

eco**smart**

ELECTRONIC WASHING MACHINE

MODEL GWL10US

**Service Supplement to be used in conjunction with GWL03US
Service Manual Part Number PM912**

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ELECTRONIC AUTOMATIC WASHING MACHINE

MODEL GWL10US

1.0 SPECIFICATIONS

FINISH

Cabinet Prepaint (Polyester)
Lid Polypropylene
Console Polypropylene
Inner bowl stainless steel grade 430T
Outer bowl Polypropylene
Agitator Polypropylene
Top Deck Polypropylene

DIMENSIONS

Height to Lid		
Open	1350mm - 1380mm	(4ft 5inc - 4ft 6inc)
Closed	900mm - 930mm	(35 13/32inc - 36 19/32inc)
Width	650mm	(25 1/2inc)
Depth	650mm	(25 1/2inc)
Inlet Hose Length		1200mm / 43inc
Weight		
Packed		57.5kg / 126lbs
Unpacked		51.0kg / 112lbs

MAXIMUM CAPACITY (FULL LOAD) (AS 2040)

Dry Weight 7Kg / 15.4lbs

WATER CONSUMPTION PER FILL (WITH FULL CLOTHES LOAD)

87ltrs / 23gals

WASH MOTOR

Electronically commutated direct drive 3 Phase brushless DC Motor
Motor Resistance per Phase 16 ohms @ 20°C / 68°F

PUMP MOTOR

230V AC/ 0.7Amps/ 80watts (SELNI)

Thermal cut-out fitted

Flow Rate 24ltrs /min / 6.3 gal/min

Pump motor resistance 33 ohms @ 20⁰C / 68°F

WATER VALVES

24 Volts DC

Digital Valve	Resistance	64 ohms @ 20°C / 68°F
	Flow Rate	10 ltrs/min - 2.6 gal/min

Proportional Valve	Resistance	64 ohms @ 20°C / 68°F
	Flow Rate	16ltrs/ min - 4.2 gal/min

Operating pressure	Max	1034 kpa (150PSI)
	Min	20 kpa (3 PSI)

THERMISTOR

NTC-type temperature sensor Resistance 10,000 ohms @ 25°C / 77°F

RECIRCULATING VALVE

Resistance 1.5 Kohms @ 20°C/68°F

INNER BOWL SPEED

	Other Cycles	Regular Cycle
Fast Spin	1,000 RPM	1,000 RPM
Medium Spin	700 RPM	800 RPM
Slow	300 RPM	700 RPM
Stir Speed	25 RPM	25 RPM

FABRIC SOFTENER DISPENSER

Dosage 75cc

ELECTRIC SUPPLY

120Volts / 60Hz

MAX CURRENT

2.8 amps

2.0 INTRODUCTION

This Service Supplement contains information on the Product Specifications, Diagnostic Mode and the Detailed Fault Codes. For all other Service and Option Adjustment information please refer to your GWL03 Service Manual part number 426348.

Note: The water temperature adjustment in the Option Adjustment mode is only available on model GWL03. Model GWL10 has 5 preset temperatures which are factory set and are non-adjustable.

The detailed fault codes in this Service Supplement can also be used for GWL03 Smart Drive™ washing machines.

PERFORMANCE CHANGES

The introduction of model GWL10 sees changes to the way the Smart Drive wash cycle is composed.

RECIRCULATING SMART DRIVE SYSTEM

The machine will start to fill with the temperature selected by the user. The bowl will only fill until the clothes load is 100 per cent saturated with water. The machine will stop filling and begin the re-circulating phase (for every cycle except Permanent Press, which features a traditional full bowl fill). The water in the bowl is pumped up through the re-circulating hose and back into the bowl onto the clothes, with a fan-like spray pattern. As the water recirculates, the bowl will stir, pausing every 16 seconds. Short top-ups may occur, as garments absorb water, keeping the water level constant. Recirculating this small amount of water dissolves detergent, activates enzymes plus bleach that will then penetrates dirt at fibre level, accelerating the wash process.

After 3 minutes, the bowl will begin to fill with cooler water (cold controlled to 16°C/61°F) to the level selected by the user, or, if auto is selected, to the level chosen by the machine and will begin to agitate. Because the wash cycle has already been boosted, less agitation time is needed.

The default rinse setting for the regular cycle of the GWL10 consists of a series of multiple shower rinses and spins that flush water through the clothes, assisted by the specially designed nozzle. Fabric Softener cannot be dispensed during this rinse. If fabric softener is required, the **Softener Rinse Option** must be selected. This will convert the machine to a spray and deep rinse, which will allow the fabric softener to be dispensed correctly.

The Smart Drive™ washing machine has 2 load sensing methods to ensure the right wash action is used for the type and size of wash load.

- **LSD - Load Sensing Detection** is used to continually sense the load and automatically adjust the agitation profiles to suit the wash load. It is also used to determine when a maximum capacity profile needs to be used. If additional garments are added during the cycle the washer will adjust accordingly, increasing the amount of water and changing the wash profile. If the machine is operating on high water level, regular cycle, with a very large heavy load, then the Load Sensing Detection will activate the Maximum Capacity Profile.
- **MCP - Maximum Capacity Profile** is present in the regular cycle, high water level only. It is clearly noticeable. The machine will stop agitating and restart with a perceivably different profile. The agitation time will also increase by 1 minute. MCP usually occurs 1-3 minutes into the wash and will, of course, only occur if the machine is heavily loaded.

ELECTRONICS

The electronics for Series 10 Smart Drive are now air cooled instead of being water cooled as in previous models. This has been made possible by changes to the stator winding which allows a lower current through the electronics and the use of the latest low loss semiconductor-switching device.

With the Series 10 Smart Drive you can no longer turn the machine on by using the cycle buttons, you must press the Power button first.

The delay start is now 1, 3 or 9 hours; previous models were 1, 6 or 9 hours. This change was introduced as a result of the last customer survey.

