



INSTALLATION INSTRUCTIONS

“GEMKIT-100” FAST CHARGE KIT FOR PRE-2005 MODEL YEAR GEM VEHICLES

Rev. 0
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INTRODUCTION

This document provides instructions for installing the ETEC 100-Amp fast charging kit on a pre-2005 model year GEM vehicle. Detailed circuit, connector and pin numbers were verified to be correct on several vehicles. Always refer to the manufacturer's wiring diagrams. Contact ETEC for installation instructions for 2005 and newer vehicles.

Installing this kit will put the installer in close proximity to batteries (including highly-acidic electrolyte where flooded batteries are installed) and potentially high voltage. These instructions are intended for personnel qualified to work on and around battery-powered systems. If you are not qualified, **DO NOT** proceed with this installation!

These instructions assume that the fast charge kit was purchased with cables from ETEC. At the end of these instructions is a table listing all components required for the installation, including cables (by type and length) in case the installer chooses to fabricate the cables.

INSTALLATION

STEP 1

Turn the key switch to the off position. Next, turn the main disconnect (located under the front seat in a two-passenger vehicle and under the rear seat in a four-passenger vehicle) to the off position. Set the seat aside to allow access to the battery compartment.

STEP 2

Remove the upper and lower portions of the dashboard being careful to note where any accessories may have been plugged in. The front of the upper dash is fastened to the “firewall” under the front hood by two ¼-20 bolts. Remove these bolts and pull the upper dash off by releasing the Velcro holding the back edge to the lower dash. Remove the lower dash by removing the three self-tapping screws attaching it to the aluminum frame. Be sure to mark any wiring attached to the lower dash for correct reassembly.

STEP 3

Place the outer charge receptacle bezel in the location where you want the receptacle installed and trace around the inside opening. (Fig. 3.1) Mark the location of the four mounting holes on the bezel and drill them out using a ¼” drill bit. **CAUTION: ALWAYS CHECK FOR CLEARANCE BEHIND THE PANEL BEFORE DRILLING HOLES.** Figure 3.1 shows ETEC’s recommended location for the fast charge receptacle.



Figure 3.1

STEP 4

Cut out the opening previously traced from the bezel template and mount the charge receptacle assembly as shown in Figures 4.1 & 4.2 to the panel using the provided 2 ½” – long bolts, washers and lock nuts as shown in Figures 4.3 & 4.4. Be sure to orient the black plastic guide and receptacle so that the polarizing key is at the top of the opening, between the small pins on the receptacle.



Figure 4.1 Charge Receptacle Assembly – Expanded View



Figure 4.2 Charge Receptacle Assembly



Figure 4.3 Charge Receptacle Assembly – Mounted under the Driver GEM seat



Figure 4.4 Charge Receptacle Assembly – Mounted under the Driver's seat

STEP 5

Install the contactor (provided) under the seat in a location that provides adequate clearance to the batteries and other components that may be in close proximity as shown in Figs. 5.1 and 5.2.



Figure 5.1 Contactor



Figure 5.2 Contactor and Charge Receptacle

Route one cable from the contactor to the negative terminal on the charge receptacle. Note that the cable from the charge receptacle should be connected to the #2 or “-“ terminal on the contactor (the terminal opposite the side with the contactor coil power connector). Route the other cable from the contactor to the most negative battery (usually the outer most battery on the driver’s side; confirm with a volt meter). Connect this cable to the negative terminal on the most negative battery on top of the existing cable. Be sure the connection is clean and tight to prevent overheating this connection.

STEP 6

Route cable from the positive terminal of the charge receptacle under the vehicle, between the frame rails through an opening under the dash panel and to the most positive battery (closest to the “firewall”) under the hood. Connect this cable to the positive terminal on the most positive battery on top of the existing cable. Be sure the connection is clean and tight to prevent overheating this connection.

STEP 7

Route the ground cable (marked with green tape) from the charge receptacle to a convenient point on the aluminum frame using a self-tapping screw.

STEP 8

Locate the temperature sensor connected to terminals 5 & 6 of the charge receptacle. Mount the temperature sensor to the nearest battery. Find a suitable location on the smooth side of the battery and clean the area with alcohol then affix the sensor with

epoxy or silicone adhesive. If the sensor is not pre-mounted to the receptacle, the red wire should be attached to terminal 5 and the black wire to terminal 6.

