



Mobile

# MCP200 Installation Guide

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October 2015

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**Glossary**



## Important Safety Information

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### Safety Definitions

The following Caution and Warning definitions are intended to advise the driver when it is safe to use a display unit.

**CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

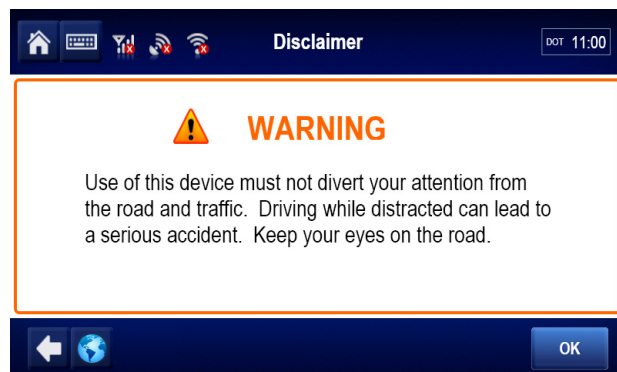
**WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

### Safety Advice

The following Safety Advice is provided for drivers, installers, and application developers who use and/or locate all types of display units.

**If you are a Driver**, do not use a display unit when the vehicle is in motion.

**If you are an Installer**, do not locate the display unit, including third-party devices, where it obstructs the driver's field of vision, distracts the driver from the driving task, or interferes with the driver's operation of controls or instruments. The following is displayed when ignition is turned on.



**If you are a Third-party Device Manufacturer or Application Developer**, it is your responsibility to provide appropriate warnings regarding the safe use of your device(s) in conjunction with Omnitrac's equipment. Applications should not require the driver to divert his attention from the road while driving a vehicle.





Topics in this chapter provide a basic overview of the MCP 200 Series and how its components interact to deliver effective, two-way information transmission and other value-added services.

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Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

## **MCP200 Overview**

MCP200 is a high bandwidth mobile computing platform designed to help increase customer service, reduce operating costs, enhance driver productivity, and ensure vehicle safety.

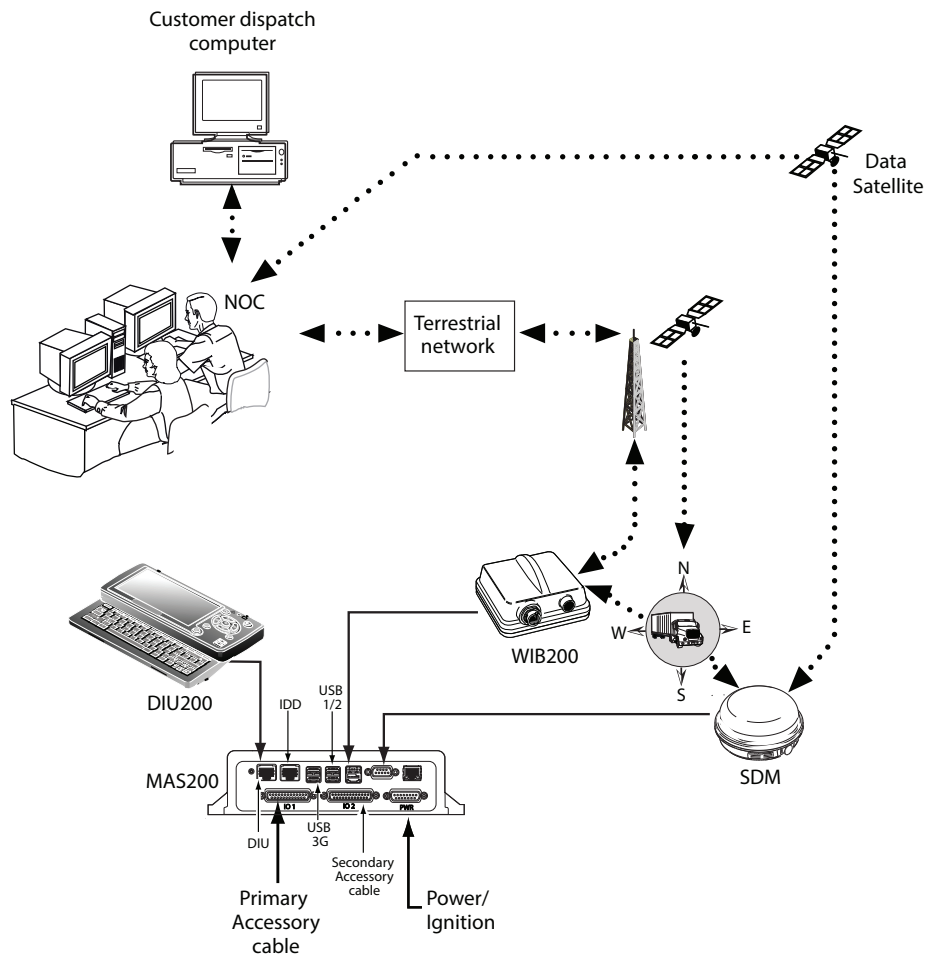
MCP200 offers multi-mode transmissions (terrestrial and WiFi are standard, satellite is optional); and delivers more processing power on the mobile unit, an increased number of hardware ports, and a Windows® Embedded Standard operating system.

Data transmitted through the MCP200 is backward compatible and interoperable with the host, so customers can access information across various Omnitracs platforms, such as MCP 100 Series, OmniTRACS Mobile Computing System, OmniExpress Mobile Computing System, and Untethered Asset Management Service.

## **Why MCP200 Makes Companies More Efficient**

- Companies can maintain two-way contact with their vehicles and drivers 24 hours a day.
- Dispatchers can send pickup and delivery information directly to drivers, keeping vehicles on the road.
- Text-to-speech alerts drivers of incoming notifications and their importance, so drivers can choose to immediately listen to notifications without pulling off the road.
- Dispatchers know when vehicles are expected to arrive at locations, and can pass that information on to customers.
- Provides dispatchers with vehicle location and position history information by tracking the location of each MCP200 using latitude and longitude or distance and direction from landmarks (usually large towns and cities).
- Drivers can inform the dispatcher of road conditions or problems.
- Optional applications allow monitoring of driver performance, engine diagnostics, trailer locations, refrigeration status, and critical event reporting.
- Decision support software enables customers to optimize assets and inform shippers and consignees of load status.
- Over-the-air software upgrades allow drivers to remain on the road rather than having to stop at service centers.
- Display interface unit 200 (DIU200) provides a color graphical display, with a sliding keyboard that integrates touchscreen functionality, extended temperature range, and improved clarity for delivering critical information to drivers.
- Hours of service data ensures regulatory compliance.
- On-board navigation application provides truck-specific route mappings.
- International Fuel Tax Agreement (IFTA) simplifies fuel reporting for inter-state operations.
- Helps with safety and accident prevention.
- Optimizes fuel management.

## MCP200 Component Description



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| Component   | Description  |
|---|--|
| Network Operations Center (NOC)                               | <ul style="list-style-type: none"> <li>Responsible for processing and managing information traffic between dispatch center and fleet.</li> <li>Within the NOC is the Network Management Computer (NMC), which receives and handles information traffic.</li> <li>Located at Omnitracs in Las Vegas, NV.</li> </ul>   |
| Omnitracs Dispatch Software (QTRACS software/Services Portal) | <ul style="list-style-type: none"> <li>Software on the trucking company's dispatch computer and dispatcher's interface with the MCP200.</li> <li>Allows dispatcher to send and receive information, request MCP200 location information, and perform other dispatch functions.</li> <li>QTRACS/400 customers communicate with the NMC with the NOC.</li> </ul> |

|   |  |
|---|--|
| Code Division Multiple Access (CDMA) Wireless Network | <ul style="list-style-type: none"> <li>Radio frequency (RF) signals are received from the antenna by the MCP200 via the wireless interface box (WIB200) from a wireless communication network.</li> </ul>    |
| Optional Data Satellite                               | <ul style="list-style-type: none"> <li>Handles all two-way information traffic between the vehicle and the NMC if you are using a satellite data modem (SDM).</li> </ul>                                     |
| GPS Positioning Satellites                            | <ul style="list-style-type: none"> <li>Uses 24 satellites to provide vehicle positioning information.</li> </ul>   |
| Mobile Computing Platform 200 (MCP200)                | <ul style="list-style-type: none"> <li>Driver's interface with the Omnitrac's platform and the component that resides in the vehicle.</li> <li>Allows the driver to send and receive information.</li> </ul> |

- The MCP200 includes the MAS200, which consists primarily of a microprocessor, a wireless modem module, and data storage.
- The user interface device (DIU200) is the driver's display terminal that enables the driver to read, write, and send information.
- The antenna (located inside the WIB200) relays information between dispatch and the driver.
- The antenna receives and transmits wireless information to and from the MAS200.
- The antenna interfaces with wireless networks. Information is passed through the Omnitrac's NOC where it is distributed to the dispatch center. Dispatchers respond by sending a message back to the Omnitrac's NOC, where it is relayed to the PCS gateway and broadcast out to the wireless network to be picked up by the vehicle's antenna.

## **CDMA Wireless Network**

- MCP200 uses CDMA technology to connect dispatchers and vehicles over the wireless airwaves.
- Wherever a cellular/terrestrial wireless network exists, drivers can send information to and receive information from dispatchers while traveling.
- Utilizes wireless digital roaming to enable many cellular networks.

## **WiFi Network**

- A wireless networking technology that uses radio waves to provide wireless high-speed internet and network connections.
- The MCP200 will transmit and allow access to the internet when within range ("hotspot" area) of a specified wireless network.
- Uses IEEE 802.11 standards.

## **GPS Network**

- A worldwide radio-navigation system formed from a constellation of 24 satellites and their ground stations.
- Uses satellites as reference points to calculate positions accurate to a matter of meters.
- A standard feature of the MCP200 for positioning.
- MCP200 receives positioning data from the GPS receiver, which is integrated inside the antenna to determine location.
- Position data from the MCP200 is forwarded to dispatch whenever information is sent to a vehicle and acknowledged, and whenever a driver sends information.
- Position data is sent at regular intervals and is made available to dispatch.

## **Optional Data Satellite**

- Used if equipped with a satellite data modem (SDM).
- Uses Ku-band signals to handle all two-way information traffic between the vehicle and the NMC.
- Offers ubiquitous coverage even in remote locations.

## **MCP200 Mobile Components**

- Mobile part of the Omnitracs platform is installed in a customer's vehicle.
- Each MCP200 has its own unique unit address which is the serial number on the MAS200. This address is used to route information to the correct vehicle.
- Standard components:
  - Wireless interface box (WIB200)—Contains terrestrial and WiFi modems, and antenna that provide CDMA/GSM/UMTS communication.
  - Mobile application server (MAS200)—Unit which contains the operating circuitry and memory for the MCP200. The “black box” of the platform.
  - Display interface unit (DIU200)—Standard display unit for the MCP200, which the driver uses to communicate with the dispatcher. Consists of a color graphical display with a sliding keyboard that integrates touchscreen functionality, extended temperature range, and improved clarity for drivers.
- Optional components:
  - Satellite data modem (SDM)—Contains the antenna that transmits with the satellite and GPS receiver.



2

Component Overview

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Topics in this chapter provide information on the basic components of the MCP200.

- For planning and installation instructions, see Chapters 4–10.
- For optional accessory installation, refer to *Optional Accessories/Applications for the MCP200* on page 2-6.

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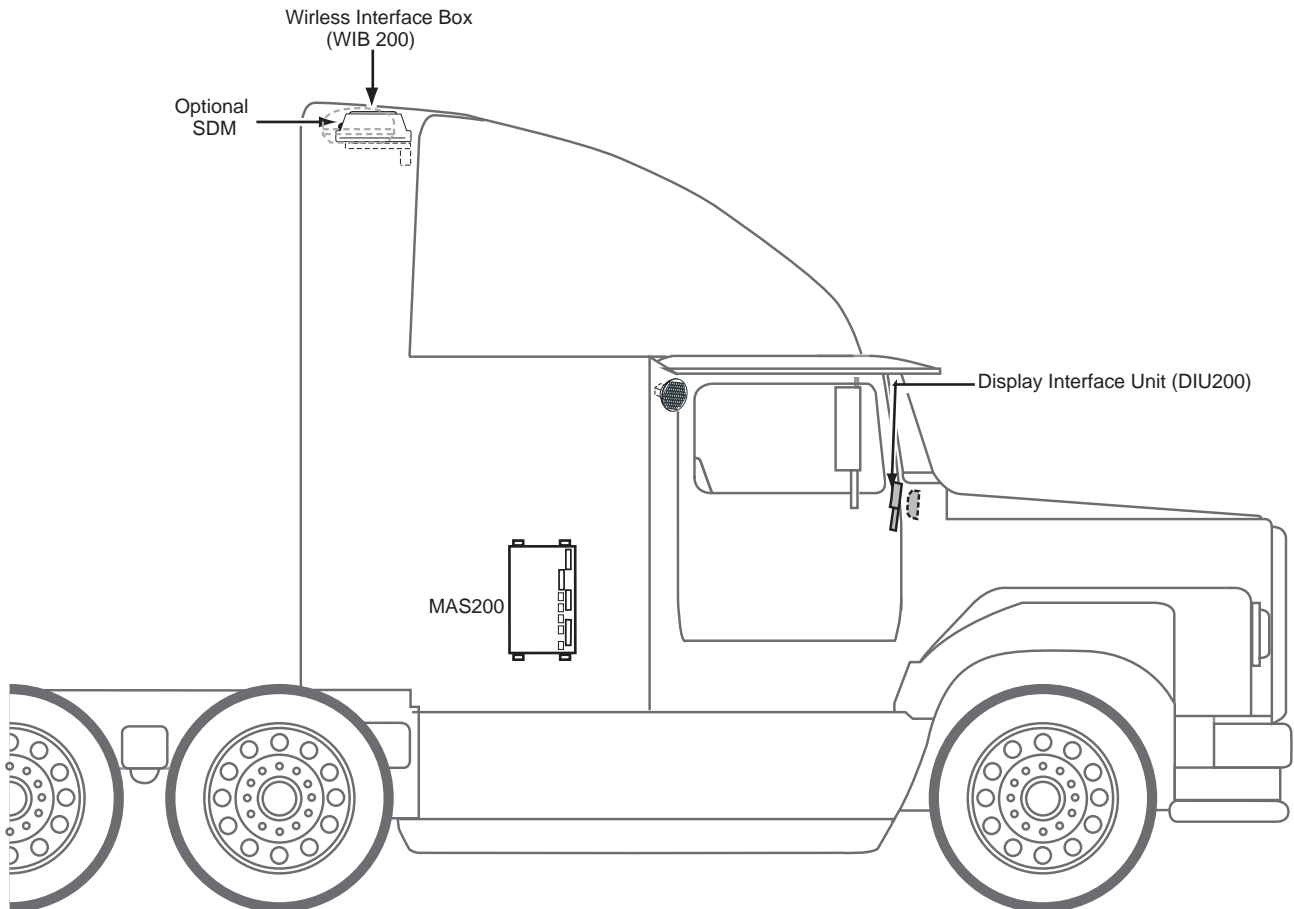
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- In Canada, call 800-863-9191

The MCP200 masterpack includes:

- Wireless Interface Box 200 (WIB200)
- Display Interface Unit 200 (DIU200)
- Mobile Application Server 200 (MAS200)
- Cables
- Backup battery



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## Wireless Interface Box 200 (WIB200)

The WIB200 includes terrestrial and WiFi modems, and antennae that provide CDMA/GSM/UMTS communication. The hardware provides reliable transmission and GPS positioning.

- Dimensions: 6.5 x 6.5 x 3.4 inches
- Weight: 1.2 pounds
- Extended operating temperature range:  
-30C to +70 C / -22F to +158F
- 802.11 compatible
- Lightweight housing for easy installation.
- Rugged design



## Display Interface Unit 200 (DIU200)

A color graphical display with sliding keyboard that integrates touchscreen functionality, extended temperature range, and improved clarity for delivering critical information to drivers.

- Dimensions—Open: 10.4 x 8.5 x 2.0 inches  
Dimensions—Closed: 10.4 x 5.3 x 2.0 inches
- Weight: 3.2 pounds
- Screen size: 7-inch diagonal
- Resolution: 800 x 480
- Extended operating temperature range: -30C to +70C / -22F to +158F. Display brightness is reduced at temperatures above +60C / +140F to reduce internal heat generation.
- Standard QWERTY keyboard with 4 arrow/navigation keys.
- Three indicator LEDs alert drivers of incoming notifications, connectivity, and other alerts.
- 16:9 aspect ratio color TFT LCD touchscreen includes stylus. Icon- and task-driven to maximize driver efficiency.
- Holstered dash mount and tethered display allows for use anywhere in the cab.
- Display and keyboard are backlit, allowing the driver to distinguish keys in the dark. An ambient light sensor adjusts backlight when it gets dark.
- Standard USB port for peripherals.
- Utilizes in-motion user interface to reduce driver distraction and increase safe driving.
- Touchscreen provides valid Cartesian touch coordinates for the entire active display surface.



## Mobile Application Server 200 (MAS200)

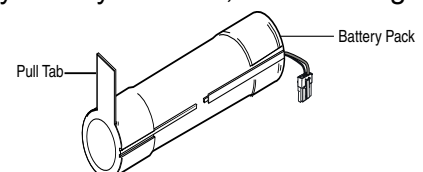
The hardware component that leverages the Windows® Embedded Standard operating system to deliver computing intelligence, processing power, and expansion capability.

- Dimensions: 9.7 x 7.7 x 2.3 inches
- Weight: 4.3 pounds
- Extended operating temperature range:  
-40C to +70C / -40F to +158F
- Storage temperature range: -40C to +85C / -40F to +185F
- On-board memory: 8 GB of compact flash solid state memory and 1 GB RAM. Optional 16GB flash memory upgrade available.
- Rugged hardware is compliant to SAE xJ1455 vibration profiles.
- .NET framework version 3.5.
- Intel® Extended Temperature Atom 1.3 GHz.
- Backup battery for cold crank condition.
- Supports a wide range of port interfaces that allow connections to on-board equipment:
  - **J1708 Bus** connects to J1708 bus of older trucks.
  - **(2) J1939/CAN Bus** connect to J1939 bus of newer trucks. Can be used to drive some serial tachographs.
  - **(5) USB 2.0 Host Ports** allow USB peripherals, such as handheld scanners, keyboards, and storage devices.
  - **Ethernet Port RJ45 Connector**
- Supports these other interfaces:
  - **Panic Button Input** allows connection of a panic button for emergency driver signaling.
  - **Tamper Detect Line** detects tampering with vehicle wiring.
  - **Tethered Asset Management Receiver** allows the MAS200 to determine what trailer is attached to the tractor.
  - **Audio Output** drives a truck's speakers which allow for voice navigation and messaging prompts, i.e., text-to-speech.



## Backup Battery

- When vehicle power is lost to the MCP200, the backup battery allows the MAS200 to shut down gracefully and properly store data. Without a healthy battery installed, there is a high probability of experiencing data loss or corruption.
- For more specific information about the backup battery, see [Chapter 5](#).



### **Optional Satellite Data Modem (SDM)**

The SDM transmits bi-directionally via an antenna to a geostationary satellite. The SDM is lightweight and rugged in design with strengthened antenna housing for protection against weather and external elements.

- Height: 6.8 inches
- Diameter: 12 inches
- Weight: 7.0 pounds
- Operating temperature range:  
-40C to +70C / -40F to +158F
- Connects with one Ku-band satellite for two-way data transmission. A secondary frequency exists as a backup satellite.
- Robust sealing mechanism for use in all outdoor environments.
- Housing has the same bolt pattern as the OmniTRACS® ACU for ease of installation.



### **Optional Remote Control Device (RCD)**

An easily accessible in-cab device allowing drivers to easily manage message playback and the text-to-speech (TTS) feature. Used when display cannot be located on dash.

- Dimensions: 2.5 x 2.3 x 1.1 inches
- Weight: 0.15 pounds
- Extended operating temperature range: -30C to +70C / -22F to +158F
- Storage temperature range: -40C to +85C / -40F to +185F.
- Small and easy to mount to the vehicle dash.



**Optional Accessories/Applications for the MCP200**

| <b>Accessory</b>              | <b>Chapter</b>     |
|-------------------------------|--------------------|
| Performance monitoring system | <a href="#">12</a> |
| Vehicle maintenance           | <a href="#">13</a> |
| Critical event reporting      | <a href="#">14</a> |
| Trailer management system     | <a href="#">15</a> |
| Panic button                  | <a href="#">16</a> |
| Wireless panic button         | <a href="#">17</a> |
| Scanner                       | <a href="#">18</a> |
| Remote control device         | <a href="#">19</a> |

## ***General Wiring and Installation Guidelines***

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Topics in this chapter provide the Omnitrac-approved general methods for making connections to cables and wires and the proper connectors to use to avoid potential problems.

|  |      |
|--|------|
| <i>Making Electrical Connections</i> .....   | 3-2  |
| <i>Proper Grounding</i> .....                | 3-10 |
| <i>General Installation Guidelines</i> ..... | 3-11 |
| <i>Routing and Protecting Cables</i> .....   | 3-11 |

**For technical questions, contact Omnitrac Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

## Making Electrical Connections

### Approved Omnitrac<sup>®</sup>s Electrical Connectors

The only Omnitrac-approved electrical connectors are crimp butt splices and crimp ring terminals. Omnitrac recommends Nylon insulated, seamless butt connectors with inspection windows. Heat-shrinkable butt connectors are preferred. When butt splicing multiple wires on one end of a butt splice and a different number of wires on the other end, step-down butt splices are recommended.

**WARNING**

*Not following proper wiring guidelines and using improper crimps and butt splices may cause intermittent connections and may result in unexpected truck down time or system failure.*

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### Wire Stripping

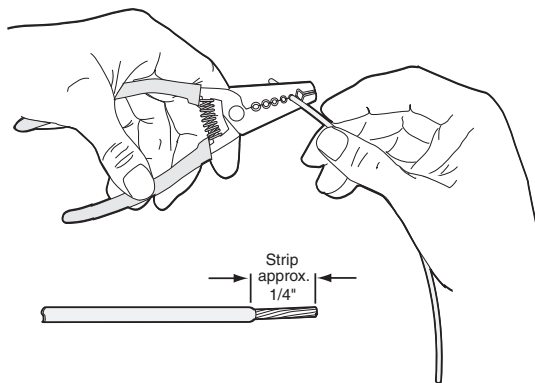
**Caution**

*Use care in stripping wires. Vibration can cause nicked wires to fail. Using wire cutters, knives, or other tools can damage the conductor wire and/or insulation.*

---

Knowing and following proper wire stripping techniques is essential for performing successful and safe electrical connections of all system components.

1. Using a wire stripper, strip approximately 1/4" off the end of an insulated wire.



2. After stripping the wire, verify that the wire is not severed, nicked, or damaged by the stripping tool. If the wire has been properly stripped, it is ready to be butt spliced. If the wire has been damaged, restrip the wire (see [step 1](#)).

## Butt Splicing

- Omnitracs recommends Nylon insulated, seamless butt connectors with inspection windows.
- Heat-shrinkable butt connectors are preferred.

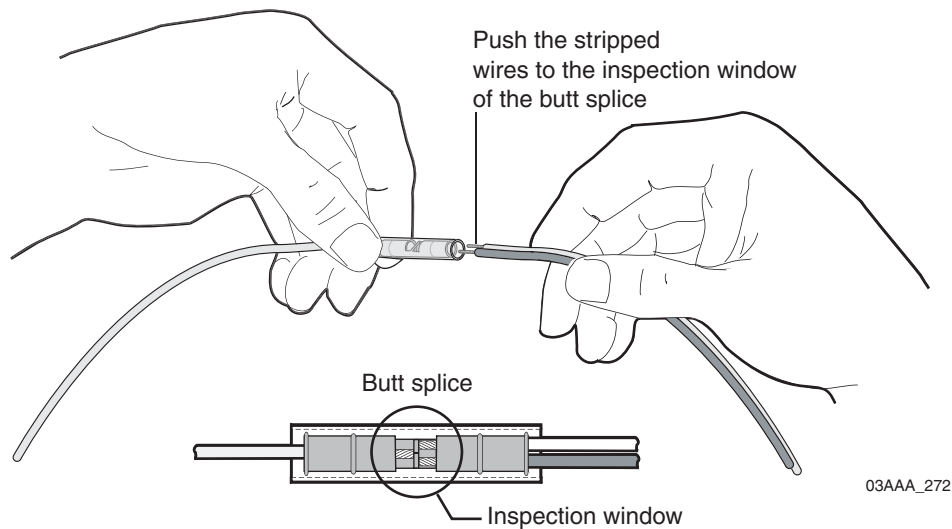
**Butt splicing can be done inside and outside the cab or enclosure.** See [Butt Splicing Connections Done Inside the Vehicle \(Out of the Weather\)](#) on page 3-3 and [Moisture Protection for Connections Done Outside the Vehicle](#) on page 3-7.

Make sure the size of the butt splice is appropriate for the job. A good butt splice has these characteristics:

- The ends of the bare wires are visible through an inspection window.
- The ends of the wires “butt” up against the stop.
- The wires are not exposed beyond splice shielding.
- Crimping does not sever or damage the wires or insulation.

### **Butt Splicing Connections Done Inside the Vehicle (Out of the Weather)**

1. Insert the stripped wires approximately half way into a butt splice, preferably one with an inspection window for verifying the wire is in the correct position.



2. Repeat this process for the wire on the opposite end of the butt splice. Once a proper butt splice is confirmed, it is important to properly crimp the butt splice to hold the connection.

## Crimping

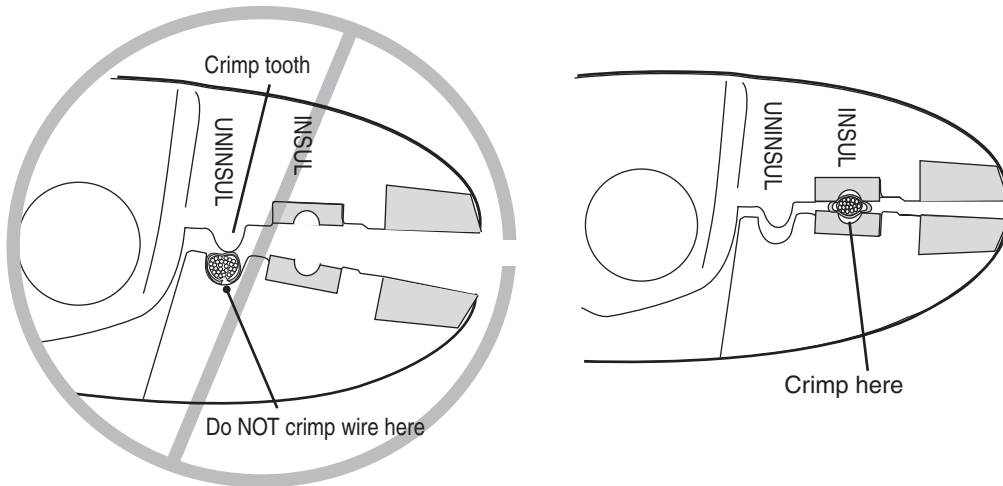
- When crimping a butt-spliced wire or cable, be sure the insulated butt splice is crimped using the insulated position on the crimp tool and not the crimping “tooth” of the tool.
- Crimping butt splices incorrectly can result in a severed wire and a failed wire connection.



### Caution

**DO NOT crimp on the crimp “tooth.”**

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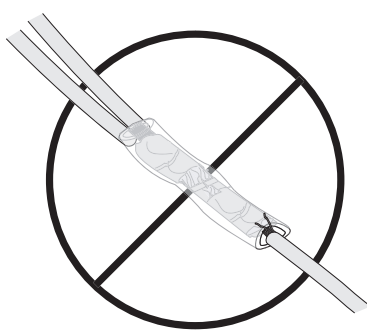
03AAA\_90b

1. Using a crimping tool, crimp the butt splice one end at a time. **First**, crimp the inside crimp area where the wire has been stripped. Apply necessary pressure to this inside area.



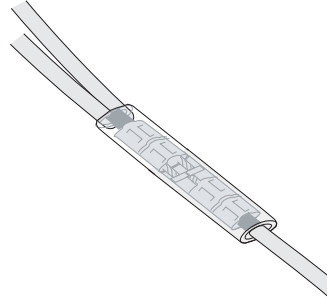
**Note**

The objective is to apply only the necessary pressure to crimp the butt splice closed and hold the wire connections together. **Do not** apply so much pressure as to crush the butt splice and sever the wire or the insulation on the wire.

**WRONG**

Butt splice is visibly crushed, possibly damaging the wire and the wire connection.

Some wires are exposed.

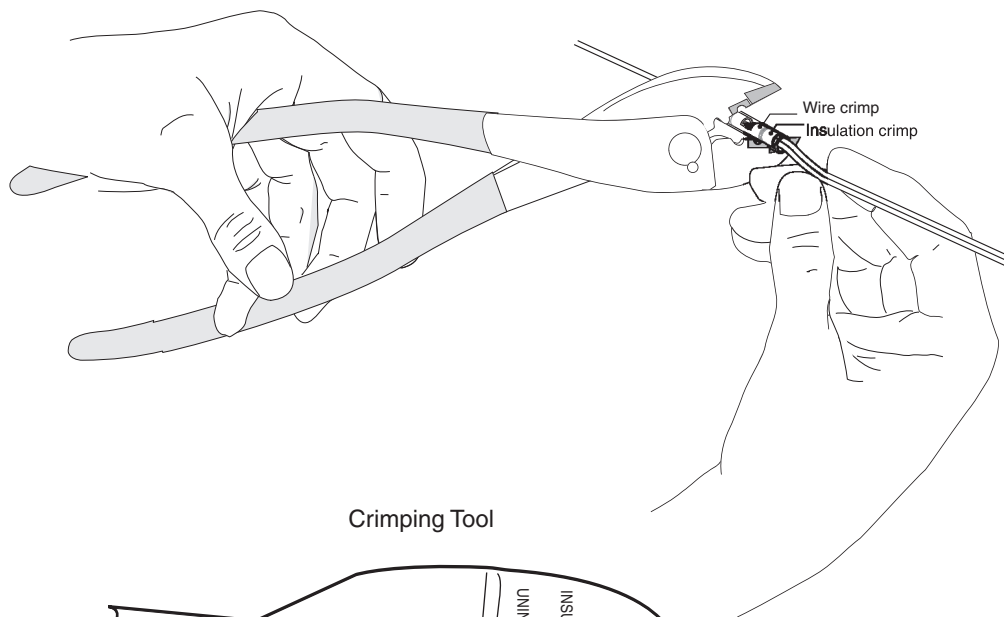
**CORRECT**

Crimping is done properly, protecting the wire and the wire connection.

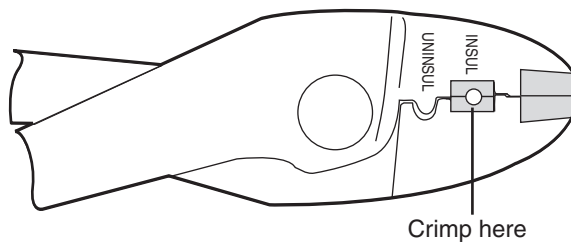
No exposed wires.

03AAA\_277A

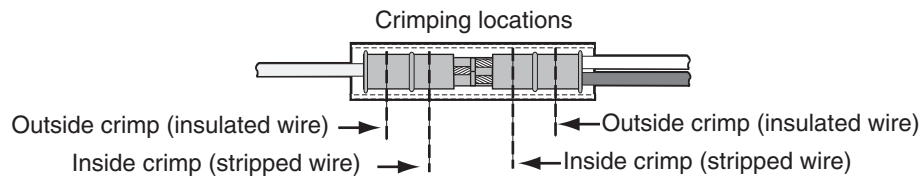
2. After crimping the inside of both ends of the butt splice on the “insulated” area of the crimping tool, next crimp the outside of both ends of the butt splice.



Crimping Tool

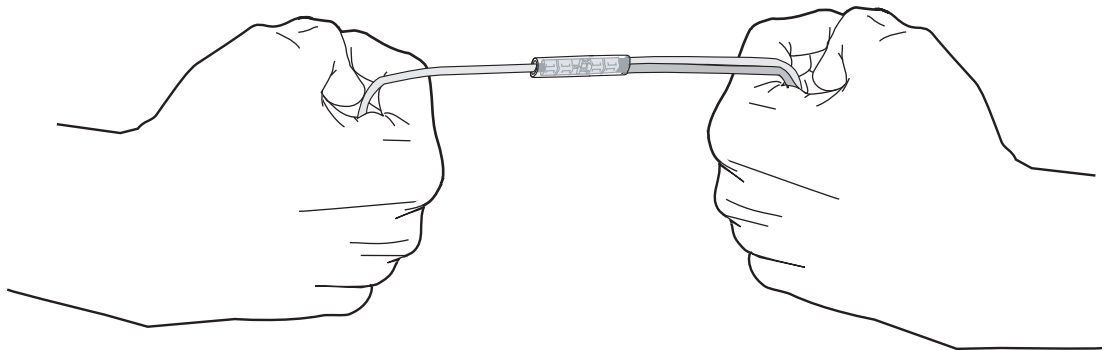


03AAA\_271



03AAA\_273

3. Verify that the crimps are good and the wires have not been damaged.
4. Do a pull test. Pull on both ends of the wires to ensure a solid butt-spliced connection exists. The crimped butt splice securely grips the insulated wires.



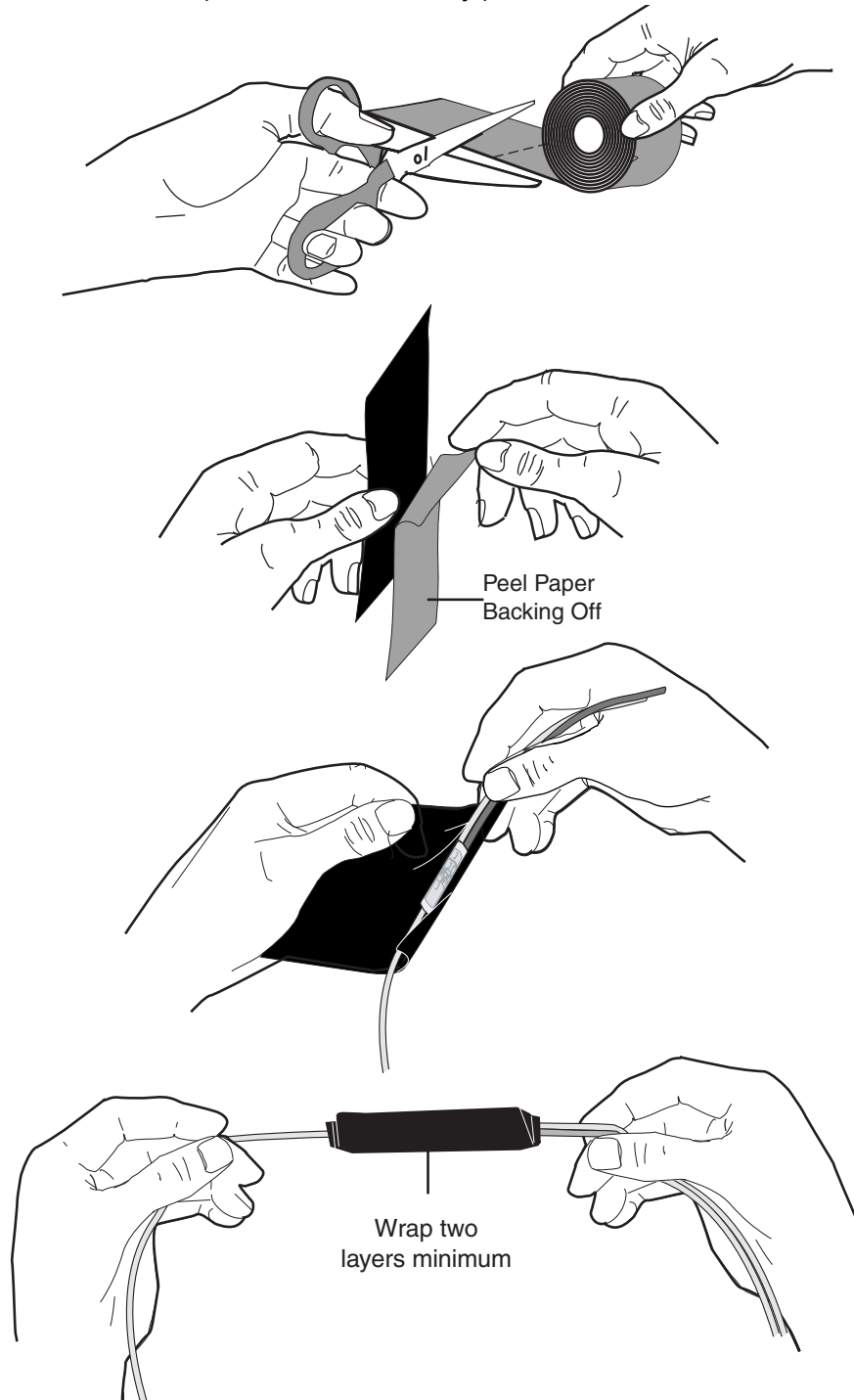
03AAA\_282

**WARNING**

*If using heat shrinkable crimps, DO NOT use a heat gun or open flame near combustible materials. Use a heat gun only when it is safe and appropriate to do so. Protect surrounding wiring and other components when using a heat gun.*

**Moisture Protection for Connections Done Outside the Vehicle**

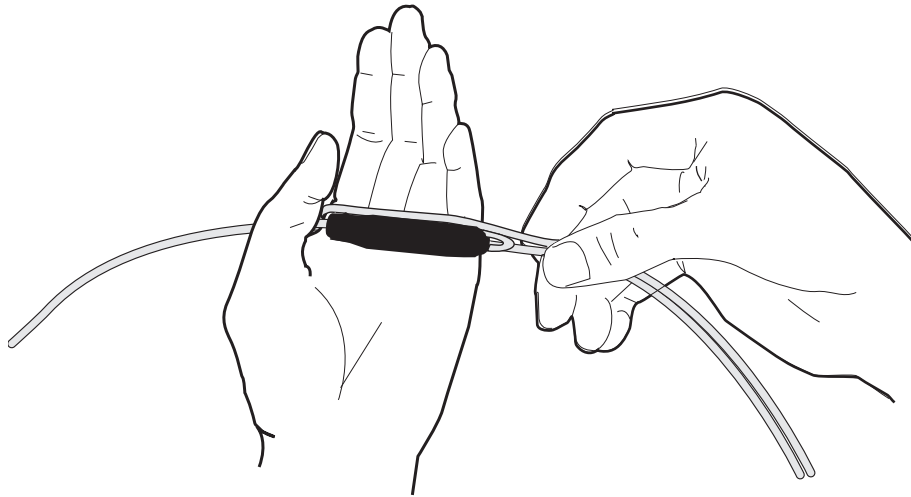
1. For crimps done outside the vehicle, when the crimps are verified to be good, use plastic seal tape to wrap the entire connection. Use a minimum of two layers of seal tape to completely wrap the connection.
  - 3M industrial tape (tape sealant, vinyl/rubber mastic) is available in a 10' roll from Omnitrac (MCN# 800-01788-0168). To find a local or nationwide supplier, visit <http://www.3m.com> (Mastic, Scotch® Vinyl).



04AAA\_22a

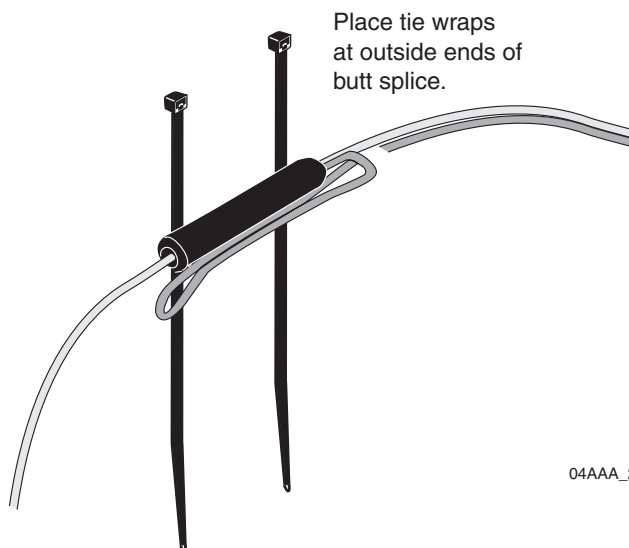
**Strain Relief With or Without Weather Protection Tape****If there is sufficient wire available for the Four-Finger Wrap Method:**

1. Wrap a wire around four fingers of a hand, one full loop, so that the wire loop is longer than the wrapped butt splice.
2. Pinch the loop tightly and center it against the wrapped butt splice.



04AAA\_24a

3. Secure the wires together and place 4" tie wraps at the outside ends of the butt splice.

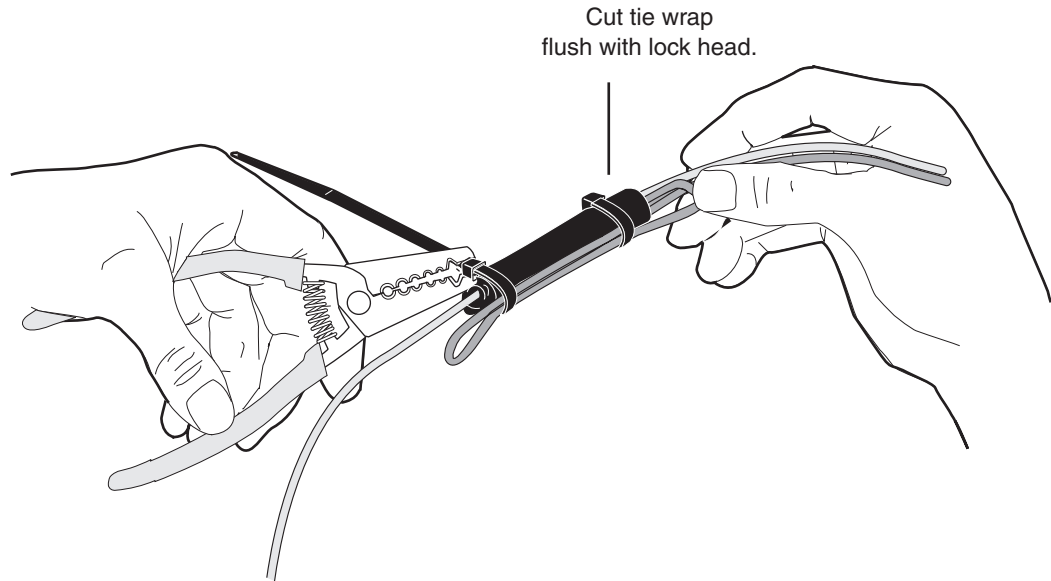


04AAA\_23a

4. Cinch the tie wraps tight and cut them *flush* to the lock head.

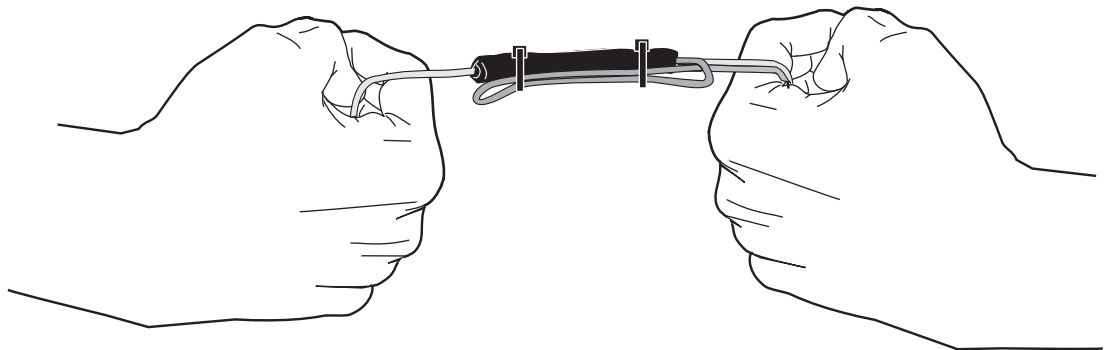
**Caution**

*Failure to cut the tie wraps flush to the lock head can result in minor injury.*



04AAA\_25a

5. Firmly tug on the butt-spliced wire connection to make sure the tie wraps do not pull loose.



04AAA\_26a

***If there is NOT sufficient wire available for the Four-Finger Wrap Method:***

1. Securely tie wrap the butt spliced wires to existing wires or harnesses in the nearby vicinity.

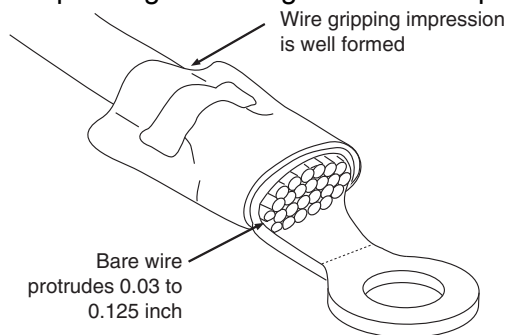
**Note**

*It is good practice to tie wrap the newly installed wires to existing wires approximately every 15"–18".*

## Ring Terminals

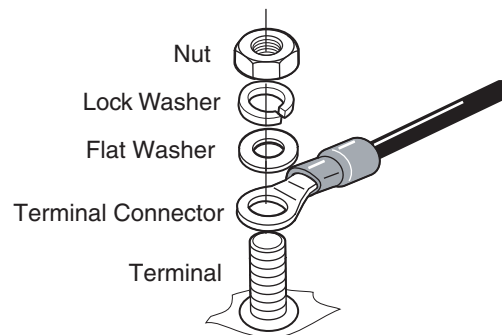
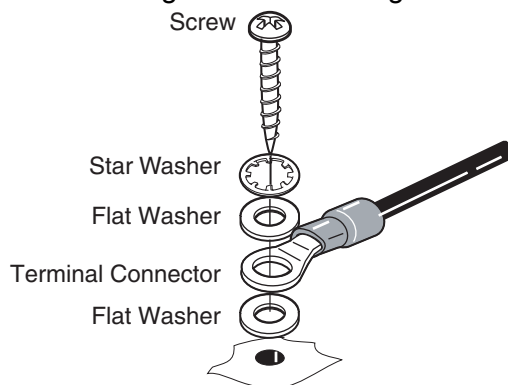
When making electrical connections, crimp ring terminals onto the ends of the wires to ensure good contacts. A properly crimped ring terminal has these characteristics:

- The barrel crimping indent is well-formed and properly positioned.
- The insulated wire's grip impression is well-formed and provides proper support without crushing the insulation.
- The wire does not move independently of the lug. Firmly tug on the ring terminal to ensure it does not pull loose.
- The end of the bare wire protrudes through the crimp barrel approximately 0.03 to 0.125" depending on the lug size and crimp tool.



OM/E-0093-97

Install the ring terminal on the ground connection using one of the following options:



03444 285

## Proper Grounding

When establishing a good chassis ground, avoid areas that may be potentially isolated from ground by a hinge or bad welds. It is extremely important that you create clean, secure, tight, metal-to-metal grounds. If grounding terminals are not available, remove the paint from the surface of the metal connected to the chassis to make the ground. Make sure the wires are not strained or vulnerable to damage.



### WARNING

*Not following proper grounding guidelines may cause intermittent connections and may result in unexpected truck downtime or system failure.*

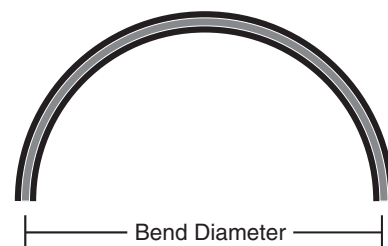
## General Installation Guidelines

- Determine the most direct and protected route when routing cables to connect the components to each other and to the vehicle. Refer to [Chapter 4](#).
- The standard cable length for the power, display, and accessory cables is 20 feet.
  - If you are working with a tilt cab, a longer cable may be necessary.
- Do not trim cable lengths to fit a specific vehicle.
- Keep protective caps in place or wrap connector with plastic/electrical tape until you're ready to connect the cable to the component.
- Use only wire strippers for stripping wires.
- Use only the appropriate insulated crimping tool for crimping insulated connectors.
- Use existing holes for cable routing whenever possible.

## Routing and Protecting Cables

PROTECT THE ENTIRE LENGTH of cabling with convoluted tubing when routing the cable:

- Limit the minimum bend diameter:
  - accessory cable to 5.0 inches
  - display cable to 1.5 inches
  - power cable to 2.5 inches
  - antenna cable to 2.5 inches
  - SDM cable (optional) to 2.5 inches
- Provide strain relief for all cables
- Use supplied grommets
- Use tie wraps
- Debur any drilled holes



DO NOT route cables:

- Near audio system amplifiers
- Near exhaust pipes and other sources of heat
- Near the brake, clutch, or accelerator pedals, and linkage
- Near foot traffic areas
- Near the windshield wiper mechanism
- Near CB radio wires
- Over sharp edges
- Over moving parts

**Special Exterior Routing Guidelines**

- Always use convoluted tubing to protect the cables. Secure the cables to the vehicle with tie wraps at approximately 18" intervals.
- Route away from exhaust pipes and moving parts. If an exhaust pipe or moving part must be crossed, use extra tie wraps and route the cable in such a manner that if the tie wrap fails, the cable will be caught or will rest on a safe part (not hot or moving).
- Seal all external holes for cables with refrigeration/tar tape or silicone sealant to keep moisture out.
- Route cables with any existing vehicle cables.

**Special Interior Routing Guidelines**

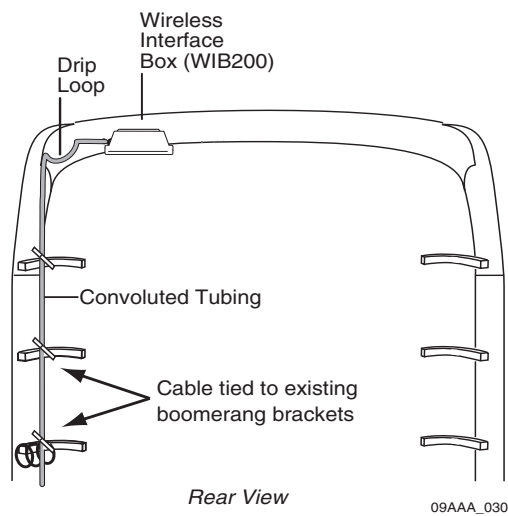
- Route cables under kick plates or carpets.
- Avoid high foot traffic areas.
- When reinstalling kick plates or carpets, be careful that screws do not penetrate cables.
- Route cables with any existing vehicle cables.
- Use convoluted tubing and refrigeration/tar tape when cables are routed through interior holes with sharp edges.

