QUALCOMM®

Qualcomm® Mobile Computing Platform 200 Series and Accessory Installation Guide

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Important Safety Information

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 displays. The following label is to be posted in clear view for the driver to see.

> ⚠️ **WARNING** | **Driver - Do not use while vehicle is in motion.**
> **Use of display unit while driving will cause distraction and loss of vehicle control which may lead to serious injury or death.**
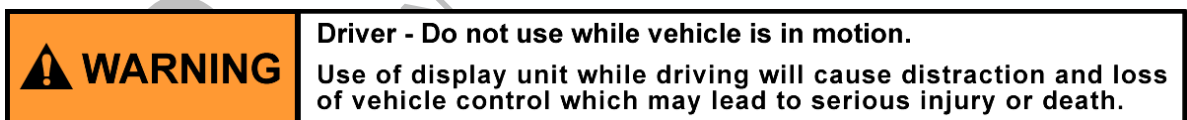
If you are a Third-party Device Manufacturer or Application Developer, it is your responsibility to provide appropriate warnings regarding the safe use of your device(s) in conjunction with Qualcomm® equipment. Applications should not require the driver to divert his attention from the road while driving a vehicle.

FCC notice:
Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum 20 cm between the radiator and your body. This transmitter must not be collocated or operating in conjunction with any other antenna or transmitter unless authorized to do so by the FCC.
IC Notice:
The device's user manual does not contain the following or equivalent statement as per RSS-GEN section 7.1.5: Operation of this device is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

1

How the Qualcomm® Mobile Computing Platform 200 Series Works

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

For technical questions, contact Qualcomm Enterprise Services (QES℠) 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 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 communications (terrestrial and Wi-Fi® 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 Qualcomm platforms, such as MCP 100 Series, OmniTRACS® Mobile Communications System, OmniExpress® Mobile Communications 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 messages and their importance, so drivers can choose to immediately listen to messages 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 devices allow monitoring of driver performance, engine diagnostics, trailer locations, and refrigeration status.
- 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

Customer dispatch
computer

GPS   Data
Satellite Satellite

NOC

Terrestrial
network

DIU200

IDD   USB
1/2

MAS200

LAN

WIB200

N

W E

S

SDM

IO 2   IO 1   PWR

USB
3G

Secondary
Accessory
cable

Primary
Accessory
cable

Power/
Ignition

09AAA_019

Component	Description
Network Operations Center (NOC)	• Responsible for processing and managing message traffic between dispatch center and fleet. • Within the NOC is the Network Management Computer (NMC), which receives and handles message traffic. • Located at QUALCOMM Incorporated, in San Diego, CA.
Qualcomm Dispatch Software (QTRACS® software)	• Software on the trucking company's dispatch computer and dispatcher's interface with the MCP200. • Allows dispatcher to send and receive messages, request MCP200 location information, and perform other dispatch functions. • QTRACS/400 and QTRACS/Windows customers communicate with the NMC via dialup using PPTP or a frame relay connection. • QTRACS/Web customers communicate via the NMC using RI/Web client over a PPTP connection.

Code Division Multiple Access (CDMA) Wireless Network	• Radio frequency (RF) signals are received from the antenna by the MCP200 via the wireless interface box (WIB200) from a wireless communication network, which varies depending on geographic location.
Optional Data Satellite	• Handles all two-way message traffic between the vehicle and the NMC if you are using a satellite data modem (SDM).
GPS Positioning Satellites	• Uses 24 satellites to provide vehicle positioning information.
Mobile Computing Platform 200 (MCP200)	• Driver's interface with the Qualcomm platform and the component that resides in the vehicle. • Allows the driver to send and receive messages.

CDMA Wireless Network and PCS

- MCP200 uses CDMA technology to connect dispatchers and vehicles over the wireless airwaves.

- The Personal Communications Service (PCS) System is a low-powered, higher frequency competitive technology to cellular, ideal for "in-city" trucking and transport.

- Wherever a terrestrial wireless network exists, drivers can send messages to and receive messages from dispatchers while traveling.

How MCP200 Uses PCS

- 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 messages.

- The antenna (located inside the WIB200) relays messages between dispatch and the driver.

- The antenna receives and transmits wireless information to and from the MAS200.

- The antenna interfaces with local wireless networks. Communication is collected at the PCS gateway and obtained by Qualcomm's NOC where it is distributed to the dispatch center. Dispatchers respond by sending a message back to Qualcomm'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.

Optional Data Satellite

- Used if you are using an SDM.

- Located approximately 22,300 miles over the equator at 83° west longitude (south of Georgia).

- Uses Ku-band signals to handle all two-way message traffic between the vehicle and the NMC.

- Sends the message along the forward message link to the MCP200.

- Receives the message back from the driver along the return message link.

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.

- Allows every square meter of the planet to have a unique address.

- Originally created for and used by the military.

- Currently used in a number of industries, including construction, film, farming, computer, transportation, telecommunication, and wireless.

- A standard feature of the MCP200.

How the MCP200 Uses GPS

- MCP200 receives positioning data from the GPS receiver, which is integrated inside the antenna to determine location.

- NOC receives position data from the MCP200 whenever a message is sent to a vehicle and acknowledged, and whenever a driver sends a message to a dispatcher.

- NOC automatically retrieves position data from the NOC at regular intervals and makes it available to the dispatcher.

- Dispatcher can request a position report from the MCP200 at any time.

Wi-Fi® Network

- A wireless networking technology that uses radio waves to provide wireless high-speed internet and network connections.

- Provides Wi-Fi enabled devices, such as PCs, game consoles, mobile phones, MP3 players, and PDAs, access to the internet when within range ("hotspot" area) of a wireless network.

- Applications and devices that support Wi-Fi are interoperable with one another.

- Based on IEEE 802.11 standards.

How the MCP200 Uses Wi-Fi®

What Is MCP200?

- Mobile part of the Qualcomm platform installed in a customer's vehicle.

- Provides the driver with the ability to exchange messages with the dispatch center.

- Sends vehicle location information to the NOC.

- Each MCP200 has its own unique unit address which is the serial number on the MAS200. This address is used by the NMC to route messages to the correct vehicle. The unit address for a particular vehicle changes if the MAS200 in the vehicle is replaced.

- MCP200 operator, typically the driver, uses the display screens for creating, sending, and reading messages; system verification; and troubleshooting.
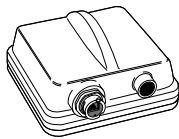
Wireless Interface Box
(WIB200)
Antenna
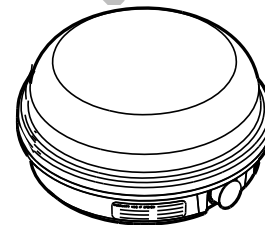
OPTIONAL
Satellite Data Modem
(SDM)

Display Interface Unit
(DIU200)

Mobile Application
Server (MAS200)
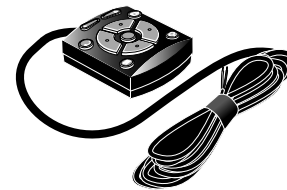
OPTIONAL
Remote Control
Device (RCD)

08AAA_053

- Standard components:

  - Wireless interface box (WIB200)—Contains terrestrial and Wi-Fi® modems, and antennae that provide CDMA/GSM/UMTS communication.

  - Mobile application server (MAS200)—Communication 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 communicates with the satellite and GPS receiver.

  - Remote control device (RCD)—Small keypad that allows the driver to safely listen to incoming messages without having to sop the vehicle and read the message(s) on the display.

2
Component Overview

Topics in this chapter provide a basic component and wiring overview of the Qualcomm® mobile computing platform 200 (MCP200) installation.

- For planning and installation instructions, see Chapters 4–11.

- For optional accessory installation, refer to *Optional Accessories for the MCP200* on page 2-7.

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In Canada, call 800-863-9191

Equipment Installation

Qualcomm MCP200 masterpack:

- Wireless interface box 200 (WIB200)
- Display interface unit 200 (DIU200)
- Mobile application server 200 (MAS200)
- Cables
- Backup battery

Terrestrial MCP Connection Points
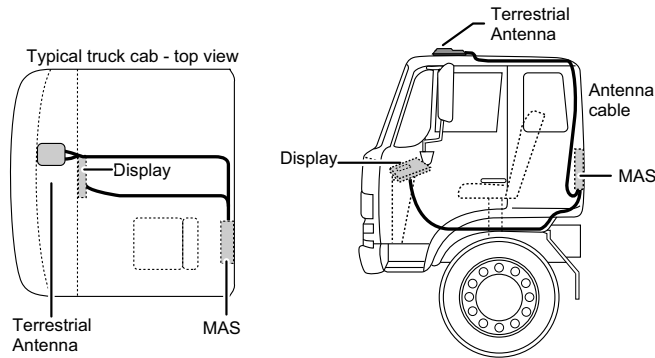
Satellite MCP Connection Points
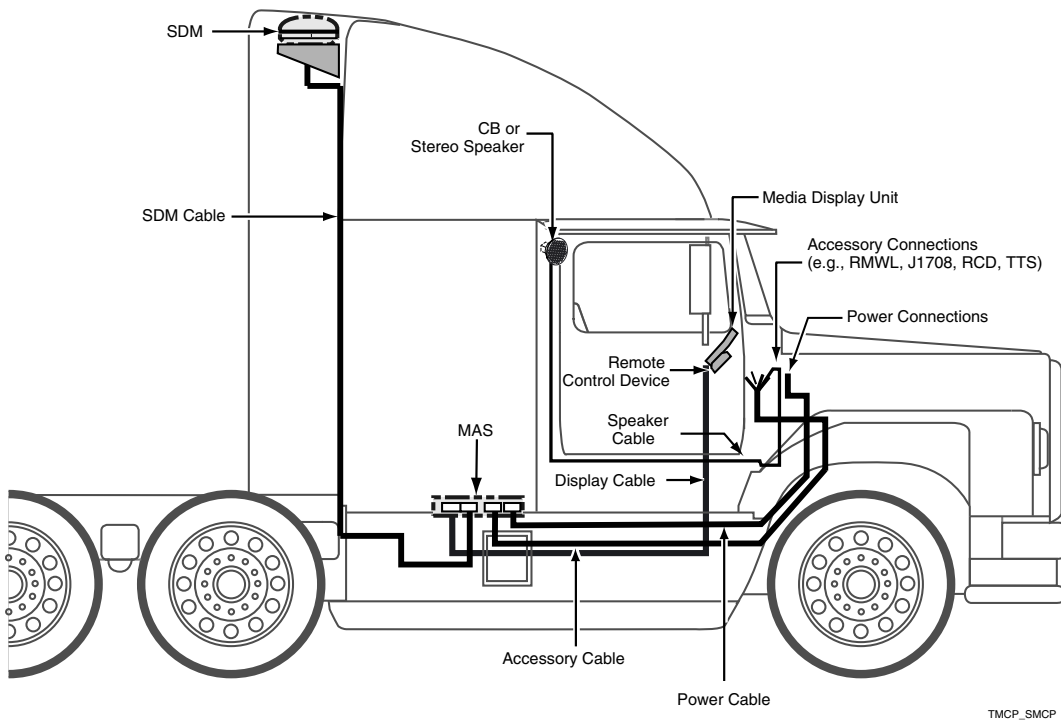
Wireless Interface Box 200 (WIB200)

The WIB200 includes terrestrial and Wi-Fi® modems, and antennae that provide CDMA/GSM/UMTS communication. The hardware provides reliable communication and GPS positioning.

- Height: 3.4 inches

- Width: 6.5 inches

- Length: 6.5 inches

- Extended operating temperature range:

  -30C to +70 C / -22F to +158F

- 802.11 compatible

- Lightweight housing for easy installation.

- Rugged design

Wireless Interface Box (WIB200) Cable

- Connects the WIB200 to the MAS200.

- Standard length is two feet.

Optional Satellite Data Modem (SDM)

The SDM communicates 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® antenna communication unit (ACU) for ease of installation.

Satellite Data Modem (SDM) Cable

- Connects the SDM to the MAS200.

- Standard length is 20 feet.

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 messages, connectivity, and other information.

- 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.

- Integrated speaker can be used for audio throughout the cab.

- One 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.

Display Cable

- Connects the DIU200 to the MAS200.

- Standard length is 20 feet: 17 feet of straight cable; 3 feet of coiled cable.

Procedures for Using the DIU200

What to use for navigating the DIU200 touchscreen—PDA stylus (provided) or your fingers.

What NOT to use for navigating the DIU200 touchscreen—pencils, pens, metal objects, or any other devices which could possibly scratch the touchscreen.

What to use when cleaning the DIU200—a soft cloth and either plain water, glass cleaner, or mild soap. Do not spray any liquid directly onto the DIU200.

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 6.5 x 2.4 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.

  - **(4) USB 2.0 Host Ports** allow USB peripherals, such as handheld scanners, keyboards, and storage devices.

  - **RS-232 Interface** allows connectivity to devices, such as printers, barcode readers, and scanners.

  - **Configurable Interface (RS-232 or RS-485)** connects to modular truck interface systems.

  - **Ethernet Port RJ45 Connector**

  - **(2) Display Ports** allow for in-dash infotainment system and one other display.

- Supports these other interfaces:

  - **(7) Power Drivers** act as switches to control lights, buzzers, door locks, etc.

  - **(6) Digital Inputs** allow the MAS200 to sense door openings, button pushes, alarm status, power takeoff (PTO) clutch position, etc.

  - **(2) Analog Inputs** allow the MCP200 to read and react to analog values, such as temperature, light levels, and humidity levels.

  - **Panic Button Input** allows connection of a panic button for emergency driver signaling.

  - **Engine and Vehicle Speed Inputs** sense the speed of the engine and the vehicle.

- **(2) Tamper Detect Lines** detect tampering with the SDM and WIB200.

- **Decoy Tamper Detect Line** detects tampering with decoy vehicle wiring.

- **Indicator Box Output** drives a warning lamp to alert drivers of overspeed or overrev.

- **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

- Qualcomm MCP200 requires a rechargeable lead-acid battery installed into the MAS200.

- For more specific information about the backup battery, see Chapter 5.

- 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.
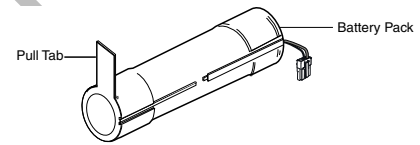
Accessory Cable for the Qualcomm® MCP200

- Connects accessories and options, such as the SensorTRACS system®, the TrailerTRACS system, and the RCD and speaker to the MAS200 for text-to-speech (TTS) play.

- Standard length is 20 feet.

- Does not support wiring for the CDU, Axle, RPM, PTOP, or PTOC.

Speaker Switch Cable

- Connects a vehicle into a speaker to play text-to-speech.

- Cable length is 8 feet.

- Do not need if a dedicated speaker is added to the vehicle for text-to-speech (TTS).

Power Cable

- Connects the +12/24 VDC unswitched power source (battery), the +12/24 VDC switched power (ignition), and the system ground to the MAS200.

- Standard length is 20 feet.

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.

- Extended operating temperature range: -30C to +70C.

- Storage temperature range: -40C to +85C.

- Small and easy to mount to the vehicle dash.

Optional Accessories for the MCP200

Accessory	Chapter
SensorTRACS system	13
Vehicle Maintenance	14
TrailerTRACS system	15
Buzzer	17
Remote message waiting light	18
Panic button	19
Printer	20
Scanner	21

3

General Wiring and Installation Guidelines

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

If you have technical questions while reviewing this chapter, please contact Qualcomm Enterprise Services (QES℠) Customer Support. Customer Support is staffed 24 hours a day, 365 days a year:

<div align="center">

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

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Making Electrical Connections

Approved Qualcomm Electrical Connectors

The only Qualcomm-approved electrical connectors are crimp butt splices and crimp ring terminals. Qualcomm 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.

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.

Strip
approx.
1/4"

03AAA_270a
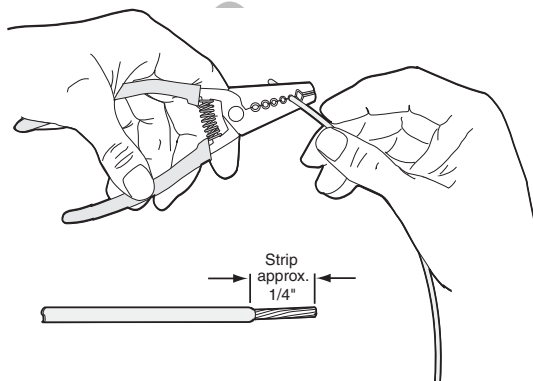
2. After stripping the wire, verify that the wire is not severed, nicked, or damaged by the stripping tool. If the wire has been properly stripped, it is ready to be butt spliced. If the wire has been damaged, restrip the wire (see step 1.).

Butt Splicing

- Qualcomm 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.

Push the stripped wires to the inspection window of the butt splice

Butt splice

Inspection window

03AAA_272
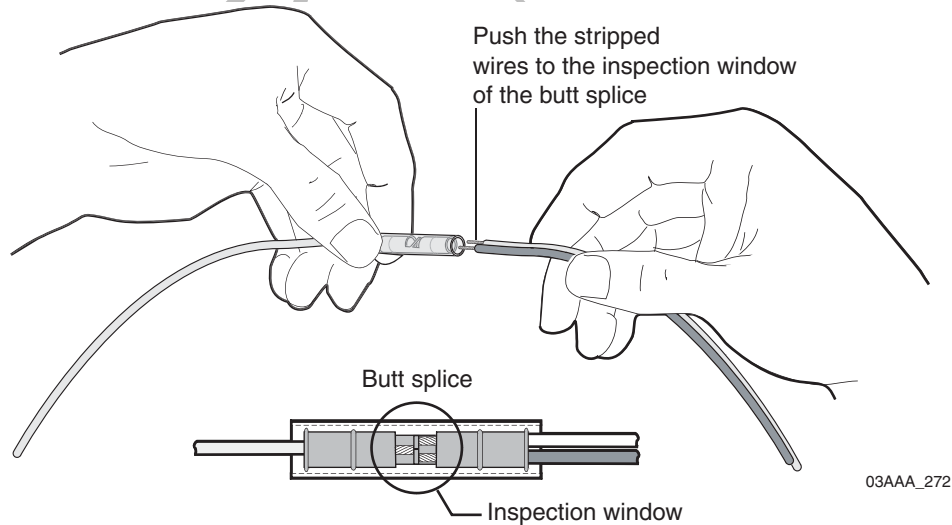
2. Repeat this process for the wire on the opposite end of the butt splice. Once a proper butt splice is confirmed, it is important to properly crimp the butt splice to hold the connection.

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."
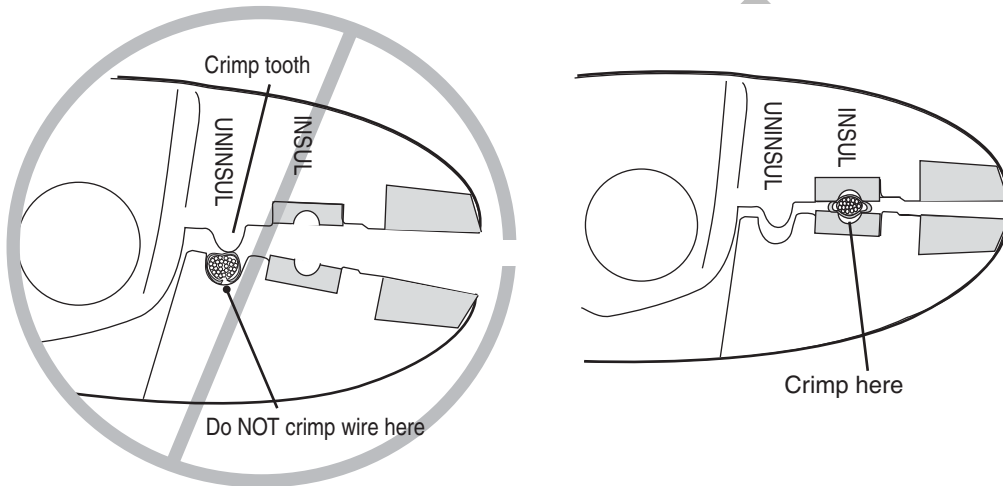
03AAA_90b

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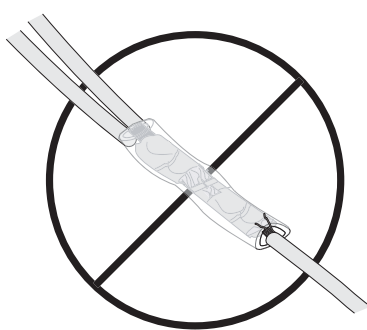
WRONG
Butt splice is visibly crushed,
possibly damaging the wire
and the wire connection.

Some wires are exposed.
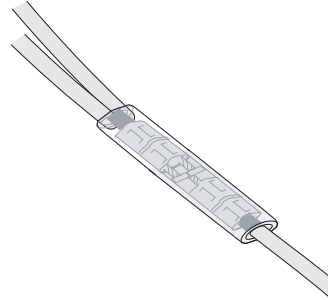
CORRECT
Crimping is done properly,
protecting the wire and
the wire connection.

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.

Wire crimp
Insulation crimp

Crimping Tool

UNINSUL
INSUL

Crimp here

03AAA_271

Crimping locations

Outside crimp (insulated wire) →   ←Outside crimp (insulated wire)
        Inside crimp (stripped wire) →   ←Inside crimp (stripped wire)
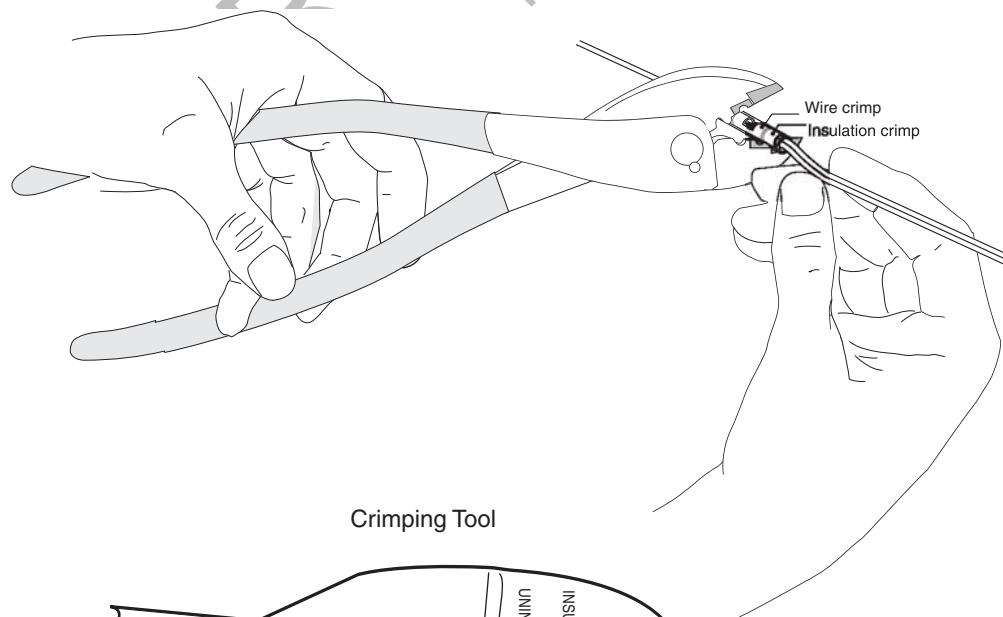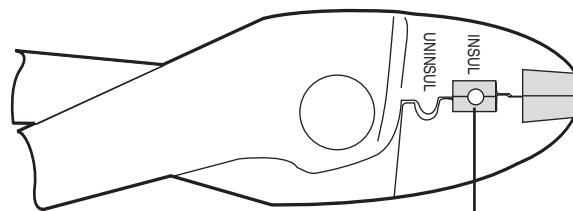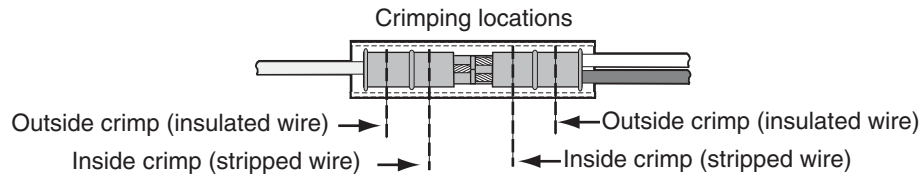
03AAA_273

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.
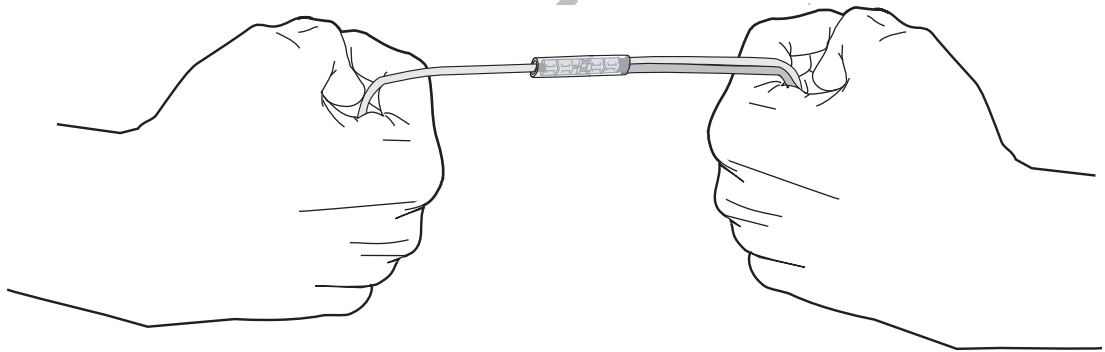
03AAA_282

> ⚠ **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 Qualcomm (MCN# 800-01788-0168). To find a local or nationwide supplier, visit http://www.3m.com (Mastic, Scotch® Vinyl).

Peel Paper
Backing Off

Wrap two
layers minimum
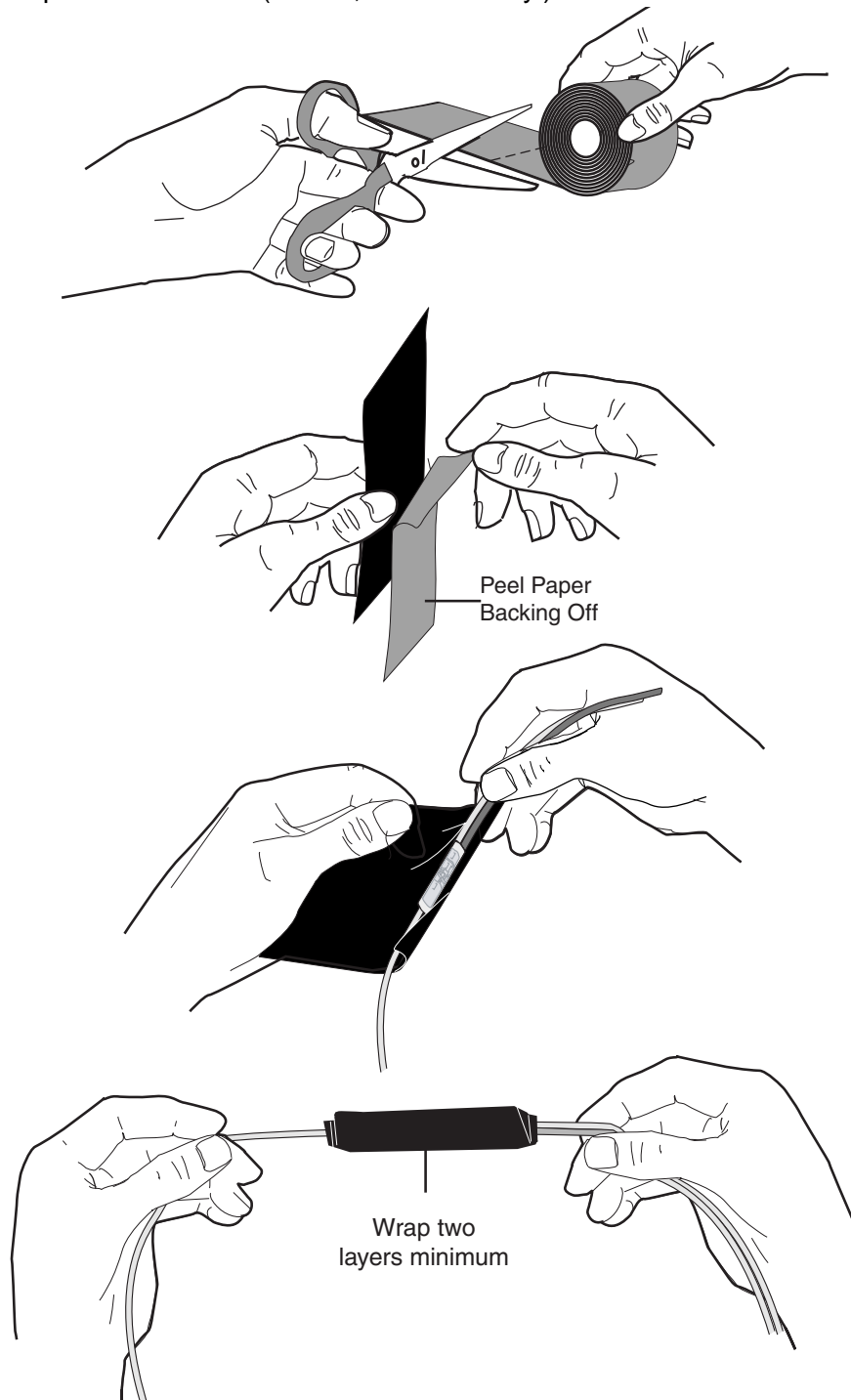
04AAA_22a

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.
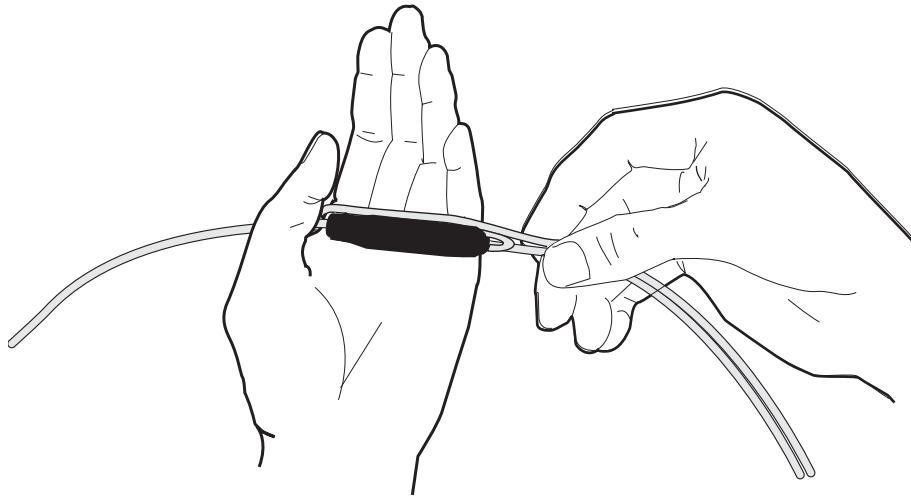
04AAA_24a

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

Place tie wraps
at outside ends of
butt splice.
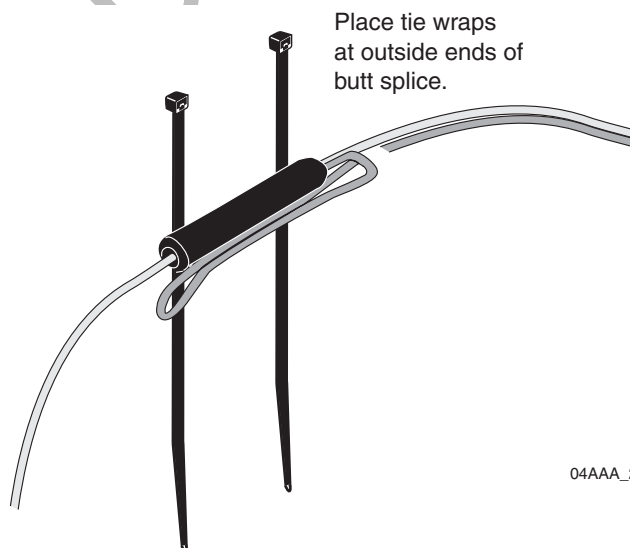
04AAA_23a

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.

Cut tie wrap
flush with lock head.
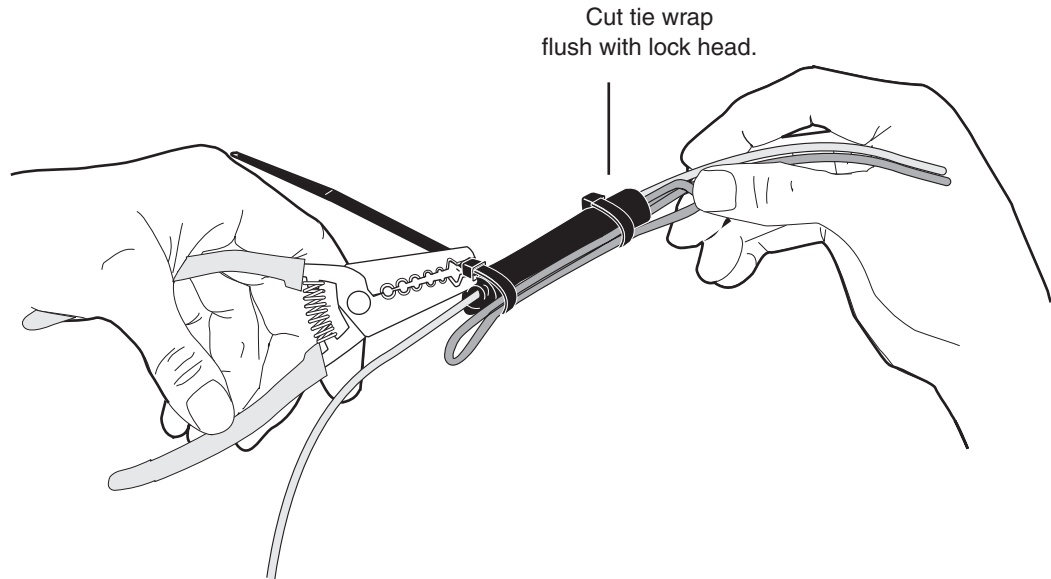
04AAA_25a

5. Firmly tug on the butt-spliced wire connection to make sure the tie wraps do not pull loose.
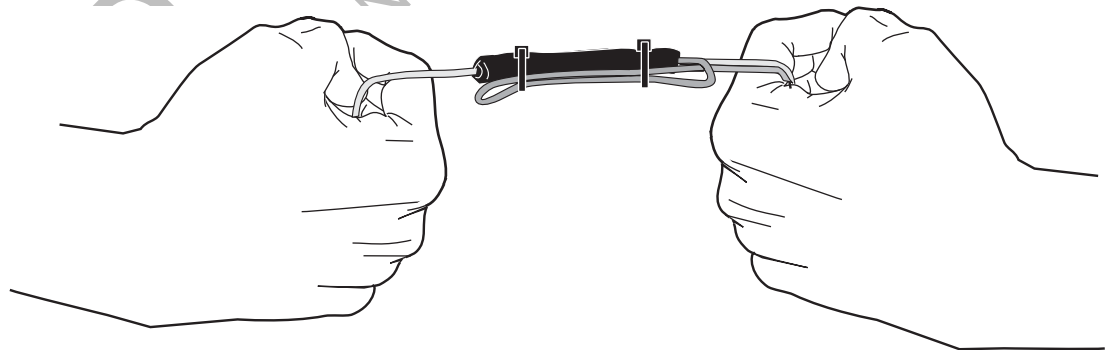
04AAA_26a

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.

Wire gripping impression is well formed

Bare wire protrudes 0.03 to 0.125 inch
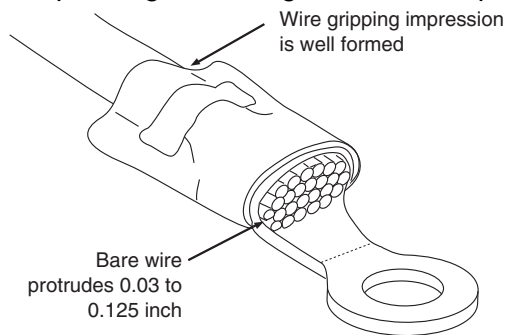
OM/E-0093-97

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

Screw
Star Washer
Flat Washer
Terminal Connector
Flat Washer

Nut
Lock Washer
Flat Washer
Terminal Connector
Terminal
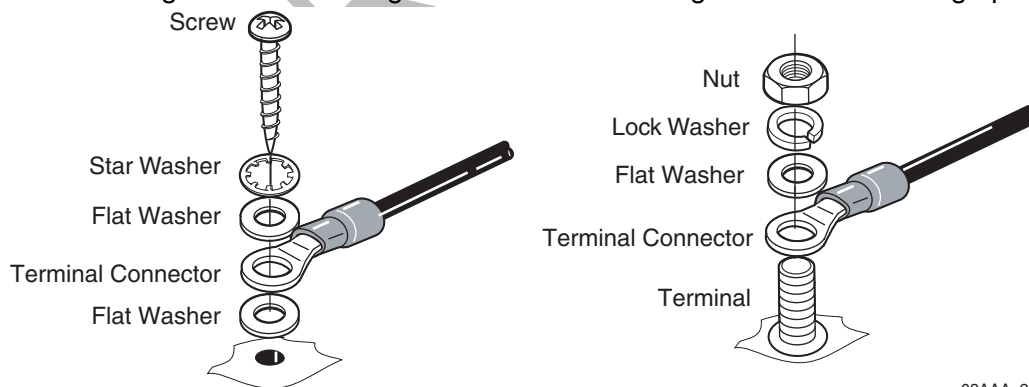
03AAA_285

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

Bend Diameter
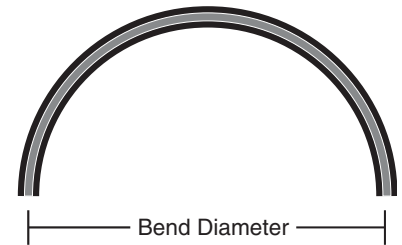
DO NOT route cables:

- 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 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.

