

Introduction

Purpose

This manual provides instructions to install the Ecometer™ Connection Retrofit Kits (M14370K001/K002) in Encore® 500 S/700 S dispensers. This manual explains the procedure to remove the existing Ecometer cabling and replace it with a Grade-to-Side Adapter (GSA) Printed Circuit Assembly (PCA) and the appropriate cabling. The new system features line filtering and more reliable connection system.

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Required Tools and Materials

Following tools and materials are required for installing the Ecometer Connection Retrofit Kits:

- 1/4 -inch Socket Set (Nut Driver)
- Phillips® Screwdriver, size 3
- Metric Socket Wrench Set
- Wire Cutter
- Wire Stripper
- Wire Crimper
- Channel Locks
- Par Flange Bracket

Parts List

Ecometer Connection Retrofit Kits is configured based on the number of Ecometers used per side in the dispenser for which they are intended. Following table lists the parts included in the Ecometer Connection Retrofit Kits:

M14370K001 Ecometer Connection Retrofit Kit

Item	Description	Part Number	Quantity
1	4-grade Cable	M14393A001	1
2	3-grade Cable	M14393A002	2
3	2-grade Cable Extended Reach	M14393A003	1
4	GSA Assembly (PCA, Nylon Block)	M14367A001	1
5	MTE Replacement Cable	M14394A001	1 (per Ecometer)
6	Wire Nut	Q10158-04	4 (per Ecometer)
7	Self-tapping Screw	Q11677-24	3

M14370K002 Ecometer Connection Retrofit Kit

Item	Description	Part Number	Quantity
1	4-grade Cable	M14393A001	1
2	3-grade Cable	M14393A002	2
3	2-grade Cable Extended Reach	M14393A003	1
4	GSA Assembly (PCA, Nylon Block)	M14367A001	1
5	MTE Replacement Cable	M14394A001	1 (per Ecometer)
6	Wire Nut	Q10158-04	4 (per Ecometer)
7	Self-tapping Screw	Q11677-24	3
8	Ecometer Assembly	M07300A005	1

For more information, contact your distributor or Gilbarco® Customer Service.

Related Documents

Document Number	Title	GOLD SM Library
MDE-3804	Encore and Eclipse® Start-up/Service Manual	<ul style="list-style-type: none"> • Encore and Eclipse • Service Manual
PT-1936	Encore Series Pumps and Dispensers Illustrated Parts Manual	<ul style="list-style-type: none"> • Encore and Eclipse • Parts Manual • Encore and Eclipse Installers

Abbreviations and Acronyms

Term	Description
GSA	Grade-to-Side Adapter
GOLD	Gilbarco Online Documentation
ESD	Electrostatic Discharge
MT	Mass Termination
OSHA	Occupational Safety and Health Administration
PCA	Printed Circuit Assembly
PCN	Pump Control Node

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 Gilbarco Support Center at 1-800-800-7498. 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 lines.

Important Safety Information

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.

To prepare the site and dispensers for the installation, proceed as follows:

- 1 Inform the manager that you are upgrading the dispensers.
- 2 Barricade the unit to be worked on.
- 3 Remove power to the Encore 500 S/700 S unit at the breaker panel. Follow OSHA lockout/tagout procedures.
- 4 Close the shear valves and drain fuel from the hoses.
- 5 Match the parts received in the kit with “Parts List” on [page 1](#). Check that there is no damage to the parts.

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 kit installation.

