Sandpiper Electronics Error Code & Troubleshooting Guide

Purpose:

This document provides information relating to error condition troubleshooting on Encore and Eclipse units with Sandpiper electronics. The information contained will provide insight on the possible causes and resolutions of Encore error codes.

Note: This guide does not include all possible error codes.

Units with Sandpiper Electronics:

- Encore 500
- Encore S
- Encore 700 S
- Eclipse

Error Severity Definitions:

Severity	Definition
Super-Major	Catastrophic error. The unit is either unable to come online, or process a transaction. Component cause must be remedied before the unit can be restored to functionality. All grades, both sides are disabled.
Major	Catastrophic error. The unit senses that required equipment is not present, or startup programming has not been completed. Will not clear until issue is resolved or programming completed. All grades on one side are disabled.
Medium	Non-catastrophic error. Ends the transaction in progress. Will typically clear on a warmstart. The unit will attempt to recover at the start of the next transaction.
Minor	Non-catastrophic error. Component level error only. Will typically clear on a warmstart. The unit will attempt to recover at the start of the next transaction.
Informational /Undefined	Non-catastrophic error. Shown in the Event Logs for notification only. Not usually indicative of an actual problem.

Error Code 1 – W&M RAM Database Corrupted:

Error Code Definition:

This super-major error code is generated when the Pump Control Node (PCN) has a Weights & Measures (W&M) database error upon powerup. This error applies to unit types with Sandpiper electronics of any generation. This error will display on the Door Node display on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) On the manager's keypad, press vol/total, then enter, and then clear.
2) On the manager's keypad, press F1, then F2.
3) Verify that the error clears.
4) Verify that the PCN battery is reading 3.0VDC or higher, if not replace the battery and restart the procedure.
5) Warmstart the unit and verify that the error clears. If the error does not clear, replace the PCN and restart the procedure.

Note: If replacing a LON node, verify that the security switch is in the "ON" (to the right) position when powering the unit up or a security error will occur.

Possible Causes; Any Generation Sandpiper Electronics:

- Low voltage on the PCN battery (Q12674-01).
- Damaged/defective PCN.

Error Code 2 – Application RAM Database Corrupted:

Error Code Definition:

This super-major error code is generated when the Pump Control Node (PCN) has an application RAM database error upon powerup. This error applies to unit types with Sandpiper electronics of any generation. This error will display on the Door Node PCA display on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) On the manager's keypad, press F1, then F2.
2) Verify that the error clears.
3) Warmstart the unit and verify that the error clears. If the error does not clear, replace the PCN and restart the procedure.

Note: If replacing a LON node, verify that the security switch is in the "ON" (to the right) position when powering the unit up or a security error will occur.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/defective PCN.

Error Code 3 – LON Configuration Error:

Error Code Definition:

This super-major error code is generated when the Pump Control Node (PCN) has a LON configuration error upon powerup. This error applies to unit types with Sandpiper electronics of any generation. This error will display on the Door Node display on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Verify that the LON software in use is compatible.
2) Verify that the LON is connected properly.
3) On the manager's keypad, press F1, then F2.
4) Verify that the error clears.
5) Warmstart the unit and verify that the error does not reoccur. If the error reoccurs, replace the PCN and restart the procedure.

Note: If replacing a LON node, verify that the security switch is in the "ON" (to the right) position when powering the unit up or a security error will occur.

Possible Causes; Any Generation Sandpiper Electronics:

- Incompatible LON software.
- Damaged/defective LON node.

Error Code 4 – One or More Tasks Not Started:

Error Code Definition:

This super-major error code is generated when the Pump Control Node (PCN) attempts to complete internal startup procedures and the process fails. This error applies to unit types with Sandpiper electronics of any generation. This error will show on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Further Information:

As this error can be generated at any time during the PCN's internal startup procedures, this issue can be related to any LON component. If this error does not clear on a warmstart, components should be isolated one at a time until the issue component is identified.

Troubleshooting Steps:

1) Check the unit configuration in Command Codes 40, 47, 90 and 91. Each Function Code must be verified to ensure correct configuration.
2) Verify the side select jumper on the Door Node.

Note: Side 1(A) = No jumper installed, Side 2(B) = jumper installed

3) Verify the LON cabling is not damaged and is connected properly.
4) Warmstart the unit.
5) Isolate the PCN.
6) Isolate the Door Nodes.
7) Unplug LON peripherals one at a time.

Note: If the error persists , perform a coldstart on the unit. See Service Bulletin 2491 for details.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/malfunctioning PCN.
- Damaged/malfunctioning Door Node.
- Damaged/malfunctioning LON peripheral.
- Damaged or improperly connected LON cabling.

Error Code 5 – Coldstart by Jumper:

Error Code Definition:

This super-major error code is generated when the Pump Control Node (PCN) is coldstarted via the coldstart jumper (JP5). This error applies to unit types with Sandpiper electronics of any generation. This error will show on the Door Node displays on both sides. Cause and resolution information are shown below.

Further Information:

This error was introduced in version 2.9.42 and shows as part of the coldstart process. See Service Bulletin 2491 for details.

Steps to Resolve:

1) Verify that the security switch is in the "ON" (to the right) position.
2) Remove the jumper from JP5, being careful not to remove JP6.
3) Warmstart the unit.
4) Verify after the PCN version shows on the door node that "5056" is shown in the product 1 PPU window.
5) Place the security switch into the "OFF" (to the left) position.
6) Restart the unit by pressing F1 then F2 on the manager's keypad. A double beep will be heard upon pressing F1 as security has not yet been bypassed.
7) Bypass security and reprogram the dispenser.