On the Delicate and Permanent Press cycles the medium spin speed can now be selected if required, the default setting is still the slow spin. This was done to improve the customer's options, as slow spin left the clothes too damp for some customers.

Electronic Modules are **not inter-changeable** between models. The different modules for the different models can be identified by their color. Phase 3 modules are green, Series 8 modules are yellow and the latest Series 10 modules are Grey.

It is important not to mix the different colored modules as they are not compatible with each other and you will find that the washing machine will not work. It will automatically display a fault code and beep if the modules have been mismatched.

STAND BY MODE

If the washing machine has not received any instructions for 15 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. Before entering the Diagnostic or Option Adjustment modes the machine must be taken out of the Stand By mode. To do this the power button will have to be pressed on and off or the machine turned off and on at the power point.

WATER TEMPERATURE SENSING

The Thermistor for sensing the water temperature is now located in the inlet chamber (GW models only) and will be available as a separate spare part under part number 479164P. See specifications for the temperature/resistance reading.

WATER VALVES

The water valves are now 24 volts and are **not interchangeable** with previous model Smart Drive washing machines. The terminals have been changed to the "RAST 2.5" system. Extra care must be taken to ensure these connections are plugged in squarely to avoid damage to the terminals. When removing the harness plug from the valve you must release the small retaining clip located on the solenoid coil behind the plug.

RECIRCULATING VALVE

The Recirculating valve is situated at the bottom of the bowl, and is connected to the pump. If the valve should leak or block then to service the valve, (working under the machine) remove the hose clips connecting the hoses to the valve, and remove the screwed clamp around the inlet hose to the valve. The valve now can remove for cleaning or checking.

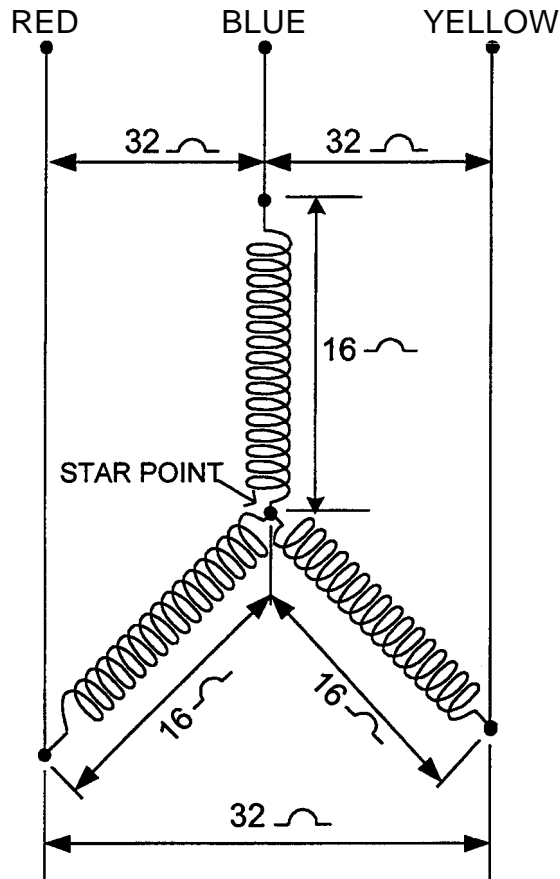
The valve can be tested in the DIAGOSTIC mode by pushing the Delicate button. This will turn the valve on and off.

Note: The valve will take approx. 1 minute to activate and approx. 3 minutes to cool down and return to it default position.

STATOR

The stator resistance has changed to allow for a lower current through the electronics. This stator is not interchangeable with the previous models and can be identified by smaller terminal connections. The resistances of the windings are now 16 ohms per phase.

The rotor has not changed and can be used for all models Smart Drives except Phase 1 models.



SERIES 10 STATOR RESISTANCE

PUMP

The pump now uses a vortex impeller, which reduces the operating sound levels at the end of the drain cycle.

The way we control the pump has changed. During the drain cycle the pump is stopped and started quickly every 10 seconds. When the pump stops, the water keeps flowing, flushing away any lint in the pump chamber.

The pump is now part of the electronic circuit and acts as a brake resistor as well as being part of the switch mode power supply. We run the pump at 60Hz at the beginning of the drain cycle and change to 50Hz when the water level reaches the bowl check stage. The pulsing on and off of the drain pump only occurs during the 60Hz stage.

If the mains voltage drops below approximately 106 VAC, the 60Hz mode is disabled until the module is reset.

Because the pump is part of the switch mode power supply, it is important to **first check the pump before changing a module for "no power"**.

If the pump's thermal overload goes open circuit the power to the module will be lost, so no fault will be reported. When the thermal device has reset, the module will power up normally. This could take between 3 - 10 minutes depending on the temperature of the pump at the time of failure.

The number of times the auto restart feature tries to start a stalled pump has been reduced to prevent nuisance tripping of the pump's thermal overload.

Note:

If the pump has blocked and the thermal overload has gone open circuit, just remove the blockage from the pump, the module and the pump should still be okay.

If the pump windings are **water damaged**, the pump will quickly overheat and cut off again. The pump must be replaced in this case. The electronics should still be okay.

It is important to check the pump windings thoroughly for water damage. It is possible for the resistance of a water damaged pump to be normal, however the inductance of the pump can change causing it to overheat and cut out.

There are new fault codes in the system, which now relate to the pump circuit and its extended function. (Fault code 62, pump over current. Fault code 63, pumps COM's error)

SIZE SETTING MODE (SAME AS SERIES 8)

It is important to set the size of the machine into the Motor Controller's memory whenever a replacement Motor Controller or Display Module is fitted to the washing machine. Failure to do this could result in the machine faulting to detailed fault code 9.

