Omnitracs
a Qualcomm company

Mobile

MCP100 Diagnostic Guide

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Safety Definitions

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

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

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

Safety Advice

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

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

If you are an Installer, do not locate the display unit, including third-party devices, where it obstructs the driver's field of vision, distracts the driver from the driving task, or interferes with the driver's operation of controls or 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 Omnitracs equipment. Applications should not require the driver to divert his attention from the road while driving a vehicle.

1
How the MCP100 Works

Topics in this chapter provide a basic overview of the MCP100 and how its components interact to send and receive information.

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

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

Note

This guide combines satellite and terrestrial MCP100 information and diagnostic procedures. Most of the information is applicable to both versions. Where appropriate,

 *indicates satellite only*

 *indicates terrestrial only*

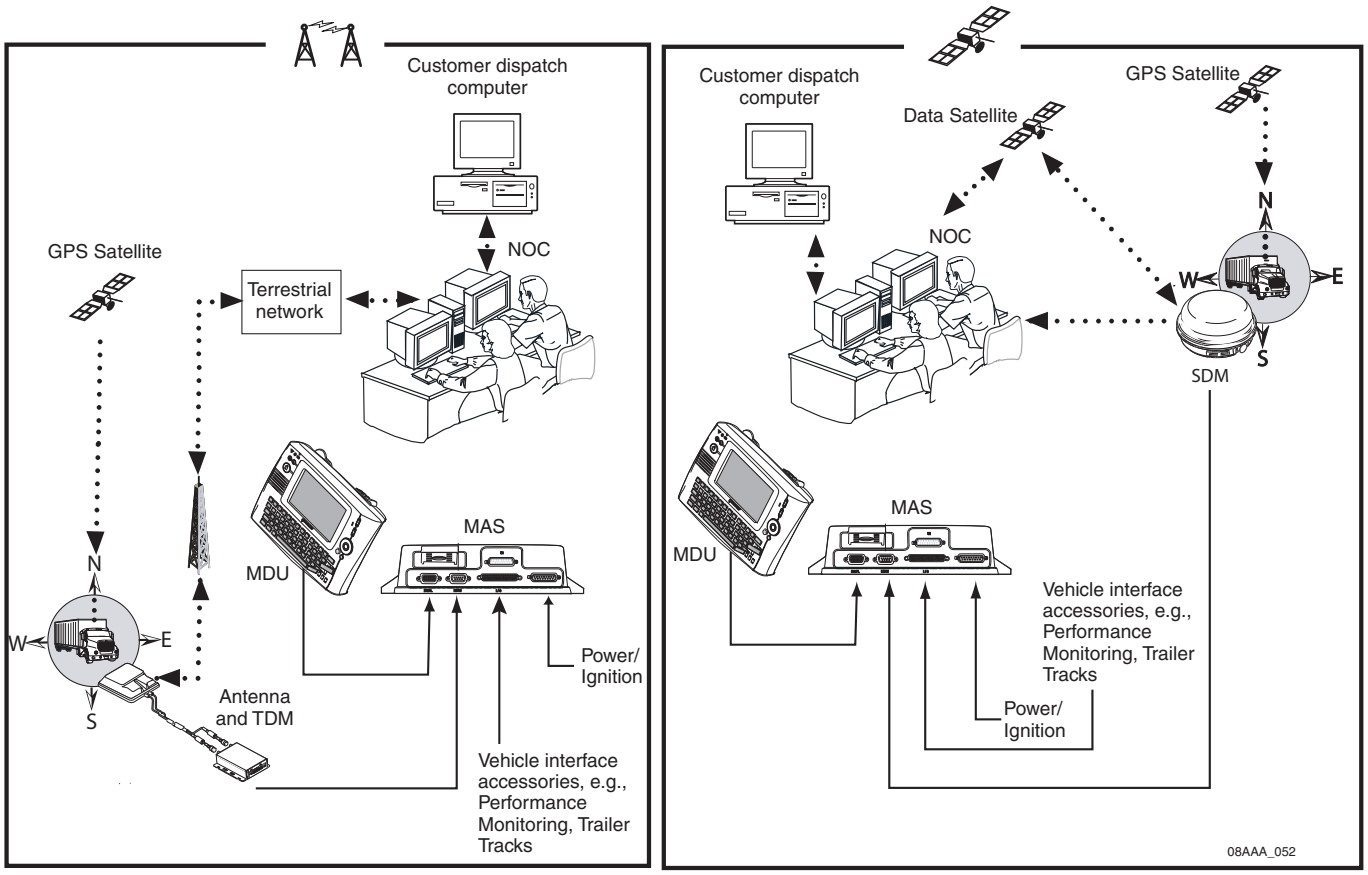
MCP100 Overview

- Provides two-way, mobile information transmission and other value-added services.
- Provides vehicle location and performance data including, hours of service, navigation, inter-state operations, safety and accident prevention, and optimization of fuel management.
- Terrestrial and Satellite versions

Why the MCP100 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 MCP100 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.
- Omnitracs media display unit (MDU) offers enhanced capabilities, such as touchscreen and color graphics for an easy to understand user interface which reduces training time.
- 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.

MCP100 Component Description



Component	*Description*
Network Operations Center (NOC)	• Responsible for processing and managing information traffic between dispatch center and fleet. • Within the NOC is the Network Management Computer (NMC), which receives and handles information traffic. • Located at Omnitracs in San Diego, CA.
Omnitracs Dispatch Software (QTRACS® software)	• Software on the trucking company's dispatch computer and dispatcher's interface with the MCP100. • Allows dispatcher to send and receive information, request MCP100 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 and QTRACS Portal customers communicate via the NMC over the Web.

 Code Division Multiple Access (CDMA) Wireless Network	• Radio frequency (RF) signals are received from the antenna by the MCP100 via the terrestrial data modem (TDM) from a wireless communication network, which varies depending on geographic location.
 Data Satellite	• Handles all two-way message information between the vehicle and the NMC.
GPS Positioning Satellites	• Uses 24 satellites to provide vehicle positioning information.
Mobile Computing Platform 100 (MCP100)	• Driver's interface with the Omnitracs platform and the component that resides in the vehicle. • Allows the driver to send and receive information.

Data Satellite and GPS Network

Data Satellite

- Located approximately 22,300 miles over the equator at 83° west longitude (south of Georgia).
- Uses Ku-band signals to handle all two-way information traffic between the vehicle and the NMC.
- Sends the information along the forward message link to the MCP100.
- Receives the information back from the driver along the return message link.

What Is the 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 MCP100.

How the MCP100 Uses GPS

- MCP100 receives positioning data from the GPS receiver, which is integrated inside the antenna to determine location.
- NOC receives position data from the MCP100 whenever information is sent to a vehicle and acknowledged, and whenever a driver sends information 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 MCP100 at any time.

CDMA Wireless Network and PCS

- Terrestrial MCP100 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.

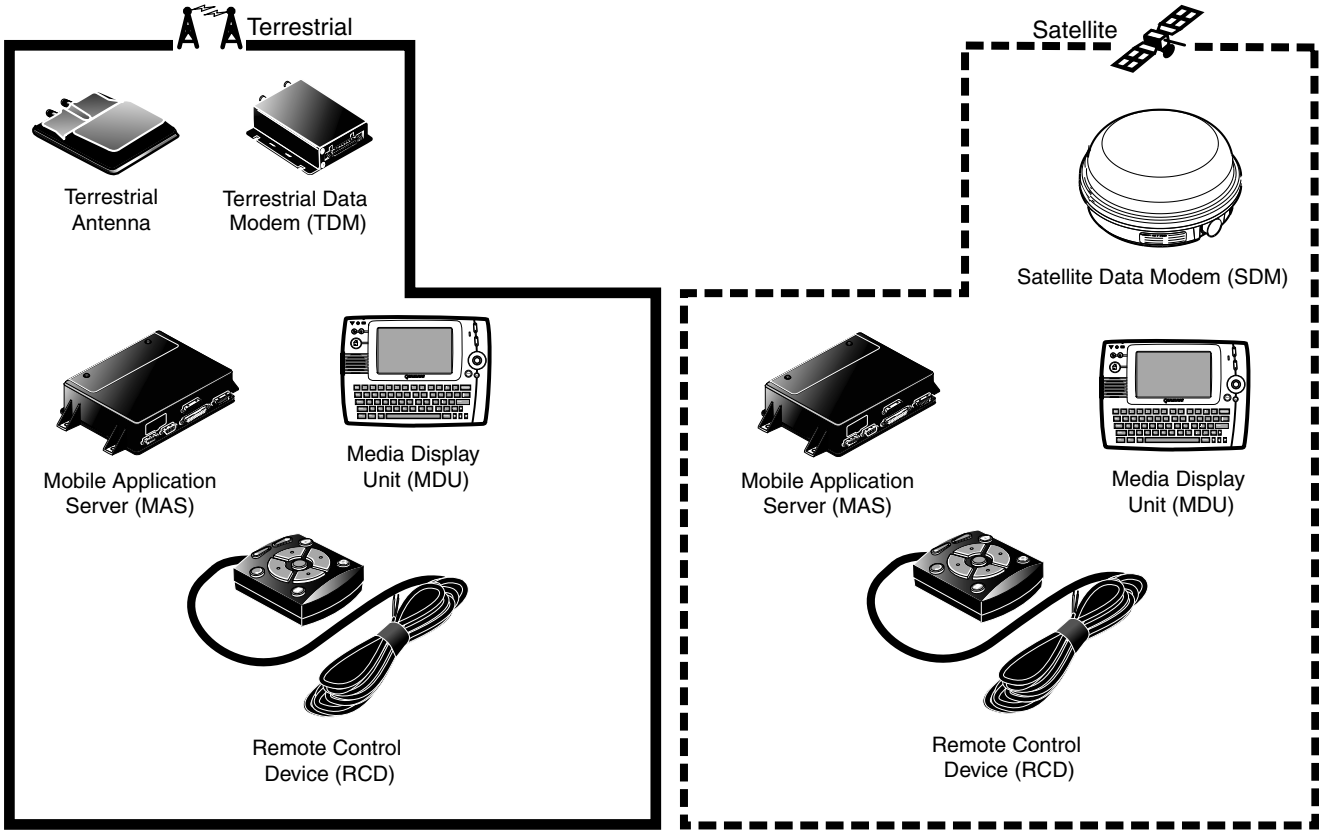
How the Terrestrial MCP100 Uses PCS

- MCP100 includes the MAS, which consists primarily of a microprocessor, a wireless modem module (TDM), and data storage.
- The user interface device is the driver’s display terminal that enables the driver to read, write, and send messages.
- Antenna is responsible for relaying information between dispatch and the driver.
- Antenna receives and transmits wireless information to and from the MAS.
- Antenna interfaces with local wireless networks. Information is collected at the PCS gateway and obtained by the Omnitracs NOC where it is distributed to the dispatch center. Dispatchers respond by sending information back to the Omnitracs 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.

What Is the MCP100?

- Mobile part of the Omnitracs platform installed in a customer’s vehicle.
- Provides the driver with the ability to exchange information with the dispatch center.
- Sends vehicle location information to the NOC.
- Each MCP100 has its own unique unit address which is the serial number on the MAS. This address is used by the NMC to route information to the correct vehicle. The unit address for a particular vehicle changes if the MAS in the vehicle is replaced.
- MCP100 operator, typically the driver, uses the display screens for creating, sending, and reading messages; system verification; and troubleshooting.

- Consists of these components:
  - Satellite data modem (SDM)—Contains the antenna that transmits with the satellite and GPS receiver.
  - Antenna—Interacts with the PCS and GPS receiver.
  - Terrestrial data modem (TDM)—Connects the antenna to the MAS.
  - Mobile application server (MAS)—Unit which contains the operating circuitry and memory for the MCP100. The “black box” of the platform.
  - Media display unit (MDU)—Standard display unit for the MCP100, which the driver uses to interact with the dispatcher. Consists of a keyboard and a color touchscreen LCD display.
  - Remote control device (RCD)—Small keypad that allows the driver to safely listen to incoming messages without having to stop the vehicle and read the message(s) on the display.



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2
Read This First...

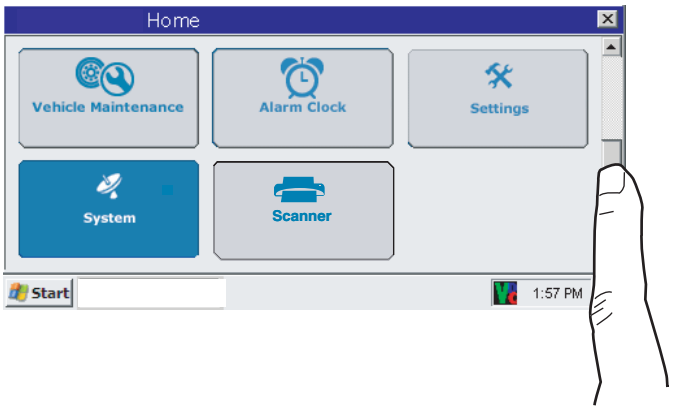
Topics in this chapter provide troubleshooting concepts and ideas. Read this chapter before you proceed to other chapters in this manual.

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

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

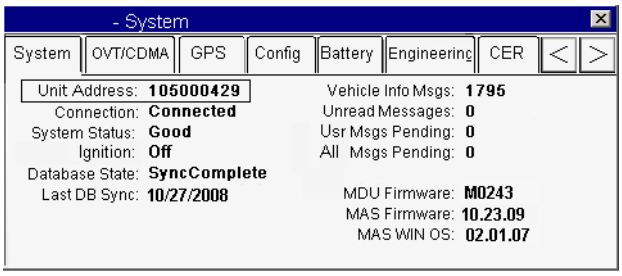
How to Find the MCP100 Unit Address (UA)

Before you call Customer Support for assistance, write down the serial number of the MAS.

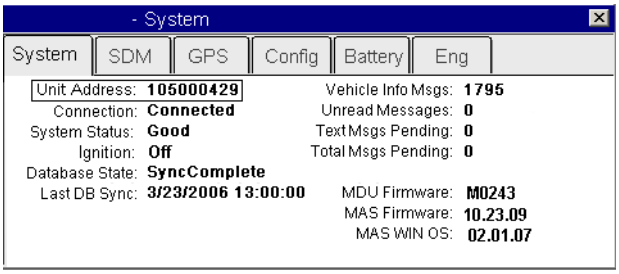


To view the MCP100 unit address on the media display unit (MDU):

- Tap the **System** icon.

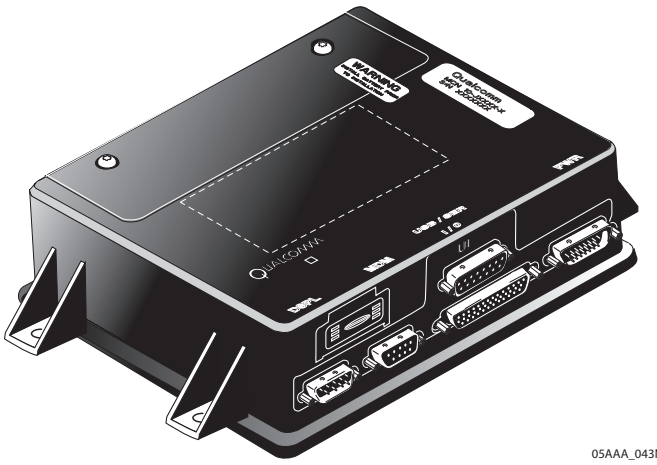


- Tap the **System** tab.



To view the MCP100 unit address (serial number—S/N) on the MAS

- You will find the S/N on the label.



Troubleshooting Guidelines

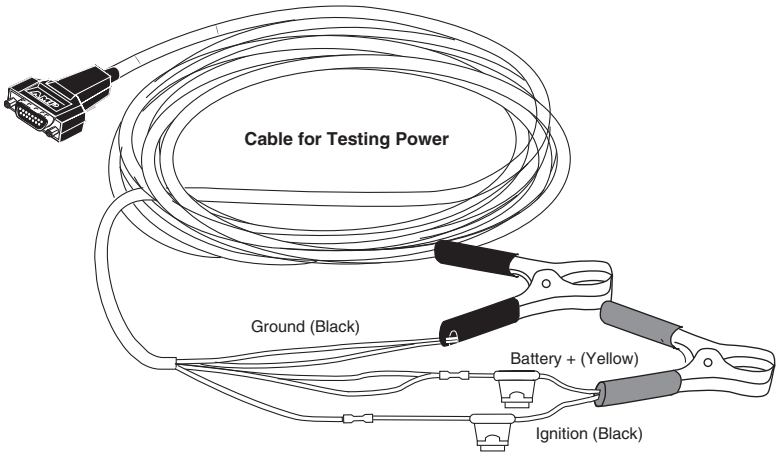
Keep Known Good Omnitracs MCP100 Component Spares in Shop

Spare parts should include:

- Mobile application server (MAS)
- MAS backup battery
- Terrestrial data modem (TDM)
- Antenna and antenna cable
- Satellite Data Modem (SDM)
- Media display unit (MDU)
- Power cable
- Accessory cable
- TDM cable
- SDM cable
- Remote control device (RCD)
- Display cable
- Power source (either a 12 volt battery or 12 volt power supply)
- Speaker switch cable
- Speaker
- Accessory items

To test for power and ground, use a power cable with large alligator-style clips on a test cart or the tractor. If you want to bypass the installed power cable, use the test cable connected to the tractor batteries:

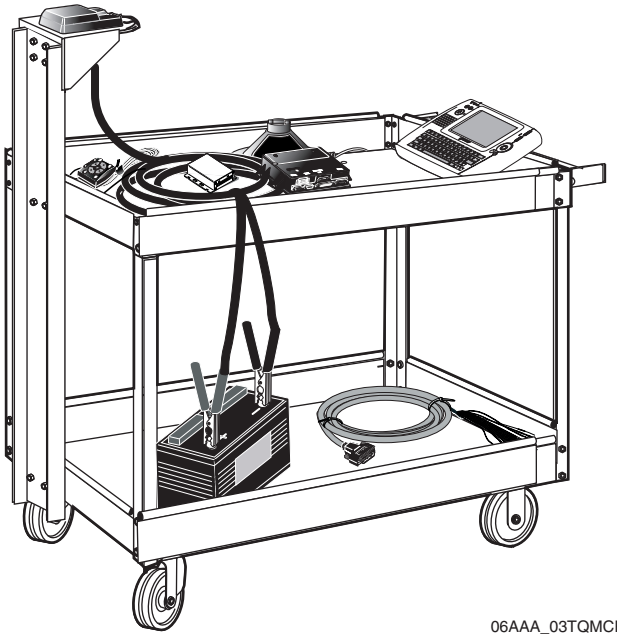
- Place one alligator clip on the ground (BAT RTN) and the other alligator clip on the power and ignition wires (BAT + and IGNITION).



Use a Test Cart to Perform Bad Part Verification/Double Checking

If a MCP100 part is diagnosed bad on a truck, insert the failed part on the test cart.

- If it continues to fail, the RMA process should be utilized to replace the part.
- If the suspect part does not fail on the test cart, further troubleshoot the MCP100.



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Perform a Visual Inspection of the Installed MCP100

- Check for damaged cables, improper grounds, improper electrical connections, loose butt splices, and the integrity of the installation, particularly the antenna.
- Bad mounts can contribute to system problems.
- Loose antenna connections or an antenna not installed properly can allow excessive vibration which can affect system performance.
- Airdams with multiple layers of fiberglass, metallic logos, or metallic/lead based paints, and other devices such as metal wings can affect system performance.

Reseat All Cables

- Always inspect and reseat cable connectors prior to replacing any components.
- Inspect for corrosion and bent, broken, pushed, missing pins, and/or sockets.

Verify MAS and TDM LED Indicators Are in Normal States

- MAS LED on the left side is blinking blue and MAS LED on the right side is off.
- TDM LED on the left side is blinking green and TDM LED on the right side is off.
- See Chapter 14 for more information.

Check System Voltage Measurements and Grounding

Use the same ground reference that a particular circuit uses.

- Check the MAS light indicators.
- Verify that vehicle battery and cables are in good condition.
- Check voltages (see Appendix A for more information):
  - Power cable: you must use pin 8, 14, or 15 as the ground reference.
  - Display cable: you must use pin 1 or 8 as the ground reference.
  - Antenna cable: you must use pin L as the ground reference.
- Verify grounds:
  - Run a jumper lead between the power cable ground connection and the battery negative (-) terminal.
  - Make sure the fastener is tight and the metal is free of paint or corrosion.
  - Make sure the grounding point is well-connected to the vehicle chassis ground or to the negative terminal of the battery.

Replace Only Faulty Parts

Typically, only one part is bad. Once the system is operating, you can substitute suspect parts back into the system to verify which part is bad, or use a test cart equipped with known good spare parts to retest suspect parts.

Install Parts Correctly

Refer to the *MCP100 Installation Guide*.

Determine If the Problem Is Intermittent

The MCP100 can display fault codes that appear on the System screen of the display. Many status codes have a corresponding number that indicates the Bad status has cleared itself.

- Bad or loose electrical connections including cable connectors, ring terminals, butt splices, and power/ground connections can contribute to intermittent system performance.
- Cables that run under the tractor are subject to harsh weather and road debris which can impact performance.

Use Service Writer's Questionnaire and Keep Vehicle Maintenance Records

Use the "Service Writer's Questionnaire" on the following page and record all maintenance performed on each tractor.

Omnitracs MCP100 Service Writer's Questionnaire

Driver/Operator Section:

MCP100 ID:
Truck #:
Model/Make:

Reported Problem:

❏ NO SIGNAL light on or flashing
❏ Can't send messages (NO SIGNAL light on)
❏ Can't send messages (NO SIGNAL light off)
❏ Can't receive messages (NO SIGNAL light off)
❏ Performance Monitoring
❏ Trailer Tracks asset management
❏ System Status code displayed_____
❏ Display screen not clear
❏ Unit doesn't turn off
❏ Missing/Broken keys_____
❏ Display chirps constantly
❏ Display touchscreen not working
❏ Text-to-speech not working correctly
❏ Sticky keys (list) _____
❏ Not positioning or inaccurate positions
❏ Database not "SyncComplete"
❏ Does not have macros_____
❏ Other/Comments:_____
_____

Problem Occurs When:

❏ Wiggling cables
❏ Hitting bumps
❏ All the time
❏ Vehicle startup
❏ Raining
❏ Specific location_____
❏ Moving in a certain direction_____
❏ At cold/hot temperatures
❏ Other/Comments:_____

Length of Problem Seen:

❏ day(s)
❏ week(s)
❏ month(s)
❏ Since installed on date: _____

How Often Does It Occur?:

❏ Sometimes
❏ Continual problem

Miscellaneous Information:

_____

_____

_____

_____

_____

3
Preventive Maintenance Inspection

Topics in this chapter provide steps for inspecting the mobile application server (MAS), the media display unit (MDU), the terrestrial antenna and terrestrial data modem (TDM), the satellite data modem (SDM), and Trailer Tracks asset management.

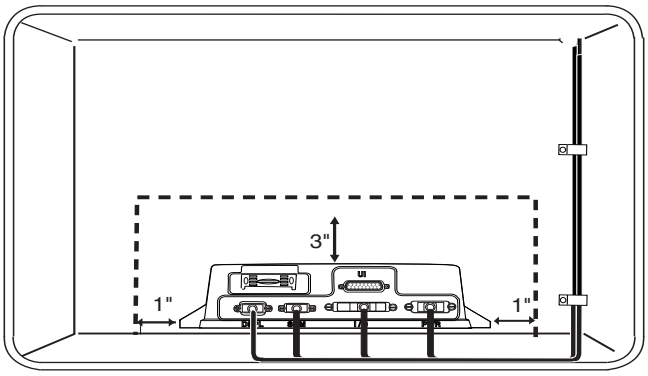
For technical questions, contact Omnitracs Customer Support.
Customer Support is staffed 24 hours a day, 365 days a year:

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

How Often Should Inspections Be Performed?

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

Inspecting the Mobile Application Server (MAS)



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1. Make sure the compartment where the MAS 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.

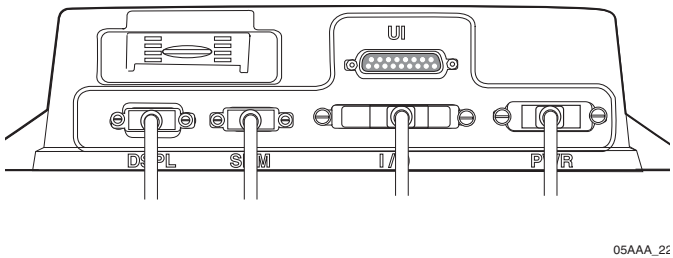
3. Make sure tire chains, tools, and other equipment are not stored on top of the MAS.

4. Make sure the mounting hardware holding the MAS in place is tight and does not allow the MAS to vibrate.

   Caution

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

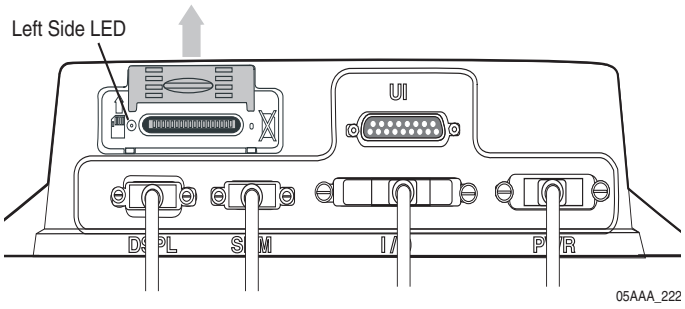
5. Make sure the MCP100 display unit, TDM, power, and accessory cables coming into the compartment have enough slack and are not pulling on the MAS connectors. Make sure the cables are not being chafed or cut by sharp edges. Inspect for proper strain relief.



6. Make sure the cable connectors have not worked themselves loose from the MAS. Hand tighten any loose connectors.

Caution

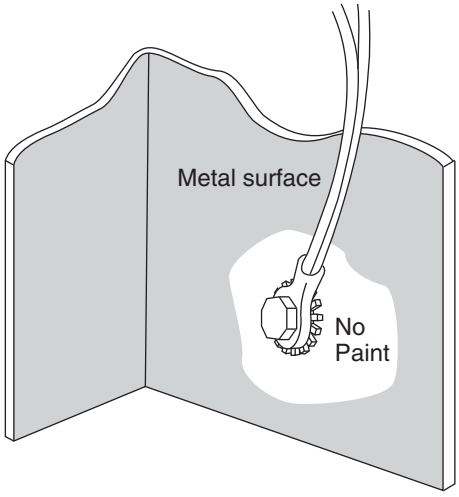
ONLY hand-tighten or use a small screwdriver on the connectors.
DO NOT use a pneumatic tool or pliers to tighten the connectors as this could damage the screws or the MAS mounting tabs.
DO NOT over-tighten.
DO NOT apply grease to the connectors.



7. Check the left side LED indicator on the MAS. Normally, the left side LED indicator will be blinking blue.

Refer to Chapter 13 in this 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.



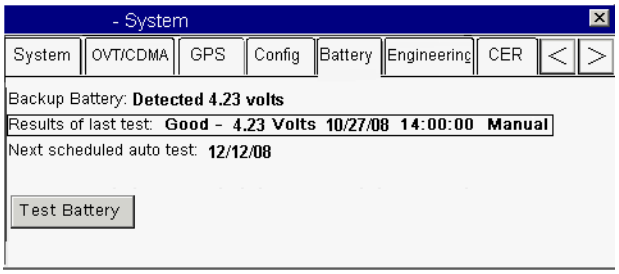
9. Check the power connections, such as at the power distribution panel, to ensure they are tight and the wiring is secure.

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 MAS 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 tap the **System** icon. Tap the **Battery** tab and tap the **Test Battery** button.

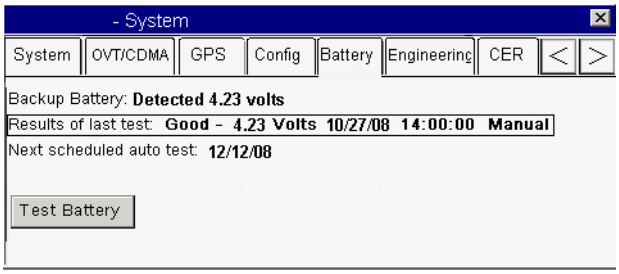
Warning

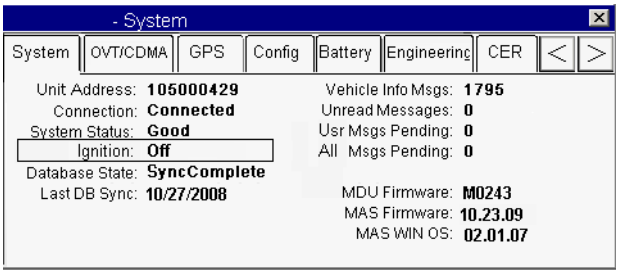
It may take a few minutes to perform this test.

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 this guide.

Inspecting the Media Display Unit (MDU)





1. Verify proper MDU 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.**

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2. Verify the MDU keys and screen are clean.

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

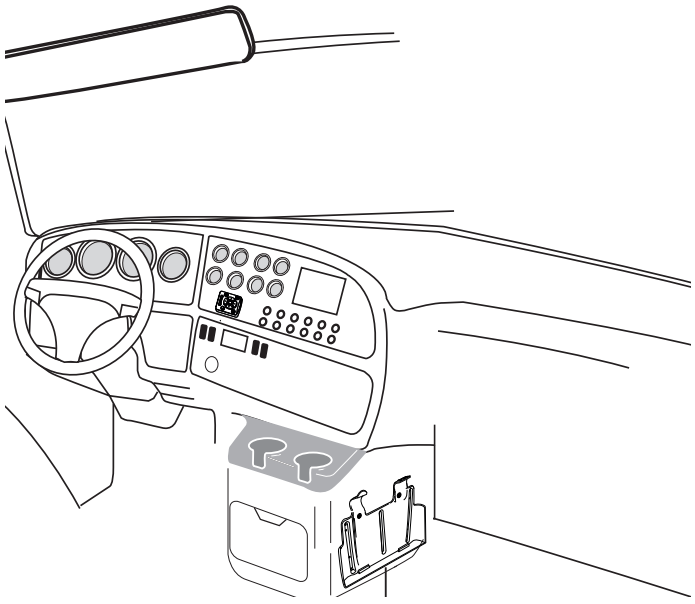
Caution

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

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

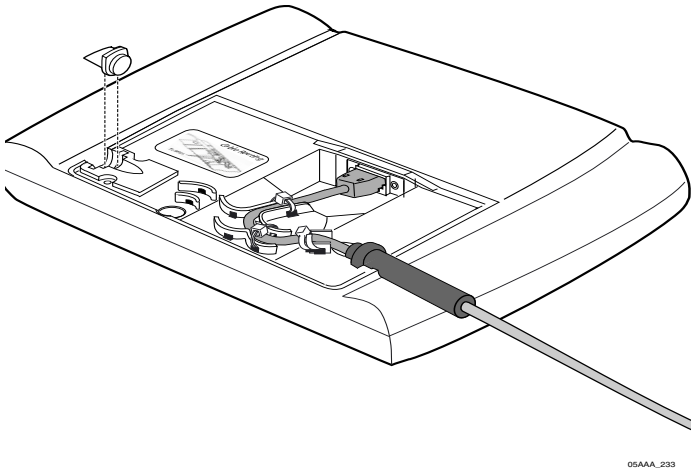
3. Verify the display screen is readable in any lighting condition.

4. Check the MDU screen protector. If the screen protector is warn, scratched, or damaged, it can degrade the performance of the MDU touch screen. To replace the screen protector see *Replacing the MDU Screen Protector* on page 3-6.



5. Make sure the display cable has enough slack and is not being rubbed or cut by anything inside the cab.

6. Remove the MDU from the holster and make sure the screws holding the holster in place are secure.



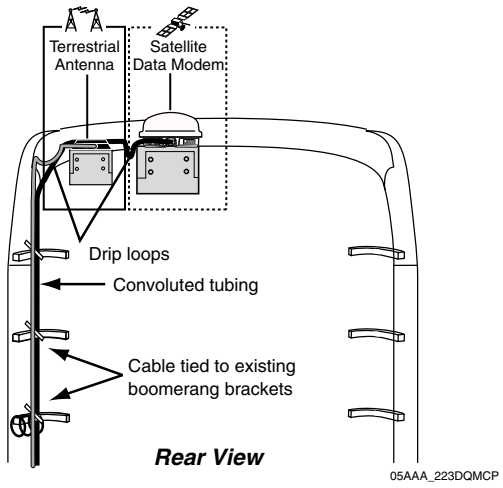
7. Inspect the underside of the MDU to make sure the tie wraps are securely tightened and the cable is not damaged.

The illustration to the left is the underside of the MDU showing the tie wraps.

Replacing the MDU Screen Protector

If the screen protector is worn, scratched, or damaged, it can degrade the performance of the MDU touch screen. The MDU screen protector can be replaced (see *Appendix E: Component and Document Information*). To replace the screen protector, lift it by the corner and pull away from the MDU screen. Carefully clean the MDU screen with a clean, water-based moist towelette. Never spray water directly onto the screen. Remove the backing of the replacement screen protector. Align the protector with the top right most edges and apply. Use the towelette to squeegee any air bubbles trapped between the MDU screen and the newly applied screen protector.

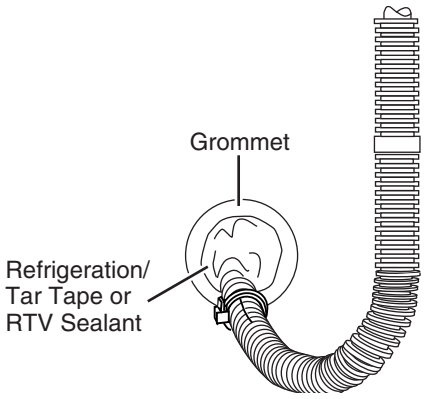
Inspecting the Terrestrial Antenna and TDM, and the Satellite Data Modem (SDM)



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.

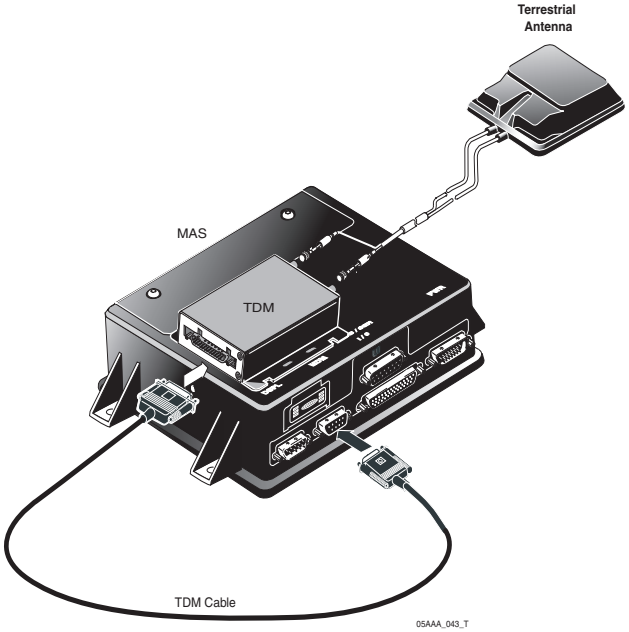


3. Make sure grommets are in place around any holes the cables pass through.

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.

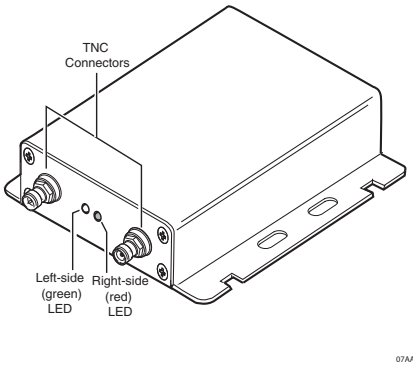
Go to step 4. if you are inspecting a terrestrial unit.

Go to step 7. if you are inspecting a satellite unit.



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.

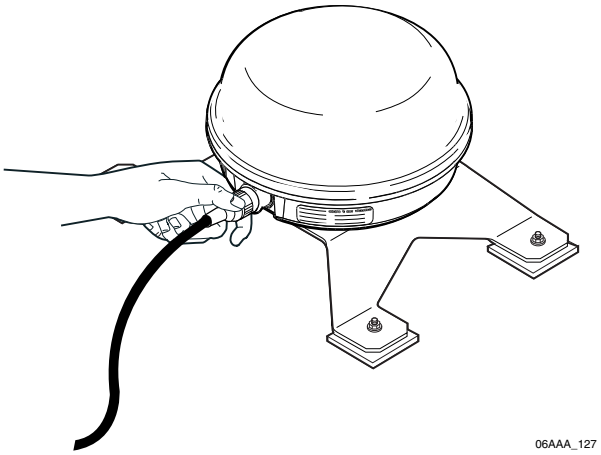
5. Check that the antenna cable (TNC) connectors have not worked themselves loose from the TDM and that the TDM is securely attached to the MAS.



6. Check the TDM lights. Normally, the left-side LED will be blinking green and the right-side LED will be off.

Refer to Chapter 9 in this guide for other TDM light states.

Go to step 9. to complete the terrestrial antenna and TDM inspection.



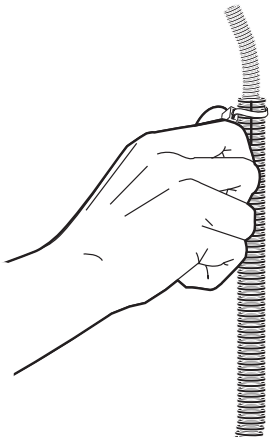
7. Make sure the SDM is securely attached to the SDM mount. Check the mount hardware to make sure it is secure and does not show any signs of loosening.

8. Twist SDM collar 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.

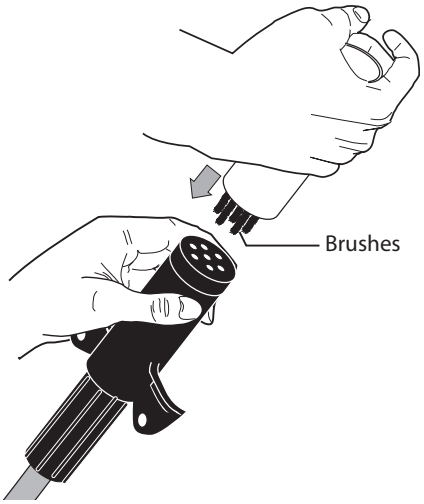
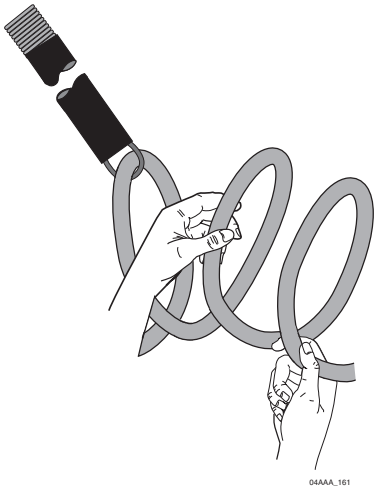
Go to step 9. to complete the SDM inspection.

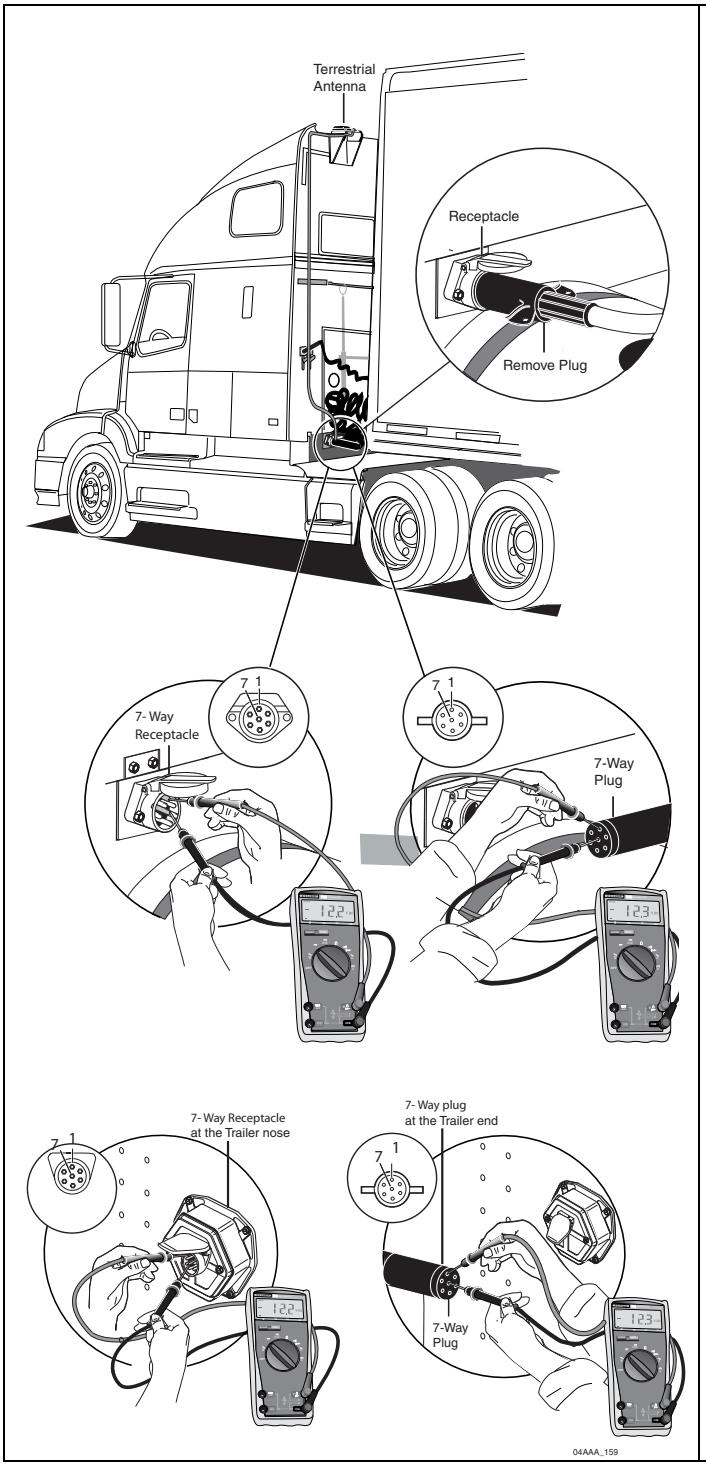


Twist tie wrap between fingers to make sure it doesn't break

9. 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 Trailer Tracks Asset Management Connections

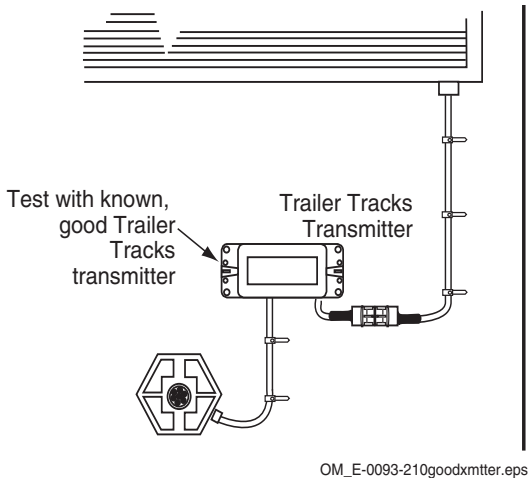
	**1.** Make sure all 7-way connection points have been cleaned, inspected, and greased. Omnitracs recommends that you use dielectric grease on the connection points.
	**2.** Check the 7-way coil cord for nicks, cuts, or abrasions. Replace the cord as necessary.



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

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

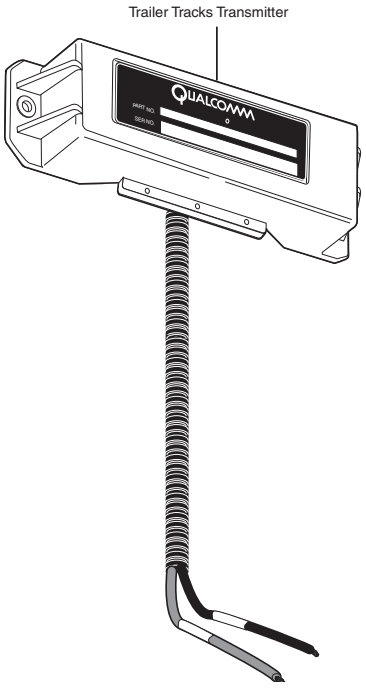
The illustrations at left show the connection at the tractor and at the trailer.



4. Connect a test transmitter to the truck.

5. Turn IGN to ON.

6. Access the Trailer Tracks ID screen by selecting the **Trailer** icon and verifying that the transmitter's ID displays.



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.

4
System Verification

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

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

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

For verifying Performance Monitoring, Trailer Tracks asset management, and other accessories, see the appropriate chapter in this manual.

Note

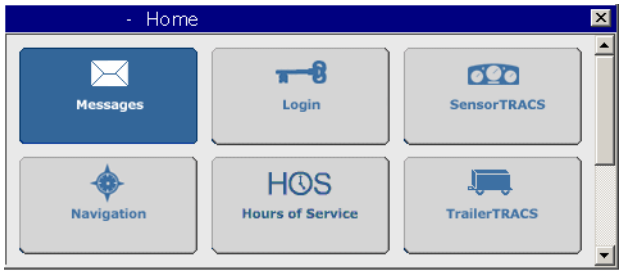
*GPS is required for **both** satellite and terrestrial networks.*

What Is Basic MCP100 System Verification?

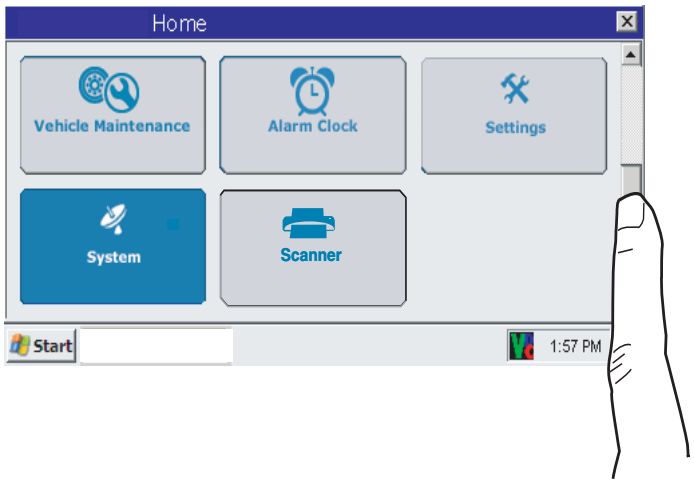
- A functional system check that should be performed after installation or service to verify that the MCP100 is operating properly.

MCP100 Display Unit Screens

- Shortly after you power up the MCP100, the Home screen displays.
- Tap the different icons to access information.

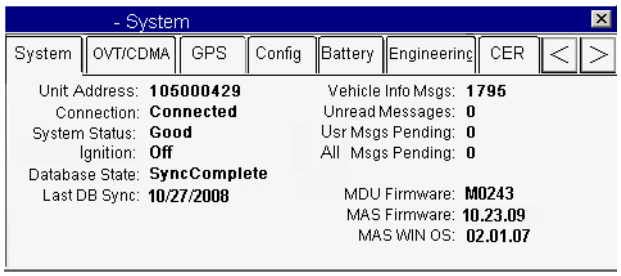


- Before you perform the system verification procedure, you may find it helpful to become familiar with the commonly used display unit screens.
- System verification information has been stored on screens/tabs under the **System** icon.
- Scroll down to the **System** icon and tap the icon to access the display screens shown on the following pages.



MCP100 System Screen

- Tap the **System** tab to access system information about the MCP100.

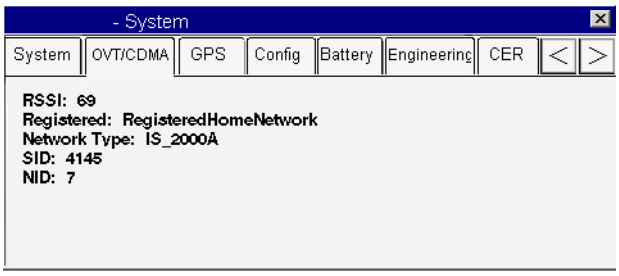


Field	*Description*
Unit Address	• Also called the UNIT SERIAL NUMBER. • Shows the mobile unit ID, e.g., 105000xxx. • Tells the dispatcher the correct address for sending messages to the vehicle. • If the MCP100 is replaced, this field will display a different address.
Connection	• Indicates whether the link within the terrestrial data modem (TDM) is transmitting properly. • Indicates whether the link within the satellite data modem (SDM) is transmitting properly.
System Status	Indicates the MCP100's operational status: • Good is displayed if the MCP100 is operating properly. • A numerical error code (e.g., 10000) is displayed if the MCP100 detects a problem. • Refer to the appropriate section in this guide for troubleshooting procedures. • 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 MCP100's database status: • SyncComplete is displayed if customer and mobile unit information has been received by the MCP100 and is up-to-date. This is the desired state. • Out of Sync is displayed if the mobile unit information has not been received by the MCP100 and is waiting to be updated.
Last DB Sync	Indicates the date of the most recent SyncComplete status for the MCP100.