Note: Security must be bypassed again, as the unit defaults to 2-wire mode after completion of the coldstart procedure.

Possible Causes; Any Generation Sandpiper Electronics:

- Software coldstart performed via the coldstart jumper (JP5).

Error Code 10 – New Software Version Detected and Security Switch Not Open:

Error Code Definition:

This super-major error is generated when redundant storage notes a software version change that takes place while the security switch is not in the "ON" (to the right) position. This error applies to all unit types with Sandpiper electronics of any generation with Pump Control Node (PCN) version 1.8.00 or higher loaded. This error will display on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Power down the unit.
2) Place the security switch in the "ON" (to the right) position.
3) Restore power to the unit.
4) If the error persists or a different security error shown, perform another warmstart.
5) Verify that "5056" is shown in the PPU windows.
6) Place the switch back in the "OFF" (to the left) position.
7) Restart the dispenser by pressing F1 then F2 on the manager's keypad.
8) Using your multimeter, check the security switch for proper continuity.
9) Swap PCN.
10) Swap Door Nodes one at a time.

Possible Causes; Any Generation Sandpiper Electronics:

- PCN software was loaded without the security switch in the "ON" (to the right) position.
- A LON node was installed without the security switch in the "ON" (to the right) position.
- Damaged/malfunctioning security switch.
- Damaged/malfunctioning PCN.

Error Code 12 – Restore Calibration Factors from Door Node:

Error Code Definition:

This super-major error is generated when a Pump Control Node (PCN) is replaced and the security switch is not in the "ON" (to the right) position when the unit is powered up. This error indicates that the calibration factor has not been restored from redundant storage. This error applies to unit types with Sandpiper electronics of any generation with PCN version 2.9.42 or higher loaded. This error will display on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Verify that the security switch is in the "ON" (to the right) position and warmstart the unit.
2) Using your multimeter, check the security switch for proper continuity.
3) Swap PCN.
4) Swap Door Nodes one at a time.

Possible Causes; Any Generation Sandpiper Electronics:

- PCN software was replaced and the unit powered up without the security switch in the "ON" (to the right) position.
- Damaged/malfunctioning security switch.
- Damaged/malfunctioning LON node.

Error Code 20 – Pulser Disconnected:

Error Code Definition:

This super-major error is generated when the Pump Control Node (PCN) loses all communication with the pulser. This error applies to all unit and pulser types, though the causes may vary. Non-blending units will display this error on the PPU display for the product on which pulser communication was lost. Blending units will display this error on the PPU display for any product that uses the pulser on which communication was lost. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Further Information:

Beginning with software version 02.8.74, pulser errors (EC20) that occur are persistent through a power cycle. Only when either level 2, 3 or 4 programming is entered using a valid PIN code and programming is exited can the error clear. Once the cause of the error has been remedied this procedure will clear the error condition.

Note: Prior to performing this action security must be properly bypassed.

Procedure for clearing a pulser error (EC20):

1) Install the manager's keypad
2) Press F1
3) Enter any valid level 2,3 or 4 PIN code
4) Press enter
5) Press F2
6) Remove the manager's keypad

Note: If the unit being serviced is in standalone, security has already been bypassed and does not need to be bypassed again prior to entering and exiting programming with a valid level 2,3 or 4 PIN code.

Troubleshooting Steps:

1) Using the Laptop Tool, verify the affected pulser in the Event Log.
2) Verify proper unit programming.
3) Check the pulser wiring and connections for proper termination. Reseat as necessary.
4) Verify that no corrosion exists on the pulser wiring connections. Clean as necessary.

5) Attempt to clear the EC 20 through the procedure above. If the error condition clears, consider swapping the pulser to another position as the error condition may be intermittent.
6) If the error condition does not clear, swap the pulser from one position to another. If the issue follows, replace the pulser.
7) If the issue does not follow, troubleshoot the associated PCAs (PCN, Coriolis Interface, Intrinsically Safe Barrier etc.).

Possible Causes; Standard (Non Ultra-Hi) Pulser, Encrypted Pulser and Ecometer:

- Damaged/malfunctioning pulser.
- Improper, corroded or damaged wiring/connection.
- Damaged PCN.

Note: Ecometer pulsers are not independently serviceable.
Moving the pulser requires moving the entire Ecometer assembly.

Possible Causes; Ultra-Hi Pulser:

- Damaged/malfunctioning Intrinsically Safe Barrier PCA (F1 fuse).
- Damaged/malfunctioning pulser.
- Improper, corroded or damaged wiring/connection.
- Damaged PCN.
- Damaged/malfunctioning Ultra-Hi Interface PCA.

Note: See Service Bulletin 2540 for advanced troubleshooting information.

Possible Causes; Coriolis (DEF) Meter:

- Damaged/malfunctioning Coriolis Interface PCA.
- Damaged/malfunctioning pulser.
- Improper, corroded or damaged wiring/connection; see PSB 2551 for further details.
- Damaged PCN.

Note: To move the pulser on a Coriolis meter the Coriolis electronics must be moved.
The purple meter programming chip must remain matched with the meter hydraulics.

IMPORTANT INFORMATION

If the unit is under warranty, it is extremely important that the proper Fault/Cause/Remedy codes be reported when providing call closing information to Gilbarco. See MDE-3026 Standardized Service Coding/Terminology available on GOLD to obtain the proper codes.