STEP 9

Locate the white wires on the contactor. Connect these wires to terminals 1 & 2 on the charge receptacle (polarity doesn't matter). Make sure that a short loop of wire has been connected from terminal 3 to terminal 4 on the charge receptacle.

STEP 10

Locate the gray wires on the contactor. Route the gray wires under the vehicle, between the frame rails and under the dash panel next to the controller. Locate the 16 pin connector which plugs into the top of the controller. Locate pin 1 on the connector. There will be a white wire located in pin 1 (Fig 10.1). Cut this wire halfway between the connector and the wire loom. Splice the gray wires onto these white wires (Fig 10.2). Make sure the splice connections are well made to prevent arcing and potential hot spots when the vehicle is turned on. It does not matter which white wire is spliced to which gray wire. This circuit prevents the vehicle from being driven while the charger is on.

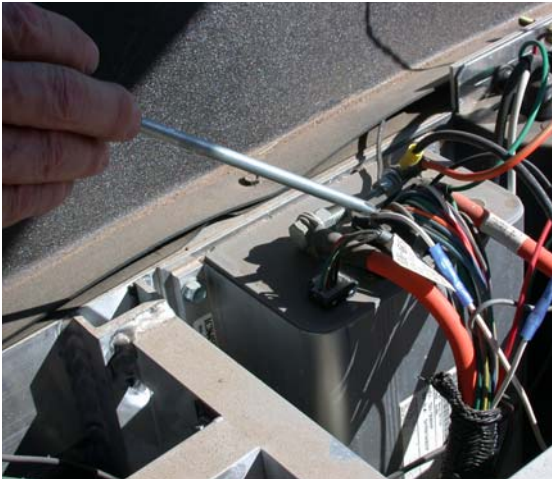


Figure 10.1 Controller Pin 1



Figure 10.2 Pin 1 Splice

STEP 11

Secure all wires with nylon wire ties to insure the wires do not chafe against any sharp edges during operation. Replace the lower dash then upper dash panels. Turn on vehicle disconnect switch and check vehicle for operation. Turn the key switch to the off position and plug in the charger. Turn key switch on while vehicle is charging to verify that vehicle will not operate. If the vehicle does not operate with the charge cable disengaged or if the vehicle operates with the charge cable plugged in, check wiring. If problems persist contact an ETEC service representative at 1-888-ETECEVS (383-2387).

EQUIPMENT LIST “GEMKit-100”

COMPONENTS

Part	Description	Note
Receptacle	100A, 9-PIN BIW	
Bezel	Aluminum	
Guide	Black plastic, machined	
Charging Contactor	Matsushita AEV18012	Modified with 24VAC rectifier board
Temperature Sensor	Temperature Puck, white with wire lead	
Cable Kit (Optional - Not included in base kit)	Pre-made cables for recommended installation locations	

CABLE SCHEDULE

Description	Qty	Color	Length	Size	Termination
BIW + to Battery 72V+	1	Red	68”	#4 Welding Cable	#10 Crimp Lug & Crimp Lug Sized for Existing Batteries
BIW ‘-’ to Charger Contactor #1 or ‘-’	1	Black	12”	#4 Welding Cable	2-#10 Crimp Lugs
Charger Contactor #2 or ‘+’ to Battery 72V-	1	Black	12”	#4 Welding Cable	#10” Crimp Lug & Crimp Lug Sized for Existing Batteries
BIW ‘G’ to Chassis	1	Green	18”	#4 Welding Cable	2-#10 Crimp Lugs
BIW Terminals 1 & 2 to Charging Contactor Coil	2	White	12”	18 AWG stranded, min 300V insulation	#6 Crimp Ring Terminal & Butt Splice
Charging Contactor N/C Aux to controller pin #1	2	Gray	72” (2-Seat) 96” (4-Seat)	18 AWG stranded, min 300V insulation	Butt Splice

Description	Qty	Color	Length	Size	Termination
Temperature Sensor to BIW Terminals 5 & 6	2		(Included with Sensor)		#6 Crimp Ring
BIW Terminals 3&4 Pilot Loop Back	1	White	4"	18 AWG stranded, min 300V insulation	#6 Crimp Ring