

# AutoCoil™

By Control Module Inc., EVSE LLC

*State of the Art EVSE*

3704 Family

Service Manual

Electric Vehicle Supply Equipment



**Control Module Inc.**

Founded in 1969

**EVSE LLC**

**Service Manual**

**Models 3704-001, 3704-002, 3704-003**

Patents Pending

**3704-SM-001**

**August 2015**

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## Important Notes

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### Safety and Compliance

This document provides instructions for servicing the AutoCoil™ Charging Station Model 3704 Series of chargers. Servicing of the Charging Station should be performed only by licensed professionals who should review this manual carefully prior to beginning work. The licensed contractor, licensed electrician or trained installation expert should ensure continued compliance with local building practices, climate conditions, safety standards, and state and local codes during and upon completion of the servicing.

Under no circumstances will compliance with the information in this manual relieve the user of responsibility to comply with all applicable codes or safety standards. This document describes the most anticipated servicing scenarios. If situations arise in which it is not possible to service an installation following the procedures provided in this document, contact Control Module Inc., EVSE LLC. Control Module Inc., EVSE LLC, is not responsible for any damages that may occur resulting from custom installations that are not described in the user manuals or this guide.

### Warranty Information and Disclaimer

Your use of, or modification to, the Charging Station in a manner in which the Charging Station is not intended to be used or modified will void the limited warranty. Other than any such limited warranty, the Control Module Inc., EVSE LLC, products are provided "AS IS," and Control Module Inc., EVSE LLC, and its distributors expressly disclaim all implied warranties, including any warranty of design, merchantability, fitness for particular purposes and non-infringement, to the maximum extent permitted by law.

### Limitation of Liability

IN NO EVENT SHALL CONTROL MODULE INC, EVSE LLC, OR ITS AUTHORIZED DISTRIBUTORS BE LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST PROFITS, LOST DATA, LOSS OF USE, COST OF COVER, OR LOSS OR DAMAGE TO THE WATT POINT CHARGING STATION, ARISING OUT OF OR RELATING TO THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CONTROL MODULE INC, EVSE LLC, OR ITS AUTHORIZED DISTRIBUTORS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

### FCC Compliance Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### Exposure to Radio Frequency Energy

The radiated power output of the ZigBee® radio (optional) in this device is below the FCC radio frequency exposure limits for uncontrolled equipment. This device should be operated with a minimum distance of at least 7.9 inches (20 cm) between the ZigBee antenna and a person's body and must not be co-located with any other antenna or transmitter by the manufacturer, subject to the conditions of the FCC Grant.

## Copyright and Trademarks

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Copyright 2015 Control Module Inc., EVSE LLC. All rights reserved. This material is protected by the copyright laws of the United States and other countries. It may not be modified, reproduced or distributed without the prior, express written consent of Control Module Inc., EVSE LLC.

AutoCoil is a U.S. registered trademark and service mark of Control Module Inc., EVSE LLC. All other products or services mentioned have the trademarks, service marks, registered trademarks or registered service marks of their respective owners. Control Module Inc., EVSE LLC, has filed several patent applications.

ZigBee is a registered trademark of the ZigBee Alliance.

## Instructions Pertaining To Risk of Fire or Electrical Shock

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The following is a summary of safety concerns relevant to the installation and use of the Model 3704 EVSE Unit. Failure to follow these safety instructions may lead to serious injury, death and/or damage to the equipment

As a matter of definition:



**WARNING:** is used to provide a warning of hazardous voltage and possibility of electric shock.



**CAUTION:** is used to provide awareness of important safety information in these instructions.

### IMPORTANT SAFETY INSTRUCTIONS



**WARNING:** Only qualified personnel should perform installation and servicing of the EVSE. This installation must be performed in accordance with all local electrical/building codes and ordinances. Follow lockout/tagout procedures.

Improper connection of the equipment grounding conductor may result in a risk of electric shock. Reference National Electrical Code, ANSI/NFPA 70 for proper sizing of the ground conductor.

Do not use this product if the EV cable is frayed, has broken insulation or shows any signs of damage.



**CAUTION:** This device is intended to be used to charge vehicles that do not require ventilation during charging.

To reduce the risk of fire, connect only to a dedicated circuit with 40A maximum branch circuit over-current protection in accordance with the National Electrical Code, ANSI/NFPA 70.

(For ZigBee equipped units)

To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 7.9 inches (20 cm) or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended. The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

Additional considerations which will contribute to safe operation of this unit include the following:

**DO:** Read all instructions before using this product.

The device should be supervised when used around children.

In case of a problem, contact your installer or CMI Customer Support.

**DON'T:** Put fingers into the electric vehicle connector.

Use this product if the enclosure or the EV connectors are broken, cracked, open or show any other indication of damage.

Attempt to repair or service the unit yourself.

### SAVE THESE INSTRUCTIONS

## Instructions De Sécurité Importantes



**AVERTISSEMENT:** Seul le personnel qualifié doit effectuer l'installation. Cette installation doit être effectuée conformément à tous les codes électrique/bâtiment locaux et ordonnances. Suivre les procédures de verrouillage/verrouillage.

Connexion inadéquate de l'équipement échouement du chef d'orchestre peut entraîner un risque de choc électrique. Code National de l'électricité, ANSI/NFPA 70 pour le dimensionnement bon chef d'orchestre au sol de référence.

Ne pas utiliser ce produit ou l'EV sont effiloché de câble, ont brisé isolant ou présentent pas de signes de dommages



**ATTENTION:** Ce dispositif est destiné à être utilisé pour charger les véhicules qui ne nécessitent pas de ventilation pendant la recharge.

Afin de réduire le risque d'incendie, se connecter uniquement à un circuit dédié avec 40 a maximum des branches circuit over-current protection conformément aux dispositions du Code électrique National, ANSI/NFPA 70.

(Pour les unités de ZigBee équipé)

Pour satisfaire les exigences de l'exposition du FCC RF pour des périphériques mobiles de transmission, une distance de séparation de 7.9 inches (20 cm) ou plus devrait être maintenue entre l'antenne de ce dispositif et de personnes au cours de l'opération de l'appareil. Afin d'assurer la conformité des opérations au plus près que cette distance n'est pas recommandée. L'antenne utilisée pour cet émetteur ne doit pas être colocalisé conjointement avec une autre antenne ou éme.

Voici d'autres considérations qui contribueront à la sécurité de fonctionnement de cette unité:

**DO:** Lire toutes les instructions avant d'utiliser ce produit.

Le dispositif devrait être supervisé lorsqu'il est utilisé autour des enfants.

En cas de problème, contactez votre installateur ou soutien à la clientèle CMI.

**NE PAS:** - Mettre les doigts dans le connecteur de véhicule électrique.

Utiliser ce produit si l'enceinte ou les connecteurs EV sont cassées, fissuré, ouvrir ou afficher toute autre indication de dommages.

Tenter de réparer ou d'un service de l'unité de vous-même.

### ENREGISTREZ CES INSTRUCTIONS

## System Overview

### System Introduction

The Model 3704 is a 7.2 KW wall- or pole-mounted Electronic Vehicle Supply Equipment (EVSE) charging station. The unit complies with all J1772 standards, and is capable of providing up to 30A at 208-240V AC, single phase, 50 or 60 Hz. The model 3704 is capable of being controlled remotely to apply, reduce or disconnect power to the electric vehicle, and measures both voltage and current being supplied to the Electric Vehicle (EV). The 3704 can communicate directly with a Payment or Gateway Module, and five status lights clearly indicate the state of the charging operation. A 20-foot charging cable with J1772 connector coils internally inside the unit for easy storage.

The Control Module is integrated into the 3704 EVSE unit as a Status Indicator.

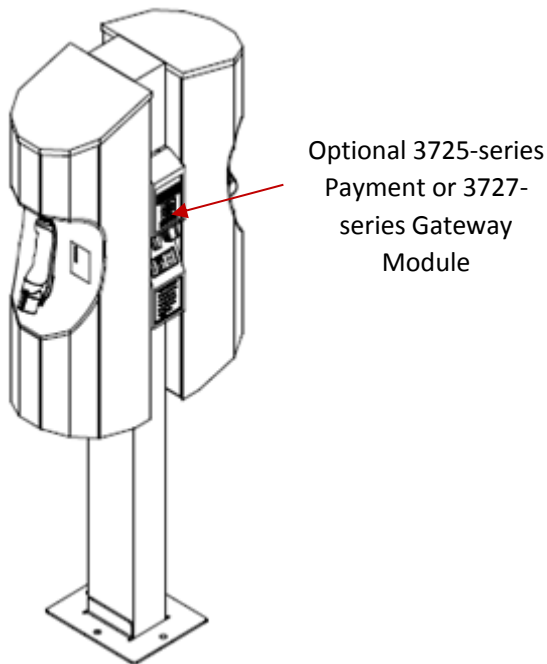


Figure 1

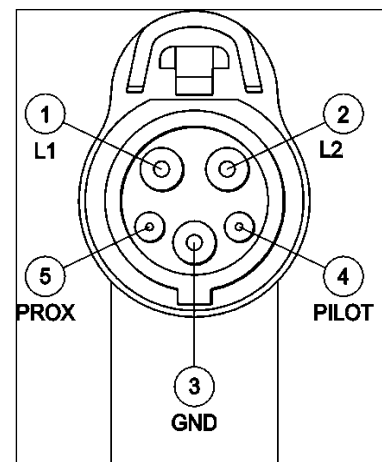


Figure 2



The Model 3704 Watt Point Electric Vehicle Supply Equipment (EVSE) is available in three standard configurations. A Payment or Gateway Module can be used to control all three configurations.

	<p>Single, Surface-Mounted: 3704</p> <p>The Single, Surface-Mounted 3704 EVSE is designed for applications in straight-on parking at curbside locations. Typically located at the head of a parking space, the 3704 can accommodate one electric vehicle at a time.</p>
	<p>Dual, Surface-Mounted: 3704</p> <p>The Dual, Surface-Mounted 3704 EVSE is designed to support abutting spaces in a parking lot. The Control Module is integral to each unit so, e.g., a dual would have two integral Control Modules for independent operation of each charger.</p>
	<p>Wall-Mount: 3704</p> <p>The Wall-Mount is a derivative of the Single, Surface Mount 3704, and is for applications where it is most convenient to mount the unit on a vertical wall without the use of a base support. The Wallmount uses an integral Control Module. The Payment Station for a 3704 is also typically wall-mounted, and can support eight wall-mount EVSEs in a serial configuration, or 32 using a ZigBee mesh network.</p>

# Technical Specifications

## Product Code

Product Code	3704
On/Off (No Communication)	3704-001
ZigBee Communication	3704-002
Serial Communication	3704-003

## Electrical\*

Voltage	208-240 VAC
Current (Rated)	30A/16A Switchable by Dip Settings
Current (Simulated Level 1)	7A@208-240 VAC (On Command)
Connections	Line 1 and 2, Ground
Required Service (Panel Breaker)**	2-pole 40A breaker <b>Non GFCI</b> on a dedicated circuit/20A Switchable by Dip Settings
Stand By Power (Per EVSE)	Less than 8W typical (without communication/Payment Module/Gateway operating)
Power Output	7.2KW

## Safety Features

Over Current Disconnect	32A/18A Switchable by Dip Settings
Surge Protection	6KV @ 3000A
Ground Fault	Internal 20 MA CCID with auto re-closure (three attempts)

## Compliance

Safety	IEC/UL/CSA C22.2 61010-1, UL2594, UL2231-1, UL2231-2, NEC Article 625, SAE J1772
EMC	FCC Part 15 Class A, Canadian ICES-003

## Communications

ZigBee	Model 3704-002 contains FCC ID: MCQ-PROS2B, IC: 1846A-PROS2B
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## Environmental

Operating Temperature	-22° to 122° F (-30° C to 50° C) ambient
Operating Humidity	Up to 95% non-condensing
NEMA Rating	NEMA 3R

## General

Dimensions	37 in (h) x 10.25 in (w) x 10.5 in (d) (Excluding Pole)
Weight	32 lbs. (Excluding Pole)
Mounting	Wall, Surface-mounted Pole

\*Observe all required Lockout/Tagout procedures while making any electrical connections or servicing the unit.