**Storing Excess Cabling**

- Secure excess cabling with tie wraps.
- Stow out of sight.

**Service Loops (Drip Loops)**

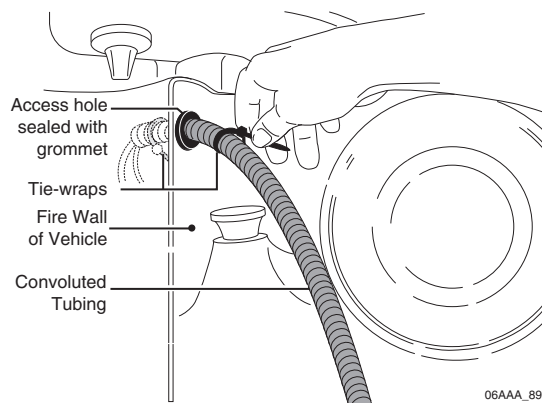
- Provide for all cables.
- Ensure that service loops do not cause any obstruction.





**Access Holes**

- Use existing holes for cable routing.
- If you drill, drill the smallest hole for the purpose:
  - 1-1/2" hole is recommended for cables with a 9-pin DSUB connector, e.g., SDM cable.
  - 1" hole is needed for the connectors on the antenna cable.
- Finish holes prior to routing cables:
  - Debur holes.
  - Use supplied grommet/convoluted tubing with internal holes.
  - Extend convoluted tubing beyond the hole.

**Stress Relief**

- At the MAS, tie-wrap cables to each other to reduce stress on any individual cable.
- Ensure cables have enough slack so connections are not being pulled.



# 4

## ***Installation Planning***

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Topics in this chapter provide guidelines for planning a basic Omnitrac MCP200 installation.

*Installation Guidelines* ..... 4-2

*Typical Installation Sequence*..... 4-2

*Typical Installation Locations for MCP200 Components* ..... 4-3

*Tools and Supplies Recommended for Installations* ..... 4-11

**For technical questions, contact Omnitrac Customer Support.**

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- In Canada, call 800-863-9191

## Installation Guidelines

### **Safety, Reliability, and Accessibility**

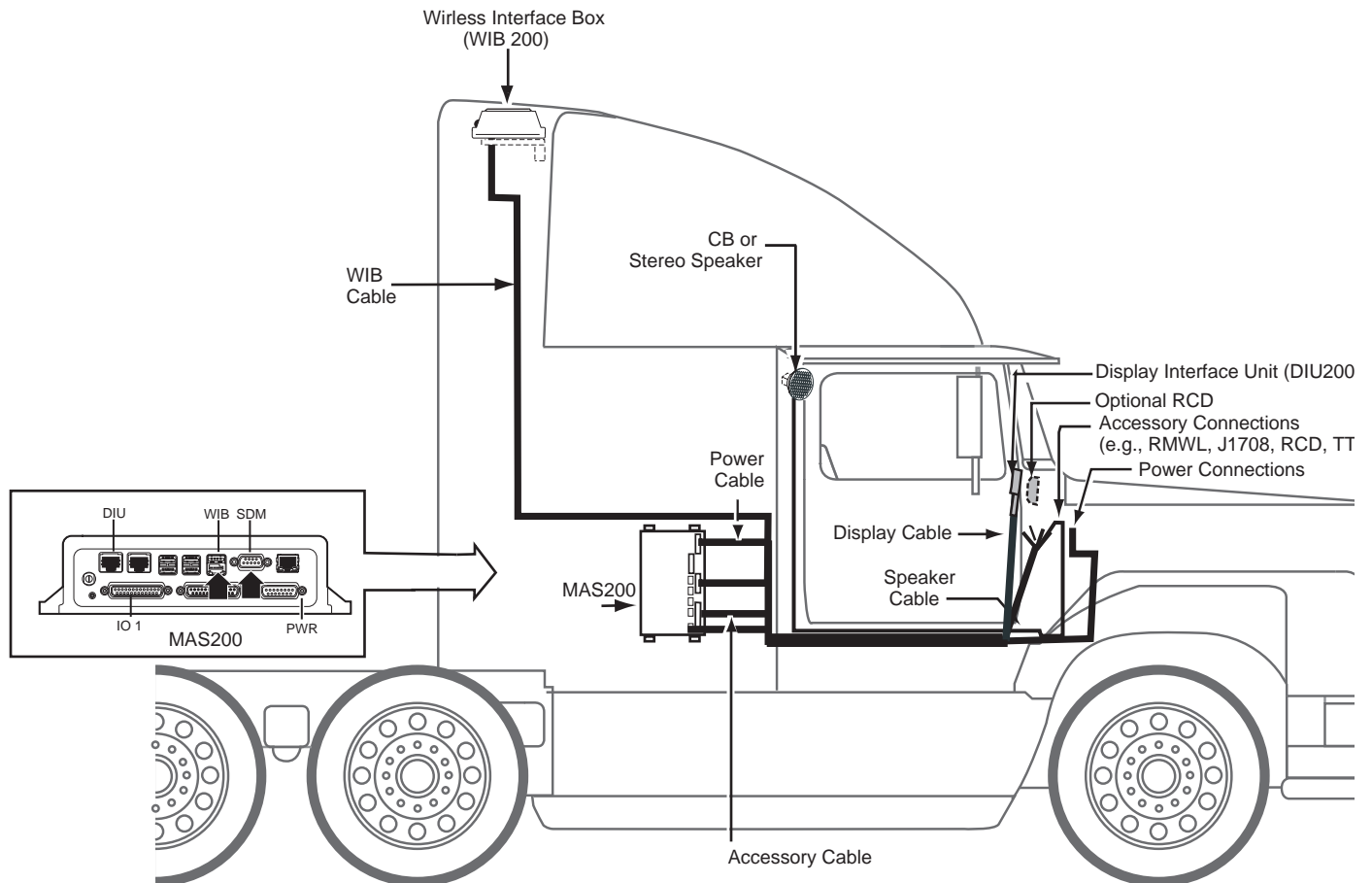
- Use eye protection when using a drill/performing work that may be hazardous to the eyes.
- Use ear protection in noisy work areas.
- Wear appropriate clothing/uniforms and safety shoes.
- Make sure you know what is behind the area before you drill.
- Use hood safety lanyards when the vehicle hood is open.
- Make sure ladders are in good working order.
- Place ladders in safe positions.
- Install equipment so it will not cause damage to the vehicle or work loose over time.
- Make sure there are no loose components/cables and no unsecured components.
- Use solid mounting surfaces.
- Do not modify or design your own mounts without first obtaining Omnitracs approval (applies domestically only).
- Mount WIB200 in locations where the unit will receive uninterrupted and undegraded GPS satellite signals. Refer to *Routing the WIB Cable* [on page 6-5](#).
- Mount optional SDMs in locations where the unit will receive uninterrupted and undegraded GPS satellite signals. Refer to *Line-of-Sight Requirements* [on page 7-4](#).
- Install all components in locations where they will not be abused.
- Do not mount antennas on headache racks or exhaust stacks.
- Route all cables away from hot or abrasive areas.
- Ensure that electrical connections are solid and the system ground is a clean, secure, metal-to-metal chassis ground.
- Choose installation locations where future maintenance can be easily serviced.
- Choose installation locations where components are safe from tampering and damage.

### **Typical Installation Sequence**

1. Determine component installation locations best-suited for your vehicle.
2. Locate the MAS200, see [Chapter 5](#).
3. Install and route cables.
4. Locate and install Antenna, see [Chapter 6](#).
5. Locate and install the Display unit holster and DIU, see [Chapter 8](#).
6. Accessories.

7. After you install the MCP200 components, see [Chapter 11](#) to perform a system verification.

### Typical Installation Locations for MCP200 Components

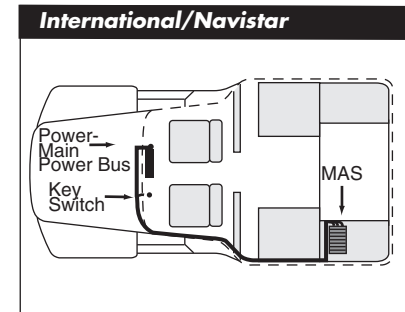


09AA

## Conventional Vehicle Types

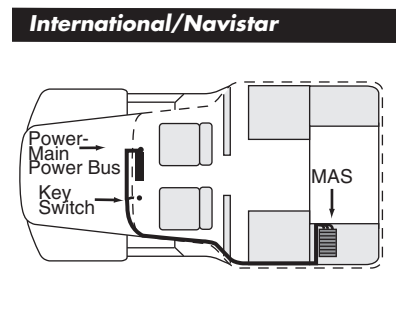
### International/Navistar ProStar Series

- MAS200—Install on side wall or hang under bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route externally or internally.
  - Drill a 1" hole for antenna cable.
- Typical Connection Points
  - Power: red wire labeled A-15
  - Chassis ground: driver side firewall, ground post
  - Ignition: Ignition Switch. Pink wire A-13F
  - J1708: driver side, near drivers's knee, Deutsch plug. Blue wire A3B (+), Grey wire A3B (-)
  - J1939: locate terminating resistors at engine block or transmission. Follow 1939 wires to backbone
  - TTRACS: outside driver side firewall, where 7-way blue # N94T wire enters cab



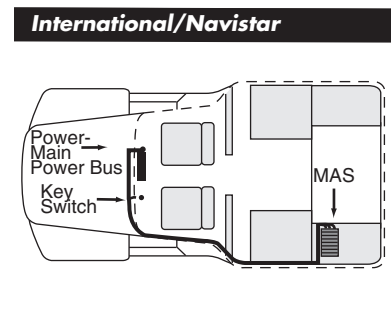
### International/Navistar 9000i Series

- MAS200—Install on side wall or hang under bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route externally or internally.
  - Drill a 1" hole for antenna cable.
- Typical Connection Points
  - Power: at key/ignition switch
  - Chassis ground: driver side firewall area
  - Ignition: ignition switch
  - J1708: wires are marked 98 DP+ and 98 DN- for data minus. Each connector is also tagged; one is labeled "D1 Data Link Pos" and the other is "D2 Data Link neg." Recommend the use of Packard-style female terminals - International part #16612094.
  - J1939: driver side dash, 9-pin Deutsch connector. If autoshift or Eaton VORAD, connection at doghouse, center of dash. Green (+) and Yellow (-) wires
  - TTRACS: back of truck sleeper at 7-way receptacle. Aux wire #94F or 94L for post 03/07 trucks

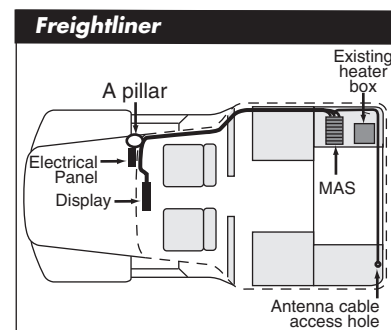


**International/Navistar 8600 Series**

- MAS200—Install on side wall or hang under bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route externally or internally.
  - Drill a 1" hole for antenna cable.
- Typical Connection Points
  - Power: passenger side fuse panel red wire A13AF A13 - fuse slot F38
  - Chassis ground: driver side firewall post
  - Ignition: passenger side fuse panel, pink wire A13F - fuse slot F28
  - J1708: driver side steering column. wires A3C+, A3C-. Recommend the use of Packard style female terminals - International part #16612094.
  - J1939: driver side kick panel, 9-pin Deutsch connector
  - TTRACS: outside driver cab at 7-way harness to OEM harness junction

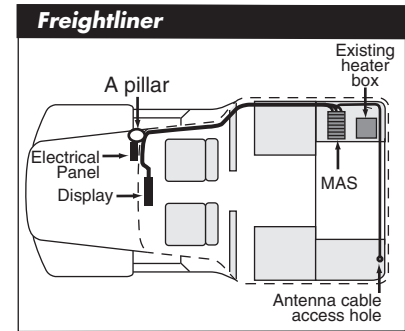
**Freightliner Cascadia**

- MAS200—Install on side wall or hang under bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route internally.
  - Use existing 1.25" hole for antenna cable.
- Typical Connection Points
  - Power: center lower dash, main bus bar
  - Chassis ground: center lower dash, main bus bracket
  - Ignition: center lower dash, main bus bar, ignition terminal block
  - J1708: 6-pin Deutsch connector (pin A+, pin B -), 9-pin Deutsch connector (pin F+, pin G-)
  - J1939: 9-pin Deutsch connector Green (+) and Yellow (-) wires or wires near lower passenger side doghouse
  - TTRACS: reference OEM wiring specs

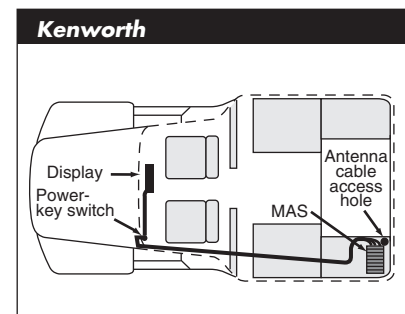


**Freightliner Century/Columbia**

- MAS200—Install on side wall or hang under bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route internally.
  - Power is at A pillar on passenger side.
  - Use existing 1.25" hole for antenna cable.
- Typical Connection Points
  - Power: passenger side fuse panel, under red cover, post labeled BATT+
  - Chassis ground: on metal at A Pillar, scrape paint from surface and use self drilling screw
  - Ignition: passenger side fuse panel, under red cover, post labeled IGN
  - J1708: passenger side below fuse panel Green (-) and Orange (+) wires
  - J1939: at or near the Diagnostic plug at B pillar Green (+) and Yellow (-) wires
  - TTRACS: passenger side firewall #45

**Kenworth T300/T600/T800/W900**

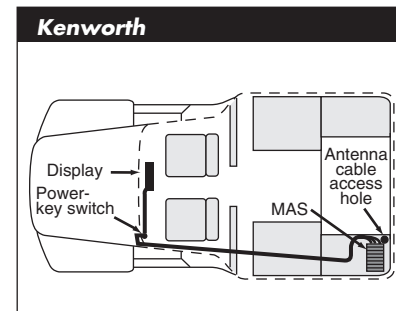
- MAS200—Install on side wall or hang under the bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route externally.
  - Connect power cable to key switch.
  - Cables exit/enter sleeper floor near MAS200.
  - Cables enter/exit cab through firewall high on driver side. Look for rubber plugs.
  - Drill a 1" hole in floor of side box for antenna cable. A hole already exists in the firewall.
- Typical Connection Points
  - Power: behind left gauge dash panel, Red wire labeled BATT
  - Chassis ground: behind left gauge dash panel, White wire labeled Ground
  - Ignition Dash: behind the far left gauge dash panel, Orange wire labeled Ignition
  - J1708: Terminal block next to the Deutsch plug
  - J1939: at diagnostic connector/Deutsch connector
  - TTRACS: connect at ABS fuse slot in driver side main fuse panel



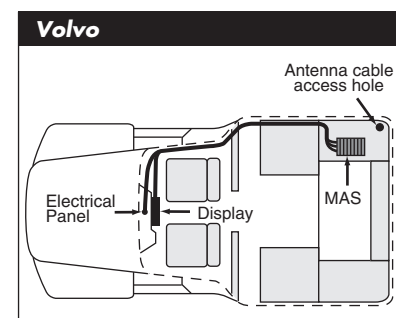


**Kenworth T2000**

- MAS200—Install on side wall or hang under the bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route externally.
  - Connect power cable to key switch.
  - Cables exit/enter sleeper floor near MAS200.
  - Cables enter/exit cab through firewall high on passenger side. Look for rubber plugs.
  - Drill a 1" hole in floor of side box for antenna cable. A hole already exists in the firewall to route cables to the passenger side fuse panel.
- Typical Connection Points
  - Power: passenger side, main fuse panel, behind glove box, open fuse slot
  - Chassis ground: passenger side below main fuse panel, remove kick panel for access
  - Ignition: passenger side main fuse panel, behind glove box, open fuse slot for Ignition
  - J1708: passenger side, terminal block left of fuse panel Blu/Blk E108DB (+) and Blue/Lt Blue E109DB (-) wires
  - J1939: Feb 2007 to present, behind diagnostic connector
  - TTRACS: passenger side firewall, purple with pink stripe wire labeled P154TR

**Volvo**

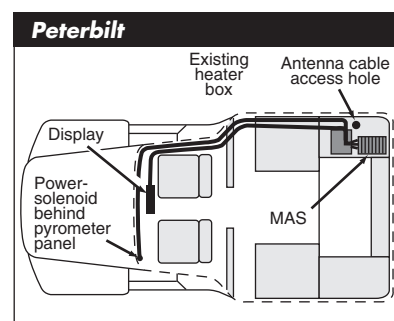
- MAS200—Install on side wall or hang under the bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route internally.
  - Connect power cable to electrical panel in top center of dash.
  - Drill a 1" hole in floor of side box for antenna cable.
- Typical Connection Points
  - Power: open fuse positions B1 (1-3) VN 670 use F-14 for battery, VN 780 use F-13 for battery
  - Chassis ground: main fuse panel bracket in center, top of dash
  - Ignition: spare fuse position B1 (4). The primary fuse position for all VN models is F59



- J1708: at Deutsch connector (pin F+ pin G-), or attach to the J1708 pigtail at top of dash, the main fuse panel area, wire + # 400 and wire - # 401
- J1939: main fuse panel, top of dash 2 pin Deutsch connector between the fuse panel and the windshield. Yellow (+) and Green(-) wires
- TTRACS: driver side firewall, or floorboard behind driver seat, connect to wire labeled "AUX"

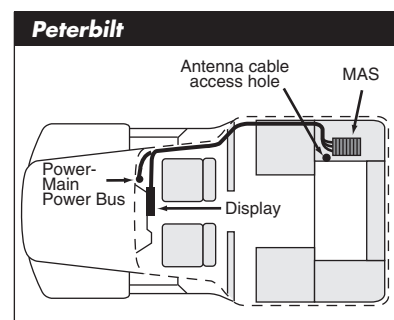
### **Peterbilt 378/379**

- MAS200—Install on side wall or hang under the bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route display cables internally or externally.
  - Connect power cable to solenoid behind pyrometer panel.
  - Cables exit/enter the sleeper floor near MAS200.
  - Cables enter/exit cab through firewall, high on passenger side. Use existing cable path. Remove map box.
  - Drill a 1" hole in floor of side box for antenna cable.
- Typical Connection Points
  - Chassis ground: main frame just below the solenoid
  - Ignition: ignition switch or solenoid mounted behind speedometer
  - J1708: dash, behind speedometer/tach. Purple (+) and White (-) wires  
Post March 2005 trucks - Purple (+) and Green (-)
  - J1939: behind A pillar or ignition switch, Blue AMP connection
  - TTRACS: behind driver side fuse panel, Black wire labeled AUX



### **Peterbilt 387**

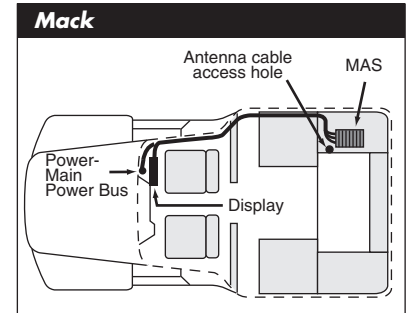
- MAS200—Install on side wall or hang under the bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route externally.
  - Drill a 1" hole in floor of side box for antenna cable.
- Typical Connection Points
  - Power: passenger side main fuse panel, behind glove box, 3rd row open fuses



- Chassis ground: passenger side main fuse panel - attach to support brackets
- Ignition: passenger side main fuse panel, behind glove box, 2nd row open fuses
- J1708: passenger side main fuse panel, behind glove box. Purple (+) and White (-) wires
- J1939: behind A pillar or ignition switch. Connectors are AMP 282080-1 & 282104-1.
- TTRACS: outside Cab, driver side frame rail PDM (Power Distribution Module), Aux line

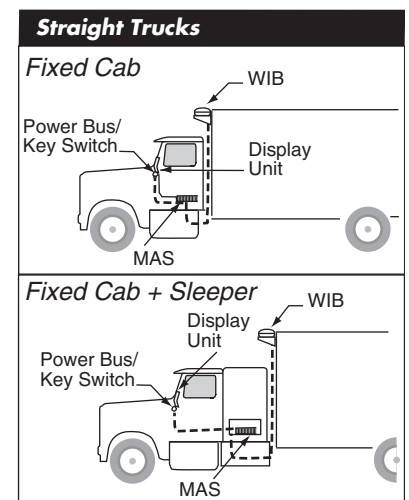
### **Mack**

- MAS200—Install on side wall or hang under the bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route externally.
  - Drill a 1" hole in floor of side box for antenna cable.
- Typical Connection Points
  - Power: passenger side dash, behind glove box, BAT post
  - Chassis ground: passenger side dash, behind glove box, GND post
  - Ignition: passenger side dash, behind glove box, IGN post
  - J1708: passenger side dash, behind glove box, J1708 + post = A, J1708 - post = B
  - J1939: top of dash, below triangular cover, 2-pin Deutsch connector. Yellow (+) and Green (-) wires.
  - TTRACS: outside driver side firewall, 7-way terminal block, Aux Post # 7 blue wire



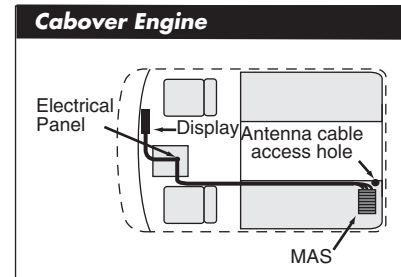
### **Straight Truck Vehicle Types (All Makes)**

- MAS200—Install on side wall or hang under bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route externally or internally.
  - Tilt cabs may require longer cables.
  - Drill a 1" hole in floor of side box for antenna cable.

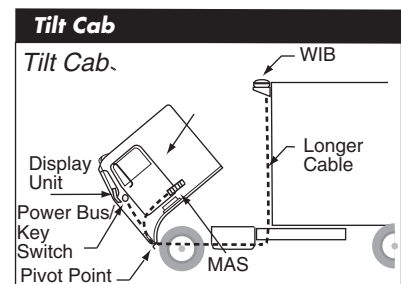


**Cabover Engine Vehicle Types (All Makes)**

- MAS200—Install on side wall or hang under bunk.
  - Install so there is always access to a USB port for the memory stick.
- DIU200—Install on dash where space allows/customer preference.
- Cables—Route internally.
  - Connect power cable to main bus or keyswitch.
  - Drill a 1" hole in floor of side box for antenna cable.

**Special Cable Ordering Instructions for Tilt Cabs**

- Typically, the antenna cable must be routed through the cab pivot point to allow for the tilt.
- In most tilt cab vehicles, this routing requires a longer cable than the standard cable.
- When ordering the MCP200, specify the length of the cable(s) you need.



## Tools and Supplies Recommended for Installations

| <b>Essential Tools</b>  | <b>Miscellaneous Tools</b>                            |
|---|---|
| • Standard Combination Wrench Set   | Measuring Tape  |
| • Diagonal Wire Cutters   | Ratchet/Sockets                                       |
| • Wire Strippers  | Adjustable Wrench                                     |
| • 3/8" Drive Standard Deep Well Socket Set with ratchet   | Level   |
| • Butt Splice Crimping Tool   | Debur Tool  |
| • Screwdrivers: Phillips #2 and Slotted   | Flush Cutters   |
| • Torx Drivers: #10, #20, #25   | Hacksaw   |
| • Volt/ohm Meter  | Hammer  |
| • 1/4" Drill Bit and assorted size bits   | Utility Knife   |
| • 1" Hole Saw   | Files (flat, round)                                   |
| • 3/8" Cordless Drill (this will speed up installation time)  | Channel Locks   |
| • Radio Removal Tool "U"  | Straight Awl  |
|   | 1/4" Drive Standard Deep Well Socket Set with ratchet |
| <b>Miscellaneous Supplies</b>   |   |
| • Silicone Sealant or Refrigeration/Tar Tape  | Flash/Drop Light                                      |
| • Assorted Ring Terminals   |   |
| • Assorted Butt Splices   |   |
| • Electrical Tape   |   |
| Items marked with a <b>bullet (•)</b> are considered necessary, must-have tools and supplies required to perform an installation. Additional tools may be required to facilitate certain installations and for maintenance. |   |

## Omnitracs Approved Sealants

| <b>Sealant, Lubricant, or Liquid</b> | <b>Acceptable For</b>               | <b>Required For</b>                               |
|--------------------------------------|-------------------------------------|---|
| Refrigeration/tar tape (supplied)    | Sealing exterior to interior holes. | Sealing 1" hole for antenna cable.                |
| Silicone sealant                     | Sealing exterior to interior holes. | Sealing bolt holes for antenna mounting brackets. |



## ***Mobile Application Server 200 (MAS200) Installation***

---

Topics in this chapter provide general guidelines and instructions for installing the MAS200 and connecting the cables to the MAS200.

|  |     |
|--|-----|
| <i>General Installation Guidelines</i> .....               | 5-2 |
| <i>Installing the Backup Battery into the MAS200</i> ..... | 5-2 |
| <i>Installing the MAS200</i> .....                         | 5-3 |
| <i>Installing the Power Cable</i> .....                    | 5-5 |
| <i>Grounding Guidelines</i> .....                          | 5-6 |
| <i>Installing the Accessory Cable</i> .....                | 5-7 |

**For technical questions, contact Omnitrac's Customer Support.**

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- In the United States, call 800-541-7490
- In Canada, call 800-863-9191



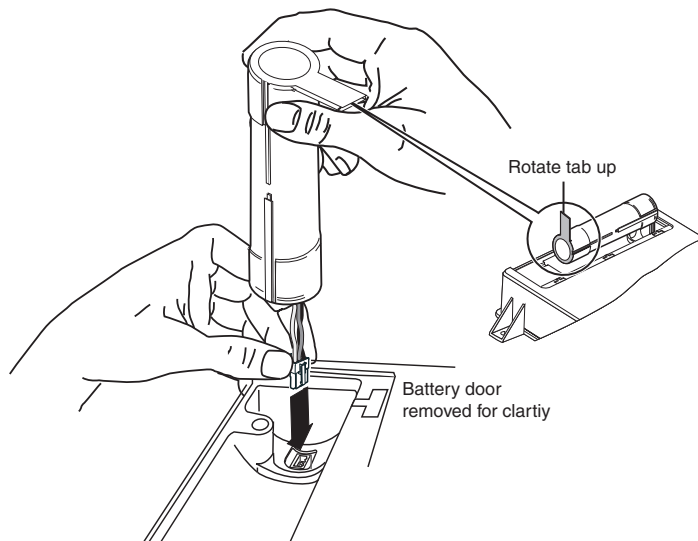
## General Installation Guidelines

1. Install the backup battery into the MAS200.
2. Install the MAS200.
3. Connect cables to the MAS200.

## Installing the Backup Battery into the MAS200

Install the backup battery before installing the MAS200.

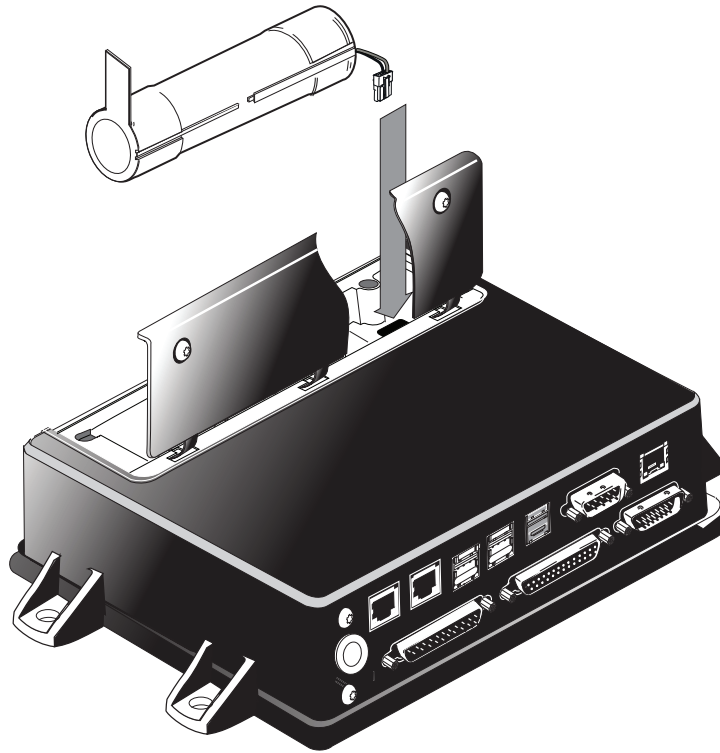
1. Open the battery door on the MAS200 using a Torx #10 driver.
2. Hold the backup battery in a vertical position with the connector facing down.
3. Insert the backup battery connector into the keyed mating connector in the MAS200.



05AAA\_45QMCP



4. Rotate the backup battery into a horizontal position and place in the MAS200.



09AAA\_01

5. Close door and tighten the T10 Torx screws using a hand tool. Do not overtighten the door screws.

## Installing the MAS200

### Selecting a Mounting Location

**Caution**

*The MAS200 is not watertight. DO NOT get it wet. Do not locate the MAS200 where it could come into contact with liquids or solvents.*

### Adequate Clearance

The minimum requirements for adequate clearance around the MAS200 for ventilation, cooling, and easy access are:

- Sides and back of unit—1".
- Top of unit—1".
- Top of unit—3" to open the battery door and access the battery.
- Front of unit—6" to allow for proper cable bend diameter exiting the unit.

**Location and Orientation**

- When possible, do not install the MAS200 on the floor of the vehicle.
- Preferably, install the MAS200 on the vertical side wall with cable exiting to the side.



- If possible, install the MAS200 in a storage compartment.
- Choose a location that provides easy access to the USB port you are using for the memory stick.
- Choose a location where the MAS200 will not come into contact with liquids or solvents.
- Choose a location where tire chains or other tools will not likely be stowed on top of the unit or cables. Do not mount the unit near items that may fall on it or bump cable connections.
- Choose a location for the MAS200 that is structurally sound. The surface must support the full weight of the MAS200 under all circumstances.
- Choose a location that provides for the various cable lengths.
- In cabover vehicles, install the MAS200 in the rear of the storage compartment. In this location, tools or tire chains will not fall on top of the unit when the cab is tilted up.
- Be sure to provide enough room for cable bends or the removal of cables for servicing (4" to 6" is recommended).
- Install the MAS200 so that the unit, cables, and backup battery can be serviced in the future.

**Securing the MAS200**

- Use four self-drilling screws or well nuts and screws to mount and secure the MAS to a solid surface.

## **Installing the Power Cable**

### **Low Voltage Disconnects (LVDs)**

An LVD is circuitry in some trucks that remove “non-critical” loads, such as TVs, radios, and microwaves from the truck battery when operating these items without the vehicle running. This ensures that there will be enough battery power left to start and run the vehicle.

Do not wire the MCP200 through any LVD device as this will affect the normal operation of the system. When the LVD is engaged:

- MCP200 will not transmit or receive information
- Panic button will not operate
- Tamper detection will not work
- Vehicle position will be missed
- Backup battery life will be significantly reduced

### **Power Cable Run**

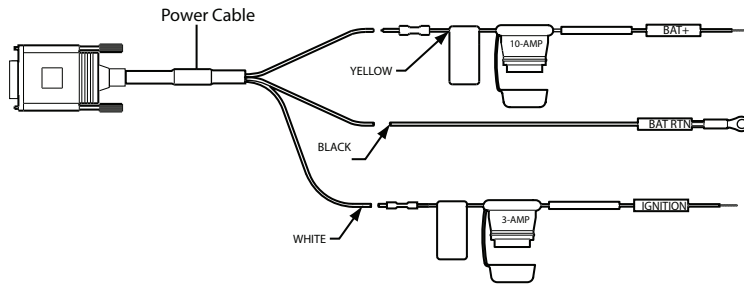
- Run direction—Route the power cable from the MAS200 to the power connection points.
- Routing location—Route internally or externally. If routed externally, use the supplied convoluted tubing.
- Cable dressing—Store and secure excess cable.

### **Power Cable Routing**

1. If needed, temporarily remove the two fuses from the fuse holders on the end of the cable.
2. Route the fuse end of the power cable from the MAS200 location to the power connection points in the cab.
3. Re-install the fuses onto the appropriate wires.
4. Power on the MAS200 when ready. Powering up the MAS200 should be the last step of the installation.

### **Power Cable Wire Connections**

- The three required connections that you must make at the fuse end of the power cable:
  - Chassis ground - labeled “BAT RTN”
  - +12/24 VDC Battery (Main) (unswitched) - labeled “BAT+”
  - +12/24 VDC Ignition (switched) - labeled “Ignition”
- Never wire the constant BAT+ connection or the IGNITION connection to the Accessory position. See [Appendix A](#) for detailed pin and wire callouts.

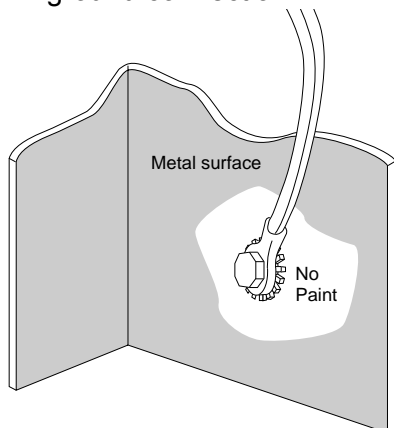


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1. Connect the black BAT RTN wires to a good grounding surface on the vehicle chassis or one that is connected to the chassis. Refer to [Grounding Guidelines on page 5-6](#) for more information.
2. Connect the yellow BAT+ wire to an unswitched (Main) +12/24 VDC power source, such as the hot side of the vehicle main wiring bus, the battery side of the ignition switch, or the battery side of the fuse block (not the load side). This bus provides constant +12/24 VDC to the MCP200 and must not be connected to the accessory bus or any other switched bus.
3. Connect the white IGNITION wire to the switched (ignition) +12/24 VDC power source, such as the ignition side of the ignition (key) switch or the ignition side of the fuse block.
  - +12/24 VDC should be present on the IGNITION wire only when the ignition switch is in the ON position, not in the OFF or Accessory position.
4. Lastly, connect the power cable to the MAS after all other connections have been made.

## Grounding Guidelines

- Create clean, secure, tight, metal-to-metal grounds.
- If grounding terminals are not available, remove the paint from the surface of the firewall or other metal connected to the chassis to make the ground.
- Remove the paint from the metal and tighten the bolt for a good metal-to-metal, chassis ground connection.

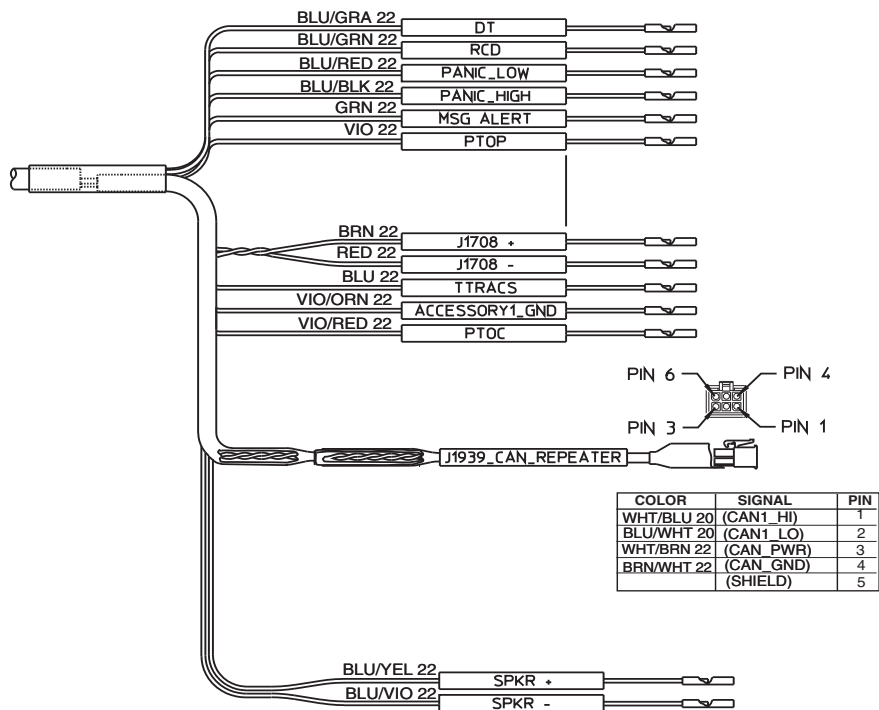


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Installing the Accessory Cable

- Connects the MCP200 to the truck’s audio for text-to-speech, the J1708/1587 and J1939 data links, and other vehicle inputs and optional system devices.
- Typically, the accessory cable is routed to the vehicle’s dash area where accessory connections are made.
- Provides necessary wiring for optional system features, such as display screen disabling, Performance Monitoring system, Trailer Management system, buzzer, RMWL, panic button and other security devices.
- Standard length of accessory cable is 20 feet
- See [Appendix A](#) for detailed wiring diagrams.

MCP200 Accessory Cable



09AAA\_027

Note

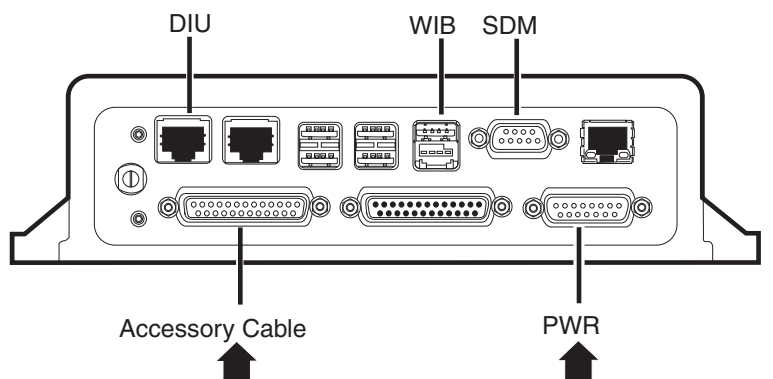
If a truck is pre-wired with an MCP100 accessory cable, an adapter cable is available to bridge that existing cable to the the MCP200 MAS. This adapter cable must be ordered separately. See [Appendix A](#) for adapter cable details and limitations.

### Cable Run

- Run direction—Run the loose conductor end of the cable from the MAS200 to the dash area. (The connector is too large to pass through most access holes.)
- Routing location—Route internally or externally. Use existing cable runs.
- Cable dressing—Stow and secure any loose wires. Use convoluted tubing for cables run externally.
- Installation instructions for optional accessories which use the accessory cable are provided in later chapters of this guide.
- Before connecting the accessory cable to the MCP200, inspect the connectors to make sure they are not damaged and the pins are not bent. Do not attempt to straighten bent pins. This further weakens the pins and results in cable failure.

### Connecting Cables to the MAS200

1. Inspect all connectors for bent pins.
2. Align the connector so it is straight before sliding into position and connect the accessory cable into the I/O 1 slot.
3. Only hand-tighten the thumb screws on the connector.



09AAA\_018A

4. Stress relief all cables by tie-wrapping them together and using the strain relief bracket to ensure connectors stay secure.



## ***Wireless Interface Box 200 (WIB200) Antenna Installation***

---

Topics in this chapter provide general guidelines and instructions for installing the wireless interface box 200 (WIB200) antenna.

|   |     |
|---|-----|
| <i>General Installation Guidelines</i> .....            | 6-2 |
| <i>Installation of WIB Mount</i> .....                  | 6-3 |
| <i>Routing the WIB Cable</i> .....                      | 6-5 |
| <i>Connecting the Antenna Cable to the MAS200</i> ..... | 6-5 |

**For technical questions, contact Omnitrac's Customer Support.**

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- In the United States, call 800-541-7490
- In Canada, call 800-863-9191



## General Installation Guidelines

1. Install the WIB mount (not always needed).
2. Mount the WIB antenna.
3. Connect cable to WIB.
4. Route and connect the antenna cable to the MAS200.

### Note

*For vehicles with flat roofs, the WIB antenna can be mounted directly to a clean roof surface. If this preferred, there is no WIB mount needed.*

## WIB Antenna View-of-Sky Requirements

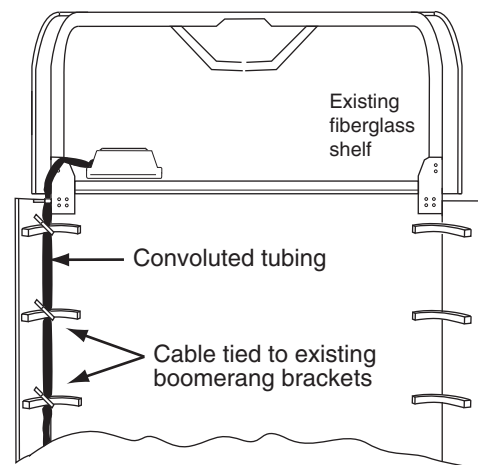
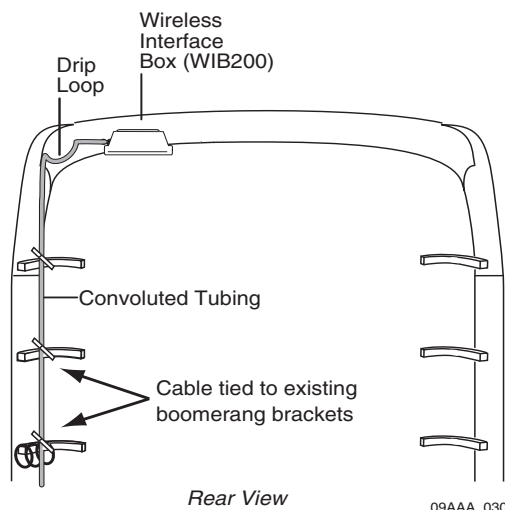


### Caution

*Failure to comply with the view-of-sky requirements and installation guidelines sections of this document could degrade the performance of the MCP system.*

The antenna should have a clear, unobstructed line-of-sight view of the sky for optimum antenna operation. The WIB antenna transmits and receives GPS, cellular, and WiFi signals. Normally, the signals can pass through a single layer of glass, fiberglass, or plastic with minimal signal loss. However, other obstructions, such as metallic paint, may degrade performance or completely block the signals. Commonly encountered obstructions on vehicles include:

- metallic paint
- metal canopies
- metal cages





## Installation of WIB Mount

The WIB mount attaches to the backside of the vehicle - it should be placed as high up on the vehicle as possible. Be sure to consider the WIB cable routing distance is no more than 17 feet between the WIB antenna and the MAS200. There are two options on installing.

---

### Caution

*Do not locate the WIB near an exhaust stack where there is possible exposure to excessive heat.*

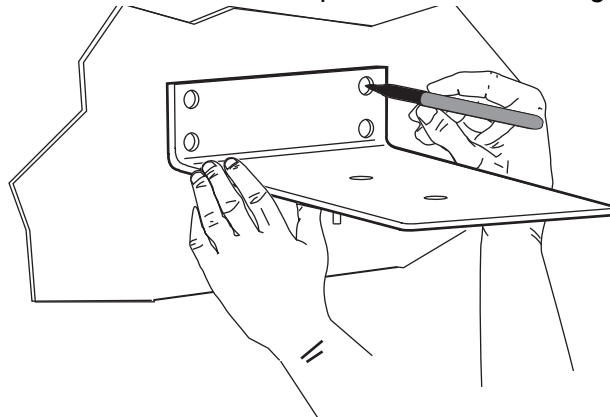
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### Option #1

For MCP200 systems installed that do not have an optional satellite antenna, the WIB mount plate is typically attached directly to the factory installed antenna mount. The two studs on the bottom of the WIB mount are designed to fit through the hole pattern of a factory installed antenna mount. The WIB is then attached to the plate using the attached VHB tape.

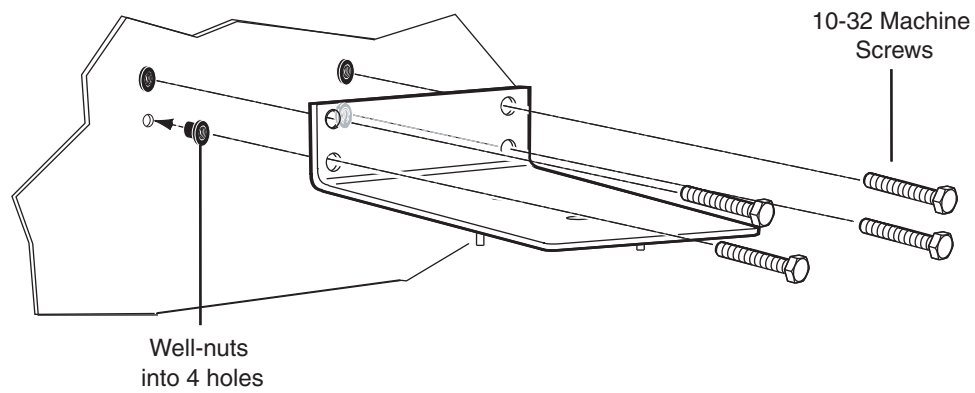
### Option #2

1. Align mount on any rigid surface between .035 and .232 inches thick. It should be located as high as possible.
2. Use the mount as a template to mark two diagonal mounting holes prior to drilling.



09AAA\_042

3. Drill four .375 (3/8") holes in the positions marked in [step 2](#).
4. Place the well-nut inserts all the way into each .375 hole until the flanges fit firmly against the mounting surface.
5. Place the mount over the mounting holes.



6. Add a small bead of silicone on the 10-32 machine screws before passing them the through the mounting holes and tighten until snug.

### **Mount the WIB Antenna**

1. Use alcohol pad to ensure that the surface is free of dirt and wax.
2. Peel protective plastic from VHB tape on the WIB antenna and attach squarely to the mount with cable connector facing the appropriate side of the mount. The WIB connector should be routed to the side and not directly off the back to avoid being hit by the trailer or load locks.

### **Routing the WIB Cable**

The antenna cable connects the WIB to the MAS200. The standard length is 17 feet.

- Run direction—Start at the WIB and run the cable down to the MAS200.

---

#### **Caution**

*Do not route the cable where it will be in excessive heat.*

---

### **Connecting the Antenna Cable to the MAS200**

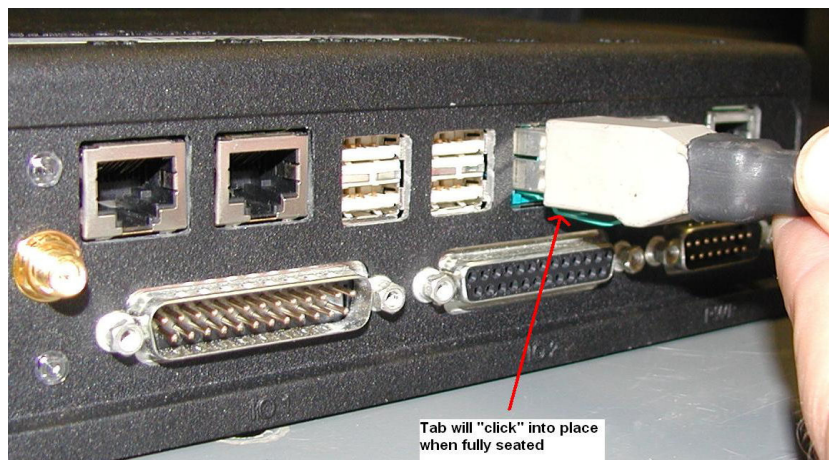
1. Inspect the antenna cable connectors for damaged or bent pins.
2. Connect the antenna cable into the MAS's WIB slot.

---

#### **Caution**

*The WIB cable connector should slide in easily to the MAS and a slight click will occur when it's fully mated. There is a release tab on the bottom side of the connector. Be careful not to use too much force when connecting or disconnecting the cable.*

---





## Optional Satellite Data Modem (SDM) Installation

---

Topics in this chapter provide guidelines for installing the MCP200 optional satellite data modem (SDM).

|   |     |
|---|-----|
| <i>General Installation Guidelines</i> .....        | 7-2 |
| <i>Orienting the SDM on the Mount</i> .....         | 7-2 |
| <i>Installing Mounting Bolts</i> .....              | 7-3 |
| <i>Line-of-Sight Requirements</i> .....             | 7-4 |
| <i>Trailer Swing Area</i> .....                     | 7-5 |
| <i>Installing the SDM Cable</i> .....               | 7-5 |
| <i>Connecting the SDM Cable to the MAS200</i> ..... | 7-7 |

**For technical questions, contact Omnitrac's Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191



## General Installation Guidelines

1. Orient the SDM on the mount.
2. Connect the SDM.
3. Route the SDM cable.
4. Connect the SDM cable to the MAS200.

### Selecting a Mount

See the **Outdoor Unit Mount Installation Guide** for a complete list of Omnitrac's mounts for specific vehicle types and complete instructions for installing the SDM on the mount.

- Use only Omnitrac's-designated mounts for equipment installed in the United States.
- Provide adequate clearance from any nearby structures, such as airdams and exhaust stacks.
- Position the mount on the driver's side, if possible, where tree branches and other hazards will less likely contact the SDM.
- DO NOT install SDMs on headache racks or exhaust pipes.



#### Caution

*Headache racks are mounted to the vehicle frame and there is no shock cushioning. An SDM mounted on a headache rack risks damage. Omnitrac's reserves the right to charge for replacement or repair of damaged or malfunctioning SDMs which Omnitrac's determines to have failed as a result of installation on the headache rack.*

---

- DO NOT paint the SDM. Painting the SDM will degrade the performance of the mobile computing platform (MCP200) and void the unit warranty. The SDM *mount* may be painted.
- DO NOT open the SDM. Removing the radome will void the warranty unless you have obtained authorization and instructions from Omnitrac's. Removing the radome exposes the MCP200 antenna to moisture.
- DO NOT overtighten bolts or connectors.

### Orienting the SDM on the Mount

- Install the SDM so that it is level when the vehicle is level.

