. Each clamp has 3 mounting screws securing each clamp to the upper housing. See [Figure 39](#).

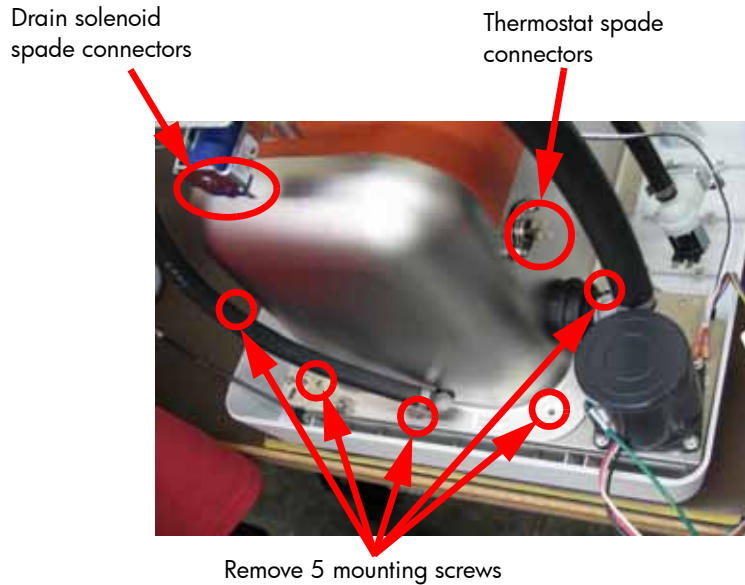
*Figure 39: Cleaning tank clamp removal*

Tank holding  
clamps (X4)



4. Disconnect the 2 spade connectors from the drain solenoid. See [Figure 40](#).
5. Disconnect the 2 spade connectors from the thermostat.
6. Remove 5 screws that attach the cleaning tank to the agitation assembly and remove the agitation assembly.

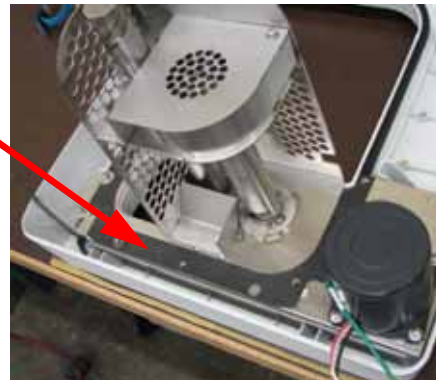
Figure 40: Cleaning tank removal locations



7. Remove the cleaning tank from the system by slightly twisting the cleaning tank to clear the agitation assembly.
8. Remove and discard the tank chassis seal from the upper housing. See [Figure 41](#).

Figure 41: Cleaning tank assembly removal

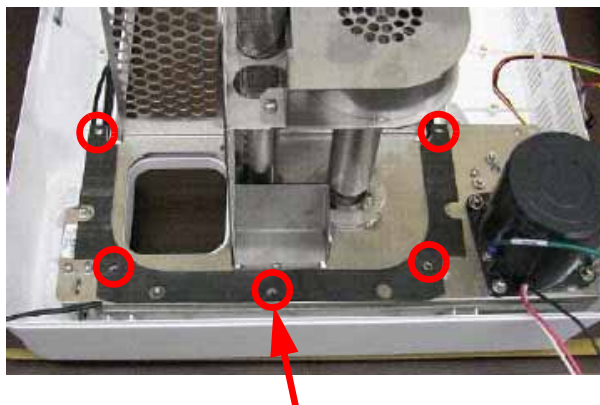
Remove and discard the tank chassis seal



### Installing the cleaning tank assembly

1. Use alcohol wipes to clean any remnants left by the tank chassis seal.
2. Position the tank chassis gasket over the agitation assembly as show in [Figure 42](#). Make sure the holes in the tank chassis gasket aligned over the threaded holes on the agitator assembly.
3. Install the cleaning tank on top of the lower housing making sure to not wrinkle the tank chassis seal.

Figure 42: Agitation assembly tank chassis gasket alignment



Alignment holes (5X)

4. Using a #2 phillips screwdriver, attach the cleaning tank to the upper housing using 5 screws. Make sure to use anti-seize compound on the screws before installing.
5. Using a #2 phillips screwdriver, loosely attach 4 tank holding clamps. Each holding clamp is secured to the upper housing by 3 screws each. The tank holding clamps are all a unique size so make sure they are in their proper location.

6. After all 4 tank clamps are in and their screws are holding the cleaning tank in position, tighten the 4 tank clamps in the sequence show in [Figure 43](#).

*Figure 43: Cleaning tank tightening sequence*

Tighten 3 screws on this tank clamp first.



