Introduction

Purpose

This manual provides instructions to install the following Encrypted Pulser Retrofit Kits (M12514K00X) for Encore® 500/S/700 S/S E-CIM™ units with standard flow positive displacement meters:

Retrofit Kit	Description
M12514K001	Encrypted Pulser Retrofit Kit, U.S.: All Encore 500/S/700 S/S E-CIM units built after June 2003.
M12514K003	Encrypted Pulser Retrofit Kit, U.S.: All Encore 500/S E-CIM units built before June 2003.

Note: For encrypted pulser retrofit diagrams, refer to "Appendix B: Encrypted Pulser Retrofit Kits" on page 23.

IMPORTANT INFORMATION

This manual is not intended for use with Ultra-Hi™ or Diesel Exhaust Fluid (DEF) Encore 500/S/700 S/S E-CIM units or units installed with Ecometer™.

High Level Overview

Installation of the Encrypted Pulser Retrofit Kits includes the following:

1. Remove the existing Encore standard flow positive displacement meter pulser.
2. Install the encrypted pulser.
3. Upload the latest software.

Table of Contents

Topic	Page
Introduction	1
Important Safety Information	4
Before You Begin	6
Removing Existing Encore Series Pulsers	7
Installing Encrypted Pulser Retrofit Kits (M12514K00X)	9
Appendix A: Encrypted Pulser Error Codes and Troubleshooting	16
Appendix B: Encrypted Pulser Retrofit Kits	23

Required Tools

The following tools are required to install the Encrypted Pulser Retrofit Kits:

- 7-mm Hexagonal-head Driver
- Security-bit Screwdriver

Recommended Tool

The Pulser Gauge [M14437B001 (see Figure 5 on page 10)] is used to install the Encrypted Pulser Retrofit Kits.

IMPORTANT INFORMATION
The pulser gauge is not included in the kits and must be ordered separately.

Parts List

The following table lists the parts included in the M12514K001 Kit:

Item	Description	Part Number	Quantity
1	Pulser, Encrypted	M11816B002	1
2	Screw, Metric, Thread Forming Hexagonal Washer Head	M11866B001	6

The following table lists the parts included in the M12514K003 Kit:

Item	Description	Part Number	Quantity
1	Pulser, Encrypted	M11816B002	1
2	Screw, Metric, Thread Forming Hexagonal Washer Head	M11866B001	10
3	Plate, Pulser Seal Gasket	M12423B001	2
4	Gasket, Pulser Drive	M03081B001	2
5	Plate, Pulser Gasket	M12527B001	2
6	Gasket, Pulser	M12528B001	2

Related Documents

Document Number	Title	GOLD℠ Library
MDE-3804	Encore and Eclipse® Start-up/Service Manual	• Encore and Eclipse • Service Manual
MDE-3860	Programming Quick Reference Guide	• Encore and Eclipse • Encore and Eclipse Installers
MDE-3921	Laptop Tool User Reference Guide	• Encore and Eclipse • Encore and Eclipse Installers
MDE-4281	Calibration Quick Reference Card Encore 300/500/500 S/700 S/800 and Eclipse Units	• Encore and Eclipse • Encore and Eclipse Installers • Service Manual
PT-1936	Encore Series Pumps and Dispensers Illustrated Parts Manual	• Encore and Eclipse • Encore and Eclipse Installers • Parts Manual
PT-1937	Encore 300, Encore 500/500 S, Encore 550, Encore 700 S, Eclipse Recommended Spare Parts Manual	• Encore and Eclipse • Parts Manual

Abbreviations and Acronyms

Term	Description
CC	Command Code
CD	Computer Display
DEF	Diesel Exhaust Fluid
E-CIM	Enhanced Customer Interface Module
EC	Error Code
ESD	Electrostatic Discharge
GOLD	Gilbarco® Online Documentation
I.S.	Intrinsic Safety
MPD®	Multi Product Dispenser
OSHA	Occupational Safety and Health Administration
PCA	Printed Circuit Assembly
PCN	Pump Control Node
TAC	Technical Assistance Center
TRP	Technician Resource Page

Important Safety Information

Notes: 1) Save this Important Safety Information section in a readily accessible location.

2) Although DEF is non-flammable, Diesel is flammable. Therefore, for DEF cabinets that are attached to Diesel dispensers, follow all the notes in this section that pertain to flammable fuels.

This section introduces the hazards and safety precautions associated with installing, inspecting, maintaining or servicing this product. Before performing any task on this product, read this safety information and the applicable sections in this manual, where additional hazards and safety precautions for your task will be found. Fire, explosion, electrical shock or pressure release could occur and cause death or serious injury, if these safe service procedures are not followed.

Preliminary Precautions

You are working in a potentially dangerous environment of flammable fuels, vapors, and high voltage or pressures. Only trained or authorized individuals knowledgeable in the related procedures should install, inspect, maintain or service this equipment.

Emergency Total Electrical Shut-Off

The first and most important information you must know is how to stop all fuel flow to the pump/dispenser and island. Locate the switch or circuit breakers that shut off all power to all fueling equipment, dispensing devices, and Submerged Turbine Pumps (STPs).

⚠ WARNING

The EMERGENCY STOP, ALL STOP, and PUMP STOP buttons at the cashier's station WILL NOT shut off electrical power to the pump/dispenser. This means that even if you activate these stops, fuel may continue to flow uncontrolled.

You must use the TOTAL ELECTRICAL SHUT-OFF in the case of an emergency and not the console's ALL STOP and PUMP STOP or similar keys.

Total Electrical Shut-Off Before Access

Any procedure that requires access to electrical components or the electronics of the dispenser requires total electrical shut off of that unit. Understand the function and location of this switch or circuit breaker before inspecting, installing, maintaining, or servicing Gilbarco equipment.

Evacuating, Barricading and Shutting Off

Any procedure that requires access to the pump/dispenser or STPs requires the following actions:

- An evacuation of all unauthorized persons and vehicles from the work area
- Use of safety tape, cones or barricades at the affected unit(s)
- A total electrical shut-off of the affected unit(s)

Read the Manual

Read, understand and follow this manual and any other labels or related materials supplied with this equipment. If you do not understand a procedure, call a Gilbarco Authorized Service Contractor or call the Technical Assistance Center (TAC) at 1-800-743-7501. It is imperative to your safety and the safety of others to understand the procedures before beginning work.

Follow the Regulations

Applicable information is available in National Fire Protection Association (NFPA) 30A; *Code for Motor Fuel Dispensing Facilities and Repair Garages*, NFPA 70; *National Electrical Code (NEC)*, Occupational Safety and Health Administration (OSHA) regulations and federal, state, and local codes. All these regulations must be followed. Failure to install, inspect, maintain or service this equipment in accordance with these codes, regulations and standards may lead to legal citations with penalties or affect the safe use and operation of the equipment.

Replacement Parts

Use only genuine Gilbarco replacement parts and retrofit kits on your pump/dispenser. Using parts other than genuine Gilbarco replacement parts could create a safety hazard and violate local regulations.

Safety Symbols and Warning Words

This section provides important information about warning symbols and boxes.

Alert Symbol

This safety alert symbol is used in this manual and on warning labels to alert you to a precaution which must be followed to prevent potential personal safety hazards. Obey safety directives that follow this symbol to avoid possible injury or death.

Signal Words

These signal words used in this manual and on warning labels tell you the seriousness of particular safety hazards. The precautions below must be followed to prevent death, injury or damage to the equipment:

DANGER: Alerts you to a hazard or unsafe practice which will result in death or serious injury.

