



6400 Vehicle Dock

***INSTALLATION
INSTRUCTIONS***

PN: 962-020-006
Revision B
August 1998

" NOTICE

The information contained herein is proprietary and is provided solely for the purpose of allowing customers to operate and service Intermec manufactured equipment and is not to be released, reproduced, or used for any other purpose without written permission of Intermec.

Disclaimer of Warranties. The sample source code included in this document is presented for reference only. The code does not necessarily represent complete, tested programs. The code is provided **"AS IS WITH ALL FAULTS."** **ALL WARRANTIES ARE EXPRESSLY DISCLAIMED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

We welcome your comments concerning this publication. Although every effort has been made to keep it free of errors, some may occur. When reporting a specific problem, please describe it briefly and include the book title and part number, as well as the paragraph or figure number and the page number.

Send your comments to:
Intermec Technologies Corporation
Publications Department
550 Second Street SE
Cedar Rapids, IA 52401

INTERMEC, NORAND, NOR*WARE, and PEN*KEY are registered trademarks of Intermec Technologies Corporation.

© 1997 Intermec Technologies Corporation. All rights reserved.



This publication printed on recycled paper.

FCC Computer Compliance

" NOTICE

This equipment meets Class A digital device limits per Part 15 of FCC Rules. These limits protect against interference in a commercial area. It emits, uses, and can radiate radio frequency energy. If you do not install and use the equipment according to its instructions, it may interfere with radio signals. Using it in a residential area is likely to cause interference. If this occurs, you must correct the interference at your expense.

Canadian Computer Compliance

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada

Telephone Installation Warning Notices

The following notices apply to equipment that may be connected to telephone lines or systems. For your personal safety, and to protect this equipment from potential electrical or physical damage, do NOT connect equipment to telephone lines or data communication equipment unless the following warnings have been read, understood, and complied with.

- " Never install telephone wiring during a lightning storm.
- " Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- " Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- " Use caution when installing or modifying telephone lines.
- " Avoid using a telephone (other than cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- " Do not use the telephone to report a gas leak in the vicinity of the leak.

Installation du téléphone : avertissements

Les avertissements qui suivent s'appliquent à tout équipement qui peut être branché aux lignes ou systèmes téléphoniques. Pour votre sécurité personnelle et pour protéger l'équipement de tout dommage électrique ou physique potentiel, NE PAS brancher un ordinateur tablette électronique ou ses périphériques aux lignes téléphoniques ou équipements avant que les avertissements suivants aient été lus, compris et observés :

- " Ne jamais installer de câblage téléphonique pendant un orage électrique.
- " Ne jamais installer de prise téléphonique dans un endroit humide à moins que la prise ait été spécifiquement conçue pour être utilisée dans les endroits humides.
- " Ne jamais toucher les fils de téléphone ou de l'équipement terminal non isolés à moins que la ligne téléphonique n'ait été débranchée de l'interface réseau.
- " User de prudence lors de l'installation ou de la modification de lignes téléphoniques.
- " Éviter d'utiliser un téléphone (autre qu'un appareil téléphonique sans fil) pendant un orage électrique. Il pourrait y avoir un faible risque d'électrocution par la foudre.
- " Ne pas utiliser le téléphone afin de signaler une fuite de gaz à proximité de la fuite.

B CAUTION: Intermec Technologies Corporation suggests you buy cables from us to connect with other devices. Our cables are safe, meet FCC rules, and suit our products. Other cables may not be tested. They may cause problems from electrostatic discharge or induced energy. Our warranties do not cover loss, injury, or damage from other cables.

B CAUTION: Intermec Technologies Corporation recommends that you only purchase Norand Mobile Systems Division certified modems. Intermec does not certify all modems available in the marketplace. Intermec does not warrant noncertified modems; furthermore, these modems may cause problems from electrostatic discharge and may not conform to FCC regulations. For a list of Norand Mobile Systems Division certified modems call Customer Support at 1-800-221-9236.

CONTENTS

SECTION 1

General Information

Vehicle Dock Description	1-1
Specifications	1-1
DC-DC Power Converter	1-3
Connector Pin-Outs	1-4
Vehicle Dock 3-Pin Male Power Connector	1-4
Vehicle Dock Voltage Contacts	1-4

SECTION 2

Installation

Introduction	2-1
Installation Guidelines	2-2
Tools Required	2-3
Vehicle Installation	2-4
Installing the Cables	2-4
Routing the Cables	2-4
Power Cable Assembly	2-6
Assembling the In-line Fuse Holder	2-6
Terminating Wire Ends	2-8
Connecting the Fuse Holder	2-9
Side Mount Battery Connection	2-10
Top Mount Battery Connection	2-12
Dock Installation Kits	2-14
Installing the DC-DC Power Converter	2-15
Final Cable Connections	2-15
Converter to Power Source Cable	2-15
Converter to Dock Cable	2-16
Using the Vehicle Dock	2-18

Inserting Your Computer into the Vehicle Dock	2-19
Jump Starting Your Vehicle	2-22

FIGURES

Figure 1-1 Vehicle Dock Side View	1-2
Figure 1-2 DC-DC Power Converter	1-3
Figure 1-3 Vehicle Dock 3-Pin Male Power Connector	1-4
Figure 1-4 Vehicle Dock Top View	1-4
Figure 2-1 Stripping the Power Cable Jacket	2-5
Figure 2-2 Assembling the In-line Fuse Holder	2-7
Figure 2-3 Terminating Wire Ends	2-8
Figure 2-4 Prepare Cable Ends	2-9
Figure 2-5 Side-Mount Battery Terminals	2-11
Figure 2-6 Top-Mount Battery Terminals	2-13
Figure 2-7 Vehicle Dock with Free Standing Mounting Plate	2-14
Figure 2-8 Converter to Battery Cable	2-16
Figure 2-9 Power Converter to Dock Cable	2-16
Figure 2-10 Connecting the Power Cable to the Vehicle Dock	2-17
Figure 2-11 Vehicle Dock Components	2-18
Figure 2-12 Rotating the Bumper Pad	2-19
Figure 2-13 Inserting the Computer into the Vehicle Dock	2-20
Figure 2-14 Putting a Computer with Scanner Handle in Vehicle Dock	2-21

