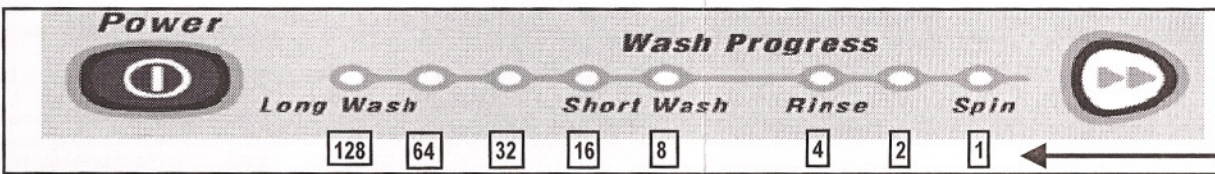


Read Fault Codes

Hold this up to Wash Progress LEDs



Add these numbers for LEDs that are on to get FAULT CODE (while in diagnostics mode with **Hold** and **Slow** Spin LEDs on)

Smart Drive Diagnostic Guide
Covers all Phase 5 & 6 Washers (GW, MW, IW Series 9,10,11,12)

BEFORE REPLACING ELECTRONIC MODULE ALWAYS CHECK FIRST:

Wash Motor Resistance: @ 20°C (68°F) Per Winding Phase to Phase 16 ohms @ 20°C 32 ohms @ 20°C	Pump Motor: @ 20°C (68°F) 230V Pump motor resistance: 33 ohms 120V Pump motor resistance: 7 ohms
Water Valves @ 20°C (68°F) 24 volts DC Resistance 64 ohms	Thermistor @ 20°C (68°F) Resistance = approx 10,000 ohms Resistance = approx 12,500 ohms (NTC)
Diverter Valve Resistance Range between 0.7kΩ and 2.5kΩ. It is NTC (Resistance goes down as temperature goes up).	Lid Lock Resistance range 65 ohms +/- 5 ohms

ARE ONE OR TWO LEDS FLASHING AND MACHINE PLAYING A MELODY TUNE? IF SO, THIS INDICATES A USER WARNING:

Refer to Service Manual or Use & Care Manual for list of USER WARNINGS.

IS MOTOR CONTROLLER DEAD? IF SO, THEN DO THE FOLLOWING:

- 1) Ensure AC power is available from wall outlet.
- 2) Ensure all component resistances listed above have been checked.
- 3) Check whether machine was built before July 2002 (RotorPositionSensor part No. 425221). If so, then REPLACE RPS WITH NEW RPS (PART NO. 420296)
- 4) If ECO machine: Check whether diverter valve has a clear plastic shield. If not then REPLACE DIVERTER VALVE
- 5) Replace M/C.

NEXT, (IF MOTOR CONTROLLER IS NOT DEAD): CHECK FAULT CODE

GW/MW models DIAGNOSTIC MODE –how to go into:

1. With the machine off (wall power on): Press and hold the **WASH TEMP DOWN** button and then the **POWER** button until the machine gives 2 short beeps and lights up. The SmartDrive is now in diagnostic mode.
2. To obtain the last fault code press the **SPIN SPEED UP** button three times so that the **Hold** and **Slow** LEDs are illuminated.
3. The eight wash progress LEDs will now show the last fault in a binary code. Hold this paper up to the Wash Progress LEDs and add the numbers with LEDs ON. That added number is the last Fault Code. Then check the Fault Codes section of this manual **AND FOLLOW THE SERVICE PROCEDURE AS DETAILED.**

IW model DIAGNOSTIC MODE –how to go into:

With the Machine off (wall power on): Press and hold the **LIFECYCLES** button (**SPECIAL** button on Phase 5) and then the **POWER** button. The SmartDrive will give 2 short beeps and the LCD screen will go blank.
Note: Make sure that the buttons are released after the beeps, or the SmartDrive will turn itself out of the diagnostic mode.

IW Diagnostic Data Display

1. To enter the **DATA DISPLAY** screens, push the **LIFECYCLES** button again (**SPECIAL** button on Phase 5). This will enable the out of balance switch to be tested, as well as giving access to the Detailed Fault Codes and User Warning Faults.
2. One of three displays will appear in the screen. Use the **OPTIONS** up or down buttons to the bottom of the display screen to toggle between these to find Fault Code number.
3. Then check the Fault Codes section of this manual **AND FOLLOW THE SERVICE PROCEDURE AS DETAILED.**

CAN'T REPLICATE THE REPORTED FAULT? TRY CHANGING RESTART FEATURE

If a problem occurs in SmartDrive, it will try to correct the problem and retry. If there is a continuous problem SmartDrive will retry several times before indicating a fault code (beeping and flashing LEDs). Alternatively, in order to enable fault codes to show up as soon as faults occur, the RESTART feature can be turned off.