Field	Description
Vehicle Info Msgs	Indicates the total number of messages the MCP100 has received from the electronic control module (ECM) since the ignition was turned ON.
Unread Messages	• Indicates the number of messages that the MCP100 has received but have not been read. • This number increases as the MCP100 receives new messages, and decreases as they are read.
Usr Msgs Pending	Indicates the number of text messages the MCP100 has in the queue to be sent.
All Msgs Pending	Indicates the total number of all messages the MCP100 is currently sending.
MDU Firmware	Indicates the software version currently installed on the media display unit (MDU).
MAS Firmware	Indicates the software version currently installed on the mobile application server (MAS), e.g., 10.23.09.
MAS WIN OS	Indicates the Windows operating system currently installed on the MAS.

MCP100 OVT/CDMA Screens

- Tap the **OVT/CDMA** tab to access antenna information about the MCP100, such as signal strength.
- There are five OVT/CDMA screens, which you navigate by touching the screen and then using the arrow keys to move from screen to screen.

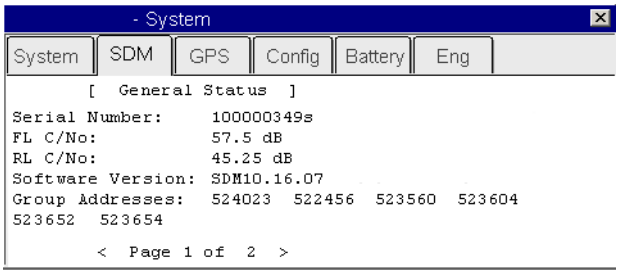


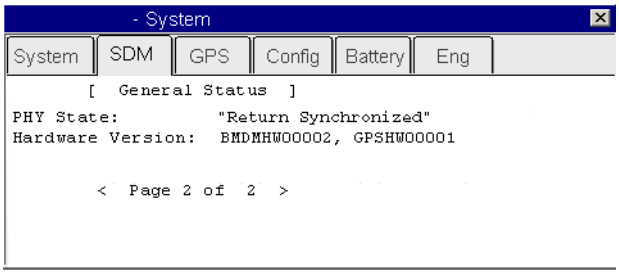
Field	Description
RSSI	• Received Signal Strength Indication—The strength of a wireless communication network signal being received by the antenna during forward link acquisition to the wireless network provider. • RSSI should be less than 105.

Registered	• MCP100 terrestrial system checks network coverage every 3 minutes. • If the unit is within the RegisteredHomeNetwork, 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.

MCP100 SDM Screens

- Tap the **SDM** tab to access antenna information about the MCP100, such as signal strength.



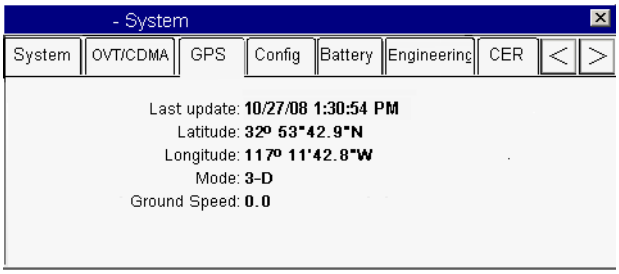


Field	***Description***
Serial Number	The serial number of the SDM.
FL C/No	• Signal strength received from the data satellite (the forward signal). • Typically, values should be greater than 50.
RL C/No	• Signal strength received at the NOC from the MCP100 (the return signal). • Typically, values should be greater than 33.

Software Version	Indicates the firmware version currently installed on the SDM.
Group Addresses	• Shows the group ID to which the MCP100 is assigned. • Also shows other groups to which the MCP100 is a member. • Numbers are defined and used by the dispatcher to address the fleet or groups of MCP100s.
PHY State	Indicates the physical state of the antenna, where “Return Synchronized” is normal.
Hardware Version	Indicates the SDM hardware version.

MCP100 GPS Screen

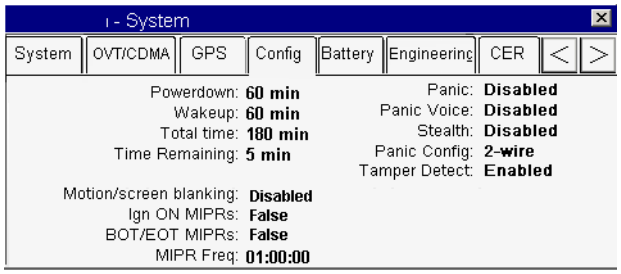
- Tap the **GPS** tab whenever you want to see basic GPS information.
- GPS is required for initial communication.



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 MCP100’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.

MCP100 Config Screen

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

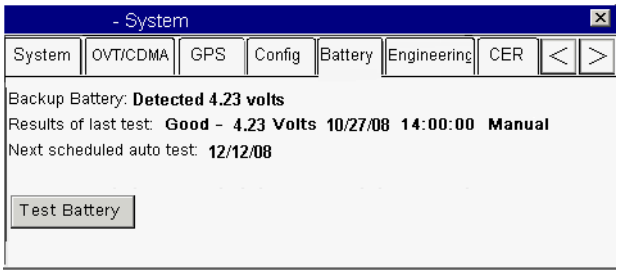


Field	***Description***
Powerdown	• Number of minutes after ignition is turned OFF when the MCP100 will go into sleep mode. • Configured by dispatch.
Wakeup	• The frequency the MCP100 wakes up from sleep mode to check for dispatch messages. • Configured by dispatch.
Total Time	• Number of minutes the MCP100 draws power from the vehicle battery with the ignition OFF. • Configured by dispatch.
Time Remaining	Number of minutes before the MCP100 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 MCP100 is enabled or disabled for tamper detection.

MCP100 Battery Screen

- Tap the **Battery** tab whenever you want to see the state of the backup battery.



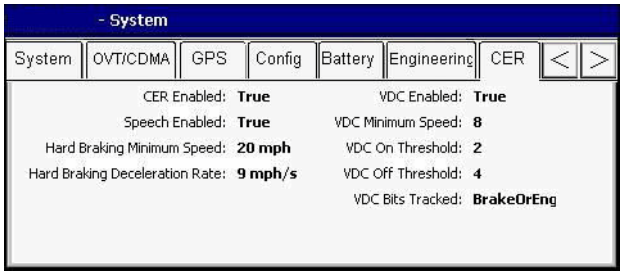
Field	***Description***
Backup Battery	Indicates the backup battery is detected.
Results of last test	Indicates the voltage of the backup battery when last tested.
Next scheduled auto test	The date the next automatic test will be performed.
Test Battery	Used to perform a manual battery test.

MCP100 Engineering Screen

- This screen is for engineering purposes only.

MCP100 CER Screen

- Tap the **CER** tab 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 MCP100 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” notices 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” notices 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

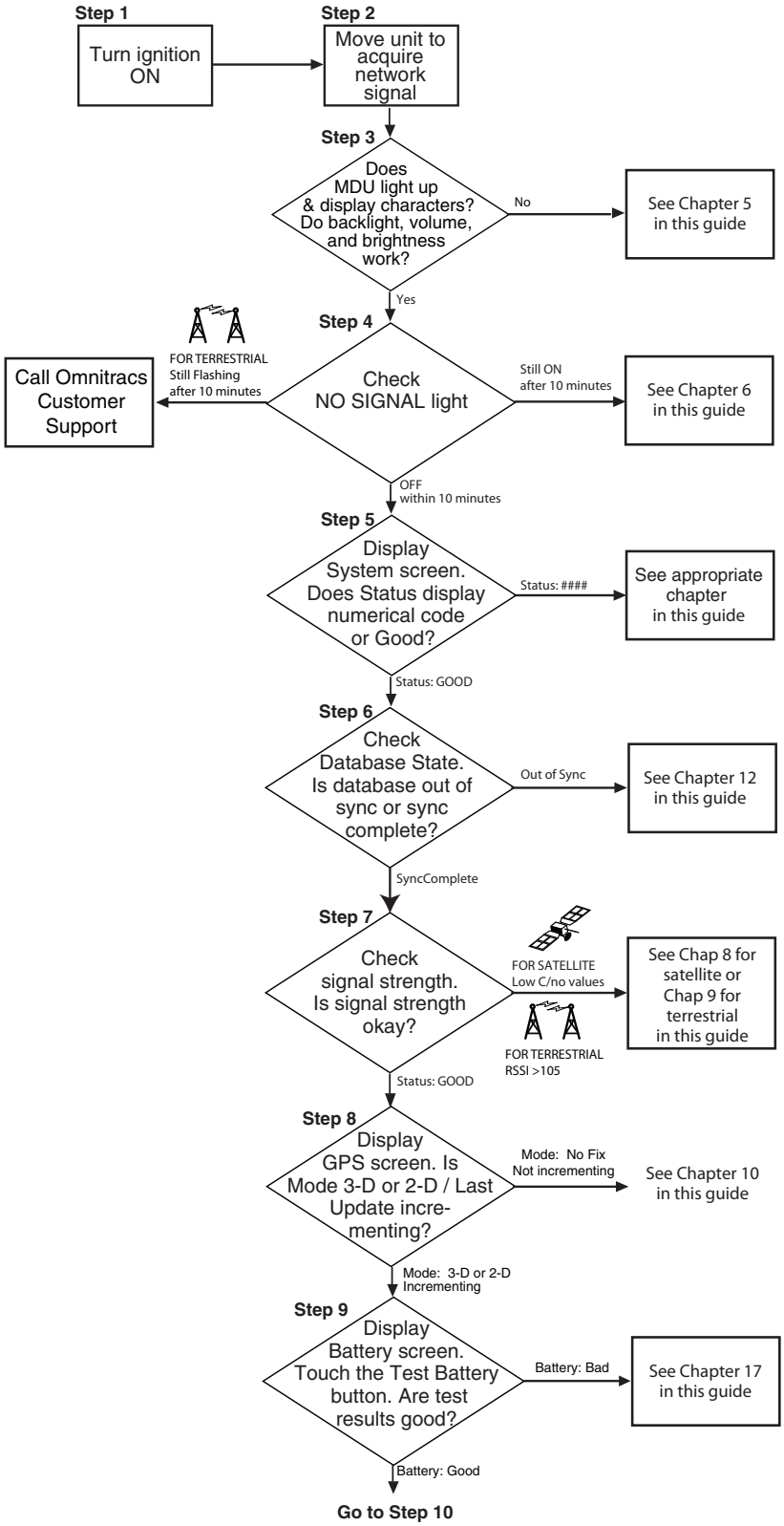
VDS (Status) Screen

- Access vehicle data services (VDS) information, by using the scroll bar and touching the **VDS (Status)** tab.

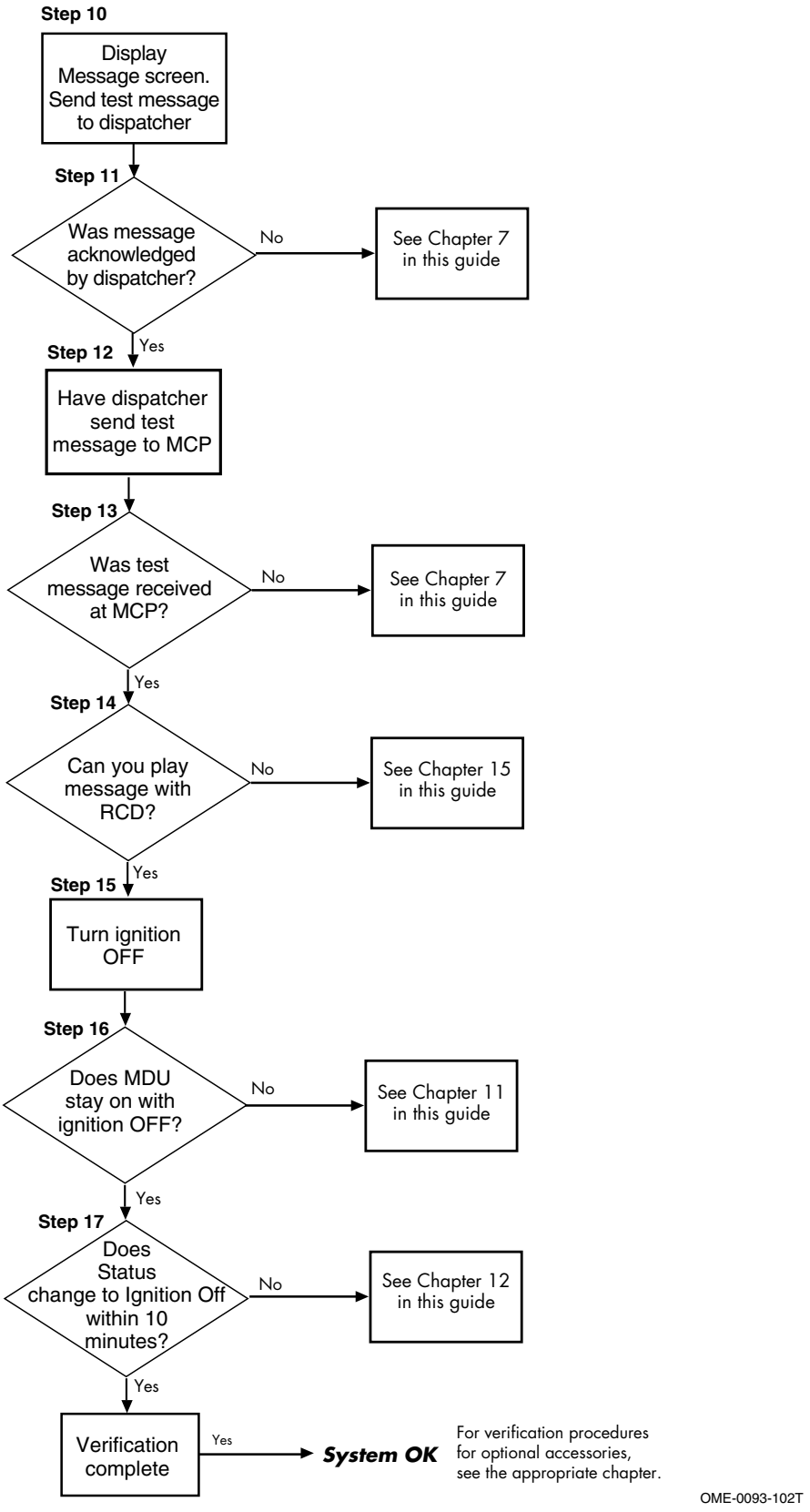
Field	*Value*
J1587	If vehicle is configured to receive data, the light is green if the vehicle is receiving data from the J1587 data source.
J1939	If vehicle is configured to receive data, the light is green if the vehicle is receiving data from the J1939 data source.
Trad	The PTO, which is always active (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 transmitted on the data bus by the MCP100.
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 MCP100 System Verification



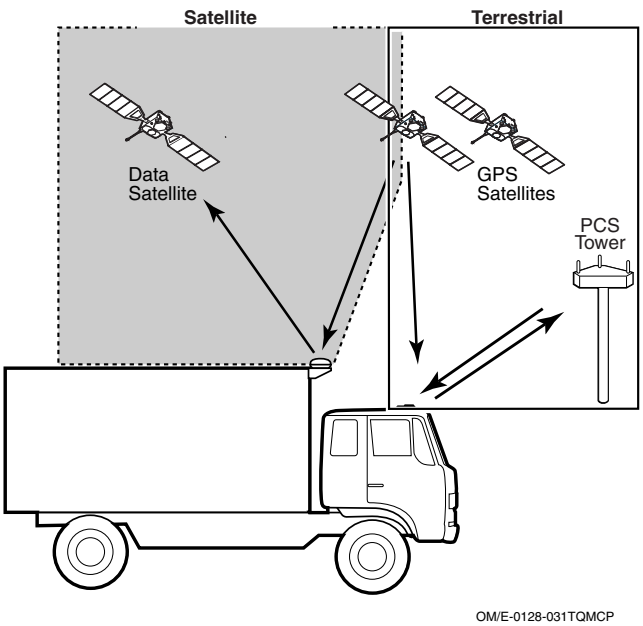
OME-0093-102QMCP



Basic MCP100 System Verification Procedure

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.

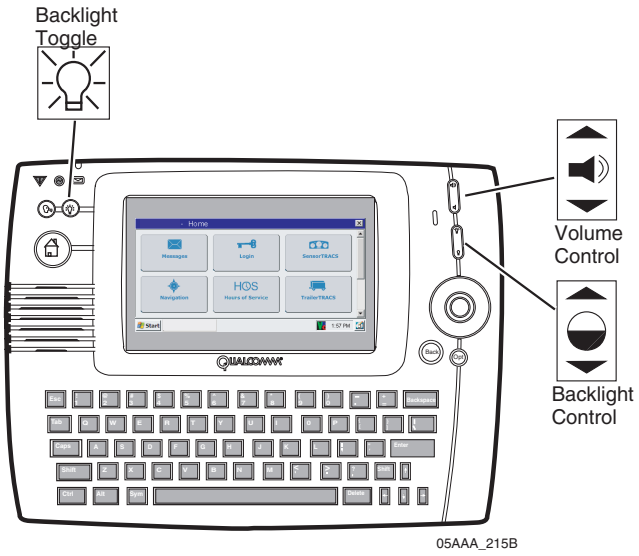
1. Turn the vehicle ignition ON; the engine does not have to be running.



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

If you are using the terrestrial MCP100, 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 the satellite MCP100, the SDM should have a clear view of the satellite which is located above the equator, roughly south of Georgia.



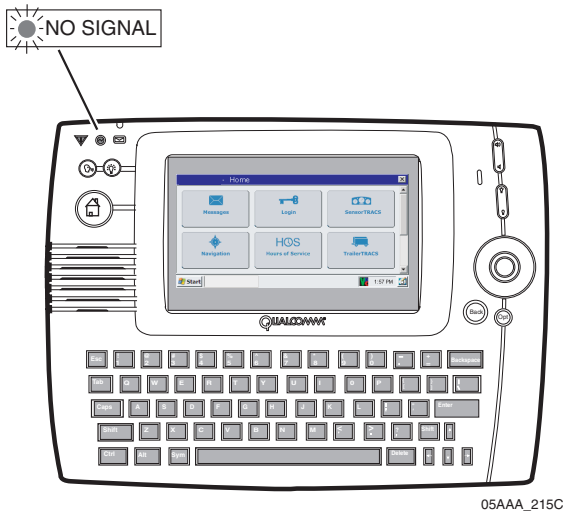
3. Check the display unit and verify that the screen lights up and displays characters; and that the backlight, brightness, and volume controls work correctly.

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 MDU 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 this guide.



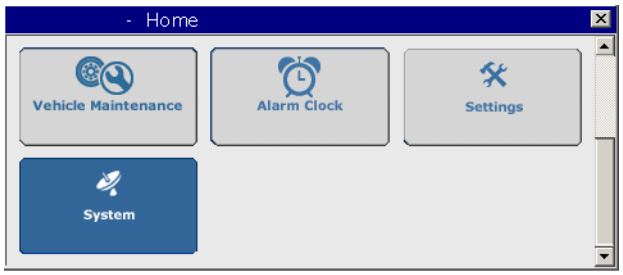
4. Check the display unit NO SIGNAL light. When the MCP100 acquires the PCS network/satellite signal, the NO SIGNAL light goes out.

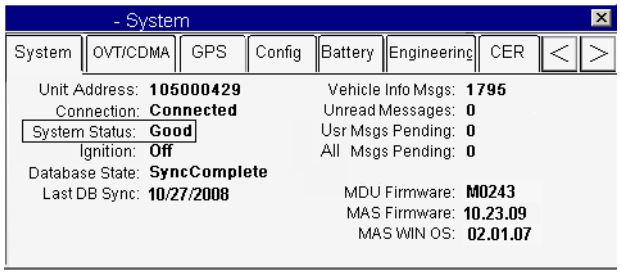
- If the NO SIGNAL light goes out, go to step 5.

If the NO SIGNAL light continues to flash after 10 minutes, call Omnitracs Customer Support:
US: 800-541-7490
Canada: 800-863-9191

- If the NO SIGNAL light stays on after 10 minutes, perform the diagnostic procedure in Chapter 6 in this guide.

If the MCP100 was just installed, it may take as long as 5 minutes for the MCP100 to acquire the PCS network/satellite signal.





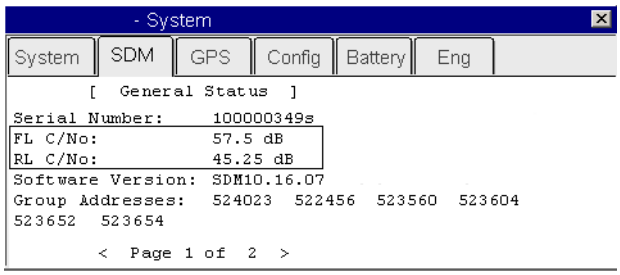
5. Go to the Home screen and tap the **System** icon. Tap the **System** tab.

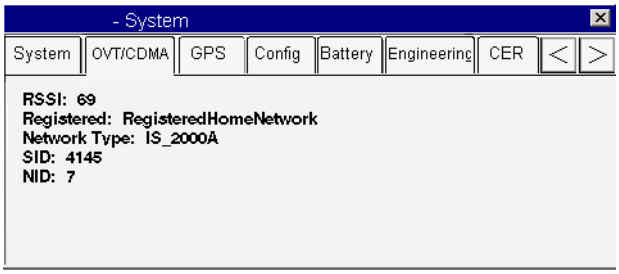
Check the System Status field and verify that the Status is Good.

- If the Status is Good, go to step 6.
- If the Status is a numerical value, go to the appropriate diagnostic procedure for that value in this guide.

6. Check the Database State field and verify that it is SyncComplete. This may take up to 10 minutes.

- If the Database State is SyncComplete, go to step 8.
- If the Database State is Out of Sync, perform the diagnostic procedure in Chapter 13 in this guide.





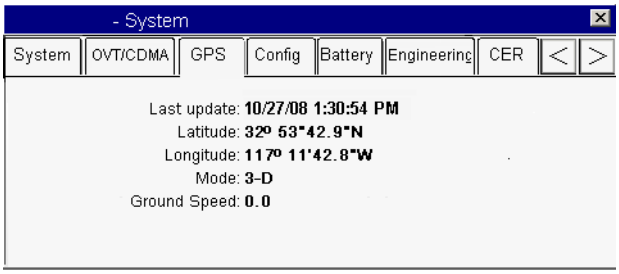
7. Check the signal strength.

Tap the **SDM** tab. The FL C/No value should be greater than 50; the RL C/No value should be greater than 33.

- If the C/No values are in a high range, go to step 8.
- If the C/No values are in a low range, perform the diagnostic procedure in Chapter 8 in this guide.

Tap the **OVT/CDMA** tab. Check the RSSI value on the screen. The *desired* RSSI value should be less than 105.

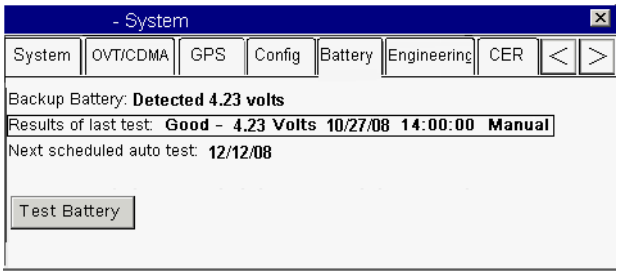
- If the RSSI value is less than 105, go to step 8.
- If the RSSI value is greater than 105, perform the diagnostic procedure in Chapter 9 in this guide.



8. Tap the **GPS** tab.

Check that the Mode is 3-D or 2-D and that the Last Update field is incrementing every second.

- If the Mode is 3-D or 2-D and the Last Update field is incrementing, go to step 9.
- If the Mode is No Fix, and the Last Update field is not incrementing, perform the diagnostic procedure in Chapter 10 in this guide.



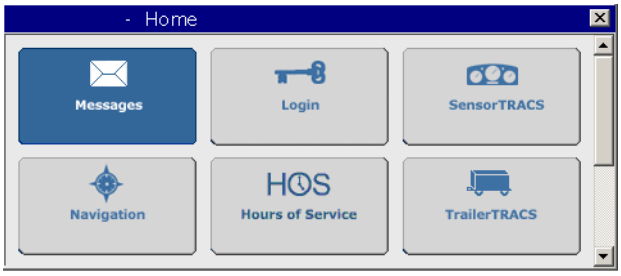
9. Tap the **Battery** tab. Tap the **Test Battery** button.

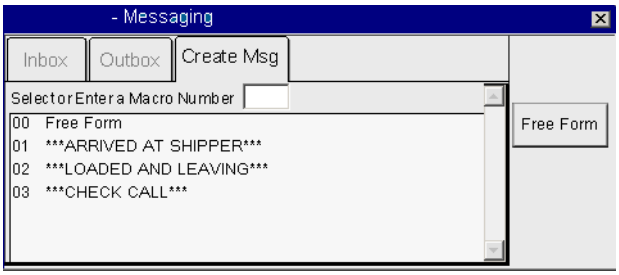
Note

It may take a few minutes to perform this test.

After the field updates, check that the last test results are Good.

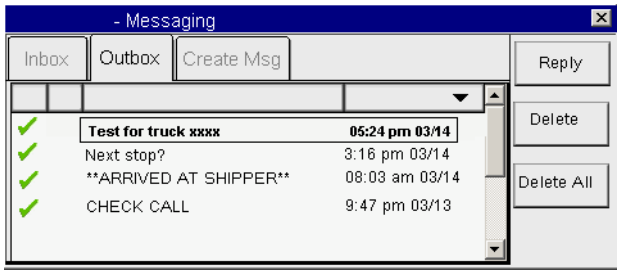
- If the results of last test are Good, go to step 10.
- If the results of last test are Bad, perform the diagnostic procedure in Chapter 17 in this guide.





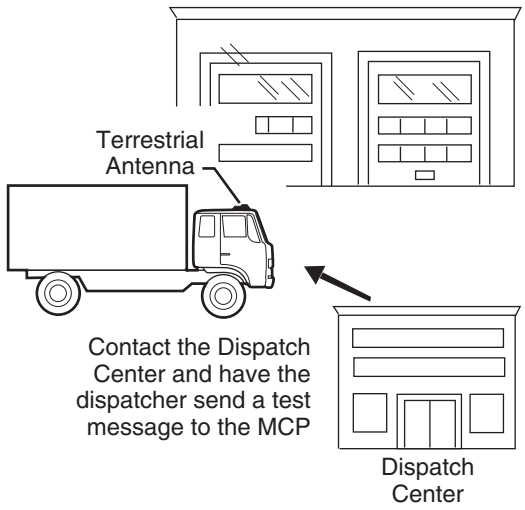
10. Send a test message to the dispatcher. Go to the Home screen and tap the **Messages** icon.

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



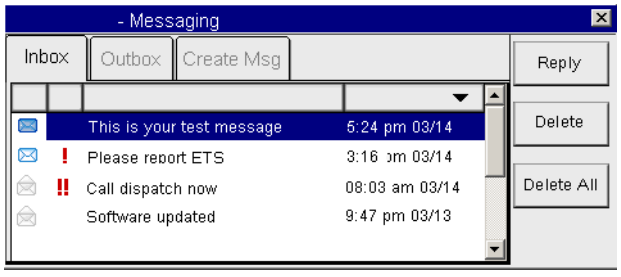
11. Tap the **Outbox** tab to display the message that was just sent. Orange **"⇆"** (arrows) indicate the message is in transit; a green "✓" (check mark) indicates the message has been acknowledged.

- If the message is acknowledged, go to step 12.
- If the message is not acknowledged, perform the diagnostic procedure in Chapter 7 in this guide.



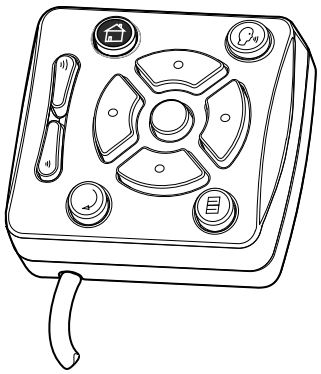
12. Have the dispatcher send a test message to the MCP100. If the dispatcher is not available, call Omnitracs Customer Support (800-541-7490) to have the message sent.

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



13. 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** tab to display the dispatcher's message.

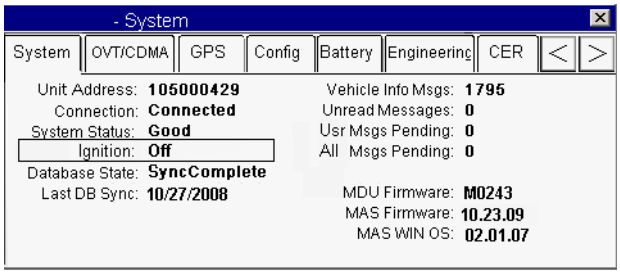
- If the MCP100 received the message, go to step 14.
- If the MCP100 did not receive the message, perform the diagnostic procedure in Chapter 7 in this guide.



14. Verify that the message can be played with the RCD by pressing the RCD **Home** key once and the **center** key twice.

- If the message can be played with the RCD, go to step 15.
- If the message cannot be played with the RCD, perform the diagnostic procedure in Chapter 15 in this guide.

15. Turn the vehicle ignition OFF.



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

- If the display unit stays on, go to step 17.
- If the display unit does not stay on, perform the diagnostic procedure in Chapter 11 in this guide.

17. Tap the **System** icon. Tap the **System** tab and verify that the System 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 this guide.

For verifying Performance Monitoring, Trailer Tracks asset management, and other accessories, see the appropriate chapter in this manual.

Omnitracs MCP100 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 MCP100.

Omnitracs MCP100 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 ❒ Trailer Tracks

❒ Other_____

MCP—System Icon/System Tab

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 Icon/OVT/CDMA Tab

RSSI: _____

What is the “Registered” status (circle):

RegisteredHomeNetwork RegisteredRoaming

Network Type: IS_2000A ? ____yes _____no

Other Network Type: _____

SID: _____Channel: _____

MCP—System Icon/SDM Tab

FL C/No: _____ RL C/No _____

MCP—System Icon/GPS Tab

Is GPS “Last update” status updating every second?

____yes _____no

MCP—System Icon/Battery Tab

Press “Test Battery Now” button. Are “Results of the last test” Good? ____yes _____no _____volts

Is Backup Battery detected? ____yes _____no

MCP—SensorTRACS Icon/Installer Tab

With ignition ON, is “J1708 Rx MSGs” rapidly incrementing several times per second? ____yes _____no

DATA MISSING_____

Vehicle Connections (circle):
J1708 J1939 AXLE RPM

Message Verification

❒ Successfully Sent ❒ Successfully Received

Text-to-Speech Verification

❒ Message successfully played

Installation Notes:

5
Media Display Unit (MDU) Troubleshooting

These topics are covered in this chapter:

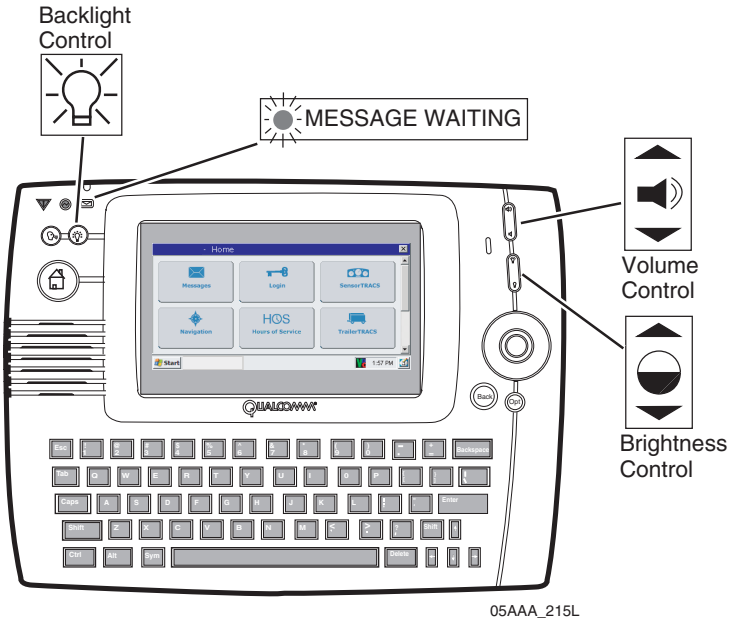
For technical questions, contact Omnitracs Customer Support.
Customer Support is staffed 24 hours a day, 365 days a year:

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

Using the MDU

The media display unit (MDU) is designed to work with the MCP100. Other display units, such as the Omnitracs EDU and DU are not supported.

- When the vehicle ignition is ON, an image appears on the display screen.
  - The brightness can be adjusted using the backlight control.
  - The MDU lowers the brightness of the backlight after four minutes of not being used.
  - Touching the screen or any key brings back the brightness of the touchscreen.
- When the vehicle ignition is turned OFF, the display screen goes dark or blank when the MCP100 power-down timer expires.
- The display alerts you that you have received one or more messages when the message waiting light goes on and the display chirps.
- When the message waiting light is off, there are no new messages.
- If the message waiting light flashes constantly, an emergency message has been received.
- Make sure screen protector is not warn, scratched, or damaged. If it is, see*Replacing the MDU Screen Protector* on page 3-6.



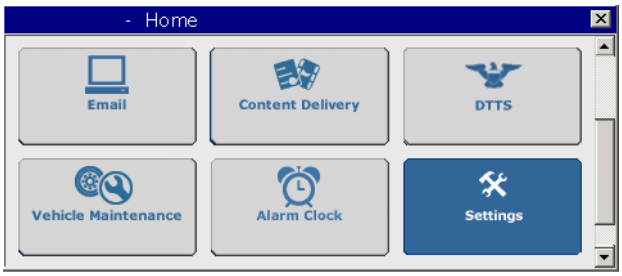
If any of the functions do not work as described, there is a problem with one or more of the following:

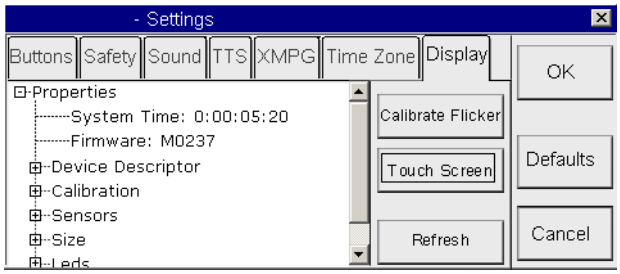
- Display controls are turned off or turned low
- Faulty display cable
- Faulty display
- Faulty mobile application server (MAS)
- Faulty MAS power connection
- Bad system ground or power connection problem
- Short in the accessory cable

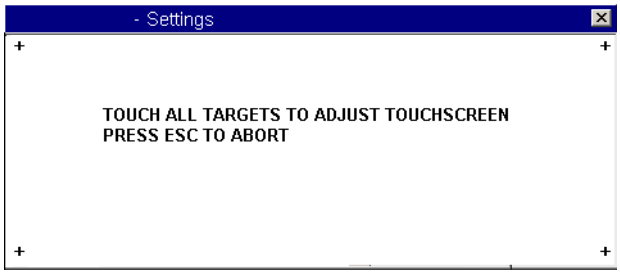
MDU Touchscreen Calibration

If you are touching any of the icons on the touchscreen and the screen is not responding quickly, the touchscreen may not be calibrated properly. To recalibrate the MDU touchscreen settings, from the Home screen:

- Tap the **Settings** icon.
- Tap the **Display** tab.
- Using the Display screen, tap the **Touch Screen** button.
- When the four targets display, carefully tap each of the **targets (+)** in the center.
- Press **Enter** when prompted.

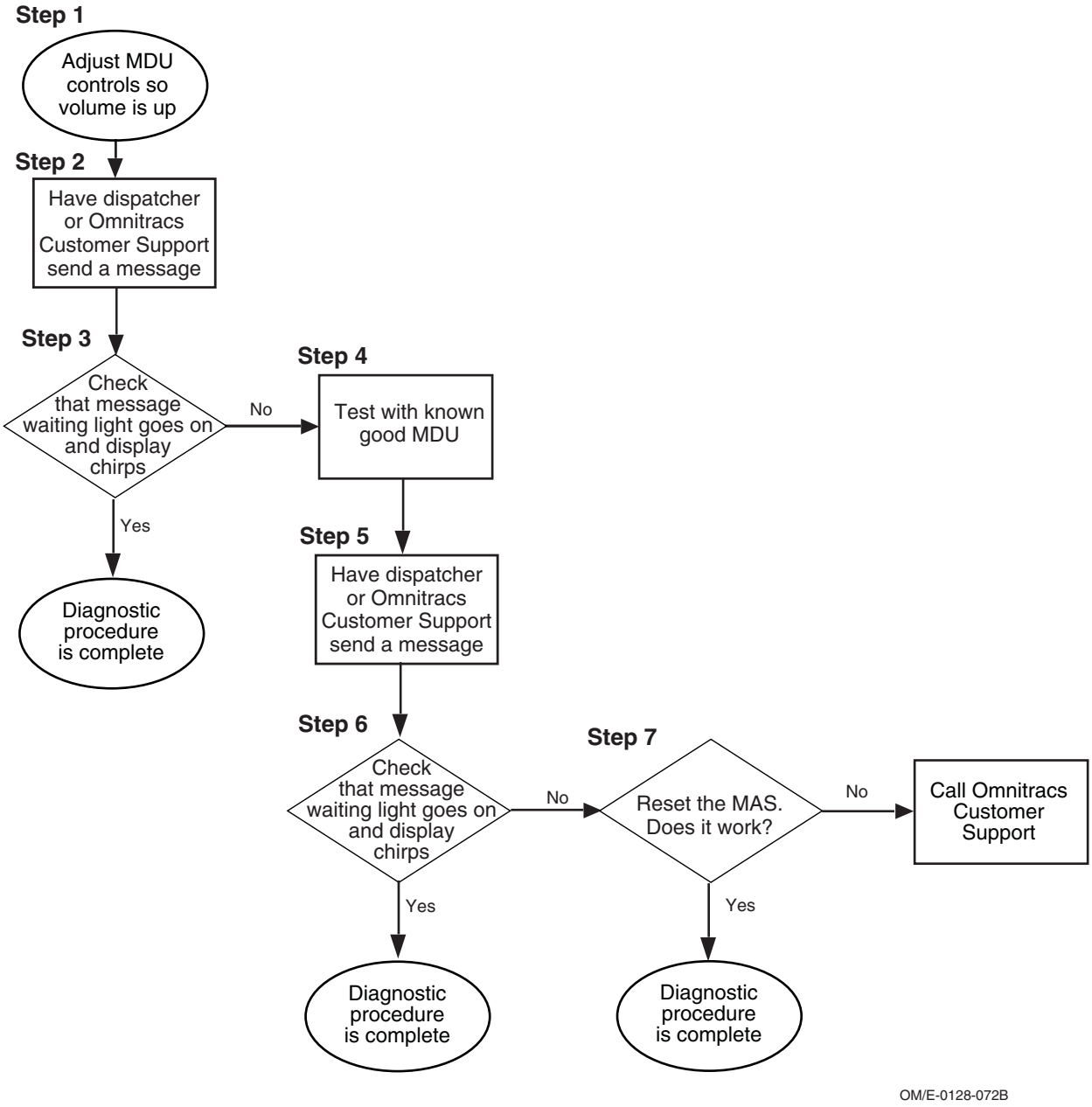




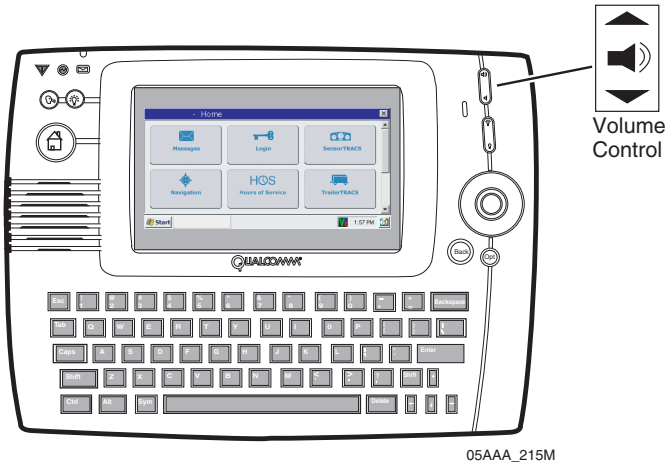


MDU Message Waiting Light/Chirp Does Not Work

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Diagnostic Procedure

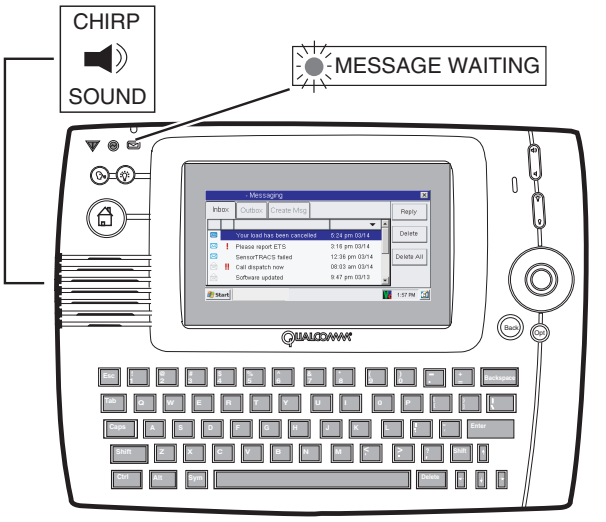


05AAA_215M

The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Turn up volume on the MDU.

2. Have the dispatcher send a test message to the MCP100. (If the dispatcher is not available, have Omnitracs Customer Support send a message.)



05AAA_215N

3. After the message is received, check that the message waiting light goes on and the display chirps.

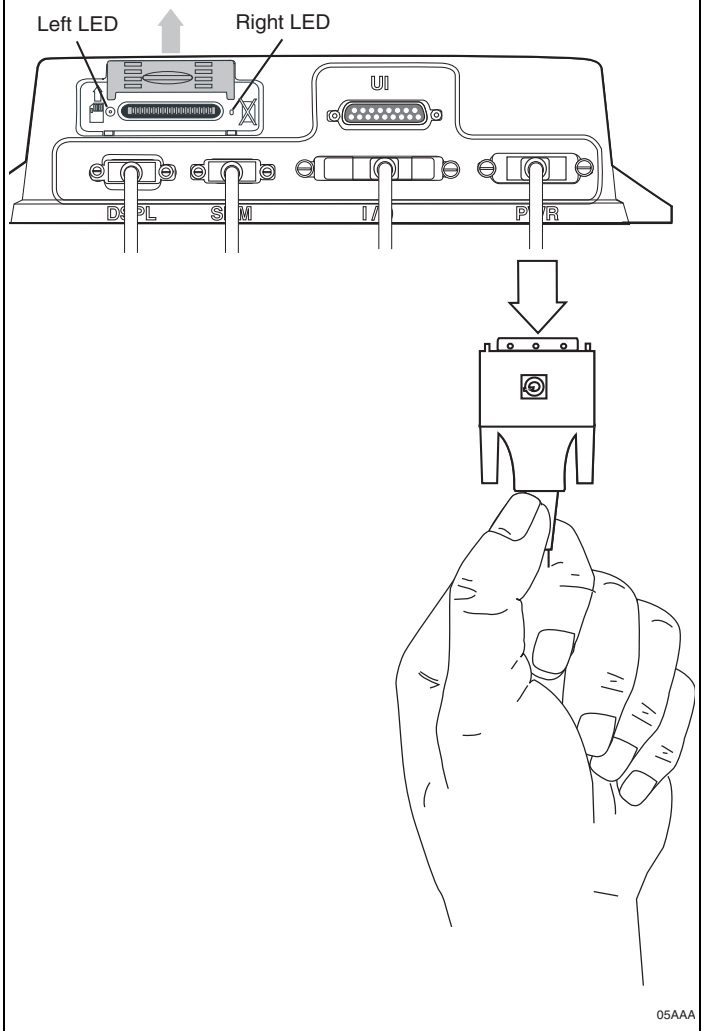
- If the message waiting light goes on and the display chirps, the diagnostic procedure is complete.
- If the message waiting light does not go on and the display does not chirp, go to step 4.

4. Test with a known good MDU. Go to step 5.

5. Have the dispatcher send another test message to the display. Go to step 6.

6. Check again for the message waiting light to go on and for the display to chirp.

- If the message waiting light goes on and the display chirps, the diagnostic procedure is complete.
- If the message waiting light does not go on and the display does not chirp, go to step 7.



7. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

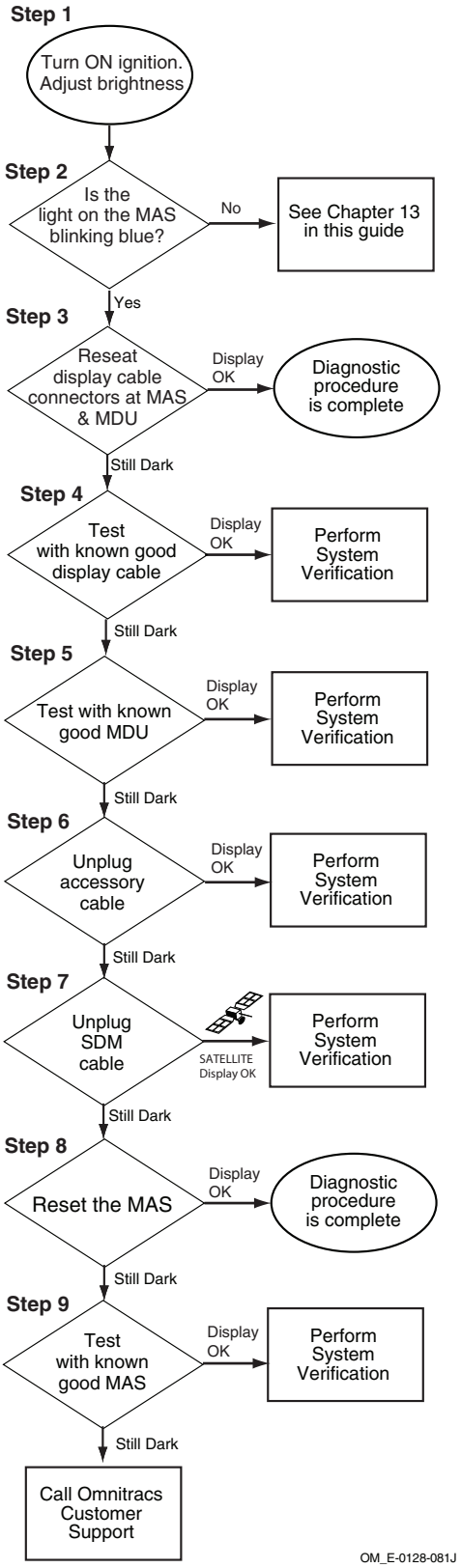
Have the dispatcher send another test message to the MCP100 and check that it has been received.

- If the display chirps and the message waiting light comes on, the diagnostic procedure is complete.
- If the display does not chirp and the message waiting light does not come on, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

MDU Screen Is Dark or Blank

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



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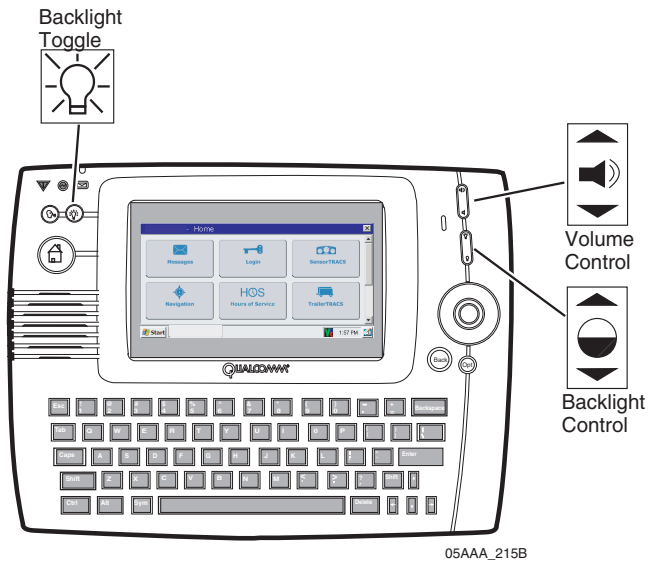
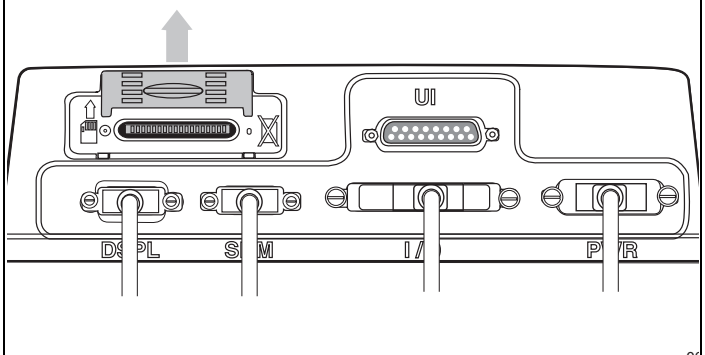
Diagnostic Procedure



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Turn the vehicle ignition ON. Adjust the brightness controls. Does the display screen light up?

