

Service Manual

AQUASMART™
Hi-Efficiency washer

Model:

WL37T26CW2

WL37T27DW2

WL37T26KW2



care

The specifications and servicing procedures outlined in this manual are subject to change without notice.

The latest version is indicated by the reprint date and replaces any earlier editions.

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FISHER & PAYKEL



ELECTRONIC WASHING MACHINE

Covering the following models			
Market	Model Number	Product codes	
		US	CA
North America	WL37T26CW2	96108	96109
	WL37T26DW2	96112	96113
	WL37T26KW2	96100	96104

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1 SPECIFICATIONS

1.1 Model Information

AquaSmart™ introduces the new Fisher & Paykel model numbering system, which provides a clearer description of the product and its features. The new model numbering system will come in to affect with each new model released.

The model identification is explained below.

W	Washer	W	Washer	W	Washer
L	Low (Profile Agitator)	L	Low (Profile Agitator)	L	Low (Profile Agitator)
37	Capacity cu/ft (3.7) IEC	37	Capacity cu/ft (3.7) IEC	37	Capacity cu/ft (3.7) IEC
T	Top Loading	T	Top Loading	T	Top Loading
26	26 inches wide	26	26 inches wide	26	26 inches wide
C	LCD Screen	D	LED Display	K	LED Display Non Dispense
W	White	W	White	W	White
2	Series	2	Series	2	Series

1.2 Dimensions

Height to lid	
Open	55.5in – 56.7in / 1410mm – 1440mm
Closed	37.4in – 38.6in / 950mm – 980mm
Height to console	39.8in – 41.3in / 1010mm – 1050mm
Width	26in / 650mm
Depth	26in / 650mm
Inlet hose length	47.24in / 1200mm
Packed weight	133.4lb / 60.5 kg
Unpacked weight	114.64lb / 52.0kg

Note: The exact height of AquaSmart™ is dependent on how far the feet are inserted into the base of the machine.

1.3 Maximum Capacity (AS/NZS 2040.1:2005)

Dry Weight: 15.4 lb / 7 kg

1.4 Water Consumption

Load Size	Regular High Efficiency*
15.5 lb / 7kg	21.7 G / 82 litres
11 lb / 5kg	18.2 G / 69 litres
6.6 lb / 3kg	15.85 G / 60 litres
2.2 lb / 1kg	14.5 G / 55 litres

*Regular High Efficiency is the default wash cycle for AquaSmart™

1.5 Water Fill Temperature (Approximate Factory Settings)

Supply	Water Fill Temp*
Hot	140°F (60°C)
Hot / Warm	115°F (46°C)
Warm	102°F (39°C)
Warm / Cold	91°F (33°C)
Cold Plus	68°F (20°C)
Cold	Supply temperature

Recommended hot water inlet temperature 149°F (65°C) (Maximum)

*Dependent on hot and cold supply temperatures and water pressures

1.6 Wash Motor

Electronically commutated 36 pole direct drive 3 phase brushless DC motor.

Motor Resistance @68°F (20°C): 19.5Ω +/- 10% (39Ω +/- 1.95Ω across any two phases)

1.7 Pump Motor

The motor is a fully electronically controlled 325V, 3 phase, 6 pole, brushless DC motor.

The speed of the motor will vary depending on whether it is draining or re-circulating the water.

Motor Resistance @68°F (20°C): 8.1Ω +/- 10% per phase (16.2Ω +/- 10% across any two phases)

Maximum Wattage: 200W

Nominal Wattage: 60W

Drain Speed: 2500rpm

Recirculation Speed: 2000 rpm

Head Height	Drain Speed	Flow Rate
4ft (Nominal)	2500rpm	6.2 gallons (23.6 litres) per minute
8ft (Maximum)	2500rpm	3.9 gallons (15 litres) per minute

1.8 Water Valves

Supply	Operation Mode	Voltage	Resistance	Flow Rate
Cold	Digitally Operated	24VDC	64Ω @ 68°F (20°C)	2.6 Gal (10 litres) per min. max
Hot	Digitally Operated	24VDC	64Ω @ 68°F (20°C)	2.6 Gal (10 litres) per min. max
Detergent	Digitally Operated	24VDC	64Ω @ 68°F (20°C)	2.1 Gal (8 litres) per min. max
Fabric	Digitally Operated	24VDC	64Ω @ 68°F (20°C)	.5 Gal (2 litres) per min. max
Bleach	Digitally Operated	24VDC	64Ω @ 68°F (20°C)	.66 Gal (2.5 litres) per min. max

Note: The flow rate will vary slightly depending on pressure.

Water Supply

- For the best operating conditions the hot water temperature should be approximately 149°F.
- The hot or cold-water temperature should not exceed 167°F (75°C) or 95°F (35°C) respectively. Temperatures above these may cause the machine to fault or cause damage to the machine.
- If there is an uncontrolled water-heating source (e.g. a wet back or solar heating) a tempering device should be fitted. This will ensure the hot water temperature remains within safe limits. For the most suitable type of tempering device we recommend contacting a local plumber or plumbing supply merchant.
- Inlet Water Static Pressure 3psi (20kPa) to 150psi (1MPa).

Note: If using a header tank, then the outlet of the header tank must be at least 2 metres above the top of the clothes washer.

- The water supply flow rate should be greater than 1.6 gallons (6 litres) per minute (assumes ½ inch diameter pipes).
- The minimum height of the taps to clear the top of the machine is 45.25 inches (1150mm).

1.9 Thermistor

NTC-type temperature sensor (Thermistor) Resistance 10,000Ω @ 77°F (25°C)

1.10 Cabinet

Pre-painted steel

1.11 Lid

ABS plastic (co-injected)

1.12 Top Deck

Polypropylene

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1.13 Inner Basket

Stainless steel: Grade 430T
Bowl base and balance ring: Polypropylene

Inner Basket Weight
24lb 3oz (10.965kg) +/- 4.2oz (120g)

Inner Basket Speed	
Fast Spin	1,000 RPM
Medium Spin	700 RPM
Slow Spin	300 RPM
Stir Speed	25 RPM

1.14 Outer Tub

Aluminium insert over-moulded with polypropylene

1.15 Console

ABS plastic

1.16 Facia

IMD (In-mould decorative) Polycarbonate/PET

1.17 Neck Ring / Straps

Neck Ring: Polypropylene
Straps: Dynaflex TPE (Thermoplastic Elastomer)

1.18 Low Profile Agitator

Low profile agitator: Polypropylene
Low profile agitator Cap: Polypropylene
Low profile agitator Bolt: Acetyl

1.19 Energy Label / Water Rating

Modified Energy Factor – 2.15
Water Factor – 4.3

1.20 Bleach Dispenser

Dosage 120mls (To the Max indicator level).

Note: Any amount above the Max level may cause the bleach to self-siphon into the machine.

1.21 Fabric Softener Dispenser

Dosage 70mls (To the Max indicator level).

Note: Any amount above the Max level may cause the fabric softener to self-siphon into the machine.

1.22 Electric Supply

Operating Voltage: 110/120V AC 60Hz
Maximum Current: 7 amps

1.23 User Guide

User Guide: Part Number
LCD 478153
LED 478139

1.24 Lid Lock

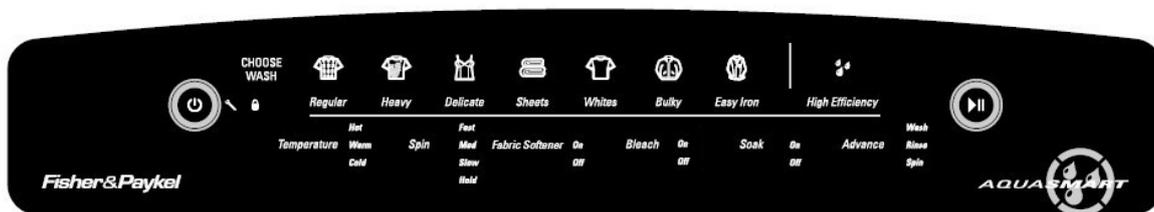
Resistance: $63\Omega \pm 10\%$ @ 68°F (20°C)

Note: Normally low voltage, potentially 110V if harness is grounded on the cabinet!

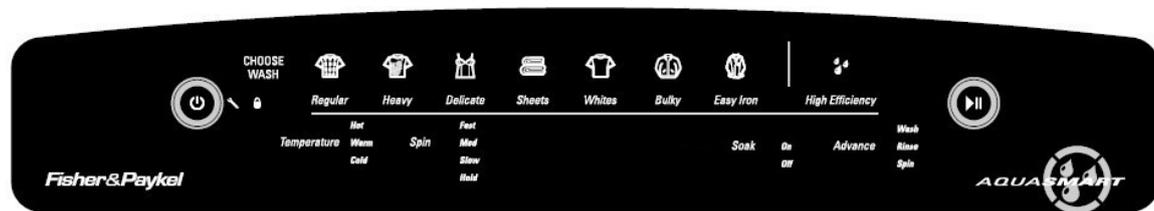
1.25 Control Panel LCD Model



1.26 Control Panel Triple Dispensing LED Model



1.27 Control Panel Non Dispensing LED Model



1.28 Important Screw / Bolt Torque Settings

Below are the important screw torque settings on the AquaSmart™ washer. These settings must be adhered to. For all other screws and bolts that are not listed, we recommended that they are tightened sufficiently without being over-tightened.

Screw / Bolt	Torque (in/lbs)	Torque (Nm)
Pump hood to cap to outer tub	27 in/lbs	3Nm
Rotor bolt to shaft	70 in/lbs	8Nm
Pump housing to outer tub	18 in/lbs	2Nm
Stator to Outer Tub	44 in/lbs	5Nm

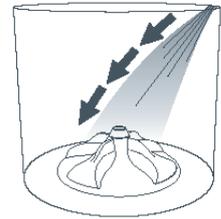
2 THE UNIQUE AQUASMART™ WASH

The AquaSmart™ is a EcoSmart™ based washing machine that has two modes of washing, **High Efficiency & Conventional**. It is essentially a front loader (high efficiency mode) and a top loader (conventional mode) washer in one.

Both washing modes start the same way, with a detergent activating wash.

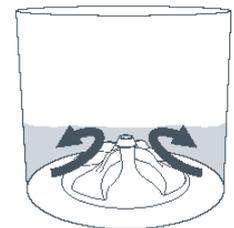
Detergent Activating Wash

AquaSmart™ fills at the selected water temperature, with just enough water so that the clothes are saturated. This concentrated detergent solution is then re-circulated through the wash. This thoroughly dissolves and activates the detergent.



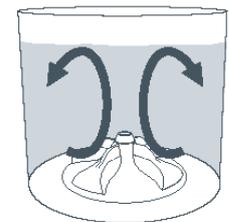
High Efficiency Mode (front loader type wash)

In the High Efficiency mode, the AquaSmart™ fills with just enough water to lift the clothes off the low profile agitator, so that when it rotates, the clothes gently roll over each other. This wash uses similar quantities of water to most Front Loaders and so, not only are there the benefits of water savings, but also the higher detergent concentrations give optimum soil removal.



Conventional Mode (top loader type wash)

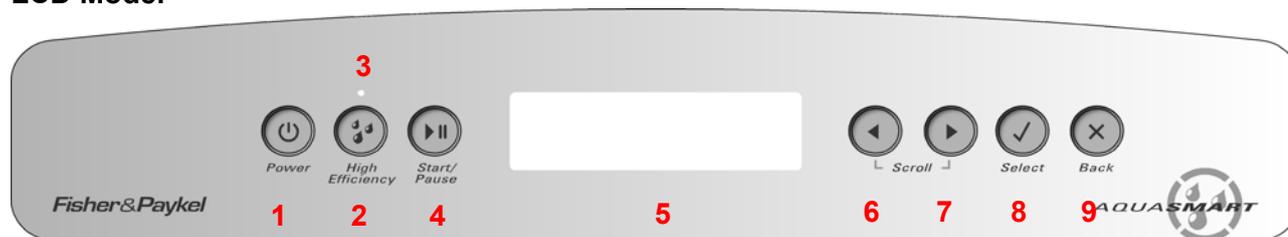
The Conventional mode is the immersion wash all Top Loader users are familiar with. After the Detergent Activating Wash, the AquaSmart™ fills with water until the clothes are underwater, whilst gently turning the clothes over. We recommend this mode when the dilution effect of water can solve or prevent common wash problems. For example when dye or colour run can be a problem or when washing sandy towels. Sheets are better washed in this mode. Some cycles can be used in both modes, whilst others work in only one.



Cycle	Modes Available
Regular	High Efficiency
Sheets	Conventional
Whites	High Efficiency and Conventional
Colors	Conventional
Heavy Duty	High Efficiency and Conventional
Delicate	High Efficiency and Conventional
Easy Iron	Conventional
Bulky	Conventional

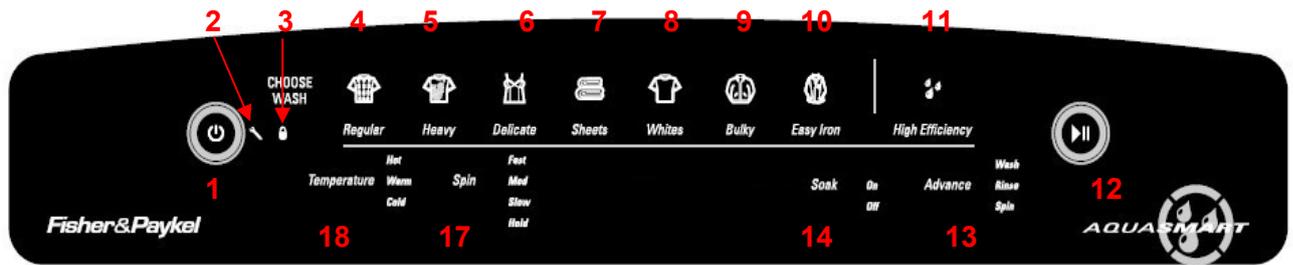
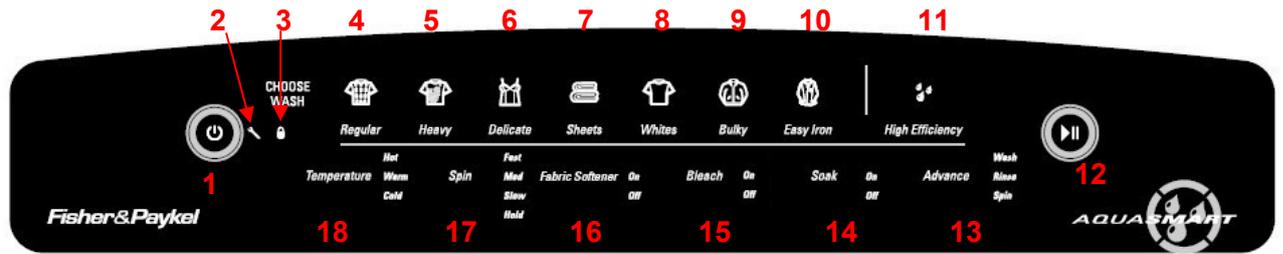
3 CONTROL PANEL

LCD Model



1. Power On/Off button.
2. High-Efficiency mode On/Off. When off, the machine uses the conventional wash mode
3. High-Efficiency LED used also for data download (refer to Section 6.3).
4. Start/Pause button
5. LCD Screen.
6. Left arrow (used when scrolling through options on the LCD screen).
7. Right arrow (used when scrolling through options on the LCD screen).
8. Select button – Use to confirm setting.
9. Back button - Use to cancel setting.

LED Model



1. Power On/Off button.
2. Service Spanner LED.
3. Lid Lock LED.
4. Regular button.
5. Heavy button.
6. Delicate button.
7. Sheets button.
8. Colours button.
9. Bulky button.
10. Easy Iron button.
11. High-Efficiency mode On/Off. When off, the machine uses the conventional wash mode
12. Start/Pause button.
13. Advance button.
14. Soak button.
15. Bleach button. (Not present on Non-dispensing model)
16. Fabric Softener button. (Not present on Non-dispensing model)
17. Spin Speed button.
18. Temperature button.

4 TECHNICAL OVERVIEW

This Service Manual contains information on the Product Specifications, Diagnostic Mode, Detailed Fault Codes and the complete disassembly and assembly instructions for the AquaSmart™ washing machines.

4.1 Electronics

4.1.1 Motor Control Module

The Motor Control Module used on the AquaSmart™ washer is similar to the other washers in its physical size and shape, however the electronics have different software to control the unique aspects of this machine.

Therefore the Motor Control Module is specific to this machine and is not interchangeable with any other machines.

The text on the yellow identifier label (P7SPL) stands for Phase 7, SmartPump™, Low profile Agitator.



4.2 Stand By Mode

If the machine has not received any instructions for 10 minutes after being switched on at the power point, or after completing the cycle, it will automatically go into a low power “Stand By” mode. The control panel will be blank as if it was powered off at the wall.

Before entering the Diagnostic or Option Adjustment mode, the machine must be taken out of the Stand-By mode. To do this, the **POWER** button will have to be pressed, or the machine turned off and back on at the power point.

4.3 Out of Balance Detection – ‘Bump Detect’

Past electronic machines have used a lever connected to a mechanical switch to detect if the load in the inner bowl is out of balance. On this series of machine the system has been replaced with electronic sensing known as ‘Bump Detect’. ‘Bump Detect’ is software written into the Motor Control Module, which looks at specific feedback from the Rotor Position Sensor.

No fault codes are associated with ‘Bump Detect’, and there are no hard and fast tests that can be carried out.

If a machine continually goes into an out of balance condition, then the following need to be checked in the order given.

1. Even distribution of the clothes load.
2. Ensure that the machine is both level and stable on the floor.
3. Ensure that the feet have the rubber inserts fitted and the cabinet corners are clear of the floor.
3. Check that any of the straps on the neck ring are not broken and that they are fitted correctly.
4. Check the weight of the inner bowl. Bowl weight is as follows.
 - 24lb 3oz +/- 10oz (10.965kg +/- 275g).
5. Check the RPS using a RPS Tester.

4.4 Water temperature Sensing

The thermistor for sensing the water temperature is located in the back of the outlet elbow on the valve assembly, and is connected directly to the Motor Control Module.

Details for adjusting the wash temperature, Refer to the Use & Care Book.

Specifications

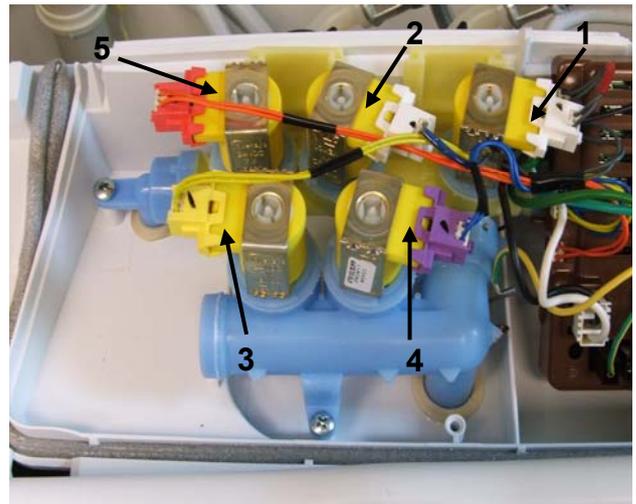
NTC-type temperature sensor (Thermistor)
Resistance 10,000Ω @ 77 °F / 25°C

4.5 Water Valves

The water valve assembly incorporates up to five valves that are joined by a common valve body. The two main inlet coils control the flow of water into the valve body assembly that then in turn supplies water into the machine through the inlet nozzle.

Up to three additional coils are used that control the valves for the fabric, detergent and bleach dispensing. They control the flow of water to the fabric, detergent and bleach dispensing system via hoses that run underneath the top deck.

1. Hot coil (White Clip)
2. Cold coil (White Clip)
3. Fabric coil (Yellow Clip)
4. Detergent coil (Purple Clip)
5. Bleach Coil (Red Clip)



4.6 Dispensing System

Three hoses of different lengths run underneath the top deck and connect to the detergent dispenser, the bleach dispenser and the fabric softener dispenser. The detergent dispenser hose has cream elbows. The fabric softener dispenser hose has grey elbows and the bleach dispenser has red elbows.

Moulded into the top deck at the valve end are identification letters ('D' for Detergent and 'S' for softener & 'B' bleach). At the dispenser end are moulded the words 'Detergent', 'Softener' and 'Bleach'.

It is important that the hoses are retained in the clips around the perimeter of the opening of the top deck correctly.



4.6.1 Detergent Dispensing

During fill, the detergent valve is also energised. This allows a proportion of the inlet water to flow into the detergent dispenser.