**Vehicles with Airdams**

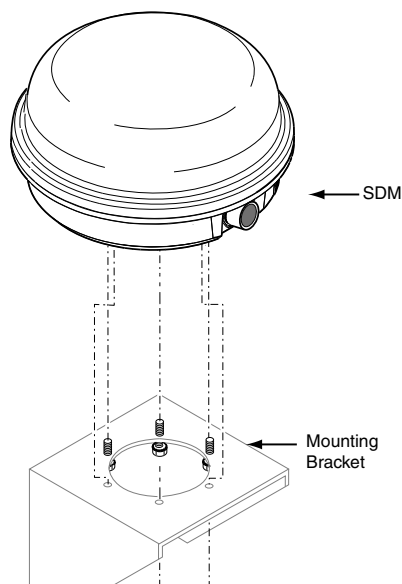
- Under a full airdam, orient the SDM so the SDM cable exits toward the **front** of the vehicle.
- This orientation reduces the likelihood of water entering the SDM through the connector port, especially when the vehicle is cleaned with high-pressure water.

**Vehicles Without Airdams**

- On a vehicle without an airdam and/or the mount is on the rear of the cab, orient the SDM so the SDM cable connection faces toward the **side** of the vehicle. See page 3-11 for cable routing examples.
- This orientation prevents wind-driven rain from pounding the connector, while preventing trailer swing from hitting the connector.
- Install the SDM so that it does not exceed the Federal D.O.T. mandated maximum legal height of 13' 6".

**Installing Mounting Bolts**

1. Mount the SDM to the mounting bracket using the bolts and washers supplied with the SDM mounting hardware (or exact substitutions). Normally, bolts longer than 3/4" should not be used. If longer bolts are needed, such as when the SDM is being attached to a fiberglass shelf with a plywood base, use 1/4-20 UNC grade 8 or better.
2. Tighten the SDM mounting bolts to the recommended torque of 72 **inch/pounds**.

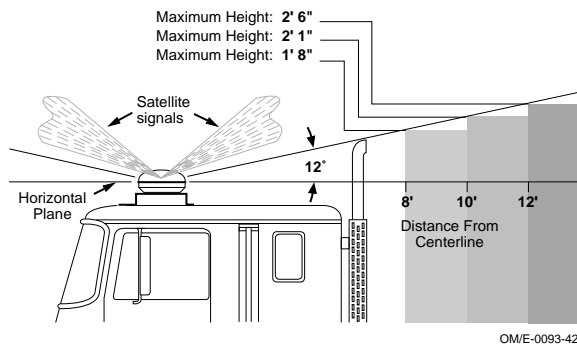
**Caution**

To avoid over-torquing, **never** use power tools to tighten mounting hardware.

## Line-of-Sight Requirements

- SDM requires an unobstructed line-of-sight view to the satellite in order to clearly send and receive signals.
- SDM must be able to send and receive the signals at a 12° angle above the horizontal plane of the unit. There must be an unobstructed view of the satellite at all angles above 12°.

The following illustration shows the 12° angle and the maximum allowable height of objects located at various distances from the SDM centerline.

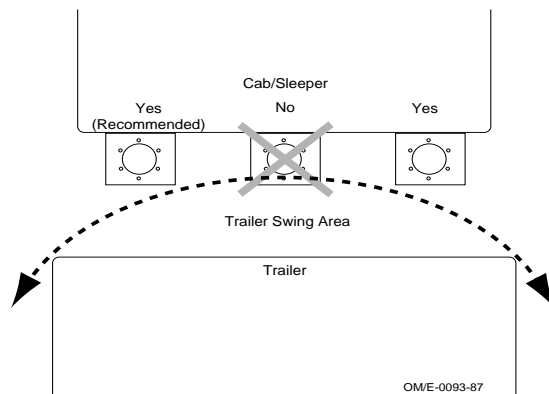


- An obstruction height of 2.5 feet for every 12 feet away from the SDM centerline is acceptable. Use this same formula to verify that a trailer hooked up to the vehicle does not extend above the 12° angle.
- Satellite signal can normally pass through thin layers of glass, fiberglass, and plastic. Thick layers or obstructions above the 12° angle may block the satellite signal and cause “blind spots.” Keep blind spots to a minimum:
  - Multiple layers of fiberglass, glass, or plastic
  - Areas with numerous bends in the fiber glass
  - Metal and wood bracing
  - Metallic paints and lead-based paints
  - Company logos that contain metallic materials
  - Metal airdams, metal wings, metal side skirts, air conditioning units, and exhaust stacks.
- When mounting an SDM, make sure that the mounting surface is strong enough to support the weight of the SDM and mount.
- The installation must also withstand very strong shock forces exerted by the vehicle when it is moving.



## Trailer Swing Area

- DO NOT position the mount in the rear center of the vehicle. The corner of the trailer could hit the SDM when the vehicle turns sharply.
- When positioning the SDM on the mount, protect the SDM connector by turning the antenna so it faces the side and NOT the back of the trailer.
- Make sure that when the “fifth wheel” of a vehicle is fully forward, the trailer clears the SDM when executing sharp turns or going up ramps.
- If the vehicle will be hauling refrigerated trailers, make sure that the refrigeration unit still clears the SDM when the driver turns sharply or drives up ramps.

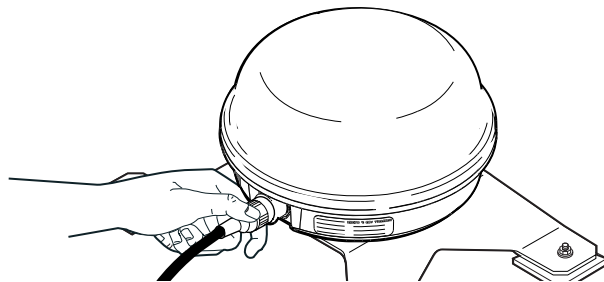


## Installing the SDM Cable

- Connects SDM to MAS200.
- Standard length is 20 feet.

## Connecting the SDM Cable

1. Install the SDM cable on the SDM connector and hand-tighten.



**Caution**

If the cable does not easily connect to the SDM cable connector, check the part number of the cable to make sure you are using the SDM cable. The SDM cable is keyed to avoid an incorrect cable with a similar connector type from being attached.

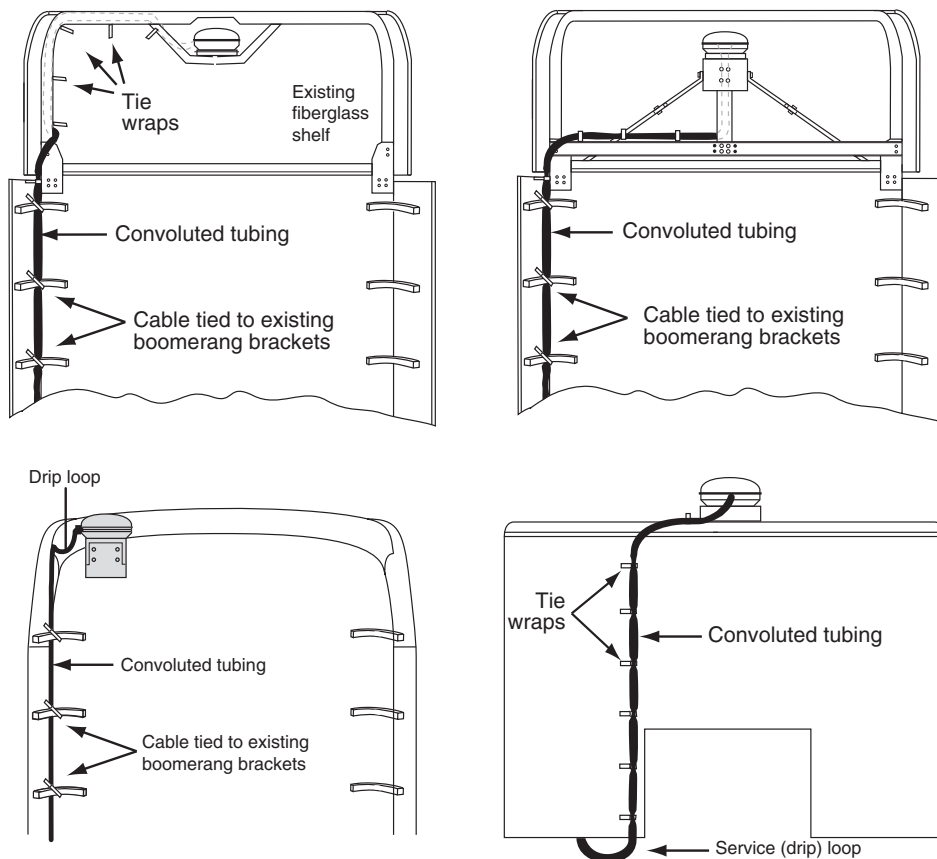
- The SDM connector is weather-resistant; do not weather-proof the SDM connector.

**Caution**

Do not use refrigeration/tar tape on the SDM connector.

**SDM Cable Run**

- Run direction—Start at the SDM mount and run the cable down to the MAS200.
- Routing location—Route the cable externally.



- Cable dressing—SDM cable comes with pre-installed convoluted tubing and UV resistant tie wraps.

### SDM Cable Installation

1. Start at the SDM and run the cables down the back of the sleeper/cab and under the body toward the MAS200.
  - Route the cable using existing brackets as tie points.
2. Drill an access hole through the bottom of the cab so it enters where the MAS200 is installed. See [Access Holes on page 3-13](#).
3. Store and coil excess cable near the MAS200.

**Caution**

*Do not tie the cable to the headache rack. Headache racks are mounted to the chassis and move at different rates than the body.*

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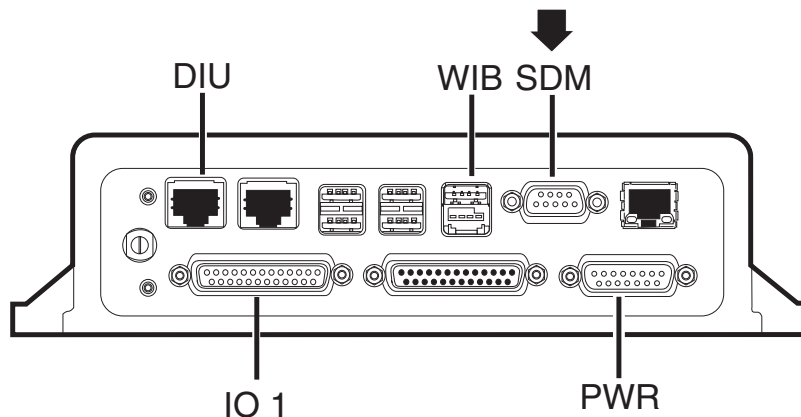
**Caution**

*Loose cables can cause damage to paint and wear to the fiberglass. Ensure that the cables are secured to the vehicle with tie wraps at approximately 18" intervals.*

---

### Connecting the SDM Cable to the MAS200

1. Inspect the connector for bent pins.
2. Only hand-tighten the thumb screws on the connector.
3. Align the connector so it is straight before sliding into position.
4. Connect the SDM cable into the SDM slot.



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## Display Interface Unit 200 (DIU200) Installation

Topics in this chapter provide guidelines and instructions for installing the DIU200.

|   |     |
|---|-----|
| <i>General Installation Guidelines</i> .....            | 8-2 |
| <i>Installing the Display Holster and Display</i> ..... | 8-5 |
| <i>Connecting the Display Cable to the DIU200</i> ..... | 8-6 |
| <i>Inserting the DIU200 into the Holster</i> .....      | 8-7 |
| <i>Connecting the Display Cable to the MAS200</i> ..... | 8-7 |

**For technical questions, contact Omnitrac's Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191



## **General Installation Guidelines**

1. Install the holster and DIU200.
2. Route and connect the cable to the DIU200.
3. Connect the display cable to the MAS.

### **Selecting a Mounting Location**

#### **IMPORTANT SAFETY INFORMATION**

Do not locate the display unit where it obstructs the driver's field of vision, distracts the driver from the driving task, or interferes with the driver's operation of controls or displays.

#### **DO NOT locate the DIU where it:**

- obstructs the driver's field of vision
- distracts the driver from the driving task
- interferes with the driver's operation of controls or displays
- obstructs the area swept by the windshield wipers
- blocks the deployment of an airbag

#### **DO locate the DIU where:**

- it can be safely installed on a secured bracket that is robust enough to minimize any vibration and sustain the weight of the DIU.
- the mounting surface is strong enough to support the mounting hardware and DIU
- the mounting surface is flat
- it is in the driver's line-of-sight, easy to touch, but does not block the view of the road or mirrors
- the surrounding area is clear of dash controls and gauges
- the display cable is long enough to reach the mating connector on the accessory cable
- it is not mounted in constant, direct sunlight
- it does not limit a passenger's leg room or block access to any other compartments
- it does not interfere with anyone entering or exiting the vehicle cab
- it is not likely to impact the driver or passenger in case of an accident or collision

***Example of Volvo truck and DIU placement***

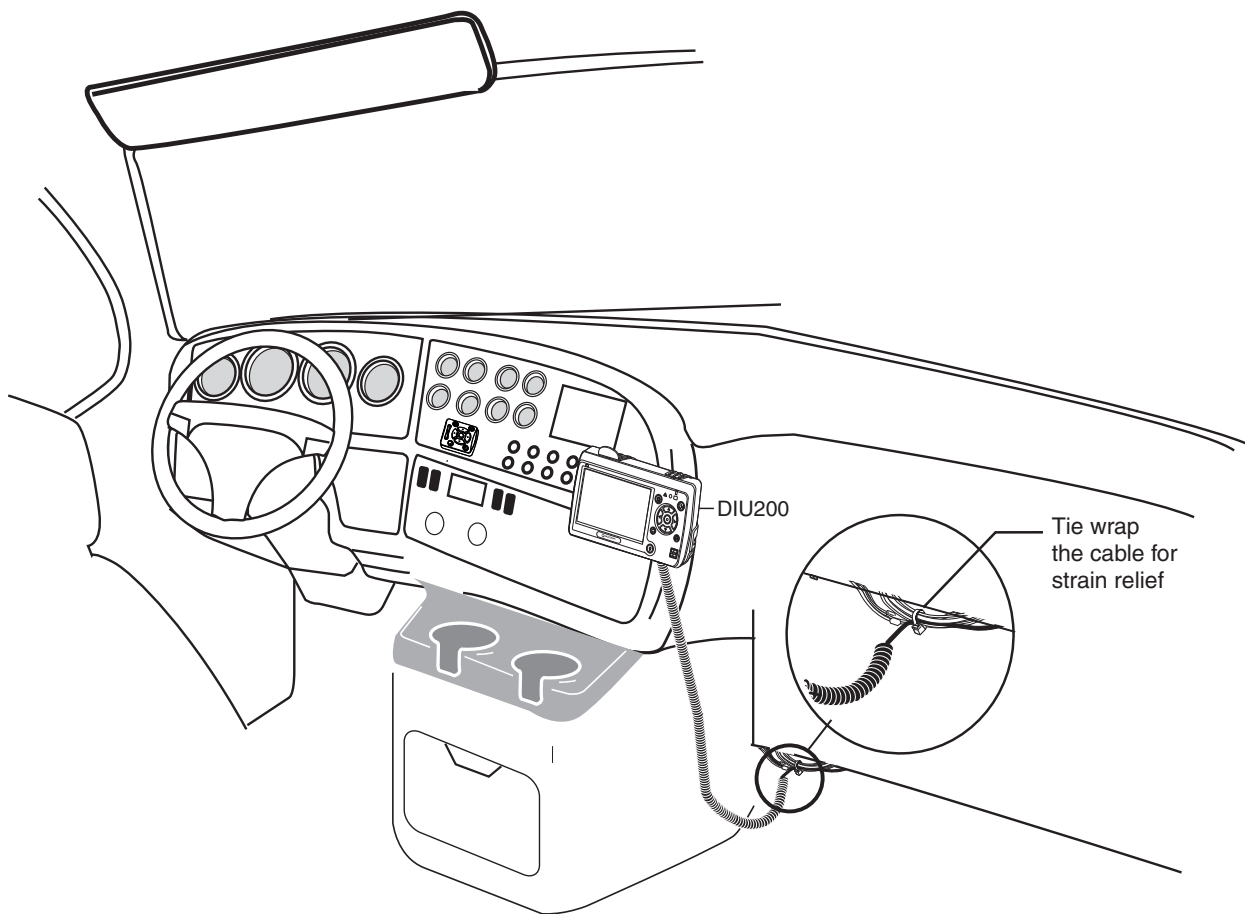


***Example of Freightliner truck and DIU placement***



***Example of International truck and DIU placement***





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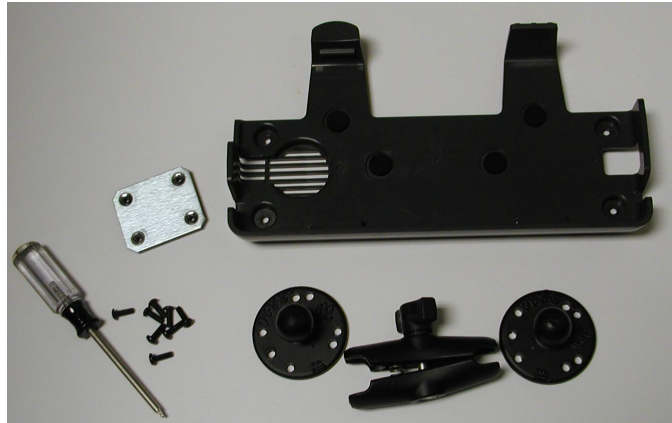
**Additional information for selecting an installation location:**

- Nothing should be installed on the windshield that obstructs the area swept by the windshield wipers or obstructs the driver's sight to the road and highway signs and signals. (FMCSA document 49 CFR 393)
- No devices should be mounted more than 6 inches below the upper edge of the windshield, or extend more than 4.5 inches above the bottom of the windshield. (FMCSA document 49 CFR 393)
- Before installing the device, be aware of and follow all state laws and driving codes.  
California Driving Code Section 26708(a)(1) states: No person shall drive any motor vehicle with any object or material placed, displayed, installed, affixed, or applied upon the windshield or side or rear windows.
- Consider the owner's preference in selecting the installation location and whether there is a team or a single driver.



## Installing the Display Holster and Display

Omnitracs recommends using RAM Mounting Systems mounting hardware. This can be ordered separately from Omnitracs. Refer to [Appendix F](#). Always use a backing plate to strengthen the area.



1. Verify that there is nothing behind the mounting surface that might be damaged by drilling holes.
2. Drill holes for the mounting bracket and backing plate.
3. If applicable, follow installation instructions from the third-party bracket mount manufacturer.
4. Attach the holster to the third-party bracket mount using four 8x24 screws.

To attach the RAM mount ball-joint to the holster, the screws should be 1/2 inch long. Do not use screws that are too long or they will protrude through the holster.

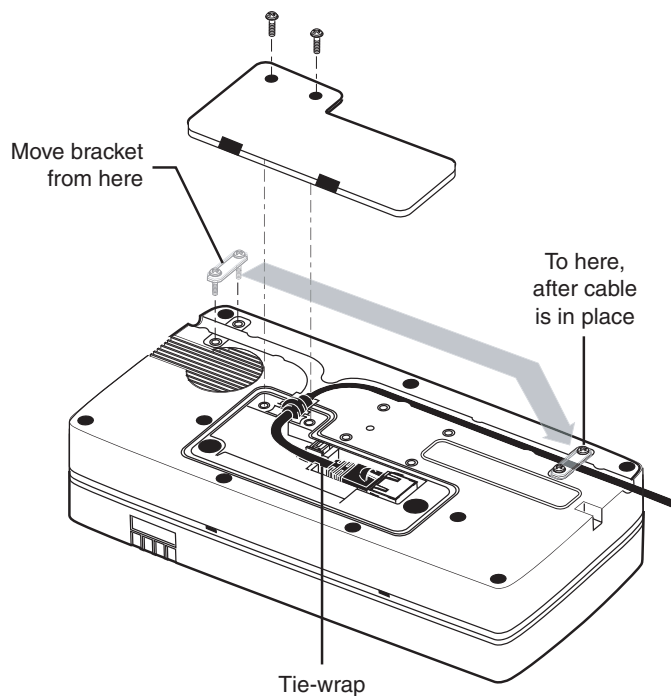


**Display Cable Routing**

- Run direction—In most vehicles, the display is mounted on the dash. Route the cable from the DIU200 to the MAS200 with the coiled end of the cable at the DIU200 and the uncoiled end routed to the MAS200.
- Cable dressing—For strain relief, the base of the coil should be secured with tie wraps. The strain-relief tie wrap is normally positioned at the point where the cable transitions from a straight cable to a coiled cable.

**Connecting the Display Cable to the DIU200**

1. Use a #10 Torx driver to remove the DIU200's back housing.
2. Remove the protective cap on the connector.
3. Plug connector into DIU200. This provides strain relief.
  - Make sure the rubber grommet fits in the grooves of the DIU200.
  - Make sure the flat side of the grommet is facing up.
4. Route the display cable through a channel on the back of the DIU200.

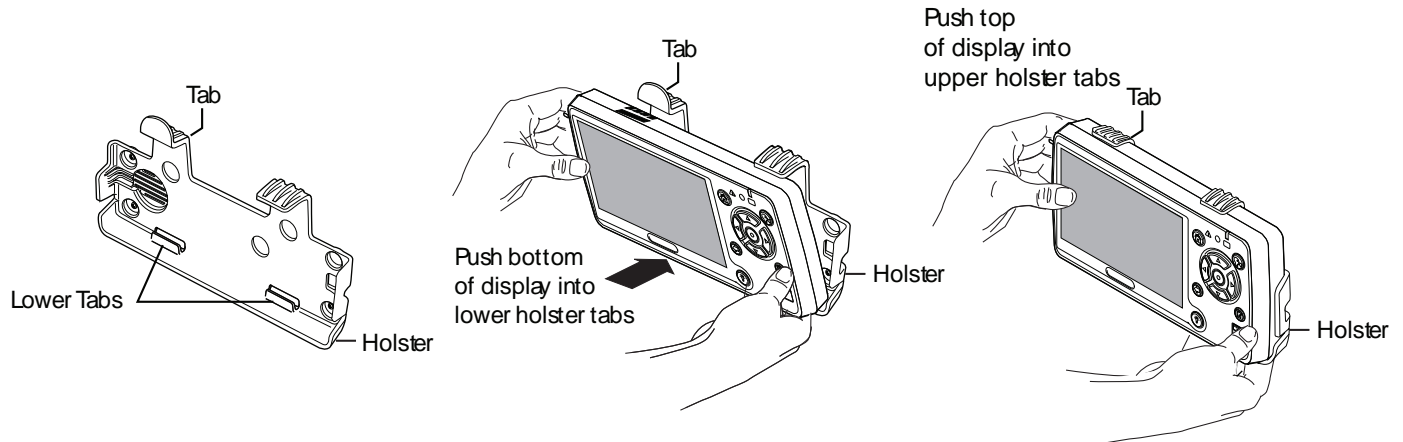


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5. Insert a small tie-wrap near the tie-wrap connection.
6. Reinstall the back housing and install the small bracket over the cable.

## Inserting the DIU200 into the Holster

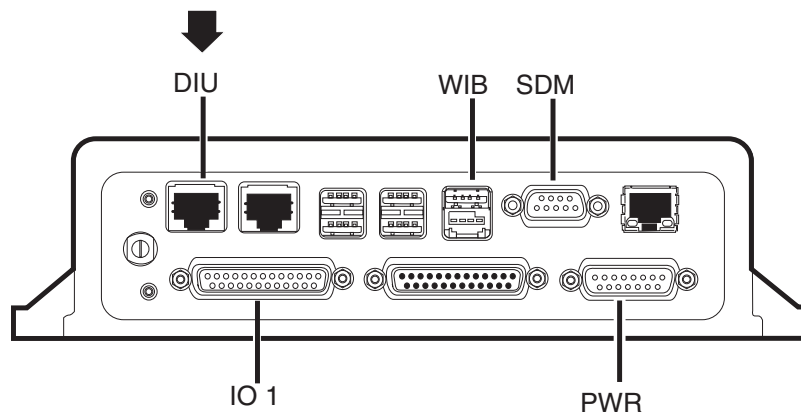
1. Push bottom of display into lower holster tabs.
2. Push top of display into upper holster tabs.



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## Connecting the Display Cable to the MAS200

1. Align the connector so it is straight before sliding into position.
2. Connect the display cable into the DIU slot. The latch faces down.



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## Text-to-Speech (TTS) Installation

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Topics in this chapter provide guidelines for installing the speaker switch cable for the MCP200 text-to-speech (TTS) feature.

For optional RCD installation, see [Chapter 19](#).

|  |     |
|--|-----|
| <a href="#">General Installation Guidelines</a> .....                      | 9-2 |
| <a href="#">Selecting a Speaker</a> .....                                  | 9-2 |
| <a href="#">Option 1—Connecting to an Existing or Shared Speaker</a> ..... | 9-3 |
| <a href="#">Option 2—Connecting to a Dedicated 8-ohm Speaker</a> .....     | 9-6 |

**For technical questions, contact Omnitrac's Customer Support.**

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- In Canada, call 800-863-9191

## General Installation Guidelines

1. Select a speaker (either dedicated or shared/existing truck speaker).
2. Route and connect speaker switch cable to speaker and accessory cable.

## Selecting a Speaker

### Speaker Requirements

There are two basic speaker requirements for TTS:

- Only one speaker can be connected to the MCP200 for text-to-speech play, otherwise the volume will be very low.
- An 8-ohm speaker, such as a standard CB speaker or standard truck audio speaker, **should be** used for text-to-speech play.

Some 60-ohm and 40-ohm speakers may work. We recommend testing prior to performing installation.

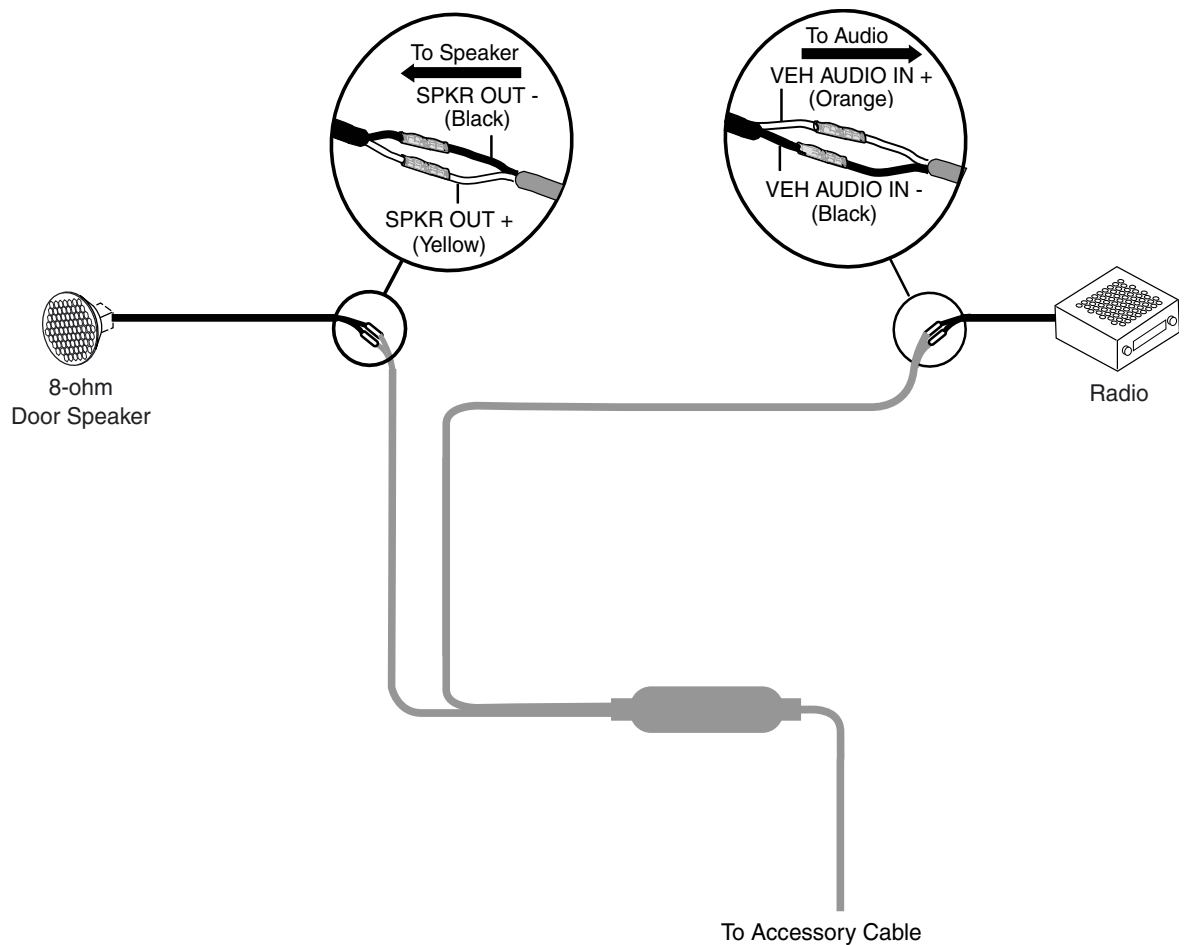
### Choosing a Speaker

Text-to-speech works with either an existing speaker (typically, the driver's side door speaker) that is part of the vehicle's audio system, or a speaker that can be added for text-to-speech.

- If you are using a vehicle's audio system 8-ohm speaker, see [Option 1—Connecting to an Existing or Shared Speaker on page 9-3](#).
- If you are adding a dedicated speaker for TTS, see [Option 2—Connecting to a Dedicated 8-ohm Speaker on page 9-6](#).

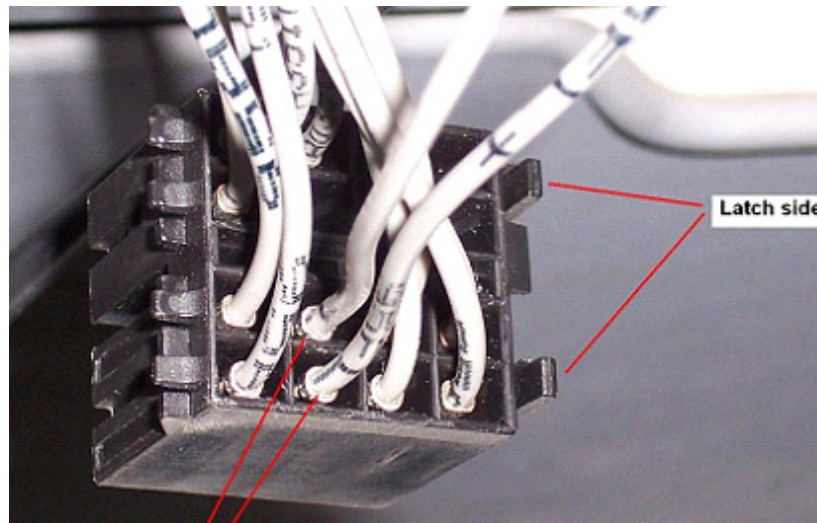
**Option 1—Connecting to an Existing or Shared Speaker**

1. Test the audio system prior to installation.
2. Remove audio/radio.
3. Locate the speaker wires to be used for message playback. Refer to *Radio Connector Pin Callouts* on page A-12.
4. Find a good location on the speaker wires where they can be cut and where there will be enough room to work on either side of the cut.
5. Cut the speaker wires.



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Example of common radio harness with the two driver-side speaker wires identified.



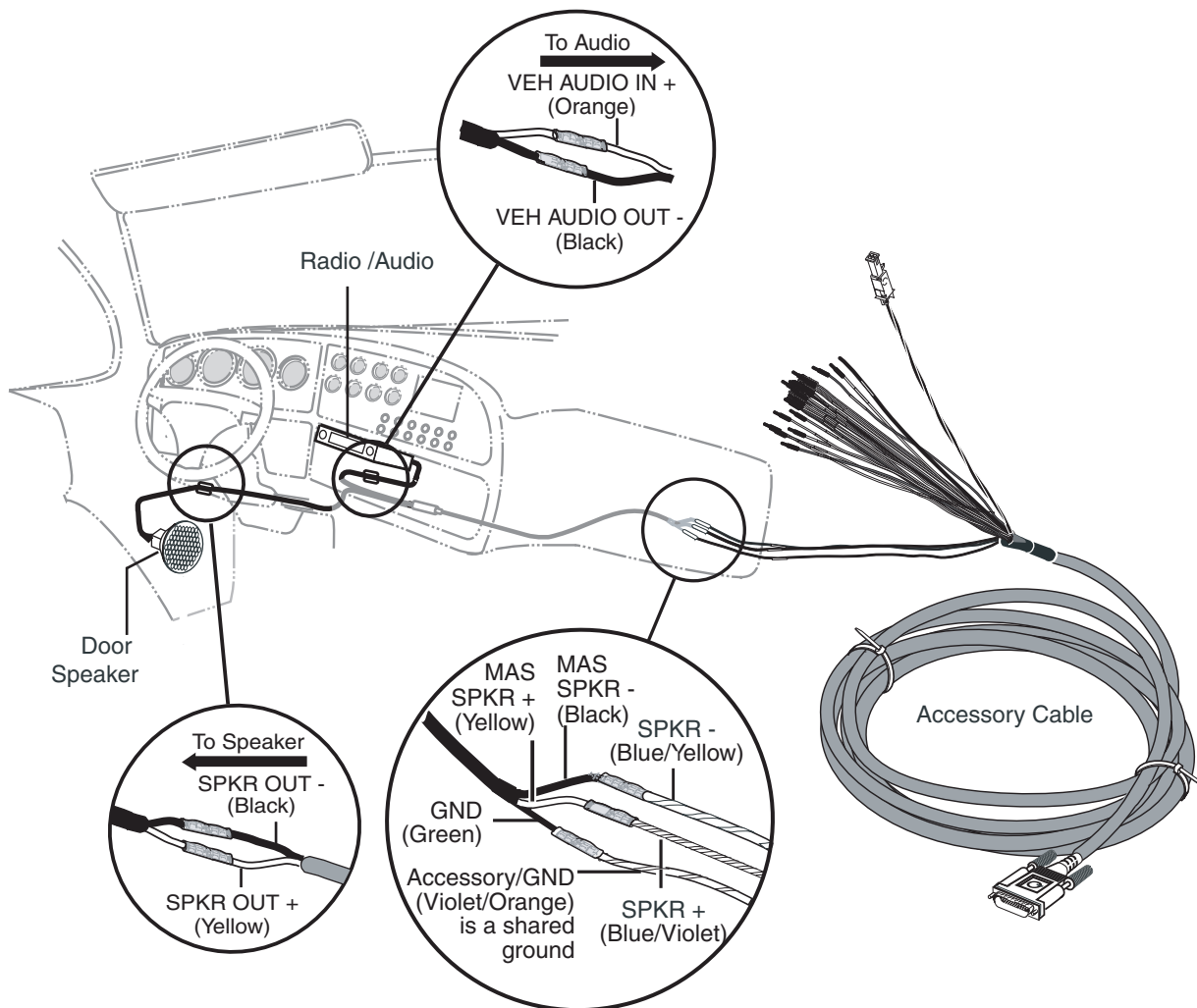
6. Butt splice the yellow SPKR OUT+ wire on the speaker switch cable to the positive (+) wire that leads from the speaker.
7. Butt splice the black SPKR OUT- wire on the speaker switch cable to the negative (-) wire that leads from the speaker.
8. Butt splice the orange VEH AUDIO IN + wire on the speaker switch cable to the positive (+) speaker wire that leads from the audio.
9. Butt splice the black VEH AUDIO IN - wire on the speaker switch cable to the negative (-) speaker wire that leads from the audio.
10. Tie wrap loose cabling and reconnect/replace the radio.

### **Connecting Speaker Switch Cable to Accessory Cable**

1. Butt splice the yellow MAS SPKR + wire on the speaker switch cable to the blue/yellow SPKR + wire on the accessory cable.
2. Butt splice the black MAS SPKR - wire on the speaker switch cable to the blue/violet SPKR - wire on the accessory cable.



- Butt splice the green GND wire on the speaker switch cable to the violet/orange Accessory/GND on the accessory cable.



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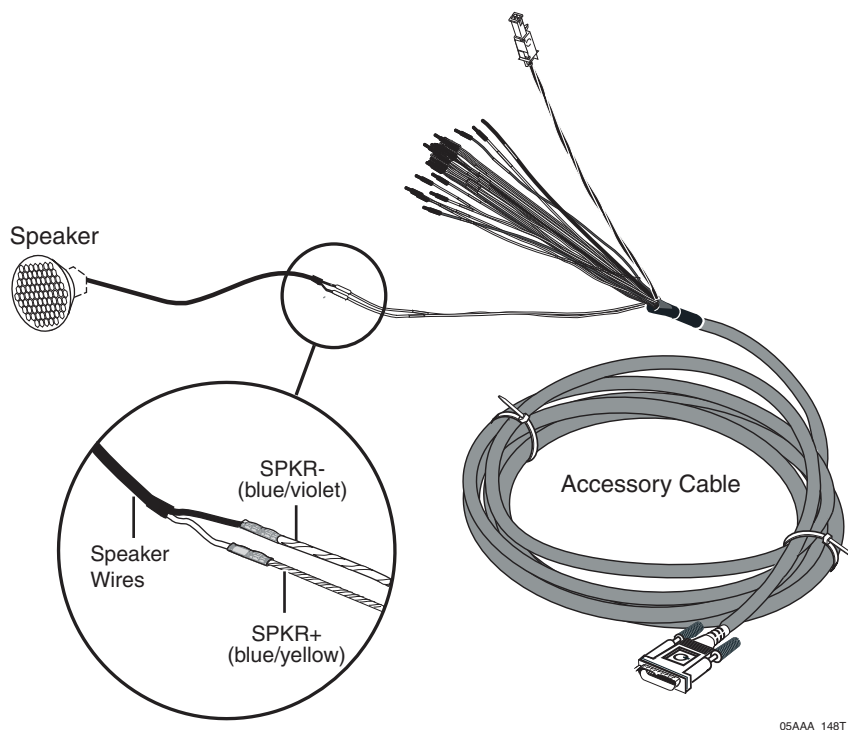
**Option 2—Connecting to a Dedicated 8-ohm Speaker**

Connect the dedicated speaker for text-to-speech play directly to the accessory cable:

1. Butt splice the blue/yellow SPKR + wire on the accessory cable to the positive (+) wire that leads from the speaker.
2. Butt splice the blue/violet SPKR - wire on the accessory cable to the negative (-) wire that leads from the speaker.

**Note**

*The speaker switch cable is not used if you are adding an external, dedicated speaker.*



# 10

## Vehicle Data Bus Connections

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Topics in this chapter provide the procedures for performing J1939, J1708/J1587, and traditional sensors (standard speed and RPM) installations.

|   |       |
|---|-------|
| <i>Vehicle Data Source Overview</i> .....                               | 10-2  |
| <i>Vehicle Data Source Selection</i> .....                              | 10-3  |
| <i>Guidelines for Connecting to the J1939 Data Bus</i> .....            | 10-3  |
| <i>J1939 Pre-installation Check Out</i> .....                           | 10-4  |
| <i>Option 1—Connecting J1939 Using the Repeater Cable</i> .....         | 10-5  |
| <i>Option 2—Connecting J1939 Without Using the Repeater Cable</i> ..... | 10-7  |
| <i>Connecting J1708 /J1587</i> .....                                    | 10-10 |
| <i>Verifying Data Source Connectivity</i> .....                         | 10-12 |

**For technical questions, contact Omnitracs Customer Support.**

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- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

## **Vehicle Data Source Overview**

The Omnitrac mobile computing platform can use the J1708/J1587 and J1939 data buses, as well as traditional sensors to monitor critical vehicle data:

- Traditional sensors are used on most pre-1992 trucks (limited application use).
- J1708/J1587 data bus is used on most 1992–2009 trucks.
- J1708/J1587 and J1939 data buses are available on 2007–2010 trucks.
- J1939 will be the only data bus used on most trucks built after 2010.

These data inputs can be monitored on the vehicle data services (VDS) screens. The vehicle data source makes this data available to specific applications on the MCP200.

### **J1939 Data Bus**

Omnitracs applications only support 2007 and newer trucks with ECMs that support the SAE J1939-71, Rev. Nov 2006 standard.

- High speed (250 Kb/sec) data bus.
- Uses a two-wire differential serial bus, which is a network backbone running throughout the vehicle with several stubs connecting each ECM to the backbone.

### **J1708/J1587 Data Bus**

- Low speed (9.6 Kb/sec), bi-directional data bus.
- Uses a two-wire differential serial bus, which runs throughout the vehicle.

### **Traditional Sensors**

- Use traditional sensors if the truck does not have the J1708/J1587 or J1939 data bus. For information on connecting traditional sensors and calibration, contact Omnitrac Customer Support.

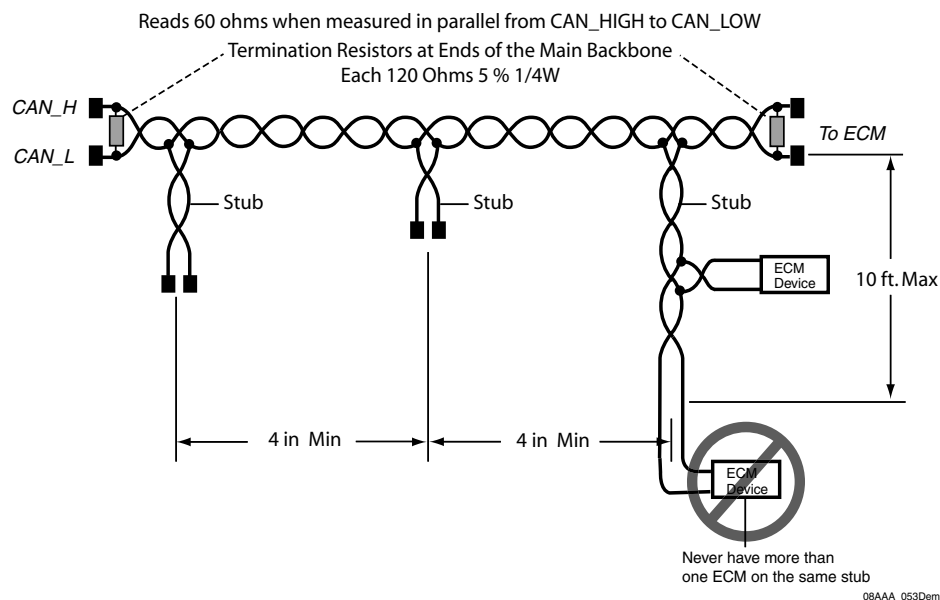
## Vehicle Data Source Selection

When making data source connections, there are two possible data buses available: the J1708 /J1587 low-speed data bus and the J1939 high-speed data bus. The truck year, make, and model, as well as the Omnitracs applications used determine which data bus to use. If both the J1708/J1587 and J1939 are available, we recommend connecting to both.

If you do not know which data source to use, contact your Omnitracs representative for assistance.

### Guidelines for Connecting to the J1939 Data Bus

- Choose Option 1 or Option 2 according to these specifications:
  - **Option 1:** Use the repeater cable when the distance between the MAS200 and the J1939 bus connection point exceeds 10 feet. Also use Option 1 for any after market installation.
  - **Option 2:** Use the direct connection method (no repeater cable) when the distance between the MAS200 and the J1939 bus connection point does not exceed 10 feet. Option 2 is not typically used in an after market installation.
- DO NOT extend factory wires.
- Maximum stub length is 10 feet.
- Minimum stub spacing is 4 inches.
- Never have more than one ECM device on the same stub.



## J1939 Pre-installation Check Out

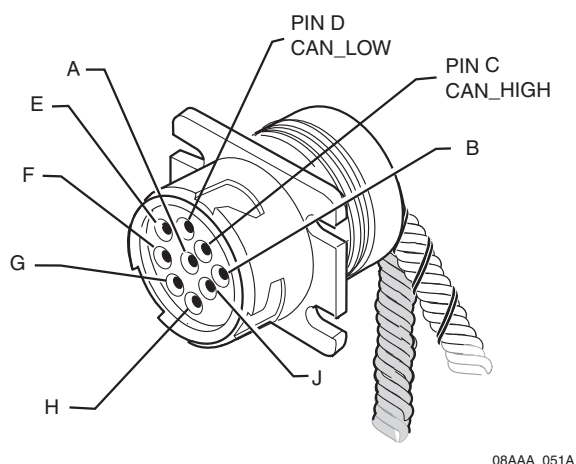
Prior to beginning any installation, start the vehicle and verify that the vehicle is in good working order, has no faults, and no check engine lights display.

### Resistance Test (to Verify that J1939 Is Present)

1. Turn ignition OFF.
2. Verify that J1939 is present on vehicle. Locate the 9-pin diagnostic (Deutsch) connector.

#### Note

If you have a 6-pin connector, you have J1708/J1587 only. See [Connecting J1708 / J1587 on page 10-10](#).



3. Using an ohmmeter, place the positive lead on pin C and the negative lead on pin D of the diagnostic connector. Verify that the resistance is 55–65 ohms.
  - If the resistance is 55–65 ohms, J1939 is present. Go to [Checking the MCP200 Accessory Cable for CAN on page 10-5](#).
  - If the resistance is not 55–65 ohms, there is a problem with your J1939 data bus. Fix the problem before proceeding.

#### Note

On some vehicles, open doors and/or cabin lights on may cause CAN/J1939 bus activity which may interfere with diagnostic connector resistance measurements.

|       |                                  |       |  |
|-------|----------------------------------|-------|--|
| Pin C | CAN High (tractor bus)<br>YELLOW | Pin H | Proprietary OEM use/<br>Implement bus CAN High |
| Pin D | CAN Low (tractor bus)<br>GREEN   | Pin J | Proprietary OEM use/<br>Implement bus CAN Low  |
| Pin E | CAN Shield (J1939-11)            |       |  |

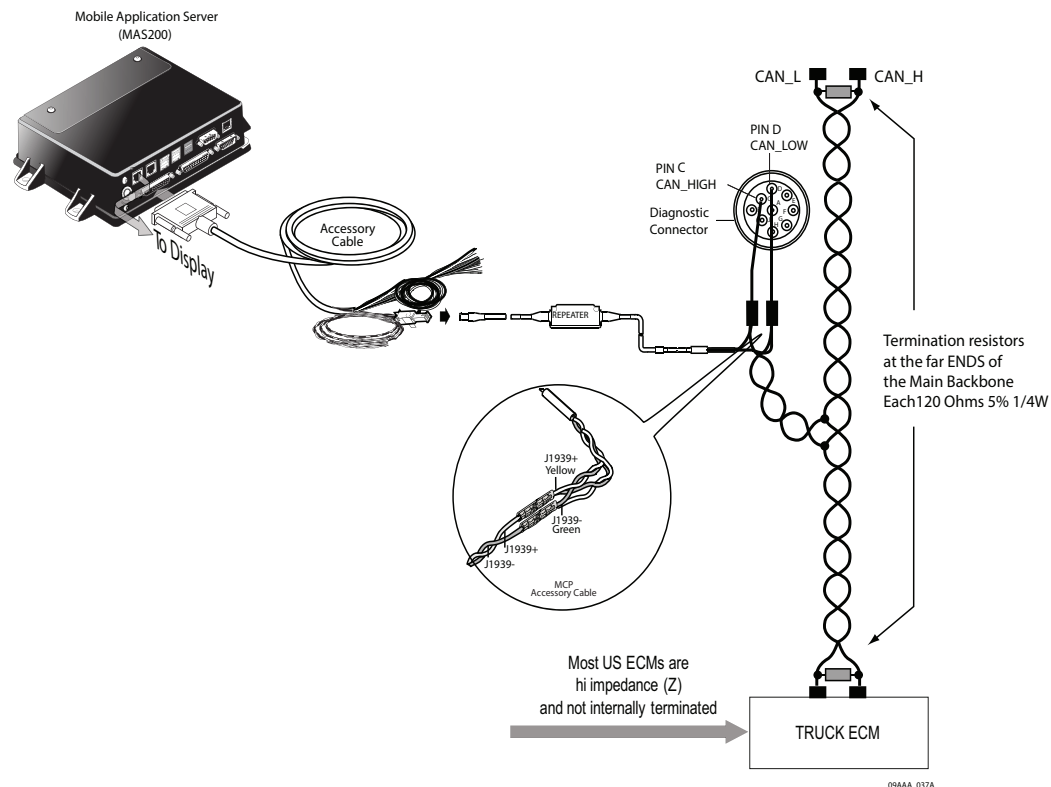
### Checking the MCP200 Accessory Cable for CAN

1. Locate the end of the installed MCP200 accessory cable. This cable is usually located in either the vehicle's dash or B-pillar.
2. Locate the CAN connector on the accessory cable.
3. For J1939 connections when the distance between the MAS200 and the J1939 data bus exceeds 10 feet, (including most after market cables), go to [Option 1—Connecting J1939 Using the Repeater Cable on page 10-5](#).
4. For J1939 connections when the distance between the MAS200 and the J1939 data bus does not exceed 10 feet, (including a larger percentage of factory prewires), go to [Option 2—Connecting J1939 Without Using the Repeater Cable on page 10-7](#).

### Option 1—Connecting J1939 Using the Repeater Cable

Use the repeater cable when the distance between the MAS200 and the J1939 bus connection point exceeds 10 feet. Also use Option 1 for any after market installation.

Connect the MCP200 accessory cable to the CAN repeater. A CAN repeater cable is required for this procedure (see [Appendix A](#) for detailed pin and wire callouts of the CAN repeater cable).



In order for the MCP200 to receive J1939 data, the MAS200 CAN/J1939 wires must be connected to the truck's J1939 CAN bus in the vehicle.

Follow all SAE guidelines when connecting to the vehicle's J1939 data bus.

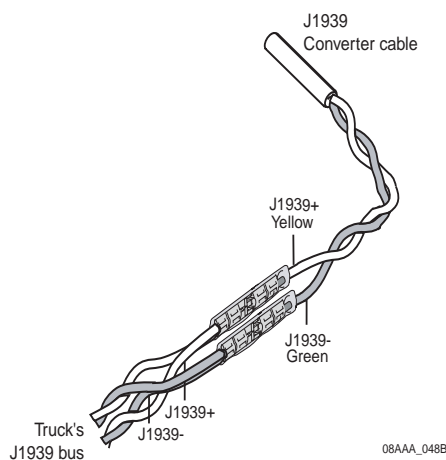
### **Making the Connection**

1. Start the vehicle and verify that the truck is in good working order and displays no dash faults.
2. Turn OFF the truck and ensure that no dash lights are on.