- If **yes**, the screen is working properly. The diagnostic procedure is complete.
- If the screen is dark or blank, go to step 2.

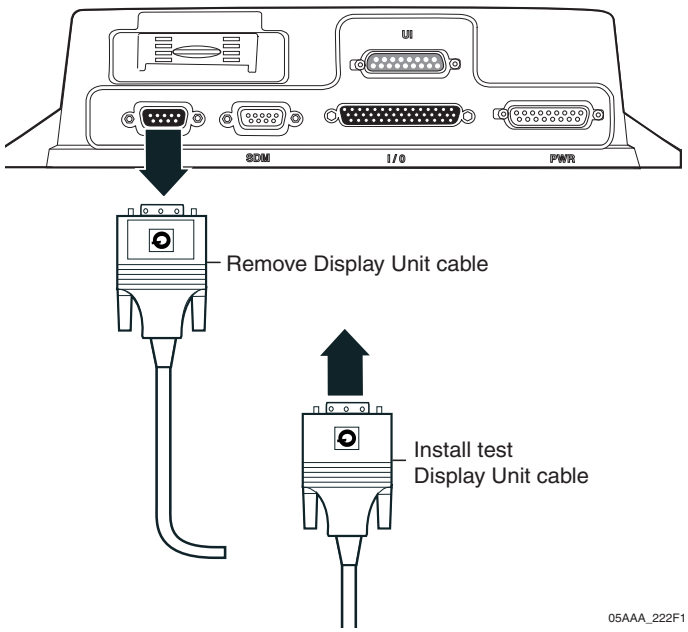


2. Is the left-side LED on the MAS blinking blue every second?

Note

The MAS LED blinks blue every second when the unit is awake and once every 12 seconds when it is asleep. For information concerning other LED colors and combinations, refer to Chapter 14.

- If yes, the MAS has truck power and is in a normal state. Go to step 3.
- If no, go to Chapter 14.

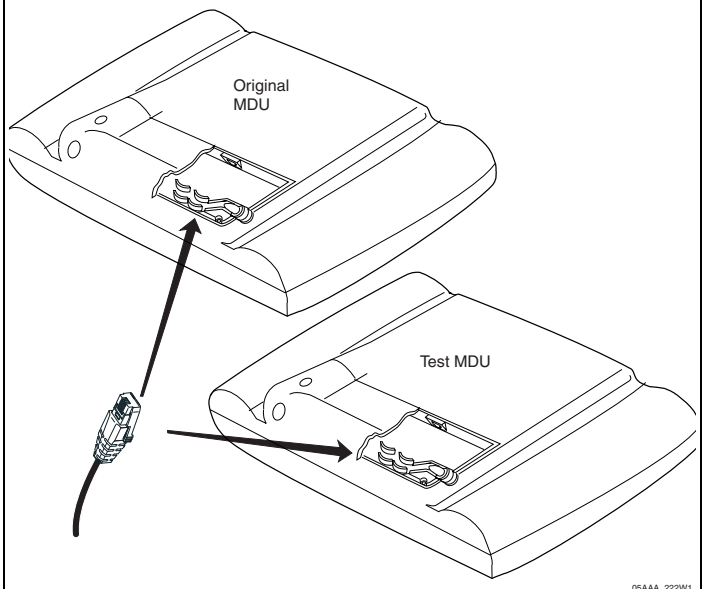


3. Reseat the display connectors on the MAS and MDU. Is the display working?

- If yes, the diagnostic procedure is complete.
- If no, go to step 4.

4. Install a replacement display cable and recheck the display.

- If the display is now working, the original display cable was bad. Replace the display cable and perform the system verification in Chapter 4.
- If the display is still not working, the original display cable is probably okay. Go to step 6.



5. Test with a known good MDU.

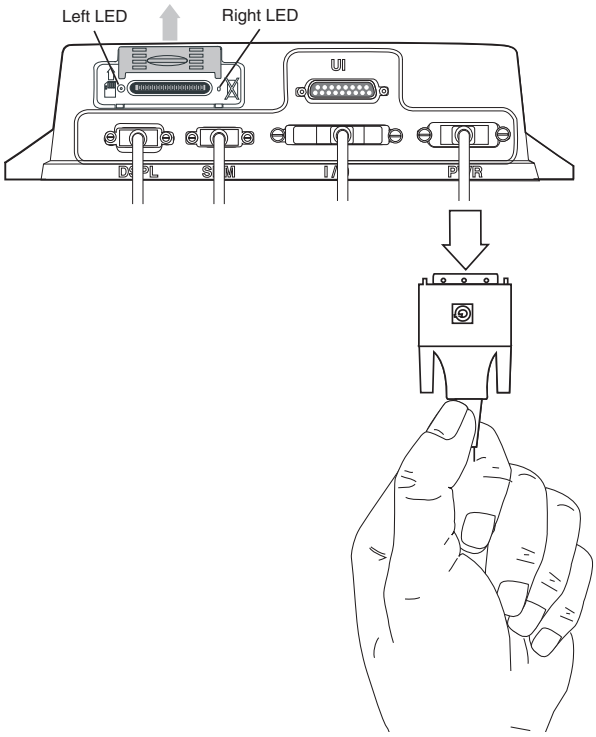
- If the display is now working, the original MDU is bad. Replace the MDU and perform the system verification in Chapter 4.
- If the display is still not working, the original MDU was probably okay, go to step 6.

6. Unplug the accessory cable, then plug it back in again. Is the display now working?

- If the display is now working, the accessory cable is bad. Replace the accessory cable and perform the system verification in Chapter 4.
- If the display is not working and you are using an SDM, go to step 7.
- If the display is not working and you not using an SDM, go to step 8.

7. Unplug the SDM cable, then plug it back in again. Is the display now working?

- If the display is now working, the SDM cable is bad. Replace the SDM cable and perform the system verification in Chapter 4.
- If the display is not working, go to step 8.



8. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

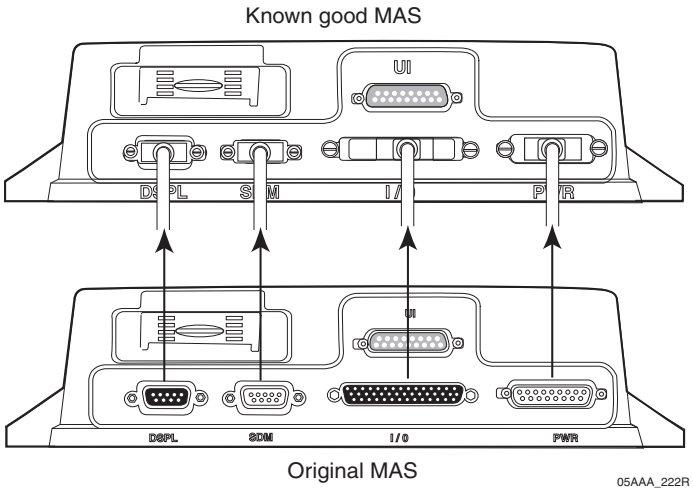
It usually takes about 10 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

If the display is still not working, go to step 9.



9. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

- If the display is now working, the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

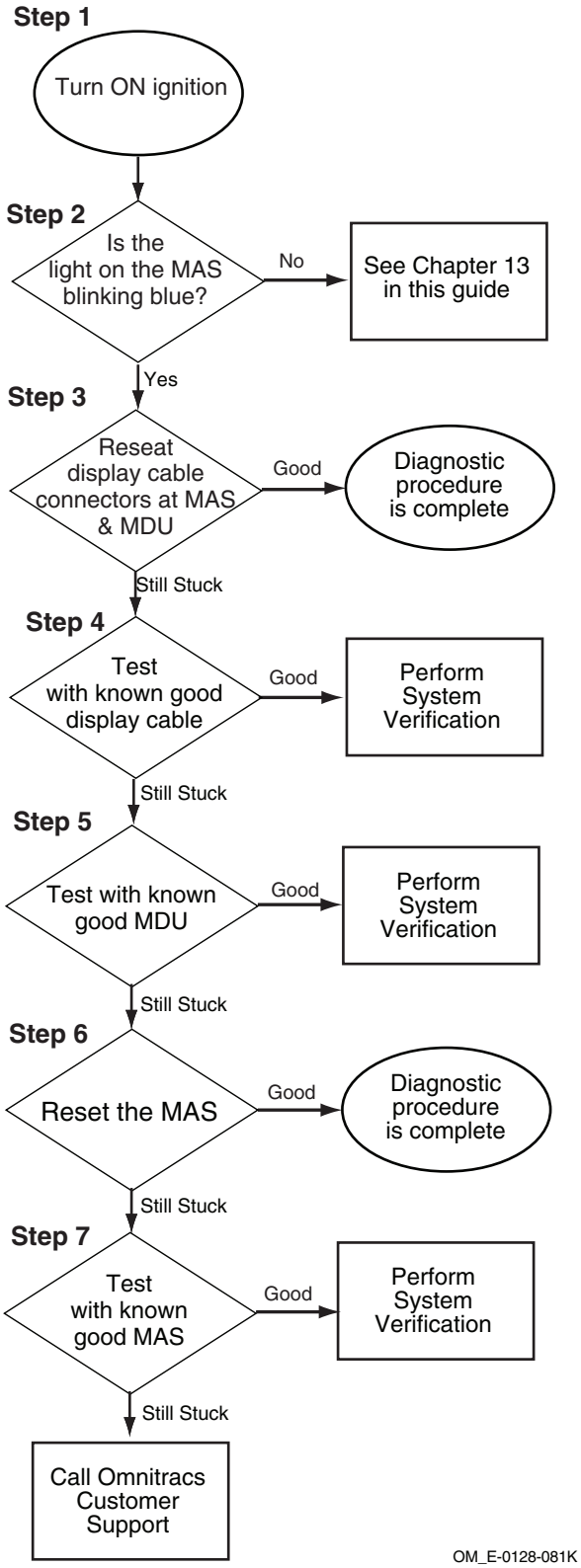
After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the display is still not working, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

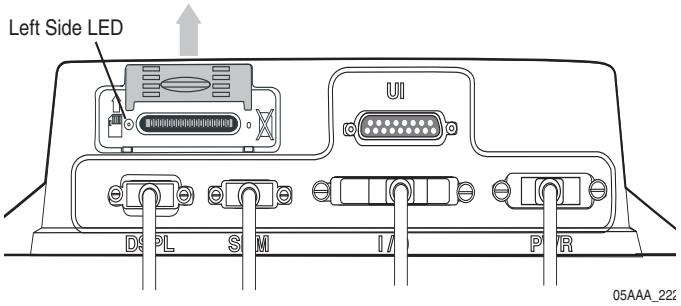
MDU Stuck on Loading Screen

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



OM_E-0128-081K

Diagnostic Procedure



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

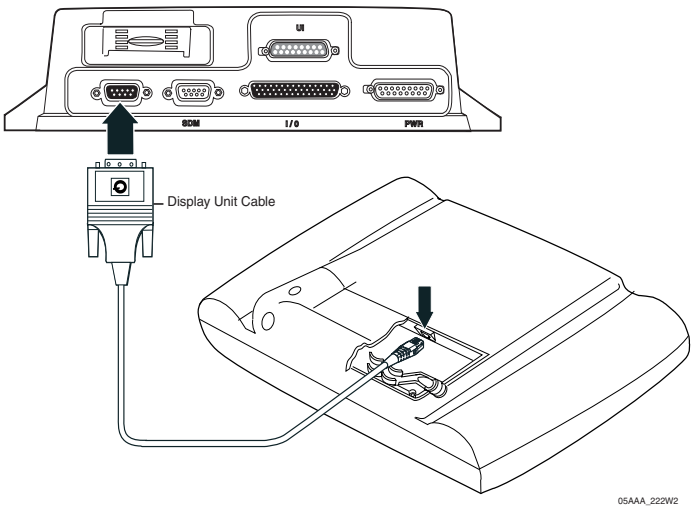
1. Turn ON ignition.

2. Check the MAS status LEDs. Is the light blinking blue every second?

Note

The MAS LED blinks blue every second when the unit is awake and every 12 seconds when it is asleep.

- If yes, the MAS has truck power and is in a normal state. Go to step 3.
- If no, go to Chapter 14 to diagnose the MAS LEDs.



3. Reseat the display connectors on the MAS and MDU. Has the Loading screen cleared?

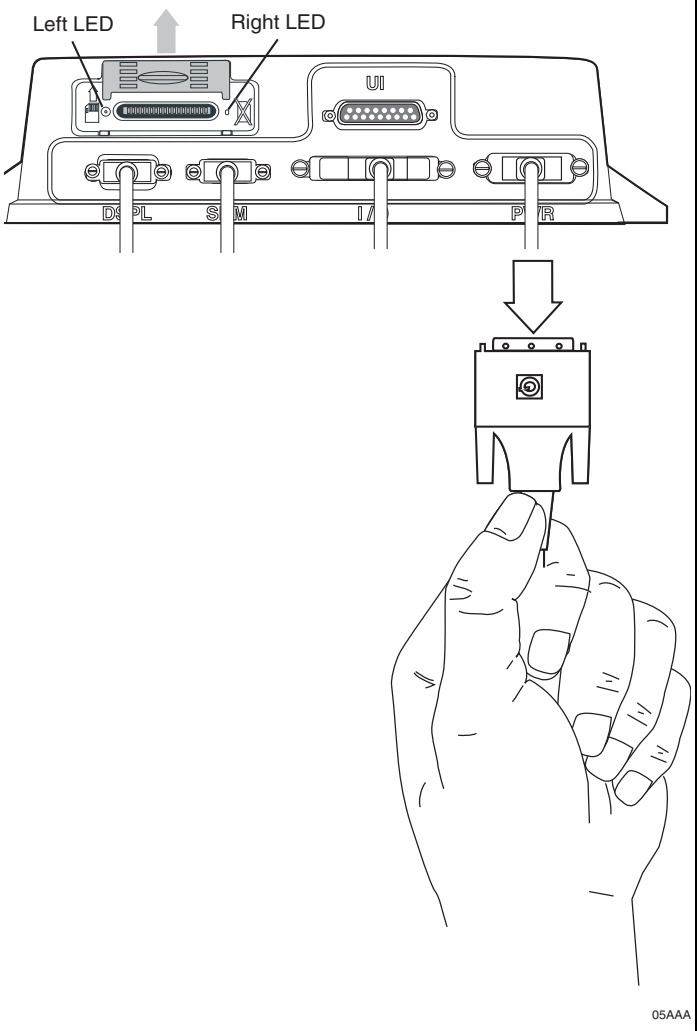
- If yes, the MDU is working properly. The diagnostic procedure is complete.
- If no, go to step 4.

4. Install a replacement display cable and recheck the display.

- If the display is now working, the original display cable was bad. Replace the display cable and perform the system verification procedure in Chapter 4.
- If the display is still not working, the original display cable is probably okay. Go to step 5.

5. Test with a known good MDU.

- If the display is now working, the original MDU was bad. Replace the MDU and perform the system verification procedure in Chapter 4
- If the display is still not working, the original MDU is probably okay. Go to step 6.



6. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

- If the display is now working, the diagnostic procedure is complete.
- If the display is still not working, go to step 7.

7. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

- If the display is now working, the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the display is still not working, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

6
NO SIGNAL Light On or Flashing

These topics are covered in this chapter:

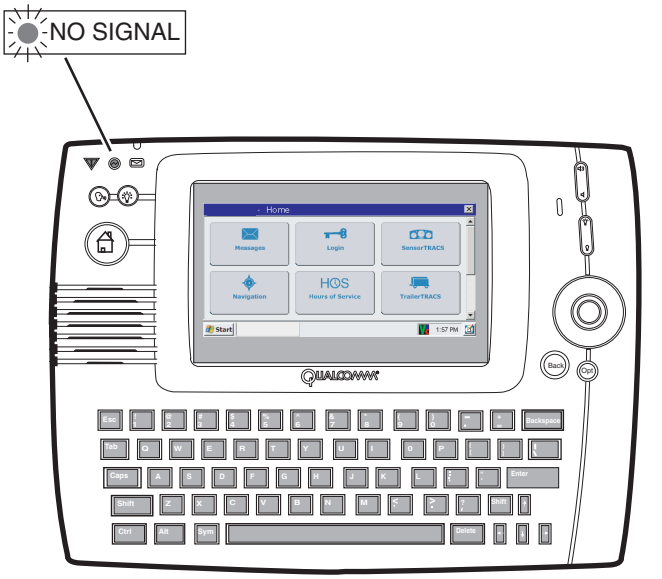
For technical questions, contact Omnitracs Customer Support.
Customer Support is staffed 24 hours a day, 365 days a year:

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

Normal Performance

It is normal for the NO SIGNAL light on the display to occasionally go on when the vehicle is in motion. This is either because

- the PCS antenna has temporarily lost a wireless communication network signal, or
- the SDM has temporarily lost the satellite signal.



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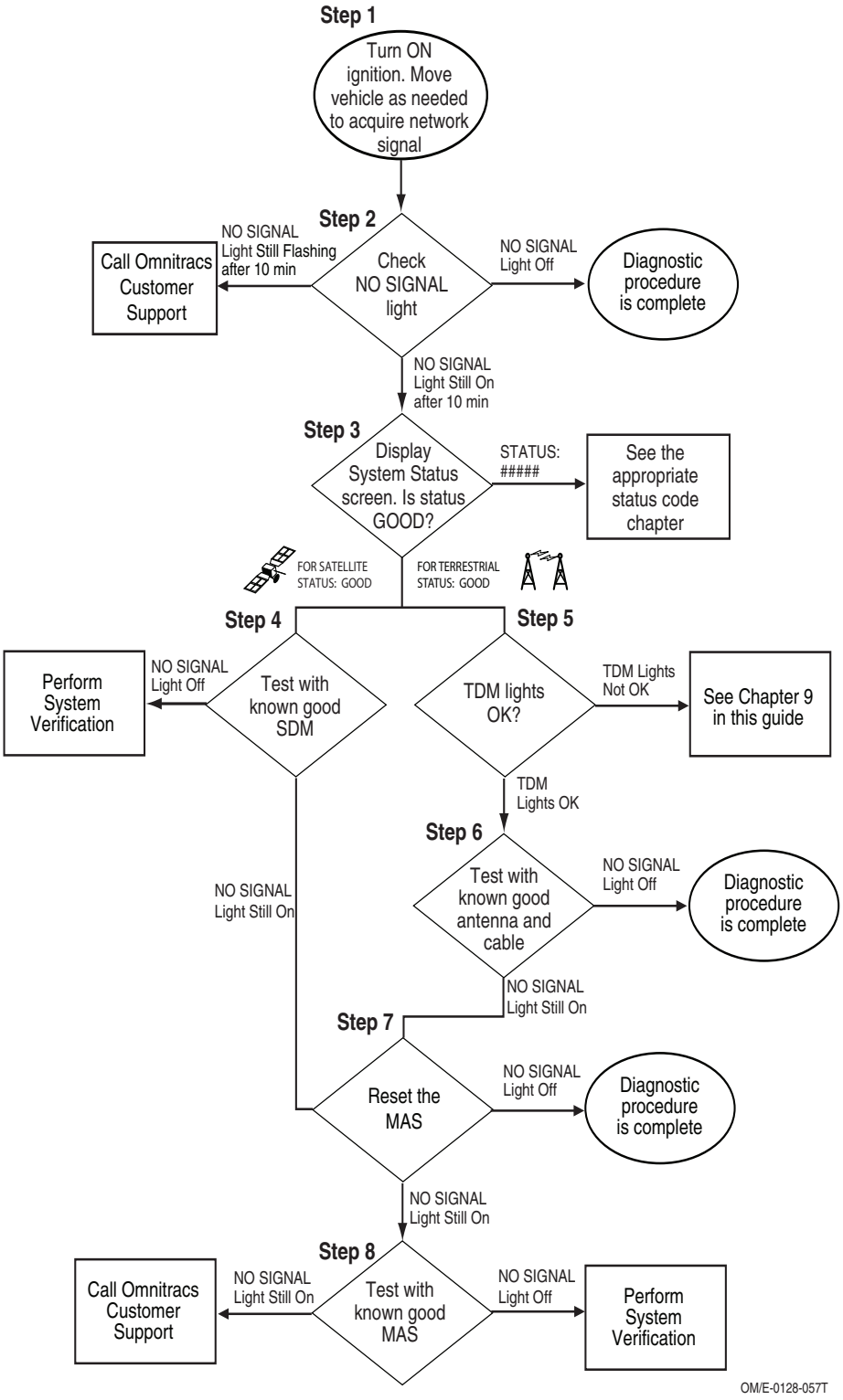
Abnormal Performance

If the light stays on or keeps flashing longer than ten minutes when the vehicle is sitting still and the PCS antenna is in a wireless communication network, the problem is usually caused by one or more of the following:

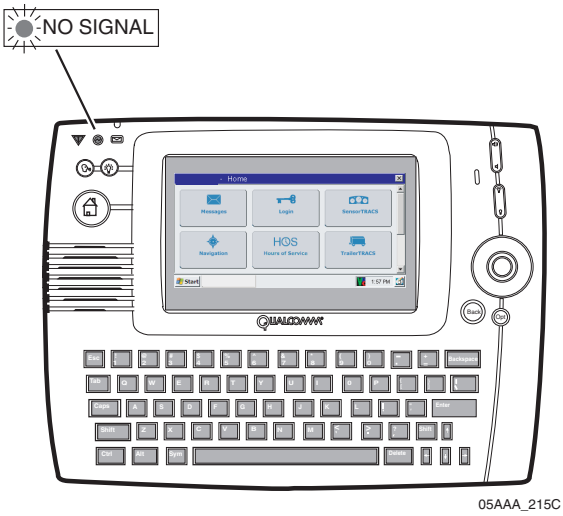
- Faulty antenna
- Faulty antenna cable
- Faulty SDM
- Faulty SDM cable
- Faulty mobile application server (MAS)

NO SIGNAL Light On or Flashing

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Diagnostic Procedure



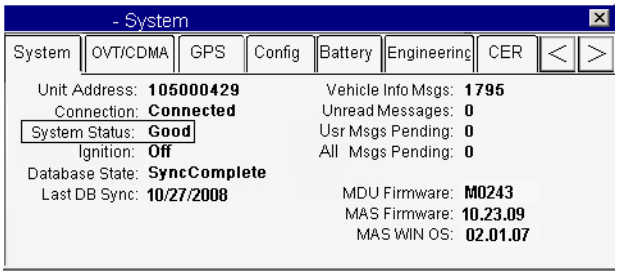
The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential–you may be instructed to skip steps.

1. Turn the vehicle ignition ON. Move the vehicle, as needed, to acquire a wireless communication network signal.

2. Check the NO SIGNAL light on the display. After the MCP100 acquires a network signal, the NO SIGNAL light will go off.

It may take 5 minutes for the MCP100 to acquire a network signal.

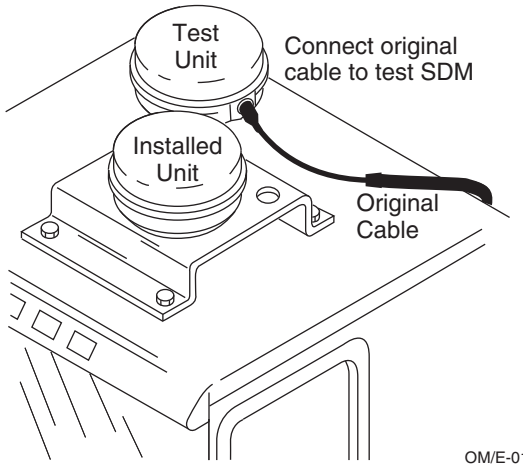
- If the NO SIGNAL light goes off, the diagnostic procedure is complete.
- If the NO SIGNAL light continues to flash after 10 minutes, call Omnitracs Customer Support:
  US: 800-541-7490
  Canada: 800-863-9191
- If the NO SIGNAL light stays on, go to step 3.



3. Tap the **System** tab to display the System screen. Check the System Status field.

- If the satellite System Status is **Good**, go to step 4.
- If the terrestrial System Status is **Good**, go to step 5.
- If a System Status code appears in the System Status field, go to the appropriate chapter in this guide for that status code:

  Status 10000/10001—Chapter 16
  Status 12000/12001—Chapter 17
  Status 13000/13001—Chapter 18
  Status 22000/22001—Chapter 19

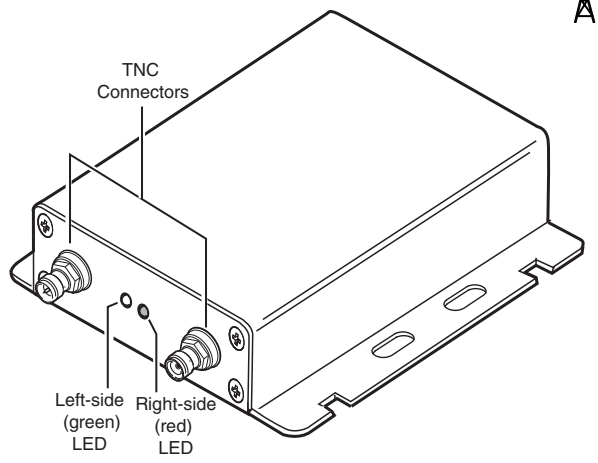


4. Test with a known good SDM as follows:

Disconnect the original SDM cable from the original SDM and connect it to the known good SDM.

Allow a few minutes for the unit to acquire the satellite signal.

- If the NO SIGNAL light goes off, the original SDM was bad. Replace the original SDM with a good replacement SDM and again check the light. Perform the system verification procedure in Chapter 4.
- If the light is still on, go to step 7.



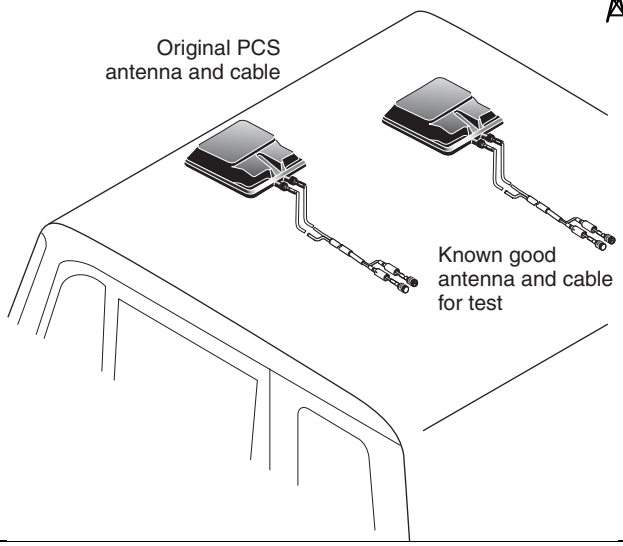
5. Check the terrestrial data modem (TDM) lights. The left-side LED should be blinking green and the right-side LED should be off.

Note

The red GPS signal light should be off when receiving a good signal, however, it may *occasionally* blink.

Are the lights okay?

- If the TDM lights are not okay, go to Chapter 9 in this guide.
- If the TDM lights are okay, go to step 6.

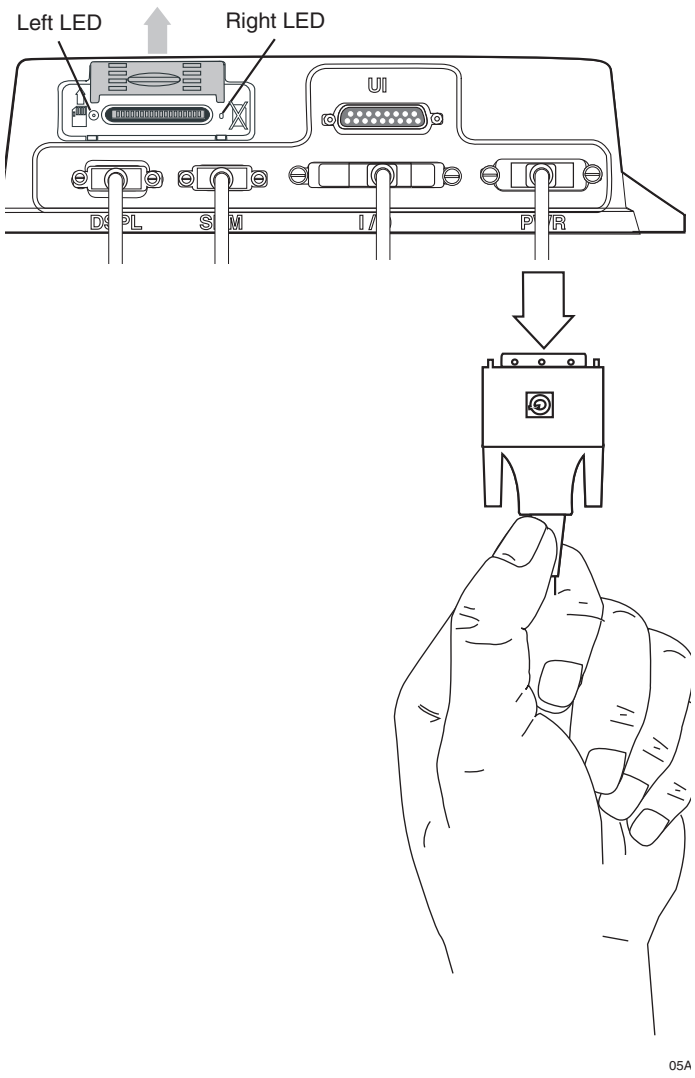


6. Test with a known good antenna and cable as follows:

Disconnect the original antenna and cable from the original TDM and connect it to the known good antenna and cable.

Allow a few minutes for the unit to acquire the satellite signal.

- If the NO SIGNAL light goes off, the original antenna and cable were bad. Perform the system verification procedure in Chapter 4.
- If the light is still on, go to step 7.



7. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

- If the NO SIGNAL light goes off, the diagnostic procedure is complete.
- If the NO SIGNAL light stays on, go to step 8.

8. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS, attach them to the known good MAS, and turn ON the ignition. The unit will take 5 minutes to boot up.

- If the NO SIGNAL light goes off, the original MAS was bad. Replace the original MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the NO SIGNAL light stays on, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

7
MCP100 Cannot Transmit/Receive

These topics are covered in this chapter:

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

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

Normal Performance

When the MCP100 has a clear view of the satellite (the NO SIGNAL light is off), it can transmit and receive information in all types of weather.

Abnormal Performance

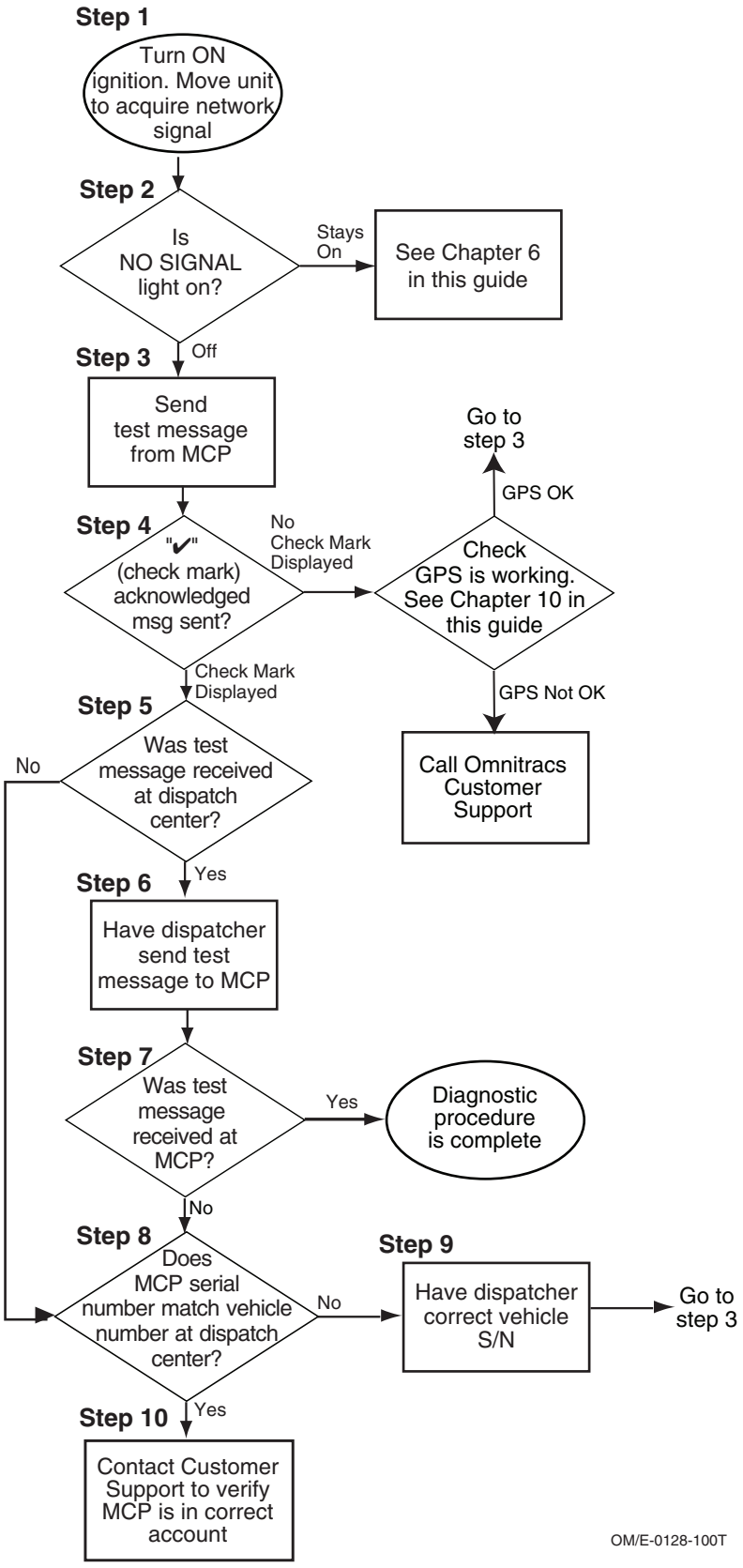
A problem exists if the MCP100 is unable to transmit or receive information when the NO SIGNAL light is off. This problem is usually caused by one or more of the following:

- The MCP100 unit address is not set up correctly in the dispatch software
- The MCP100 unit address is not in the correct account at the Omnitracs Network Operations Center (NOC)

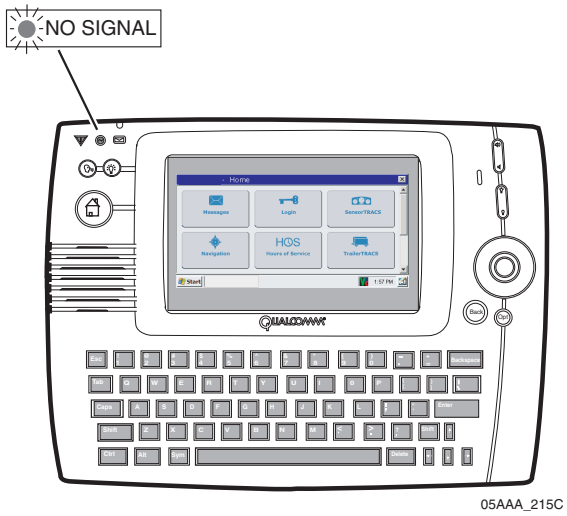
Typically, these situations arise when a new mobile application server (MAS) is installed on a vehicle.

When an MCP100 cannot transmit and/or receive messages, the cause is usually **not** with the MCP100 but rather with the MCP100 account setup. However, if the NO SIGNAL light is on, see Chapter 6.

MCP100 Cannot Transmit/Receive



Diagnostic Procedure



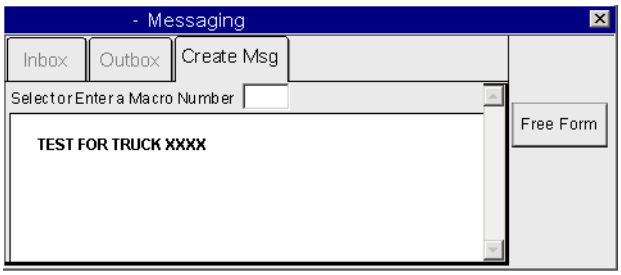
The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Turn the vehicle ignition ON. Make sure the antenna has acquired a wireless communication network signal. Move the vehicle, if necessary.

2. Check the NO SIGNAL light on the display. After the MCP100 acquires the satellite signal, the NO SIGNAL light goes off.

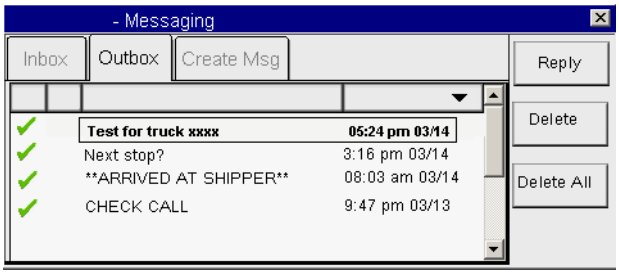
It may take a few minutes for the MCP100 to acquire the satellite signal. If the MCP100 was just installed, it may take as long as 5 minutes.

- If the NO SIGNAL light stays on, go to Chapter 6.
- If the NO SIGNAL light goes off, go to step 3.



3. Send a test message to the dispatcher, as follows:

- From the MCP100 Home screen, tap the **Messages** icon.
- Create and send a message.



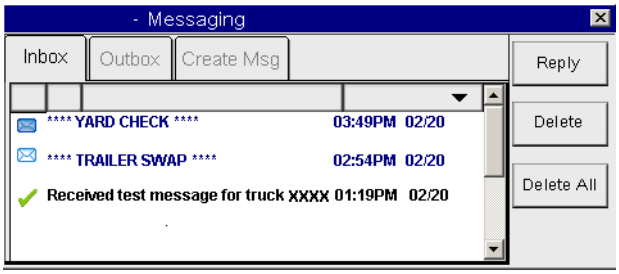
4. Check for message acknowledgement. Verify a "✔" (check mark) appears next to the message in the Outbox.

Note

Orange "⇆" (arrows) indicate message is in transit. When a green "✔" (check mark) appears next to the message in the Outbox, a message was sent and acknowledged by the NOC.
*A red "**X**" indicates the message failed to transmit.*

- If the message is acknowledged, go to step 5.
- If the "✔" (check mark) does not appear next to the message after 5 minutes, check that GPS is functioning properly (refer to Chapter 10). Return to step 3.
- If the "✔" (check mark) does not appear next to the message after GPS has been checked and fixed, call Omnitracs Customer Support:

US: 800-541-7490
Canada: 800-863-9191



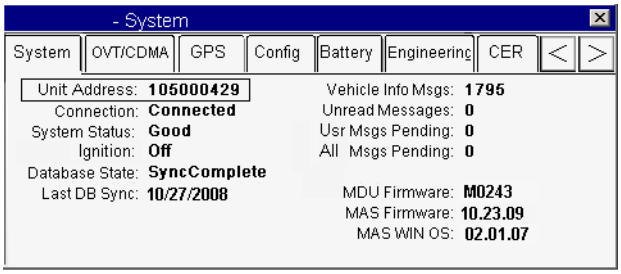
5. Have the dispatcher verify that the test message from the MCP100 was received.

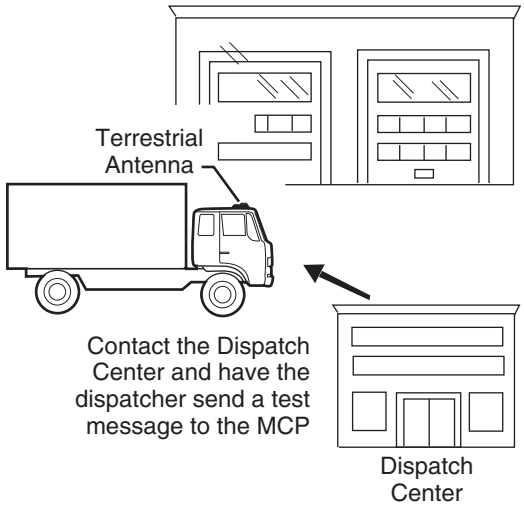
- If the dispatcher received the message, go to step 6.
- If the dispatcher did not receive the message, go to step 8.

6. Ask the dispatcher to send a test message to the MCP100.

7. After the MESSAGE WAITING light illuminates, go to the Inbox to display the dispatcher's message.

- If the MCP100 received the message, the diagnostic procedure is complete.
- If the MCP100 did not receive the message, go to step 8.





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8. Contact the dispatcher and verify that the MCP100 unit address listed on the MAS matches the number listed for this vehicle in the MCP100# field of the host software.

- If the numbers do not match, go to step 9.
- If the numbers match, go to step 10.

9. Have the dispatcher change the host software MCP100# listed for this vehicle to match the MAS's serial number. Then, repeat step 3. through step 7. to verify that the MCP100 now transmits and receives messages.

10. Contact Omnitracs Customer Support and verify that the MAS's serial number is in the correct customer account.

- If the serial number is not in your account, ask the Customer Support operator to correct the problem. Then repeat step 3. through step 7. to verify that the MCP100 now transmits and receives messages.
- If the serial number is in the correct account, tell the Customer Support operator about the problem you are having with the MCP100.

8

Low Satellite Signal—Low C/No Value

These topics are covered in this chapter:

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

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

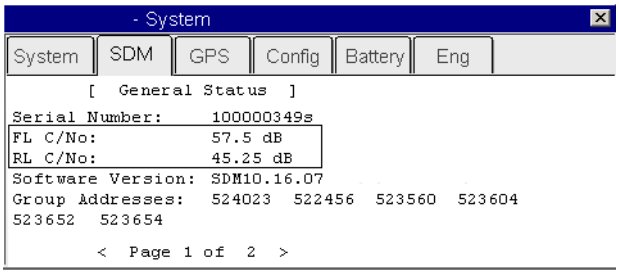
What Is the C/No Value?

The C/No value indicates the strength of the forward and return satellite signals being received and transmitted by the satellite data modem (SDM).

- Typical C/No values are:
  - 54–57 for the FL C/No
  - 40–45 for the RL C/No
- Low C/No values are:
  - <50 for the FL C/No
  - <33 for the RL C/No

A low C/No value could cause transmission problems. If the value drops too low, the MCP100 loses the satellite signal (the display NO SIGNAL light will go on). When you lose the signal you cannot exchange information with the dispatcher.

How to Check the C/No Value



To view C/No values, from the MCP100 Home screen, tap the **System** icon, then tap the **SDM** tab.

When the SDM has a clear view of the satellite, the C/No value for a forward signal (FL C/No) should be greater than 50 and the C/No value for a return signal (RL C/No) should be greater than 33. This includes cases where the SDM is installed beneath an airdam.

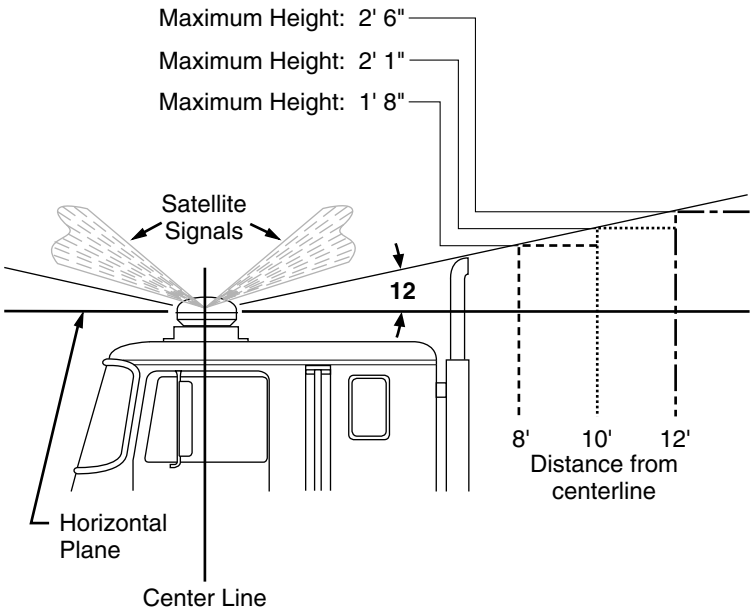
The signal strengths vary slightly from region to region. This can result in an MCP100 with a low C/No value working fine in areas with higher signal strengths, but failing to work at all in areas with lower signal strengths.

The Line-of-Sight View

The SDM requires an unobstructed line-of-sight view to the satellite in order to clearly send and receive signals.

- The minimum angle is 12° above the horizontal plane of the SDM. This is critical.
- The maximum angle is 60° above the horizontal plane of the SDM in most areas.
- There must be an unobstructed view of the satellite at angles 12° and 60°.

The illustration below illustrates the 12° angle and shows the maximum allowable height of objects located at various distances from the SDM centerline. This height is measured up from the horizontal plane of the SDM.



An obstruction height of 2.5 feet for every 12 feet away from the SDM centerline is acceptable. The MCP100 may not operate properly if there are obstructions above this height. Use this same formula to verify that a trailer hooked up to the vehicle does not extend above the 12° angle.

Materials that Obstruct the Satellite Signal

Normally, the satellite signal can pass through thin layers of glass, fiberglass, and plastic with minimal signal loss. Thick layers or obstructions above the 12° angle may block or degrade the satellite signal.

Common Obstructions: metal airdams, metal wings, metal side skirts, air conditioning units, and exhaust stacks.

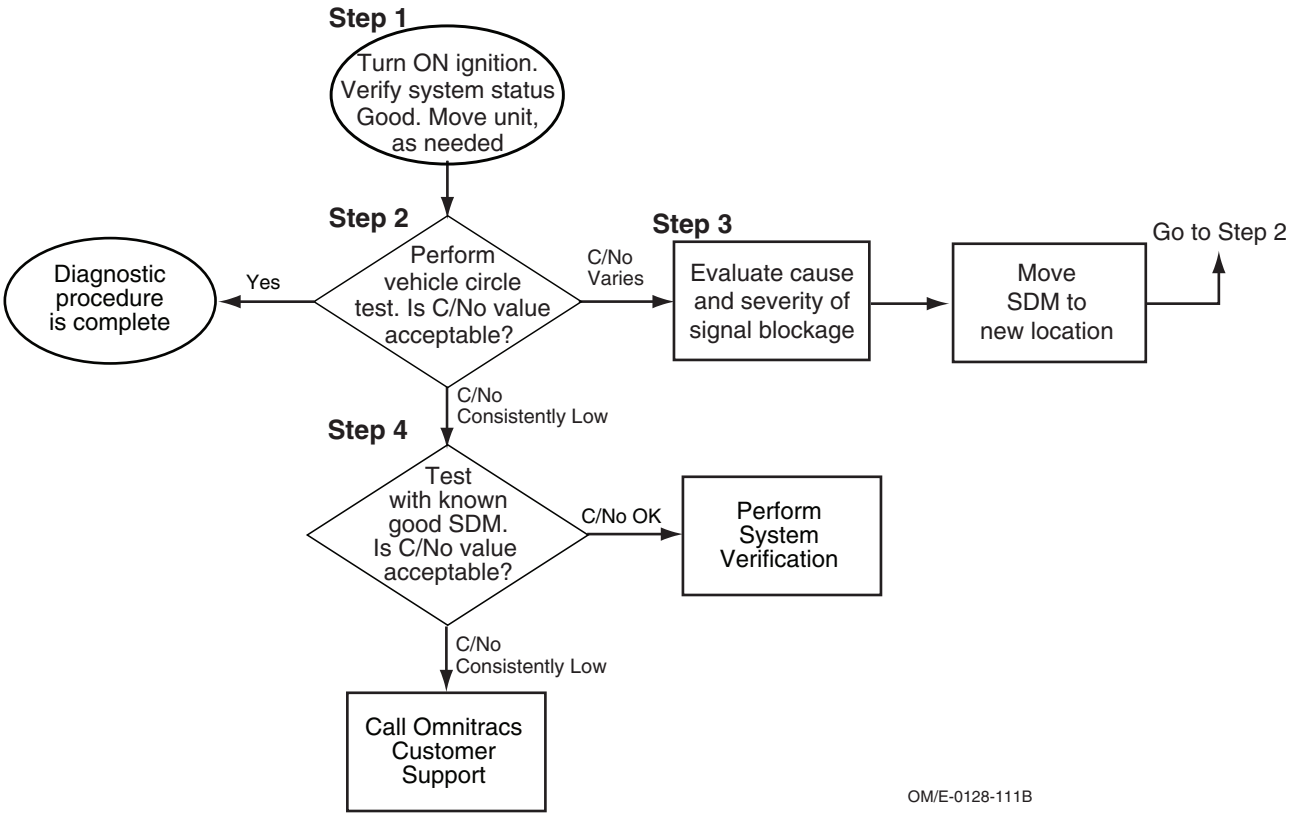
Unsuitable Airdam Materials: multiple layers of fiberglass, glass, or plastic; areas with numerous bends in the fiberglass; metal and wood bracing; metallic paints and lead-based paints; and company logo decals that contain metal.

