Zebra® P4T/RP4T
Vehicle Cradle

Installation Guide

Proprietary Statement

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Product Improvements

Since continuous product improvement is a policy of Zebra Technologies Corporation, all specifications and signs are subject to change without notice.

FCC Compliance Statement

Class B digital device. Tested to comply with FCC standards for home or office use.

WARNING: Exposure to Radio Frequency radiation with certain versions of the printer used with this product. To conform to FCC RF exposure requirements this device shall be used in accordance with the operating conditions and instructions listed in the printer's User Guide. There are several radio options available with the printer used in conjunction with this product. Additional regulatory information is contained in the printer's Users Guide in sections devoted to each radio option.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to insure compliance.

Changes or modifications to this unit not expressly approved by Zebra Technologies Corporation could void the user's authority to operate this equipment.

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Cet appareil numérique de la classe B est conforme á la norme NMB-003 du Canada.

"IC:" before the equipment certification number signifies that the Industry Canada technical specifications were met. It does not guarantee that the certified product will operate to the user's satisfaction.

Agency Approvals and Regulatory Information

- Design certified by CSA
- FCC part 15 Class B
- Canadian STD ICES-003 Class B
- EN55022:1998 Class B European Electromagnetic Radiation Standard
- EN55022:1998 European Immunity Standard
- EN60950: 2000 Safety Standard
- NOM/NYCE (Mexico)
- C-Tick (Australia)

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Special Notices

The following notices emphasize certain information in the 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.

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

Vehicle Installation Safety

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

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Caution: Do not install the Vehicle Cradle where it will be exposed to precipitation or excessive condensation.

Caution: Do not install the Vehicle Cradle on or near an airbag cover plate or within an airbag zone. Also, do not install the Vehicle Cradle in a location that will affect vehicle safety or drivability.

Caution: The means of routing and securing the Power Input cable from the Vehicle Cradle through to the vehicle power source is extremely important. Hazards associated with improper wiring can be severe. To avoid unintentional contact between the wire and any sharp edges, provide the cable with proper bushings and clamping where it passes through openings. If the wire is subjected to sharp surfaces and excess engine vibration, the wiring harness insulation can wear away, causing a short between the bare wire and the chassis. This can start a fire.

Caution: The vehicle charging circuit must neither undercharge nor overcharge the vehicle battery. Either fault condition in the vehicle electrical system can cause a no-charge condition in the printer battery.

Warning: It is very important to ensure you make the correct cable to power source connections, because electrical energy from a vehicle's power system can harm equipment and people.

Caution: If you need to jump start your vehicle from another vehicle battery, disconnect the power cable running to the Vehicle Cradle. Failure to do so can result in damage to your mobile printer and/or the Vehicle Cradle itself.

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.

This equipment should be installed in accordance with this installation guide and under the supervision of properly trained and qualified personnel.

The P4T Vehicle Cradle allows use of the Zebra® P4T Printer in a vehicle. The Vehicle Cradle will provide intelligent battery charging for a P4T Printer while still maintaining all of the Printer's functionality. Power for the Printer and the Vehicle Cradle's built in charger is provided by the vehicle's electrical system.

The Vehicle Cradle is offered with two input power connection options:

- A power cable which can be plugged into an automotive vehicle's cigarette lighter socket.
- An unterminated cable which must be wired into the vehicle's power system (12 VDC Nom.)

An optional mounting arm provides the ability to locate the Printer and Vehicle Cradle in a variety of positions and mounting locations to enhance its accessibility and ease of use.

The following instructions detail the installation and use of the P4T Vehicle Cradle. Following these instructions closely will ensure safe, reliable performance of the P4T Printer when installed in the Cradle.
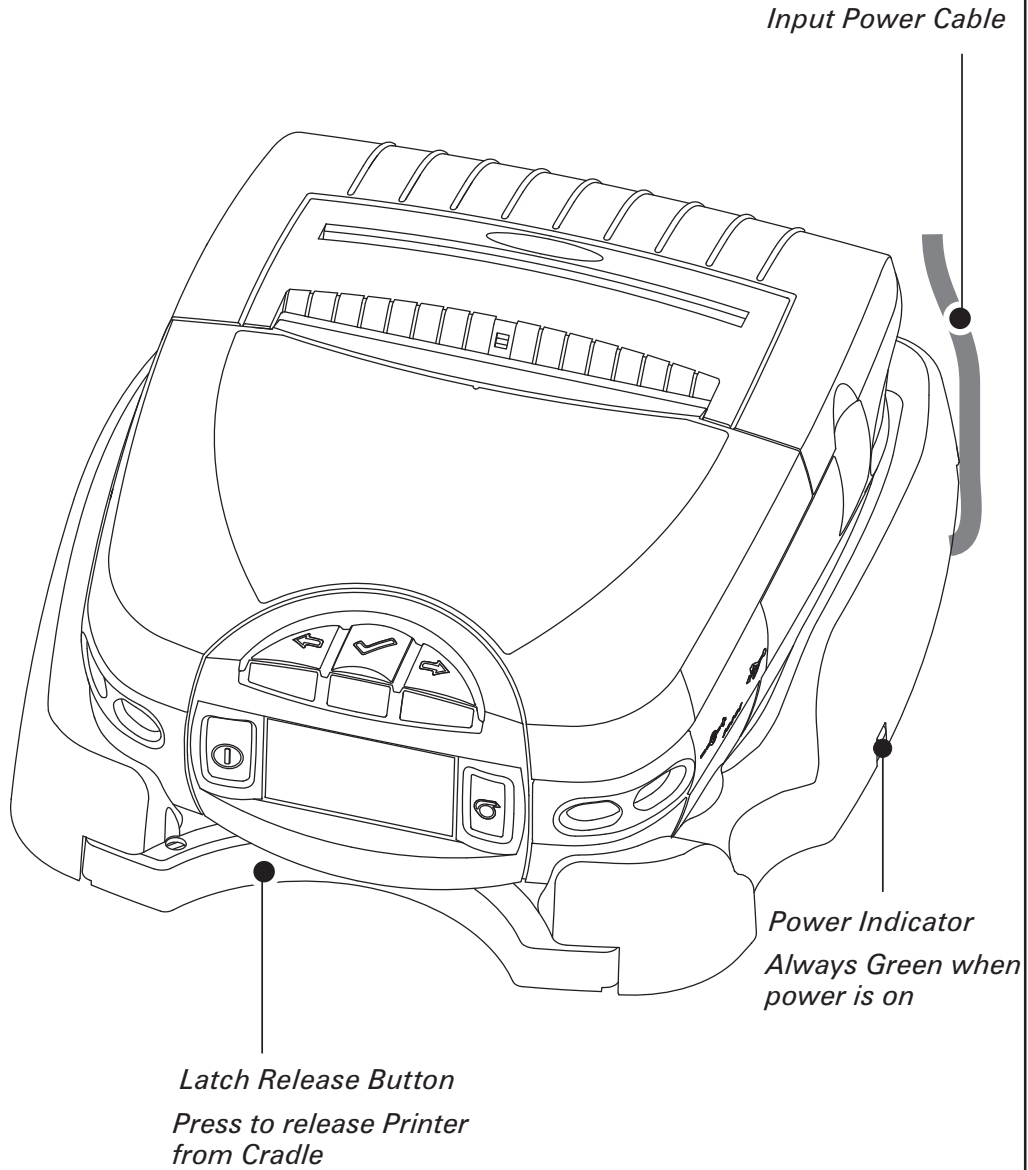
The Printer runs off its own battery, which is monitored and charged by circuitry within the Printer.