The flow rate through the detergent valve is dependent on the inlet water pressure, but it is less than the flow rate of water entering the machine. The valve will remain energised until the water level reaches 1 inch (25mm), at which point the bowl starts stirring until the desired water level has been achieved.

The detergent valve can be tested in diagnostics (refer to Section 6.1.2 for LCD models, or Section 7.2 for LED models).

4.6.2 Bleach Dispensing

The design of the bleach dispenser is such that it creates a self-siphoning effect. When the motor control module calls for bleach $\frac{3}{4}$ of the way through the wash portion of the cycle, the bleach valve will energise. This allows water to flow into and through the dispenser mechanism. The valve is pulsed on and off for a total of 95 seconds (see table below) to ensure that all of the bleach has dispensed.

Siphon Pulse	On	Off
1 st	10 s	15 s
2 nd	10 s	10 s
3 rd	10 s	10 s
4 th	10 s	10 s
5 th	10 s	remains off

Note: The 1st off time of 15 seconds is to 'kick start' the siphoning process.

If the bleach valve was to run continuously, the water would cut a path through the bleach and the bulk of the bleach would remain in the dispenser. The maximum level of the bleach is 120mls to the 'Max' mark. If the bleach dispenser was to be filled higher than this mark, the bleach may self-siphon into the machine.

The bleach valve can be tested in diagnostics (refer to Section 6.1.2 for LCD models, or Section 7.2 for LED models).

4.6.3 Fabric Softener Dispensing

The design of the softener dispenser is such that it creates a self-siphoning effect. When the motor control module calls for softener at the beginning of the deep rinse cycle, the softener valve will energise. This allows water to flow into and through the dispenser mechanism. The valve is pulsed on and off for a total of 95 seconds (see table below) to ensure that all of the bleach has dispensed.

Siphon Pulse	On	Off
1 st	10 s	15 s
2 nd	10 s	10 s
3 rd	10 s	10 s
4 th	10 s	10 s
5 th	10 s	remains off

Note: The 1st off time of 15 seconds is to 'kick start' the siphoning process.

If the softener valve was to run continuously, the water would cut a path through the softener and the bulk of the softener would remain in the dispenser. The maximum level of the softener is 70mls to the 'Max' mark. If the softener dispenser was to be filled higher than this mark, the softener may self-siphon into the machine.

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The Softener valve can be tested in diagnostics (refer to Section 6.1.2 for LCD models, or Section 7.2 for LED models).

4.6.4 Inlet Nozzle

In addition to its design, which ensures excellent rinse water distribution, the nozzle shares an important relationship with the inlet valve assembly and the dispensing system as described above.

An internal piston within the nozzle moves with the amount of water pressure against it. When the water pressure is high, more holes in the nozzle are exposed, and the backpressure on the dispensing valves is less.

When the pressure is low, more backpressure is created, which ensures that either during detergent dispensing or bleach dispensing the dispensing system takes priority.

If the water pressure was very low during dispensing, it is conceivable that no water would enter the machine via the inlet nozzle until the dispensing has been completed.

Conversely, if the piston was jammed and the water pressure was high, a high flow rate of water would go through the dispensing system and may result in water on the floor.

4.7 Water Level Measurement

The AquaSmart™ uses the same pressure sensing system used in the EcoSmart™ and Intuitive Eco™ machines to determine the water level. The difference with AquaSmart™ is that on both the Conventional and High Efficiency modes, AquaSmart™ will automatically choose the water level, as the precise water level for the clothes load is critical to the performance of the wash. ***The amount of water used in either mode is unable to be selected or adjusted by the user.***

So now there are an infinite number of water levels that AquaSmart™ can choose depending on the weight and type of the clothes being washed.

4.8 Motor

4.8.1 Stator

This stator used on the AquaSmart machine is unique to this series only and therefore are not **interchangeable** with any previous phase or series of machines. The stator has 36 poles with pole tips being curved. The windings are Aluminium and can be Identified by the printed marking **AL 60 190T** it looks the same as the Previous copper Stator but is 19.5Ω per winding. The rotor position sensor is also unique to this stator. (Refer to Section 4.8.3)

Aluminium Stator (36 Poles)



Curved pole tips



Testing the Stator

If the stator needs to be tested we would first recommend testing the resistance of the windings from the harness end that is connected to the Motor Control Module. (Refer to Section 5.2).

Note: *Ensure that the Rotor or basket is stationary when measurements are made.*

Testing the stator from the console

The resistance of each individual winding is approximately 19Ω , however when testing the stator from the console we are testing across two windings therefore the resistance should be approx. $39\Omega \pm 10\%$.

To test all windings you will need to measure across:

- Red & Blue
- Blue & Yellow
- Yellow & Red

If the meter shows an incorrect reading we would then recommend testing the stator from underneath the machine, as there could be a fault in the wiring harness. To test the stator, both rotor and stator need to be removed. (Refer to Sections 10.23 and 10.24).

Note: *Two clamp plates are used to secure the Stator, one on each side. The four bolts are tightened to a torque of 44in/Lbs (5Nm). The plastic bolt for securing the Rotor requires a 5/8" (16mm) socket and should be tightened to 70 in/lbs (8Nm)*

Testing the Stator

After removing the Stator, it can now be tested.

Test points are:

R / B
B / Y
Y / R

The value should be approx. $39\Omega \pm 10\%$ across any of the two windings.



4.8.2 Rotor

The rotor is also unique to this series of AquaSmart machines. It has 48 blocks of individual magnets in a black moulding, as opposed to earlier machines having 16 blocks, containing 3 magnets in a white moulding.

The rotor is not interchangeable with any previous phase or series of machine.

The rotors can physically be interchanged, however electrically they are **incompatible**.

If the black rotor is fitted to earlier machines, fault code 240 will occur. Conversely fault code 240 will also occur if a white rotor is fitted to an AquaSmart machine.

The photographs below show the difference between black and white Rotors.

Current Black**Previous White**

4.8.3 Rotor Position Sensor

One of the inputs that the Motor Control Module needs in order to determine which switches to turn on is the position of the rotor. The rotor position sensor (RPS) supplies this information.

The rotor position sensor (RPS) is a printed circuit board that contains three Hall Sensors, which detect the magnetic field of the individual magnets in the rotor. The RPS provides this information to the Motor Control Module. The printed circuit board sits in a black plastic housing encapsulated by resin to protect the board. The only exposed area of the board is the connector for the main harness. Only the black RPS will work with the black rotor.

Note: The RPS is not interchangeable with any previous phase or series of machine.

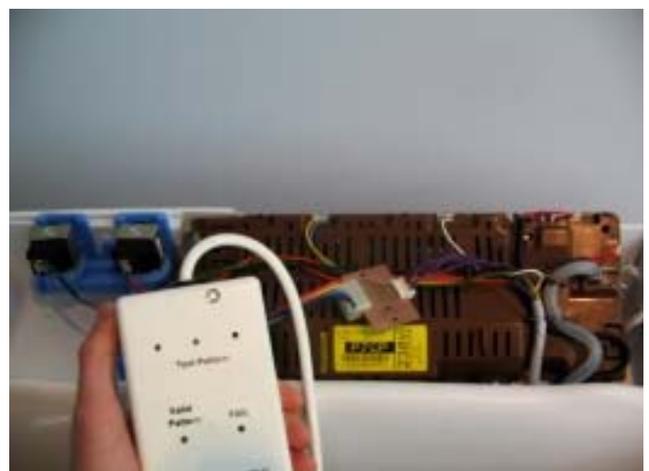


Testing the Rotor Position Sensor

To test the RPS use a RPS tester kit, part number 479413, this is powered by a 9V battery. To test the RPS follow the detailed instructions which are enclosed with the tester. The tester has 3 LEDs, and the pattern of these LEDs will change as the magnetic field of the Rotor passes the hall sensors.

Connect the RPS tester to the RPS harness. Slowly turn the basket and note the pattern of lights. A valid pattern is a pass. A fail will indicate a failure of either the harness or the RPS. If a failed pattern is showing, connect the RPS tester directly on to the RPS at the stator and retest.

A pass is when 1 or 2 LEDs are illuminated at a time, 0 or 3 LEDs illuminated indicates fail. Any flickering of the fail LED will indicate that the RPS or rotor is faulty. A faulty rotor would give a fail at certain points of rotation.



Note: This tester does not test all the functionality of the RPS. It tests the 3 outputs but cannot indicate all faults, for example if a capacitor on the RPS is cracked.

The rotor may also be tested with a RPS Tester. A complete rotation will test all the magnets.

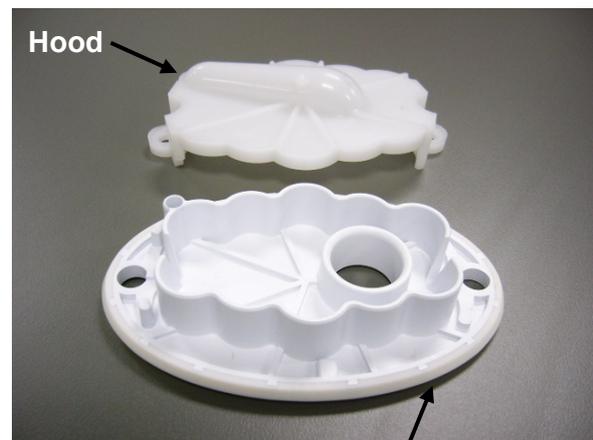
If the rotor has cracked or chipped magnets it will work fine, and does not need to be replaced.

4.9 Smart Pump

SmartPump™ provides a more flexible and efficient pumping system than a conventional pump/diverter valve combination. SmartPump™ can be diverted quickly; it reacts faster and is better controlled. In addition, SmartPump™ has the capability of pumping to a much higher head whilst maintaining a constant volume flow rate regardless of pump efficiency degradations due to age.

4.9.1 Hood and Cap

The hood and cap form the top of the pump housing, which must seal to the outer bowl. The hood and cap filters out objects that cannot pass through the pump system.



4.9.2 Flapper Valve

A diverter valve has been integrated into the pump cavity and operates automatically with a change in pump direction. This change of direction moves a flapper valve, which diverts the water to the drain hose or to the recirculation hose. The valve is sealed off against the port face with water pressure.

Cap including integrated seal



4.9.3 Impeller (non-field serviceable)

The impeller imparts rotational energy into the water and keeps sand away from the shaft seal.



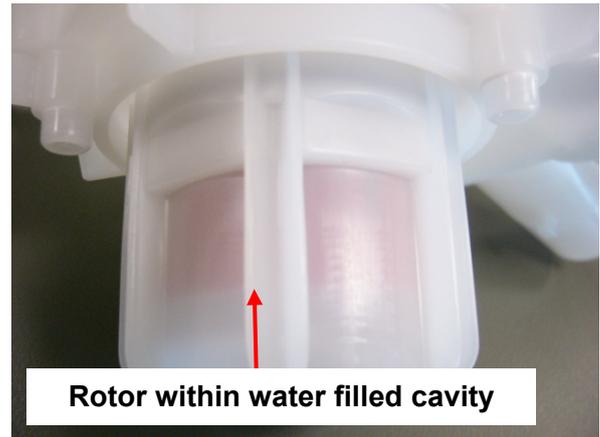
4.9.4 Rotor and Stator

The rotor and stator magnetically interact with each other in order to convert electrical energy into rotational movement of the rotor

Rotor

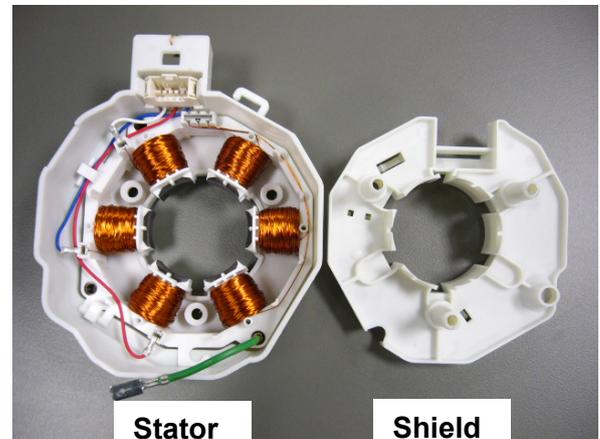
The rotor assembly is a complete unit that is permanently fixed into the pump housing. The resulting cavity is charged with water, which acts as a lubricant. In the event of a failure of the rotor, the whole assembly must be replaced.

Note: Contained within the rotor cavity are seals and bearings that are non field serviceable. The bearings provide a low friction wear surface for the rotor shaft to run on, and the seals eliminate grit from the rotor and bearing cavity



Stator & Shield

The Stator is mounted to the base of the pump housing together with the shield & cap. The harness connector inserts into the underside of the motor. Care must be taken to isolate the machine from the mains power before servicing the pump, and it is important that the harness connector cover has been refitted after reassembly.



4.9.5 Pump Housing

The pump housing is bolted directly to the outer bowl. It contains the volute shape and flapper sealing faces and also provides a structure to attach stator and rotor assemblies.



4.9.6 SmartPump™ Spare Parts

The following spare parts service kits are available for SmartPump™.

Hood And Cap (SmartPump™) Kit
P/N 479418



Flapper (SmartPump™)
P/N 420403



Seal (SmartPump™) Housing
P/N 479420



Pump Assembly (SmartPump™) Kit
P/N 479417



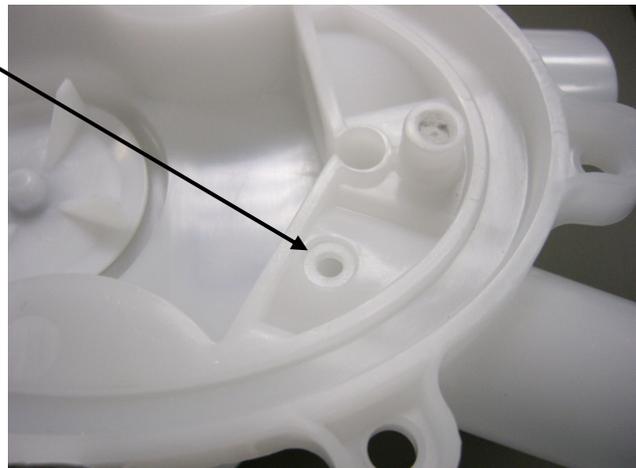
Connector cover →

Note: The pump assembly is supplied with the connector removed from the stator shield. The cover must be fitted in place after the wiring harness has been attached.

4.9.7 SLR Feature

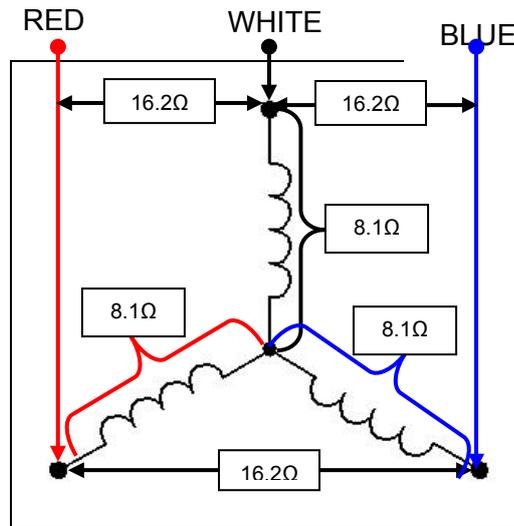
SLR stands for Simplified Leak Recirculation. This feature has been added so that should the flapper not completely seal against the housing of the pump when draining, water can bypass through this hole and back into the pump, avoiding re-circulating back into the bowl and on to the washing load.

It is important that this hole remains clear, and it should be checked whenever the pump is serviced.



4.9.8 Testing the Pump Stator

SmartPump™ Wiring Diagram



The stator resistance can either be tested from the harness at the motor controller or at the connections to the stator itself.

4.9.9 Testing SmartPump™ Stator from the Console

The resistance of each individual winding is approximately $8.1\Omega \pm 10\%$, however when testing the stator from the console we are testing across two windings, therefore the resistance should be approximately $16.2\Omega \pm 10\%$.

To test all windings you will need to measure across:

- Red and White
- White and Blue
- Blue and Red



If the meter shows an incorrect reading, we would recommend testing the stator from underneath the machine, as there could be a fault in the wiring harness. To test the stator it will need to be removed from the machine (refer to Section 10.19).

4.9.10 SmartPump™ Test Routine

Use the following procedure to test the SmartPump™. It is equally important to test both the drain and recirculation modes. In diagnostic mode the lid lock is disabled, which allows the technician to visually inspect both aspects of the pump.

1. Enter diagnostic mode. (Refer to Section 6 for LCD models, or Section 7 for LED models.)
2. If the inner basket is empty of water, activate either or both of the water valves until the inner basket is approximately 1/4 full with water. (Refer to Section 6.1.2 for LCD models, or Section 7.2 for LED models.)
3. While in diagnostic mode, set the pump to Recirculation Mode (refer to Section 6.1.2 for LCD models, or Section 7.2 for LED models), run for at least 1 minute and observe the following:
 - Ensure that a good flow rate is being delivered through the portal of the hose.
 - Ensure that a good pattern of flow is being delivered. If a poor flow rate is apparent, firstly check that the neck ring is fitted correctly and is not obstructing the flow of water. Secondly, remove the neck ring and check the shape and location of the recirculation nozzle is as expected. If no faults are found, the pump must be inspected. To access the pump cavity, (refer to Section 0).
 - Ensure that no leaks are occurring from either the recirculation hose where it attaches to the outer bowl (to do this the top deck will need to be lifted, refer to Section **Error! Reference source not found.**), or where it attaches to the SmartPump™.
 - Ensure that no water is exiting from the drain hose. If it is, this indicates that water is bypassing. For the description of bypassing, refer to Section 4.9.11.
4. Again, whilst in diagnostic mode, set the machine to drain (refer to Section 6.1.2 for LCD models, or Section 7.2 for LED models), run for at least 1 minute or until all water has been drained, and observe the following:
 - Ensure that a good pattern of flow is being delivered. If a poor flow rate is apparent the pump must be inspected. To access the pump cavity, refer to Section 0.
 - Ensure there are no leaks from where the drain hose exits from the cabinet or at the pump housing.
 - Ensure no water is exiting from the recirculation hose. Again, this would indicate that bypassing is occurring.

4.9.11 Bypassing

Bypassing is the term given to water that either flows from the recirculation hose when the pump is draining, or from the drain hose when the pump is re-circulating. No water at all should exit from the opposing hose. The flapper valve not sealing against the face of the pump cavity, or a poor fit of the hood and cap can generally cause bypassing.

If bypassing occurs, the pump (including the SLR Feature (refer to Section 4.9.7) must be inspected. To access the pump cavity (refer to Section 0).

4.10 Lid Lock

AquaSmart™ uses the same lid lock that is used on previous machines, and is locked during the complete cycle.

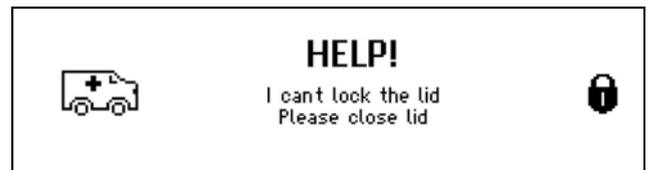


The Lid Lock symbol (padlock) appears in the top right hand corner of the screen on LCD models, and in the centre left next to the power button on the control panel on LED models, letting you know at a glance if you can open the lid or not.



To unlock the lid at any time, press **START/PAUSE**.

If the lid is left open on the AquaSmart™, the machine will be unable to lock the lid, and the cycle will be halted. The machine will beep and on the LCD model display a message to alert the user, with the padlock symbol flashing on the LED model. If this occurs, ensure that the lid is closed, and press the **START/PAUSE** button.



If the lid-lock fails in the closed position, the locked lid can be forced upwards and out of the lock.
Note: This is the only time in which we would recommend doing this.

If the harness is damaged, the complete lid lock assembly will need to be replaced.

If the power supply is cut during the spin cycle, the machine will keep the lid locked until the rotor has ceased to turn (3 to 10 seconds). Only then will it release the lid from the lock. The motor is acting like a generator and allows the lock to stay energised under the bowls inertia.

In a brown out situation (where power is lost only momentary), the machine will restart at the start of whichever section of the cycle it was on and continue the wash.

The lid is locked throughout the complete cycle.

Eco-Active	Locked
Agitate	Locked
Spray Rinse	Locked
Deep Rinse	Locked
Spin	Locked

4.11 Neck Ring

The neck ring incorporates wells used for the fabric, detergent and bleach dispensing.