\*\*Dual requires two breakers.

## Primary System Components

Replaceable parts are described below.

	<p><b>GFI Module</b></p> <p>The GFI Module is the heart of the charging system. It includes the GFCI electronics, sequencer board, low voltage power supply, contactor and distributes power/control signals to all elements of the charger. Refer to the Block Diagram of the Motorized GFI Module in Figure 3.</p>
	<p><b>J1772 Charging Cable and Connector</b></p> <p>This cable, as mentioned previously, transfers the energy from the charger to the EV via the standardized J1772 connector and mating receptacle in the EV. Four wires return from the J1772 cable with terminations in the GFI Module (Red L1, Black L2, Orange-Pilot, Green-Ground). The proximity circuit terminates within the connector/ proximity latch housing.</p>
	<p><b>Control Module</b></p> <p>The Control Module provides user activation access to the charger at the charger itself and a visual indication of the charging process. There is a serial version and a ZigBee version.</p>
	<p><b>Motor Drive Assembly</b></p> <p>This assembly controls cable coiling and uncoiling.</p>
	<p><b>Antenna Tube, Antenna and Cable (ZigBee version only)</b></p> <p>Housing, antenna and cable for ZigBee communications. Optional ZigBee communications permits remote operation of the charger with a remote Gateway or Payment Station.</p>

# Troubleshooting

## Problem Diagnosis and Initial Survey

This manual provides a great deal of information which will help in diagnosing and repairing problems you might encounter. These items of information include indicator charts and troubleshooting procedures, and part replacement instructions.

**NOTE:** It is highly recommended that troubleshooting this unit and replacing its parts be performed by an electrician. It is also recommended that *Control Module Inc.'s Electrician Tester* be purchased in order to perform tests without the need of an EV. Refer to the **Diagnostic Tools** section for more information.

But first, before you do anything, survey the installation to gather any clues regarding the source of the problem:

- Is the EVSE still connected to an electric vehicle or was it when the problem occurred?
- Are any LEDs lit on the Control Module panel?
- Are any of the LEDs on the Control Module red or flashing?
- Is the circuit breaker in the source panel tripped?
- Obtain the serial number from the attached label on the right side of the front cover.

## Problem Symptoms

Depending upon the problem, the Control Module LEDs might have been cleared of any diagnostic information. However, the Status Indicator Chart provided in Table 1 (next page) is a good place to continue with your information gathering. On the assumption that you might still have LED data available, check the chart for fault modes that might be apparent before proceeding. Any combination of a red LED and flashing LEDs on the Control Module is an indication of a problem that should be noted. If you reset a breaker or otherwise attempt to work on the unit, the fault LEDs might clear, so check and note these indicators at the beginning of your service.

Do you still have at least a blue **Power** LED lit on the Control Module? If not, that might indicate a power issue or several other issues that must be checked out. Finally, is the J1772 cable still extended even though it is not connected to the vehicle? That might suggest a drive system problem. If the J1772 cable is still connected to the vehicle, when disconnected, does it immediately retract into the housing?

Note these symptoms before you proceed with your investigation.

## Troubleshooting Flows

Instructions for troubleshooting are covered in the following sections:

- Initial Troubleshooting (A) (Page 16) – start here; also use for retesting the system after fixes have been performed
- Electrician Tester Checks (B) (Page 18) – use this section if you have a model 3840 Electrician Tester from Control Module, Inc.
- Control Module or GFI Module Failure (C) (Page 21) – use for suspected issues with these modules
- Electrical or J1772 Cable Assembly (D) (Page 22) - use for suspected issues with these modules
- System Ground (E) (Page 23) – use for suspected ground failures
- Motor Drive Assembly (F) (Page 24) – use for cable retraction issues
- Lockout/Tagout (Page 25) – perform when instructed to in the troubleshooting instructions

**NOTE:** Some troubleshooting instructions will refer you to steps in other sets of instructions. For example, while performing an initial set of tests, you might be referred to **Control Module or GFI Failure (C), Step C2**, based upon your results in your testing.

# Control Module Status Indicator Chart

**Table 1: Status Indicator Chart**

		(Power)	(Connected)	(Charging)	(Problem)
NORMAL USE MODES:		BLUE	YELLOW	GREEN	RED
1	Line Voltage On	F/2	F/2	F/2	F/2
2	Self-Diagnostics Pass Line Voltage is between 208-240VAC Ground Connection Present	ON	X	X	X
3	Cable Extending/Waiting to connect Cable Retracting/Disconnected	ON	SF	X	X
4	Cable is connected	ON	ON	X	X
5	Random start time activated – Charging begins in 2-5 minutes	ON	X	SF	X
6	Vehicle in charge mode (Level 2)	ON	X	FF	X
7	Vehicle charged	ON	X	ON	X
8	Cable is connected/standby mode (ext. contact)(Level 1 Charge)	ON	SF	SF	X
9	Cable is connected/off mode (ext. contact)	ON	FF	FF	X
FAULT MODES:					
1	Ground wire is NOT connected	FF	X	X	ON
2	Line Voltage Is less than 208VAC	SF	X	X	SF
3	Cable Motor Failure	X	SF	X	ON
4	GFCI Trip (reclosure in process)	SF	SF	X	SF
5	GFCI Trip	SF	SF	X	ON
6	GFCI Circuit Failure	SF	X	X	ON
7	Over Current Trip	FF	FF	X	ON
8	Stall Trip (reclosure in process)	ON	SF	X	SF
9	Stall Trip	ON	SF	X	ON
10	Pilot Problem	ON	ON	X	SF
11	Ventilation Required	ON	X	X	SF
12	Display Offline (comm. problem with sequencer)	FF	X	X	X
13	Non-volatile Logic Error	SF	SF	SF	SF
PROGRAM MODES:					
1	In Program Mode	SF <--	SF <--	SF <--	SF <--
2	Program Completed/program connector attached	ON	ON	ON	ON

<b>Legend</b>	F/2 = Flash once for 2 sec.	X = Led is off
	SF = Slow flash (1/sec)	<-- = In Sequence
	FF = Fast flash (3/sec)	

## Diagnostic Tools

Control Module Inc. sells the *Electrician* tester unit, Model 3840-001 (**Figures 3 A and B**). It is used in place of an actual vehicle and simulates the EV pilot response when the J1772 connector is attached to the mating receptacle on the rear of the device. The *Electrician* provides indications of voltage and current availability through the EVSE, correct functioning of the pilot and proximity signals, and tests the GFI circuits of the EVSE.

Use of the Model 3840 tester, along with the fault-indicating LEDs (**Figure 3C**) on the Control Module, will help isolate the problem when used in conjunction with the previous **Control Module Status Indicator Chart**.



Figure 3A

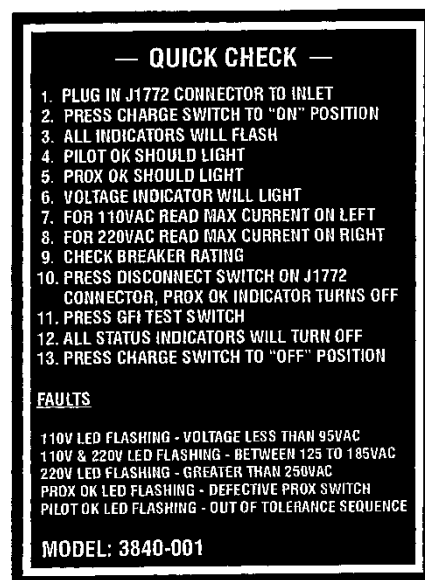


Figure 3B

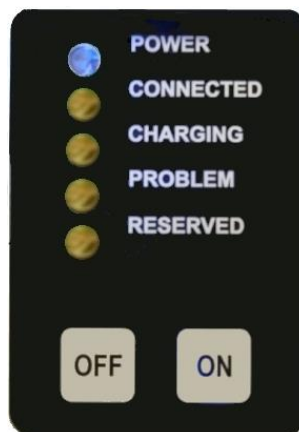


Figure 3C

## Procedures for Problem Isolation

After performing the initial surveys mentioned in previous sections of this manual, the next step is to isolate the problem to a subsystem. For this section, follow through the steps until you are able to return to full functionality. **Table 2** might also assist your problem assessment. It relates the fault modes called out in **Table 1** to the root failure modes associated with these indicators. The table also points to whether the fault can be related to the electric vehicle itself.