#### **Note**

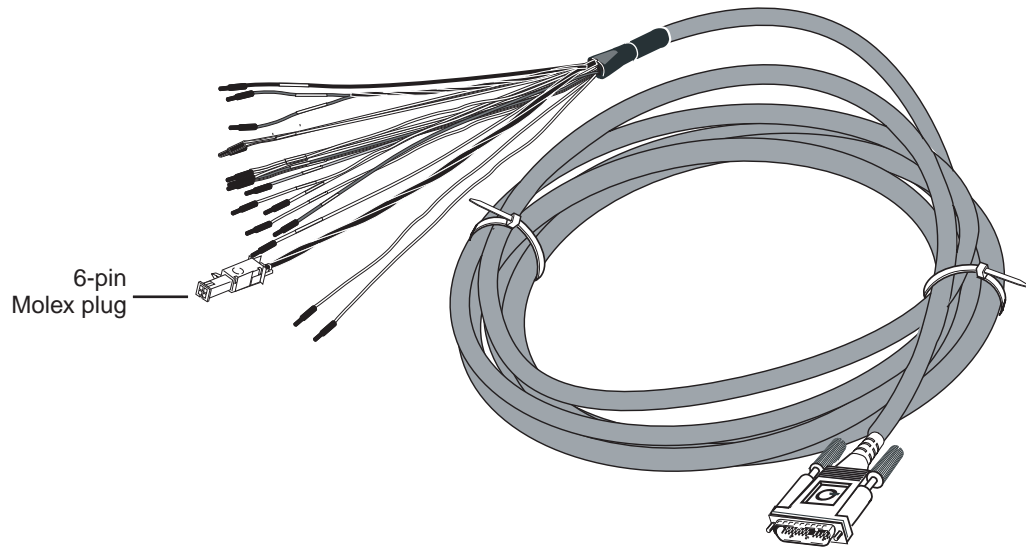
*Some trucks may have activity on the J1939 bus with the door open or if an accessory is active. This can cause a faulty resistance reading on the CAN bus.*

3. Measure the J1939 bus resistance at the diagnostic connector. It should read 60 ohms. (Refer to [Resistance Test \(to Verify that J1939 Is Present\)](#) on page 10-4.)
4. Locate the J1939 bus wires.
  - The J1939 wires are a twisted pair
  - CAN high (J1939+) (yellow)
  - CAN low (J1939-) (green)
5. Determine a suitable J1939 location point. In many vehicles you can connect behind the truck diagnostic connector. Be aware that only one electronic device should be connected to the J1939 stub at the back of the diagnostic connector at a time. If another device is already present you will need to splice directly into the vehicle's J1939 backbone. When splicing directly to the J1939 backbone bus, you will need to Ohm out (0 Ohms) CAN + and CAN - wires to Pin C (CAN high) and Pin D (CAN low) on the diagnostic connector. Contact Omnitracs Customer Support for assistance if needed.
6. Splice the yellow CAN high J1939+ wire from the repeater cable to the yellow CAN high J1939+ wire from the truck's J1939 bus. (Refer to the illustration on page 10-5.)
7. Splice the green CAN low J1939- wire from the repeater cable to the green CAN low J1939- wire from the truck's J1939 bus. (Refer to the illustration on page 10-5.)





8. Measure the J1939 bus resistance from Pin C to Pin D at the diagnostic connector. It should read 60 ohms.
9. Locate the CAN 6-pin Molex connector on the MCP200 accessory cable.
10. Connect the CAN repeater cable to the 6-pin Molex plug on the MCP200 accessory cable.



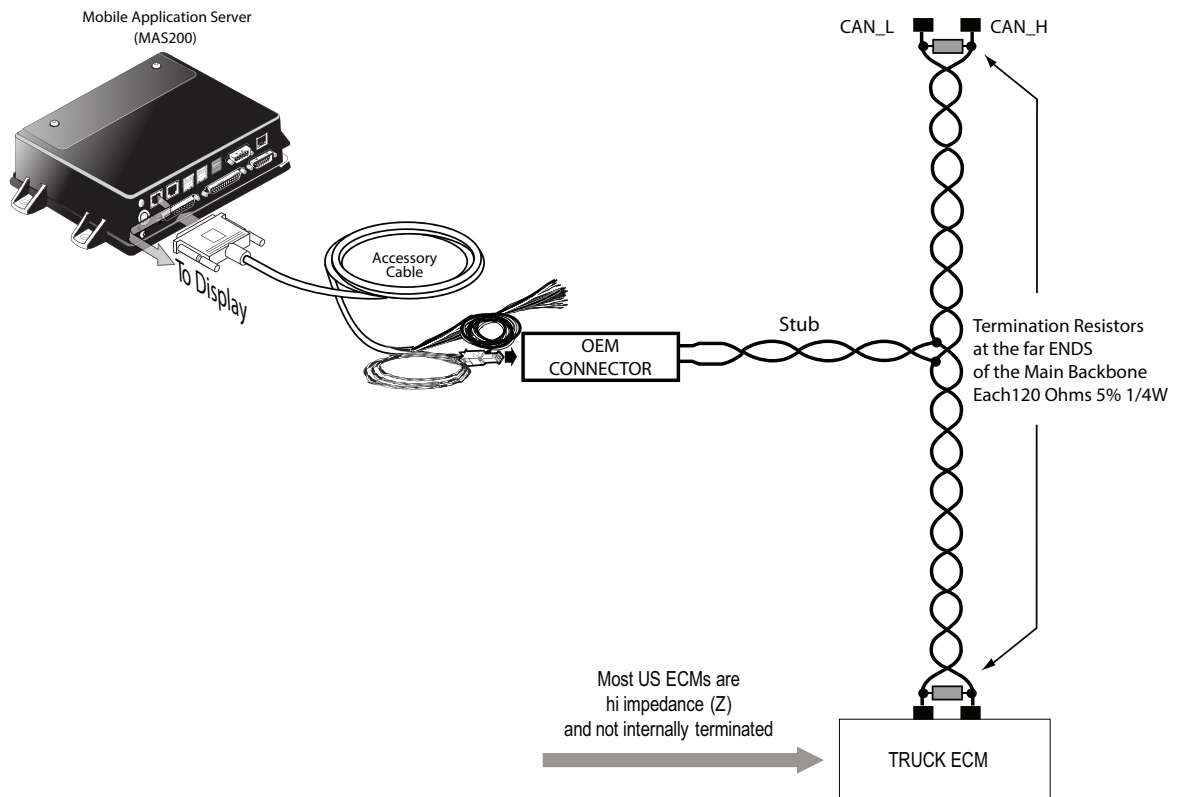
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11. Start the vehicle and verify that the truck is in good working order and displays no dash faults.
12. Verify that the J1939 data is being passed to the MAS200 from the data bus by monitoring the VDS screen on the MAS200. (Refer to [Verifying Data Source Connectivity](#) on page 10-12.)
13. Stow and secure any loose wires, making sure to keep the wires clear of sharp edges and away from panels and moving parts.

### **Option 2—Connecting J1939 Without Using the Repeater Cable**

Use the direct connection method (no repeater cable) when the distance between the MAS200 and the J1939 bus connection point does not exceed 10 feet. Typically, this option can be used if a special OEM accessory cable is supplied that has a distance of less than 10 feet.

Connect the MCP200 accessory cable to the OEM-supplied stub connector only.



In order for the MCP200 to receive J1939 data, the MAS200 CAN/J1939 wires must be connected to the truck's J1939 CAN bus in the vehicle.

Follow all SAE guidelines when connecting to the J1939 data source.

#### Note

*If you are doing an installation on an OEM prewired truck with a CAN MCP200 accessory cable and a repeater cable is not included as part of the prewire, go to [Option 1—Connecting J1939 Using the Repeater Cable on page 10-5](#).*

**Making the Connection**

1. Start the vehicle and verify that the truck is in good working order and displays no dash faults.
2. Turn OFF the truck and ensure that no dash lights are on.
3. Measure the J1939 bus resistance at the diagnostic connector. It should read 60 ohms.

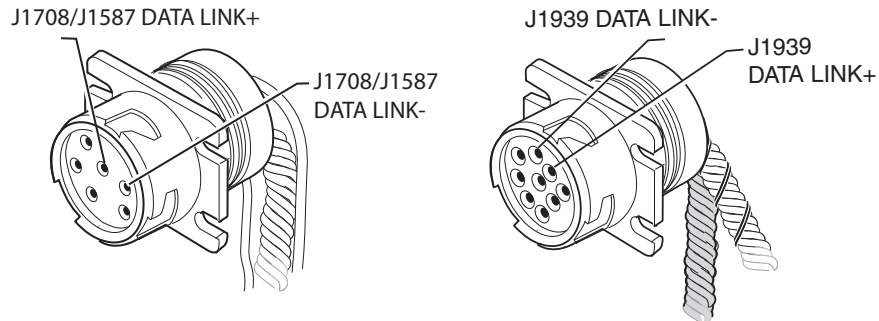
**Note**

*Some trucks may have activity on the J1939 bus with the door open or if an accessory is active. This can cause a faulty resistance reading on the CAN bus.*

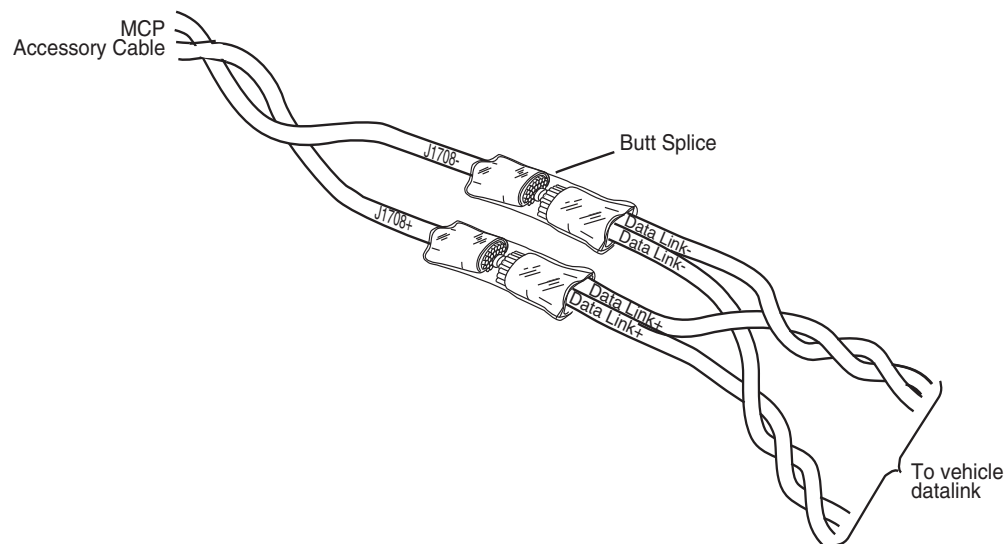
4. Locate the OEM J1939 stub connector and the CAN mating connector on the MCP200 accessory cable. These are usually located either in the truck's B pillar or in the center of the dash.
5. Connect the two J1939 connectors. If a stub does not exist, splice directly into the J1939 backbone. Locate a connector point and Ohm out (0 Ohms) CAN + and CAN - wires to Pin C (CAN high) and Pin D (CAN low) on the diagnostic connector.
6. Measure the J1939 bus resistance at the diagnostic connector. It should read 60 ohms.
7. Start the vehicle and verify that the truck is in good working order and displays no dash faults.
8. Verify that the J1939 data is being passed to the MAS200 from the data bus by monitoring the VDS screen on the MAS200. (Refer to [Verifying Data Source Connectivity on page 10-12.](#))
9. Stow and secure any loose wires, making sure to keep the wires clear of sharp edges and away from panels and moving parts.

## Connecting J1708/J1587

1. Start the vehicle and verify that the truck is in good working order and displays no dash faults.
2. Verify that the engine ignition switch is OFF.
3. Locate the engine data diagnostic connector.



- The data source wires to the engine data diagnostic connector are a twisted pair that should remain twisted after the installation is complete.
  - Consult the manufacturer's wiring diagrams to identify the wires (some are marked DATA+ and DATA- or D/L+ and D/L-, and some are marked with numbers or colors).
  - Note which wire is plus (+) and which is minus (-).
  - To avoid confusion, cut and splice the positive wires first and then the negative wires. Because there usually is not much slack in the engine data diagnostic connector wires, be careful in cutting and splicing to them.
4. Splice the brown J1708+ wire from the accessory cable to the DATA+ (pin F) wire of the engine diagnostic connector. Reconnect the wires.



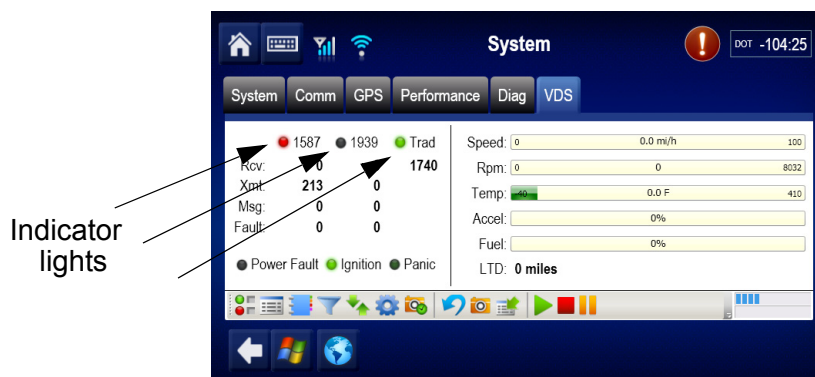
5. Splice the red J1708- wire from the accessory cable to the DATA- (pin G) wire of the engine diagnostic connector.
6. Start the vehicle and verify that the truck is in good working order and displays no dash faults.
7. Go to [Verifying Data Source Connectivity on page 10-12](#).
8. Stow and secure any loose wires, making sure to keep the wires clear of sharp edges and away from panels and moving parts such as throttle and brake linkage.
  - Dress any bare-ended wires to prevent a short.
  - Maintain wire twists as close to the splice as possible.

## Verifying Data Source Connectivity

1. Turn ignition ON.
2. **Verifying Data Bus Connectivity**

Check the VDS (Status) screen and verify that the MAS200 is enabled for J1708/1587, and or J1939, and/or traditional sensors. The associated indicator lights will be:

- Green, if configured and receiving active vehicle data.
- Red, if configured but the vehicle data is stale.
- Black, if not configured/no data.



### Note

Tap the **Green Light/Red Light** icon located along the bottom of the screen to display the VDS Summary screen and note the data source and LED status.

If data is not being passed, check connections to the data bus.

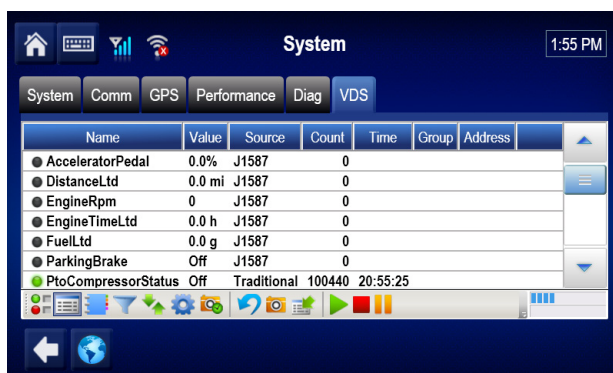
Proceed to the VDS detail screen to verify specific data sources.

### 3. Verify Data Source

#### a. Verifying Data Is Present

Verify the following data fields are showing green to confirm that J1708/J1587 or J1939 data is present:

- Speed
- Distance LTD
- Engine Time LTD
- RPM
- Fuel LTD



The screenshot shows a software interface titled "System" with a clock displaying "1:55 PM". Below the title are tabs for "System", "Comm", "GPS", "Performance", "Diag", and "VDS". The "VDS" tab is selected, displaying a table with the following data:

| Name                | Value  | Source      | Count  | Time     | Group | Address |
|---------------------|--------|-------------|--------|----------|-------|---------|
| AcceleratorPedal    | 0.0%   | J1587       | 0      |          |       |         |
| DistanceLtd         | 0.0 mi | J1587       | 0      |          |       |         |
| EngineRpm           | 0      | J1587       | 0      |          |       |         |
| EngineTimeLtd       | 0.0 h  | J1587       | 0      |          |       |         |
| FuelLtd             | 0.0 g  | J1587       | 0      |          |       |         |
| ParkingBrake        | Off    | J1587       | 0      |          |       |         |
| PtoCompressorStatus | Off    | Traditional | 100440 | 20:55:25 |       |         |

If connections are made to both the J1708/1587 and the J1939 data buses, the source column will indicate which data bus is supplying the data. If the data needed is not provided, reference the MCP200 Diagnostic Guide.





# 11

## System Verification

---

Topics in this chapter provide information and procedures for performing a basic system verification.

|   |       |
|---|-------|
| <i>What Is Basic MCP200 System Verification?</i> .....  | 11-2  |
| <i>Basic MCP200 System Verification Procedure</i> ..... | 11-8  |
| <i>MCP System Screens</i> .....                         | 11-12 |
| <i>Omnitracs MCP200 System Verification Form</i> .....  | 11-17 |

**For technical questions, contact Omnitrac's Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

For verifying the Performance Monitoring system, the Trailer Management system, and other accessories, see the appropriate chapter in this manual.

**Note**

*GPS is required for **both** satellite and terrestrial networks.*

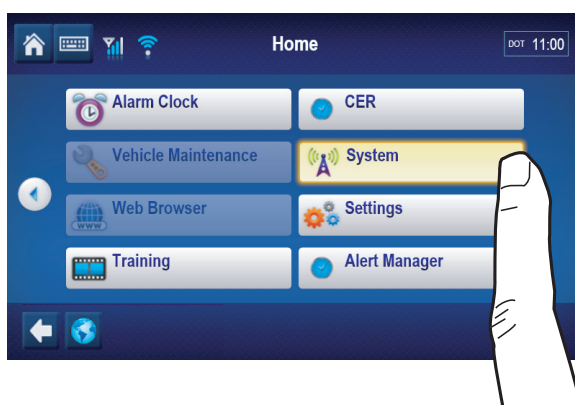
## What Is Basic MCP200 System Verification?

- A functional system check that should be performed after installation or service to verify that the MCP200 is operating properly.

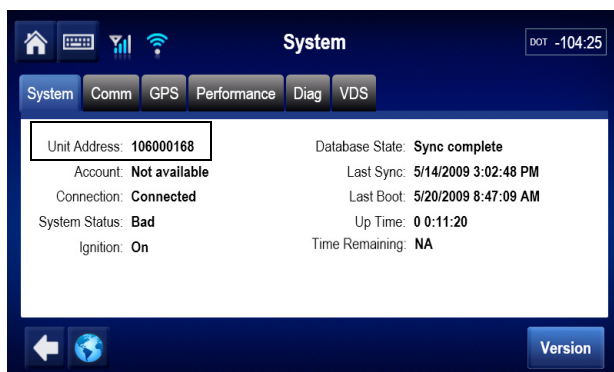
### How to Find the MCP200 Unit Address (UA)

Before you call Omnitrac's Customer Support for assistance, write down the serial number of the mobile application server 200 (MAS200).

1. To view the mobile computing platform 200 (MCP200) unit address on the display interface unit 200 (DIU200), use the right and left arrows to get to the **System** button, then tap the button.



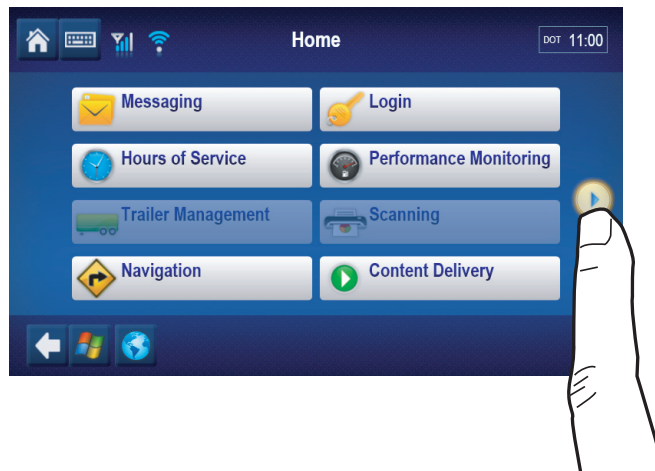
2. Tap the **System** tab.



## Performing System Verification

Shortly after you power up the MCP200, the Driver Warning screen appears. Then the MCP200 Home screen displays.

Tap the arrow on the right to access the system button.



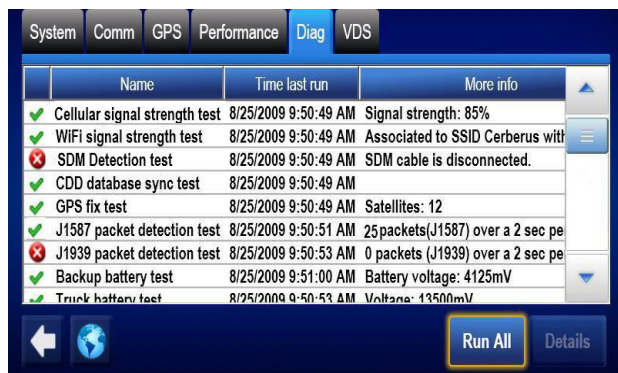
System verification information has been stored on screens/buttons under the **System** button.

Tap the **System** button to access the display screens shown on the following pages.



**MCP200 Diag Screen**

- Tap the **Diag** tab to access diagnostic information about the MCP200.
- Tap the **Run All** button, located at the bottom right of the screen. The system runs tests on all listed items then displays the results.
- found (green ✓), or not found (red X).



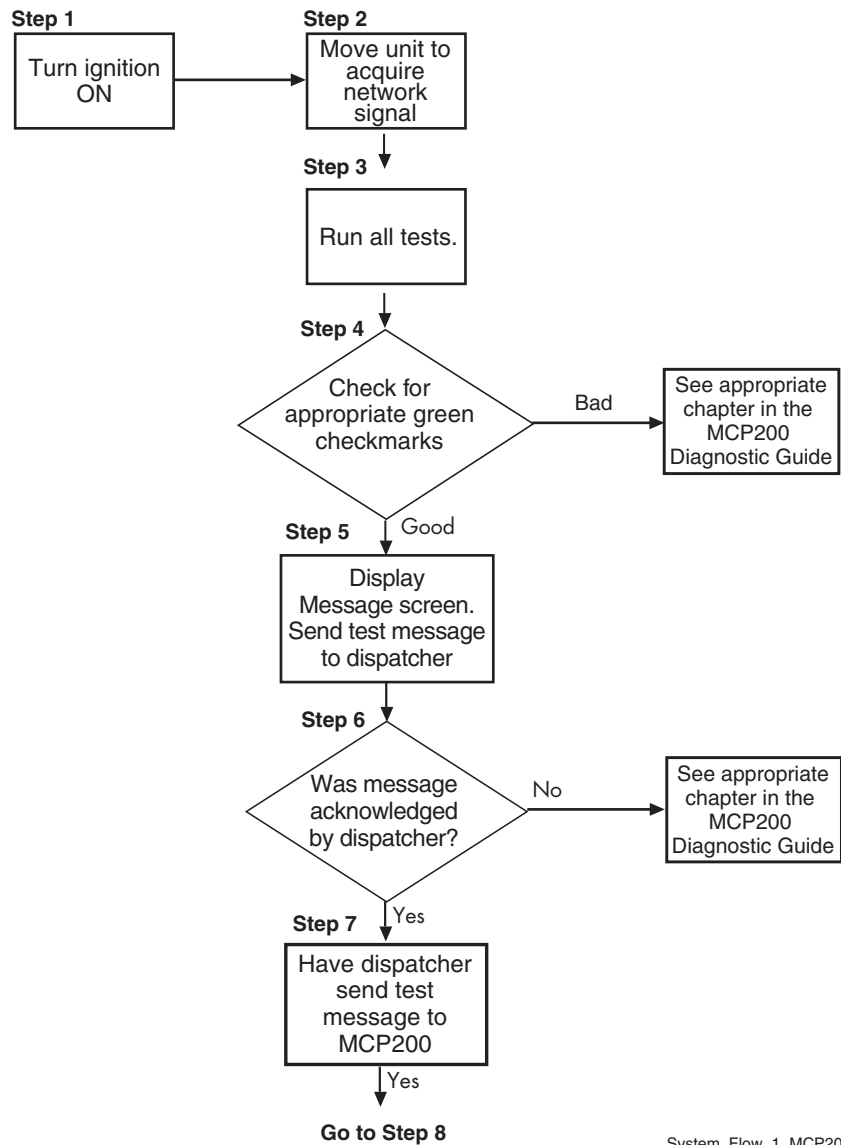
|                                      |  |
|--------------------------------------|--|
| <b>Cellular signal strength test</b> | Will show a green checkmark when in good cellular network coverage.  |
| <b>WiFi signal strength test</b>     | Will show a green checkmark when in good WiFi network coverage for a configured SSID.  |
| <b>SDM Detection test</b>            | Will show a green checkmark for good satellite network coverage. NOTE: The SDM Satellite Data Modem is an optional antenna.                                  |
| <b>CDD database sync test</b>        | Will show a green checkmark when database has been synchronized with NOC (usually takes 3–5 minutes after unit is first powered up).                         |
| <b>GPS fix test</b>                  | Will show a green checkmark if GPS network is detected.  |
| <b>J1587 packet detection test</b>   | Will show a green checkmark if accessory cable leads are connected to the J1587 databus, the vehicle's ignition is ON, and its getting data                  |
| <b>J1939 packet detection test</b>   | Will show a green checkmark if accessory cable/CAN bus repeater cable is connected to the J1939 databus, the vehicle's ignition is ON, and its getting data. |
| <b>Backup battery test</b>           | Will show a green checkmark if the battery is installed in the MAS and has acceptable voltage (>3.6VDC).   |
| <b>Truck battery test</b>            | Will show a green checkmark if the truck's voltage is >12VDC.  |

***Important***

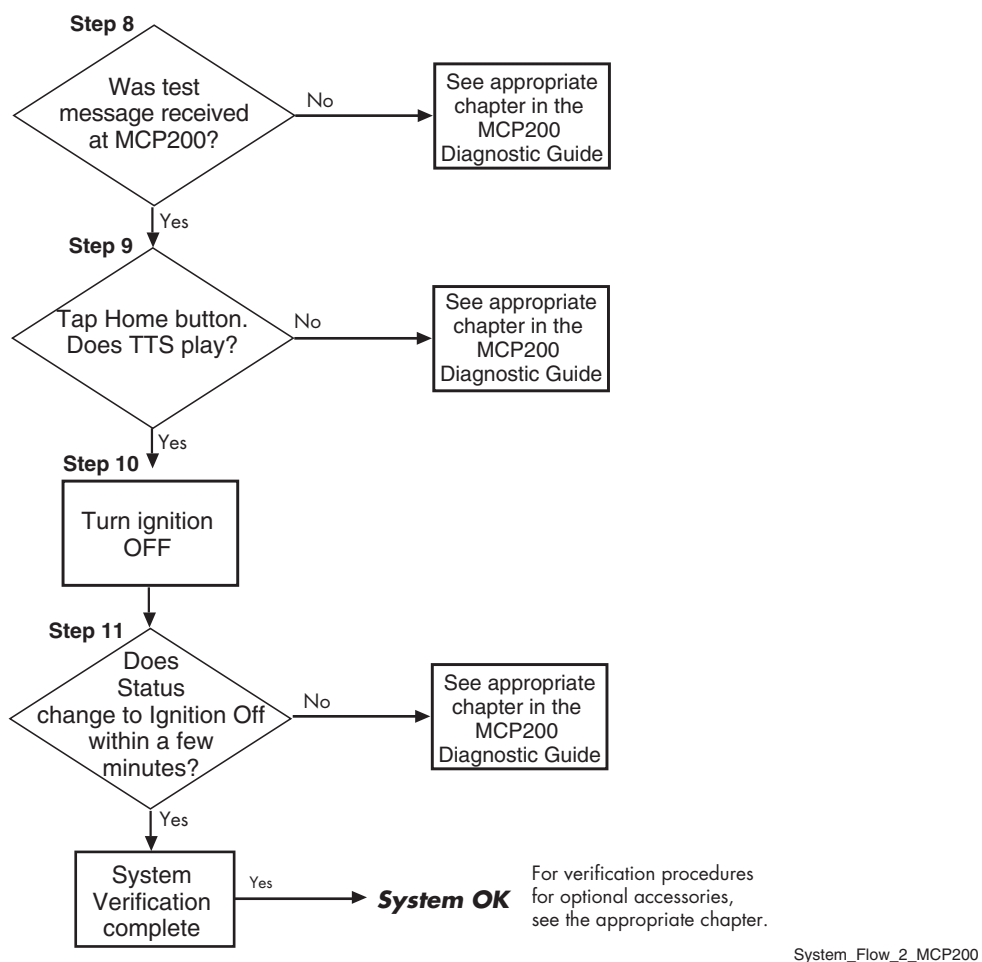
*At a minimum, Cellular, CDD, GPS, and Backup Battery should have a green checkmark.*

*If the results of the Run All checks are acceptable, send a message from the unit and verify the message is received by dispatch. Once that is confirmed, have dispatch send a message and confirm the message is received.*

**System Verification complete.**

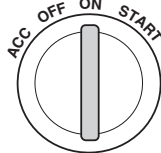
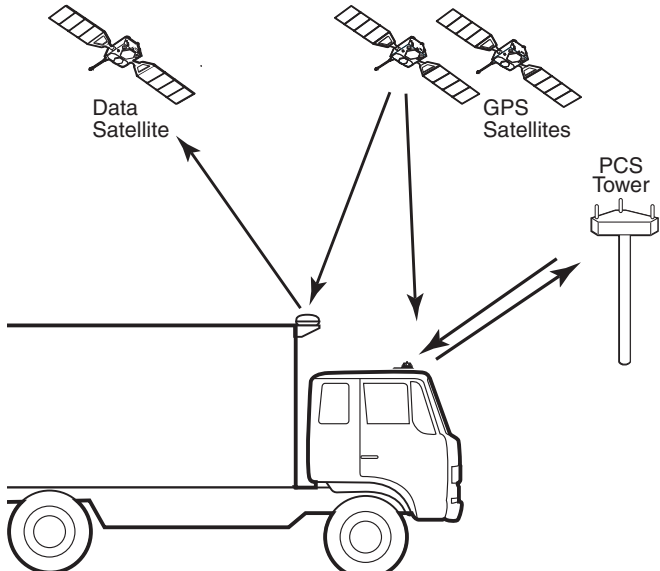
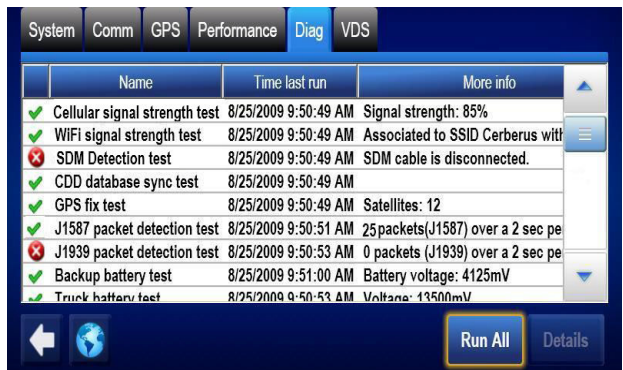
**Flowchart—Basic MCP200 System Verification**

System\_Flow\_1\_MCP200

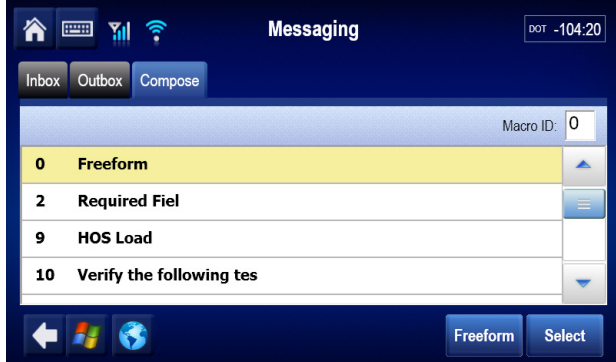
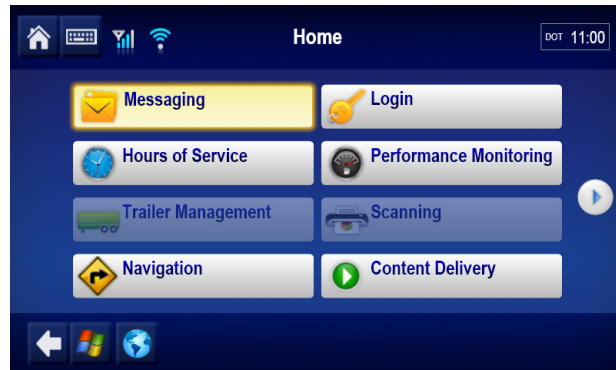


For verifying the Performance Monitoring system, the Trailer Management system, and other accessories, see the appropriate chapter in this manual.

## Basic MCP200 System Verification Procedure

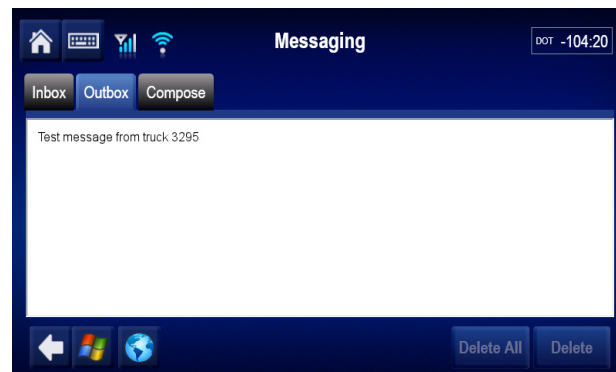
| <p>Turn the ignition ON</p>    | <p>The steps in this procedure match the steps on the flowcharts on the previous pages. The steps are not always sequential—you may be instructed to skip steps.</p> <p>1. Turn the vehicle ignition ON; the engine does not have to be running.</p>  |                                   |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
|---|---|-----------------------------------|-----------|---------------------------------|----------------------|----------------------|-----------------------------|----------------------|----------------------------------|----------------------|----------------------|----------------------------|--------------------------|----------------------|--|----------------|----------------------|----------------|-------------------------------|----------------------|-----------------------------------|-------------------------------|----------------------|-----------------------------------|-----------------------|----------------------|-------------------------|----------------------|----------------------|------------------|--|
|   | <p>2. Make sure the vehicle is in a good location.</p> <ul style="list-style-type: none"><li>• The vehicle should be in a location where the antenna is able to acquire a cellular network signal. Additionally, a clear view of the sky is needed for GPS when the unit is brought on the air for the first time, or after any reset.</li><li>• If you are using an SDM with the MCP200, the SDM should have a clear view of the satellite which is located above the equator, roughly south of Georgia.</li></ul> |                                   |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
|  <table><tr><th>Name</th><th>Time last run</th><th>More info</th></tr><tr><td>✓ Cellular signal strength test</td><td>8/25/2009 9:50:49 AM</td><td>Signal strength: 85%</td></tr><tr><td>✓ WiFi signal strength test</td><td>8/25/2009 9:50:49 AM</td><td>Associated to SSID Cerberus with</td></tr><tr><td>✗ SDM Detection test</td><td>8/25/2009 9:50:49 AM</td><td>SDM cable is disconnected.</td></tr><tr><td>✓ CDD database sync test</td><td>8/25/2009 9:50:49 AM</td><td></td></tr><tr><td>✓ GPS fix test</td><td>8/25/2009 9:50:49 AM</td><td>Satellites: 12</td></tr><tr><td>✓ J1587 packet detection test</td><td>8/25/2009 9:50:51 AM</td><td>25 packets(J1587) over a 2 sec pe</td></tr><tr><td>✗ J1939 packet detection test</td><td>8/25/2009 9:50:53 AM</td><td>0 packets (J1939) over a 2 sec pe</td></tr><tr><td>✓ Backup battery test</td><td>8/25/2009 9:51:00 AM</td><td>Battery voltage: 4125mV</td></tr><tr><td>✓ Trunk battery test</td><td>8/25/2009 9:50:53 AM</td><td>Voltage: 13500mV</td></tr></table> | Name  | Time last run                     | More info | ✓ Cellular signal strength test | 8/25/2009 9:50:49 AM | Signal strength: 85% | ✓ WiFi signal strength test | 8/25/2009 9:50:49 AM | Associated to SSID Cerberus with | ✗ SDM Detection test | 8/25/2009 9:50:49 AM | SDM cable is disconnected. | ✓ CDD database sync test | 8/25/2009 9:50:49 AM |  | ✓ GPS fix test | 8/25/2009 9:50:49 AM | Satellites: 12 | ✓ J1587 packet detection test | 8/25/2009 9:50:51 AM | 25 packets(J1587) over a 2 sec pe | ✗ J1939 packet detection test | 8/25/2009 9:50:53 AM | 0 packets (J1939) over a 2 sec pe | ✓ Backup battery test | 8/25/2009 9:51:00 AM | Battery voltage: 4125mV | ✓ Trunk battery test | 8/25/2009 9:50:53 AM | Voltage: 13500mV | <p>3. Go to the Home screen and tap the <b>Diag</b> tab. Tap <b>Run All</b> button.</p> <p>4. Check for appropriate green checkmarks (✓).</p> <ul style="list-style-type: none"><li>• At minimum, <b>Cellular</b>, <b>CDD</b> database, <b>GPS</b>, and <b>Battery Backup</b> should show green checkmarks.</li><li>• If the MCP200 passed the tests, go to <a href="#">step 5</a>.</li><li>• If the MCP200 failed any of the tests, go to the appropriate diagnostic procedure for the failed item in the <i>MCP200 Diagnostic Guide</i>.</li></ul> |
| Name  | Time last run   | More info                         |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
| ✓ Cellular signal strength test   | 8/25/2009 9:50:49 AM  | Signal strength: 85%              |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
| ✓ WiFi signal strength test   | 8/25/2009 9:50:49 AM  | Associated to SSID Cerberus with  |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
| ✗ SDM Detection test  | 8/25/2009 9:50:49 AM  | SDM cable is disconnected.        |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
| ✓ CDD database sync test  | 8/25/2009 9:50:49 AM  |                                   |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
| ✓ GPS fix test  | 8/25/2009 9:50:49 AM  | Satellites: 12                    |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
| ✓ J1587 packet detection test   | 8/25/2009 9:50:51 AM  | 25 packets(J1587) over a 2 sec pe |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
| ✗ J1939 packet detection test   | 8/25/2009 9:50:53 AM  | 0 packets (J1939) over a 2 sec pe |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
| ✓ Backup battery test   | 8/25/2009 9:51:00 AM  | Battery voltage: 4125mV           |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |
| ✓ Trunk battery test  | 8/25/2009 9:50:53 AM  | Voltage: 13500mV                  |           |                                 |                      |                      |                             |                      |                                  |                      |                      |                            |                          |                      |  |                |                      |                |                               |                      |                                   |                               |                      |                                   |                       |                      |                         |                      |                      |                  |  |





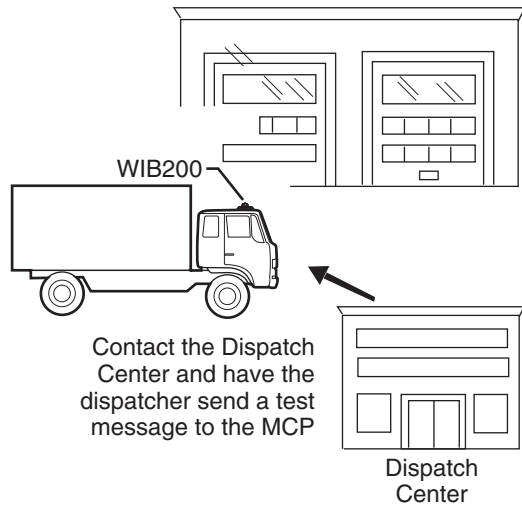
5. Send a test message to the dispatcher. Go to the Home screen and tap the **Messaging** button.

- Tap the **Compose** tab.
- Type the message text including the truck number.
- **Send the message?**
- Tap **Yes** to send the message.



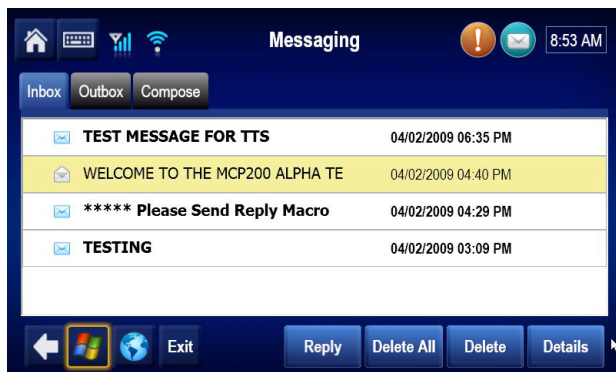
6. Tap the **Outbox** tab to display the message that was just sent. Orange “↔” (arrows) indicate the message is in transit; a green “✓” (check mark) indicates the message has been acknowledged.

- If the message is acknowledged, go to [step 7](#).
- If the message is not acknowledged, see the *MCP200 Diagnostic Guide*.



7. Have the dispatcher send a test message to the MCP200. If the dispatcher is not available, call Omnitracs Customer Support (800-541-7490) to have the message sent.

If the Remote Message Waiting Light or Message Waiting Buzzer feature is installed, you can also test them at this time by having an Important or Sleepy Important message sent.




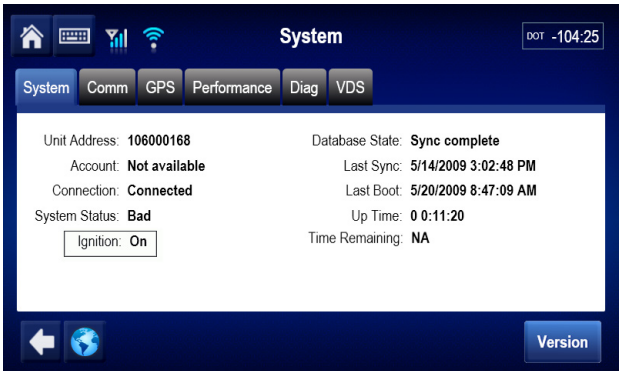
8. After a few minutes, the display should chirp, the Message Waiting Light should come on, and a voice notification will tell you the message has been received. Tap the **Inbox** tab to display the dispatcher's message.

- If the MCP200 received the message, go to [step 9](#).
- If the MCP200 did not receive the message, see *MCP200 Diagnostic Guide*.



9. Verify that the message can be played using the center button on the 5-way key on the DIU200.

- If the message can be played, go to [step 10](#).
- If the message cannot be played through TTS, see the *MCP200 Diagnostic Guide*.

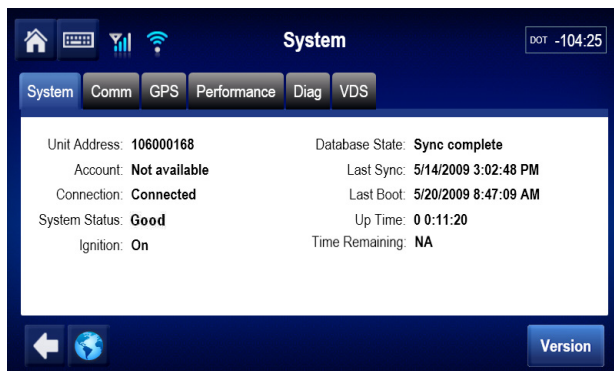
|  |  |
|--|--|
| <p>Turn the ignition OFF</p>  | <p><b>10.</b> Turn the vehicle ignition OFF.</p> <p><b>11.</b> Make sure the display unit stays on with the ignition OFF.</p> <ul style="list-style-type: none"><li>• If the display unit stays on, go to <a href="#">step 12</a>.</li><li>• If the display unit does not stay on, see the <i>MCP200 Diagnostic Guide</i>.</li></ul>   |
|                               | <p><b>12.</b> Tap the <b>System</b> button. Tap the <b>System</b> tab and verify that the STATUS field changes from <b>Good</b> to <b>Ignition Off</b> within 10 minutes.</p> <ul style="list-style-type: none"><li>• If the Status changes to Ignition Off within 10 minutes, System Verification is complete.</li><li>• If the Status does not change to Ignition Off within 10 minutes, see the <i>MCP200 Diagnostic Guide</i>.</li></ul> |

For verifying the Performance Monitoring system, the Trailer Management system, and other accessories, see the appropriate chapter in this manual.

## MCP System Screens

### MCP200 System Screen

- Tap the **System** tab to access system information about the MCP200.



| Field          | Description   |
|----------------|---|
| Unit Address   | Also called the UNIT SERIAL NUMBER. This number is linked to the truck number in the dispatch software.   |
| Account        | The NOC account number the unit is assigned. Currently not available.   |
| Connection     | Connected or Disconnected. Indicates whether the link between MAS and antenna is up and passing data.   |
| System Status  | Good, Quiet, or a status code of 10000, 12000, etc. (see <i>MCP200 Diagnostic Guide</i> for more information).  |
| Ignition       | On or Off. Off displays within seconds after you turn the ignition OFF.   |
| Database State | Out of Sync or Sync Complete. Indicates the MCP200's database status: <ul style="list-style-type: none"> <li>• Sync complete is displayed if configuration data has been received by the MCP200 and is up-to-date. This is the desired state.</li> <li>• Out of sync is displayed if configuration data not been received by the MCP200.</li> </ul> |
| Last Sync      | Indicates the date and time of the most recent Sync complete status for the database state mentioned above.   |
| Last Boot      | Indicates the date and time of the most recent boot-up for the MCP200.  |
| Up Time        | The amount of time the unit has been awake since the last boot up.  |

| Field          | Description  |
|----------------|--|
| Time Remaining | The time in hh:mm before the unit is scheduled to go to sleep. If ignition is on, N/A will be displayed. |

### MCP200 Comm Screen

- Tap the **Comm** tab to access antenna information about the MCP200.
- This screen displays antenna information about the satellite (optional SDM) and the WIB200 (terrestrial and WiFi).



### Satellite

| Field              | Description  |
|--------------------|--|
| <b>Satellite</b>   |  |
| Active<br>In Use   | Green indicator light shown when communication type is available.<br>Black indicator light shows not Active/not In Use.            |
| Session            | Time and date when the satellite link was last used.   |
| Duration           | Duration of last satellite session.  |
| <b>Terrestrial</b> |  |
| Active<br>In Use   | Green indicator light shown when communication type is available.<br>Black indicator light shows not Active/not In Use.            |
| Session            | Date and time the unit used terrestrial mode.  |
| Duration           | Duration of last terrestrial session.  |
| IP                 | The IP address that the unit has been given by the terrestrial network for the last/most recent terrestrial communication session. |

|               |   |
|---------------|---|
| RSSI          | Received Signal Strength Indication—The strength of a wireless communication network signal being received by the antenna. RSSI should be less than 110.  |
| Registered    | MCP200 terrestrial system checks network coverage every 3 minutes. If the unit is within the Home network, it is in home network coverage. If the unit is Registered roaming, it is either roaming to find the home network or roaming to find another network. |
| SID           | System Identification Number—The number that allows the unit to quickly register on the cellular network.   |
| <b>WiFi</b>   |   |
| Active In Use | Green indicator light shown when communication type is available. Black indicator light shows not Active/not In Use.  |
| Session       | Date and time the unit used WiFi mode.  |
| Duration      | Duration of last WiFi session.  |
| State         | Indicates the physical state of the antenna.  |
| Signal        | The signal strength of the associated/authenticated WiFi access point.  |
| SSID          | Service Set Identifier—The IEEE 802.11 wireless networking name.  |

**MCP200 GPS Screen**

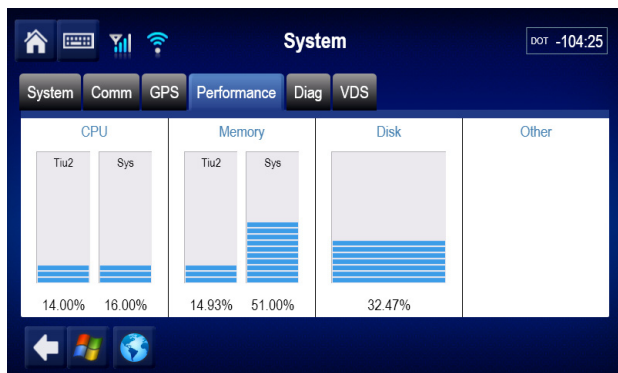
- Tap the **GPS** tab whenever you want to see basic GPS information.



| <i><b>Field</b></i> | <i><b>Description</b></i>   |
|---------------------|---|
| Last Update         | The time of the last GPS update. This value should update every second.   |
| Latitude            | The last received latitude value.   |
| Longitude           | The last received longitude value.  |
| Altitude            | The last received altitude value.   |
| Mode                | Indicates the MCP200's GPS status: <ul style="list-style-type: none"> <li>• 3-D is displayed if the receiver is able to view three or more GPS satellites. Under normal performance, a 3-D mode will be displayed.</li> <li>• 2-D is displayed if the receiver is able to calculate a position, but has a limited view to the GPS satellites.</li> <li>• NO FIX is displayed when the GPS satellites cannot be viewed.</li> </ul> |
| Ground Speed        | Speed calculated by GPS through a change in vehicle location.   |
| Precision           | Measure of how accurate the GPS signals are that are being received. Values less than 4 gives best accuracy.  |
| Satellites          | Number of GPS satellites the receiver is viewing at any given time.   |
| Messages            | GPS statements received by the unit from a GPS source.  |

**MCP200 Performance Screen**

- Tap the **Performance** tab whenever you want to see the basic configuration of the unit.



| Field  | Description                                    |
|--------|--|
| CPU    | Shows MAS200 usage by applications and system. |
| Memory | Amount of memory used applications and system. |
| Disk   | Amount of disk space used.                     |
| Other  | Not currently used.                            |



**VDS Screen**

- Tap the **VDS** tab to access vehicle data services information.



- Information on the VDS screen is described in [Chapter 10: Vehicle Data Bus Connections](#).

**Omnitracs MCP200 System Verification Form**

You can make copies of the System Verification Form on the following page and record important information you may want to keep concerning MCP200 installations.