Error Code 24 – Volume Unit Type Not Set:

Error Code Definition:

This major error code is generated when Pump Control Node (PCN) startup programming has not been completed. This error applies to unit types with Sandpiper electronics of any generation. This error will show on the Door Node displays on both sides. Cause and resolution information are shown below.

Steps to Resolve:

1) Bypass security on the unit and enter the level 4 PIN code.
2) Enter Command Code 71.
3) With the security switch in the "ON" (to the right) position, enter in the Volume Units value.
    - 0 – not programmed.
    - 1 – US Gallons.
    - 2 – Liters.
    - 3 – UK Gallons.
4) If no other programming is required, turn the security switch to the "OFF" (to the left) position and exit programing.

Possible Causes; Any Generation Sandpiper Electronics:

- Volume Units not programmed in Command Code 71.

Error Code 26 – Invalid Calibration Factor:

Error Code Definition:

This medium error code is generated when Pump Control Node (PCN) startup calibration has not been completed. This error applies to unit types with Sandpiper electronics of any generation. This error will show on the Door Node displays on both sides. Cause and resolution information are shown below.

Further Information:

When entering calibration mode, only straight grades may be calibrated. All straight grades that the unit has been programmed to have via Command Code 90 (unit type) must have a calibration factor entered before this error will clear. Blend ratios can be checked by pressing "ENTER" on the manager's keypad when the unit is at an idle state or through viewing the Command Code 72 (blend ratios).

Steps to Resolve:

1) Follow the instructions in *MDE-4281Encore and Eclipse Calibration Quick Reference Card* to calibrate the unit. The instructions will vary dependent upon the version of software that has been loaded onto the PCN.

   *Note: Once in calibration mode, only products that show **8888** in the PPU display can be calibrated. Calibrated grades will show the number of days since the last calibration was performed.*

If you are unable to enter calibration mode, check the following:

- Command Code 90 – Verify that the unit is configured for the proper grade/products.
- Command Code 72 – Verify that all straight grades may be calibrated; if you have a non-standard blend (Ex. 100/50/5) the last grade will have to be changed to a 0 in order to perform the calibration procedure.
- Command Code 75 – Verify that the Fuel Density is configured.
- Command Code 92 – Verify that the unit is configured for the appropriate number of sides.
- Event logs through the Laptop Tool.

Possible Causes; Any Generation Sandpiper Electronics:

- Calibration has not been completed on at least one product the unit has been configured to include on the side showing the error.

Error Code 29 – Valve Stuck or Initial/Dispenser Timeout:

Error Code Definition:

This medium error is generated when the Pump Control Node (PCN) detects that a transaction is authorized but no flow is detected. This error applies to all unit types with Sandpiper electronics of any generation. Non-blending units will display this error on the PPU display for the pulser on which no flow was detected. Blending units will display this error on the PPU display for any product using the pulser on which no flow was detected. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Further Information:

This error code will display when no flow is detected inside of the values programmed into Command Code 53 Functions 3 (Dispenser Timeout) or Command Code 53 Function 4 (Initial Timeout). The default for these values is 0 (No Timeout). If these have been changed, it may be necessary to increase the timeout value to avoid erroneous errors. These values can be programmed from 0-999 seconds. If these values are left at default then the cause is likely hardware related.

Troubleshooting Steps:

1) Attempt to dispense from the indicated product.
2) If no flow is found, check for voltage to the valve.
3) If proper voltage is found, swap the coil with another product.
4) If no help repair/replace the valve.
5) If voltage is not found, swap the Valve Control PCA.
6) If no help verify the Valve Control cable is not damaged.
7) If no help swap the PCN.

Possible Causes; Any Generation Sandpiper Electronics:

- A timeout value programmed through Command Code 53 was exceeded.
- Stuck valve.
- Damaged/improper valve connection.

Note: This may be a result of transactions not starting within the time allotted in unit programming, hardware issue. Verify programming prior to troubleshooting hardware.

Error Code 31 – DEF Freeze Warning

Error Code Definition:

PCN V2.9.42 and earlier:
This major error is generated when the Pump Control Node (PCN) senses a potential frozen condition reported from the Coriolis Interface PCA. This error applies only to units equipped with both Sandpiper electronics of any generation and DEF. This error will display on the DEF PPU display, and the entire unit is rendered inoperable.

PCN V2.9.80 and later:
This major error is generated when the Pump Control Node (PCN) senses a potential frozen condition reported from the Coriolis Interface PCA. This error applies only to units equipped with both Sandpiper electronics of any generation and DEF. This error will display on the DEF PPU display, and only the DEF product is rendered inoperable. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Check the Coriolis Interface PCA, if CR5 is illuminated the Coriolis Interface PCA is reporting a possible frozen condition.
2) Verify that the Frozen Thermostat is plugged into P1400 on the Coriolis Interface.
3) In the DEF cabinet, verify that the Frozen Thermostat is plugged into JTRMF.
4) If the ambient temperature is lower than approximately 12F/-11C, the potential for the DEF to freeze exists. Verify the heater assembly in the DEF cabinet is working properly.
5) If the ambient temperature in the DEF cabinet is above 12F/-11C, isolate the Coriolis Interface PCA.
6) If no help, isolate the Frozen Thermostat and related cabling

Note: See Service Bulletin 2532 for further information and troubleshooting steps.

Possible Causes; Any Generation Sandpiper Electronics:

- Ambient temperature is below 12F/-11C and the heater is not operational.
- Damaged/Malfunctioning Coriolis Interface PCA.
- Unplugged or improper connection to the Frozen Thermostat.
- Damaged/Malfunctioning Frozen Thermostat.