Tighten 3 screws on this tank clamp next.



Tighten 3 screws on this tank clamp next.



Tighten 3 screws on this tank clamp last.



7. Install the user interface board. See [“Installing the user interface board” on page 51](#).
8. Install the back panel. See [“Installing the back panel” on page 42](#).



## Agitation Assembly

### Required Tools

- #2 phillips screwdriver
- Anti-seize compound

### Hardware

- 8-32 x 3/8" phillips screw (x1)



- #8 lock washer (x1)



### Removing the agitation assembly

1. Remove the back panel. See ["Removing the back panel" on page 39](#).
2. Remove the user interface board. See ["Removing the user interface board" on page 49](#).
3. Remove the cleaning tank assembly. See ["Removing the cleaning tank assembly" on page 60](#).
4. Using a #2 phillips screwdriver, remove 1 mounting screw and 1 lock washer that attach the agitation assembly to the upper housing. See [Figure 44](#).

*Figure 44: Agitation assembly removal*

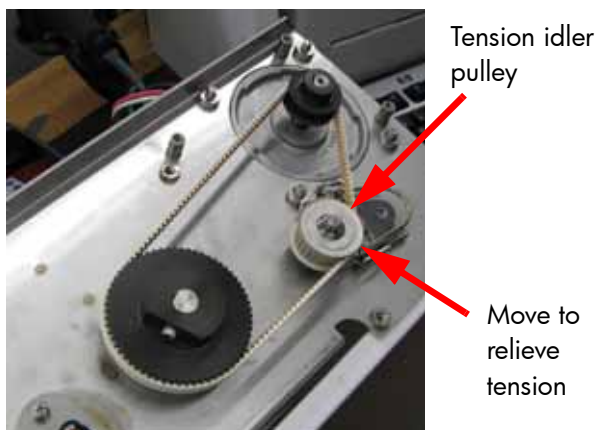


Remove  
1 screw

5. Lift up and remove the agitation assembly from the upper housing.

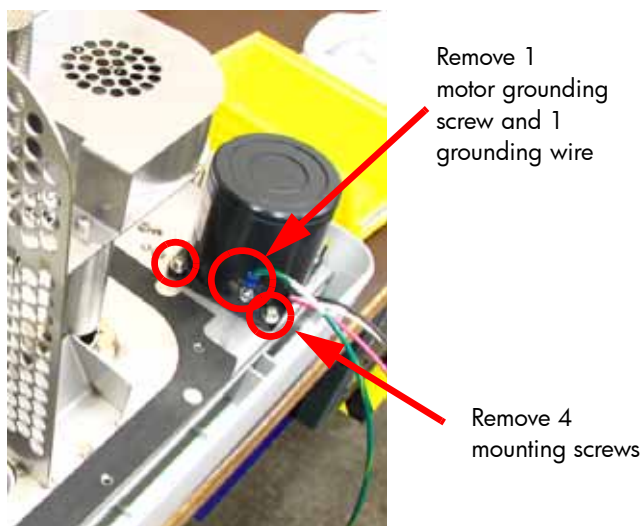
6. Move the tension idler pulley to relieve tension on the drive belt and then remove the drive belt. See [Figure 45](#).

*Figure 45: Drive belt replacement*



7. Using a #2 screwdriver, remove 1 grounding screw and 1 grounding wire.
8. Using a #2 screwdriver, remove the 4 mounting screws.

*Figure 46: Induction motor assembly*

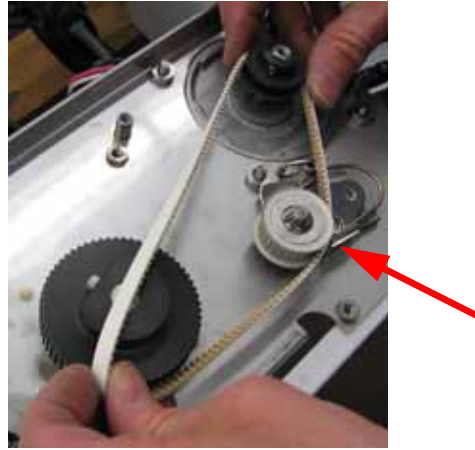


9. Remove the induction motor from the agitation assembly for installation on the new agitation assembly.

## Installing the agitation assembly

1. Install the induction motor removed from the old agitation assembly onto the new agitation assembly.
2. Move the tension idler pulley up and then install the drive belt as shown in [Figure 47](#).