MW/GW - How to turn RESTART off:

1. Go into Diagnostic Mode (see previous section).
2. From Diagnostic mode use the **WATER LEVEL DOWN** button to turn the RESTART on or off.
3. Console **Power** button off to set

LOW WATER LEVEL LED OFF = RESTART OFF.

LOW WATER LEVEL LED ON = RESTART ON. (Default)

RESTART status can be easily identified when SmartDrive is first turned on at the wall-

If none of the 5 leftmost green wash progress LEDs are on, the RESTART is on.

If the 5 leftmost green wash progress LEDs are flashing, the RESTART is off.

IW - How to turn RESTART off:

1. Go into Diagnostic Mode (see previous section).
2. Press **Options** down button. Press **Home** button to turn off RESTART
3. Console **Power** button off to set (**Stained More-Less** LEDs should flash)

NB. RESTART is 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 default setting, power off SmartDrive at the wall for at least 10 seconds.

DETAILED FAULT CODES; INTRODUCTION

The format for fault description in this booklet follows the Primary, Secondary, Tertiary and Quaternary 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 code shows the last recorded fault. Always confirm fault.

Note: Only the most common fault codes are shown below. For a complete list refer to F&P Service Manual.

"Phase" Number to "Model" correlation examples: GW-L10 = Phase5, GW-L11 & GW-L12 = Phase6.

Fault Code Numbers

FAULT CODES AND SERVICE PROCEDURES

1. (00000001) Phase 2 to 6 - Motor Control Module Fault EEPROM memory write error.
Primary Source: Motor Control Module. **Action:** Replace Motor Control Module.
3. (00000011) Phase 1 to 6 - Motor Control Module Fault General memory error.
Primary Source: Motor Control Module. **Action:** Replace Motor Control Module.
9. (00001001) Phase 1 to 6 - Size Switch Error
Primary Source: Motor Control Module. **Action:** Reset machine size –as per service manual instructions. Console **Power** off to set. If fault is repeating for the same module, replace Motor Control Module.
10. (00001010) Phase 1 to 6 - Temperature Sensor (Thermistor) Error. The temperature sensor may be open circuit or the ambient temperature is below minus 10°C. This fault is only applicable in the Intuitive Washer and the GW models.
Primary Source: Thermistor. **Action:** Replace Thermistor.

11. (00001011) Phase 1 to 6 - Pressure Sensor Fault
Reconnecting the pressure tube to the pressure sensor while the bowl has been partly filled with water may have caused this.
Primary Source: Pressure Tube. **Action:** 1. Check bowl is fully pumped out. Remove pressure tube from pressure sensor, clear pressure tube of any water and reconnect tube (blow down the tube if necessary). 2. If fault is still present, replace the Motor Control Module.
12. (00001100) Phase 1 to 6 - Flood Protection Error
Primary Source: Water Valves. **Action:** If the water valves are on continuously, check that the water valves turn off mechanically (remove power from SmartDrive).
Secondary Source: Pump system. **Action:** Check pump for blockage and drain hose for correct height (end not immersed) and kinking.
Tertiary Source: Motor Control Module. **Action:** If water valves are being driven on electrically, replace Motor Control Module.
36. (00100100) Phase 1 to 6 - Water Leak Fault
The Motor Control Module has needed to top up the water level more than 4 times during agitate. The most likely cause is that the SmartDrive is siphoning out. The other alternative is that the SmartDrive has developed a leak.
Primary Source: Pump System. **Action:** 1. Check the height of the drain hose outlet. Minimum 850mm, maximum 1200mm. 2. Check that the hose guide is fitted and check that the hose does not protrude more than 20mm beyond the guide.
Secondary Source: Mechanical. **Action:** 1. Check the pressure tube connections on the outer bowl 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) Phase 1 to 6 - Pump Blocked Error (No Change in 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 1 metre extension hose of the same diameter is max extra allowed.
3. Check for open circuit windings in the pump. (**Note:** Pumps are fitted with a thermal cut-out that will reset on cooling.)
4. If the bowl 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 bowl contains water, then service the pump from the top of the SmartDrive by removing the top deck and inner bowl. Bail/Syphon 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. **Action:** Activate the pump by operating the SmartDrive 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.
Note: Consider fitting Pump Hood Kit(TechBulletinWM013). If 5kg model, fit pump splashguard. **Quaternary Source:** Diverter Valve failure (Phase 5 and 6 Eco's). **Action:** Check the diverter valve, see fault code 51.
38. (00100110) Phase 1 to 6 - Pressure Sensor Fault (empty bowl reading during agitate)
Primary Source: Mechanical. **Action:** Check that the pressure tube is intact and has not been cut. Blow down the tube to clear water from tube.
Secondary Source: Motor Control Module. **Action:** Replace the Motor Control Module if the pressure tube shows no sign of being faulty.
39. (00100111) Phase 1 to 6 - Pressure Tube Fault -see Actions for FC 38.
40. (00101000) Phase 1 to 6 - Bowl Dis-engage Fault
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 bowl rotating. 2. If the SmartDrive 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/blocked. Blow down tube to clear water. **Secondary Source:** Motor Control Module. **Action:** Replace Motor Control Module.
43. (00101011) Phase 1 to 6 - OOB Switch Fault
The Motor Control 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. **Actions:** 1. Check that the out of balance switch is free to move. 2. Check that no harnesses are blocking switch movement. 3. Check that the switch operates correctly when activated. Replace the switch if suspect. 4. If