TABLES

Table 2-1 Fuseline Power Kit 203-472-001	2-4
Table 2-2 Free Standing Mounting Bracket Kit 203-470-001	2-14
Table 2-3 Vehicle Mounting Kit 203-471-001	2-15

Section 1

General Information

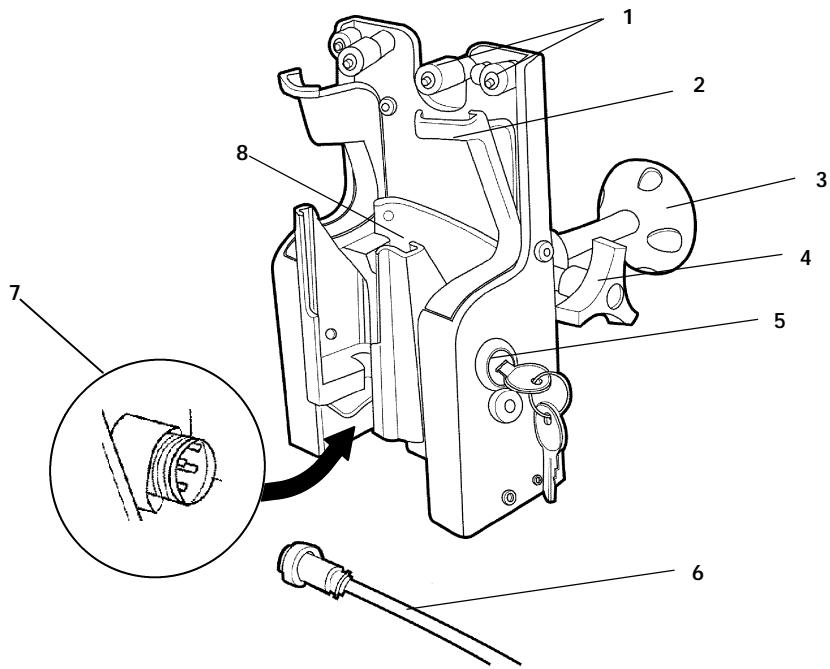
Vehicle Dock Description

Figure 1-1 on page 1-2 shows the key features of the Vehicle Dock.

- Keylock to lock in your computer.
- Keyed cable connector for securing the power cable coming from the converter or power source.
- Push to release levers to release the computer from the dock.
- Bumper pads to protect and brace your computer when it is secured in the dock. The pad assembly can be rotated to accommodate your computer with an optional scanner handle.
- Rotating swivel stand

Specifications

- Weight: 5 lbs. (22.68 kg)
- Dimensions:
 - Length: With key installed 6.75inches (17.15 cm)
 - Width: Mounted with swivel stand in the vertical position, 6 inches (15.24 cm)
Mounted with swivel stand in the horizontal position, 8.5 inches (21.59 cm)
 - Height: Dock only 9.25 inches (23.50 cm)
Dock with hand-held computer
13.0 inches (33.02 cm)

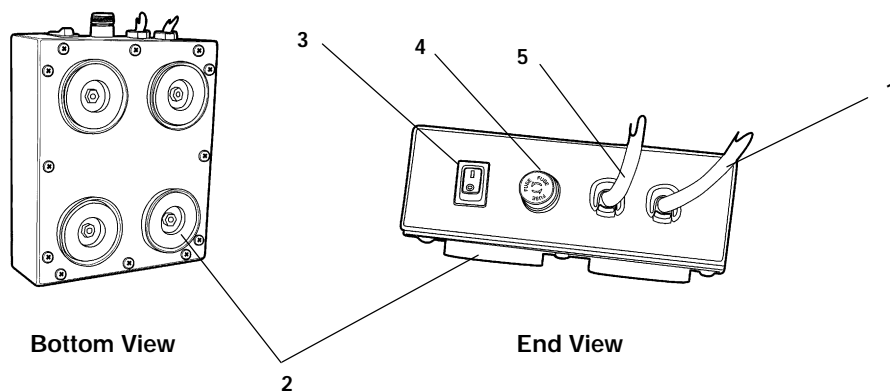


- 1. Pivoting computer bumper supports
- 2. Computer release levers
- 3. Rotating swivel base
- 4. Release lever for swivel base
- 5. Keylock
- 6. Power cable
- 7. Keyed power connector
- 8. Computer holder

Figure 1-1
Vehicle Dock Side View

DC-DC Power Converter

The DC-DC Power Converter is shown in Figure 1-2. The large magnets on the bottom of the converter aid in mounting the unit.