Error Code 44 – Pump Handle on at Power Up:

Error Code Definition:

This medium error is generated when the Pump Control Node (PCN) completes startup procedures after a power fail and detects that a handle is removed, or a lift lever is up. This error applies to all unit types with Sandpiper electronics of any generation. Single hose units will display this error on all PPU displays. Multi-hose units will display this error on the PPU display for the corresponding handle or lever. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Verify that no nozzles are removed or all handles are down.
2) Test for continuity on the nozzle/handle switch connector. Continuity=engaged.
3) If nozzle/handle is inactive and continuity is found, replace the switch.
   If no continuity is found, swap the PPU display.
4) If no help, test the PPU to Door Node cable.
5) If no help swap the Door Node.

Possible Causes; Any Generation Sandpiper Electronics:

- Handle out (flapper) or lift lever on at power up. (error will clear when nozzle replaced or handle dropped)
- Damaged/malfunctioning handle or lift lever.
- Damaged/malfunctioning PPU display.
- Damaged/corroded PPU to Door Node cable.
- Damaged/malfunctioning Door Node.

Error Code 46 – Preset Below Minimum Value:

Error Code Definition:

This medium error is generated when a preset below the minimum value is sent to the Pump Control Node (PCN). This error applies to all units with Sandpiper electronics of any generation with PCN version 2.9.42 or higher loaded. Cause and resolution information are shown below.

Steps to Resolve:

1) Verify that the unit is properly functioning with a preset value above the minimum allowed.
2) Educate site personnel regarding the minimum allowed preset amount.

Possible Causes; Any Generation Sandpiper Electronics:

- A preset below the minimum value (.1 gallons or .3 liters) was sent to the PCN.

Error Code 4329 – Leaky Valve:

Error Code Definition:

This medium error is generated when the Pump Control Node (PCN) detects improper forward pulses from one pulser during a blended transaction. This error only applies to blending units. This error will display on the PPU display for the product the pulses are detected on. An example of this would be during a transaction takes place where a blended mid-grade is being dispensed and the PCN detects forward pulses from a pulser that is used for the blend, but is supposed to be closed causing a blend tolerance error. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Using the Laptop Tool, verify the affected grade in the Event Log.
2) Authorize the opposite side of the unit on that grade to pressurize the product line.
3) Without authorizing the unit, trigger the nozzle to test for product flow.
4) If flow is found, test for voltage being supplied to the valve. If no voltage is present repair/replace the valve.
5) If voltage is being supplied to the valve, the problem will be caused by a component in the pump electronics. Swap the Valve Interface PCA.
6) If no help, swap the Pump Control Node unit.
7) If no help, swap the cable connecting to the PCN at P1102 (Valve Control) and going to the Valve Interface PCA.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/malfunctioning valve.
- Damaged/malfunctioning Valve Interface Board.
- Damaged/malfunctioning PCN.

Error Code 5047 – Reverse Flow Detected:

Error Code Definition:

This medium error code is generated when the Pump Control Node (PCN) detects reverse pulses from a connected pulser. This error applies primarily to multi-product single hose units, though it can occur on single product units such as the Ultra-Hi. Non-blending units will display this error on the PPU display for the pulser on which the reverse flow was detected. Blending units will display this error on the PPU display for any product using the pulser on which the reverse flow was detected. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Further Information:

The quadrature and later pulsers detect its correct rotational direction by monitoring the first 20 pulses every time the dispenser is powered up. In case the pulser replaces an existing pulser and it turns (or is turned) in the wrong direction for the first 20 pulses or more after power-up of a unit, it will establish the rotational direction as being correct. The subsequent delivery will result in an error code 5047. To avoid this, do not assemble or rotate a "live" pulser in the wrong direction just after replacement or power-up. If the pulser is inadvertently rotated incorrectly, you can simply correct the condition by powering the unit down and back up ensuring that the pulser turns in the proper direction for the first 20 pulses.

Troubleshooting Steps:

1) Using the Laptop Tool, verify the affected meter in the Event Log.
2) Verify that the unit hydraulics have not been recently serviced, and not properly purged afterwards.
3) Warmstart the unit and test the affected product.
4) Authorize another product on the affected side; if the pulser/meter is a type where the linkage is visible look for the pulser/meter turning backwards.
5) Replace the meter check valve for the affected meter.

Possible Causes; All Encore pulser types except Ultra-Hi and Coriolis (DEF) meter:

- Leaking meter check valve.
- Air in the product line or line hydraulics causing pulser jitter.
- Improper, corroded or damaged wiring/connection.
- Damaged PCN.

Possible Causes; Ultra-Hi Pulser:

- Incorrect initial pulser rotation.
- Damaged/malfunctioning pulser.
- Damaged PCN.

Note: Ultra-Hi units with the Liquid Controls meter do not have a meter check valve. Any reverse pulses detected are likely due to fluctuations in line pressure.

Possible Causes; Coriolis (DEF) meter:

- Air in the unit or line hydraulics causing pulser jitter.
- Damaged/malfunctioning Coriolis Interface PCA.
- Damaged/malfunctioning pulser.

Note: To move the pulser on a Coriolis meter the Coriolis electronics must be moved. The purple meter programming chip must remain matched with the meter hydraulics.

- Improper, corroded or damaged wiring/connection.
- Damaged PCN.

Error Code 5049 – Unauthorized Flow Detected:

Error Code Definition:

PCN V2.8.60 and earlier:
This medium error is logged when the Pump Control Node (PCN) detects forward pulses and the unit is not authorized to dispense.