**Table 2: EVSE Troubleshooting Guide**

Fault Indicated		Non-EVSE Related	Possible Causes
1	Ground Wire Not Connected	System Ground	EVSE Ground
2	Line Voltage Less Than 208 VAC	Supply Voltage	
3	Cable Motor Failure		Gear-set mechanism bind or failure Motor connector not plugged in Retract motor wiring or failure Motor-drive circuitry within GFCI
4	GFCI (Reclosure in Process) - Leakage to ground of greater than 20 mA as measured by differential between L1 and L2. Contactor opens, retries in 1 minute for up to 3 tries...then to Fault 5.		Transitional Mode
5	GFCI Trip		Check System for Source
6	GFCI Trip Failure - Internal test at startup indicates GFI Module circuit problem.		GFI Module
7	Over Current Trip - While vehicle is charging, vehicle draws more than 32 amps based upon three samples at five-second intervals; to reset, unplug the J1772 connector and replug into vehicle.	EV Related	
8	Stall Trip (Reclosure in Process) - during retraction, restriction of mechanism is indicated by cable position motor current. Tries three times before moving to Fault 9.		Transitional Mode
9	Stall Trip - to reset, power unit down or press <b>ON</b>	Line Voltage	Recycle (Breaker Off/On)
10	Pilot Problem	EV Related	Orange Wire Connections J1772 Cable/Connector GFI Module
11	Ventilation Required - lead acid or other battery requiring ventilation when charging as indicated by vehicle pilot level. EVSE does not support vehicles requiring ventilating fan.	EV Related (Safety)	
12	Display Offline (No LED's, Communication Problem with Sequencer)		GFI Module Control Module Control Module Connecting Wire
13	Nonvolatile Logic Error - all four LED's blinking simultaneously.		Possible water intrusion in Control Module
<b>Non-Indicated Problems</b>			
Can't pull out cable when <b>On</b> Button pressed		Line Power	Control Module GFI Module Control Module Connecting Wire
Charge Does Not Start / Contactor Does Not Close		Vehicle Timer On Vehicle Software Update Problem	Orange (Pilot) Wire J1772 Cable/Connector GFI Module
No communication between the 3704 and the remote Payment or Gateway Module (ZigBee version)			ZigBee Antenna, cable or both



## Part Locations

With the cover removed, these are the locations of the replaceable parts you will be troubleshooting:

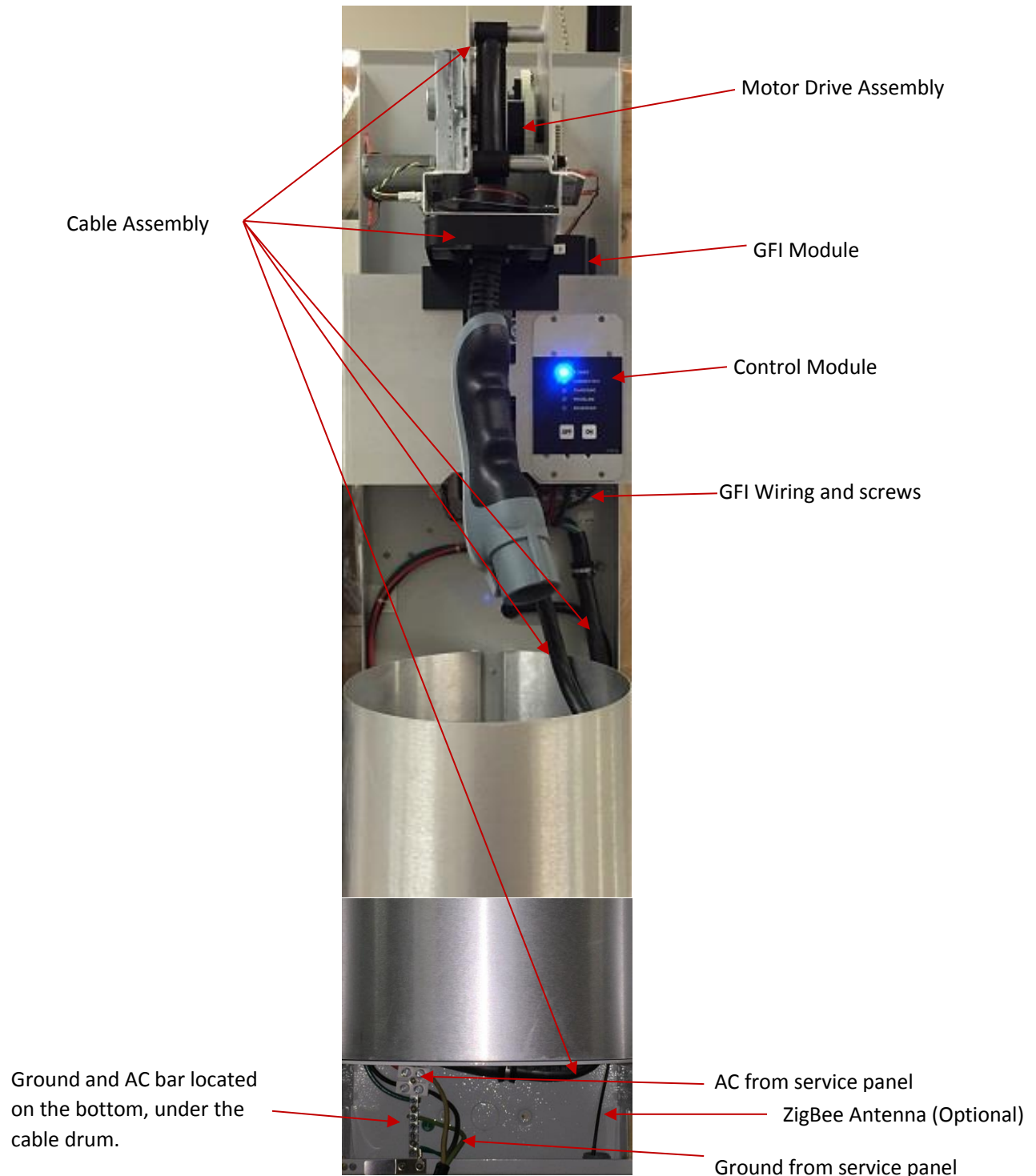


Figure 4



## Initial Troubleshooting (A)

**NOTE:** Return to this section whenever you are instructed to *Retest the System*.



**WARNING:** As you begin troubleshooting, remember that the **POWER IS STILL ON** and you will have exposure to **208-240 VAC!**

**Step A1:** Check that the Control Module blue **POWER** LED is lit.

NO - If no lights are visible on the Control Module, continue to **Step A2**.

YES - Check to see if there are any additional fault lights (using the **Control Module Status Indicator Chart** in **Table 1**) suggesting a **Fault Mode 1** (Ground Fault) or **Fault Mode 6** (GFI Module) failure mode.

If you have **no fault lights**, or have fault lights other than a **Fault Mode 1** or **6**, proceed to **Step A4**.

If you have a fast flashing blue LED and a solid red LED, a ground fault is indicated. If you have a slow flashing blue LED with a solid red LED, the GFI Module is the likely problem. If these fault lights are visible, **proceed to System Ground or GFI Module Failure (E)** to complete the process.

**Step A2:** If the Control Module LEDs are not lit, then look for the red LED located on the GFI Module in the head of the housing. You will need to remove the access cover to be able to view this LED. (See the **Removing The Cover** to gain access to the GFI.) Remove the service cover and see **Figure 6** to locate the LED.

YES - If the red GFI Module LED is lit, go to **Step A3**.

NO - If it is not lit, skip to **Step A4**.



Figure 5

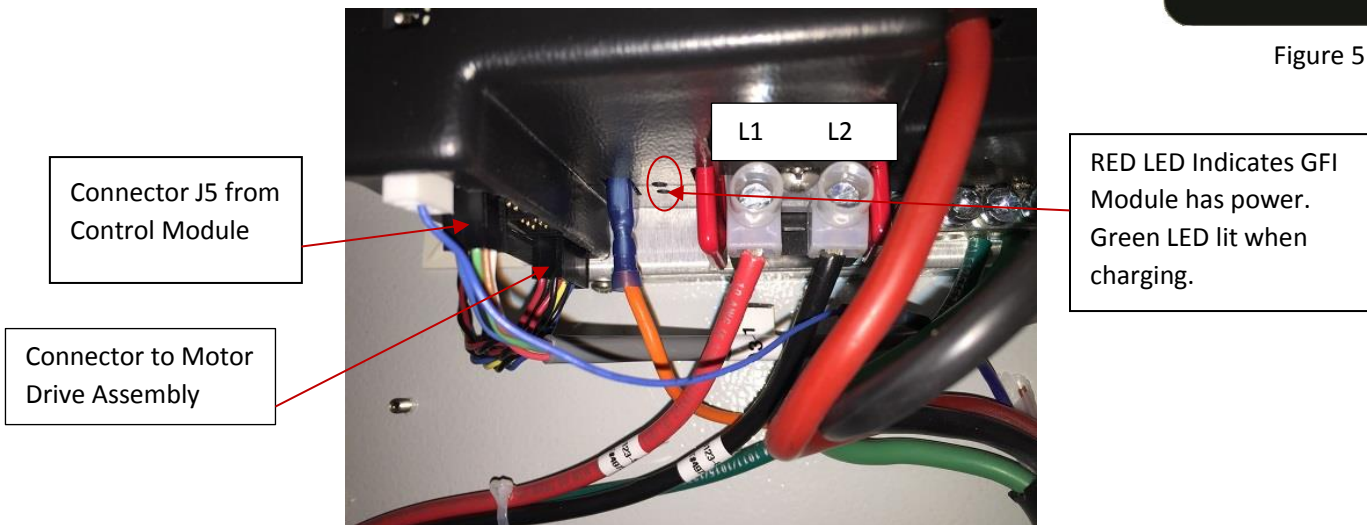


Figure 6

**Step A3:** If the GFI Module's red LED is lit, then you have power to the GFI Module. Check to see if the J5 connector for the Control Module is firmly seated in the GFI Module (**Figure 6**). If the connection is loose or not fully seated, unplug and reconnect the connector, and check again for the blue **POWER** LED on the Control Module. Is the blue **POWER** LED lit?

YES – If the blue **Power** LED lights on the Control Module after reconnecting the J5 connector, then confirm that no fault codes are indicated by the LEDs. Take note of these faults if they should appear at this time.

**Proceed to Step A5.**

NO - If you still do not see the lit blue LED on the Control Module after you reseal the connector or the connector was properly inserted when you checked, then **proceed to Control Module or GFI Failure (C), Step C4** to complete the process.

**Step A4:** The GFI Module red LED is not lit, having checked it in **Step A2**. Carefully check the voltage between L1 and L2 on the GFI Module (**Figure 6**). There should be a source voltage of 208-240 VAC.

YES - If this voltage is measured, **proceed to Replacing the GFI Module**.

NO - If no voltage is measured, check the breaker at the source panel and reset the breaker if it has tripped. Otherwise, check the service line to the EVSE for the source of the power problem and correct it. Once power is restored to the EVSE, the Control Module blue **POWER** LED should be lit. Note any fault indicators on the Control Module LEDs and **go to Step 5** to continue the EVSE checkout.

**Step A5:** If you have *Control Module Inc.'s*, Electrician Tester, **proceed to Electrician Tester Checks (B)**. If you do not have a tester and you do not have an EV available for testing, call Control Module Technical Support at 1-888-753-8222 between the hours of 8:30 AM and 5:00 PM EST, Monday to Friday to speak with a specialist. If an EV is available for testing, proceed with this step.

At this point, only the blue, **POWER** LED will be lit. It will be solid and the yellow **CONNECTED** LED will slowly flash. Plug the J1772 connector into the EV's receptacle and press the **ON** button on the Control Module. Observe the Control Module LEDs. Once the cable is connected to the vehicle, the **CONNECTED** LED will stop flashing. This indicates that the proximity latch has been recognized as closed and the pilot has been applied. Once charging has begun, the green **CHARGING** LED slowly flashes with a solid blue LED. When charging is complete, the **CHARGING** LED stops flashing. Did this process occur without fault lights?

YES - Call Control Module Technical Support at 1-888-753-8222 between the hours of 8:30 AM and 5:00 PM EST, Monday to Friday to speak with a specialist.