Blind Spots: Materials described above that fall within the SDM's line-of-sight view can block the satellite signal that result in a constant or intermittent low C/No value problem. Keep blind spots to an absolute minimum.

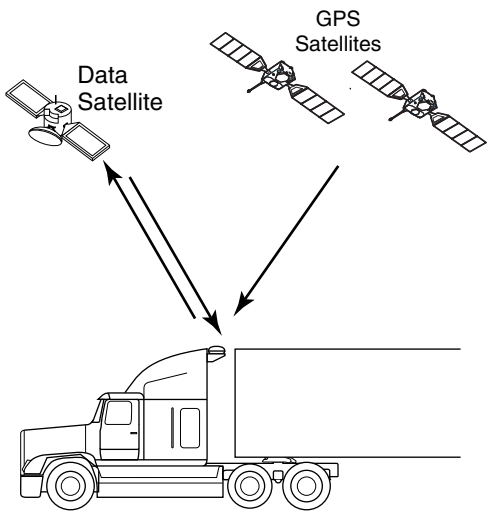
Corrective Action for Blocked Signal: If the signal is severely blocked because of airdam or other obstructions, re-install the SDM in a location with fewer obstructions.

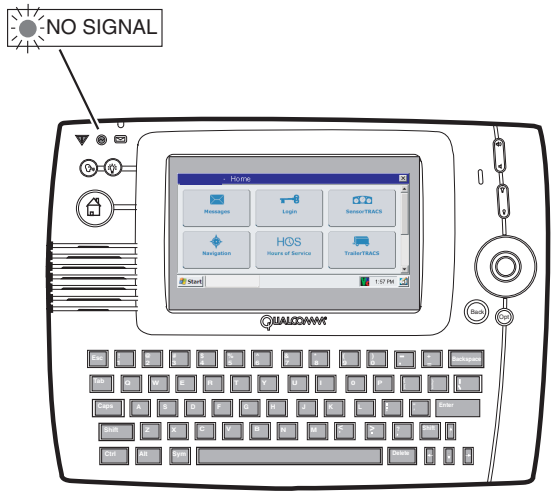
Low Satellite Signal—Low C/No Value

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Diagnostic Procedure





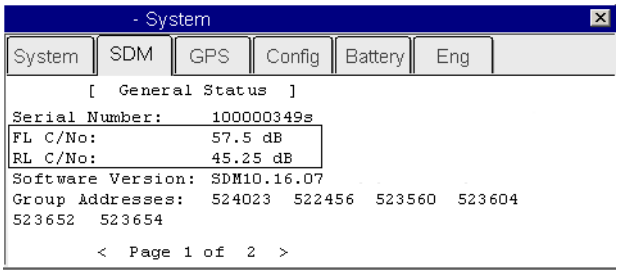
The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

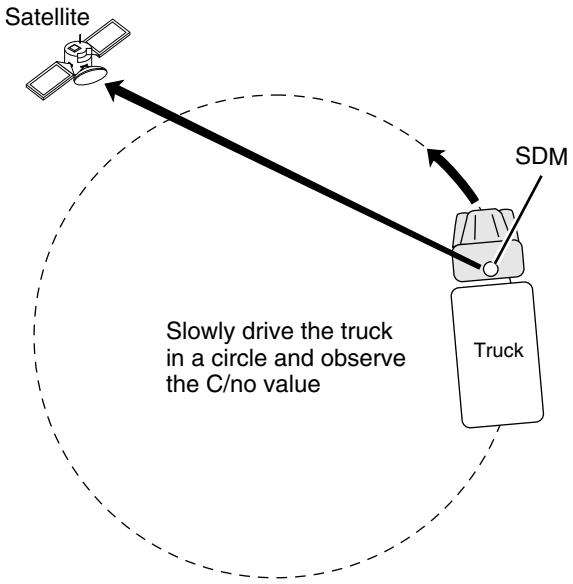
1. Turn the vehicle ignition ON. Check System Status field on System screen and verify that the System Status is **Good**.

- If the System Status is not Good, go to Chapter 6 in this guide.
- If the NO SIGNAL light is on, make sure the SDM has a clear view of the satellites. The data satellite is located above the equator, roughly south of Georgia.

Wait for the MCP100 to acquire the satellite and the display NO SIGNAL light to go off.

It may take several minutes for the MCP100 to acquire the satellites. If the MCP100 was just installed, it may take as long as 5 minutes.





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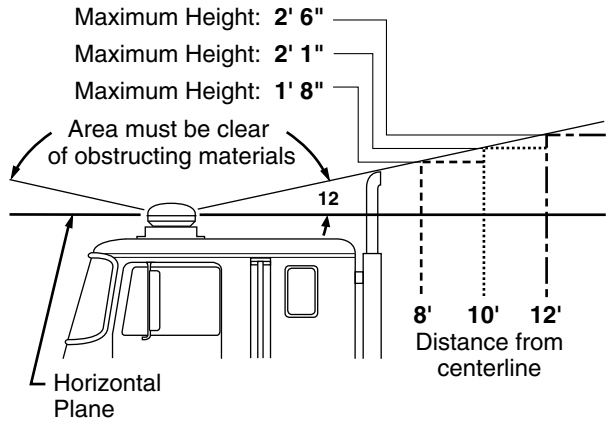
Ch 10

Two people are needed to perform the circle test in step 2., a driver and a passenger to monitor the C/No values on the SDM screen.

2. Tap the **SDM** tab to display the SDM screens.

Drive the truck in a circle, stopping periodically to record the C/No value. The NO SIGNAL light should stay off during this test. The circle test allows the SDM to receive the signal from all angles.

- If the C/No value stays at or near the acceptable level (FL C/No should be greater than 50; RL C/No should be greater than 33), the diagnostic procedure is complete.
- If you see large changes in the C/No value, go to step 3.
- If the C/No value remains below the acceptable level and there is little or no change, there is probably a hardware fault. Go to step 4.



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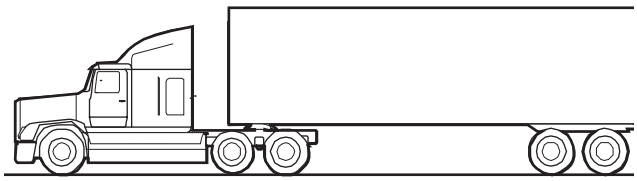
Ch 10



3. If the C/No value varies during the circle test, there are probably obstructions blocking the satellite signal when the truck is facing certain directions.

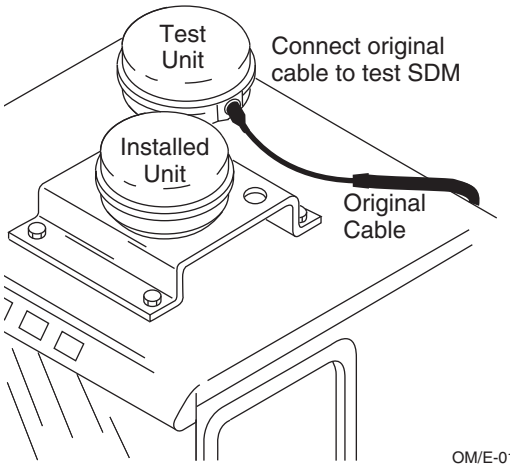
Park the vehicle in the spots where the C/No value is the most severely reduced. Look at the SDM and any surrounding objects to find the cause of this problem. Any obstructions located in the SDM line-of-sight could block or degrade the satellite signal.

Note

The SDM needs an unobstructed view of the data satellite, which is located above the equator, roughly south of Georgia.

An obstruction height of 2.5 feet for every 12 feet away from the SDM centerline is acceptable.

Depending on the severity of the problem, it may be necessary to remove the obstruction, change the height of the SDM by using a different mount (e.g., AMA-98), or move the SDM where the satellite signal is not blocked. Make the appropriate changes and repeat step 2.



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4. Connect the known good SDM. After the SDM has acquired the satellite and the NO SIGNAL light goes off, check the C/No values on the SDM screen.

- If the C/No values are now good, the original SDM was faulty. Replace SDM and perform the system verification procedure in Chapter 4.
- If the C/No values are consistently low, i.e., FL < 50 and RL < 33, call Omnitracs Customer Support:

US: 800-541-7490
Canada: 800-863-9191

9


Low Terrestrial Signal—RSSI Value > 105

These topics are covered in this chapter:

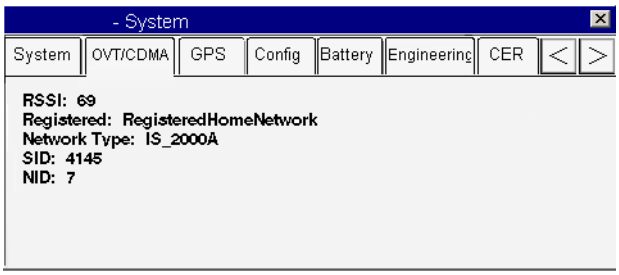
For technical questions, contact Omnitracs Customer Support.
Customer Support is staffed 24 hours a day, 365 days a year:

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

What Is the RSSI Value?

- The RSSI value indicates the strength of the wireless communication network signal being received by the antenna.
- Typical RSSI value is less than 105.
- An unacceptable RSSI value could cause messaging problems. If the value goes to an unacceptable level, the MCP100 will lose the wireless communication network signal (the display NO SIGNAL light will go on). When you lose the signal, i.e., the NO SIGNAL light is on, you cannot communicate with the dispatcher.

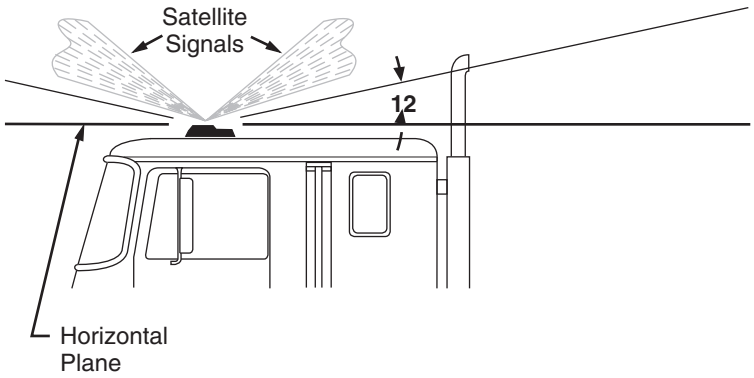
How to Check the RSSI Value



To view the RSSI value, from the MCP100 Home screen, tap the **System** icon, then tap the **OVT/CDMA** tab.

To navigate through the five OVT/CDMA screens, tap the screen and then use the arrow keys to move from screen to screen.

Materials that Obstruct the PCS Signal



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Normally, the PCS signal can pass through thin layers of glass, fiberglass, and plastic with minimal signal loss. Thick layers or obstructions may block or degrade the PCS signal.

Common Obstructions: metal airdams, metal wings, metal side skirts, air conditioning units, and exhaust stacks.

Unsuitable Airdam Materials: multiple layers of fiberglass, glass, or plastic; areas with numerous bends in the fiberglass; metal and wood bracing; metallic paints and lead-based paints; and company logo decals that contain metal.

Blind Spots: Materials described above that fall within the antenna's line-of-sight view can block the PCS signal that result in a constant or intermittent unacceptable RSSI value. Keep blind spots to an absolute minimum.

Corrective Action for Blocked Signal: If the signal is severely blocked because of airdam or other obstructions, re-install the antenna in a location with fewer obstructions.

Other Causes of an Unacceptable RSSI Value:

- Faulty PCS antenna and cable
- Faulty terrestrial data modem (TDM) or TDM cable

For additional antenna installation recommendations, refer to the *MCP100 Installation Guide*.

10
MCP100-GPS Positioning Problems

These topics are covered in this chapter:

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

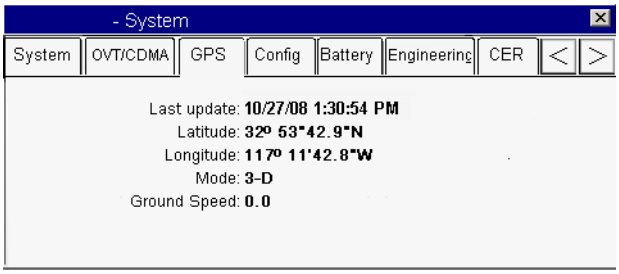
- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

GPS Positioning System

- Positioning data is sent to the dispatcher as frequently as every 15 minutes, as configured by the host, or whenever messages are sent and received.
- The MCP100 uses global positioning system (GPS) position reporting, which provides current vehicle positioning with latitude and longitude updates displayed on the MCP100 display every second.
- Identify a location near your facility that offers a clear view to the sky, horizon to horizon. Test all new units from this same location.

Normal Performance

- Normally the GPS positioning system will update positioning data every second at the MCP100, as shown in the Last Update field.
- The desired value for the Mode field, is 2-D or 3-D, although No Fix may show when the antenna is temporarily blocked or in a garage.

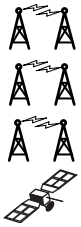


To access the GPS screen, from the MCP100 Home screen, tap the **System** icon and then tap the **GPS** tab.

Field	*Description*
LAST UPDATE	The time of the last GPS update. This value should update every second when the vehicle has a view to the open sky.
LATITUDE	The last received latitude value.
LONGITUDE	The last received longitude value.
MODE	Indicates the MCP100's GPS status. This field displays one of the following: • **3-D** is displayed if the receiver is able to view many 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.

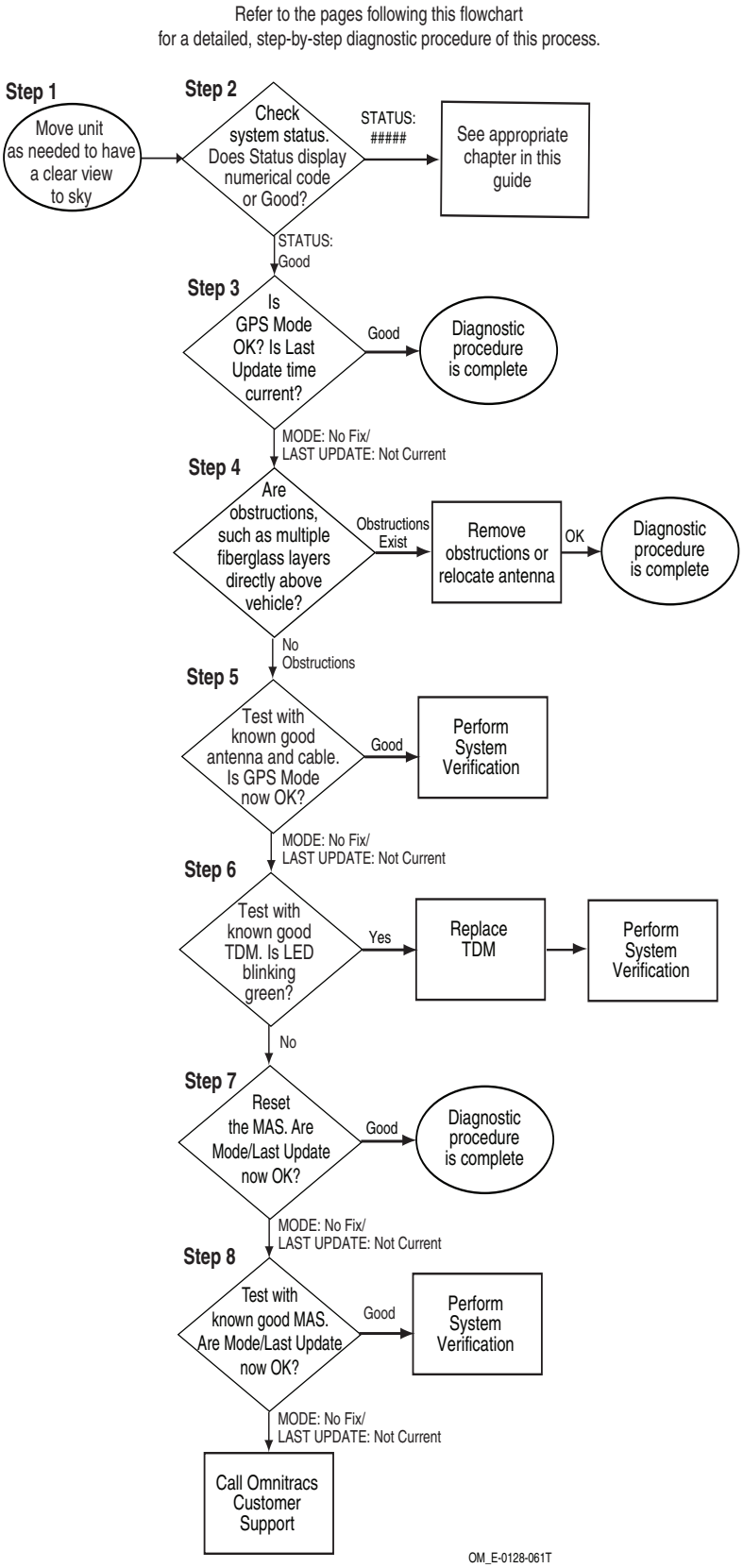
Abnormal Performance

With an MCP100, GPS is the only method available for positioning data. If the vehicle is in the open with a clear view of the sky, the mode should show 2-D or 3-D. If the mode shows NO FIX or the LAST UPDATE time is not current, the problem is usually caused by one or more of the following:

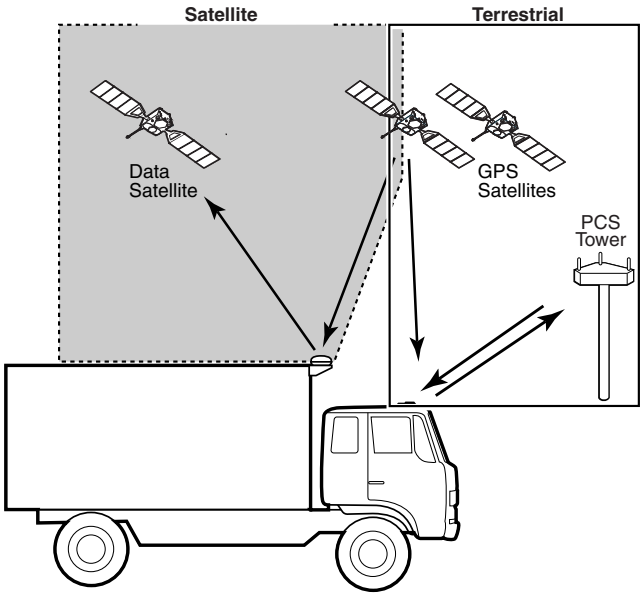


- The antenna or SDM is in a location where the view to the sky is blocked or obstructed
- A faulty antenna and/or cable
- Faulty TNC connectors
- Faulty terrestrial data modem (TDM)
- A faulty SDM
- A faulty mobile application server (MAS)

GPS Positioning



Diagnostic Procedure



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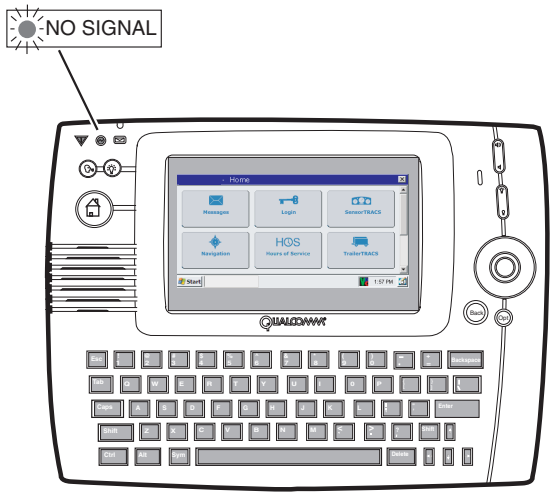


05AAA_215C

The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

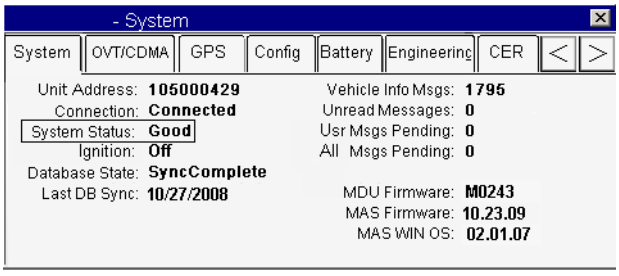
1. Turn the vehicle ignition ON.

- Make sure the antenna has acquired a wireless communication network signal. Move the vehicle, if necessary.
- Make sure the SDM has a clear view of the satellites. Move the vehicle, if necessary.

Wait for the display NO SIGNAL light to go off.

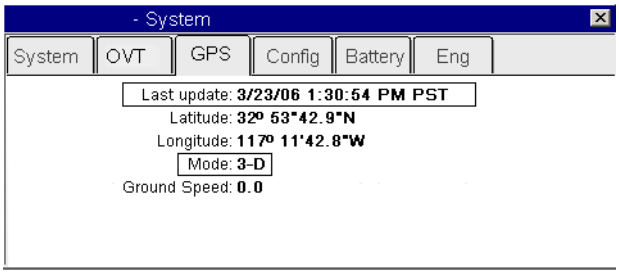
It may take several minutes for the MCP100 to acquire the satellites. If the MCP100 was just installed, it may take as long as 5 minutes.

If the NO SIGNAL light stays on, go to Chapter 6 in this guide.



2. Tap the **System** icon, then tap the **System** tab to display the System screen. Check the System Status.

- If the System Status is **Good**, go to step 3.
- If the System Status is a numerical value, go to the appropriate diagnostic procedure for that value in this guide.

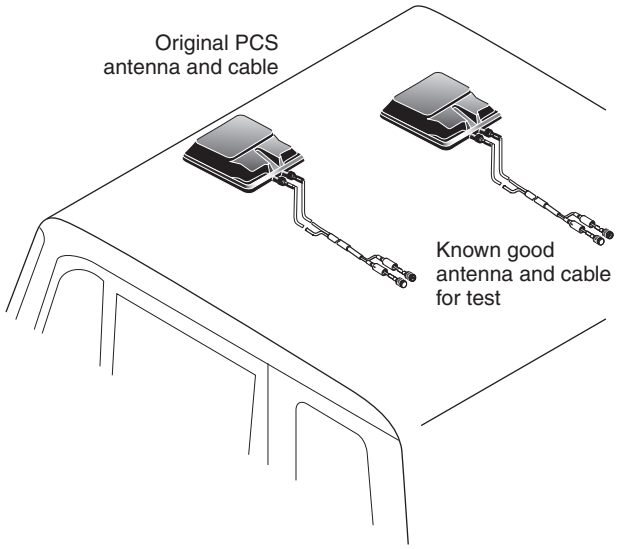


3. Check the GPS mode and that the Last Update time is current.

- If No Fix appears or if the Last Update time is not current, go to step 4.
- If 2-D or 3-D appears in the Mode field and the Last Update time/date are current, this is a good positioning status and the diagnostic procedure is complete.

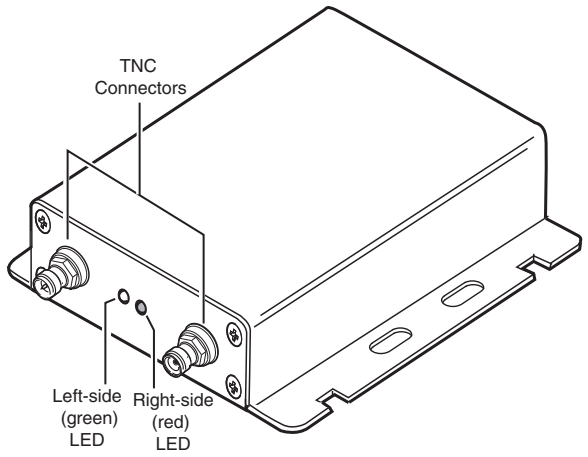
4. Check for any obstructions that may block or degrade the satellite signal, such as multiple layers of fiberglass directly above the vehicle.

- If there are any obstructions, remove the obstructions or relocate the antenna.
- If there are no obstructions, go to step 5.



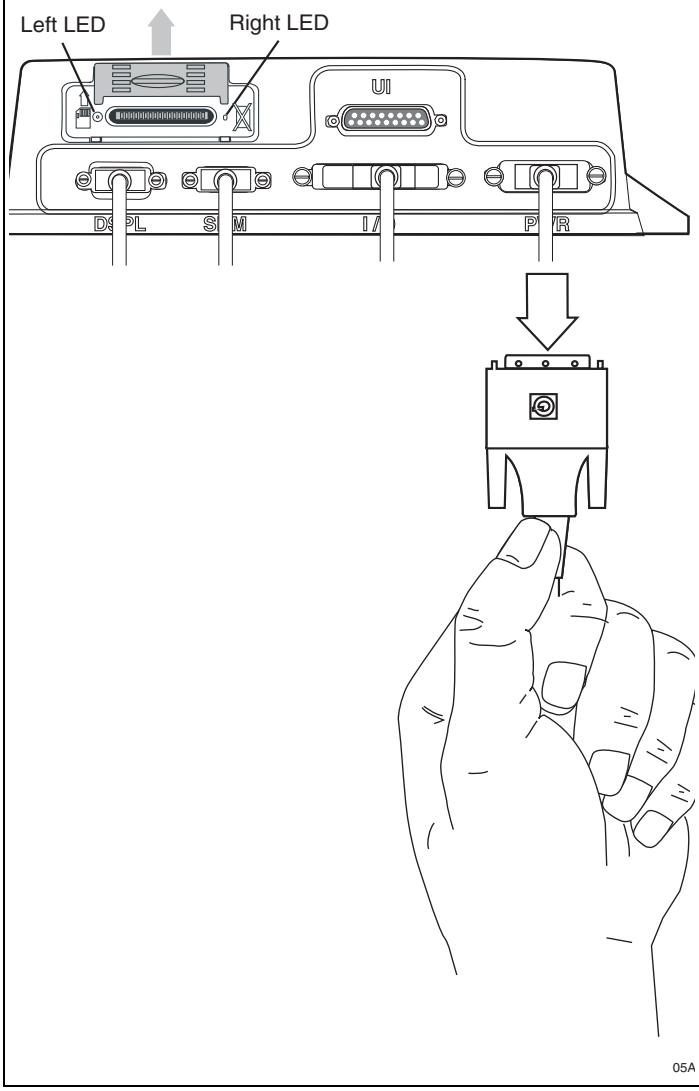
5. Test with a known good antenna and cable. After the antenna has acquired the satellite and the NO SIGNAL light has turned off, check the Mode and Last Update time/date on the GPS screen.

- If 2-D or 3-D now appears in the Mode field, the original antenna and cable were bad. Replace the antenna and cable and perform the system verification procedure in Chapter 4.
- If No Fix appears, the original antenna and cable are probably okay. Go to step 7.



6. Test with a known good TDM. Is the left-side LED blinking green?

- If the left-side LED is blinking green, the original TDM was bad. Replace the TDM and perform the system verification procedure in Chapter 4.
- If the left-side LED is out, the original TDM was probably okay. Go to step 7.



7. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

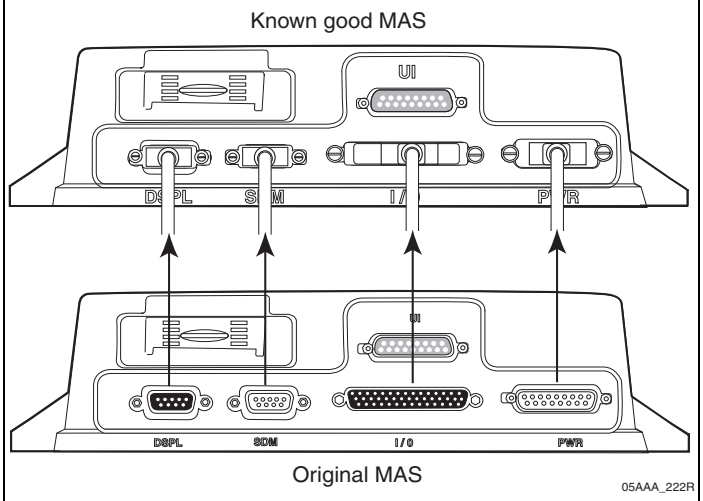
Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

Check the Mode and Last Update fields again.

- If 2-D or 3-D now appears in the Mode field, the diagnostic procedure is complete.
- If No Fix appears or the Last Update time/ date is not current, go to step 8.



8. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

- If the display is now working, the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the display is still not working, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

11
MDU Immediately Goes Blank When Ignition Is Turned Off

These topics are covered in this chapter:

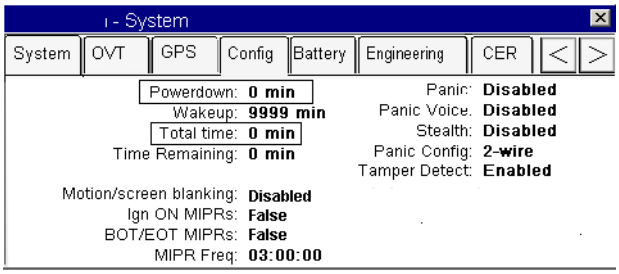
For technical questions, contact Omnitracs Customer Support.
Customer Support is staffed 24 hours a day, 365 days a year:

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

Normal Performance

When vehicle ignition is turned OFF, the system should stay awake and the display should show whatever screen was last displayed.

- Dispatch can configure the MCP100 to stay awake and powerdown for the time periods they choose.



To access the configuration screen, from the MCP100 Home screen, tap the **System** icon and then tap the **Config** tab.

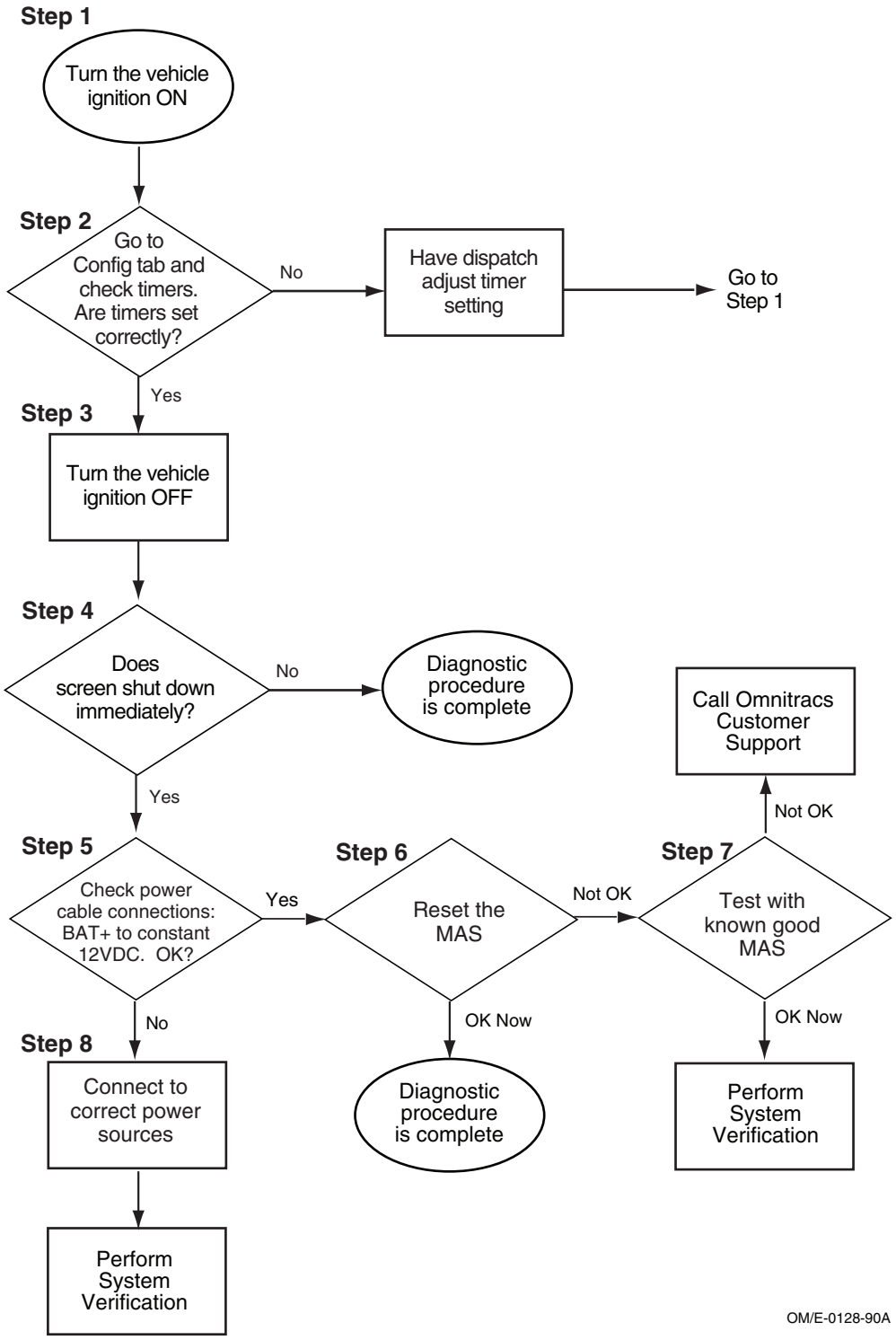
Abnormal Performance

If the display screen *immediately* blanks out when the ignition is turned OFF, this is caused by one or more of the following:

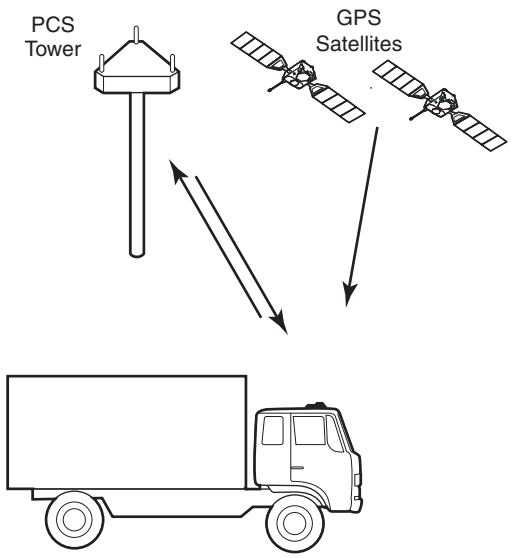
- The MCP100's power-down timer/total timer are incorrectly set
- BAT+ wire connected incorrectly
- Faulty mobile application server (MAS)

Screen Immediately Goes Blank When Ignition Is Turned Off

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.

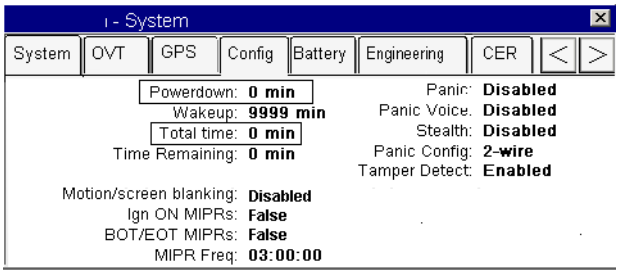


Diagnostic Procedure



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Turn vehicle ignition ON.



2. Go to the Home screen and tap the **System** icon. Tap the **Config** tab and check the settings for Powerdown and Total time. Are both set correctly?

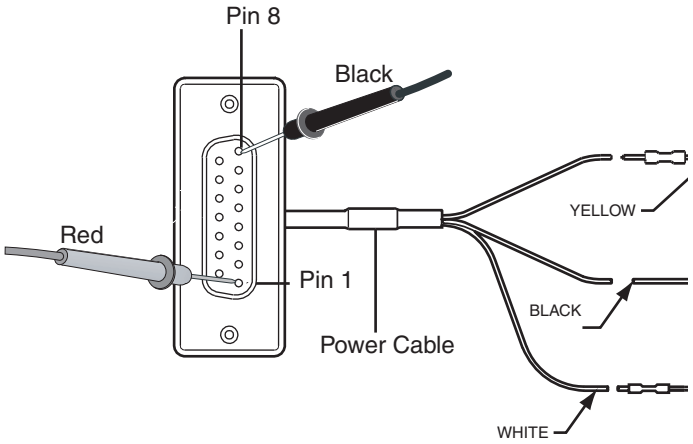
The Powerdown setting is the minutes until the MCP100 shuts off; the Total time setting is the minutes the MCP100 draws power from the battery with the ignition OFF. The Total time should not be less than the Powerdown time.

- If the timers are correctly set, go to step 3.
- If the timers are not correctly set, have the dispatcher adjust the timer settings. Wait for the settings to update and return to step 1.

3. Turn vehicle ignition OFF.

4. Does the screen shut down immediately?

- If no, the diagnostic procedure is complete.
- If yes, go to step 5.

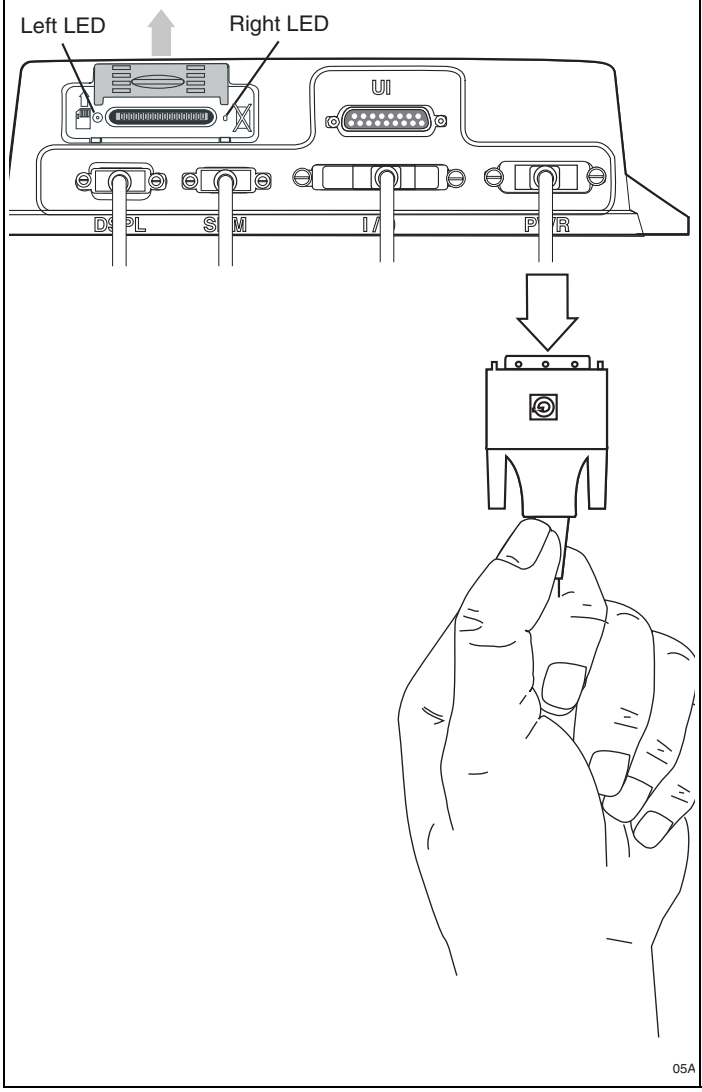


5. Check the MAS power cable connections. Is BAT+ connected to an unswitched +12/24 VDC constant power source? Is IGN connected to a switched +12/24 VDC power source?

Note

The connection for BAT+ should always be +12/24 VDC when ignition is ON or OFF.

- If yes, go to step 6.
- If no, go to step 8.



6. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

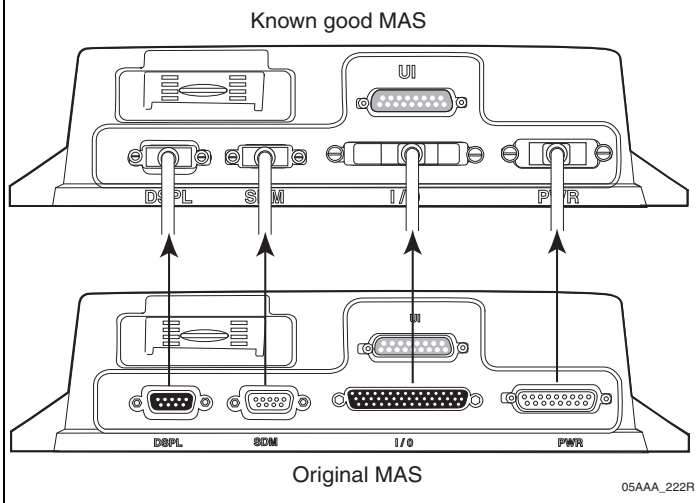
Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

Check that the screen stays ON when ignition is turned OFF.

- If yes, the diagnostic procedure is complete.
- If the screen goes blank immediately, go to step 7.



7. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up. Turn OFF ignition. Does screen stay on?

- If the screen stays on, the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the screen immediately goes blank, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

8. Connect to the correct power source, and perform the system verification procedure in Chapter 4.

12
MCP100 Does Not Go to Ignition Off

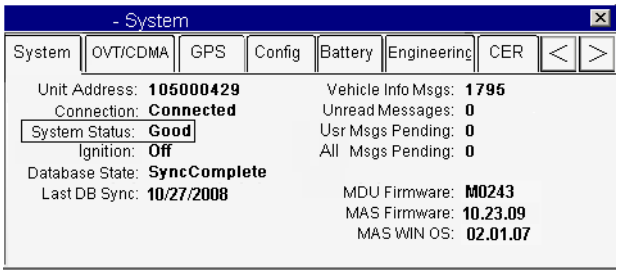
These topics are covered in this chapter:

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

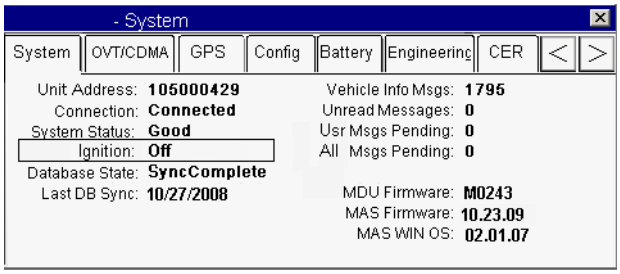
- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Normal Performance

When the vehicle ignition is turned ON, the System Status displays **Good**.



When vehicle ignition is turned OFF, the System Status should change to **Ignition Off** within 10 minutes.



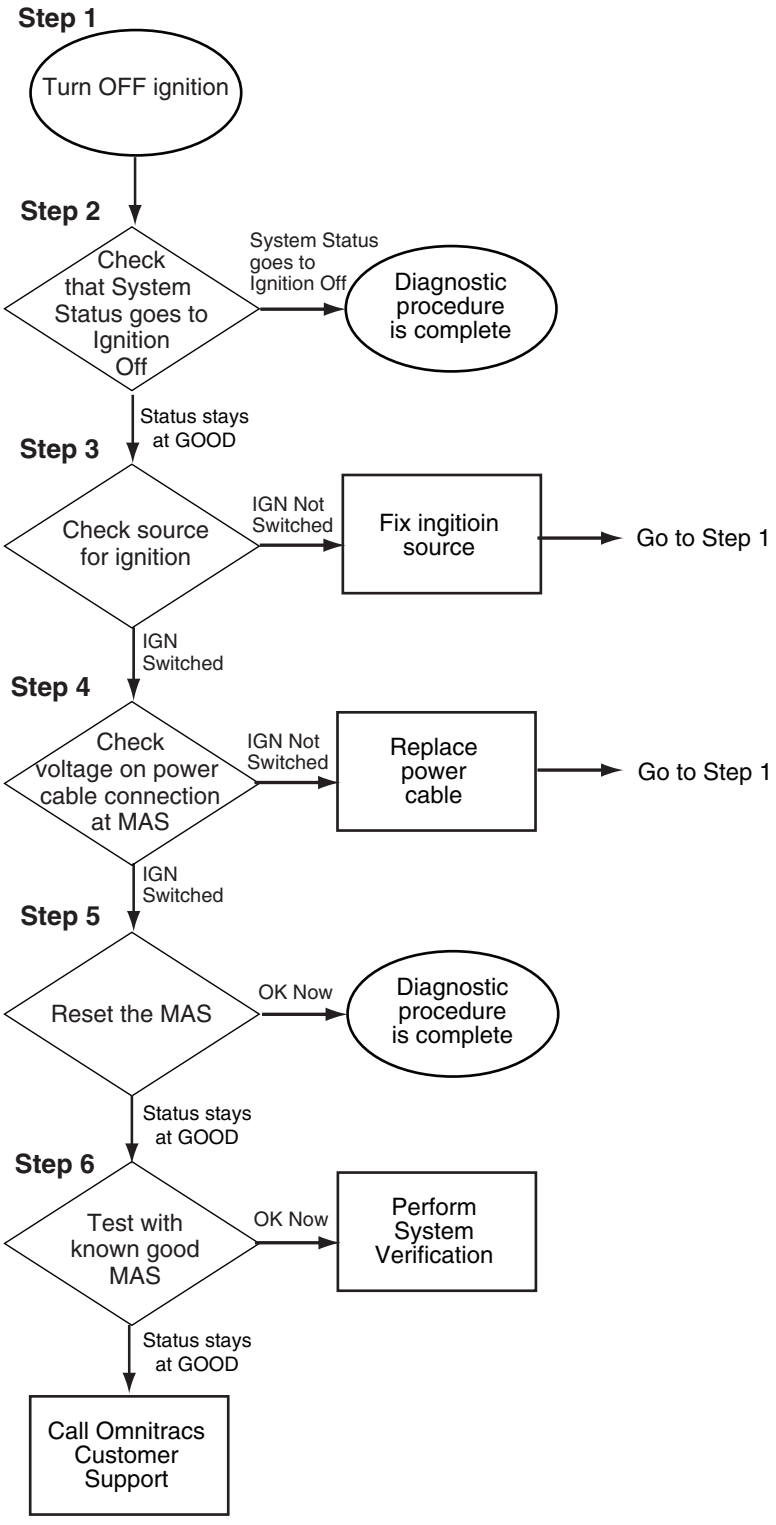
Abnormal Performance

If the System Status does not change to **Ignition Off** within 10 minutes after you turn OFF the ignition, there is a problem with one or more of the following:

- Power cable's ignition wire is connected to wrong source
- Faulty mobile application server (MAS)
- Faulty power cable

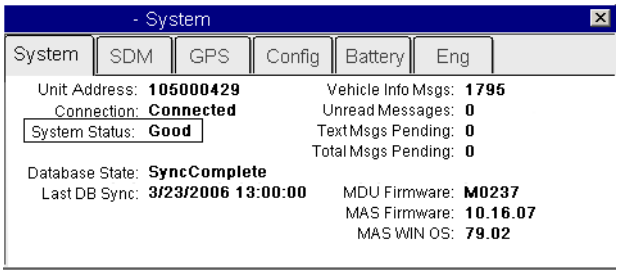
MCP100 Does Not Go to Ignition Off Status

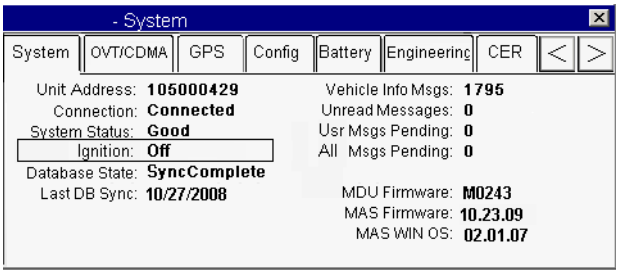
Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



OM/E-0128-90A

Diagnostic Procedure



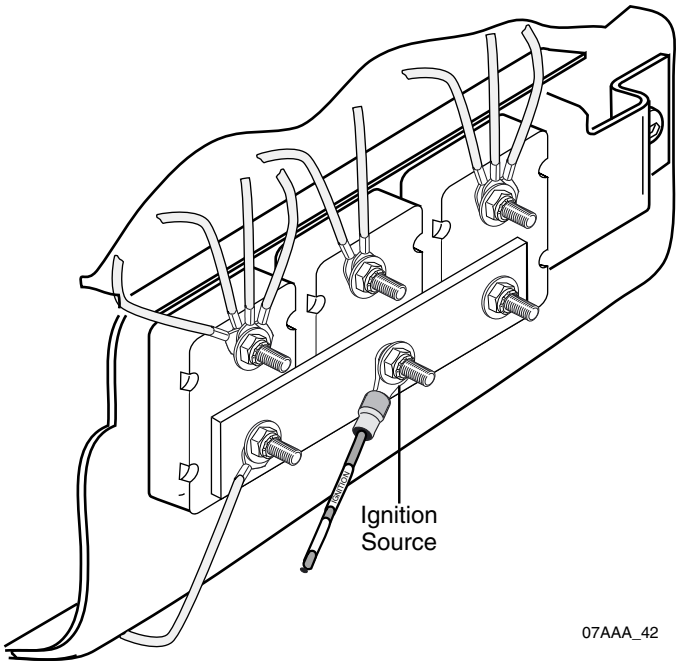


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential–you may be instructed to skip steps.