- the out of balance micro switch shows signs of corrosion, replace the switch and switch harness, and fit a condensation kit to the console area if not incorporated in the top deck.
5. Check that the SmartDrive is level and also that the bias spring is in place.
Secondary Source: Wiring. **Action:** Check the harness to the out of balance 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 and switch.
Tertiary Source: Motor Control Module. **Action:** Replace Motor Control Module.
44. (00101100) Phase 2 to 6 - Water in Bowl During Spin
Primary Source: Pump System.
Action: 1. Check that the drain hose is not squashed or kinked. 2. Check the length of the drain hose and try to reduce the length if excessively long. A 1 metre extension hose of the same diameter fitted to the existing drain hose is the maximum allowable length. 3. If the bowl is empty of water, remove the pump from the pump housing and check that it is not blocked. Also check that the drain hose is not blocked. 4. If the bowl contains water, then service the pump from the top of the SmartDrive by removing the top deck and inner bowl. Bail out the water, remove the pump cap and hood and clear the pump of any obstruction. 5. Check that water is not siphoning back into the SmartDrive when the pump turns off when the spin speed reaches 600 rpm.
Secondary Source: Motor Control Module. **Action:** Replace Motor Control Module.
48. (00110000) Phase 2 to 6 - Hot and Cold Valve incorrect feedback signal.
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 coil resistances
Tertiary Source: Motor Control Module. **Action:** Replace the Motor Control Module.
49. (00110001) Phase 2 to 6 - Cold Valve Faulty - See fault 48 for service procedure.
50. (00110010) Phase 2 to 6 - Hot Valve Faulty - See fault 48 for service procedure.
Note: Phase 5 can give a fault code 50 when the SmartDrive powers off while spinning. There will actually be no fault if this has happened.
51. (00110011) Phase 5 and 6 Eco - Diverter Valve Fault
the power off at the SmartDrive but leave the power on at the wall, then measure the voltage across the terminals of the wax actuator. If a reading of 230V is achieved, the Motor Control Module has failed due to the valve and both will need to be replaced.
Secondary Source: Check for blockage in the valve itself or a broken hinge mechanism.
52. (00110100) Phase 5 and 6 Eco - Diverter Top-up Fault
Primary Source: Diverter valve. **Action:** Remove the diverter valve and check for blockages or broken hinge mechanism.
Secondary Source: Wax Solenoid. **Action:** Check the resistance of the wax solenoid. Also look for corrosion on the terminals (greenie deposit). Resistance range will be between 0.7k Ω and 2.5k Ω . Values are dependant on ambient temp and when the valve was last actuated. Valve should be replaced if outside of these values.
56. (00111000) Phase 4 to 6 - Bowl Check No Valid Fault
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: Rotor Position Sensor **Action:** Replace Rotor position Sensor
Tertiary Source: Motor Control Module. **Action:** Replace Motor Control Module.
64. (01000000) Phase 5 and 6 - Pressure Transducer (Ptx) Error - Frequency < 66 kHz
The Motor Control Module has received signals from the water level sensor (Ptx) below normal frequency values. **Primary Source:** Motor Control Module. **Action:** Replace MC.
Secondary Source: Motor Control Module. **Action:** Replace MC.
65. (01000001) Phase 5 and 6 - Pressure Transducer (Ptx) Error - Frequency > 90 kHz
The Motor Control Module has received signals from the water level sensor (Ptx) above normal frequency values. **Primary Source:** Motor Control Module. **Action:** Replace MC.
Secondary Source: Motor Control Module. **Action:** Replace MC.
66. (01000001) Phase 6 - Pressure Transducer (Ptx) Error - Frequency > 90 kHz
Primary Source: Motor Control Module. **Action:** Replace MC
104. (01101000) Phase 2 to 6 - See Fault Code 106
105. (01101001) Phase 2-6 - MC to Display Comms Error Time Out
Note: If the product is an IW, the wrong Motor Control Module may have been fitted.
Primary Source 6: Display Module/harness. **Action:** check harness/Replace Display
Primary Source Phase 5: Pump **Action:** Measure resistance of pump. If resistance is less than 33 ohms, replace pump.
Secondary Source: Motor Control Module. **Action Phase 6** Replace Motor Control Module.
Action Phase 5: Leave replacement pump in place and replace Motor Control Module.
Tertiary Source Phase 5: Display module **Action:** Leave replacement pump and Motor Control Module in place and replace Display Module.
Tertiary Source Phase 6: Rotor Position Sensor. **Action:** Replace Rotor Position Sensor. If this corrects the fault, refit the original Display Module or Motor Control Module.