PCN V2.9.42 and later:
This minor error is logged only when the Pump Control Node (PCN) detects forward pulses with a flow rate of 5GPM or higher and the unit is not authorized to dispense.

This error applies to all unit types with Sandpiper electronics of any generation. Non-blending units will display this error on the PPU display for the pulser on which the unauthorized flow was detected. Blending units will display this error on the PPU display for any product using the pulser on which the unauthorized flow was detected. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Further Information:

When troubleshooting this issue, ensure that the STP for the product being investigated is running during the process. If starting up a unit or site, ensure that the product line has been properly purged. Due to the need to test this issue without the unit being authorized, it may be necessary to authorize the opposite side or another unit. The STP should remain on during the troubleshooting process. Verify first if the product being investigated will flow without authorization.

Troubleshooting Steps:

If flow continues with the unit powered down:
1) Repair/replace the affected valve.

If the flow stops when the unit is powered down:
1) Unplug the cable coming from P1102 (Valve Control) from the Valve Interface PCA. Restore power the unit. If flow stops, verify the Valve Control cable is not damaged and continue. If flow does not stop, move to step 4.
2) Coldstart the PCN.
3) Swap the PCN.
4) Swap the Valve Control Board.

Possible Causes; Any Generation Sandpiper Electronics:

- Air in the unit or line hydraulics.
- Fluctuations in line pressure causing pulser rocking (Ultra-Hi Only).
- Damaged/malfunctioning valve allowing flow when the unit is not authorized.
- Debris in the valve.
- Damaged/malfunctioning Valve Interface PCA (varies dependent upon valve type).
- Damaged/malfunctioning PCN.

Error Code 5050 – Invalid Pulser Pattern:

Error Code Definition:

This medium error is generated when the Pump Control Node (PCN) detects an erratic pulse pattern from a connected pulser. This error applies to all unit and pulser types, though the causes may vary. Non-blending units will display this error on the PPU display for the pulser on which the erratic pulse pattern was detected. Blending units will display this error on the PPU display for any product using the pulser on which the erratic pulse pattern was detected. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Special Consideration Regarding Coriolis (DEF) Meters:

Error Code 5050 may show while purging the unit on a startup or due to hydraulic service, or air introduced into the system in another area. It is necessary to plug a standard pulser into the PCN and spin the pulser manually to purge the system. Once the system is properly purged, reconnect the Coriolis meter and proceed.

Troubleshooting Steps:

1) Using the Laptop Tool, verify the affected pulser in the Event Log.
2) Verify proper unit programming.
3) Verify that the unit hydraulics have not been recently serviced, and not properly purged or calibrated afterwards.
4) Check the pulser wiring and connections for proper termination. Reseat as necessary.
5) Verify that no corrosion exists on the pulser wiring connections. Clean as necessary.
6) Warmstart the unit, verify that the error condition clears.
7) Test the pulser to check if the issue is returns.
8) Swap the pulser from one position to another.
9) If the issue follows, replace the pulser.
10) If the issue does not follow, troubleshoot the associated PCAs (PCN, Coriolis Interface etc.).

Possible Causes; Standard (Non Ultra-Hi) Pulser, Encrypted Pulser and Ecometer:

- Damaged/malfunctioning pulser.

Note: Ecometer pulsers are not independently serviceable.
Moving the pulser requires moving the entire Ecometer assembly.

- Improper, corroded or damaged wiring/connection.
- Air in the unit or line hydraulics causing pulser jitter.
- Damaged PCN.
- Incorrect calibration factor.

Example: CC 82 (Calibration measure capacity) programmed to 50 gallons and the unit was calibrated with a 5 gallon test measure.

- Flow control error.

Example: CC 80 (Maximum Flow Rate) programmed to a value of 10, but the unit cannot properly throttle the flow due to a hydraulic or electronic failure.

Possible Causes; Ultra-Hi Pulser:

- Damaged/malfunctioning pulser.
- Damaged or defective Intrinsically Safe Barrier PCA.
- Improper, corroded or damaged wiring/connection.
- Air in the unit or line hydraulics causing pulser jitter.
- Damaged PCN.
- Unstable pulser voltage through the Intrinsically Safe Barrier PCA F1 fuse.
- Incorrect calibration factor.

Example: CC 82 (Calibration measure capacity) programmed to 50 gallons and the unit was calibrated with a 5 gallon test measure.

Possible Causes; Coriolis (DEF) Meter:

- Air in the unit or line hydraulics causing pulser jitter.
- Damaged/malfunctioning Coriolis Interface PCA.
- Damaged/malfunctioning pulser.

Note: To move the pulser on a Coriolis meter the Coriolis electronics must be moved.
The purple meter programming chip must remain matched with the meter hydraulics.

- Improper, corroded or damaged wiring/connection.
- Damaged PCN.
- Incorrect calibration factor.

Ex: CC 82 (Calibration measure capacity) programmed to 50 gallons and the unit calibrated with a 5 gallon test measure.

Error Code 5056 – Calibration Switch on During Startup/Transaction:

Error Code Definition:

This super-major error is generated when the unit is powered up with the security switch in the "ON" (to the right) position. This error applies to unit types with Sandpiper electronics of any generation with Pump Control Node (PCN) version 1.8.00 or higher loaded. This error will display on PPU displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Power down the unit.
2) Place the security switch in the "OFF" position (to the left).
3) Restore power to the unit.
4) If the error persists or a different security error shown, perform another warmstart.
5) Verify that the security errors have cleared.

