Installation and Users Guide
Cameo® Series NiMH Vehicle
Chargers

AT13824-2 & AT15390-2
SPECIAL NOTICES

The following notices emphasize certain information in this guide. Each serves a special purpose and is displayed in the format shown:

Note: Note is used to emphasize any significant information.

Caution: Indicates information that, if not followed, can result in damage to software, hardware, or data.

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Caution: This symbol indicates a potentially hazardous situation which, if not avoided, can result in personal injury.

Caution: This warning symbol indicates a potentially hazardous situation which, if not avoided, may be a shock hazard.

Warning: This warning symbol indicates an imminently hazardous situation which, if not avoided will result in death or serious injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

GENERAL WARNINGS AND CAUTIONS

Caution: Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

Caution: Read the installation instructions before you connect the system to its power source.

Note: Zebra Technologies Corporation is not liable for personal injury or damage to any equipment caused by the improper installation of this equipment to any power source. Check with the vehicle manufacturer or dealer for installation assistance in order to prevent the voiding of the vehicle warranty or maintenance contract.

Warning: Risk of ignition or explosion. Explosive gas mixture may be vented from the vehicle battery. Work only in a well ventilated area. Avoid creating arcs and sparks at the battery terminal.

IMPORTANT SAFETY INSTRUCTIONS

1. SAVE THESE INSTRUCTIONS- This manual contains important safety and operating instructions.

2. Before using these battery chargers, read all instructions and cautionary markings on the battery charger, the battery and the product using the battery.
3. **CAUTION-** To reduce risk of injury charge only lithium ion type rechargeable batteries. Other types of batteries may burst causing injury to persons and damage.

4. Do not expose this charger to rain, moisture or snow.

5. Use of an attachment not recommended or sold by Zebra may result in a risk of fire, electric shock or injury to persons.

6. (AT15390-2 only) To reduce the risk of damage to cigarette lighter connector and cord, disconnect the charger by pulling on the connector housing rather than the cord.

7. Make sure the cord is located so that it will not be stepped on, tripped over or otherwise subjected to damage or stress.

8. Do not operate the charger with a damaged cord or cigarette lighter connector- replace it immediately.

9. Do not operate the charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified service person.

10. Do not disassemble the charger. Take it to a qualified service person when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.

**INSTALLATION**

To ensure that the charger has proper cooling, do not place any padding or cushioning material under the unit or next to the back of the unit.

**USE OF SHIELDED DATA CABLE**

Printing systems comply with international regulations governing radiated emissions when using fully shielded data cables. Data cables must be fully shielded and fitted with metal or metalized connector shells. Shielded data cables and connectors are required to prevent radiation and reception of electrical noise. Use of un-shielded data cables may increase radiated emissions above the regulated limits.

**DC POWER CONSIDERATIONS**

This charger is intended only for use with a 11 to 18 VDC (12 VDC nominal) input power source. Insure the power take off point can supply 300 mA for extended periods of time.

⚠️ Caution: All electrical connections should be performed with the vehicle’s battery disconnected to prevent equipment damage and personal injury.
INTRODUCTION

NOTE: Zebra Technologies Corporation is not liable for personal injury or damage to any equipment caused by the improper installation of this equipment to any power source.

The Cameo Series Vehicle Charger system is designed to allow a Zebra™ Mobile Printer using Nickel Metal Hydride type batteries to run off the 12 volt electrical system of a vehicle. Once installed it will provide intelligent charging capabilities thus allowing the printer to constantly charge its battery using power provided by the vehicle’s electrical system.

This charger system is designed to work with the following Zebra Mobile printers:

- Cameo 2 and 2sc
- Cameo 3 and 3sc
- Cameo PEP
- Cameo 3N
- Encore 2
- Encore 3
- Encore 4 and 4se

1. Discontinued models

The charger should be installed under the supervision of properly trained and qualified personnel. Follow these installation instructions closely to ensure safe, reliable performance of

Since the Vehicle Charger runs off the vehicle’s DC electrical system it is important that the vehicle’s electrical system meet the following criteria:

- The vehicle’s charging circuit must work properly and vehicle-generated electrical “noise” must be minimized and within specifications.
- The vehicle charging circuit must neither undercharge nor over-charge the vehicle battery.

Defective ignition wiring, damaged insulation, or faulty vehicle electrical components can cause electrical noise and excess electrical noise can be severe enough to defeat the electrical filtering that is built into the printer. When this happens, printers and any data devices communicating to them can behave unpredictably.