1. Converter to dock cable
2. Magnet
3. On/Off switch
4. Fuse holder
5. Converter to power source cables

Figure 1-2
DC-DC Power Converter

Connector Pin-Outs

Vehicle Dock 3-Pin Male Power Connector

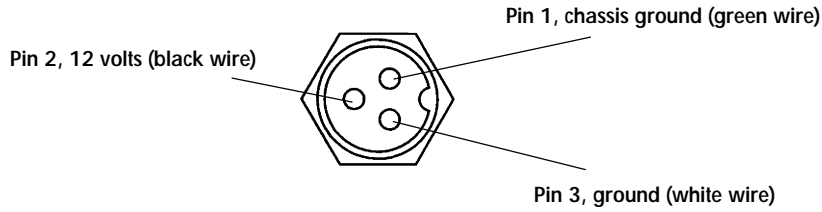
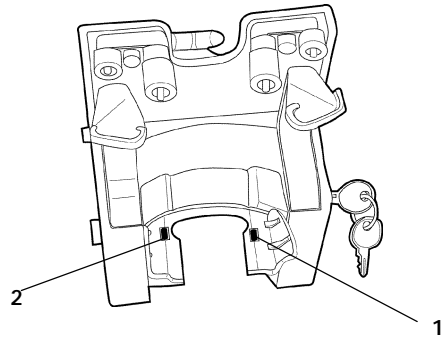


Figure 1-3
Vehicle Dock 3-Pin Male Power Connector

Vehicle Dock Voltage Contacts



- 1. Negative voltage contact
- 2. Positive voltage contact

Figure 1-4
Vehicle Dock Top View

Section 2

Installation

Introduction

This section provides detailed instructions for mounting the vehicle dock on to a motorized load-handling piece of equipment such as a forklift. During this installation the power cable is wired directly to the vehicle battery or bank of batteries.

When the installation is complete, you will have a secure place to store the computer. In addition, the vehicle electrical system provides power to recharge the batteries in your hand-held computer.

" NOTE: *Norand Corporation is not responsible for loss or damage to the hand-held computers or docks resulting from improper installation.*

" NOTE: *Mounting bracket and bracket installation hardware are not provided in this kit.*

Two separate autoranging dc-dc power supply converters are available to accept a wide range (12 V dc or 24.0-48 V dc) of input voltages. In general, the low-range converter is intended for propane-fueled forklifts, or delivery vehicles with 12 volt power system, while the high-range converter is intended for other models.

B CAUTION: *If the overall vehicle voltage exceeds 48 volts, you must tap into the bank of batteries at a point that is 48 volts or less.*

Installation Guidelines

Since each situation or equipment type may pose unique requirements, mounting hardware selection and mechanical installation of the vehicle dock shall be the responsibility of the installer. Norand recommends using 3/8-inch terminal rings for connecting the electrical cable directly to the vehicle battery. A waterproof in-line fuse holder must be installed between the positive battery terminal and the black wire in the power cable.

The installation kit contains nuts, bolts, washers, battery terminal rings, and a fuse link for connecting the battery cable directly to the vehicle battery. It also contains adjustable wire clamps to secure the cable in place.

Your tasks are to:

- Install the vehicle dock
- Install the dc-dc converter onto the vehicle
- Connect the power cable from the converter to the dock
- Connect the power cable to the vehicle battery terminals

The dock mounting location must **not** restrict the drivers view. Mount the dock and cables away from the brake pedal, accelerator, steering wheel, emergency brake, gear shift, and any other area that interferes with safe operation of the vehicle. Decide where you will mount the vehicle dock, then proceed with the following instructions.

The vehicle dock and associated electrical wiring should be installed under the supervision of properly trained and qualified personnel. Follow these installation instructions closely to ensure safe, reliable performance for your equipment.

The vehicle's electrical system must be in excellent condition. This means the charging circuit must work properly and that vehicle-generated electrical "noise" must be minimized and within specifications (SAE J113).

B 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 terminal battery.*

Excess electrical noise can be severe enough to defeat the electrical filtering that is built into your equipment. Defective ignition wiring, damaged insulation, or a faulty vehicle electrical component can cause electrical noise. When this happens, computers and other equipment can behave unpredictably.

Tools Required

- " Wire crimping and stripping tool
- " An electric drill, #26 drill bit
- " Common hand tools (3/8" wrench, flat blade screwdriver, phillips screwdriver, and small punch)

Vehicle Installation

Table 2-1
Fuseline Power Kit 203-472-001

Description	NPN	Qty
Fuseholder	315-062-001	1
Fuse (15 amp, 250 volt)	315-064-001	1
Self tapping screw #6	800-008-001	8
Bolt 3/8"	800-099-001	2
Brass Nut	802-099-001	4
Flat Washer	803-099-001	4
Adjustable cord clip	808-011-001	8
Terminal ring (3/8")	809-083-027	2

Installing the Cables

Use cable clamps or wire-ties at least every 18 inches when installing cables on a vehicle. This eliminates loose or sagging cables, guarding against breakage and ensuring that they do not pose a hazard to the vehicle operator or to other workers.

Routing the Cables

Decide the mounting location for the vehicle dock, dc-dc power converter, and the cables. When you are certain your arrangement works and that cables will reach from the batteries to the power converter to the dock, proceed with the instructions below.

1. Completely install the cable that connects to the vehicle battery before connecting the dc-dc converter.
2. Route the cable from the vehicle battery toward the general area where the computer will be mounted.

Take extra care to make sure the cabling:

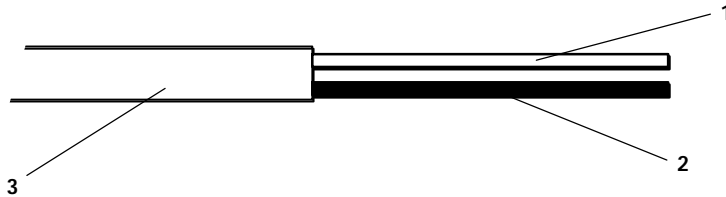
- Does not endanger the operator.
- Is not in the path of moving vehicle parts.
- Will not harm other equipment.

- " Does not invite damage to the cable.
 - " Does not snag on fixtures or any passing equipment.
3. Cut the power cable near the battery to eliminate the need for coiling excess cable.

" NOTE:

Do not cut the cable too short to reach the battery terminals.