## Installation Work Order Details (MCP200)

Company Name: \_\_\_\_\_ Installation Date: \_\_\_\_\_

Installer #1: \_\_\_\_\_ Installer #2: \_\_\_\_\_

Driver Name: \_\_\_\_\_ Truck #: \_\_\_\_\_ Year: \_\_\_\_\_ MFG/Model: \_\_\_\_\_

Driver ID: \_\_\_\_\_ Driver Contact #: \_\_\_\_\_

Unit Address (MAS S/N): \_\_\_\_\_ MAS S/W Version: \_\_\_\_\_ WIB S/N: \_\_\_\_\_

Display (MDU/DIU S/N): \_\_\_\_\_ SDM S/N (if installed): \_\_\_\_\_

Options: ☐ Panic Button ☐ Wireless Panic Button ☐ RMWL ☐ Buzzer ☐ TTRACS (tractor)☐ Scanner ☐ RCD ☐ Other \_\_\_\_\_**Communications Signals:**

| Cellular signal | WiFi  | Satellite signal (when installed) |          |
|-----------------|-------|-----------------------------------|----------|
| RSSI:           | SSID: | FL C/NO:                          | RL C/NO: |

**Database State:**

Sync Completed? Yes\_\_\_ No\_\_\_

**Positioning:**

GPS Fix Test passed? Yes\_\_\_ No\_\_\_

**Vehicle Data Source Verification:**Database Connections: ☐ J1708 (J1587) and/or ☐ J1939

Packets Detected for J1587? Yes\_\_\_ No\_\_\_ Packets Detected for J1939? Yes\_\_\_ No\_\_\_

**Backup Battery Test:**

MAS Battery test passed? Yes\_\_\_ No\_\_\_ Backup Battery Voltage: \_\_\_\_\_ Volts

**Text to Speech Verification:**

TTS responds to HOME button? Yes\_\_\_ No\_\_\_ TTS volume control works? Yes\_\_\_ No\_\_\_

**Message Verification:**

Send test message with truck number – Message Acknowledged (shows green checkmark)? Yes\_\_\_ No\_\_\_

**Ignition Status:**

Does the ignition status correctly show ON/OFF key positions? Yes\_\_\_ No\_\_\_

I find the service rendered and materials installed in connection with the above mentioned work to have been completed in a satisfactory manner.

Driver/Customer Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# 12

## ***Performance Monitoring System Verification***

---

Topics in this chapter provide the procedures for conducting Performance Monitoring system installations.

|  |       |
|--|-------|
| <i>Performance Monitoring System Overview</i> .....              | 12-2  |
| <i>Performance Monitoring System Verification</i> .....          | 12-2  |
| <i>Other Performance Monitoring System Display Screens</i> ..... | 12-6  |
| <i>Special Alert Display Notifications</i> .....                 | 12-12 |
| <i>Power Take-off (PTO) Overview</i> .....                       | 12-12 |
| <i>PTO Data Input Verification Procedure</i> .....               | 12-14 |

**For technical questions, contact Omnitrac's Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

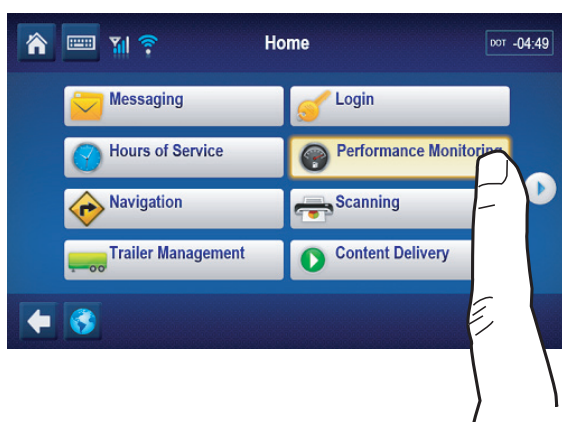
- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

## Performance Monitoring System Overview

The Performance Monitoring system is an optional Omnitrac MCP200 application that records vehicle and driver performance data. The data is then retrieved from the MCP200 by the host computer either manually or automatically at preset intervals.

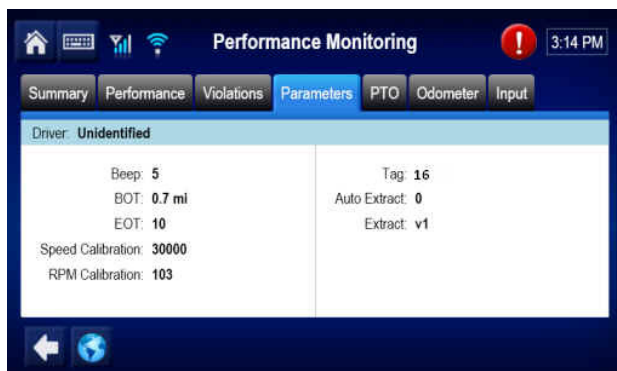
The hardware installation on the vehicle consists of:

1. Connecting the MCP200 to the **data link** (see [Chapter 10](#)).
2. Sending performance monitoring parameters from the host computer.
3. Performing system verification.



## Performance Monitoring System Verification

First verify that performance monitoring parameters have been sent to the unit and received. Use the Parameters tab within the Performance Monitoring application and verify the tag field is not "0."



A tag of “0” indicates that the unit has not received its parameters. Call your company dispatch administrator and ask for the parameters to be sent. A non-zero tag indicates that the unit has received parameters.

Next, with ignition in the ON position, use the Input Tab within the Performance Monitoring application to understand what data is being provided. Review data that is available listed under the **Data Item** column. Notice indicator lights.

- **Green** indicator light means that those items are being received (this is good).
- **Red** indicator light means the data is stale and not currently available.
- **Black** indicator light means no data has been received for that item.

**Input Screen Example**

Indicator Lights  
Verify they  
are green

Performance Monitoring

DOT -104:23

Summary

Performance

Violations

Parameters

PTO

Odometer

Input

| Data Item        | Value    | Source | Count | Fault            | Id   |
|------------------|----------|--------|-------|------------------|------|
| Speed            | 0.0 mi/h | J1587  | 0     | NoPower          | 0x00 |
| EngineRpm        | 0        | J1587  | 0     | RPMZero          | 0x01 |
| DistanceLtd      | 0.0 mi   | J1587  | 0     | BadIgnition      | 0x02 |
| EngineTimeLtd    | 0.0 h    | J1587  | 0     | J1708RPM         | 0x03 |
| FuelLtd          | 0.0 g    | J1587  | 0     | J1708Speed       | 0x04 |
| AcceleratorPedal | 0.0%     | J1587  | 0     | J1708LTDMismatch | 0x09 |
| ParkingBrake     | Off      | J1587  | 0     | BadSpeed         | 0x0A |
| PtoEngineStatus  | Off      | J1587  | 0     | ZeroSpeedAndRPM  | 0x0B |

At a minimum, Performance Monitoring needs current data from Speed, EngineRPM, and DistanceLTD. If these show green, the verification is complete.

If ignition is on and all the data items have a black indicator light, recheck your data link installation. See [Chapter 10](#).

**Understanding Performance Monitoring Faults**

Certain types of conditions or faults can be monitored using performance monitoring. A table of those faults follows. Which faults are monitored is determined by the configuration a customer sends to a unit with the performance monitoring parameters.

| Data Item          | Value    | Source | Count | Fault              | Id   |
|--------------------|----------|--------|-------|--------------------|------|
| ● Speed            | 0.0 mi/h | J1587  | 0     | ● NoPower          | 0x00 |
| ● EngineRpm        | 0        | J1587  | 0     | ● RPMZero          | 0x01 |
| ● DistanceLtd      | 0.0 mi   | J1587  | 0     | ● BadIgnition      | 0x02 |
| ● EngineTimeLtd    | 0.0 h    | J1587  | 0     | ● J1708RPM         | 0x03 |
| ● FuelLtd          | 0.0 g    | J1587  | 0     | ● J1708Speed       | 0x04 |
| ● AcceleratorPedal | 0.0%     | J1587  | 0     | ● J1708LTDMismatch | 0x08 |
| ● ParkingBrake     | Off      | J1587  | 0     | ● BadSpeed         | 0x0A |
| ● PtoEngineStatus  | Off      | J1587  | 0     | ● ZeroSpeedAndRPM  | 0x0B |

Consult with your company's dispatch administrator with questions concerning monitoring faults.

- **Green** indicator light means that those items are being monitored.
- **Red** indicator light means the fault is active.
- **Orange** indicator light means that the fault item was active but the condition cleared.
- **Gray** indicator light means that the condition is not being monitored (turned off).

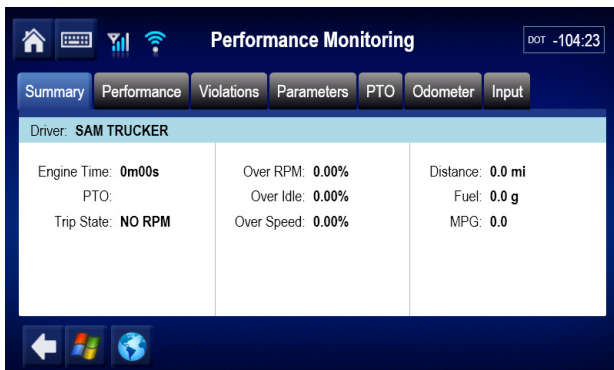
**Performance Monitoring Faults and Descriptions**

| <b>Active Fault Field Value Definitions</b> |                         |   |   |
|---|-------------------------|---|---|
| <b>Display Shows</b>                        | <b>Associated Fault</b> | <b>Description/Symptom</b>  | <b>Possible Cause</b>   |
| 0   | No Power (MCP200)       | Power detected OFF for more than the wake-up time.  | Main power was lost, causing the MCP to stay asleep longer than its wake-up interval.   |
| 1   | RPM Zero (MCP200)       | RPM zero when speed is non-zero.  | -RPM sensor or connection problem.<br>-J1708 selection parameter set wrong.<br>-In rare cases, no idle can be caused by faulty axle sensor input (e.g., wires reversed) causing a positive reading for speed while the vehicle is stationary. |
| 2   | Bad Ignition (MCP200)   | Ignition OFF and speed or RPM non-zero.   | Problem with MCP200's ignition line wiring or fuse.   |
| 3   | RPM Sensor (MCP200)     | Engine posted PID (194) and PID (190).  | RPM sensor or connection problem to the engine, detected by the engine's diagnostics.   |
| 4   | Speed Sensor (MCP200)   | Engine posted PID (194) and PID (84).   | Speed sensor or connection problem to engine, detected by the engine's diagnostics.   |
| 9   | LTD Mismatch (MCP200)   | LTD mismatch with stored MCP200 data.   | -Engine run with main power disconnected.<br>-Engine run with data link disconnected.<br>-Engine run with ignition line disconnected.   |
| A   | Bad Speed (MCP200)      | More than 2 hrs IGN = ON with Spd = 0, RPM greater than 1300.   | -Speed sensor or connection problem—MCP200.<br>-Speed sensor or connection problem—engine.<br>-Engine speed sensor parameter not enabled.   |
| B   | 0 Spd and RPM (MCP200)  | More than 2 hrs with IGN = ON with Spd = 0, RPM = 0.  | -Disconnect of entire accessory cable.<br>-J1708 selection parameter set wrong.<br>-Data link connection problem.<br>-Driver using ignition position for accessory operation.<br>-MCP200 ignition line wired to accessory position.           |
| D   | MCP200 Speed (MCP)      | Speed signal constant for more than 5 minutes.  | A pulse generator may have been connected to either the MCP200 or the engine.   |
| E   | Hard Braking Event      | Speed is suddenly decreased by more than 9 MPH/second (speed must be above 20 MPH for this fault to occur). | Driver is braking too quickly (hard braked).  |

## Other Performance Monitoring System Display Screens

### Summary Screen

Data associated with the active driver since the last data extract.



| <b>Field</b> | <b>Description</b>   |
|--------------|--|
| Driver       | Active driver name. If no driver is currently logged on as the active driver, "UNIDENTIFIED" is displayed.   |
| Engine Time  | Engine time in minutes and seconds.  |
| PTO          | Indicates if PTO configuration is using Pump or Compressor.  |
| Trip State   | Current trip state. Possible values are: WARMING IDLE; WARM IDLE; PRE-INTERTRIP IDLE; PRE-TRIP RUN; PRE-TRIP IDLE; TRIP RUN; TRIP IDLE; COOL IDLE; POST-INTERTRIP IDLE; ENGINE STOP; PTO COMP; PTO PUMP; PTO ENGN. |
| Over RPM     | Computed over RPM percentage. Based on company configurations.   |
| Over Idle    | Over idle percentage.  |
| Over Speed   | Computed overspeed percentage.   |
| Distance     | Total distance since beginning of trip detected.   |
| Fuel         | Total fuel consumed for trip.  |
| MPG          | Computed fuel mileage in miles/gallon (or km/gal).   |



## Performance Screen

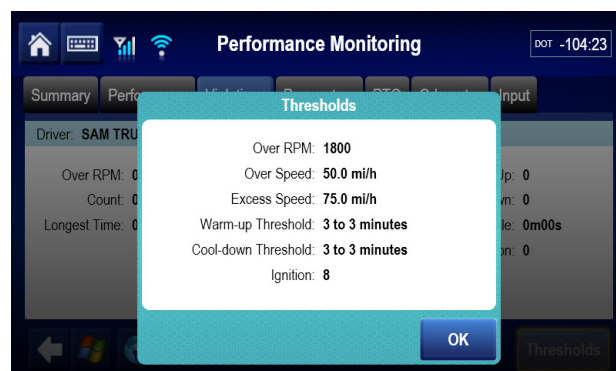
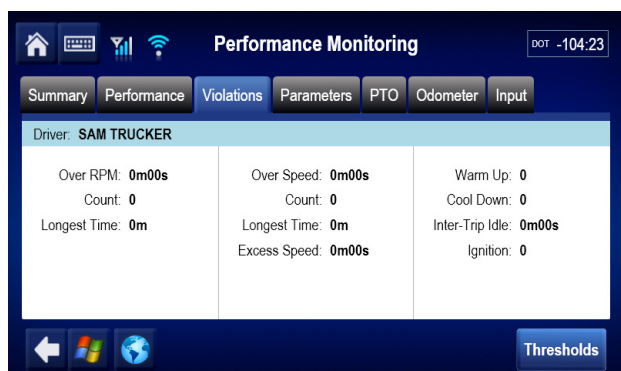
Data associated with the active driver since the last data extract.



| Field       | Description  |
|-------------|--|
| Driver      | Active driver name. If no driver is currently logged on as the active driver, "UNIDENTIFIED" is displayed. |
| Trip #      | Current trip number.   |
| Engine Time | Total elapsed time the engine has been running.  |
| Drive Time  | Driving (road) time.   |
| Distance    | Total miles accumulated.   |
| Trip State  | Current trip state.  |
| Speed       | Current vehicle speed.   |
| RPM         | Current engine RPM.  |
| Park Fuel   | Current value of the amount of fuel used while parked.   |
| Idle Fuel   | Current value of the idle fuel.  |
| Coast OOG   | Coasting out-of-gear time (displayed in minutes and seconds).  |
| Gear        | Current gear ratio based on the current speed and RPM.   |

## Violations Screen

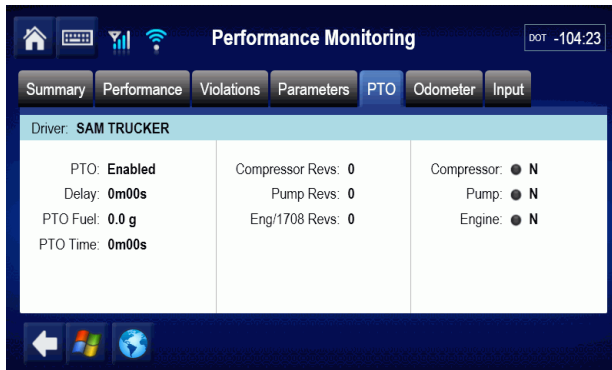
Data associated with the active driver since the last data extract.



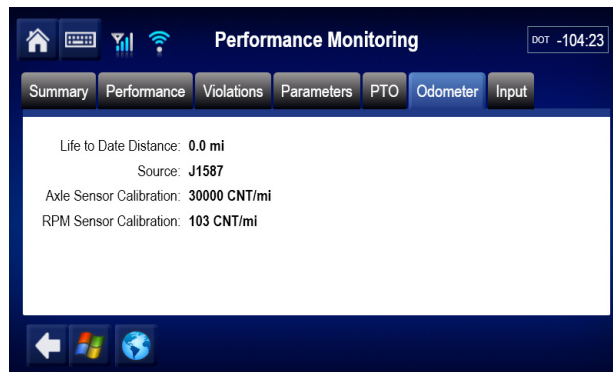
| Field           | Description  |
|-----------------|--|
| Driver          | Active driver name. If no driver is currently logged on as the active driver, "UNIDENTIFIED" is displayed. |
| Over RPM        | Displays while RPM time is accumulating.   |
| Count           | Accumulates by one each time vehicle exceeds RPM threshold for longer than one minute.                     |
| Longest Time    | Longest single period of time spent over RPM threshold.  |
| Over Speed      | Displays while overspeed time is accumulating.   |
| Count           | Accumulates by one each time vehicle exceeds speed threshold for longer than one minute.                   |
| Longest Time    | Longest single period of time spent over speed threshold.  |
| Excess Speed    | Displays while excessive speed time is accumulating.   |
| Warm Up         | Minimum amount of idle time engine is allowed to warm up.  |
| Cool Down       | Minimum amount of idle time engine is allowed to cool down.  |
| Inter-Trip Idle | Displays every 60 seconds for up to five times while intertrip idle time is accumulating.                  |
| Ignition        | Ignition violation count.  |

**Parameters Screen**

| <b>Field</b>      | <b>Description</b>   |
|-------------------|--|
| Driver            | Active driver name. If no driver is currently logged on as the active driver, "UNIDENTIFIED" is displayed.   |
| Beep              | Unidentified driver beep period in minutes.  |
| BOT               | Distance vehicle must travel before the MCP200 declares the Beginning of Trip and starts Trip_Run recording. |
| EOT               | End of Trip time threshold in minutes.   |
| Speed Calibration | Speed calibration parameter.   |
| RPM Calibration   | RPM calibration parameter.   |
| Tag               | Parameter version indicator.   |
| Auto Extract      | Dispatch-configured extract frequency (in days).   |
| Extract           | Unit extract frequency.  |

**PTO Screen**

| <b>Field</b>    | <b>Description</b>   |
|-----------------|--|
| Driver          | Active driver name. If no driver is logged on as the active driver, "UNIDENTIFIED" is displayed.   |
| PTO             | Current state of the PTO (enabled or disabled).  |
| Delay           | Dispatch-configured time-to-start for PTO time.  |
| PTO Fuel        | PTO fuel data in gallons.  |
| PTO Time        | Total time logged as PTO data. (Displayed in minutes and seconds until the elapsed time exceeds 1 hour; then it is displayed in hours and minutes.)  |
| Compressor Revs | Current value of PTOC revolutions.   |
| Pump Revs       | Current value of PTOP (pump output shaft) revolutions.   |
| Eng/1708 Revs   | Current value of PTOE (engine crankshaft) revolutions.   |
| Compressor      | Displays "Y" if the PTOC input is active.  |
| Pump            | Displays "Y" if the PTOP input is active.  |
| Engine          | Displays "Y" if the PTOE input is active.  |
|                 | <p><i>Note</i></p> <p><i>If the PTO is Disabled or if the Vehicle Is In Motion (&lt;20 MPH), the inputs will always read "N." If both the PTOP and PTOC inputs are active, then only the PTOP input will read "Y."</i></p> |

**Odometer Screen**

| <b>Field</b>            | <b>Description</b>   |
|-------------------------|--|
| Driver                  | Active driver name. If no driver is currently logged on as the active driver, "UNDENTIFIED" is displayed.  |
| Life to Date Distance   | Total distance the vehicle has traveled in its lifetime if data is provided by the ECM, otherwise it is Life To Date Performance Monitoring system miles only. |
| Source                  | Indicates that the signal source for the vehicle's distance is the standard speed sensor (AXLE) or the J1708/1587 data link (J1708).                           |
| Axle Sensor Calibration | Speed or distance calibration value. Number should be the same as the Speed Calibration value displayed on the performance monitoring Parameters screen.       |
| RPM Sensor Calibration  | Speed or distance calibration value. Number should be the same as the RPM Calibration value displayed on the performance monitoring Parameters screen.         |

## **Special Alert Display Notifications**

Certain notifications can be configured to show when the MCP200 needs to warn or remind the driver of certain pending conditions.

### **Warning Notifications**

Warning notifications are accompanied by an audible chirping beep sound from the display unit speaker.

**COASTING OUT OF GEAR.** Displays while coasting-out-of-gear time is accumulating.

**EXCESSIVE OVERSPEED.** Displays while excessive speed time is accumulating.

**OVERSPEED.** Displays while overspeed time is accumulating.

**OVERRPM.** Displays while over RPM time is accumulating.

**INTERTRIP IDLE IN 60 SECONDS.** Displays only once 60 seconds before intertrip idle accumulation begins.

**INTERTRIP IDLE.** Displays every 60 seconds for up to five times while intertrip idle time is accumulating.

### **Power Take-off (PTO) Overview**

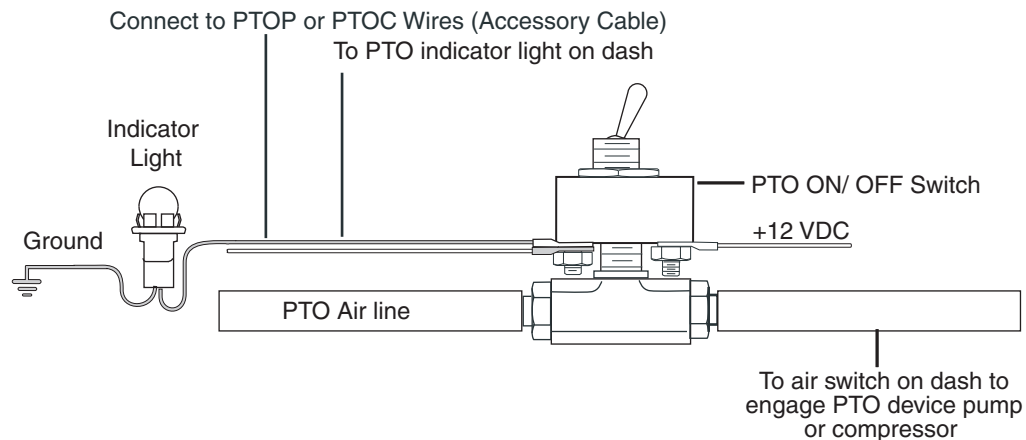
This option provides customers with the ability to log the time the vehicle engine is used for non-transportation purposes, such as when it is powering auxiliary devices.

In order to log PTO time, one of the two PTO wires must be connected to the pump or compressor input. Also, a unit must be configured to record PTO. Configuration values are sent through Performance Monitoring parameters

Typically, there are two types of switching methods, those switched to +12 VDC and those switched to ground.

**PTOP (Power Take-off Pump)/PTOC (Power Take-off Compressor)**

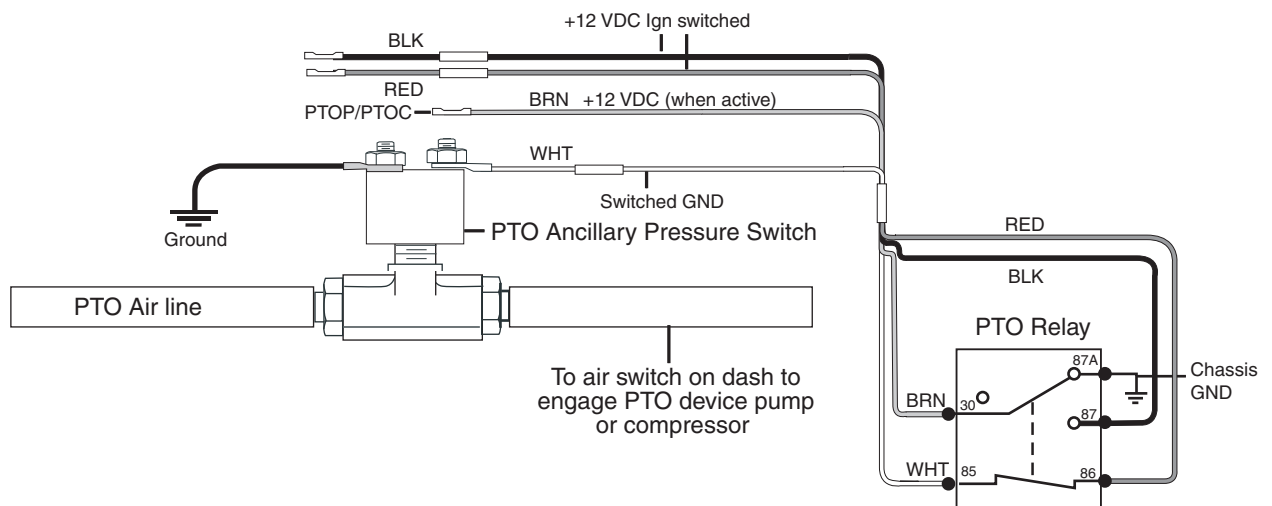
Use your multi-meter to determine which circuit you are connecting to by engaging the PTO/PTOC and measuring for voltage.

**A. Switched +12VDC Circuits**

04AAA\_217AQMCP

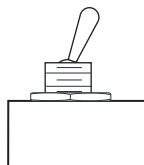
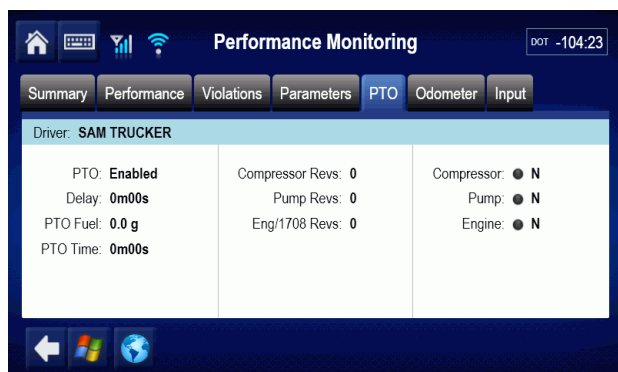
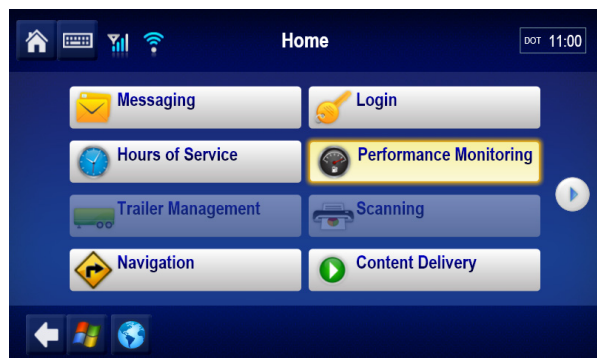
**B. Switched to Ground Circuits**

If you only have a switched circuit that is activated to the ground to detect PTO time, a relay must be used, as shown in the configuration below.



08AAA\_062

## PTO Data Input Verification Procedure



1. Start the vehicle.
2. Turn the PTO device **ON**.
3. Navigate to the PTO screen.

### Note

If performance monitoring is grayed out, Performance Monitoring system is not enabled. Call your company dispatch to have this application enabled.

4. Verify that PTO is Enabled and the Compressor, Pump, or Engine field displays a **Y** according to what is active.
  - You should see the green indicator light.
5. Check that the PTO Time field is incrementing. Is this field incrementing?

### Note

In order for PTO time to be recorded, RPM must be >0, speed <20 mph, and the PTO time delay must be reached.

- If yes, PTO verification is complete.
- If no, check the wire connections, see [Power Take-off \(PTO\) Overview on page 12-12](#). Go to [step 6](#).

6. Turn off PTO device. PTO time should now stop incrementing.



# 13

## **Vehicle Maintenance System Verification**

---

Topics in this chapter provide a basic overview of the vehicle maintenance application. This is a vehicle diagnostics tool that alerts the driver and the fleet of active vehicle diagnostics' conditions.

|  |      |
|--|------|
| <i>Vehicle Maintenance Overview</i> .....            | 13-2 |
| <i>Connecting the J1939 Wires</i> .....              | 13-2 |
| <i>Vehicle Maintenance System Verification</i> ..... | 13-3 |

**For technical questions, contact Omnitracs Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

## Vehicle Maintenance Overview

Vehicle maintenance is a vehicle diagnostics tool that alerts the driver and the fleet of active vehicle diagnostics' conditions. When a configured engine condition becomes active, the driver is alerted via the **Vehicle Maintenance** button by displaying in orange the number of active conditions. An e-mail notification is also sent to a pre-subscribed list notifying fleet personnel of the active condition.

### Feature Requirements

- Connection to the J1939 datalink is required.
- The vehicle maintenance service only supports conditions from the J1939 datalink.
- The following conditions are monitored at this time:

| <i>Description</i>                    | <i>Source</i> | <i>PGN</i> | <i>SPN</i> | <i>FMI</i> |
|---------------------------------------|---------------|------------|------------|------------|
| Engine power supply voltage (low)     | 0             | 65226      | 627        | 004        |
| Auxiliary water pump pressure (high)  | 0             | 65226      | 073        | 003        |
| Auxiliary water pump pressure (low)   | 0             | 65226      | 073        | 001        |
| Fuel delivery pressure (high)         | 0             | 65226      | 094        | 003        |
| Engine oil pressure (high)            | 0             | 65226      | 100        | 003        |
| Engine oil pressure (low)             | 0             | 65226      | 100        | 001        |
| Engine coolant temperature (high)     | 0             | 65226      | 110        | 000        |
| Engine coolant temperature (low)      | 0             | 65226      | 110        | 004        |
| Engine coolant level (high)           | 0             | 65226      | 111        | 003        |
| Engine coolant level (low)            | 0             | 65226      | 111        | 001        |
| Engine fuel temperature (high)        | 0             | 65226      | 174        | 003        |
| Engine oil temperature (high)         | 0             | 65226      | 175        | 003        |
| Engine oil temperature (above normal) | 0             | 65226      | 175        | 000        |
| Brake ABS valve (high)                | 11            | 65226      | 795        | 003        |
| Brake ABS valve (low)                 | 11            | 65226      | 798        | 004        |

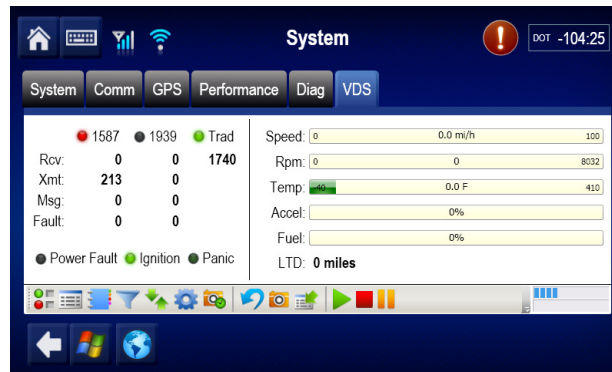
### Connecting the J1939 Wires

See [Chapter 10](#) in this guide for detailed information.

## Vehicle Maintenance System Verification

Refer to the following DIU200 screens to verify Vehicle Maintenance:

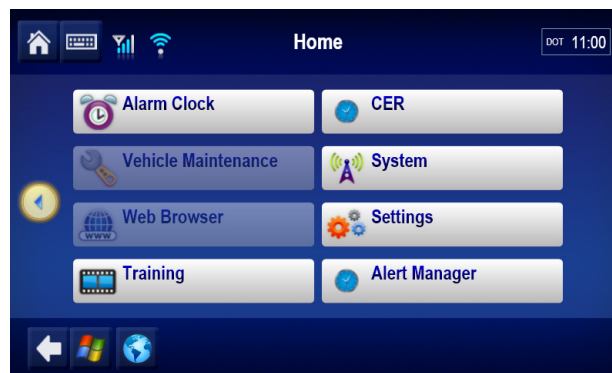
1. Go to the Vehicle Data Service (VDS) status screen. Tap the **Home** key and use the right and left arrows to get to the **System** button. Tap the **System** button and tap the **VDS** tab.



With the ignition ON, verify the following on the VDS (Status) screen:

- The J1939 light is green. This confirms that the J1939 is enabled for the unit. The Rcv value should be constantly increasing.
  - If the J1939 light is red, the data is stale.
  - If the J1939 light is dark, the unit is not enabled for J1939.

2. Tap the **Home** button and scroll down to the **Vehicle Maintenance** button.

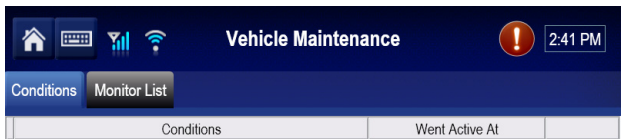


### Note

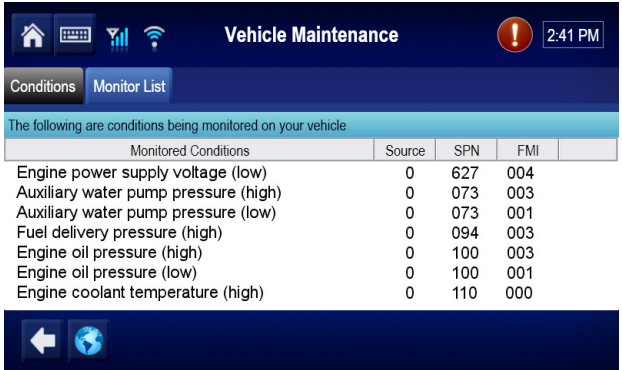
*If the Vehicle Maintenance button is **not** highlighted blue, the service is not enabled for the unit and must be turned on via the Customer Portal.*

3. Simulate an engine condition. The number of conditions you create should appear in orange on the Vehicle Maintenance button.

4. Tap the **Vehicle Maintenance** button and select the **Conditions** tab to view the current Active and Inactive Conditions.



- Conditions with red dots are active conditions.
  - Conditions with gray dots are inactive conditions.
  - The simulated condition should have a red dot.
  - Conditions must be active 40 seconds before they are reported on the DIU200.
  - 40 seconds after a condition becomes inactive the dot for that condition turns gray.
  - 40 minutes after the condition has been inactive, it is removed from the list.
5. Select the **Monitor List** tab to view the complete list of Monitored Conditions (also listed on page 13-2).



6. Verify that e-mail notification goes out upon detection of condition. If you do not receive e-mail notification, contact Omnitracs Customer Support at (800) 541-7490.

14

**Critical Event Reporting System Verification**

---

This chapter contains information regarding Critical Event Reporting (CER) requirements, installation, and system verification. The topics include:

|   |      |
|---|------|
| <a href="#">CER Overview</a> .....            | 14-2 |
| <a href="#">CER System Verification</a> ..... | 14-3 |

**For technical questions, contact Omnitrac's Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

## **CER Overview**

CER captures and reports critical event information such as:

- hard braking events
- stability control/roll stability events
- lane departure warning (LDW) events
- panic button events
- manually triggered events

The CER feature records a set of predefined data for the five minute period before a critical event occurs and the two minute period after a critical event is triggered. The event information is sent from the mobile unit over the air where it is made available to the customer for analysis via a web application.

Text-to-speech (TTS) can be enabled so CER events can be audibly conveyed to the driver. Performance Monitoring is not required for CER. The “hard brake” feature in Performance Monitoring does not have to be enabled for the hard brake CER trigger to operate.

For the CER feature to function, the datalink wires must be connected. Please refer to [Chapter 10: Vehicle Data Bus Connections](#).

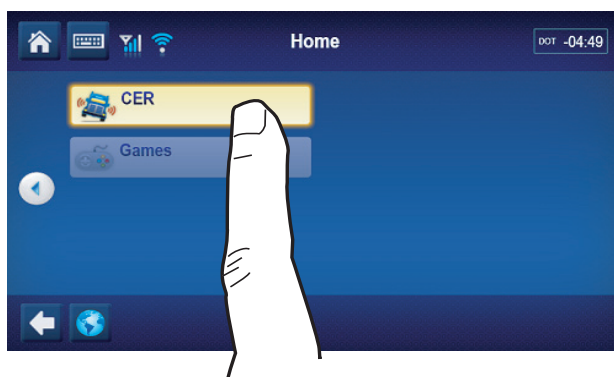
Some CER features are dependent on connection to both J1708/J1587 and J1939 data links and rely on the vehicle’s ECM to supply needed information.

## CER System Verification

1. Identify configuration and available CER features
2. Test system by manually reporting an event

### Identify Configuration and Available CER Features

1. To access CER information, go to the **Home** screen and tap the **CER** button.

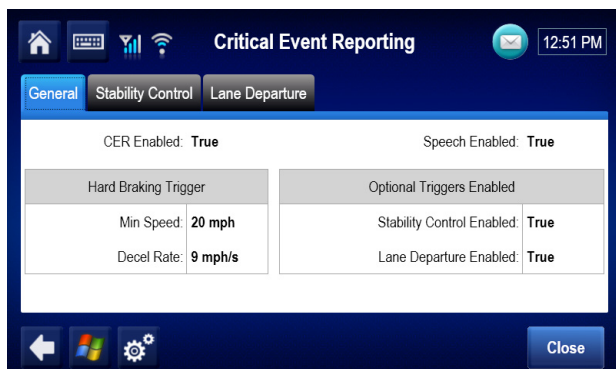


If the CER button is grayed out, then the CER service for the unit is not enabled. It will need to be enabled from the Customer Portal by assigning the unit to the correct operational profile. The Main CER screen will show.



2. From the Main CER screen shown above, tap the **General** tab.

## General Features



### General Screen field definitions

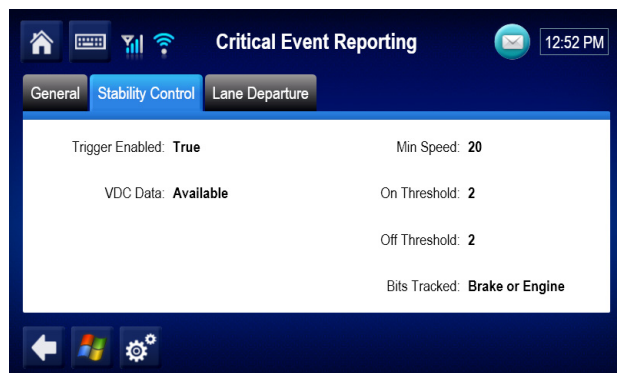
| <b>Field</b>              | <b>Description</b>   |
|---------------------------|--|
| CER Enabled               | True or False. If true, the MCP200 captures CER events.                          |
| Hard Braking Min Speed    | The minimum speed at which mobile unit will start to detect hard brake events.   |
| Hard Braking Decel Rate   | The rate of deceleration that triggers a hard brake event (Default = 9 MPH/SEC). |
| Speech Enabled            | True or False. If true, the text in the alert pop-ups are spoken.                |
| Stability Control Enabled | True or False. If true, stability control is enabled.                            |
| Lane Departure Enabled    | True or False. If true, lane departure warning is enabled.                       |



## Stability Control

For stability control critical event reporting to work, the vehicle must be equipped and configured with Eaton Vorad's stability control product or other similar product.

To see if Stability Control is enabled and configured properly, tap the **Stability Control** tab.

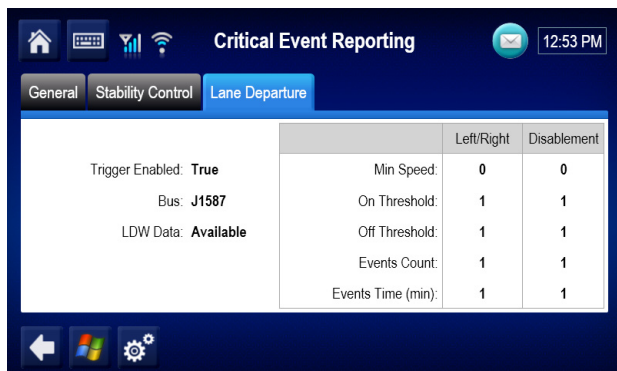


### Stability Control Screen field definitions

| <b>Field</b>    | <b>Description</b>   |
|-----------------|--|
| Trigger Enabled | True or False. If true, stability control events are configured to be recorded. If false, VDC is Not Seen.   |
| VDC Data        | Available or Not Seen. If stability control information is provided by the anti-lock brake system (ABS), it shows Available. If it is not provided, shows Not Seen.<br>If stability control is enabled and the truck has ABS, but it shows Not Seen, contact your administrator to apply the correct configurations. |
| Min Speed       | Minimum speed at which mobile unit detects events.   |
| On Threshold    | Number of notifications from the ABS indicating brake or engine being modulated in a row before an event is considered to be in progress.  |
| Off Threshold   | Number of notifications from the ABS indicating brake or engine not being modulated in a row before an event is considered to be no longer in progress.  |
| Bits Tracked    | Indicates which bits the mobile unit tracks to monitor stability control events mentioned above: <ul style="list-style-type: none"> <li>• Brake only</li> <li>• Engine only</li> <li>• Brake or Engine (Default)</li> <li>• Brake and Engine</li> </ul>  |

## Lane Departure

For LDW to function, the vehicle must be equipped with an LDW system. To access LDW information, tap the **Lane Departure** tab.

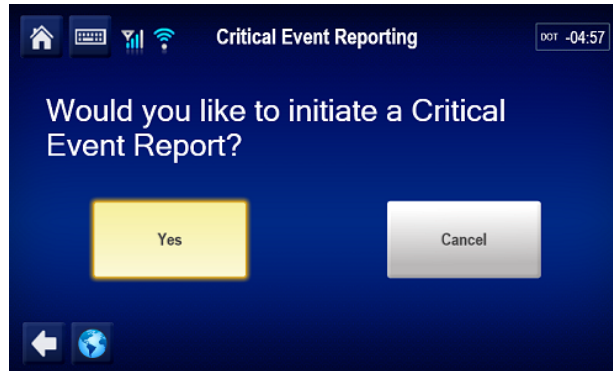


### Lane Departure Screen field definitions

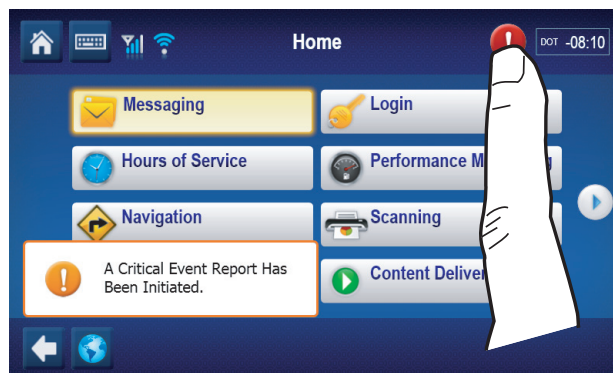
| Field             | Description  |
|-------------------|--|
| Trigger Enabled   | True or False. If true, LDW is being recorded.   |
| Bus               | J1587 or J1939. Should be J1939 unless a converter box is installed for using J1587)   |
| LDW Data          | Available or Not Seen. If LDW data information is provided, it shows available. If it is not provided, shows Not Seen.<br>If LDW is enabled and the truck has an LDW system, but it shows Not Seen, contact your administrator to apply the correct configurations |
| Min Speed         | Minimum speed at which mobile unit detects events.   |
| On Threshold      | Number of notifications from LDW that indicate a departure that must be seen in a row before an event is considered to be in progress.   |
| Off Threshold     | Number of notifications from LDW that do not indicate a departure that must be seen in a row before an event is considered to be not in progress.  |
| Events Count      | [Events Count] LDW events within [Events Time (min)] that will result in notifications by CER.   |
| Events Time (min) |  |

**Test System by Manually Reporting an Event**

1. With the MCP200 powered on, create a CER event by doing **one** of the following:
  - From the Home screen, press the **Ctrl** and **t** keys on the DIU. When the screen appears, tap the **Yes** button.
  - From the Home screen, tap the **Critical Event Reporting** icon. When the screen appears, tap the **Yes** button.



2. Verify that the CER web application receives the CER event message and the data surrounding the event is present. If the message is not received at the CER web application then the NOC account could be set up incorrectly. Call Omnitrac's Customer Support at 800-541-7490.
3. Clear the event by pressing the **Exclamation** icon and then the **Clear** button.





15

**Trailer Management System Installation**

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Topics in this chapter provide how to install Trailer Management system hardware on tractors and trailers and how to verify that the system is working properly.

|   |      |
|---|------|
| <i>Trailer Management System Overview</i> .....             | 15-2 |
| <i>Trailer Management System Wiring for the Truck</i> ..... | 15-2 |
| <i>Trailer Management System Verification</i> .....         | 15-3 |

**For technical questions, contact Omnitracs Customer Support.**  
Customer Support is staffed 24 hours a day, 365 days a year:

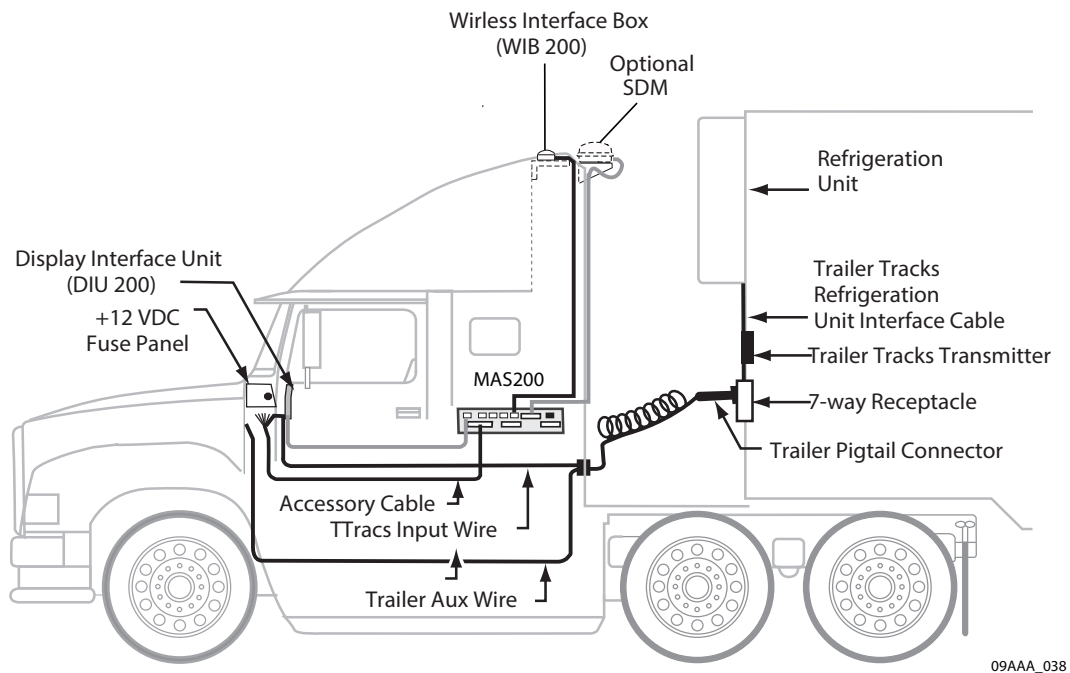
- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

## Trailer Management System Overview

- Monitors trailer connects and disconnects and passes the information on to dispatch via the wireless communication network with the date, time, and location.
- Monitors the refrigeration unit of a trailer.

### Hardware Requirements

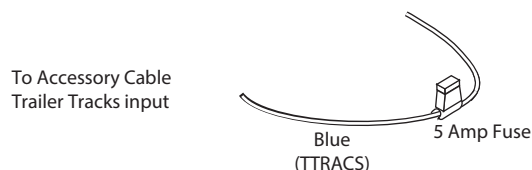
- The MCP200 accessory cable must be installed (see [Chapter 5](#)) on the mobile application server 200 (MAS200).



## Trailer Management System Wiring for the Truck

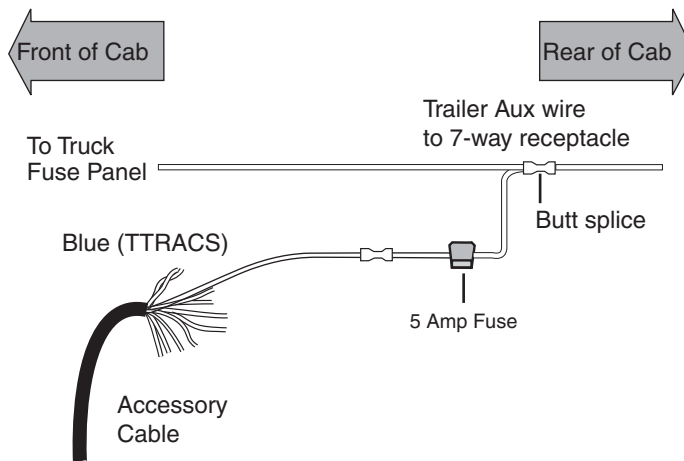
### Fuse Kit Installation

Fuse kits are needed for all Trailer Management system installations.



1. Locate the blue AUX wire in the 7-way trailer harness. With ignition turned ON, determine if +12/24 VDC is present on this wire.
  - If +12/24 VDC is present, proceed to [step 2](#).

- If +12/24 VDC is not present, first verify that the main aux fuse is not blown. If no circuit exists, then connect ignition-switched +12/24 VDC from the fuse panel to the trailer auxiliary line. The trailer auxiliary wire must be protected by a 30-amp fuse or a circuit breaker. Proceed to [step 2](#).
- 2. Locate the trailer auxiliary wire connection point, usually where the trailer auxiliary wire enters the truck cab.
- 3. Install the 5-amp fuse on the accessory cable's blue TTRACS wire.
- 4. Butt splice the protected end of 5-amp fuse to trailer auxiliary wire connection point.



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**Caution**

**Filters:** Filtering of the 7-way AUX wire to stop the vehicle's ABS PLC signal (SAE 2497) from getting into the vehicle electrical system, will also filter the Trailer Management system signal. The TTRACS wire should be connected so it does not go through the PLC filter.

**ABS Interoperability:** The Trailer Management system product has been tested by Omnitracs for interoperability with the SAE standard PLC4Trucks ABS signal. These tests resulted in no adverse impact on the ABS warning function. Furthermore, Omnitracs is not aware of any interoperability issues in actual operation on vehicles in the marketplace.