Overview

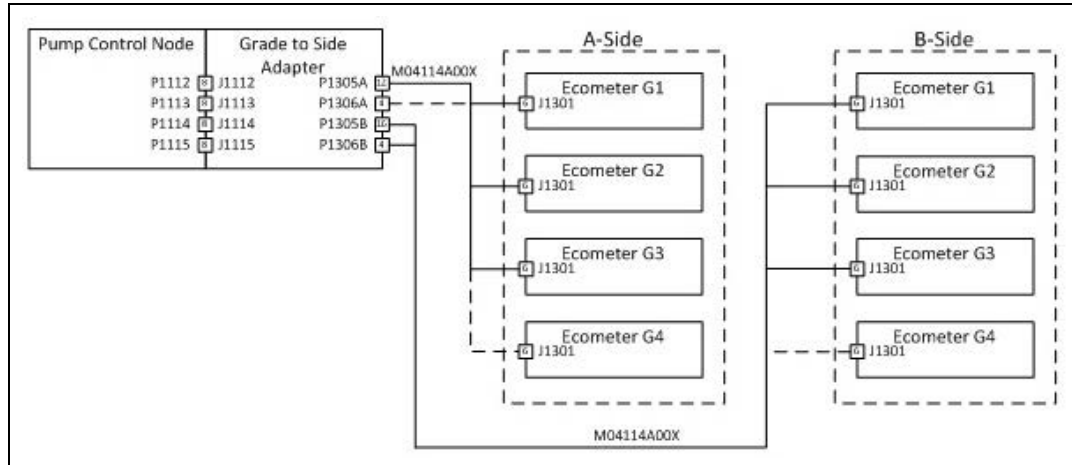
Following is a high level overview of kit installation:

- 1 Remove the existing Ecometer wiring.
- 2 Remove mini mate-n-lock connector from the pulser on the Ecometer.
- 3 Install the MTE replacement cable on the Ecometer.
- 4 Install the GSA assembly on to the Pump Control Node (PCN).
- 5 Install the new Ecometer.

Note: This only applies to the M14370K002 Kit.

- 6 Run the new cables to both side columns. When finished, the wiring should accurately reflect Figure 1.

Figure 1: High-level Block Diagram of Ecometer Connections



- 7 Turn on power and check the functionality of meters by running transactions for each grade.

Installing Ecometer Connection Retrofit Kits (M14370K001/K002)

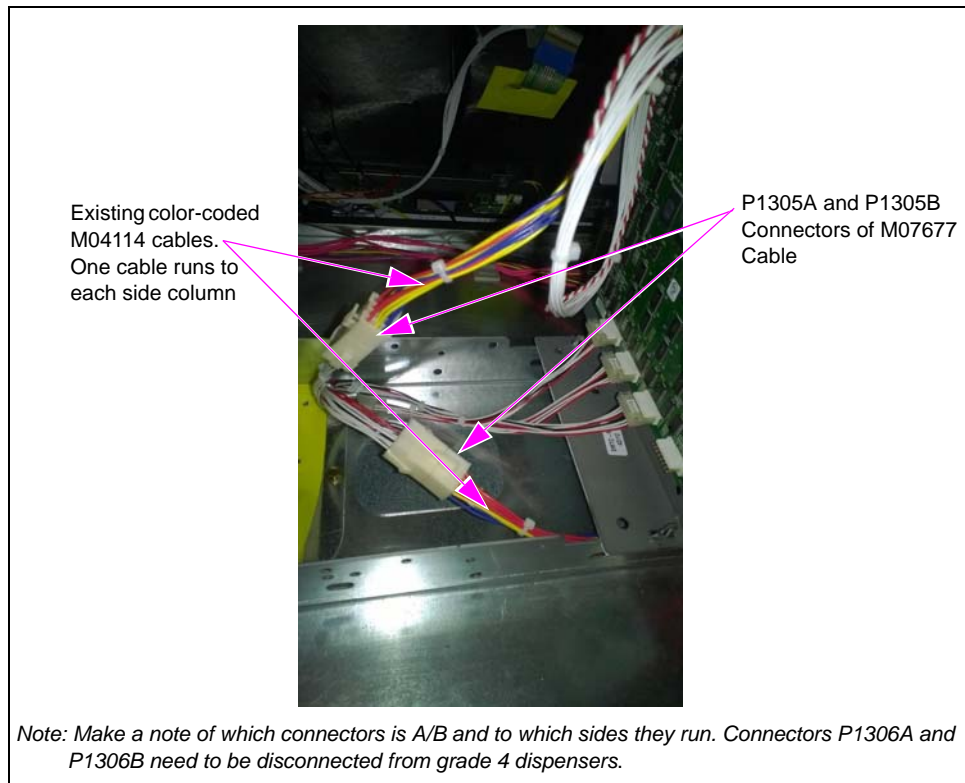
Note: Retain all parts (including cables, nuts, bolts, screws, and so on) that are removed. These are required in case the unit must be reverted to the original as a fallback mitigation.