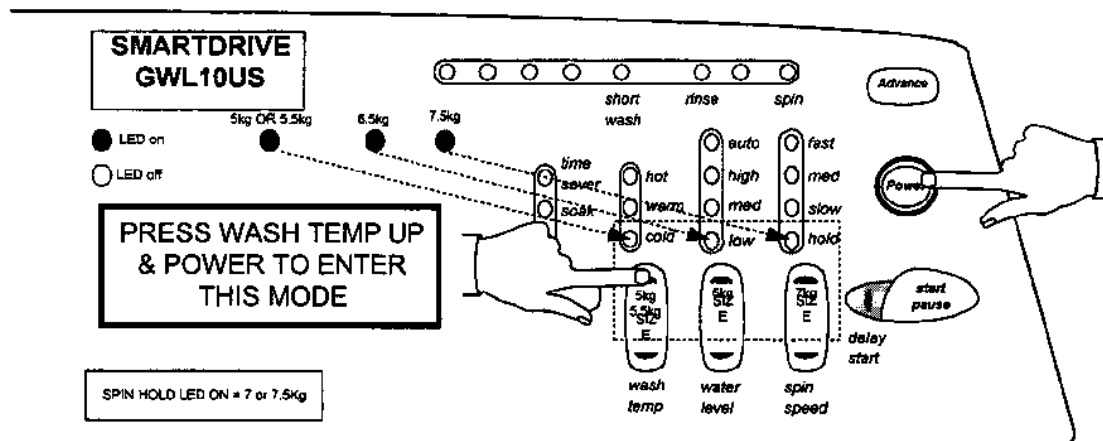
To set the size turn the power on at the power point and off at the console. Press and hold the **TEMPERATURE UP** button then press the **POWER** button. The machine will give 4 short beeps and the pattern of LED's will change.

Press the **TEMPERATURE UP** button until the **COLD** LED is on for **5kg & 5.5kg** machines.

Press the **WATER LEVEL UP** button until the **LOW WATER** LED is on for **6.5kg** machines.

Press the **SPIN SPEED UP** button until the **SPIN HOLD** LED is on for **7kg/7.5kg** machines. (This is the setting for GWL10)

Press **POWER** to exit this mode.

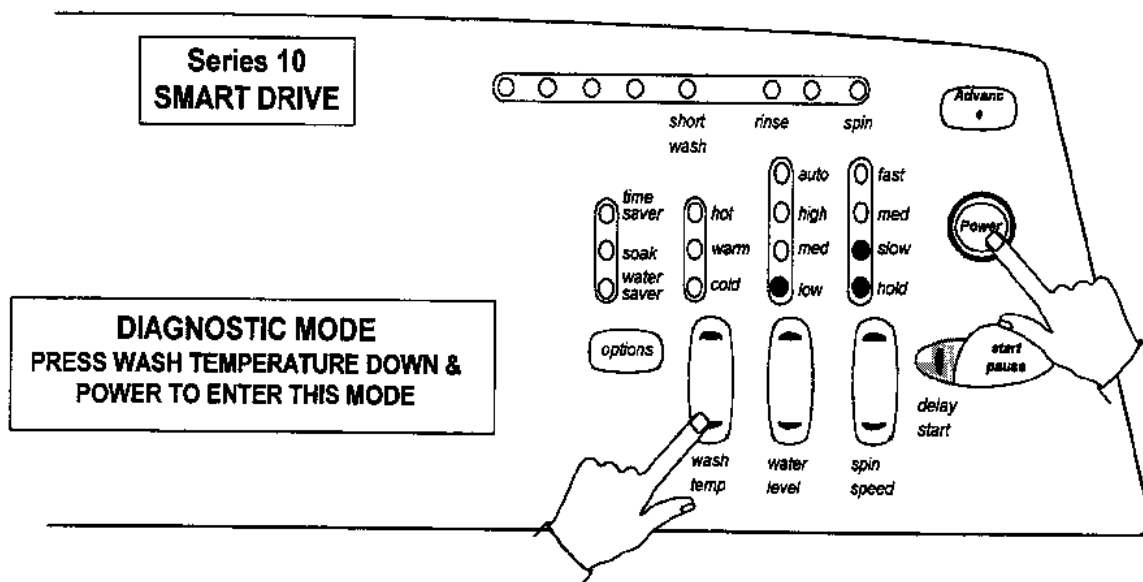


3.0 DIAGNOSTIC MODE

The **DIAGNOSTIC MODE** for mode GWL10 now incorporates both the switch test mode and the data display mode. You no longer have to use the advance button to toggle between them.

To enter the **DIAGNOSTIC MODE**:

1. Turn the power on at the power point and off at the console.
2. Press and hold the **WASH TEMPERATURE DOWN** then press the **POWER** button. The machine will give 2 short beep
3. Using the **SPIN SPEED UP** or the **SPIN SPEED DOWN** buttons can now extract the different levels of information.