*Figure 47: Drive belt installation*



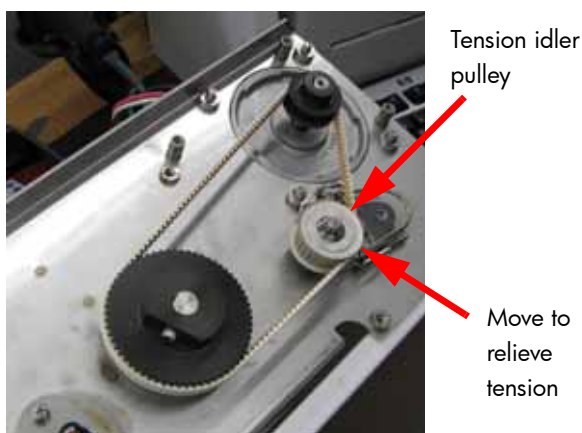
3. Place the agitation assembly in position on the upper housing.
4. Using a #2 phillips screwdriver, attach 1 screw and 1 lock washer to secure the agitation assembly to the upper housing. Make sure to use anti-seize compound on the screw before installing.
5. Install the cleaning tank assembly. See [“Installing the cleaning tank assembly” on page 61](#).
6. Install the user interface board. See [“Installing the user interface board” on page 51](#).
7. Install the lower housing. See [“Installing the lower housing assembly” on page 37](#).
8. Install the back panel. See [“Installing the back panel” on page 42](#).

## Drive Belt

### Removing the drive belt

1. Remove the back panel. See ["Removing the back panel" on page 39](#).
2. Remove the user interface board. See ["Removing the user interface board" on page 49](#).
3. Remove the cleaning tank assembly. See ["Removing the cleaning tank assembly" on page 60](#).
4. Remove the agitation assembly. See ["Removing the agitation assembly" on page 65](#).
5. Move the tension idler pulley to relieve tension on the drive belt and then remove the belt. See [Figure 48](#).

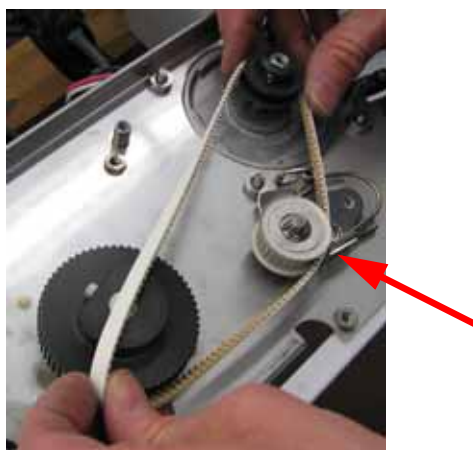
*Figure 48: Drive belt replacement*



### Installing the drive belt

1. Move the tension idler pulley up and then install the drive belt as shown in [Figure 49](#).

*Figure 49: Drive belt installation*



2. Install the agitation assembly. See [“Installing the agitation assembly” on page 67](#).
3. Install the cleaning tank assembly. See [“Installing the cleaning tank assembly” on page 61](#).
4. Install the user interface board. See [“Installing the user interface board” on page 51](#).
5. Install the back panel. See [“Installing the back panel” on page 42](#).

## Induction Motor Assembly

### Required Tools

- #2 phillips screwdriver

### Hardware

- #10 lock washer (x4)



- #10 flat washer (x4)



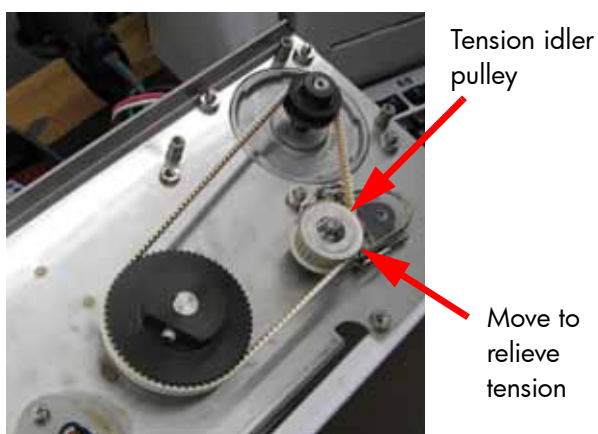
- 10-32 x 3/4" phillips screw (x4)