05AAA_223E

05AAA_223A
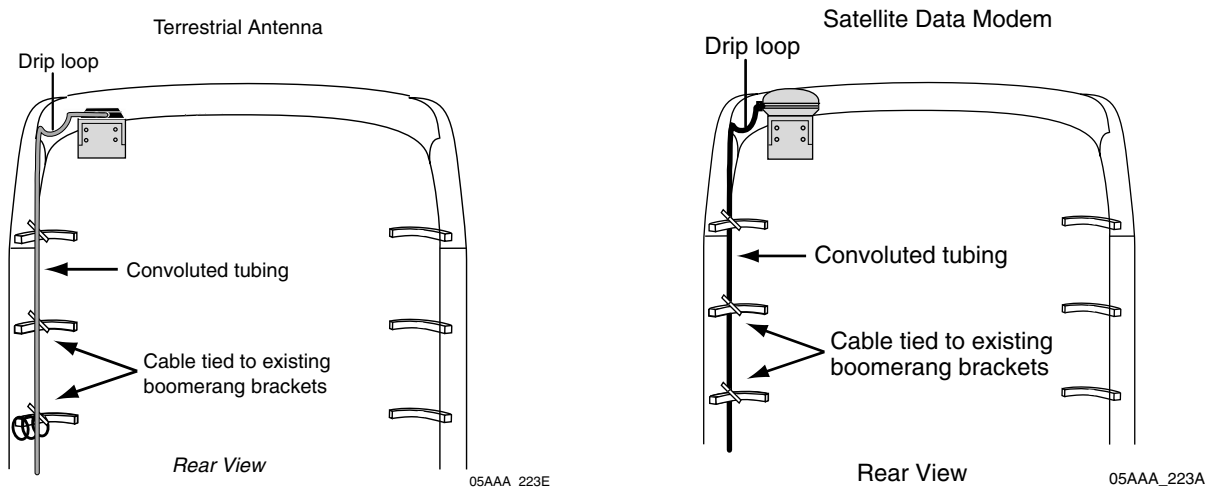
Access Holes

- 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.

Access hole
sealed with
grommet

Tie-wraps

Fire Wall
of Vehicle

Convoluted
Tubing

06AAA_89
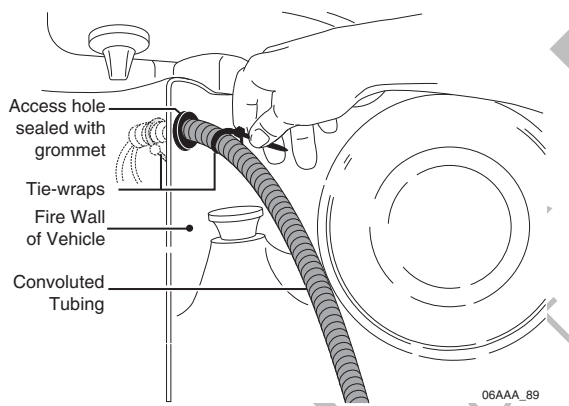
4
Installation Planning

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

For technical questions, contact Qualcomm Enterprise Services (QES℠) 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

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 Qualcomm approval (applies domestically only).
- Mount WIB200 in locations where the unit will receive uninterrupted and undegraded GPS satellite signals. Refer to *Routing the WIB200 Cable* on page 7-4.
- Mount optional SDMs in locations where the unit will receive uninterrupted and undegraded GPS satellite signals. Refer to *Line-of-Sight Requirements* on page 8-4.
- 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. Install and route cables.

3. Antenna, see Chapter 7: Wireless Interface Box 200 (WIB200) Antenna Installation or Chapter 8: Optional Satellite Data Modem (SDM) Installation.

4. Display unit holster and display unit, see Chapter 9.

5. Remote control device (RCD), see Chapter 10.

6. Accessories.

7. MAS200, see Chapter 5.

8. After you install the MCP200 components, see Chapter 12.

Typical Installation Locations for MCP200 Components

SDM

CB or
Stereo Speaker

SDM Cable

Media Display Unit

Accessory Connections
(e.g., RMWL, J1708, RCD, TTS)

Power Connections

Remote
Control Device

Speaker
Cable

MAS

Display Cable

Accessory Cable

Power Cable
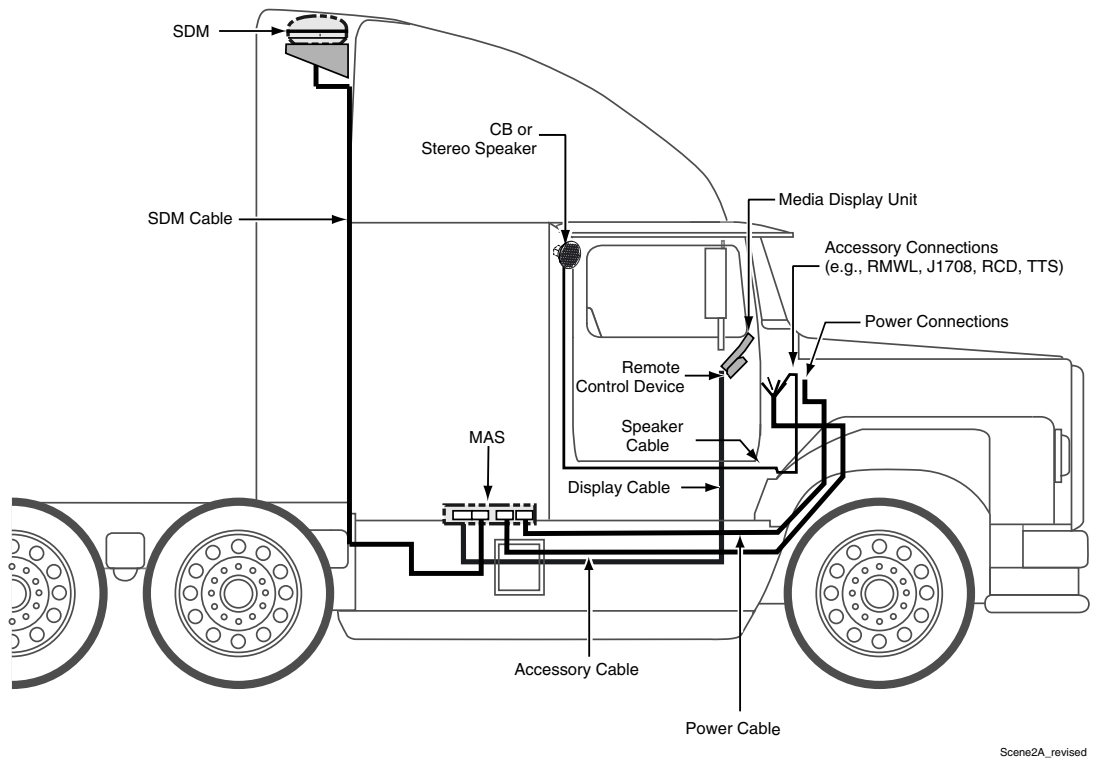
Scene2A_revised

- Securely mount the wireless interface box 200 (WIB200) with a clear "line-of-sight" to the GPS satellite (see Chapter 7).
- Securely mount the optional satellite data modem (SDM), if being used, to the mounting assembly with a clear "line-of-sight" to the satellite (see Chapter 8).
- Install the display unit in the cab where it can be easily accessed by the driver.

⚠️ **WARNING**

The driver should not use the display unit while the vehicle is in motion.

- Install the MAS200 in a dry, protected space, such as the side box or bunk area.
- Install the optional RCD, if being used, within reach of the driver but where it will not interfere with the operation of the vehicle.

Conventional Vehicle Types

International/Navistar

- MAS200—Install on side wall or hang under bunk.

    - Install so there is always SD card slot access.

- DIU200—Install where space allows/customer preference.

- Cables—Route externally or internally.

    - Drill a 1" hole for antenna cable.
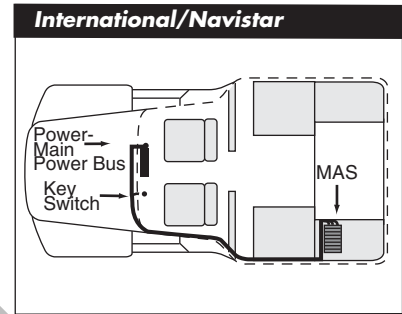
Freightliner FLD

- MAS200—Install on side wall or hang under bunk.

    - Install so there is always SD card slot access.

- DIU200—Attach to electrical access panel behind gearshift.

- Cables—Route externally.

    - Cables exit/enter sleeper near MAS200.

    - Cables enter/exit cab low on passenger side firewall.

    - Drill a 1" hole for antenna cable.

Freightliner Century/Columbia

- MAS200—Install on side wall or hang under bunk.

    - Install so there is always SD card slot access.

- DIU200—Install where space allows/customer preference.

- Cables—Route internally.

    - Power is at A pillar on passenger side.

    - Drill a 1" hole for antenna cable.

Kenworth T600/W900

- MAS200—Install on side wall or hang under the bunk.

    - Install so there is always SD card slot access.

- DIU200—Install on face of mapbox.

- 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.

Kenworth T2000

- MAS200—Install on side wall or hang under the bunk.
  - Install so there is always SD card slot access.
- DIU200—Install on passenger side glovebox.
- 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.
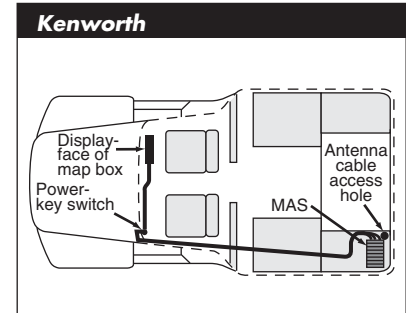
Volvo

- MAS200—Install on side wall or hang under the bunk.
  - Install so there is always SD card slot access.
- DIU200—Install on engine cover/dog house.
- 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.
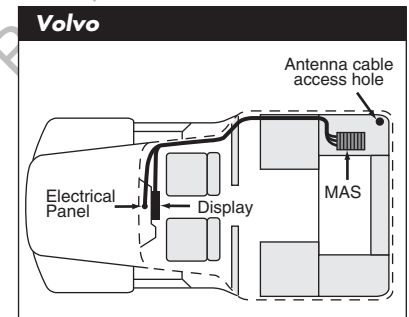
Peterbilt 378/379

- MAS200—Install on side wall or hang under the bunk.
  - Install so there is always SD card slot access.
- DIU200—Install behind passenger seat.
- 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.
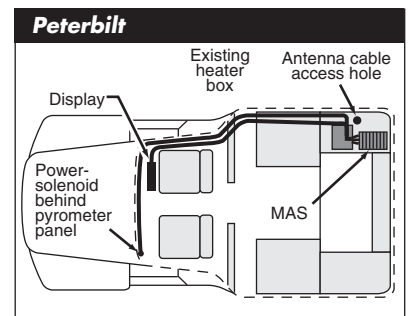
Peterbilt 387

- MAS200—Install on side wall or hang under the bunk.
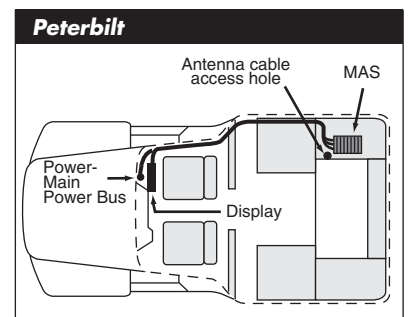
- - Install so there is always SD card slot access.
- • DIU200—Install on face of connector panel.
- • Cables—Route externally.
  - - Drill a 1" hole in floor of side box for antenna cable.

Mack

- • MAS200—Install on side wall or hang under the bunk.
  - - Install so there is always SD card slot access.
- • DIU200—Install on face of connector panel.
- • Cables—Route externally.
  - - Drill a 1" hole in floor of side box for antenna cable.
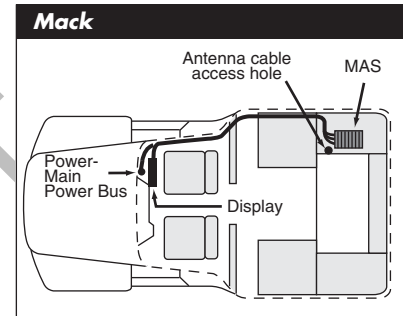
Straight Truck Vehicle Types (All Makes)
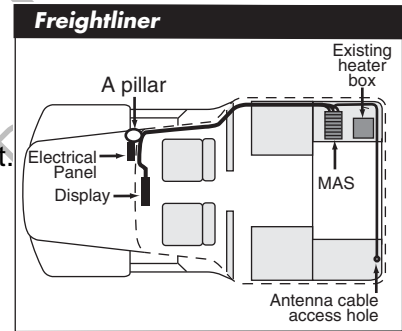
- • MAS200—Install on side wall or hang under bunk.
  - - Install so there is always SD card slot access.
- • DIU200—Install where space allows/customer preference.
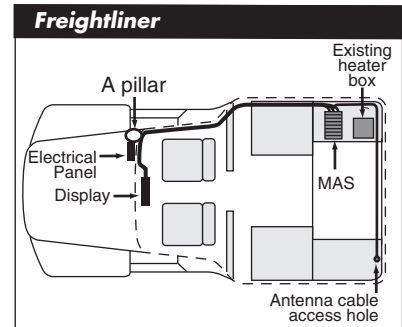- • Cables—Route externally or internally.
  - - Tilt cabs may require longer cables.
  - - Drill a 1" hole in floor of side box for antenna cable.
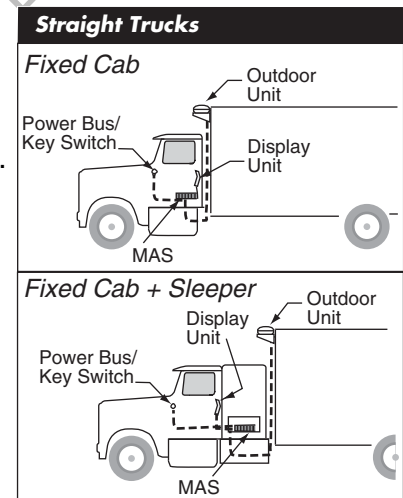
Cabover Engine Vehicle Types (All Makes)
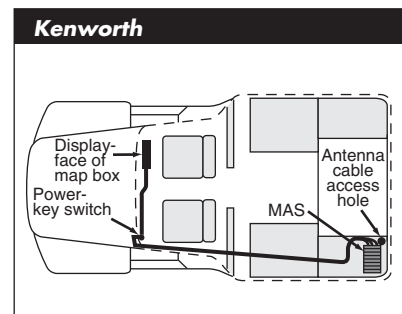
- • MAS200—Install on side wall or hang under bunk.
  - - Install so there is always SD card slot access.
- • DIU200— Install on dash.
- • Cables—Route internally.
  - - Connect power cable to main bus or keyswitch.
  - - Drill a 1" hole in floor of side box for antenna cable.
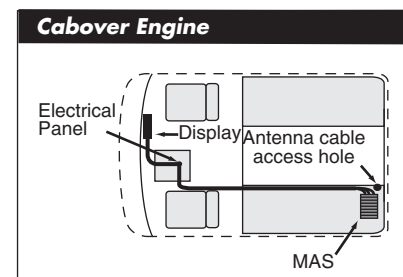
Special Cable Ordering Instructions for Tilt Cabs

*   Typically, the antenna cable must be routed through the cal 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.
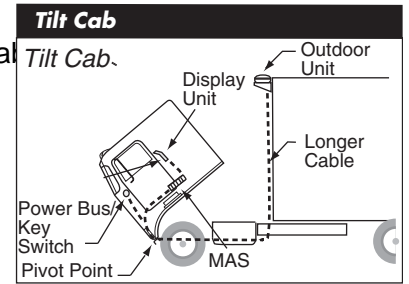
Installation Planning Worksheets for the MCP200 Components

Conventional Vehicle
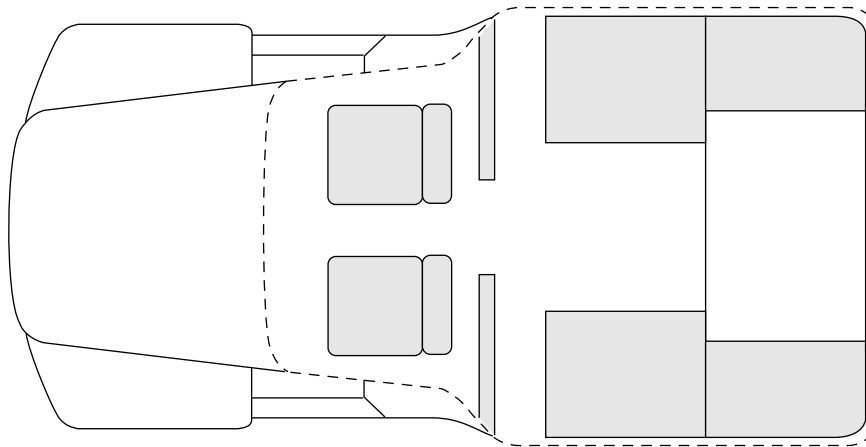
Locations

User Interface Device:

Communication Unit:
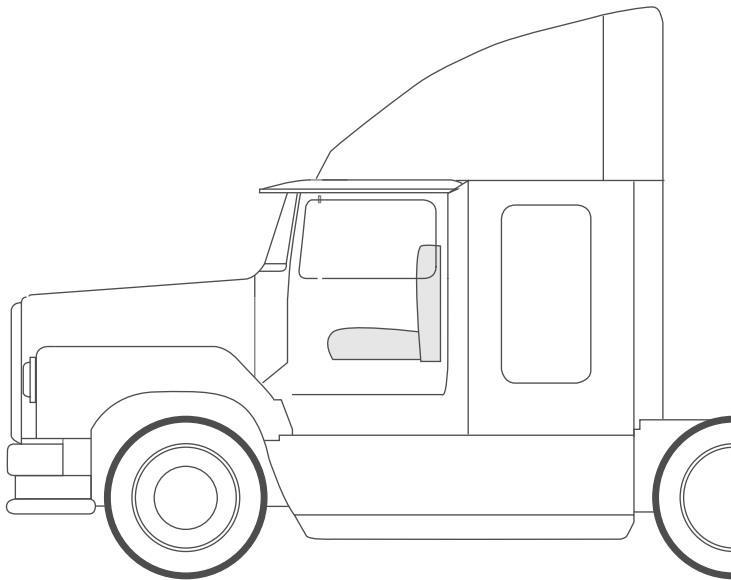
Cables:

Access Holes:

OM/E0093-152

Installation Planning Worksheet

Cab Over Engine
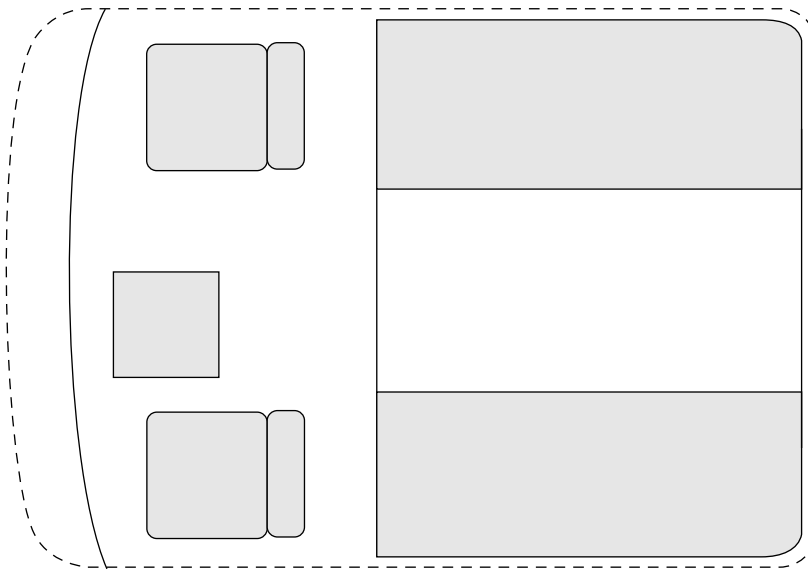
Locations

User Interface Device:

Communication Unit:
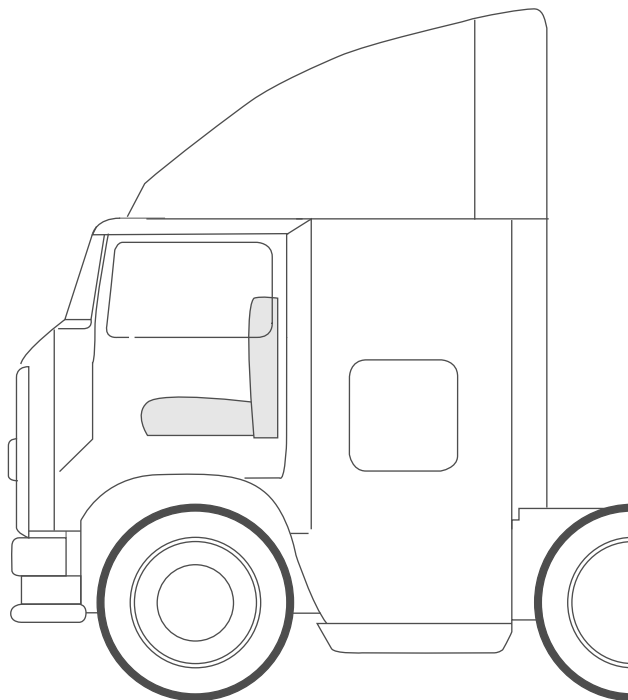
Cables:

Access Holes:

OM/E0093-151

Day Cab
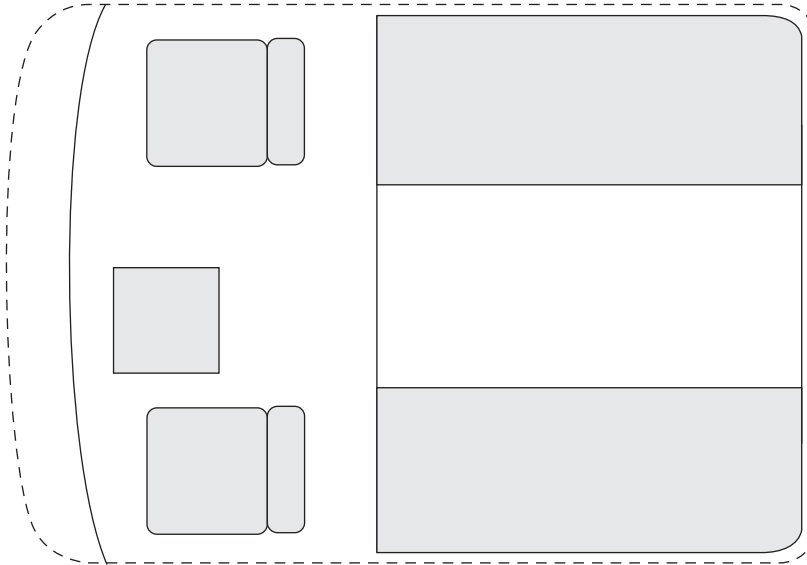
Locations

User Interface Device:

Communication Unit:
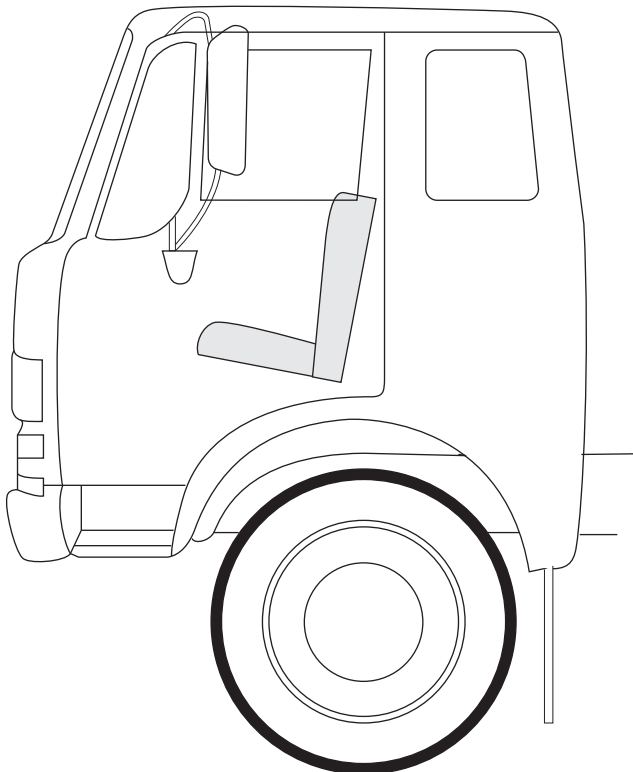
Cables:

Access Holes:

OM/E0093-153

Tools and Supplies Recommended for Installations

Essential Tools	Miscellaneous Tools
• Standard Combination Wrench Set	Measuring Tape
• Diagonal Wire Cutters	Rachet/Sockets
• Wire Strippers	Adjustable Wrench
• 3/8" Drive Standard Deep Well Socket Set with rachet	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
• 1-1/2" 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 rachet
Miscellaneous Supplies	
• Silicone Sealant or Refrigeration/Tar Tape	Flash/Drop Light
• Assorted Ring Terminals	
• Assorted Butt Splices	
• Electrical Tape	
Items marked with a **bullet (•)** 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.	

Qualcomm Approved Sealants

Sealant, Lubricant, or Liquid	Acceptable For	Required For
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.

5

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.

For technical questions, contact Qualcomm Enterprise Services (QES℠) 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 backup battery into the MAS200.

2. Install the MAS200 onto the mounting surface.

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.

Rotate tab up

Battery door
removed for clartiy
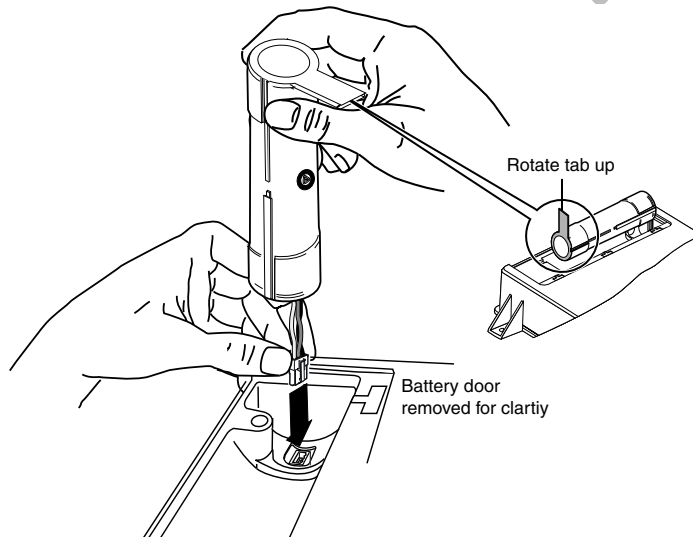
05AAA_45QMCP

4. Rotate the backup battery into a horizontal position and place in the MAS200.
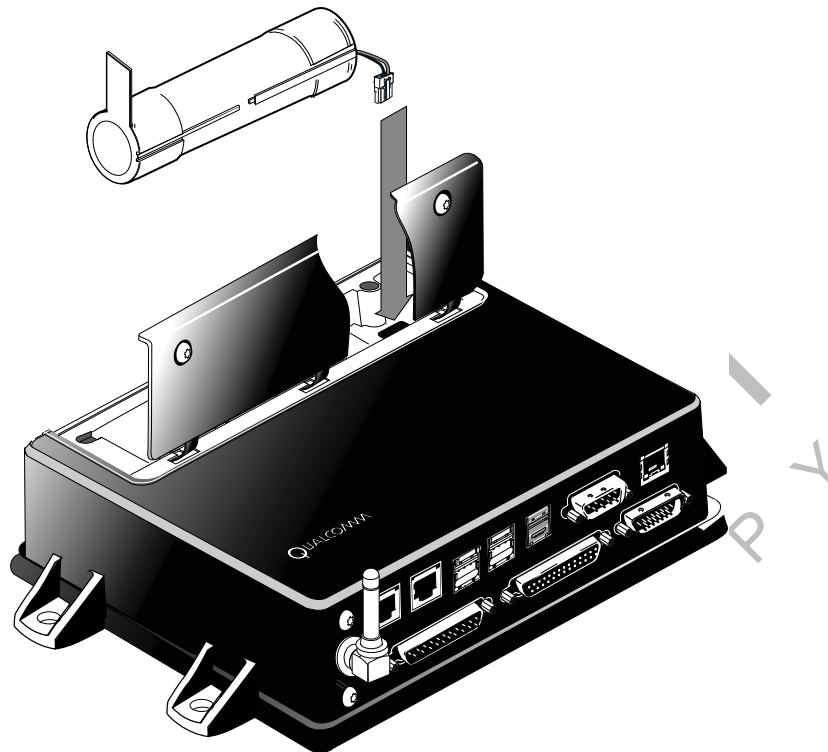
09AAA_01

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

Installing the MAS200 into the Mounting Surface

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.

05AAA_237A

05AAA_237B

05AAA_237
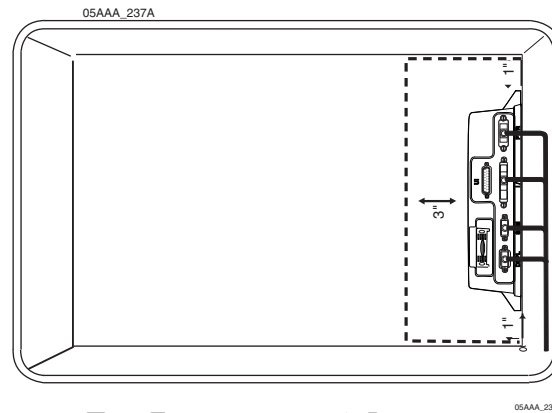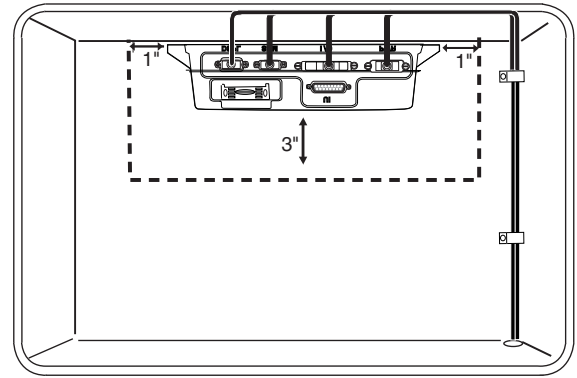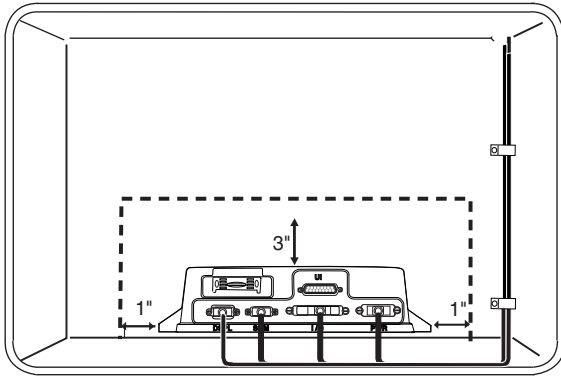
Location and Orientation

- **When possible, do not install the MAS200 on the floor of the vehicle.**

- **Preferably, install the MAS200 on the vertical side wall.**

- If possible, install the MAS200 in a storage compartment.

- Choose a location that provides easy access to the SD card slot and visibility to LEDs located inside the SD card slot.

- 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 any accessories can be serviced in the future.

Securing the MAS200

- Tighten the four self-drilling screws into the mounting surface.

Installing the Power Cable

- Connects MAS200 to vehicle's electrical power source.

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. Select one of the following electrical power interface locations on the vehicle:
   - Key switch
   - Fuse panel
   - Bus bar
   - Circuit breakers

2. If needed, temporarily remove the two fuses from the fuse holders on the end of the cable.

3. Route the fuse end of the power cable from the MAS200 location into the cab of the vehicle.

4. Re-install the fuses onto the appropriate wires.

5. Power on the MAS200 when ready.

Low Voltage Disconnects (LVDs)

- Removes "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 Qualcomm® 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 messages
  - Panic button will not operate
  - Tamper detection will not work
  - Vehicle position will be lost
  - Backup battery life will be significantly reduced

Power Cable Wire Connections

- Vehicle battery supplies power to the MAS200.

- The three required connections that you must make at the fuse end of the power cable:

  - Chassis ground

  - +12/24 VDC Battery (Main) (unswitched)

  - +12/24 VDC Ignition (switched)

- Never wire the constant BAT+ connection or the IGNITION connection to the Accessory position. See Appendix A for detailed pin and wire callouts.
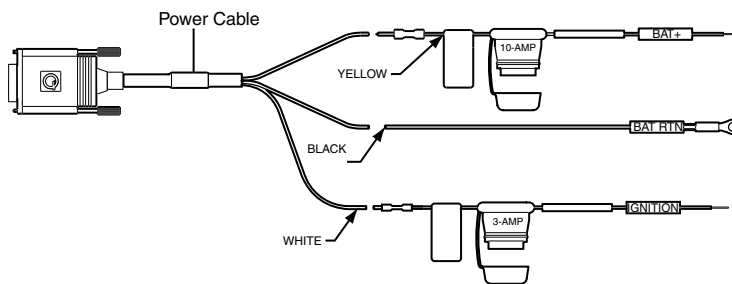
1. Connect the black BAT RTN wires to a good grounding surface on the vehicle chassis or one that is connected to the chassis. Refer to *Grounding Guidelines* on page 5-7 for more information.

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.

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 ground connection.

Metal surface

No
Paint
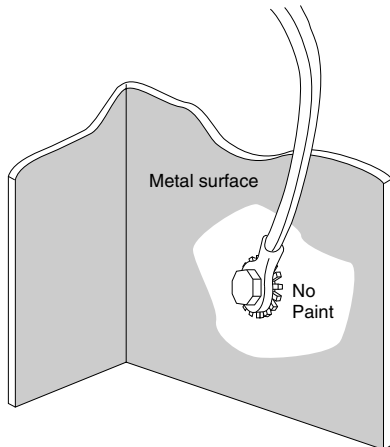
Installing the Accessory Cable

- Connects the MCP200 to the optional remote control device (RCD) for text-to-speech, the J1708/1587 data link, and other vehicle inputs and optional system devices.

- Provides necessary wiring for optional system features, such as display screen disabling, the SensorTRACS® system, TrailerTRACS® asset management, buzzer, RMWL, panic button and other security devices.

- Two accessory cables available:
    - primary accessory cable
    - secondary accessory cable
    - standard length of either cable is 20 feet
    - See Appendix A for detailed wiring diagrams.

Primary Qualcomm® MCP200 Accessory Cable

• Connects accessories and options, and the optional RCD and speaker to the MAS200 for text-to-speech (TTS) play.

• Supports wiring for J1708/J1587, J1939, Panic Button, PTOC, TrailerTRACS.

COLOR	SIGNAL	PIN
WHT/BLU 20	(CAN_B(TX))	
BLU/WHT 20	(CAN_C(GND))	
WHT/BRN 22	(CAN_D(PWR))	
BRN/WHT 22	(CAN_A(RX))	
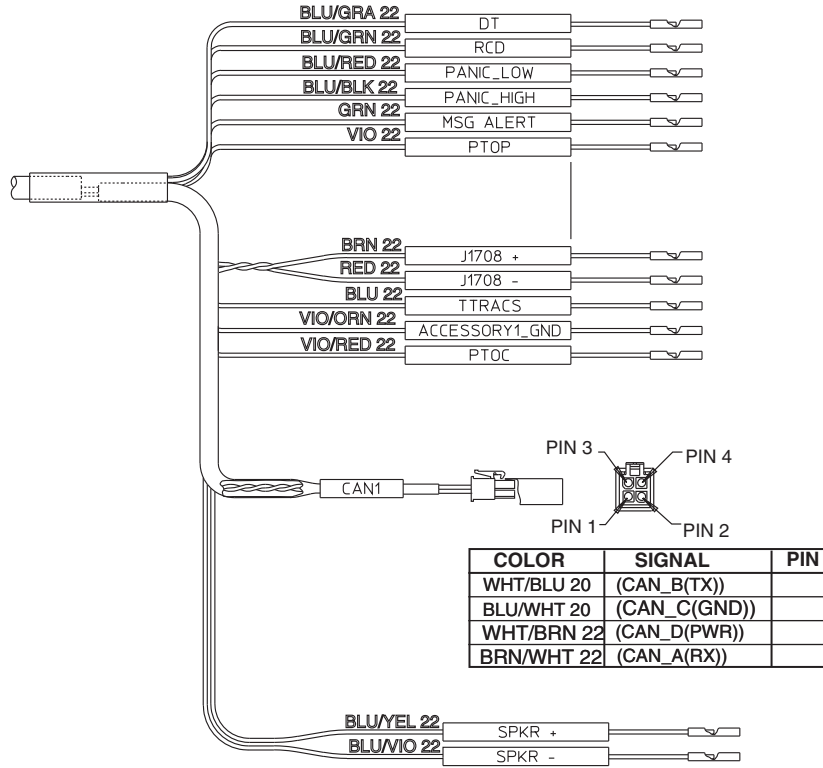
09AAA_014A

Secondary Qualcomm® MCP200 Accessory Cable

• See Appendix A for detailed pin and wire callouts.

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. Only hand-tighten the thumb screws on the connector.

3. Align the connector so it is straight before sliding into position.

4. Connect the accessory cable into the I/O slot.

5. Connect the power cable into the PWR slot.

Accessory Cable

Power Cable

05AAA_222DD

DRAFT
DO NOT COPY

7

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.

For technical questions, contact Qualcomm Enterprise Services (QES℠) 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 antenna on the exterior of the vehicle roof.

2. Connect and route the cable.

3. Connect the antenna cable to the WIB200.

The antenna can be installed using tape or screws.

*   If you are using a VHB tape, see *Option A—Antenna Installation Using VHB Tape* on page 7-2.
*   If you are using self-drilling screws, see *Option B—Mount Method Installation Using Hardware* on page 7-3.

Option A—Antenna Installation Using VHB Tape

*   Attaches to the backside of the vehicle roof without drilling.

Terrestrial Antenna

Back of Truck Cab

To TDM

01AAJ_79cQMCP
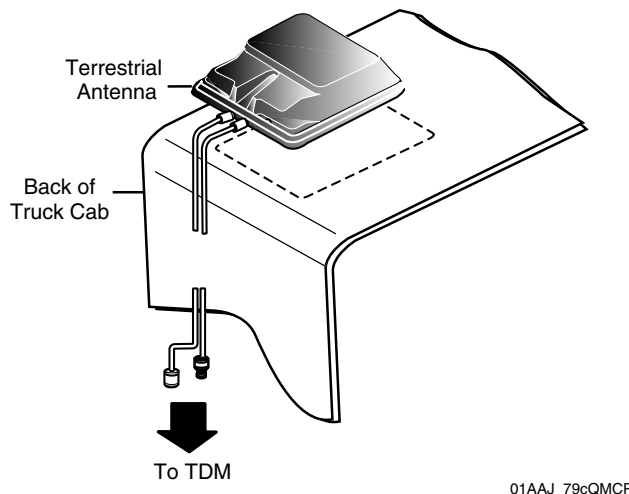
> ⚠ **Caution**
> *Do not use VHB tape on chrome surfaces.*

Antenna Surface Preparation

1. Pick a location toward the back of the vehicle roof.

2. Ensure that the vehicle mounting surface is flat.

3. Verify that the cable routing will adequately reach the bottom of the TDM where the connection is required.

4. Use alcohol pad to ensure that the vehicle mounting surface is free of dirt and wax.

7-2   **MAY CONTAIN U.S. AND INTERNATIONAL EXPORT CONTROLLED INFORMATION**   *80-J9968-1 Rev. A*

5. Apply the tape primer evenly across the vehicle mounting surface. Wait five minutes before installing the antenna bracket.

6. Remove the backing from the VHB tape. Position the vertical bracket assembly up to the mounting surface. Apply even pressure until fully adhered to the mounting surface.