DATA DISPLAY

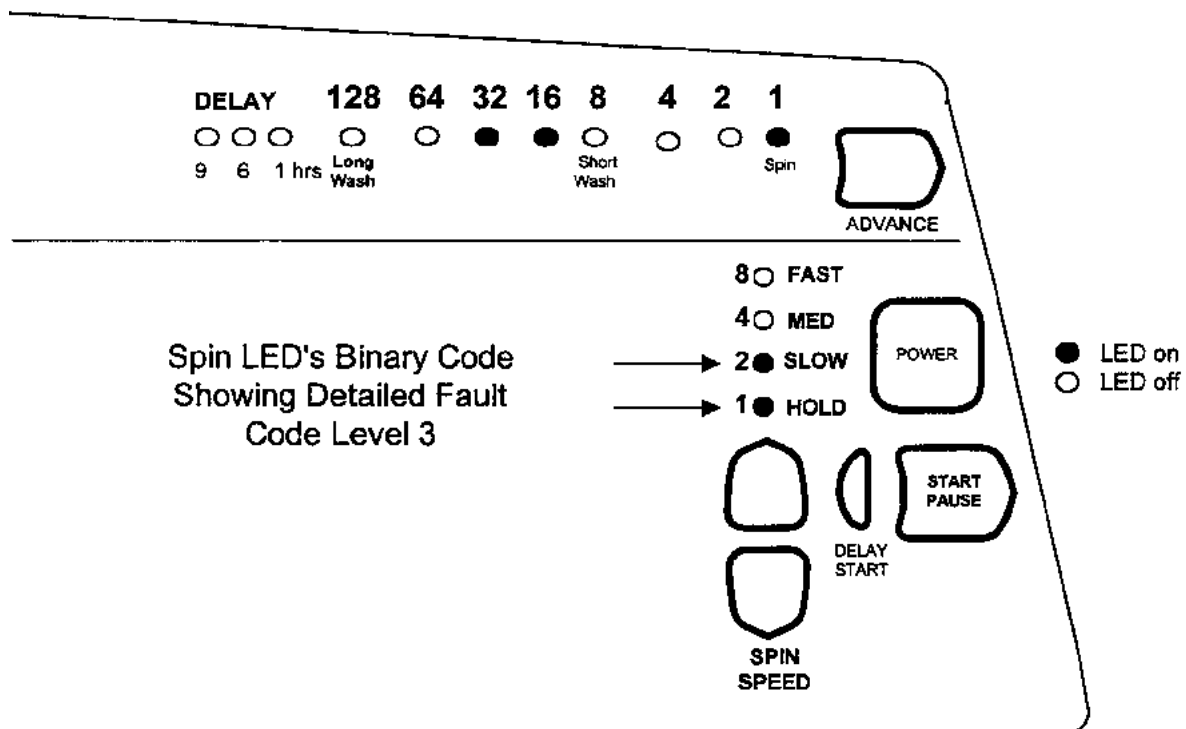
Press the **SPIN SPEED UP** button until the **HOLD** and **SLOW SPIN** LED's are on, (Binary count 3). The **WASH PROGRESS** LED's will now display the fault code.

By using a BINARY NUMBERING SYSTEM each unique fault code can be given a number.

3.1 EXAMPLES OF BINARY CODE

Wash Progress LED's Binary Code

Detailed Fault Code $32+16+1=49$



Note: The detailed fault code will only be displayed for 1 cycle after the fault has been rectified.

The following tests can be carried out in the diagnostic mode.

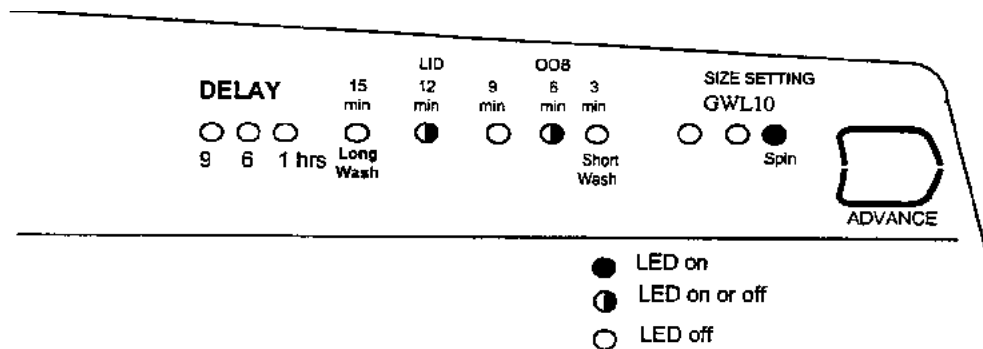
3.2 LID SWITCH & OUT OF BALANCE SWITCH TEST

Press the **SPIN SPEED UP** button until the **MEDIUM SPIN** LED is on, (binary count 4).

When the Lid is open the 12-minute wash LED will be on.

Activating the Out of Balance lever under the top deck will cause the 6-minute LED to turn on. Moving the inner basket towards the right hand corner of the cabinet can activate the Out of Balance lever. It will take up to 1 second for the LED to respond after the Out of Balance has been activated.

Also when in this mode with the **MEDIUM SPIN SPEED** LED on, the **SPIN LED** will display the **SIZE SETTING**.



3.3 DRAIN PUMP TEST

The **REGULAR CYCLE** button turns the drain pump on or off. The **REGULAR LED** will turn on when the pump is on. This feature can be used to drain the tub.

3.4 WATER VALVE TEST

Press the **WASH TEMPERATURE DOWN** button to turn the Cold Water Valve on. The Cold Water LED will also turn on.

Press the **WASH TEMPERATURE UP** button to turn the Hot Valve on. The Hot Water LED will also turn on.

NOTE:

The drain pump test, water valve test, restart and recycle features can be used on any level in the diagnostic mode.

3.5 RE-START FEATURE

WATER LEVEL DOWN button turns the RE-START feature on/off.

LOW WATER LEVEL LED ON = RE-START ON. (Factory setting).

LOW WATER LEVEL LED OFF = RE-START OFF.

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 RE-START.
2. If the fault was only of a temporary nature, the machine will re-start.
3. If there is a continuous fault the machine will try to RE-START 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.

The machine leaves the factory with the RE-START feature turned on. When the machine is being serviced it is more convenient to turn the RE-START feature OFF. This will allow any fault in the system to show up immediately.

Whether the RE-START feature is on or off can be easily identified without going into the DIAGNOSTIC MODE.

When the machine is first turned on -

- (a) If none of the 5 green wash progress LED's are on, the RE-START feature is on.
- (b) If the 5 green wash progress LED's are flashing, the RE-START feature is off.

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 RE-START feature to the factory setting, switch the machine off at the wall or disconnect from the mains supply.

3.6 RE-CYCLE FEATURE

WATER LEVEL UP button turns the RE-CYCLE feature on/off.

MEDIUM WATER LEVEL LED ON = RE-CYCLE ON.

MEDIUM WATER LEVEL LED OFF = RE-CYCLE OFF. (Factory setting).

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 RE-CYCLE feature the machine will continuously repeat the wash cycle until the RE-CYCLE feature is turned off.

Whether the RE-CYCLE feature is on or off can be easily identified without going into the DIAGNOSTIC MODE.

When the machine is first turned on:

- (a) If the 3 orange/red rinse and spin progress LED's are on, the re-cycle feature is off.
- (b) If the 3 orange/red rinse and spin LED's flash, the re-cycle feature is on.