Note: Powering up the unit with the security switch in the "ON" (to the right) *position is part of clearing certain error codes. See Service Bulletin 2476 for further information.*

Possible Causes; Any Generation Sandpiper Electronics:

- The security switch is in the "ON" (to the right) position at startup.
- The security switch was turned to the "ON" (to the right) position during a transaction.
- Damaged/malfunctioning PCN.
- Damaged/malfunctioning security switch.

Error Code 5115 – Door Node Download Error:

Error Code Definition:

This major error is generated when the Pump Control Node (PCN) is not able or not authorized to communicate with a Door Node. This error applies to unit types with Sandpiper electronics of any generation. This error will display on the opposite side from the node the PCN cannot communicate with, or on the new node display upon replacement. In some circumstances (such as incorrect jumper settings) the error may display on both sides. This error may show when a transaction is attempted. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Verify that the "Neuron Status" LED on either Door Node is illuminated or flashing. If on or flashing the Door Node must be replaced.
2) Verify the side select jumper on the Door Nodes.

Note: Side 1(A) = No jumper installed, Side 2(B) = jumper installed

3) Verify that the LON cables are not damaged and seated properly.
4) Bypass security, enter and exit programming with a valid level 2, 3 or 4 PIN code.
5) If the error persists, replace the Door Node on the opposite side where the error is showing.

Note: If the unit being serviced is in standalone, security has already been bypassed and does not need to be bypassed again prior to entering and exiting programming with a valid level 2,3 or 4 PIN code.

Further Information:

Door Node errors may show on the opposite side from where the error actually is. The reason behind this is that the node that is actually in error may not be able to display any errors; the PCN will show the error on any communicating Door Node. The heartbeat LED on the Door Node 4 and below should be on solid at a normal idle state. The heartbeat LED on the Door Node 5 should flash at a normal idle state.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/malfunctioning Door Node.
- Damaged LON cable.
- Incorrect Door Node jumper setting.

Error Code 5116 – Door Node Data Download Incomplete:

Error Code Definition:

This medium error is generated when the Pump Control Node (PCN) is unable to complete a redundant storage download from a Door Node. This error applies to unit types with Sandpiper electronics of any generation. This error will display on the opposite side from the node the PCN cannot communicate with, or on the new node display upon replacement. In some circumstances (such as incorrect jumper settings) the error may display on both sides. This error may show on startup. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Verify that the "Neuron Status" LED on either Door Node is not illuminated or flashing. If on or flashing the Door Node must be replaced.
2) Verify the side select jumper on the Door Nodes.

Note: Side 1(A) = No jumper installed, Side 2(B) = jumper installed

3) Verify that the LON cables are not damaged and seated properly.
4) Bypass security, enter and exit programming with a valid level 2, 3 or 4 PIN code.
5) If the error persists, replace the Door Node on the opposite side where the error is showing.

Note: If the unit being serviced is in standalone, security has already been bypassed and does not need to be bypassed again prior to entering and exiting programming with a valid level 2,3 or 4 PIN code.

Further Information:

Door Node errors may show on the opposite side from where the error actually is. The reason behind this is that the node that is actually in error may not be able to display any errors; the PCN will show the error on any communicating Door Node. The heartbeat LED on the Door Node 4 and below should be on solid at a normal idle state. The heartbeat LED on the Door Node 5 should flash at a normal idle state.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/malfunctioning Door Node.
- Damaged LON cable.
- Incorrect Door Node jumper setting.

Error Code 5139 – Stop Button Stuck:

Error Code Definition:

This major error code is generated when the Pump Control Node (PCN) detects that a button such as a Push-To-Stop button is stuck. This error applies to any generation Sandpiper electronics. This error will display on the Door Node display on the affected side. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Unplug all membrane keypads on the unit including CRIND soft and auxiliary keys, as well as any push-to-stop keys and warmstart the unit. These keys may be installed but covered up by a blank overlay.
2) Verify that the error clears.
3) Plug the keypads back in one at a time, and test each for proper operation until the component causing the issue is found.
4) If the error does not clear, a keypad was likely missed. Check the printer doors, and the back of the EPP pinpad.

Note: Loading V2.9.42 or higher into the PCN will allow for enhanced detection of this error.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/malfunctioning keypad.
- Damaged/malfunctioning keypad cable.

Note: The component causing the issue may be on either side of the unit.

Error Code 5142 – Push to Start Button Stuck:

Error Code Definition:

This major error code is generated when the Pump Control Node (PCN) detects that a button connected to the unit is stuck. This error applies to any generation Sandpiper electronics. This error will display on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Unplug all membrane keypads on the unit including CRIND soft and auxiliary keys, as well as any push-to-stop keys and warmstart the unit. These keys may be installed but covered up by a blank overlay.
2) Verify that the error clears.
3) Plug the keypads back in one at a time, and test each for proper operation until the component causing the issue is found.
4) If the error does not clear, a keypad was likely missed. Check the printer doors, and the back of the EPP pinpad.

Note: Loading V2.9.42 or higher into the PCN will allow for enhanced detection of this error.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/corroded PPU PCA or assembly.
- Damaged grade select button.
- Damaged/corroded PPU cable.
- Damaged grade select 'soda' button.
- Damaged/malfunctioning keypad on either side of the unit.
- Damaged/malfunctioning keypad cable.