### Removing the induction motor assembly

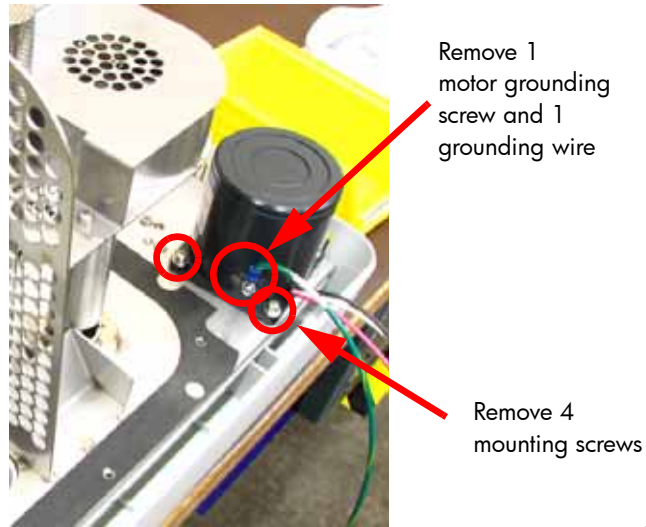
1. Remove the back panel. See ["Removing the back panel" on page 39](#).
2. Remove the user interface board. See ["Removing the user interface board" on page 49](#).
3. Remove the cleaning tank assembly. See ["Removing the cleaning tank assembly" on page 60](#).
4. Remove the agitation assembly. See ["Removing the agitation assembly" on page 65](#).
5. Move the tension idler pulley to relieve tension on the drive belt and then remove the belt. See [Figure 50](#).

*Figure 50: Drive belt replacement*



6. Using a #2 screwdriver, remove 1 grounding screw and 1 grounding wire.
7. Using a #2 screwdriver, remove the 4 mounting screws.

*Figure 51: Induction motor assembly*



8. Remove the induction motor from the agitation assembly.

### **Installing the induction motor assembly**

1. Place the induction motor assembly in position and using a #2 phillips screwdriver, attach 4 screws to secure the motor to the agitation assembly.
2. Using a #2 phillips screwdriver, attach 1 grounding wire to the induction motor assembly.
3. Install the drive belt. See ["Installing the drive belt" on page 68](#).
4. Install the agitation assembly. See ["Installing the agitation assembly" on page 67](#).
5. Install the cleaning tank assembly. See ["Installing the cleaning tank assembly" on page 61](#).
6. Install the user interface board. See ["Installing the user interface board" on page 51](#).
7. Install the back panel. See ["Installing the back panel" on page 42](#).

## Float Level Sensor Assembly

### Required Tools

- #2 phillips screwdriver
- Anti-seize compound

### Hardware

- #8 lock washer (x2)



- 8-32 x 3/8" phillips screw (x7)

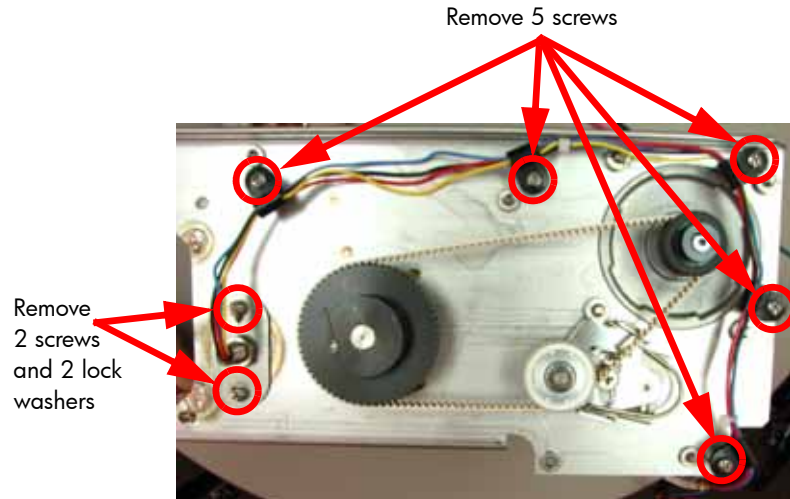


### Removing the float level sensor assembly

1. Remove the back panel. See ["Removing the back panel" on page 39](#).
2. Remove the user interface board. See ["Removing the user interface board" on page 49](#).
3. Remove the cleaning tank assembly. See ["Removing the cleaning tank assembly" on page 60](#).
4. Remove the agitation assembly. See ["Removing the agitation assembly" on page 65](#).
5. Using a #2 phillips screwdriver, remove 5 cable routing clamps. See [Figure 52](#).
6. Lift the float level sensor assembly out of the agitation assembly.
7. Using a #2 phillips screwdriver, remove the 2 screws that attach the float level sensor assembly to the agitation assembly.
8. Remove the float level sensor assembly from the agitation assembly.



Figure 52: Float level sensor assembly



### Installing the float level sensor assembly

1. Place the float level sensor assembly in the agitation assembly.
2. Using a #2 phillips screwdriver, secure the float level sensor assembly to the agitation assembly with 2 screws. Make sure to use anti-seize compound on the screws before installing.
3. Using a #2 phillips screwdriver, secure 5 cable routing clamps to the agitation assembly standoffs. Make sure to use anti-seize compound on the screws before installing.
4. Install the agitation assembly. See ["Installing the agitation assembly" on page 67](#).
5. Install the cleaning tank assembly. See ["Installing the cleaning tank assembly" on page 61](#).
6. Install the user interface board. See ["Installing the user interface board" on page 51](#).
7. Install the lower housing. See ["Installing the lower housing assembly" on page 37](#).
8. Install the back panel. See ["Installing the back panel" on page 42](#).