4. Strip the power cable jacket back 12-14 inches.



1. White wire (negative)
2. Black wire (positive)
3. Power cable

Figure 2-1
Stripping the Power Cable Jacket

Power Cable Assembly

The power cable must have an in-line fuse installed before making final connections to the vehicle battery. You must also crimp a 3/8 inch terminal ring to the end of the white wire.

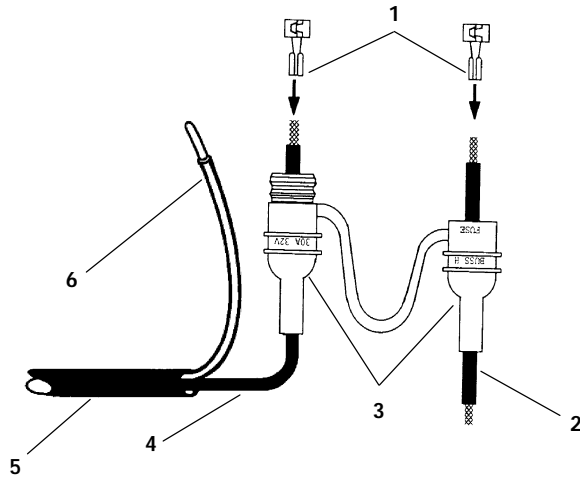
Assembling the In-line Fuse Holder

Refer to Figure 2-2 for help with completing this procedure. The in-line fuse holder consists of a rubber boot, two crimp-type fuse clips, and a fuse.

This fuse holder may be preassembled, in which case you should skip the following fuse holder assembly procedures and go to the next set of instructions, **Connecting the Fuse Holder** on page 2-9.

If the fuse holder is not preassembled, carefully follow these instructions to assemble the in-line fuse holder.

1. Locate the in-line fuse holder components.
2. Cut the black wire in the power cable midway between its end and the cable jacket. Save the 6-7 inch length of black wire.
3. Strip 1/4-inch of insulation from the black wire that extends from the power cable; also strip 1/4-inch of insulation from both ends of the 6 inch length of black wire saved in step 2.
4. Slide the longer portion of the in-line fuse holder boot (yellow rubber) over the black wire that extends from the power cable.
5. Slip a fuse clip onto this wire and crimp the clip onto the wire.
6. Slip the remaining fuse clip onto one end of the 6 inch wire saved from step 2 and crimp securely.
7. Slide this wire into the other half of the fuse holder boot. Insert the fuse into the fuse clips and snap the halves of the fuse holder boot together.
8. Go to **Terminating the Wire Ends**.



- 1. Fuse clips
- 2. Black wire (6-7 inches)
- 3. Fuse holder "boot"
- 4. Black wire
- 5. Power cable
- 6. White wire

Figure 2-2
Assembling the In-line Fuse Holder

Terminating Wire Ends

Crimp 3/8-inch terminal rings to the stripped end of the white wire and to the black wire from the fuse holder. See the battery drawing and instructions for recommended assembly to connect the cable to the vehicle battery.

1. Strip approximately 1/4" of insulation from the white wire on the power cable.
2. Crimp the 3/8" terminal ring onto this wire.
3. Crimp a 3/8" terminal ring onto the black wire from the end of the in-line fuse holder

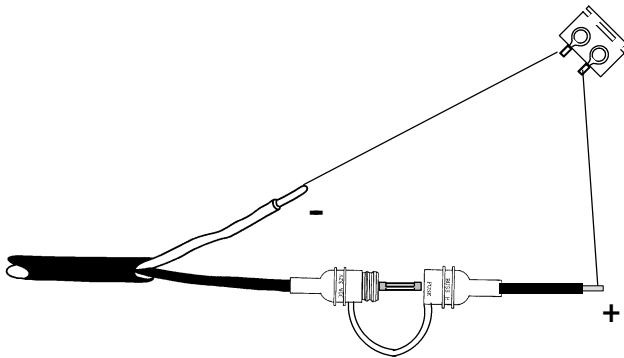


Figure 2-3
Terminating Wire Ends

Connecting the Fuse Holder

If the installation kit contains a preassembled in-line fuse holder, you must crimp it on the black wire from the power cable. Follow the instructions below to terminate the ends of the power cable when your kit includes a preassembled fuse holder.

1. Strip the white wire.
2. Crimp the 3/8" terminal ring (1) onto the white wire.
3. Locate the fuse link (2): it attaches to the black wire.
4. Shorten the black wire if desired.
5. Then, strip 1/4" of insulation from the black wire.
6. Securely crimp the fuse link splice (3) onto the black wire.