- Quaternary Source Phase 5:** Rotor Position Sensor. **Action:** Replace RPS. If this corrects the fault, refit the original Display Module or Motor Control Module.
130. (10000010) Phase 1 to 6 - Single Rotor Position Sensor Error
Primary Source: Wiring. **Action:** 1. Check for corrosion on the edge connector of the Rotor Position Sensor and the Motor Control Module connector. 2. Check the contacts on the rotor positional sensor end of the hall harness **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.
131. (10000011) Phase 1 to 6 - Repetitive Rotor Position Sensor Error. See fault 130 for service procedure.
136. (10001000) Phase 1 to 6 - Motor Stall
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 approximately 32 ohms for Phases 5 and 6.
Secondary Source: Motor.
Action: 1. Check free rotation of the agitator and bowl 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) Phase 1 to 6 - Bowl has re-engaged itself during agitate.
Primary Source: Mechanical.
Action: 1. Check that the rotating bowl 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 bowl is not overloaded with too many clothes.
4. Check the air bell at the bottom of the inner bowl for leaks.
230. (11100110) Phase 6 - EEPROM Value Out of Range. Wrong version detected.
Primary Fault: Motor Control Module is the wrong version. **Action:** Change MC Module.
231. (11100111) Phase 6 - MW GW Link Error. Component has failed on the display board.
Primary Fault: Display Module faulty. **Action:** Replace Display Module.
Secondary Fault: MC Module fault. **Action:** Replace MC Module.
233. (11101001) Phase 6 - EEPROM Read Error
Primary Fault: Motor Control Module faulty. **Action:** Replace MC Module.
234. (11101010) Phase 6 - Lid Lock Open Circuit
Primary Fault: Connector to the harness (Either end) **Action:** Replace Harness.
Secondary Source: Lid Lock has failed activate. **Action:** Replace Lid Lock housing.
Tertiary Source: MC 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.
235. (11101011) Phase 6 - Lid Lock Short Circuit
Primary Fault: Lid Lock mechanism has jammed or failed. **Action:** Check resistance across the connections, should be around 73 ohms. If not within 5 ohms, replace the Lid Lock.
236. (11101100) Phase 6 - Incompatible EEPROM Version
Primary Fault: Motor Control Module is the wrong one. **Action:** Replace MC Module.
237. (11101111) Phase 6 - Temperature Sensor Error
Primary Fault: The sensor has failed either in the harness or 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 MC Module if connections look ok and the fault still occurs.
240. (11110000) Phase 6 - Hall Out of Order. RPS Fault. See FC 130 for directions.
242. (11110010) Phase 6 - OOB Hit Greater Than Max for 5 Seconds
Primary Fault: SmartDrive has detected the bowl movement to be excessive or the Micro switch is permanently on or harness to it is disconnected. **Action:** See FC 43 for details.
243. (11110011) Phase 6 - Stepper Test Failure
Rotor Position Sensor Fault. **Primary Fault:** Wiring. **Action:** See fault codes 53 and 54.