1. Turn the vehicle ignition OFF.

2. The System Status should go to **Ignition Off** within 10 minutes.

- If the System Status goes to **Ignition Off**, the diagnostic procedure is complete.
- If the System Status remains at **Good**, go to step 3.



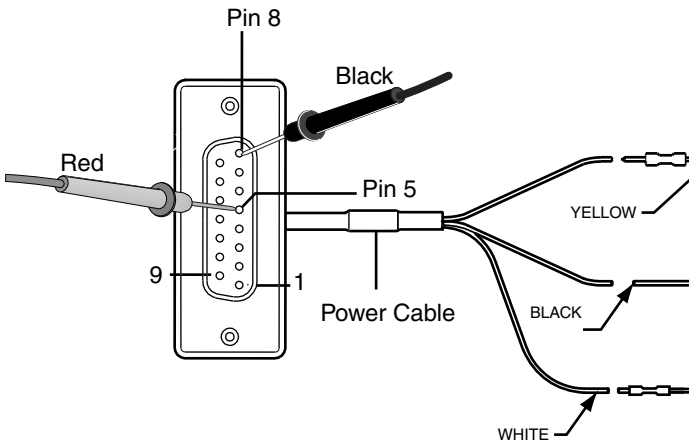
3. Check the source for the ignition wire on the vehicle. Make sure the IGNITION wire is connected to the switched +12/24 VDC power source.

Note

With the IGN OFF, there should not be voltage on the ignition power source.

With the IGN ON, you should see +12/24 VDC on the ignition power source.

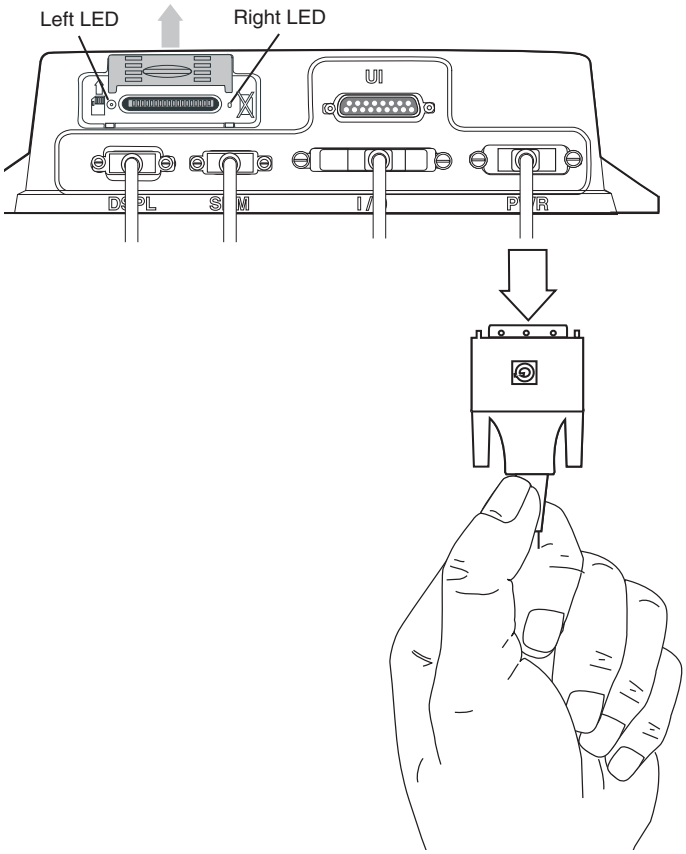
- If the ignition source is okay, go to step 4.
- If the ignition source is not okay, disconnect the ignition wire of the power cable and reconnect it to the switched +12/24 VDC power source. Return to step 1.



4. Disconnect the power cable from the MAS. Use a voltmeter to test pin 5, as follows:

Pin 5—Verify that +12/24 VDC is supplied only when the ignition is in the ON position. Use pin 8, 14, or 15 as ground reference.

- If the voltages test OK, go to step 5.
- If the voltages test bad, the power cable may be faulty. Replace the power cable and return to step 1.



5. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

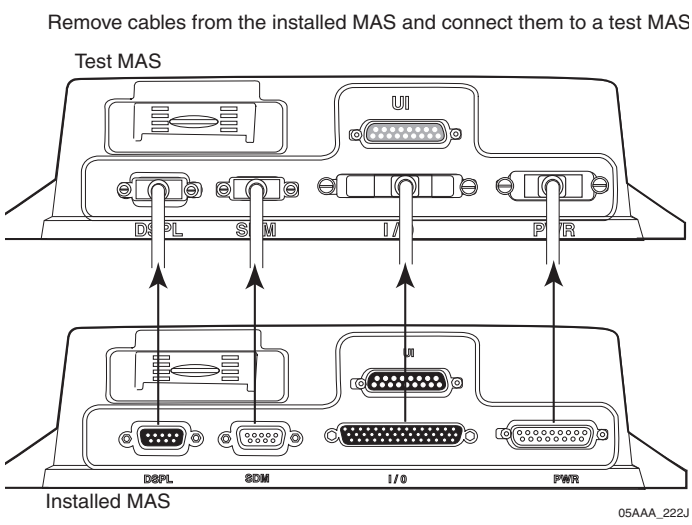
Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

Toggle the ignition from ON to OFF and check to make sure the System Status goes to **Ignition Off**.

- If the System Status goes to **Ignition Off**, the diagnostic procedure is complete.
- If the System Status does not go to **Ignition Off**, go to step 6.



6. Test with a known good MAS and turn the vehicle ignition to ON and then to OFF. Wait 10 minutes to see if the System Status changes from **Good** to **Ignition Off**.

- If the MCP100 now works correctly, the original MAS is faulty. Replace the MAS and perform the system verification procedure in Chapter 4.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

- If the MCP100 still does not work correctly, call Omnitracs Customer Support:

US: 800-541-7490
Canada: 800-863-9191

13
Database Status—Out of Sync

These topics are covered in this chapter:

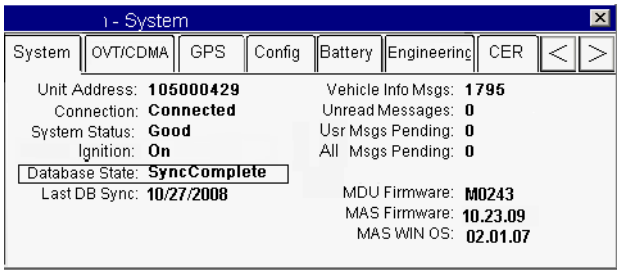
For technical questions, contact Omnitracs Customer Support.
Customer Support is staffed 24 hours a day, 365 days a year:

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

What Is Database Status?

Items, such as account settings and message macros must be downloaded over-the-air to a database in the MCP100 before it will operate correctly.

- When these items are loaded onto a unit over-the-air (OTA), the database status will show SyncComplete on the System screen.



To access the System screen, from the MCP100 Home screen, tap the **System** icon and then tap the **System** tab.

- Possible database states are:
  - SyncComplete—Unit has configuration and macro information.
  - Out of Sync—Unit does not have configuration and macro information.

Normal Performance

After an MCP100 is installed and powered up with good signal and line-of-sight to the satellite, it usually takes about 10 minutes for it to get all the company defined settings and configurations. Once it acquires all settings and configurations, it will go into the desired state of SyncComplete.

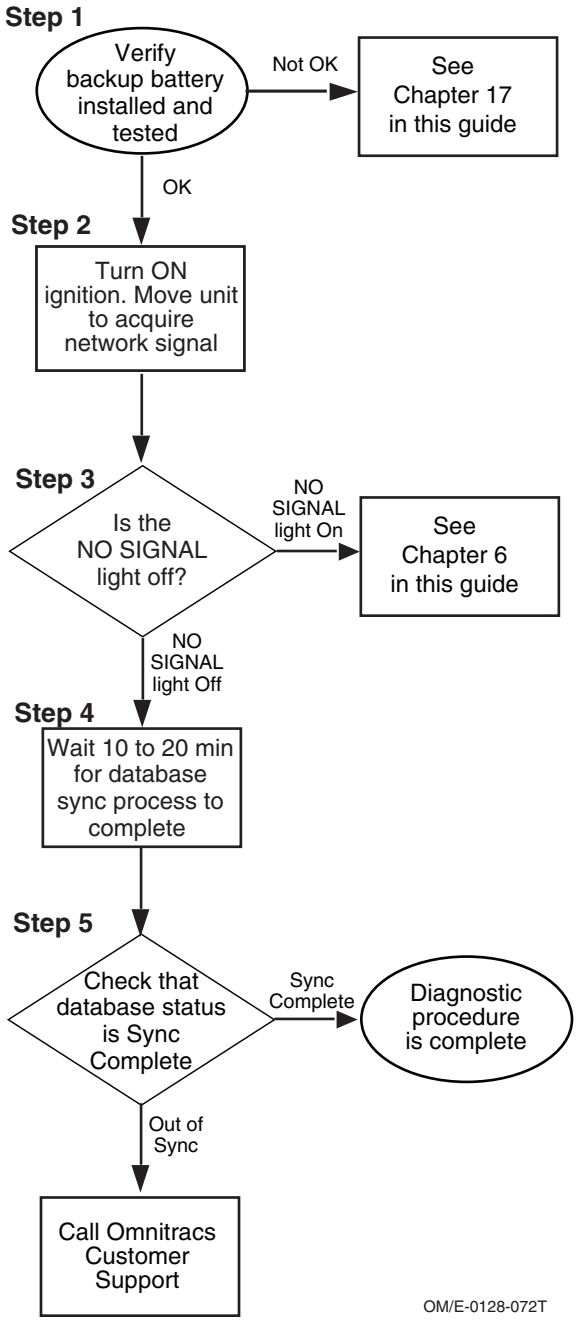
Abnormal Performance

An MCP100 will usually go to a database state of SyncComplete in 10 minutes after it is first installed and moved to a location that has good line-of-sight to the satellites.

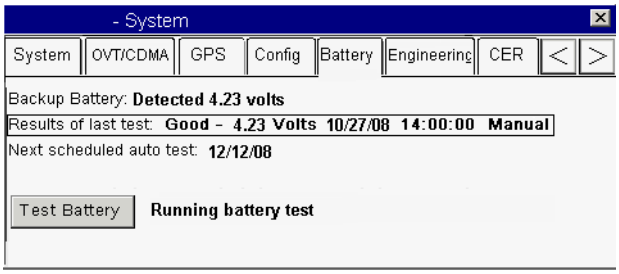
- If the mobile application server (MAS) backup battery was not originally installed correctly, there is a possibility the MCP100 will not go to a SyncComplete state.
- Generally, if an MCP100 has been installed and powered up with good signal and line-of-sight to the satellite for more than 20 minutes and it has not gone to a SyncComplete state, refer to the Database Status on page 13-3.

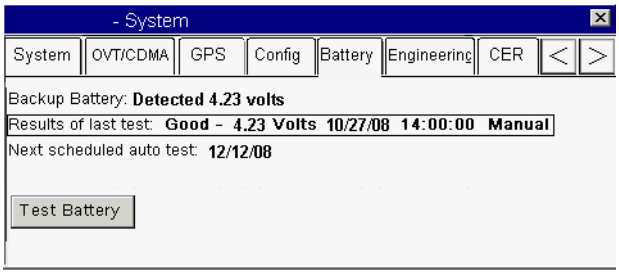
Database Status

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Diagnostic Procedure





The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

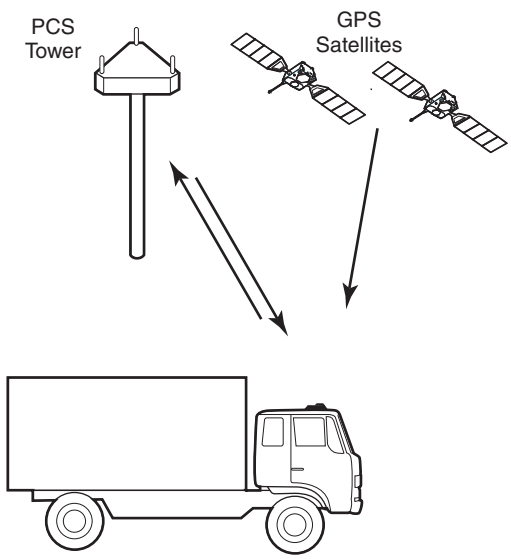
1. Verify that the MAS backup battery is installed and tested. Tap the **Battery** tab and tap the **Test Battery** button. The screen should display, “Running battery test.”

Note

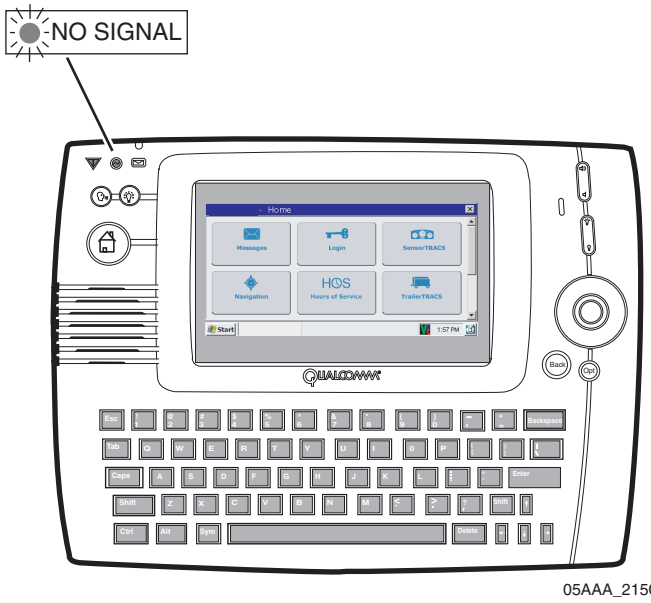
It may take a few minutes to perform this test.

After the field updates, check that the last test results are **Good**.

- If the results of last test are **Good**, go to step 2.
- If the results of last test are Bad, perform the diagnostic procedure in Chapter 17 in this guide.



2. Turn the vehicle ignition ON. Locate the vehicle so the antenna is able to acquire a network signal. Move the antenna or vehicle, if necessary.



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3. Check the NO SIGNAL light on the display. After the MCP100 acquires the satellite, the NO SIGNAL light will go off.

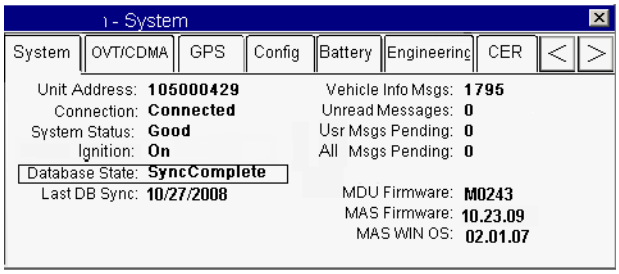
Note

If you have just installed the MCP100, it may take 5 minutes to acquire the satellite.

- If the NO SIGNAL light stays on, go to Chapter 6.
- If the NO SIGNAL light flashes for 2 minutes, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191
- If the NO SIGNAL light goes off, go to step 4.

4. Wait 10–20 minutes for the database sync process to complete.



5. Is Database State SyncComplete?

- If database state is SyncComplete, the diagnostic procedure is complete.
- If database state is Out-of-Sync, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

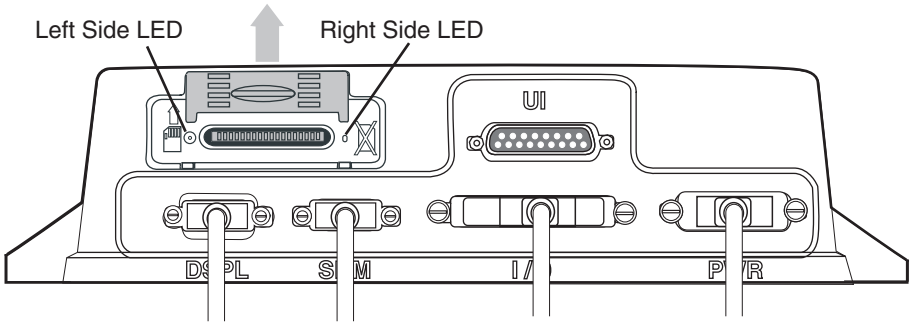
14
MAS and TDM Status—LED Indicators

These topics are covered in this chapter:

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

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

MAS Performance—LED Indicators



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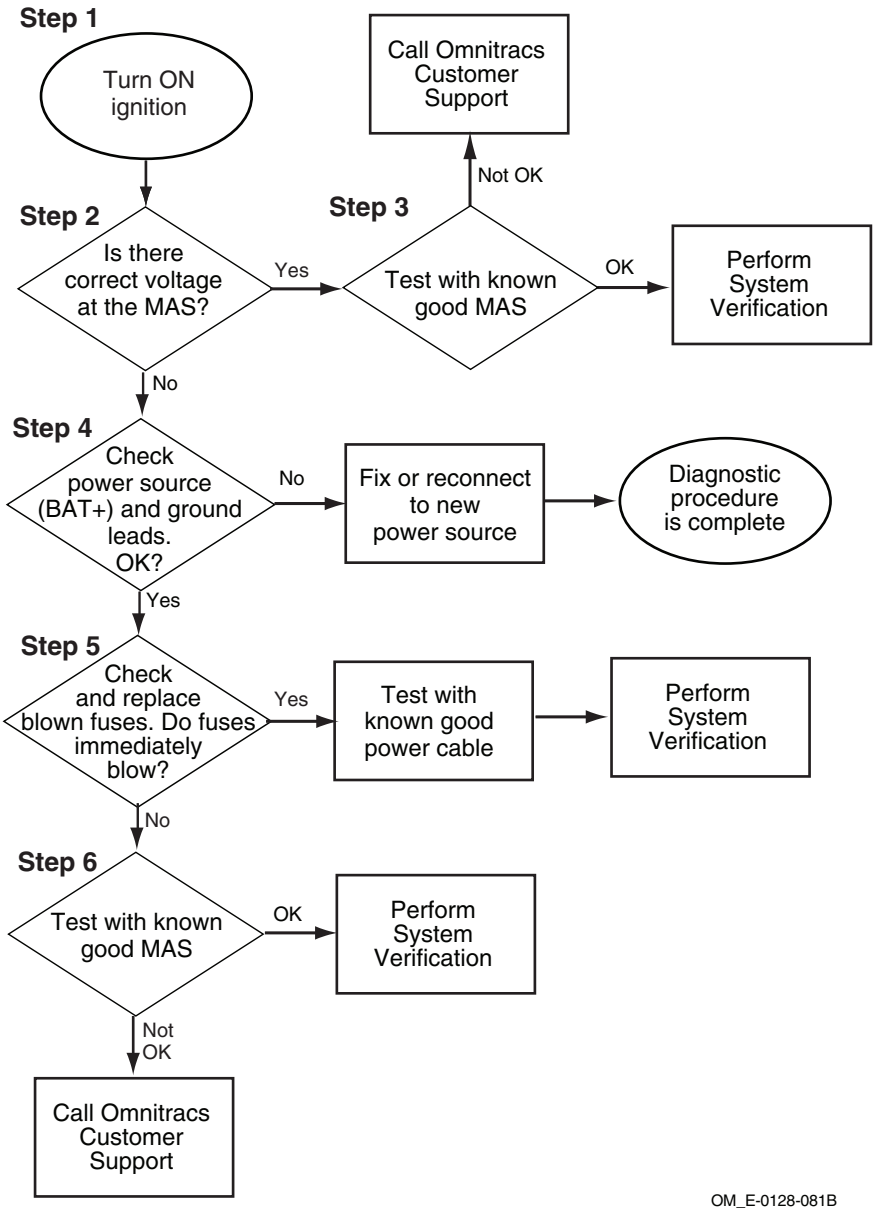
The following table lists the various states of the left and right side LEDs. In a normal operating environment, the left side LED should be *BLINKING BLUE* and the right side LED should be *OFF*. If you have technical questions, call Omnitracs Customer Support: for US customers call 800-541-7490; for Canadian customers call 800-863-9191.

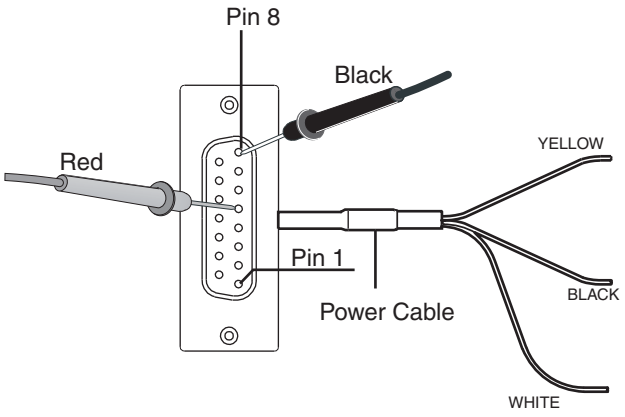
Left Side LED	Right Side LED	State	Necessary Action
BLINKING BLUE every second	*OFF*	The mobile application server (MAS) is awake and receiving truck power. The MAS is in a normal state.	None
BLINKING BLUE every 12 seconds	*OFF*	The MAS is asleep because ignition is OFF and it is receiving truck power. The MAS is in a normal state.	None
BLINKING RED	*OFF*	The MAS has lost truck power. At this time the MAS is shutting down and saving data.	Wait approximately 10 minutes for MAS to complete shut down and save data.
OFF	*OFF*	If there are no LEDs present, the MAS does not have power.	If this occurs when unit is connected to vehicle power, see *No Power to MAS—LEDs OFF/OFF* on page 14-3.
BLINKING GREEN	*SOLID RED*	The MAS is loading the Windows CE OS via the SD card.	If this occurs when not loading software, call Customer Support.
BLINKING GREEN	*SOLID GREEN*	The MAS has loaded the OS and now needs the MAS application software.	If this occurs when not loading software, call Customer Support.
BLINKING GREEN	*OFF*	The MAS has booted the OS and is unable to load or boot the MAS application software.	If this occurs when not loading software, call Customer Support.
BLINKING RED/BLUE/GREEN	*OFF*	The MAS is rebooting and loading the OS. This should last no longer than 1–2 minutes.	If this persists/reoccurs, call Customer Support.
SOLID RED	*OFF*	The MAS has detected an internal problem.	Call Customer Support.

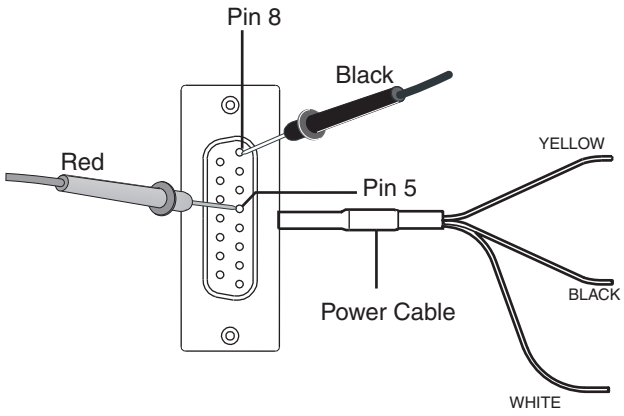
No Power to MAS—LEDs OFF/OFF

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Diagnostic Procedure





The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential–you may be instructed to skip steps.

1. Turn the vehicle ignition ON. Go to step 2a.

2a. To determine if the correct power is supplied, disconnect the power cable at the MAS and use a digital voltmeter to measure voltages.

- Is the voltage at MAS between 12 and 24 VDC for unswitched power? Test by using pin 8 (ground) and pin 1 (power).

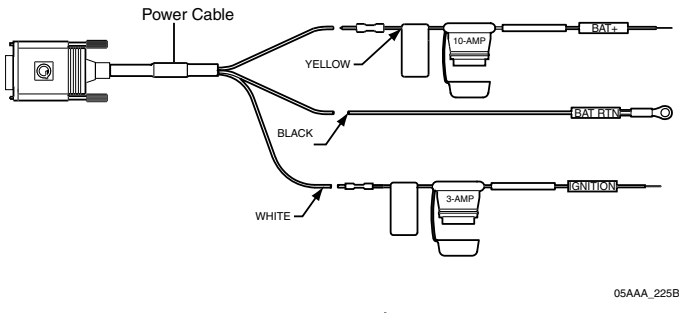
2b. Is the voltage at MAS between 12 and 24 VDC for switched power? Test by using pin 8 (ground) and pin 5 (ignition).

- If voltages are okay, go to step 3.
- If voltages are not okay, go to step 4.

3. Test with a known good MAS.

- If the display now lights up, the original MAS was bad. Replace the MAS and perform the system verification procedure in Chapter 4.
- If the display still does not light up, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191



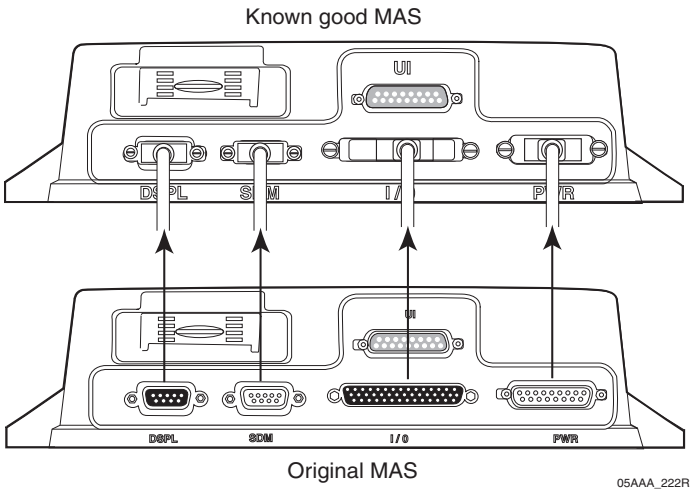
4. Check the power source and ground. Are the power source and ground OK?

- If the power source and ground are OK, go to step 5.
- If the power source and ground are not OK, reconnect to a new power source. The diagnostic procedure is complete.

5. Check the 3-amp and 10-amp fuses at the end of the power cable (or the circuit breakers if the wiring is factory-installed). If the fuses are bad, replace them.

- If the fuses blow immediately, the power cable may be shorted. Replace the power cable and perform the system verification procedure in Chapter 4
- If all fuses are okay, go to step 6.

If the fuse holders show signs of overheating, such as discoloration or melting, replace the holders.



6. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

- If the unit is now working, the MAS is faulty. Replace the MAS.

Note

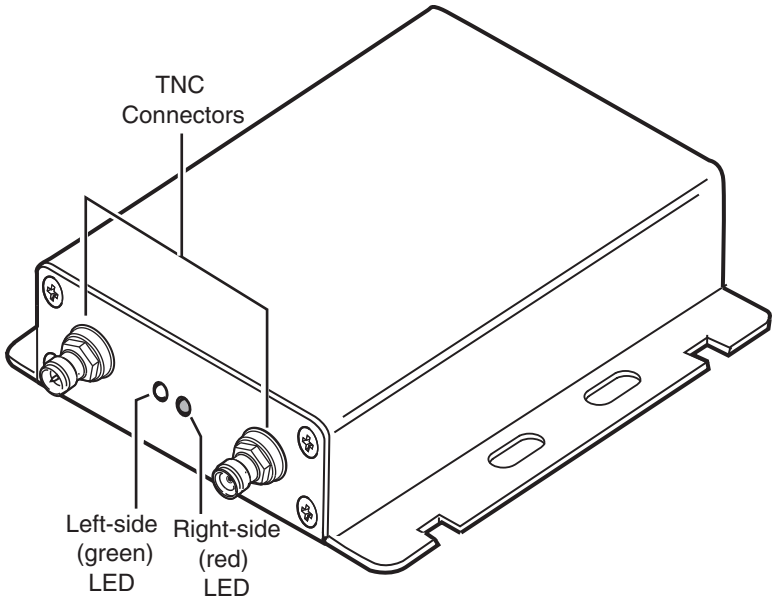
Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the unit is still not working, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

TDM Performance—LED Indicators



In a normal operating environment, the left side LED should be *BLINKING GREEN* and the right side LED should be *OFF.* Refer to the table below for what actions to take if the right side LED is *BLINKING RED.*

Note

The right side (red) LED is an error indicator. It should be off when receiving a good signal, however, it may occasionally *blink red.*

Right Side—Red LED	***State***	***Necessary Action***
BLINKING RED 2–1 *Blinks 2x, stops, blinks 1x*	Module fault	Replace terrestrial data modem (TDM).
BLINKING RED 2–2 *Blinks 2x, stops, blinks 2x*	Module fault	Replace TDM.
BLINKING RED 2–3 *Blinks 2x, stops, blinks 3x*	No signal	Check antenna and cable connections. If antenna is okay, replace TDM.
BLINKING RED 2–4 *Blinks 2x, stops, blinks 4x*	Network not found	Call Customer Support.
BLINKING RED 2–5 *Blinks 2x, stops, blinks 5x*	Last data session failed	Call Customer Support.
BLINKING RED 2–6 *Blinks 2x, stops, blinks 6x*	Last call establishment failed	Call Customer Support.
BLINKING RED 3–1: *Blinks 3x, stops, blinks 1x*	TDM is bad.	Replace the TDM.
BLINKING RED 3–2: *Blinks 3x, stops, blinks 2x*	Antenna and/or cable is faulty.	Replace the antenna and cable.
BLINKING RED 3–3: *Blinks 3x, stops, blinks 3x*	Antenna cable is connected, but no GPS signal.	Move vehicle so the antenna has a clear view of the sky.

15
Text-to-Speech Troubleshooting

These topics are covered in this chapter:

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

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

What Is Text-to-Speech?

With the MCP100 text-to-speech (TTS) feature, a driver can safely listen to incoming messages through the audio system or a dedicated speaker without having to pull off the road. There are two primary items needed for text-to-speech play—a remote control device (RCD) and a speaker. When a driver presses the keys on the RCD, messages in the Inbox can be played. Alerts and notifications can also be configured to play via text-to-speech.

Speaker Requirements

There are two basic speaker requirements for best performance of the MCP100:

- Only one speaker can be connected to the MCP100 for text-to-speech play. If more than one speaker is connected for text-to-speech play, the volume will most likely be very low or there will be no volume at all.
- An 8-ohm speaker, such as a standard CB speaker, must be used for TTS play.

  The MCP100 amplifier has an active safe operating area (SOA) protection on its output electronics. This protection is easily tripped at higher volume levels when connected to lower impedance speakers. This means that the MCP100 may produce sound into a 2 ohm speaker but will most likely shut off quickly when the volume is turned up even slightly (the protection circuit will trip).

  Lower impedance speakers (2–6 ohm speakers) are more often used in higher-end, performance audio systems. These systems typically have separate amplifiers. If an audio system has an external amplifier separate from the radio head unit, this may indicate it has low impedance speakers. Check with the vehicle manufacturer for detailed specifications concerning speaker types.

Normal Performance

Messages should be heard when a user selects a message from the Inbox to be played using the RCD. The truck's radio does not need to be on for TTS to work because the mobile application server (MAS) supplies about 10 watts of power to the speaker. The volume for TTS is controlled using the RCD and should be loud enough for the driver to hear while driving.

- When a message or alert is played using a **shared audio speaker,** the speaker should immediately stop all other communication coming from the audio system and play the message or alert. After the message or alert has played, control of the speaker immediately returns to the audio system, i.e., radio or CB.
- When a message or alert is played using a **dedicated audio speaker,** only TTS messages and alerts will be played on that speaker.

Abnormal Performance

Message Does Not Play

There could be a problem with one or more of the following:

- TTS is not configured properly for the MCP100
- TTS volume is turned off or is too low to hear
- Audio speaker has failed
- Loose connections or faulty speaker switch cable
- Loose connections or faulty accessory cable
- MAS is not functioning properly
- Problem with the RCD
- Wired incorrectly using an incompatible speaker

Message Plays but Volume Is Very Low

There could be a problem with one or more of the following:

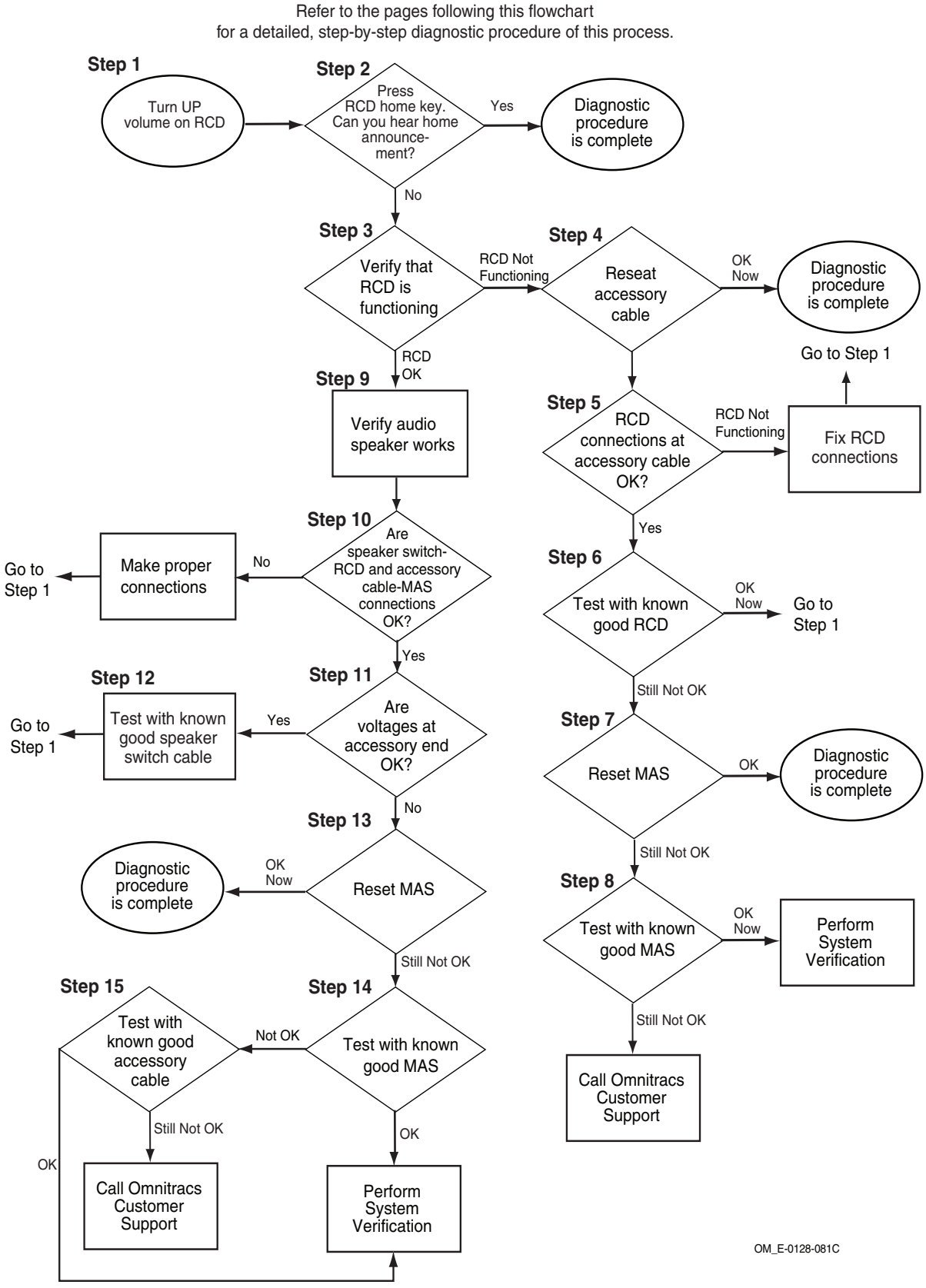
- TTS volume is turned too low
- Loose connection
- Audio speaker is failing
- TTS is wired to more than one speaker
- Wired incorrectly
- Speaker being used is incorrect ohm, i.e., less than 8 ohms

Message Plays but Sound Is Choppy or Breaks up

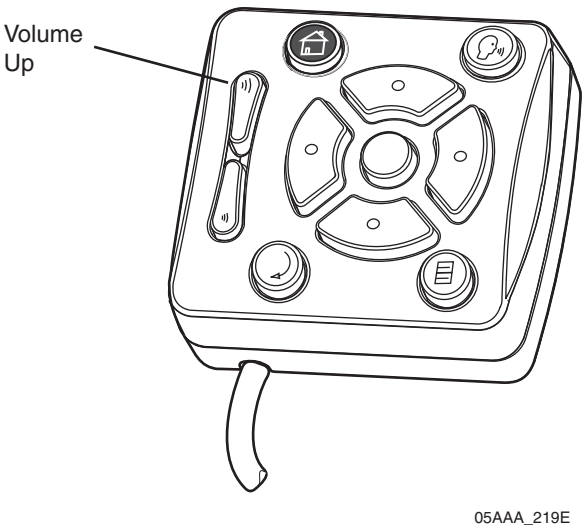
There could be a problem with one or more of the following:

- Loose connection
- Audio speaker is failing
- Wired incorrectly
- Accessory cable problem
- Speaker switch cable is faulty

Message Does Not Play



Diagnostic Procedure



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

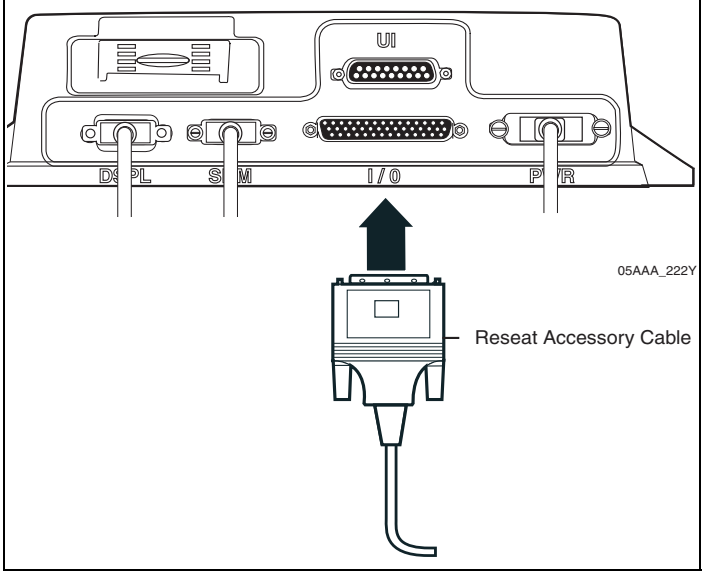
1. Turn up the volume on the RCD.

2. Press the **Home** key on the RCD. Can you hear the home announcement?

- If you can hear the announcement, the diagnostic procedure is complete.
- If you cannot hear the announcement, go to step 3.

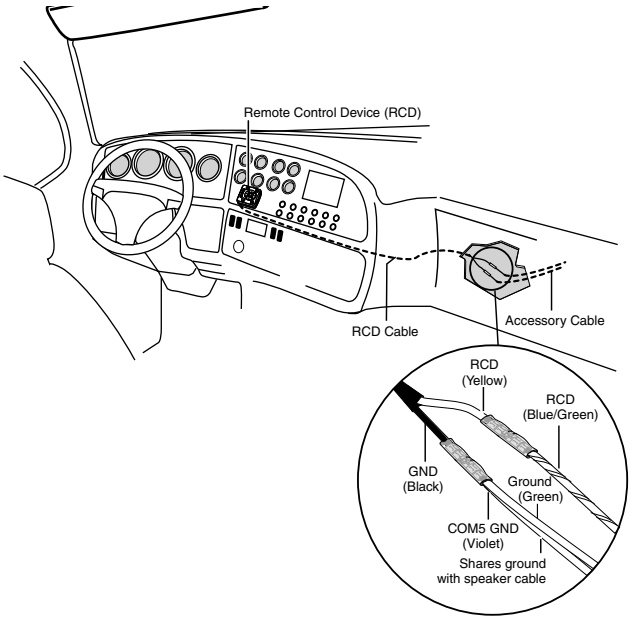
3. To verify that the RCD is functioning properly, press the **Home** key and the **center** button on the RCD while watching the display (MDU).

- If the display (MDU) reacts to the RCD key and button presses, go to step 9.
- If the display (MDU) does not react to the RCD key and button presses, go to step 4.



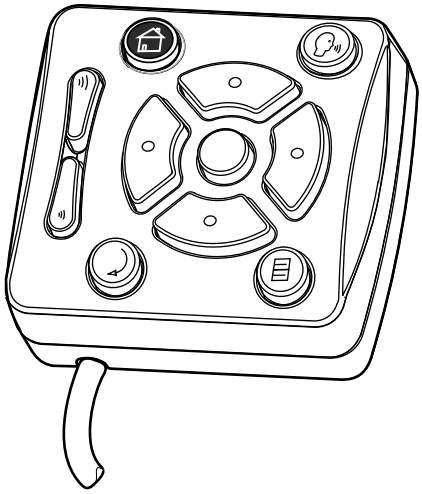
4. Reseat the accessory cable at the MAS. Check for any damage, such as bent or missing pins. Once reconnected, press the **Home** key again. Can you hear the announcement?

- If you can now hear the announcement, the diagnostic procedure is complete.
- If you still cannot hear the announcement, go to step 5.



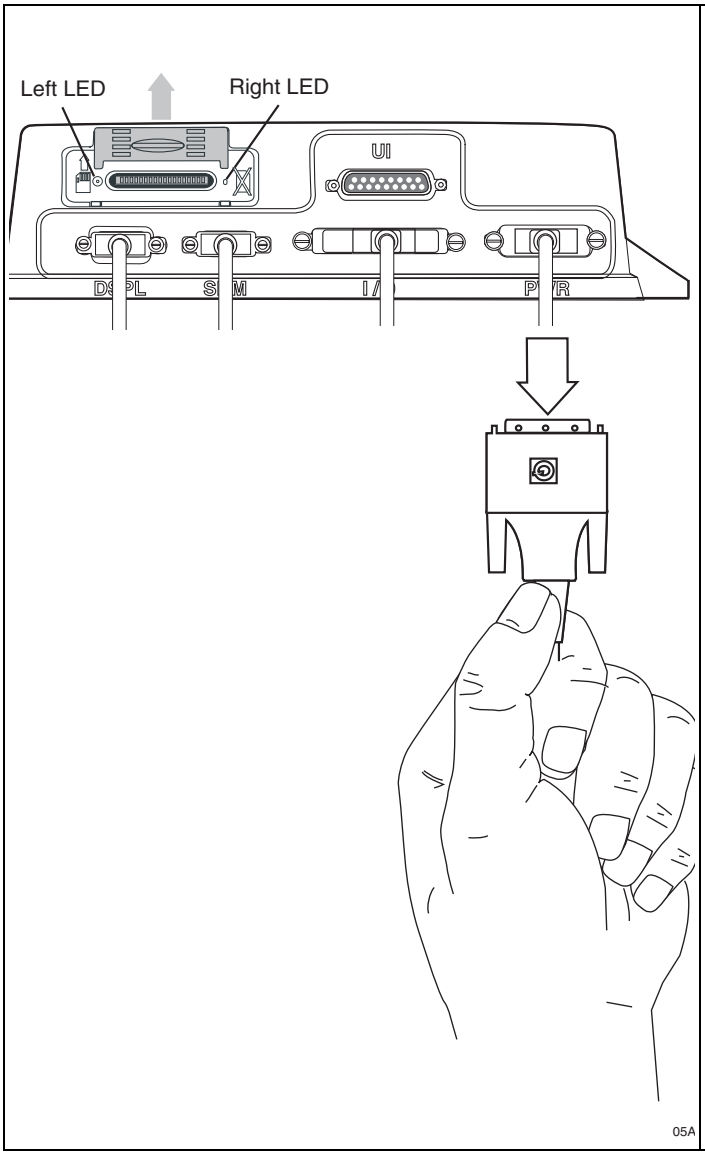
5. Check the RCD connections at the accessory cable. Are they okay?

- If the RCD connections are okay, go to step 6.
- If the RCD connections are not okay, fix the connections and return to step 1.



6. Test with a known good RCD. Can you hear the announcement?

- If the RCD is functioning now, return to step 1.
- If the RCD is still not functioning, go to step 7.



7. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

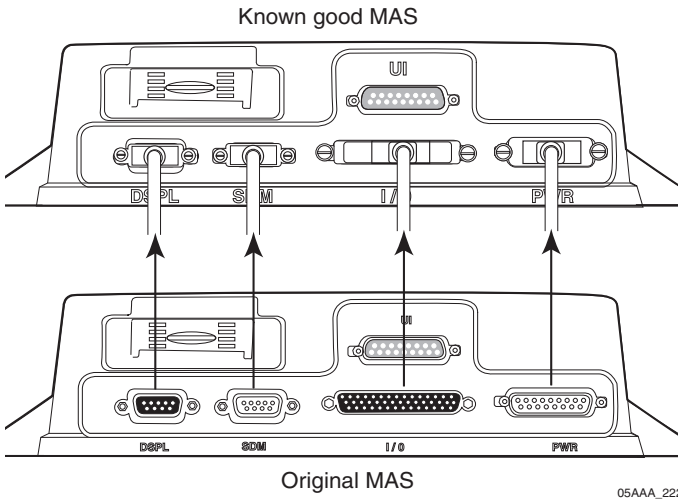
Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

Press the **Home** key and the **center** button on the RCD. Can you hear the announcement?

- If the display reacts and you can hear the announcement, the diagnostic procedure is complete.
- If the RCD is still not functioning properly and you cannot hear the announcement, go to step 8.



8. Replace the original MAS with a known good MAS. Is the RCD functioning and can you hear the announcement?

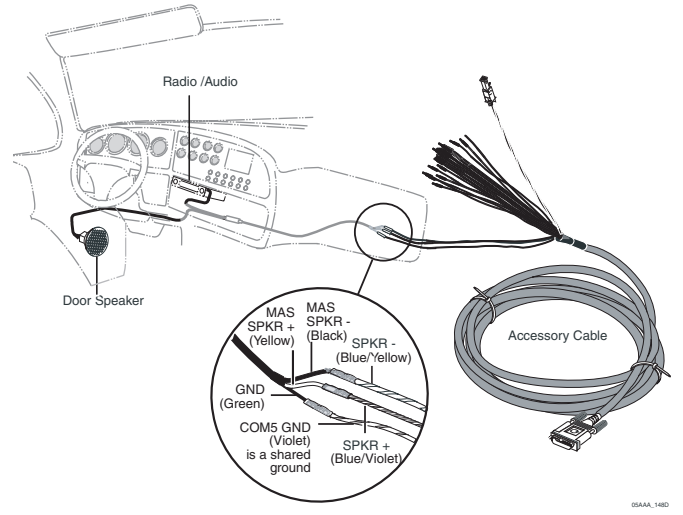
- If the RCD works and you can now hear the announcement, the original MAS was bad. Perform the system verification procedure in Chapter 4.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

- If the RCD still does not work and you still cannot hear the announcement, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

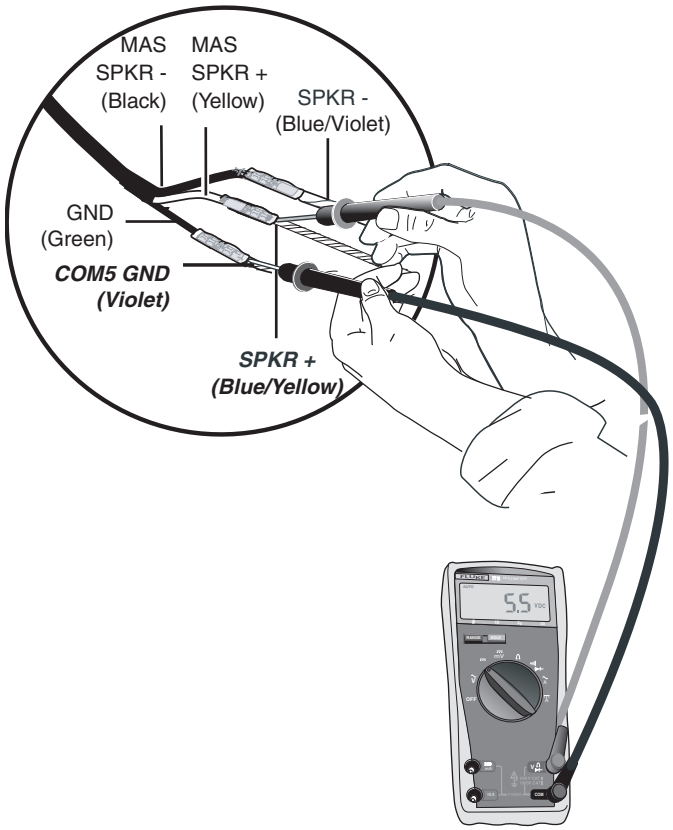


9. Verify that the speaker is working. If the MCP100 shares a speaker, use the radio to play sound through the speaker.

- If the speaker is not working, replace the speaker.
- If the speaker is working, go to step 10.