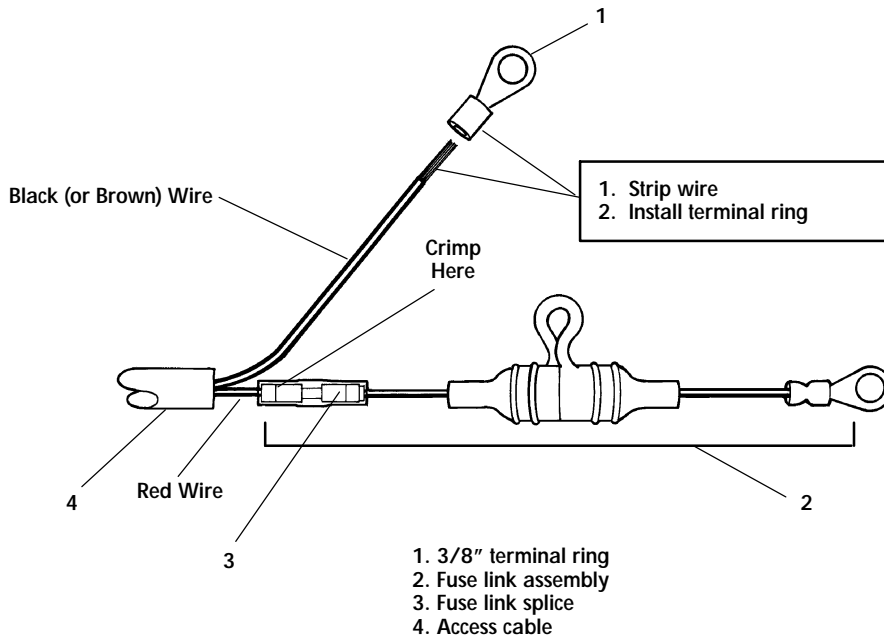


Figure 2-4
Prepare Cable Ends

Side Mount Battery Connection

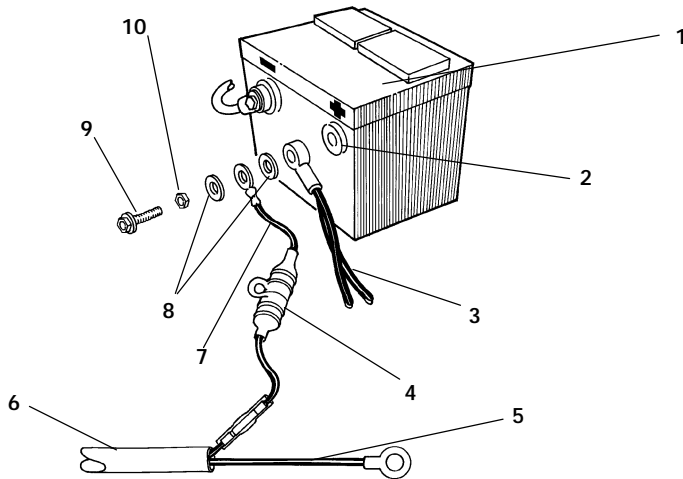


WARNING:

It is very important to make sure that you make the correct cable to battery connections, because electrical energy from vehicle batteries can harm equipment and people.

1. Remove both battery terminal bolts from the vehicle battery.
2. Screw a 3/8 inch nut **(10)** as far as it will go onto a 3/8" x 1 1/2" bolt **(9)** furnished in kit.
3. Slip a 3/8 inch washer **(8)** onto the battery terminal bolt.
4. Slide the positive (red wire/fuse link **(7)**) terminal ring from the battery cable onto the positive (+) battery terminal bolt.
5. Slip a second 3/8 inch washer **(8)** onto the battery terminal bolt.
6. Slide the vehicle positive battery cable **(3)** onto the battery terminal bolt.
7. Thread the bolt assembly (steps 2-6, above) into the positive battery terminal. Tighten the battery terminal bolt securely.
8. Tighten the nut **(9)** installed in step 2 to secure washers **(8)** and cables firmly in place.

Repeat steps 2 through 8 for the negative wire (black or brown) from the battery cable, hooking up the negative cables to the negative (-) battery terminal.



1. Battery
2. Positive battery terminal
3. Battery cable (positive)
4. Fuse link
5. Black or brown wire (negative)
6. Power cable
7. Red wire (positive)
8. Washers
9. Battery terminal bolt (positive)
10. Nut

Figure 2-5
Side-Mount Battery Terminals

Top Mount Battery Connection

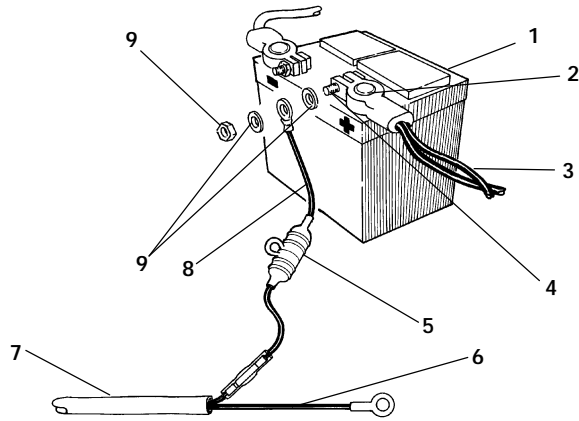


WARNING:

Because electrical energy from vehicle batteries can harm equipment and people, it is very important to make sure that you make the correct cable to battery connections.

1. Remove the bolts from the vehicle battery terminals.
2. Replace the bolts removed in step 1 with 3/8" x 1-1/2" bolts (4) and nut (10) furnished in the installation kit. Tighten nut securely.
3. Slip a 3/8 inch washer (9) onto the extended end of each battery terminal bolt.
4. Slide the positive (fuse link with red wire (8)) terminal ring from the battery cable onto the positive (+) battery terminal bolt (4).
5. Slip a second 3/8 inch washer (9) onto the battery terminal bolt (4).
6. Thread a second 3/8 inch nut (10) onto the battery terminal bolt (4).
7. Tighten the nut.

Repeat steps 3 through 6 for the negative wire (black or brown) from the battery cable, connecting the wire to the negative (-) battery terminal.



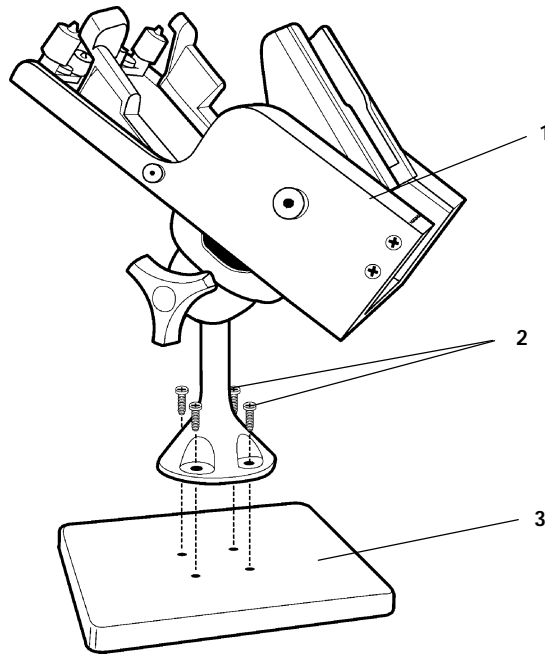
- 1. Battery
- 2. Positive battery terminal
- 3. Battery cable (positive)
- 4. 3/8" x 1-1/2" bolt
- 5. Fuse link
- 6. Black or brown wire (negative)
- 7. Power cable
- 8. Red wire (positive)
- 9. Washers
- 10. Nut (2)