The user should always refer to the P4T Users Guide for complete information on using the Printer.

It is important that the vehicle's electrical system function properly. 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 overcharge the vehicle battery. Defective ignition wiring, damaged insulation, or faulty vehicle electrical components can cause excess electrical noise severe enough to defeat the electrical filtering that is built into the Cradle and the Printer.

Figure 1: Vehicle Cradle with P4T Printer Installed

Input Power Cable

Power Indicator

Always Green when power is on

Latch Release Button

Press to release Printer from Cradle

Required for Installation

- An electrical drill, 1/4"(6 mm) drill bit
- Common hand tools.
- #10-32 or 10-24 Bolts with self-locking (ESN) nuts and appropriate mounting hardware for securing the Vehicle Cradle

Note: Use of appropriate hardware used to secure the Vehicle Cradle to the vehicle is the responsibility of the installer

Reference

- P4T User's Guide

Contents of the Package

- The P4T Vehicle Cradle Assembly
- One of two power input cables: either (1) an unterminated cable with an integrated fuse holder, or (2) a cable terminated with a cigarette lighter adapter.
- Hardware for routing and securing the input power cable.
- This Guide

Installation

Introduction to Installation

The P4T Vehicle Cradle allows you to mount a P4T printer into virtually any vehicle with an electrical system voltage 12 VDC. The installation kit provided with the Cradle includes an input power cable which, when connected to the vehicle's electrical system, provides power to run the Printer and charge its battery.

The input power cable is wired to the vehicle's battery power system indirectly through a power take-off point. One version of the Vehicle Cradle supplies an input power cable that can be plugged into an automotive vehicle's cigarette lighter.

⚠️ *CAUTION: Under no circumstances should this 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. The Cradle is secured with #10-32 or #10-24 mounting hardware (4 places).
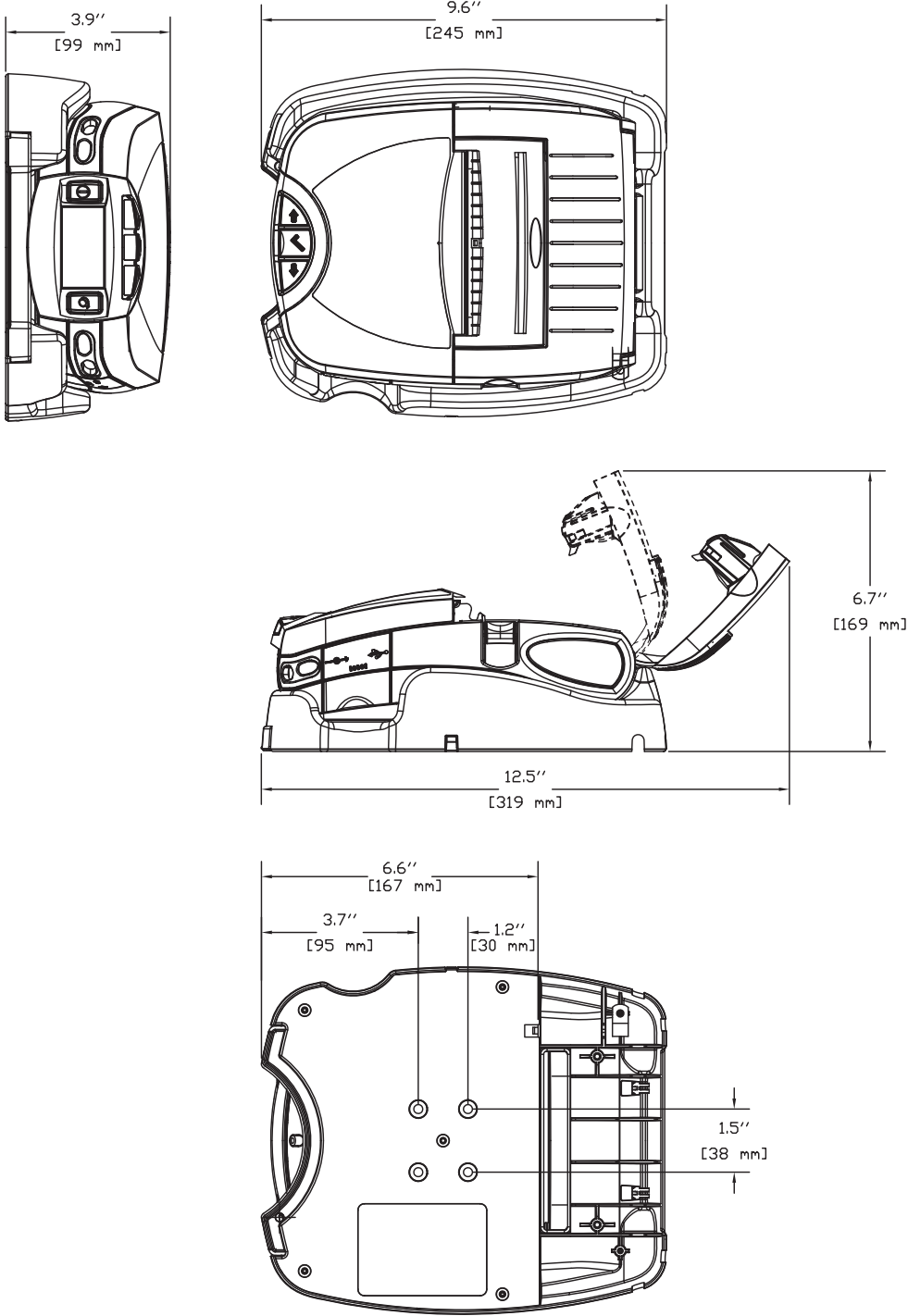
Note: Hardware used to secure the Vehicle Cradle to the vehicle is not supplied in the installation kit.