To install the Ecometer Connection Retrofit Kits, proceed as follows:

- 1 Open the dispenser door.
- 2 To remove both the inner and outer side column sheathing, remove the four screws on each side column using a size 3 Phillips screwdriver.
Note: The canopy may have to be removed from the top of this dispenser to remove the side column sheathing.

- 3 Disconnect both M04114A00X Cables from the M07677 Cable (see [Figure 2](#)). Note which side column uses the side A of the M07677 Cable and which side column uses the side B.
Note: You need this information when you install the new cables. Generally, the side column next to the power supply is column B and the other is column A. In extended reach, this is reversed, the column closest to the power supply is column A, while the opposite is column B.

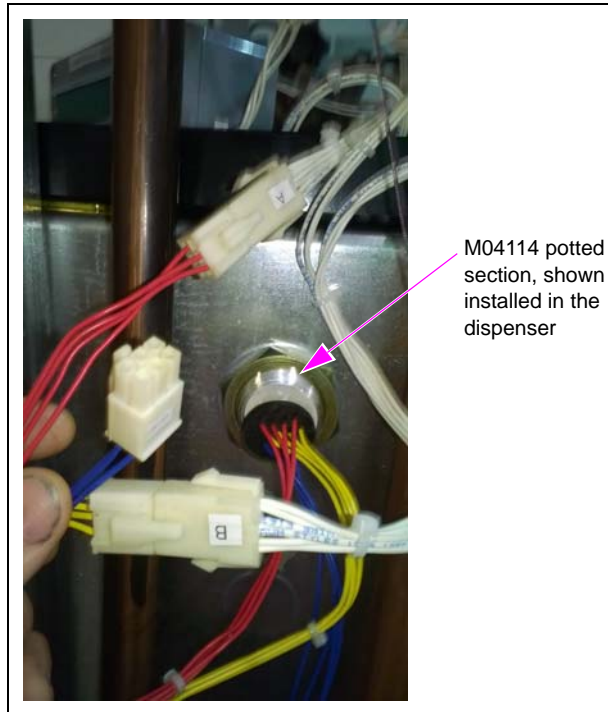
Figure 2: Removing M07677 Existing Cabling



- 4 Disconnect the pulser connectors, J1112-J1115 on the M07677 Cable from the PCN, and remove the cable from the dispenser.
- 5 Record the color wire of the M04114 Cable that each Ecometer is connected to.
- 6 Disconnect the Ecometers at their existing connections, J1301.

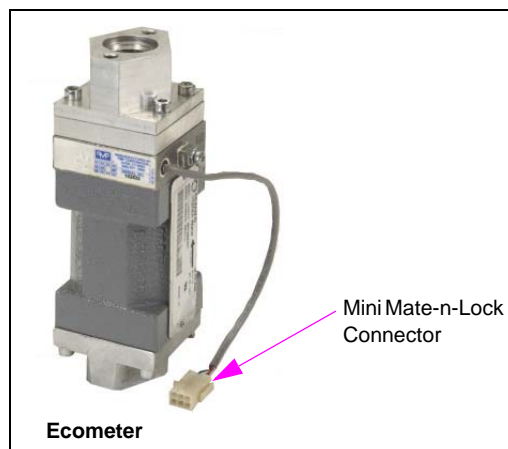
- 7 Unscrew the potted section of the existing M04114 Cables as shown in [Figure 3](#), on both sides and remove the cables from the dispenser.

Figure 3: M04114 Potted Sections



- 8 Remove the mini mate-n-lock connector (see [Figure 4](#)) coming from the Ecometer using a wire cutter.