## Trailer Management System Verification

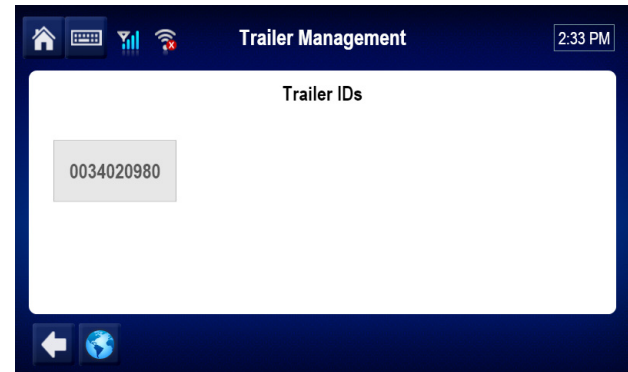
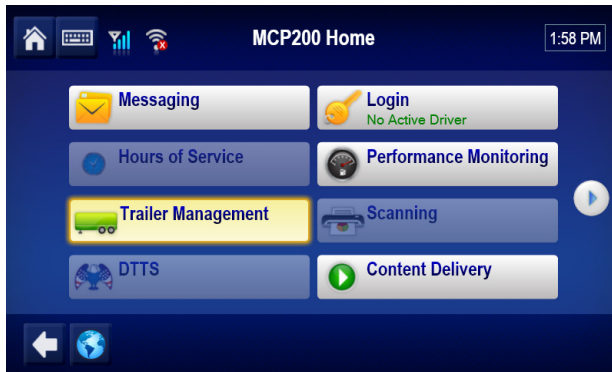
### Enabling the Option for the Trailer Management System

- If the Trailer Management button is grayed out, Trailer Management is not enabled.
- Call your company dispatch to have the correct operational profile selected so this application is enabled.

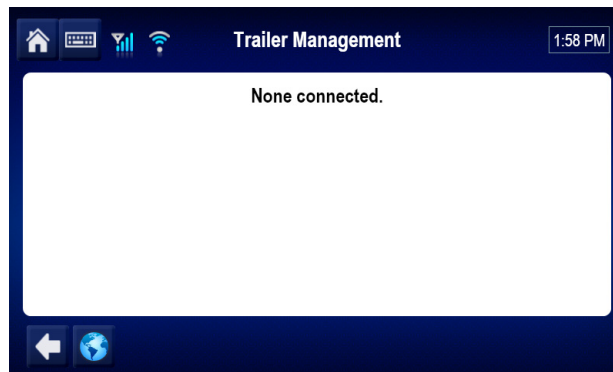
## Trailer Connection/Disconnection

### Connection

1. Connect an MCP200-equipped tractor to the trailer, connect the tractor/7-way pigtail.
2. Tap the **Trailer Management** button.



If a trailer is not currently connected, the status is **None Connected**.



After the trailer is connected and the TrailerTRACS transmitter sends its ID to the MCP200, the trailer ID is updated on the display.

### Disconnection

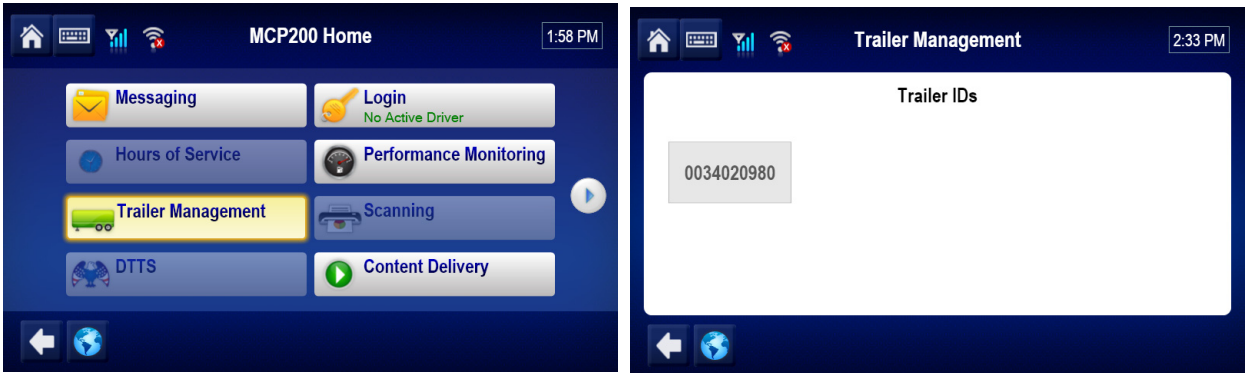
1. Remove 7-way pigtail.
2. Leave ignition ON.
3. Wait for disconnect message (approximately 2 to 3 minutes).

A disconnect message is sent when the tractor's ignition is on and there has been no signal from the Trailer Management transmitter for a preset time period. This usually occurs within five minutes.



**Trailer Management Diagnostic Screen**

1. Tap the **Trailer Management** button. The Trailer IDs screen displays.



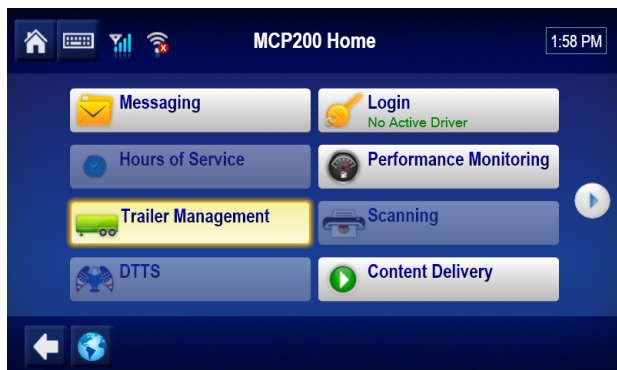
2. Tap the “D” key and the Diagnostics screen will display,.
3. When a trailer is connected, the Trailer Management Diagnostic screen displays. The Trailer Management transmitter ID shows on the Trailer IDs screen.

A Trailer Management ID number displays, as well as other numerical information.

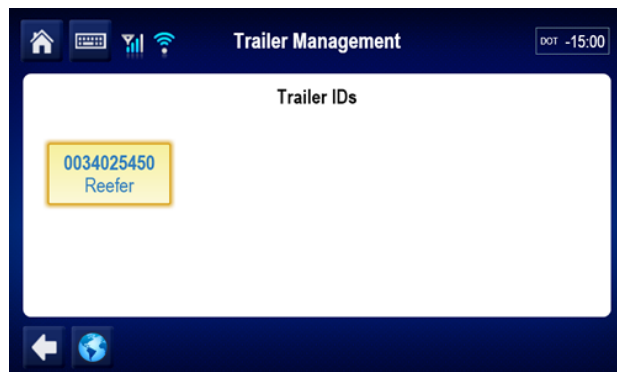
| <i><b>Field</b></i>          | <i><b>Description</b></i>  |
|------------------------------|--|
| First Line<br>Trailer Diag   | Number of seconds since the ignition was turned ON.  |
| Second Line<br>First Number  | Trailer Management ID number.  |
| Second Line<br>Second Number | Number of ID packets from the TrailerTRACS transmitter since the ignition was turned ON.                 |
| Second Line<br>Third Number  | Number of seconds since the last ID packet was received from the TrailerTRACS transmitter by the MCP200. |

## Refrigeration Status Screen

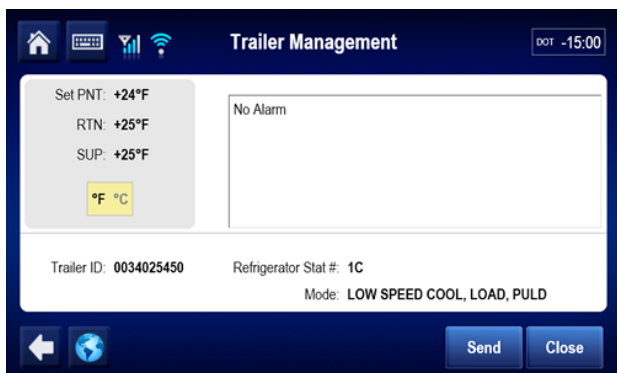
1. Tap the **Trailer Management** button.



2. If a refrigeration unit is detected, it will say Reefer in the ID box.



3. Refrigeration Status screen appears. To send the information to dispatch, Tap the **Send** button.



| <b>Field</b>        | <b>Description</b>   |
|---------------------|--|
| Trailer ID          | The trailer's TrailerTRACS transmitter ID.   |
| Refrigerator Stat # | Number of refrigeration status notifications sent from the refrigeration unit to the MCP200. When this number is incrementing regularly, your data is being sent from the refrigeration unit.<br>The number is followed by a code that identifies the refrigeration unit's manufacturer: <ul style="list-style-type: none"><li>• T—Thermo King</li><li>• C—Carrier</li></ul> |
| Mode                | Refrigeration unit's operating mode.   |
| SET PT              | Trailer's set point. Shown in Celsius (C) or Fahrenheit (F).   |
| RTN                 | Temperature of air coming out of the trailer register.   |
| SUP                 | Temperature of air going into the trailer.   |



# 16

## Wired Panic Button Installation

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### Wired Panic Button Overview

The wired panic button meets all Defense Transportation Tracking System (DTTS) requirements and can be used for vehicles hauling U.S. Department of Defense loads or hazardous materials.

It can be configured at the NMC to function as a non-DTTS panic button. When this configuration is used, the panic button sends an alert to the NMC and an Emergency notification to the dispatcher, but DTTS is not notified.

For information on installing the wireless panic button, see chapter [Chapter 17: Wireless Panic Button Installation](#).

|   |      |
|---|------|
| <a href="#">Installing the Panic Button</a> ..... | 16-2 |
| <a href="#">Installation Verification</a> .....   | 16-4 |

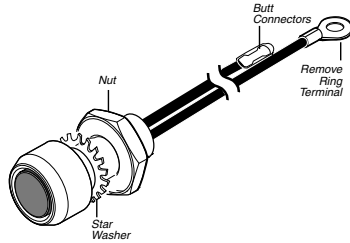
#### **For technical questions, contact Omnitrac's Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

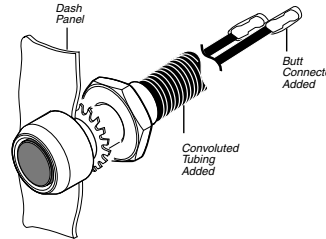
- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

## Installing the Panic Button

1. Install the accessory cable according to the guidelines in [Chapter 5](#).
2. Remove the pre-installed ring terminal and replace with the supplied butt connector.



Before Installation



After Installation

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3. Select a suitable location for the panic button.



### Caution

*Check behind the dash to ensure that the area is clear of obstructions before drilling.*

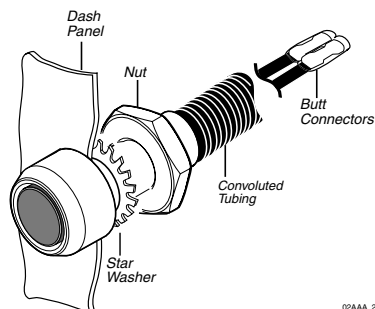
4. Drill a 5/8" hole in the vehicle dash.



### Caution

*Always deburr holes before routing the cables.*

5. Insert the button assembly into the dash and secure it in place using the lock washer and nut provided.



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### WARNING

*When routing the cable, avoid any moving parts or sharp edges.*

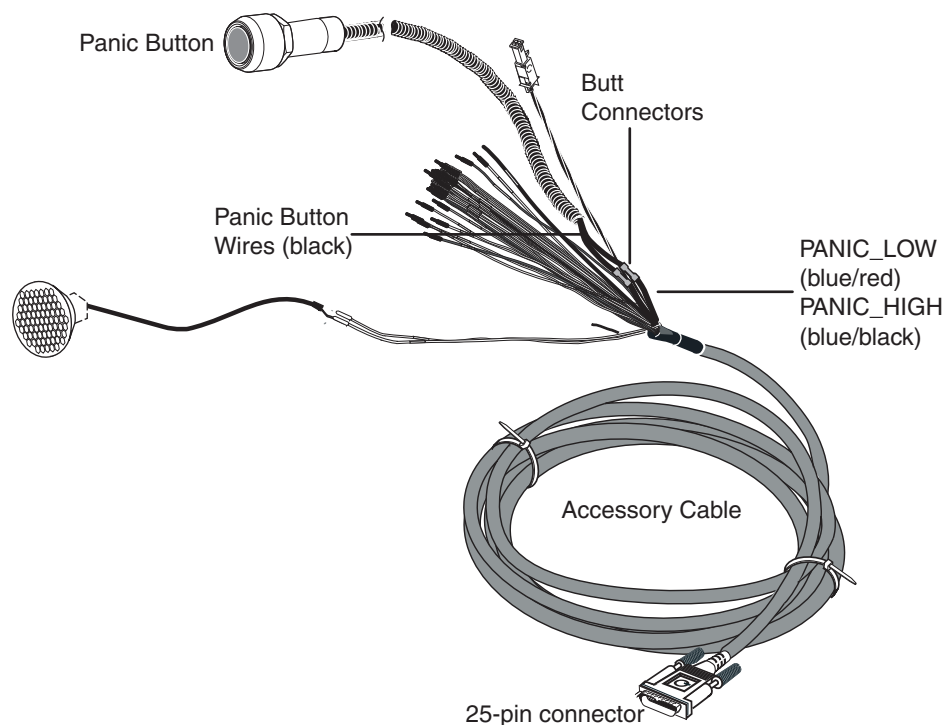
6. Route the cable to where you make the accessory cable connections on the MCP200.

7. Locate and separate the blue/red PANIC\_LOW and blue/black PANIC\_HIGH wires from the other accessory wires on the accessory cable.

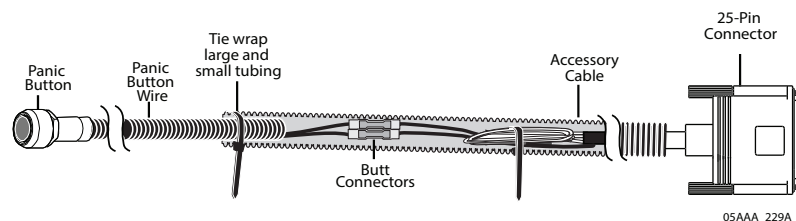
**Caution**

*Always use the appropriate crimping tool for insulated terminals.*

8. Connect the blue/red PANIC\_LOW and blue/black PANIC\_HIGH wires to the two wires of the PANIC button.



9. Once you have completed all connections, cover all wires with convoluted tubing, secure all loose or unsecured wires with wire ties, and stow away cabling.



## **Installation Verification**

### **Automated Panic Button Test System Dial-in Procedure**

Before you begin, you need the following:

- The MCP200 serial numbers you are testing.
- Your customer ID.
- Your authorization ID.

If you don't have this information, contact Omnitrac's Customer Support at 800-541-7490 before dialing in to test the procedure.

1. Call Omnitrac's Customer Support at 800-541-7490.
2. When prompted, press the **0** key for AUTOMATED SERVICES.
3. Press the **7** key for PANIC TESTING.
4. When prompted, enter your customer ID and press the **#** key.
5. Confirm or re-enter your customer ID.
6. When prompted, enter your authorization ID and press the **#** key.
7. Confirm or re-enter your authorization ID.
8. If more than one location has been set up for your company, you will hear a list of locations. Press the **number** key that corresponds with your current location and press the **#** key.
9. When prompted, enter the MCP200 serial number and press the **#** key.
10. When the serial number is accepted, the number is read back and you receive a confirmation number.
11. Press the **2** key to enter another MCP200 number or hang up to end the call.

If this process is unsuccessful, hang up and call Omnitrac's Customer Support at 800-541-7490 to speak with a representative.

12. You can now press the panic button. You will have an hour to perform the test.

When the test is complete, Omnitrac's sends a fax and/or an e-mail to your designated contact confirming the MCP200s you tested and the number of times you pressed the panic button for each MCP200 during the test.



# 17

## Wireless Panic Button Installation

---

### Overview

This chapter discusses the remote transmitter and instructions for installing the wireless panic button (WPB). The WPB works by sending an over-the-air notification using the MCP200. The WPB is approved for use for Defense Transportation Tracking System (DTTS) carriers.

The WPB is designed to operate within 100 feet of the vehicle with clear line-of-sight (no obstructions) between the WPB antenna (on the front windshield) and the remote transmitter (key fob).



#### **Caution**

*Although the WPB may be effective at ranges in excess of 100 feet, local atmospheric conditions will diminish the unit's consistent success as the distance from the antenna increases beyond 100 feet.*

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#### **For technical questions, contact Omnitrac's Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

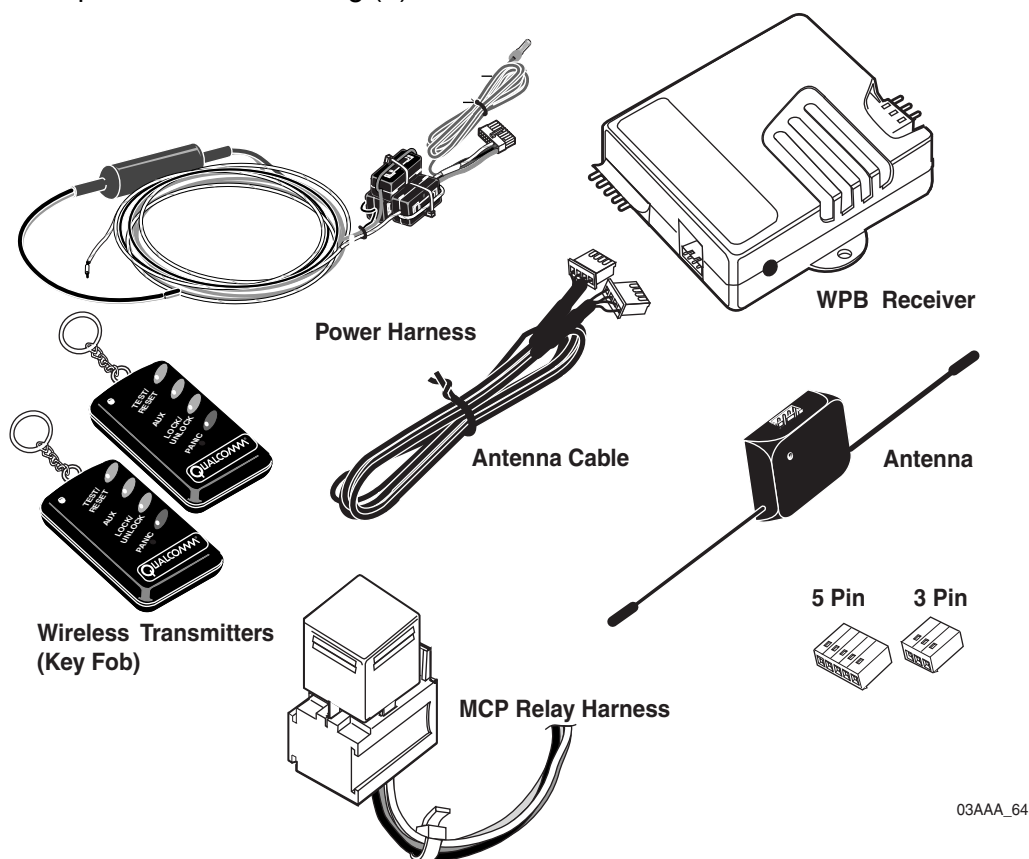
## Wireless Panic Button Kit

The WPB kit contains:

- Receiver (1)
- Transmitters (2)

*Make sure that the sliding guard on each transmitter is snapped over the front, so that the red **PANIC** button cannot accidentally be pushed. The **PANIC** button should show through the opening in the guard when properly installed.*

- Remote antenna
- Antenna cable
- Power harness cable with 18-pin connector (45-J6053-8)
- Relay harness assembly (45-J6061-1A)
- Tie wraps (5), butt splices (4), ring terminals (3)
- 3-pin connector housing (1)
- 5-pin connector housing (1)



**Additional Wireless Panic Button Accessories**

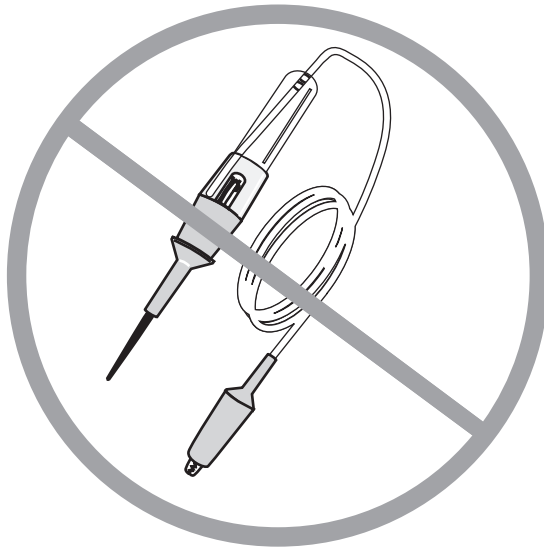
The following kit is also available:

- Kit, Wireless Panic Spare XMTR Upgrade. Needed to replace lost or damaged transmitters.

**Tools and Supplies Needed for Installation**

The following tools are recommended for installing the WPB:

- crimping tool (for insulated crimp terminals)
- wire stripper(s)/cutters
- screw driver(s)
- volt/ohm meter
- alcohol swabs



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**Caution**

*Do not use a voltage test light, as damage to the WPB receiver or the vehicle may occur.*

**Caution**

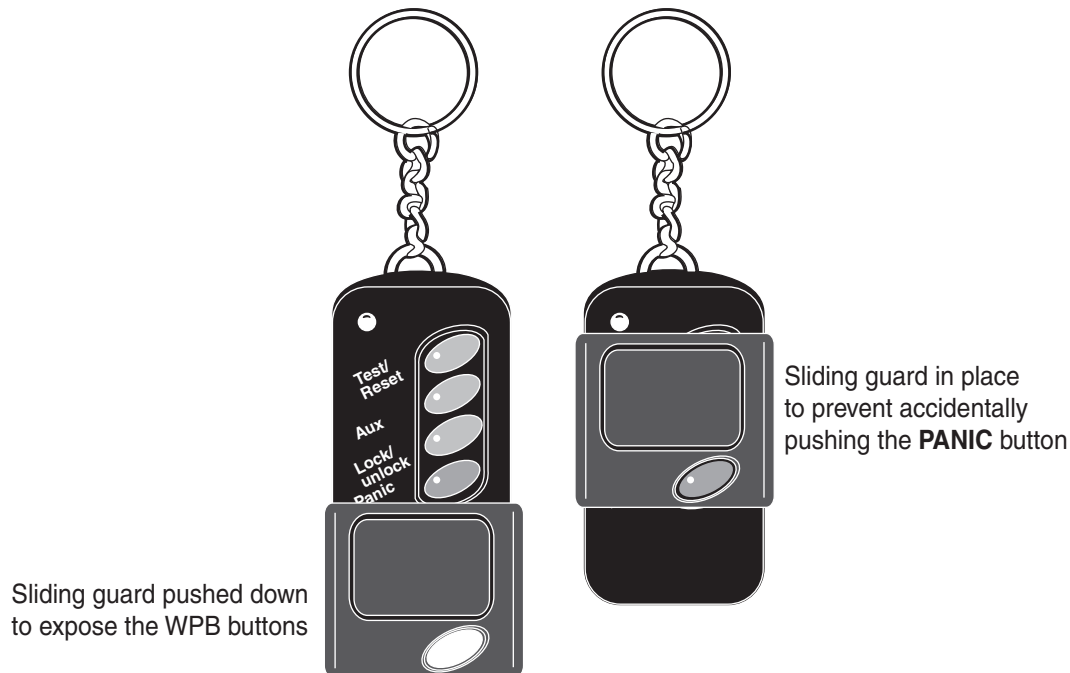
*Do not use Scotchloks™ or Scotchlok™-type connectors. Scotchloks™ are not approved for any accessory electrical connections. Use butt splices or ring terminals only.*

## Using the Remote Transmitter

### Note

Customers should train all WPB users to properly use the WPB and ensure that he/she understands what a panic notification as registered on the DIU200 looks like. A user should experience sending three or four panic notifications during installation or training.

The following sections provide information for using the WPB remote transmitter.



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### Activating the PANIC Feature

To activate the panic feature, press the **PANIC** button. **To ensure reception of the transmitter signal, hold the PANIC button down firmly for at least 1 second.** Activating the panic feature will send an over-the-air panic notification to the dispatch center. The panic feature will remain activated as long as the **PANIC** button is pressed. The **PANIC** button is recessed within the plastic cover to prevent false panics. If the button has accidentally been pressed, notify your dispatcher immediately.

### Activating the AUX Feature

The **AUX** button is not immediately functional, but is available for performing additional functions as set up during installation. Contact an Omnitrac customer service representative before wiring this feature. To activate the AUX feature (if functional), press and release the **AUX** button.

### **TEST/RESET Feature**

The **TEST/RESET** button is used to terminate the AUX function after the **AUX** button has been pushed. When the **TEST/RESET** button is pressed alone, a self-test on the receiver portion is activated, performing a local transmitter/receiver system test.

### **Activating the LOCK/UNLOCK Button**

At this time, the **LOCK/UNLOCK** button is not used. It may be used for future applications. Contact your Omnitrac customer service representative before wiring this feature.

## **Wireless Panic Button Receiver Installation**

### **Note**

*Before beginning installation, inspect all wiring of the existing MCP200 unit and the wired panic button (if installed).*

*The receiver should be mounted under the dash in a location that can easily be mounted with tie wraps, preferably near the fuse panel or near the entrance of the MCP200 power cable.*

The WPB receiver harness should be wired and checked for proper voltages (see [Voltage Check on page 17-8](#)) before connecting it to the receiver.



### **Caution**

*CB radios that have been modified to increase power beyond the legal limits, including the use of linear amplifiers (power boosters), may interfere with proper operation of the WPB. (Code of Federal Regulations (CFR), Title 47, Part 95, Subpart E, Section 95.667, "CB Transmitter Power".)*

---

## **Wireless Panic Button Wiring**

The following sections provide wiring information for the WPB.

### **Grounding**

1. Locate the chassis ground on the truck.
2. Attach the black (GROUND) wire of the WPB power harness to the chassis ground, making sure it is the same potential as the battery ground of the truck.

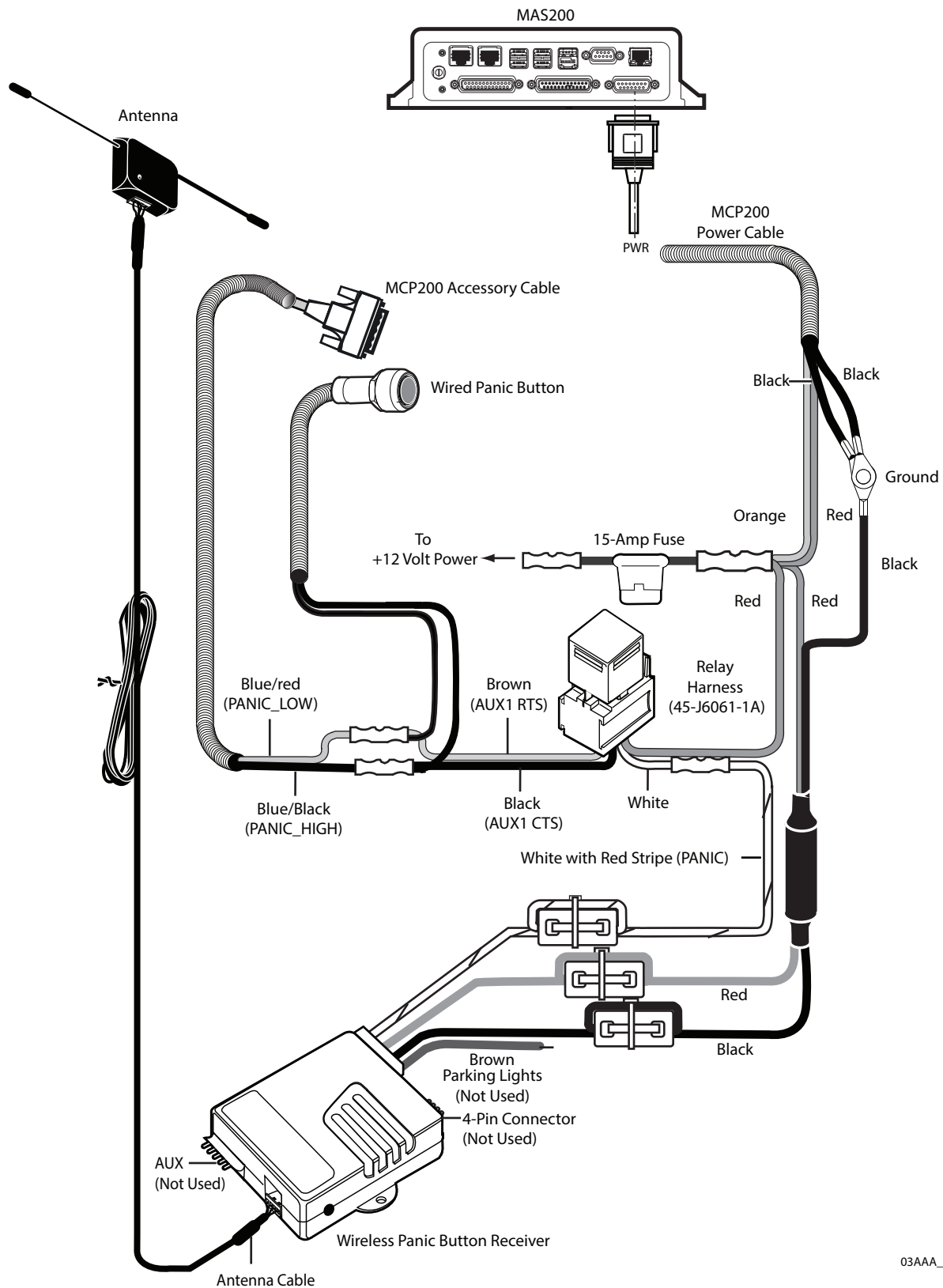
### **Power**

3. Locate the input power in the fuse panel (preferably, this is the same location as the power input to the MCP200).

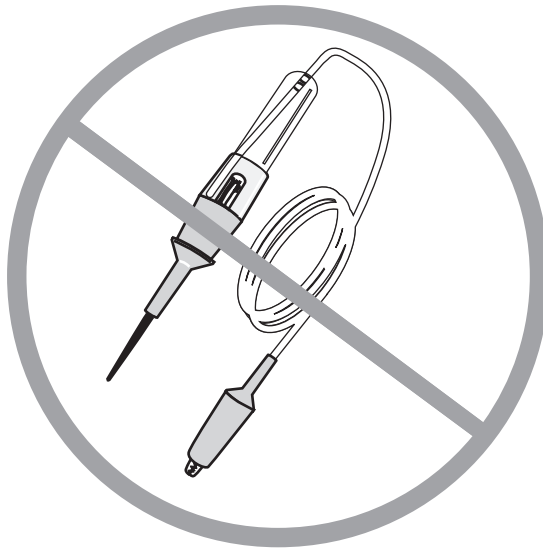
4. Securely fasten the red (POWER) wire of the WPB power harness to this power location using a butt splice.

***Panic Wire Installation***

1. Securely fasten the red (BAT+) wire from the relay harness to the red (POWER) wire from the WPB power harness using a butt splice.
2. Securely attach the white with red stripe (PANIC) wire from the WPB power harness to the white (PANIC) from the relay harness using a butt splice.
3. Securely attach the blue/red (PANIC\_LOW) wire from the MCP200's accessory cable to the brown (AUX1 RTS) wire on the relay harness using a butt splice.
4. Securely attach the blue/black (PANIC\_HIGH) wire from the MCP200's accessory cable to the black (AUX1 CTS) wire from the relay harness using a butt splice.
5. Securely fasten down the relay using a tie wrap.



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**Voltage Check**

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**Caution**

*Do not use a voltage test light, as damage to the WPB receiver or vehicle may occur.*

1. Now that you have connected the WPB power harness, using a voltmeter, check the voltages on the four wires at the end of the 18-pin connector.
  - The red wire should read battery voltage.
  - The black wire should read ground.
  - The white with red stripe wire should read approximately 3.8V.
2. Once this is verified, properly fasten the wires in place using tie wraps.
3. Ensure that no wires are dangling or that none of the wires were cut in the installation process.

**Antenna Installation**

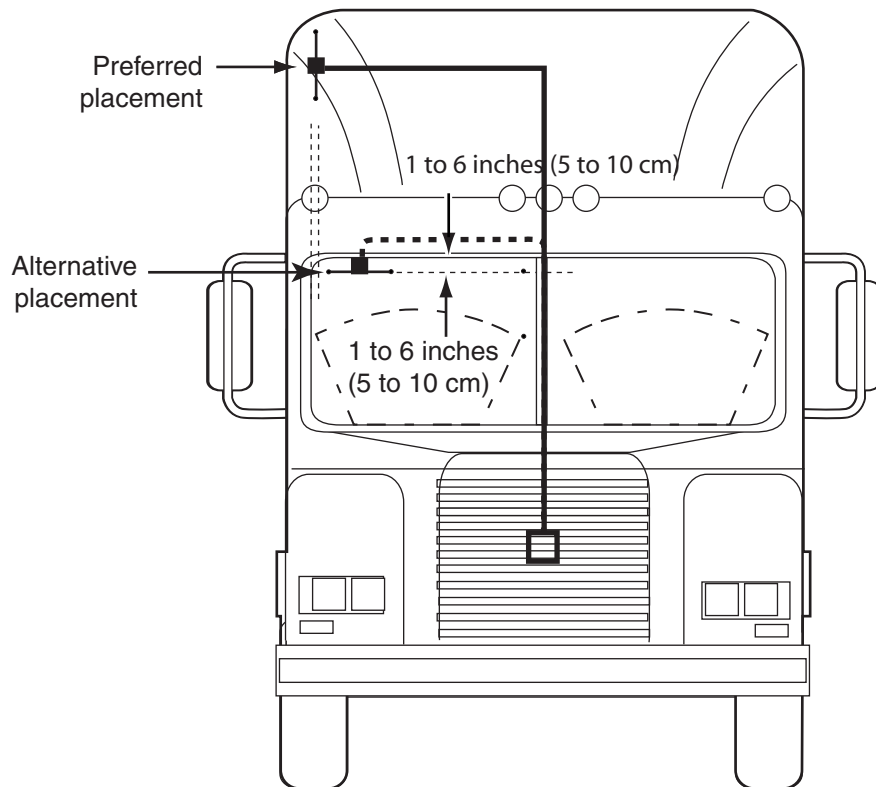
The following section provides information on installing the WPB antenna.

Federal requirements mandate that the antenna be mounted not more than 6 inches below the upper edge of the windshield; outside the area swept by the windshield wipers; and outside the driver's line of sight to the road and highway signs and signals.



### Antenna Placement

The antenna should be placed as high as possible, away from metal obstructions. For sleeper cabs with airdams, place the antenna as high as possible in a vertical position.



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### Antenna Cable Routing and Connection

1. Route the antenna cable up through the dash to the approximate area where the antenna will be mounted.
2. The antenna should be mounted so that it does not obstruct the view of the driver. If it is necessary to mount the antenna on the windshield, it should not be more than 6 inches down from the top edge of the windshield on the passenger side.
3. Thoroughly clean the antenna mount area with alcohol before mounting the antenna to the windshield.
4. Use the adhesive-backed tape on the back of the antenna to secure it to the windshield.
5. Plug the antenna cable into the antenna.
6. Secure the remaining wire with tie wraps under the dash.

**Final Connection**

1. Snap the supplied 3-pin and 5-pin connector housings onto the respective connectors of the WPB receiver to protect the exposed pins.
2. Connect the antenna cable to the receiver.
3. Connect the WPB power harness to the receiver.
4. When the WPB power harness is connected, there should be a clicking sound indicating that the WPB relays have activated.
5. Test that the unit is working. (See information below).

**Installation Verification for the Wireless Panic Button**

From the Home screen, tap the **Settings** icon. Tap the **Settings** tab. Verify that PANIC is Enabled and PANIC CONFIG is set to 2-wire.

Follow these steps to verify that the panic button has been installed correctly.

**Automated Panic Button Test System Dial-in Procedure**

Before you begin, you need the following:

- The MCP200 serial numbers you are testing.
- Your customer ID.
- Your authorization ID.

If you don't have this information, contact Customer Support at 800-541-7490 before dialing in to test the procedure.

1. Call Omnitrac's Customer Support at 800-541-7490.
2. When prompted, press the **0** key for AUTOMATED SERVICES.
3. Press the **7** key for PANIC TESTING.
4. When prompted, enter your customer ID and press the **#** key.
5. Confirm or re-enter your customer ID.
6. When prompted, enter your authorization ID and press the **#** key.
7. Confirm or re-enter your authorization ID.
8. If more than one location has been set up for your company, you will hear a list of locations. Press the **number** key that corresponds with your current location and press the **#** key.
9. When prompted, enter the MCP200 serial number and press the **#** key.

10. When the serial number is accepted, the number is read back and you receive a confirmation number.
11. Press the **2** key to enter another MCP200 number or hang up to end the call.

If this process is unsuccessful, hang up and call Omnitrac's Customer Support at 800-541-7490 to speak with a representative.

12. You can now press the panic button. You will have an hour to perform the test.

When the test is complete, Omnitrac's sends a fax and/or an e-mail to your designated contact confirming the MCP200s you tested and the number of times you pressed the panic button for each MCP200 during the test.

When the notification has been successfully transmitted, the display will show the panic notification in your Outbox with a check mark indicating the panic notification has been successfully transmitted, as shown below.

If the panic button is configured for audio notification, when the notification has been successfully transmitted you will first hear, "A panic message has been queued" and then you will hear, "A panic message has been sent."

## Wireless Panic Button Battery

### Note

Omnitrac's recommends testing the remote transmitter weekly to ensure battery operation. To test for battery operation, push any button **except** the red **PANIC** button, to light the red LED in the upper left corner. If the LED does not light, replace the battery immediately. (See [Wireless Panic Button Battery Replacement on page 17-12](#) for information on replacing the WPB battery.)



### Caution

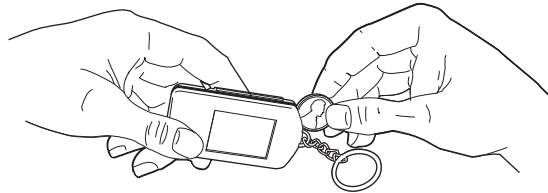
Due to battery temperature limitations (50° C/122° F), do not leave the transmitter exposed to direct sunlight. If the battery dies, replace it immediately with a new A23, 12V alkaline battery.

---

## Wireless Panic Button Battery Replacement

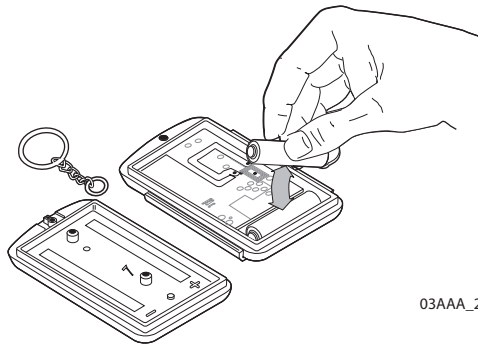
Follow these steps to properly replace the WPB transmitter battery.

1. Pry open the transmitter at the seam to separate the two halves of the transmitter unit.  
**Be careful not to lose the chain.**



03AAA\_26

2. Remove the dead battery and dispose of it properly.

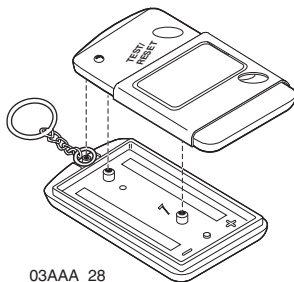


03AAA\_27

### Note

*Proper disposal of defective or dead alkaline batteries is the responsibility of the WPB owner. Please dispose of defective or dead batteries at a local alkaline battery recycling center.*

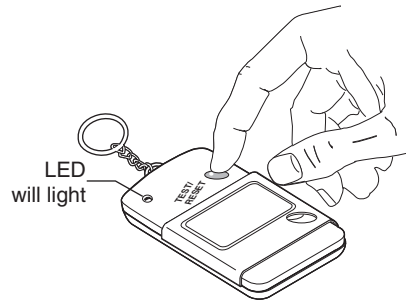
3. Replace the dead battery with a new (customer provided) A23, 12V alkaline battery. Follow the polarity shown embossed on the plastic housing.



03AAA\_28

4. Snap the housing back together **making sure that the chain is properly in place.**

5. Ensure that the unit is operating by pushing any button **except** the red **PANIC** button to light the red LED in the upper left corner.



03AAA\_29



18

In-Cab Scanner Installation

---

The in-cab scanner is a product of BCS Solutions.

|  |      |
|--|------|
| Installation Guidelines .....                                  | 18-2 |
| Mounting the Scanner .....                                     | 18-2 |
| Installing the Scanner .....                                   | 18-3 |
| Calibrating the Scanner .....                                  | 18-3 |
| Sending a Scan .....   | 18-4 |
| Cleaning the Scanner .....                                     | 18-5 |
| Return Material Authorization (RMA) Process for Scanners ..... | 18-6 |

**For technical support for the in-cab scanner, contact BCS Solutions:**

- In the United States and Canada, call 800-555-5555

**For initial support only, contact Omnitracs Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191



## **Installation Guidelines**

Install the scanner in the cab of the vehicle in a location that is convenient and safe. This can be on a vertical or horizontal surface. The scanner cannot obscure the driver's view of the road.



## **Mounting the Scanner**

The scanner can be mounted in one of two ways, with or without the holster.

### **Scanner Mounting Option (without the holster)**

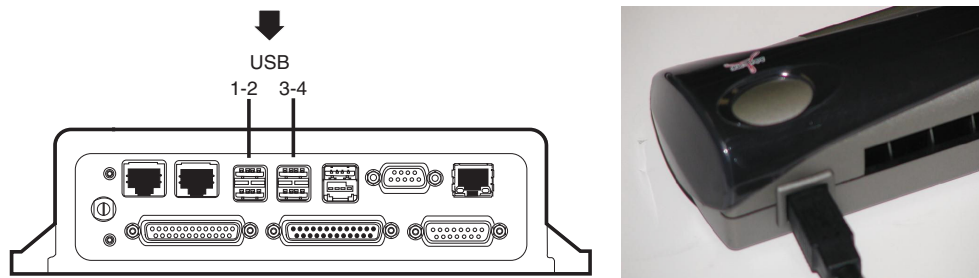
1. Cut the dual-lock tape into four 2.5" sections.
2. Clean the scanner bottom with an alcohol pad, remove protective film and apply two dual-lock pieces to the bottom ends of the scanner.
3. Clean the vehicle's mounting surface with an alcohol pad.
4. Remove protective film and apply two dual-lock pieces to the desired mounting surface.



### **Holster Mounting Option**

1. Select holster location.
2. Clean the location with an alcohol pad and let dry.
3. Carefully remove film from VHB adhesive locations on holster.
4. Position holster onto desired location and firmly press down to ensure contact with the surface.

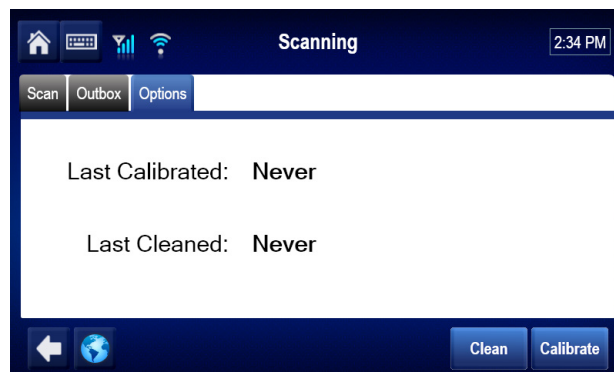
### **Installing the Scanner**



1. Connect smaller end of scanner cable to the USB port on the end of the scanner.
2. Connect the scanner cable to the MAS200 using any of the 4 USB ports.
3. Store excess scanner cable where it will not be damaged and is out of harm's way and will not obstruct the driver or hinder truck performance. Keep cable away from sharp metal edges to avoid damage.

### **Calibrating the Scanner**

1. From the Scanning Home screen, Tap the **Options** tab.



2. Insert the black and white calibration page or plain white paper into the slot.

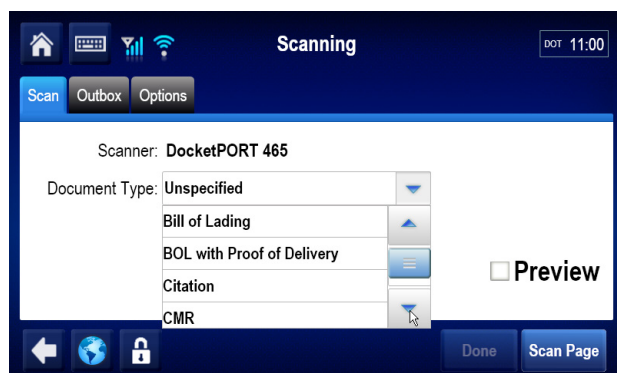
3. Tap the **Calibrate** button. Wait a few minutes for the calibration to complete.



4. Tap the **Scan** tab to return to the scanning home screen.

## Sending a Scan

1. On the Home screen, tap the **Scanning** button.
2. Select the Document Type from the drop-down list.

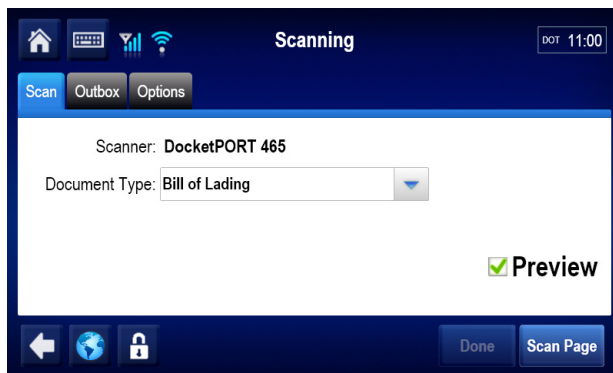


3. Insert the paper, face down.
  - It will go in about 1/2".
  - If it's not 8-1/2" wide, line it up with the right edge.

### Note

*The small tooth in the slot must be covered.*

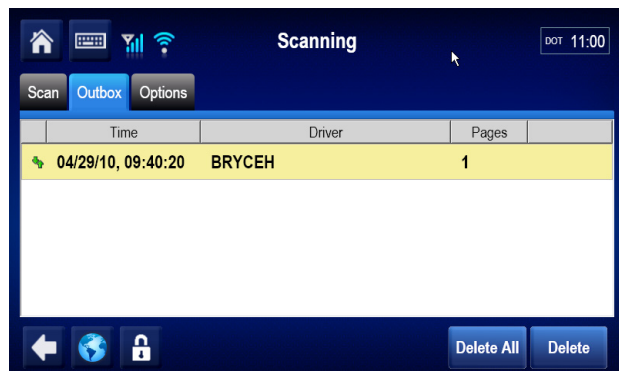
4. Tap the **Scan Page** button.



**Note**

*If the preview box is checked, a preview page appears. Tap the **Accept** button.*

5. Tap the **Done** button.
6. Select the active Driver ID from the drop-down list, and enter the Load and Trailer #. Tap the **Send** button.
7. When asked to confirm, tap the **OK** button.
8. Tap the **Outbox** tab and confirm a green check mark is displayed next to the scan.



## Cleaning the Scanner

1. Tap the **Options** tab.
2. Insert the cleaning paper.
3. Tap the **Clean** button. Wait a few minutes while the scanner draws through the cleaning paper and cleans the scanner.

***Return Material Authorization (RMA) Process for Scanners***

1. Request an RMA from BCS Solutions.
2. BCS Solutions arranges shipment of a replacement component to you.
3. Return the failed component to the address specified by BCS Solutions.

## Optional Remote Control Device (RCD) Installation

---

Topics in this chapter provide guidelines for installing the remote control device (RCD). This is an option that can be used if the DIU200 is not located where the driver can readily touch the 5-way to play messages.

|   |      |
|---|------|
| <i>General Installation Guidelines</i> .....            | 19-2 |
| <i>Installing the Remote Control Device (RCD)</i> ..... | 19-2 |

**For technical questions, contact Omnitrac's Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191



## **General Installation Guidelines**

1. Install the RCD.
2. Route and connect RCD cable.
3. Route and connect RCD cable to speaker.

### **Selecting a Mounting Location**

- Mount the RCD on the dash panel of the vehicle.
- RCD must be easily accessible to the driver while seated in the driver's seat, but cannot interfere in any way with the operation of the vehicle.
- Check **Important Safety Information** on page -xi when choosing a location.

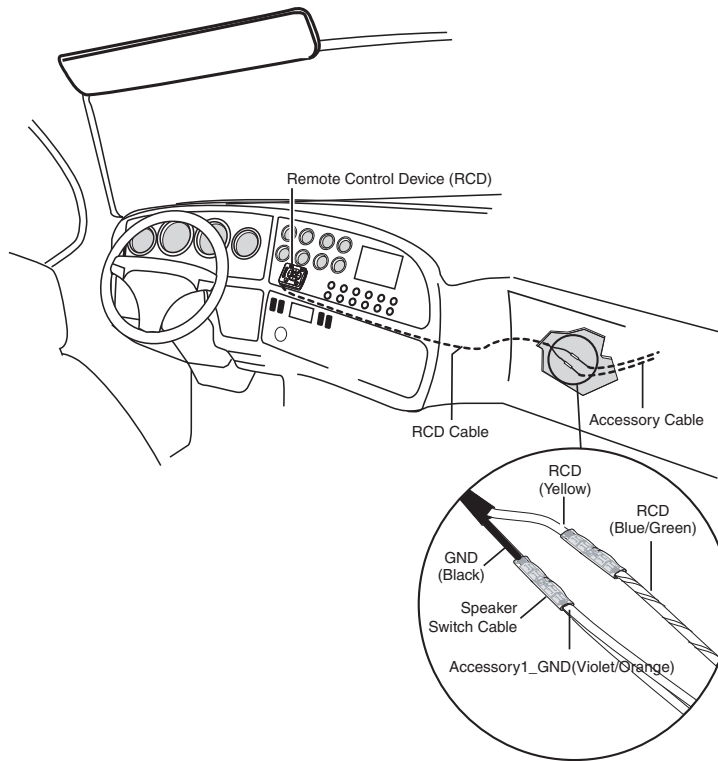
## **Installing the Remote Control Device (RCD)**

1. Determine a suitable location.
  - VHB (very high bond) tape *permanently* bonds the device to the dash panel.
2. Remove the dash panels to expose the backside of the dash. Check that the area is free of cable, wires, and/or hoses.
3. Drill a 1/4" hole in the dash panel and debur the hole.
  - OPTIONAL: If routing the cable over the dash, use tie wraps to secure the cable.
4. Route cable through the hole and behind the dash panel.
5. Use the alcohol wipe provided to clean the mounting surface of any dirt, oil, or grime.
  - OPTIONAL: There are two nutserts on the back of the RCD that can be used instead of/in addition to the VHB tape. If you use the nutserts, you will need 4-40 x 0.375-0.412 screws. These screws are not supplied by Omnitrac.
6. Remove the paper backing from the VHB tape and firmly press the RCD onto the mounting surface. Let it stand for a few minutes to allow surfaces to fully bond.
7. Finish routing the RCD cable to where the accessory cable ends.