NO - If faults **F7** (Overcurrent Trip), **F10** (Pilot Problem), **F11** (Ventilation Required) or **F13** (Non-Volatile Logic Error) occur, the problem is most likely related to the electric vehicle itself. **Investigate this problem before proceeding.**

## Electrician Tester Checks (B)

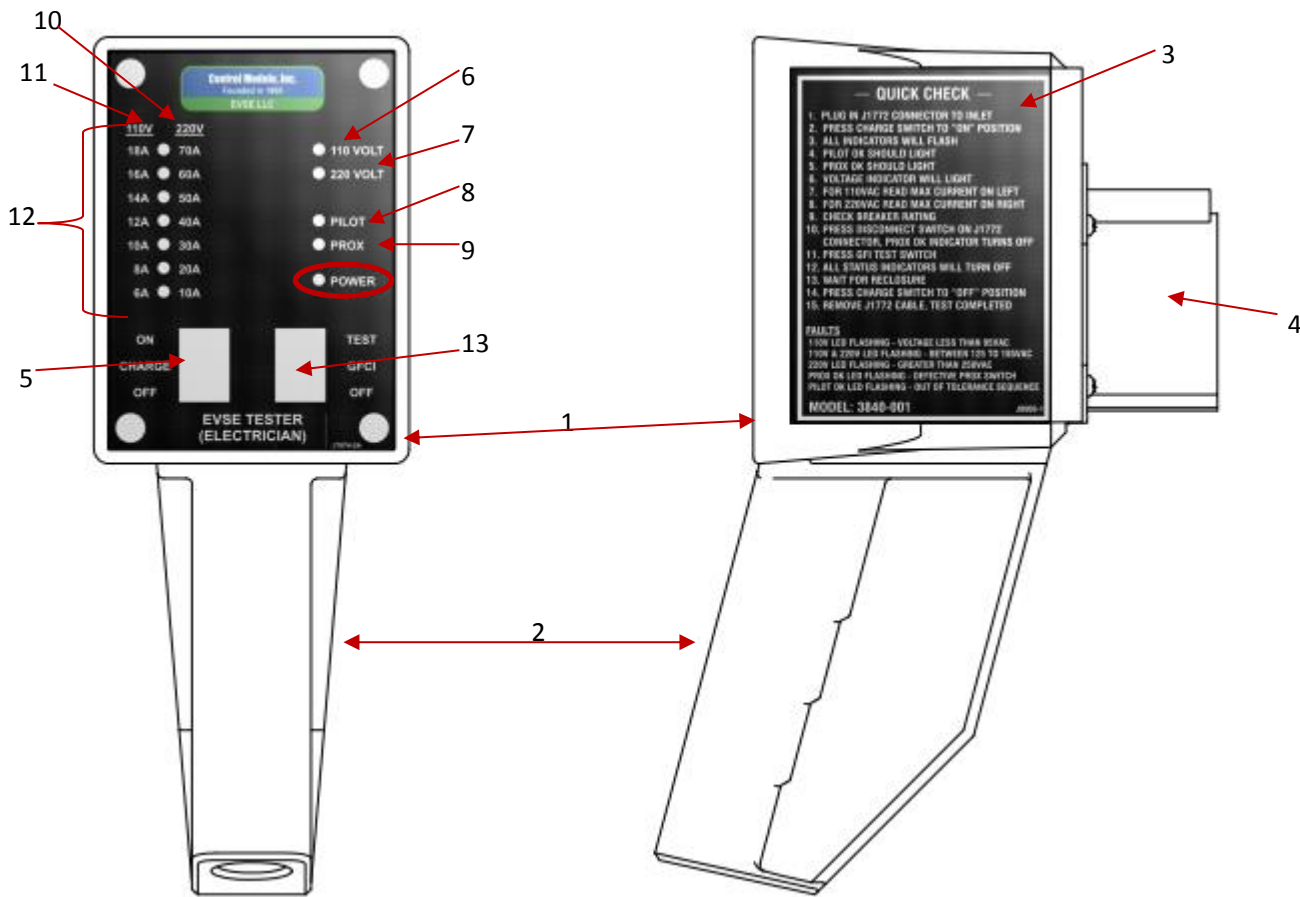


Figure 7

**Note:** Your tester might have an additional LED indicating Power.

Connect the J1772 Connector to the tester (**Figure 8**)

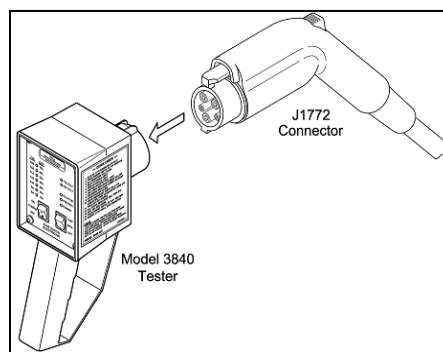


Figure 8

**Step B1:** Proceeding from **Step 5** of **Initial Troubleshooting (A)**, with the **CHARGE ON** switch of the tester turned on (**Item 5, Figure 7**), there should be lights indicating the tester and the EVSE are communicating. The LEDs on the left (**Item 12, Figure 7**) should indicate the charging current capacity of the EVSE. Typically, that will be 30A at 220VAC. Are the LEDs in **Item 12** above on?

**YES – Proceed to Step B2.**

**NO** – If no LEDs are lit on the tester, **proceed to Step D3 in the Electrical, J1772 Cable or GFI Module** section.

**Step B2:** Is the tester **PILOT** LED (**Item 8, Figure 7**) lit?

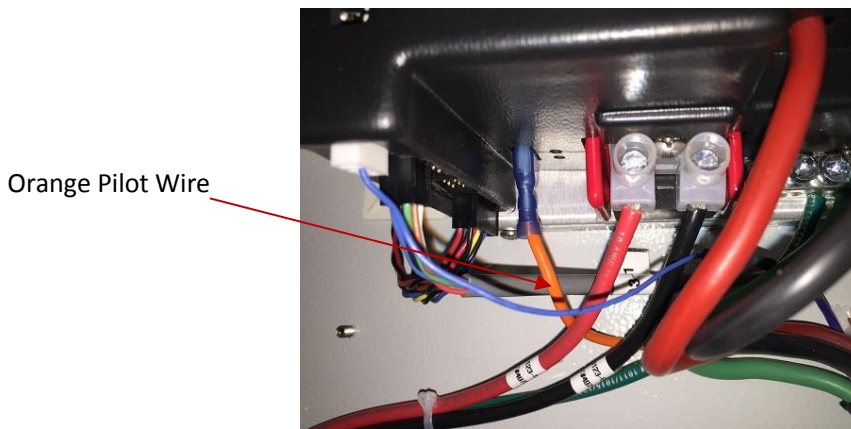
**YES** - If it is lit and not flashing, the tester has confirmed the simulated pilot signal. **Proceed to Step B3.**

**NO** - If not lit, or lit and flashing, there should also be an indication that a pilot problem exists with the fault lights on the Control Module. A solid blue and solid yellow light, accompanied by a slow flashing red light on the Control Module, indicate a pilot fault.

To further diagnose this, you will need to remove the service cover to gain access to the GFI Module, if you have not done so previously. (See **Removing the Cover** to gain access to the GFI.)

The orange pilot wire runs from the J1772 connector to the GFI Module and connects as shown in **Figure 9**. Once the cover is removed, confirm that the pilot wire is securely connected to the GFI Module. If the connector has become loose, reconnect it and reattach the tester to the J1772 connector to see if the **PILOT** LED now lights solid on the tester. If this happens, any fault indications on the Control Module should also have been eliminated. **If this has solved the problem, retest the system.**

If none of the previous steps have solved the problem, check continuity from the GFI Module-end of the orange pilot wire to the pilot pin on the J1772 connector (see **Item 4, Figure 2** on page 9). If the pilot continuity is OK, and if the **PILOT** LED is not lit, the pilot frequency is outside of specification. An out-of-spec pilot frequency that shifts in and out of spec can also create a flickering LED. Similarly, if the pilot continuity is OK, and the **PILOT** LED has been flashing, the PILOT voltage is outside of specification. Check Pin 4 (pilot) to ground Pin 3 on the J1772 connector. The voltage between these pins should be between +11 and +13 VDC.



**Figure 9**

If the continuity check suggests the pilot wire is broken somewhere in the J1772 charging cable, the entire cable assembly will need to be replaced. **Proceed to Replacing the J1772 Cable Assembly.**

If the preceding steps suggest there is a pilot problem but it is not related to pilot continuity, **proceed to Replacing the GFI Module.**

**Step B3:** Does the tester **PROX**(imity) LED (**Item 9, Figure 7**) light without flashing?

**YES** - **Proceed to Step B4.**

**NO** - If it is not lit or is flashing, check to see that the proximity latch in the J1772 connector is seated properly on the tester receptacle (**Figure 8**). The resistance between Pin 5 and ground Pin 3 should be 150 ohms and change

to 480 ohms when the lock latch is pressed. If the **PROX** LED light problem cannot be rectified, call Control Module Technical Support at 1-888-753-8222 between the hours of 8:30 AM and 5:00 PM EST, Monday to Friday to speak with a specialist.

**Step B4:** Is the 220V LED (**Item 7, Figure 7**) lit on the tester while the 110V LED (**Item 6, Figure 7**) is not lit? When the AC voltage is between 185VAC and 250VAC, the 220V LED will be lit and solid on the tester. Is the 220V LED lit?

YES - **Proceed to Step B5.**

NO - If the 220V LED flashes, the line voltage is above 250VAC. If the 220V and 110V LEDs flash at the same time, the line voltage is between 125VAC and 185VAC. If the 110V LED flashes, the line voltage is less than 95VAC. The indicated problem is a source voltage. Investigate the reasons behind this source voltage problem before proceeding further. When fixed, retest the system.

**Step B5:** Press the **GFCI Test** toggle switch (**Item 13, Figure 7**). This creates a 20 ma leakage current to ground, which should cause the EVSE under test to drop AC power and indicate a ground fault condition. All status LEDs on the tester will turn off. Wait one minute and the EVSE unit will provide an automatic reclosure which will restore power to the unit. Does this process occur as expected?

YES - **Proceed to Step A6.**

NO - If the GFI test does not work, or the reclosure does not occur, then **proceed to Replacing the GFI Module.**

**Step B6:** **If an EV is not available for test**, call Control Module Technical Support at 1-888-753-8222 between the hours of 8:30 AM and 5:00 PM EST, Monday to Friday to speak with a specialist. If an EV is available for testing, proceed with this step.

At this point, only the blue, **POWER** LED will be lit. It will be solid and the yellow **CONNECTED** LED will slowly flash. Plug the J1772 connector into the EV's receptacle and press the **ON** button on the Control Module. Observe the Control Module LEDs. Once the cable is connected to the vehicle, the **CONNECTED** LED will stop flashing. This indicates that the proximity latch has been recognized as closed and the pilot has been applied. Once charging has begun, the green **CHARGING** LED slowly flashes with a solid blue LED. When charging is complete, the **CHARGING** LED stops flashing. Did this process occur without fault lights?

YES - Call Control Module Technical Support at 1-888-753-8222 between the hours of 8:30 AM and 5:00 PM EST, Monday to Friday to speak with a specialist.