## Lid Switch Assembly

### Required Tools

- #2 phillips screwdriver

### Hardware

- 0.174 x 0.375 flat washer (x1)



- 8-32 x 5/8" phillips screw (x1)



### Removing the lid switch assembly

1. Remove the back panel. See ["Removing the back panel" on page 39](#).
2. Remove the user interface board. See ["Removing the user interface board" on page 49](#).
3. Remove the cleaning tank assembly. See ["Removing the cleaning tank assembly" on page 60](#).
4. Remove the agitation assembly. See ["Removing the agitation assembly" on page 65](#).
5. Using a #2 phillips screwdriver, remove 1 screw that attaches the lid switch assembly to the agitation assembly. See [Figure 53](#).

*Figure 53: Lid switch assembly*

Remove 1 screw and 1 flat washer

Lid switch



## Installing the lid switch assembly

1. Place the lid switch assembly in position and using a #2 phillips screws, attach the lid switch assembly to the agitation assembly
2. Route the wiring as shown in [Figure 54](#). Make sure no wiring is pinched during installation.

*Figure 54: Lid lock assembly wire routing*



Wire routing

3. Install the agitation assembly. See [“Installing the agitation assembly” on page 67](#).
4. Install the cleaning tank assembly. See [“Installing the cleaning tank assembly” on page 61](#).
5. Install the user interface board. See [“Installing the user interface board” on page 51](#).
6. Install the back panel. See [“Installing the back panel” on page 42](#).

## Lid Lock Assembly

### Required Tools

- #2 phillips screwdriver

### Hardware

- 8-32 x 3/8" phillips screw (x3)



- #8 lock washer (x3)



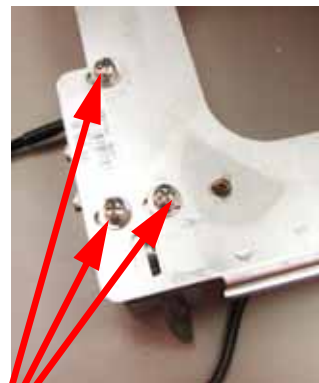
- 0.174 x 0.375 flat washer (x3)



### Removing the lid lock assembly

1. Remove the back panel. See ["Removing the back panel" on page 39](#).
2. Remove the user interface board. See ["Removing the user interface board" on page 49](#).
3. Remove the cleaning tank assembly. See ["Removing the cleaning tank assembly" on page 60](#).
4. Remove the agitation assembly. See ["Removing the agitation assembly" on page 65](#).
5. Using a #2 phillips screwdriver, remove 3 screws that attach the lid lock assembly to the agitation assembly. See [Figure 55](#)