Your tasks are to:

- Mechanically prepare and install the P4T Vehicle Cradle

Figure 2: Vehicle Cradle Installation Dimensions (P4T Printer Installed)

3.9''
[99 mm]

9.6''
[245 mm]

6.7''
[169 mm]

12.5''
[319 mm]

6.6''
[167 mm]

3.7''
[95 mm]

1.2''
[30 mm]

1.5''
[38 mm]

- Connect the power input cable from the vehicle's electrical system.

It is important to leave a free zone around the printer to allow loading of paper and routine cleaning of the print head. Refer to Figure 2.

If you are installing the optional mounting arm, remember the arm provides a considerable range of movement for the Cradle and Printer. This allows adjustment to the best position for the operator. Extra clearance should be provided for this movement if it is desired in the installation. Refer to pages 17-19 for more information on installing the Cradle using the Mounting Arm.

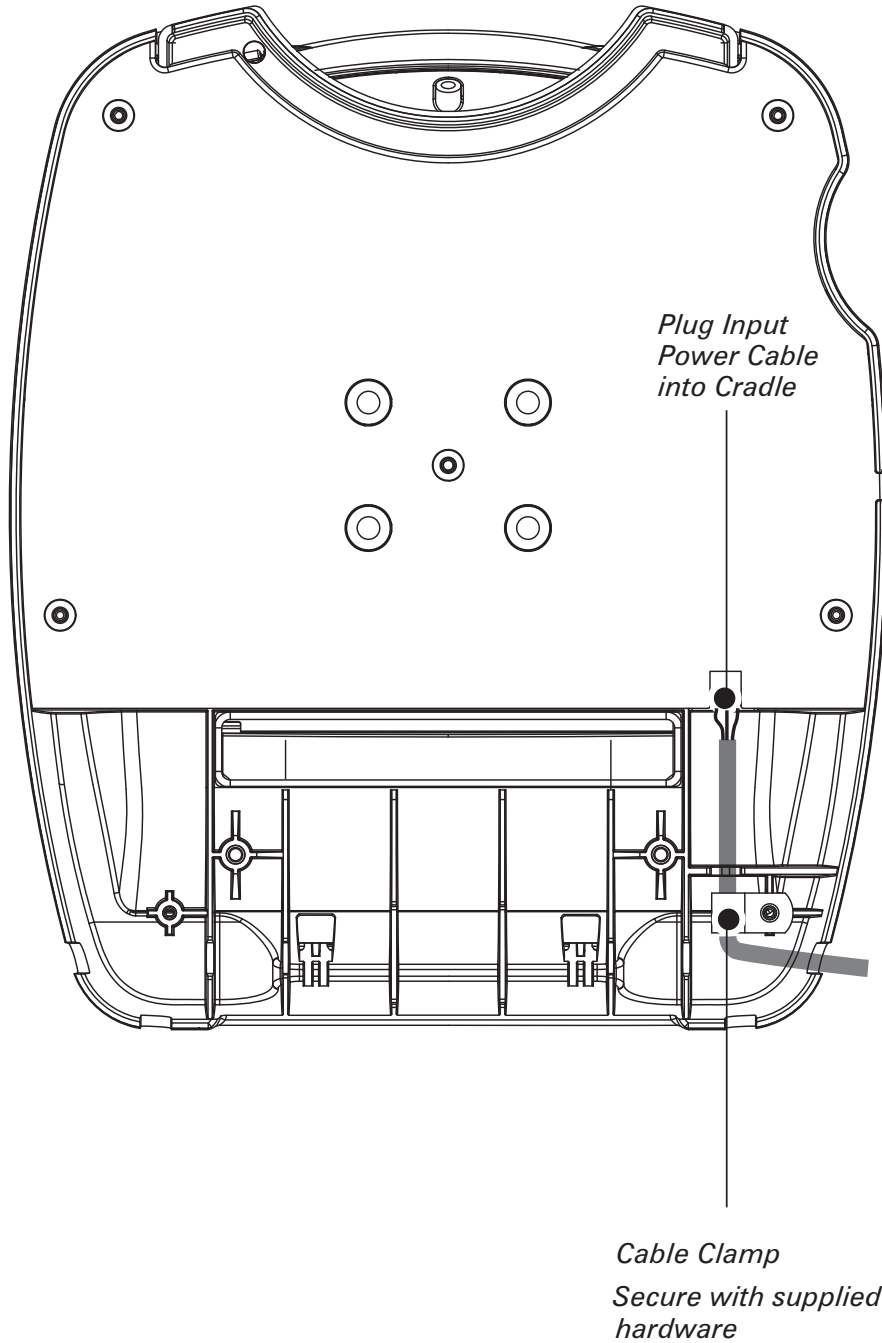Decide where you will mount the printer, and proceed with the following instructions.