NO - If faults **F7** (Overcurrent Trip), **F10** (Pilot Problem), **F11** (Ventilation Required) or **F13** (Non-Volatile Logic Error) occur, the problem is most likely related to the electric vehicle itself. **Investigate this problem before proceeding.**

## Control Module or GFI Module Failure (C)

---

**Step C1:** If not previously performed, check the J5 connector (**Figure 6**) to verify the Control Module is firmly seated in the GFI Module. Is the J5 connector firmly seated in the GFI Module?

YES - **Proceed to Step C2.**

NO – Reseat and verify the Control Module’s LEDs are now lit properly. If so, **retest the system**. If not, **proceed to Step C2.**

**Step C2:** Check the voltage L1 to L2 (**Figure 6**) at the GFI Module, if this has not been done previously. Is the voltage between 208 – 240VAC?

YES - **Proceed to Step C3.**

NO – If the voltage is under 185VAC or over 250VAC, there is a problem with the source voltage coming from the service panel. Investigate this, correct the voltage and **retest the system**.

**Step C3:** Are the Control Module’s LEDs now lit properly?

YES – **Retest the system.**

NO – **Contact Control Module Technical Support** at 1-888-753-8222 between the hours of 8:30 AM and 5:00 PM EST, Monday to Friday to speak with a specialist.

## Electrical, J1772 Cable or GFI Module (D)

**Step D1:** Recheck for a ground fault problem. Is there an **F1** fault (ground wire not connected) indicated on the Control Module LEDs?

YES - Check system grounding. If it needs correcting, correct and retest the system. If the grounding checks out and doesn't need correcting, **proceed to Replacing the GFI Module**.

NO - **Proceed to Step D2.**

**Step D2:** Disconnect any connector that might be attached to J3 (External Control) on the GFI Module. (**Figure 10**). Recheck tester LEDs. Does this resolve the tester LED issue?

YES - **Go to Step B2 of the Electrician Tester (B) section and continue that process.** If you do not have an Electrician Tester, **proceed to Step B6 of the Electrician Tester section.**

NO - **Continue to Step D3.**

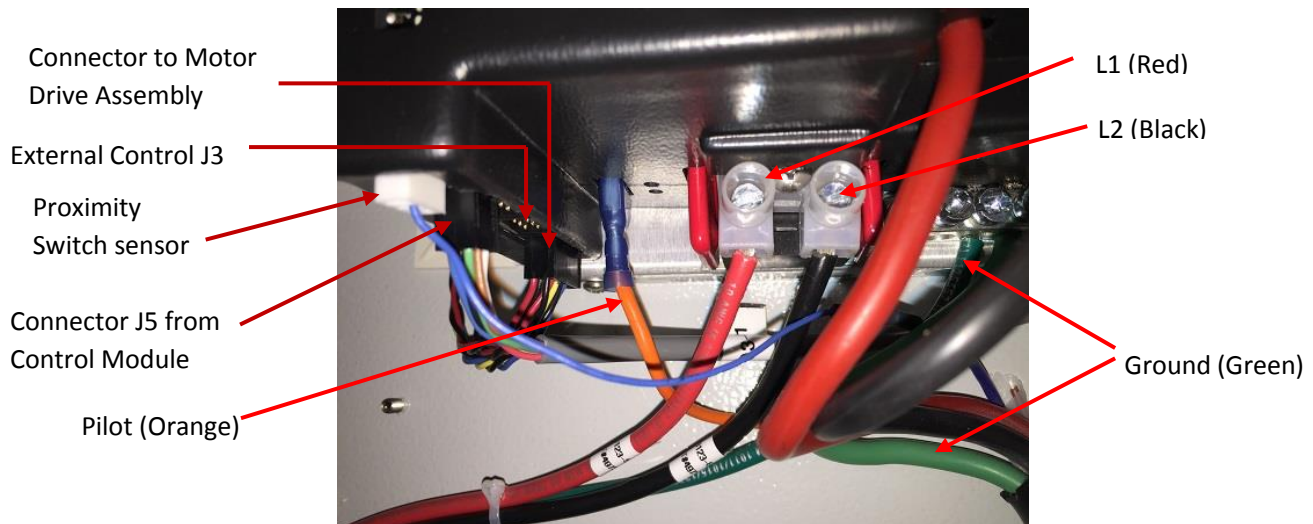


Figure 10

**Step D3:** Verify the J1772 cable wires are securely connected at the GFI Module. (**Figure 10**). They are Ground (Green), Pilot (Orange), L1 (Red) and L2 (Black). Are all J1772 cable wires securely connected?

YES – **Continue to Step D4.**

NO – Reconnect wires, **go to Electrician Tester Checks (B), Step B2 and continue that process.** If you do not have an Electrician Tester, **proceed to Electrician Tester Checks (B), Step B6.**



**WARNING** - Before proceeding further, turn off the power at the service panel and perform lockout/tagout procedures.

**Step D4:** Check the continuity of the four (4) wires running from the J1772 connector to the GFI Module (**Figure 10**). Check each from its pin on the J1772 connector (**Figure 2**) to its termination at the GFI Module. Have any broken wires been isolated?

YES - **Proceed to Replacing the J1772 Cable Assembly.**

NO – If no problem is found, **proceed to Replacing the GFI Module.**

## System Ground or GFI Module Failure (E)

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**Step E1:** Check all system grounds, including the service panel, to ensure a proper ground is in place. If you find a problem, correct it. After correcting the ground problem, **retest the system**.

**Step E2:** If you found no system ground problems, **proceed to Replacing the GFI Module**.



## Motor Drive Assembly Failure (F)

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**Step F1:** If the J1772 connector is still attached to the EVSE, disconnect it from the vehicle. Does the J1772 cable assembly begin to retract into the EVSE within a few seconds? Does it fully retract?

YES: If it does retract properly, **proceed to Step F2.**

NO: If the J1772 connector is not attached to an EV and has not retracted or when disconnected from the EV it has not retracted, continue to **Step F3.**

**Step F2:** Press **ON** on the Control Module. Can you fully retract the cord?

YES: **Proceed to Electrician Tester Checks (B).** If you do not have a tester, **proceed to Initial Troubleshooting (A), Step A5.**

NO: There is a possible extension mechanical failure. **Proceed to Step F3.**

**Step F3:** Is the Control Module showing a **Fault 9** Stall Trip (Blue Solid, Yellow Slow Flash, Red Solid)?

YES: If the fault is indicated, it will be necessary to open up the unit and check for restrictions which might prevent retraction. **Proceed to the Removing the Cover and then to Step F3A.**

NO: If there is no **Fault 9**, **proceed to Replacing the GFI Module.** Once it has been replaced, confirm proper operation of the system by repeating **Step F1.** If replacement of the GFI Module does not result in proper J1772 cable and connector retraction, contact Customer Support for further assistance.

**Step F3A:** Are there any obstructions?

YES: Remove any obstructions and wait approximately 1 minute. If the cable retracts, then make sure the fault indicators have cleared and **repeat Step F1 to check out the entire system's operation. If the cable does not retract, continue to Step F3B.**

NO: If there are no visible obstructions, **proceed to Step F3B.**

**Step F3B:** Reset the system by either pressing the **ON** button on the Control Module or turning the service panel circuit breaker **OFF** and then **ON.** Wait approximately one minute. Continue to **Step F3C.**

**Step F3C:** Has the cable retracted?

YES: If the cable retracts within one minute, repeat **Step F1** to check out the entire system's operation.

NO: If the cable has not retracted after one minute, check the EVSE voltage L1 to L2 (**Figure 7**). If the voltage measured between L1 and L2 is under 185VAC or greater than 250VAC, there is a line voltage problem that should be investigated and corrected before proceeding further. If the voltage is normal, contact Customer Support for further assistance.

## Lockout/Tagout Procedures

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Prior to performing any disassembly steps or when working in high voltage parts of the EVSE, ensure that power has been removed from the service lines originating from the service panel.

To maintain the safety of all persons in the area, a lockout/tagout procedure should be followed per 29 CFR 1910.147.

Lockout is the placement of a lockout device on the service panel energy isolation device (circuit breaker) to ensure that the power source cannot be operated until the lockout device is removed. A lockout device utilizes a positive means, such as a lock (key or combination lock with a circuit breaker lockout) to hold the breaker in a safe position to prevent energization.

Tagout is the placement of a tagout device (a tag or other prominent warning device) on an energy isolation device to indicate that the energy isolation device and the equipment being controlled cannot be operated until the tagout is removed. The tagout device should be non-reusable, attached by hand, self-locking and non-releasing with a minimum unlocking strength of no less than 50 pounds.

The lockout approach shall be used unless the utilization of a tagout procedure will provide full personnel protection.

## EVSE Disassembly and Part Replacement Tools

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### Recommended Tools

- Lockout/Tagout Items
- 3840 Electrician Tester
- Multimeter
- Flat Head Screwdriver
- Phillips Head Screwdriver (large and small)
- Needle-nose Pliers
- Wire-Stripper
- 3/8" Wrench
- 25-inch-pounds Torque Wrench
- 35-inch-pounds Torque Wrench

### Replacement Items

- GFI Module
- Control Module
- J1772 Connector Cable Assembly
- Motor Drive Assembly
- Antenna Tube, Antenna and Cable

**Note:** Put a VAC meter on the conductors to verify the correct breaker was shutoff during the Lockout/Tagout process.

## Removing the Cover

Whether wall- or pole-mounted, begin by removing the EVSE cover.

1. Remove the two screws near the conduit knock-out access hole in the bottom of the cover (**Figure 11A**). Pull the cover slightly out at the bottom of the EVSE (**Figure 11B**) to clear the cover's bottom tab from the bottom of the EVSE frame.

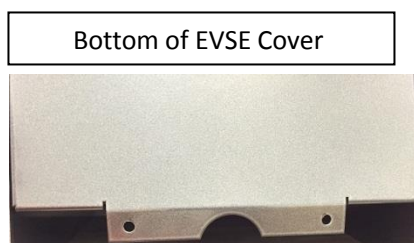


Figure 11A



Figure 11B

2. With the bottom-cover tab clear of the frame, push the cover slightly up to clear the cover's top from the top-rear of the EVSE frame (**Figure 11C**).



Figure 11C

3. With both top and bottom cover tabs clear of the EVSE frame, hold the cover in the middle and pull it straight out (**Figure 11D**).

**Important!** - While pulling the cover out, carefully maneuver both the cover and J1772 cable connector to allow the connector and Bee-Guard to pass through the cover's access hole.



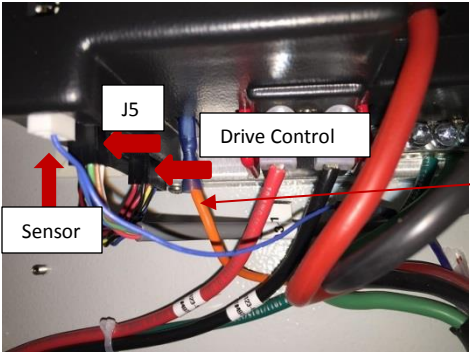
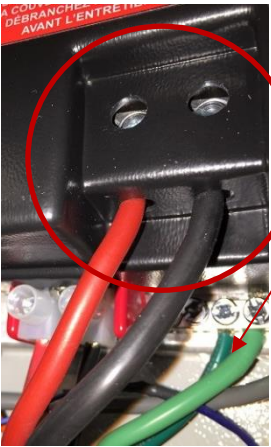
4. When clear of the J1772 cable connector, place the cover in a safe location until needed later.