7. Connect and route the cables according to the cable routing instructions on page 7-4.

Option B—Mount Method Installation Using Hardware

• Attaches to the backside of the vehicle roof by using self-drilling screws.
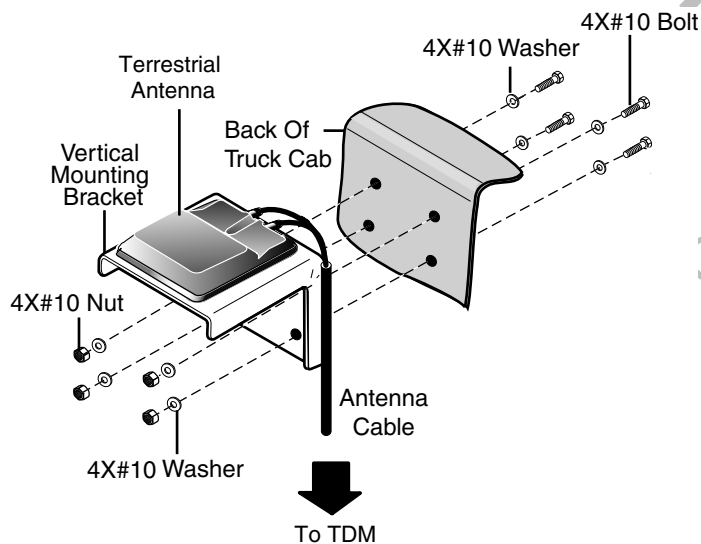
01AAJ_79dQMCP

Mount Surface Preparation

1. Use alcohol pad to ensure that the vehicle mounting surface is free of dirt and wax.

2. Using a razor knife, cut the adhesive tape from the four vertical bracket mounting holes.

3. Using the vertical bracket as a template, hold it against the mounting surface and mark the mounting holes.

4. Mount the bracket over the holes.

5. Tighten the four self-drilling screws into the mounting surface with a Torx #25 driver.

Routing the WIB200 Cable

The antenna cable connects the WIB200 to the MAS200.

- Run direction—Start at the WIB200 and run the cable down to the MAS200.

- Run location—Route the cable internally or externally.

- Cable connectors—Make sure the rubber boots are completely forward so the connectors are totally covered.

Connecting the Antenna Cable to the MAS200

1. Inspect the antenna cable connectors for damaged or bent pins.

2. Connect the antenna cable connectors to the mobile application server (MAS200).

Terrestrial
Antenna

GPS

Celluar

Terrestrial
Data Modem (TDM)

07AAA_56BQMCP

8
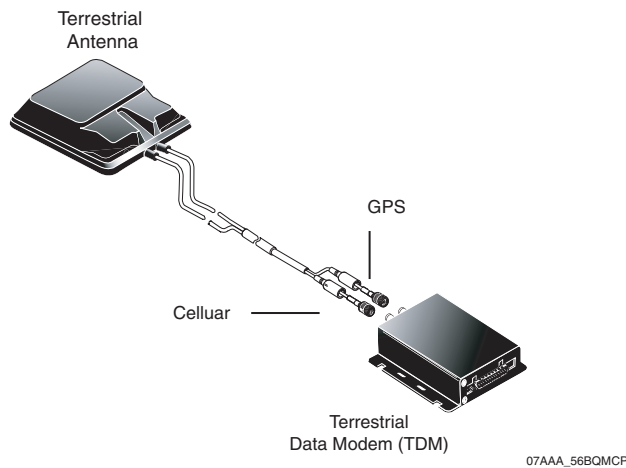
Optional Satellite Data Modem (SDM) Installation

Topics in this chapter provide guidelines for installing the Qualcomm® MCP200 optional SDM.

For technical questions, contact Qualcomm Enterprise Services (QESSM) 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 Qualcomm mounts for specific vehicle types and complete instructions for installing the SDM on the mount.

• Use only Qualcomm-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. Qualcomm reserves the right to charge for replacement or repair of damaged or malfunctioning SDMs which Qualcomm 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 (MCP) 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 Qualcomm. Removing the radome exposes the MCP 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.

SDM
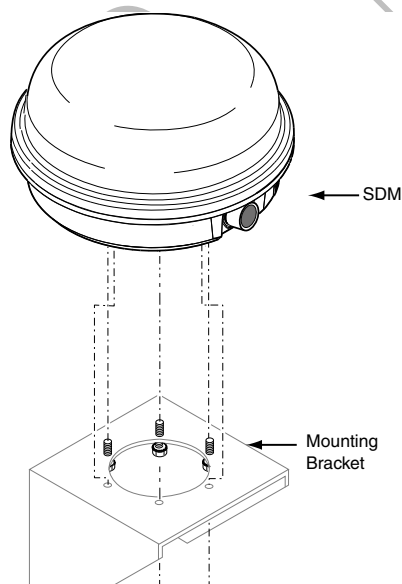
Mounting
Bracket

> ⚠️ **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.

OM/E-0093-42
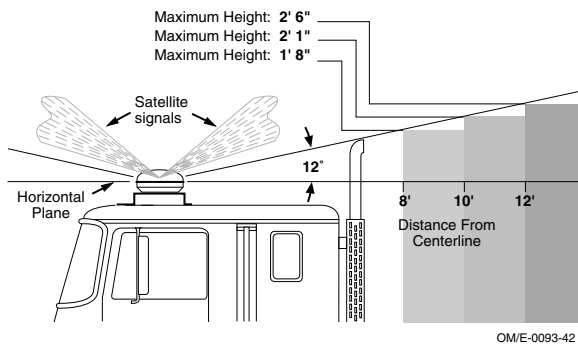
• An obstruction height of 2.5 feet for every 12 feet away from the SDM centerline is acceptable. Use this same formula to verify that a trailer hooked up to the vehicle does not extend above the 12° angle.

• 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.
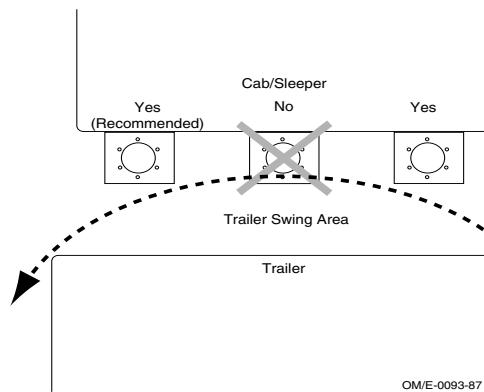
Installing the SDM Cable

- Connects SDM to MAS200.

Connecting the SDM Cable

1. Install the SDM cable on the SDM connector and hand-tighten.
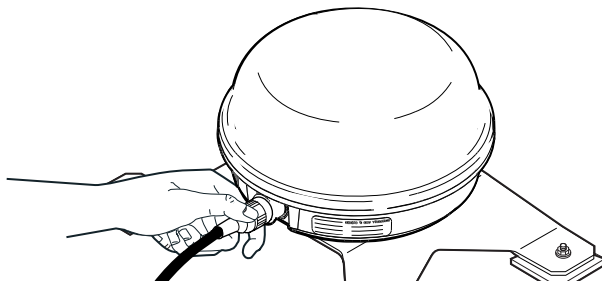
> ⚠️ **Caution**
>
> *If the cable does not easily connect to the SDM cable connector, check the part number of the cable to make sure you are using the SDM cable. The SDM cable is keyed to avoid an incorrect cable with a similar connector type from being attached.*

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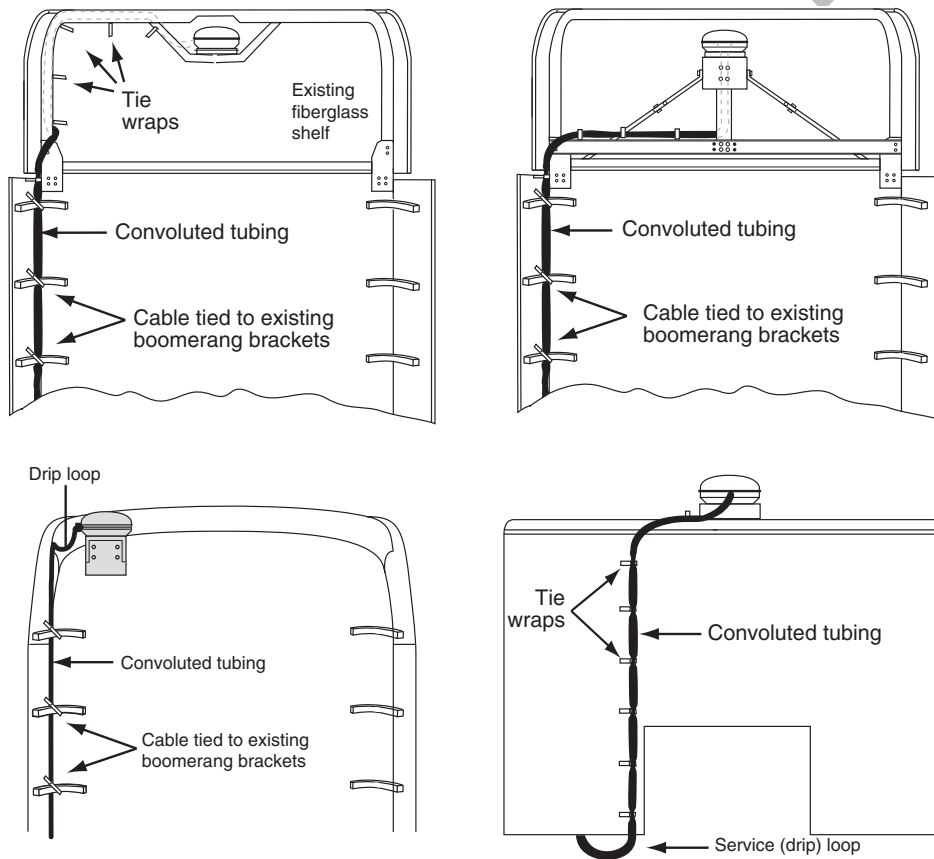
• Cable dressing—SDM cable comes with pre-installed convoluted tubing and UV resistant tie wraps.

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.

⚠ **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 satellite data modem (SDM) slot.

SDM Cable

05AAA_222E

9

Display Interface Unit 200 (DIU200) Installation

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

For technical questions, contact Qualcomm Enterprise Services (QESSM) 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 DIU200 holster.

2. Route and connect the cable.

3. Connect the DIU200 cable to the MAS200.

Selecting a Mounting Location

<u>IMPORTANT SAFETY INFORMATION</u>

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.

⚠ **WARNING**	**Driver - Do not use while vehicle is in motion.**
	Use of display unit while driving will cause distraction and loss of vehicle control which may lead to serious injury or death.

Tie wrap
the cable for
strain relief

Hole Mount Tie
Wrap and Self
Drilling Screw

Media Display Unit (MDU)

02AAA_210D

1. Each display unit is equipped with a holster to hold and protect the device when not in use.

- The holster can be installed inside the cab in locations, such as map box door/glove compartment door, engine cover/"dog house," and behind the passenger's seat/ cabinet wall, depending on the owner's preference and whether there is a team or single driver.

- Make sure there is enough clearance to lift the unit out of the holster easily.

- Before you install the device on a map box/glove compartment door, make sure the driver can still open the map box/glove compartment.

2. **Select an installation location where:**

    • driver can easily see the message waiting light from his seat

    • mounting surface is flat

    • device will not be positioned high in the cab

    • device will not be stored in constant, direct sunlight

    • device will not fall out of the holster when the vehicle is in motion

    • device will not limit a passenger's leg room or block access to the wiring panel or any other compartments

    • device will not interfere with a passenger entering or exiting the vehicle

    • device will not adversely impact a passenger in case of a vehicle accident or collision

    • driver can easily pull the device toward the driver's seat

Installing the DIU200 Holster Using Well-nut Fasteners

1. Mount on any rigid surface between .035 and .232 inches thick and able to support the weight of the DIU200 (3.2 lbs.).

2. Use your display holster as a template to mark the four mounting holes.

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 holster correctly over the mounting holes.

6. Pass the 10-32 machine screws through the holster and mounting holes and tighten until snug.
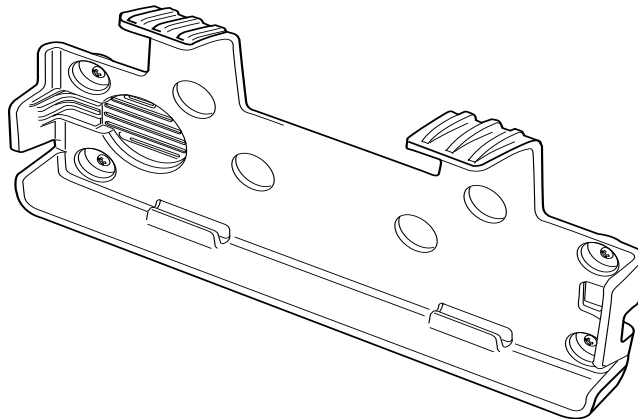
09AAA_07

Installing the DIU200 Cable

- Connects DIU200 to MAS200.

DIU200 Cable Run

- Run direction—In most vehicles, the display unit is mounted in the dash area. 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. If drilling is necessary, the 9-pin DSUB connector end of the display cable requires a 1-1/2" hole.

- Routing location—Route the cable internally or externally.

  - In a few vehicles, the display unit may be installed in the sleeper. In this case, route the cable internally to this area.

- 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. If the cable is not yet routed, refer to page 3-11 for routing procedures.

<table>
<tr><td>⚠</td><td>**Caution**

Do not step on or drop any objects on the display cable connectors. Do not let the connectors lie on the ground unprotected.</td></tr>
</table>

2. Use a #10 Torx driver to remove the DIU200's back housing.

3. Remove the protective cap on the connector.
   - Inspect the connectors for damage and bent pins.
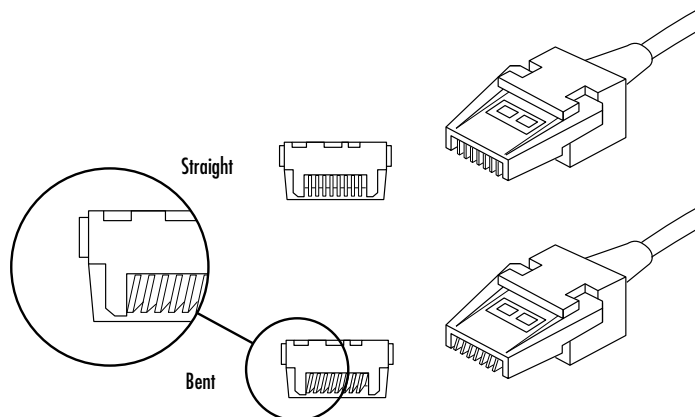
4. Plug in connector.
   - Make sure the rubber grommet fits in the grooves of the DIU200.
   - Make sure the flat side of the grommet is facing up.

5. Install and tighten the cable strain tie wraps on the back of the DIU200.

6. Route the display cable through the right or left channel on the back of the DIU200.
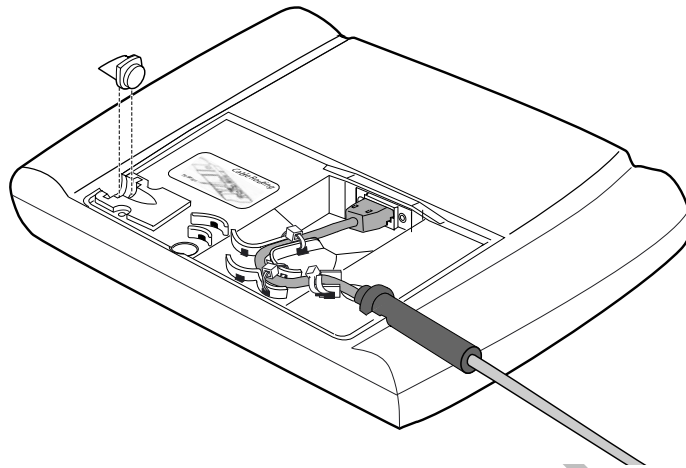
7. Reinstall the back housing.

8. Install the rubber plug on the opposite side from where the cable has been run.

9. Secure the cable with tie wrap.

Inserting the DIU200 into the Holster

1. Push bottom of display into lower holster tabs.

2. Push top of display into upper holster tabs.
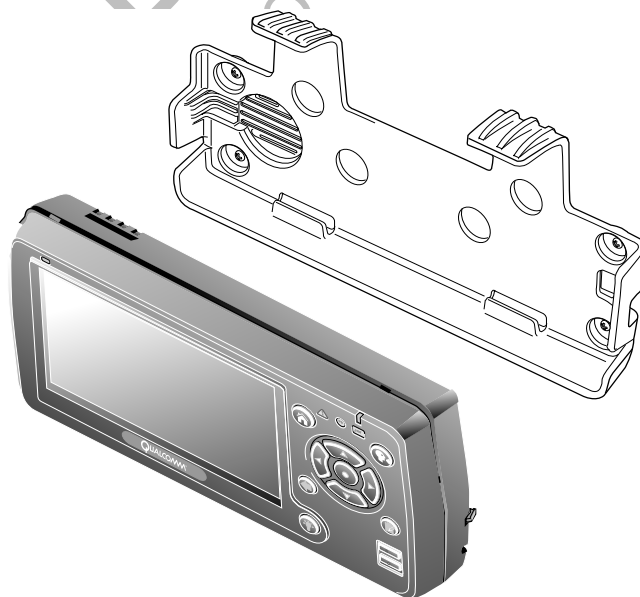
09AAA_08

Connecting the Display 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 display cable into the DSPL slot.

Display Unit Cable
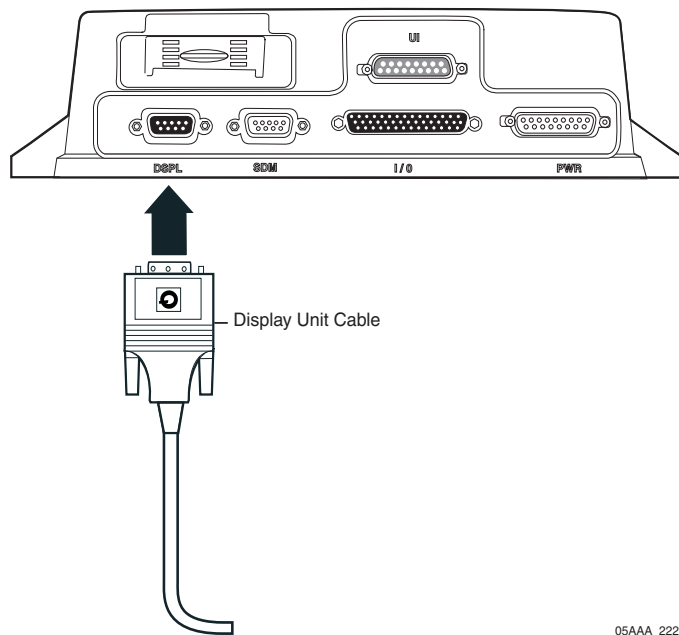
05AAA_222F

10
Optional Text-to-Speech (TTS) Installation

Topics in this chapter provide guidelines for installing the remote control device (RCD) and speaker switch cable for the Qualcomm® MCP200 optional text-to-speech (TTS) feature. This is an option that can be used if the DIU200 is not located where the driver can readily hear incoming messages.

For technical questions, contact Qualcomm Enterprise Services (QESSM) 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 Qualcomm.

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 COM5 GND wire on the accessory cable.

- The COM5 GND wire is also used for the speaker switch cable ground (green wire), if used. Make both ground connections at the same time.

Remote Control Device (RCD)

RCD Cable

Accessory Cable

RCD
(Yellow)

RCD
(Blue/Green)

GND
(Black)

Speaker
Switch Cable

COM5 GND
(Violet)

05AAA_148B
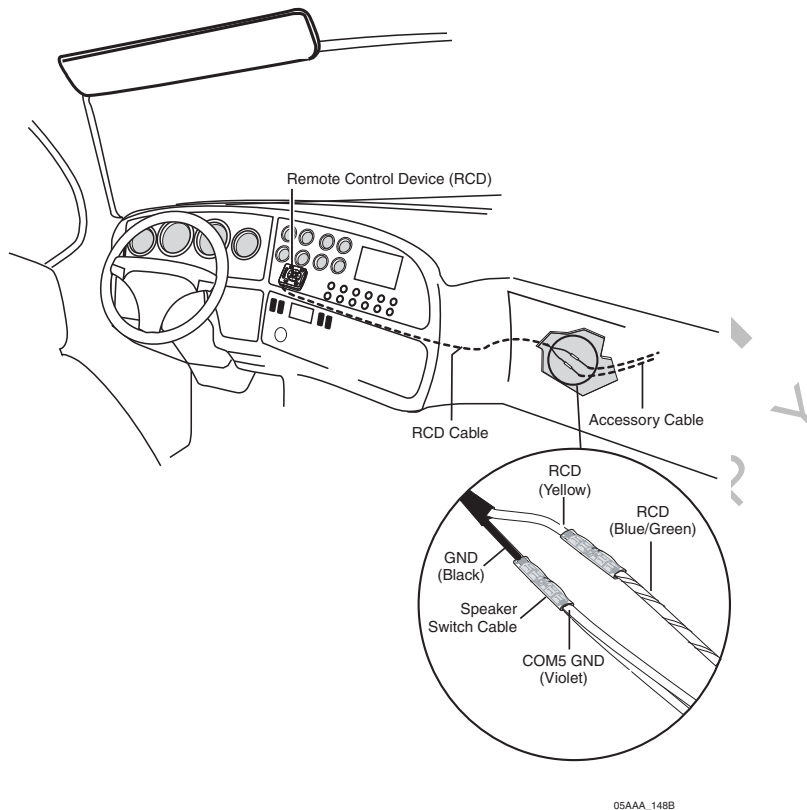
Selecting a Speaker

Speaker Requirements

There are two basic speaker requirements for TTS:

- Only one speaker should 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, **must be** used for text-to-speech play.

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 A—Connecting to an Existing or Shared Speaker* on page 10-4.

- If you are adding a dedicated speaker for TTS, see *Option B—Connecting to a Dedicated 8-ohm Speaker* on page 10-6.

Option A—Connecting to an Existing or Shared Speaker

1. Identify the speaker to be used for message playback. See *Speaker Requirements* on *page 10-3*.

2. Test the audio system prior to installation.

3. Remove audio/radio.

4. Locate the speaker wires to be used for message playback. Refer to *Radio Connector Pin Callouts* on *page A-11*.

5. 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.

6. Cut the speaker wires.
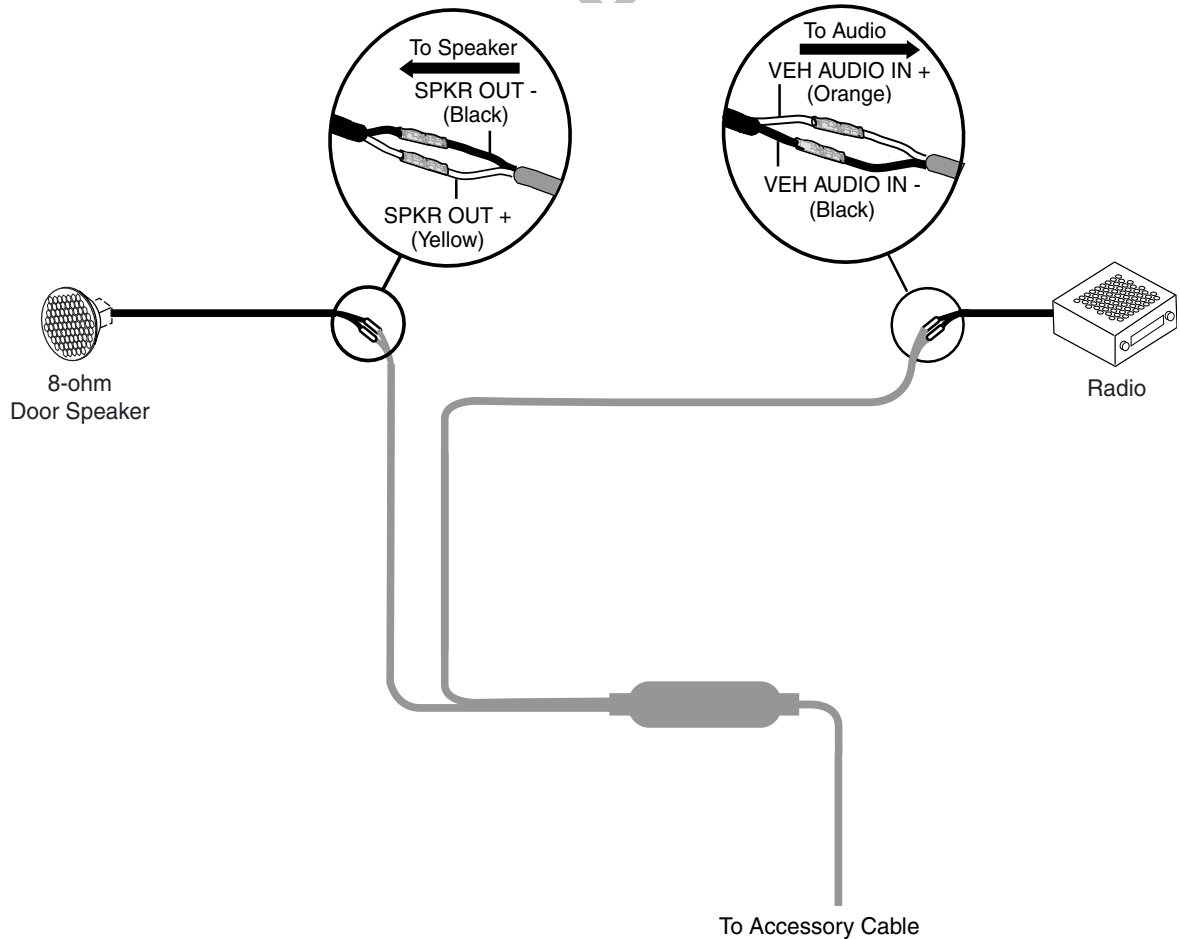
06AAA_180

7. Butt splice the yellow SPKR OUT+ wire on the speaker switch cable to the positive (+) wire that leads from the speaker.

8. Butt splice the black SPKR OUT- wire on the speaker switch cable to the negative (-) wire that leads from the speaker.

9. Butt splice the orange VEH AUDIO IN + wire on the speaker switch cable to the positive (+) speaker wire that leads from the audio.

10. Butt splice the black VEH AUDIO IN - wire on the speaker switch cable to the negative (-) speaker wire that leads from the audio.

11. 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.

3. Butt splice the green GND wire on the speaker switch cable to the violet COM5 GND on the accessory cable. As noted on page 10-2, the COM5 GND is a shared ground with the black RCD wire.

To Audio
VEH AUDIO IN +
(Orange)
VEH AUDIO OUT -
(Black)

Radio /Audio

Door Speaker

To Speaker
SPKR OUT -
(Black)
SPKR OUT +
(Yellow)

MAS SPKR +
(Yellow)
MAS SPKR -
(Black)
SPKR -
(Blue/Yellow)
GND
(Green)
COM5 GND
(Violet)
is a shared
ground
SPKR +
(Blue/Violet)
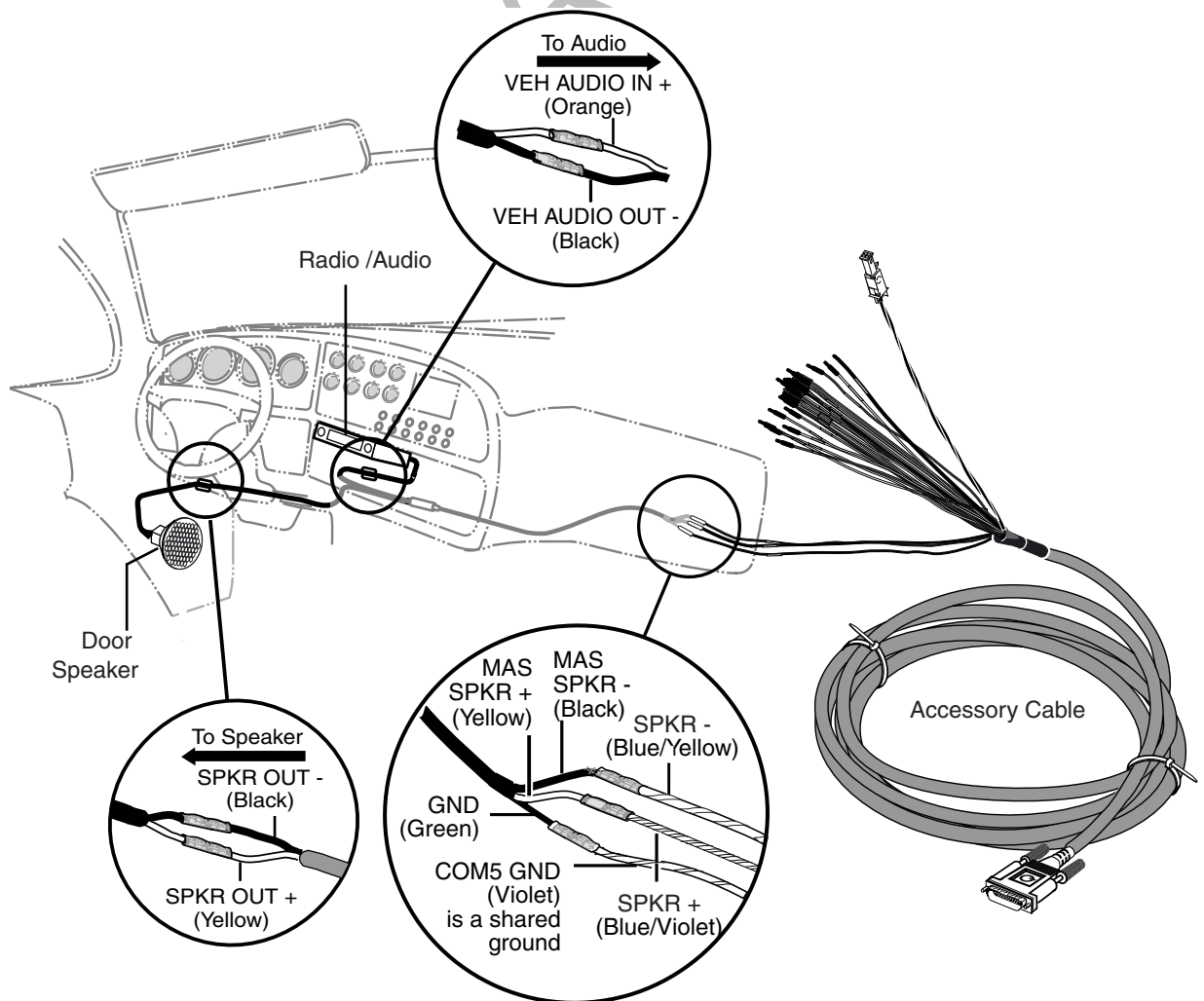
Accessory Cable

05AAA_148DQMCP

Option B—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.

Speaker

SPKR-
(blue/violet)

Speaker
Wires

Accessory Cable

SPKR+
(blue/yellow)

05AAA_148T

11
Vehicle Data Bus Connections
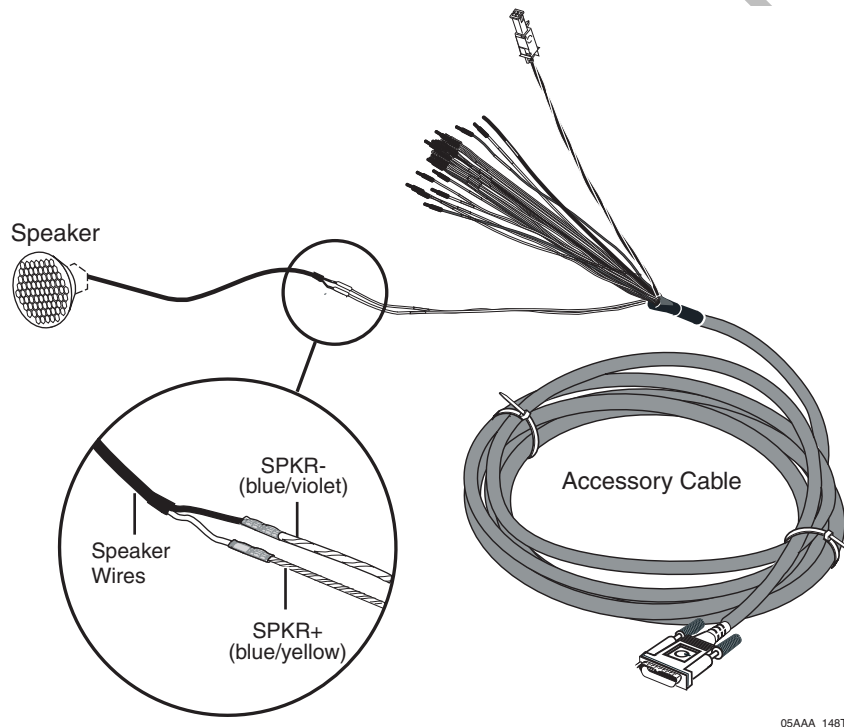
Topics in this chapter provide the procedures for performing J1939, J1708/J1587, and traditional sensors (standard speed and RPM) installations.

For technical questions, contact Qualcomm Enterprise Services (QES℠) 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 Data Source Overview

Qualcomm's 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.

- 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

Qualcomm 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, contact Qualcomm Enterprise Services (QES℠) 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 Qualcomm applications used determine which data bus to use.

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

Guidelines for Connecting to the J1939 Data Bus

- The MCP200 has two J1939 CAN inputs. Choose Option 1 or Option 2 according to these specifications:

    - **Option 1:** CAN 1 is used for all after market installations and some factory prewired installations when the distance between the MAS200 and the J1939 bus connection point exceeds 10 feet.

    - **Option 2:** CAN0 is only used for factory prewired installations when the distance between the MAS200 and the J1939 bus connection point does not exceed 10 feet.

- 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.
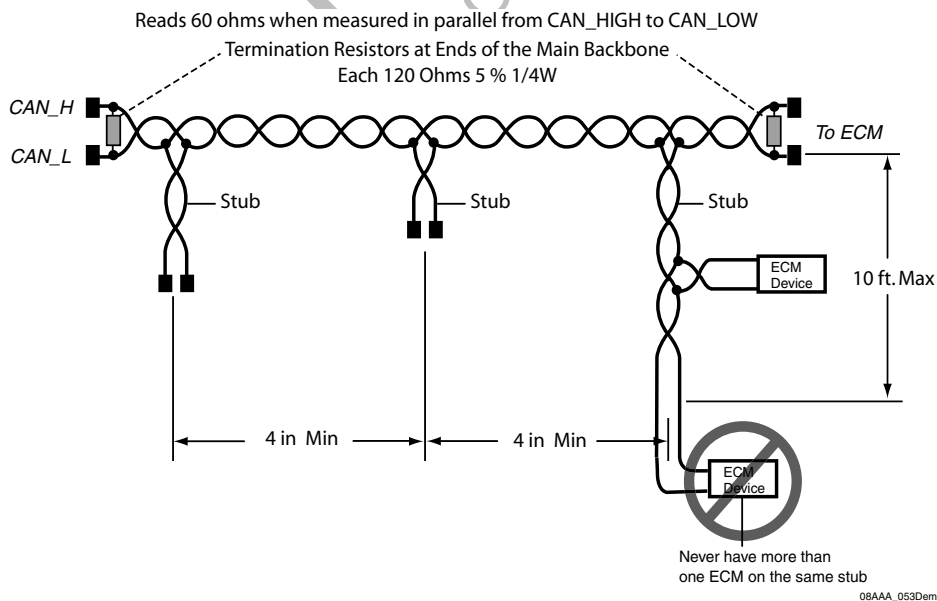
J1939 Pre-installation Check Out

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 11-10.

   08AAA_051A
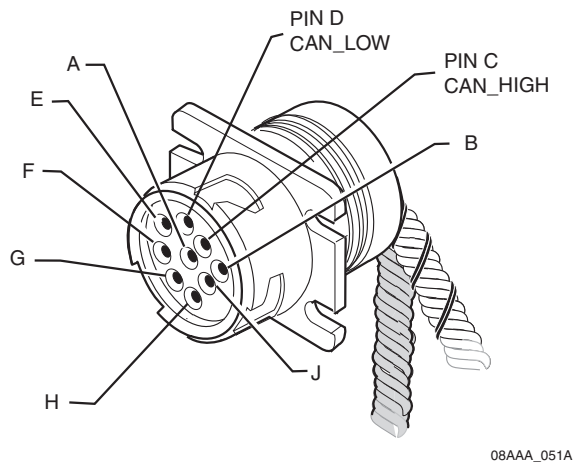
3. Using an ohmmeter, place the positive lead on pin C and the negative lead on pin D of the diagnostic connector. Verify that the resistance is 55–65 ohms.

   • If the resistance is 55–65 ohms, J1939 is present. Go to *Checking the MCP200 Accessory Cable for CAN0 and CAN1* on page 11-5.

   • If the resistance is not 55–65 ohms, there is a problem with your J1939 data bus. Fix the problem.

   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)	Pin H	Proprietary OEM use/ Implement bus CAN High
Pin D	CAN Low (tractor bus)	Pin J	Proprietary OEM use/ Implement bus CAN Low
Pin E	CAN Shield (J1939-11)		

Checking the MCP200 Accessory Cable for CAN0 and CAN1

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. The CAN connector is marked **either** CAN0 or CAN1 to identify the MAS200 CAN port being used.

   • All after-market installations have a CAN1 connector.

   • OEM prewires can have **either** a CAN0 or a CAN1 connector, depending on the truck model/manufacturer.

3. For a CAN1 connector, go to *Option 1—Connecting J1939 Using CAN 1 (for All After-Market Installations) on page 11-5*.