⚠️ *CAUTION: Mount the Printer and Vehicle Cradle where it will not hit the operator in case of an accident.*

Vehicle Cradle Preparation

Plan your installation with the above considerations in mind, and locate the Printer and Vehicle Cradle so that the operator can easily load printing media, operate the printer's controls and perform routine maintenance such as cleaning the printhead. Follow these steps:

1. Select a location in the vehicle that will avoid personal contact in case of an accident.
2. Turn the Cradle upside down, and plug the input power cable into the bottom of the Cradle.
3. Route the input power cable out of the Cradle. Note that there are retaining features in the Cradle to keep the cable in place. Refer to Figure 3.
4. Once the Cable has been located, secure it to the Cradle with the cable clamp supplied with the installation kit. Use the self-tapping screw and flat washer supplied in the kit to attach the clamp to the Cradle.
5. Make sure that the input power cable routing does not invite damage to the cable. To avoid unintentional contact between the wire and any sharp edges, provide the cable with proper bushings and clamping where it passes through openings.
6. Route the input power cable to the vehicle's power take-off point you will be using.

Figure 3: Input Power Cable Routing

Plug Input
Power Cable
into Cradle

Cable Clamp

Secure with supplied
hardware

Input Power Cable Completion

There are two power cable options that can be used with the Vehicle Cradle. One terminates in a (fused) cigarette lighter adapter. The other terminates in bare wire and is intended for direct wiring into the vehicle electrical system. This second option has an in-line fuse holder near the end of the cable that connects to the vehicle electrical system.

If you are using a Vehicle Cradle with the cigarette lighter plug, all you need to do is plug the power cable into the vehicle's cigarette lighter socket. The cable must be secured along its entire length and must not be allowed to hang loose, as described in the section "Secure the Power Cable", below

If you are using the cable that terminates in bare wire, the directions are as follows:

- You must not cut the cable shorter as this will cut off the in-line fuse holder. If there is extra length bundle the cable securely to eliminate the excess.

⚠️ *CAUTION: There must be a fuse between the vehicle's power source and the input power cable connection! If you are not using the cable supplied with the Vehicle Cradle, selecting the size and rating of this fuse is the installer's responsibility.*

- The installer must find the nearest practical connection point to the vehicle's main battery voltage. Consult the vehicle manufacturer or a dealer to determine the best power connection location. Note that the vehicle wiring leading to the connection point must be at least 18 AWG. Note also that many vehicles use SAE wiring gage, which is different from AWG.

Prepare the Cable Ends:

NOTE: Actual cable termination used must be compatible with the power source. The following is a guideline.

1. Strip 1/4" (6 mm) of insulation from the BLACK wire.
2. Securely crimp the supplied 3/8" terminal ring onto the BLACK wire.
3. Strip 1/4" (6 mm) of insulation from the RED wire.
4. Securely crimp the supplied 3/8" terminal ring onto the RED wire.

Connect Cable to the Power Source

1. Ensure that cable terminals are well connected to the cable.
2. Connect black cable ground (-) terminal to vehicle ground location.
3. Connect red cable power (+) terminal to vehicle power source.

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.

Using the Printer in the Vehicle Cradle

Printer Preparation

Prepare the printer for installation into the Vehicle Cradle by doing the following:

⚠️ *It is strongly recommended as a safety precaution that the adjustable shoulder strap be removed prior to docking the Printer. This precaution will ensure the strap will not interfere with proper operation of the vehicle.*

• Always install the Battery prior to mounting the printer in the Cradle.
• Remove the Docking Connector Cover from the bottom of the printer, and retain it for future use. (Refer to Figure 4)