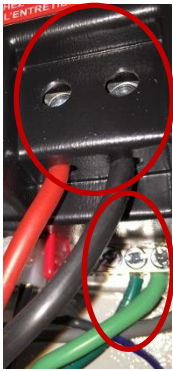


Bee Guard

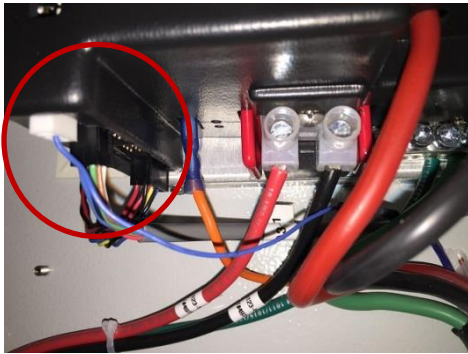


Figure 11D

## Replacing the GFI Module

	 <p><b>WARNING:</b></p> <p><b>Step 1:</b> Perform the lockout/tagout procedure to ensure power is removed at the source. Refer to the discussion of lockout/tagout.</p>
	<p><b>Step 2:</b> Take off the Service Cover as discussed in the previous section. The Service Cover slides down and away from the assembly after the two screws are removed. Set the cover aside. You now have access to the GFI Module and connecting wires. Refer to <b>Figure 4</b> for the GFI's location.</p>
	<p><b>Step 3:</b> Remove the 6-pin J5 Control Module connector and the Drive Control connector from the bottom of the GFI Module. If present, remove the blue Proximity Switch sensor wire from the Vehicle Sensor connector.</p> <p><b>Step 4:</b> Carefully disconnect the orange pilot wire from the Pilot connector, next to the Driver Control connector, using needle-nose pliers.</p>
	<p><b>Step 5:</b> Disconnect the red and black power wires leading from the J1772 cable.</p> <p><b>Step 6:</b> Disconnect the two green ground wires attached to the ground bar located underneath the GFI.</p>

	<p><b>Step 7:</b> Disconnect the red (L1) and black (L2) wires leading from the service panel at the GFI Module.</p>
	<p><b>Step 8:</b> With all of the wires disconnected from the GFI Module, it can now be removed from the EVSE assembly. Using a Phillips, remove the two bottom screws and slide the module down and out over the cable drum. Note the dip switch settings as you will need them for the new GFI Module.</p>
	<p><b>Step 9:</b> Ensuring all wires are clear, install the new GFI Module by sliding it up into position and screwing the two bottom screws back in. Set the dip switch settings to the old GFI's settings.</p> <p><b>Step 10:</b> Reattach all green ground wires that were previously removed to the ground bar on the bottom of the GFI Module. Recommended torque = 25-inch/pounds. If the wires appear damaged, remove the bare wire and re-prep by stripping off 3/8 inch of insulation.</p> <p><b>Step 11:</b> Reattach the Red and Black wires from the J1772 cable to the connector as shown here. Recommended torque = 35-inch/pounds. If the wires appear damaged, remove the bare wire and re-prep by stripping off 3/8 inch of insulation.</p>
	<p><b>Step 12:</b> Reattach the Red (L1) and Black (L2) wires from the power source to the connector as shown here. Recommended torque = 18.5-inch/pounds. If the wires appear damaged, remove the bare wire and re-prep by stripping off 3/8 inch of insulation.</p>
	<p><b>Step 13:</b> Plug in the orange pilot wire from the J1772 connector as shown. Needle-nose pliers can be helpful here.</p> <p><b>NOTE:</b> Ensure the metal clip is plugged onto the mating GFCI connector. Do not misalign.</p>



**Step 14:** Re-connect the 6-pin Control Module connector and the Motor Drive connector at the bottom of the GFI Module. If present, re-connect the blue Proximity Switch sensor wire.





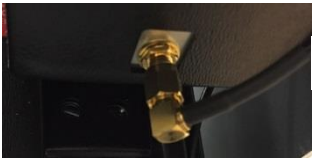
**Step 15:** Re-install the service cover by carefully replacing the cover and aligning the screw holes. Push the bottom in until you hear a click. Replace the two screws previously removed. See **Replacing the Cover** for more details.

**Step 16:** Restore power at the source following lockout/tagout procedures.






Return to Flowchart A and begin the checkout process again to see if the replacement of the GFI Module has solved the initial problem.



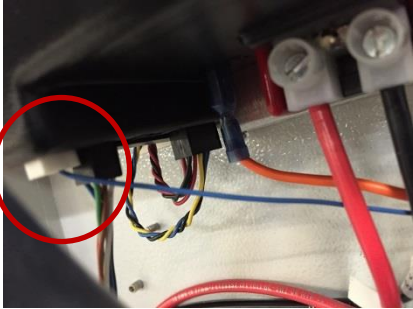

## Replacing the Control Module

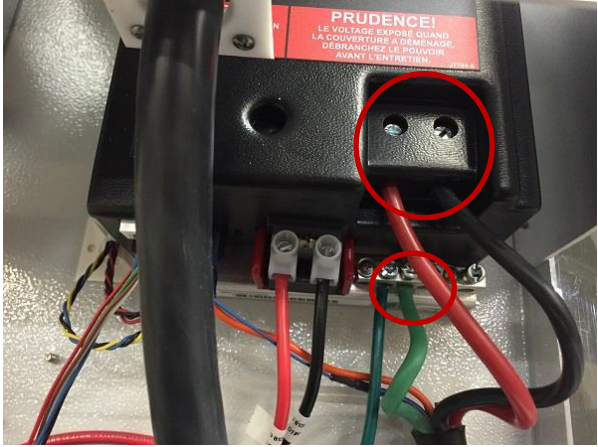

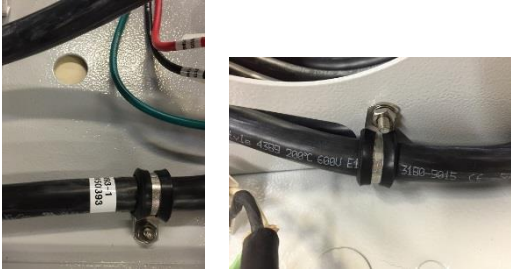
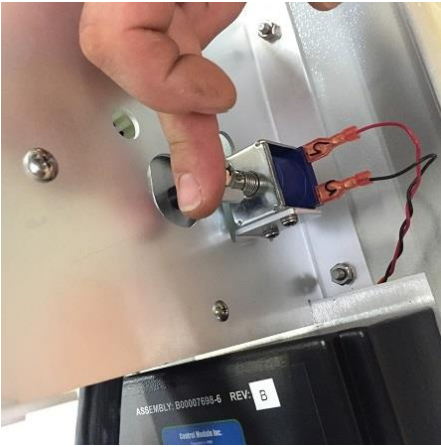
	 <p><b>WARNING:</b></p> <p><b>Step 1:</b> Perform the lockout/tagout procedure to ensure power is removed at the source. Refer to the discussion of lockout/tagout.</p>
	<p><b>Step 2:</b> Remove the Service Cover as previously discussed.</p> <p><b>Step 3:</b> The Service Cover slides down and away from the assembly after the two screws are removed. You now have access to the Control Module. See <b>Figure 4</b> for the Control Module's location.</p>
	<p><b>Step 3:</b> Remove the gray cable with the 6-pin from the top of the Control Module connector.</p>
<p>Serial</p>   <p>ZigBee</p>	<p><b>Step 4:</b> Either unplug the serial connector (3704-003) or, if this is a Zigbee version (3704-002), unscrew the antenna from the bottom of the Control Module.</p>



	<p><b>Step 5:</b> Use a small Phillips Head screwdriver to remove four (4) front screws holding the Control Module to the front panel. Lift the module out, being careful of the gray 6-pin cable hanging off the back of it.</p>
	<p><b>Step 6:</b> Position the replacement Control Module. Thread the gray 6-pin cable through the hole so you can later re-connect it to the bottom of the GFI. Replace the four (4) mounting screws to secure it to the panel.</p>
	<p><b>Step 7:</b> Re-connect the 6-pin Control Module connector to the J5 position at the bottom of the GFI Module.</p> <p><b>Step 8:</b> If this is a Zigbee version, screw the antenna back into the bottom of the Control Module. See the <i>3725 Payment Module User Guide</i> for instructions for adding this EVSE back into the ZigBee Mesh Network. If not, proceed to <b>Step 9</b>.</p>
	<p><b>Step 9:</b> Re-install the service cover by carefully replacing the cover and aligning the screw holes. Press down the bottom until you hear a click. Replace the two screws previously removed. See <b>Replacing the Cover</b> for more details.</p>
<p><b>Step 10:</b> Restore power at the source following lockout/tagout procedures.</p> <div data-bbox="188 1388 290 1486">  </div> <p>Return to Flowchart A and begin the checkout process again to see if the replacement has solved the initial problem.</p>	

## Replacing the J1772 Connector Cable Assembly

	 <b>WARNING</b>  <b>Step 1:</b> Perform the lockout/tagout procedure to ensure power is removed at the source. Refer to the discussion of lockout/tagout.
	<b>Step 2:</b> Remove the Service Cover as previously discussed. Refer to <b>Figure 4</b> for threading the cable.
	<b>Step 3:</b> If present, remove the blue Proximity Switch sensor wire.
	<b>Step 4:</b> Carefully disconnect the orange pilot wire from its connector using needle-nose pliers, if necessary.

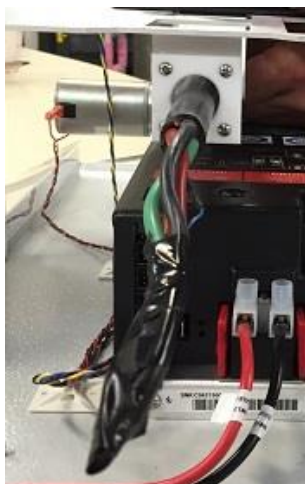
	<p><b>Step 5:</b> Disconnect the Red and Black power wires leading from the J1772 cable, then disconnect the green Ground wire.</p>
	<p><b>Step 6:</b> Tape the wire ends together. This will allow for easier threading through the 3704 when removing the cable.</p>
	<p><b>Step 7:</b> Remove the 3/8-inch nuts holding down the cable on the side and bottom of the 3704. Place the screws and P-clamps in a safe place.</p>
	<p><b>Step 8:</b> Press down on the solenoid on the right side of the 3704 and remove the cable by grasping the connector and pulling through until the entire cable has been removed.</p> <p><b>Note:</b> The solenoid requires a fair amount of pressure.</p>



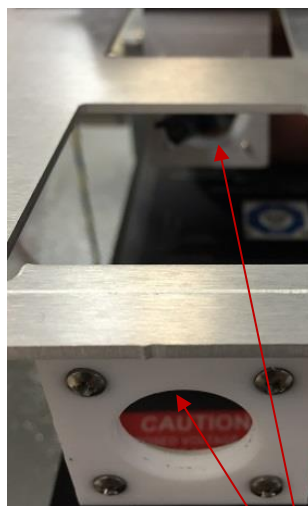
**Step 9:** Take the new cable and tape its wire ends to make it easier to thread the cable through the 3704.