The Vehicle Charger is supplied with a output cable with a special plug for the printer’s charging port, and an input power cable connection to the vehicle’s power source. The Vehicle Charger is supplied in two configurations:

- Part Number AT13824-2 has lugs attached to its input voltage lines and is designed to be wired into a vehicle’s fuse-pro-
ected circuit compatible with the charger’s power requirements. Ensure the power take off point can supply 300 mA for extended periods of time.

- Part Number AT15390-2 is supplied with a fused cigarette adapter on its input voltage lines, and is designed to be plugged into a compatible power take-off point in the vehicle. Refer to the installation section of this manual for more information.

**NOTE:** All of these systems must be connected in strict accordance with the instructions in this document. Failure to install this equipment per these instructions will void the warranty.

### INSTALLATION

#### TOOLS REQUIRED

- An electrical drill
- 3/16"[3 mm] drill bits (for clearance holes)
- Taps- #4-40 [M2.6] (optional).
- Common hand tools.

#### REFERENCE DOCUMENTS

- Cameo Series Users Guide
- Encore Series Users Guide

#### CONTENTS OF THE PACKAGE

- The Vehicle Charger Assembly including integrated input and output cables.
- This Guide

### INTRODUCTION TO INSTALLATION

The Vehicle Charger System provides a source of power to run and charge the printer’s battery from the vehicle’s electrical system. In all installations, the power cable is connected to the vehicle’s battery power indirectly through a power take-off point.

⚠️ **CAUTION:** Under no circumstances should the equipment be attached directly to the vehicle’s battery without a proper fuse.

Since each situation or equipment type may pose unique requirements, mounting hardware selection and mechanical installation shall be the responsibility of the installer. Zebra recommends using self-locking (ESN) nuts, bolts, and/or lock washers for installing the mount.

**NOTE:** Hardware used to secure the Charger to the vehicle is not supplied in the Charger kit. Recommended fasteners are #4-40 [2.6M] hex.

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Figure 1
Cameo Series NiMH Vehicle Chargers
Cameo Series NiMH Vehicle Chargers

AT15390-2

AT13824-2

70" [178 cm]

ø .13"
[33 mm] x2
head or socket head bolts with flat washers, lock washers, nuts and/or locking nuts. You may optionally elect to drill and tap for a #4-40 or M2.6 screw.

Your tasks are to:
• Route and install the input power cable to the vehicle’s power source
• Mechanically install the Vehicle Charger System
• Decide where you will mount the printer, then proceed with the following instructions.
• Connect the output cable from the Mobile Charger to the Printer’s battery charging connector.

POWER CABLE ROUTING

When Installing a Terminal

You most likely will be installing a terminal at the same time. Follow the terminal manufacturer’s instructions for installing his unit. The printer and terminal usually are linked together with a data cable which typically is no longer than six (6) feet (1.8 M).

Some installations may require the terminal and printer to communicate via radio frequency (RF) rather than cables.

Plan your installation with these considerations in mind, and locate the printer so that the operator can easily load printing media and operate the printer’s controls.

CHARGER INSTALLATION

The Vehicle Charger System is supplied in two different versions of input power connection per Table 1 below.

<table>
<thead>
<tr>
<th>MOBILE CHARGER P/N</th>
<th>INPUT CONNECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT13824-2</td>
<td>Lugs</td>
</tr>
<tr>
<td>AT15390-2</td>
<td>Plug for cigarette lighter socket</td>
</tr>
</tbody>
</table>

The Charger must be located in the operator’s compartment and within 5’ [1.78 M] of the printer. Do not locate near operator’s feet or where it could hinder operation of the vehicle.

⚠️ CAUTION: Locate the Charger in the vehicle so that it will avoid contact with the operator in case of an accident.

Refer to Figure 1 for Charger mounting dimensions. Recommended fasteners for the Vehicle Charger are #4-40 [M2.6] bolts, flat washers and lock washers

The AT13824-2 Charger is pre-wired with a 12” [30.5 cm]) input power cable. Splicing onto the input power cable is not recommended due to voltage drops encountered across splices and other discontinuities.
INSTALLATION GUIDELINES (ALL CHARGER VERSIONS)

- Completely install the input power (battery) cable before connecting the unit(s).
- Route the Input Power from the general area where the unit(s) will be mounted.
- Use a snap-in bushing if either the Input Power or output power cables pass through the fire wall or other sheet-metal.
- Make sure that cable routing does not interfere with other equipment or vehicle controls.
- Make sure that cable routing does not invite damage to the cable.

Follow the guidelines and other instructions closely when installing the Input Power.

**CAUTION:** Insure that the charger you are using for this installation is clearly labeled for use with the vehicle’s voltage. This charger is rated for use with 12V electrical systems only.

Failure to match the charger capacity to the vehicle’s voltage could result in improper printer operation, or severe damage to either the printer and/or the battery charger.