4. For a CAN0 connector, go to *Option 2—Connecting J1939 Using CAN0 (for Most OEM Prewires) on page 11-8*.

Option 1—Connecting J1939 Using CAN 1 (for All After-Market Installations)

Connect the MCP200 accessory cable to the CAN converter. A CAN converter cable *is required* for this procedure (see Appendix A for detailed pin and wire callouts of the CAN converter cable).
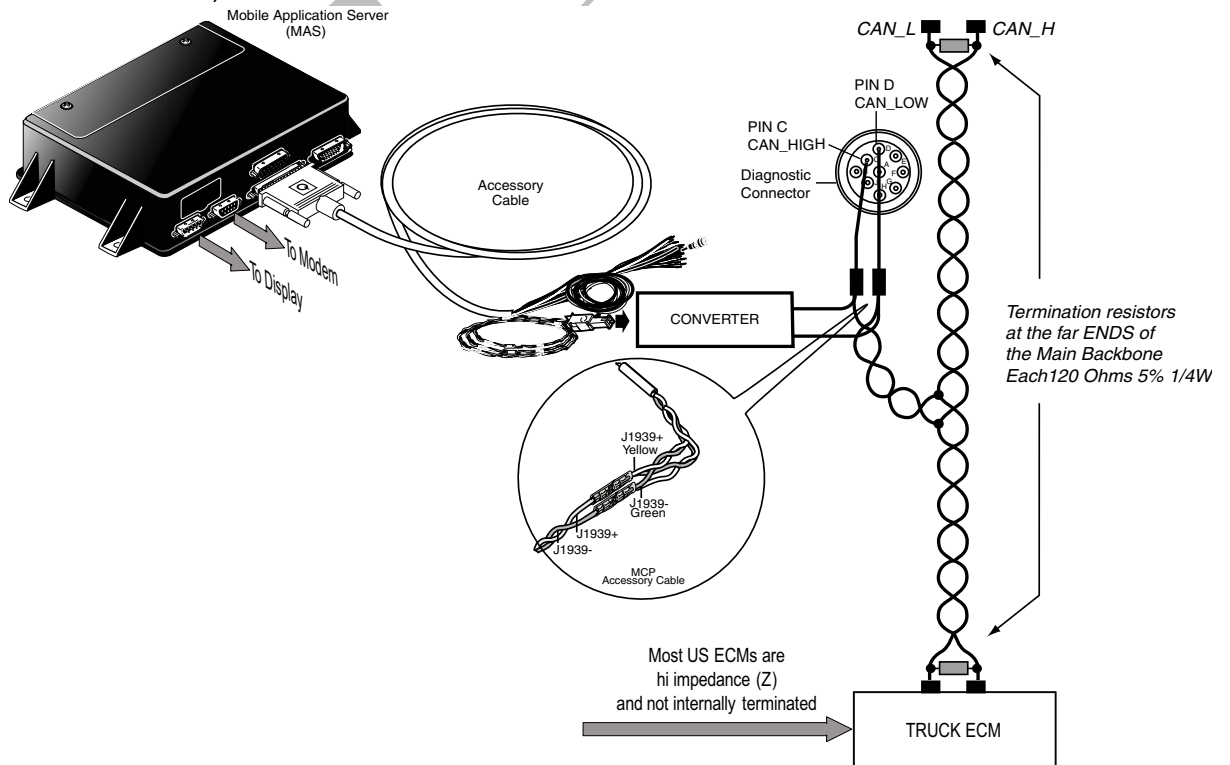
In order for the MCP200 to receive J1939 data, the MAS200 CAN/J1939 wires must be connected to the truck's J1939 CAN bus in the vehicle.

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 11-4*.)

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 backbone. Contact Qualcomm Enterprise Services (QESᴮᴹ) Customer Support for assistance if needed.

6. Splice the yellow CAN high J1939+ wire from the converter cable to the yellow CAN high J1939+ wire from the truck's J1939 bus. (Refer to the illustration on page 11-5.)

7. Splice the green CAN low J1939- wire from the converter cable to the green CAN low J1939- wire from the truck's J1939 bus. (Refer to the illustration on page 11-5.)
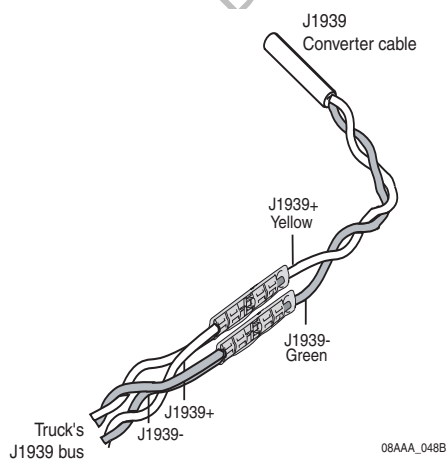
8. Measure the J1939 bus resistance at the diagnostic connector. It should read 60 ohms.

9. Locate the CAN1 4-pin Molex connector on the MCP200 accessory cable.

10. Connect the CAN converter cable to the CAN1 Molex plug on the MCP200 accessory cable.
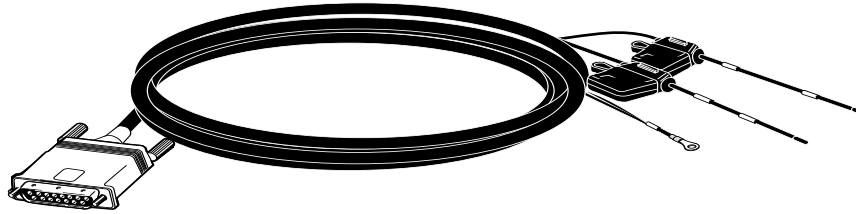
09AAA_02

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 11-11.)

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 Using CAN0 (for Most OEM Prewires)

Connect the MCP200 accessory cable to the OEM-supplied stub connector. A CAN converter cable *is not required* for this procedure.

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 CAN1 MCP200 accessory cable and a converter cable is not included as part of the prewire, go to Option 1—Connecting J1939 Using CAN 1 (for All After-Market Installations) on page 11-5.

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 CAN0 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.

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 11-11.)

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
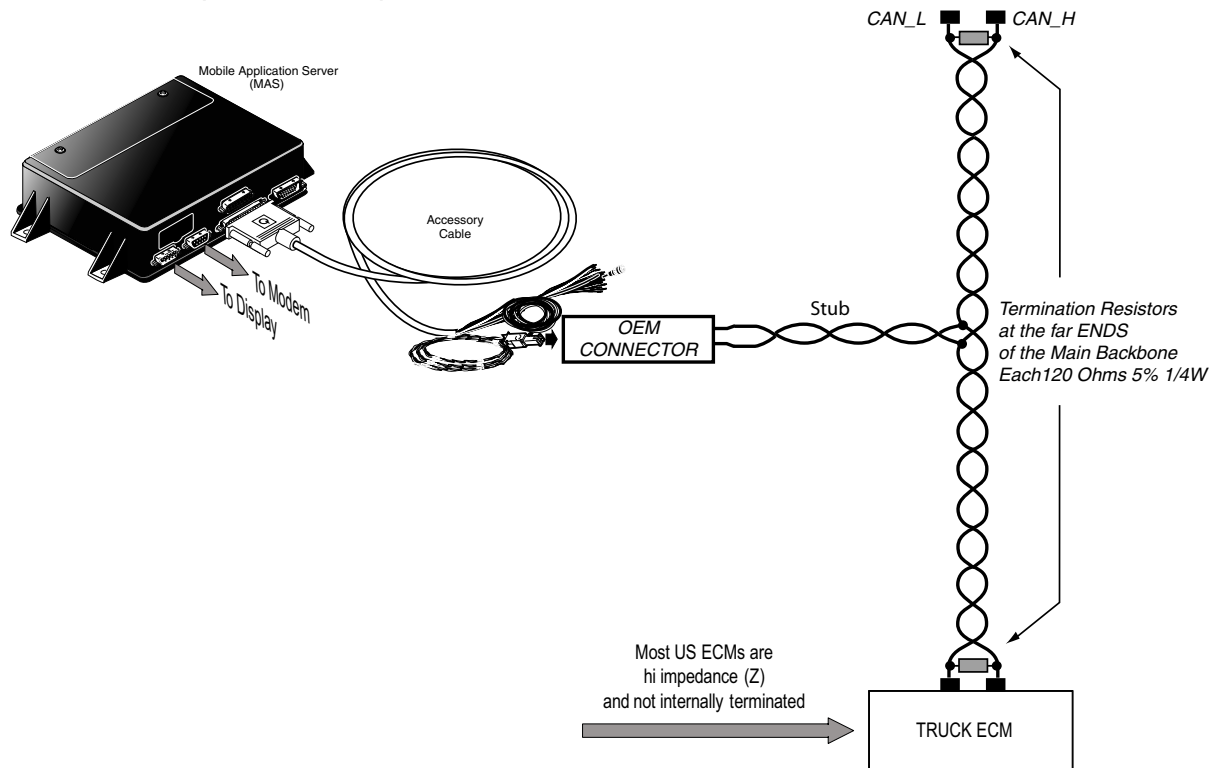
1. Start the vehicle and verify that the truck is in good working order and displays no dash faults.

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.
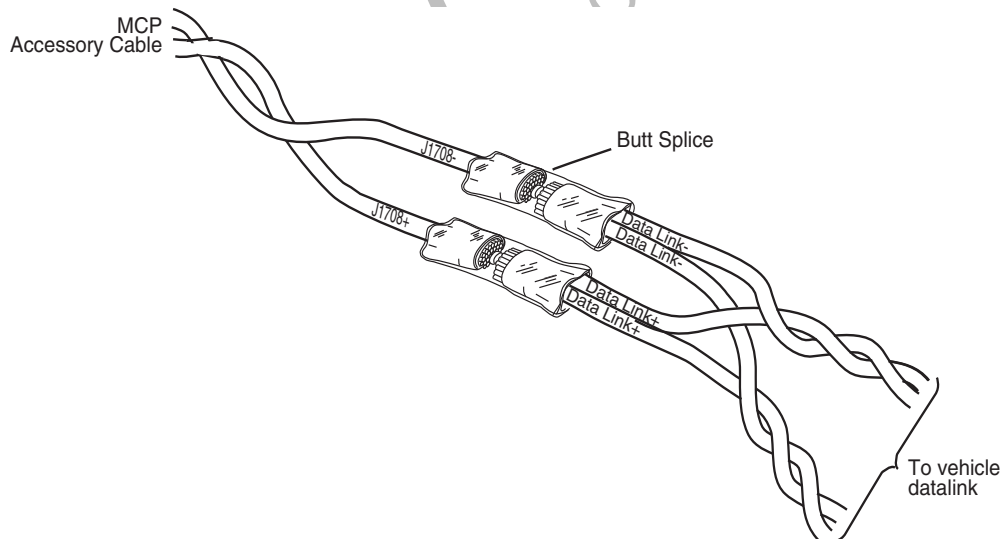
5. Splice the red J1708- wire from the accessory cable to the DATA- (pin G) wire of the engine diagnostic connector.

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 11-11.

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 J1939, J1708, and/or traditional sensors.

* The light indicator will be green when a data source is enabled to receive data from that source.

* Data source must be active to increment data.

If you have any questions, contact QES Customer Support.

Black: *Not Configured/No Data;* **Green:** *Active Data;* **Red:** *Stale Data.*
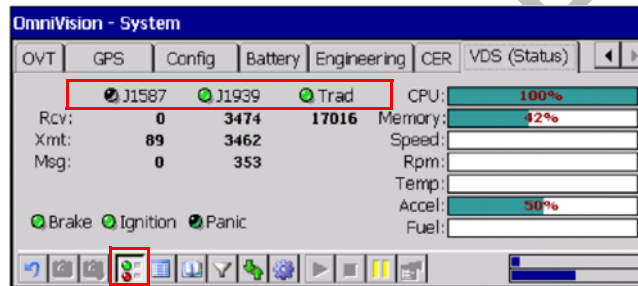
Note

Press 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, debug.

3. **Verify Data Source**

a. **Verifying J1939 Data Is Present**

Verify the following data fields are showing green and incrementing to confirm that J1939 data is present:

- Speed   RPM

- Parking Brake   Accelerator

- Distance LTD   Fuel LTD

- Engine Time LTD
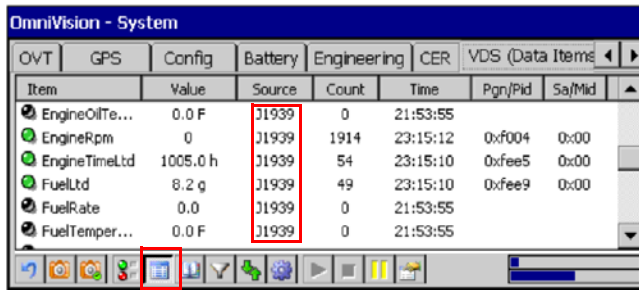
Note

*Press the **VDS Details** icon located along the bottom of the screen to display the VDS Details screen and note the data source.*

b. **Verifying J1587/J1708 Data Is Present**

Verify the J1587/J1708 data fields are showing green and incrementing to confirm that J1587/J1708 data is present.
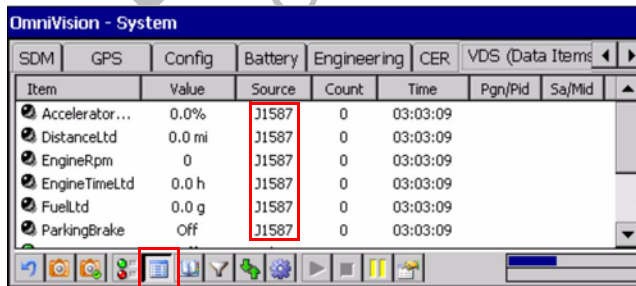
Note

*Press the **VDS Details** icon located along the bottom of the screen to display the VDS Details screen and note the data source.*

12
System Verification

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

For technical questions, contact Qualcomm Enterprise Services (QESSM) 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 SensorTRACS® system, the TrailerTRACS® system, and other accessories, see the appropriate chapter in this manual.

Note

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

What Is Basic Qualcomm® MCP200 System Verification?

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

MCP200 Display Unit Screens

- Shortly after you power up the MCP200, the Qualcomm® MCP200 Home screen displays.

- Tap the different buttons to access information.

- Before you perform the system verification procedure, you may find it helpful to become familiar with the commonly used display unit screens.

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

- Scroll down to the **System** button and tap the button to access the display screens shown on the following pages.

MCP200 System Screen

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

Field	Description
Unit Address	• Also called the UNIT SERIAL NUMBER. • Shows the mobile unit (MCP200) ID, e.g., 105000xxx. • Tells the dispatcher the correct address for sending messages to the vehicle. • If the MCP200 is replaced, this field will display a different address.
Connection	• Indicates whether the link within the terrestrial data modem (TDM) is communicating properly. • Indicates whether the link within the satellite data modem (SDM) is communicating properly.
System Status	Indicates the MCP200's operational status: • Good is displayed if the MCP200 is operating properly. • A numerical error code (e.g., 10000) is displayed if the MCP200 detects a problem. • Refer to the appropriate section in the *Qualcomm® MCP 200 Series and Accessory Diagnostic Guide* for troubleshooting procedures. • If you are using the optional SDM, Quiet is displayed within seconds after you turn the ignition OFF.
Ignition	• Ignition Off is displayed within seconds after you turn the ignition OFF.
Database State	Indicates the MCP200's database status: • SyncComplete is displayed if customer and mobile unit (MCP200) information has been received by the MCP200 and is up-to-date. This is the desired state. • Out of Sync is displayed if the mobile unit (MCP200) information has not been received by the MCP200 and is waiting to be updated.
Last DB Sync	Indicates the date of the most recent SyncComplete status for the MCP200.

Field	Description
Vehicle Info Msgs	Indicates the total number of messages the MCP200 has received from the electronic control module (ECM) since the ignition was turned ON.
Unread Messages	• Indicates the number of messages the MCP200 has received but that have not been read. • This number increases as the MCP200 receives new messages, and decreases as they are read.
Usr Msgs Pending	Indicates the number of text messages the MCP200 has in the queue to be sent.
All Msgs Pending	Indicates the total number of all messages the MCP200 is currently sending.
MDU Firmware	Indicates the software version currently installed on the display interface unit 200 (DIU200).
MAS Firmware	Indicates the software version currently installed on the mobile application server 200 (MAS200), e.g., 10.22.13.
MAS WIN OS	Indicates the Windows operating system currently installed on the MAS200.

MCP200 Diagnostic Screen

- Tap the **Diagnostics** button to access diagnostic information about the MCP200.
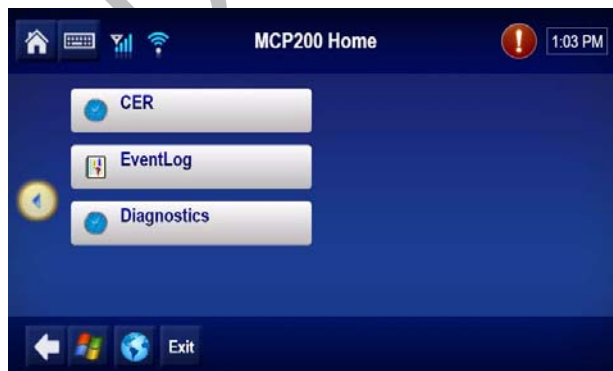
- Run Test All.

MCP200 OVT/CDMA Screens

- Tap the **OVT/CDMA** button to access antenna information about the MCP200, such as signal strength.

- There are five OVT/CDMA screens, which you navigate by tapping the screen and then using the arrow keys to move from screen to screen.

```
OmniVision - System                                           ×
System │OVT/CDMA│ GPS │ Config │Battery│Engineering│ CER │ < │ > │

RSSI: 69
Registered: RegisteredHomeNetwork
Network Type: IS_2000A
SID: 4145
NID: 7




Start │OmniVision - S...                              1:57 PM
```

Field	Description
RSSI	• Received Signal Strength Indication—The strength of a wireless communication network signal being received by the antenna during forward link acquisition to the wireless network provider. • RSSI should be less than 100.
Registered	• MCP200 terrestrial system checks network coverage every 3 minutes. • If the unit is within the RegisterdHomeNetwork, it is in home network coverage. • If the unit is RegisteredRoaming, it is either roaming to find the home network or roaming to find another network.
Network Type	IS2000A.
SID	System Identification Number—The number that allows the unit to quickly register on the cellular network.
NID	Network Identification Number.

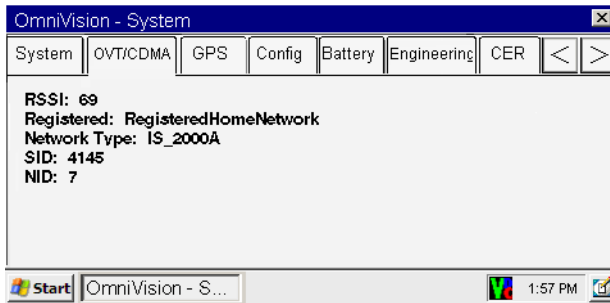### 📡 *MCP200 SDM Screens*

• Tap the **SDM** button to access antenna information about the MCP200, such as signal strength.

```
OmniVISION - System                                    ☒
┌────────┬─────┬─────┬────────┬─────────┬──────┐
│ System │ SDM │ GPS │ Config │ Battery │ Eng  │
┴────────┴─────┴─────┴────────┴─────────┴──────┴──

        [  General Status  ]
Serial Number:       100000349s
FL C/No:             57.5 dB
RL C/No:             45.25 dB
Software Version: SDM10.16.07
Group Addresses:   524023   522456   523560   523604
523652   523654

        <  Page 1 of  2  >

🏁 Start │ Q OmniVISION │              📺 1:57 PM  📝
```

```
OmniVISION - System                                    ☒
┌────────┬─────┬─────┬────────┬─────────┬──────┐
│ System │ SDM │ GPS │ Config │ Battery │ Eng  │
┴────────┴─────┴─────┴────────┴─────────┴──────┴──

        [  General Status  ]
PHY State:           RETURN SYNCHRONIZED
Hardware Version:   BMDMHW00002, GPSHW00001

        <  Page 2 of  2  >


🏁 Start │ Q OmniVISION │              📺 1:57 PM  📝
```
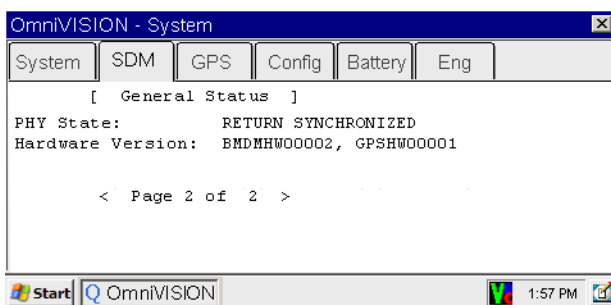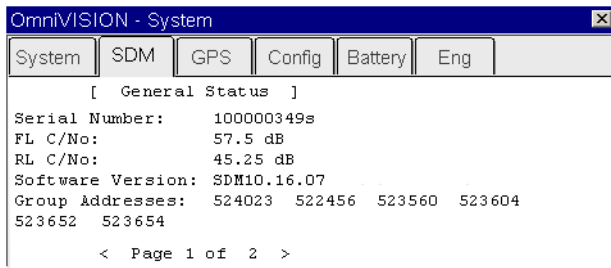
Field	*Description*
Serial Number	The serial number of the SDM.
FL C/No	• Signal strength received from the data satellite (the forward signal). • Typically, values should be greater than 50.
RL C/No	• Signal strength received from the MCP200 (the return signal). • Typically, values should be greater than 33.
Software Version	Indicates the firmware version currently installed on the SDM.
Group Addresses	• Shows the group ID to which the MCP200 is assigned. • Also shows the number of other groups, which the MCP200 is a member. • Numbers are defined and used by the dispatcher to address the fleet or groups of MCP200s.
PHY State	Indicates the physical state of the antenna.
Hardware Version	Indicates the SDM hardware version.

MCP200 GPS Screen

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

Field	*Description*
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.
Mode	Indicates the MCP200's GPS status: • **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. • 2-D is displayed if the receiver is able to calculate a position, but has a limited view to the GPS satellites. • NO FIX is displayed when the GPS satellites cannot be viewed.
Ground Speed	Speed calculated by GPS through a change in vehicle location.

MCP200 Config Screen

- Tap the **Config** button whenever you want to see the basic configuration of the unit.
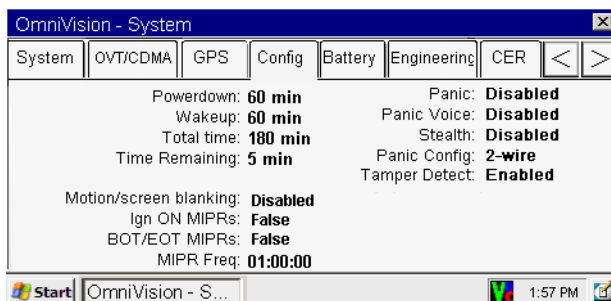
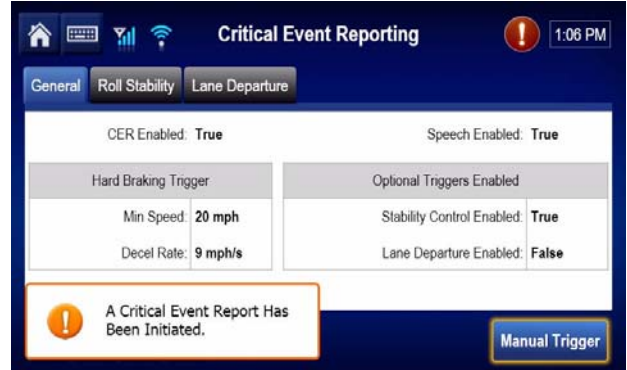| Field	Description
Powerdown	• Number of minutes after ignition is turned OFF when the MCP 200 will go into sleep mode. • Configured by dispatch.
Wakeup	• The frequency the MCP200 wakes up from sleep mode to check for dispatch messages. • Configured by dispatch.
Total Time	• Number of minutes the MCP200 draws power from the vehicle battery with the ignition OFF. • Configured by dispatch.
Time Remaining	Number of minutes before the MCP200 goes into sleep mode.
Motion/screen Blanking	• Indicates if the display screen will be active when motion is detected (shown as Disabled or BlankEntireScreen). • Configured by dispatch.
Ign ON MIPRs	Indicates if a mobile-initiated position report will be sent when ignition is turned ON.
BOT/EOT MIPRs	Indicates if beginning of trip and end of trip mobile-initiated position reports will be sent.
MIPR Freq	Indicates the frequency (HH:MM:SS) of mobile-initiated position reports.
Panic	Indicates whether the panic button/message feature is enabled.
Panic Voice	Indicates if an audio message will be played (TTS) when a panic button press is detected.
Stealth	Indicates whether panic messages will show in the messaging Outbox.
Panic Config	Indicates how hardware needs to be connected for panic button presses to be detected.
Tamper Detect	Indicates if the MCP is enabled or disabled for tamper detection.

MCP200 Engineering Screen

• This screen is for engineering purposes only.

MCP200 CER Screen

- Tap the **CER** button to access the screen that captures and reports critical event information, such as hard braking, vehicle speed, location, stability control (VDC), and panic button events, to the customer before and after the event occurs.

Field	**Value**
CER Enabled/disabled	If enabled, the MCP200 captures CER events.
Speech Enabled/disabled	If enabled, what is printed in the alert pop-ups is spoken.
Hard Braking Minimum Speed	Speed at which mobile unit detects hard brake events.
Hard Braking Deceleration Rate	The rate of deceleration that triggers a hard brake event (Default = 9 MPH/SEC).
VDC Enabled/disabled	Stability control is enabled/disabled.
VDC Minimum Speed	Minimum speed at which mobile unit detects VDC messages.
VDC On Threshold	Number of ATC (PID hex value is 97) "on" messages that must be seen in a row before a VDC event is considered to be in progress.
VDC Off Threshold	Number of ATC (PID hex value is 97) "off" messages that must be seen in a row before a VDC event is considered to have ended.
VDC Bits Tracked	Setting that determines which bits the mobile unit tracks to monitor stability control events: • Brake bits only • Engine bits only • Brake or Engine bits (Default) • Brake and Engine bits

VDS (Status) Screen

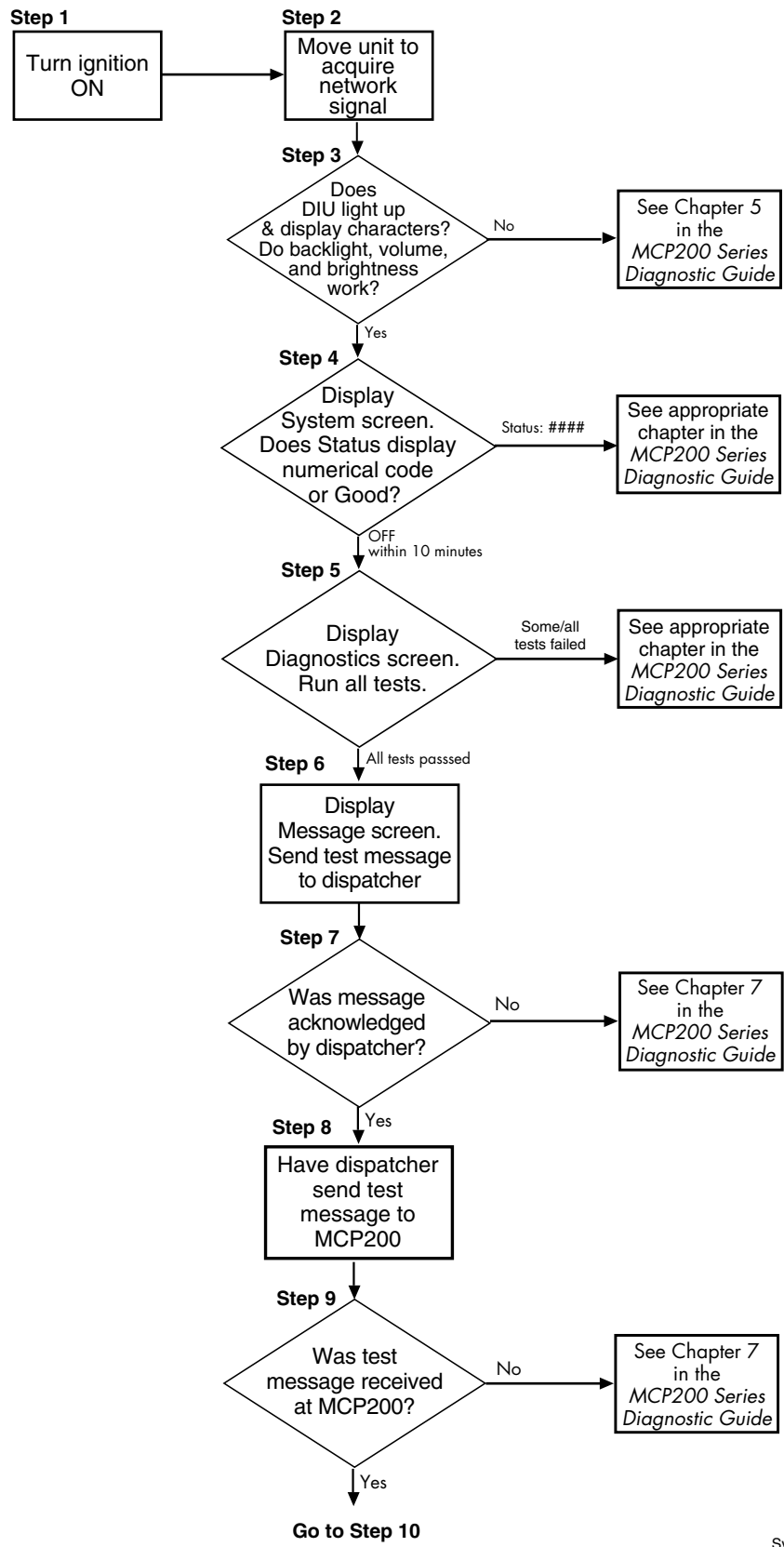- Access vehicle data services (VDS) information, by using the scroll bar and tapping the **VDS (Status)** button.
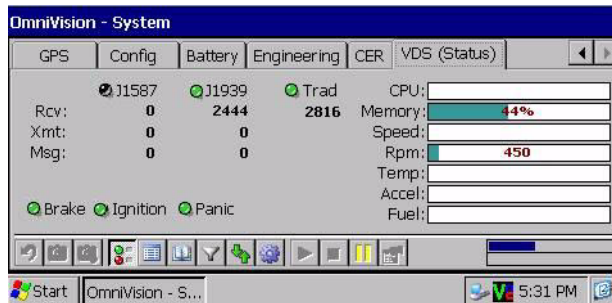
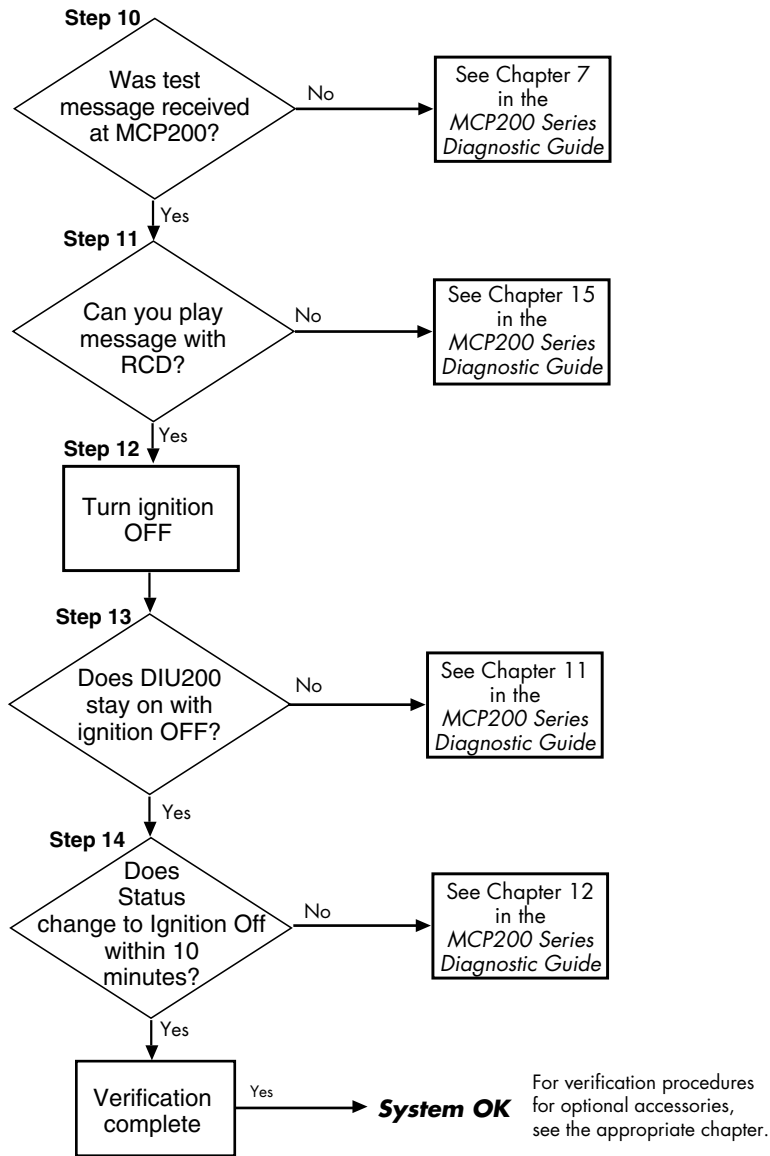| *Field*	*Value*
J1587	If vehicle is configured to receive data, the light is green if the vehicle is receiving data from the J1587 data source.
J1939	If vehicle is configured to receive data, the light is green if the vehicle is receiving data from the J1939 data source.
Trad	The PTO, which is always active (the light is always green).
RCV	• These are the packets of data being received on the data bus. • Value should be constantly increasing.
Xmt	Packets of data being received on the data bus as requested (transmitted) packets.
Msg	Packets of data being received on the data bus that are of longer length than the normal data packet size.
Brake	Brake light is green if the parking brake is engaged.
Ignition	Ignition light is green if the ignition is ON.
Panic	Panic light is green if PANIC is enabled.
CPU	Shows MAS usage.
Memory	Amount of memory used.

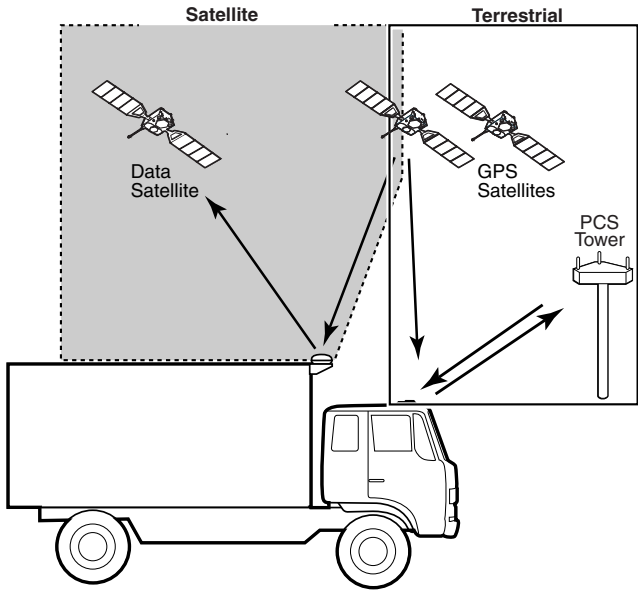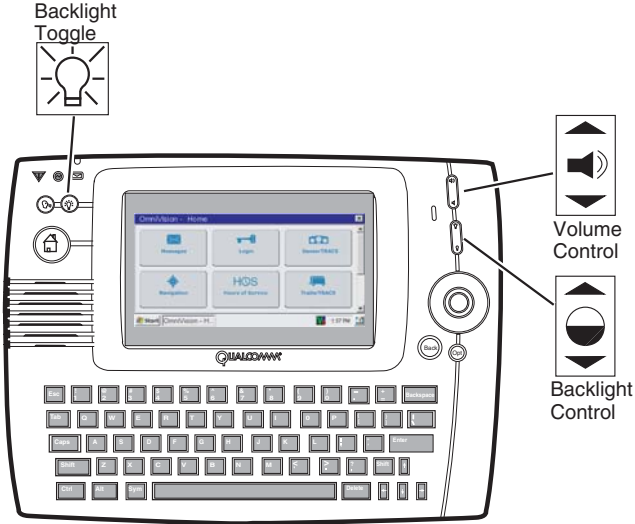| *Field*	*Value*
Speed	Speed of the vehicle.
Rpm	RPM of the vehicle.
Temp	Oil temperature.
Accel	Acceleration (throttle position) percentage.
Fuel	Life-to-date (LTD) fuel.

Flowchart—Basic MCP200 System Verification

Step 1
Turn ignition
ON

Step 2
Move unit to
acquire
network
signal

Step 3
Does
DIU light up
& display characters?
Do backlight, volume,
and brightness
work?

No → See Chapter 5
in the
*MCP200 Series
Diagnostic Guide*

Yes

Step 4
Display
System screen.
Does Status display
numerical code
or Good?

Status: #### → See appropriate
chapter in the
*MCP200 Series
Diagnostic Guide*

OFF
within 10 minutes

Step 5
Display
Diagnostics screen.
Run all tests.

Some/all
tests failed → See appropriate
chapter in the
*MCP200 Series
Diagnostic Guide*

All tests passsed

Step 6
Display
Message screen.
Send test message
to dispatcher

Step 7
Was message
acknowledged
by dispatcher?

No → See Chapter 7
in the
*MCP200 Series
Diagnostic Guide*

Yes

Step 8
Have dispatcher
send test
message to
MCP200

Step 9
Was test
message received
at MCP200?

No → See Chapter 7
in the
*MCP200 Series
Diagnostic Guide*

Yes

Go to Step 10

System_Flow_1_MCP200

Step 10

Was test message received at MCP200? — No → See Chapter 7 in the *MCP200 Series Diagnostic Guide*

Yes ↓

Step 11

Can you play message with RCD? — No → See Chapter 15 in the *MCP200 Series Diagnostic Guide*

Yes ↓

Step 12

Turn ignition OFF

↓

Step 13

Does DIU200 stay on with ignition OFF? — No → See Chapter 11 in the *MCP200 Series Diagnostic Guide*

Yes ↓

Step 14

Does Status change to Ignition Off within 10 minutes? — No → See Chapter 12 in the *MCP200 Series Diagnostic Guide*

Yes ↓

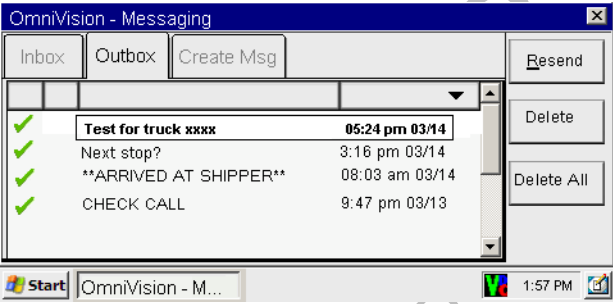Verification complete — Yes → **System OK**   For verification procedures for optional accessories, see the appropriate chapter.
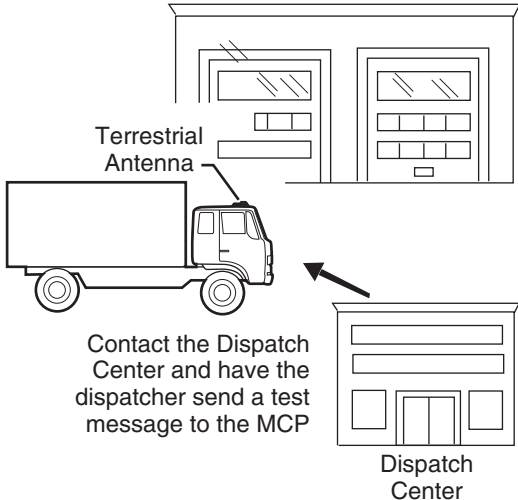
System_Flow_2_MCP200

Basic MCP System Verification Procedure

Turn the ignition ON

ACC OFF ON START

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.

1. Turn the vehicle ignition ON; the engine does not have to be running.

Satellite

Terrestrial

Data
Satellite

GPS
Satellites

PCS
Tower

OM/E-0128-031TQMCP

2. Make sure the vehicle is in a good location.

- The vehicle should be in a location where the antenna is able to acquire a wireless communication 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.
- 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.