WARNING: Alerts you to a hazard or unsafe practice that could result in death or serious injury.

CAUTION with Alert symbol: Designates a hazard or unsafe practice which may result in minor injury.

CAUTION without Alert symbol: Designates a hazard or unsafe practice which may result in property or equipment damage.

Working With Fuels and Electrical Energy

Prevent Explosions and Fires

Fuels and their vapors will explode or burn, if ignited. Spilled or leaking fuels cause vapors. Even filling customer tanks will cause potentially dangerous vapors in the vicinity of the dispenser or island.

DEF is non-flammable. Therefore, explosion and fire safety warnings do not apply to DEF fluid lines.

No Open Fire

Open flames from matches, lighters, welding torches or other sources can ignite fuels and their vapors.

No Sparks - No Smoking

Sparks from starting vehicles, starting or using power tools, burning cigarettes, cigars or pipes can also ignite fuels and their vapors. Static electricity, including an electrostatic charge on your body, can cause a spark sufficient to ignite fuel vapors. Every time you get out of a vehicle, touch the metal of your vehicle, to discharge any electrostatic charge before you approach the dispenser island.

Working Alone

It is highly recommended that someone who is capable of rendering first aid be present during servicing. Familiarize yourself with Cardiopulmonary Resuscitation (CPR) methods, if you work with or around high voltages. This information is available from the American Red Cross. Always advise the station personnel about where you will be working, and caution them not to activate power while you are working on the equipment. Use the OSHA Lockout/Tagout procedures. If you are not familiar with this requirement, refer to this information in the service manual and OSHA documentation.

Working With Electricity Safely

Ensure that you use safe and established practices in working with electrical devices. Poorly wired devices may cause a fire, explosion or electrical shock. Ensure that grounding connections are properly made. Take care that sealing devices and compounds are in place. Ensure that you do not pinch wires when replacing covers. Follow OSHA Lockout/Tagout requirements. Station employees and service contractors need to understand and comply with this program completely to ensure safety while the equipment is down.

Hazardous Materials

Some materials present inside electronic enclosures may present a health hazard if not handled correctly. Ensure that you clean hands after handling equipment. Do not place any equipment in the mouth.

⚠ WARNING

The pump/dispenser contains a chemical known to the State of California to cause cancer.

⚠ WARNING

The pump/dispenser contains a chemical known to the State of California to cause birth defects or other reproductive harm.

In an Emergency

Inform Emergency Personnel

Compile the following information and inform emergency personnel:

- Location of accident (for example, address, front/back of building, and so on)
- Nature of accident (for example, possible heart attack, run over by car, burns, and so on)
- Age of victim (for example, baby, teenager, middle-age, elderly)
- Whether or not victim has received first aid (for example, stopped bleeding by pressure, and so on)
- Whether or not a victim has vomited (for example, if swallowed or inhaled something, and so on)

⚠ WARNING

Gasoline/DEF ingested may cause unconsciousness and burns to internal organs. Do not induce vomiting. Keep airway open. Oxygen may be needed at scene. Seek medical advice immediately.

⚠ WARNING

DEF generates ammonia gas at higher temperatures. When opening enclosed panels, allow the unit to air out to avoid breathing vapors. If respiratory difficulties develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention.

⚠ WARNING

Gasoline inhaled may cause unconsciousness and burns to lips, mouth and lungs. Keep airway open. Seek medical advice immediately.

⚠ WARNING

Gasoline/DEF spilled in eyes may cause burns to eye tissue. Irrigate eyes with water for approximately 15 minutes. Seek medical advice immediately.

⚠ WARNING

Gasoline/DEF spilled on skin may cause burns. Wash area thoroughly with clear water. Seek medical advice immediately.

⚠ WARNING

DEF is mildly corrosive. Avoid contact with eyes, skin, and clothing. Ensure that eyewash stations and safety showers are close to the work location. Seek medical advice/recommended treatment if DEF spills into eyes.

IMPORTANT: Oxygen may be needed at scene if gasoline has been ingested or inhaled. Seek medical advice immediately.

Lockout/Tagout

Lockout/Tagout covers servicing and maintenance of machines and equipment in which the unexpected energization or start-up of the machine(s) or equipment or release of stored energy could cause injury to employees or personnel. Lockout/Tagout applies to all mechanical, hydraulic, chemical, or other energy, but does not cover electrical hazards. Subpart S of 29 CFR Part 1910 - Electrical Hazards, 29 CFR Part 1910.333 contains specific Lockout/Tagout provision for electrical hazards.

Before You Begin

Before you begin, read and understand all safety information found in *MDE-3804 Encore and Eclipse Start-up/Service Manual*.

CAUTION

A properly grounded Electrostatic Discharge (ESD) wrist strap must be worn while servicing any electronic devices or components. Failure to use electrostatic precautions may damage electronic components and void warranty.

1. Inform the manager.
2. Barricade the unit to be worked on.
3. Remove power to the unit at the breaker panel. Follow OSHA lockout/tagout procedures.

⚠ WARNING

Failure to turn off the unit during kit installation may cause injury or bodily harm from electrical shock. Ensure that all power to the unit is switched off before opening the door to the unit and during installation of the kit.

4. Match the parts received in the kit with “Parts List” on page 2.

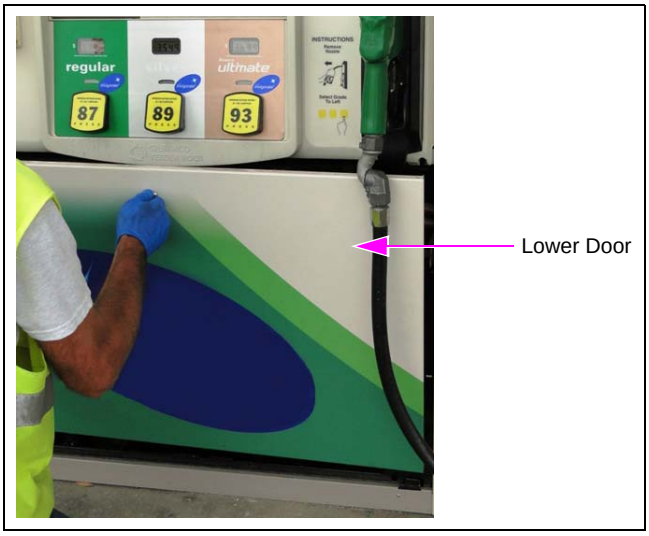
Removing Existing Encore Series Pulsers

To remove the existing Encore series pulsers, proceed as follows:

1 Select the dispenser that must be upgraded.

2 Remove the lower door from side 1/side A of the dispenser.

Figure 1: Removing Lower Door

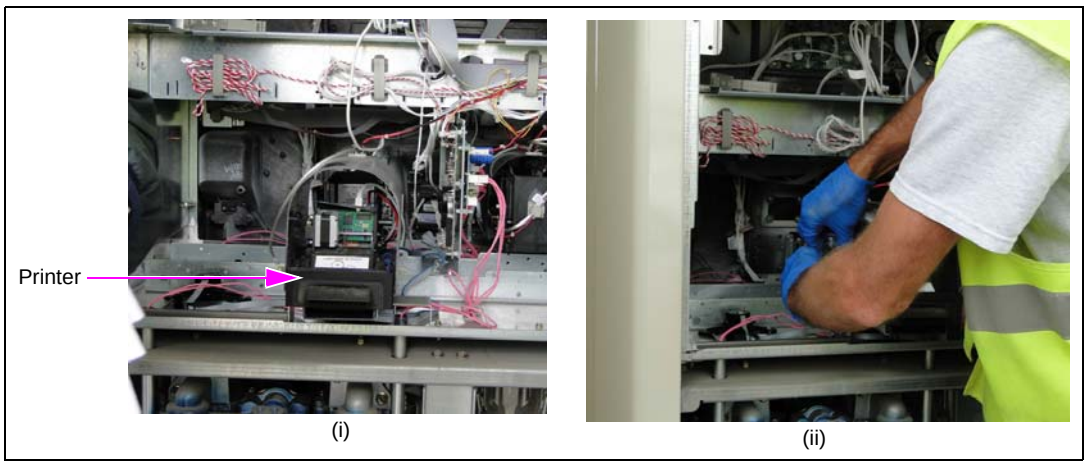


3 Open the bezel door (main door).

Figure 2: Opening Bezel Door (Main Door)

4 If the pulsers are located underneath a sliding printer, disconnect the cables (if required), remove the printer, and place it in a safe area. Also, remove the pulser security brackets (if any).