Printer Installation

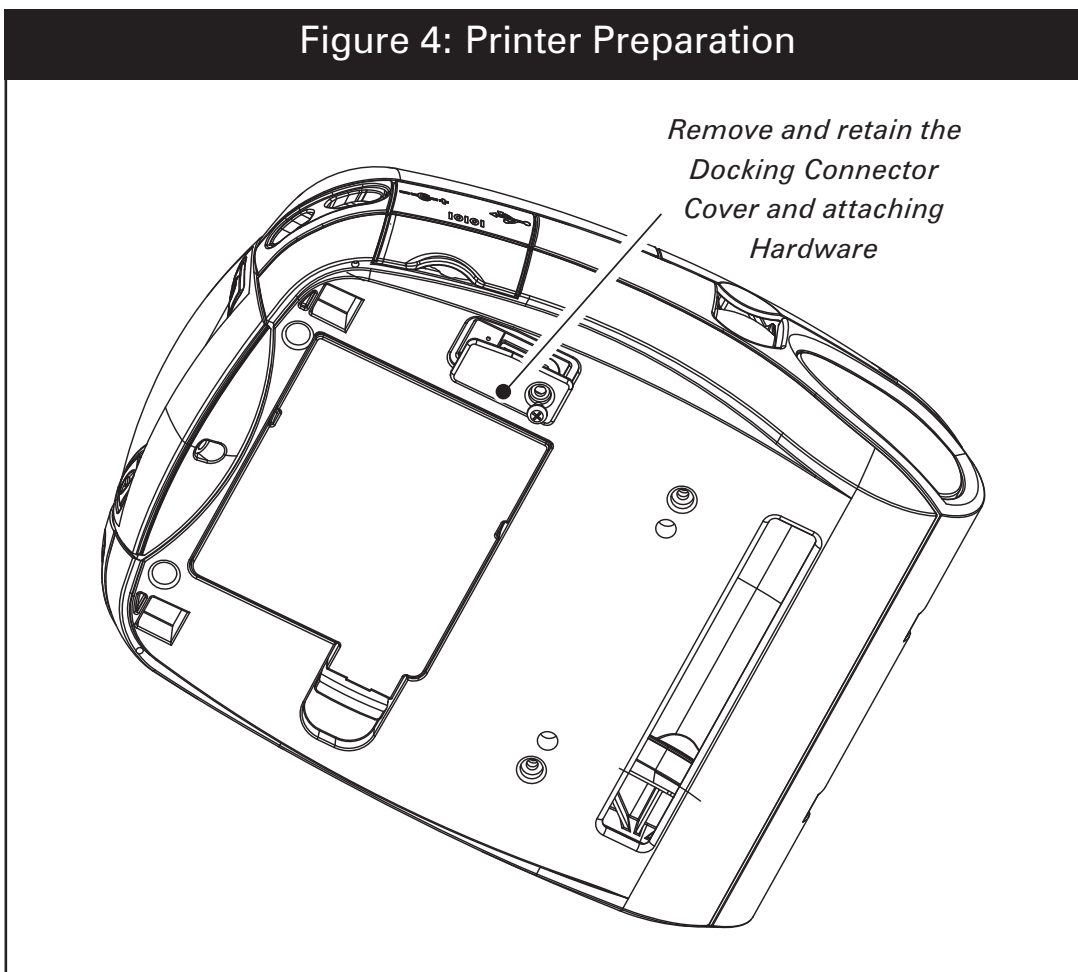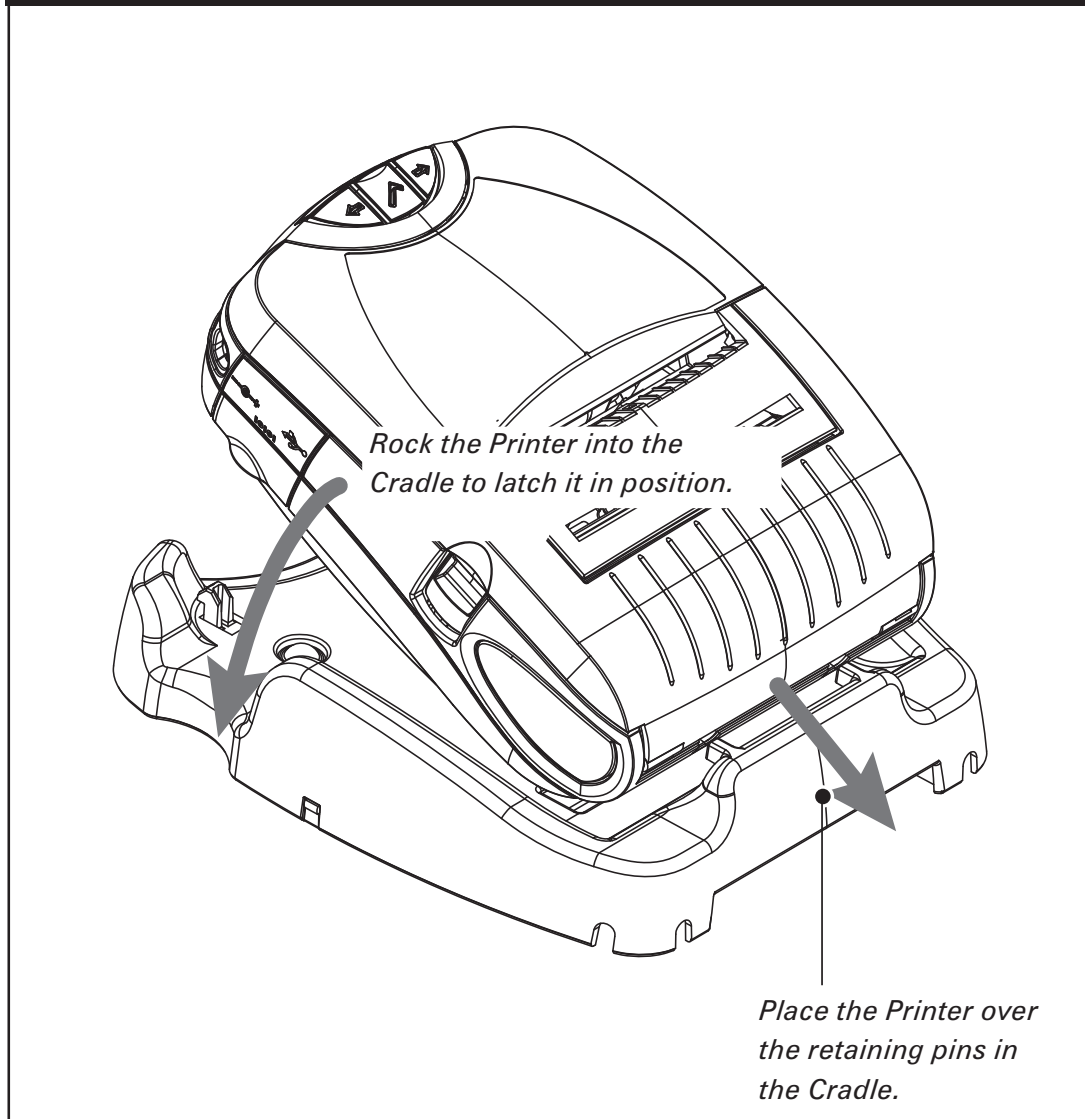The P4T Printer can now be installed in the Vehicle Cradle:

Figure 4: Printer Preparation

Remove and retain the Docking Connector Cover and attaching Hardware

Rock the Printer into the Cradle to latch it in position.

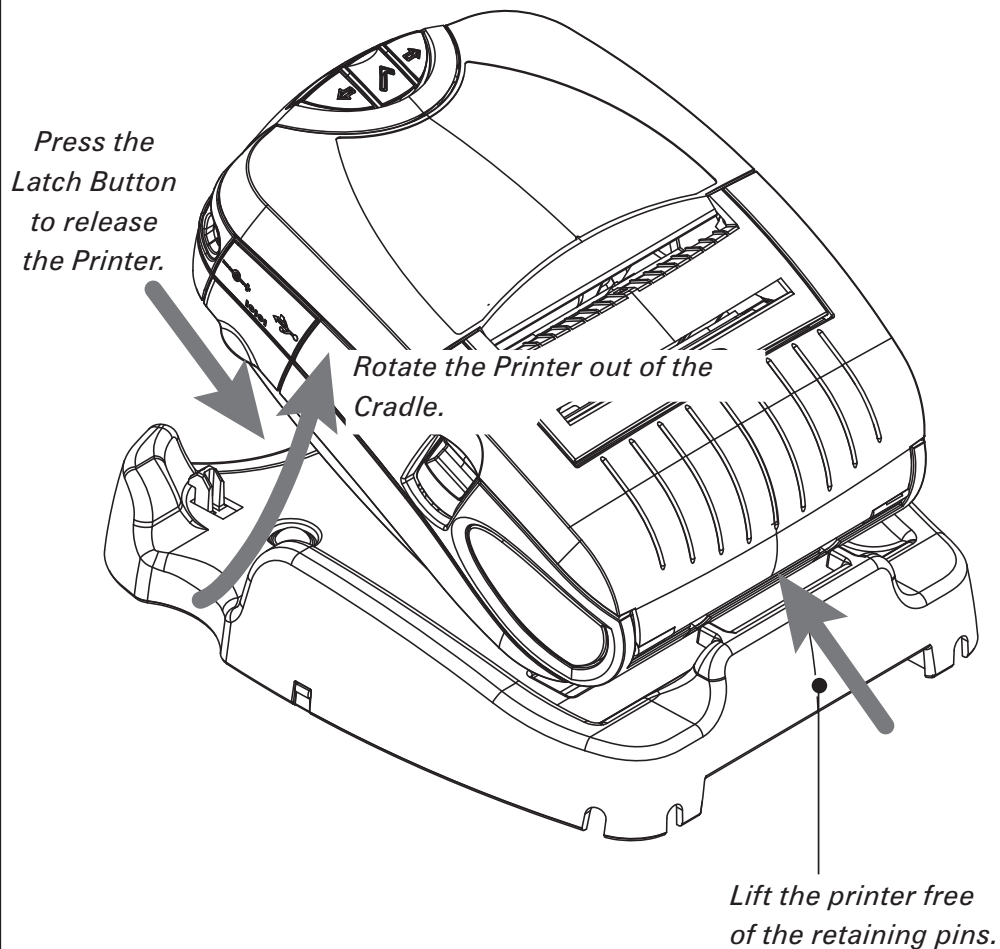*Place the Printer over the retaining pins in the Cradle.*

- Place the bottom of the printer over the two pegs in the Cradle.
- Rotate the Printer into the Cradle and press firmly until it latches in place.
- Turn the vehicle's power source for the Cradle on, and verify that the charger indicator on printer LCD and power indicator light on the Cradle's side panel are lit.
- Turn the printer on and print a configuration label to verify that the printer is functioning properly. Refer to the P4T User's Guide for instructions on printing a configuration label.

Removing the Printer

Remove the Printer by doing the following:

- Turn the Printer off.
- If the Printer is directly connected to a communications ca-

Figure 6: Removing the Printer from the Vehicle Cradle

Press the Latch Button to release the Printer.

Rotate the Printer out of the Cradle.

Lift the printer free of the retaining pins.

ble, unplug and remove the cable from the Printer.
- Press the latch release button on the Vehicle Cradle and pivot the Printer out of the Cradle.
- If you will be using the Printer out of the Vehicle Cradle for a prolonged period, replace the Docking Connector Cover on the Printer.

Loading Media

Using the Printer's Internal Media Supply

If you are using the Printer's internal media compartment, follow the loading procedures found in the P4T User's Guide.

Using an External Media Supply

If the printer's media supply is from an external supply, typically fanfold media, you must make provisions for a media bin to be positioned to allow media to enter the printer through either the bottom or the back of the Vehicle Cradle. If the Cradle is mounted against a vertical surface there is a slot and guiding features in the base to insure the media will feed properly into the printer.