The neck ring is clipped in place to the outer bowl. It also restrains the re-circulating nozzle.

It is important that the neck ring is secured correctly to the outer bowl, as it affects bump detect (out of balance detection). The bowl assembly may experience more movement, which could lead to cabinet damage.

Dynaflex straps are located at four points on the neck ring and connect to lugs on each of the suspension rods.

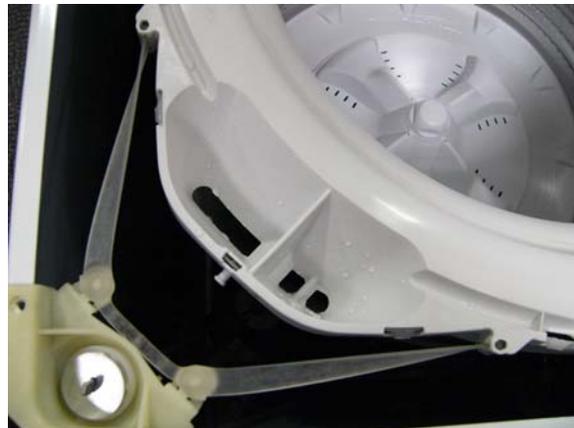


The straps serve two purposes:

1. To limit radial bowl motion during agitation.
2. As the straps stabilise the bowl, it also improves wash performance.

If one or more straps break, this can cause an increase in out of balance activity, which again may lead to cabinet damage and noise from loose straps, always replace the straps never refit them.

For a detailed explanation of Bump Detect, (refer to Section 4.3).



4.12 Inner Basket and Outer Tub

The outer tub is the assembly to which all the motor, pump system, suspension rods, etc are mounted. Within the outer tub is the inner basket and the agitator. During spin, the agitator and inner basket have to be coupled together and turn as a single unit. In agitate; the agitator and inner basket are free to rotate independently.

The inner basket is free to move in a vertical direction. The position of the inner basket is determined by the water level. At the base of the inner basket is a flotation chamber consisting of a number of individual cells. When the machine is filling with water, the pressure on the air in these cells increases as the water level rises until eventually the inner basket floats upwards and disengages the driven spline from the drive spline. This action frees the agitator from the inner basket and allows it to move freely in both directions.

When the water is draining, the pressure on the air trapped in the cells of the flotation chamber decreases allowing the inner basket to settle back down onto the drive spline and re-engage the driven spline, thus allowing the agitator and inner basket to turn as one unit. The floating basket is also used to detect if the correct water level for the size of the clothes load.

The point at which the basket starts to float is determined by the water level and the size of the load. The greater the load, the more water is needed before the inner basket will float. By detecting the point at which the basket floats, the machine can determine whether the correct water level for the particular clothes load has been reached

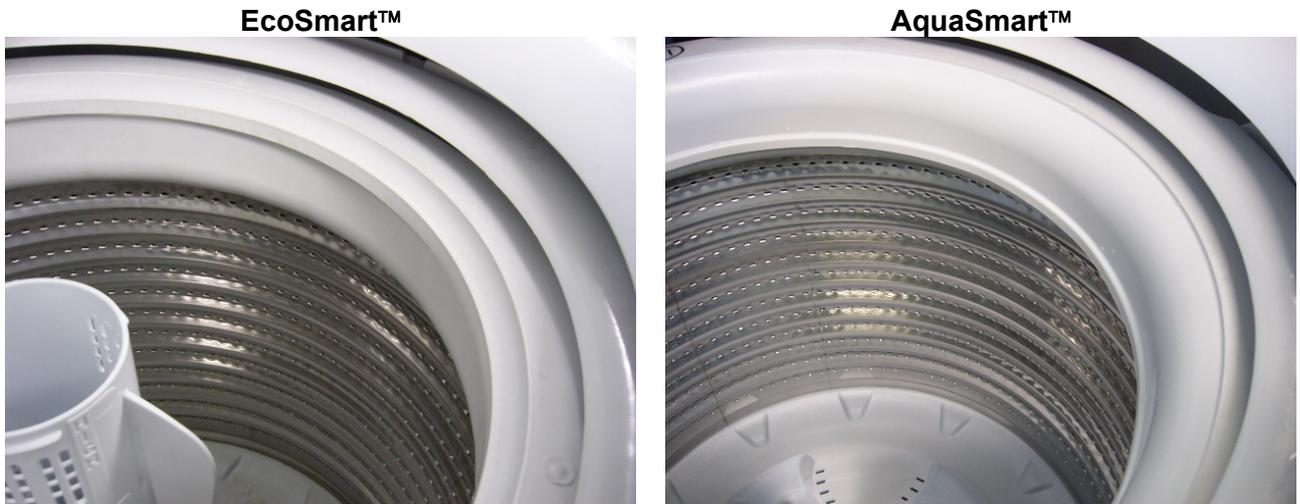
4.12.1 Detection of Inner Basket Float Off Point – Basket Check

During fill the inner basket will rotate to ensure that the clothes are evenly saturated with water. When the chosen water level is reached, and before the agitate cycle is started, the machine will carry out inner basket float checks (basket check). The inner basket will stop and commence a number of small agitate type actions. During this action the machine determines if the inner basket has floated if it has, the machine determines the correct water level has been reached. If the inner basket has not floated, the machine will continue filling and check again later. The water level at which the inner basket floats is not necessarily the same as the final water level.

4.12.2 Detection of Inner Basket Re-Engagement – Basket Check

After the water has drained, the inner basket will sink down and re-engage onto the drive spline. To ensure the inner basket has re-engaged correctly, the machine will carry out a basket re-engage test sequence (basket check). Basket check consists of a series of short agitate type actions before the spin cycle starts. A sound may be heard as the inner basket re-engages.

4.12.3 Inner Basket



4.12.4 Balance Ring

The inner basket for AquaSmart™ has a new top balance ring, which has 2 internal chambers instead of just one as on EcoSmart™ bowls. Both chambers are ½ filled with water.

The physical appearance of the balance rings changes from a square profile to a curved profile.

4.12.5 Inner Basket Base

The new basket used on the AquaSmart™ has all 3 chambers partially filled with water where as the basket base used on large EcoSmart™ (one with the internal bumps) has only the inner and middle chambers filled with water.

IMPORTANT

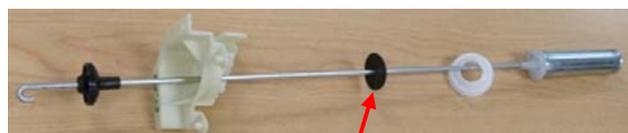
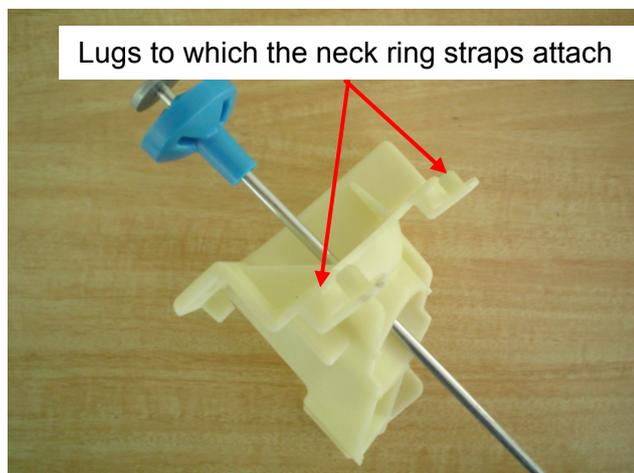
It is important that the new inner bowl for AquaSmart™ is only used on AquaSmart™ models. If the inner bowl is fitted to an EcoSmart™, it will cause the bump detect software not to function correctly, leading to increased cases whereby the inner bowl could hit against the top deck and cabinet.

Conversely, an EcoSmart™ inner bowl should not be fitted to AquaSmart™.

4.13 Suspension Rods

The suspension rods on AquaSmart™ need to be more robust than the suspension rods used on previous EcoSmart™ machines. The top bracket has lugs to which the straps from the neck ring attach.

A rubber washer sits midway down the rod, this helps detergent residue from running down the rod and into the grease filled damper.



IMPORTANT

It is important that these suspension rods are used only for AquaSmart™ machines. These rods haven't been tested on EcoSmart™ machines, however if they were to be fitted it is likely that there will be an increased level of noise and vibration on spin.

Conversely, rods from a EcoSmart™ should not be fitted to AquaSmart™.

There is also an increased chance that the inner bowl may strike against the top deck on spin up.

The current machines use the suspension rods on the left.

This new rod provides even greater dampening, and assists in preventing out of balance loads.

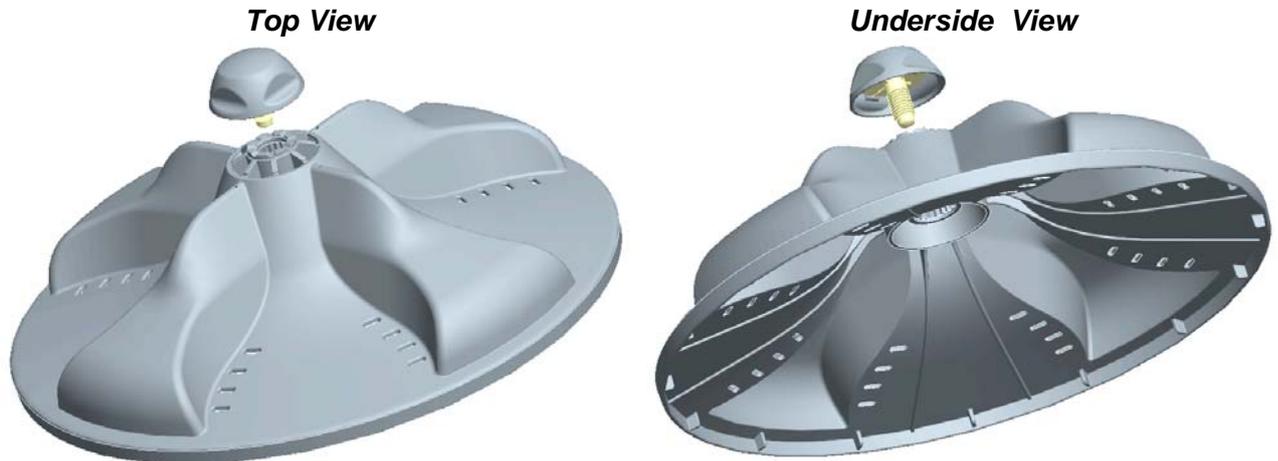


Service Version "B" (current) Service Version "B" (early)

4.14 Agitator Low Profile

The unique low profile agitator works well in both the High Efficiency and Conventional modes. In the High Efficiency mode, the clothes have greater contact with the agitator due to the low water level, and the agitator ensures a high level of clothes turnover.

In Conventional mode, the clothes are completely submerged in the water and the curving steep side walls and raised shoulders of the wash plate vanes create enough inward and upward movement to keep the clothes turning over even when there is reduced contact with the agitator.



4.15 Control Panel

The three core components of the control panel on the LCD model are the console, the IMD facia, and the PCB and housing. A new look that differs from existing machines has been created, so now capacitive touch buttons drive a high-resolution dot matrix display. The facia provides a sleek look and no protruding buttons makes it easier to clean.

Console:

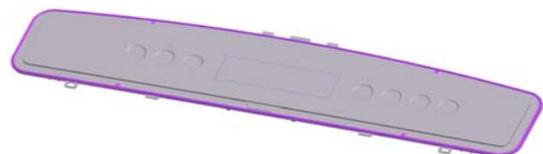
The console, which is made from ABS, is the housing to which the facia and PCB housing attaches. Lugs at the base of the console locate into the top deck. The console is secured to the rear of the top deck by two screws.



IMD Facia – LCD Model

IMD stands for In Mould Decorative display. Clear plastic is molded over the decorative polycarbonate silver film. The last process is to mould the seal on to the facia. The IMD process means a reduction of parts and any subsequent printing process.

- No lens.
- No light pipes.
- No separate buttons.
- No separate seal.



PCB and Housing – LCD Model

The PCB, which contains the capacitive touch buttons and LCD, is mounted within a plastic housing. The PCB housing is clipped into the console at the bottom, and secured with four screws along the top.



Facia – LED Model

Is a clear plastic molded insert with an adhesive backed touch panel fitted



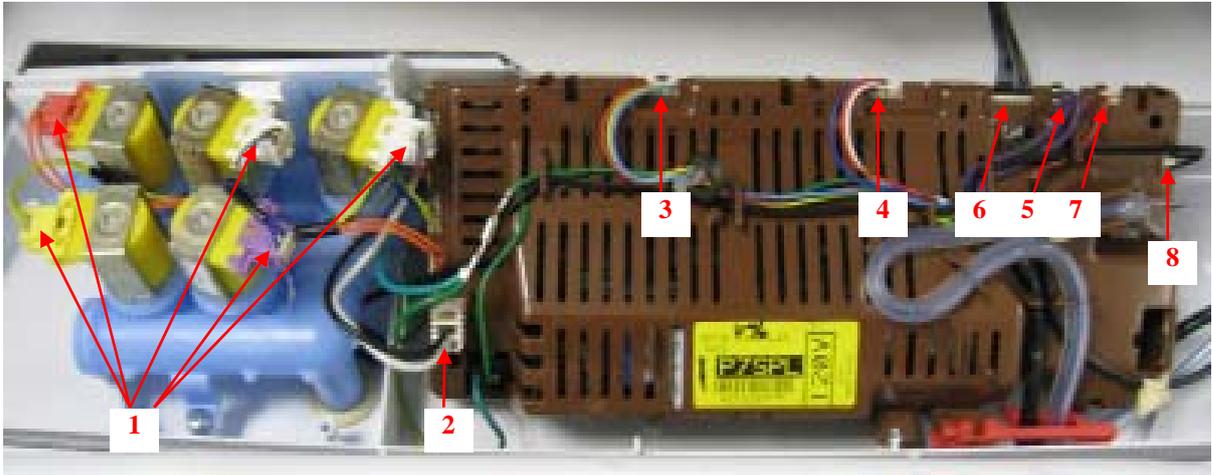
PCB and Housing – LED Model

The PCB, which contains the touch buttons and LED's, is mounted within a plastic housing. The PCB housing is clipped into the console at the bottom, and secured with four screws along the top.



5 VOLTAGE AND RESISTANCE READINGS FROM THE CONTROLLER

5.1 Voltage Readings



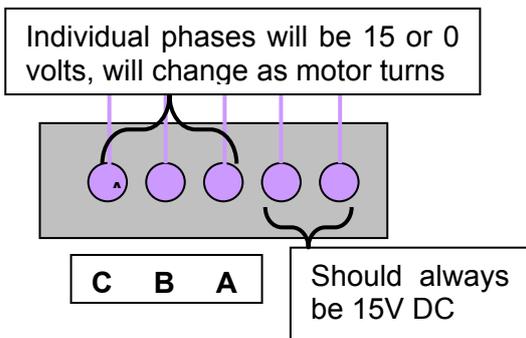
1. Water Valves
 Varies between 13 – 22V DC
Note: Accurate voltages can only be obtained by using a True RMS multimeter.

2. Supply voltage
 110V AC

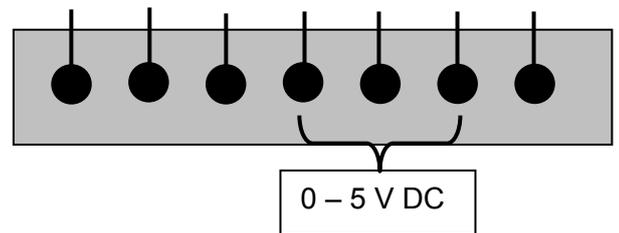
3. Wash Motor
 No accurate readings are possible.

4. Pump Motor
 No accurate readings are possible.

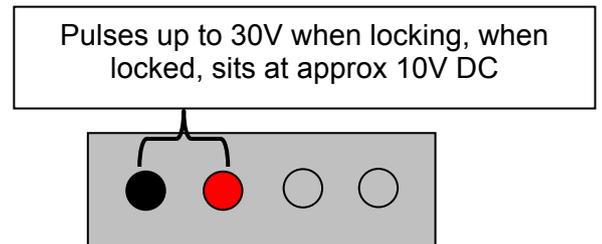
5. RPS



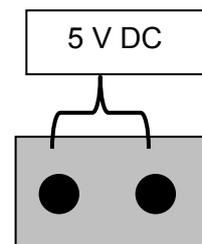
6. Display Module



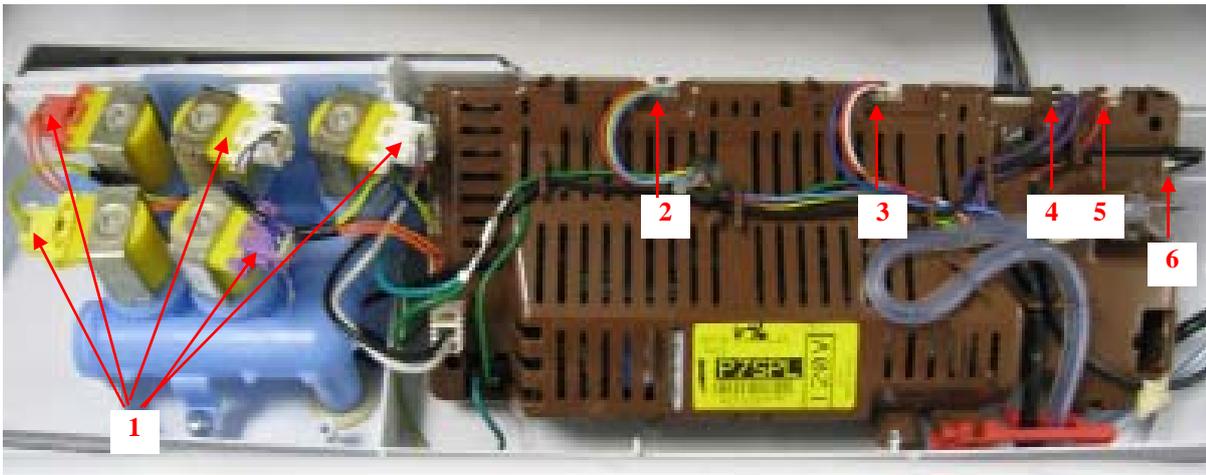
7. Lid lock



8. Thermistor



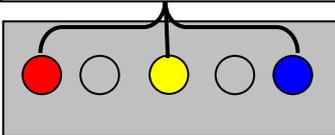
5.2 Resistance Readings



1. Water Valves
64 Ω +/- 10%

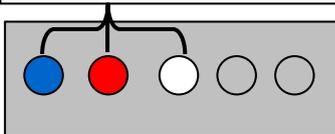
2. Wash Motor

39 Ω across any two windings



3. Pump Motor

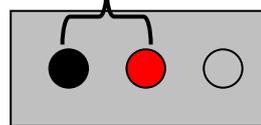
16.2 Ω across any two windings



4. RPS - Unable to be tested with multimeter.

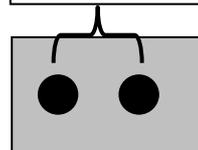
5. Lid lock

63 Ω +/- 10% @ 68°F / 20°C

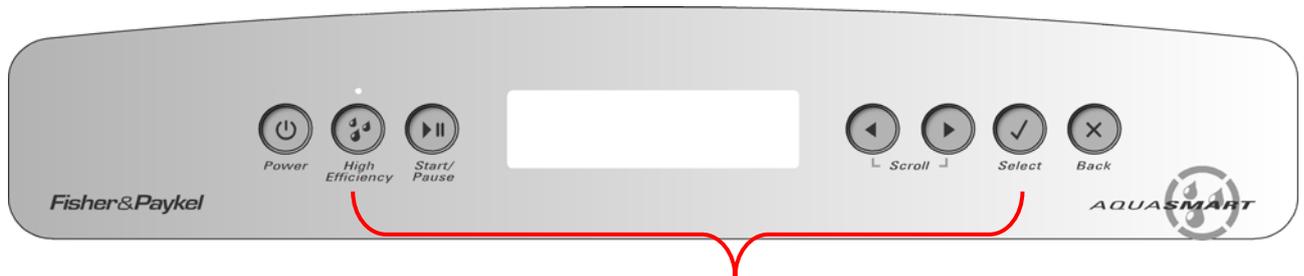


6. Thermistor

10,000 Ω @ 77°F / 25°C



6 DIAGNOSTIC MODE – LCD MODEL



Press and hold the **HI-EFFICIENCY** and **SELECT** buttons for 2 seconds

To enter the **DIAGNOSTIC MODE**, turn the power on at the power point and off at the console. Press and hold the **HI-EFFICIENCY** and **SELECT** buttons. Keep the buttons pressed for at least 2 seconds, after which time two beeps will sound and the screen below will appear.