Backlight Toggle Volume Control Backlight Control 05AAA_215B	**3.** Check the display unit and verify that the screen lights up and displays characters; and that the backlight, brightness, and volume controls work correctly. The **BACKLIGHT** key turns the display unit backlight ON and OFF. The **BRIGHTNESS** key adjusts the brightness of the display window; press the top of this key to lighten the display window or the bottom to darken the display window. The **VOLUME CONTROL** key adjusts the volume of the DIU200 speaker. Press the top of this key to increase the volume or the bottom of the key to decrease the volume. • If the screen displays characters, and the controls work correctly, go to step 4. • If the screen is dark, or the controls do not work correctly, perform the diagnostic procedure in Chapter 5 in the *Qualcomm® MCP200 Series and Accessory Diagnostic Guide.*
	4. Go to the Home screen and tap the **System** button. Tap the **System** button. Check the System Status field and verify that the Status is Good. • If the Status is Good, go to step 5. • If the Status is a numerical value, go to the appropriate diagnostic procedure for that value in the *Qualcomm® MCP200 Series and Accessory Diagnostic Guide.*
	5. Go to the Home screen and tap the **Diagnostics** button. Run all diagnostics' tests. • If the MCP200 passed all the tests, go to step 6. • If the MCP200 failed any of the tests, go to the appropriate diagnostic procedure for the failed item in the *Qualcomm® MCP200 Series and Accessory Diagnostic Guide.*

6. Send a test message to the dispatcher. Go to the Home screen and tap the **Messages** button.

- Tap the **Create Msg** button.
- Tap the **Free Form** button.
- Type the message text including the truck number.
- Tap the **SEND** button.
- Tap **Yes** to send the message.

7. Tap the **Outbox** button 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 .
- If the message is not acknowledged, perform the diagnostic procedure in Chapter 7 in the *Qualcomm® MCP200 Series and Accessory Diagnostic Guide.*

Terrestrial Antenna

Contact the Dispatch Center and have the dispatcher send a test message to the MCP

Dispatch Center

8. Have the dispatcher send a test message to the MCP. If the dispatcher is not available, call QES 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.
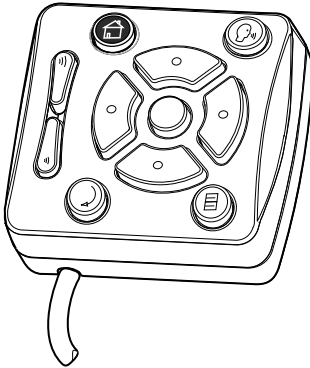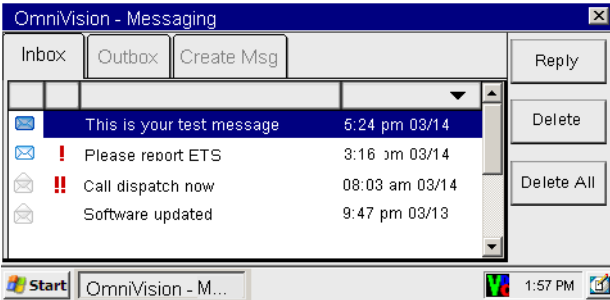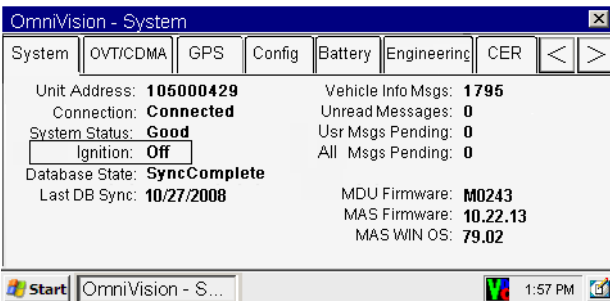
9. After a few minutes, the unit should chirp, the Message Waiting Light should come on, and a voice notification will tell you the message has been received. Tap the **Inbox** button to display the dispatcher's message.

- If the MCP received the message, go to step 10.
- If the MCP did not receive the message, perform the diagnostic procedure in Chapter 7 in the *Qualcomm® MCP200 Series and Accessory Diagnostic Guide.*

10. Verify that the message can be played by pressing the TTS key using the Omni keys on the DIU200.

- If the message can be played using the Omni keys, go to step 11.
- If the message cannot be played using the Omni keys, perform the diagnostic procedure in Chapter 15 in the *Qualcomm® MCP200 Series and Accessory Diagnostic Guide.*

Turn the ignition OFF

11. Turn the vehicle ignition OFF.

12. Make sure the display unit stays on with the ignition OFF.

- If the display unit stays on, go to step 13.
- If the display unit does not stay on, perform the diagnostic procedure in Chapter 11 in the *Qualcomm® MCP200 Series and Accessory Diagnostic Guide.*

13. Tap the **System** button. Tap the **System** button and verify that the STATUS field changes from **Good** to **Ignition Off** within 10 minutes.

- If the Status changes to Ignition Off within 10 minutes, System Verification is complete.
- If the Status does not change to Ignition Off within 10 minutes, perform the diagnostic procedure in Chapter 12 in the *Qualcomm® MCP200 Series and Accessory Diagnostic Guide.*

For verifying the SensorTRACS system, the TrailerTRACS system, and other accessories, see the appropriate chapter in this manual.

Qualcomm® MCP 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 the vehicle and the MCP.

Qualcomm® MCP200 System Verification Form

Installer(s):	Date:
Display Unit S/N:	TDM S/N:

Vehicle Information

Driver: _____Truck #: _____

Make: _____Model: _____

Engine Type: _____

Accessories Installed

☐ Buzzer   ☐ Panic Button

☐ RMWL   ☐ TrailerTRACS

☐ Other_____

MCP—System Button/System Button

Unit Address: _____

Connection: _____

System Status with ignition ON: _____

System Status with ignition OFF: _____

Is Database State "SyncComplete"?   ____yes   ____no

With ignition ON, is "Vehicle Info Msgs" rapidly incrementing several times per second?   ____yes   ____no

MAS Firmware: _____

MCP—System Button/OVT/CDMA Button

RSSI: _____

What is the "Registered" status (circle):

RegisteredHomeNetwork   RegisteredRoaming

Network Type: IS_2000A ?   ____yes   ____no

Other Network Type: _____

SID: _____Channel: _____

MCP—System Button/SDM Button

FL C/No: _____ RL C/No _____

MCP—System Button/GPS Button

Is GPS "Last update" status updating every second?

____yes   ____no

With ignition ON, is "J1708 Rx MSGs" rapidly incrementing several times per second?   ____yes   ____no

DATA MISSING_____

MCP—System Button/Battery Button

Press "Test Battery Now" button. Are "Results of the last test" Good?   ____yes   ____no   _____volts

Is Backup Battery detected?   ____yes   ____no

Vehicle Connections (circle):
J1708   J1939   AXLE   RPM

Message Verification

☐ Successfully Sent   ☐ Successfully Received

Text-to-Speech Verification

☐ Message successfully played

Installation Notes:

13
SensorTRACS® Performance Monitoring Verification

Topics in this chapter provide the procedures for performing SensorTRACS® performance monitoring system installations.

For technical questions, contact Qualcomm Enterprise Services (QESSM) 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

SensorTRACS® System Overview

- The SensorTRACS system is an optional Qualcomm® MCP200 application that records vehicle and driver performance data.

- The data is then retrieved from the mobile computing platform 200 (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** or the **standard speed and RPM sensors.**

2. Sending SensorTRACS parameters from the host computer.

**3.** Performing system verification.

Performing SensorTRACS® System Verification

Conducting a Road Test

- Vehicle must be set up and appropriate SensorTRACS parameters must be sent to the vehicle from the host system.

- The PTAG value on the Parameters screen must be a number other than zero.

  - Have a passenger accompany you on the road test to review the results on the display interface unit 200 (MDU200).
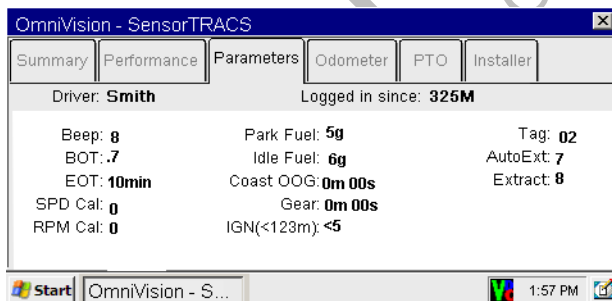
1. Start the engine.

2. Touch the **SensorTRACS** icon and touch the **Performance** tab to access the Performance screen.
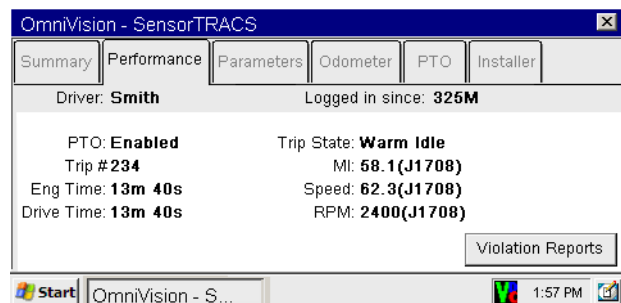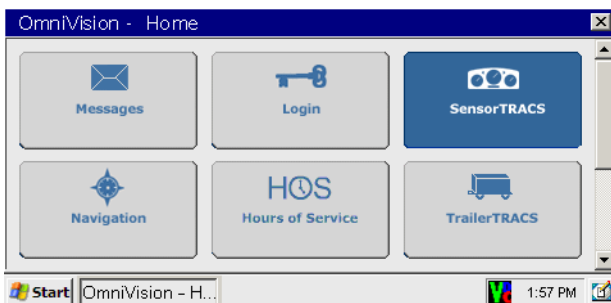
3. Road test the vehicle over a distance of at least one mile.

  • Note the beginning mileage on the vehicle's odometer.

  • Have a passenger compare the speed information on the DIU200 to the speedometer's readout.

4. Drive the vehicle at various speeds during the road test.

  • Compare the speedometer readout with the value displayed on the DIU200 in the SPD field and verify that they are the same.

5. When you're finished, check the change in distance (MI field) on the DIU200 to verify that it corresponds with the distance of the road test, as indicated by the vehicle's odometer.

6. If Life-to-Date distance on the Odometer screen does not match the truck's odometer, it could be

  • the vehicle's ECM was replaced

  • the ECU needs programming

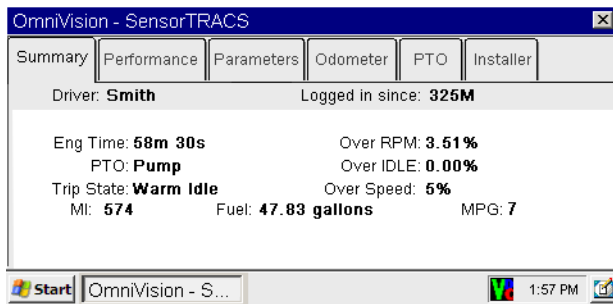 • there is a mismatch between the J1587 and J1939 data links

SensorTRACS® System Display Screens

Accessing the SensorTRACS® Screens

1. Touch the **SensorTRACS** icon.

  • If the SensorTRACS icon is grayed out, the SensorTRACS system is not enabled. Call your company dispatch to have this application enabled.
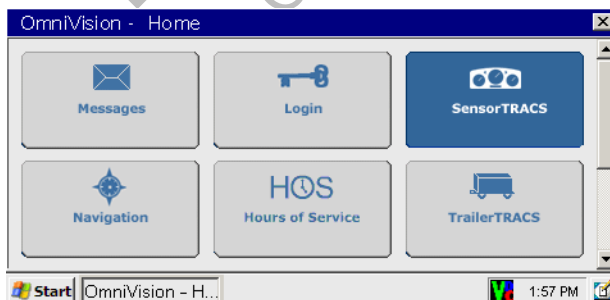

2. Touch any of the six tabs to access these individual screens.

  • Summary screen

  • Performance screen

  • Parameters screen

  • Odometer screen

  • PTO screen

  • Installer screen

Summary Screen

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

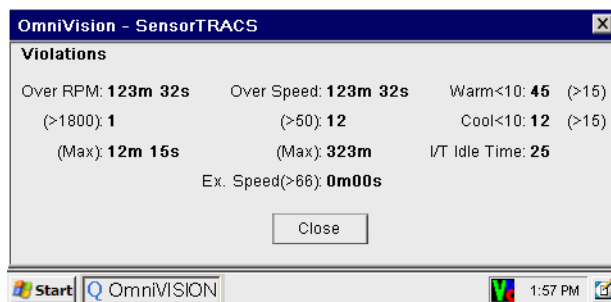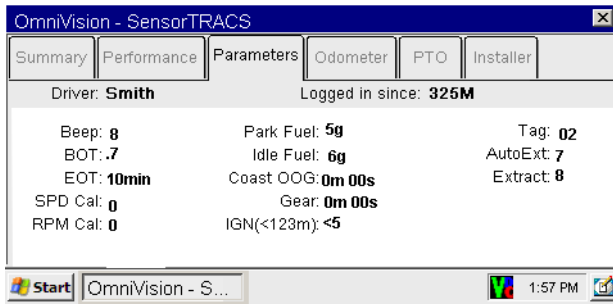| *Field*	*Description*
Driver	Active driver name. If no driver is currently logged on as the active driver, "UNIDENTIFIED" is displayed.
Logged in since	Number of minutes current driver has been logged in.
Eng Time	Engine time in minutes and seconds.
PTO	Indicates if PTO configuration is using Pump 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.
MI	Total distance since beginning of trip detected.
Over RPM%	Computed over RPM percentage.
Over IDLE	Over idle percentage.
Over Speed	Computed overspeed percentage.
Fuel	Total fuel consumed for trip.
MPG	Computed fuel mileage in miles/gallon (or km/gal).

Performance Screen
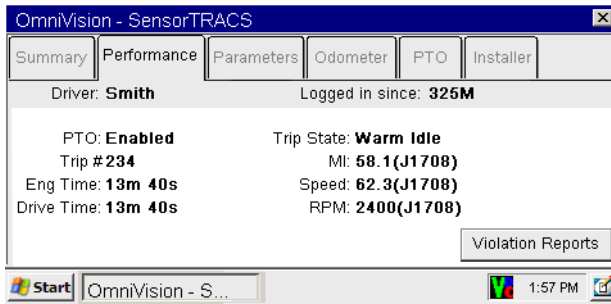
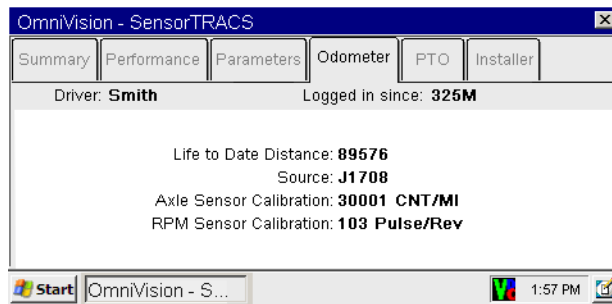Data associated with the active driver since the last SensorTRACS system data extract.

Field	Description
Driver	Active driver name. If no driver is currently logged on as the active driver, "UNIDENTIFIED" is displayed.
Logged in since	Number of minutes current driver has been logged in.
PTO	Indicates if PTO is Enabled or Disabled
Trip	Current trip number.
Eng Time	Total elapsed time the engine has been running.
Drive Time	Driving (road) time.
Trip State	Current trip state.
MI	Total miles accumulated.
Speed	Current vehicle speed.
RPM	Current engine RPM.

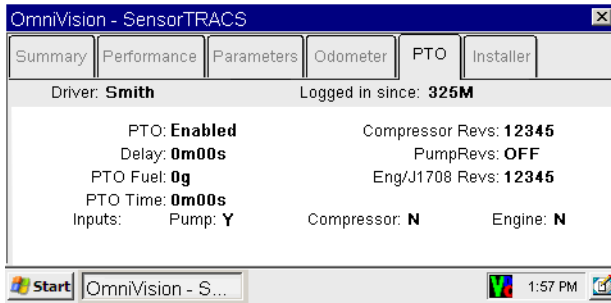Touch the **Violations** button to view Violation Reports screen.

Parameters Screen

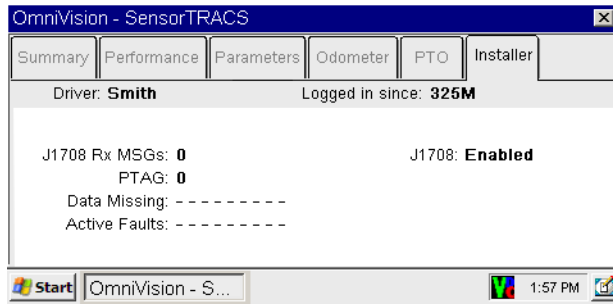| *Field*	*Description*
Driver	Active driver name. If no driver is currently logged on as the active driver, "UNIDENTIFIED" is displayed.
Logged in since	Number of minutes the active driver has been logged in.
Beep	Unidentified driver beep period in minutes.
BOT	Distance vehicle must travel before the MCP200 declares the Beginning of Trip and starts Trip_Run recording.
EOT	End of Trip time threshold in minutes.
SPD Cal	Speed calibration parameter.
RPM Cal	RPM calibration parameter.
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.
IGN	Ignition violation time followed by : the ignition violations count.
Tag	Parameter version indicator.
AutoExt	Dispatch-configured extract frequency (in days).
Extract	Unit extract frequency.

Odometer Screen

Field	*Description*
Driver	Active driver name. If no driver is currently logged on as the active driver, "UNDENTIFIED" is displayed.
Logged in since	Number of minutes current driver has been logged in.
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 SensorTRACS 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 SPD CAL value displayed on the SensorTRACS Parameters screen.
RPM Sensor Calibration	Speed or distance calibration value. Number should be the same as the RPM CAL value displayed on the SensorTRACS Parameters screen.

PTO Screen

Field	*Description*
Driver	Active driver name. If no driver is logged on as the active driver, "UNIDENTIFIED" is displayed.
Logged in since	Number of minutes current driver has been logged in.
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.)
Inputs: Pump Inputs: Compressor Inputs: Engine	Displays "Y" if the PTOP input is active. Displays "Y" if the PTOC input is active. Displays "Y" if the PTOE input is active. If the PTO is DISABLED or if the VEHICLE IS IN MOTION (<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."
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.

Installer Screen

Field	Description
Driver	Active driver name. If no driver is logged on as the active driver, "UNIDENTIFIED" is displayed.
Logged in since	Number of minutes current driver has been logged in.
J1708 Rx MSGS	Number of J1708 messages received from the engine controller with the engine running. If this number is not steadily incrementing several times per second when the engine is running, the J1708/1587 data link is not correctly connected to the MCP.
PTAG	Parameter version tag.
Data Missing	Any data that is missing from the J1708/1587 data link. Field values are described on page 13-9.
Active Faults	SensorTRACS faults that are currently active. Field values are described in the table on page 13-10.
J1708 Enabled or J1708 Disabled	The MCP200 is looking at the J1708/1587 data link for the SensorTRACS data. The MCP200 is looking at standard and RPM sensors or J1708/1587 hybrid speed sensor for the SensorTRACS data.

Data Missing Field Value Definitions			
Field Value	Meaning	Associated PID	Effect
0	Missing Road Speed (MPH)	84	SensorTRACS system is not receiving road speed from the ECM.

Data Missing Field Value Definitions			
Field Value	*Meaning*	*Associated PID*	*Effect*
1	Missing Engine Speed (RPM)	190	SensorTRACS system is not receiving engine speed from the ECM.
2	Missing Total Distance	245	SensorTRACS system is missing distance from the ECM.
3	Missing Total Engine Hours	247	Engine hour data will not be available.
4	Missing Total Fuel	250	SensorTRACS system will not record fuel data.
5	Missing Throttle Position	91	Coasting will not be a factor in overspeed threshold.
6	Missing Ambient Temperature	171	Ambient temperature will not be available.
7	Missing Parking Brake Status	70	Parked Idle Fuel will not be available.
8	Missing PTO Status	89	PTOE data will not be available.
9	Automatic Traction Control (ATC)	151	Applies only to CER functionality.

Active Fault Field Value Definitions			
Display Shows	*Associated Fault*	*Description/ Symptom*	*Possible Cause*
0	No Power (MCP)	Power detected OFF for more than the wake-up time.	Main power was lost, causing the MCP200 to stay asleep longer than its wake-up interval.
1	RPM Zero (MCP)	RPM zero when speed is non-zero.	-RPM sensor or connection problem. -J1708 selection parameter set wrong. -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.

Active Fault Field Value Definitions (Continued)			
Display Shows	Associated Fault	Description/ Symptom	Possible Cause
2	Bad Ignition (MCP)	Ignition OFF and speed or RPM non-zero.	Problem with MCP200's ignition line wiring or fuse.
3	RPM Sensor (MCP)	Engine posted PID (194) and PID (190).	RPM sensor or connection problem to the engine, detected by the engine's diagnostics.
4	Speed Sensor (MCP)	Engine posted PID (194) and PID (84).	Speed sensor or connection problem to engine, detected by the engine's diagnostics.
9	LTD Mismatch (MCP)	LTD mismatch with stored MCP data.	-Engine run with main power disconnected. -Engine run with data link disconnected. -Engine run with ignition line disconnected.
A	Bad Speed (MCP)	More than 2 hrs IGN = ON with Spd = 0, RPM greater than 1300.	-Speed sensor or connection problem—MCP200. -Speed sensor or connection problem—engine. -Engine speed sensor parameter not enabled.
B	0 Spd and RPM (MCP)	More than 2 hrs with IGN = ON with Spd = 0, RPM = 0.	-Disconnect of entire accessory cable. -J1708 selection parameter set wrong. -Data link connection problem. -Driver using ignition position for accessory operation. -MCP200 ignition line wired to accessory position.
D	Steady 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).

Special Alert Display Messages

Certain messages spontaneously display on the display unit when the MCP200 needs to warn or remind the driver of certain pending conditions.

Warning Messages

Warning messages 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 SensorTRACS vehicle performance monitoring system 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.

- 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)

1. Engage the PTOP/PTOC.

2. Use your multi-meter to determine which type of circuit you are connecting to.

**Power Take-off Pump (PTOP) or
Power Take-off Compressor (PTOC)**
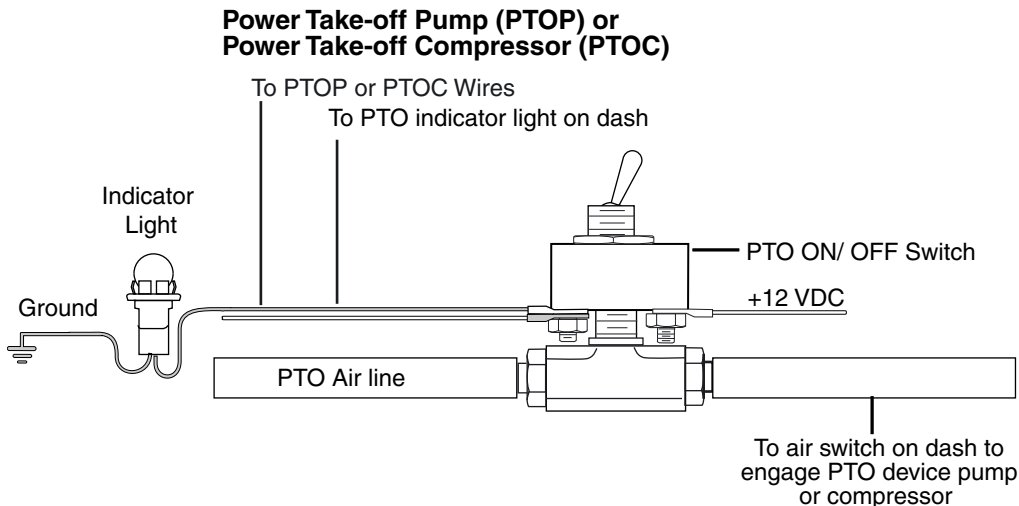
04AAA_217AQMCP

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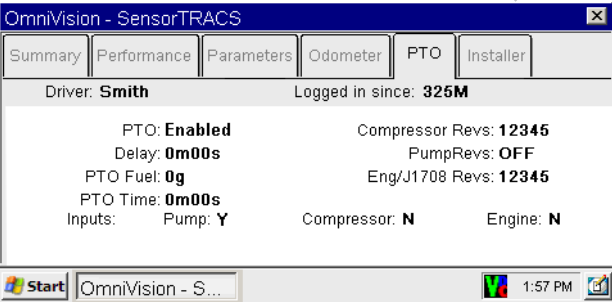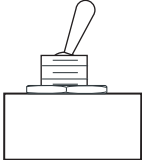

**Power Take-off Pump (PTOP) or
Power Take-off Compressor (PTOC)**
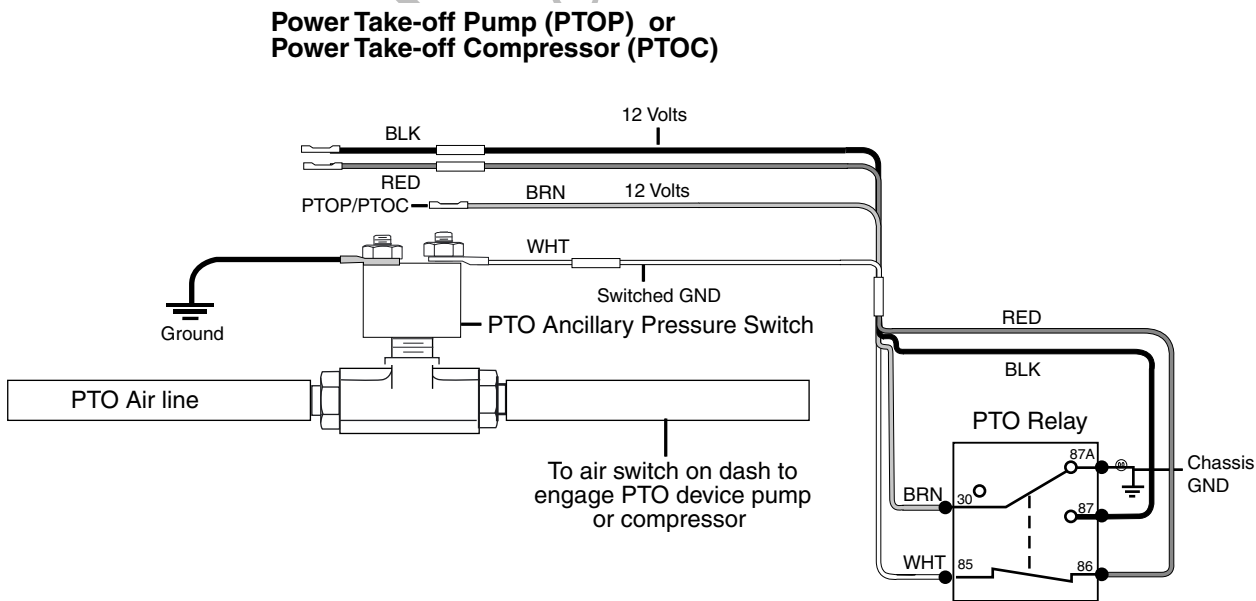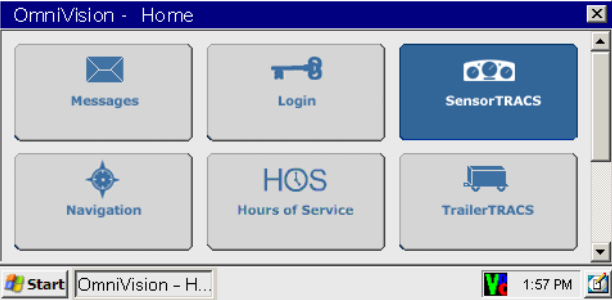
08AAA_062

4. Connect either PTOP or PTOC wires.

5. If the pump activation circuit is +12 VDC (active high) or ground (active low), connect the white/red PTOP wire from the accessory cable to the PTO side of the switch.

If the compressor activation circuit is +12 VDC (active high) or ground (active low), connect the white/black PTOC wire from the accessory cable to the PTO side of the switch.

6. Perform the System Verification in Chapter 12 in this guide.

7. Perform the Power Take-off (PTO) Data Input Verification Procedure in *PTO Data Input Verification Procedure* on page 13-14.

PTO Data Input Verification Procedure

1. Turn the vehicle ignition **ON.**

2. Turn the PTO device **ON.**

3. Navigate to the PTO screen.
  • Touch the **SensorTRACS** icon.

Note

If SensorTRACS is grayed out, SensorTRACS system is not enabled. Call your company dispatch to have this application enabled.

  • Touch the **PTO** tab.

4. Verify that PTO is ENABLED and the INPUTS field displays a **Y** according to what is active.
  • For PTO Information screen field values, see *PTO Screen* on page 13-8.

5. To verify that the parameters were sent, check that the PTO TIME field is incrementing. Is this field incrementing?
  • If yes, PTO verification is complete.
  • If no, check the wire connections, see *Power Take-off (PTO) Overview* on page 13-12. Go to step 6.

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

14

Vehicle Maintenance Installation

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

For technical questions, contact Qualcomm Enterprise Services (QES�) 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** icon 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

*   The Qualcomm® mobile computing platform 200 (MCP200) is normally upgraded with software by sending it over-the-air using satellite transmissions, so that the MCP200 platform should always have the current software version that supports vehicle maintenance. If you need to perform a manual upgrade using the secure digital (SD) card, see Appendix D in this guide for detailed information.

*   The MCP200 can bus converter cable assembly (CV90-J9389) is required to connect the J1939 datalink.

*   The vehicle maintenance service only supports conditions from the J1939 datalink. The following conditions are monitored at this time:

Description	Source	PGN	SPN	FMI
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

Note

For aftermarket installations, the MCP200 J1939 conversion cable is needed.
E-mail notification must be setup by the CSR.

Connecting the J1939 Wires

See Chapter 11 in this guide for detailed information.

Enabling a Vehicle for Vehicle Maintenance

1. Log into iQ at: https://iq.qualcomm.com/qwbs/ngiq/faces/iq/common/Main.jspx

2. Select **Manage OmniVision**.
   - Check to see which Operational Profile is enabled for vehicle maintenance services.

3. Select an Operational Profile to enable a vehicle/unit for Vehicle Maintenance.

4. Select **Transfer Unit**.

5. Enter the serial number of the unit.

6. Select the Operation Profile for that unit.

Vehicle Maintenance System Verification

Refer to the following DIU200 screens to verify vehicle maintenance:

1. Go to the Vehicle Data Service (VDS) status screen. Press the **Home** key and scroll down to the **System** icon. Touch the **System** icon and press the **VDS** tab.
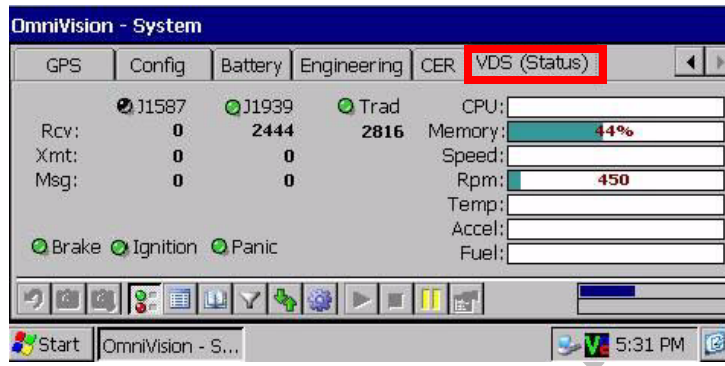
Various screen fields are described below.

Field	*Value*
RCV	These are the packets of data being received on the data bus.
XMT	These are the packets of data being received on the data bus as requested (transmitted) packets.
MSG	These are the packets of data being received on the data bus that are of longer length than the normal data packet size.

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, there is an error.

    - If the J1939 light is dark, the unit is not enabled for J1939.

• The Brake light is green if the parking brake is engaged.

• The Ignition light is green during this test.

**2.**   Press the **Home** button and scroll down to the **Vehicle Maintenance** icon.
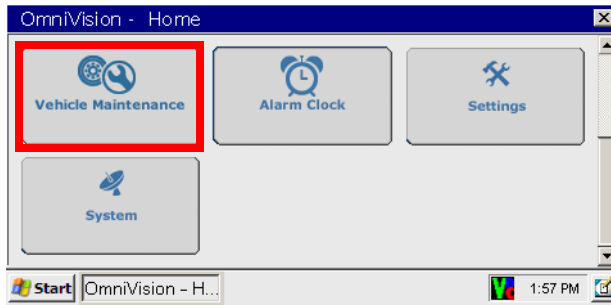
Note

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

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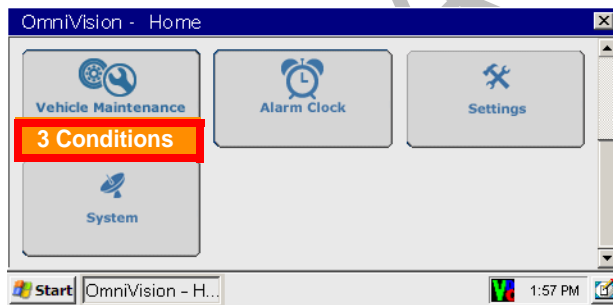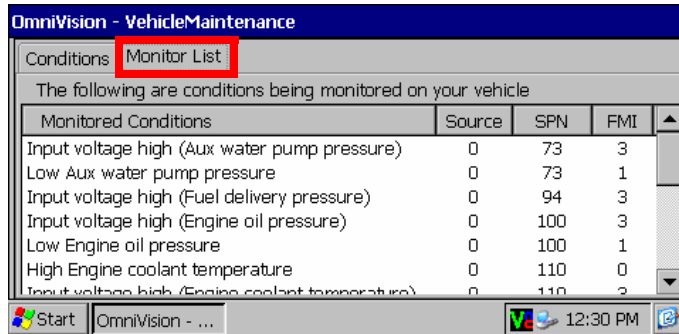

4.   Press the **Vehicle Maintenance** icon and select the **Conditions** tab to view the current Active and Inactive Conditions.
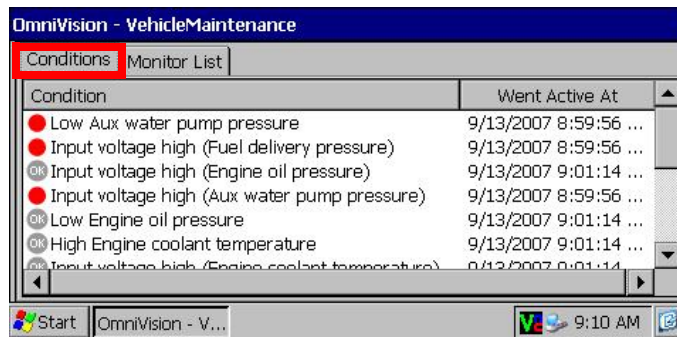
*   Conditions with red dots are active conditions.

*   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.

Monitored Conditions	Source	SPN	FMI
Input voltage high (Aux water pump pressure)	0	73	3
Low Aux water pump pressure	0	73	1
Input voltage high (Fuel delivery pressure)	0	94	3
Input voltage high (Engine oil pressure)	0	100	3
Low Engine oil pressure	0	100	1
High Engine coolant temperature	0	110	0
Input voltage high (Engine coolant temperature)	0	110	3

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

15
TrailerTRACS® System Installation

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

For technical questions, contact Qualcomm Enterprise Services (QESᔆᴹ) 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

TrailerTRACS® 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).
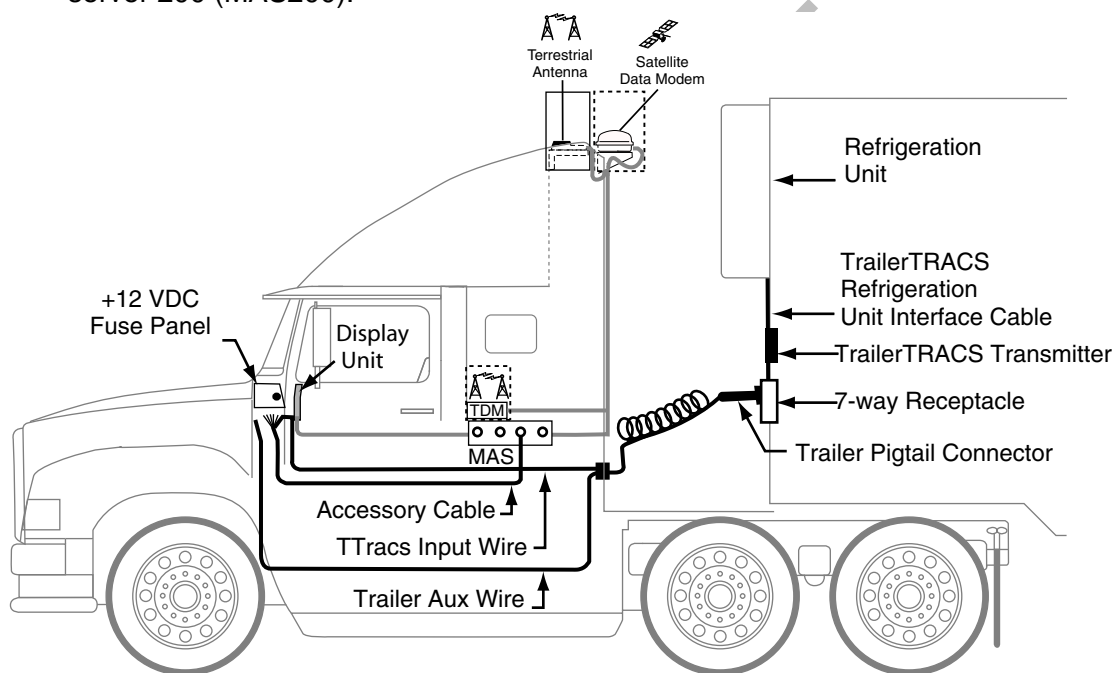
TrailerTRACS® System Wiring for the Truck

Fuse Kit Installation

Fuse kits are needed for all TrailerTRACS system installations.
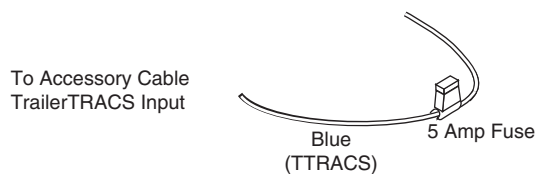
1. Locate the blue AUX wire in the 7-way trailer harness. With ignition turned ON, determine if +12/24 VDC is present on this wire.

   - 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.