*Figure 55: Lid lock assembly removal*



Remove 3  
screws

6. Remove the lid lock assembly from the agitation assembly.

## Installing the lid lock assembly

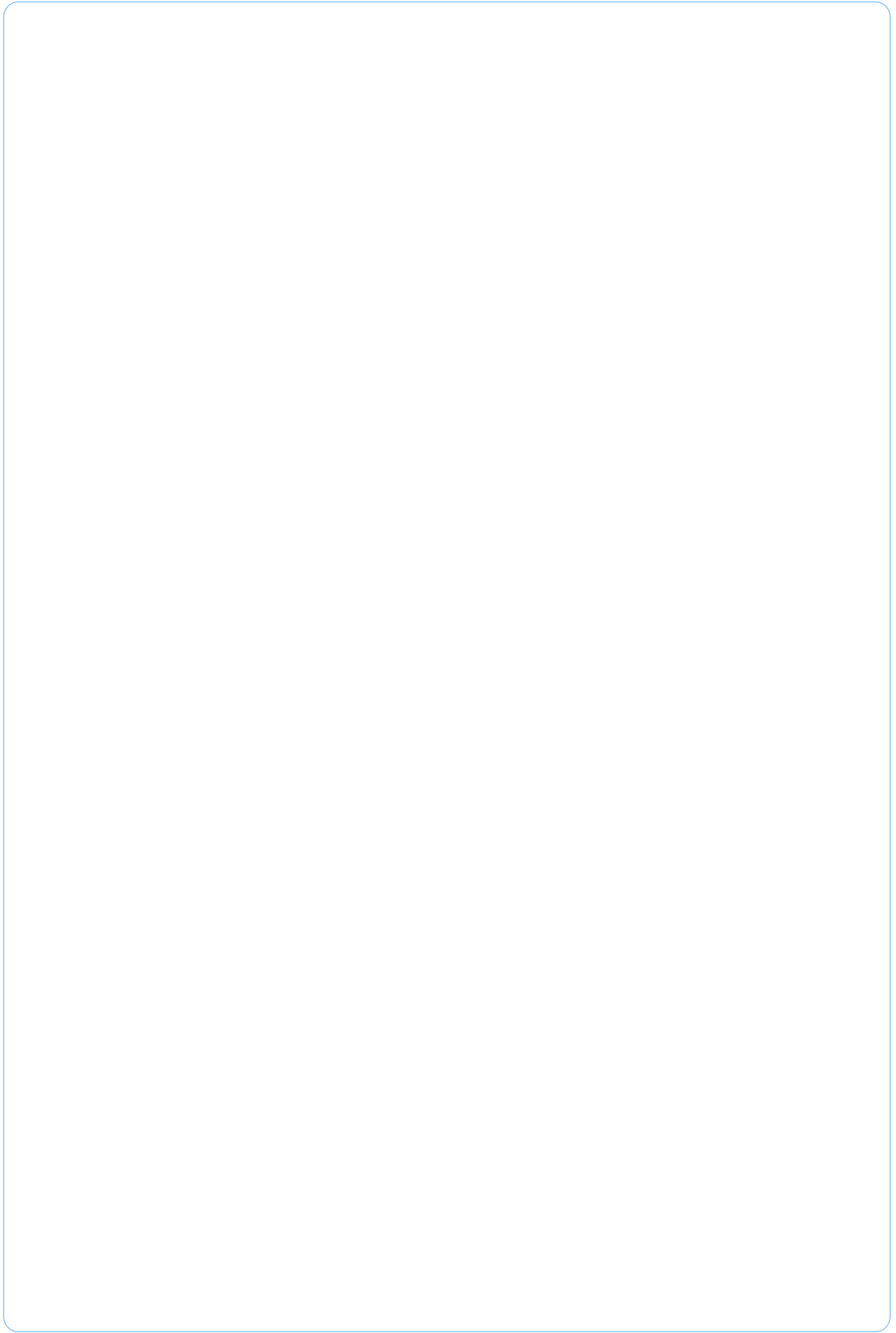
1. Using a #2 phillips screwdriver, loosely attach the lid lock assembly to the agitation assembly.
2. Temporarily place the agitation assembly in position and adjust the lid lock assembly for smooth operation and with no binding. Using a #2 phillips screwdriver, tighten 3 screws to secure the solenoid to the agitation assembly.
3. Route the wiring as shown in [Figure 56](#). Make sure no wiring is pinched during installation.

*Figure 56: Lid lock assembly wire routing*



Wire routing

4. Install the agitation assembly. See ["Installing the agitation assembly" on page 67](#).
5. Install the cleaning tank assembly. See ["Installing the cleaning tank assembly" on page 61](#).
6. Install the user interface board. See ["Installing the user interface board" on page 51](#).
7. Install the back panel. See ["Installing the back panel" on page 42](#).