Use the left and right scroll arrows to highlight the screen you wish to view, then press the select button to enter that screen.

The screens are explained below.

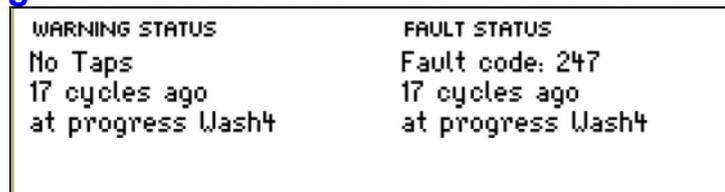
6.1 Service Screen

Upon entering the service screen, one of the following screens will appear

- Warning Status / Fault Status
- Machine Status

To scroll between the screens use the left and right scroll arrows.

6.1.1 Warning Status Screen / Fault Status Screen



Warning Status

In this screen will be displayed the last USER WARNING FAULT that occurred and will show how many cycles ago and in what part of the cycle it occurred.

The User Warning Faults are as follows:

- No Faucets
- Overloaded
- Out Of Balance
- Over Suds or water still in the machine during spin
- No Hot Water
- No Cold Water
- Agitate Overloaded

Fault Status

In this screen will be displayed a fault code for the last fault that has occurred and will show how many cycles ago and in what part of the cycle it occurred.

The fault code number can now be checked in the detailed fault codes, to ascertain what repairs may be necessary.

For fault code details refer to section 8.

6.1.2 Machine Status Screen

In the top half of the screen it displays the following information.

Size is the size of machine, (650mm = Large)

HVDC is for on line testing in the factory.

WL displays the water level in mm.

T is the actual temp of the inlet chamber water.

Target temp is the temperature selected.

MACHINE STATUS					
Size: 650mm			HVDC: 323		
WL: 5		T: 22degC		Target: degC	
Hot	Cold	Det	Fab	Pump	Blch
Off	Off	Off	Off	Off	Off

In the lower half of the screen it displays the status of the following components.

- Hot Valve (HOT)
- Cold Valve (COLD)
- Detergent Valve (DET)
- Softener Valve (FAB)
- SmartPump™ (PUMP)
- Bleach Valve (Blch)

Component Testing

In this screen the components that are displayed can be tested. To test a component, firstly highlight the component by using the left and right scroll arrows. To activate a component, press the select button. To deactivate the component, depress the select button again.

Note: SmartPump™ can be tested in both the drain and recirculation modes. After highlighting Pump, the first press of the Select button activates the pump in the drain direction, the second press activates the pump in the recirculation direction, a final press turns the pump off.

6.2 Control Screen



6.2.1 Hot Bowl Flag

If the machine has been filled with the hot water valve utilised (i.e. warm or hot fill) and has not had a cold rinse, the electronics will not allow the machine to spin up to its full speed of 1000 RPM. It will only allow the spin speed to reach 700 RPM.

To remove this flag, enter the Control Screen mode and push the **HI-EFFICIENCY** button. This flag can also be removed by putting the machine through a complete final rinse.

6.2.2 Restart Feature

The LCD AquaSmart™ leaves the factory with the RESTART set to the ON position, which is indicated in the screen by the word RESTART highlighted. To turn the RESTART feature OFF, push the Left scroll arrow. This will remove the highlight from the word RESTART. When the machine is being serviced, it is more convenient to turn the RESTART feature OFF. This will allow any fault in the system to show up immediately it occurs.

With the RESTART feature on:

1. If a fault occurs in the machine, the diagnostic system will detect it. However, instead of displaying a fault code immediately, the machine will try to RESTART.
2. If the fault was only of temporary nature, the machine will restart and finish the cycle.
3. If there is a continuous fault the machine will try to RESTART a number of times. This process could take up to 8 minutes depending on the type of fault. After this, if the machine still cannot restart, the fault code is displayed and the machine will beep continuously.

NOTE - This feature is designed as a service aid only and should be left ON in the customer's home. To return to normal operation, and to reset the RESTART feature to the factory setting, switch the machine off at the wall or disconnect from the mains supply.

To identify that the RESTART feature has been activated, refer to the Restart / Recycle table. (Refer to Section 6.2.4)

6.2.3 Recycle Feature

At the end of servicing, the machine may require an extended test where the machine can be left to complete a number of wash cycles. By turning on the RECYCLE feature, the machine will continuously repeat the wash cycle until the RECYCLE feature is turned off. To toggle this feature on or off, press the right scroll arrow. When the recycle feature is on, the word RECYCLE will be highlighted.

NOTE - This feature is designed as a service aid only and should be OFF in the customer's home. To return to normal operation, and to return the recycle feature to the factory setting, switch the machine off at the wall or disconnect from the mains supply.

To identify that the RECYCLE feature has been activated, refer to the Restart / Recycle table. (Refer to Section 6.2.4)

6.2.4 Restart / Recycle Table LCD

As the LCD AquaSmart™ has only one LED (located above the High Efficiency button) the state of the LED will signify which feature has been selected or not selected. The table below explains the state of the LED when the machine is on at the wall and off at the machine.

LED: Off (Factory Default)	Restart on
	Recycle off
LED: Solid	Restart off
	Recycle on
LED: Slow Flashing	Restart off
	Recycle off
LED: Quick Flashing	Restart on
	Recycle on

6.2.5 Restart/Recycle Features Permanently Programmed

It is possible for the Restart Feature to be disabled, or the Recycle Feature to be enabled, or a combination of both to be permanently programmed into the memory of the electronics so that in the event of a power cut the electronics will remember the setting.

The factory settings are:

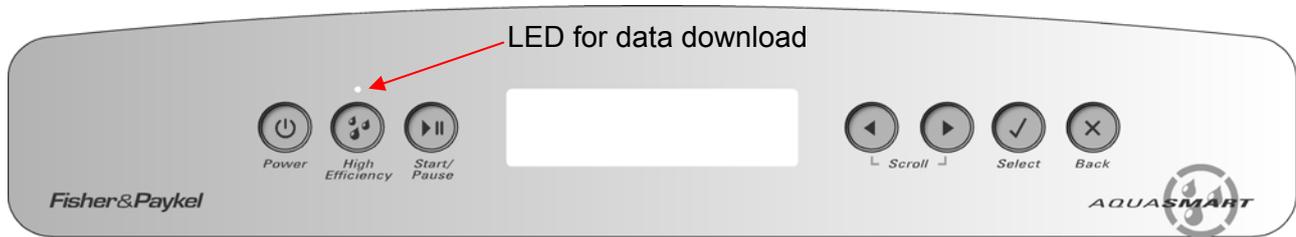
- Restart is enabled
- Recycle is disabled

If a machine is encountered with the Restart/Recycle features not set to the factory defaults, the machine must be re-programmed using following steps;

1. Enter diagnostic mode by pressing and holding the **HI-EFFICIENCY** button and then pressing the **SELECT** button. Keep the buttons pressed for at least 2 seconds, after which time two beeps will be heard and a screen showing 'Service' & 'Control' will appear.
2. Using the arrow buttons, highlight the 'Control' screen, then press **SELECT**.
3. To enable/disable the Restart feature permanently, press and hold the **LEFT SCROLL ARROW** for three seconds until a beep is heard.
4. To enable/disable the Recycle feature permanently, press and hold the **RIGHT SCROLL ARROW** for three seconds until a beep is heard.

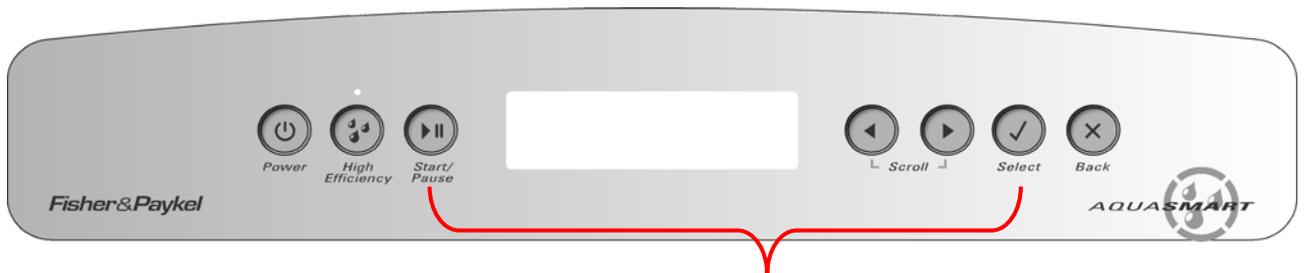
6.3 Data Download

To activate the data download, enter the diagnostic mode with the power on at the power point and off at the console, press and hold the **HI-EFFICIENCY** and **SELECT** buttons. Keep the buttons pressed for at least 2 seconds, after which time two beeps will sound. Then press the **START/PAUSE** button. The LED above the High Efficiency button will be on and flickering.



Place the download pen over this LED and follow the instructions supplied with the data download program.

6.4 Showroom Mode



Press and Hold **START/PAUSE**, then press the **SELECT** button

Showroom mode will play the introduction and repeat it continuously, until the machine has been isolated from the power supply.

To access the showroom mode follow the steps below.

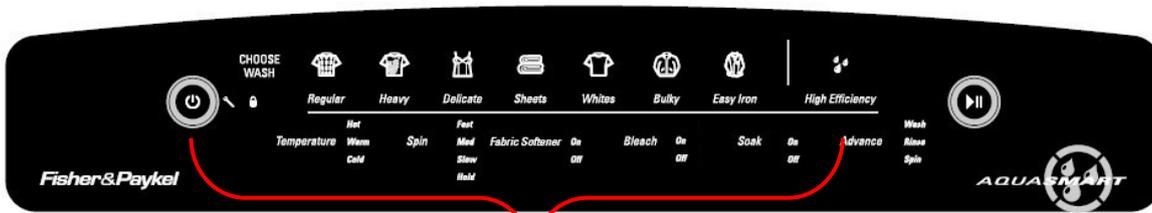
1. Turn the power supply to the washing machine on.
2. During the introduction sequence on the LCD display (which lasts for approximately 1 minute) press and hold the **START/PAUSE** button and the **SELECT** button, and hold these buttons for at least two seconds.

To exit, turn off the power supply to the washing machine at the wall.

7 DIAGNOSTIC MODE – LED MODEL

This washer has a diagnostic system to help diagnose faults. Use Diagnostic Mode 2 for non-dispensing LED models. For all other models use Diagnostic Mode 1.

To enter **DIAGNOSTIC MODE 1** for dispensing models;



- Turn the power on at the power point and off at the console.
- Press and hold the **HI-EFFICIENCY** button, then press the **POWER** button until you here two beeps.

To enter **DIAGNOSTIC MODE 2** for non dispensing models;



- Turn the power on at the power point and off at the console.
- Press and hold the **EASYIRON** button, then press the **POWER** button until you here two beeps.

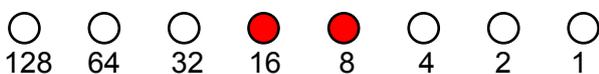
7.1 Fault Codes

Enter diagnostics then press the **SPIN** button three times, until both the **SLOW** and **HOLD** lights are on. The last fault code is now displayed in the wash cycle LEDs using a binary code. Each LED has a value as follows:

LED	VALUE
Regular	= 128
Heavy	= 64
Delicate	= 32
Sheets	= 16
Colours	= 8
Bulky	= 4
Easy Iron	= 2
Hi Efficiency	= 1

The fault code is determined by adding up the value of the illuminated LEDs.

For Example:



This is Fault Code 24 – Dispensing type not set.

If this appears you need to set the dispensing type of the LED AquaSmart™:

1. Press and hold down the **TEMPERATURE** button, then press the **POWER** button until three beeps are heard.
2. Press the **TEMPERATURE** button to scroll through the 'dispensing type' options stopping at desired 'dispensing type' setting.
Cold LED = No Dispensing
Warm LED = Double Dispensing (Detergent & Fabric Softener or Detergent & Bleach)
Hot LED = Triple dispensing (Detergent, Fabric softener & Bleach)
3. Press the **POWER** button to exit and save current setting.

For detailed fault codes (refer to section 8)

7.2 Component Testing

To select the Component Test Mode:

1. Press and hold the **HI EFFICIENCY** button, then press the **POWER** button until two beeps are heard.
2. Press the **SPIN** button until all the spin LEDs are illuminated.

To operate the:

- Hot Water Valve Push the **REGULAR** button.
- Cold Water Valve Push the **HEAVY** button.
- Detergent Valve Push the **DELICATE** button.
- Fabric Softener Valve Push the **SHEETS** button
- Bleach Valve Push the **WHITES** button.
- Drain Pump Push the **BULKY** button.
- Re-circulating Pump Push the **EASY IRON** button.

To turn each component off, push the same buttons that were pushed to turn them on.

7.3 Hot Bowl Flag

If the machine has been filled with the hot water valve utilised (i.e. warm or hot fill) and has not had a cold rinse, the electronics will not allow the machine to spin up to its full speed of 1000 RPM. It will only allow the spin speed to reach 700 RPM and the **HOT** LED will flash. To remove this flag, push and hold the **TEMPERATURE** button until the hot LED turns off.

7.4 Restart Feature

The LED AquaSmart™ leaves the factory with the RESTART turned on.

With the RESTART feature on:

1. If a fault occurs in the machine, the diagnostic system will detect it. However, instead of displaying a fault code immediately, the machine will try to RESTART.
2. If the fault was only of a temporary nature, the machine will restart and finish the cycle.
3. If there is a continuous fault, the machine will try to RESTART a number of times. This process could take up to 8 minutes depending on the type of fault. After this, if the machine still cannot restart, the fault code is displayed and the machine will beep continuously.

Dispensing Model

To turn RESTART off:

- Enter the COMPONENT TEST MODE by pressing and holding the **HI EFFICIENCY** button, and then press the power button until two beeps are heard.
- Press the **SPIN** button until all the spin LEDs are illuminated.
- Press the **FABRIC SOFTENER** button. The Fabric Softener LED will then be turned off.
- When the restart feature is turned off the power button will flash when the power is on at the wall but off at the console, indicating that the restart is in the off mode.

To turn RESTART on:

- Enter the COMPONENT TEST MODE by pressing and holding the **HI EFFICIENCY** button, and then press the power button until two beeps are heard.
- Press the **SPIN** button until all the spin LEDs are illuminated.
- Press the **FABRIC SOFTENER** button. The Fabric Softener LED will then be turned on.

Non-Dispensing Model

To turn RESTART off:

- Enter DIAGNOSTIC MODE 2 by pressing and holding the **HI EFFICIENCY** button, and then press the power button until two beeps are heard (refer to section 7).
- Press the **TEMPERATURE** button. The Temperature LED will then be turned off.
- When the restart feature is turned off the power button will flash when the power is on at the wall but off at the console, indicating that the restart is in the off mode.

To turn RESTART on:

- Enter DIAGNOSTIC MODE 2 by pressing and holding the **HI EFFICIENCY** button, and then press the power button until two beeps are heard (refer to section 7).
- Press the **TEMPERATURE** button. The Temperature LED will then be turned on.

NOTE - This feature is designed as a service aid only and should be left ON in the customer's home. To return to normal operation, and to reset the RESTART feature to the factory setting, switch the machine off at the wall or disconnect from the mains supply.

7.5 Recycle Feature

At the end of servicing, the machine may require an extended test where the machine can be left to complete a number of wash cycles. By turning on the RECYCLE feature the machine will continuously repeat the wash cycle until the RECYCLE feature is turned off.

To turn RECYCLE on:

- Enter COMPONENT TEST MODE by pressing and holding the **HI EFFICIENCY** button, then press the **POWER** button until two beeps are heard.
- Press the **SPIN** button until all the spin LEDs are illuminated.
- Press the **SOAK** button. The Soak LED will then be illuminated.

To turn RECYCLE off:

- Enter COMPONENT TEST MODE by pressing and holding the **HI EFFICIENCY** button, then press the **POWER** button until two beeps are heard.
- Press the **SPIN** button until all the spin LEDs are illuminated.
- Press the **SOAK** button. The Soak LED will then be turned off.

7.6 Restart/Recycle Features Permanently Programmed

It is possible for the Restart Feature to be permanently disabled, or the Recycle Feature to be permanently enabled, or a combination of both to be permanently programmed into the memory of the electronics so that in the event of a power cut the electronics will remember the setting.

The factory settings are:

- Restart is enabled
- Recycle is disabled

If a machine is encountered with the Restart/Recycle features not set to the factory defaults, the machine must be re-programmed using following steps;

Dispensing Model

1. Enter DIAGNOSTIC MODE 1 by pressing and holding the **HI-EFFICIENCY** button and then pressing the **POWER** button.
2. To enable/disable the Restart feature permanently, press and hold the **FABRIC SOFTENER** button for three seconds until a beep is heard.
3. To enable/disable the Recycle feature permanently, press and hold the **SOAK** button for three seconds until a beep is heard.

Non-Dispensing Model

1. Enter DIAGNOSTIC MODE 2 by pressing and holding the **EASY IRON** button and then pressing the **POWER** button
2. To enable/disable the Restart feature permanently, press and hold the **TEMPERATURE** button for three seconds until a beep is heard.
3. To enable/disable the Recycle feature permanently, press and hold the **SOAK** button for three seconds until a beep is heard.

NOTE - This feature is designed as a service aid only and should be SET TO THE FACTORY SETTINGS in the customer's home. To return to normal operation, and to return the recycle feature to the factory setting, switch the machine off at the wall or disconnect from the mains supply.

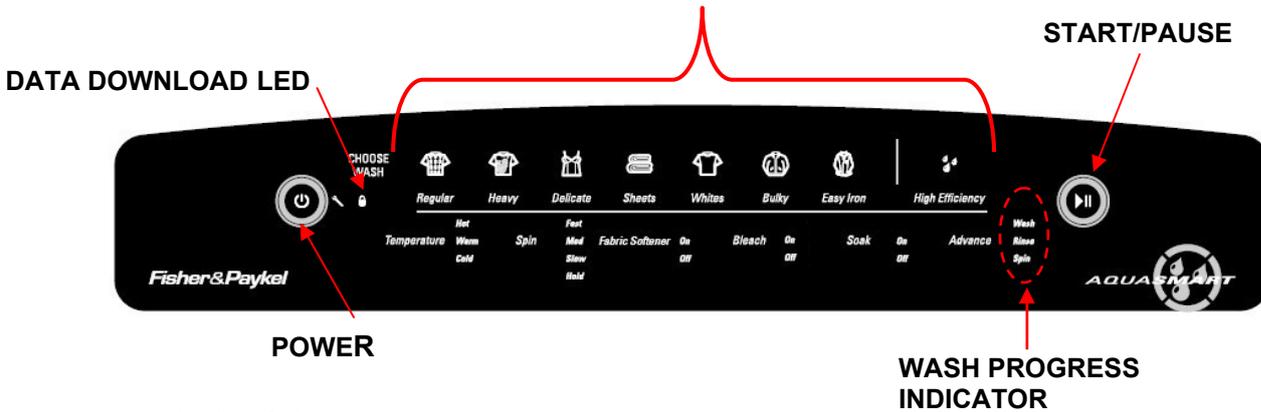
7.7 Restart / Recycle Table LED

The LED Aquasmart uses a combination of Power button and Wash Cycle LED's to indicate which state has been selected or not selected. The table below explains the state the of LED's when the machine is on at the wall but off at the machine.

LED'S Off (Factory Default)	Restart on
	Recycle off
Power & Wash Cycle LED's Flashing	Restart off
	Recycle on
Power LED Flashing	Restart off
	Recycle off
Wash Cycle LED's Flashing	Restart on
	Recycle on

For more information on resolving the binary coded value from the Wash Cycle LEDs, refer to Section 8

7.8 Data Download



To enter the Data download mode

1. Press and hold the **HI EFFICIENCY** button, then press the **POWER** button until the machine beeps.
2. Press the **START/PAUSE** button. The lid lock LED will be on and flickering.
3. Place the download pen over this LED and follow the instructions supplied with the data download program.

7.9 AquaSmart™ LED Diagnostic Table

To use this table, firstly enter Diagnostic Mode (Refer to Section 7) the different levels of information can be extracted by using the Spin Speed button.