Front of Cab

Rear of Cab

Trailer Aux wire
to 7-way receptacle

To Truck
Fuse Panel

Butt splice

Blue (TTRACS)

5 Amp Fuse

Accessory
Cable
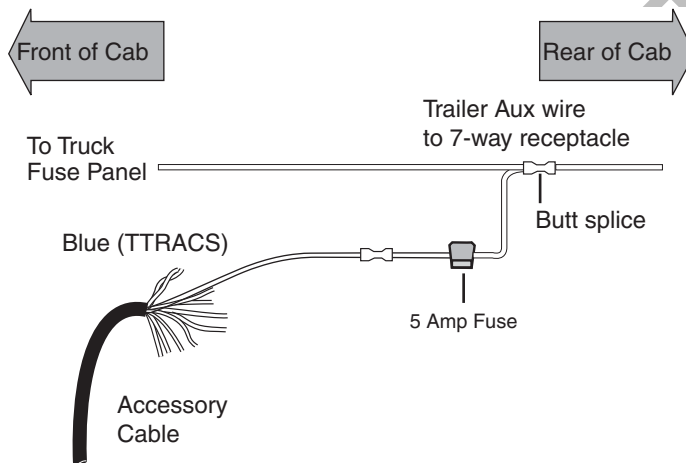
04AAA_49

⚠ **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 TrailerTRACS system signal. The TrailerTRACS wire should be connected so it does not go through the PLC filter.*
ABS Interoperability: *The TrailerTRACS system product has been tested by Qualcomm for interoperability with the SAE standard PLC4Trucks ABS signal. These tests resulted in no adverse impact on the ABS warning function. Furthermore, Qualcomm is not aware of any interoperability issues in actual operation on vehicles in the marketplace.*

TrailerTRACS® System Verification

Enabling the Option for the TrailerTRACS® System

- If the TrailerTRACS icon is grayed out, TrailerTRACS is not enabled.

- Call your company dispatch to have the correct operational profile selected so this application is enabled.
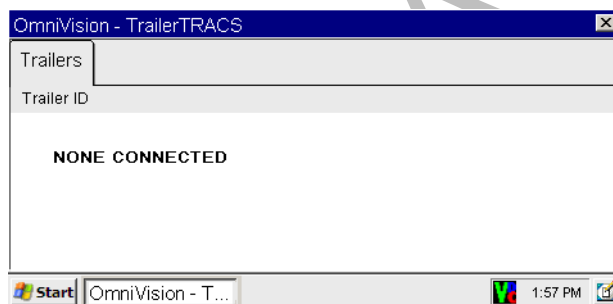
Trailer Connection/Disconnection

Connection

1. Connect an MCP200-equipped tractor to the trailer, connect the tractor/7-way pigtail.

2. Touch the **TrailerTRACS** icon.
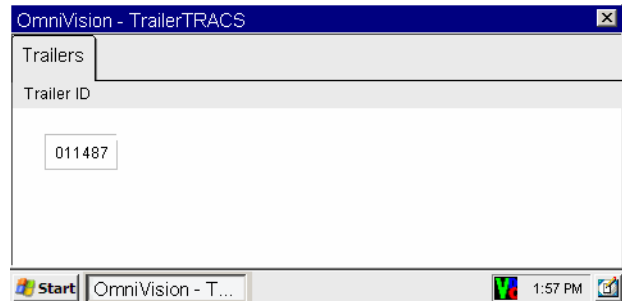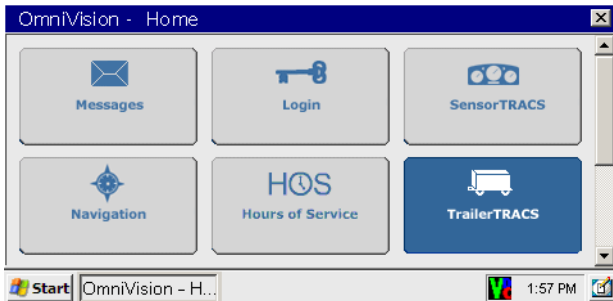
If a trailer is not currently connected, the status is **None Connected.**

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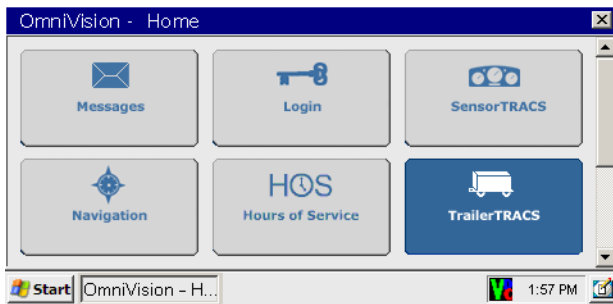
Disconnection

1. Remove 7-way pigtail.

2. Leave ignition ON.

3. Wait for disconnect message (approximately five minutes).

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

TrailerTRACS® Diagnostic Screen

1. Touch the **TrailerTRACS** icon.

2. Touch the **Trailers** tab to display the TRAILER ID screen.
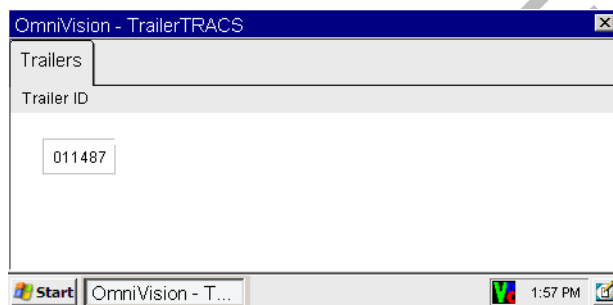
3. When a trailer is connected, the TrailerTRACS Diagnostic screen displays. The TrailerTRACS transmitter ID shows on the TRAILER ID screen.

A TrailerTRACS ID number displays, as well as other numerical information.

Field	*Description*
First Line Trailer Diag	Number of seconds since the ignition was turned ON.
Second Line First Number	TrailerTRACS ID number.
Second Line Second Number	Number of ID packets from the TrailerTRACS transmitter since the ignition was turned ON.
Second Line Third Number	Number of seconds since the last ID packet was received from the TrailerTRACS transmitter by the MCP200.

Refrigeration Status Screen

1. Touch the **TrailerTRACS** icon.
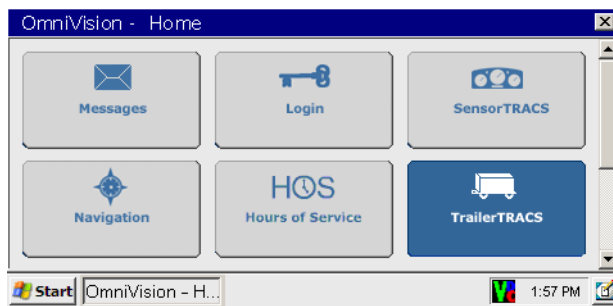
2. If a refrigeration unit is detected, a snowflake appears above the transmitter ID box. Touch the **Transmitter** box.
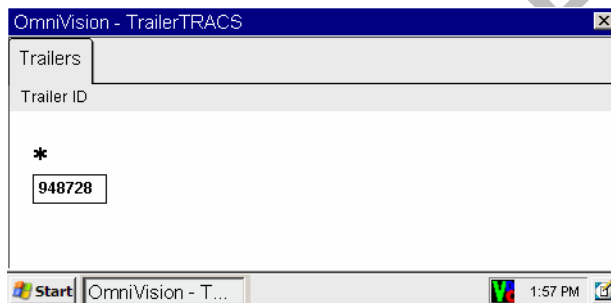
3. Refrigeration Status screen appears. To send the information to dispatch, touch the **Send** button.

Field	Description
Trailer ID	The trailer's TrailerTRACS transmitter ID.
Refrigerator Stat #	Number of refrigeration status messages sent from the refrigeration unit to the MCP200. When this number is incrementing regularly, your data is being sent from the refrigeration unit. The number is followed by a code that identifies the refrigeration unit's manufacturer: • T—Thermo King • C—Carrier
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.

17
Buzzer Installation

Buzzer Overview

- The message waiting buzzer is an audible alarm triggered by incoming Important, Sleepy Important, or Emergency messages (the message priority is assigned by the dispatcher).

- It is activated by the message waiting light circuit provided with each Qualcomm® MCP200. It can be substituted for, or used with, the remote message waiting light (RMWL).

- Because the buzzer is very loud, an optional toggle switch can be installed to allow the driver to disable the buzzer.

Topics in this chapter include:

For technical questions, contact Qualcomm Enterprise Services (QES℠) Customer Support. Customer Support is staffed 24 hours a day, 365 days a year:

<center>
In the United States, call 800-541-7490
In Canada, call 800-863-9191
</center>

Mounting Location

- The typical mounting location for the buzzer is behind the dash.
- The toggle switch, when used, can be mounted on the dash.

Installation Guidelines

1. Connect one end of the buzzer power wire to either terminal on the buzzer.

2. To use the optional toggle switch, connect the toggle switch in line with the buzzer power wire.

Buzzer

Toggle Switch (Optional)

12V

Buzzer Power Wire +12 VDC

Green MSG Alert

Mobile Application Server

In-line Fuse

Accessory Cable

+12VDC From Battery

06AAA_84
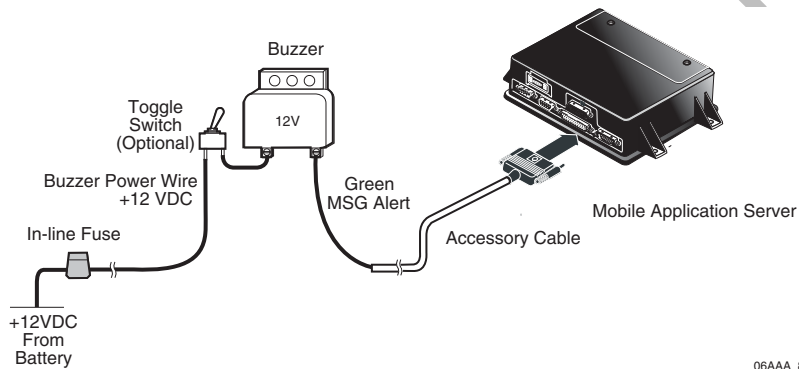
3. Connect the green MSG ALERT wire on the MCP200 accessory cable to the other terminal on the buzzer.

This wire connects the buzzer to ground when activated by the MAS200. It is activated when an Important or Emergency message is received by the mobile computing platform (MCP).

Installation Verification

1. Have the dispatcher, or QES Customer Support, 800-541-7490, send an Important or Sleepy Important message.

2. If the optional toggle switch is installed, turn it OFF and ON and verify that the buzzer turns OFF and ON when it is activated.

3. With the buzzer activated, read the message sent by the dispatcher and verify that the buzzer stops sounding.

18
Remote Message Waiting Light (RMWL) Installation

RMWL Overview

- The RMWL can be used when the display unit is located where the driver cannot see the message waiting light.

- The RMWL illuminates whenever an Important, Sleepy Important, or Emergency message is received by the Qualcomm® MCP200.

Topics in this chapter include:

For technical questions, contact Qualcomm Enterprise Services (QESSM) 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 Remote Message Waiting Light

> ⚠️ **Caution**
>
> *Be sure to clear the area behind the dash before drilling.*

1. Select a suitable location for the RMWL. Make sure that there is approximately 2-1/2" of clearance directly behind the mounting surface where the light will be inserted.

2. Carefully drill a 3/4" diameter hole in the mounting surface.

3. Pull the RMWL bulb assembly straight out of the housing assembly. Remove the nut and washer from the housing assembly.

4. Insert the RMWL housing assembly into the hole in the mounting surface and re-install the washer and nut. Tighten the nut until the housing assembly is secured flush against the vehicle dash and re-install the bulb assembly.

   • The power wire can be identified by the in-line fuse holder.

5. Connect the power wire to a +12/+24 VDC unswitched source, such as the BAT+ wire on the MCP200 power cable.

6. Connect the RMWL's ground wire to the accessory cable's green MSG ALERT wire using a butt splice.
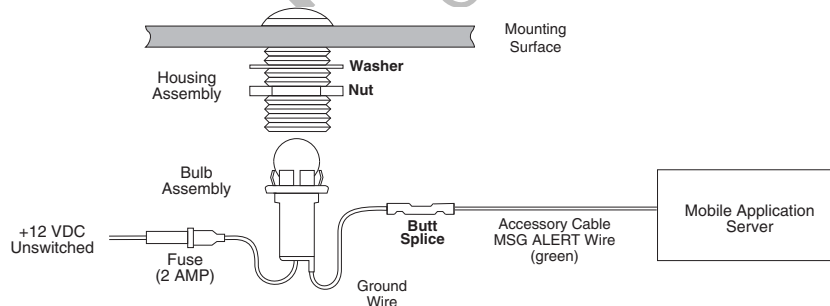
If the RMWL bulb burns out, use a GE53 replacement bulb. The light is protected by a 2-amp in-line fuse.

Installation Verification

1. Have the dispatcher, or QES Customer Support, 800-541-7490, send an Important or Sleepy Important message.

2. Verify that the light comes ON.

3. Verify that the light goes OFF when the message is read on the display unit.

4. Refer to the *Qualcomm® MCP 200 Series and Accessory Diagnostic Guide* for troubleshooting procedures.

19

Wired Panic Button Installation

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 message to the dispatcher, but DTTS is not notified.

- For information on installing the wireless panic button, see the *Wireless Panic Button Installation and User Guide* (80-J6059-1).

Topics in this chapter include:

For technical questions, contact Qualcomm Enterprise Services (QES℠) 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**
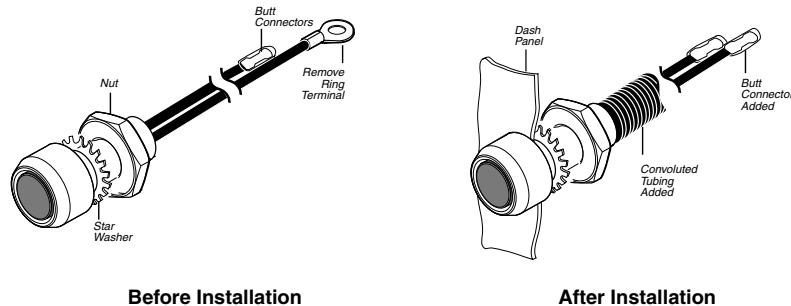
02AAA_46

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.
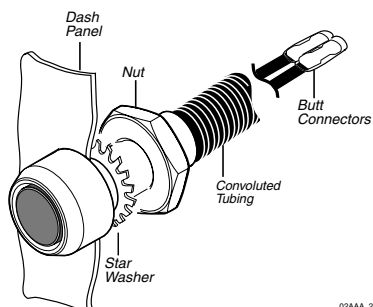
02AAA_23

> ⚠ **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.

Panic Button

Butt Connectors

Panic Button Wires (black)

PANIC_LOW (blue/red)
PANIC_HIGH (blue/black)

Convoluted Tubing

44 Pin Connector

05AAA_230B
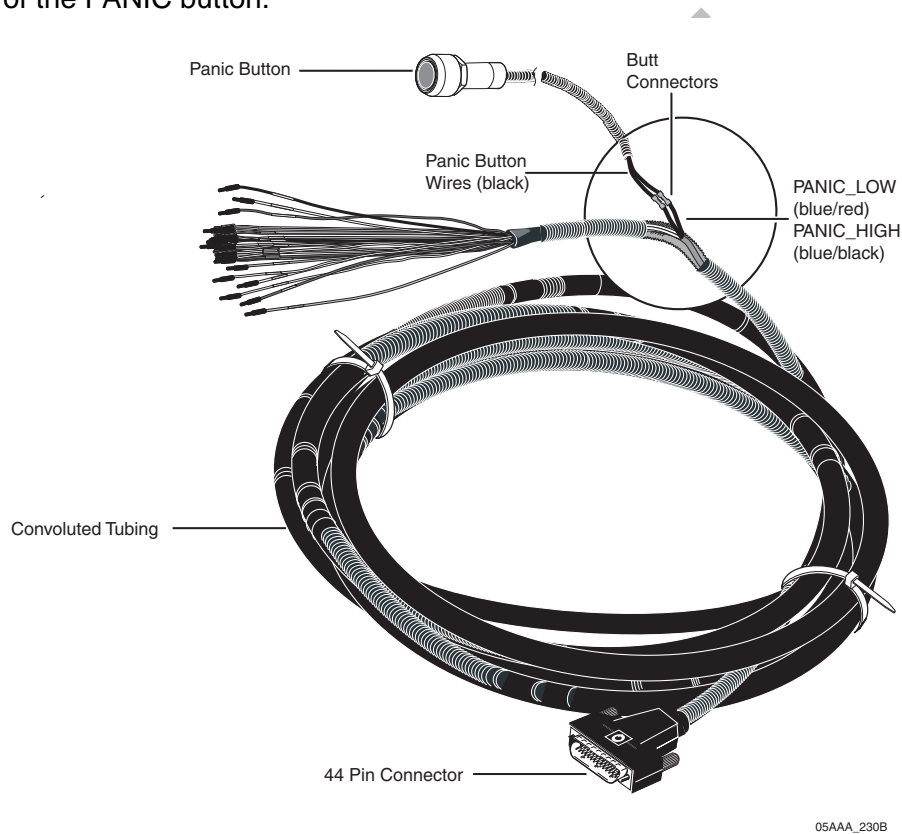
Caution

Be sure to cover all wires with convoluted tubing and secure them away from sharp or moving parts.

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.

Tie wrap large and small tubing

44-Pin Connector

Panic Button

Panic Button Wire

Accessory Cable

Butt Connectors

05AAA_229A
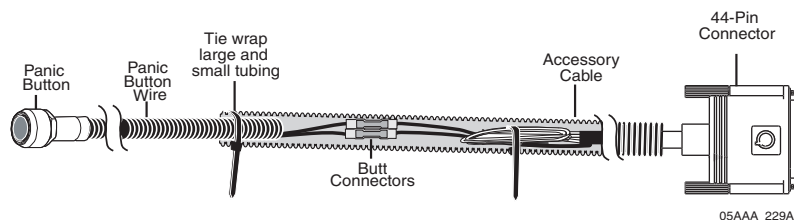
Installation Verification

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 QES Customer Support at 800-541-7490 before dialing in to test the procedure.

1. Call QES 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 QES 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, Qualcomm 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.

20
In-Cab Printer Installation

The in-cab printer is a product of O'Neil Product Development, Inc.

For general questions and technical support, contact O'Neil Product Development, Inc.:

In the United States and Canada, call 800-796-6345
Outside these areas, call 949-458-0500

To enable the printer function only, contact Qualcomm Enterprise Services (QES℠) 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

Wiring Configuration

The printer can be connected to the MCP200 in the vehicle using the standard or full function accessory cable.

Installation Guidelines

Location

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

Cables

Keep away from sharp metal edges to avoid damage to cables. Connect the printer to the vehicle and the MCP200 using the printer power cable and the printer data cable.

Printer Power Cable

The power cable connects to the chassis ground wire and the ignition source.
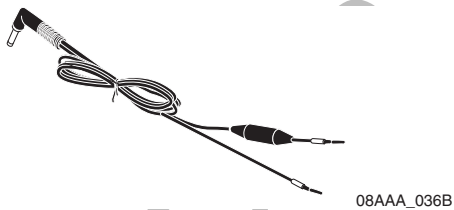
08AAA_036B

Printer Data Cable

The data cable connects the printer to the MCP200 primary function accessory cable and provides the path for data from the MCP200 to the printer.

Data Cable
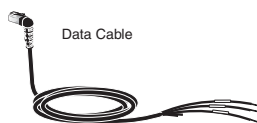
08AAA_036C

Mounting Bracket

A swivel mounting bracket is provided for installing the printer to a flat surface. This mounting bracket works in a variety of locations in a variety of vehicles.

You may also order an optional velcro mount.

Installing the Printer

08AAA_036A

1. Select the printer location:

    • Select a location that is convenient and safe.

    • This can be a vertical or horizontal surface.

    • Printer cannot obstruct the driver's view of the road.

2. Install the bracket:

    • Use the hardware provided.

    • You may also use the optional velcro mount.

3. Install the printer in the bracket.

4. Install the printer power cable:

    a. Run the printer power cable from the printer to the MCP200 power cable connections.

    b. Connect the printer GND wire to CHASSIS_GND.

    c. Connect the printer IGN wire to ignition source on the vehicle.

5. Install the printer data cable:

    a. Run the printer interface cable from the printer to the MCP200 accessory cable connections.

    b. Connect data cable GND wire to violet MCP200 accessory cable COM5_GND wire.

    c. Connect data cable RXD wire to violet/red MCP200 accessory cable COM5_TX485+ wire.

    d. Connect data cable TXD wire to violet/orange MCP200 accessory cable COM5_RX485- wire.

6. Connect the cables to the printer.

Installation Verification

Verify that print function is enabled.

1. From the DIU200 Inbox, display a message.

2. Press **O** or **CTRL-P.**

    •   If the Confirmation to print pop-up screen displays, print a message.

    •   If the Confirmation to print pop-up screen does not display, call QES Customer Support at 800-541-7490 to have the print function enabled.

Return Material Authorization (RMA) Process

1. Request an RMA from O'Neil Printers.

2. O'Neil arranges shipment of a replacement component to you.

3. Return the failed component to the address specified by O'Neil.

O'Neil Printer Parts List

Part	Part Number
O'Neil Printer Kit contains: printer, power and data cables, and swivel mounting bracket.	**230206-000**
O'Neil Printer	200247-103
Power Cable	210292-001
Data Cable	210291-001
Mounting Bracket, swivel	210216-000
Optional Velcro Mount	220264-000

Order parts directly from O'Neil Product Development, Inc.:

•   Call: 800-796-6345 (U.S. and Canada) or 949-458-0500.

•   Email: info@oneilprinters.com

•   Website: www.oneilprinters.com

21
In-Cab Scanner Installation

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

For technical support, contact BCS Solutions:

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

For initial support only, contact Qualcomm Enterprise Services (QES^{SM}) 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

- Check with your local CSR for the minimum software versions needed to support navigation.

Location

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.

Scanner Cable

Keep away from sharp metal edges to avoid damage to cable. Connect the scanner to the MCP200 using the 15-pin DSUB connector.

Mounting the Scanner

The scanner can be mounted in one of two ways.

Scanner Mounting Option

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 four VHB adhesive locations on holster.

4. Position holster onto desired location and firmly press each corner to ensure contact with the surface.

5. Self-drilling screws can be installed for more support.

Installing the Scanner

1. Remove the metal cover from the MAS200 USB/SER connector.

2. Connect the 15-pin DSUB cable end of the scanner to the MAS200. Determine where to locate the scanner. If installing the holster, use four VHB adhesive pads (self-tapping screws optional). If mounting the scanner only, use dual-lock tape.

3. Go to *Scanner Mounting Option* on page 21-2 or *Holster Mounting Option* on page 21-2 for mounting options.

4. Route the 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.

Note

It may be necessary to route cable under the wells and truck interior molding.

Calibrating the Scanner

1. From the Scanning Home screen, touch the **Options** tab.
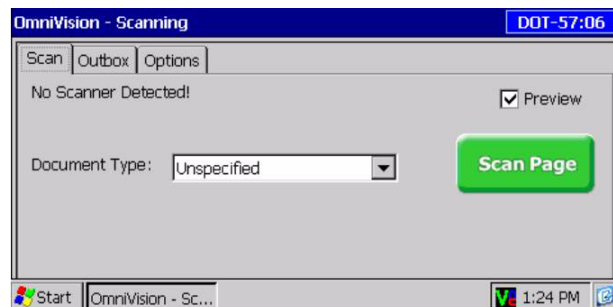
2. Insert the black and white calibration page or plain white paper into the slot.

3. Touch the **Calibrate** button. Wait a few minutes for the calibration to complete.
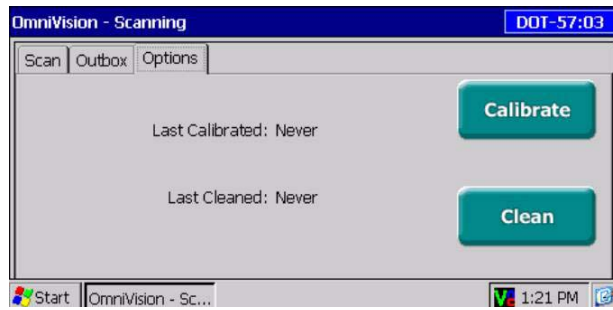
4. Touch the **Scan** tab to return to the scanning home screen.

Sending a Scan

1. On the Home screen, touch the **Scanner** button.

2. 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.

3. Touch the **Scan Page** button.

Note

*If the preview box is checked, a preview page appears. Touch the **Accept** or **Reject** button.*

4. After the page goes through, insert another page and touch the **Add Page** button, or if you are finished, touch the **Done** button.
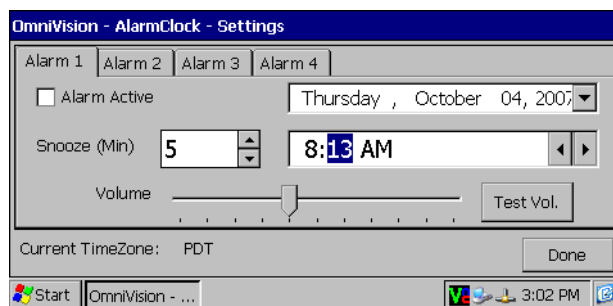
5. Identify what you're sending and touch the **Send** button.
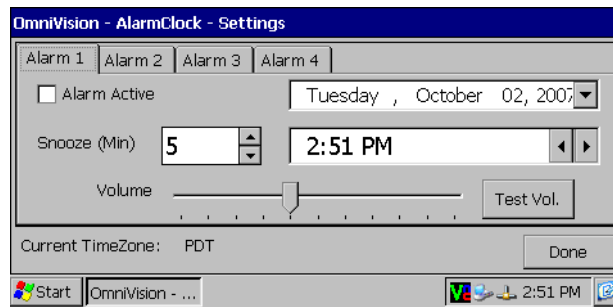
6. When asked to confirm, touch the **Yes** button.

Cleaning the Scanner

1. Touch the **Options** tab.

2. Insert the cleaning paper.

3. Touch the **Clean** button. Wait a few minutes while the scanner draws through the cleaning paper and cleans the scanner.

Return Material Authorization (RMA) Process

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.

BCS Solutions Scanner Parts List

Part	Part Number
BCS Scanner Kit contains: scanner, scanner cable, and holster	65-J9630-1
BCS Scanner Kit contains: scanner and scanner cable	65-J9630-2
BSC Scanner	825-53392-0000
Scanner Cable	45-J9652-16
Optional Holster	65-J9631-1

Order parts directly from BCS Solutions:

• Call: 800-555-5555.

• Website: www.bcssolutions.com

A
Wiring Diagrams and Charts

Topics in this appendix provide wiring diagrams and pin description charts for the Qualcomm® mobile computing platform 200 (MCP200) and accessories.

For technical questions, contact Qualcomm Enterprise Services (QES℠) 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

Qualcomm® MCP200 Electrical Diagram
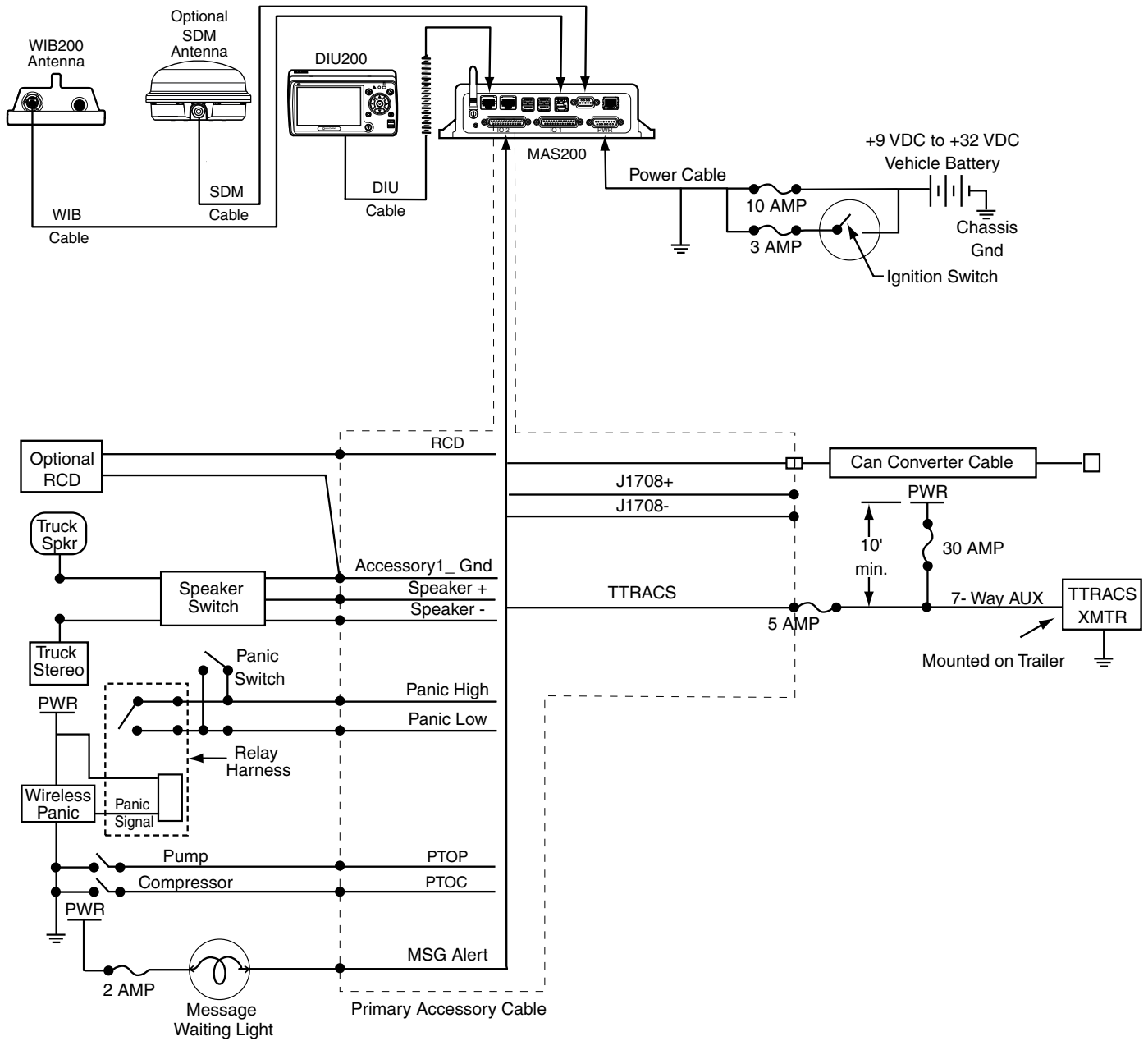
09AAA_022

Qualcomm® MCP200 Wiring Diagram

Optional
Satellite Data Modem
(SDM)
and Mount

MCP Wiring Diagram

BLU/GRN   RCD
BLU/RED   Panic Low
BLU/BLK   Panic High
GRN   MSG   Alert1
VIO   PTOP
VIO/RED   PTOC

CAN1 Connector

BRN
RED   J1708+
VIO/GRN   BLU   J1708-
Accessory   Gnd   TTRACS

SDM Cable

I/O Cable

Wireless Interface Box
(WIB200)
Antenna

WIB Cable

SDM   WIB   DIU

IO 1   PWR

DIU Cable

Power Cable

Mobile Application Server
(MAS200)

Power Cable

YELLOW
15-AMP   BAT+

BAT RTN

BLACK

3-AMP   IGNITION

WHITE

Display Interface Unit
(DIU200)
and Holster

Vehicle Dash/
Electrical Center

09AAA_023

Power Cable Connector Pin Callouts

PIN	SIGNAL	COLOR
8	(BAT RTN)	BLACK
15	(BAT RTN)	BLACK
7	(BAT RTN)	BLACK
14	(BAT RTN)	BLACK
6	(ID)	
5	(IGNITION) Switched 12VDC	WHITE
2	(BAT+) 12 VDC	YELLOW
9	(BAT+) 12 VDC	YELLOW
1	(BAT+) 12 VDC	YELLOW
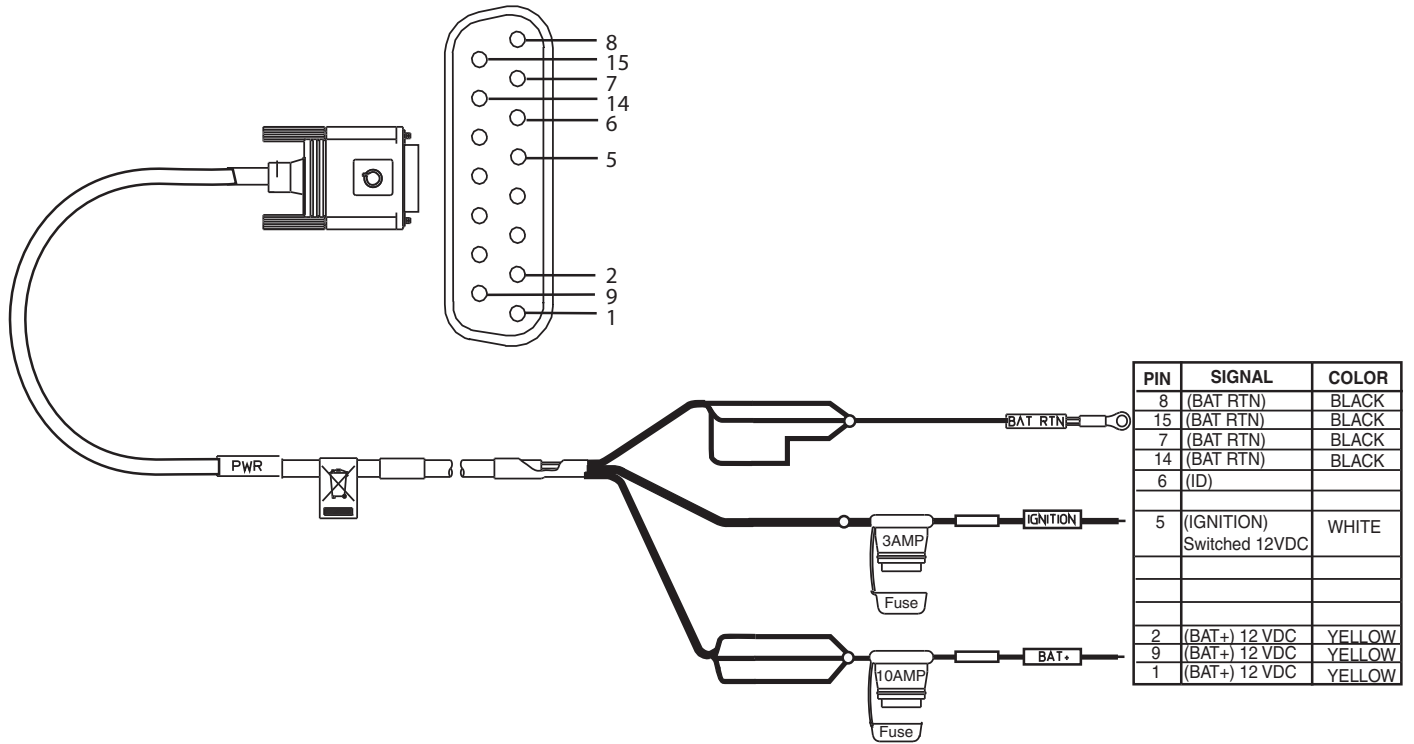
Wireless Interface Box (WIB) Cable Connector Pin Callouts

COLOR	SIGNAL	PIN
Red	WIB_TEMPER_1	7
Black	WIB_TEMPER_2	8
Gray	WIB_Gnd	5
Blue	WIB_9 V	6
Green	WIB_Gnd	4
Violet	WIB_DATA_P	3
Yellow	WIB_DATA_M	2
Orange	USB_VCC	1
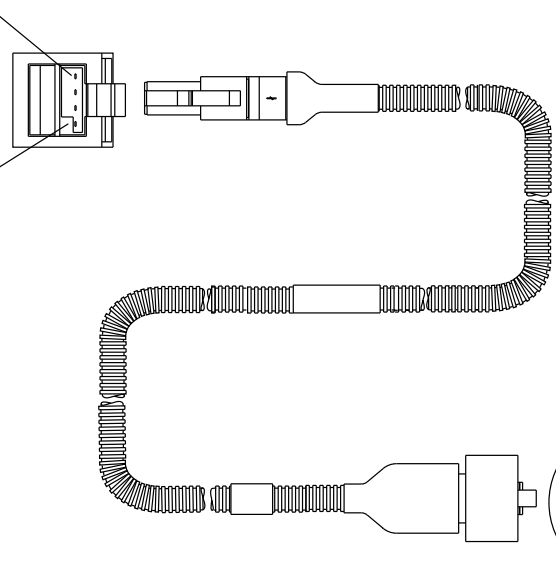
COLOR	SIGNAL	PIN
Red	WIB_TEMPER_1	1
Black	WIB_TEMPER_2	2
Gray	WIB_Gnd	3
Blue	WIB_9 V	4
Green	WIB_9 V	5
Violet	WIB_Gnd	6
Yellow	WIB_DATA_P	7
Orange	WIB_DATA_M	8