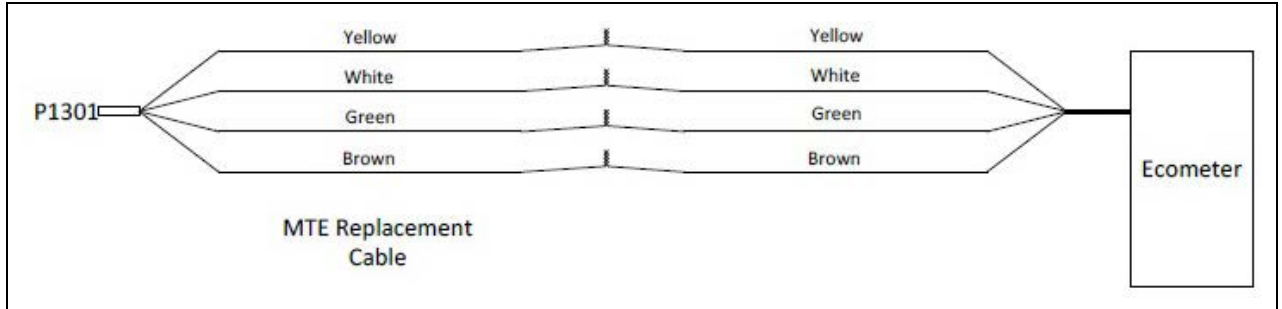
Figure 4: Ecometer with Mini Mate-n-Lock Connector



- 9 Remove a portion of the gray sleeve and strip all wires coming from the Ecometer using a wire stripper.

- 10 Using the provided wire nuts and a crimper, match the same colored wires on the MTE replacement cable to the wires coming from the Ecometer and then crimp both ends of the wire together with a wire crimper and wire nut (see [Figure 5](#)).

Figure 5: Ecometer MTE Replacement Cable



- 11 Repeat steps 7 to 9 on [page 8](#) for all Ecometers in the dispenser.
- 12 Place the provided plastic mounting block on the PCN bracket, and install two of the self-tapping screws on the back of the bracket to secure the block to the bracket. For specific mounting holes, see [Figure 6](#) and [Figure 7](#).

Figure 6: Screw Holes on Mounting Block

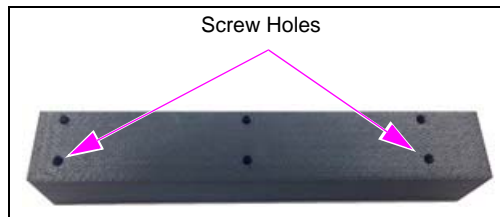
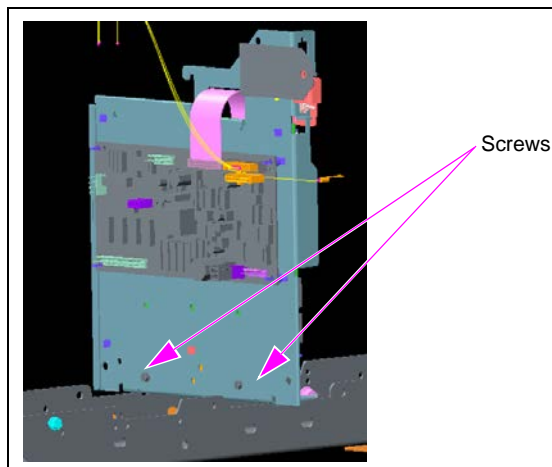


Figure 7: Screws Attached to PCN



- 13 Connect the GSA Assembly (M14367A001) to the PCN. The GSA assembly should rest on a nylon block. P1112-P1115 should connect to J1112-J1115 respectively. For more information, see [Figure 9](#). Tilt the GSA assembly upward while resting on the four MTA connectors on the PCN so that the connectors on the GSA assembly clear the lip of the MTAs. Press downward on the GSA assembly for the connectors to mate.
- 14 Install the three remaining screws through the mounting holes on the GSA assembly to secure it to the nylon block. For specific mounting holes, see [Figure 8](#) and for more information, see [Figure 9](#).

Note: The GSA PCB assembly comes pre-assembled on the nylon block.