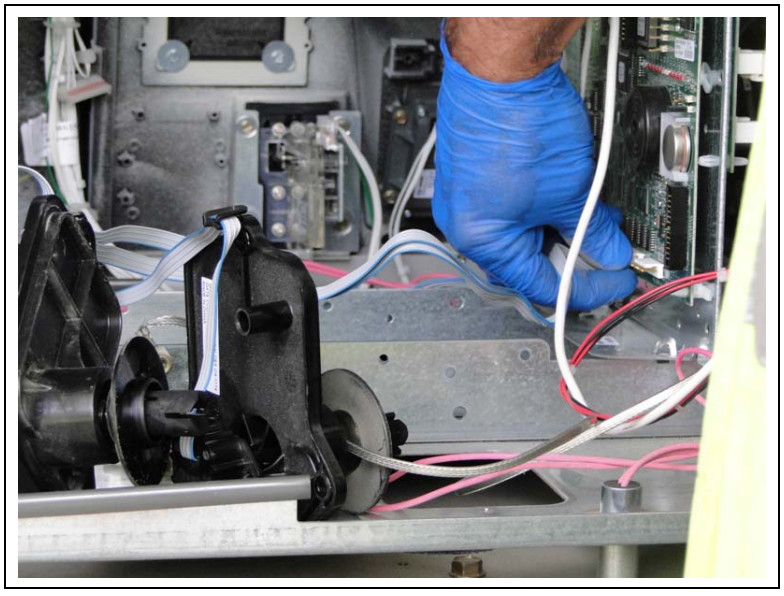
Figure 3: Removing Printer



5 Remove and discard the existing security screws from each pulser using a security-bit screwdriver.
Note: Pulsers are assembled in pairs [same grade for both sides of one connector on the Pump Control Node (PCN)].

6 Disconnect the pulsers from the PCN.
Note: Remove one pulser pair at a time.

Figure 4: Disconnecting Pulsers from PCN



7 Remove the pulsers from the unit.

Removing the existing pulsers is now complete.

Installing Encrypted Pulser Retrofit Kits (M12514K00X)

To install the Encrypted Pulser Retrofit Kits, proceed as follows:

IMPORTANT INFORMATION
Encrypted pulsers require a minimum PCN software of V02.9.42 or later.

Note: Allow one hour to complete installation of the Encrypted Pulser Retrofit Kits.

Installing Encrypted Pulsers

To install the encrypted pulsers, proceed as follows:

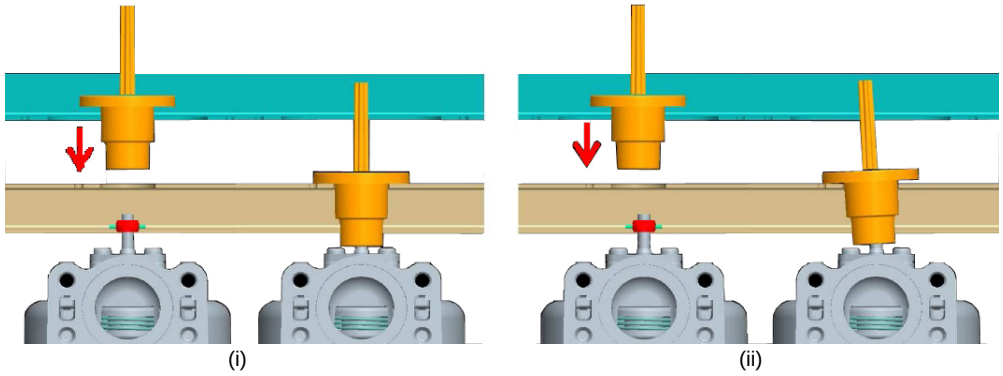
IMPORTANT INFORMATION
All old pulsers must be replaced with the new encrypted pulsers. You cannot combine old and new pulsers.

Note: The encrypted pulser includes security features that make it less vulnerable to theft. The encrypted pulser has a rigid security collar and the pulser body is designed to prevent tampering of the connecting meter shaft.

IMPORTANT INFORMATION
Correct installation is critical to the pulser's performance. The encrypted pulser is designed to operate at a tilt to allow for the meter mounting tolerances. However, it must not touch the lower air gap plate. Installing the encrypted pulser at an extreme angle and/or pressing against the lower air gap plate can damage the internal drive shaft. To prevent this, reposition the meter and/or the meter mounting manifold, if required.

1 Insert the Pulser Gauge (M14437B001) into the pulser opening in the lower air gap plate and look through the two air gap plates. If the large flange of the gauge sits flat on the lower air gap, then the meter shaft alignment is acceptable [see Figure 5 (i)]. If the large flange of the gauge does not sit flat, then the shaft alignment is not acceptable [see Figure 5 (ii)]. Reposition the meter and/or meter manifold so that the gauge sits flat.
Note: Pulser gauge is used to properly install the pulsers.

Figure 5: Using Pulser Gauge



(i)

Pulser Gauge indicating an acceptable meter shaft alignment.

(ii)

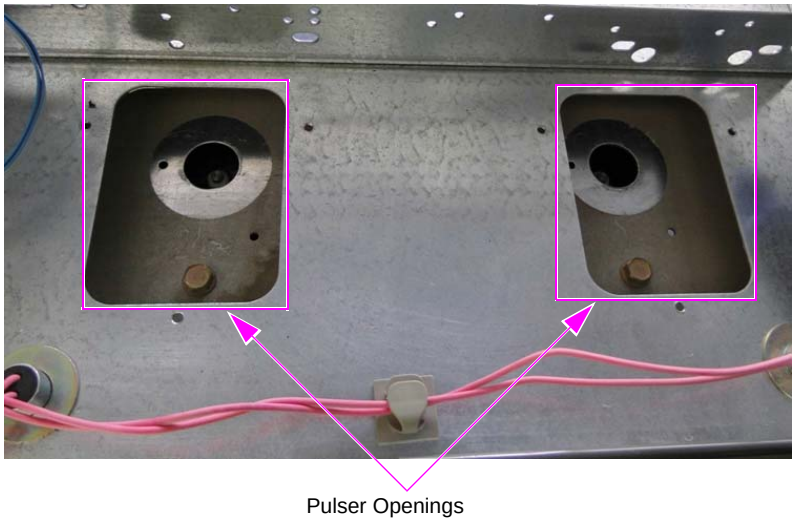
Pulser Gauge indicating a not acceptable meter shaft alignment. Meter and/or meter manifold must be repositioned.

Note: Do not discard the pulser gauge. This is a service tool that can be used for future maintenance repairs of pulsers or meters.