Figure 2-6
Top-Mount Battery Terminals

Dock Installation Kits

Table 2-2
**Free Standing Mounting Bracket
 Kit 203-470-001**

Description	NPN	Qty
Free standing mounting plate	714-390-001	1
Phillips head screws #8 1/2"	802-287-000	4



1. Vehicle Dock
2. Mounting plate screws
3. Mounting plate

Figure 2-7
Vehicle Dock with Free Standing Mounting Plate

Table 2-3
Vehicle Mounting Kit 203-471-001

Description	NPN	Qty
Phillips head screws #8 x 3/4"	801-289-000	4
Nuts #8	802-114-000	4
Flat head washer #8	803-085-000	4

Installing the DC-DC Power Converter

This is an autoranging power converter that accepts a direct current (dc) input voltage (12 V dc or 24-48 V dc). The output is a regulated and filtered 12 volts dc to power the vehicle-mounted computer.

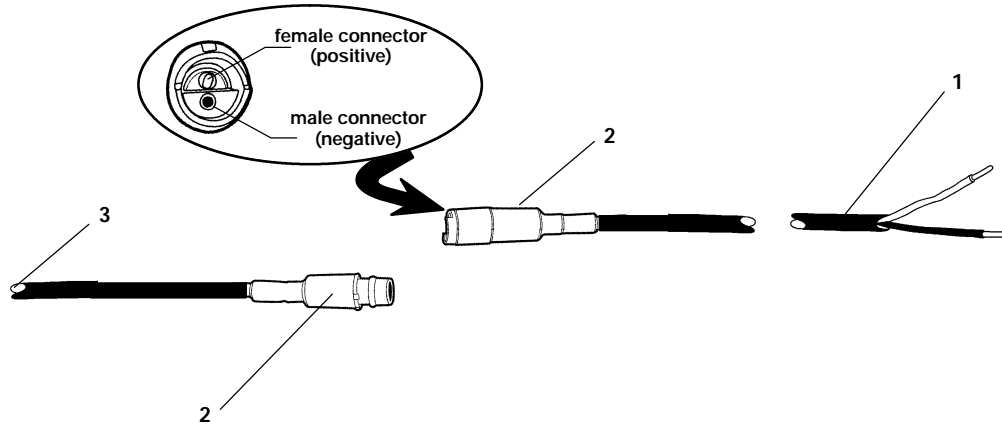
Mount the dc-dc power converter on a ferrous metal vehicle surface. The distance to the rubber booted connector is about three feet from the converter and three feet from the power source (battery). Any bends made during cable routing will further reduce the distance between vehicle batteries and the dock itself.

The converter should be located where it will not be exposed to moving vehicle components, and at the same time allow easy access to the On/Off switch on the converter. The four magnets on the bottom of this converter hold it securely to any large ferrous metal vehicle surface.

Final Cable Connections

Converter to Power Source Cable

The converter to power source cable is hardwired at one end into the power converter, and contains a white (negative) and black (positive) exposed wires for power source connection at the other end. The cable contains a rubber, waterproofed, in-line keyed connector for easy separation to service or install the power source cable.

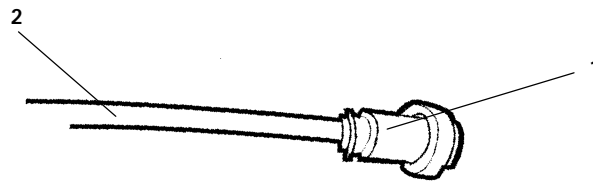


1. To vehicle battery, white wire-positive, black wire-negative
2. Rubber booted keyed connector
3. To dc-dc power converter

Figure 2-8
Converter to Battery Cable

Converter to Dock Cable

The converter to dock cable is hardwired into the converter and has a locking connector that is keyed to the dc power jack on the dock.

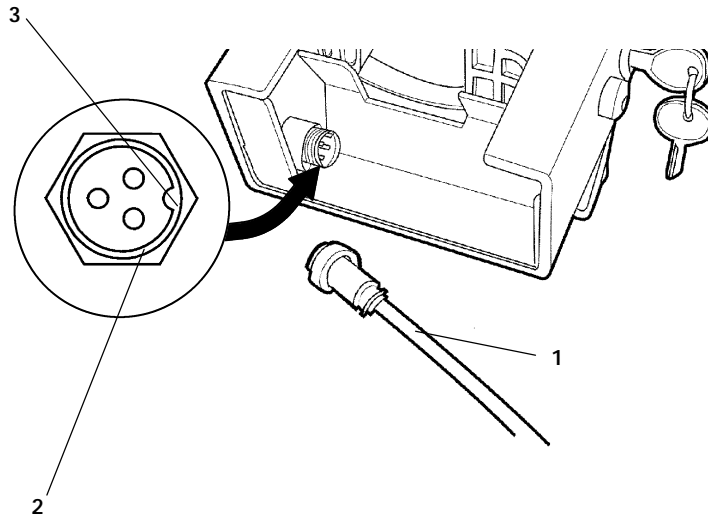


1. Keyed dock connector
2. From power converter

Figure 2-9
Power Converter to Dock Cable

Connecting the Cable to the Dock

1. Align the notch on the cable connector to the key on the vehicle dock three-pin connector.
2. Slide the connector into the connector on the dock.
3. Turn the nut on the cable connector clockwise to attach the cable to the dock.