### **Connecting the RCD to the Accessory Cable**

1. Butt splice the yellow wire on the RCD cable to the blue/green RCD wire on the accessory cable.
2. Butt splice the black wire on the RCD cable to the violet/orange Accessory1\_GND wire on the accessory cable.

- The Accessory1\_GND wire is also used for the speaker switch cable ground (green wire). Make both ground connections at the same time.



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## Wiring Diagrams and Charts

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Topics in this appendix provide wiring diagrams and pin description charts for the MCP200 and accessories.

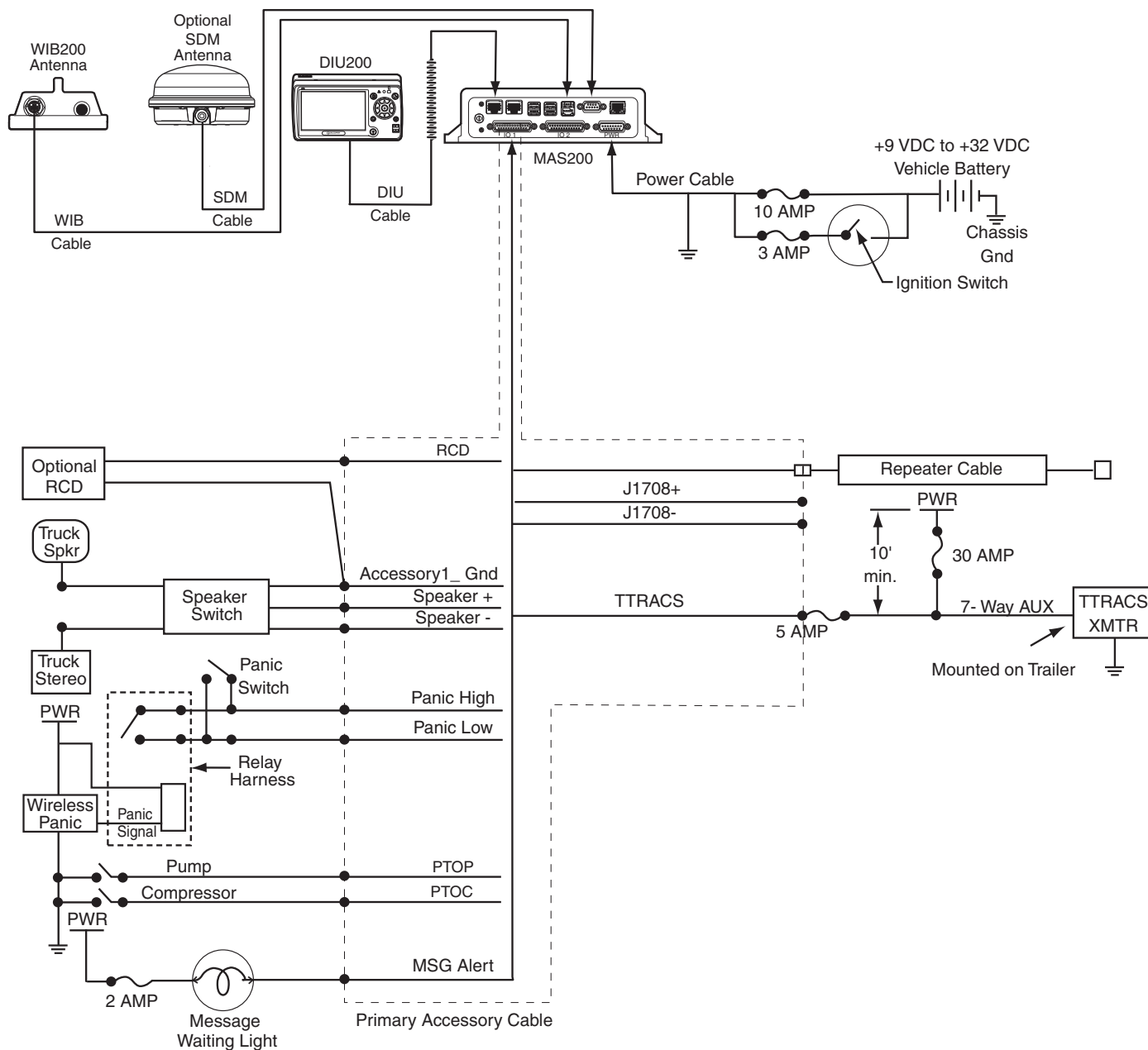
|  |      |
|--|------|
| <i>MCP200 Electrical Diagram</i> .....   | A-2  |
| <i>MCP200 Wiring Diagram</i> .....   | A-3  |
| <i>Power Cable Connector Pin Callouts</i> .....  | A-4  |
| <i>Wireless Interface Box (WIB200) Cable Connector Pin Callouts</i> .....                    | A-5  |
| <i>Optional Satellite Data Modem (SDM) Cable 9-Pin Connector Callouts</i> .....              | A-6  |
| <i>Primary Accessory Cable Connector Pin Callouts</i> .....                                  | A-7  |
| <i>Secondary Accessory Cable Connector Pin Callouts (Optional, not typically used)</i> ..... | A-8  |
| <i>Display Interface Unit 200 (DIU200) Cable Connector Pin Callouts</i> .....                | A-9  |
| <i>Six-pin Data Link Connector Pin Callouts</i> .....  | A-10 |
| <i>Nine-pin Data Link Connector Pin Callouts</i> .....                                       | A-11 |
| <i>Radio Connector Pin Callouts</i> .....  | A-12 |
| <i>CAN Repeater Cable Pin Callouts</i> .....   | A-13 |
| <i>Speaker Switch Cable</i> .....  | A-14 |

**For technical questions, contact Omnitrac's Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

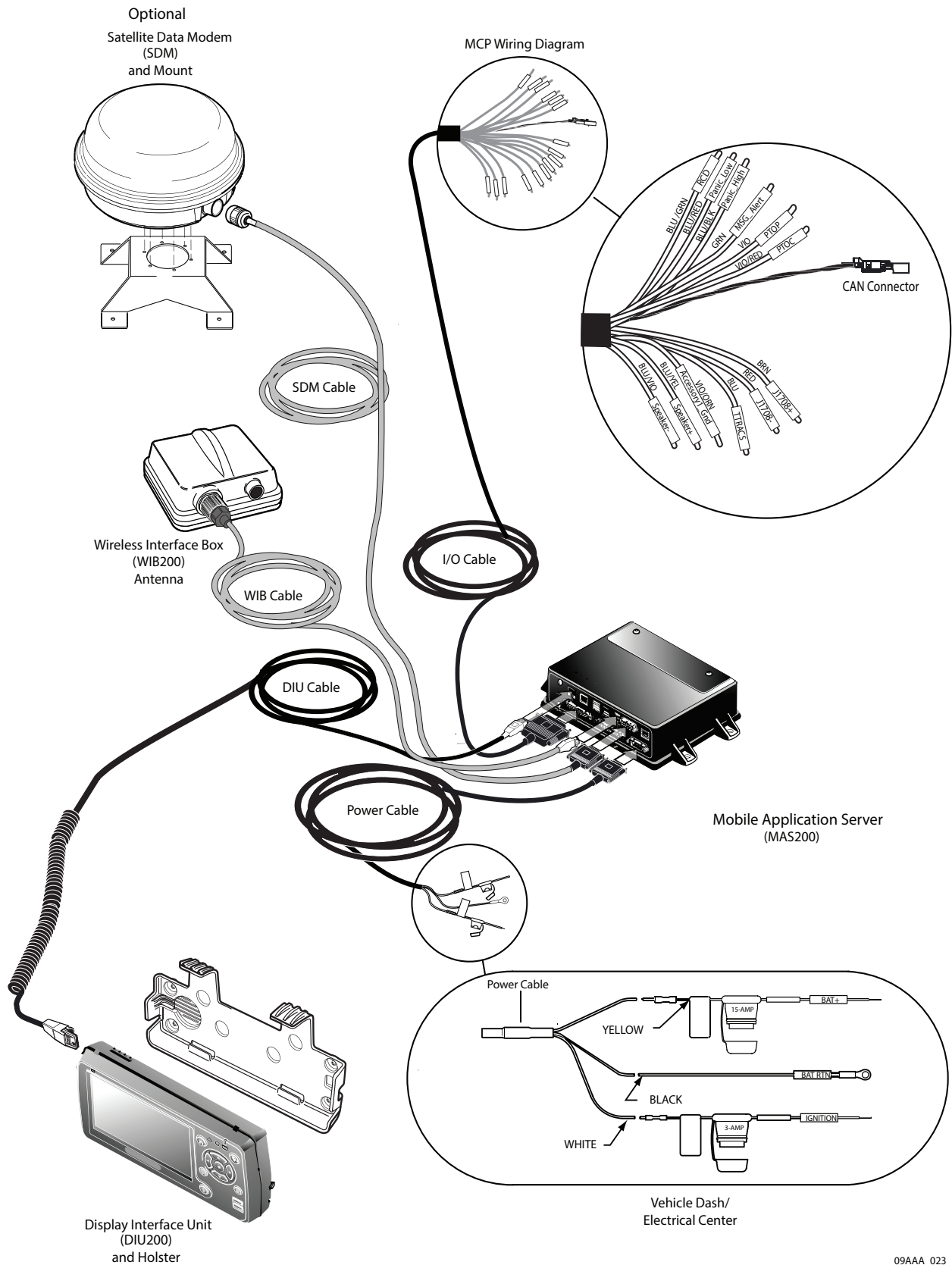
- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

## MCP200 Electrical Diagram



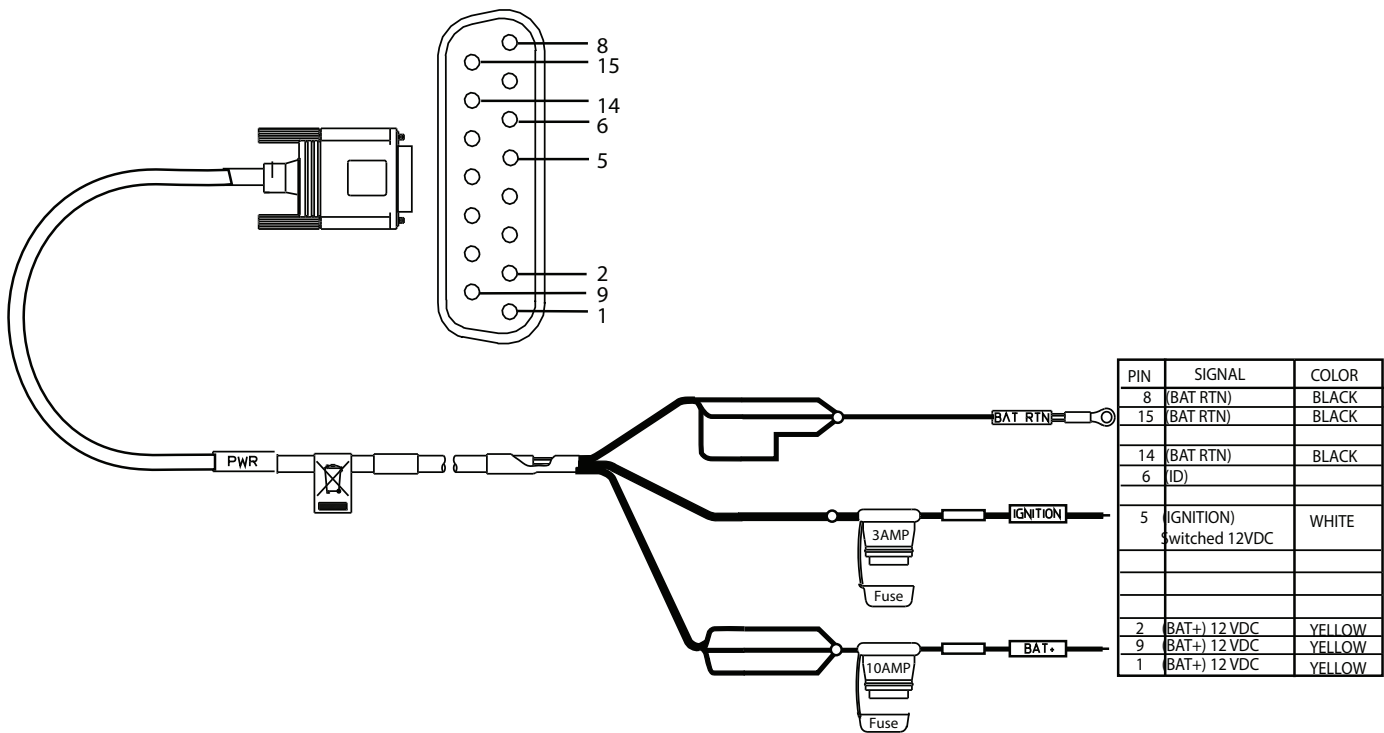
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# MCP200 Wiring Diagram



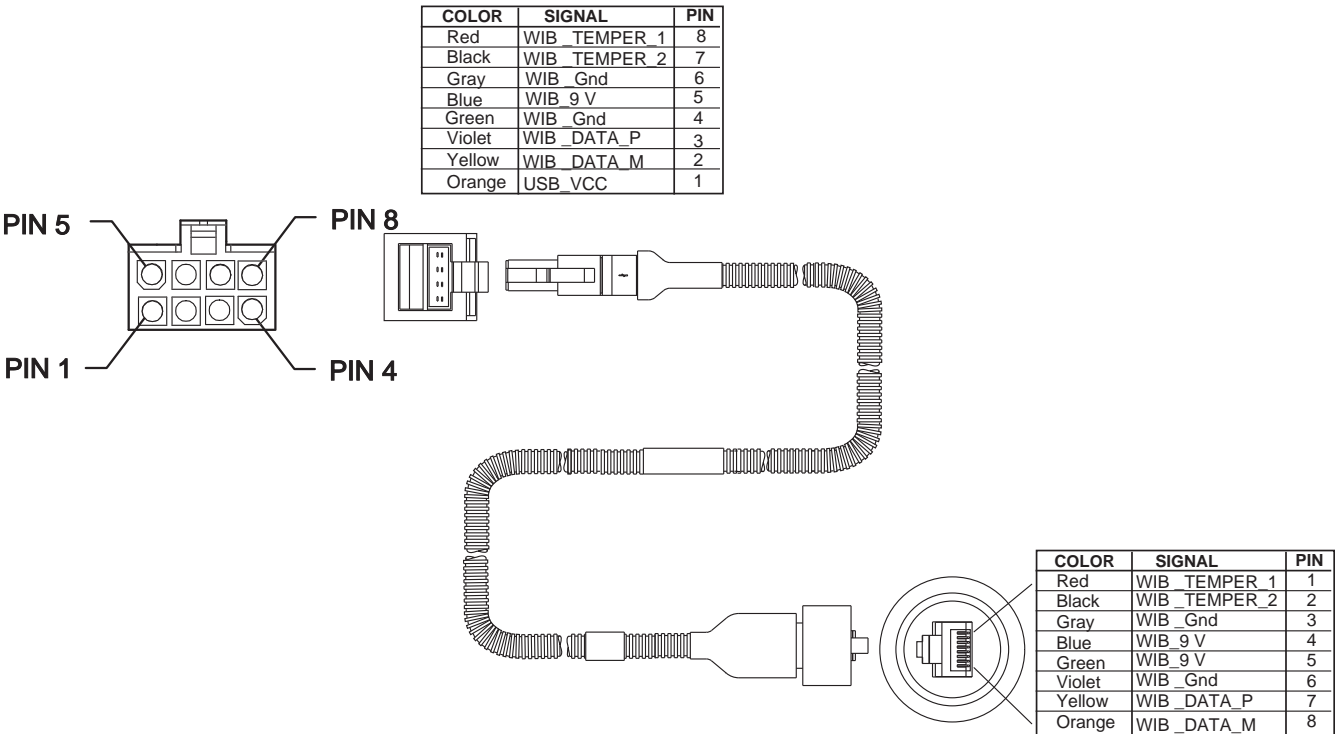
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Power Cable Connector Pin Callouts



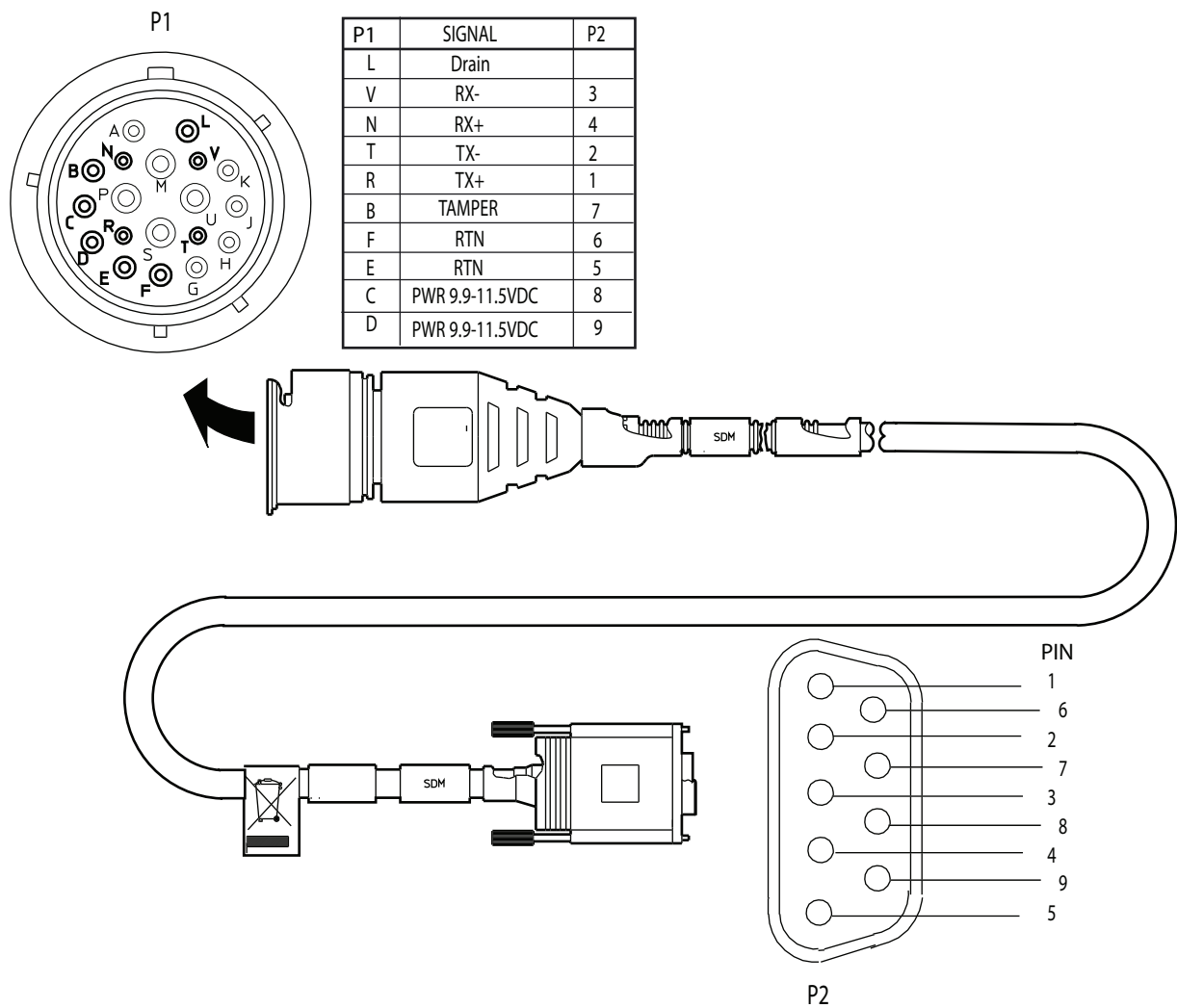
06A<sub>1</sub>

**Wireless Interface Box (WIB200) Cable Connector Pin Callouts**



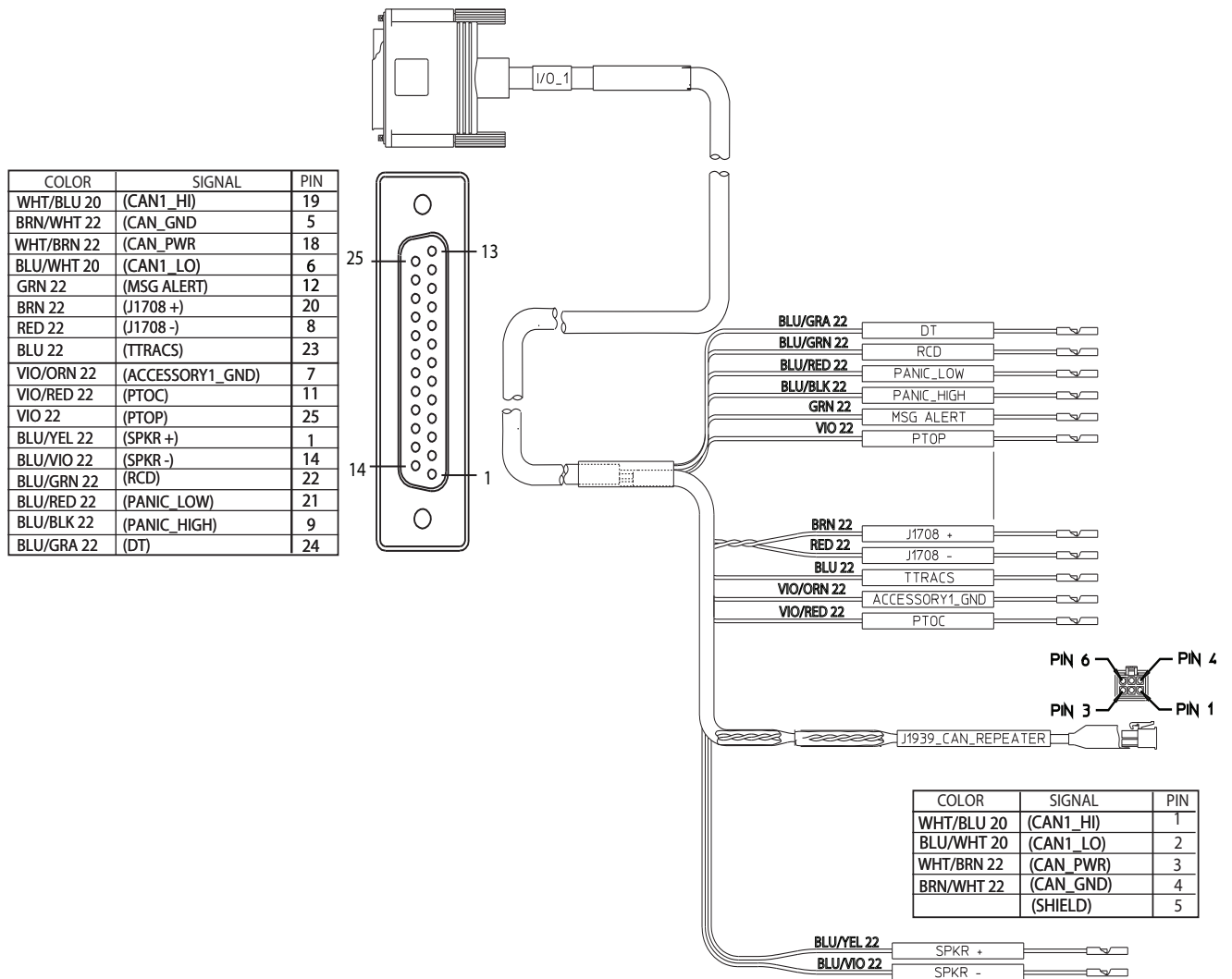
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Optional Satellite Data Modem (SDM) Cable 9-Pin Connector Callouts



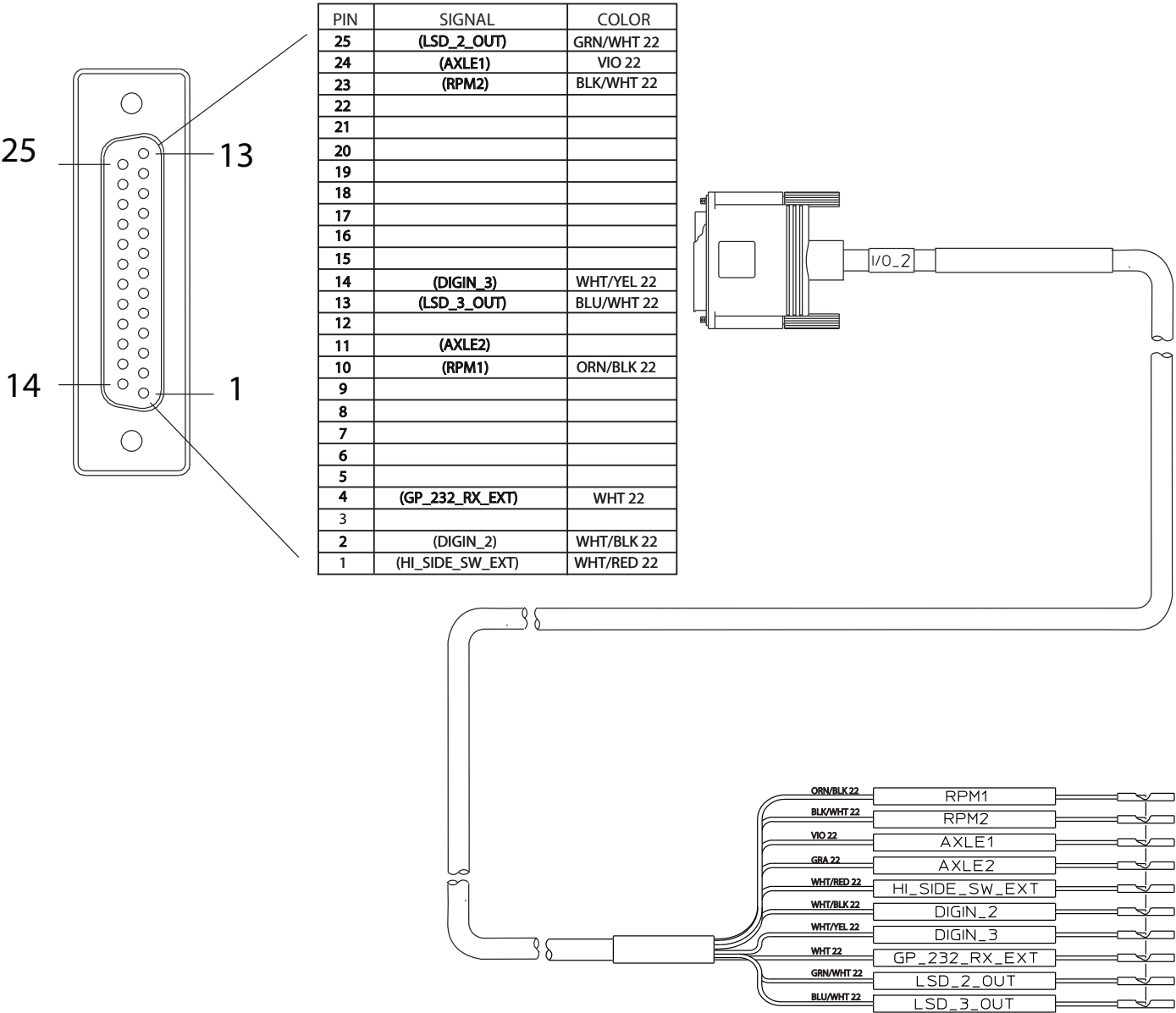
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### Primary Accessory Cable Connector Pin Callouts



09AAA\_014

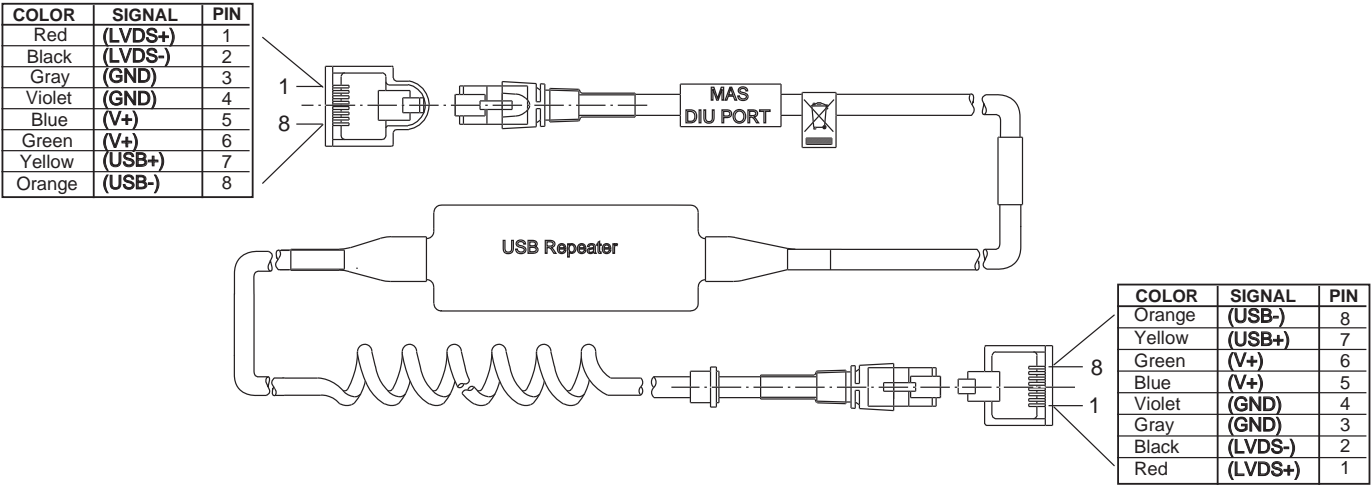
Secondary Accessory Cable Connector Pin Callouts (Optional, not typically used)



09AAA\_015

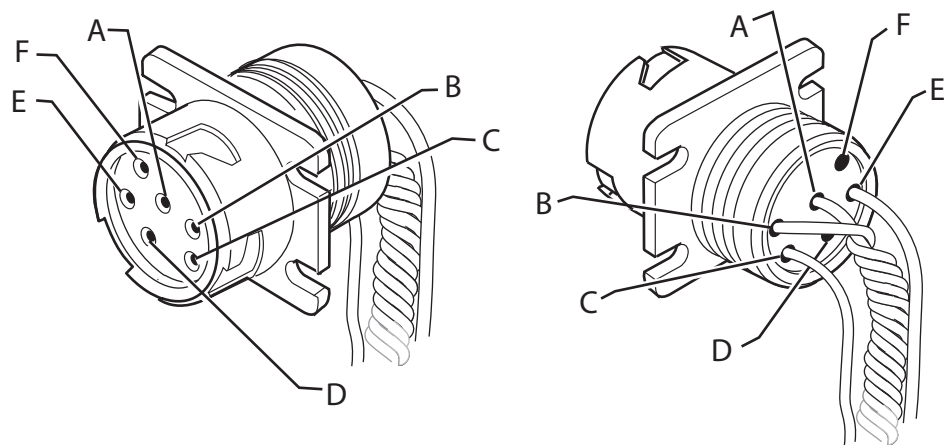


Display Interface Unit 200 (DIU200) Cable Connector Pin Callouts



09AAA\_017

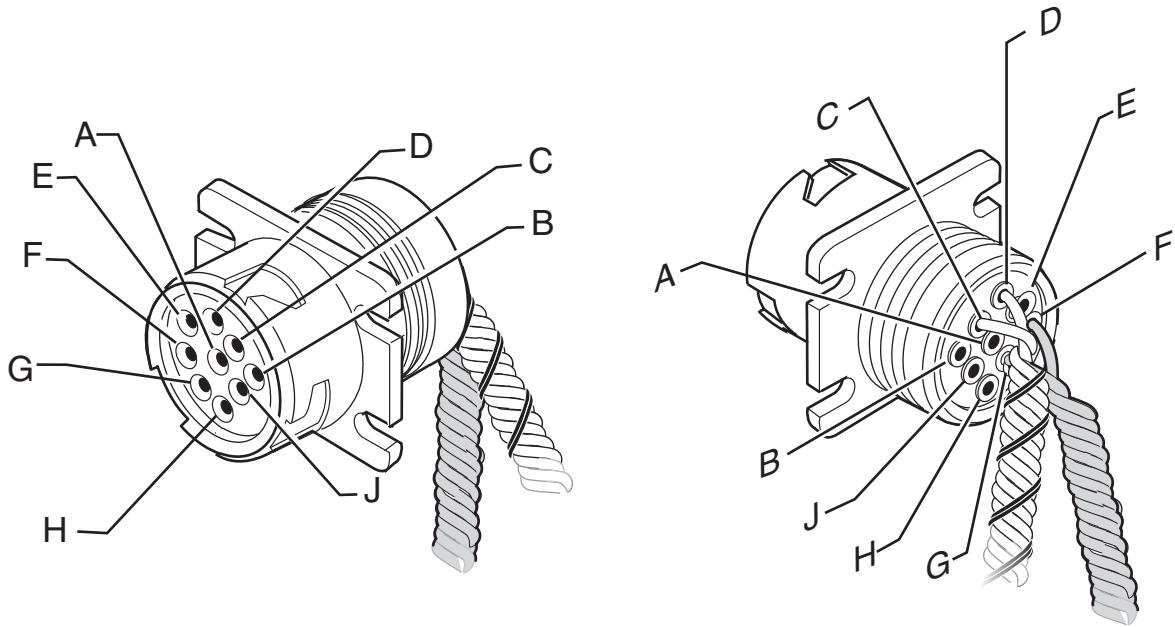
Six-pin Data Link Connector Pin Callouts



08AAA\_050

| SIGNAL                 | PIN |
|------------------------|-----|
| J1708/J1587 DATA LINK+ | A   |
| J1708/J1587 DATA LINK- | B   |
| +12VDC                 | C   |
| PLUG P/N:23507136      | D   |
| BATTERY GROUND         | E   |
| PLUG P/N:23507136      | F   |

# **Nine-pin Data Link Connector Pin Callouts**

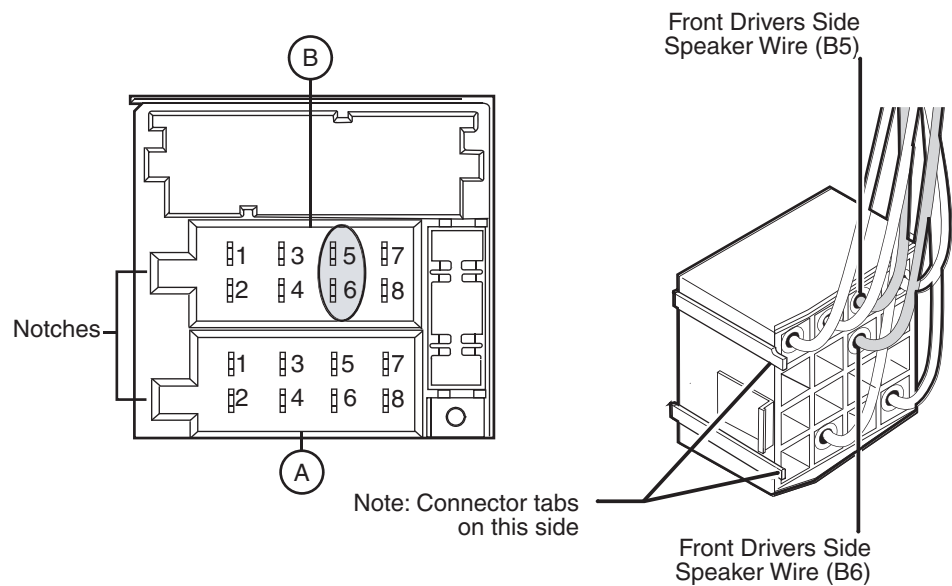


08AAA\_051

| SIGNAL                 | PIN |
|------------------------|-----|
| BATTERY GROUND         | A   |
| +12VDC                 | B   |
| J1939 DATA LINK+       | C   |
| J1939 DATA LINK-       | D   |
| J1939 SHIELD           | E   |
| J1708/J1587 DATA LINK+ | F   |
| J1708/J1587 DATA LINK- | G   |
| PLUG                   | H   |
| PLUG                   | J   |

Radio Connector Pin Callouts

Common Radio and Harness

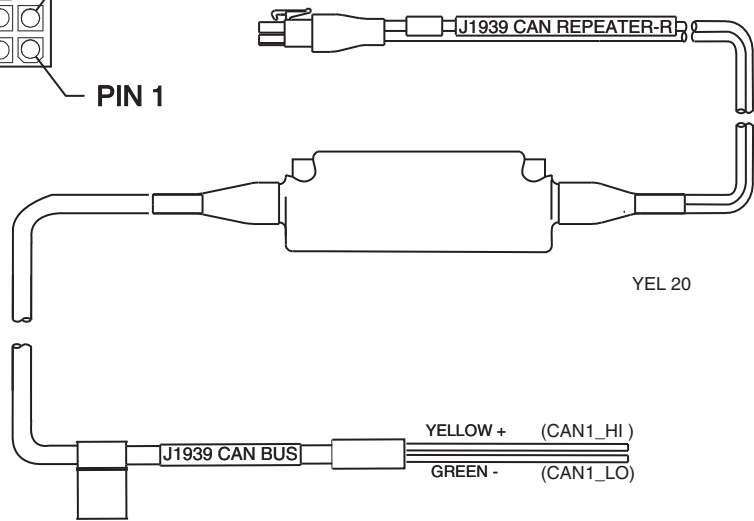
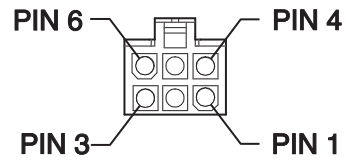


| PIN | SIGNAL         | PIN | SIGNAL       |
|-----|----------------|-----|--------------|
| A1  | N/C            | B1  | RR + SPEAKER |
| A2  | N/C            | B2  | RR - SPEAKER |
| A3  | PARK LIGHTS    | B3  | RF + SPEAKER |
| A4  | IGN CONTACT    | B4  | RF - SPEAKER |
| A5  | PWR ANT OUTPUT | B5  | LF + SPEAKER |
| A6  | PWM/ANALOG DIM | B6  | LF - SPEAKER |
| A7  | BATTERY - MAIN | B7  | LR + SPEAKER |
| A8  | GROUND         | B8  | LR - SPEAKER |

06AAA\_179A

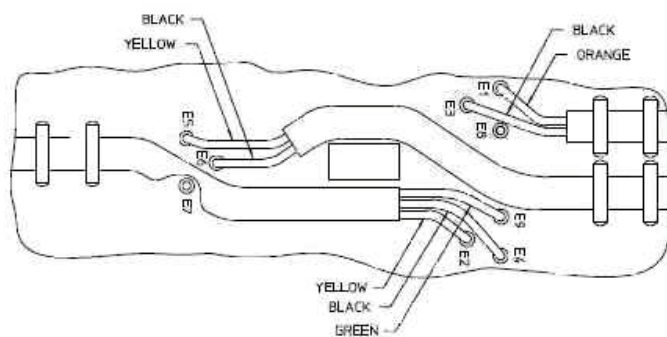
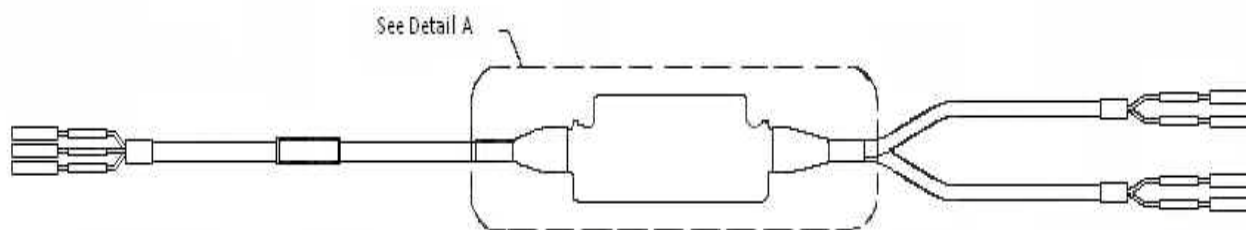
**CAN Repeater Cable Pin Callouts**

| COLOR      | SIGNAL    | PIN |
|------------|-----------|-----|
| WHT/BLU 20 | (CAN1_HI) | 1   |
| BLU/WHT 20 | (CAN1_LO) | 2   |
| WHT/BRN 22 | (CAN_PWR) | 3   |
| BRN/WHT 22 | (CAN_GND) | 4   |
|            | (SHIELD)  | 5   |

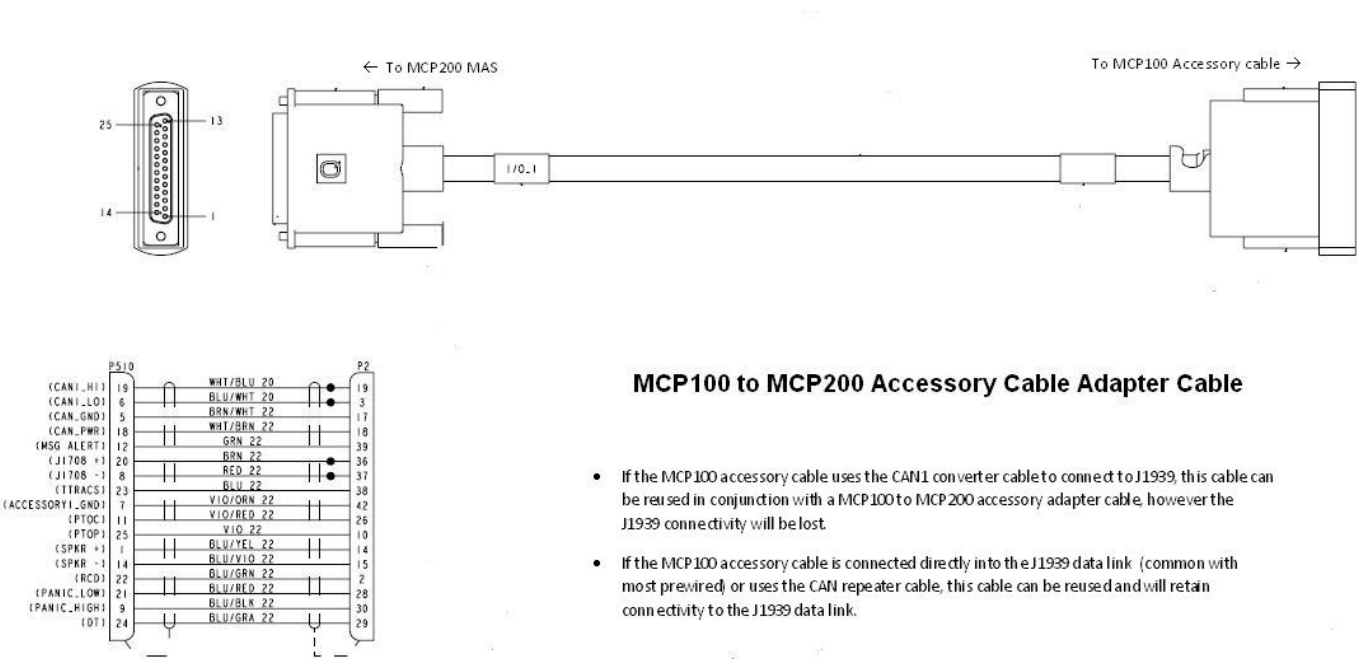


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## Speaker Switch Cable



**MCP100 to MCP200 Accessory Cable Adapter Cable**



**MCP100 to MCP200 Accessory Cable Adapter Cable**

- If the MCP100 accessory cable uses the CAN1 converter cable to connect to J1939, this cable can be reused in conjunction with a MCP100 to MCP200 accessory adapter cable, however the J1939 connectivity will be lost.
- If the MCP100 accessory cable is connected directly into the J1939 data link (common with most prewired) or uses the CAN repeater cable, this cable can be reused and will retain connectivity to the J1939 data link.





## ***Environmental and Power Requirements***

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Topics in this appendix provide environmental and power requirements for the MCP200 and accessories.

*MCP200 Environmental and Power Requirements* ..... *B-2*

**For technical questions, contact Omnitrac's Customer Support.**

Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

**MCP200 Environmental and Power Requirements**

| <b>Condition</b>                    | <b>Requirement</b>  |
|-------------------------------------|---|
| Extended Operating Temperature      | -40° C to 70° C (-40° F to 158° F)  |
| Vibration/Shock                     | <p>Mobile application server 200 (MAS200) does not have a shock tray.</p> <p>Neither the wireless data box 200 (WIB200) nor optional satellite data modem (SDM) should be mounted to any member/support directly connected to the chassis, such as a headache rack.</p> |
| Humidity                            |   |
| WIB200                              | Weatherproof.   |
| MAS200                              | Not watertight. DO NOT get wet.   |
| Display interface unit 200 (DIU200) | Not watertight. Turn over immediately if liquids are spilled on it.   |
| Optional SDM                        | Weatherproof.   |
| Power                               | +12 to +32 Volts DC   |
| Operating at +12V (WIB and DIU)     | MCP200 draws a maximum of 2.0 amps.   |
| Asleep                              | MCP200 draws 30 mA.   |
| Using optional SDM                  |   |
| Operating at +12V                   | MCP200 draws a maximum of 2.5 amps.   |
| Asleep                              | MCP200 draws 30 mA.   |

## ***Standard RMA Procedure***

---

**For customers, to return failed equipment, go to Omnitracs Customer Portal at <https://customer.omnitracs.com>**

For service centers only, please return equipment to Omnitracs at the following address. Make sure that the RMA number is marked clearly on the outside of the box.

Omnitracs, LLC - RMA Receiving  
c/o Baja Freight Forwarders, Inc.  
8662 Siempre Viva Road  
San Diego, CA 92154  
RMA #: \_\_\_\_\_  
(800) 541-7490

To prevent damage during shipment and handling, carefully package all equipment being returned. If the original shipping container and packing material are available, please use them to return the equipment.



## ***Upgrading the MCP200 Using Memory Sticks***

---

An MCP200 is normally upgraded with software by sending it over-the-air using satellite connectivity. However, there may be occasions when upgrades are necessary using USB memory sticks.

Topics in this document provide specific instructions for checking the software versions installed on the MCP200 and upgrading the MCP200 using USB memory sticks.

*Checking the Software Versions Installed* .....D-2

*Upgrading Only the MAS200 Software* .....D-2

*Upgrading the MAS OS and MAS Software* .....D-3

For technical questions, contact Omnitrac's Customer Support. Customer Support is staffed 24 hours a day, 365 days a year:

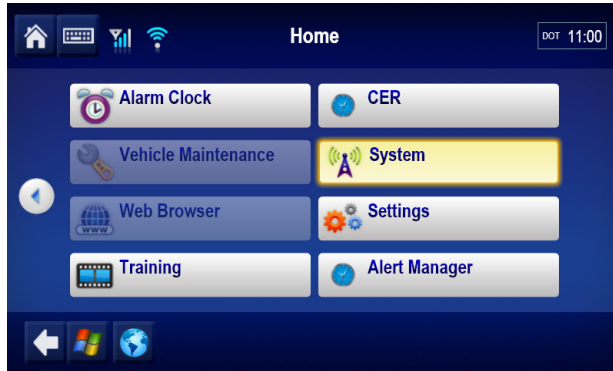
In the United States, call 800-541-7490

In Canada, call 800-863-9191

## Checking the Software Versions Installed

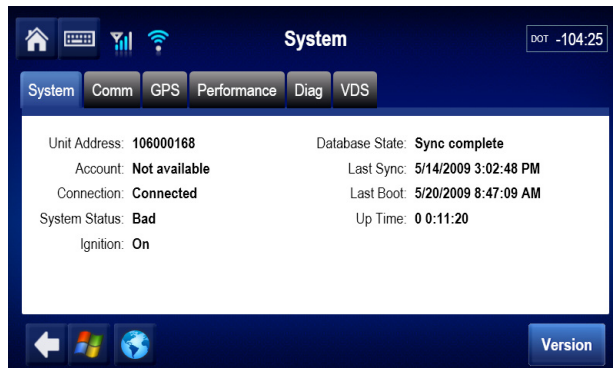
Shortly after you power up the MCP200, the user interface screen displays.

1. Use the left arrow to get to the **System** button. Tap the **System** button.



2. Tap the **System** tab. Tap the **Version** button at the bottom right to access system information about the MCP200.

- MCP, Win OS, and Display firmware version numbers are listed here.

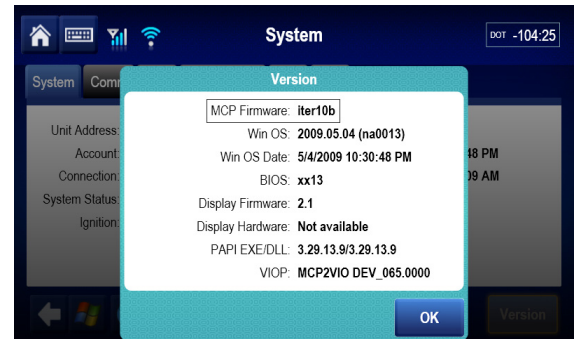
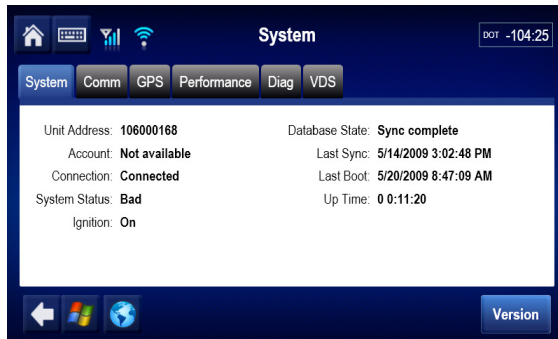


## Upgrading Only the MAS200 Software

MAS200 should be powered ON, ignition ON.