2 Place the new encrypted pulser into the existing opening.
Note: Pulser with long yellow cable [see Figure 7 (ii) on page 11] must be placed at the opening that is closest to the outside column.

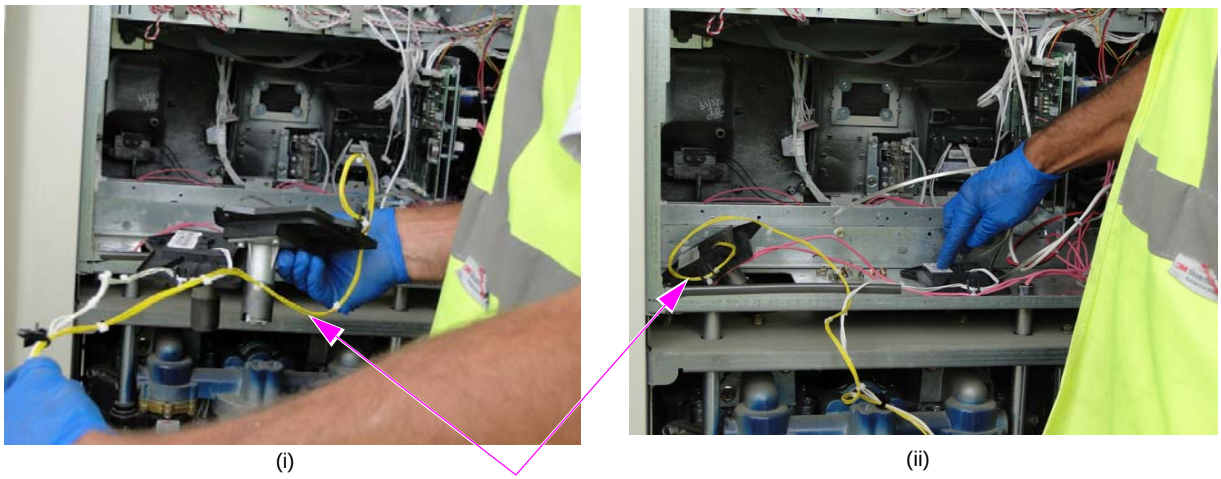
If installing the M12514K003 Kit, you must install the new Pulser Drive Gasket (M03081B001) and new Pulser Gasket Plate (M12527B001) before placing the encrypted pulser into the opening (see Figure 16 on page 24).

Figure 6: Pulser Openings



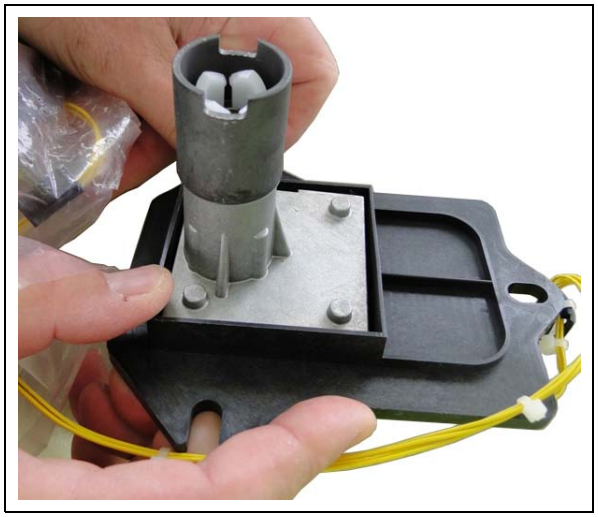
3 Ensure that the new pulser is aligned and fits into the pulser opening by verifying that the pulser fits flush into bottom side of the Computer Display (CD) module [see Figure 7 (ii)]. Check this for both pulsers.

Figure 7: Mounting Pulsers



4 Place the encrypted pulser shield against the top of the meter (located just above the meter seal retainer) with a gap of 1/16-inch maximum. Apply pressure to push the pulser until you hear it snap into position. The pulser assembly will be sealed flush when properly seated (see Figure 8).
Note: Do not use excessive force when pushing down to seat the pulser.

Figure 8: Encore Pulser (Rear View)

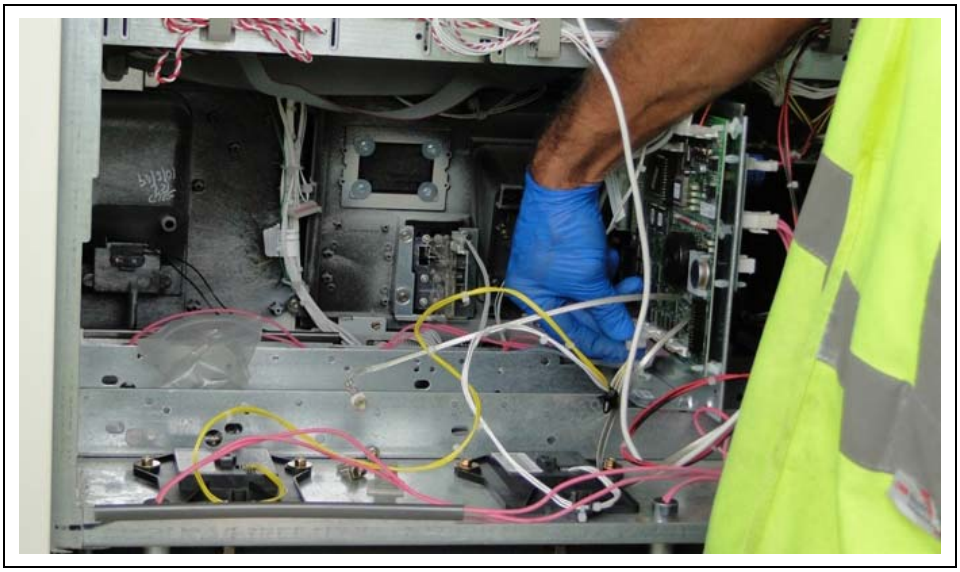


If a security shield protects the meter output shaft and pulser coupling interface, the interlock between the meter output shaft cross pin and coupler may not be physically/visually verified. The verification must be done after the unit is powered on and the pulser is tested.

5 Do not mount the pulsers or reinstall the printer at this stage.

6 Connect the pulsers to the appropriate pulser connector on the PCN (see Figure 9).

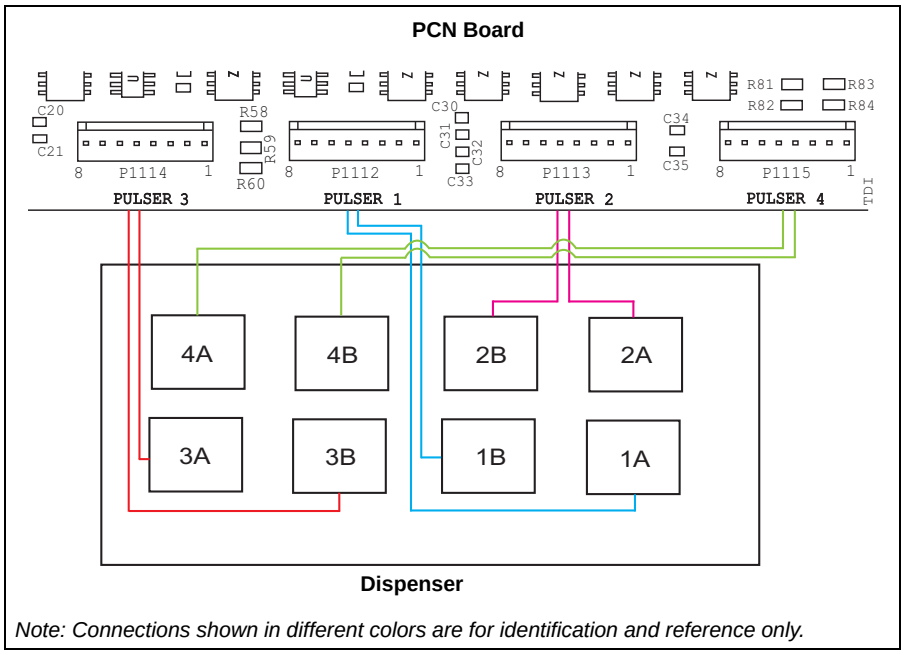
Figure 9: Connecting Pulsers



Connectors from the encrypted pulsers must be connected as follows (see Figure 10):

- Grade 1 pulser must plug into P1112 port
- Grade 2 pulser must plug into P1113 port
- Grade 3 pulser must plug into P1114 port
- Grade 4 pulser must plug into P1115 port

Figure 10: Encrypted Pulser Connections



Note: Connections shown in different colors are for identification and reference only.