09AAA_016

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

P1

P1	SIGNAL	P2
L	Drain	
V	RX-	3
N	RX+	4
T	TX-	2
R	TX+	1
B	TAMPER	7
F	RTN	6
E	RTN	5
C	PWR 9.9-11.5VDC	8
D	PWR 9.9-11.5VDC	9

PIN

1
6
2
7
3
8
4
9
5

P2
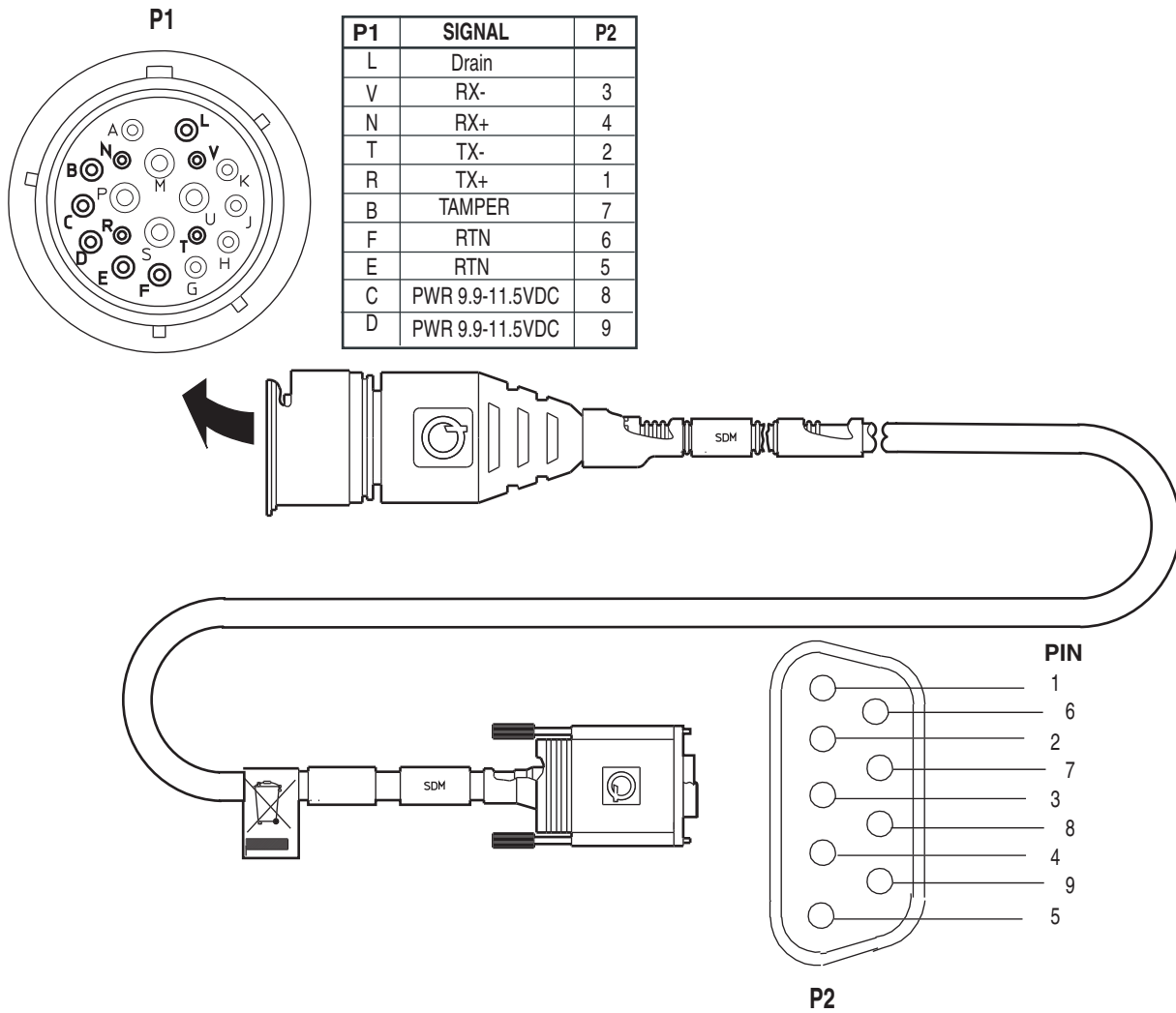
06AAA_130

Primary Accessory Cable Connector Pin Callouts

COLOR	SIGNAL	PIN
WHT/BLU 20	(CAN_B(TX))	19
BLU/WHT 20	(CAN_C(GND)	5
WHT/BRN 22	(CAN_D(PWR)	18
BRN/WHT 22	(CAN_A(RX))	6
GRN 22	(MSG ALERT)	12
BRN 22	(J1708 +)	20
RED 22	(J1708 -)	8
BLU 22	(TTRACS)	23
VIO/ORN 22	(ACCESSORY1_GND)	7
VIO/RED 22	(PTOC)	11
VIO 22	(PTOP)	25
BLU/YEL 22	(SPKR +)	1
BLU/VIO 22	(SPKR -)	14
BLU/GRN 22	(RCD)	22
BLU/RED 22	(PANIC_LOW)	21
BLU/BLK 22	(PANIC_HIGH)	9
BLU/GRA 22	(DT)	24
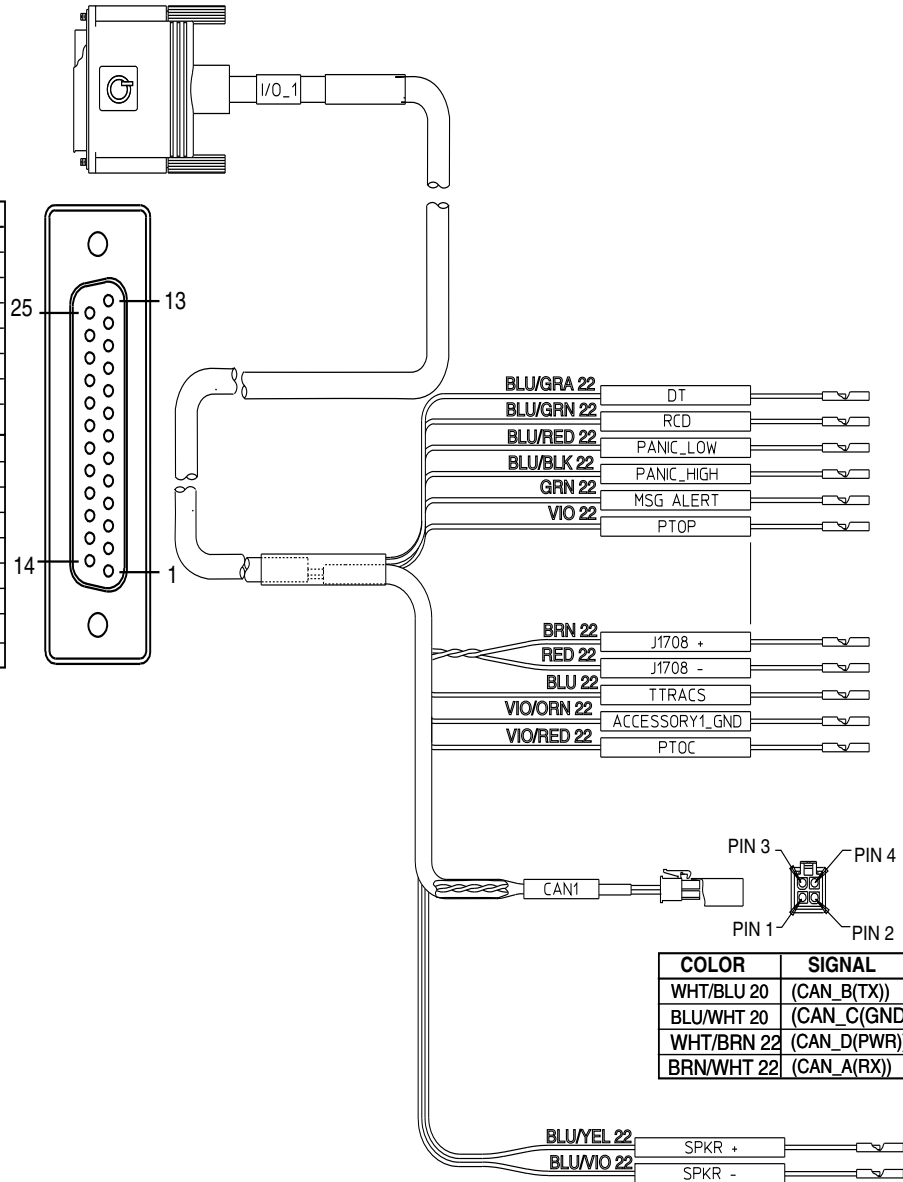
COLOR	SIGNAL	PIN
WHT/BLU 20	(CAN_B(TX))	1
BLU/WHT 20	(CAN_C(GND))	4
WHT/BRN 22	(CAN_D(PWR))	3
BRN/WHT 22	(CAN_A(RX))	2

09AAA_014

Secondary Accessory Cable Connector Pin Callouts

PIN	SIGNAL	COLOR
25	(LSD_2_OUT)	GRN/WHT 22
24	(AXLE1)	VIO 22
23	(RPM2)	BLK/WHT 22
22		
21		
20		
19		
18		
17		
16		
15		
14	(DIGIN_3)	WHT/YEL 22
13	(LSD_3_OUT)	BLU/WHT 22
12		
11	(AXLE2)	GRA 22
10	(RPM1)	ORN/BLK 22
9		
8		
7		
6		
5		
4	(GP_232_RX_EXT)	WHT 22
3		
2	(DIGIN_2)	WHT/BLK 22
1	(HI_SIDE_SW_EXT)	WHT/RED 22
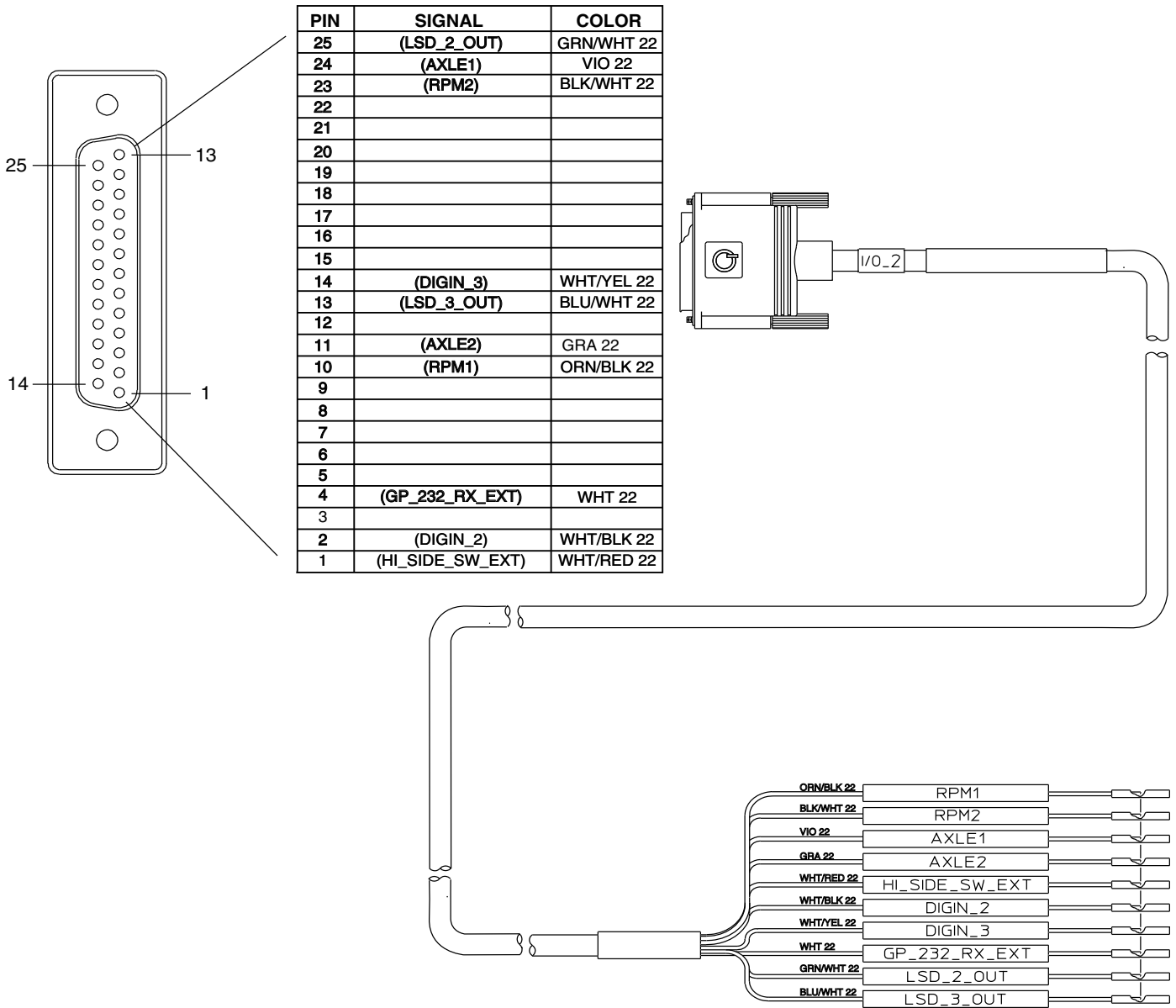
09AAA_015

Display Interface Unit 200 (DIU200) Cable Connector Pin Callouts

COLOR	SIGNAL	PIN
Red	**(LVDS+)**	1
Black	**(LVDS-)**	2
Gray	**(GND)**	3
Violet	**(GND)**	4
Blue	**(V+)**	5
Green	**(V+)**	6
Yellow	**(USB+)**	7
Orange	**(USB-)**	8

MAS
DIU PORT
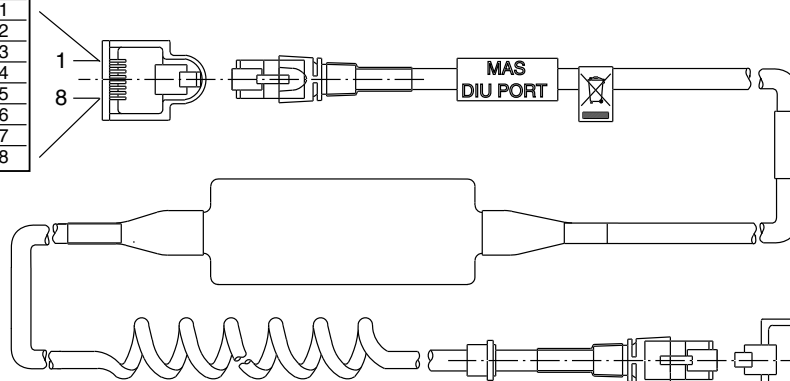
COLOR	SIGNAL	PIN
Orange	**(USB-)**	8
Yellow	**(USB+)**	7
Green	**(V+)**	6
Blue	**(V+)**	5
Violet	**(GND)**	4
Gray	**(GND)**	3
Black	**(LVDS-)**	2
Red	**(LVDS+)**	1

09AAA_017

Six-pin Data Link Connector Pin Callouts
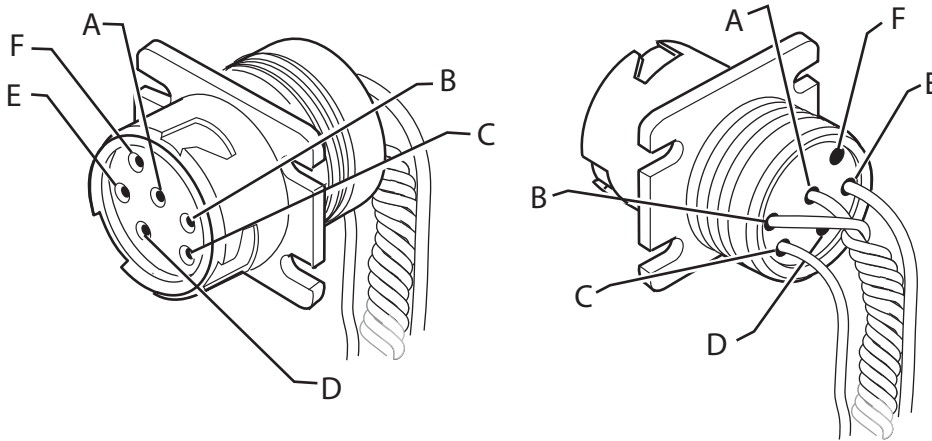
08AAA_050

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
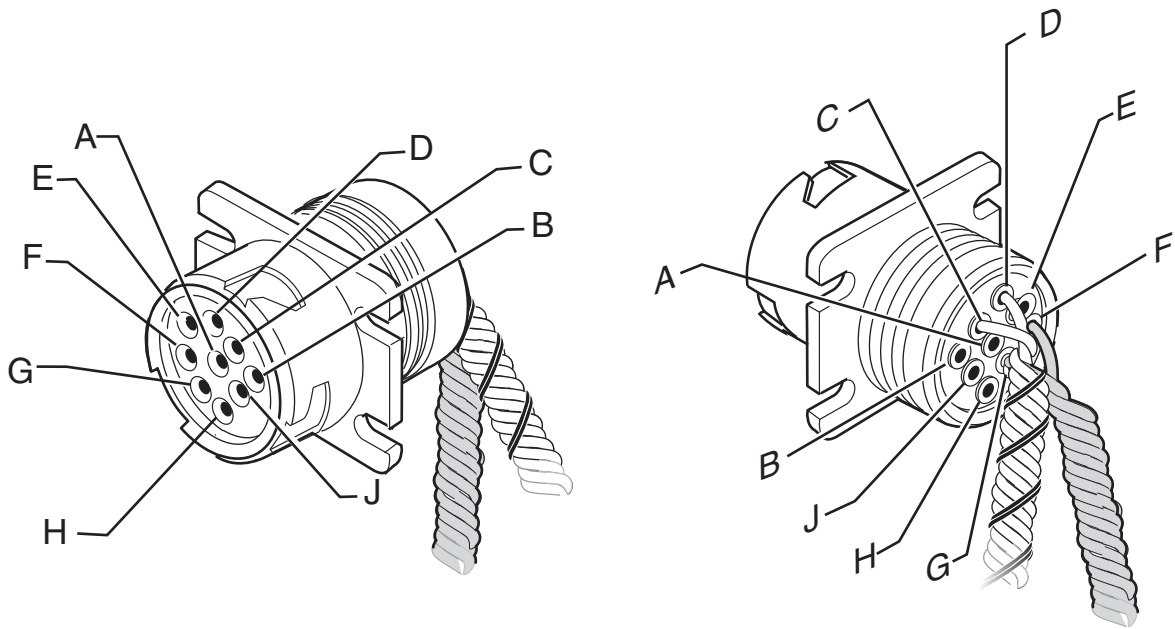
08AAA_051

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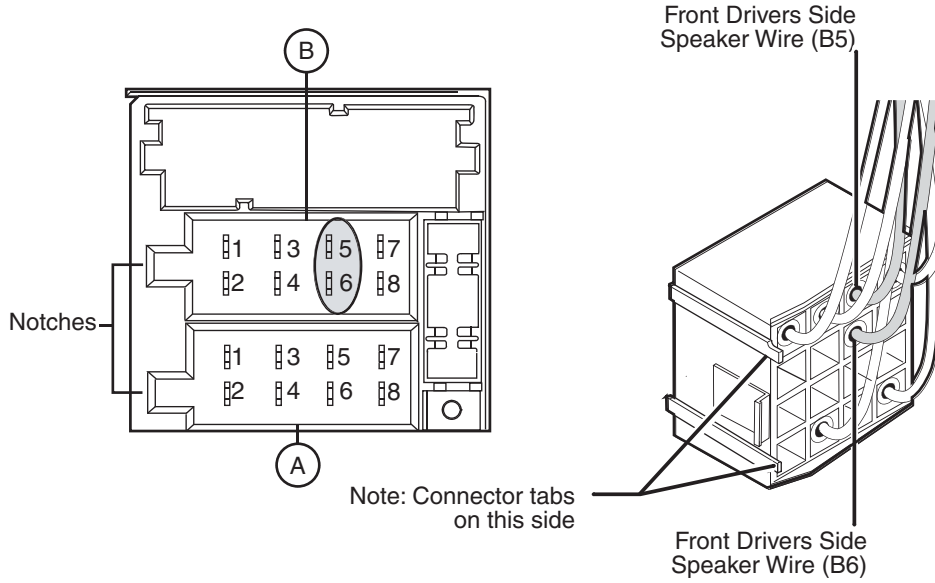
PIN	SIGNAL	PIN	SIGNAL
A1	N/C	B1	RR + SPEAKER
A2	N/C	B2	RR - SPEAKER
A3	PARK LIGHTS	B3	RF + SPEAKER
A4	IGN CONTACT	B4	RF - SPEAKER
A5	PWR ANT OUTPUT	B5	LF + SPEAKER
A6	PWM/ANALOG DIM	B6	LF - SPEAKER
A7	BATTERY - MAIN	B7	LR + SPEAKER
A8	GROUND	B8	LR - SPEAKER

06AAA_179A

CAN Conductor Cable Pin Callouts
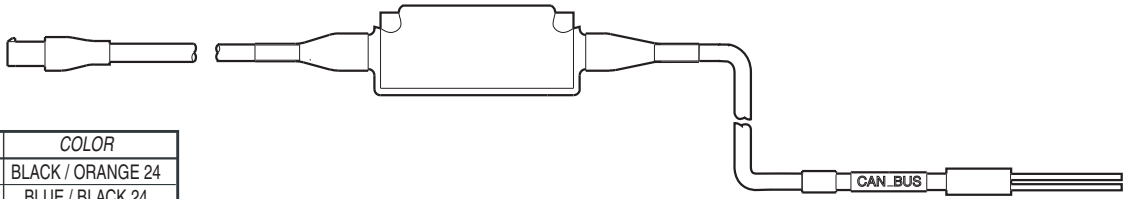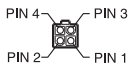
P1	SIGNAL	COLOR
		BLACK / ORANGE 24
		BLUE / BLACK 24
1	CAN_B (TX)	BLACK / BLUE 24
2	CAN_A (RX)	ORANGE / BLACK 24
3	CAN_D (PWR)	BLACK / RED 22
4	CAN_C (GND)	BLACK 22

P	SIGNAL	COLOR
	CAN_H	YELLOW
	CAN_L	GREEN

08AAA_045

MAY CONTAIN U.S. AND INTERNATIONAL EXPORT CONTROLLED INFORMATION *80-J9968-1 Rev. A*

B
Environmental and Power Requirements

Topics in this appendix provide environmental and power requirements for the Qualcomm® mobile computing platform 200 (MCP200) and accessories.

For technical questions, contact Qualcomm Enterprise Services (QES℠) 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

Condition	Requirement
Extended Operating Temperature	-40° C to 70° C (-40° F to 158° F)
Vibration/Shock	Mobile application server 200 (MAS200) does not have a shock tray. 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.
Humidity	
WIB200	Not watertight. DO NOT get wet.
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	+9 to +32 Volts DC
Operating at +12V.	MCP200 draws a maximum of 1.12 amps.
Operating at +12V using optional RCD and speaker switch cable only—no accessories.	MCP200 draws a maximum of 1.6 amps from the battery (12 W).
Asleep.	MCP200 draws 110 mA.
Asleep using optional RCD and speaker switch cable only—no accessories.	MCP200 draws 110 mA.
Using optional SDM	
Operating at +12V.	MCP200 draws a maximum of 1.5 amps.
Operating at +12V using optional RCD and speaker switch cable only—no accessories.	MCP200 draws a maximum of 1.8 amps from the battery (24 W).
Asleep.	MCP200 draws 60–70 mA.
Asleep using optional RCD and speaker switch cable only—no accessories.	MCP200 draws 60–70 mA.

C
Standard RMA Procedure

Topics in this appendix provide Qualcomm's standard Return Material Authorization (RMA) procedure and policies for use in the United States only. It applies to current Qualcomm Enterprise Services (QES℠) products that need to be returned for replacement. For information on the GlobalTRACS® RMA procedure, refer to *GlobalTRACS® Standard RMA Procedure,* 80-J5638-1.

This document does not cover equipment problem diagnosis. For technical assistance, please refer to the current diagnostic or installation guide. Listings of manuals and ordering information may be obtained at our web site at *qes.qualcomm.com.*

The Return Material Authorization Process

RMAs are used whenever equipment must be returned. They authorize, schedule, and track the return, repair or replacement, and shipment of equipment.

The RMA process involves three separate events:

- You request an RMA number.
- Qualcomm arranges shipment of a replacement component to you.
- You return a failed component to the address specified by Qualcomm.

The RMA process is started when you request an RMA number. The RMA number is a reference number that is used to track the status of each part as it moves through the RMA process. After you are issued the RMA number, a replacement part will be shipped to you. You are responsible for returning the defective equipment to the address specified by Qualcomm within 14 days.

How to Obtain an RMA Number

There are two ways to obtain an RMA number:

- Visit our web site at *qes.qualcomm.com* and then log into iQ. See *Creating an RMA On-line* on page C-4. Access for customers only.

- Call Qualcomm Enterprise Services Customer Support at (800) 541-7490 and request an RMA number.

Our web site provides customers with forms and the option for RMAs on-line. If you call QES Customer Support between 6:00 a.m. and 5:00 p.m. Pacific Time, Monday through Friday, you can be issued an RMA number over the phone.

Required Information

Before the RMA number can be issued, you need to provide Qualcomm with the following information.

Date. The date that you are sending the form to Qualcomm.

Customer Name and Contact. The name of the company that is requesting the RMA and the name of the person making the RMA request.

"Ship to:" Address. The complete address where the replacement component is to be shipped, plus the name of the person to whose attention the package should be addressed.

Delivery Priority. All replacements are **typically** shipped within 48 hours (two business days). If you require 24-hour delivery, you will need to include your shipper account number. (This is your FedEx or UPS account number.) The cost of shipping for 24-hour delivery will be billed to your shipper account number.

Return Code. The code that best describes the reason you are returning the unit. Frequently used codes include:

CD	**Customer Damage.** Any damage that occurred due to improper or negligent use of the equipment by the customer. Customer damage may be caused by an accident, incorrect installation, mishandling, or intentional abuse. A purchase order number is required in order to process a customer damage RMA.
DOA	**Dead on Arrival.** A component is considered DOA if it fails to function when taken out of the box at installation.
FF	**Field Failure.** A working unit that has failed in the field after installation.
OE	**Order Error.** Receipt of wrong parts or of parts not ordered.
SE	**Shipping Error.** The correct part was ordered but the wrong part was received.
UP	**Upgrade.** The return of a working unit for an upgraded model. Upgrades can be made to software or hardware. Use of this return code requires a contractual amendment and a purchase order number.

Truck or Vehicle Number. The number of the truck, tractor, or item on which the component was installed.

Unit ID (System Serial Number). The identification number of the mobile system which is required to verify correct ownership of the system. To find the number, press the **Down Arrow** key on the display screen and look for the Unit Serial Number, or read the serial number on the main communication unit. This number is also used to determine warranty status of the unit.

Part Number (Product ID/MCN). Due to the multiple variations of Qualcomm equipment, the part number—Material Control Number (MCN)—must be provided to ensure that the correct replacement part is shipped. Be sure to verify the part number by looking at the actual part being returned, not by checking a pre-defined parts list. For an MVPc™ unit, use the model number.

Failed Serial Number. A serial number (S/N) is required for each serialized component on an RMA. The major serialized components include:

- MCT Communication Unit, IMCT Antenna Communication Unit, TruckMAIL™ Mobile Messaging Terminal, OmniExpress® Terrestrial Communication Unit, T2™ Unit, Qualcomm MAS, Qualcomm TDM
- Outdoor Unit, Qualcomm SDM
- MVPc unit, DU/EDU, Qualcomm MDU
- Some PC components

The serial number decal is affixed to the component chassis. (Always include the leading zeros in a serial number.)

Replacement Serial Number. The serial number (S/N) of the unit that was installed to replace the failed part listed on the RMA. (Always include leading zeros in a serial number.)

Purchase Order. A purchase order (P.O.) number may be required when an item is customer damaged or when you are requesting an upgrade. Companies may also require a P.O. when products have an RMA at an authorized Qualcomm Service Center.

Failure Description. A complete description of the problem associated with the failed component. Please be specific. Qualcomm needs as much information as possible to effectively duplicate the failure, diagnose the problem, and repair the failed unit. It is better to give too much information than not enough information. Descriptions such as "Unit not operating" or "Not working" do not provide enough information.

Work Order (WO) Number (for Service Centers only). This number only applies if the repair is being performed at an authorized Qualcomm Service Center. If the repair is done at a service center, the shipped replacement unit will be sent to the service center instead of to the customer.

Creating an RMA On-line

Depending on the program you are using, you may create an RMA on-line. You can cancel the RMA at anytime during the procedure. You can also see a list of tips in various parts of the web site. This is for customers only.

1. Log on to *qes.qualcomm.com*. You will see the iQ web site.

2. Enter your name and password then click **Log in**.

3. Click the **Returns and Warranties** tab.

4. Click **Create an RMA**.

5. Follow the instructions provided on this web site.

RMA Policies

What to Return/Not Return

Normally, **all** failed equipment must be returned for repair or replacement. The following major system components **need to be returned:**

- MCT Communication Unit (Comm Unit)
- IMCT Antenna Communication Unit (ACU)
- TruckMAIL Mobile Messaging Terminal (MMT)
- OmniExpress Terrestrial Communication Unit (TCU)
- Qualcomm Mobile Application Server (MAS)
- Outdoor Unit (ODU)
- Qualcomm Satellite Data Modem (SDM)
- Qualcomm Terrestrial Data Modem (TDM)
- MVPc unit
- Display Unit/Enhanced Display Unit (DU/EDU)
- Qualcomm Media Display Unit (MDU)
- T2 Unit
- 7-Way tool
- Major PC components
- Any Dead on Arrival (DOA) component

There are a few **exceptions** to this policy. You are **not required to return** the following components **unless** they are Dead on Arrival.

• All cables

• Pager System Components (receiver, transmitter, and antenna)

• Panic Button

• Remote Message Waiting Light (RMWL)

• Buzzer/Switch Kit

• Antennas (i.e., GPS, cellular, or Loran)

• Dual Signal Multiplier

• MPG Display

• TrailerTRACS® Transmitter

• T2 external battery—DO NOT return to Qualcomm unless specifically requested by a Qualcomm representative. Proper disposal of defective or dead lead-acid batteries is the responsibility of the T2 owner/customer. Please dispose of defective or dead batteries at a local lead-acid battery recycling center.

• Qualcomm Remote Control Device (RCD)

• Qualcomm MAS battery—DO NOT return to Qualcomm unless specifically requested by a Qualcomm representative. Proper disposal of defective or dead lead-acid batteries is the responsibility of the Qualcomm MCP owner/customer. Please dispose of defective or dead batteries at a local lead-acid battery recycling center.

Any components that are found to be Dead on Arrival (DOA) within 90 days of shipment, including cables and antennas, must be returned to Qualcomm for failure analysis. If available, please provide the Lot Date Code for the defective component when you request the RMA. If possible, return the defective component in its original packaging.

Where to Return Equipment

Please return equipment to Qualcomm at the following address. Make sure that the RMA number is marked clearly on the outside of the box.

QUALCOMM Incorporated
5995 Pacific Center Blvd., Suite# 103
San Diego, CA 92121

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.

"Past Due" Equipment

Qualcomm's standard policy is to "advance replace" equipment when the RMA number is issued. This means that a replacement component will be shipped before the defective component is received at Qualcomm. Customers are responsible for returning the failed equipment to Qualcomm within fourteen (14) days after receiving the RMA number.

If the failed items are not received within this time period, Qualcomm may invoice the customer for the higher of the current price or the applicable spare part price for the component. In addition, customers with "past due" equipment will be notified that Qualcomm will discontinue its "advance replace" RMA policy and future RMAs will be considered "no advance replace." This means that a replacement component will not be shipped until the defective component is received at Qualcomm. When all the past due components are received by Qualcomm or paid in full, Qualcomm may resume advance replacement of failed equipment. Certain upgrade programs may be structured as no advance replace.

Customer-Damaged Equipment

Customer-damaged items are those which have been damaged as a result of improper or negligent use of the equipment. This can include accidental damage, incorrect installation, mishandling, or intentional abuse. Customer-damaged equipment must be identified at the time the RMA is requested.

If an RMA item cannot be repaired, it will be declared "scrap." The "scrap" determination will be made if the cost of repairing the item exceeds the cost of replacing it.

Types of damage that usually result in major system components being scrapped are crushed components; internal corrosion of components; fire damage to components; and cracked housing of components.

⚠️ *Caution*

Never open the Communication Unit; MAS; TDM; or ODU, ACU, and SDM antennas. Breaking the seal on these components voids their warranties, causing them to be treated as customer-damaged items.
(Exceptions to this include opening the Antenna radome for maintenance; opening the Communication Unit for EPROM upgrades; and opening the MAS to test or replace the battery.)

Missing, Lost, Stolen, or Destroyed Equipment

It is not necessary to obtain an RMA number for missing, lost, stolen, or destroyed equipment since nothing will be returned to Qualcomm. Replacements for missing, lost, stolen, or destroyed equipment should be ordered through Sales Administration as spare parts. P.O. numbers are required for all spare parts orders.

If the missing, lost, stolen, or destroyed equipment includes an MCT Communication Unit, IMCT Antenna Communication Unit, TruckMAIL Mobile Messaging Terminal, OmniExpress

Terrestrial Communication Unit, or Qualcomm Mobile Application Server and a replacement is not required, you should submit a "Fleet Size Reduction Request Form." This form is shown on the next page.

For Service Centers only: If equipment is missing at the time of installation, indicate this when you request equipment and you will be issued a Sale number instead of an RMA number.

Permanent Fleet Size Reduction Request Form

This form (shown on the following page) should be used to *permanently* decrease the size of your OmniTRACS® fleet in the event that a Comm. Unit is permanently lost, stolen, or destroyed. Submitting this form will ensure that your base message charges and extended maintenance billing (if applicable) are adjusted appropriately.

Permanent Fleet Size Reduction Request Form

To: Customer Support AdministrationFacsimile: (858) 658-1598

From:_____(Print Customer Name)

Phone number:_____Fax number:_____

_____

This form should be used only if you would like to **PERMANENTLY**** decrease your delivered fleet size. Your delivered fleet size is determined based on the number of complete systems, i.e., MCT, IMCT, TruckMAIL, OmniExpress, or Qualcomm MCP (collectively referred to as "Unit"), purchased and automatically increases incrementally with the purchase of each new Unit. The shipment of spare components, such as the shipment of an IMCT Antenna Communication Unit or a MCT Communication Unit (collectively referred to as "Hardware Messaging Units"), will not increase your delivered fleet size value. Your delivered fleet size value is used to calculate base message charges and extended maintenance charges (if applicable). If a customer does not notify Qualcomm by completing and signing this "Permanent Fleet Size Reduction Request Form," these charges per Unit will continue. You may reduce your fleet size if one of the following occurs:

A Hardware Messaging Unit (i.e., an MCT Communication Unit, an IMCT Antenna Communication Unit, a TruckMAIL Mobil Messaging Terminal, an OmniExpress Terrestrial Communication Unit, or an Qualcomm Mobile Application Server) is destroyed, stolen, or lost and you elect not to replace it via an RMA or a sales order for a spare Hardware Messaging Unit. In this situation, the salvageable components are put into spares stock.

A Unit (i.e., a complete system) is destroyed, stolen, or lost, and you elect to purchase a replacement Unit via a sales order, since the shipment of a Unit will automatically increase your delivered fleet size value.

A Component of a Unit (other than the Hardware Messaging Unit, i.e., Outdoor Unit, or MVPC) is destroyed, stolen, or lost and you want to accurately reflect the components currently existing in your fleet for warranty and/or extended maintenance purposes.

** NOTE: ONCE A FLEET SIZE REDUCTION REQUEST FORM IS SIGNED BY CUSTOMER AND RECEIVED BY QUALCOMM, THE COMPONENT(S) SET FORTH WILL BE PERMANENTLY REMOVED FROM QUALCOMM's NETWORK MANAGEMENT FACILITY COMPUTER AND WILL NOT BE RECREATED.

To PERMANENTLY decrease your fleet size, fill in the lower part of this worksheet and fax copies to Customer Support Administration using the above fax number. Qualcomm will contact you upon completion.

Customer:_____   Truck Number:_____

Communication Unit Serial Number (IMCT ID):_____

Equipment was ___stolen ___lost __destroyed ___other (please check one).

D

Upgrading the Qualcomm® MCP Using Secure Digital Cards

An MCP is normally upgraded with software by sending it over-the-air using satellite transmissions. However, there may be occasions when upgrades are necessary using secure digital (SD) cards, for example, when there is an operating system (OS) upgrade and when upgrades need to be performed very quickly.

Topics in this appendix provide specific instructions for checking the software versions installed on the Qualcomm® MCP and upgrading the MCP using SD cards.

For technical questions, contact Qualcomm Enterprise Services (QES℠) 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 MCP, the user interface screen displays.
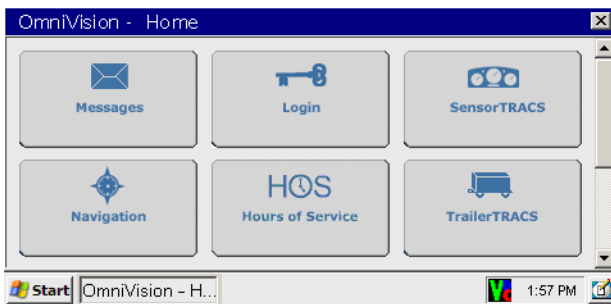
1. Scroll down to the **System** icon and touch the icon.
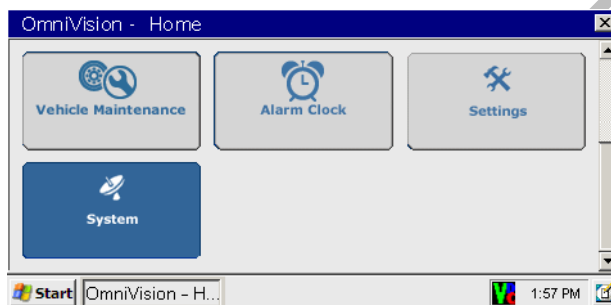
2. Touch the **System** tab to access system information about the MCP.

   • MAS, MAS Win OS, SDM, and MDU firmware version numbers are listed here.
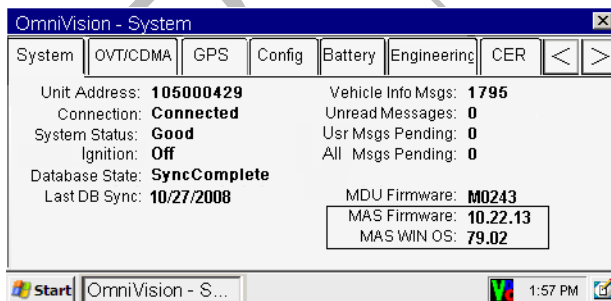
3. Touch the SDM tab to access the SDM version.
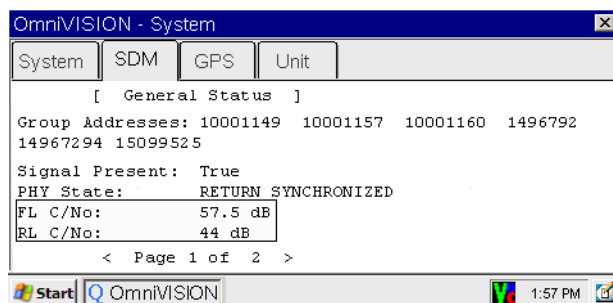
SD Card Instructions

- Most brands of SD card work with the MCP.
    - Use a 1 GB SD card to load software.
- The SD card must **always** be inserted into the SD card slot in the MAS with label side down/metal strips facing up.
- Organize files on the SD card so the MAS can read them.
    - Software is available on the iQ/iQSC website, or you can check with a Qualcomm representative for more information on where to get the software and how the files need to be organized.
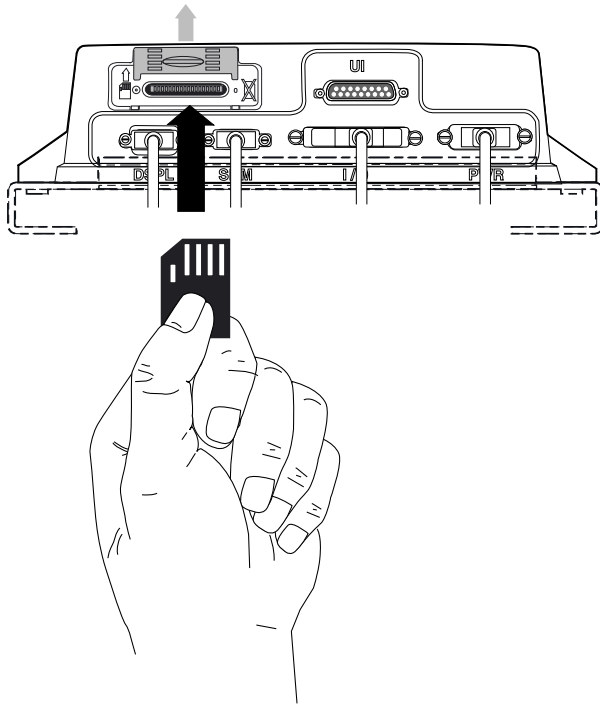
05AAA_222X5

Upgrading Only the MAS Software

MAS should be powered ON, ignition ON.