If you are using an external media supply follow these steps to load media:

1. Open the P4T's media supply compartment.
2. Load the media from the external supply through the feed slots in the bottom of the Cradle and the Printer and past the printhead. Note that if you are using 4 inch (10.16 cm) wide external media, you can install the Fanfold Spacer (Zebra p/n BA16625-1) between the printer's media supports to keep them from binding on the edges of the media.
3. Close and latch the media compartment.

NOTE: Your printer must be configured with the External Media option to use an external media supply. If using an external media supply bin, ensure no extra items are suspended from either the Printer or the Vehicle Cradle.

Printer Access

The media compartment and operator controls can be reached while the printer is secured in the Vehicle Cradle.

If you need to remove the printer for servicing follow the removal procedure detailed above in the Printer Installation and Removal section.

Vehicle Cradle Indicators

The Vehicle Cradle has one LED indicator on the side panel as shown in Figure 1. The power LED is green when power is supplied to the Cradle.

Charging status will be displayed on the printer LCD.

A fault condition could be caused by the battery's internal temperature exceeding its specified limits (too hot or too cold) or could be caused by an internal short in the battery. Allow the battery to return to specified charging temperature range and try to recharge. If the fault condition persists, discontinue use of that battery.

NOTE: If the charge indicator on the Printer LCD does not indicate charging when the printer is installed, it may be the result of one of two possible conditions:

1) The printer is not seated properly in the cradle. Unlatch and redock the printer into the cradle. Observe if LCD indicates charging.

2) If redocking the printer does not cause the LCD to indicate charging it is because the printer has entered a 30 minute prequalification process. At the end of this process the printer will either (1) commence charging or (2) not

commence charging in which case there is a battery error.

Connections to a Terminal

Communications with a Terminal

If you are also installing a terminal in the vehicle, consult the terminal manufacturer's literature for installation instructions. If the terminal and Printer will communicate using either an RS232 or USB cable, use shielded cables and keep their length as short as possible. Ensure the routing of the cable does not invite damage to the cable or interfere with the control or use of the vehicle.

Consult the factory for information on the various I/O data cables offered by Zebra for use with a variety of widely used terminals.

NOTE: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to insure compliance.

If the terminal and the Printer will communicate via an RF link, it is the installer's responsibility to test the strength and reliability of such a link prior to final installation.

Power Connections to a Terminal

If you are also installing a terminal in the vehicle, you must run two separate cables from the vehicle power source: one to the printer and one to the terminal.

Warning: Do not attempt to power both devices from the same power cable.

The terminal power cable must be either supplied by the terminal manufacturer or fabricated by the installer.

It is the installer's responsibility to determine the suitability of running a terminal from the vehicle's battery.

NOTES: This Installation Guide does not cover the installation of any terminal used in conjunction with the P4T Printer or Vehicle Cradle.

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

Installing the Mounting Arm

Description

An optional mounting arm (Zebra p/n P1010338) is offered for use with the Vehicle Cradle which allows a more versatile method of positioning the P4T printer. It consists of an arm with a ball and socket joint at either end, which in turn are terminated with a mounting flange. One flange is secured to the Cradle by the four mounting holes provided on the bottom plate, and the other is secured to the desired mounting surface. A clamp on the arm locks the Cradle in the desired position.

NOTE: Do not use #8 screws.

Installation

⚠ *CAUTION: Mount the Printer and Vehicle Cradle where it will not hit the operator in case of an accident.*

⚠ *Warning: Do not connect the input power cable to the Vehicle Cradle until the Cradle and Mounting Arm installation have been completed.*

For ease of installation, the Arm can be disassembled by loosening the clamp enough to remove the two ball and socket flanged ends. These end flanges can then be easily secured to the Vehicle Cradle and the desired mounting surface. Then the arm can be slipped over the two ends and the clamp tightened to secure the Cradle in position.

When installing the mounting arm, remember that the arm provides a considerable range of movement for the Vehicle Cradle and Printer. Extra clearance should be provided for this movement if it is desired in the installation.

Mounting Hardware

Mounting hardware is supplied with the Mounting Arm Kit. The #10-32 or #10-24 screws should be used to secure one end of the arm to the bottom of the Vehicle Cradle. The #10-24 x 3/4" screws and associated hardware may be used to secure the other end of the arm to the desired mounting surface.

Vehicle Cradle Preparation

Refer to the section on Vehicle Cradle Preparation earlier in this manual for more specific instructions and illustrations on securing the power cable to the Cradle. Locate the Printer and Cradle so when installed with the Mounting Arm the operator can easily load printing media, operate the printer's controls and perform routine maintenance such as cleaning the printhead. Follow these steps:

1. Select a location in the vehicle that will avoid personal contact in case of an accident.
2. Turn the Cradle upside down, and plug the input power cable
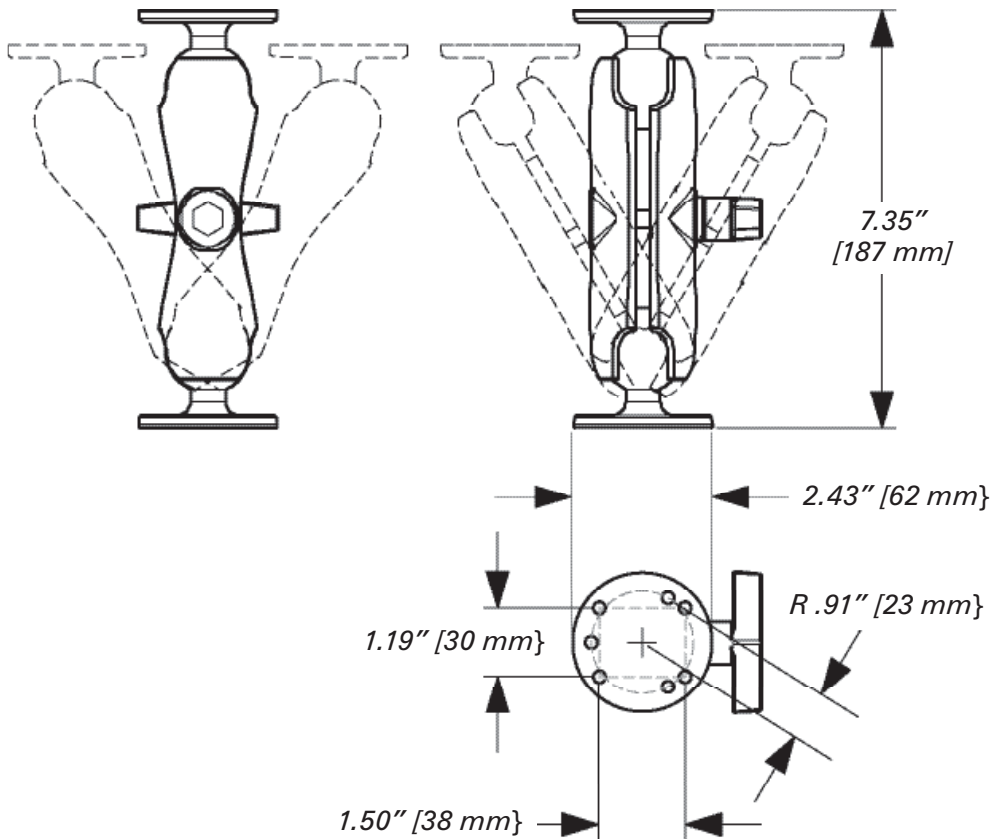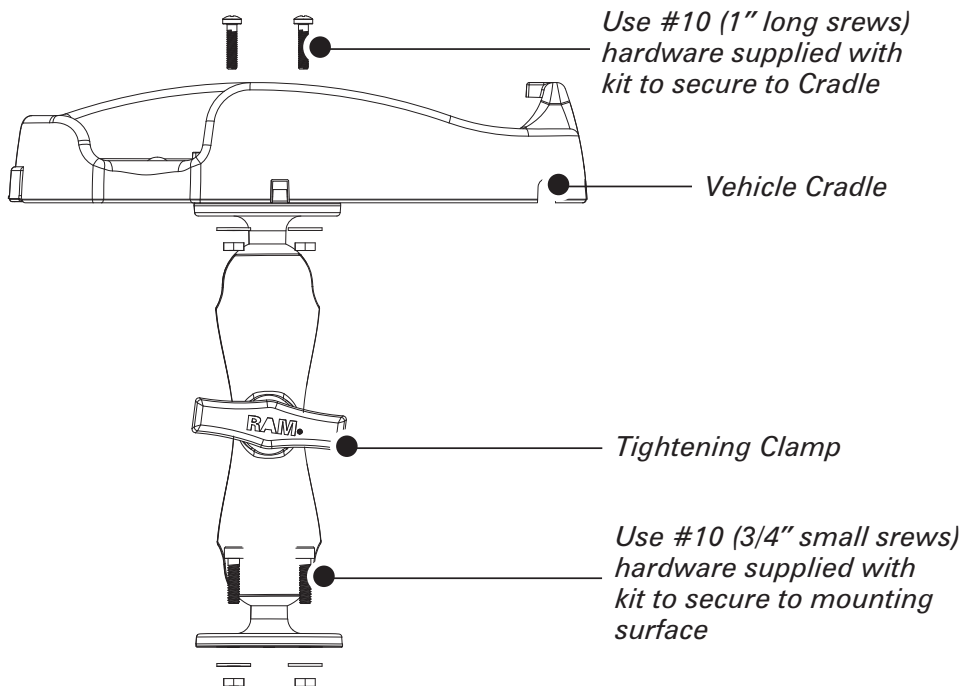
Figure 7: Optional Mounting Arm Dimensions

7.35"
[187 mm]

2.43" [62 mm}

R .91" [23 mm}

1.19" [30 mm}

1.50" [38 mm}

Figure 8: Securing the Vehicle Cradle to the Mounting Arm

Use #10 (1" long srews)
hardware supplied with
kit to secure to Cradle

Vehicle Cradle

Tightening Clamp

Use #10 (3/4" small srews)
hardware supplied with
kit to secure to mounting
surface

into the bottom of the Cradle.
- Route the input power cable out of the Cradle. Note that it can be routed out either side of the Cradle and that there are retaining features in the Cradle to keep the cable in place. Refer to Figure 3.
- Be sure to leave enough slack in the power cable to allow the Mounting Arm to pivot freely without putting strain on the power connections.
- Make sure that the input power cable routing does not invite damage to the cable when the Vehicle Cradle is pivoted.

3. Once the cable routing has been determined, secure it to the Vehicle Cradle with the cable clamp(s) supplied with the installation kit. Use the self-tapping screws and flat washers supplied in the kit to attach the clamp to the Cradle.
4. Secure one of the mounting flanges from the movable Arm to the bottom of the Vehicle Cradle with the (4) #10-32 or #10-24 screws supplied with the Mounting Arm.
5. Secure the other mounting flange on the Movable Arm to the desired mounting surface. You can use the #10-24 x 3/4" screws and associated hardware supplied in the Mounting Arm Kit or use other hardware as the mounting conditions dictate.

Input Power Completion

Route the input power cable per the earlier section in this Guide: "Input Power Cable Completion."

Technical Support

U.S. ONLY

Zebra maintains a help line for questions involving installation and use of the P4T Vehicle Cradle.

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.

ALL OTHERS

For Technical Support please contact your local Zebra sales representative listed below:.

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