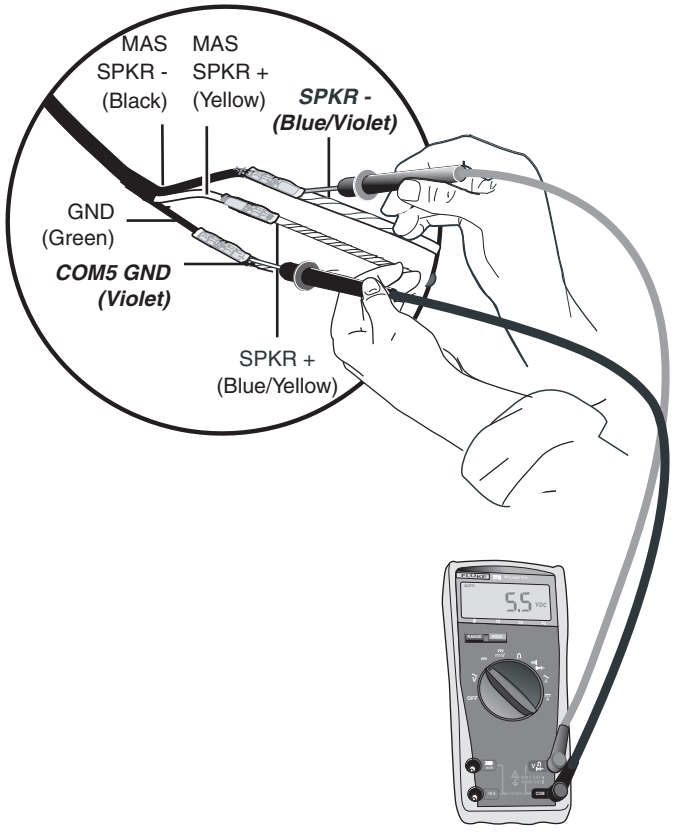
10. Verify that the speaker connections are correct. If the sound is low, it is possible that the speakers are wired in parallel and the MAS amplifier is supplying power to more than one speaker, **or** that the VEH AUDIO IN and SPKR OUT connections are reversed.

- If the speaker connections are correct, go to step 11.
- If the speaker connections are not correct, make the proper connections and return to step 1.



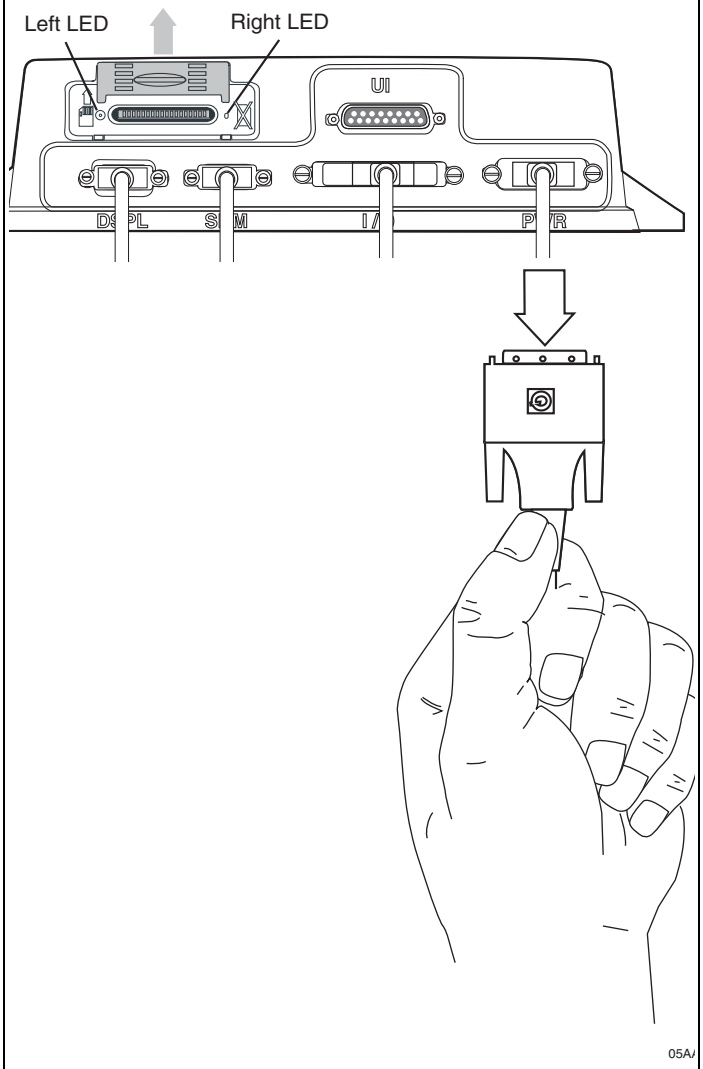
11. To isolate a problem with the speaker switch cable, measure voltages of TTS wires at end of the accessory cable, as follows:

First touch the positive lead of the voltmeter to the SPKR+ wire. Then touch the negative lead of the voltmeter to the violet COM5 GND wire. Now press the **Home** key on the RCD. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.



Now touch the positive lead of the voltmeter to the SPKR- wire and leave the negative lead of the voltmeter on the violet COM5 GND. Press the **Home** key on the RCD. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.

- If the voltages are not okay, go to step 13.
- If the voltages are okay, go to step 12.



12. Test with a known good speaker switch cable. Can you hear the announcement?

- If you can now hear the announcement, the original speaker switch cable was bad. Replace the speaker switch cable and return to step 1.
- If you still cannot hear the announcement, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

13. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

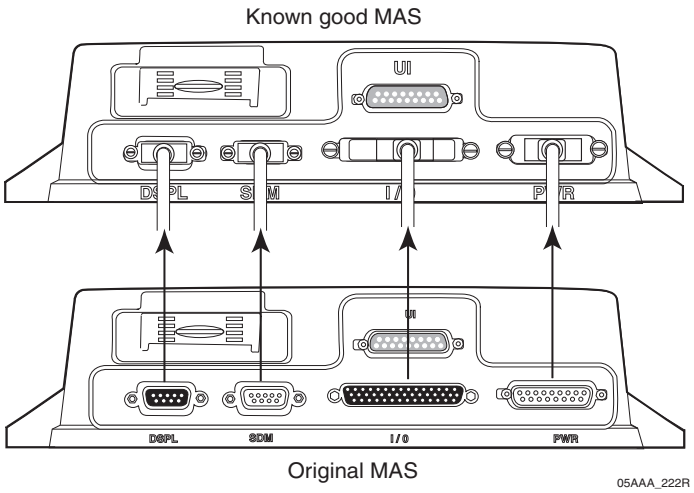
Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

Test TTS by pressing the **Home** key on the RCD. Can you hear the announcement?

- If you can now hear the announcement, the diagnostic procedure is complete.
- If you still cannot hear the announcement, go to step 14.



14. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

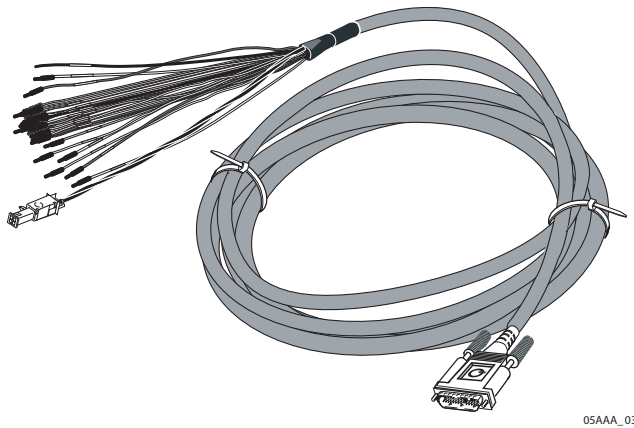
- If you can now hear the announcement, the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If you still cannot hear the announcement, go to step 15.

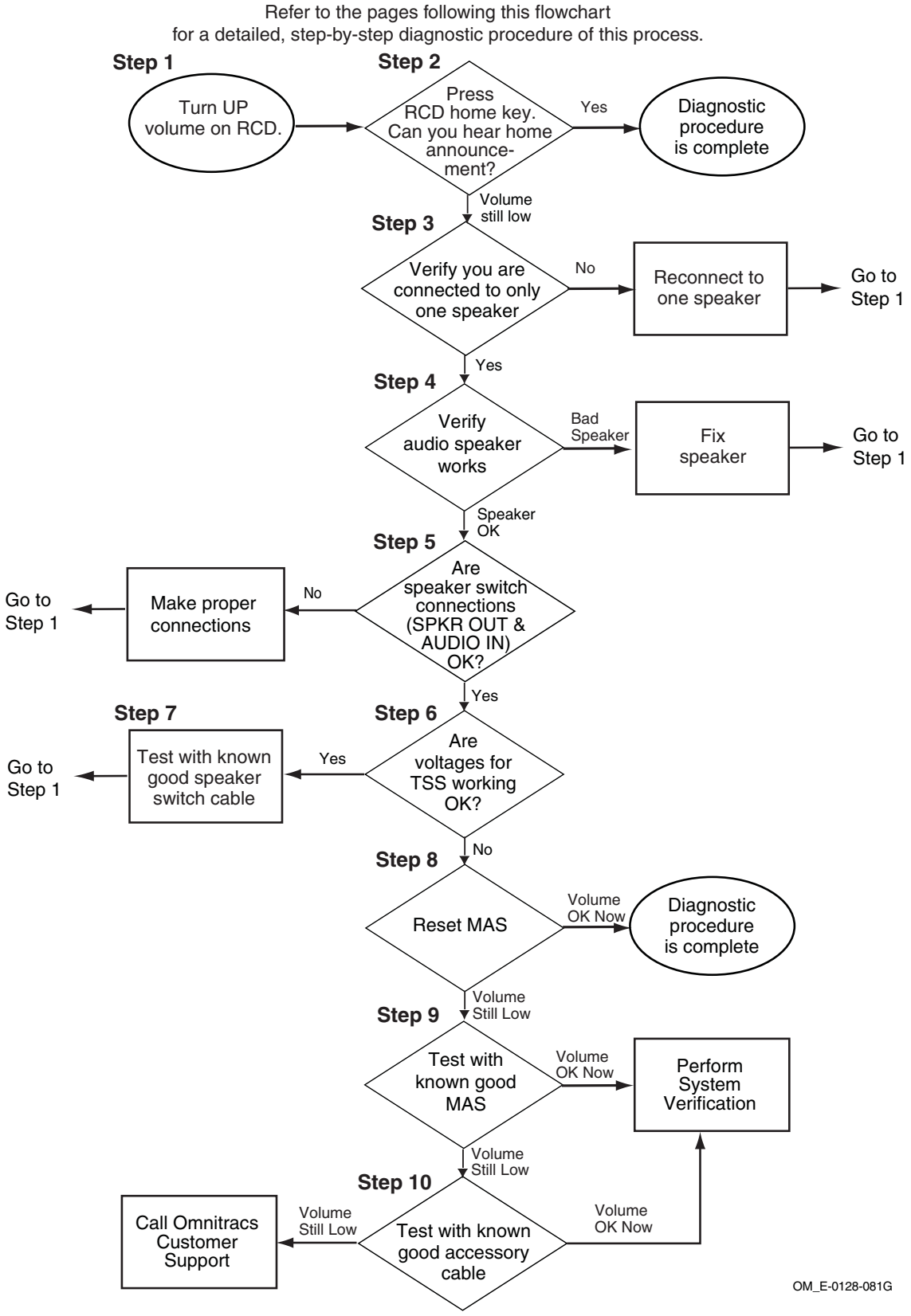


15. Test with a known good accessory cable. Can you hear the announcement?

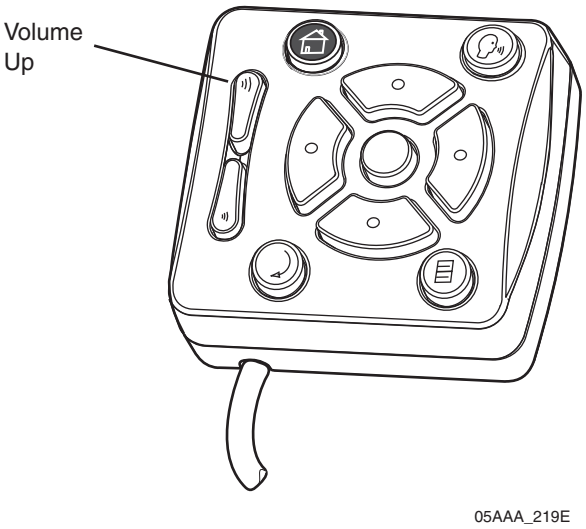
- If you can now hear the announcement, the accessory cable is faulty. Replace the accessory cable and perform the system verification in Chapter 4.
- If you still cannot hear the announcement, call Omnitracs Customer Support:

US: 800-541-7490
Canada: 800-863-9191

Message Plays but Volume Is Very Low



Diagnostic Procedure



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

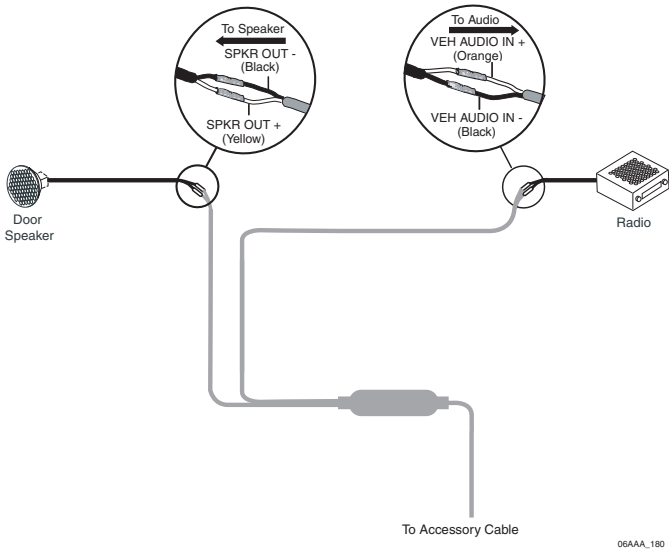
1. Turn up the volume on the RCD.

2. Press the **Home** key on the RCD. Is the volume level okay?

- If volume is acceptable, the diagnostic procedure is complete.
- If volume is still low, go to step 3.

3. Verify that you are connected to only one speaker. TTS supports only one speaker.

- If you are connected to only one speaker, go to step 4.
- If you are connected to more than one speaker, disconnect and reconnect so only one speaker is used and test for TTS volume. Return to step 1.

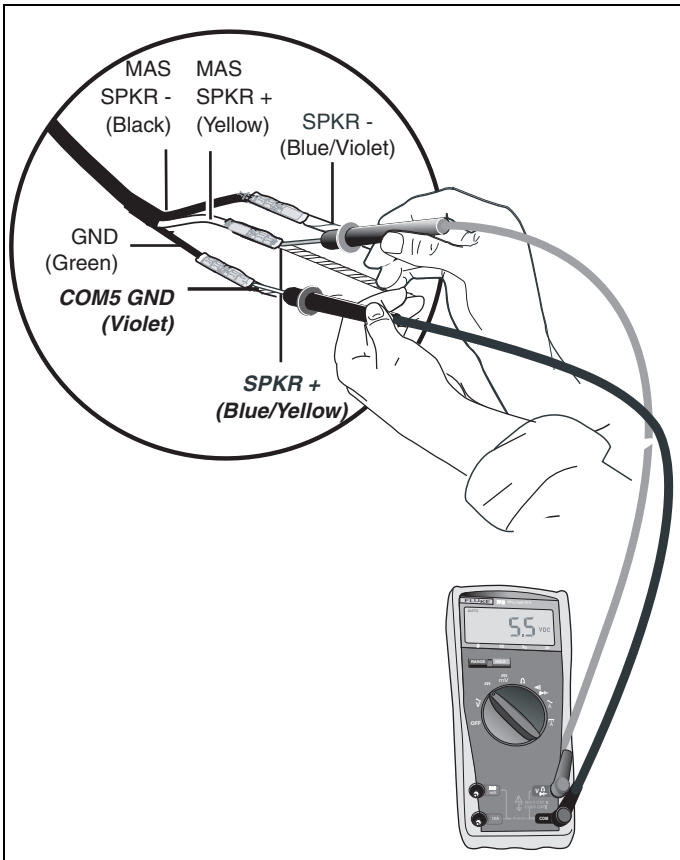


4. Test with known good 8-ohm speaker.

- If the volume with replacement speaker is okay, go to step 5.
- If the volume with replacement speaker is still too low, fix the speaker and return to step 1.

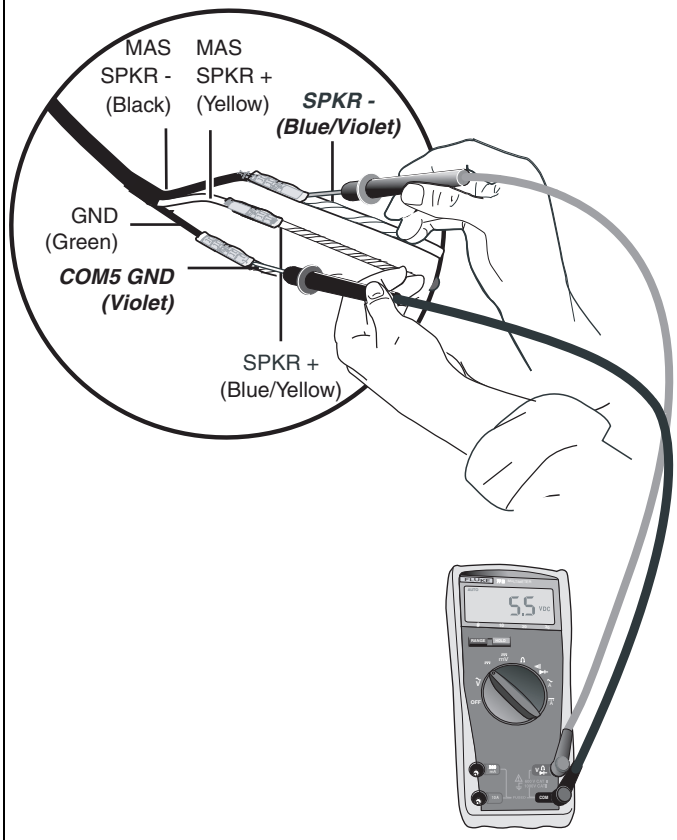
5. Verify that the speaker connections are correct. Be sure speaker switch cable VEH AUDIO IN leads are going toward the radio and SPKR OUT leads are going toward the speaker. If these leads are reversed, the RCD may still play, but it would be powered through the radio at a low volume.

- If the speaker connections are correct, go to step 6.
- If the speaker connections are incorrect, make the proper connections and return to step 1.



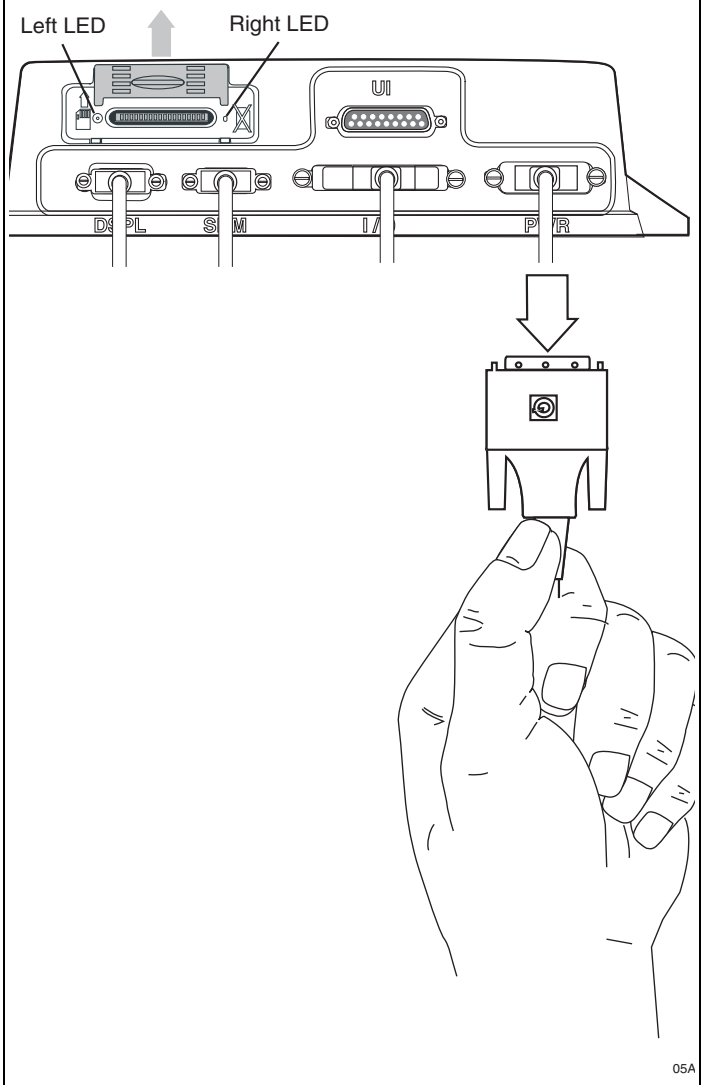
6. To isolate a problem with the speaker switch cable, measure voltages of TTS wires at end of the accessory cable, as follows:

First touch the positive lead of the voltmeter to the SPKR+ wire. Then touch the negative lead of the voltmeter to the violet COM5 GND wire. Now press the **Home** key on the RCD. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.



Now touch the positive lead of the voltmeter to the SPKR- wire and leave the negative lead of the voltmeter on the violet COM5 GND. Press the **Home** key on the RCD. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.

- If the voltages are not okay, go to step 8.
- If the voltages are okay, go to step 7.



7. Test with a known good speaker switch cable. Is the volume level okay?

- If the volume level is now okay, the original speaker switch cable was bad. Replace the speaker switch cable and return to step 1.
- If the volume level is still not okay, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

8. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

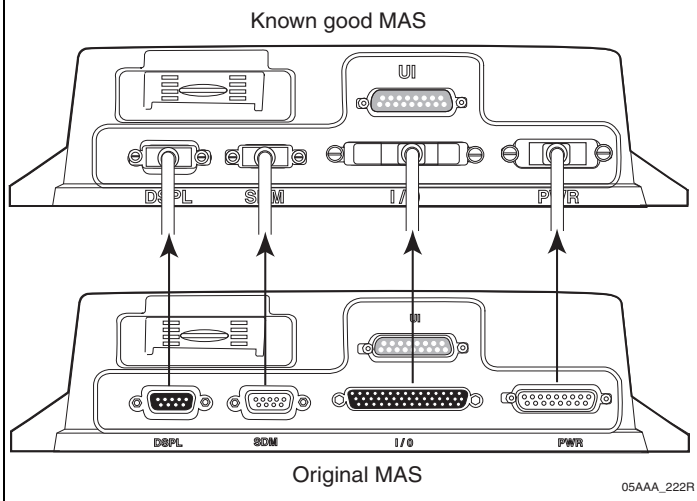
Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

Test TTS volume. Is the volume okay now?

- If the volume is okay now, the diagnostic procedure is complete.
- If the volume is still not okay, go to step 9.



9. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

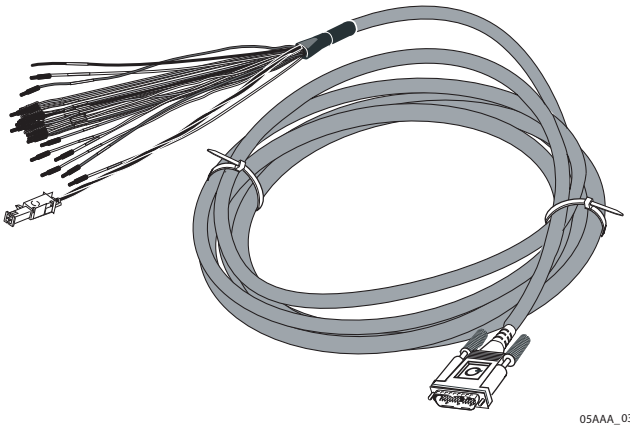
- If the volume is okay now, the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the volume is still too low, go to step 10.

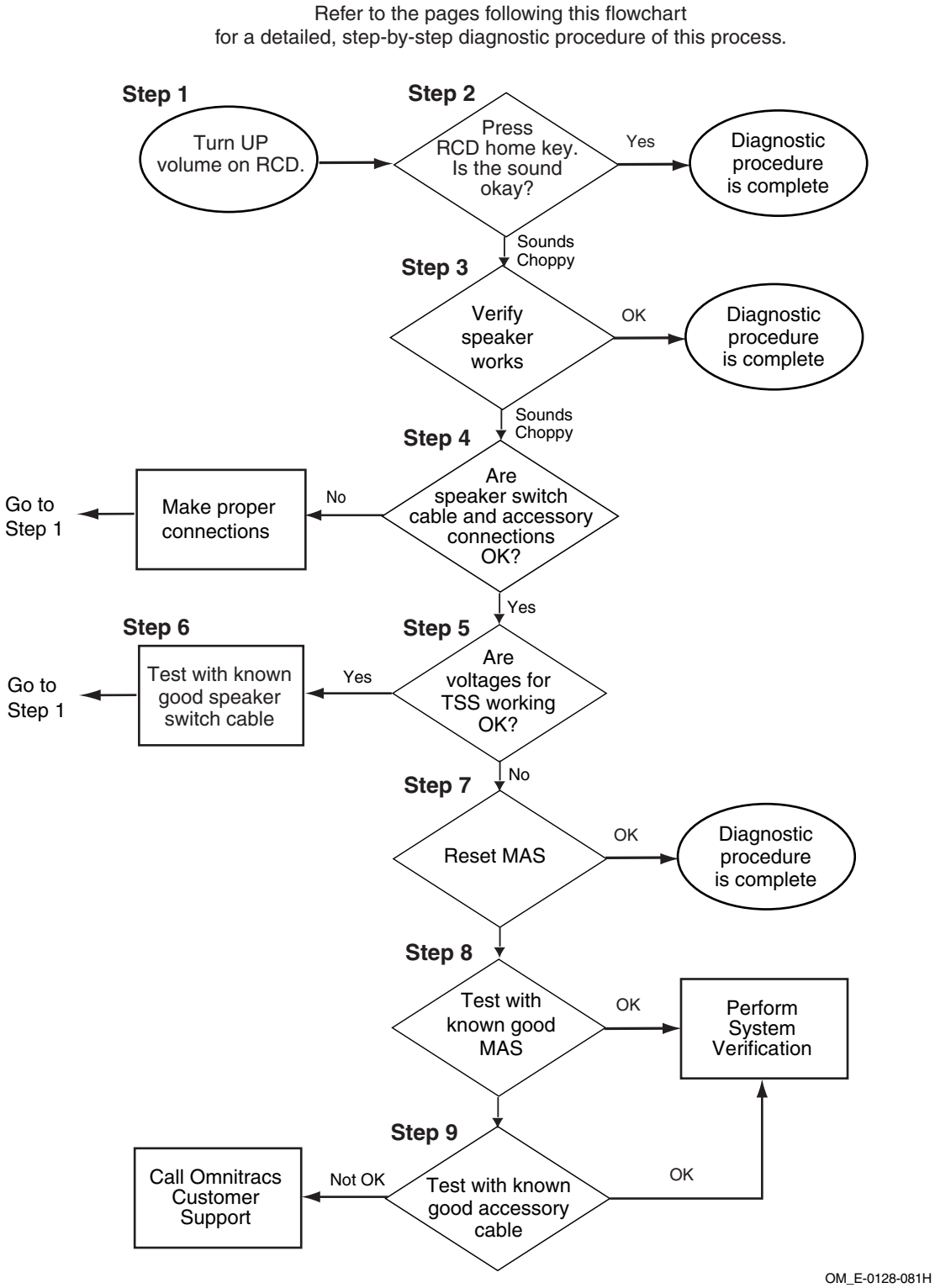


10. Test with a known good accessory cable. Can you hear the announcement?

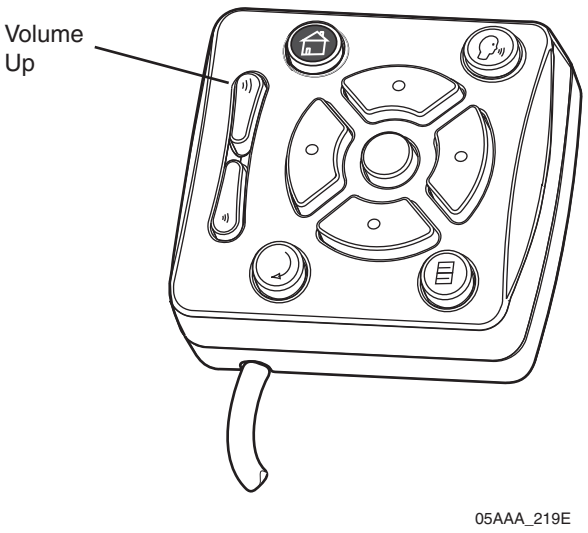
- If you can now hear the announcement, the accessory cable is faulty. Replace the accessory cable and perform the system verification in Chapter 4
- If you still cannot hear the announcement, call Omnitracs Customer Support:

US: 800-541-7490
Canada: 800-863-9191

Message Plays but Sound Is Choppy or Breaks up



Diagnostic Procedure

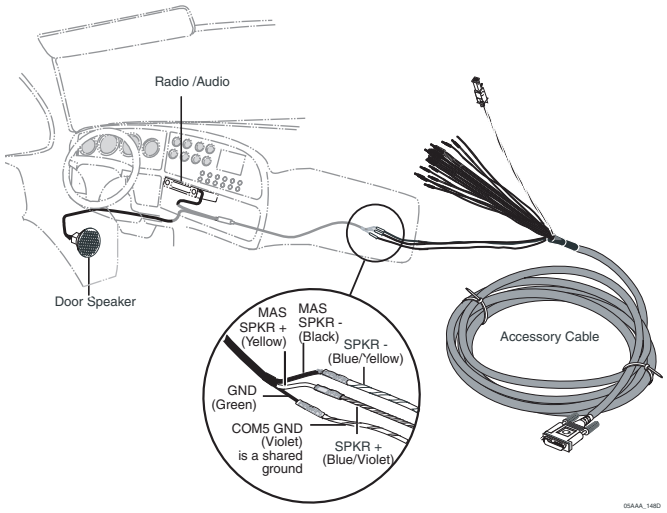


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Turn up the volume on the RCD.

2. Press the **Home** key on the RCD. Does the message sound choppy or does it break up?

- If the message sounds okay, the diagnostic procedure is complete.
- If the message does not sound okay, go to step 3.

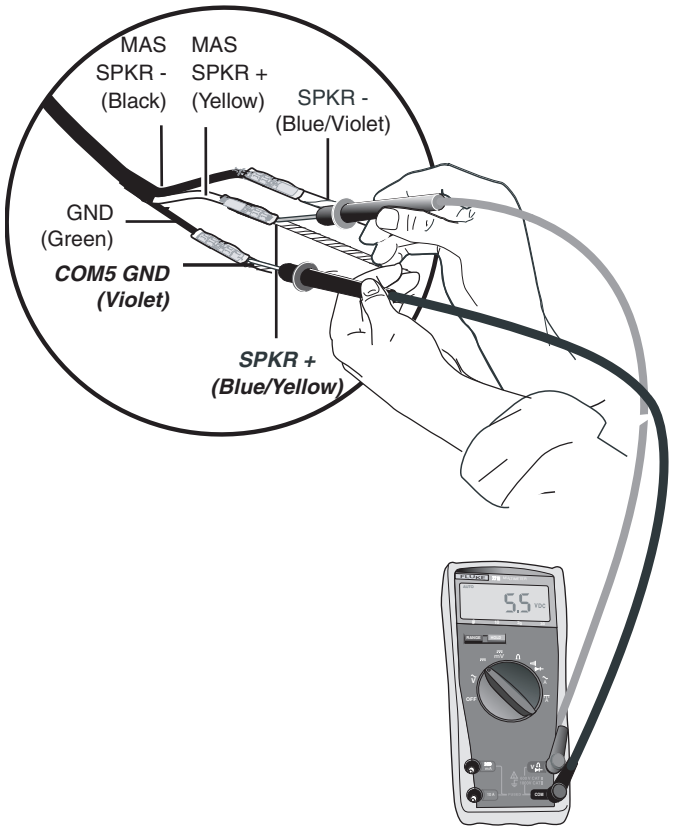


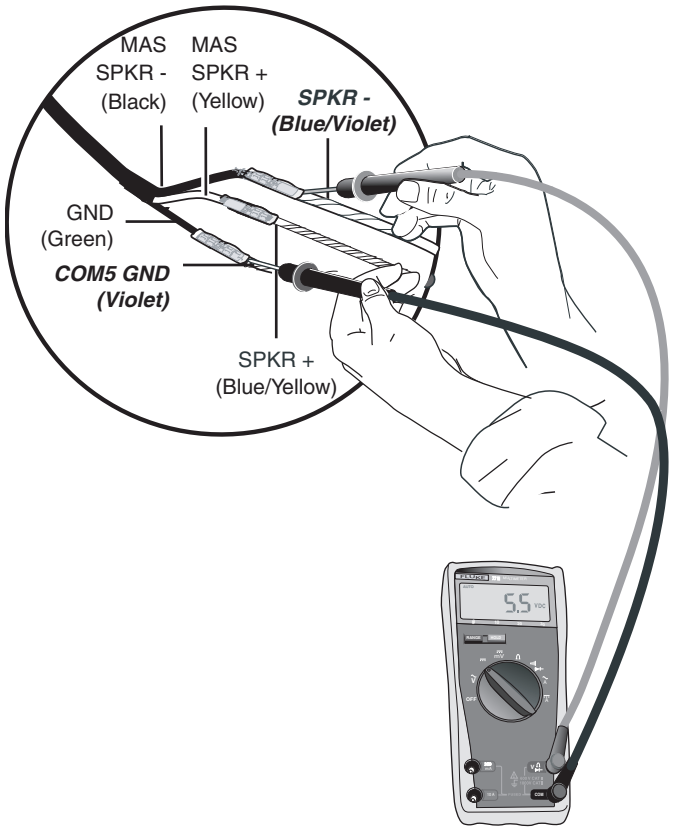
3. Test with known good 8-ohm speaker.

- If the sound is good with the replacement speaker, replace the speaker. The diagnostic procedure is complete.
- If the sound is still choppy with the replacement speaker, go to step 4.

4. Verify that the speaker connections are correct. Be sure the green GND wire from the speaker switch cable is connected to the violet COM5 GND wire from the accessory cable.

- If the speaker connections are correct, go to step 5.
- If the speaker connections are not correct, make the proper connections and return to step 1.



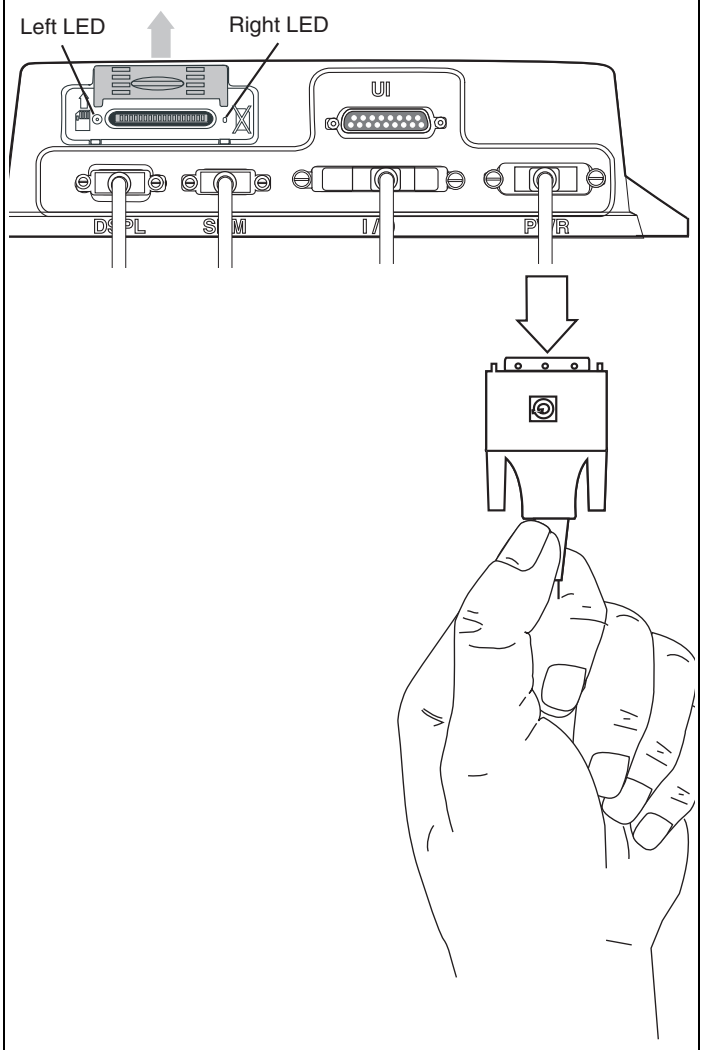


5. To isolate a problem with the speaker switch cable, measure voltages of TTS wires at end of the accessory cable, as follows.

First touch the positive lead of the voltmeter to the SPKR+ wire. Then touch the negative lead of the voltmeter to the violet COM5 GND wire. Now press the **Home** key on the RCD. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.

Now touch the positive lead of the voltmeter to the SPKR- wire and leave the negative lead of the voltmeter on the violet COM5 GND. Press the **Home** key on the RCD. The voltage should measure +5.5VDC momentarily while the unit attempts to play text-to-speech.

- If the voltages are not okay, go to step 7.
- If the voltages are okay, go to step 6.



6. Replace the original speaker switch cable with a known good speaker switch cable.
   - If the sound is good with the new cable, the original speaker switch cable was bad. Replace the speaker switch cable and return to step 1.
   - If the sound is still choppy, go to step 7.

7. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

   Note

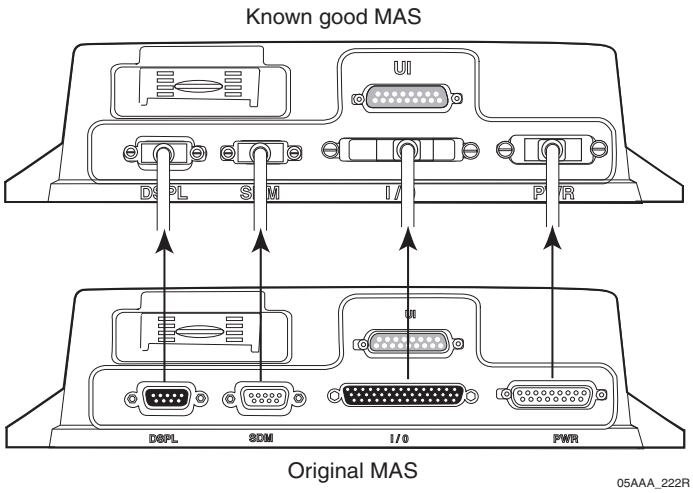
   It usually takes about 10 minutes for the LED indicators to go out.

   Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

   Note

   In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

   Test TTS sound again. Is the sound good?
   - If the sound is now good, the diagnostic procedure is complete.
   - If the sound is still choppy, go to step 8.



8. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

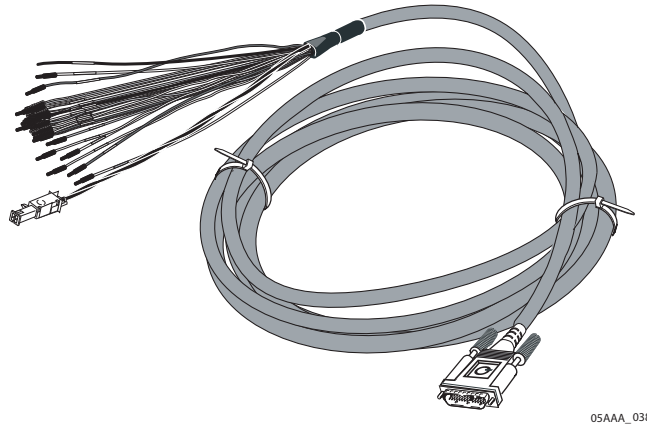
- If the sound okay now, the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the sound is still not okay, go to step 9.



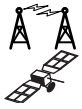
9. Test with a known good accessory cable. Is the sound good?

- If the sound is now good, the accessory cable is faulty. Replace the accessory cable and perform the system verification in Chapter 4.
- If the sound is still choppy, call Omnitracs Customer Support:

US: 800-541-7490
Canada: 800-863-9191

16
Status 10000/10001

If 10000 or 10001 is displayed in the System Status field, either



- the MAS and terrestrial data modem (TDM) are not communicating with each other, or
- the satellite data modem (SDM) and mobile application server (MAS) are not communicating with each other.

These topics are covered in this chapter:

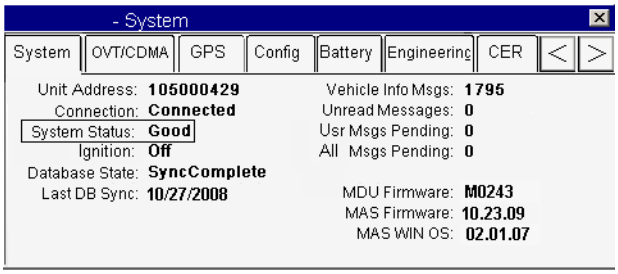
For technical questions, contact Omnitracs Customer Support.
Customer Support is staffed 24 hours a day, 365 days a year:

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

Good Status

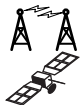
Display the System screen by pressing the **System** icon and then pressing the **System** tab.

- The System Status field normally displays **Good** when ignition is in the ON position.

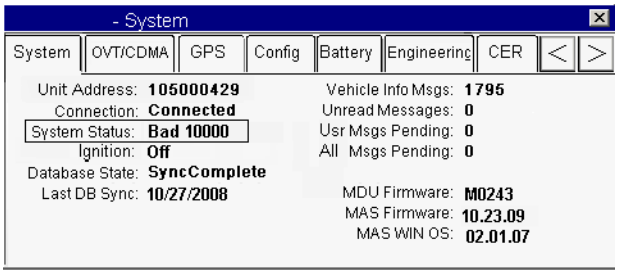


Bad Status

When the System Status field displays **Bad 10000:**



- the MAS and terrestrial data modem (TDM) are not communicating with each other, or
- the satellite data modem (SDM) and mobile application server (MAS) are not communicating with each other.



System Status Bad 10001 indicates the fault is intermittent.

- Press the **ENTER** key to reset the MCP100 System Status field.
- If System Status Bad 10001 resets to **Good**, perform the system verification procedure in Chapter 4 and continue to operate the MCP100.

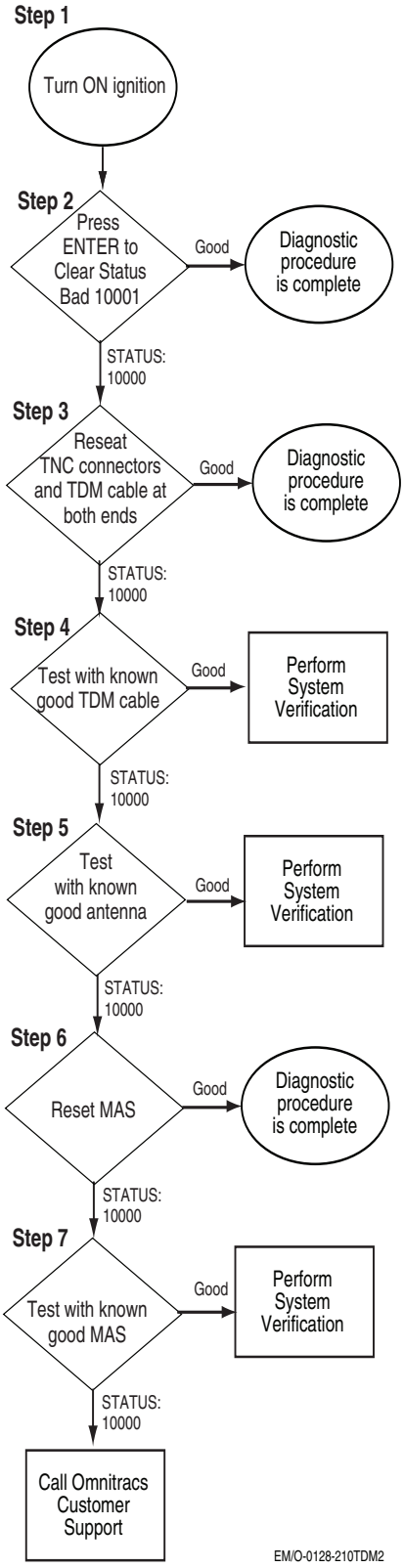
There is a problem if the MCP100 System Status is Bad 10000 or if System Status Bad 10001 does not reset to **Good** or reoccurs within a short period of time.

This problem is usually caused by one or more of the following:

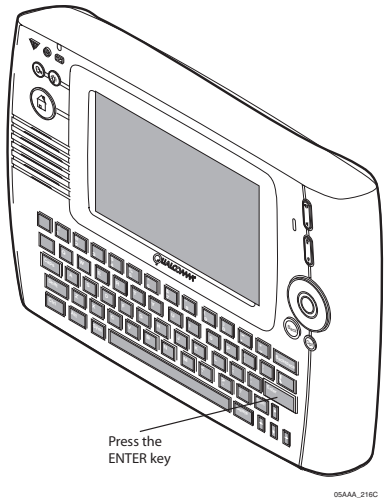
- Loose antenna cable connections
- Faulty antenna cable
- Faulty antenna
- Faulty TDM

Status 10000/10001

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Diagnostic Procedure

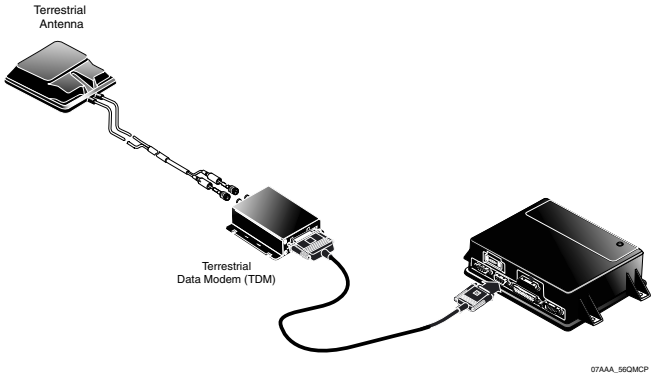


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Turn the vehicle ignition ON.

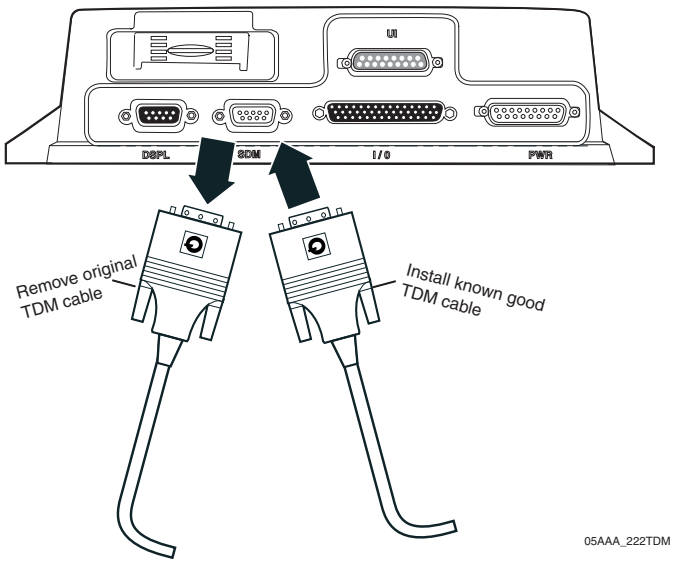
2. Clear the Bad 10001 System Status field by pressing the display **ENTER** key.

- If the System Status changes to **Good**, the diagnostic procedure is complete.
- If the System Status is still Bad 10000 or Bad 10001, go to step 3.



3. To isolate and correct loose connections, reseat the TNC connectors and the data modem cable at both ends. Check the System Status on the MCP100 System screen. Press **ENTER** on the display to clear Bad 10001 status.

- If the System Status is **Good**, the diagnostic procedure is complete.
- If the System Status is still Bad 10000 or Bad 10001, go to step 4.