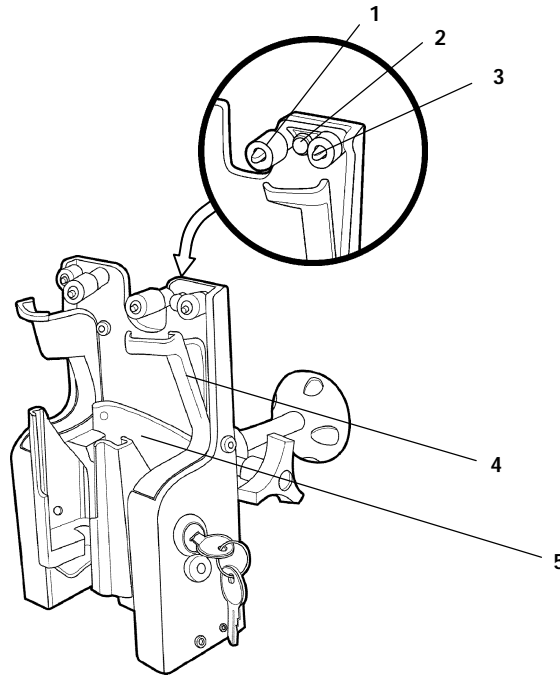


1. Power cable
2. Power cable connector
3. Notch on connector to match that on cable

Figure 2-10
Connecting the Power Cable to the Vehicle Dock

Using the Vehicle Dock

Your held-held computer must have the Communication Adapter (NPN: 705-368-001) installed to work with the vehicle dock. The vehicle dock can accept a held-held computer with or without the optional scanner handle. To review the key components of your vehicle dock refer to Figure 2-11.



1. Long bumper pad for using without a scanner handle
2. Screw for loosening and rotating bumper pad assembly
3. Short bumper pad for using with a scanner handle
4. Release lever to release computer
5. Computer holder

Figure 2-11
Vehicle Dock Components

Inserting Your Computer into the Vehicle Dock

1. Rotate the bumper pad to accommodate your computer. The longer pad to the inside is for a computer without a scanner handle.
 - " Loosen the screw with your fingers or insert a screwdriver into the slot in the screw head.

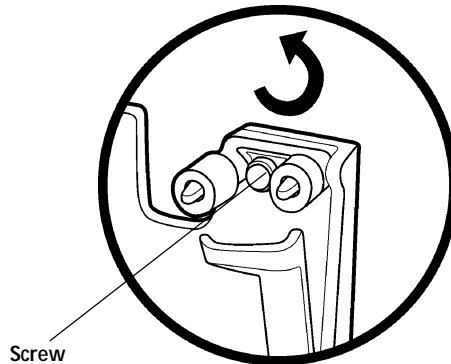


Figure 2-12
Rotating the Bumper Pad

2. Turn the key counterclockwise to unlock the keylock.
3. Push the computer release levers to enable the computer holder braces to tilt out.
4. Insert the computer into the holder (refer to Figure 2-13).
5. Push the computer back against the bumper pads.
6. Ensure your computer is pushed all the way into the computer holder and the bumper pads are properly seated into the slots on the back of the computer.
7. Turn the key clockwise to lock the keylock.