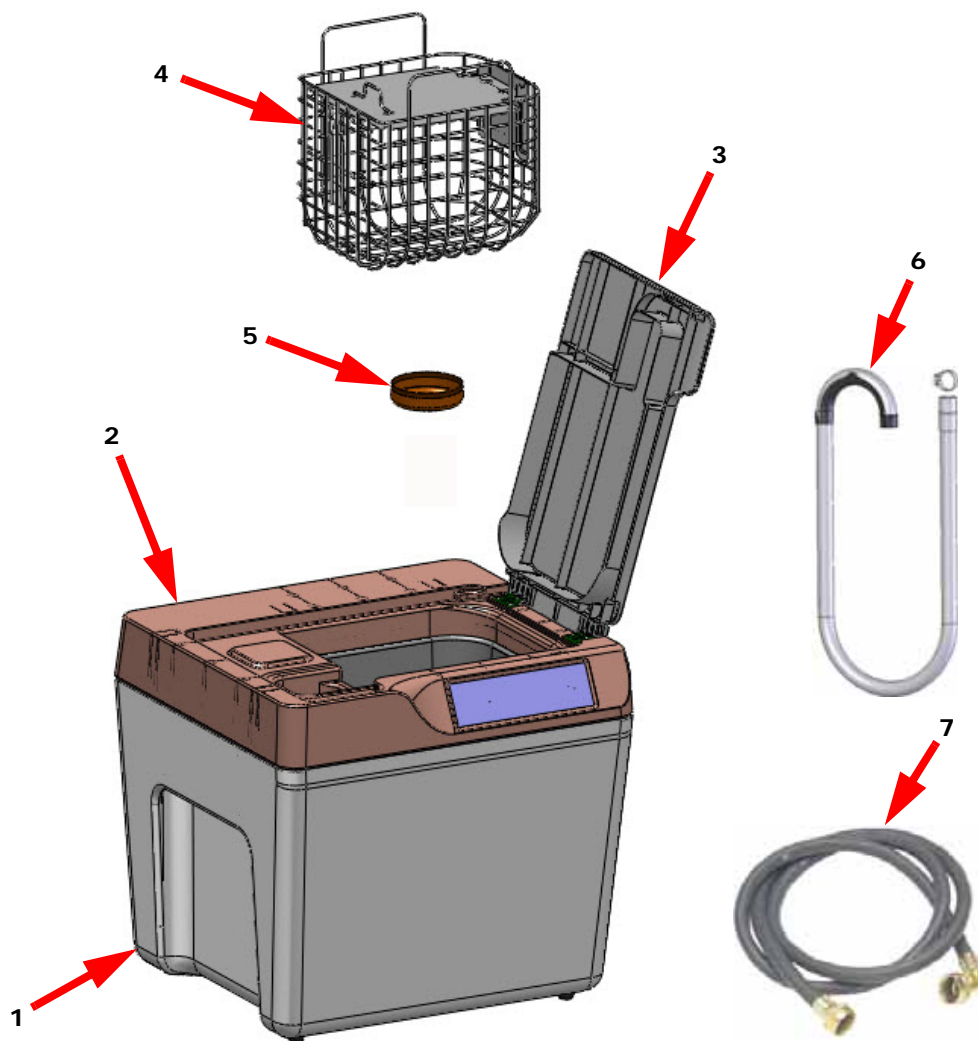
# *Appendix*

## **Illustrated Parts Breakdown**

Cabinet Components .....	page 78
Upper Components .....	page 79
Lower Components .....	page 80

## System Components

Figure 1: System component locations

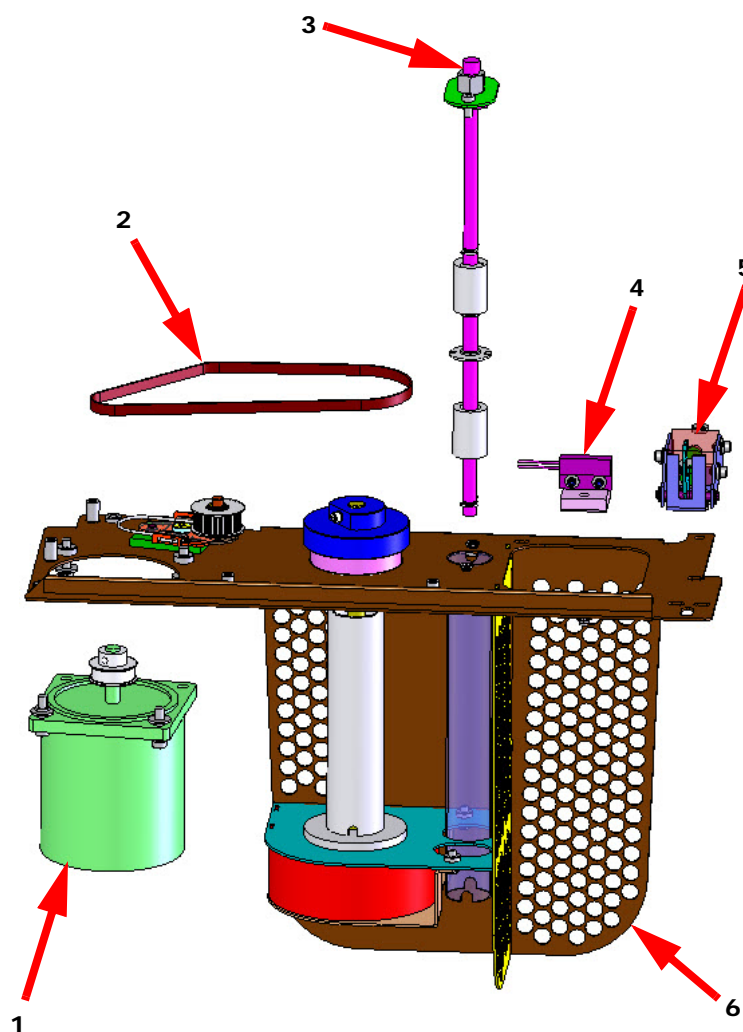


Item	Part Number	Description	Qty
1	CQ658-67014	Lower Housing Assembly	1
2	CQ658-67015	Upper Housing Assembly	1
3	CQ658-67019	System Lid	1
4	CQ658-67027	Dual Level Part Basket	1
5	CQ658-67026	Filter Sink Drain	1
6	CQ658-67024	Drain Hose (with clamp)	1
7	CQ658-67025	Inlet Hose	1