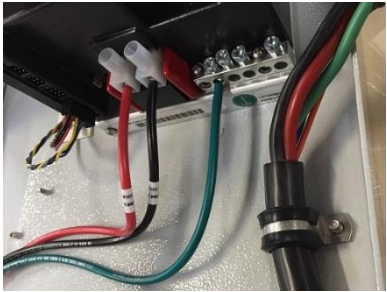
**Step 10:** Start threading the taped end through the Roller Guide assembly, then up over the top of the wheel, fitting the cable between the wheel and the two rollers, pulling down through to the first cable guide.



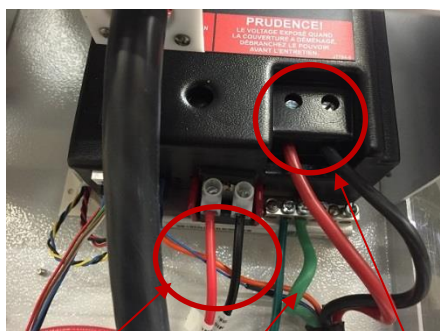
**Step 11:** Thread through the cable guide, coming down from the top of the wheel and on through the second guide.



Cable Guides

	<p><b>Step 11:</b> Thread the cable through the hole at the bottom of the cable drum, wrapping one round into the bottom of the drum, pulling enough cable through to reach the GFI.</p>
	<p><b>Step 12:</b> Attach the P-Clamp with the 3/8-inch nut to hold the cable in place at the bottom of the drum.</p>
	<p><b>Step 13:</b> Guide the cable from the bottom of the cable drum through the cutout to the right of the clamp.</p>
	<p><b>Step 14:</b> Pull the cable up, alongside the back of the drum, towards the GFI connector panel.</p>
	<p><b>Step 15:</b> Attach the P-Clamp over the cable jacket using the 3/8-inch nut, and secure the cable in place. Remove the tape from the wire ends.</p>



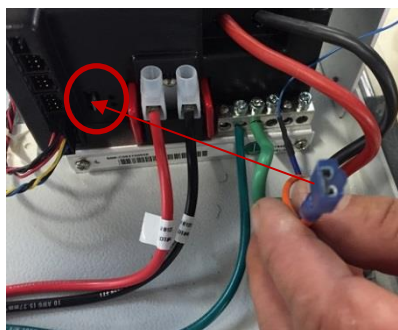
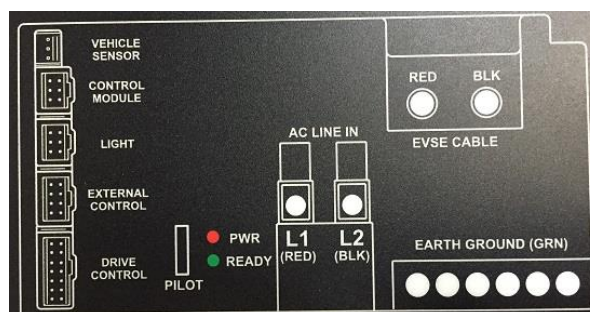


Threaded Wires

Ground

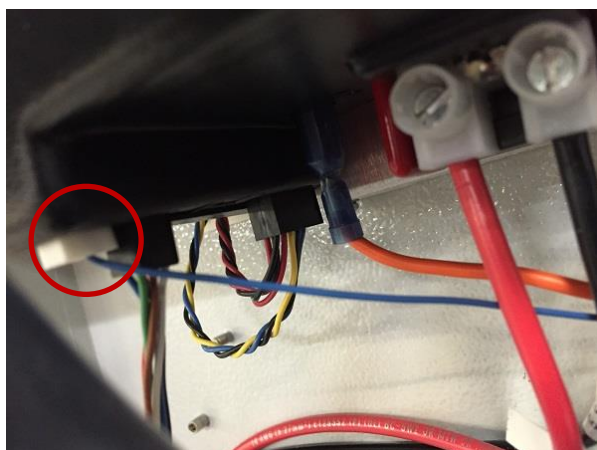
Attach to GFI

**Step 16:** Using the label on the GFI as a guide, use the 35-inch-pounds torque wrench to attach the Red and Black wires from the replacement cable to the GFI, and use the 25-inch-pounds torque wrench to attach the Green ground wire to the ground panel. Thread the orange Pilot wire and blue Proximity Switch sensor wire under the green wire and attach them.



**Step 17:** Plug in the orange pilot wire from the J1772 connector as shown. Needle-nose pliers can be helpful here.

**NOTE:** Ensure the metal clip is plugged onto the mating GFCI connector. Do not misalign.



**Step 18:** If present, attach the blue Proximity Switch sensor wire.



**Step 19:** Pull the remainder of the cable through, wrapping one round into the bottom of the drum, leaving the excess cable with the connector hanging down.



**Step 20:** Restore power at the source following lockout/tagout procedures. After about five seconds, the excess cable will automatically coil up inside the drum.

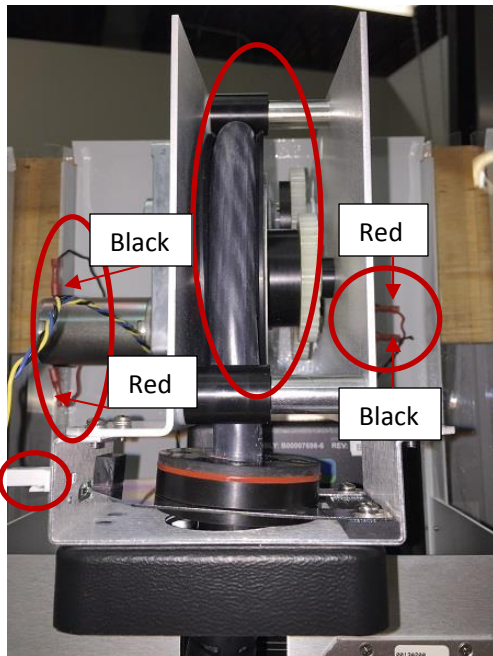
**Step 21:** Re-install the service cover by carefully replacing the cover and aligning the screw holes. Press down the bottom until you hear a click. Replace the two screws previously removed. See **Replacing the Cover** for more details.

## Replacing the Motor Drive Assembly

**WARNING:**

**Step 1:** Perform the lockout/tagout procedure to ensure power is removed at the source. Refer to the discussion of lockout/tagout.

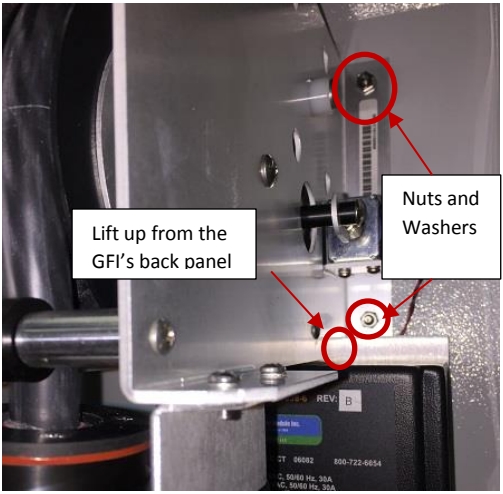
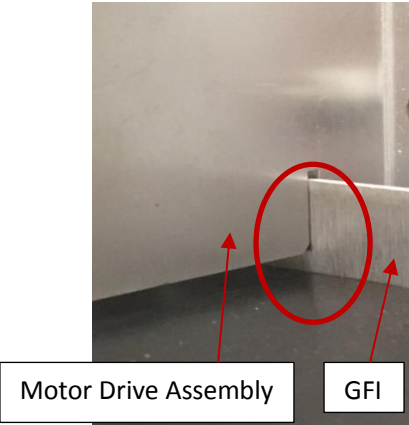


**Step 2:** Remove the Service Cover as previously discussed. You now have access to the Motor Drive Assembly. See **Figure 4** for the Assembly's location.





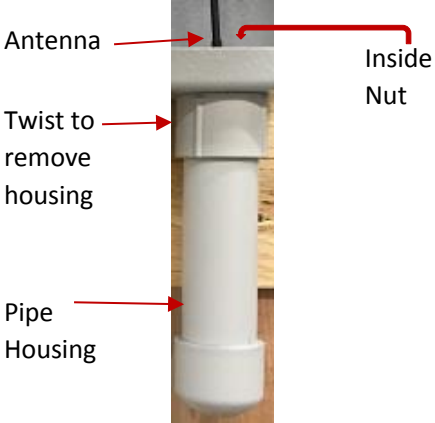



**Step 3:** Disconnect the cables attached to the Motor Drive Assembly. Pay attention to the positions of the Red and Black connectors on either side of the assembly.

**Step 4:** Follow the directions for **Replacing the J1772 Connector Cable Assembly** to remove the cable from the Motor Drive Assembly.



	<p><b>Step 5:</b> Remove the four nuts and washers, two on either side of the assembly, lift the assembly up from the GFI's back panel and pull the assembly towards you.</p>
	<p><b>Step 6:</b> Position the new assembly so that the side panel slits slide onto the top of the GFI's back panel. Reinstall the new assembly with the nuts and washers.</p>
	<p><b>Step 7:</b> Follow the directions in <b>Replacing the J1772 Connector Cable Assembly</b> to feed the cable back into the Motor Drive assembly.</p> <p><b>Step 8:</b> Re-connect all wiring. Refer to <b>Step 4</b> to make sure you correctly connect the Red and Black wires.</p>
	<p> <b>Step 9:</b> Restore power at the source following lockout/tagout procedures. After about five seconds, the excess cable will automatically coil up inside the drum.</p> <p><b>Step 10:</b> Re-install the service cover by carefully replacing the cover and aligning the screw holes. Press down the bottom until you hear a click. Replace the two screws previously removed. See <b>Replacing the Cover</b> for more details. Return to Flowchart A and begin the checkout process again to see if the replacement has solved the initial problem.</p>

## Replacing the Antenna Assembly (Zigbee Version)

	 <p><b>WARNING:</b></p> <p><b>Step 1:</b> Perform the lockout/tagout procedure to ensure power is removed at the source. Refer to the discussion of lockout/tagout.</p>
	<p><b>Step 2:</b> Remove the Service Cover as previously discussed.</p> <p><b>Step 3:</b> The Service Cover slides down and away from the assembly after the two screws are removed. You now have access to the Antenna Assembly.</p> <p><b>Step 4:</b> To replace the pipe housing, pull the antenna out of the tube, remove the inside nut, twist the plastic bolt at the top of the housing and remove the pipe. The antenna will remain, hanging from the bottom of the Control Module.</p> <p><b>Step 5:</b> Slide the new pipe into the hole, install and tighten the nut. Place the antenna back into the tube.</p>
 	<p><b>Step 6:</b> To replace the antenna you do not need to remove the pipe housing. Unscrew the antenna from the bottom of the Control Module and slide it up, out of the pipe.</p> <p><b>Step 7:</b> Slide the new antenna into the pipe and reconnect it to the bottom of the Control Module. Ensure the new cable is properly tightened. Do not leave loose.</p>
	<p><b>Step 8:</b> Re-install the service cover by carefully replacing the cover and aligning the screw holes. Press down the bottom until you hear a click. Replace the two screws previously removed. See <b>Replacing the Cover</b> for more details.</p>
<p><b>Step 9:</b> Restore power at the source following lockout/tagout procedures.</p>  <p>Return to Flowchart A and begin the checkout process again to see if the replacement has solved the initial problem.</p>	

## Replacing the Cover

Replacing the cover involves the same steps, in opposite order, as removing the cover. However, pulling the J1772 cable out a little, to run it through the cover first, makes the job much easier.