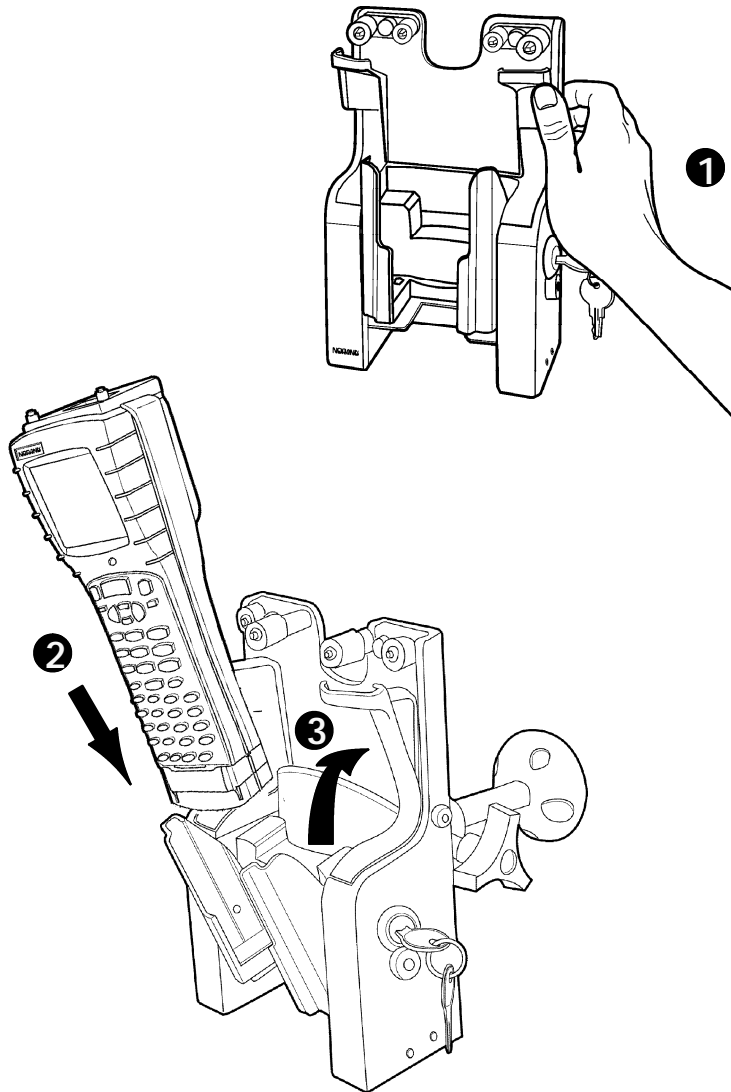


Figure 2-13
Inserting the Computer into the Vehicle Dock

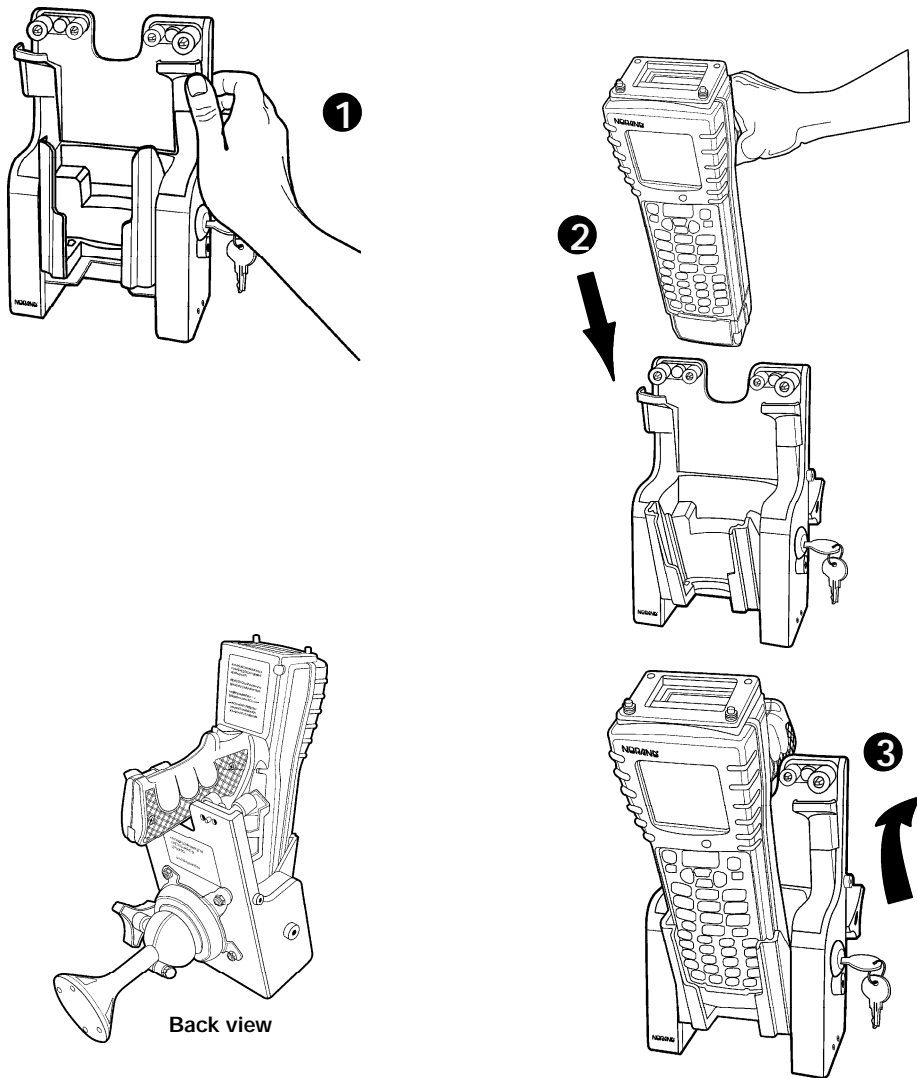


Figure 2-14
Putting a Computer with Scanner Handle in Vehicle Dock

Jump Starting Your Vehicle

- B CAUTION:** *If you need to jump start your vehicle from another vehicle battery, disconnect the power cable running to the dock. Failure to do so can result in loss or damage to your held-held computer.*

INDEX

C

- Cable installation, 2-4
- Connecting the dock cable, 2-17
- Connector pin-outs
 - positive and negative contacts, 1-4
 - vehicle dock 3-pin male power connector, 1-4

D

- DC-DC power converter, 1-3
 - installation, 2-15
- Dock
 - dimensions, vehicle, 1-1
 - installing, vehicle, 2-2
 - weight, vehicle, 1-1
- Dock descriptions, vehicle, 1-1

G

- Guidelines for installing, vehicle dock, 2-2

I

- In-line fuse installation, 2-6
- Inserting unit into vehicle dock, 2-19
- Installation
 - cables, 2-4

dc-dc converter, 2-15

in-line fuse, 2-6

- terminating the wire ends, 2-8

side mount battery cable connection, 2-10

top mount battery cable connection, 2-12

Installation guidelines, vehicle dock, 2-2

Installing

- vehicle dock, connecting the fuse holder, 2-9
- vehicle dock final cable connections, 2-15
- vehicle dock kits, 2-14

Installing the cables, 2-4

Installing the power converter, 2-15

Installing vehicle dock, tools needed, 2-3

P

- Power cable assembly, 2-6
- Power converter
 - dc-dc, 1-3
 - installing, 2-15
- Putting unit in vehicle dock, 2-19

S

Side mount battery cable connection, 2-10

T

Top mount battery cable connection, 2-12

U

Using, vehicle dock, 2-18

V

- Vehicle dock
 - describing its features, 1-1
 - jump starting your vehicle, disconnecting power cables, 2-22
- Vehicle dock 3-pin male power connector, 1-4
- Vehicle dock cables
 - connecting to dock, 2-17
 - converter to battery, 2-15
 - converter to dock, 2-16
- Vehicle dock features, 1-1
- Voltage contacts, 1-4

Index-2 *6400 Docks Installation Instructions*