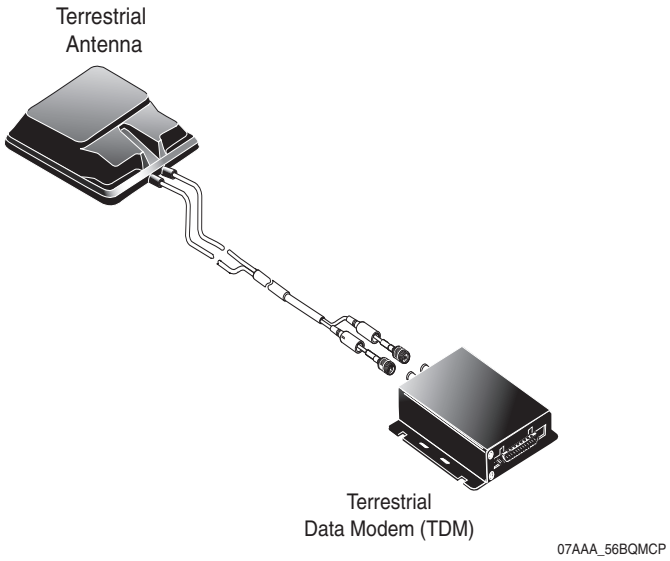


4. Disconnect the TDM cable and test with a known good TDM cable. Check the System Status on the MCP100 System screen. Press **ENTER** on the display to clear Bad 10001 status.

Note

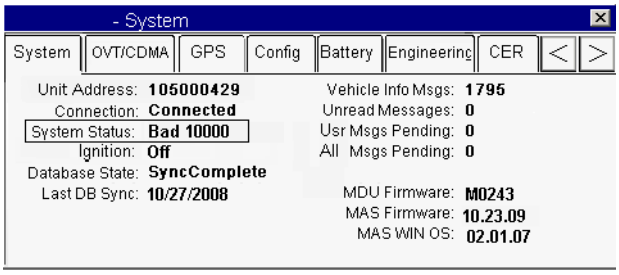
It may take a few minutes for the status to clear.

- If the System Status is now **Good**, replace the TDM cable and perform the system verification procedure in Chapter 4.
- If the System Status is still Bad 10000 or Bad 10001, go to step 5.



5. Connect the known good antenna and cable to the original TDM. Allow a few minutes for the unit to reestablish connection.

- If the System Status is now **Good**, replace the antenna and then perform the system verification procedure in Chapter 4.
- If the System Status is still Bad 10000 or Bad 10001, go to step 6.



6. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

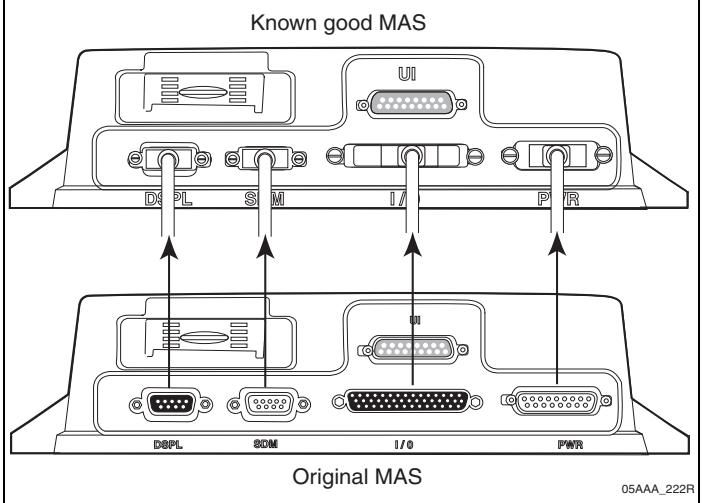
Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

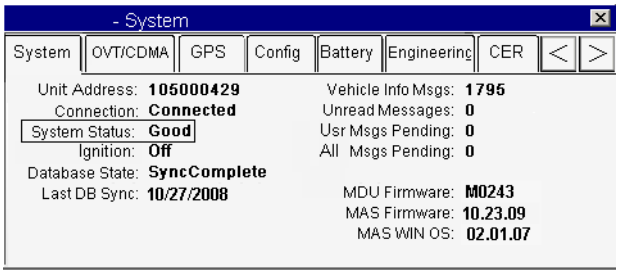
Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

After the unit resets, check the System Status on the MCP100 System screen.

- If the System Status is still Bad 10000 or Bad 10001, go to step 7.
- If the System Status changes to **Good**, the diagnostic procedure is complete.





7. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

- If the System Status is now **Good,** the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the System Status is still Bad 10000 or Bad 10001, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

17
Status 12000/12001—Bad Backup Battery

If Bad 12000 is displayed in the System Status field, the MAS backup battery is bad or missing. If a 12001 is displayed in the System Status field, the problem has been cleared.

These topics are covered in this chapter:

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

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

About the MAS Backup Battery

The MCP100 battery has a normal operating life of 5 years. The purpose of the backup battery is to allow the MCP100 to gracefully shut down and save data when power from the truck is lost. The backup battery is critical to the operation of the system.

ALERT!

Unless specifically requested by an Omnitracs representative, Omnitracs MCP100 lead-acid batteries should NOT be sent back to Omnitracs. Proper disposal of defective or dead lead-acid batteries is the responsibility of the Omnitracs MCP100 owner/customer. Please dispose of defective or dead batteries at a local lead-acid battery recycling center.

If the backup battery needs replacing, DO NOT return it to Omnitracs unless specifically told to do so. A replacement battery can be ordered and shipped without Omnitracs receiving the defective battery. Please see Appendix C for more information on Omnitracs's Standard RMA Procedure.

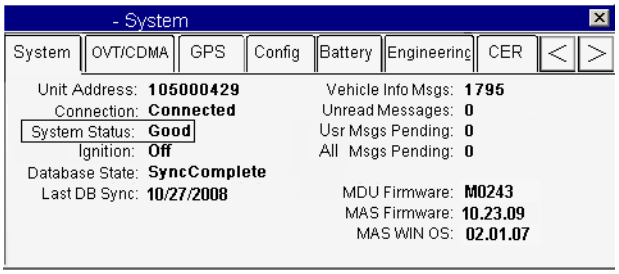
If batteries are stored, Omnitracs recommends auditing the backup battery Open Circuit Voltage (OCV) every six months to ensure that it does not drop below 3.6V. If the storage temperature is greater than 85° F, the audits should take place more frequently. Immediately recharge the backup battery if it measures OCV < 3.6V. Batteries that sit for more than six months need to be recharged. The preferred method to recharge a backup battery is to install it into a MAS on a test bench for eight hours.

The mobile application server (MAS) will periodically test the backup battery to determine if the battery will accept a charge and retain a charge. This automatic test will happen every 60 to 90 days when the MAS is in operation. The backup battery can also be tested manually from the **Battery** screen (located within the **System** icon). If the backup battery is not detected or fails the test, an error will be displayed, System Status 12000 Bad Backup Battery or Battery Not Detected.

For backup battery installation procedures, see Chapter 5 in the *MCP100 Installation Guide.*

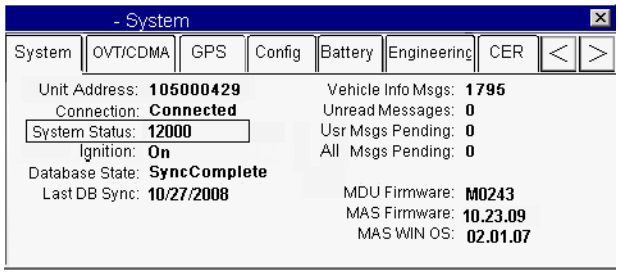
Good Status

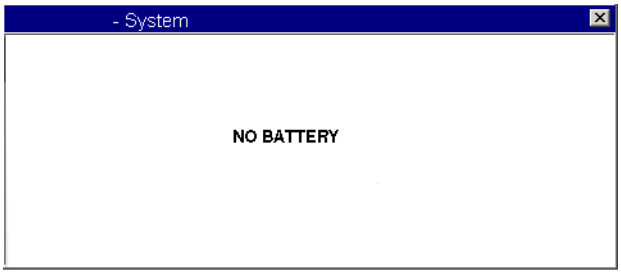
The MCP100 System screen, shown below, can be displayed by pressing the **System** icon at the MCP100 Home screen and then pressing the **System** tab. This screen has a System Status field that normally displays **Good**.



Bad Status

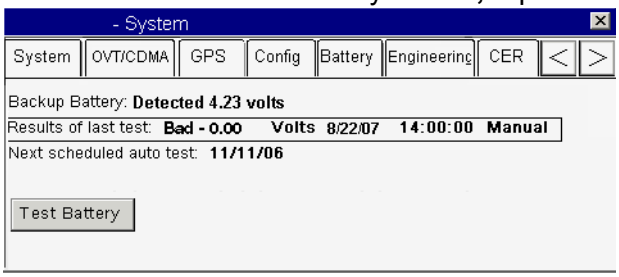
When 12000 is displayed in the System Status field or a pop-up icon displays the MCP100 has a bad or missing backup battery, the backup battery needs replacing. The MCP100 also alerts the user if it does not detect a backup battery. If a 12001 is displayed in the System Status field, the problem has been cleared. This status should clear by pressing **ENTER.**



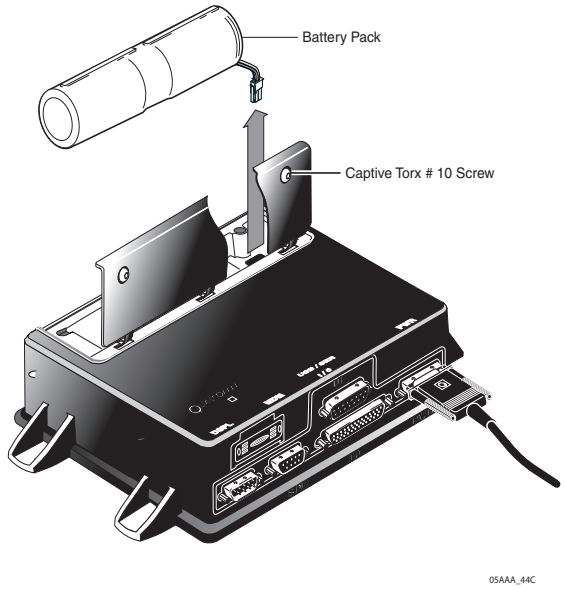


Manually Testing the Backup Battery

1. Go to the Home screen and tap the **System** icon.
2. Tap the **Battery** tab.
3. Tap the **Test Battery** button. An indicator that the battery is being tested will display. Wait for the results of the last test to update. This may take a few minutes. If the results of the test indicate the battery is **Bad,** replace the battery.



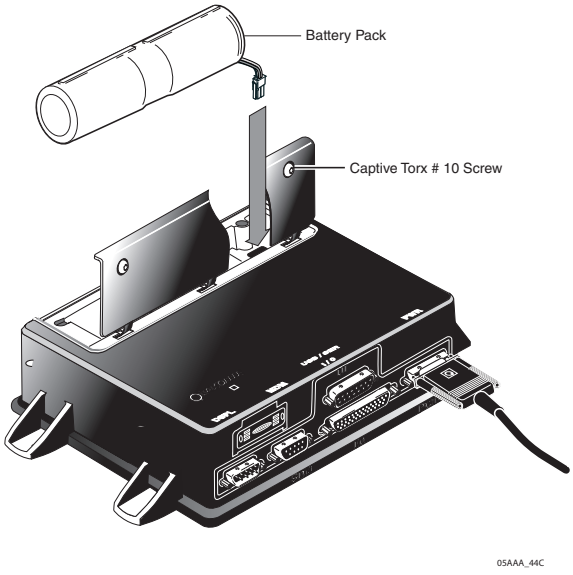
Status 12000/12001



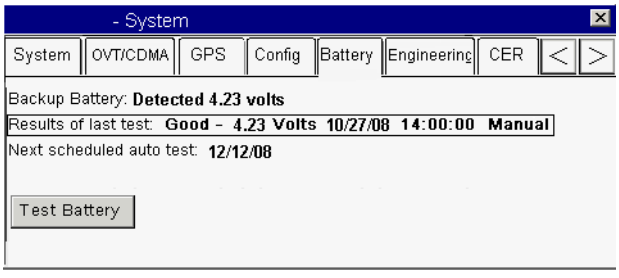
1. Remove the battery from the MAS.

Caution

IMPORTANT: Ensure the power cable to the MAS remains connected. If the power cable has been removed, wait until the MAS LED lights are out before removing the battery. This will prevent loss of data.



2. Install a new battery into the MAS.



3. Test the new battery as follows:

- Tap the **Battery** tab.
- Tap the **Test Battery** button. Wait for the results of the last test to update. This may take a few minutes.
- Verify that the results of the test are **Good.**
- If the results of the test are **Bad,** the replacement battery was not good.

18
Status 13000/13001

If 13000 or 13001 is displayed in the System Status field, there is an internal mobile application server (MAS) problem.

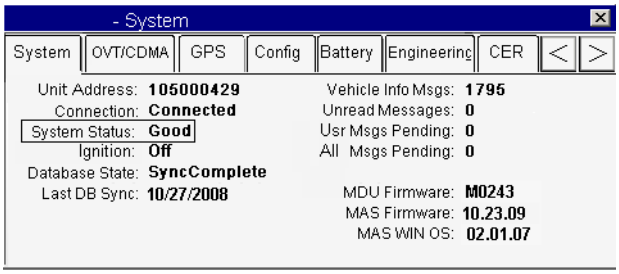
These topics are covered in this chapter:

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

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

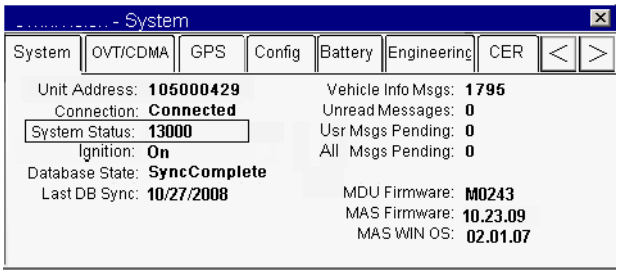
Good Status

The MCP100 System screen, shown below, can be displayed by pressing the **System** icon at the MCP100 Home screen and then pressing the **System** tab. This screen has a System Status field that normally displays **Good**.



Bad Status

When 13000 or 13001 is displayed in the System Status field, there is an internal MAS problem.



What to Do

If you receive a System Status of 13000 which does not clear, or a System Status of 13001 appears more than two times, call Omnitracs Customer Support:

For US customers, call 800-541-7490
For Canadian customers, call 800-863-9191

19
Status 22000/22001

If 22000 or 22001 is displayed in the System Status field, there are positioning problems.

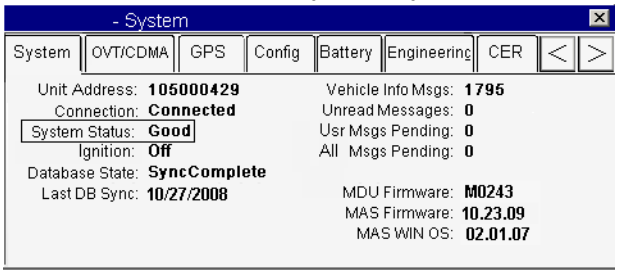
These topics are covered in this chapter:

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

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

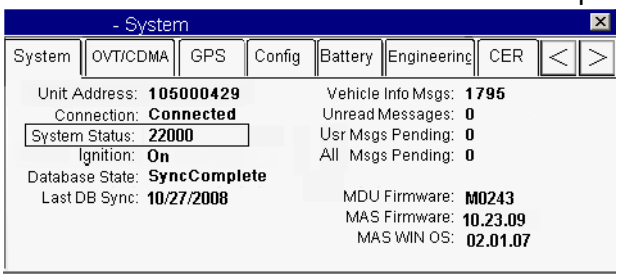
Good Status

The MCP100 System screen, shown below, can be displayed by pressing the **System** icon at the MCP100 Home screen and then pressing the **System** tab. This screen has a System Status field that normally displays **Good**.

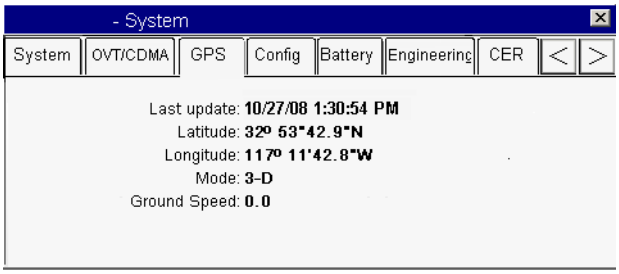


Bad Status

When 22000 or 22001 is displayed in the System Status field, there are positioning problems. System Status 22001 indicates the fault is intermittent. Press the **ENTER** key to reset the MCP100 System Status field. If System Status 22001 resets to **Good**, perform the system verification procedure in Chapter 4 and continue to operate the MCP100.
There is a problem if the MCP100 System Status is 22000 or if System Status 22001 does not reset to **Good** or reoccurs within a short period of time.



Additional information concerning positioning status can be found by selecting the **GPS** tab.

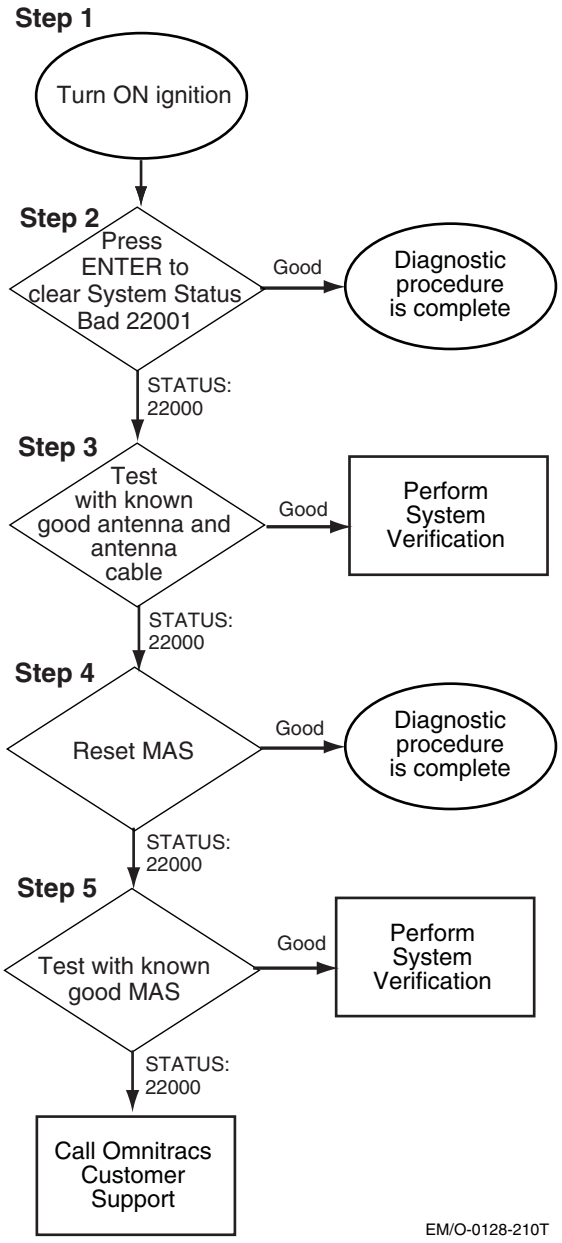


If the MCP100 is not receiving an updated position every second, shows a mode of NO FIX, or System Status 22000/22001 will not clear or reoccurs, the problem is usually caused by one or more of the following:

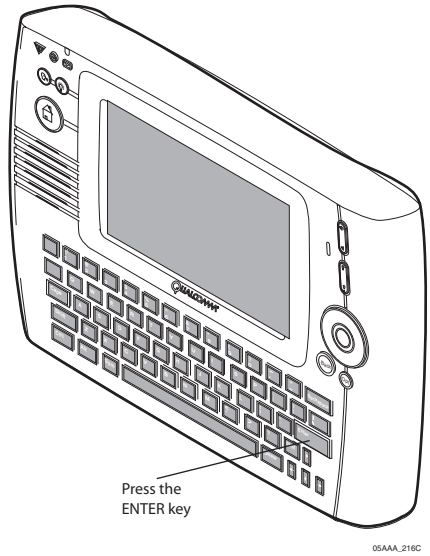
- Faulty antenna/Faulty antenna cable
- Faulty mobile application server (MAS)

Status 22000/22001

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Diagnostic Procedure

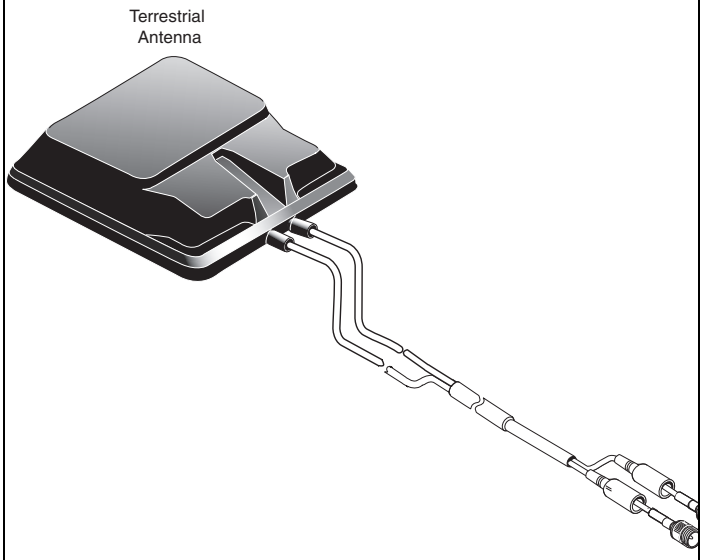


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Turn the vehicle ignition ON.

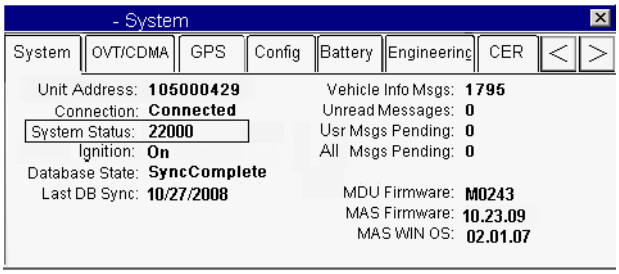
2. Clear the Bad 22001 System Status field by pressing the display **ENTER** key.

- If the System Status changes to **Good**, the diagnostic procedure is complete.
- If the System Status is still Bad 22000 or Bad 22001, go to step 3.



3. Test with a known good antenna and cable.

- If the System Status is now **Good**, replace the antenna and cable and then perform the system verification procedure in Chapter 4.
- If the System Status is still Bad 22000 or Bad 22001, go to step 4.



4. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

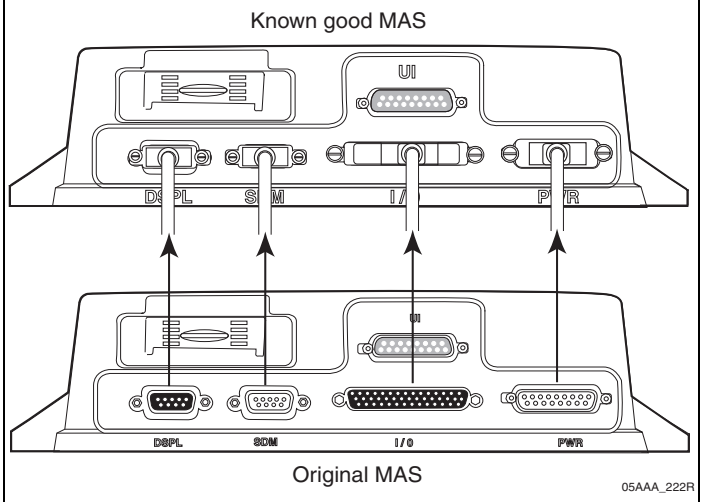
Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

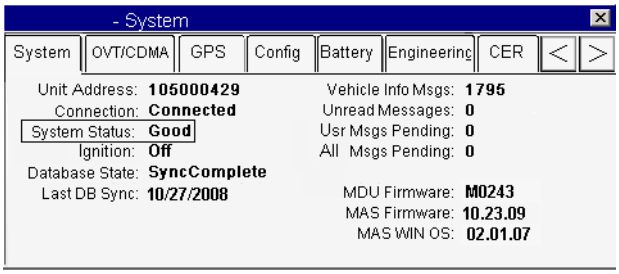
Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

After the unit resets, check the System Status on the MCP100 Status screen.

- If the System Status is still Bad 22000 or Bad 22001, go to step 5.
- If the System Status changes to **Good**, the diagnostic procedure is complete.





5. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

- If the System Status is now **Good,** the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the System Status is still Bad 22000 or Bad 22001, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

20
Vehicle Data Link Diagnostic/Verification Procedures

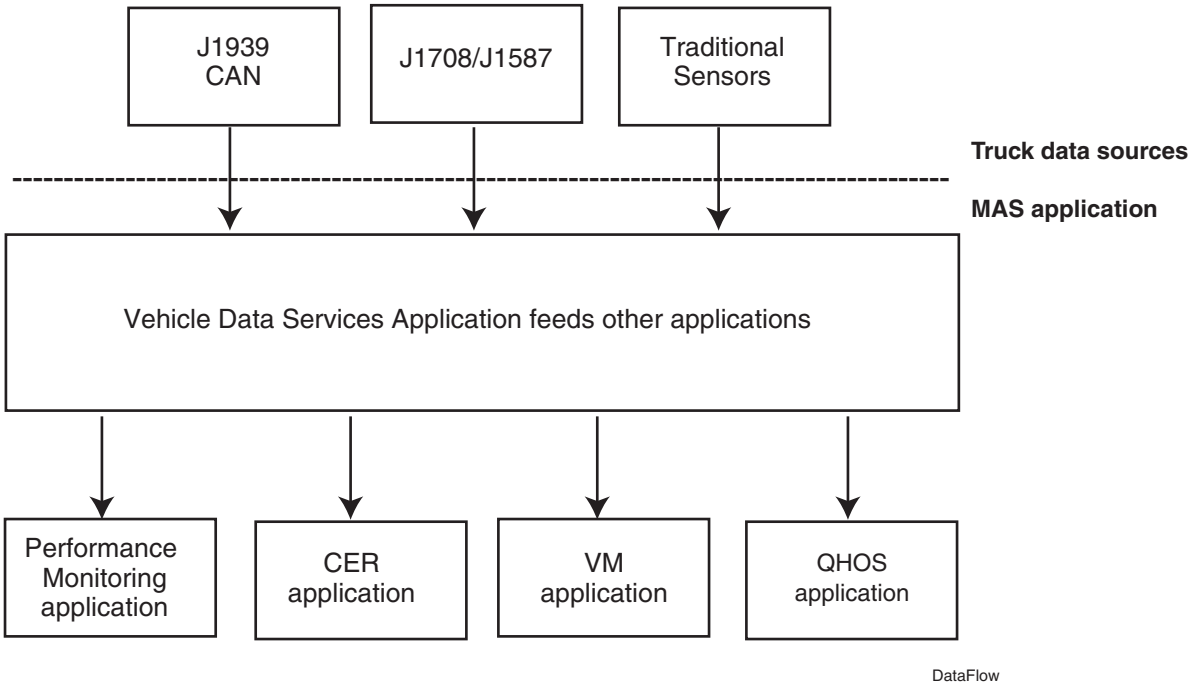
These topics are covered in this chapter:

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

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

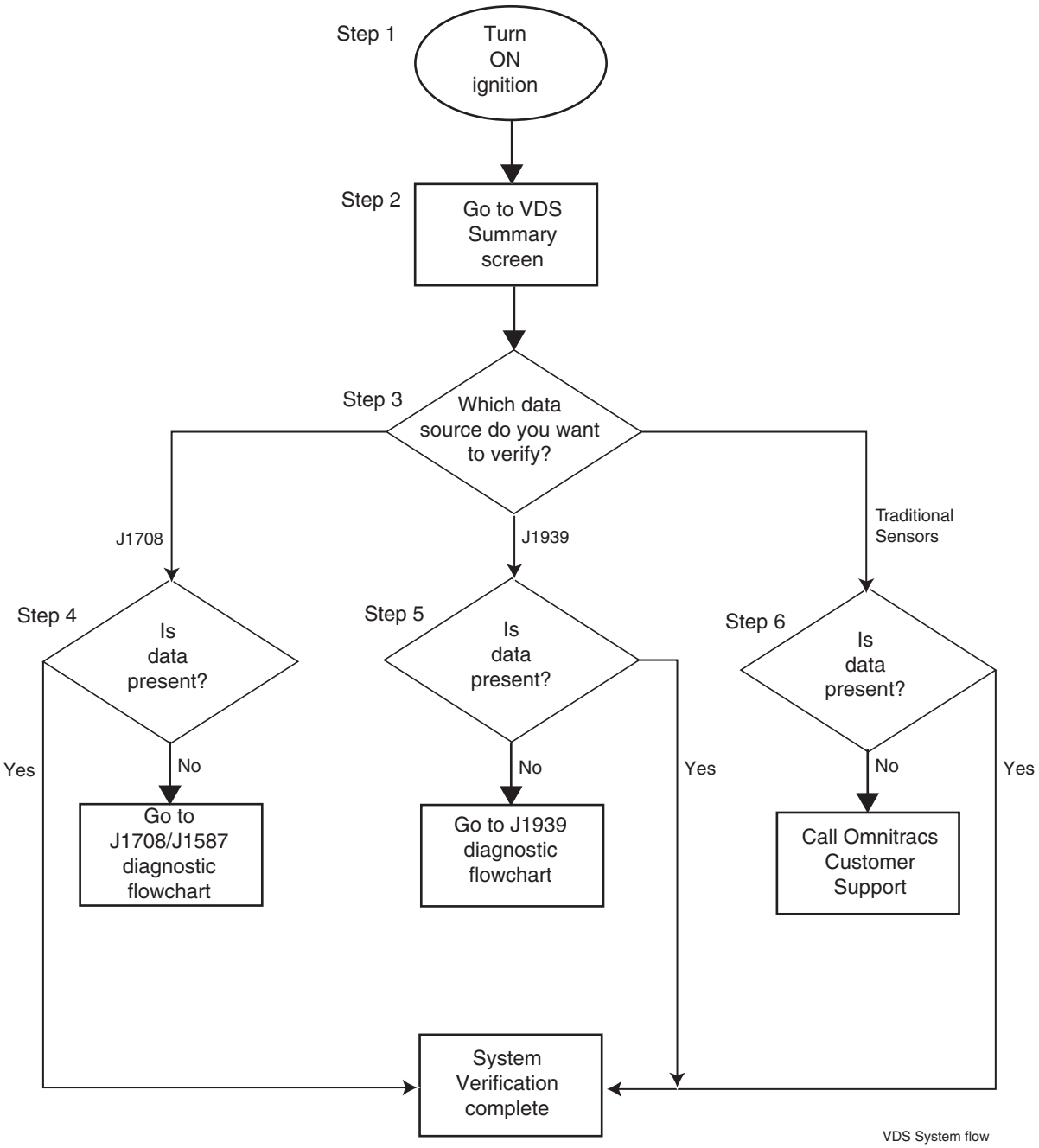
Vehicle Data Services (VDS) Overview

The VDS application receives vehicle data from J1939, J1587/J1708, and traditional data sources. It then makes the data available for applications that use vehicle data, such as Performance Monitoring, Vehicle Maintenance, CER, and QHOS.

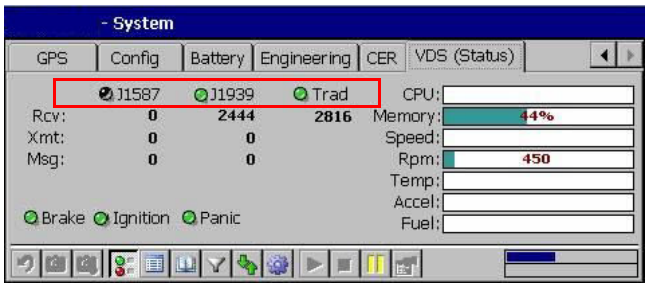


Vehicle Data Link Verification

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Verification Procedure



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential–you may be instructed to skip steps.

1. Turn the ignition ON.

2. Go to VDS (Status) tab by selecting the **VDS (Status)** in the system section.

   Press the Traffic Lights icon located along the bottom of the screen to display the VDS Summary screen.

   To verify data bus connectivity, check that the mobile application server (MAS) is enabled for J1939, J1708/J1587, and/or traditional sensors.

   - 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 EPA 2010 compliant trucks.

   Check the data source and LED status.

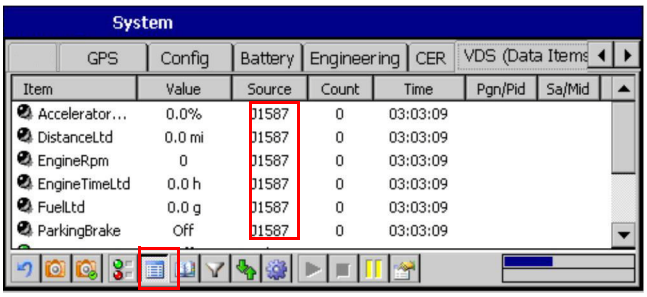
   - The LED indicator is green when a data source is enabled and receiving data from that source.

   Note

   The LED indicator is black when a data source is not enabled or there is no data.
   The LED indicator is red when the data is stale.

   - The data source must be active to increment data counters.
   - If data is not being passed, see diagnostic flowchart for *J1708/J1587 Diagnostics* on page 20-6 or diagnostic flowchart for *J1939 Diagnostics* on page 20-9.

   If you have any questions, contact Omnitracs Customer Support.



3. Which data source do you want to verify?

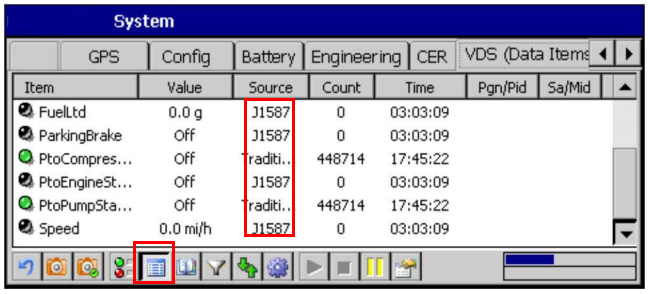
- If verifying J1708/J1587, go to step 4.
- If verifying J1939, go to step 5.
- If verifying traditional sensors, go to step 6.

4. Is J1708/J1587 data present?

- If yes, and data fields are showing green and incrementing, system verification is complete.
- If no, go to the diagnostic flowchart for *J1708/J1587 Diagnostics* on page 20-6.

Note

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



5. Is J1939 data present?

- If yes, and the following data fields are showing green and incrementing, system verification is complete:
  - Speed
  - RPM
  - Parking Brake
  - Accelerator
  - Distance LTD
  - Fuel LTD
  - Engine Time LTD
- If no, go to the diagnostic flowchart for *J1939 Diagnostics* on page 20-9.

Note

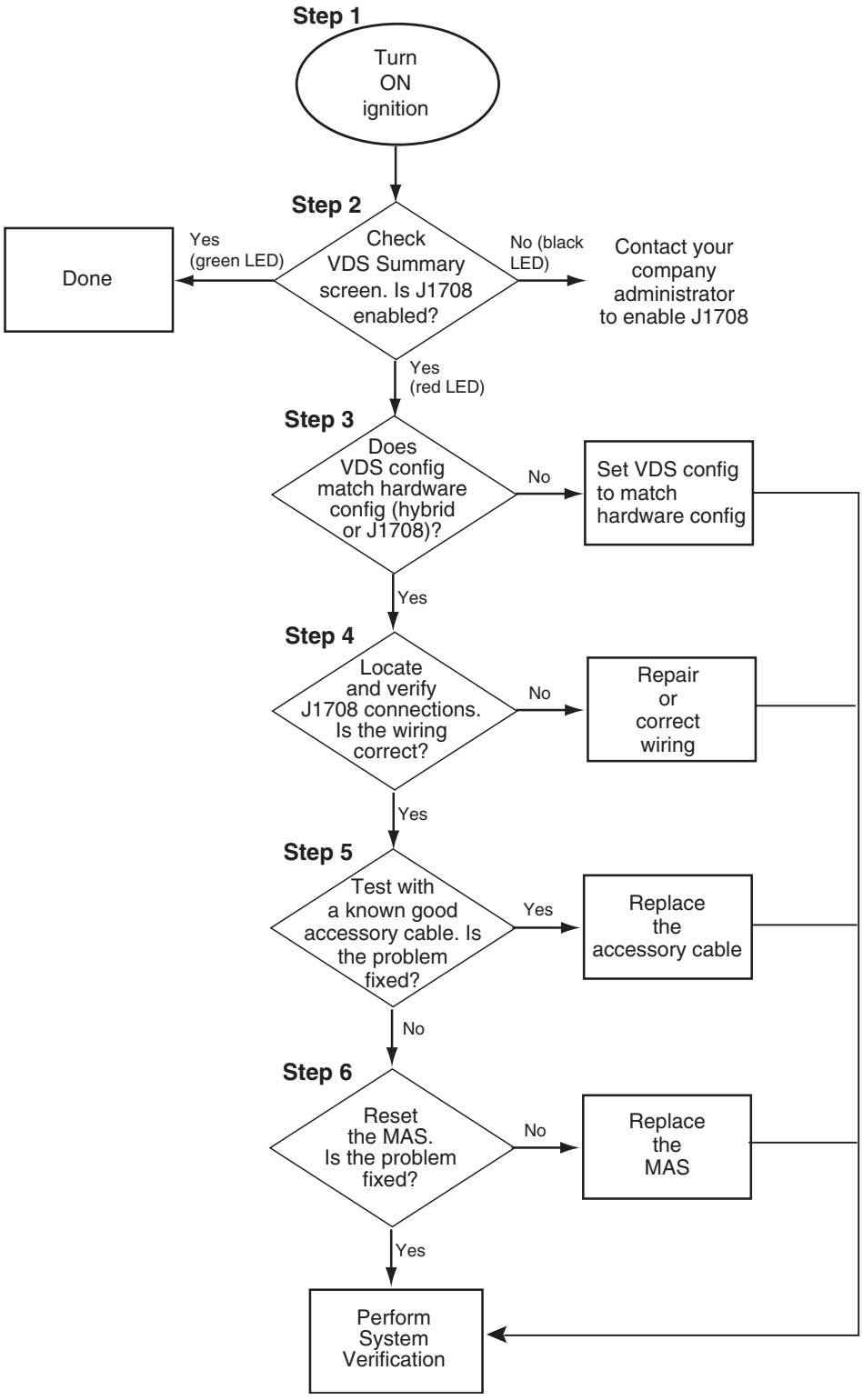
*Press the **VDS Details** icon located along the bottom of the screen to display the VDS Details screen and note the data source.*

6. Is traditional sensors' data present?

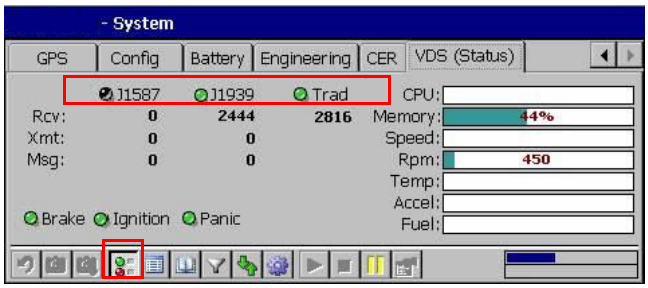
- If yes, and data fields are showing green and incrementing, system verification is complete.
- If no, contact Omnitracs technical support for assistance.

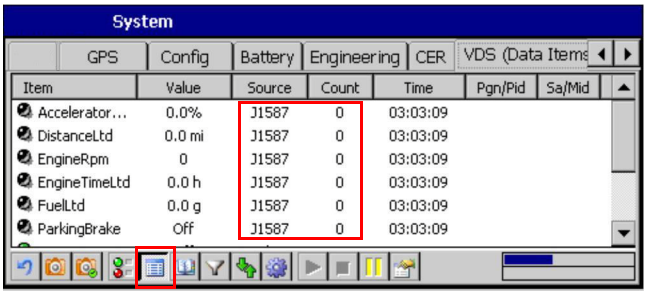
J1708/J1587 Diagnostics

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



J1708/J1587 Diagnostic Procedure



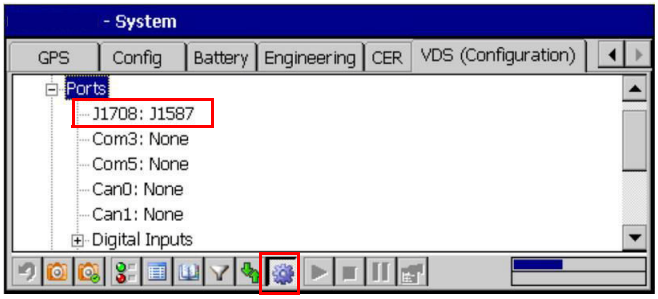


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential–you may be instructed to skip steps.

1. Turn the ignition ON.

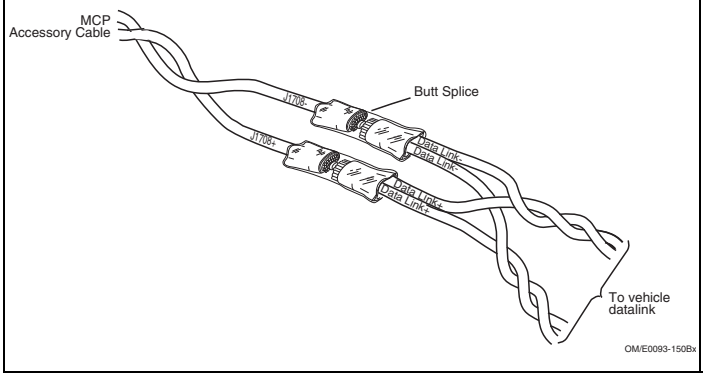
2. Check the VDS Summary screen. Is J1708/J1587 enabled?

- If **no** and LED is **black,** you are not enabled. Call your company administrator to enable J1708/J1587.
- If **yes** and LED is **red,** you are enabled but not passing data (Count field is not incrementing). Go to step 3.



3. Check the VDS Configuration/Ports screen. Does the VDS configuration match the hardware configuration (hybrid or J1587/J1708 only)?

- If **no,** confirm that the hardware configuration is hybrid or J1587/J1708 only and set the VDS configuration to match it. Perform system verification.
- If **yes,** go to step 4.

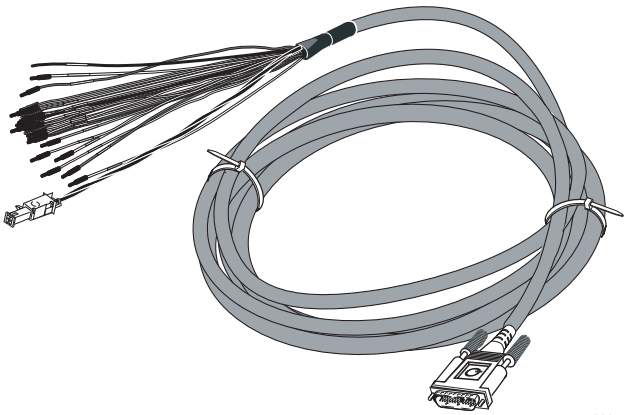


4. Locate the J1708/J1587 connections:

- Check wire connections.
- Check butt splices.
- Check polarity.

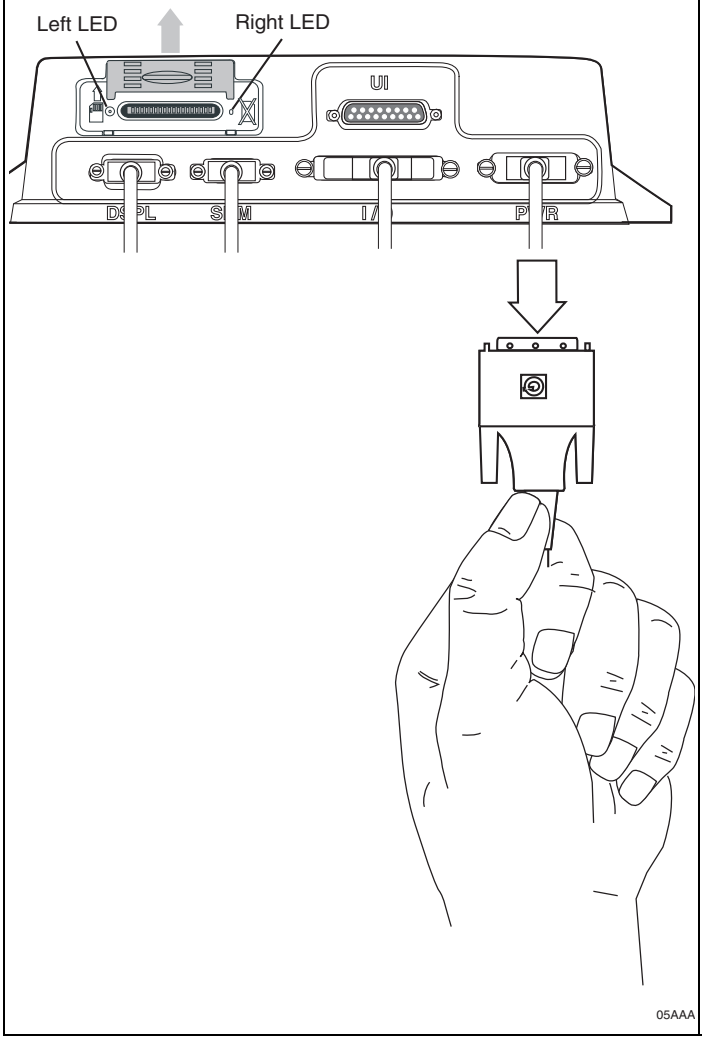
Is the wiring correct?

- If **no,** repair/correct the wiring. Perform system verification.
- If **yes,** go to step 5.



5. Test with a known good accessory cable. Did this fix the problem?

- If **yes,** replace the accessory cable. Perform system verification.
- If **no,** go to step 6.



6. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

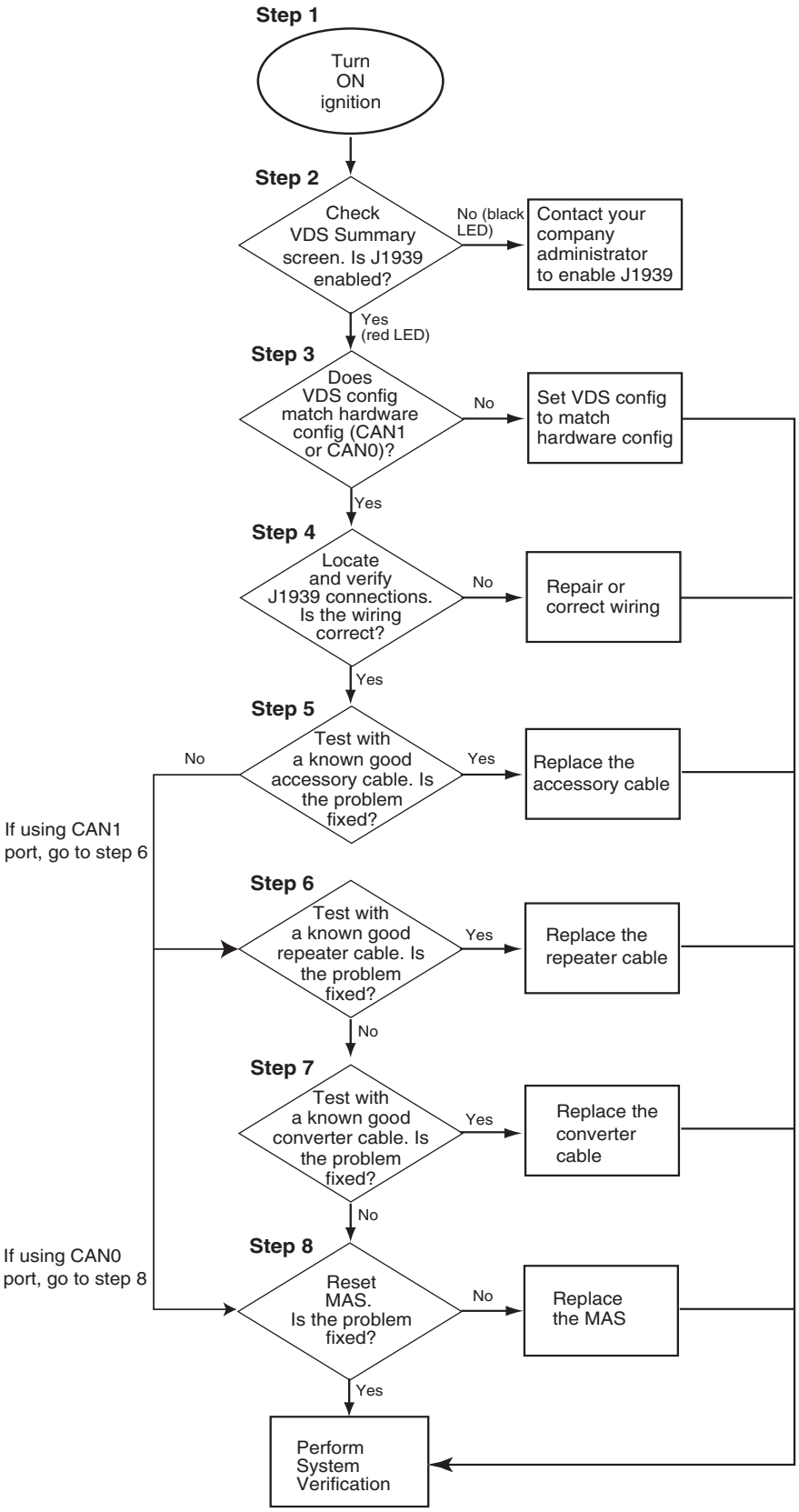
Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

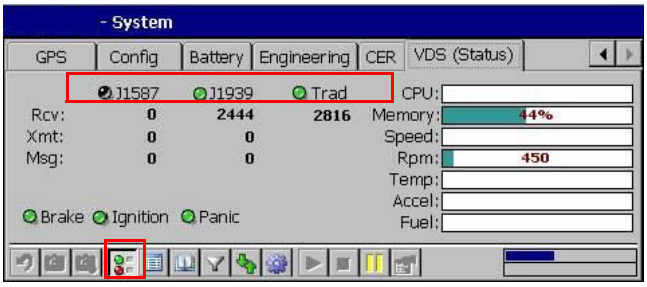
Did this fix the problem?