**NOTES:** It is the installer’s responsibility to insure correct wiring and installation.

Zebra is not liable for damage to any equipment caused by improper installation or wiring of the charger, or damage resulting from use of the wrong charger for the intended application.

Do not lengthen the charger’s power cable or remove the cable’s ferrite. Extending the cable or removing the ferrite will affect the charger’s reliability and radio frequency interference (RFI). Do not attach any ground wires to the charger’s housing.

**INPUT POWER CABLE COMPLETION FOR AT13824-2**

**NOTE:** Use care when attaching the charger’s power cable to the power source. The wire with the white stripe attaches to the positive (+) terminal and the black wire to the negative (-) terminal. If wired backwards, the charger will be rendered inoperable and will need to be sent back for service or replacement.

**CAUTION:** Always disconnect the vehicle’s primary battery before installing the Charger.

The installer must find the nearest practical connection point to the main battery’s voltage.

It may be possible to use internal wiring supplied in the vehicle, but only if the wire gauge is equal to or greater than 18 AWG, and the power take off point can supply 300 mA for extended periods of time.

continued
**CAUTION:** There must be a fuse between the vehicle’s power source and the input power cable connection!

The capacity of the fuse between the vehicle’s power source and the charger should not exceed 3A. Consult the vehicle manufacturer or a dealer to determine the best power connection location.

**INPUT POWER CABLE COMPLETION FOR AT15390-2:**

Plug the cigarette lighter adapter into the vehicle’s cigarette lighter power socket. A 3 Ampere, 250 Volt, Type 217 fuse is integrated with the adapter.

*Caution: Do not attempt to replace this fuse with a higher amperage fuse or damage to the charger and/or the printer may result.*

**SECURE THE POWER CABLE**

Make sure that the cable routing does not interfere with other equipment or vehicle controls. Insure that the cable routing protects the cable from damage during vehicle use.

**FINISH THE INSTALLATION (ALL VERSIONS)**

**CHARGER LOCATION**

Locate the Vehicle Charger in a location convenient to the printer. Follow these guidelines:

- Locate the Charger in the vehicle so that it will avoid contact with the operator in case of an accident.
- Route the charger’s output cable to prevent undue strain being placed on the connection to the printer’s battery.
- Make sure that cable routing does not invite damage to the cable.
- Secure the Charger with #4 (M2.6) hardware using the mounting flanges molded into the Charger. Insure that the mounting hardware will not become loose due to vibration by using locking hardware or prevailing torque fasteners.

**CONNECT THE PRINTER**

- Plug the output cable from the Charger to the battery connection on the printer. (Refer to the Cameo or Encore Series Users Guides for more information.)
- Turn the power source for the charger on, and verify that the indicator light on the Charger is lit and the Charger is functioning properly.
- Perform a two-key reset on the printer to verify it is operating correctly. Refer to the Users Guide or the Quick Start Guide supplied with your printer for more information.
CHARGER OPERATION

Once the charger is installed there is no user intervention required for proper operation. The Charger has a LED which indicates it is receiving power from the vehicle.

The Vehicle Charger System contains an internal self re-setting PTC (Positive Temperature Coefficient) fuse-like device. Internal power to the charger will be removed for current, voltage or temperature faults. The device will reset once the fault and power are cleared. The time it takes a device to reset depends on a variety of factors: type of device; mounting; configuration; ambient temperature; and duration of the trip event. In general, most devices will reset within a couple of minutes, although many will reset within seconds. There is no user intervention required.

⚠️ CAUTION: Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.

BATTERY LIFE

New NiMH batteries such as used on Cameo and Encore series printers must be cycled several times before maximum capacity is realized. A battery is “cycled” by fully charging it, then fully discharging it through normal use. Since the Trickle Charger described in this manual does not allow the battery to be fully discharged, it is recommended that printers used in conjunction with this charger have their batteries fully discharged and then recharged once a week to maintain maximum battery capacity.

The printer battery can be discharged by unplugging the charger cable and using the printer until the low battery signal turns on. You can then recharge the battery with one of the Zebra fast chargers described in the printer’s User Guide. It is recommended that a fully charged spare battery pack be available to eliminate potential delays and down-time associated with proper battery maintenance.
TECHNICAL SUPPORT

U.S. ONLY

Zebra maintains a help line for questions involving installation of the Vehicle Chargers. Please have as much information as possible regarding your particular application ready when you call to enable the technical support personnel to help you. The number in the U.S. is (800)-423-0442 and is open Monday through Friday from 8:00 am to 4:30 P.M E.S.T.. Ask for Charger Technical Support.

ALL OTHERS

For Technical Support please contact your local Zebra sales representative.