1. Insert MAS SW SD card into slot on MAS with label side down/metal strips facing up.
    - Soon after the MAS SW card is installed, the MDU screen will display, "Verifying component: xxx of XXY."
    - Approximately one minute after the SD card is inserted, the process writes data to memory and reboots itself.
    - Once the unit comes back up after the reboot, the MDU screen shows "Upgrading components: xxx of XXY." This takes about five minutes.

2. After the upgrade process finishes and the MDU screen shows the application icons or the driver warning screen, remove the SD card and confirm the upgrade is complete by checking the MAS software version on the System Information screen.
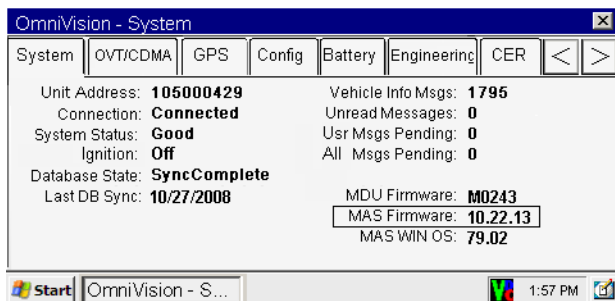
Upgrading the MAS Operating System and MAS Software

Note

If the MAS OS is upgraded, the MAS SW will also need to be upgraded. Before starting an upgrade, ensure you have SD cards for the MAS operating system and the MAS software.

1. You **must** disconnect power for 10 minutes or until all LEDs go out.

2. Insert the SD card labelled, MAS Operating System, with label side down/metal strips facing up.

3. Ensure the MAS internal battery is installed and connected.

4. Apply external power by connecting the power cable to the MAS. Vehicle ignition should be ON.

5. Normal upgrade indicators are:

- LED to the left of the SD card slot blinks green (downloading).
- LED to the right of the SD card slot is solid red.
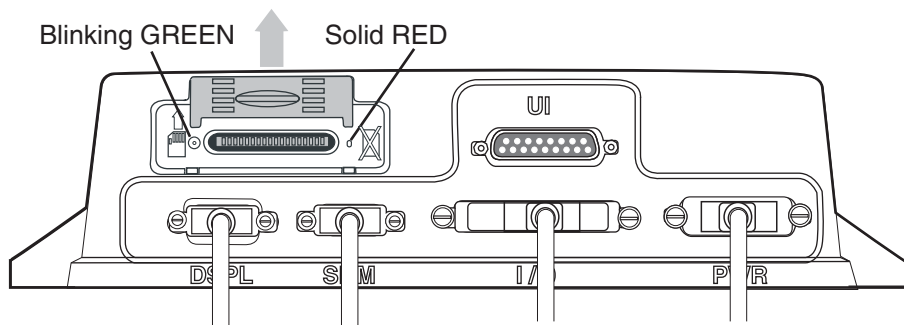
05AAA_222X1

- No MDU screens are typically available for this step.

6. Keep MAS OS SD card in slot until the right LED goes to solid green. When the right LED is solid green, the OS upgrade is complete. This should take about 3–5 minutes.

Do not remove MAS OS SD card until right LED displays solid green

Blinking GREEN   Solid GREEN
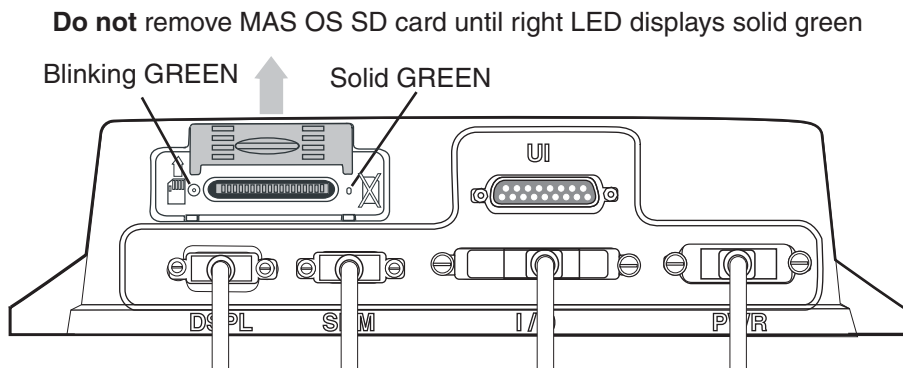
05AAA_222X2

7. Remove MAS OS SD card and quickly replace with MAS SW SD card, with label side down/metal strips facing up.

8. After approximately one minute, normal upgrade indicators are:

  • LED to the left of the SD card slot is blinking green.

  • MDU screen shows, PLEASE WAIT, LOADING.

9. Keep the MAS SW SD card in the slot until the MDU screen shows the application icons or the driver warning screen. When either of these appears, the upgrade is complete. Verify the software version on the System screen. This should take 10–15 minutes.

10. Remove the SD card and verify the S/W versions on the System screen.

Note

The S/W versions will not necessarily match those shown on the screen below.

OmniVision - System

| System | OVT/CDMA | GPS | Config | Battery | Engineering | CER | < | > |

Unit Address: **105000429**   Vehicle Info Msgs: **1795**
Connection: **Connected**   Unread Messages: **0**
System Status: **Good**   Usr Msgs Pending: **0**
Ignition: **Off**   All Msgs Pending: **0**
Database State: **SyncComplete**
Last DB Sync: **10/27/2008**   MDU Firmware: **M0243**
          MAS Firmware: **10.22.13**
          MAS WIN OS: **79.02**

Start   OmniVision - S...   1:57 PM
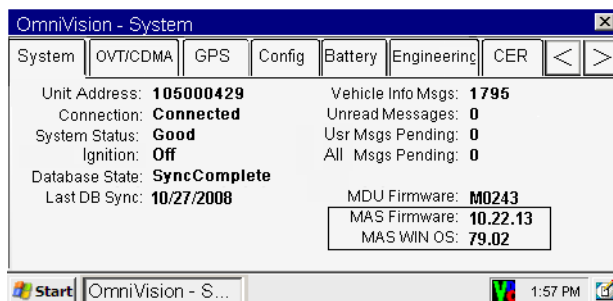
The upgrade is now complete.

Upgrading the SDM Software

1. Ensure the SDM is connected to the MAS.

2. Turn vehicle ignition to ON.

3. Insert SDM SW SD card into slot on MAS with label side down/metal strips facing up.

4. Wait approximately six minutes and then check the SDM software level.
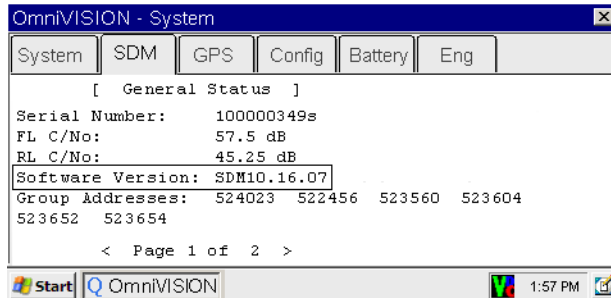
5. Once the SDM software version has updated, remove the SD card.

   The upgrade is now complete.

Upgrading the MDU Software

1. Ensure the ignition is ON.

2. Insert SD card into slot on MAS with label side down (metal strips facing up).

3. Approximately 30 seconds later, TTS advises:

   • "Setup card is supported. Please remove card and stand by."

4. Approximately 30 seconds later, TTS advises:

   • "Starting to display software update, this will take 5–10 minutes. Please do not turn off ignition."

5. Approximately 5–12 minutes later, TTS states:

   • "Display software update completed successfully."

6. Once the upgrade process is complete, you are returned to the last screen you were on before the upgrade began.
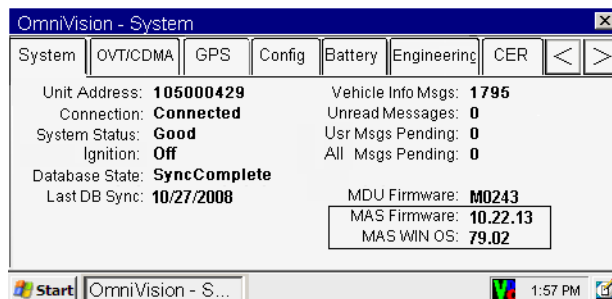
E
Preventive Maintenance Inspection

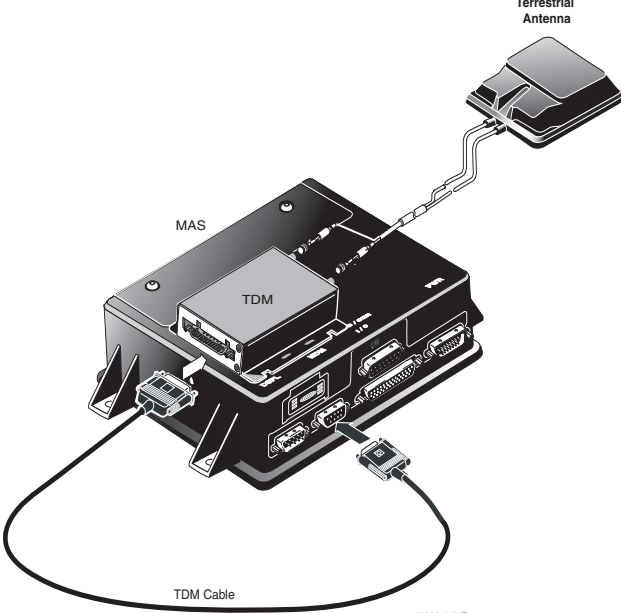Topics in this appendix provide steps for inspecting the mobile application server 200 (MAS200), the display interface unit 200 (DIU200), the wireless interface box 200 (WIB200), the optional satellite data modem (SDM), and the TrailerTRACS® system.

For technical questions, contact Qualcomm Enterprise Services (QESᔆᴹ) 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?

- Qualcomm® recommends inspections be performed at least **once every 90 days.**
- During normally scheduled vehicle preventive maintenance inspections.

Inspecting the Mobile Application Server 200 (MAS200)

05AAA_237A
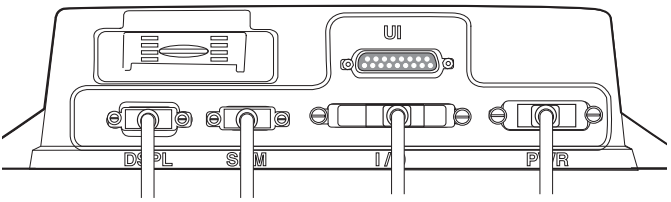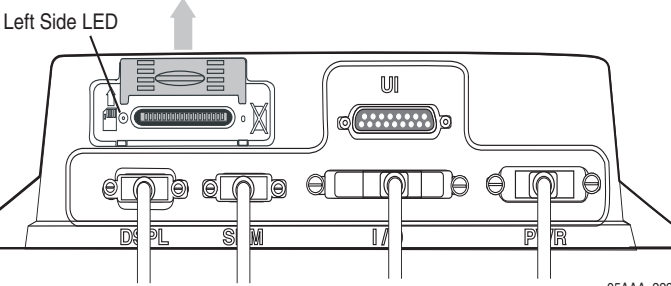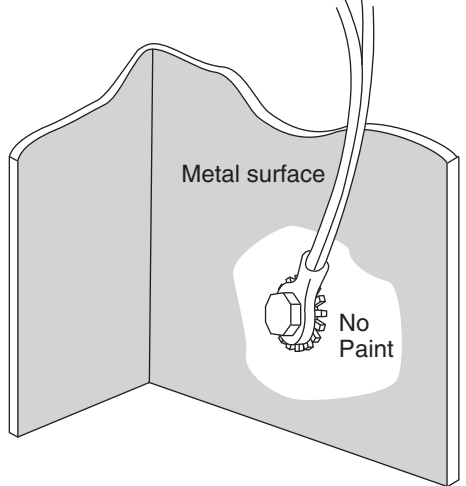
1. Make sure the compartment where the MAS200 is installed has at least 1 inch of air space on each side for cooling and at least 3 inches of space for servicing the backup battery.

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.
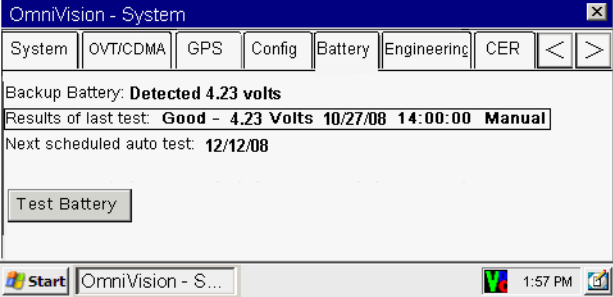
   ⚠️ **Caution**

   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.

05AAA_22	**6.** Make sure the cable connectors have not worked themselves loose from the MAS200. Hand tighten any loose connectors. ⚠ ***Caution*** *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 over-tighten.* *DO NOT apply grease to the connectors.*
05AAA_222	**7.** Check the left side LED indicator on the MAS200. Normally, the left side LED indicator will be blinking blue. Refer to Chapter 13 in the *Qualcomm® MCP 200 Series and Accessory Diagnostic Guide* for other LED states. **8.** Check to make sure the cables are stored securely with tie wraps and are stored out of the way.
	9. Check the power connections, such as at the power distribution panel, to ensure they are tight and the wiring is secure. 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. ⚠ ***Caution*** *Ground wires should not be connected to the MAS200 or mounting hardware.* 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.

10. Go to the Home screen and touch the **System** icon. Touch the **Battery** tab and touch the **Test Battery** button.
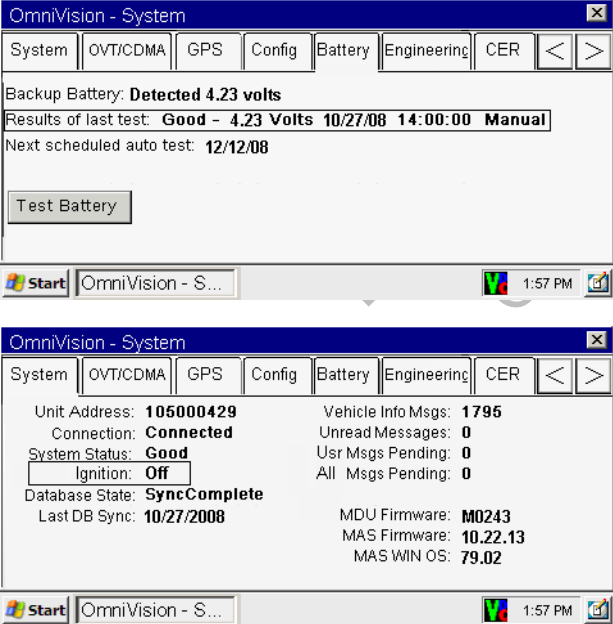
> **Warning**
>
> ⚠️ *It may take a few minutes to perform this test.*

Check the Results of last test and verify that the battery is Good.

- If the battery shows a failure, Bad—12000, go to Chapter 16 in the *Qualcomm® MCP 200 Series and Accessory Diagnostic Guide.*

Inspecting the Display Interface Unit 200 (DIU200)

1. Verify proper DIU200 operation:

- Turn IGN to the ON position and verify that the status is **Good.**
- Turn the IGN to the OFF position and verify that the status goes to **Ignition Off.**

2. Verify the DIU200 keys and screen are clean.

   Qualcomm 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 Qualcomm using the RMA process for proper cleaning.

3. Verify the display screen is readable in any lighting condition.
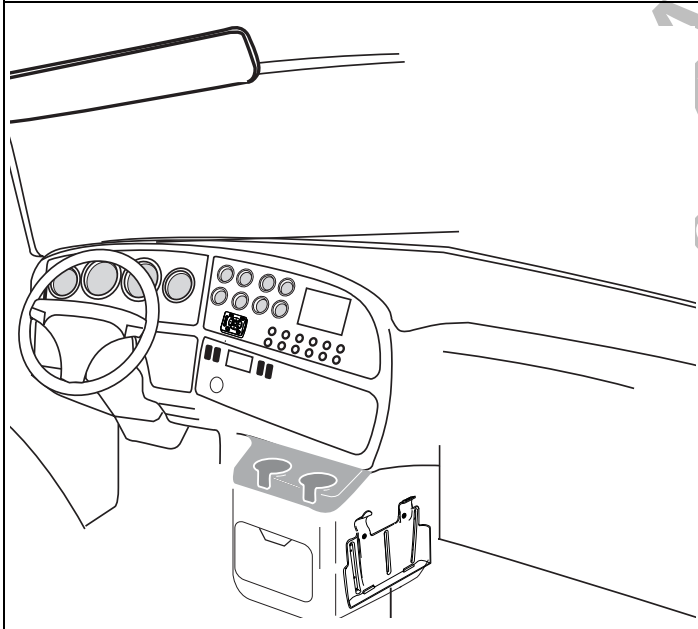
4. Make sure the display cable has enough slack and is not being rubbed or cut by anything inside the cab.

5. Remove the DIU200 from the holster and make sure the screws holding the holster in place are secure.

06AAA_001

05AAA_233
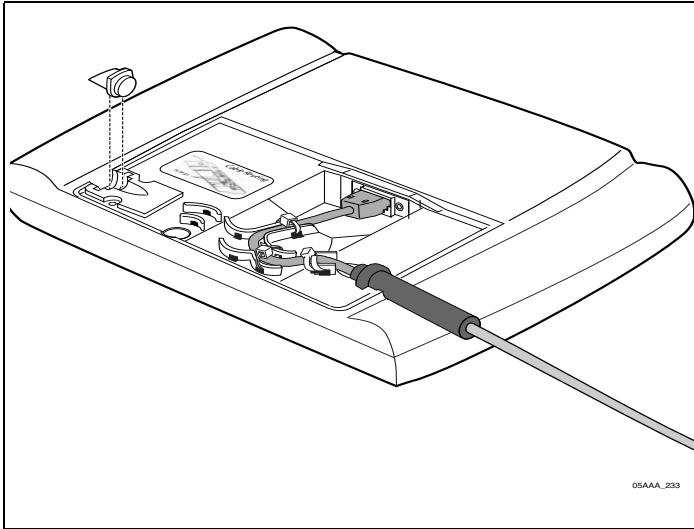
6. Inspect the underside of the DIU200 to make sure the tie wraps are securely tightened and the cable is not damaged.

The illustration to the left is the underside of the DIU200 showing the tie wraps.
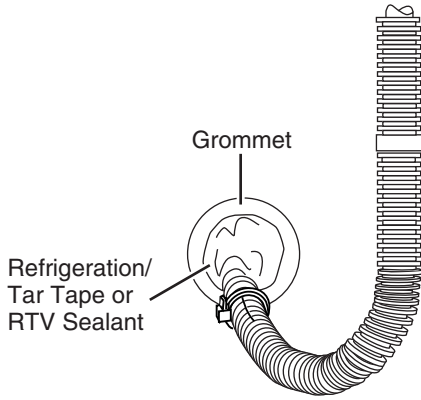
Inspecting the Wireless Interface Box 200 (WIB200) and the Optional Satellite Data Modem (SDM)

Terrestrial Antenna

Satellite Data Modem

Drip loops

Convoluted tubing

Cable tied to existing boomerang brackets

Rear View

05AAA_223DQMCP
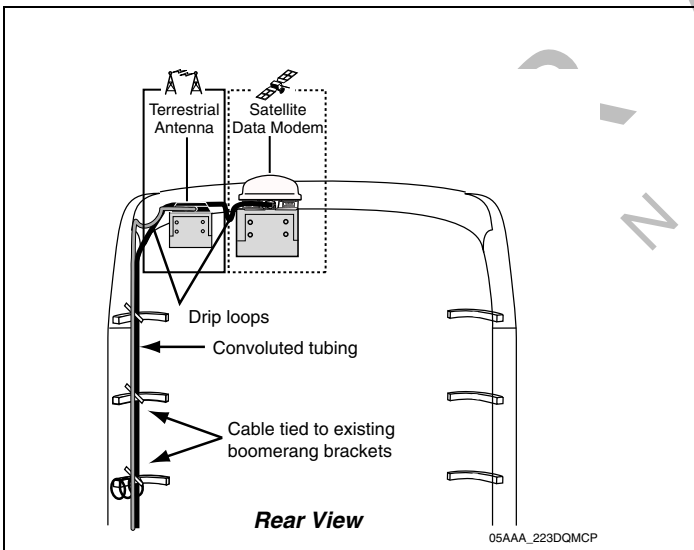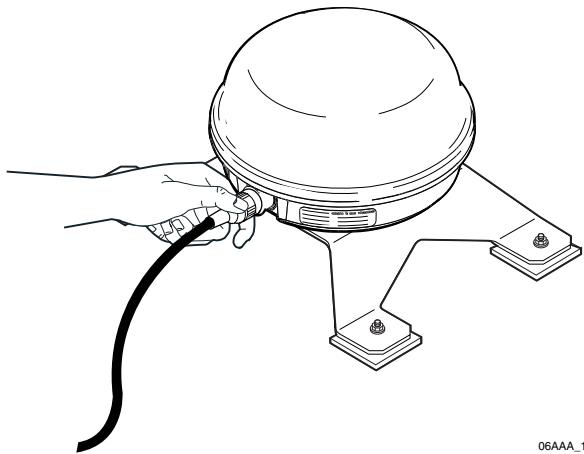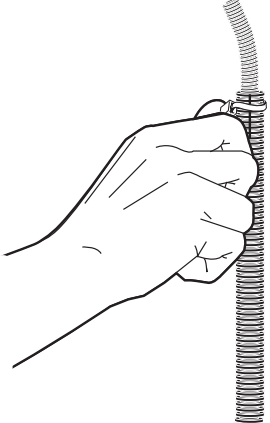
1. Make sure all cables are protected with convoluted tubing and are in good condition.
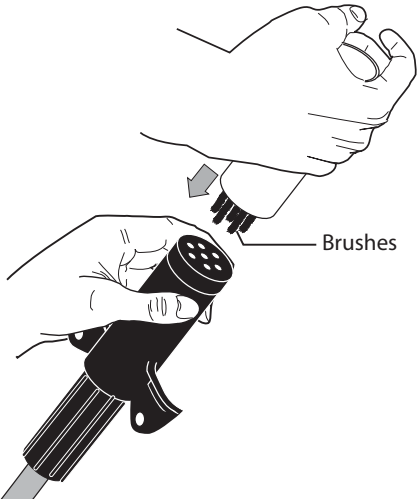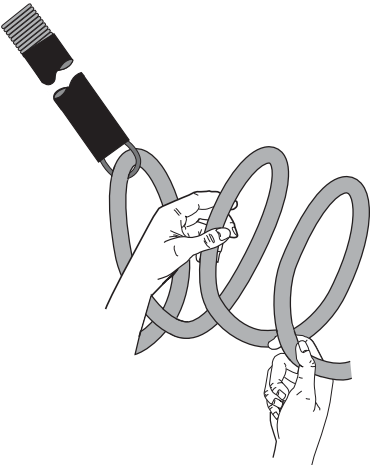
Make sure cables have no kinks or bends and are not being pulled tightly against metal edges that can rub or cut the cables.

2. Make sure there are adequate service (drip) loops in the cables at the antenna and where they enter the vehicle.

Grommet

Refrigeration/
Tar Tape or
RTV Sealant

3. Make sure grommets are in place around any holes the cables pass through.

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.

Go to step 4. if you are inspecting a terrestrial unit.

Go to step 6. if you are inspecting a satellite unit.

Terrestrial
Antenna

MAS

TDM

TDM Cable

05AAA_043_T

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.

Check that the antenna cable connectors have not worked themselves loose from the MAS200.

06AAA_127	**6.** 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. **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 **inch**/pounds (not foot/pounds). ⚠️ **Caution** *Do not use refrigeration/tar tape or RTV sealant on the SDM connector.* Go to step 8. to complete the SDM inspection.
Twist tie wrap between fingers to make sure it doesn't break.	**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.

Verifying TrailerTRACS® System Connections

Brushes

1. Make sure all 7-way connection points have been cleaned, inspected, and greased.

Qualcomm recommends that you use dielectric grease on the connection points.

2. Check the 7-way coil cord for nicks, cuts, or abrasions. Replace the cord as necessary.
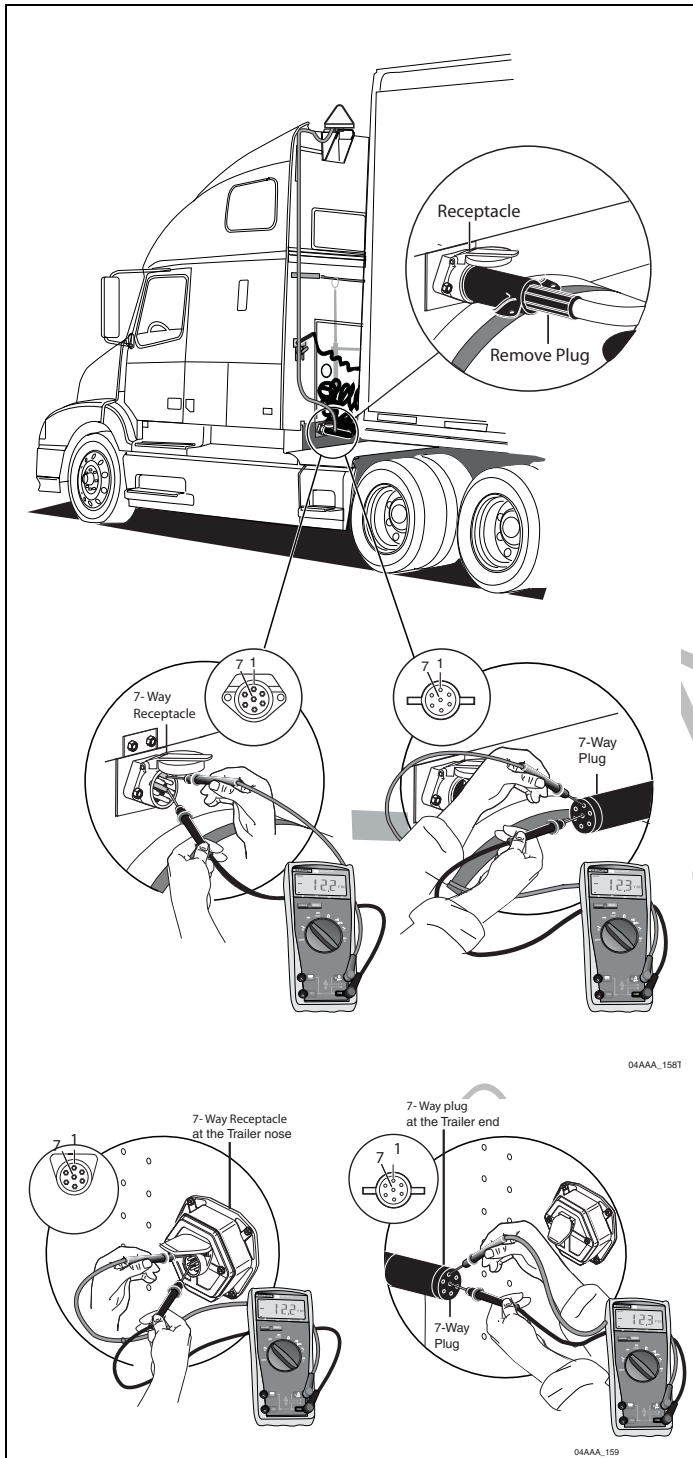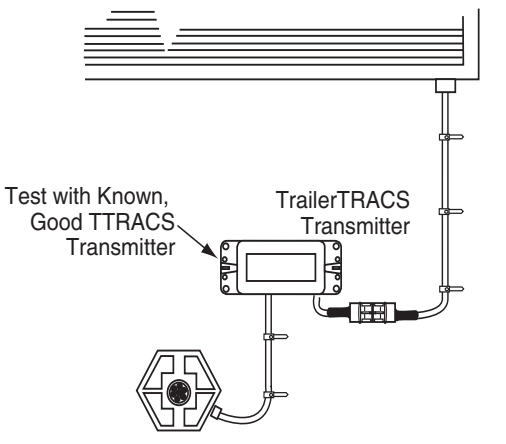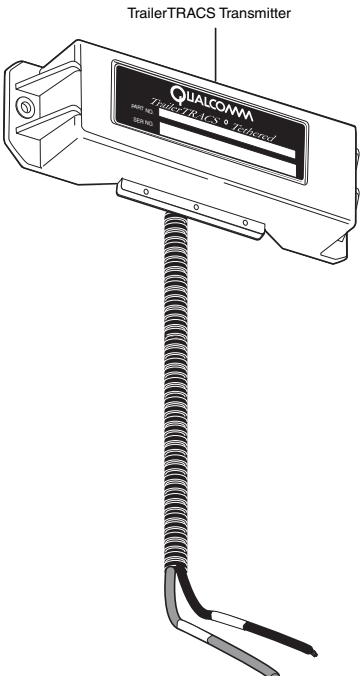
3. Make sure there is voltage (12–24V) on pin 7 at all 7-way connection points (on the tractor and trailer).

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.

Test with Known, Good TTRACS Transmitter ← TrailerTRACS Transmitter OM_E-0093-210goodxmtter.eps	**4.** Connect a test transmitter to the truck. **5.** Turn IGN to ON. **6.** Access the TrailerTRACS ID screen by selecting the **Trailer** icon and verifying that the transmitter's ID displays.
TrailerTRACS Transmitter **QUALCOMM** *TrailerTRACS® Tethered* PART NO. SER NO.	**7.** **For refrigeration customers**, do the following: • Inspect both ends of the refrigeration cable for corrosion and clean if necessary. • Turn IGN to ON. Verify the refrigeration connection and data transfer by accessing the Refrigeration Status screen. • 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.

F
Component and Document Information

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

For technical questions, contact Qualcomm Enterprise Services (QESSM) Customer Support. Customer Support is staffed 24 hours a day, 365 days a year:
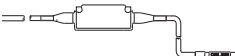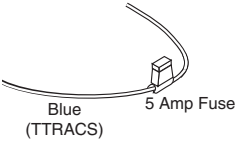
In the United States, call 800-541-7490
In Canada, call 800-863-9191

DCNs for Documents Referenced in this Guide

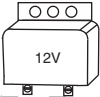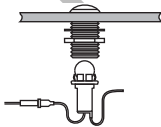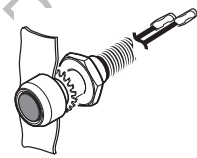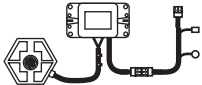| Document Name	DCN
Outdoor Unit Mount Installation Guide	TL80-6270-1
Qualcomm® MCP 200 Series and Accessory Diagnostic Guide	80-J9969-1
How to Use the Wireless Panic Button Remote Transmitter (Visor Card)	80-J6060-1
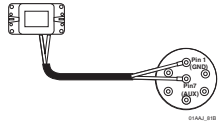
MCP200 System Component MCNs Referenced in this Guide

	System component	Illustration	Latest MCN	Alternate MCNs	Notes
	Satellite data modem (SDM)		10-J8278	10-J9490 (SDM2)	
	Flat antenna		CV90-J9496-20		
	Vertical antenna mount for flat antenna		10-J9485-1		
	Cone antenna		CV90-J1045-20		
	Vertical antenna mount for cone antenna		65-J2056-1		

System component	Illustration	Latest MCN	Alternate MCNs	Notes
Media display unit (MDU)		CV90-J4820-1		
Media display unit (MDU) holster		10-J8407-1		
Mobile application server (MAS)		10-J9313-8		
Backup battery		CV90-J4341-2		
Terrestrial data modem		CA90-J9400-x		
Remote control device (RCD)		CV90-J8640		
Terrestrial data modem cable		CV90-J9264-2		

System component	*Illustration*	*Latest MCN*	*Alternate MCNs*	*Notes*
Media display unit (MDU) cable		CV90-J4880-17		
Power cable		CV90-J4877-20		
Accessory cable (standard)		CV90-J9284-20		This cable is the standard cable.
Accessory cable (full function)		CV90-J8773-20		This cable is the full function cable.
Speaker switch cable		CV90-J4843-8		
CAN converter cable		CV90-J4843-8		
5 amp fuse (for TrailerTRACS®)		65-53011-1		

System component	Illustration	Latest MCN	Alternate MCNs	Notes
Reefer cable assembly with 6-pin Deutsch connector	N/A	45-J7857-6		For use with Thermo King refrigeration trailers
Reefer Cable Packard cable assembly with 3-pin connector	N/A	45-J7856-6		For use with Carrier refrigeration trailers
Reefer cable assembly with 5-pin Deutsch connector	N/A	45-J7854-6		For use with Carrier refrigeration trailers
Message waiting buzzer		65-3922-1		
Remote message waiting light		CV90-6414-1		
Panic button and cable		CV90-J1377-5		
Kit, Wireless Panic Spare XMTR Upgrade	N/A	65-J6070-1		
TrailerTRACS system for reefer		10-53481-2	10-52525-6	

System component	Illustration	Latest MCN	Alternate MCNs	Notes
TrailerTRACS system for dry van		10-53481-1	10-52525-4	

MCNs for Sealants and Lubricants Referenced in this Guide

Sealant	MCN
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 Qualcomm-recommended Torque Wrench Referenced in this Guide

Tool	MCN
Torque wrench for replacing the radome	800-01730-0017

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Flowchart Information	5	4	3	2	1
Graphics/pictures	5	4	3	2	1

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Step-by-step procedures	5	4	3	2	1
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Overall usefulness	5	4	3	2	1

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2. Please rate your level of agreement with the layout of pages in the manual:
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Glossary

44-Pin I/O Accessory Cable. *See* Full Function Accessory Cable and Standard Accessory Cable.

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

Black Box. *See* Mobile Application Server.

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 MCP cannot use the J1708/1587 data link for SensorTRACS® input. After sensor calibrations have been determined, the dispatch computer operator needs to send the calibration numbers to the MCP. *See* RPM Calibration and Speed/Distance Calibration.

CDU. *See* Compact Display Unit.

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.

Compact Display Unit (CDU). The user interface device that can be used to display the Qualcomm-provided navigation application for the Qualcomm MCP system.

Configuration Screen. This screen shows how the MCP is configured. The System icon (satellite dish) takes you to this screen; then press the Config 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 media display unit (MDU) to the mobile application server (MAS).

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

Full Function Accessory Cable. Connects the mobile computing platform (MCP) to the J1708/1587 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, SensorTRACS system, TrailerTRACS**®** system, panic button, TTS, RCD, Printer, Scanner, CDU, Axle, RPM, and PTOP/PTOC. See Appendix A for details on pinouts.

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

GPS. *See* Global Positioning System.

GPS Screen. The display unit screen shows the status of the mobile computing platform (MCP) satellite positioning. The System icon (satellite dish) takes you to this screen; then press the GPS tab.

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

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

Installer Screen. MCP screen that displays information you will need to check the SensorTRACS parameters. This screen can be accessed in the SensorTRACS application at the Installer tab.

J1708/1587 Network. The MCP 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 MCP 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 MCP that "tells" it to understand input from the J1708/1587 bus and define driving thresholds.

J1939 Network. The MCP 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 MCP has been set up to look at J1939 data via the J1939 data link. The dispatch computer operator must send a message to the MCP that "tells" it to understand input from the J1939 bus and define driving thresholds.

Line-of-Sight Requirement. The 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°.

MAS. *See* Mobile Application Server.

Material Control Number (MCN). The Qualcomm part number.

MCN. *See* Material Control Number.

MCP. *See* Mobile Computing Platform.

MCP Serial Number (Unit Address). Located on the connector plate of the mobile application server (MAS). The MCP System screen also has this information.

MDU. *See* Media Display Unit.

Media Display Unit (MDU). The standard display unit for the Qualcomm MCP. It consists of a keyboard and color TFT LCD display.

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

Mobile Application Server (MAS). The mobile application server contains the operating circuitry and memory for the MCP system. The unit does not require operator access. It is always installed on a mounting tray. The MAS is commonly referred to as the black box.

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

• Mobile application server (MAS)

• Display unit and its holster

• Terrestrial data modem (TDM) **and** Terrestrial Antenna **or** Satellite Data Modem (SDM)

• 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 QUALCOMM, Inc., in San Diego, CA.

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 (MCP) has lost contact with the data satellite and is searching for the satellite signal.

Odometer Screen. The mobile computing platform (MCP) display unit screen that displays the life-to-date (LTD) value and sensor calibration information. This screen can be accessed in the SensorTRACS application at the Odometer tab.

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

- Compact Display Unit (CDU)
- Panic button
- Printer (product of O'Neil Product Development, Inc.)
- Remote message waiting light
- Remote message buzzer
- Scanner (product of BCS Solutions)
- Vehicle information systems (SensorTRACS system and TrailerTRACS system)

OVT/CDMA Screens. These screens show the strength of the wireless communication network signal being received. The System icon (satellite dish) takes you to these screens; then press the OVT/CDMA tab.

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

Positioning System. *See* Global Positioning System.

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

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

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

Qualcomm Enterprise Services (QES℠) 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.

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 110.

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

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 (MAS) 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.

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

SD Card. *See* Secure Digital Card.

SDM. *See* Satellite Data Modem.

SDM Screens. These two screens show the various attributes of satellite signal strength. The System icon (satellite dish) takes you to these screens; then press the SDM tab.

Secure Digital (SD) Card. A small card that fits into a slot in the mobile application server and allows the driver to upgrade the Qualcomm MCP over-the-air and load applications.

SensorTRACS System. An accessory of the Qualcomm MCP that allows companies to collect vehicle trip and performance data.

Software Version. *See* MCP System 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.

Standard Accessory Cable. Connects the mobile computing platform (MCP) 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, SensorTRACS system, TrailerTRACS system, panic button, TTS, RCD, Printer, and Scanner. It does not support wiring for the CDU, Axle, RPM, PTOP, or PTOC. See Appendix A for details on pinouts.

Status 10000/10001. Occurs when the terrestrial data modem (TDM) 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 (MAS) problem.

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

System Parameters Screen. The screen that displays information you will need to verify the speed and RPM calibrations.

System Screen. The Firmware Version screen displays the different software versions (and hardware versions) installed in the MCP. The System icon (satellite dish) takes you to this screen; then press the System tab.

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

TDM. See Terrestrial Data Modem.

Terrestrial Antenna. Communicates with the PCS receiver for data transmission and the GPS receiver for positioning information.

Terrestrial Data Modem (TDM). This is the wireless modem that connects the antenna to the MAS.

Terrestrial Data Modem Cable. The TDM cable connects the TDM to the mobile application server.

Text-to-Speech (TTS). A feature of the Qualcomm MCP 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 MCP 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 MCP 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 MCP 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 MCP 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 MCP that "tells" it to understand input from the traditional sensors and define speed and RPM.

TrailerTRACS System. An optional Qualcomm MCP feature that allows dispatch to monitor trailer connects and disconnects. The TrailerTRACS system can also monitor the refrigeration unit of the trailer.

TTS. *See* Text-to-Speech.

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

Vehicle Information Systems (VIS). *See* SensorTRACS system and TrailerTRACS System.

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