Diagnostic Level	Spin Speed LEDs				Diagnostic Info Displayed
	Fast	Med	Slow	Hold	
0	OFF	OFF	OFF	OFF	Last User Warning Number
1	OFF	OFF	OFF	ON	Wash Cycle Position of Last User Warning Number
2	OFF	OFF	ON	OFF	Factory use only – Not applicable to the field
3	OFF	OFF	ON	ON	Fault Code of Last Fault (if within the last 8 Wash Cycles)
4	OFF	ON	OFF	OFF	Factory use only – Not applicable to the field
5	OFF	ON	OFF	ON	Cycle Count Since Last Fault (low byte)
6	OFF	ON	ON	OFF	Cycle count since Last Fault (high byte)
7	OFF	ON	ON	ON	Wash Cycle Position of Last Fault
8	ON	OFF	OFF	OFF	Water Temperature (deg C)
9	ON	OFF	OFF	ON	Cycle Count (low byte)
10	ON	OFF	ON	OFF	Cycle Count (high byte)
11	ON	OFF	ON	ON	Motor Speed (RPM)
12	ON	ON	OFF	OFF	Water Level
13	ON	ON	OFF	ON	Factory use only – Not applicable to the field
14	ON	ON	ON	OFF	Motor Control Software Version
15	ON	ON	ON	ON	Display Software Version

Diagnostic mode 0: Last User Warning Number

The Last User Warning Number is displayed on the Wash Cycle LEDs in binary* form and can be calculated by totalling the binary* value of the Wash Cycle LEDs.

Binary* Count	User Warning
0	No Warning
1	No Taps
2	Overload
3	OOB
4	Suds
5	No Hot
6	No Cold
7	Agitate Overloaded

Diagnostic mode 1: Wash Cycle Position of Last User Warning Number

The Wash Cycle position of the last user warning is primarily displayed on the wash progress indicator. E.g. Wash, Rinse or Spin.

In addition to this, the exact stage of the wash where the warning occurred is displayed via the Wash Cycle LEDs. The 8 Wash Cycle LEDs correspond to the 8 stages of a Wash Cycle. Initially, all 8 Wash Cycle LEDs are illuminated and turn off from left to right as each wash stage is completed.

Diagnostic mode 3: Fault Code of Last Fault (if within the last 8 Wash Cycles)

Also, sometimes referred to as the detailed fault code. The fault data can be displayed via the Wash Cycle LEDs in binary* form (fault codes are contained in the last section of this manual). If no LEDs are lit the fault code has not occurred in the last 8 cycles.

Diagnostic mode 5: Cycle count since last fault (low byte)**Diagnostic mode 6: Cycle count since last fault (high byte)**

The number of Wash Cycles since the last fault is displayed on the Wash Cycle LEDs. The low byte refers to binary* numbers from 1 through to 128. The high byte refers to numbers from 256 through to 32768. Always check both the low and high bytes, and then add the two together to get the final result. NB. Even though the last fault gets wiped from diagnostic level 3 after 8 cycles, the cycle number when the last fault occurs is permanently stored in the memory.

Diagnostic mode 7: Wash Cycle Position of Last Fault

The Wash Cycle position of the last fault is primarily displayed on the wash progress indicator. E.g. Wash, Rinse or Spin.

In addition to this, the exact stage of the wash where the fault occurred is displayed via the Wash Cycle LEDs. The 8 Wash Cycle LEDs correspond to the 8 stages of a Wash Cycle. Initially, all 8 Wash Cycle LEDs are illuminated and turn off from left to right as each wash stage is completed.

Diagnostic mode 8: Water Temperature (deg C)

The Wash Temperature (of the thermistor in °C) is displayed on the Wash Cycle LEDs in binary* form. See Section 15.1 for the binary* conversion chart.

Diagnostic mode 9: Cycle Count (low byte)**Diagnostic mode 10: Cycle Count (high byte)**

The number of Wash Cycles is displayed on the Wash Cycle LEDs in binary* form. The low byte refers to binary* numbers from 1 through to 128. The high byte refers to numbers from 256 through to 32768. Always check both the low and high bytes, and then add the two together to get the final result.

Note: The wash cycle count is incremented at the end of the spin cycle.

Diagnostic mode 11: Motor Speed (RPM)

The motor speed is displayed on the Wash Cycle LEDs in binary* form. The current speed (RPM) can be calculated by totalling the binary* value of the Wash Cycle LEDs and multiplying this figure by 10.

Diagnostic mode 12: Water Level

The water level is displayed on the Wash Cycle LEDs in binary* form and can be calculated by totaling the binary* value of the Wash Cycle LEDs and multiplying this figure by 2.

Diagnostic mode 14: Motor Control Software Version

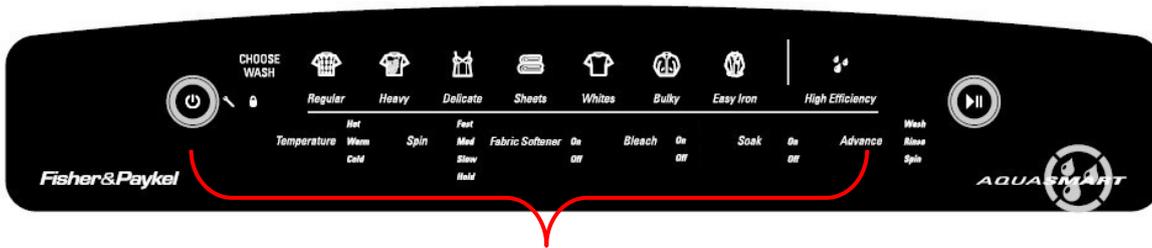
The motor control software version is displayed on the Wash Cycle LEDs in binary* form and can be calculated by totalling the binary* value of the Wash Cycle LEDs.

Diagnostic mode 15: Display Software Version

The display software version is displayed on the Wash Cycle LEDs in binary* form and can be calculated by totaling the binary* value of the Wash Cycle LEDs.

* Binary: To calculate a result displayed in binary form, (see Section 8)

7.10 Showroom Mode



Press and hold **ADVANCE**, then press the **POWER** button

Showroom mode will play the introduction and repeat it continuously, until the machine has been isolated from the power supply.

To access the showroom mode follow the steps below.

- Turn the power supply to the washing machine on.
- Press and hold the **ADVANCE** button, then press the **POWER** button. Hold these buttons for at least two seconds.

To exit, turn off the power supply to the washing machine at the wall.

8 FAULT CODES

1. (00000001) Motor Control Module Fault

The Motor Control Module has encountered an error when writing to an EEPROM address.

Primary Source: Motor Control Module.

Action: Replace Motor Control Module.

3. (00000011) Motor Control Module Fault

The Motor Control Module has found a memory error.

Primary Source: Motor Control Module.

Action: Replace Motor Control Module.

9. (00001000) Size Error

The Motor Control Module has found a fault with the size setting.

Primary Source: Motor Control Module.

Action: Replace Motor Control Module.

10. (00001010) Temperature Sensor (Thermistor) Error

The temperature sensor may be open circuit.

Primary Source: Thermistor

Secondary Source: Motor Control Module

Action:

1. Check the connection of the thermistor to the Motor Control Module.
2. Check resistance of temperature sensor. Resistance should be 10k Ω @ 77 °F / 25°C or 12.5k Ω @ 68°F / 20°C. Replace if faulty.
3. Replace Motor Control Module.

12. (00001100) Flood Protection Error

The Motor Control Module has detected the water level to be above the flood level and tried to pump the excess water out. After pumping for 30 seconds, the pump has been unable to lower the water level below the flood level. The water valves may have stuck on and are letting water in at a flow rate that is higher than the pump can handle, or the pump may be blocked and cannot drain the excess water. Note: Under extremely high flow rate conditions the machine may overflow during the “top-up” routine in agitate.

Primary Source: Water Valves.

Action: If the water valves are on continuously, check that the water valves turn off mechanically, by removing power to the machine.

Secondary Source: Pump system.

Action: Check the pump for blockages and drain hose for correct height and kinking

Tertiary Source: Motor Control Module.

Action: If water valves are being driven on electrically, replace Motor Control Module.

24. (00011000) Dispensing Type Not Set

The Motor Control Module has found that the dispensing type needs to be set. Reselect the dispensing type for the machine by using the DISPENSING TYPE SETTING.

Action, LED Machines: To set the dispensing type, turn the power on at the power point and off at the console. Ensure no LED's are lit before proceeding to the next step, if so press the power button to turn them off.

Press and hold **Wash Temperature button** then press **Power**.

Press the **Temperature button** to scroll through the dispensing type options, stopping at the desired dispensing type setting.

Cold LED = No dispensing

Warm LED = Double dispensing

Hot LED = Triple dispensing

Press Power button to confirm the setting and to exit this mode.

Action, LCD Machines: To set the dispensing type, turn the power on at the power point and off at the console. Ensure no LCD is not lit before proceeding to the next step, if so press the power button to turn it off.

Press the **Start/Pause** and Left Scroll (left arrow) buttons at the same time

Use the Left and Right Scroll (arrow) buttons to select the appropriate dispensing type

Press Power button to confirm the setting and to exit this mode.

26. (00011010) Detergent Valve Fault.

The Motor Controller module has detected that the detergent valve (purple clip) is faulty. It determines this by measuring voltages from the valve diagnostic circuit. The most likely cause is that the valve harness has not been connected correctly or the valve is open circuit.

Primary Source: Wiring.

Action: Check the valve harness is correctly fastened to the valve or the pins are not bent backwards.

Secondary Source: Detergent Valve.

Action: Check the valve coil is not faulty (i.e. not open circuit – See 1.8).

Tertiary Source: Motor Controller module.

Action: Replace the Motor Controller module.

27. (00011011) Fabric Softener Valve Fault.

The Motor Controller module has detected that the fabric softener valve (yellow clip) is faulty. It determines this by measuring voltages from the valve diagnostic circuit. The most likely cause is that the valve harnesses has not been connected correctly or the valve is open circuit.

Primary Source: Wiring.

Action: Check the valve harness is correctly fastened to the valve or the pins are not bent backwards.

Secondary Source: Fabric Softener Valve.

Action: Check the valve coil is not faulty (i.e. not open circuit – See 1.8).

Tertiary Source: Motor Controller module.

Action: Replace the Motor Controller module.

36. (00100100) Water Leak Fault

The Motor Control Module has needed to top up the water level more than 4 times during agitate. This is excessive, as normally only one or two top ups are required to replace the air that has escaped from a full load during agitate. The most likely cause is that the machine is siphoning. The other alternative is that the machine has developed a leak.

Primary Source: Pump System.

Action:

- 1) Check the height of the drain hose outlet. Minimum 33.46in / 850mm, maximum 47.24in / 1200mm.
- 2) Check that the hose guide is fitted and check that the hose does not protrude more than .78in / 20mm beyond the guide.

Secondary Source: Mechanical.

Action:

- 1) Check the pressure tube connections on the outer basket and Motor Control Module.
- 2) Check that the drive shaft seal and the pump housing seal have not developed a leak.

Tertiary Source: Motor Control Module.

Action: Replace Motor Control Module.

37. (00100101) Pump Blocked Error (No change in the water level)

While draining, the water level reading from the pressure sensor has not changed for over 3 minutes. There are four likely reasons for this fault.

- 1) The drain hose or the pressure switch hose has been squashed or kinked and the pump out rate has been dramatically reduced.
- 2) The pump is partially or fully blocked.
- 3) The pump is not operating due to Motor Control Module, wiring or pump failure. This fault could also appear if the machine is pumping to an unusually high head of drain hose or into an extended length of drain hose.
- 4) A diverter valve fault or blockage, water level is not altering as the diverter is stuck in the recirculation mode, giving the module the appearance the pump is not lowering the water level.

Primary Source: Pump System.

Action:

- 1) Check that the drain hose has not been kinked.
- 2) Check the length of the drain hose and try to reduce the length if excessively long. A 39.36in / 1 metre extension hose of the same diameter fitted to the existing drain hose is the maximum allowable length.
- 3) Check for open circuit windings in the pump. (**Note: Pumps are fitted with a thermal cut-out, which will reset on cooling.**)
- 4) If the basket is empty of water, remove the pump from the pump housing and check that it is not blocked. Also check the drain hose is not blocked.
- 5) If the basket contains water, then service the pump from the top of the machine by removing the top deck and inner basket. Bail out the water, remove the pump cap and hood and clear the restriction.

Secondary Source: Wiring.

Action:

- 1) Check the pump harness is connected correctly to the pump.
- 2) Check continuity of the pump harness.

Tertiary Source: Motor Control Module module.

Action: Activate the pump by operating the machine in spin mode. Check the pump is rotating. If it is not operating, and Primary and Secondary checks have been performed, then replace the Motor Control Module.

38. (00100110) Pressure Sensor Fault

The Motor Control Module has detected and recorded an empty water level while agitating. The water level must have been greater than empty for the machine to start agitating initially.

Primary Source: Mechanical.

Action: Check the pressure tube is attached and has not been cut.

Secondary Source: Motor Control Module.

Action: Replace the Motor Control Module, if the pressure tube shows no sign of being faulty.

39. (00100111) Pressure Tube Fault

The Motor Control Module has detected a fault with the pressure tube.

Primary Source: Mechanical.

Action: Check that the pressure tube is not blocked with water or dirt, is not kinked and it attached securely.

Secondary Source: Motor Control Module pressure sensor.

Action: Replace the Motor Control Module.

40. (00101000) Basket Dis-engage Fault

While carrying out a basket check, the Motor Control Module has found that the basket is not engaged even though the pressure sensor indicates that the basket is empty. The Motor Control Module continues to check for 2 minutes, after which time it displays this fault. The first two areas to check are the clutch and the pressure tube. If these two appear correct, then the fault could be in the pressure sensor in the Motor Control Module.

Primary Source: Mechanical.

Action:

- 1) Check that there are no clothes or other foreign objects preventing the clutch from re-engaging. Excessive suds can stop the basket rotating.
- 2) If the machine is empty of water, carry out a clutch disassembly procedure and check the spline drive.
- 3) Next check that the pressure tube has not come off and that it is not kinked.

Secondary Source: Motor Control Module.

Action: Replace Motor Control Module.

41. (00101001) Temperature Sensor Fault (Thermistor)

The temperature sensor is measuring temperatures above 230°F (110°C). This fault is most likely due to a short circuit in the sensor line.

Primary Source: Temperature Sensor (Thermistor).

Action:

- 1) Check the connection from the thermistor the Motor Control Module, especially check for a short circuit.
- 2) Check the resistance of the thermistor. Resistance should be 10kΩ @ 77°F (25°C) or 12.5kΩ @ 68°F (20°C). Replace if faulty.
- 3) Replace the Motor Control Module.

45. (00101101) Display Memory Check Fault

On power up, the display has checked its memory against a known reference and found differences.

Primary Source: Display Module.

Action: Replace Display Module.

46. (00101110) Display Memory EEPROM Check

The Intuitive™ Display has detected a problem with its internal EEPROM.

Primary Source: Display Module.

Action: Replace Display Module.

48. (00110000) Hot and Cold Valve Coil Faulty

The Motor Controller module has measured voltages from the valve diagnostic circuit that indicate both the hot and cold valves are faulty.

Primary Source: Wiring.

Action: Check the valve harnesses are correctly fastened to the valves or the pins are not bent backwards.

Secondary Source: Water Valves.

Action: Check the valve coils are not faulty (i.e. open circuit).

Tertiary Source: Motor Controller module.

Action: Replace the Motor Controller module.

49. (00110001) Cold Valve Coil Faulty

The Motor Control Module has measured a voltage from the valve diagnostic circuit that indicates the cold valve is faulty. The most likely cause is that the valve harness has not been connected correctly or the valve is open circuit. See fault 48 for service procedure.

50. (00110010) Hot Valve Coil Faulty

The Motor Control Module has measured a voltage from the valve diagnostic circuit that indicates the hot valve is faulty. The most likely cause is that the valve harness has not been connected correctly or the valve is open circuit. See fault 48 for service procedure.

56. (00111000) Basket Check No Valid Fault

While carrying out a basket check, the machine has not been able to determine a valid basket status and so the Display flags this fault. This fault differs from fault code 40 in that a valid basket status could not be determined.

Primary Source: Loading.

Action: Remove items until the remaining ones can move freely, or rearrange the load so that the clothes are evenly distributed around the basket, or select a higher water level. If the load was to one side of the basket or too heavy, it can be possible for the agitator to bind in one direction when trying to sense basket float.

Secondary Source: Mechanical.

Action:

1. Check the machine is not siphoning.
2. Check that there are no clothes or other foreign objects preventing the clutch from re-engaging, and that there aren't any defects with the clutch mechanism.
3. Check that the pressure tube has not come off and that it is not kinked.

Tertiary Source: Rotor Position Sensor.

Action: Replace the Rotor Position Sensor.

Quaternary Source: Motor Control Module.

Action: Replace the Motor Control Module.

57. (00111001) Brown Out During Display EEPROM Write Fault

The Display has requested the Motor Control Module to perform an EEPROM write. Prior to writing, the Motor Control Module has tested the 15 Volt supply and found that it is below the safety level for writing EEPROM and has reported this to the Display. This may be due to transients at the time of writing or due to a faulty Motor Control Module.

Primary Source: Motor Control Module.

Action: Replace Motor Control Module.

60. (00111100) Motor Control Memory Check Fault

On power up, the Motor Control Module has checked its memory against a known reference and found differences.

Primary Source: Motor Control Module.

Action: Replace Motor Control Module.

68. (01000100) Pressure Transducer Error – Count Too High**69 (01000101) Pressure Transducer Error – Zero Too Low****70 (01000110) Pressure Transducer Error – Zero Too High****72. (01001000) Pressure Transducer Error – Maximum Positive Drift**

The pressure transducer sensor is faulty or damaged.

Primary Source: Motor Control Module.

Action: Replace Motor Control Module.

104. (01101000) See Fault Code 106**105. (01101001) Comms Error Time Out**

These faults are reported when the Display Module detects an error in the communications between the Display Module and the Motor Control Module. Can also occur when display change with the power still on.

Primary Source: Display Module.

Action: Replace Display Module.

Secondary Source: Motor Control Module.

Action: Replace Motor Control Module.

Tertiary Source: Rotor Position Sensor

Action: Replace Rotor position Sensor. If this corrects the fault refit the original Display Module and/or Motor Control Module.

106. (01101010) Display Module to Motor Control Module Communications Error

These faults are reported when the Display Module detects an error in the communications between the Display Module and the Motor Control Module.

Primary Source: Display Module.

Action: Replace Display Module.

Secondary Source: Motor Control Module.

Action: Replace Motor Control Module.

107. (01101011) Motor Control Module Reset Error

The Display Module has detected that the Motor Control Module has reset when it should not have. This can be due to a Motor Control Module supply disturbance or microprocessor failure.

Primary Source: Motor Control Module.

Action: Replace Motor Control Module.

108. (01101100) Comms CRC Error – See Fault Code 106**110. (01101110) Motor Bridge Thermistor Open Circuit****111. (01101111) Motor Bridge Thermistor Short Circuit**

The motor bridge thermistor is faulty or damaged

Primary Source: Motor Control Module.

Action: Replace Motor Control Module.

112. (01110000) Motor Current Sense Too High

The motor current sense circuit is faulty.

Primary source: Motor Control Module.

Action: Replace Motor Control Module.

113. (01110001) AC Pump Thermistor Short Circuit

The AC Pump thermistor is faulty or damaged.

Primary source: Motor Control Module.

Action: Replace Motor Control Module.

130. (10000010) Rotor Position Sensor Error

The Motor Control Module has found an error in the pattern received from the Rotor Position Sensor. Likely causes of this fault are a bad connection on the harness between the Rotor Position Sensor and the Motor Control Module, or a faulty Rotor Position Sensor.

Primary Source: Wiring.

Action: Check for corrosion on the RAST connector of the Rotor Position Sensor and the Motor Control Module connector.

Secondary Source: Rotor Position Sensor.

Action: Check the Rotor Position Sensor with an R.P.S. tester. Replace if faulty.

Tertiary Source: Motor Control Module.

Action: Replace Motor Control Module.

Quaternary Source: Rotor

Action: Ensure the correct rotor for this series of machine has been fitted (Refer to Section 4.8.2).

136. (10001000) Motor Stall

The Motor Control Module has been unable to start the motor.

Primary Source: Wiring.

Action: Measure/check the motor harness, connectors and motor for discontinuity. This can be done by taking a resistance measurement between phases of the motor harness at the Motor Control Module end. Nominal resistance should be around 32Ω .

Secondary Source: Motor.

Action:

- 1) Check free rotation of the agitator and basket by rotating by hand. Bearings and seals may be seized.
- 2) Check the Rotor Position Sensor and associated harness for water, mechanical damage or corrosion.