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 re-cycle feature to the factory setting, switch the machine off at the wall or disconnect from the mains supply.

3.7 HOT TUB FLAG

If the machine has been filled with hot water 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.

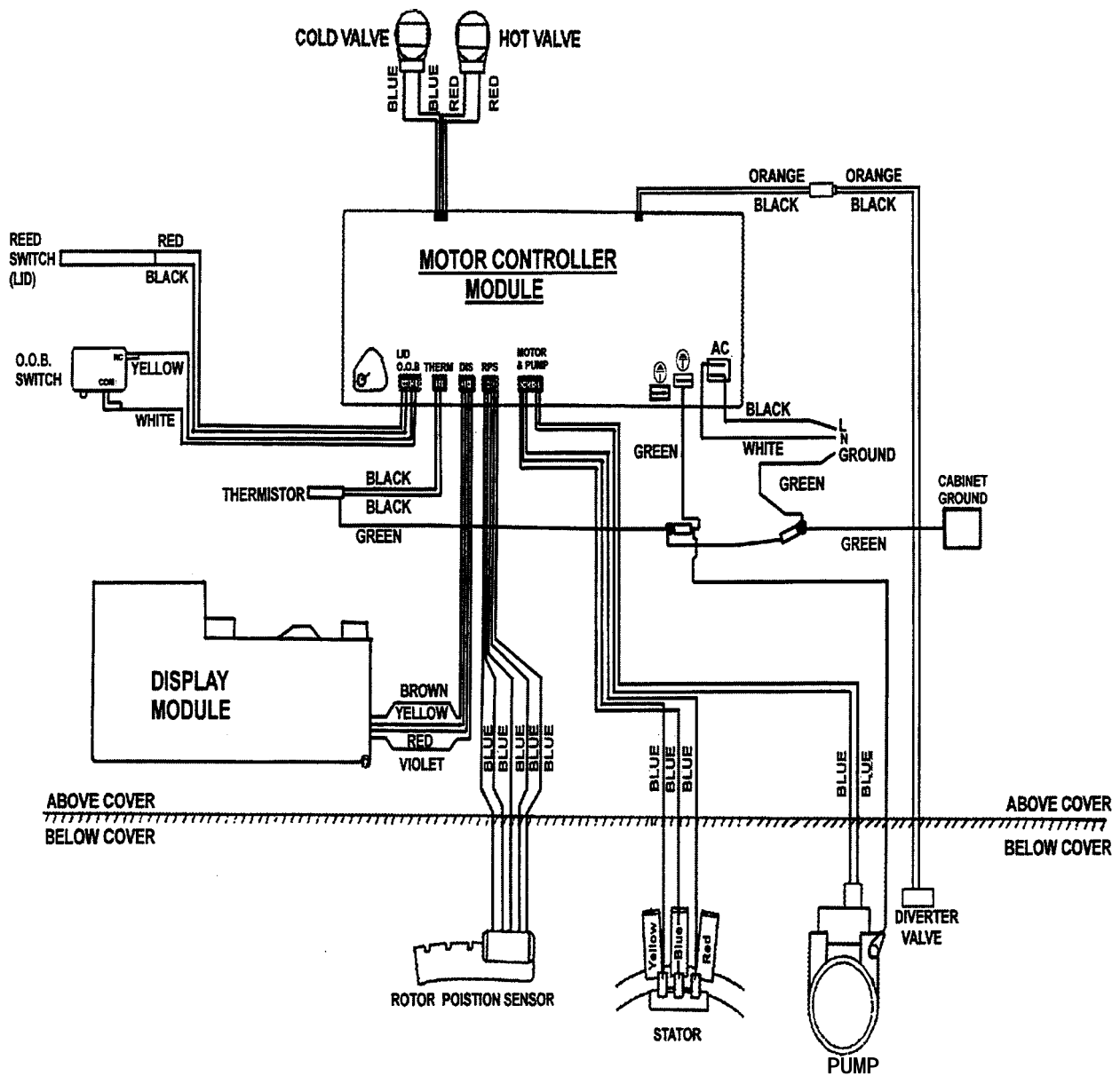
The **WATER SAVER** LED will be on when the **DIAGNOSTIC MODE** is selected if the spin speed is restricted to 700 RPM. To clear this flag press the **WASH OPTION** button.

3.8 FAULT DISPLAY

If the machine enters a fault mode during normal operation, the machine will display the detailed fault code on the wash progress LED's and beep continuously. The hold and slow spin LED's will also be displayed.

During the above process the beeper will sound continuously. It is advisable to switch the machine off at the wall, switch it on again and select the last fault details by entering the diagnostic mode.

4.0 WIRING DIAGRAM



5.0 DETAILED FAULT CODES



DETAILED FAULT CODES FOR MODEL GWL08US / GWL10US

INTRODUCTION

The format for fault description in this booklet follows the Primary, Secondary and Tertiary fault source system. These sources have mostly been arranged in order of most likely source of fault but in some cases the sequence has been modified to aid the servicing procedure.

It should be noted that the fault source Pump System includes the pump and drain hose assembly.

FAULT DESCRIPTIONS

1. **(00000001) Motor Controller Module Fault**
The Motor Controller Module has found a memory error.

Primary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

2. **(00000010) Motor Controller Module Fault**
An error has been encountered when trying to read the pressure sensor.

Primary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

3. **(00000011) Motor Controller Module Fault**
The Motor Controller Module has found a memory error.

Primary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

6. **(00000110) Motor Controller Module Fault**
The Motor Controller Module has received an incorrect signal from the pressure sensor.

Primary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

7. **(00000111) Display Module Fault**
The Display Module has found a memory fault.

Primary Source - Display Module.

Action - Replace Display Module.

9. **(00001001) Size Switch Error**
The Display size switch setting does not match that stored in the memory.

Primary Source - Display Module.

Action

If the Display Module for model GWL03 has just been inserted into a console housing, then check that the two size switch plungers accurately locate onto the console housing. If this fault has appeared during normal operation of the machine, check the size switch or replace the Display Module.