Error Code 5300 – PPU Value Changed:

Error Code Definition:

This informational error is generated when the Pump Control Node (PCN) receives a price update from the Point of Sale (POS) and updates the PPU displays. This error applies to all unit types with Sandpiper electronics of any generation prior to version 01/02.8.60. This error is displayed in the logs only, and will be generated whenever the unit updates the PPU displays. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Using the Laptop Tool, pull the Event Log.
2) Verify that the unit is showing the proper prices.
3) Verify that the time/date stamp in the logs is consistent with a price change sent from the POS.
4) Find out if the site is utilizing any loyalty program, or any other scenario that would lower the price.
5) Ask the site if the POS appears to be losing communication with the unit. If communication appears to be intermittently dropping, look for other errors in the Event Log.

Possible Causes; Any Generation Sandpiper Electronics:

- The unit received a price update from the POS.
- A discount was applied that changed the price displayed to the customer.
- The POS lost communication with the unit and updated prices when the unit was returned to service. Depends on POS type and configuration.

Error Code 5600 – Fuel Density not set with Vapor Recovery or Automatic Temperature Compensation Enabled:

Error Code Definition:

This super-major error is shown when the unit has been programmed to enable Vapor Recovery (VRC) or Automatic Temperature Compensation (ATC) and the Fuel Density value in Command Code 75 has not been configured. This error applies to all unit types with Sandpiper electronics of any generation. This error will display on the Door Node displays on both sides. Cause and resolution information are shown below.

Steps to Resolve:

1) Verify that the unit type set in Command Code 90 is correct.
2) Verify that Command Code 75 has been properly configured for the desired Fuel Density value. Fuel Density cannot be left at the default of 0 for any product configured in Command Code 90. Reference the chart below.

Programming Details:

2.8.60 or earlier:

1) Select side
2) Select product
3) Select Density code.

2.9.42 or later:

1) Select side.
2) Select meter number.
3) Select Density code.

Meter Layout Chart

Fuel Density	Product Code	Meter Number (Side 1,2)
1 – Gasoline	1	1,2
2 – Diesel (Disables VaporVac)	2	5,6
3 – Diesel Exhaust Fluid	3	3,4
4 – Ethanol	4	8,7

Possible Causes; Any Generation Sandpiper Electronics:

- ATC/VRC is enabled and Fuel Density (Command Code 75) has not been properly configured.
- Unit configuration error in Command Code 90 or 91.

Error Code 5602 – Door Node Software Updated While Security Switch Not On:

Error Code Definition:

This super-major error code is generated when the Pump Control Node (PCN) detects that Door Node software has been updated while the security switch is in the "OFF" (to the left) position. This error applies to all unit types with Sandpiper electronics of any generation with PCN version 2.9.06 or higher loaded. This error will display on the Door Node displays on both sides. Cause and resolution information are listed below.

Steps to Resolve:

1) Power down the unit.
2) Place the security switch in the "ON" position (to the right).
3) Restore power to the unit.
4) Verify that the EC 5602 has cleared, and that an EC 5056 is showing.
5) Place the security switch in the "OFF" (to the left) position and verify that all errors have cleared.
6) Press F1, then F2 on the manager's keypad.
7) Verify that all errors have cleared.

Possible Causes; Any Generation Sandpiper Electronics:

- Door Node software has been updated while the security switch was in the "OFF" (to the left) position.

Error Code 5603 – ATC Node Software Updated While Security Switch Not On:

Error Code Definition:

This super-major error code is generated when the Pump Control Node (PCN) detects that the ATC Node software has been updated while the security switch is in the "OFF" (to the left) position. This error applies to all unit types with Sandpiper electronics of any generation with PCN version 2.9.06 or higher loaded. This error will display on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Power down the unit.
2) Place the security switch in the "ON" position (to the right).
3) Restore power to the unit.
4) Verify that the EC 5603 has cleared, and that an EC 5056 is showing.
5) Place the security switch in the "OFF" (to the left) position and verify that all errors have cleared.
6) Press F1, then F2 on the manager's keypad.
7) Verify that all errors have cleared.

Possible Causes; Any Generation Sandpiper Electronics:

- ATC Node software has been updated while the security switch was in the "OFF" (to the left) position.

Error Code 5616 – Pump and Door Node Storage Match:

Error Code Definition:

This informational error is generated when the Pump Control Node (PCN) completes the internal startup procedures and no redundant storage update was necessary. This error applies to all unit types with Sandpiper electronics of any generation. This error is displayed in the event logs only. Cause and resolution information are shown below.

Further Information:

This error is logged upon a successful PCN startup where no redundant storage update was performed by the PCN.

Steps to Resolve:

- None necessary.

Note: If a large amount of these errors are noted in the Event Log, it may be necessary to troubleshoot why the unit is repetitively losing power or being power cycled.

Possible Causes; Any Generation Sandpiper Electronics:

- Normal startup of the unit.

Error Code 8025 – Encrypted Pulser: ID Mismatch:

Error Code Definition:

This medium error code is generated when the Pump Control Node (PCN) detects that the ID of an installed Encrypted Pulser does not match the ID recorded in the PCN. This error applies to all unit types with Sandpiper electronics of any generation with Encrypted Pulsers and PCN version 2.9.28 or later loaded. This error will display on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Bypass PCN security.
2) Press F1 on the manager's keypad, enter in the level 4 PIN number and press enter.
3) Press "84" and press enter.
4) Press "1" and press enter.
5) Press F2 to exit programming.
6) Verify the error has cleared.