### ***If the EVSE has power:***

Press the ON button. This will allow the J1772 cable to be pulled out from its coiled position. This assumes that the unit is not awaiting authorization from a payment module.

### ***If the 3704 EVSE has no power yet or if the Payment or Gateway Module is installed:***

Push and hold the Solenoid switch on the right-side of the EVSE toward the back (**Figure 12A**). The Solenoid requires a fair amount of pressure.

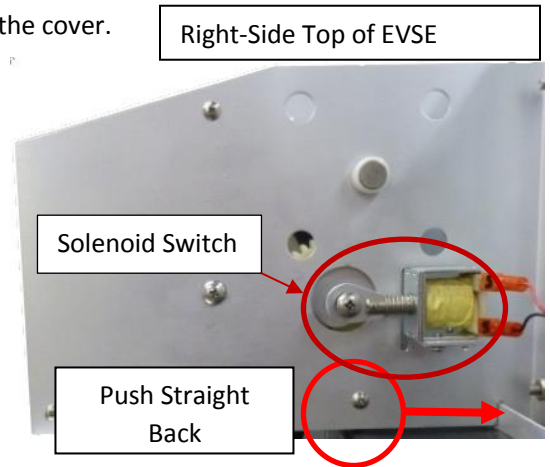


Figure 12A

1. Pull approximately 2 feet of cable out, and run the cable and connector through its access cutout in the front of the cover (**Figure 12B**).
2. Slide the cover on slightly above the EVSE, with the top pushed slightly farther on than the bottom, allowing the top tab of the cover enough room to slide over and behind the top of the EVSE frame. Ensure the top of the front cover is clipped over and behind the top of the rear mount. Failure to do this may result in water intrusion to the EVSE.
3. Ensure the bottom is pulled out enough so that the bottom tab of the cover is clear of the EVSE frame, and will slide over the bottom of the EVSE when the cover is pushed down.
4. Push the cover down from the top, ensuring the top cover tab slides outside of the EVSE frame.
5. Push the bottom of the cover on until you hear a click, and so the bottom cover's tab slides outside of the EVSE frame, and the tab's screw holes align with the EVSE's.
6. Replace the two cover screws and washers removed earlier.

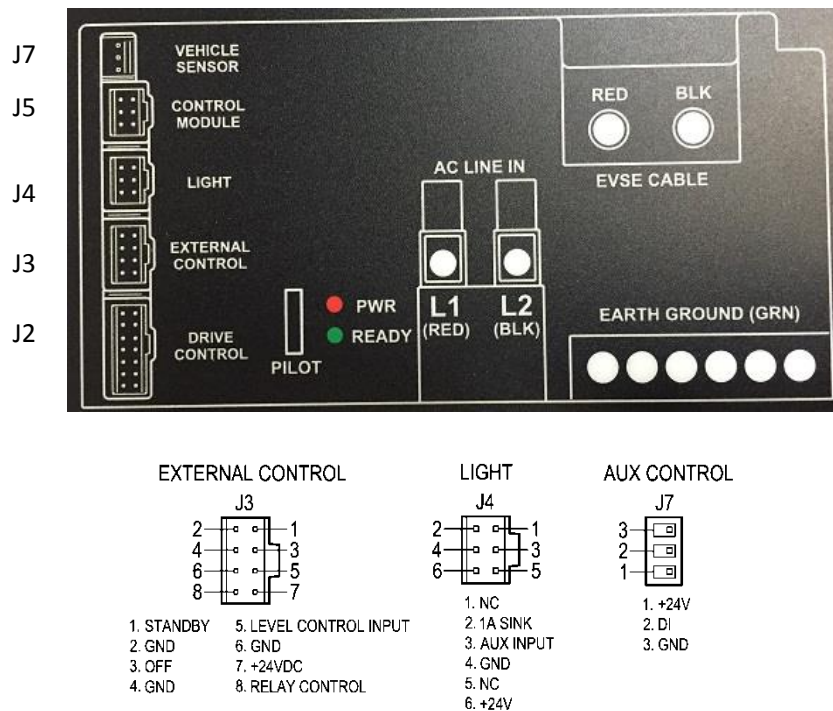


Figure 12B

## Connector Information

### GFI Module

- External Control Input (J3)
- Remote controls are wired to an eight pin connector, marked External Control.
- A contact closure between pin numbers 1 and 2 will place the EVSE in standby mode, reducing the available power to the electric vehicle to 6 Amps.
- A contact closure between pins number 3 and 4 will turn off power to the connected electric vehicle.
- A 0 to 3.2vdc signal between pin 5 and pin 6 will signal the electric vehicle to reduce its charging current. This feature is compatible with Control Module Inc.'s Power Sharing Modules (Models 3741-002 and 3741-003).
- A solid state closure to ground is provided on pin 8, when the electric vehicle signals the EVSE that an external fan is required. It is recommended that, when using these features, the optional I/O connector card (Model 3728-001) should be installed, making wiring easier.



**Figure 13**

## DIP Switch Settings

Each Model 3704 is equipped with an 8-position dip switch on the GFCI, to personalize each installation.

Service panel limitations might require the EVSE to limit the current to the electric vehicle and to reduce the size of the service breaker from 40 amps to 20 amps. The model 3704, as shipped, is set to instruct the electric vehicle that it can draw up to 30 amps (a 40 amp circuit breaker). If only a 20 amp breaker is available, switch 8 must be closed, reducing the maximum charge current to 16 amps.

Switch 7 sets the amount of time the user has to engage the J1772 connector after authorization. In the case where a payment module is not used and the 3704 **ON** button is the actuation mechanism, the default **Open** setting of this switch allows the user 1 minute to engage the J1772 connector in the vehicle. In the situation where authorization via a payment module is required prior to the initiation of charging, the closed position for switch 7 allows a 15 minutes timeout for the authorization. In other words, if the J1772 plug is not engaged in 15 minutes, a new authorization must be obtained. This allows the user time to walk from the payment module, which may be located some distance from the 3704, to the vehicle to plug in the connector.

Switch 2 determines whether the proximity switch signal in the J1772 connector is utilized, upon disconnection from the vehicle, to initiate cable retraction. In the "Open", default setting the signal is ignored and the loss of the pilot signal initiates retraction. In the "Closed" position, the cable retraction is triggered by the removal of the connector from the vehicle as indicated by the loss of a pilot signal and the proximity switch activation in the J1772 connector.

Switch 3 puts the GFI into Test Mode for adding this EVSE to a ZigBee Network.

Switches 1, 4, 5 and 6 are not currently used and are reserved for future applications.

### SW8

- \*Open 40A Breaker
- Closed 20A Breaker

### SW7

- \*Open Inactivity Timer Enabled, 1 Min  
Also EVSE Activated by Local "On" Key (No Payment Module)
- Closed Inactivity Timer Enabled, 15 Min  
Also EVSE Activated by Payment Module

### SW2

- \*Open J1772 Proximity Switch Ignored
- Open J1772 Proximity Switch Used to Initiate Cable Retraction

### SW3

- \*Open Not in Test Mode
- Closed Test Mode for adding to ZigBee Network

### SW 1, 4, 5, 6

For Future Use

### \*DEFAULT SETTINGS



# Field Replaceable Parts List

	<p><b>GFI Module</b></p> <p>B00007698-6</p>
	<p><b>Control Module Assembly</b></p> <p><b>Status Indicator:</b> B00008868-1 (On/Off)  B00008867-1 (ZigBee On/Off)  B00008867-2 (Serial On/Off)</p>
	<p><b>J1772 Cable and Connector</b></p> <p>B00008893-1</p>
	<p><b>Motor Drive Assembly</b></p> <p>B00008971-1</p>
	<p><b>Antenna Assembly(Zigbee version only)</b></p> <p><b>Antenna:</b> C869-004</p> <p><b>Antenna Tube:</b> B00008718-1</p> <p><b>Antenna Cable:</b> C338-147</p>

## Contact Information

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Should questions about installation, operation, optional features, maintenance or service arise, please call Technical Support at 1-888-753-8222 between the hours of 8:30 am to 5:00 pm EST, Monday to Friday.

**Letter**                      Service Department  
                                 Attn: Jack Batalha, Director Product Support  
                                 Control Module Inc.  
                                 89 Phoenix Avenue  
                                 Enfield, CT 06082

**Fax**                              1-860-741-6064

**E-mail**                        [jbatalha@controlmod.com](mailto:jbatalha@controlmod.com)

# Appendix 1

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## Supporting Documents and Manuals

- Electric Vehicle Supply Equipment (EVSE) Model 3704 User Manual and Installation Guide: 3704-IG-001
- EVSE Payment Module Model 3725-104 User Manual and Installation Guide: 3725-UG-002
- Tester, Electrician (Model 3840-001): 3840-UG-001



## Warranty

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FOB Enfield, CT

EVSE proprietary hardware products are warranted to be free from defects in materials and workmanship for a period of 1 (one) year from the date of receipt of the product. Customer can report an Equipment defect to the Control Module Service Division by (a) telephone between 8:00 A.M. and 4:30 P.M. (EST), Monday through Friday, excluding Control Module holidays, or (b) through the support website.

Telephone number: 800-527-4998

Email address: [service@controlmod.com](mailto:service@controlmod.com)

The foregoing warranty does NOT include

- Furnishing supplies for, painting or refinishing the product
- Electrical work external to such product
- Installation, maintenance or removal of alterations, attachments or other devices not furnished by EVSE, LLC.
- Services which cannot be practicably performed due to alterations in or attachments to the product
- Services for accessories
- Repair or replacement of defective product to the extent the defect is attributable to:
  - Neglect or misuse ( including use of the product for purposes other than that for which it was designed)
  - Transportation, vandalism or burglary of the product, acts of terrorism, accident or disaster, or other external causes (including water, wind , lightning and dust)
  - Alterations to the product or servicing of the product by a third party
- The foregoing warranty shall also not apply to the extent the defect in the product is due to the use of the product in conjunction with other products not manufactured by EVSE or to product from which the serial number has been altered, defaced or removed. This warranty extends only to the original purchaser of the product. It may not be assigned to any third party.

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