Figure 8: Mounting Holes to Secure GSA PCBA

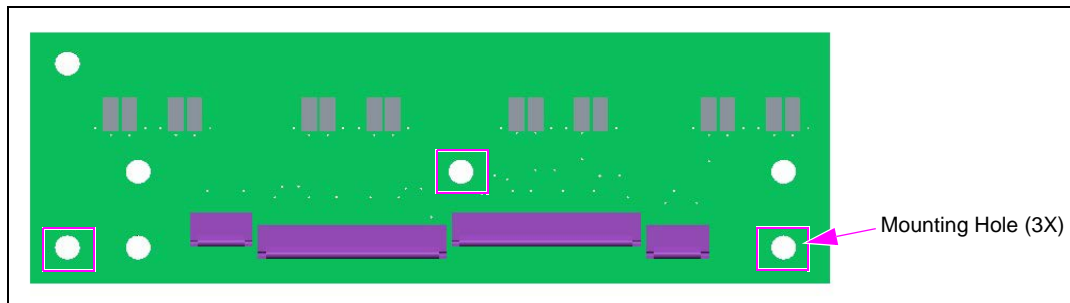
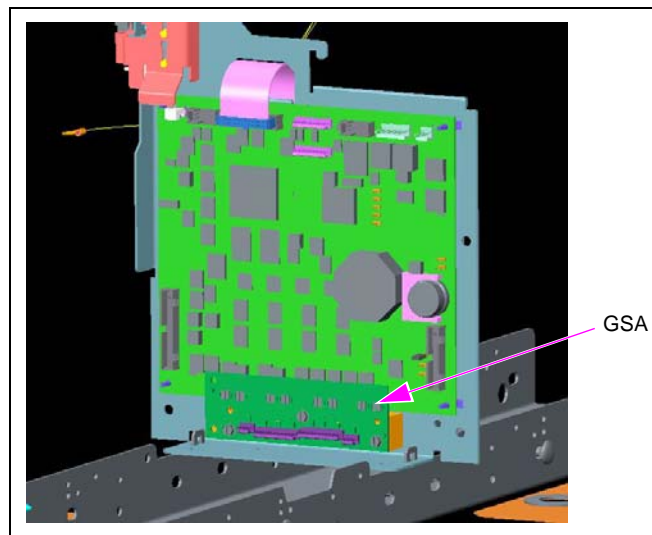


Figure 9: GSA Assembly Attached to PCN



If installing a M14370K001 kit, proceed to [“Completing Installation”](#) on [page 14](#).

Installing Ecometer Assembly (M07300A005)

Note: These instructions apply to the M14370K002 Kit only.

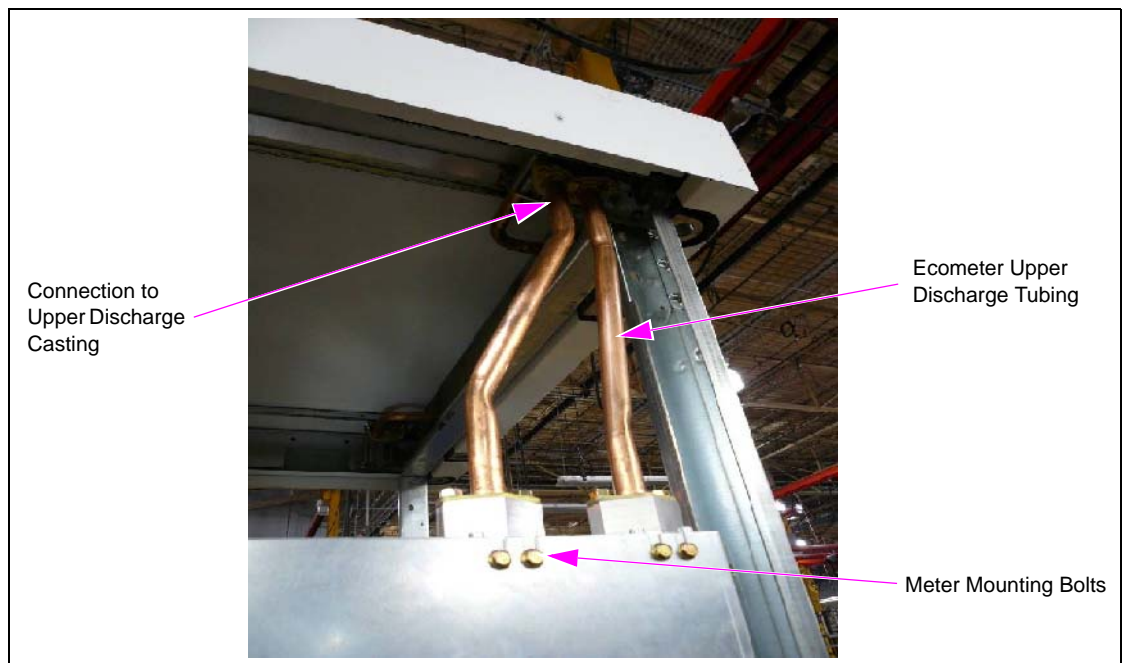
To install the new Ecometer assembly, proceed as follows:

Removing Existing Ecometer Assembly

To remove the existing Ecometer assembly from the dispenser, proceed as follows:

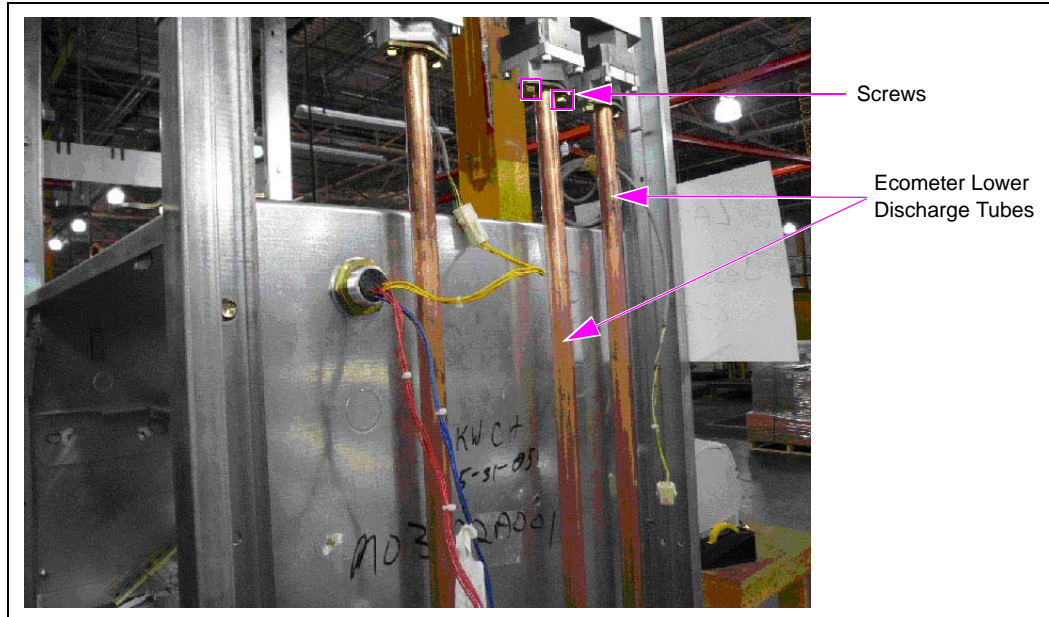
- 1 Drain the fluid from the hose.
- 2 Disconnect the cabling from the existing Ecometer in the dispenser.
- 3 Disconnect the upper hose from the top of the Ecometer by removing the M8 X 16 mm screws (see [Figure 10](#)).

Figure 10: Upper Discharge Tubing



- 4 Disconnect the lower discharge tubing by removing the two M8 X 16 mm screws (see [Figure 11](#)).

Figure 11: Lower Discharge Tubing



Removing the existing Ecometer is now complete.