Secondary Source - Motor Controller Module.

Action GWL03

If the Motor Controller Module has been changed from one size machine to another, then the size switch settings in the memory will have to be reset. This can be done by entering and exiting the Option Adjustment mode. Push and hold START/PAUSE then push POWER button.

Action GWL08 / GWL10

Reselect the size of the machine by using the SIZE SETTING MODE. Push and hold the **WATER TEMP UP** button then press the **POWER** button, to select the size of the machine push the **SPIN SPEED UP** button until the **HOLD LED** turns on.

10. (00001010) Temperature Sensor Error

The temperature sensor may be open circuit or the ambient temperature is below minus 10°C.

Primary Source - Thermistor.

Action - Replace the Thermistor.

11. (00001011) Pressure Sensor Fault

While measuring the water level the Motor Controller micro has detected a negative pressure. Reconnecting the pressure tube to the pressure sensor while the basket has been partly filled with water may have caused this.

Primary Source - Motor Controller Module.

Action

- 1) Check tub is fully pumped out. Remove pressure tube from pressure sensor, clear pressure tube of any water and reconnect tube.
- 2) Replace the Motor Controller Module.

12. (00001100) Flood Protection Error

The Motor Controller Module has found the water level to be above the flood level and tried to pump the excess water out (under extremely high flow rate conditions the machine may overflow during the "top-up" routine in agitate). After pumping for 30 seconds, it has been unable to lower the water level below the flood level. Either the water valves are stuck on and are letting water in at a flow rate that is higher than the pump can handle or the pump is blocked and can't remove the excess water.

Primary Source - Water Valves.

Action

If the water valves are on continuously, check that the water valves turn off mechanically (remove power from machine).

Secondary Source - Motor Controller Module.

Action - If water valves are being driven on electrically, replace Motor Controller Module.

Tertiary Source - Pump system.

Action - Check pump for blockage and hose for correct height and kinking.

36. (00100100) Water Leak Fault

The Motor Controller 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 min 33 1/2" (850mm)max 47"(1200mm.)
- 2) Check hose guide is fitted and check hose does not protrude more than 3/4" (20mm) beyond the guide.

Secondary Source - Mechanical.

Action

- 1) Check pressure tube connection on outer tub and Motor Controller Module.
- 2) Check that the drive shaft seal and the pump housing seal have not developed a leak, by looking through the front inspection cover.

Tertiary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

37. (00100101) Pump Blocked Error

While draining, the water level reading from the pressure sensor has not changed for over 30 seconds. There are three likely reasons for this fault. One is that the drain hose has been squashed or kinked and the pump out rate has been dramatically reduced. The second possibility is that the pump is partially or fully blocked. The third is that the pump is not operating due to Motor Controller 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.

Primary Source - Pump System.

Action

- 1) Check that the drain hose has not been kinked.
- 2) Check length of drain hose and try to reduce length if excessively long. A 39"(1 metre) extension hose of the same diameter fitted to the existing drain hose is the maximum allowable length.
- 3) If basket empty of water, remove the basket from the top and check that it is not blocked. Also check the hose is not blocked.
- 4) If basket contains water, attempt to flick start the pump fan while draining to clear water before servicing as in 3. If unsuccessful then service pump from the top of the machine by removing the top deck and inner basket.
- 5) Check for open circuit windings in the pump. (**Note:** Pumps are fitted with a thermal cutout, which will reset on cooling).

Secondary Source - Wiring.

Action

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

Tertiary Source - Motor Controller Module.

Action

Activate Pump by operating the machine in spin mode. Check Pump is rotating. If not operating and Primary and Secondary checks have been performed then replace Motor Controller Module.

38. (00100110) Pressure Sensor Fault

The Motor Controller Module has recorded a water level of empty while it is agitating. The water level must have been greater than empty for the machine to enter the agitate mode initially. The most likely cause of this fault is that the pressure sensor hose has been severed or fallen off during agitate. Alternatively the pressure sensor may be faulty.

Primary Source - Mechanical.

Action - Check that the pressure tube is intact and has not been cut.

Secondary Source - Motor Controller Module.

Action - Replace the Motor Controller Module if the pressure tube shows no sign of being faulty.

39. (00100111) Pressure Tube Fault

The probable cause of this fault is that the pressure tube has become blocked or kinked or has fallen off completely. Alternatively the pressure sensor may be faulty.

Primary Source - Mechanical.

Action - Check that the pressure tube is intact and not blocked with water, dirt or kinked.

Secondary Source - Motor Controller Module.

Action - Replace the Motor Controller Module.

40. (00101000) Basket Dis-engage Fault

While carrying out a basket check, the Motor Controller Module has found that the basket is not engaged even though the pressure sensor indicates that the basket is empty. The Motor Controller 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 Controller Module.

Primary Source - Mechanical

Action

- 1) Check that there are no clothes or other foreign objects preventing the clutch from re-engaging.
- 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 Controller Module.

Action - Replace Motor Controller Module.

41. (00101001) Temperature Sensor Fault

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

Primary Source - Thermistor.

Action - Replace the Thermistor.

43. (00101011) OOB Switch Fault

The Motor Controller Module has found that the signal returning from the out of balance switch indicates that the switch is permanently on or the harness to it is disconnected.

Primary Source - Mechanical.

Action

- 1) Check that the out of balance switch is free to move.
- 2) Check that no harnesses are blocking switch movement.
- 3) Check switch operates correctly when activated. Replace switch if suspect.
- 4) If the out of balance micro switch shows signs of corrosion replace the switch and fit a condensation kit to the console area.

Secondary Source - Wiring.

Action

Check the harness to the switch is connected correctly. The terminals should be connected to the normally closed position. If the harness terminals show signs of corrosion then fit a new harness.

Tertiary Source - Motor Controller Module.

Action-Replace Motor Controller Module.

44. (00101100) Water in Basket during Spin

The Motor Controller has sensed a water level in the basket during spin. A slow pump out rate due to pump hose or pump partial blockage may cause this.