7 From the lower hydraulics area, ensure that the pulser(s) is snug against the meter, if no security shield is present.
Note: Ensure that the connectors to the pulser(s) are secured tightly.

8 Repeat steps 2 (on page 10) to 7 for the remaining pulsers on that side of the unit.

9 Remove the lower door on side 2/side B, and repeat steps 3 (on page 7) to 10 for side 2/side B of the unit.

10 Perform a final inspection of all the work, check for pinched cables and pulser connections, and then power up the unit.

IMPORTANT INFORMATION
Cable routing is critical. It is very important to route and dress the cables properly. Exercise care in routing the cables, keeping in mind that the door(s) opens and closes for service. The cables must be dressed neatly. Ensure that there is no interference after the cables are connected and routed.

Uploading Latest Software

Before you proceed with uploading the latest software, ensure that the software requirements for the encrypted pulsers are met.

Software Requirements for Encrypted Pulsers

Encore 500/S/700 S/E-CIM units require a minimum software version 02.9.42P installed on the PCN. To verify the software version installed, power up the dispenser and look for the pump version number on the volume display at start-up or retrieve a version log using the Gilbarco Laptop Tool.

Note: For directions on using Laptop Tool, refer to MDE-3921 Laptop Tool User Reference Guide.

If a software update is required, refer to all Technician Resource Pages (TRPs) on the Gilbarco extranet for information on the current software version. V02.9.42P is the minimum supported version. Any later versions will also contain encrypted pulser support.

To upload the latest software version, proceed as follows:

1 Use the Gilbarco single-click update to obtain the current production version (V02.9.42P is the minimum supported version).
Note: Refer to TRPs for any software updates.

2 Ensure that the calibration and security switch for the PCN is unsealed and turned on before uploading software.

3 Using the Laptop Tool, upload and install the correct software version.

4 When PCN software installation is complete, double check all configuration and programming options if the previous software version was earlier than 01.8.30L or 02.8.30P. For a list of changes for this software version, refer to *MDE-3860 Programming Quick Reference Guide* and current TRPs.

5 Configure the dispenser for encrypted pulsers by entering level 4 programming and setting Command Code (CC) 84 to 1.

Figure 11: Encrypted Pulser Programming Screen

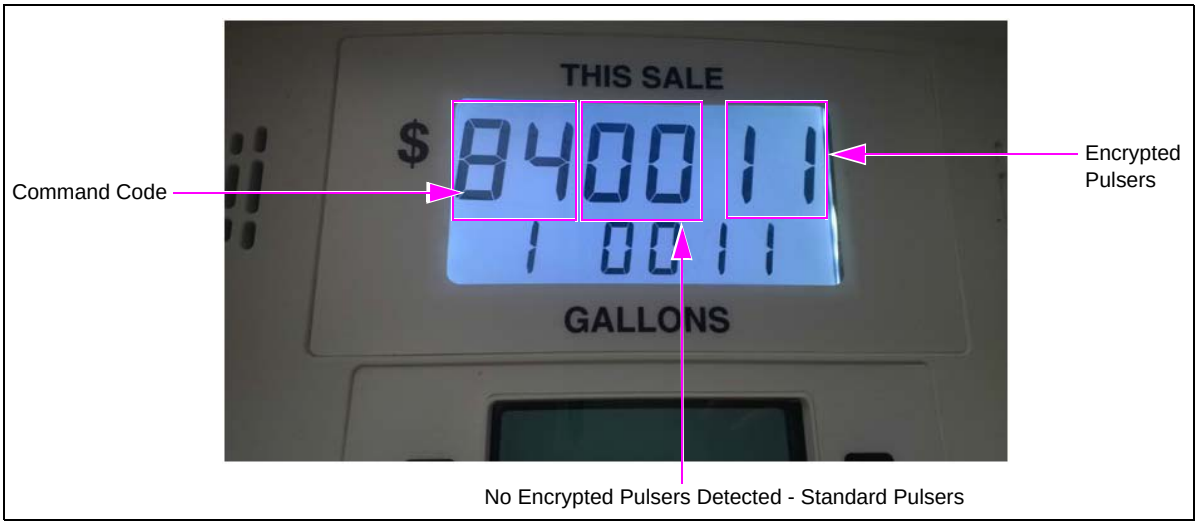


Figure 11 is an example showing an MPD unit (NA1, NC1, NG4, or NG5 model code) or 3+0 Blender type (NN1, NN5, NJ0, or NJ1 model code).

0011 and 0011 shown in Figure 11 indicate positions that are recognized by the PCN as having encrypted pulsers installed. View from side 1 (side A) will show a map with positions of pulsers as they are installed in the hydraulics (see Figure 10 on page 12).
Note: Configuration is the same regardless of unit type or model.

6 Exit the programming mode by pressing **F2** on the manager keypad.

7 After the dispenser reboots, Error Code (EC) 8025 will be displayed for each grade. Enter level 4 programming again and set CC 84 again to detect pulsers and to verify installation.
Note: This allows the unique ID for each encrypted pulser to be detected and verified in each of the current physical pulser positions.

8 Exit the programming mode by pressing **F2** on the manager keypad.

9 Ensure that there are no error codes displayed on any grade for the unit. If any error code is displayed, identify the error and troubleshoot appropriately. For the latest error codes and definitions, refer to *MDE-3860 Programming Quick Reference Guide*. For definitions of encrypted pulser error codes in this manual, refer to "Appendix A: Encrypted Pulser Error Codes and Troubleshooting" on page 16.

10 Dispense product for each grade on both sides of the unit to verify that encrypted pulsers are installed and working properly.

11 Check calibration and calibrate grades as necessary with the configured prover can size. For the configured calibration can size, refer to CC 82. For calibration procedure, refer to *MDE-4281 Calibration Quick Reference Card Encore 300/500/500 S/700 S/800 and Eclipse Units*.