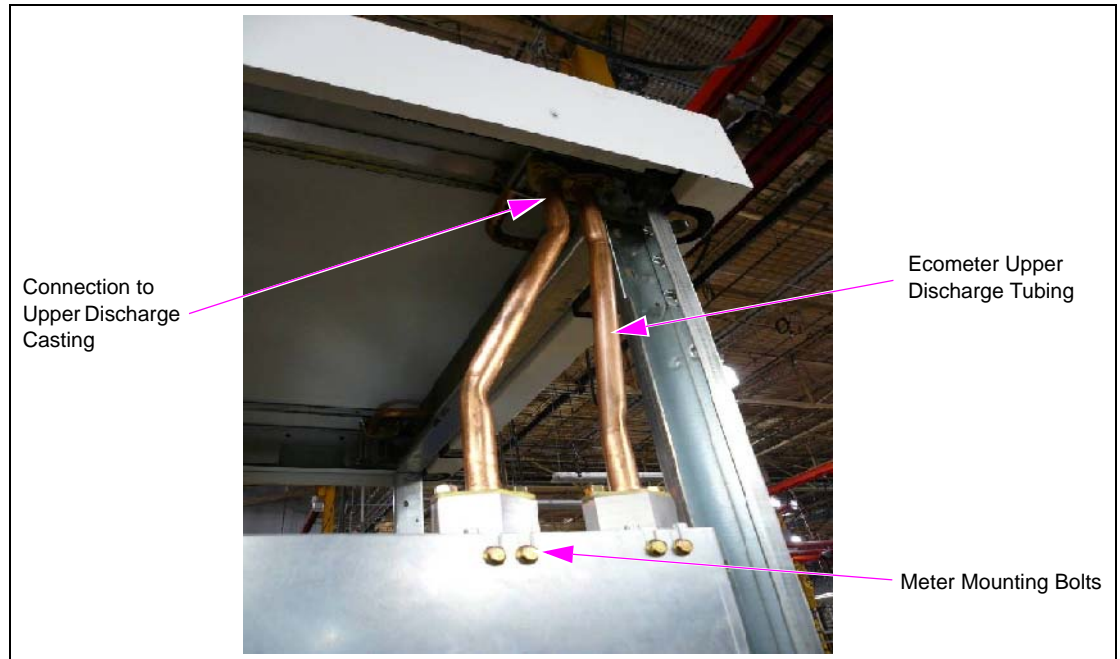
Installing New Ecometer

To install the new Ecometer, proceed as follows:

- 1 Install the two M6 X 12 mm mounting bolts loosely to each meter side and hang from the bracket facing the inside of the dispenser.
Note: To ensure an easier fit for tubing, do not tighten the meter mounting bolts until you have installed the tubing.
- 2 Remove the tube cover from the outlet side of the lower discharge tube and the plate from the inlet of the meter, and connect the tubing to the meter using the par flange bracket and M8 X 16 mm screws.

- 3 Install the upper discharge tube to the upper discharge casting using dual par flange bracket and M8 X 16 mm screws (see [Figure 12](#)).

Figure 12: Upper Discharge Tubing



- 4 Remove the Ecometer outlet plug and connect the meter outlet to the upper discharge tubing using the par flange bracket and M8 X 16 mm screws.
- 5 Tighten the meter mounting screws on the mounting bracket.

Installing the new Ecometer assembly is now complete.

Completing Installation

To complete the installation, proceed as follows:

- 1 Install the potted section of the new Ecometer cables into the side column wall.
- 2 Connect all Ecometers to the new cables, respective of grade as follows:
 - Red is G1, yellow is G2, blue is G3, and white is G4.
 - Grade 1 is on the left side of the column.
 - Grade 4 is on the right side of the column when viewing the Ecometers from the outside of the dispenser, as shown in [Figure 13](#) on [page 14](#).

Figure 13: Ecometers in Side Column with Corresponding Grades



- 3 Using the new cable installed on the side of the dispenser with the power supply, connect J1305A/B to P1305A on the GSA. Take the cable from the opposite side and connect J1305A/B to P1305B.
Note: The side A column is the column on your right when you are on the side A of the dispenser. Route cables along the T-rail and not inside the U-channel.
- 4 If you are retrofitting a grade 4 dispenser, connect J1306A/B on both cables to their respective sides on the GSA.
- 5 If installing M14370K002 Kit, proceed with step [a](#), [b](#) and [c](#). If not, proceed to step [6](#).
 - a Make the electrical connection to the cabling from the CD cabinet.
 - b Purge each dispenser grade for at least 20 gallons each. Check for leaks.
 - c Calibrate each Ecometer using electronic calibration. The meters will have a calibration factor of around 2770 pulses per gallon (or around 13850 per 8 gallons).
Note: Ensure that each meter is calibrated to 0 cubic inches at full flow rate.
- 6 Reinspect all connections and cable routing.
- 7 Ensure that no cables are below the 48-inch hazard barrier. If there are unused connections on the cable, zip-tie them to the cable in use to avoid the cable crossing the 48-inch hazard barrier.

- 8 Open the shear valves.
- 9 Reinstall the sheathing and close the dispenser.
- 10 Power on the dispenser and check that no error codes appear on screen.
- 11 Run a transaction and dispense fuel from each grade to ensure that the Ecometers are functional.

Installing the Ecometer Connection Retrofit Kits is now complete.

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