Primary Source - Pump System.

Action

- 1) Check that the drain hose is not squashed or kinked.
- 2) Check length of drain hose and try to reduce length if excessively long. A 39"(1 metre) extension hose of the same diameter fitted to the existing drain hose is the maximum allowable length.
- 3) If basket empty of water, remove the basket from the top and check that it is not blocked. Also check the hose is not blocked.
- 4) If basket contains water, attempt to flick start the pump fan while draining to clear water before servicing as in 3). If unsuccessful then service pump from the top of the machine by removing the top deck and inner basket.

Secondary Source - Motor Controller Module.

Action - Replace Motor Controller 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.

47. (00101111) Basket Dis-engage Fault

While carrying out a basket check, the Motor Controller Module has found that the basket is not engaged even though the pressure sensor indicates that the basket is empty. The Motor Controller Module continues to check for 2 minutes. During this time the module has not been able to determine a valid basket status and so displays this fault. This fault differs from fault 40 in that a valid basket status could not be determined. The first two areas to check are the clutch and the pressure tube. If these two appear correct, then the fault could be with the pressure sensor in the Motor Controller Module.

Primary Source - Mechanical.

Action

- 1) Check that there are no clothes or other foreign objects preventing the clutch from re-engaging.
- 2) Next check that the pressure tube has not come off and that it is not kinked.

Secondary Source - Motor Controller Module.

Action - Replace Motor Controller Module, if the above checks out without fault.

48. (00110000) Hot and Cold Valve Faulty

The Motor Controller Module has measured voltages from the valve diagnostic circuit that indicate both the hot and cold valves are faulty. The most likely cause is that the valve harnesses have not been connected correctly or the valve is open circuit.

Primary Source - Wiring.

Action - Check valve harnesses are correctly fastened to valves.

Secondary Source - Water Valves.

Action - Check valve coils are not faulty (open circuit).

Tertiary Source - Motor Controller Module.

Action - Replace the Motor Controller Module.

49. (00110001) Cold Valve Faulty

The Motor Controller 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 valves are open circuit. See fault 48 for service procedure.

50. (00110010) Hot Valve Faulty

The Motor Controller Module has measured a voltage from the valve diagnostic circuit that indicates that the hot valve is faulty. Also the cold water valve could have low resistance. The most likely cause is that the valve harness has not been connected correctly or the valves are open circuit. See fault 48 for service procedure.

51. (00110011) Diverter valve timeout fault

The machine has detected that the diverter valve is leaking water to the drain when it should be re-circulating.

Check by waiting for re-circulating function and observing if water is coming from the drain hose.

Primary source - Diverter valve

Action - Check diverter valve continuity. If open circuit, replace diverter valve.

Secondary source - Motor Controller Module (drive circuitry blown).

Action - Replace Motor Controller Module

Tertiary source - Diverter valve harness/connectors.

Action - Replace bowl harness

52. (00110100) Diverter valve top-up fault

The machine has exceeded the maximum number of "top-ups" during re-circulation. Check to see if water is leaking from drain hose during re-circulation.

Primary source - Diverter valve

Action - Replace diverter valve

Secondary source - Motor Controller Module

Action - Replace Motor Controller Module

Tertiary source - Diverter valve harness/connectors

Action - Replace bowl harness

53. (00110011) Rotor Position Sensor Step Fail

The Motor Controller Module has attempted a motor step test and has found that the motor has not stepped in the correct direction. It has detected that the motor is connected and that the motor drive is operational. The rotor position sensing system is at fault.

Primary Source-Wiring.

Action- Check the Rotor Position Harness for continuity and that the connectors are correctly to the Rotor Position Sensor and the Motor Controller.

Secondary Source-Rotor Position Sensor.

Action - Check the Rotor Position Sensor patterns with a RPS Tester, if faulty fit a new Rotor Position Sensor.

Tertiary Source-Motor Controller Module.

Action - Replace the Motor Controller Module.

54. (00110110) Motor/Motor Controller Module Step Fail

The Motor Controller Module has attempted a motor step test and has found that the motor has not stepped in the correct position. The Motor Controller Module has detected that there is no current. This indicates that either the motor is not connected or the Motor Controller Module motor drive is faulty.

Primary Source - Wiring.

Action - Check the continuity of the motor harness and that the connectors are correctly applied to the motor and Motor Controller Module.

Secondary Source - Motor

Action - Check continuity of motor phases. Check the bridge terminal on the stator is not open circuit.

Replace the stator.

Tertiary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

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 40 in that a valid basket status could not be determined.

Primary Source: Rotor Position Sensor.

Action: Replace the Rotor Position Sensor.

Secondary 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.

Tertiary Source: Mechanical.

Action:

1. Check the machine is not syphoning.
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. Next check that the pressure tube has not come off and that it is not kinked.

Quaternary Source: Motor Control Module.

Action: Replace the Motor Control Module

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

The Display Module has requested the Motor Controller Module to perform an EEPROM write. Prior to writing the Motor Controller 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 Module. This may be due to transients at the time of writing or due to a faulty Motor Controller Module.

Primary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

58. **(00111010) Pressure Transducer at Maximum Adjustment Fault**

When the pause or delay start is pressed to start the machine, the Display Module has checked the memory and found the count greater than expected.

Primary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

59. **(00111011) ID Out of Range Fault**

When the pause or delay start is pressed to start the machine, the Display checked the physical ID and found it was out of range.

Primary Source - Display Module.

Action - Replace Display Module.

60. **(00111100) Motor Controller Memory Check Fault**

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

Primary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

61. **(00111101) Brown Out During Motor Controller EEPROM Write Fault**

The Motor Controller Module has been attempting to perform an internal EEPROM write. Prior to writing the Motor Controller 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 Module.

62. **(00111110) Pump Over-current Fault**

The motor controller has detected excess current in the pump windings. Most likely caused by water leaking onto pump.