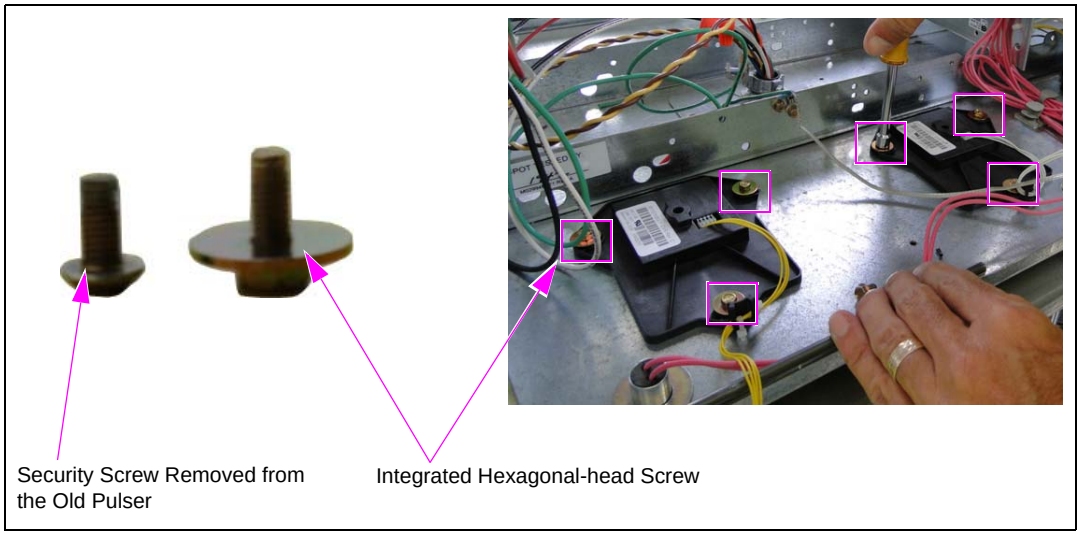
12 After verifying calibration, place a new seal on the PCN security switch.

Completing Installation

To complete the installation, proceed as follows:

1 Fasten the encrypted pulsers using the new integrated hexagonal-head screw and washer set (see Figure 12).
Note: Since hexagonal-head screws are used, a 7-mm hexagonal-head driver must be used to install.

Figure 12: Tightening Pulser Screws



2 Reinstall the printer.
Notes: 1) Ensure that the cables are clamped appropriately and printer tray slides smoothly.
2) Ensure that no cables are pinched under the printer bracket.
3) Check the water seal on the smaller printer door against the printer chute bracket.
4) Perform printer test with a diagnostic card or run a transaction to verify that the printer operates properly.

3 Close and lock both the bezel doors.

4 Replace and lock the lower doors.

Installing the Encrypted Pulser Retrofit Kits is now complete.

Appendix A: Encrypted Pulser Error Codes and Troubleshooting

This section contains an error code list and troubleshooting steps for the encrypted pulser. Refer to this section and follow the troubleshooting steps carefully for any of the following errors.

Note: Before any work is done ensure to pull the pump Event Logs and look for any pulser errors. Also ensure that you power down the dispenser first before removing or reconnecting any connectors.

Error Code	Error Condition	Actual/Potential Cause
20	Pulser Disconnected	• Faulty or broken cable • Faulty pulser For more information, refer to "EC 20 - Pulser Disconnected" on page 17.
5047	Reverse Flow	• Leaky valve • Dispenser not configured for encrypted pulser
5050	Invalid Pulser Pattern	• Dispenser not configured for encrypted pulser
8025	ID Mismatch	• Initial start-up • Different pulser installed For more information, refer to "EC 8025 - ID Mismatch" on page 19.
8040	Communication Interrupt	• Faulty or broken cable • Faulty pulser For more information, refer to "EC 8040 - Communication Interrupt" on page 19.
8041	Missing Data	• Broken or loose data wire • Faulty pulser For more information, refer to "EC 8041 - Missing Data" on page 20.
8042	Missing Clock	Broken or loose clock wire For more information, refer to "EC 8042 - Missing Clock" on page 21.
8044	Checksum Error	• Electrical noise • Faulty cable • Faulty pulser For more information, refer to "EC 8044 - Checksum Error" on page 21.
8046	Lift off Detection	Pulser not engaged with meter shaft For more information, refer to "EC 8046 - Lift off Detection" on page 22.

Note: ECs 5047 and 5050 are pre-existing error codes. In case of encrypted pulser retrofitting, these errors may be displayed on initial start-up before the dispenser is configured for encrypted pulsers. After the unit is configured properly, EC 5047 takes on its original meaning (reverse flow) and EC 5050 becomes invalid for an encrypted pulser configuration.

EC 20 - Pulser Disconnected

Note: EC 20 is a major error.

EC 20 is generated when the PCN loses all communication with the pulser. The error applies to all unit and pulser types, though the causes may vary.

- Non-blending units display this error on the PPU display for the product on which pulser communication was lost.
- Blending units display this error on the PPU display for any product that uses the pulser on which communication was lost.

Beginning with software V02.8.74, pulser errors (EC 20) that occur are persistent through a power cycle. The error can clear only when either level 2, 3, or 4 programming is entered using a valid PIN code and programming is exited. 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.

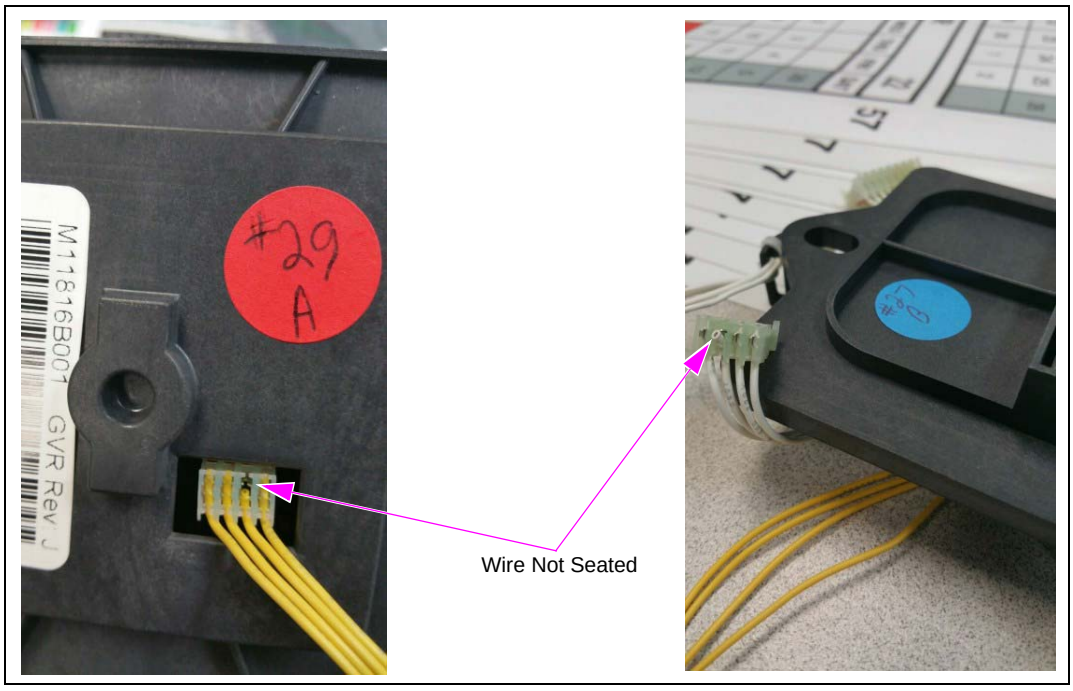
Troubleshooting EC 20

The following are troubleshooting steps listed in the order from 'most to least' possible:

1 Verify proper unit programming.

2 Check pulser wiring (see Figure 13) at both connectors for proper seating/termination. Reseat as necessary.

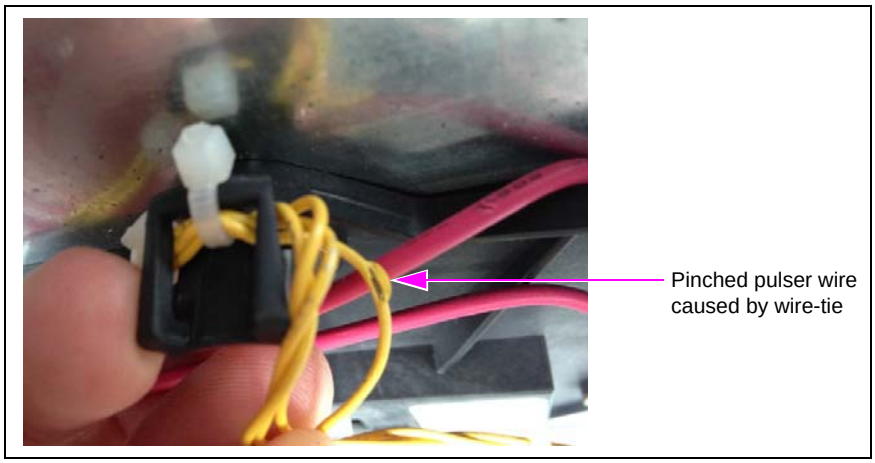
Figure 13: Examples of Wire Not Seated



3 Verify that no corrosion exists on the pulser wiring connections. Clean as necessary.

4 Check for any broken or split wires, especially where the wiring is connected to the pulser using a wire-tie (see Figure 14).

Figure 14: Example of Pinched Pulser Wire



5 Pull the Event Logs. Check the fueling position for EC 20. If there are several errors for a particular fueling position and all the wiring looks good, replace the pulser.

6 If there are no errors in the logs, attempt to clear the EC 20 by the following the steps 2 on page 17 through 5. If the error condition clears, consider swapping the pulser to another position as the error condition may be intermittent.

7 If the error condition does not clear, swap the pulser from one position to another. If the issue follows, replace the pulser.

8 If the issue does not follow, troubleshoot the associated Printed Circuit Assemblies [PCAs (PCN, Coriolis interface, Intrinsic Safety (I.S.) barrier, etc.)].

Clearing Pulser Error (EC 20)

To clear the pulser error, proceed as follows:

1 Install the manager 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 keypad.

Note: If the unit 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.

EC 8025 - ID Mismatch

Note: EC 8025 is a medium error.

EC 8025 is generated when the 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 V2.9.28 or later. This error will display on the PPU displays on both sides.

Troubleshooting EC 8025

The following are troubleshooting steps listed in the order from 'most to least' possible:

Note: Once the new pulser is installed, ensure that you wait for five minutes before starting with step 1.

1. Bypass PCN security.
2. Press **F1** on the manager keypad.
3. In the level 4, enter PIN number and press **Enter**.
4. Press **84** > **Enter**.
5. Turn on security switch.
6. Press **1** > **Enter**.
7. Turn security switch off.
8. Press **F2** to exit programming.
9. Verify that the error 8025 has cleared after the unit reboots.
10. If the error still does not clear, replace the pulser.

EC 8040 - Communication Interrupt

Note: EC 8040 is a medium error.

EC 8040 is generated when the 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 V2.9.28 or later. This error will display on the PPU displays on both sides.

Troubleshooting EC 8040

The following are troubleshooting steps listed in the order from ‘most to least’ possible:

Note: Once the new pulser is installed, ensure that you wait for five minutes before starting with step 1.

1 Verify that the encrypted pulser cabling is properly plugged in and not damaged (refer to Figure 13 on page 17).

2 Power cycle the unit and verify that the error clears. If the error does not clear, enter level 4 and exit to clear the error.

3 Pull the Event Logs and check for reoccurrence.

4 If the error still does not clear, 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. For details, refer to “EC 8025 - ID Mismatch” on page 19.

EC 8041 - Missing Data

Note: EC 8041 is a medium error.

EC 8041 is generated when the 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 V2.9.28 or later. This error displays on the PPU displays on both sides.

Troubleshooting EC 8041

The following are troubleshooting steps listed in the order from ‘most to least’ possible:

Note: Once the new pulser is installed, enure that you wait for five minutes before starting with step 1.

1 Verify that the encrypted pulser cabling is properly plugged in and not damaged (refer to Figure 13 on page 17).

2 Power cycle the unit and verify that the error clears. If the error does not clear, enter level 4 and exit.

3 Pull the pump Event Logs and look for reoccurrence.

4 If the error still does not clear, 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. For details, refer to “EC 8025 - ID Mismatch” on page 19.

EC 8042 - Missing Clock

Note: EC 8042 is a medium error.

EC 8042 is generated when the 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 V2.9.28 or later. This error displays on the PPU displays on both sides.

Troubleshooting EC 8042

The following are troubleshooting steps listed in the order from 'most to least' possible:

Note: Once the new pulser is installed, ensure that you wait for five minutes before starting with step 1.

1. Verify that the encrypted pulser cabling is properly plugged in and not damaged (refer to Figure 13 on page 17).
2. Power cycle the unit and verify that the error clears. If the error does not clear, enter level 4 and exit.
3. Pull the pump Event Logs and look for reoccurrence.
4. If the error still does not clear, 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. For details, refer to "EC 8025 - ID Mismatch" on page 19.

EC 8044 - Checksum Error

Note: EC 8044 is a medium error.

EC 8044 is generated when the 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 V2.9.28 or later. This error displays on the PPU displays on both sides.

Troubleshooting EC 8044

The following are troubleshooting steps listed in the order from 'most to least' possible:

Note: Once the new pulser is installed, ensure that you wait for five minutes before starting with step 1.

1. Verify that the encrypted pulser cabling is properly plugged in and not damaged (refer to Figure 13 on page 17).
2. Power cycle the unit and verify that the error clears. If the error does not clear, enter level 4 and exit.

3 Pull the pump Event Logs and look for reoccurrence.

4 If the error still does not clear, 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. For details, refer to "EC 8025 - ID Mismatch" on page 19.

EC 8046 - Lift off Detection

Note: EC 8046 is a major error.

This major error code is generated when the 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 V2.9.28 or later. This error displays on the PPU displays on both sides.

Once this error occurs, it persists through a power cycle. This error clears only when level 4 programming is entered using a valid PIN code and programming is exited. 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 EC 8046

The following are troubleshooting steps listed in the order from 'most to least' possible:

Note: Once the pulser has been lifted/removed, wait for five minutes before entering/exiting programming mode.