Tertiary Source: Motor Control Module.

Action: If the primary and secondary checks pass inspection, then replace the Motor Control Module.

160. (10100000) Basket Engaged In Agitate

The bowl has re-engaged itself during agitate.

Primary Source: Mechanical.

Action:

- 1) Check that the rotating basket assembly is not jammed to the agitator with any foreign object that may be caught under the agitator skirt.
- 2) Check that the clutch teeth are not locked together with dirt, lint, etc.
- 3) Make sure the basket is not overloaded with too many clothes.
- 4) If none of the above appears to be at fault, then check the air bell at the bottom of the inner basket for leaks.

Secondary Source: Installation (drain) set up

Action: Check that the drain hose is fitted into the drain caddy and extends no more than $\frac{3}{4}$ " (20 mm) from the end. Check if fitted to a stand pipe that the drain hose is not pushed down to far.

Tertiary Source: Motor Control Module.

Action: If the machine is empty of water at fault, it is possible that the pump circuit is faulty and has caused a pump out during wash. This would cause the basket to re-engage during agitate and the Motor Control Module to display this fault. Replace Motor Control Module.

220. (11011100) EEPROM Model Map Not Programmed

On power up, the Motor Control Module has detected a fault in its memory.

Primary Fault: Motor Control Module.

Action: Change Motor Control Module.

230. (11100110) EEPROM Value out of Range

Wrong version detected

Primary Fault: Motor Control Module is the wrong version.

Action: Change Motor Control Module.

232. (11101000) COMMS Timeout 5 Sec

IW only problem, either the Display or Motor Control Module has not responded in time.

Primary Fault: Display Module fault.

Action: Replace Display Module.

Secondary Fault: Motor Control Module fault.

Action: Replace Motor Control Module.

233. (11101001) EEPROM Read Error

Problem in reading the EEPROM data, coming from the Motor Control Module.

Primary Fault: Motor Control Module fault.

Action: Replace Motor Control Module.

234. (11101010) Lid Lock Open Circuit.

Check harness to Lid Lock, the connections at the Motor Control Module and lid lock ends.

Primary Fault: Connectors on the harness at either end could be at fault.

Action: Replace Harness.

Secondary Source: Lid lock has failed to be activated.

Action: Replace Lid Lock Assembly.

Tertiary Source: Motor Control Module has not responded to the lid lock being activated.

Action: Check the lid has a tang and is fitted correctly to activate the lid lock. If this is all in order, the Motor Controller must be faulty and needs replacing.

235. (11101011) Lid Lock Short Circuit.

Lid Lock fault, not activated when instructed to by the Motor Control Module.

Primary Fault: Lid Lock mechanism has jammed or failed.

Action: Check resistance across the connections, this should be 63 ohms +/- 10% @ 20 °C. If faulty, replace the Lid Lock assembly.

236. (11101100) Incompatible EEPROM Version.

Failed to start with fault being immediately displayed.

Primary Fault: Motor Control Module is wrong one.

Action: Fit correct Motor Control Module.

237. (11101111) Temperature Sensor Error

The electronics have picked up a continuity problem, the same as fault code 10.

Primary Fault: The sensor has failed either in the harness or the connection to the thermistor.

Action: Replace the thermistor (temperature sensor).

Secondary Source: Motor Control module has failed to read the temperature. Check connections.

Action: Replace Motor Control Module if the connections look fine and the fault still occurs.

238. (11101010) Lid Lock Open Circuit

Check Harness to Lid Lock and connections at the Motor Control Module and lid lock ends.

Primary Fault: Connector to the harness, either end could be at fault.

Action: Replace Harness.

Secondary Source: Lid Lock has failed to be activated.

Action: Replace Lid Lock.

Tertiary Source: Motor Control Module has not responded to the Lid Lock being activated.

Action: Check the lid has a tang and is fitted correctly to activate the Lid Lock. If this is all in order, the Motor Control Module must be at fault and needs to be replaced.

240. (11110000) Hall Out Of Order. RPS Fault

Same as previous Hall Error faults See fault code 130 for directions or the incorrect Rotor for the machine has been fitted.

241. (11110001) Function Time Out

A fault has occurred with the Display Module.

Primary Fault: Display Module has failed.

Action: Replace Display Module.

Secondary Fault: Motor Control Module has failed.

Action: Replace Motor Control Module.

243. (11110011) Stepper Test Failure

Rotor Position Sensor fault. The Motor Control Module has attempted a motor step test and found the motor has not stepped to the correct position.

Primary Source: Wiring.

Action: Check the Rotor Position Harness for continuity and that the connectors are correctly fitted to the Rotor Position Sensor and the Motor Control Module

Check the continuity of the Motor Harness and that the connectors are correctly applied to the Motor and Motor Control Module.

Secondary Source: Motor.

Action: Check continuity of motor phases. Check the bridge terminal on the stator is not open circuit or burnt. Replace Stator.

Tertiary Source: Rotor Position Sensor.

Action: Check the Rotor Position Sensor patterns with a RPS Tester. If faulty fit new Rotor Position Sensor.

Quaternary Source: Motor Control module.

Action: Replace the Motor Control Module.

245. (11110101) Smart Pump Stall

This fault is normally as a result of the pump stalling during its normal operation.

Primary Source: Pump stator winding open circuit.

Action: Check the resistance of the pump stator. Resistance per Phase: $8.1\Omega \pm 10\%$ ($16.2\Omega \pm 10\%$ across any two phases).

Secondary Source: Pump System.

Action:

1. Check that the drain hose has not been kinked.
2. Check the length of the drain hose. A 1 metre extension hose of the same diameter fitted to the existing drain hose is the maximum allowable length.
3. Check that the machine is not pumping to a head that exceeds the pump's limits (2.4 meters is maximum head height).
4. Remove the inner bowl and check that the pump hood hasn't been fitted around the wrong way.
5. Check for lint streaming from the pump hood that may be blocking the cap inlet.
6. Remove the pump hood and cap. Check for lint, grit and debris.
7. Check for free movement of the flapper and that the impeller hasn't come off the rotor.
8. Check for free movement of the flapper (replace if broken).
9. Check for lint and foreign objects in the ports of the pump housing.

Tertiary Source: Motor Control Module.

Action: Replace Motor Control Module.

246. (11110110) Bleach Valve Fault

The Motor Controller module has detected that the Bleach valve (red clip) is faulty. It determines this by measuring voltages from the valve diagnostic circuit. The most likely cause is that the valve harness has not been connected correctly or the valve is open circuit.

Primary Source: Wiring.

Action: Check the valve harness is correctly fastened to the valve or the pins are not bent backwards.

Secondary Source: Bleach Valve.

Action: Check the valve coil is not faulty (i.e. not open circuit – See 1.8).

Tertiary Source: Motor Controller module.

Action: Replace the Motor Controller module.

247. (11110111) Smart pump Flapper Fault

The Motor Control Module has registered a drop in the water level during the recirculation phase of the wash cycle. Water is being drained instead of recirculating. The most likely cause is that the flapper is stuck in the drain position.

Primary Source: Flapper valve.

Action: Check for free movement of the flapper valve (replace if broken or damaged).

248 (11111000) SmartPump Top Up Fault.

More than 6 attempts have been made to top-up the water level in the bowl during recirculation.

Primary Source: Poor Flapper Seal.

Action:

1. Clean any foreign objects out of the pump, concentrating especially on the flapper and drain/re-circulating port areas.
2. Remove the flapper to ensure no foreign objects exist below and around the flapper.
3. Check the flapper damage, especially the lip seals. If damaged, replace.

Secondary Source: Cap not tight, warped, damaged (worn).

Action:

1. Check that the hood/cap is tight. If loose and screws are difficult to tighten, foreign objects could be in the screw boss. Remove pump fully and inspect/ replace if in doubt.
2. Check the cap is not warped or it is not excessively worn in the area where it contacts the flapper. Replace the cap if warped or worn.

Tertiary Source: Damaged Pump Housing Port.

Action: Check that there is no excessive wear to the pump housing port caused by foreign objects. Replace pump if necessary.

Quaternary Source: Motor Control Module.

Action: Replace Motor Control Module.

249. (11111001) SmartPump Timeout Fault (No change in water level)

While draining, the water level reading from the pressure sensor has not changed for 3 minutes. This fault will generally be caused by a problem with the pump system, from either a blockage or restriction in the pump system. This will also flag if the machine is By-Passing (refer to section 4.9.11).

Primary Source: Pump System.

Action:

1. Check that the drain hose has not been kinked.
2. Check the length of the drain hose. A 1-metre extension hose of the same diameter fitted to the existing drain hose is the maximum allowable length.
3. Check that the machine is not pumping to a head that exceeds the pump's limits (2.4 meters is maximum head height).
4. Remove the inner bowl and check that the pump hood hasn't been fitted around the wrong way.
5. Check for lint streaming from the pump hood that may be blocking the cap inlet.
6. Remove the pump hood and cap. Check for lint, grit and debris.
7. Check for free movement of the flapper and that the impeller hasn't come off the rotor.
8. Check for free movement of the flapper (replace if broken).
9. Check for lint and foreign objects in the ports of the pump housing.

Secondary Source: Motor Control Module.

Action: Replace Motor Control Module.

250. (11111010) SmartPump Loss of Sync.

This fault is normally as a result of the pump not starting and is usually caused by an object that has got into the pump, and is either under or on top of the impeller, which is causing the motor to stall when trying to start.

Primary Source: Pump stator winding open circuit.

Action: Check the resistance of the pump stator. Resistance per Phase: 8.1Ω +/- 10% (16.2Ω +/- 10% across any two phases).

Secondary Source: Pump System.

Action:

1. Check that the drain hose has not been kinked.
2. Check the length of the drain hose. A 1 metre extension hose of the same diameter fitted to the existing drain hose is the maximum allowable length.
3. Check that the machine is not pumping to a head that exceeds the pump's limits (2.4 meters is maximum head height).
4. Remove the inner bowl and check that the pump hood hasn't been fitted around the wrong way.
5. Check for lint streaming from the pump hood that may be blocking the cap inlet.
6. Remove the pump hood and cap. Check for lint, grit and debris.
7. Check for free movement of the flapper and that the impeller hasn't come off the rotor.
8. Check for free movement of the flapper (replace if broken).
9. Check for lint and foreign objects in the ports of the pump housing.

Tertiary Source: Motor Control Module.

Action: Replace Motor Control Module.

252. (11111100) Bridge Test Failure

The Motor Control Module has tested the motor bridge electronics and sensed current when there should not have been any.

Primary Fault: Motor Control Module

Action: Replace Motor Control Module

254 (11111110) Motor Control Version to Old

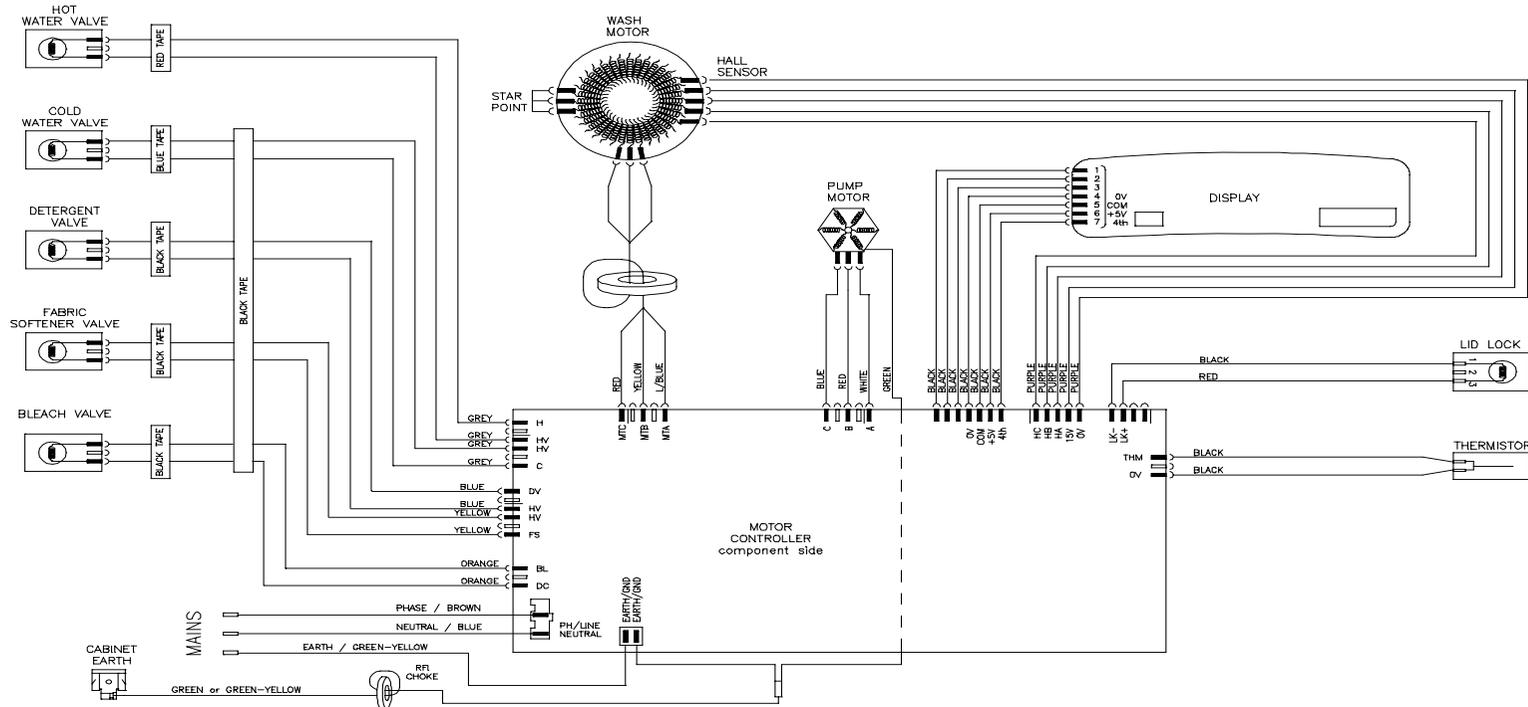
The Motor Control Module software version is too old for the display to support.

Primary Fault: Motor Control Module

Action: Replace Motor Control Module

9 WIRING DIAGRAM

Resistance Table	
Valve	64Ω @ 68°F / 20°C
Pump	16.2Ω
Lid Lock	63Ω +/- 10% @ 68°F / 20°C
Thermistor	10KΩ @ 77°F / 25°C
Stator	39Ω +/- 10%



10 SERVICE PROCEDURES

Note: Prior to carrying out any service procedures, ensure that the machine has been isolated from the power supply.

10.1 Accessing Components in Console Area

- Remove the lid.
- Remove the two screws at the rear of the console securing the console to the top deck.
- Tilt the console forward.

10.2 Removal of Display Module

- Follow procedures for accessing components in console area (refer to Section 10.1).
- Disconnect the wiring harness from the motor control module.
- Remove the 4 screws securing the display module to the console
- Remove the display module from the housing by pivoting the display away from the console.

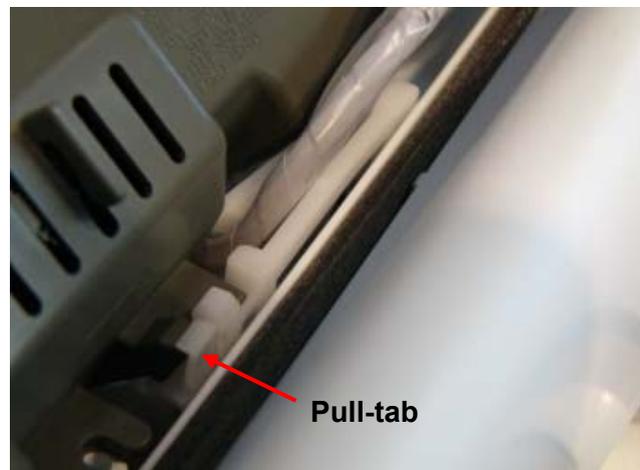


Reassembly:

Refit in the reverse manner.

10.3 Removal of motor Control Module

- Follow procedures for removal of Display Module. (Refer to Section 10.2).
- Disconnect all wiring harnesses to the Motor Control Module.
- Remove the pressure tube by squeezing on the legs of the spring clip. Pull gently on the tube to slide it off the spigot. **Note: If too much force is used on removal or reinsertion, damage to the pressure transducer may occur.**
- Pull the tab on the top deck harness clamp towards the front to release the Motor Control Module.
- Lift the Motor Control Module upwards at the front and out.



Reassembly:

Refit in reverse manner. **Important:** When refitting pressure tube to pressure transducer ensure that the pressure tube is clear of any water droplets before operating the machine on a fill cycle. If the basket is full of water, drain the water then blow down the tube before reconnecting.

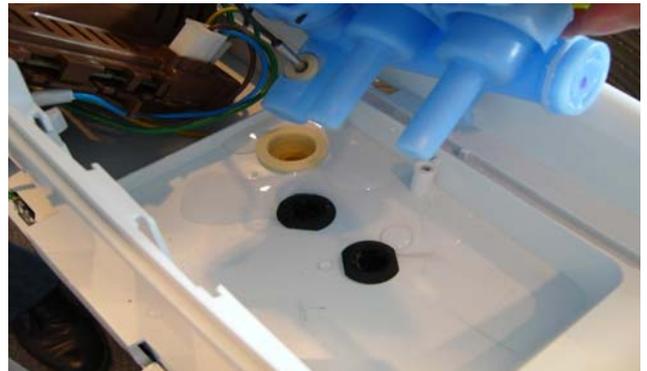
10.4 Removal of Inlet Valve Assembly

- (a) Follow procedures for accessing components in console area (refer to Section 10.1).
- (b) Remove screw securing the valve body to the top deck.
- (c) Disconnect wiring harness from each coil.
- (d) Disconnect Thermistor harness from motor control module.
- (d) Depress tab from the rear of the console and slide valve assembly upwards from the top deck.



Refitting Valve Block:

- (a) Ensure the area beneath the valve assembly is dry.
- (b) The spigots of the valve assembly must be lubricated with a small amount of either Petroleum Jelly or silicon paste before insertion.



Note: *The wires that are connected from the valve assembly to the motor control module must be placed between the coils, and must not sit on top. If the wires sit in close proximity to the display module and may cause interference.*

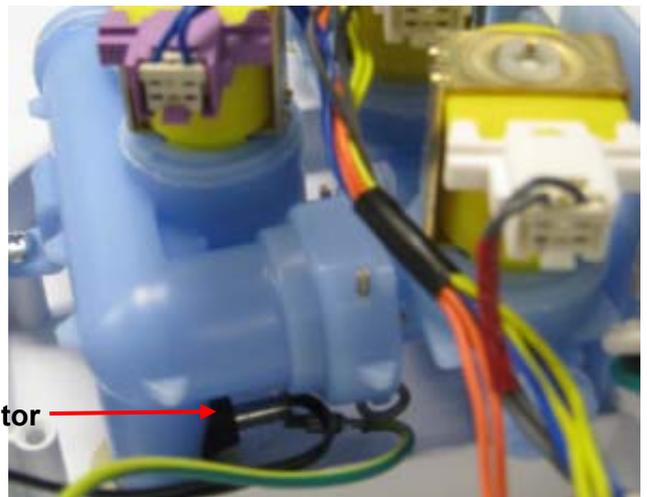
10.5 Removal of Thermistor

- (a) Follow procedures for removal of Display Module. (Refer to Section 10.2).
- (b) Disconnect thermistor-wiring harness to the Motor Control Module.
- (c) Slide body of thermistor out from the valve.

Reassembly:

Refit in reverse manner, ensuring when refitting the thermistor that the thermistor is pushed until it comes to a stop against the back wall of the elbow.

Thermistor →

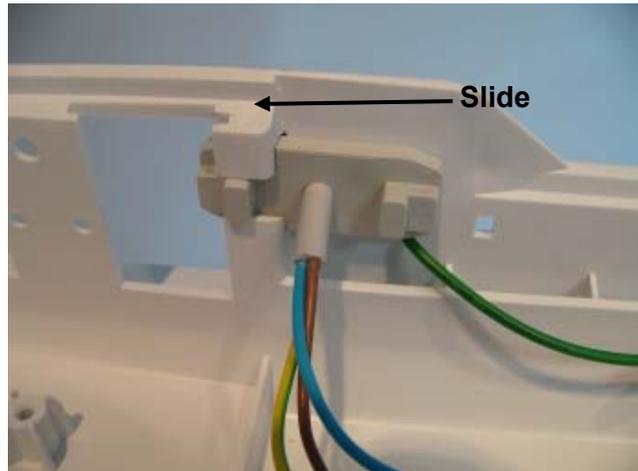


10.6 Removal of the Cord Set

- (a) Follow procedures for removal of Inlet Valves Assembly. (Refer to Section 10.3).
- (b) Disconnect the mains plug to the Motor Control Module.
- (c) Slide the strain relief to the left and slide out.