1. Insert the MAS200 Software Application USB memory stick into a USB port on the MAS or into the memory stick slot on the side of the DIU.
  - a. Within one minute after the MAS software stick is installed, the DIU screen will display a prompt.
  - b. Select **No** to keep data or **Yes** to delete data.
  - c. During the upgrade process, the unit will reboot. Once the unit comes back up after the reboot, "Upgrading" will show. This takes about ten minutes.

2. After the upgrade process finishes, the DIU screen will show the driver warning screen. Remove the memory stick and confirm the upgrade is complete by checking the MCP200 software version on the Version screen.



3. Perform system verification.

## Upgrading the MAS OS and MAS Software

A properly formatted and configured Omnitrac's USB memory stick is needed. This stick is designed to reload the OS and software on a MAS110/MAS200.

### **IMPORTANT!**

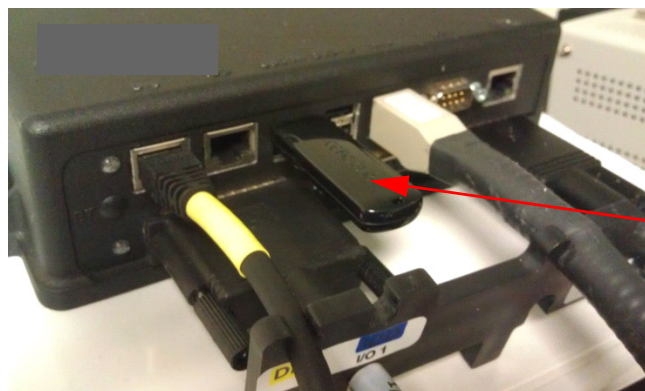
*All user data on the MAS will be removed.*

*CoPilot® Truck™ (ALK) Mapdata will be removed and will need to be reloaded (if used) after the OS is installed.*

*Do NOT disrupt power or remove the USB stick during the upgrade process as this will cause the unit to be inoperable. The entire process takes about 1 hour to complete.*

Starting with an MCP200 system that has had power removed – no MAS LEDs on, do the following:

1. Put the USB memory stick in a USB port of the MAS. This process will NOT work using the DIU USB port.

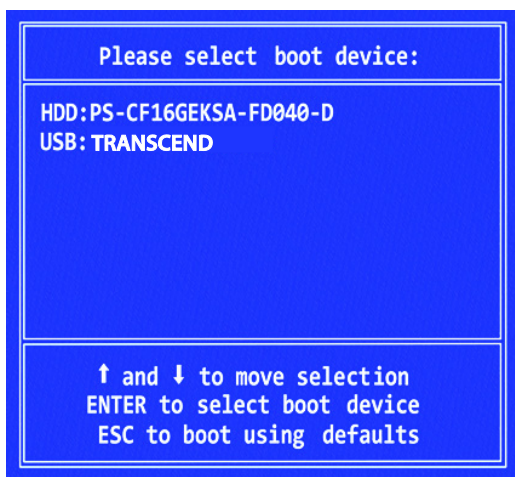


USB Stick

2. Have the keyboard open and be ready to press the **F11** key. .



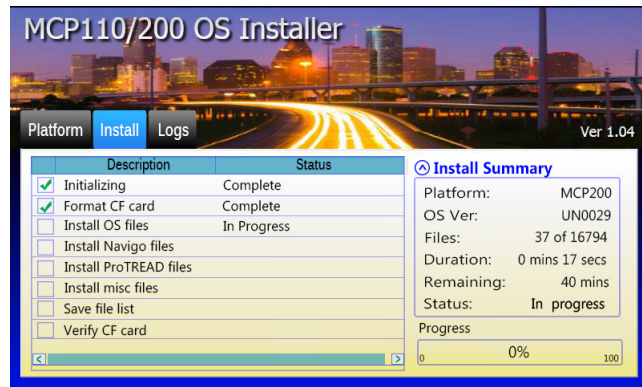
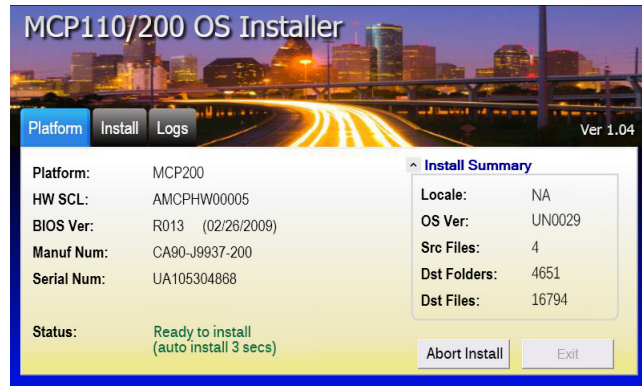
3. Power up the unit and wait for the large logo with a black background to appear (usually only a matter of seconds for it to appear.) Press and hold the F11 key while the logo is shown on the screen.
4. Once the window shows that allows selection of the available boot devices, release the F11 key and down arrow and select to boot off the USB memory stick. Then press the **Enter** key. If the pop-up window does not show, you'll need to remove power, wait for all the MAS LEDs to go off, and start over at step 2.



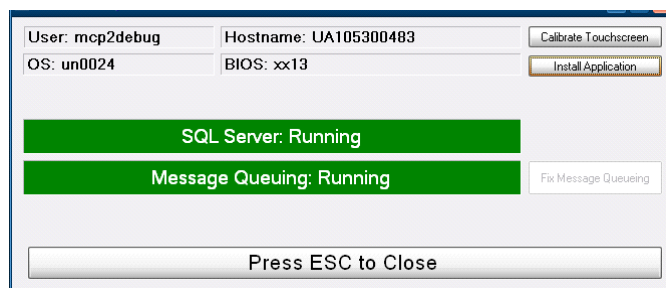
Within a minute the unit will start the OS upgrade. The screens below will be displayed.

Within a minute the unit will start the OS upgrade. The screens below will be displayed.





The OS upgrade will automatically start. At about 30 minutes, the system will reboot after the OS components are copied and verified. A SQL install process will take place. The SQL build process takes about 10 minutes. Do NOT touch the screen or any of the prompts that may be displayed. The OS installation will be complete when the screen noted below is displayed.

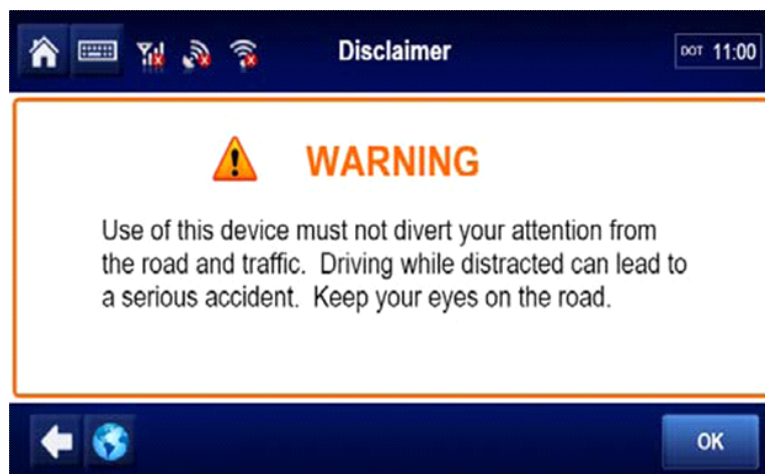


5. A keyboard may show up in front of the screen noted above. Close it out by tapping the red circle at the bottom left. Verify both bars are green. If both bars are green, go to the next step. If either of the bars are red, tap the **Fix Message Queuing** button and ensure both bars turn green before proceeding.

At the System Check screen, press the **Install Application** button. This will start the application load.



When the application software load is complete, the screen will show a Driver Warning (takes about **15 minutes**).



6. Run a complete system verification (e.g. System/Diag - Run All, verify tests show appropriate green check marks, successfully send test message, successfully receive test message, verify volume for text-to-speech). Once this is done, the OS and application software upgrade is complete.

#### NOTE

The logs of the OS installation will be stored in a folder on the unit. In the event of a problem, this log file can be viewed at C:\OsUpdate\Osupdate.txt.

# **E**

## **Preventive Maintenance Inspection**

---

Topics in this appendix provide steps for inspecting the mobile application server 200 (MAS200), the display interface unit 200 (DIU200), the wireless interface box 200 (WIB200), the optional satellite data modem (SDM), and the Trailer Management system.

|  |            |
|--|------------|
| <i>How Often Should Inspections Be Performed?</i> .....            | <i>E-2</i> |
| <i>Inspecting the Mobile Application Server 200 (MAS200)</i> ..... | <i>E-2</i> |
| <i>Inspecting the Display Interface Unit 200 (DIU200)</i> .....    | <i>E-4</i> |
| <i>Inspecting the Antennas</i> .....                               | <i>E-6</i> |
| <i>Verifying Trailer Management System Connections</i> .....       | <i>E-8</i> |

### **For technical questions, contact Omnitracs Customer Support.**

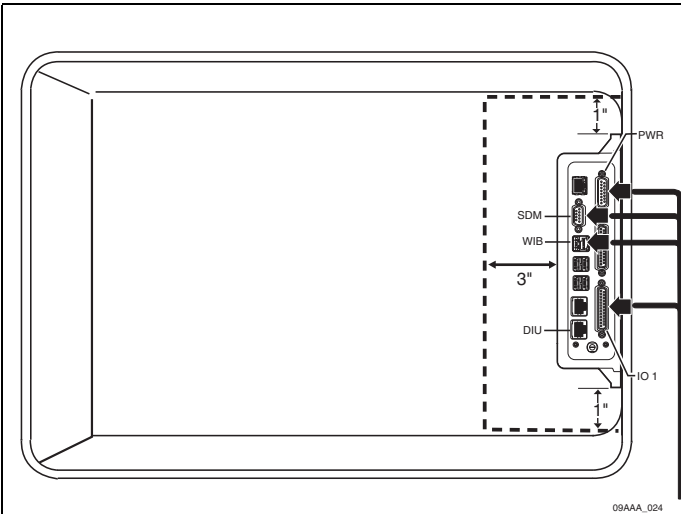
Customer Support is staffed 24 hours a day, 365 days a year:

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

## How Often Should Inspections Be Performed?

- Omnitrac's recommends inspections be performed at least **once every 90 days**.
- During normally scheduled vehicle preventive maintenance inspections.

## Inspecting the Mobile Application Server 200 (MAS200)



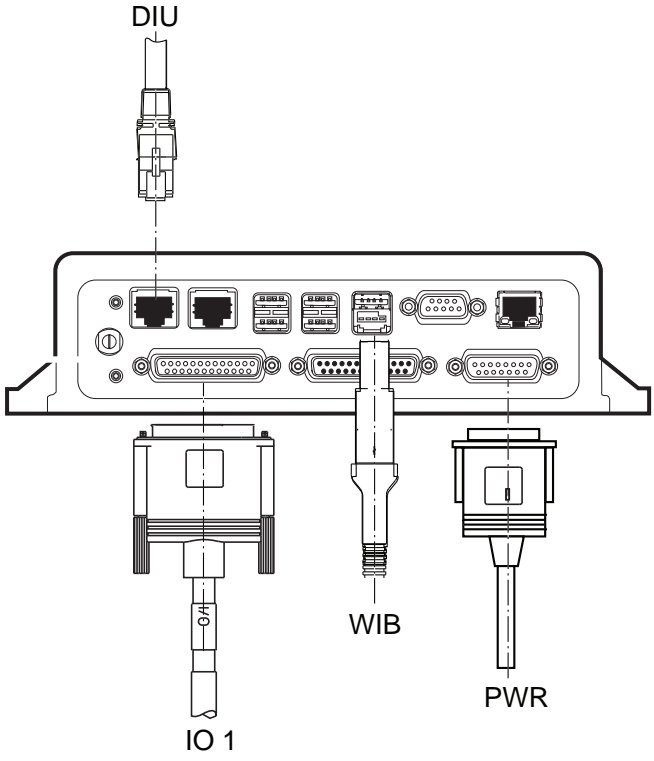

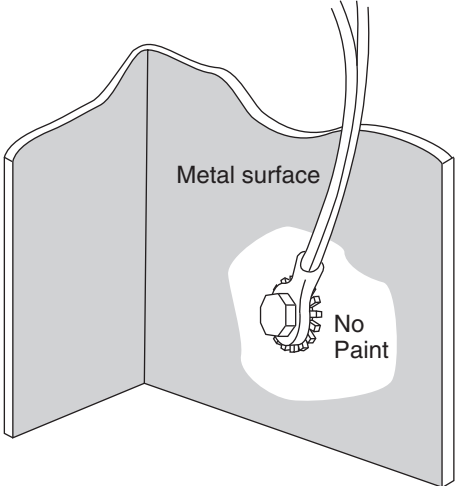

1. Make sure the compartment where the MAS200 is installed has at least 1 inch of air space on each side for cooling and at least 3 inches of space for servicing the backup battery.
2. Make sure there are 4 to 6 inches of air space on the connector side to allow for cable bends and servicing.
3. Make sure tire chains, tools, and other equipment are not stored on top of the MAS200.
4. Make sure the mounting hardware holding the MAS200 in place is tight and does not allow the MAS200 to vibrate.

### Caution



*Do not use a pneumatic tool as this could damage the hardware. Use extreme caution when working with power tools.*

5. Make sure the MCP200 display unit, antenna, power, and accessory cables coming into the compartment have enough slack and are not pulling on the MAS200 connectors. Make sure the cables are not being chafed or cut by sharp edges.

|   |  |
|---|--|
|  <p>09AAA_018I</p> | <p>6. Make sure the cable connectors have not worked themselves loose from the MAS200. Hand tighten any loose connectors.</p> <p><b>Caution</b></p> <p> <i>ONLY hand-tighten or use a small screwdriver on the connectors. DO NOT use a pneumatic tool or pliers to tighten the connectors as this could damage the screws or the MAS200 mounting tabs. DO NOT apply grease to the connectors.</i></p> <p>7. Check to make sure the cables are stored securely with tie wraps and are stored out of the way.</p>  |
|                  | <p>8. Check the power connections, such as at the power distribution panel, to ensure they are tight and the wiring is secure.</p> <p>Check all ground connections to make sure there is a good metal-to-metal contact and the wires are not strained or damaged. Ground wires should be attached to vehicle or sleeper surfaces connected to chassis ground.</p> <p><b>Caution</b></p> <p> <i>Ground wires should not be connected to the MAS200 or mounting hardware.</i></p> <p>Make sure there is no corrosion around the ground connection. If there is corrosion, take the connection apart, clean the connector and surface with a wire brush, and reconnect the parts.</p> |

## Inspecting the Display Interface Unit 200 (DIU200)

| System                          | Comm                 | GPS                               | Performance | Diag | VDS |
|---------------------------------|----------------------|-----------------------------------|-------------|------|-----|
| Name                            | Time last run        | More info                         |             |      |     |
| ✓ Cellular signal strength test | 8/25/2009 9:50:49 AM | Signal strength: 85%              |             |      |     |
| ✓ WIFI signal strength test     | 8/25/2009 9:50:49 AM | Associated to SSID Cerberus with  |             |      |     |
| ✗ SDM Detection test            | 8/25/2009 9:50:49 AM | SDM cable is disconnected.        |             |      |     |
| ✓ CDD database sync test        | 8/25/2009 9:50:49 AM |                                   |             |      |     |
| ✓ GPS fix test                  | 8/25/2009 9:50:49 AM | Satellites: 12                    |             |      |     |
| ✓ J1587 packet detection test   | 8/25/2009 9:50:51 AM | 25 packets(J1587) over a 2 sec pe |             |      |     |
| ✗ J1939 packet detection test   | 8/25/2009 9:50:53 AM | 0 packets (J1939) over a 2 sec pe |             |      |     |
| ✓ Backup battery test           | 8/25/2009 9:51:00 AM | Battery voltage: 4125mV           |             |      |     |
| ✓ Truck battery test            | 8/25/2009 9:50:53 AM | Voltage: 13500mV                  |             |      |     |

1. Verify proper DIU200 operation. From the Home screen, tap the **Diag** tab. Tap **Run All** button.
  - Verify at a minimum that Cellular, CDD, GPS, Battery Backup, and J1587 or J1939 show green check marks.
  - Turn IGN to the ON position and verify that the System Status is **Good**.
  - Turn the IGN to the OFF position and verify that the status goes to **Ignition Off**.



09AAA\_046

2. Verify the DIU200 keys and screen are clean.

Omnitracs recommends that you use a soft cloth and either plain water, glass cleaner, or mild soap to gently clean the surfaces of the DIU200 as well as the display screen.



### Caution

The MDU is not watertight. Do not spray any liquid directly on the display screen.

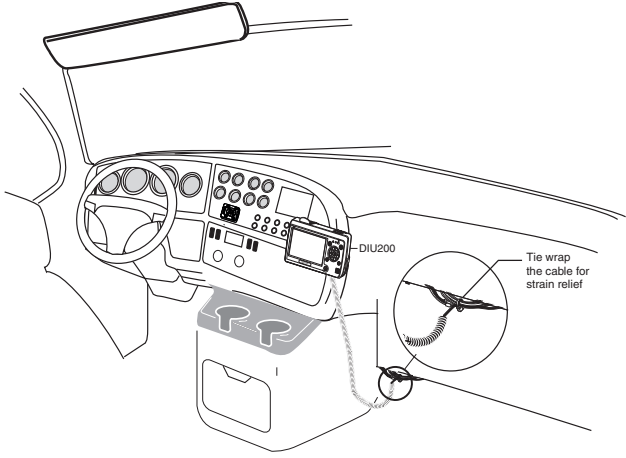
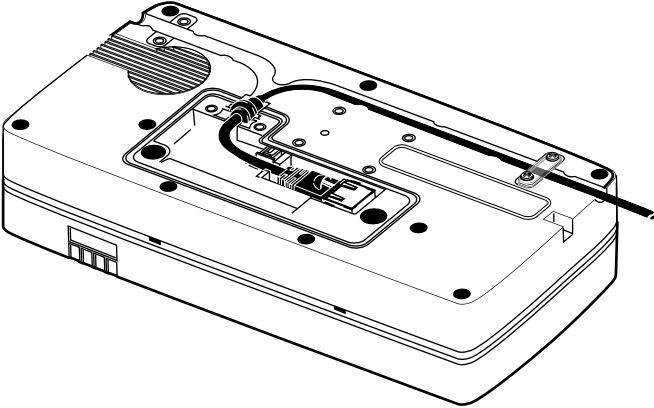
Heavily soiled DIU200s should be returned to Omnitracs using the RMA process for proper cleaning.

### Note

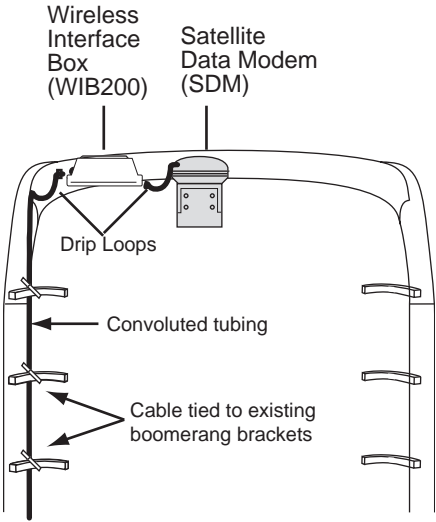
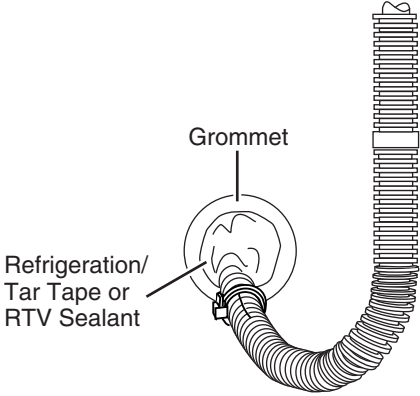
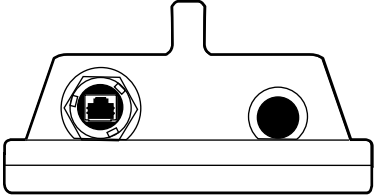
Use the PDA stylus, provided with the unit, or your fingers to navigate the DIU200.

Do not use pencils, pens, metal objects, or any other devices which could possibly scratch the touchscreen.

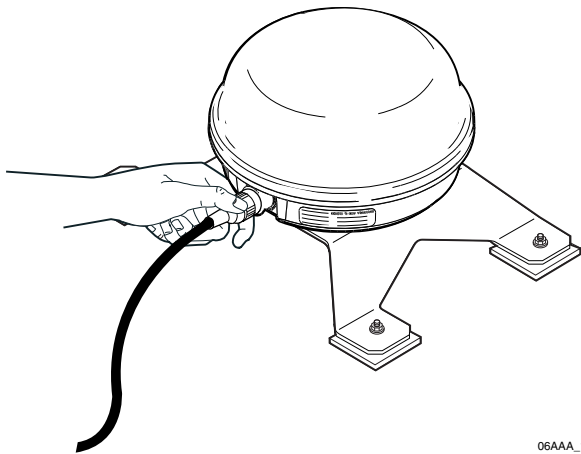

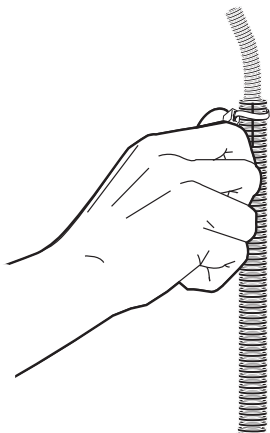
3. Verify the display screen is readable in any lighting condition.

|  |  |
|--|--|
|  <p>05AAA_033</p> | <ol style="list-style-type: none"><li>4. Make sure the display cable has enough slack and is not being rubbed or cut by anything inside the cab.</li><li>5. Remove the DIU200 from the holster and make sure the screws holding the holster in place are secure.</li></ol> |
|                  | <ol style="list-style-type: none"><li>6. Inspect the underside of the DIU200 to make sure the tie wrap is securely tightened and the cable is not damaged.</li></ol> <p>The illustration to the left is the underside of the DIU200 showing the tie wraps.</p>             |

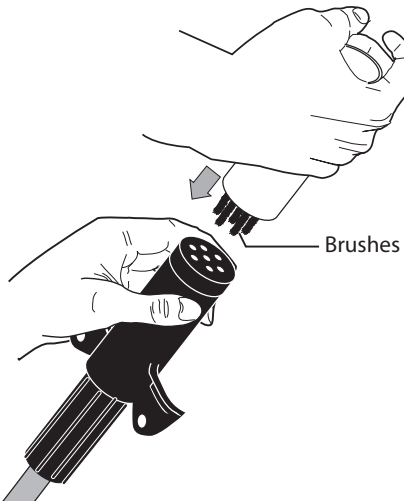
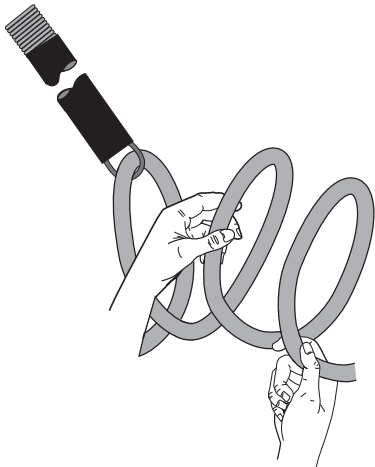
## Inspecting the Antennas

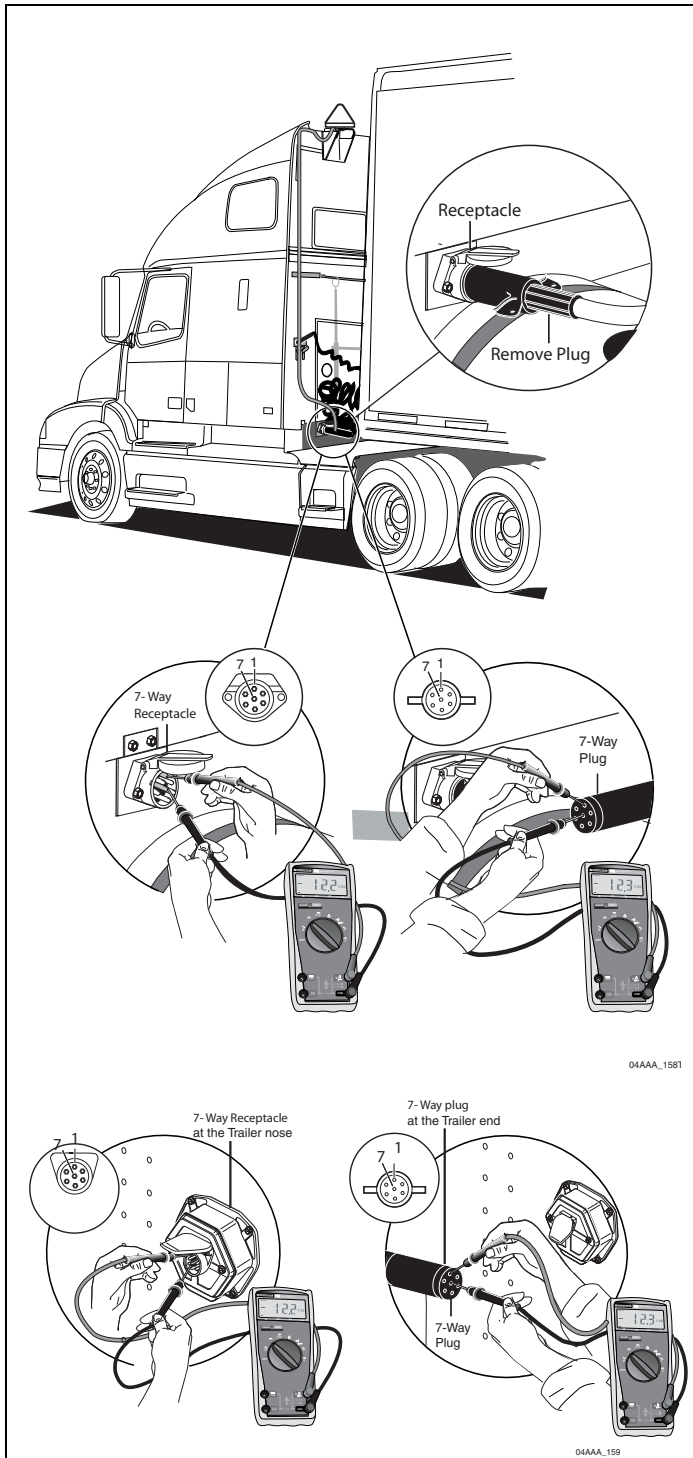
|  |   |
|--|---|
|  <p>Wireless Interface Box (WIB200)</p> <p>Satellite Data Modem (SDM)</p> <p>Drip Loops</p> <p>Convoluted tubing</p> <p>Cable tied to existing boomerang brackets</p> | <ol style="list-style-type: none"> <li>1. Make sure all cables are protected with convoluted tubing and are in good condition.</li> </ol> <p>Make sure cables have no kinks or bends and are not being pulled tightly against metal edges that can rub or cut the cables.</p> <ol style="list-style-type: none"> <li>2. Make sure there are adequate service (drip) loops in the cables at the antenna and where they enter the vehicle.</li> </ol> |
|  <p>Grommet</p> <p>Refrigeration/Tar Tape or RTV Sealant</p>   | <ol style="list-style-type: none"> <li>3. Make sure grommets are in place around any holes the cables pass through.</li> </ol> <p>Make sure RTV sealant or refrigeration/tar tape is intact and provides a good seal on any holes that lead to the exterior of the vehicle.</p> <p>Go to <a href="#">step 4</a>. if you are inspecting a terrestrial unit.</p> <p>Go to <a href="#">step 6</a>. if you are inspecting a satellite unit.</p>         |
|  <p>WIB200 Antenna</p> <p>09AAA_021</p>   | <ol style="list-style-type: none"> <li>4. Make sure the antenna is securely attached to the mount. Check the mount hardware to make sure it is secure and does not show any signs of loosening.</li> <li>5. Check that the antenna cable connectors have not worked themselves loose from the MAS200.</li> </ol>  |



|   |   |
|---|---|
|  <p>06AAA_127</p>  | <p>6. If equipped, make sure the SDM is securely attached to the SDM mount. Check the mount hardware to make sure it is secure and does not show any signs of loosening.</p> <p>7. Twist SDM to verify that the SDM connector is hand-tightened and secure. The SDM mounting bolts should be tightened to the recommended torque of 72 <b>inch</b>/pounds (not foot/pounds).</p> <p><b>Caution</b></p> <p> Do not use refrigeration/tar tape or RTV sealant on the SDM connector.</p> <p>Go to <a href="#">step 8</a>. to complete the SDM inspection.</p> |
|  <p>Twist tie wrap between fingers to make sure it doesn't break.</p> | <p>8. Visually inspect all tie wraps to make sure they are not brittle and do not break. If a tie wrap is damaged or brittle, replace it.</p>   |

## Verifying Trailer Management System Connections

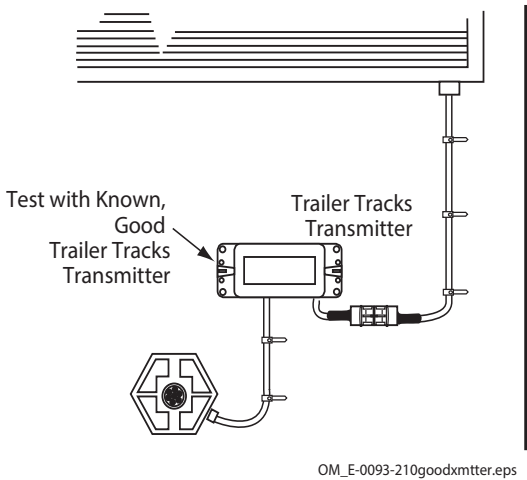
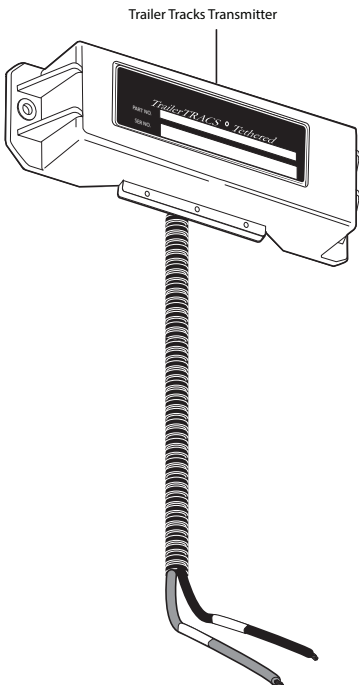
|  |  |
|--|--|
|  <p>A line drawing showing a hand holding a 7-way connector. Another hand is applying grease from a tube to the brushes of the connector. An arrow points to the brushes, and the word "Brushes" is written next to it.</p> | <ol style="list-style-type: none"><li>1. Make sure all 7-way connection points have been cleaned, inspected, and greased.</li></ol> <p>Omnitracs recommends that you use dielectric grease on the connection points.</p> |
|  <p>A line drawing showing a hand holding a 7-way coil cord. The hand is inspecting the cord for nicks, cuts, or abrasions.</p>  | <ol style="list-style-type: none"><li>2. Check the 7-way coil cord for nicks, cuts, or abrasions. Replace the cord as necessary.</li></ol>   |



3. Make sure there is voltage (12–24V) on pin 7 at all 7-way connection points (on the tractor and trailer).

Make sure you connect to ground (pin 1) as well when performing this step.

The illustrations at left show the connection at the tractor and at the trailer.

|   |   |
|---|---|
|  <p>OM_E-0093-210goodxmtrr.eps</p> | <ol style="list-style-type: none"> <li>4. Connect a test transmitter to the truck.</li> <li>5. Turn IGN to ON.</li> <li>6. Tap the <b>Trailer Management</b> button to access the Trailer IDs screen and verify that the transmitter's ID displays.</li> </ol>  |
|                                   | <ol style="list-style-type: none"> <li>7. <b>For refrigeration customers</b>, do the following: <ul style="list-style-type: none"> <li>• Inspect both ends of the refrigeration cable for corrosion and clean if necessary.</li> <li>• Turn IGN to ON.</li> </ul> <p>Verify the refrigeration connection and data transfer by accessing the Refrigeration Status screen.</p> <ul style="list-style-type: none"> <li>• With the refrigeration switch in the ON position, verify the REFRIGERATOR STAT# field is incrementing approximately once a minute. The manufacturer code for the unit should appear at the end of the refrigerator status number: "T" for Thermo King, or "C" for Carrier.</li> </ul> </li> </ol> |

**Component and Document Information**

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Topics in this appendix provide document control numbers (DCNs) and material control numbers (MCNs) for the different documents and Omnitrac's MCP200 components referred to in this guide.

*DCNs for Documents Referenced in this Guide* . . . . . F-2

*MCP200 System Component MCNs Referenced in this Guide* . . . . . F-2

*MCNs for Sealants and Lubricants Referenced in this Guide* . . . . . F-6

*MCN for other items* . . . . . F-6

**For technical questions, contact Omnitrac's Customer Support.**


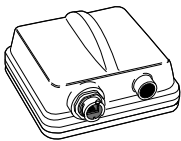
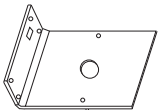
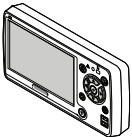
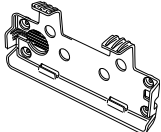
Customer Support is staffed 24 hours a day, 365 days a year:

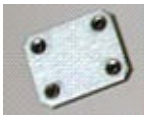



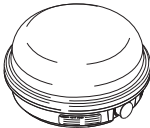
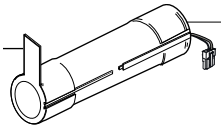

- In the United States, call 800-541-7490
- In Canada, call 800-863-9191







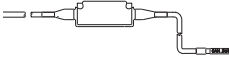
## DCNs for Documents Referenced in this Guide

| <b>Document Name</b>  | <b>DCN</b>  |
|---|-------------|
| <i>Outdoor Unit Mount Installation Guide</i>                                | TL80-6270-1 |
| <i>MCP200 Diagnostic Guide</i>  | 80-J9969-1  |
| <i>How to Use the Wireless Panic Button Remote Transmitter (Visor Card)</i> | 80-J6060-1  |

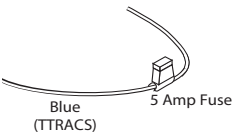
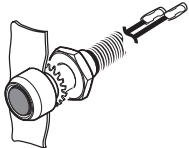
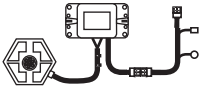
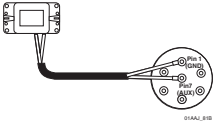
## MCP200 System Component MCNs Referenced in this Guide

| <b>System component</b>                 | <b>Illustration</b>   | <b>Latest MCN</b> | <b>Alternate MCNs</b> | <b>Notes</b> |
|---|---|-------------------|-----------------------|--------------|
| Mobile application server 200 (MAS200)  |    | CV90-J9937-xxx    |                       |              |
| Wireless interface box 200 (WIB200)     |  | CV90-J9938-xxx    |                       |              |
| Vertical antenna mount for flat antenna |  | 65-J9936-2        |                       | OPTIONAL     |
| Display interface unit 200 (DIU200)     |  | CV90-J9855-1      |                       |              |
| Display interface unit (DIU200) holster |  | CV90-J9855-710    |                       |              |

| <b>System component</b>                    | <b>Illustration</b>  | <b>Latest MCN</b> | <b>Alternate MCNs</b> | <b>Notes</b>                                      |
|--|--|-------------------|-----------------------|---|
| DIU Mounting Kit with Nut plate, RAM mount |    | 65-JB313-1        |                       |   |
| DIU Mounting Kit: bracket, RAM mount       |   | 65-JB292-1        |                       | Specifically for Freightliner Columbia or Century |
| Satellite data modem (SDM)                 |   | 10-J9490 (SDM2)   | 10-J8278              | OPTIONAL for MCP200                               |
| Backup battery                             |   | CV90-J4341-3A     |                       |   |
| Remote control device (RCD)                |   | CV90-J8640-1      |                       | OPTIONAL  |

| <b>System component</b>      | <b>Illustration</b>   | <b>Latest MCN</b> | <b>Alternate MCNs</b>                 | <b>Notes</b>                      |
|------------------------------|---|-------------------|---------------------------------------|-----------------------------------|
| Wireless interface box cable |    | 45-JB319-17       | 45-J9934-30<br>optional 30 foot cable |                                   |
| Display interface unit cable |    | CV90-JB367-17     |                                       |                                   |
| Power cable                  |    | 45-J9992-20       |                                       |                                   |
| Accessory cable (primary)    |  | 45-J9970-20       |                                       | This cable is the standard cable. |
| Accessory cable (secondary)  |  | 45-J9890-20       |                                       |                                   |
| Speaker switch cable         |  | CV90-J9204-8      |                                       |                                   |
| CAN repeater cable           |  | CV90-J9954-A42    |                                       |                                   |



| <b>System component</b>                | <b>Illustration</b>   | <b>Latest MCN</b> | <b>Alternate MCNs</b> | <b>Notes</b> |
|--|---|-------------------|-----------------------|--------------|
| 5 amp fuse (for Trailer Management®)   |    | 65-53011-1        |                       |              |
| Panic button and cable                 |    | CV90-J1377-5      |                       |              |
| Kit, Wireless Panic Button             |   | CV90-J6057-1      |                       |              |
| Kit, Wireless Panic Spare XMTR Upgrade | N/A   | 65-J6070-1        |                       |              |
| Relay Harness Assembly                 |   | 45-J6061-1A       |                       | for WPB      |
| Trailer Management system for reefer   |  | 10-53481-2        | 10-52525-6            |              |
| Trailer Management system for dry van  |  | 10-53481-1        | 10-52525-4            |              |

### **MCNs for Sealants and Lubricants Referenced in this Guide**

| <b>Sealant</b>                                       | <b>MCN</b>     |
|--|----------------|
| Sealant, Mastic Butyl Rubber .125" x 2" x 12" Black  | 755-12528-0003 |
| Seal, Coax Plastic 1/2" x 3/32" x 10" Strips OEM Pkg | 755-01910-0001 |

### **MCN for other items**

| <b>Item</b>                            | <b>MCN</b>     |
|--|----------------|
| KIT, PROTECTIVE LINER, 10 PACK, DIU200 | CV90-J9855-910 |

### **BCS Solutions Scanner Parts List**

| <b>Part</b>  | <b>Part Number</b> |
|--|--------------------|
| BCS Scanner Kit contains:<br>scanner, scanner cable, and holster | 65-J9630-1         |
| BCS Scanner Kit contains:<br>scanner and scanner cable           | 65-J9630-2         |
| Dockport 465Q Scanner with Holster                               | 65-J9630-P3        |
| Dockport 465Q Scanner only (no Holster)                          | 65-J9630-P4        |
| Scanner Cable  | 45-J9652-16        |
| Optional Holster   | 65-J9631-1         |

Order parts directly from BCS Solutions:

- Call: 800-555-5555.
- Website: [www.bcssolutions.com](http://www.bcssolutions.com)

**Accessory Cable.** See Primary Accessory Cable and Secondary Accessory Cable.

**Bad MCP200 Status.** When an MCP200 fault has been detected, the Status field will display 10000/10001, 12000/12001, 13000/13001, or 22000/22001. See specific Status numbers, or *MCP200 Diagnostic Guide* for details on status codes.

**Black Box.** See Mobile Application Server 200.

**Buzzer.** An indicator typically mounted behind the dash that buzzes if a message has been received. See Message Waiting Light, Remote Message Waiting Light.

**Calibration.** Calibration is performed when the MCP200 cannot use the J1708/1587 data link for Performance Monitoring input. After sensor calibrations have been determined, the dispatch computer operator needs to send the calibration numbers to the MCP200. See RPM Calibration and Speed/Distance Calibration.

**C/No Value.** Indicates the strength of the data satellite signal being received from or sent to the satellite. FL C/No indicates the forward signal strength; RL C/No indicates the return signal strength.

**Comm Screen.** This screen shows the signal strength being received by the satellite (if using the optional SDM), and the terrestrial and WiFi modems. To get to the Comm screen, tap the System button, then press the Comm tab.

**Data Satellite.** This satellite handles all message traffic between the vehicle and the NMC. It uses Ku-band signals and is located approximately 22,300 miles over the equator at 83° west longitude (south of Georgia).

**Display Cable.** The display cable connects the display interface unit 200 (DIU200) to the mobile application server 200 (MAS200).

**Display Interface Unit 200 (DIU200).** The standard display unit for the MCP200. It consists of a keyboard and color TFT LCD display.

**DIU200.** See Display Interface Unit 200.

**FL C/No Value.** Measures the energy going from the satellite to the mobile application server 200 (MAS200).

**Global Positioning System (GPS).** Provides current vehicle positioning with latitude and longitude updates displayed on the MCP200.

**GPS.** See Global Positioning System.

**GPS Screen.** This display unit screen shows the status of the mobile computing platform 200 (MCP200) satellite positioning. To get to the GPS screen, tap the System button, then press the GPS tab.

**Holster.** The container that holds the DIU200 when it is not in use.

**Input Screen.** MCP200 screen that displays information you will need to check the performance monitoring data items. To get to the Input screen, tap the Performance Monitoring button, then press the Input tab.

**Installation Planning Worksheet.** A worksheet on which you can plan your installations.

**J1708/1587 Network.** The MCP200 is able to monitor critical vehicle data from this low speed, bi-directional data bus. The data posted to this bus are provided by a single electronic control unit (ECU). See J1939 Network and Traditional Sensors Network.

**J1708 Enabled.** “J1708 enabled” means that the MCP200 has been set up to look at J1708 data via the J1708/1587 data link. The dispatch computer operator must send a message to the MCP200 that “tells” it to understand input from the J1708/1587 bus and define driving thresholds.

**J1939 Network.** The MCP200 is able to monitor critical vehicle data from this high speed data bus. The data posted to this bus are provided by multiple electronic control units (ECUs). SAE J1939 message protocol and controller area network (CAN) bus represent the prevalent on-vehicle networking for most construction equipment manufacturers. See J1708/1587 Network and Traditional Sensors Network.

**J1939 Enabled.** “J1939 enabled” means that the MCP200 has been set up to look at J1939 data via the J1939 data link. The dispatch computer operator must send a message to the MCP200 that “tells” it to understand input from the J1939 bus and define driving thresholds.

**Line-of-Sight Requirement.** The optional satellite data modem (SDM) requires an unobstructed line-of-sight view to the satellite in order to clearly send and receive signals. The SDM must be able to send and receive the signals at a 12° angle above the horizontal plane of the unit. There must be an unobstructed view of the satellite (southern sky) at all angles above 12°.

**MAS200.** See Mobile Application Server 200.

**Material Control Number (MCN).** The Omnitrac's part number.

**MCN.** See Material Control Number.

**MCP200.** See Mobile Computing Platform 200.

**MCP200 Serial Number (Unit Address).** Located on the connector plate of the mobile application server 200 (MAS200). The MCP200 System screen also has this information.

**Memory Stick.** A small card that allows the driver to upgrade the MCP200 over-the-air and load applications. It fits into any of the three USB ports on the mobile application server and a slot on the side of the display interface unit.

**Message Waiting Light.** An indicator light on the display that illuminates if a message has been received.

**Mobile Application Server 200 (MAS200).** The mobile application server contains the operating circuitry and memory for the MCP200 system. The unit does not require operator access. The MAS200 is commonly referred to as the black box.

**Mobile Computing Platform 200 (MCP200).** A two-way, mobile information system that allows dispatchers and drivers to send and receive critical information, and also provides vehicle location and performance data. The MCP200 is mounted in the vehicle and consists of the following components:

- Mobile application server 200 (MAS200)
- Display interface unit 200 (DIU200) and its holster
- Wireless interface box 200 (WIB200)
- Cables

**Network Management Computer (NMC).** Computer at the Network Management Facility that receives and handles the message traffic between the dispatch center and the fleet.

**Network Operations Center (NOC).** This facility is responsible for processing and managing the message traffic between the dispatch center and the fleet. Within the NOC is the Network Management Computer (NMC), which actually receives and handles the message traffic. In the continental United States, the NOC is located at Omnitrac, LLC, in Las Vegas, NV.

**NMC.** See Network Management Computer.

**NOC.** See Network Operations Center.

**NO SIGNAL Light.** An indicator light on the display that comes on if the mobile computing platform 200 (MCP200) has lost contact with the data satellite and is searching for the satellite signal.

**Odometer Screen.** The mobile computing platform 200 (MCP200) display unit screen that displays the life-to-date (LTD) value and sensor calibration information. To get to the Odometer screen, tap the Performance Monitoring button, then press the Odometer tab.

**Omnitrac Customer Support.** Call 24-hour Customer Support for information and additional help at any time, including holidays. In the United States, call 800-541-7490; in Canada, call 800-863-9191.

**Omnitrac Dispatch Software (QTRACS system).** The software on the trucking company's dispatcher computer. This is the dispatcher's interface with the MCP200. It allows the dispatcher to send and receive information, request MCP200 location information, and perform other dispatcher functions. The dispatch computer communicates with the NMC via a modem over a commercial or leased telephone line.

**Optional Accessories.** Any of these may be installed for the MCP200:

- Panic button
- Printer (product of O'Neil Product Development, Inc.)
- Remote control device (RCD)
- Remote message waiting light
- Remote message buzzer
- Scanner (product of BCS Solutions)
- Vehicle information systems (Performance Monitoring system and Trailer Management system)

**Panic Button.** Allows the driver to notify the Omnitrac Network Management Computer and the company dispatcher when an emergency situation exists.

**Parameters Screen.** The screen that displays information you will need to verify the speed and RPM calibrations. To get to the Parameters screen, tap the Performance Monitoring button, then press the Parameters tab.

**Performance Monitoring System.** An accessory of the MCP200 that allows companies to collect vehicle trip and performance data.

**Positioning System.** See Global Positioning System.

**Power Cable.** Connects the vehicle 12/24 volt power source and system ground to the mobile application server 200.

**Primary Accessory Cable.** Connects the mobile computing platform 200 (MCP200) to the J1708/1587 data link and the J1939 data link, as well as other vehicle inputs and optional system devices. This cable provides the necessary wiring for **all** optional system features such as display screen disabling, Performance Monitoring system, Trailer Management system, panic button, TTS, RCD, Printer, Scanner, Axle, RPM, and PTO/PTOC. See [Appendix A](#) for details on pinouts.

**Printer.** Provides the driver with a hard copy of the MCP200 forward or return message screen display.

**RCD.** See Remote Control Device.

**Received Signal Strength Indication (RSSI).** The strength of the wireless communication network signal being received by the antenna during forward link acquisition to the wireless network provider. The RSSI should be less than 105.

**Remote Control Device (RCD).** A small device mounts on the dash of the vehicle. It allows the driver to listen to messages while driving and also to navigate through applications.

**Repeater Cable.** Connects the J1939 to the primary accessory cable.

**Return Material Authorization (RMA).** An order used to authorize, schedule, and track the return, repair or replacement, and shipment of equipment.

**RL C/No Value.** Measures the energy from the mobile application server 200 (MAS200) to the satellite.

**RPM Calibration.** Used to determine the engine RPM when RPM data comes from the RPM sensor instead of the J1708/1587 data link.

**RSSI.** See Received Signal Strength Indication.

**Satellite Data Modem (SDM).** The SDM contains the antenna that sends and receives satellite signals. The unit is usually installed as high as possible on the vehicle so that the antenna has a clear view of the satellite.

**Satellite Data Modem Cable.** The SDM cable connects the SDM to the mobile application server 200.

**Scanner.** Provides drivers a way to send documents to their home office for back office processing without having to leave their truck.

**SDM.** See Satellite Data Modem.

**Secondary Accessory Cable.** Connects the mobile computing platform 200 (MCP200) to the J1708/1587 data link, as well as other vehicle inputs and optional system devices. This cable provides the necessary wiring for optional system features such as display screen disabling, Performance Monitoring system, Trailer Management system, panic button, TTS, RCD, Printer, and Scanner. It does not support J1939 wiring. See [Appendix A](#) for details on pinouts.

**SensorTRACS System.** See Performance Monitoring System.

**Software Version.** See MCP200 Comm Screen.

**Speed/Distance Calibration.** Used to determine the road speed and/or distance when the speed or distance data comes from the speed sensor instead of the J1708/1587 data link.

**Status 10000/10001.** Occurs when the antenna is not communicating with the mobile application server (MAS).

**Status 12000/12001.** Occurs when the backup battery needs to be replaced.

**Status 13000/13001.** Occurs when there is an internal mobile application server 200 (MAS200) problem.

**Status 22000/22001.** Occurs when there are problems with positioning.

**System Screen.** The System screen displays MCP200 unit information. To get to the System screen, tap the System button, then press the System tab.

**System Verification.** A functional system check that should be performed after installation and periodically to verify that the MCP200 is operating properly.

**Text-to-Speech (TTS).** A feature of the MCP200 that converts text messages or alerts to spoken words which are then played through an audio speaker.

**Total Distance.** The accumulated distance traveled by a vehicle during its operation. The MCP200 collects distance data in one of three ways:

- Modern electronic truck engines provide distance data via the engine controller module (ECM).
- In some older electronic engines, total distance is not available through the ECM and the MCP200 uses input from the speed sensor and the available J1708/1587 data to calculate distance.
- In non-electronic trucks, the speed sensor provides both speed and distance data.

**Traditional Sensors Network.** The MCP200 monitors speed directly via the speed transducer on the transmission and RPM via the transmission fly wheel. See J1708/1587 Network and J1939 Network.

**Traditional Sensors Enabled.** “Traditional sensors enabled” means that the MCP200 has been set up to look at traditional sensors via the traditional sensors data link. The dispatch computer operator must send a message to the MCP200 that “tells” it to understand input from the traditional sensors and define speed and RPM.

**Trailer Management System.** An optional MCP200 feature that allows dispatch to monitor trailer connects and disconnects. The Trailer Management system can also monitor the refrigeration unit of the trailer.

**Trailer Tracks System.** See Trailer Management System.

**TTS.** See Text-to-Speech.

**Unit Address.** See MCP200 Serial Number (Unit Address).

**Vehicle Information Systems (VIS).** See Performance Monitoring system and Trailer Management system.

**WIB200.** See Wireless Interface Box 200.

**WIB200 Cable.** The WIB200 cable connects the WIB200 to the mobile application server 200.

**Wireless Interface Box 200 (WIB200).** Communicates with the PCS receiver for data transmission and the GPS receiver for positioning information.