1 Verify that the encrypted pulser is properly mounted.

2 Verify that the spring is installed and installed correctly.

3 Ensure that the white collar moves freely up and down.

4 Bypass PCN security.

5 Press **F1** on the manager keypad.

6 In the level 4, enter PIN number and press **Enter**.

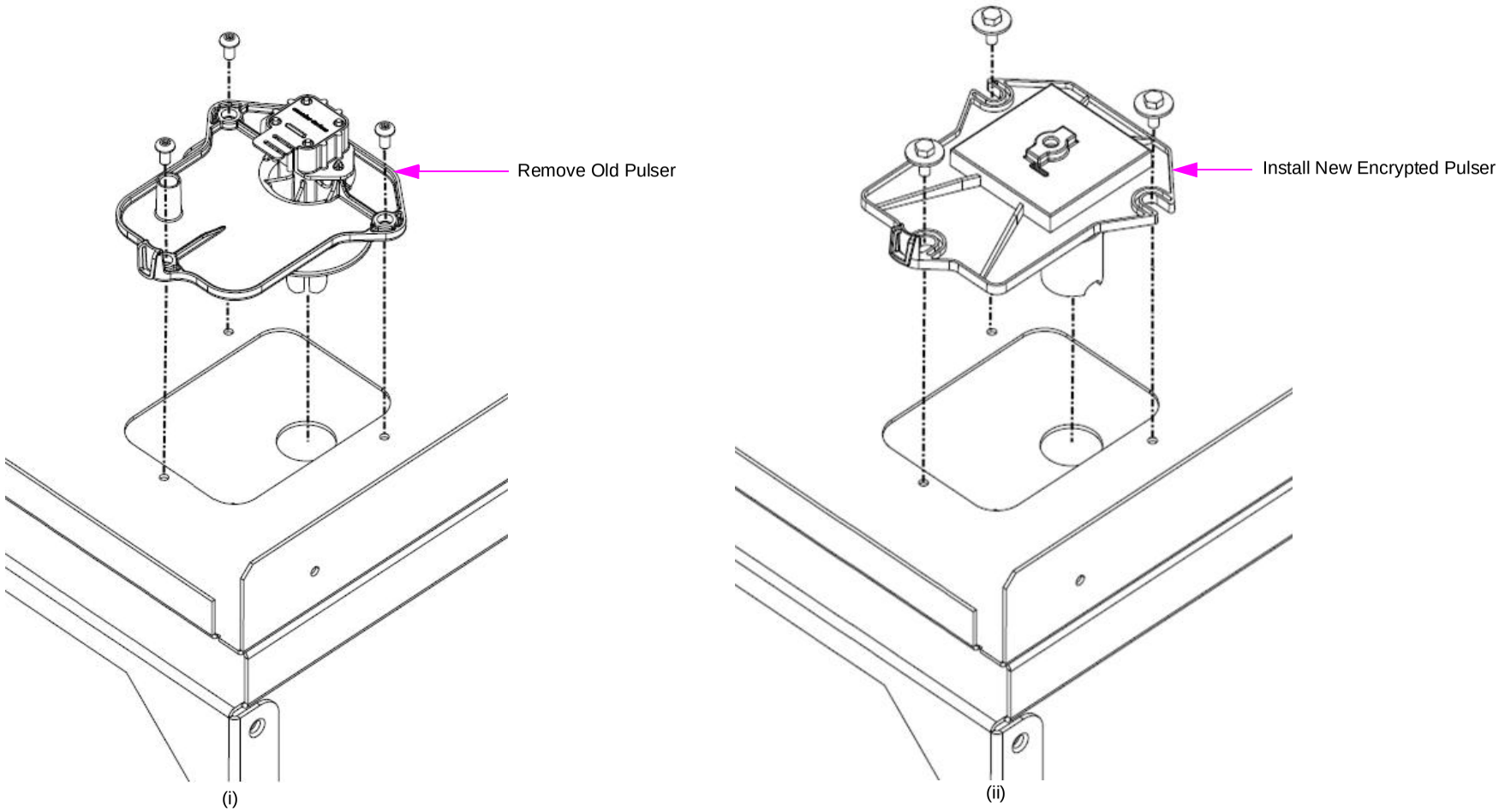
7 Press **F2** to exit programming.

8 Verify that the error 8046 has cleared after the unit reboots.

9 Pump some fuel to verify proper operation.

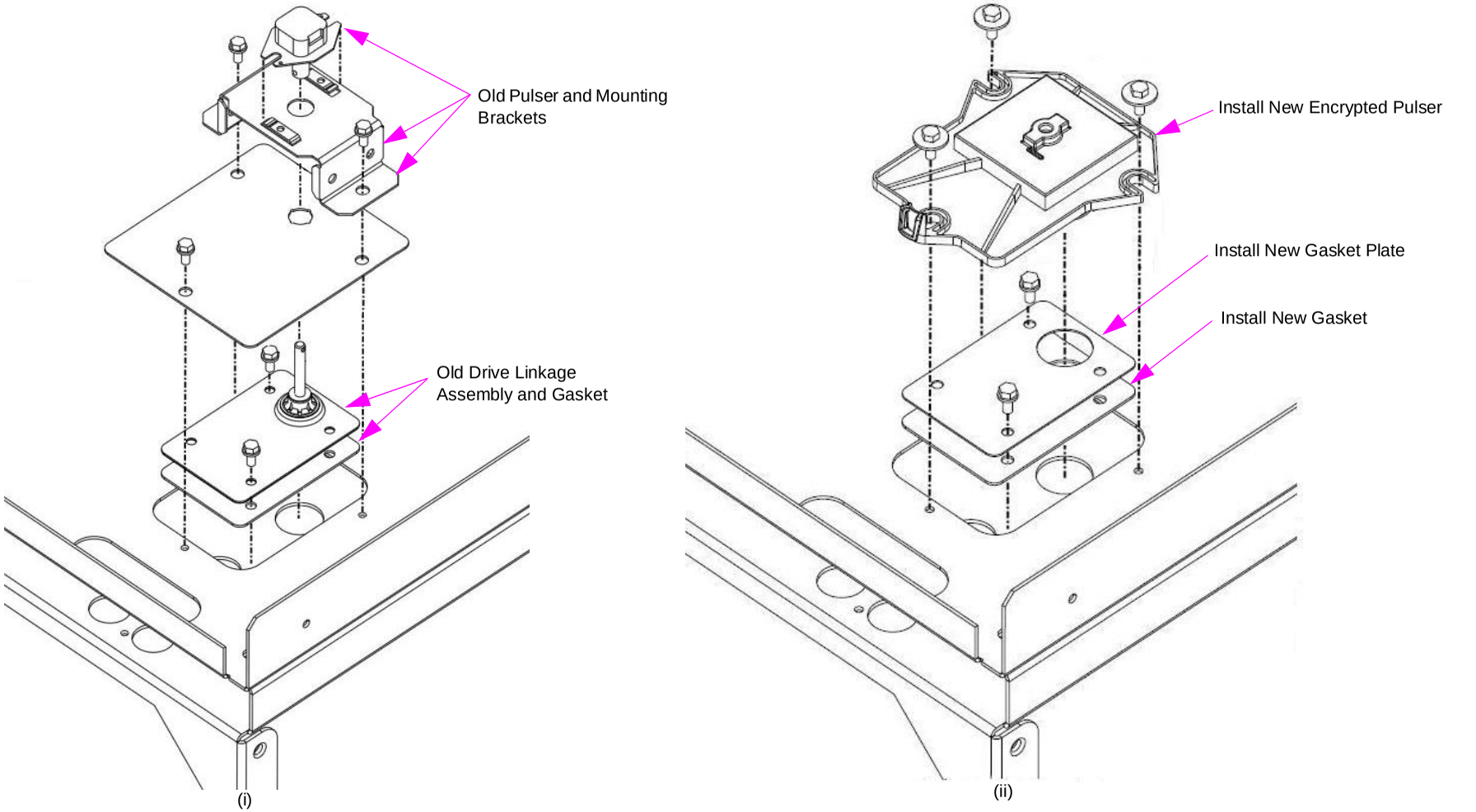
Appendix B: Encrypted Pulser Retrofit Kits

Figure 15: M12514K001 Encrypted Pulser Retrofit Kit



Note: M12514K001 Assembly is shown in the kit installation instructions.

Figure 16: M12514K003 Encrypted Pulser Retrofit Kit



Note: The M12514K003 Assembly is the same as M12514K001, except it also includes a gasket plate and gasket.

GILBARCO VEEDER-ROOT

© 2017 Gilbarco Inc.
7300 West Friendly Avenue · Post Office Box 22087
Greensboro, North Carolina 27420
Phone (336) 547-5000 · http://www.gilbarco.com · Printed in the U.S.A.
MDE-4950F Encrypted Pulser Retrofit Kits (M12514K00X) Installation Instructions for Encore® 500/S/700 S/S E-CIM™ · July 2017