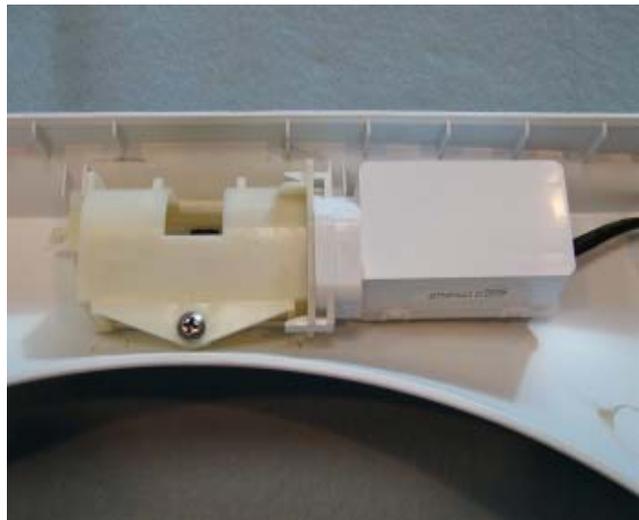
Reassembly:

Refit in reverse manner. When refitting the thermistor, ensure that the thermistor is pushed until it comes to a stop against the back wall of the elbow.



10.7 Removal of Lid Lock

- (a) Follow procedures for accessing components in console area. (Refer to Section 10.1).
- (b) Disconnect lid lock wiring harness to the Motor Control Module.
- (c) Remove Motor Control Module from the top deck (Refer to Section **Error! Reference source not found.**) leaving all remaining harnesses and press tube connected.
- (d) Remove wiring cover from top deck.
- (e) Carefully remove the two lid buffers from the front side top of the deck by levering upward, taking care not to damage the top deck.
- (f) Remove the two screws under the buffers securing the top deck to the cabinet.
- (g) Lift the top deck upwards and remove the screw securing lid lock to the underside of the top deck.
- (h) Move the front of the lid lock downwards and outwards.
- (i) Unclip the right hand rear tab of the top deck from the cabinet and raise the corner of the top deck upwards slightly to allow the wiring harness to be removed.



Reassembly:

Refit in the reverse manner.

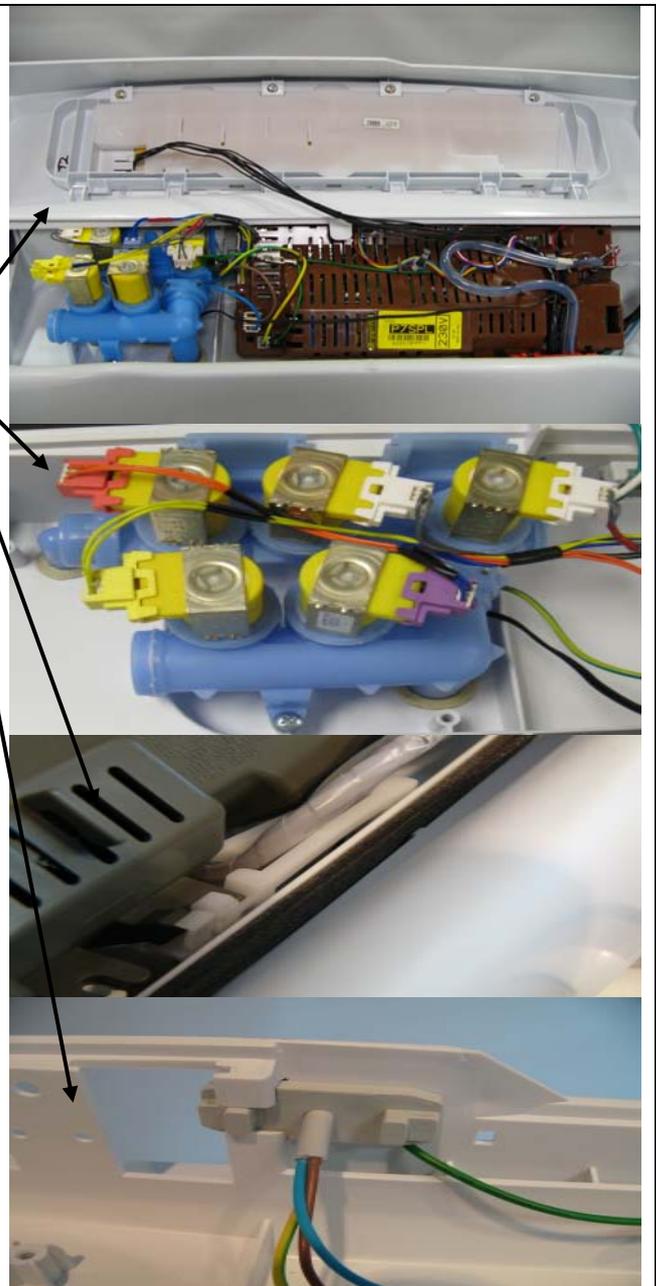
10.8 Raising Top Deck

- (a) Remove the lid.
- (b) Carefully remove the two lid buffers from the front side top of the deck by levering upwards, taking care not to damage the top deck.
- (c) Remove the two screws under the buffers securing the top deck to the cabinet.
- (d) Prior to raising the top deck ensure that there is no water, softener or bleach in the dispenser.
- (e) Raise the top deck.



10.9 Removal of Top Deck

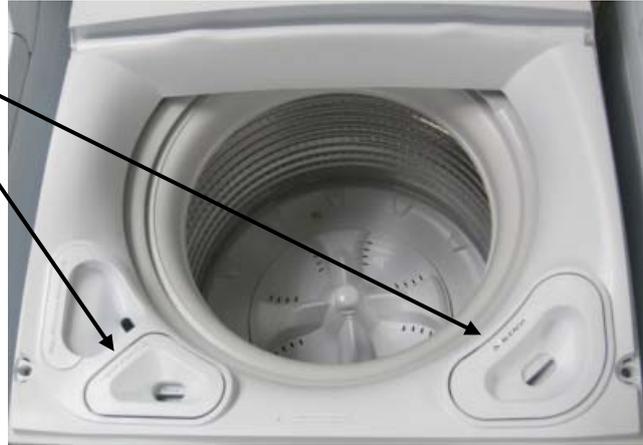
- (a) Disconnect the mains cord from the power socket.
- (b) Ensure the water faucets are turned off
- (c) Disconnect the water inlet hoses from the rear of the machine.
- (d) Remove the lid.
- (e) Follow procedures for removal of display module. (Refer to section 10.2)
- (f) Follow procedures for removal of Inlet Valve Assembly. (Refer to Section 10.3)
- (g) Follow procedures for removal of Motor Control Module. (Refer to section **Error! Reference source not found.**)
- (h) Follow procedures for removal of Cord Set. (Refer to section 10.6)
- (i) Carefully remove the two lid buffers from the front left & right side of the top deck by levering upwards, taking care not to damage the top deck.
- (j) Remove the two screws under the buffers securing the top deck to the cabinet.
- (k) Lift the top deck upwards and release the two rear tabs.
- (l) Lift the top deck clear.



10.10 Removal Of Softener and Bleach Funnel

- (a) Lift the lid.
- (b) To remove the cap, lift it upwards.

Reassembly:
Refit in the reverse manner ensuring that the funnel is clipped fully home to ensure that the bleach dispenser functions correctly.



10.11 Removal Of Detergent Cover

Note: Only remove the cover if it is essential to do so. If removed, the cover and the gasket P/No 421047 must be replaced.

- (a) Lift the lid.
- (b) To remove the cap, lift upwards (Photo1).

Reassembly:
Refit in reverse manner.

Note: On removal of the cover the retaining clips will be damaged. If the cover is refitted rather than being replaced, the cover will not provide an adequate seal, which may cause the water to fountain from the dispenser during fill. The gasket must also be replaced for the same reason (Photo2).

Photo 1



Photo 2

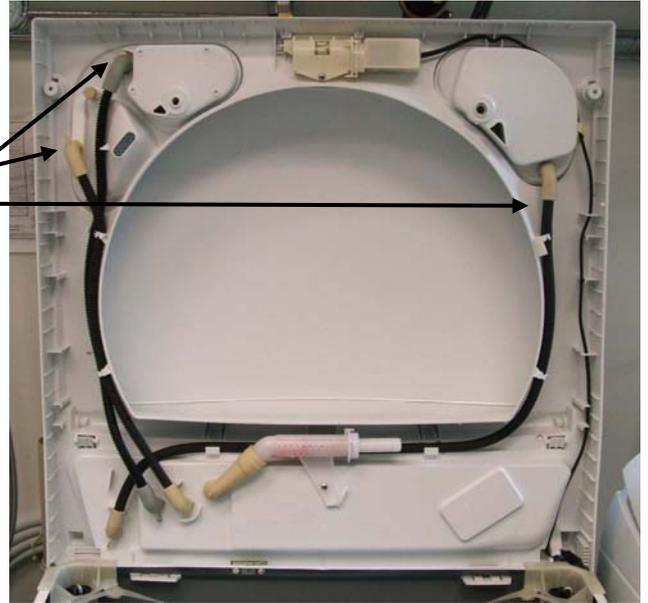


10.12 Removal Of Dispensing Hoses

- Follow procedures for removal of inlet valve assembly. (refer to Section 10.3).
- Follow procedures to raise the top deck (refer to Section **Error! Reference source not found.**).
- Remove hose clips from the hoses located at the front of the top deck.
- Remove the hose(s).

Reassembly:

Refit in the reverse manner, ensuring each hose is fitted to the correct position and that they are properly clipped in place.

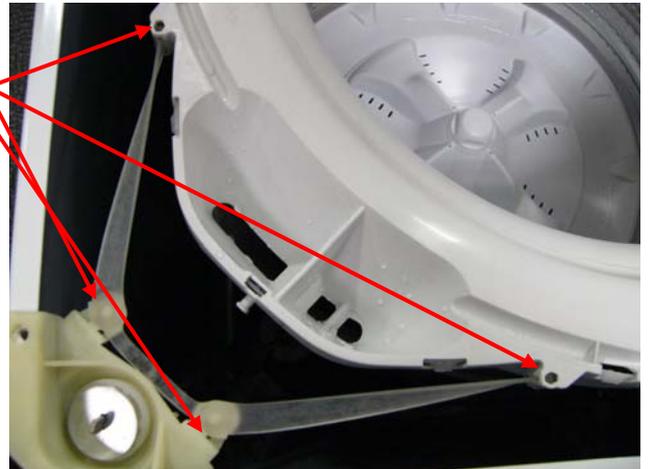


10.13 Removal of Straps

- Follow procedures for raising the top deck (refer to Section **Error! Reference source not found.**).
- Unclip each end of the straps from the neck ring.
- Unclip the strap from the suspension rod.

Reassembly:

Refit in the reverse manner, ensuring that there are no twists in the straps.



10.14 Removal of Neck Ring

- Follow procedures for raising the top deck (refer to Section **Error! Reference source not found.**).
- Unclip the strap from the suspension rod.
- Unclip the neck ring from the outer tub assembly.

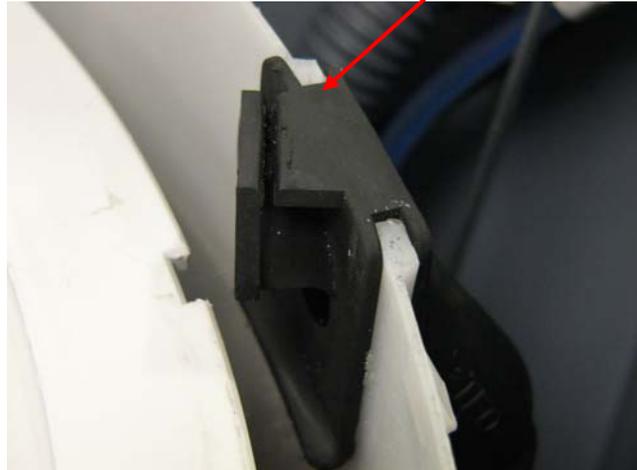


Reassembly:

- (a) Prior to fitting the neck ring, ensure the recirculating nozzle is fitted to the outer bowl correctly.
- (b) Fit the straps to the neck ring.
- (c) Fit the neck ring to the outer bowl, ensuring that all the clips are engaged.
- (d) Fit the straps to the suspension rods ensuring and that there are no twists in the straps.

Note: *The top of the nozzle must be dry before fitting the neck ring. If any water is present, a capillary action may take place which will cause water to run down the outside of the bowl and onto the floor.*

The top of the nozzle must be dry before refitting the neck ring



10.15 Removal of Low Profile Agitator

Note: *Removal of low profile agitator is not intended to be done by the user, as regular maintenance in this area should not be required.*

- (a) Lift the lid and remove the low profile agitator cap by using an appropriate flat bladed screwdriver in one side of the slots. Lever the cap upwards until it disengages. The cap can then be removed by hand.
- (b) Remove the bolt by turning anti-clockwise using a 7/16th (13mm) open-ended spanner or an adjustable spanner.
- (c) Remove the low profile agitator.



Note: *If the low profile agitator does not lift off easily, hold the top balance ring of the inner basket, and then jerk the bowl upwards. This action will push the agitator upwards.*



Reassembly:

- (a) Refit the agitator, ensuring that it is pushed as far down as it can go.
- (b) Insert the bolt into the shaft. Hand tighten until the first click has been felt, then using the open-ended or adjustable spanner, tighten a further 4 more clicks. Over tightening will cause excessive damage to the castellations on the agitator, and may cause the head of the bolt to shear off. **Failure to tighten the bolt correctly will cause the agitator to lift off the spline on the shaft during wash.**



- (c) Fit the cap to the top of the bolt. Using your hand, hit firmly on top of the cap until the clips on the cap engage to the bolt.

10.16 Removal of Inner Basket

- (a) Follow procedures for removal of Straps. (Refer to Section 10.13).
- (b) Follow procedures for removal of Neck Ring (Refer to Section 10.14)
- (c) Follow procedures for removal of Agitator. (Refer to Section 10.15).
- (d) Lift inner basket upwards and clear of machine.

Note: *If the inner basket is tight on the shaft pressure may need to be placed on the top of the shaft, while at the same time jiggling the inner basket upwards.*

Reassembly:

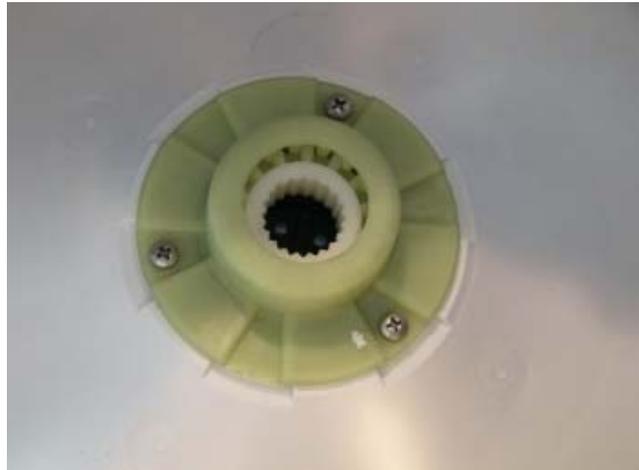
Refit in the reverse manner.

10.17 Removal of Clutch Mechanism (Spline Drive / Spline Driven)

- (a) Follow procedures for removal of Inner Basket. (Refer to Section 10.16).
- (b) Remove the 3 screws securing the spline driven to the inner basket.

Reassembly:

Refit in the reverse manner. Ensure that the screws are tightened sufficiently with out over tightening.



10.18 Removal of Pump Hood & Cap (Impeller & Flapper Inspection)

- (a) Follow procedures for removal of neck ring (refer to Section 10.14).
- (b) Follow procedures for removal of low profile agitator (refer to Section 10.15).
- (c) Remove the inner bowl by lifting the inner bowl upwards and clear of machine.

Note: If the inner bowl is tight on the shaft, pressure may need to be placed on the top of the shaft, while at the same time jiggling the inner bowl upwards.

- (d) Remove the two bolts securing pump cap to the outer bowl.



Note: It is important that the screw bosses are kept free of grit. If the bosses have any grit, this can reduce the travel of the screw, which will lead to a poor fit of the cap, which in turn will cause bypassing (refer to Section 4.9.11). Bypassing can cause water on the floor, especially if the water dribbles from the recirc nozzle on to a spinning bowl.

Grit in the bosses introduces stress in the plastic when the screw is fitted, which can lead to the cracking of the boss, which may in turn cause leaking.

- (d) The impeller and flapper area of the pump can now be inspected.

Reassembly:

Refit in reverse manner.

Note: There are features on the hood and cap that make it difficult to fit in the incorrect position. Ensure the orientation of these parts is correct before fitting.



10.19 Removal of Stator (SmartPump™) – Testing / Inspection Purposes Only

Note: The stator is not available as a separate spare part, Use this procedure for inspecting and testing the stator only.

- (a) Tilt the rear of the machine carefully against the wall ensuring that the machine is stable and locked in position, take necessary precautions not to damage the wall or the machine.
- (b) Disconnect earth by sliding connector apart.
- (c) Remove the three screws holding the Stator assembly to the Housing Pump.
- (d) Lower the stator assembly.
- (d) Unclip the wiring harness cover by releasing the two tabs from the topside of the stator shield and unplug the harness from the stator.
- (e) The stator can now be electrically tested. If a fault is shown and the stator needs to be visually inspected, the shield cap can be removed.

Reassembly:

Refit in reverse manner.

Note: Alignment arrows are moulded into the stator shield and the rotor housing to aid in the refitting process.



10.20 Removal of Pump Housing

- (a) If the bowl is full of water, drain or bail as much of the water as possible from the machine prior to continuing. To assist with bailing the water, the inner bowl can be removed.
- (b) Tilt the rear of the machine carefully against the wall ensuring that the machine is stable and locked in position, take necessary precautions not to damage the wall or the machine.
- (c) Remove the hose clamps from the Drain & Recirculation Hoses. Carefully remove the two hoses while holding a container under the hose to catch the remaining water trapped in the hoses and pump.
- (d) Undo the two screws holding the pump to the outer bowl. The pump can now be removed from the bowl by pulling down on the two port tubes.



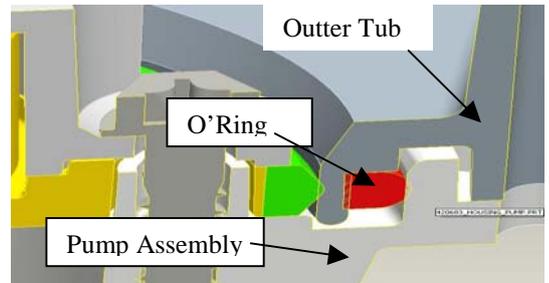
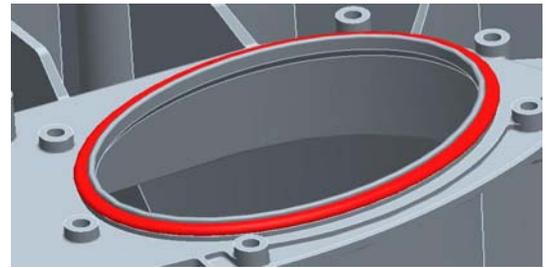
Reassembly:

- (a) Fit the Housing Pump O-ring to the Outer Bowl.
When replacing or refitting the pump housing, a new O-ring must be fitted.
- (c) Refit the Pump Housing.

Note: This should be done with the Pump Cap & Hood in place, but it is not essential.

- (c) Press the pump to its home position as much as possible by hand, then use the bolts to evenly torque the pump down.
- (d) Tighten the pump bolts to a torque of 2Nm.

Note: If the bolts happen to strip when refitting the pump housing, refer to the Pump Housing – Stripped Pump Housing Procedure (refer to Section 11.1).