## Upper Components

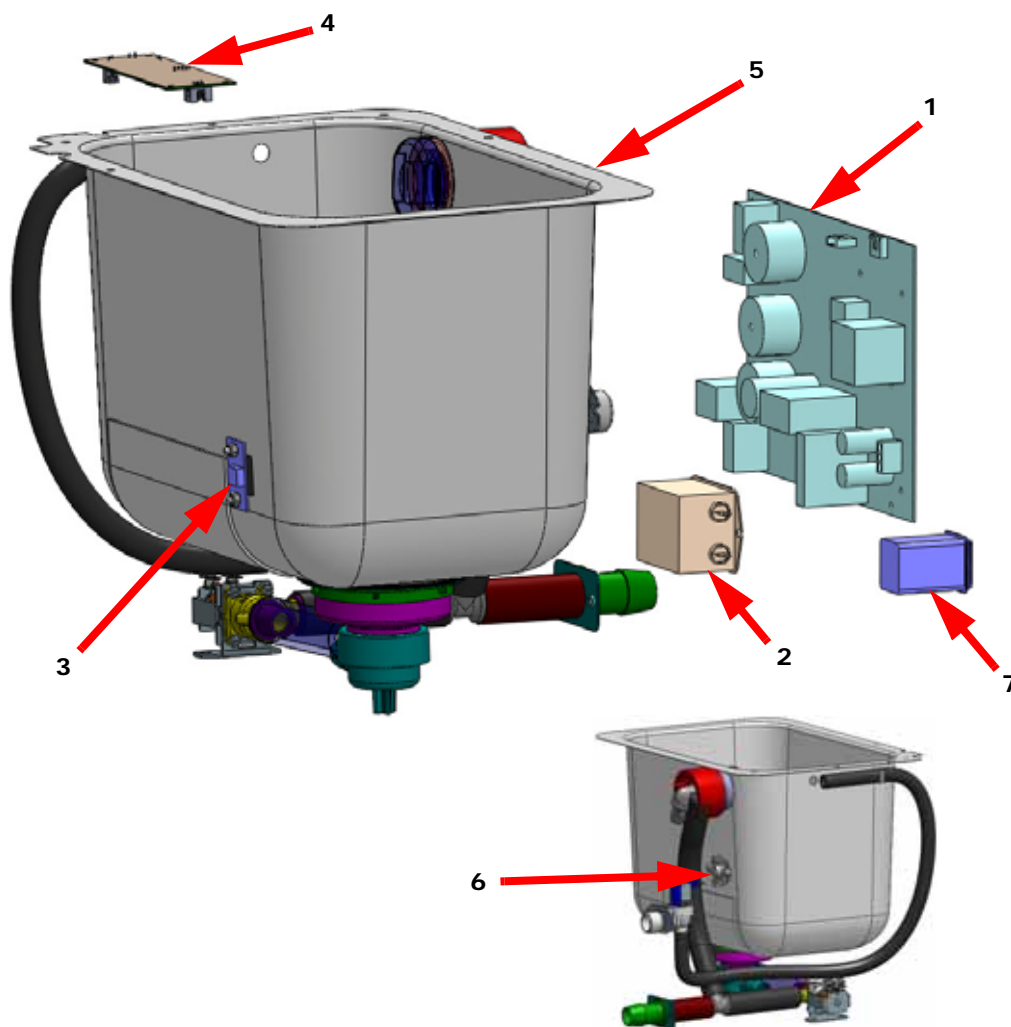
Figure 2: Upper components location



Item	Part Number	Description	Qty
1	CQ658-67005	Induction Motor Assembly	1
2	CQ658-67006	Drive Belt	1
3	CQ658-67007	Float Level Sensor Assembly	1
4	CQ658-67008	Lid Switch Assembly	1
5	CQ658-67009	Lid Lock Assembly	1
6	CQ658-67017	Agitation Assembly	1

## Internal Components

Figure 3: Internal components location



Cleaning Tank Assembly Back View

Item	Part Number	Description	Qty
1	CQ658-67011	Main Control Board	1
2	CQ658-67030	Line Filter	1
3	CQ658-67012	Thermometer Board	1
4	CQ658-67013	User Interface Board	1
5	CQ658-67017	Cleaning Tank Assembly	1
6	CQ658-67001	Thermostat	1
7	CQ658-67010	Power Entry Module	1