Possible Causes; Any Generation Sandpiper Electronics:

- A new Encrypted Pulser has been installed.
- An Encrypted Pulser has been moved to another position.
- Damaged/Malfunctioning Encrypted Pulser.

Error Code 8040 – Encrypted Pulser: Communication Interrupt:

Error Code Definition:

This medium error code is generated when the Pump Control Node (PCN) detects that the communication from an installed Encrypted Pulser to the PCN has been interrupted. This error applies to all unit types with Sandpiper electronics of any generation with Encrypted Pulsers and PCN version 2.9.28 or later loaded. This error will display on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Verify that the Encrypted Pulser cabling is properly plugged in and not damaged.
2) Power cycle the unit and verify that the error clears.
3) If the error has not cleared, swap the Encrypted Pulser cabling with another position to isolate the Encrypted Pulser. If the error follows the Encrypted Pulser, replace the Encrypted Pulser. If the error stays with the connection on the PCN, replace the PCN.

Note: Swapping positions with an Encrypted Pulser will generate an EC 8025. Reference the EC 8025 section for details.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/Malfunctioning Encrypted Pulser cabling.
- Damaged/Malfunctioning Encrypted Pulser.
- Damaged/Malfunctioning PCN.

Error Code 8041 – Encrypted Pulser: Missing Data:

Error Code Definition:

This medium error code is generated when the Pump Control Node (PCN) detects that the data transmission from an installed Encrypted Pulser to the PCN has been interrupted. This error applies to all unit types with Sandpiper electronics of any generation with Encrypted Pulsers and PCN version 2.9.28 or later loaded. This error will display on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Verify that the Encrypted Pulser cabling is properly plugged in and not damaged.
2) Power cycle the unit and verify that the error clears.
3) If the error has not cleared, swap the pulser cabling with another position to isolate the pulser. If the error follows the Encrypted Pulser, replace the Encrypted Pulser. If the error stays with the connection on the PCN, replace the PCN.

Note: Swapping positions with an Encrypted Pulser will generate an EC 8025. Reference the EC 8025 section for details.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/Malfunctioning Encrypted Pulser cabling.
- Damaged/Malfunctioning Encrypted Pulser.
- Damaged/Malfunctioning PCN.

Error Code 8042 – Encrypted Pulser: Missing Clock:

Error Code Definition:

This medium error code is generated when the Pump Control Node (PCN) detects that the clock data transmission from an installed Encrypted Pulser to the PCN has been interrupted. This error applies to all unit types with Sandpiper electronics of any generation with Encrypted Pulsers and PCN version 2.9.28 or later loaded. This error will display on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Verify that the Encrypted Pulser cabling is properly plugged in and not damaged.
2) Power cycle the unit and verify that the error clears.
3) If the error has not cleared, swap the pulser cabling with another position to isolate the pulser. If the error follows the Encrypted Pulser, replace the Encrypted Pulser. If the error stays with the connection on the PCN, replace the PCN.

Note: Swapping positions with an Encrypted Pulser will generate an EC 8025. Reference the section on EC 8025 for details.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/Malfunctioning Encrypted Pulser cabling.
- Damaged/Malfunctioning Encrypted Pulser.
- Damaged/Malfunctioning PCN.

Error Code 8044 – Encrypted Pulser: Checksum Error:

Error Code Definition:

This medium error code is generated when the Pump Control Node (PCN) detects that the checksum sent from an installed Encrypted Pulser to the PCN is incorrect. This error applies to all unit types with Sandpiper electronics of any generation with Encrypted Pulsers and PCN version 2.9.28 or later loaded. This error will display on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Troubleshooting Steps:

1) Verify that the Encrypted Pulser cabling is properly plugged in and not damaged.
2) Power cycle the unit and verify that the error clears.
3) If the error has not cleared, swap the pulser cabling with another position to isolate the pulser. If the error follows the Encrypted Pulser, replace the Encrypted Pulser. If the error stays with the connection on the PCN, replace the PCN.

Note: Swapping positions with an Encrypted Pulser will generate an EC 8025. Reference the section on EC 8025 for details.

Possible Causes; Any Generation Sandpiper Electronics:

- Damaged/Malfunctioning Encrypted Pulser cabling.
- Damaged/Malfunctioning Encrypted Pulser.
- Damaged/Malfunctioning PCN.

Error Code 8046 – Encrypted Pulser: Lift Off Detection:

Error Code Definition:

This major error code is generated when the Pump Control Node (PCN) detects that an installed Encrypted Pulser has detected a lift off event. This error applies to all unit types with Sandpiper electronics of any generation with Encrypted Pulsers and PCN version 2.9.28 or later loaded. This error will display on the Door Node displays on both sides. Troubleshooting information is below, the causes listed are ordered from most to least possible.

Further Information:

Once this error has occurred it will be persistent through a power cycle. Only when level 2, 3 or 4 programming is entered using a valid PIN code and programming is exited can the error clear. Once the cause of the error has been remedied this procedure will clear the error condition.

Note: Prior to performing this action security must be properly bypassed.

Troubleshooting Steps:

1) Verify that the Encrypted Pulser is properly mounted and shows no sign of tamper.
2) Bypass PCN security.
3) Press F1 on the manager's keypad, enter in any level PIN number and press enter.
4) Press F2 to exit programming.
5) Verify the error has cleared.

Possible Causes; Any Generation Sandpiper Electronics:

- The Encrypted Pulser is not properly mounted.
- Damaged/Malfunctioning Encrypted Pulser.

IMPORTANT INFORMATION
This bulletin does not serve as authorization to perform any site visits or warranty service.