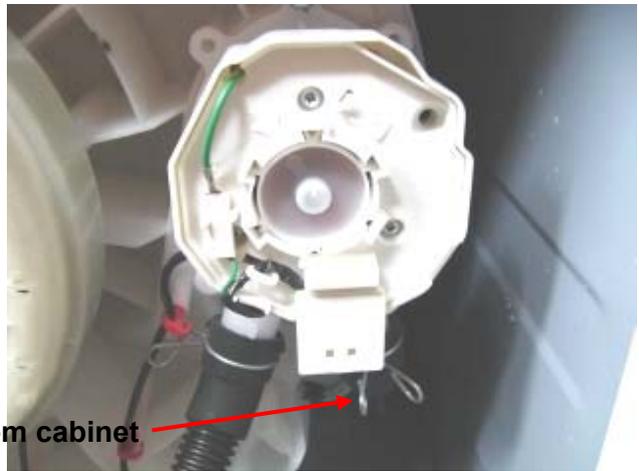


10.21 Removal of Recirculation Hose

- (a) If the bowl is full of water drain or bail as much of the water as possible from the machine prior to continuing. To assist with bailing the water, the inner bowl can be removed.
- (b) Follow procedures for removal of neck ring (refer to Section 10.14).
- (c) Lift the recirculation hose upwards and out of its position on the outer bowl.
- (d) Lay machine down or against a wall. If leaning the machine against a wall ensure that the machine is stable, and take necessary precautions not to damage the wall or the machine.
- (e) Depress the two ends of the clip and slide the clip away from the pump housing.
- (f) The hose can now be removed.

Reassembly:

Refit in the reverse manner, ensuring the recirc hose clip faces away from the cabinet.



10.22 Removal of outer Tub From The Cabinet

- (a) Follow procedures for removal of the Top Deck. (Refer to Section.10.9).
- (b) Follow procedures for removal of Inner Basket. (Refer to Section 10.16).
- (c) Thread the drain hose back in to the cabinet.
- (d) Remove the screw securing the drain hose fixture to the cabinet.
- (e) Press tab and rotate fixture carefully so remaining tabs clear the cabinet.



- (f) Remove all four-suspension rods, by lifting upwards on the top suspension bracket. Start with the suspension rod that attaches to the drain hose / wiring assembly, then do the opposing side.

Note: The pressure tube linkage will need to be unclipped from the suspension rod first.

- (g) With the suspension rods removed from the cabinet carefully lift the outer basket assembly out of the cabinet, taking care not to cut the drain hose on any sharp edges of the cabinet.



Reassembly:

Refit in reverse manner.

10.23 Removal of Rotor

- (a) Lay machine down or against a wall. If leaning the machine against a wall ensure that the machine is stable, and take necessary precautions not to damage the wall or the machine.
- (b) Using 5/8" or 16mm socket, loosen Rotor bolt. As the Rotor bolt is loosened, the Rotor will withdraw off the base of the main shaft.

Note: Place the Rotor in a plastic bag as the Rotor has very strong magnets and can attract fine metal objects.

Reassembly

Refit in reverse manner. Tighten the Rotor bolt to a torque of 70 in/Lbs (8Nm.)



10.24 Removal of Stator

- (a) Follow procedures for removal of Rotor. (Refer to Section 10.23).
- (b) Unscrew the four bolts securing the Stator to the outer basket.
- (c) Lift Stator off the base of the outer basket and clear of the shaft.
- (d) Disconnect the wiring to the terminals.

Reassembly:

- (a) Connect the wires to the Stator before locating the Stator on to the outer basket. Ensure that the correct color wire is fitted to the correct terminal. The Stator is marked RBY (Red, Blue and Yellow).
- (b) Ensure that that the stator clamp plates are flat and that there is a small amount of grease on the Stator side of the plates.
- (c) Fit the four bolts and only tighten to a torque of 44 in/Lbs (5nm).

Note: The Stator should have a slight radial movement of approximately 0.5 – 1mm when correctly tightened, and should have a maximum axial (rocking movement) of 0.5mm.



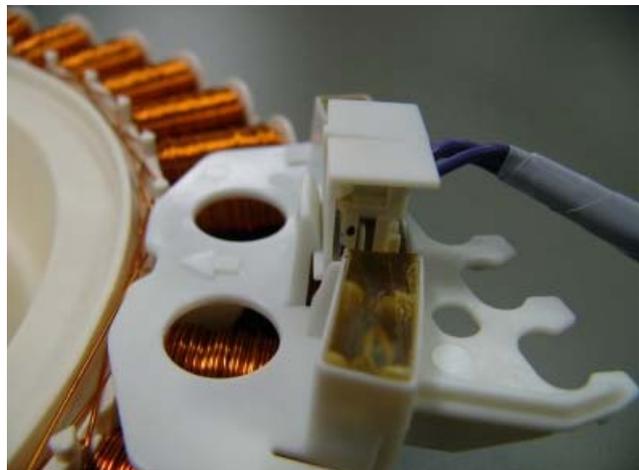
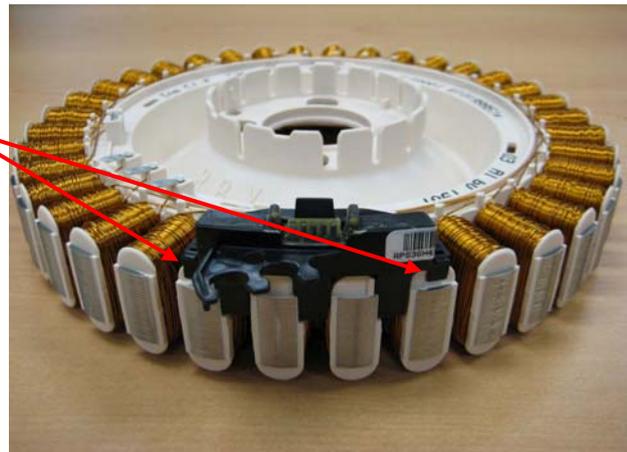
10.25 Removal of Rotor Position Sensor

- (a) Follow procedure for removal of Stator. Refer to Section 10.24.
- (b) Disconnect the harness plug to the RPS.
- (c) Unclip the RPS by releasing the tabs on either side of the RPS holder.
- (d) Slide RPS upwards.

Reassembly:

- (a) Slide the legs of the RPS housing into the Stator until the retaining clips engage.
- (b) Refit RPS harness into strain relieving labyrinth.

The adjacent photo shows the main harness connected to the RPS. The plastic retaining clip is part of the main harness and is used to provide support to the connector as PCB is single sided.



11 SPECIALISED SERVICE PROCEDURES

11.1 Pump Housing - Stripped Bolt Procedure

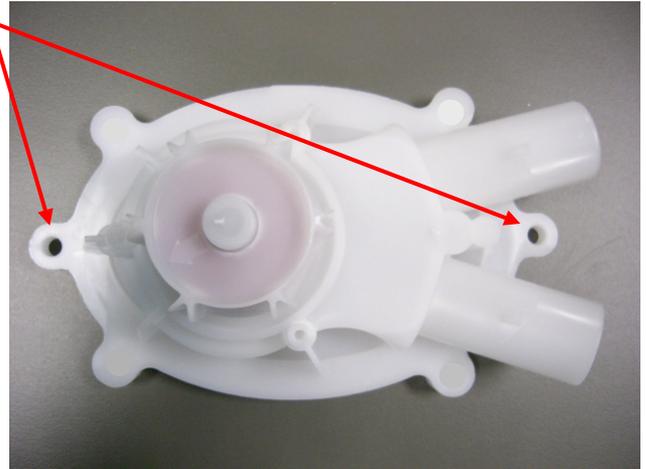
On the pump housing there are two bolt hole positions. These positions are used when the housing is assembled to the base of the outer bowl in the factory.

On servicing, should either or both bolts strip in the outer bowl, the other 'blanked off' holes can be used.

It is important to drill the two holes either side of the centre hole, otherwise the pump housing will not completely seal to the outer bowl.

- (a) Follow procedures for removal of pump housing (refer to Section 10.20).
- (b) Place the pump housing upside down on a block of timber or other such suitable surface. Using a sharp $\frac{1}{4}$ " (7mm) drill bit, drill both of the blanked off holes either side of the centre hole.
- (c) Place the pump housing on the outer bowl. Using the two new positions, screw the pump housing to the outer bowl. Ensure the bolts are tightened to 18 in/lbs (2Nm).

Note: It is essential that if using the alternate screw hole positions, the two bolts are used, otherwise the pump housing will not seat correctly and a leak will develop.



Drill hole in the two outer positions

11.2 Blocked Pump Procedure

It is possible to clear a blockage/obstruction from the pump without having to drain the water from the machine or disturbing the pump. If, however, there are concerns over the condition of the water and there may be a risk of infection, e.g. from hepatitis etc, then bail the water from the machine first. To assist in removing water from the machine, remove the inner bowl.

After removing the low profile agitator, the inner bowl, the pump hood and the cap, the impeller and flapper can easily be accessed for servicing. Use this procedure to clear any foreign objects from the machine.

Note: The impeller is not a field replaceable item, and if it is damaged, the entire pump assembly must be replaced.

- (a) Follow procedures for removal of pump hood & cap (refer to Section 0).
- (b) Spin the impeller by hand (it should be free to turn in both directions). If there is any resistance, try and locate the object. If the object can be located, remove and recheck for free movement of the impeller. Also ensure that the ports, flapper, chamber and SLR feature (refer to Section 4.9.7) are clean and free of lint or other obstructions

Note: *If there appears to be a foreign object trapped under the impeller and it cannot be freed by using the above procedure, it may be possible to clean out under the impeller area by holding it under running water while spinning the impeller. To do this the pump housing must be removed from the machine. If this fails to clear the obstruction, then the pump will have to be replaced. To remove the pump housing, (refer to Section 10.20.)*

- (c) Refit the pump hood and cap ensuring the correct orientation.
- (d) If water is in the machine, enter diagnostic mode and run the pump (refer to Section 6.1.2 for LCD model and section 7.2 for LED model.) to drain the remaining water from the machine.
- (e) After the water has drained, check for any other objects in the bowl.

On completion of service we recommend carrying out the SmartPump™ test routine (refer to Section 4.9.10).

11.3 Shaft & Bearing Replacement

Procedures described in this section as well as section 11.4 can only be carried out by using the Bearing Removal Tool Kit, part number 502009.

The contents of the kit are as follows:



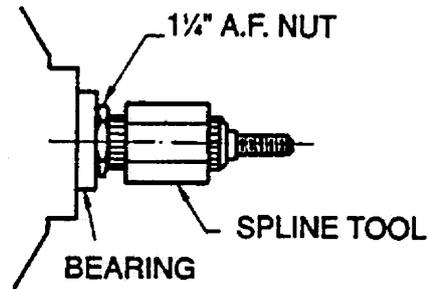
Note: *The extractor mandrel was designed for the older shaft with the external thread, however will work with the shaft on this machine with the internal thread.*

- (a) Follow procedures for Removal of Outer Tub From Cabinet. (Refer to Section 10.22).
- (b) Lay the outer tub on its side before removal of the shaft. This ensures that the shaft does not fall directly onto the floor.

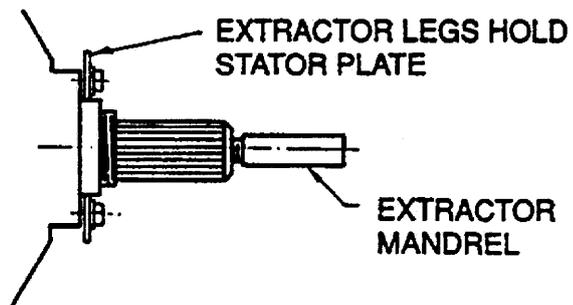
Note: *The shaft can only be removed towards the inside of the outer tub. Remove the shaft. If the shaft is difficult to remove, use a puller and a mandrel. Refit the thick Stator motor clamp plate onto the outer basket and secure with the four Stator mounting bolts. The Stator clamp plate may be used to hold the legs of the puller in place.*

SHAFT REMOVAL

STEP 1 SHAFT NUT



STEP 2 NOTE: EXTRACTOR NEEDED ONLY IF SHAFT CAN NOT BE PUSHED OUT BY HAND. (ECS EXTRACTOR USED & EXTENSION LEGS)



WARNING: Make sure the Stator clamp plate is flat before reusing. If in doubt, replace.

(c) Remove the outer bearing using the bearing removal tool.

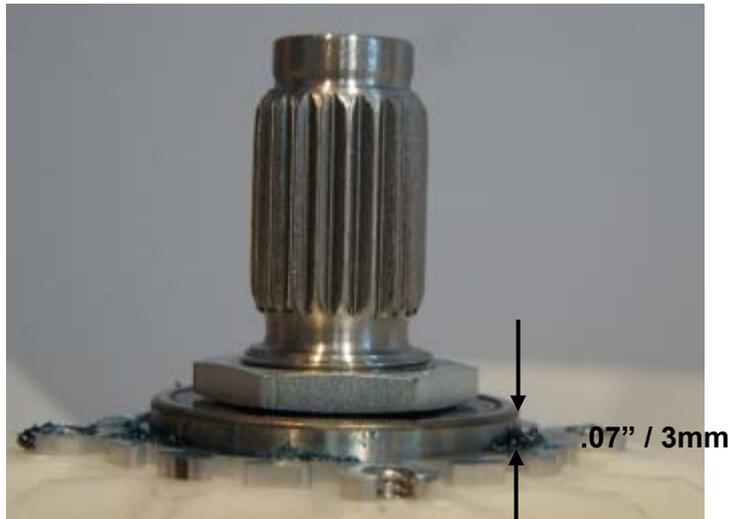
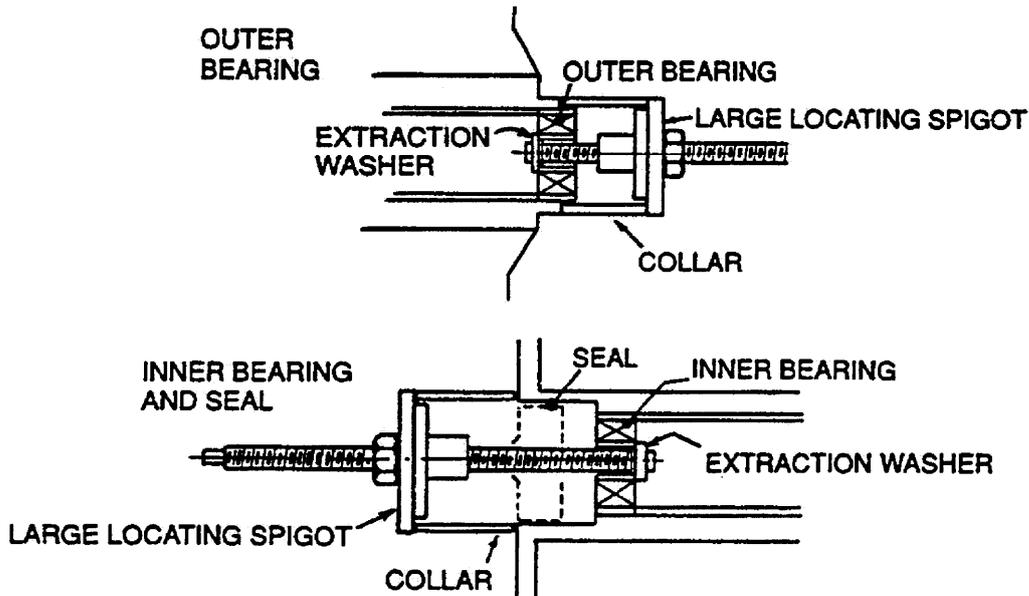
WARNING: Do not remove the bearings with a hammer and drift as serious damage to the bearing housing or outer basket may result. Use the bearing removal tool as illustrated.

(d) Remove the seal with the aid of a screwdriver handle levering from side to side.

(e) Remove inner bearing using the bearing removal tool. Insert the threaded rod and extractor washer up from the bottom of the outer basket. Place the collar and large locating spigot on the threaded rod and extract the bearing.



BEARING REMOVAL



Note: The outer bearing will be proud of the housing by approximately .07in /3mm.

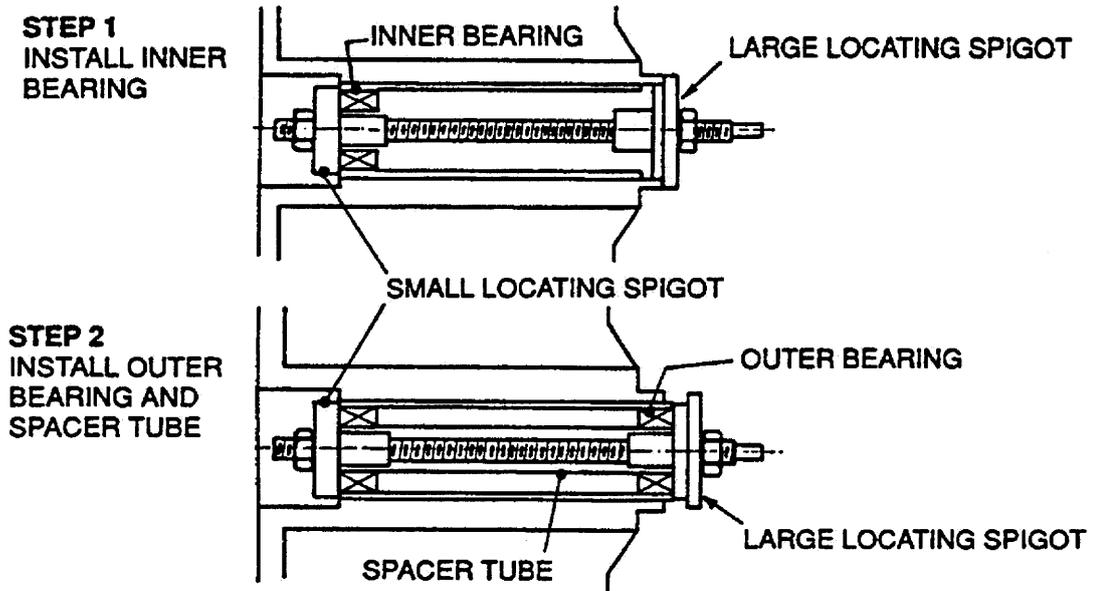
11.4 Shaft & Bearing Assembly

- (a) The bearings must be inserted separately with the **inner bearing fitted first** and pulled down with the bearing tool onto the shoulder in the bearing housing.

IMPORTANT: There must be no gap between the bearing outer race and the shoulder of the aluminium extrusion. Remove the insertion tool at this point and check that the inner bearing is fully home.

- (b) Fit the bearing spacer and press in the outer bearing using the bearing tool. Check the spacer has no end float but has slight sideways movement to allow for shaft insertion.

BEARING INSTALLATION



- (c) Ease the shaft through the bearings from inside the outer Tub. Take care the shaft is fitted with the threaded retaining nut section facing downwards in the direction of the base.
- (d) Fit the shaft retention nut. Use the spline tool and spanner to tighten the shaft retention nut.
- (e) Invert the outer basket. Take care not to damage the shaft or flooring. **Fit the assembly thimble sleeve onto the shaft before fitting the seal.** Lubricate the seal outside diameter with liquid detergent and then slide into position by pressing down on both sides of the seal.

Note: The seal should be flush with the lip on the base of the outer basket.

12 SOLVING WASH PROBLEMS

Listed below are possible causes and solutions to some common wash problems.

Creasing:

- Was the washer or dryer overloaded?
- Selecting the Easy Iron cycle will minimise creasing.
- Try not to leave wet clothes in washing machine or laundry basket.

Linting:

- Was the washer overloaded?
- Wash lint-givers (e.g. towels, flannel sheets) separately from lint collectors (e.g. synthetics).
- Have you used enough detergent to hold lint in suspension?
- Over-drying in dryer can cause a build-up of static electricity causing items to collect lint.
- Try using a Conventional cycle.

Poor soil removal:

- Did you use enough detergent for load size or amount of soil? (Note: Hard water requires more detergent than normal or soft water situations).
- Are you using a good quality detergent?
- Is the washing machine overloaded?
- Separate heavily and lightly soiled garments.
- Use a wash temperature appropriate to soil type e.g. blood and mud are better washed in cold water, while oily soils are better in warmer water.

Residue detergent

- Is the washing machine overloaded?
- Using too much detergent for the size of the load.
- Is your cold water less than 68°F (20°C)? – Select CONTROLLED COLD temperature option (rather than cold directly from the faucet).

Dye transfer:

- Remember to separate colors and whites.
- Wash non-colorfast items separately and select Colors cycle.
- Remember to remove items from washer as soon as the wash is finished.

Tangling:

- Separate larger items from smaller items.
- Use the Easy Iron cycle to wash shirts.
- Wash sheets using the Sheets cycle.
- Try washing smaller load sizes.

Black or grey marks on clothes:

- A build-up caused by detergent can flake off and mark clothes. Remove clothes and put through a “Clean Me” cycle.
- Are you using enough detergent for the amount of dirt?

13 NOTES