Primary source - drain pump

Action - replace drain pump

Secondary source - motor controller module

Action - replace motor controller module

63. **(00111111) Pump Communications Fault**

The motor controller has detected a problem communicating with the pump microprocessor.

Primary source - motor controller module

Action - replace motor controller module

64. **(01000000) Pressure transducer frequency out of range (<66kHz)**

65. **(01000001) Pressure transducer frequency out of range (>80kHz)**

66. **(01000010) Pressure transducer frequency out of range (>90kHz)**

The motor controller has detected a problem with the pressure transducer

Primary source - Motor Controller

Action - Replace Motor Controller Module

81 - 95. **(0101xxxx)** See fault code 106

104. **(01101000)** See fault code 106

105. **(01101001)** See fault code 106

106. **(01101010) Display to Motor Controller Module Communications Errors**

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

Primary Source - Pump.

Action:

Measure resistance of pump. If resistance is less than 33 ohms, replace pump.

Secondary Source: Display module.

Action:

Replace Display module

Tertiary Source: Motor Controller Module.

Action

Replace Motor Controller Module. If the new Motor Controller Module corrects the fault, refit the original Display Module.

Quaternary Source: Rotor Position Sensor.

Action: Replace Rotor Position Sensor. If this corrects the fault, and if a Display Module or Motor Control Module has been fitted, refit the original Display Module or 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 failure of the microprocessor or a power supply disturbance such as a mains surge or transient voltages, or any other source of electrical noise getting to the microprocessor.

Primary source – Rotor Position Sensor (RPS)

Action – Check the RPS harness connection at the Motor Control Module ensuring that there are no bent pins within the connector or any moisture damage. Visually check the harness connection to the RPS and look for any signs of water or mechanical damage. If there is any doubt, replace the RPS.

Secondary Source - Pump

Action: Measure resistance of pump. If resistance is less than 33 ohms, replace pump.

Tertiary Source - Stator

Action: Remove the stator, visually check the stator and look for any signs of arcing, water or mechanical damage. Measure the resistance of the Stator.

Quaternary Source - Motor Control Module.

Action - Replace Motor Control Module

130 (1000010) Single Rotor Position Sensor Error

The Motor Controller 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 Controller Module, or a faulty Rotor Position Sensor.

Primary Source - Wiring.

Action

- 1) Check for corrosion on the edge connector of the Rotor Position Sensor and the Motor Controller Module connector.
- 2) Check the contacts on the Rotor Positional Sensor end of the Hall Harness to see if any have been damaged. (Each set of contacts in the socket has two wipers. If the distance between these wipers varies between different contacts, replace the Rotor Positional Sensor Harness).

Secondary Source - Rotor Position Sensor.

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

Tertiary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

131. (1000011) Repetitive Rotor Position Sensor Error

This fault is similar to fault number 130 above but differs slightly in that it is a continuous condition. See fault 130 for service procedure.

132. (10000100) Single Current Trip

The Motor Controller Module has detected excess current in the motor or electronic switches. This fault has occurred momentarily.

Primary Source - Wiring.

Secondary Source - Motor.

Action

- 1) Measure/check the motor harness connectors and motor for shorts. This can be done by taking a resistance measurement between phases of the motor harness at the Motor Controller module end. Nominal resistance should be around 12.2 ohm.
- 2) Check the Rotor Positional Sensor and associated harness for water, mechanical damage or corrosion

Tertiary Source - Motor Controller Module.

Action

If all the above show no signs of fault then replace the Motor Controller Module. Also check for water leaks from the cooling chamber or valves that could possibly come in contact with the Motor Controller Module and fix the leak before replacing with new Motor Controller Module.

133. (10000101) Repetitive Current Trip

The Motor Controller has detected excess current in the motor or electronic switches. This fault is a more severe occurrence than Fault Number 132 but has identical fault sources and fault service procedure.

134. (10000110) Single Current Trip & Rotor Position Error.

The Motor Controller module has detected an excessive motor current AND a Rotor Position Sensor error simultaneously. See fault codes 130 and 132 for service procedure.

136. (10001000) Motor Stall

The Motor Controller Module has been unable to start the motor. Possible causes of this fault are: Faulty motor harness, faulty or jammed motor, seized bearings or seals, faulty Motor Controller Module, faulty Rotor Position Sensor or harness.

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 Controller Module end. Nominal resistance should be around 12.2 ohm.

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 Controller Module

Action - If the primary and secondary checks pass inspection then replace the Motor Controller Module.

160. (10100000) Basket Engaged

The basket has re-engaged itself during agitate. Possible causes for this are a leak in the air bell, basket is over-loaded with clothes, and the clutch has jammed or is fouled with a foreign object.

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 appear to be at fault, then check the air bell at the bottom of the inner basket for leaks.

Secondary Source - Motor Controller 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 Controller Module to display this fault. Replace Motor Controller Module.

161. (10100001) Hardware / EEPROM Supply Mismatch

The Motor Controller Module checks the hardware configuration (i.e. 110v or 230v) against its EEPROM table on power up. The Hot Valve feedback circuit divider voltage determines the hardware supply selection. Should there be a mismatch, this error is flagged.

Primary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

162. (10100010) Brake Deceleration Time-out Fault

During the brake mode the Motor Controller Module has detected that the basket has not come to a stop in the permitted time once dropping below 100rpm. This fault has been installed for software testing only.

163. (10100011) Valve Reset Pin Connect Fault

The Motor Controller Module has sensed the PCB connection is open circuit. The cold valve cannot operate with this condition.

Primary Source - Motor Controller Module.

Action - Replace Motor Controller Module.

164. (10100100) Brake Function Time-out Fault

This fault indicates that the Motor Controller Module has been attempting to brake for 20 seconds. As all spin loads should come to rest within 10 seconds something has gone wrong during the brake to prevent the basket stopping in time.

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 Controller Module end Nominal resistance should be around 12.5 ohms.

Secondary Source - Motor Controller Module

Action - Replace Motor Controller Module.

192. (11000000) Motor PMW Reset Pin Connect Fault

NOTES