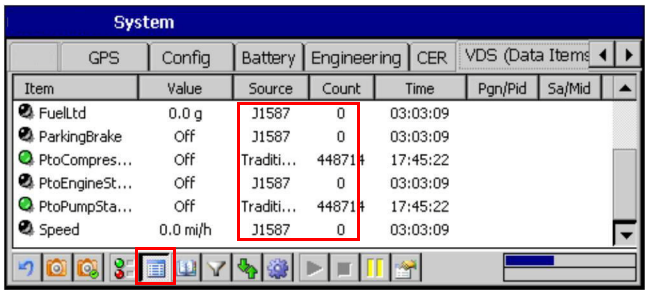
- If **no,** replace the MAS. Perform system verification.
- If **yes,** perform system verification.

J1939 Diagnostics



J1939 Diagnostic Procedure



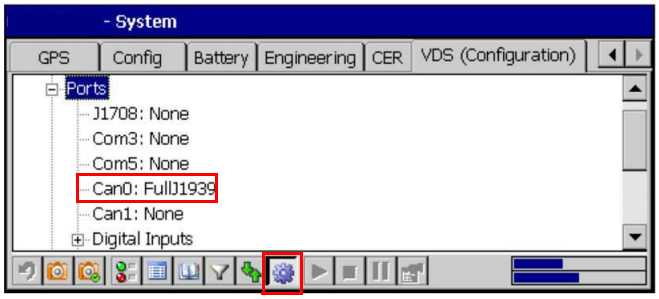


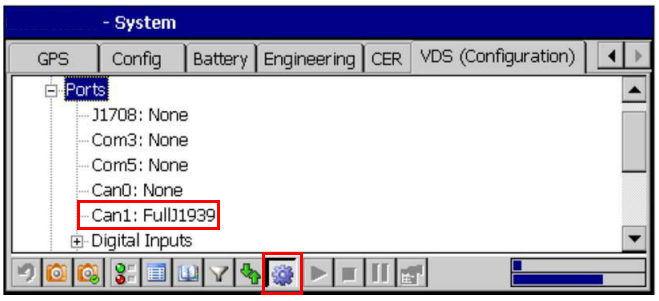
The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential–you may be instructed to skip steps.

1. Turn the ignition ON.

2. Check the VDS Summary screen. Is J1939 enabled?

- If **no** and LED is **black,** you are not enabled. Call your company administrator to enable J1939.
- If **yes** and LED is **red,** you are enabled but not passing data (Count field is not incrementing). Go to step 3.



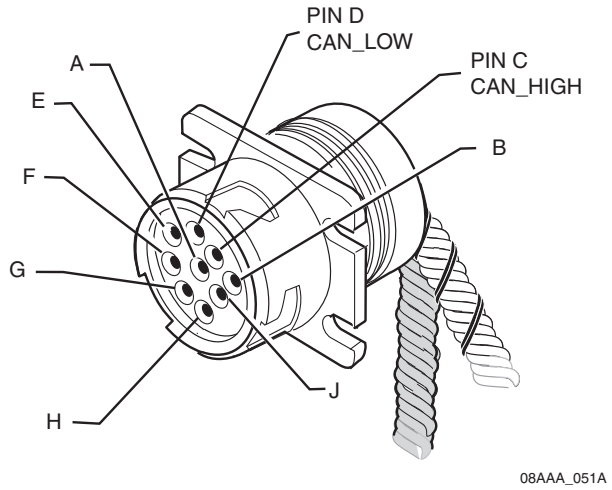


3. Check the VDS Configuration/Ports screen. Does the VDS configuration match the hardware configuration (CAN1 or CAN0 only)?

- If **no**, confirm that the hardware configuration is set to enable J1939 (CAN1 or CAN0 only) and set the VDS configuration to match it. Perform system verification.
- If **yes**, go to step 4.

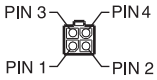
Guidelines:

- CAN 0: use on after market installs that have a repeater cable or on factory pre-wires that do not exceed 10 feet.
- CAN 1: use on all after market installs that have a converter cable or on factory pre-wires that exceed 10 feet.



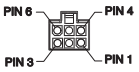
4. Check connections to J1939 bus:

- Pins C and D on diagnostic connector: Verify resistance is 57–63 ohms.
- CAN_HIGH and CAN_LOW: Verify voltage from pin C and/or pin D to ground is 1–3 VDC.



Pin	*Signal*	*Color*	*Voltage*
1	CAN_A (RX)	White/Blue	0
2	CAN_B (TX)	Brown/White	0 - 5
3	CAN_D (PWR)	White/Brown	5
4	CAN_C (GND)	Blue/White	0

008AAA_45B

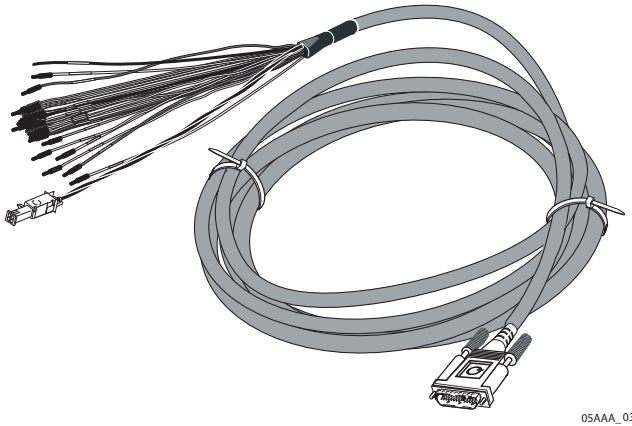


Pin	*Signal*	*Color*	*Voltage*
1	CAN_1_HI	White/Blue	2.3
2	CAN_1_LO	Blue/White	2.3
3	CAN_PWR	White/Brown	4.92
4	CAN_GND	Brown/White	GND
5	SHIELD		.73
6	BLANK		

- If you are using CAN1/Converter Cable: Verify power/ground on 4-pin connector.
- If you are using CAN0/Repeater Cable: Verify power/ground on 6-pin connector.

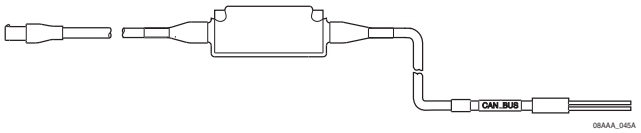
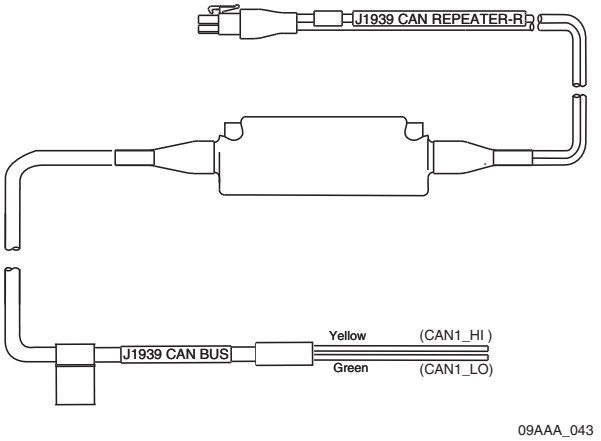
Is wiring correct?

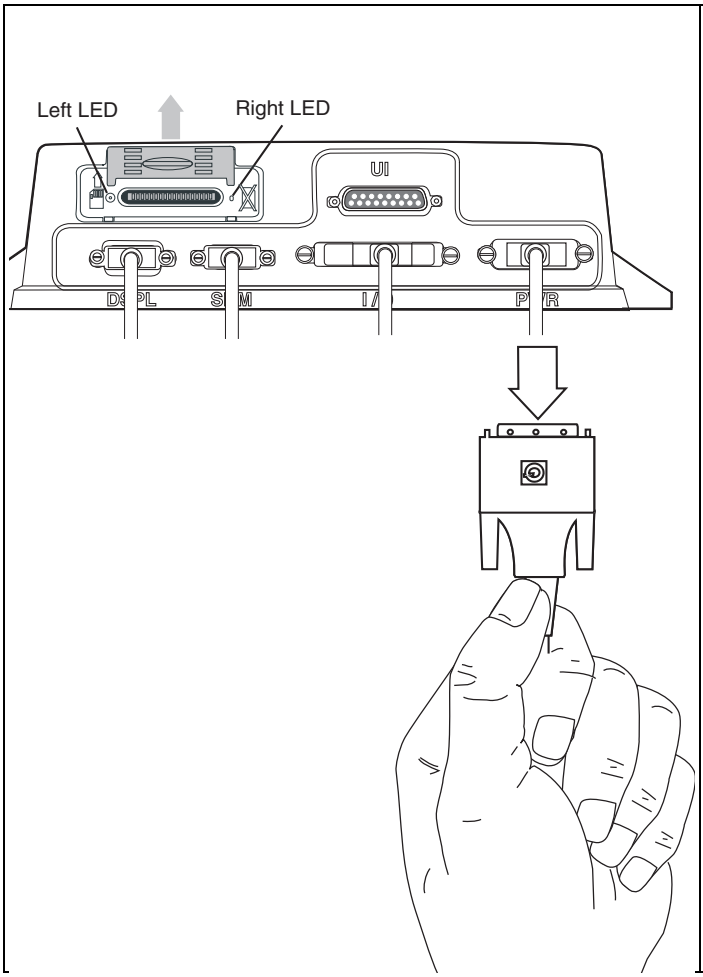
- If **no**, repair/correct the wiring. Perform system verification.
- If **yes**, go to step 5.
- If 6-pin, go to *J1708/J1587 Diagnostics* on page 20-6



5. Test with a known good accessory cable. Did this fix the problem?

- If **yes,** replace the accessory cable. Perform system verification.
- If **no** and you are using the CAN1 port/ Converter Cable, go to step 7.
- If **no** and you are using the CAN0 port/ Repeater Cable, go to step 7.

	**6.** Test with a known good converter cable. Did this fix the problem? • If **yes,** replace the converter cable. Perform system verification. • If **no,** go to step 8.
	**7.** Test with a known good repeater cable. Did this fix the problem? • If **yes,** replace the repeater cable. Perform system verification. • If **no,** go to step 8.



8. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

Did this fix the problem?

- If **no,** replace the MAS. Perform system verification.
- If **yes,** perform system verification.

21
Performance Monitoring Diagnostic/Verification Procedures

These topics are covered in this chapter:

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

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

System Overview

Connecting to the truck's data link is required for many driver performance applications. The data is retrieved from the truck by the host computer, either manually or automatically at preset intervals.

The hardware installation on the vehicle consists of connecting the MCP100 to the data link (see Chapter 20).

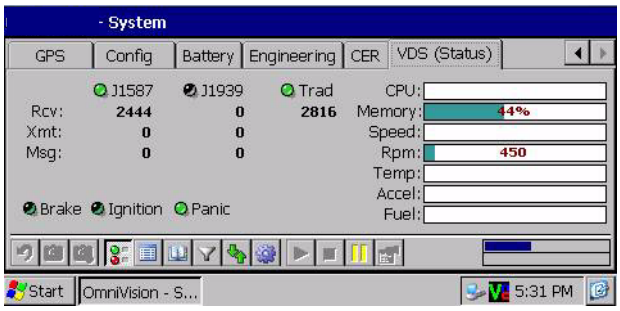
Data Collected

The performance monitoring system collects the following data from the vehicle:

- Speed
- Distance
- RPM
- Fuel
- PTO
- Hard Braking

System Verification

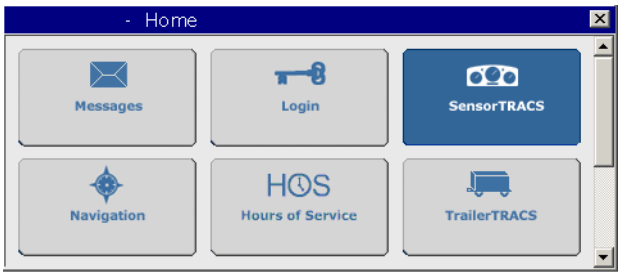
1. Turn ignition ON.
2. Access the VDS screen on the display.
   a. From the Home screen, tap the **System** icon.
   b. Tap the **VDS (Status)** tab.



3. Verify the desired data link is enabled, as indicated by a **green LED,** on the VDS screen.
4. Monitor the **Rcv** value of the desired data link. The value should be a constantly increasing number.
   a. If the value is rapidly increasing, you are receiving some type of data link messages. Go to step 5.

b. If the value is not rapidly increasing, you are not receiving any data link messages, and you need to recheck the installation.

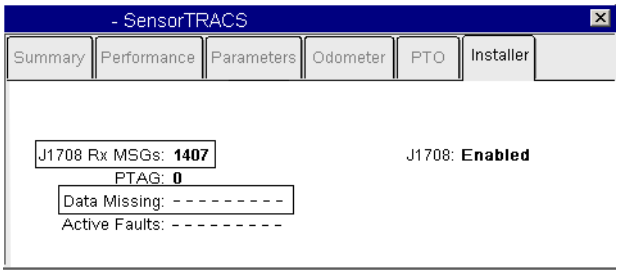
5. Return to the Home screen. Tap the **SensorTRACS** (Performance Monitoring) icon.



Note

*If the SensorTRACS (Performance Monitoring) icon is grayed out, the Performance Monitoring application is not enabled. Call your **company dispatch** to have this application enabled.*

6. Tap the **Installer** tab.



Note

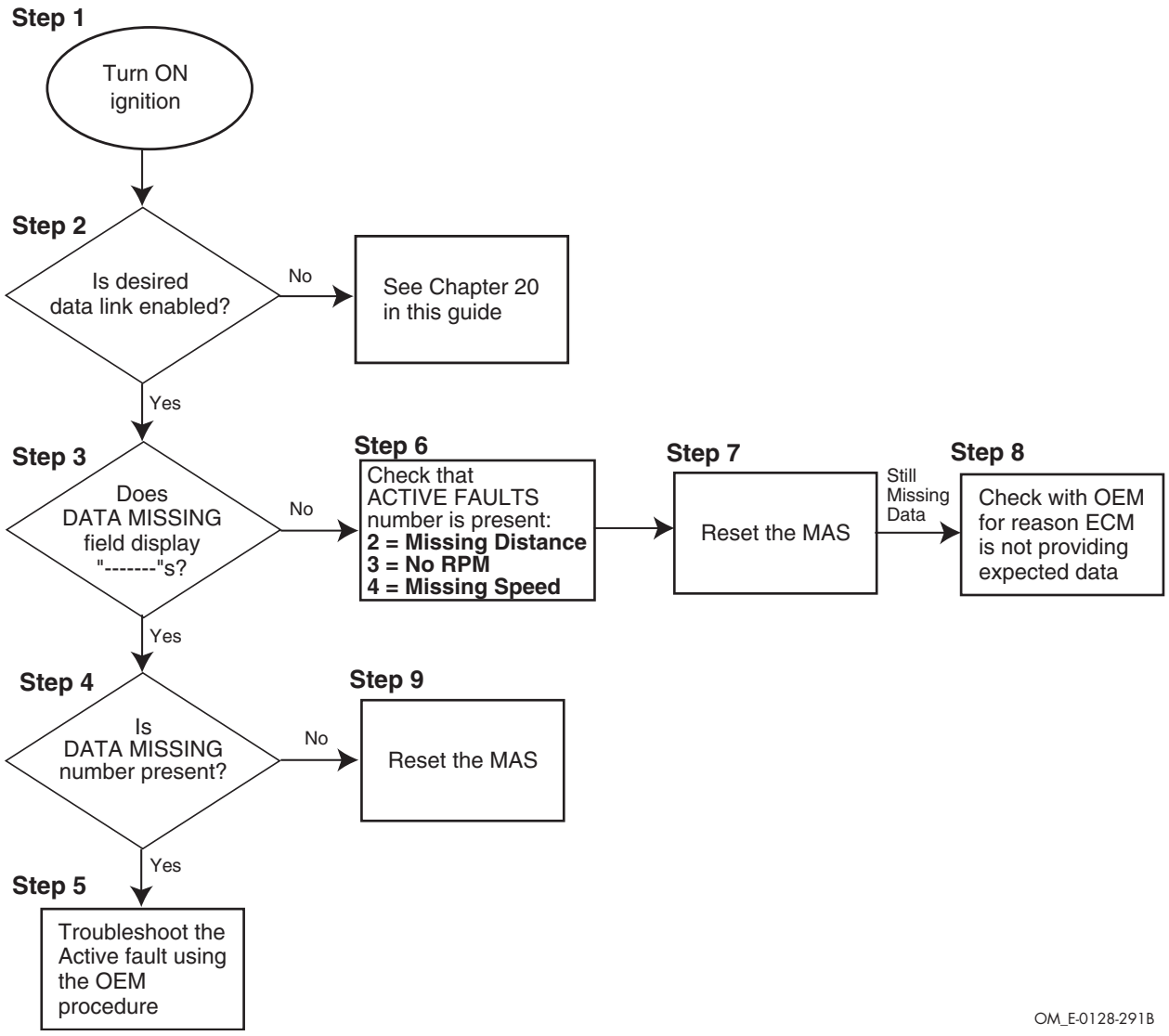
You can access other Performance Monitoring information by touching any of the six tabs.

7. Review the **Data Missing** field.

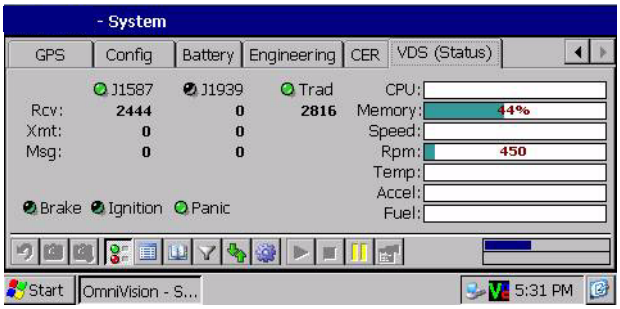
- If the Data Missing field displays all dashes, the installation is good.
- If the Data Missing field displays a few numbers, then the installation is okay because certain information may not available from the desired data link. Refer to the tables at the end of this chapter to identify specific missing information.
- If the Data Missing field is showing 012345678, you are not connected to the desired data link, or the wires are reversed. Recheck your installation.

Diagnostic Flowchart

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



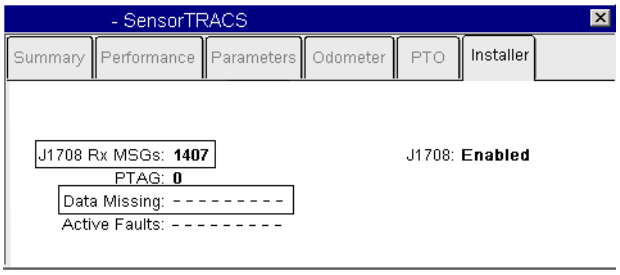
Diagnostic Procedure



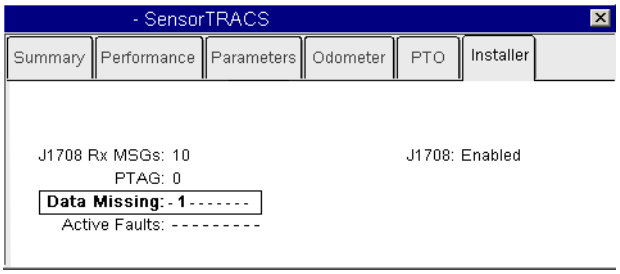
The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Turn the ignition ON.

2. From the Home screen. Tap the **System** icon. Tap the **VDS** tab. Verify the desired data link is enabled.
   - If the desired data link is not enabled (there is no green LED), perform the diagnostic procedure in Chapter 20 in this guide.
   - If the desired data link is enabled (there is a green LED), go to step 3.

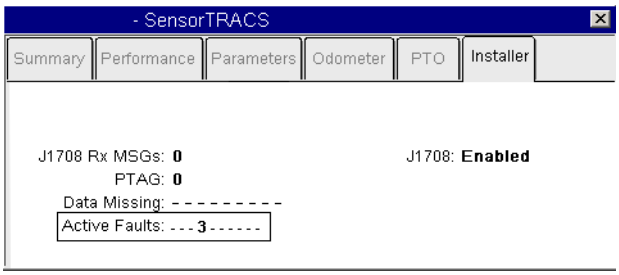


3. Return to the Home screen. Tap the **SensorTRACS** (Performance Monitoring) icon. Tap the **Installer** tab. Verify the Data Missing field displays as dashes.
   - If **no**, go to step 4.
   - If **yes**, go to step 6.



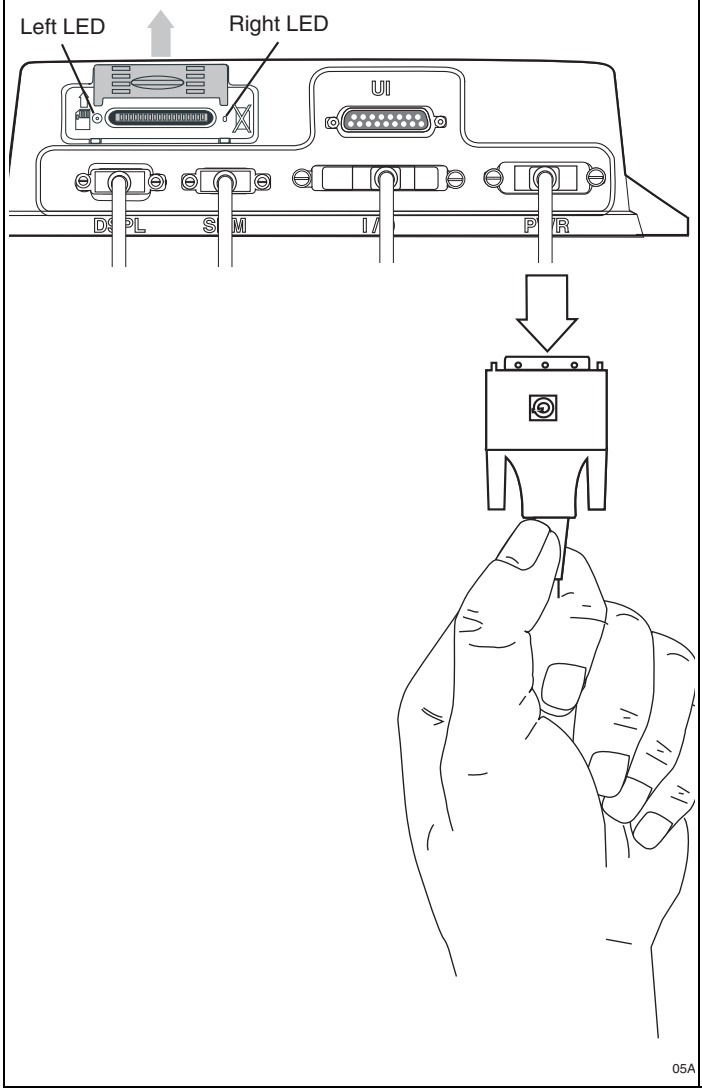
4. Check that a DATA MISSING number is present. Refer to ***Data Missing Indicators and Active Fault Values*** on page 21-7 for specific information.
   - If **no**, go to step 9.
   - If **yes**, go to step 5.

5. Troubleshoot the active fault using OEM procedures.



6. Check that an ACTIVE FAULTS number is present. Refer to ***Data Missing Indicators and Active Fault Values*** on page 21-7 for specific information.

Go to step 7.



7. Reset the mobile application server (MAS) by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

If the desired data link information is still not present, go to step 8.

8. The ECM is not providing RPM data. Check OEM-recommended procedures for the reason.

9. Reset the MAS.

Data Missing Indicators and Active Fault Values

Data Missing Field Value Definitions			
Field Value	**Meaning**	**Associated PID**	**Effect**
0	Missing Road Speed (MPH)	84	Performance Monitoring is not receiving road speed from the ECM.
1	Missing Engine Speed (RPM)	190	Performance Monitoring is not receiving engine speed from the ECM.
2	Missing Total Distance	245	Performance Monitoring is missing distance from the ECM.
3	Missing Total Engine Hours	247	Engine hour data will not be available.
4	Missing Total Fuel	250	Performance Monitoring 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.

Active Fault Field Value Definitions			
Display Shows	**Associated Fault**	**Description/Symptom**	**Possible Cause**
0	No Power (MCP100)	Power detected OFF for more than the wake-up time.	Main power was lost, causing the MCP100 to stay asleep longer than its wake-up interval.
1	RPM Zero (MCP100)	RPM zero when speed is non-zero.	-RPM sensor or connection problem. -Data link 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 (MCP100)	Ignition OFF and speed or RPM non-zero.	Problem with MCP100's ignition line wiring or fuse.
3	RPM Sensor (MCP100)	Engine posted PID (194) and PID (190).	RPM sensor or connection problem to the engine, detected by the engine's diagnostics.
4	Speed Sensor (MCP100)	Engine posted PID (194) and PID (84).	Speed sensor or connection problem to engine, detected by the engine's diagnostics.
9	LTD Mismatch (MCP100)	LTD mismatch with stored MCP100 data.	-Engine run with main power disconnected. -Engine run with data link disconnected. -Engine run with ignition line disconnected.
A	Bad Speed (MCP100)	More than 2 hrs IGN = ON with Spd = 0, RPM greater than 1300.	-Speed sensor or connection problem—MCP100. -Speed sensor or connection problem—engine. -Engine speed sensor parameter not enabled.
B	0 Spd and RPM (MCP100)	More than 2 hrs with IGN = ON with Spd = 0, RPM = 0.	-Disconnect of entire accessory cable. -Data link selection parameter set wrong. -Data link connection problem. -Driver using ignition position for accessory operation. -MCP100 ignition line wired to accessory position.
D	Steady Speed (MCP100)	Speed signal constant for more than 5 minutes.	A pulse generator may have been connected, either to the MCP100 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).

22
Trailer Tracks Asset Management Diagnostic/Verification Procedures

These topics are covered in this chapter:

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

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

Normal Performance

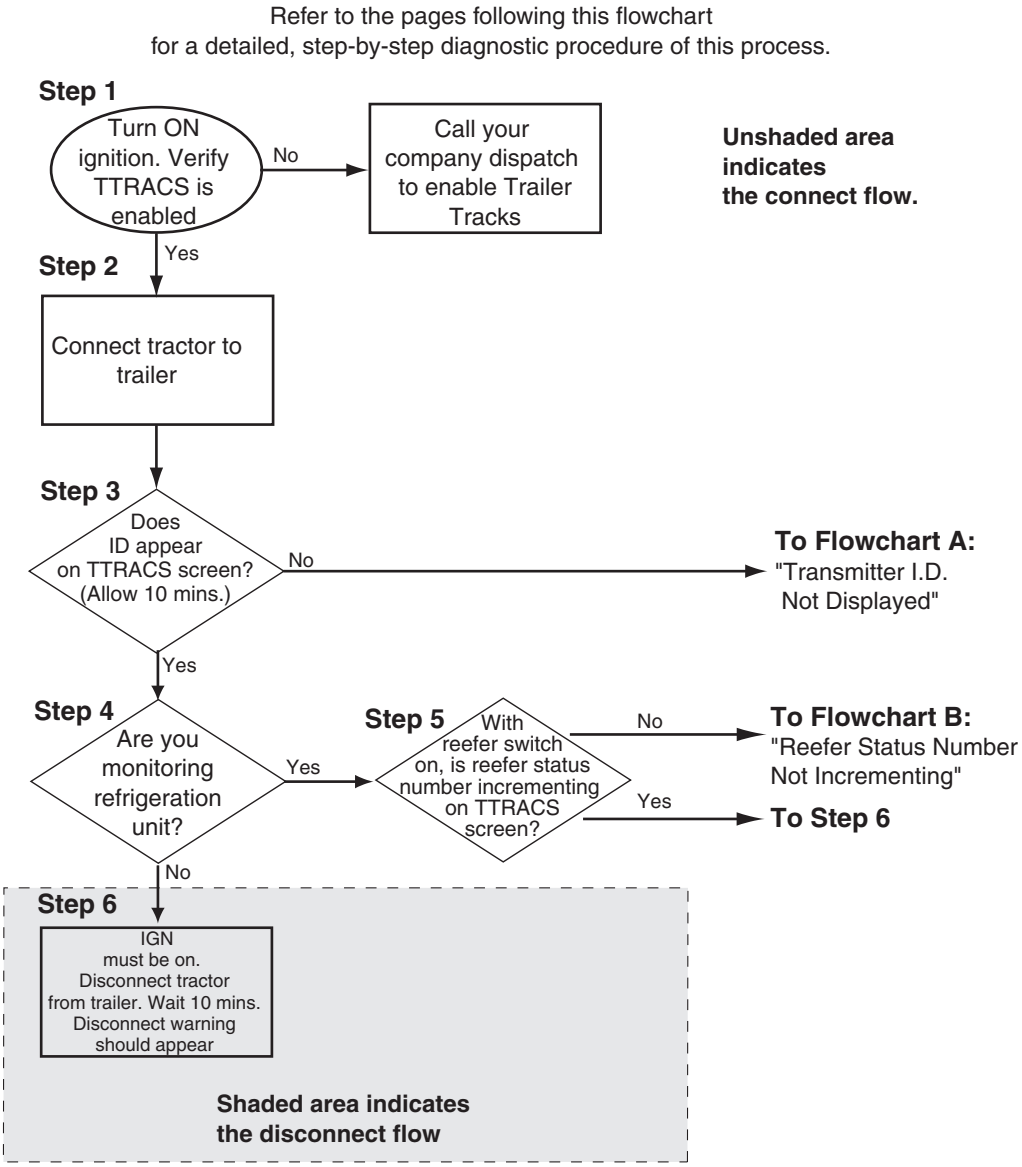
The Trailer Tracks asset management system is an option that lets dispatchers monitor trailer connects and disconnects. Connects and disconnects are detected by the MCP100 and passed on to the dispatcher via the satellite link with the date, time, and location. Trailer Tracks asset management also lets you monitor trailer refrigeration units. This feature warns the driver when the reefer develops a problem and falls outside specific user-defined values.

The current Trailer Tracks transmitter works between +9 and 32 VDC. The MCP100 also works with Omnitracs's Trailer Tracks asset management system products.

Abnormal Performance

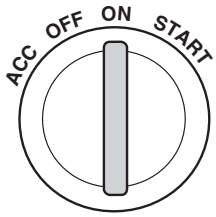
The flowcharts and diagnostic procedures in this chapter cover data reporting problems and reefer problems.

Trailer Tracks Asset Management System Verification



Verification Procedure

Turn the ignition ON



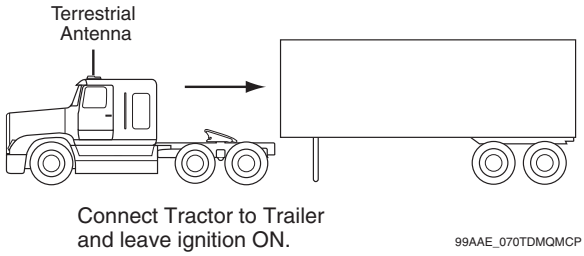
The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Turn ignition ON. Verify that the Trailer Tracks asset management system is enabled. If you can view the Trailer Tracks screen, Trailer Tracks asset management is enabled.

- From the Home screen, tap the **TrailerTRACS** (Trailer Tracks) icon. Tap the **Trailers** tab to display the Trailer ID screen.

Note

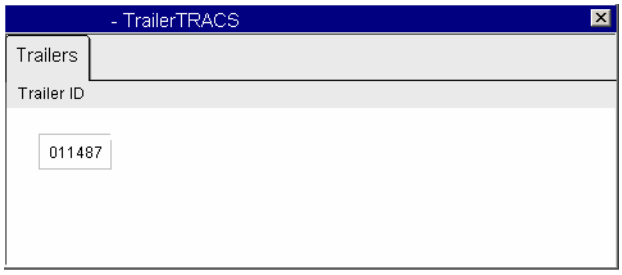
If the screen does not appear, call your company to have Trailer Tracks asset management enabled. Have the MCP100 number ready when you call.



2. Connect the tractor to the trailer and leave the ignition ON.

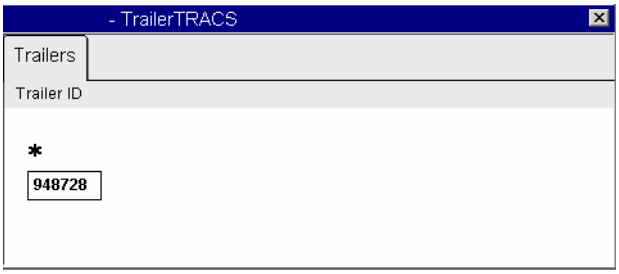
Connect the tractor 7-way pigtail to the trailer.

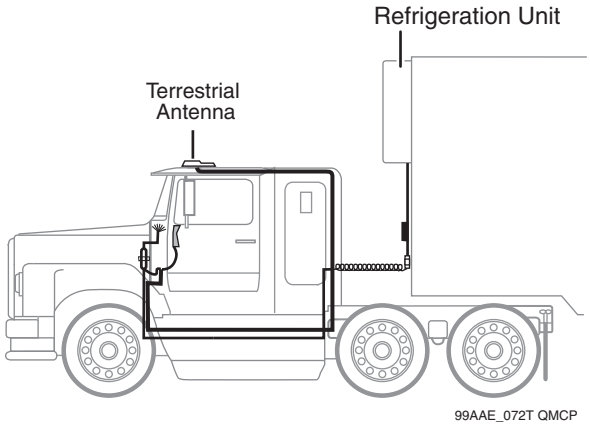
This powers the Trailer Tracks transmitter and initiates sending the ID.



3. Verify a trailer is connected. When a trailer is connected, the Trailer Tracks Transmitter ID number shows on the Trailer ID screen. If multiple trailers are connected, the ID from each transmitter will be displayed.

- For dry vans, if the Trailer ID appears, go to step 6.
- For reefer units, if the Trailer ID appears, go to step 4.
- If the Trailer ID does not appear, go to Flowchart A “Transmitter ID Not Displayed” on page 22-6.



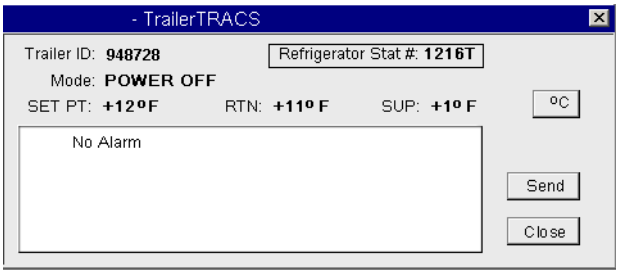


4. Is a refrigeration unit being monitored?

Note

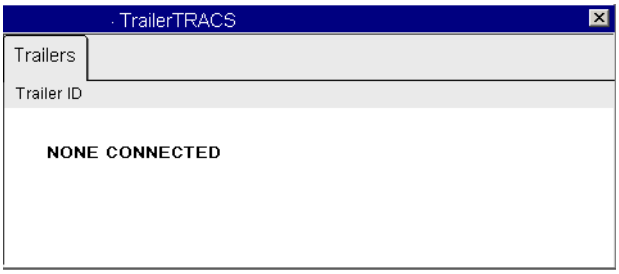
If a refrigeration unit is detected, a snowflake will appear above the transmitter ID box.

- If **yes,** go to step 5.
- If **no**, go to step 6.



5. With the reefer turned on, check that the Refrigerator Stat # is incrementing on the Trailer Tracks screen. This number should increment approximately once a minute.

- If it is incrementing, go to step 6.
- If it is not incrementing, go to Flowchart B “Reefer Status Number Not incrementing” on page 22-13.



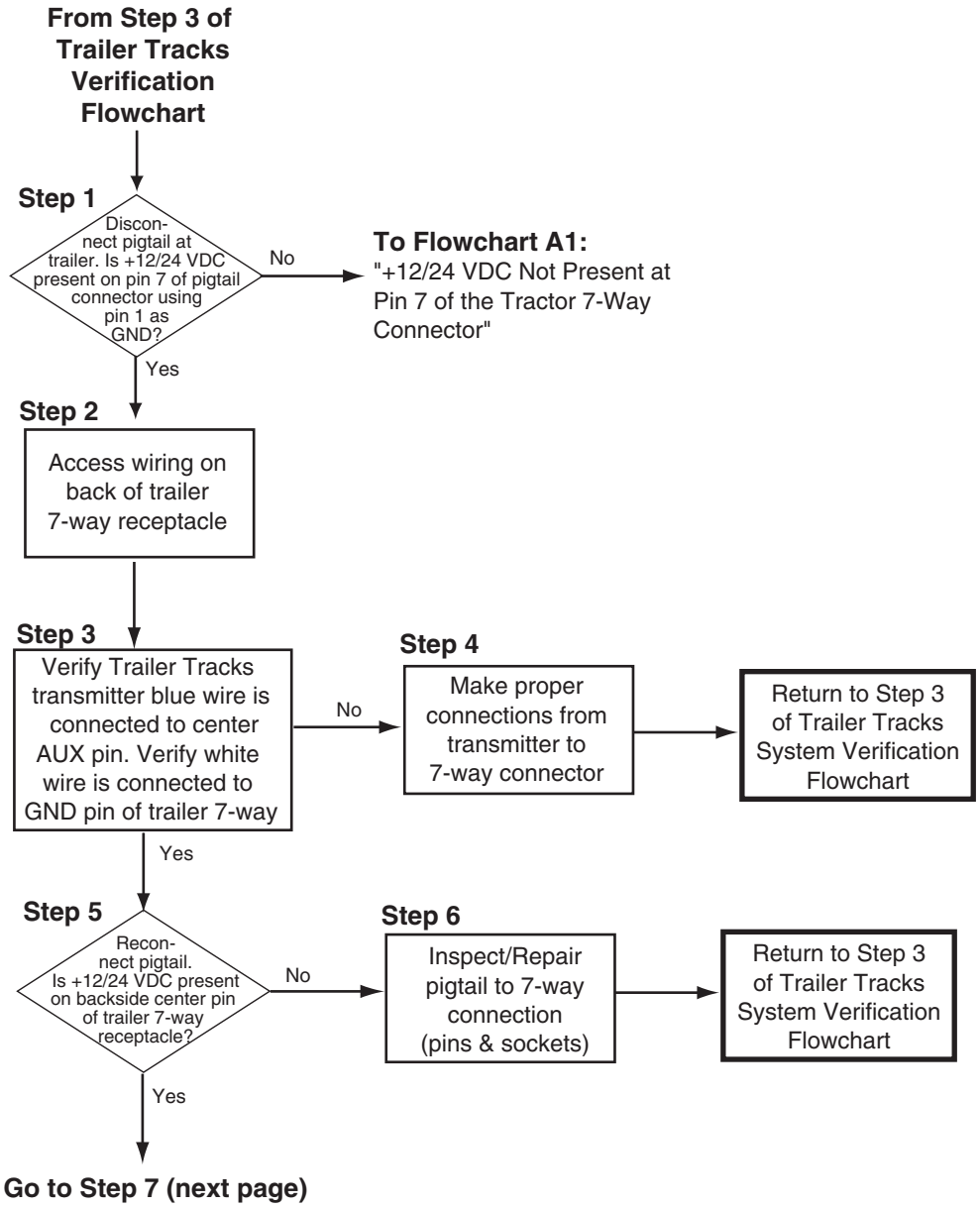
6. Disconnect the tractor from the trailer, leave the ignition ON, and wait for the disconnect message as shown at left. (Allow up to 10 minutes.)

- When the disconnect message appears on the display screen, Trailer Tracks asset management system verification is complete.
- If disconnect message does not appear (allow up to 10 minutes), call Omnitracs Customer Support:

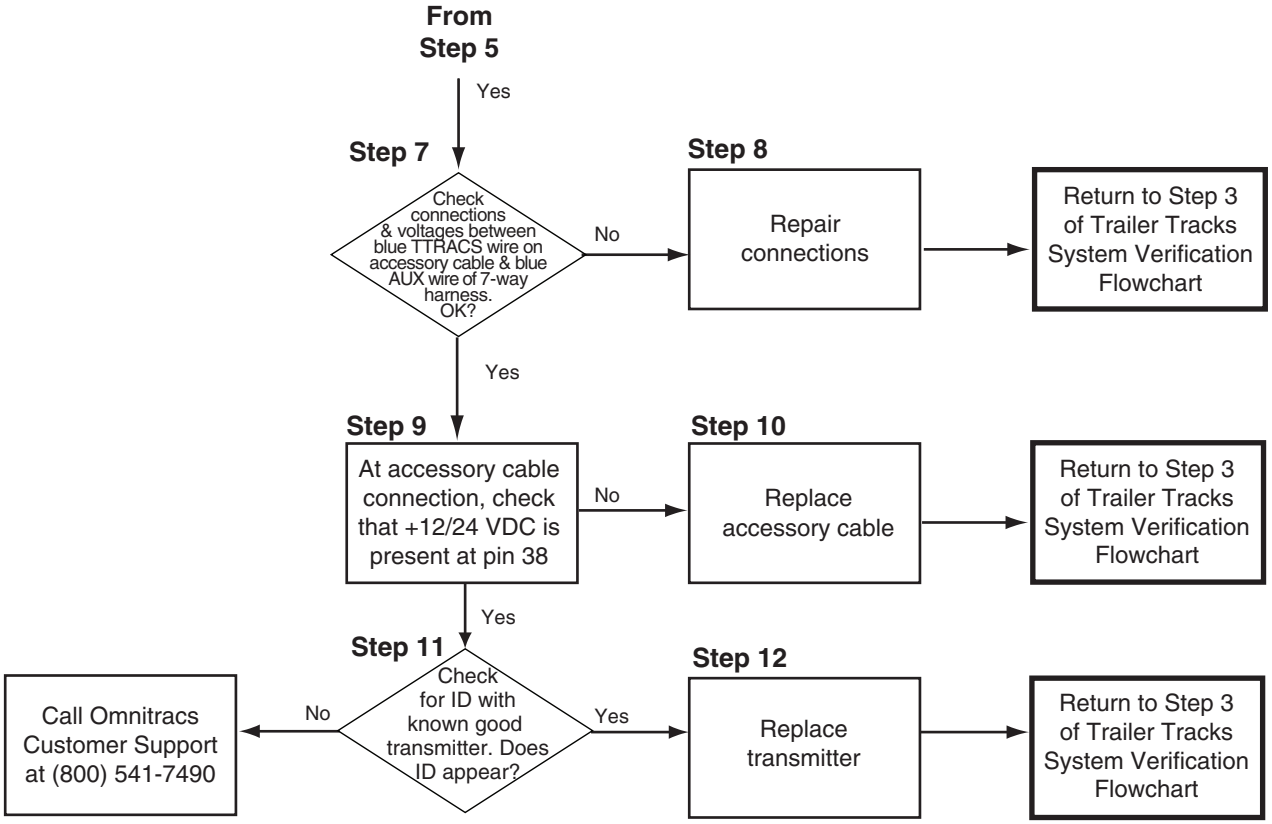
  US: 800-541-7490
  Canada: 800-863-9191

A—Transmitter ID Not Displayed

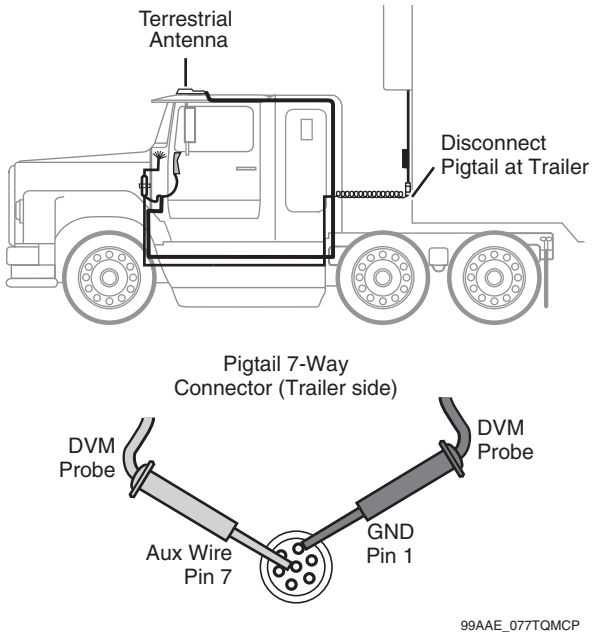
Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



A—Transmitter ID Not Displayed (continued)



Diagnostic Procedure A—Transmitter ID Not Displayed

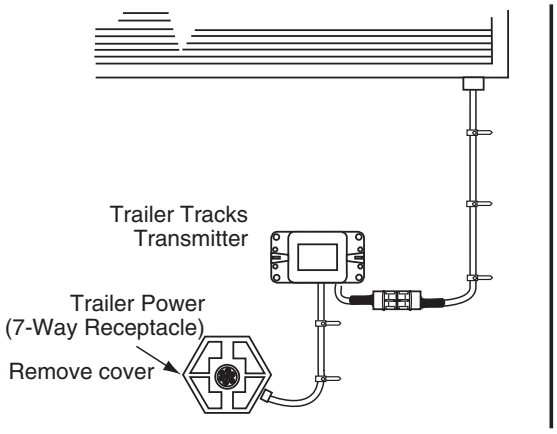


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

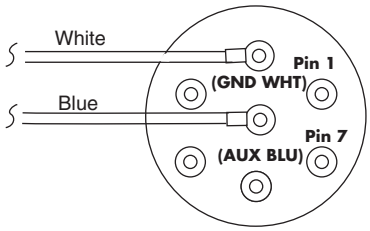
1. Disconnect the pigtail at the trailer.

Is +12/24 VDC present at pin 7 (center pin) of the pigtail connector using pin 1 as ground?

- If **yes**, go to step 2.
- If **no**, go to Flowchart A1 on page 22-11.



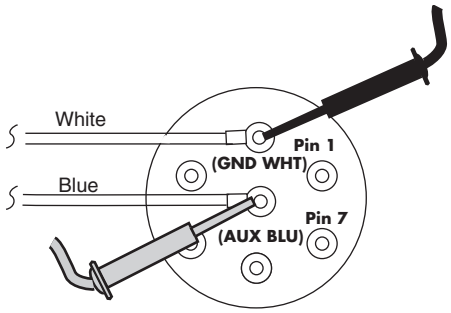
2. Access the wiring on the back of the trailer 7-way receptacle. You will have to remove the front cover.



3. Verify that the Trailer Tracks transmitter blue wire is connected to the center aux pin of the 7-way receptacle. Verify that the white wire is connected to the ground pin of the 7-way receptacle.

- If both wires are correctly connected, go to step 5.
- If the wires are not correctly connected, go to step 4.

4. Make proper connections from the Trailer Tracks transmitter to the 7-way receptacle and return to step 3. of the Trailer Tracks asset management system verification flowchart.



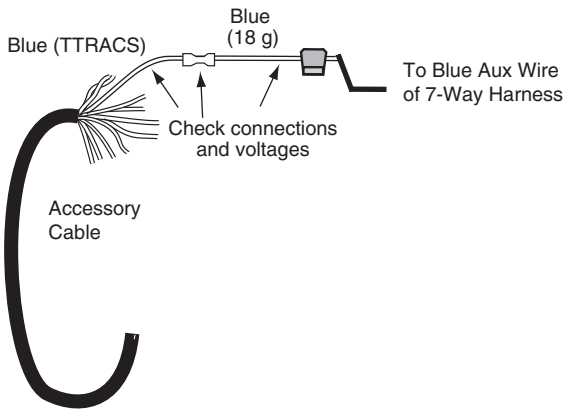
5. Reconnect the pigtail to the front cover of the 7-way receptacle.

Is +12/24 VDC present on the backside center pin of the trailer 7-way receptacle?

- If +12/24 VDC is not present, go to step 6.
- If +12/24 VDC is present, reconnect the cover and go to step 7.

6. Inspect and/or repair the pigtail to the 7-way connection (pins and sockets).

- Reconnect the cover.
- Return to step 3. of the Trailer Tracks asset management system verification flowchart.

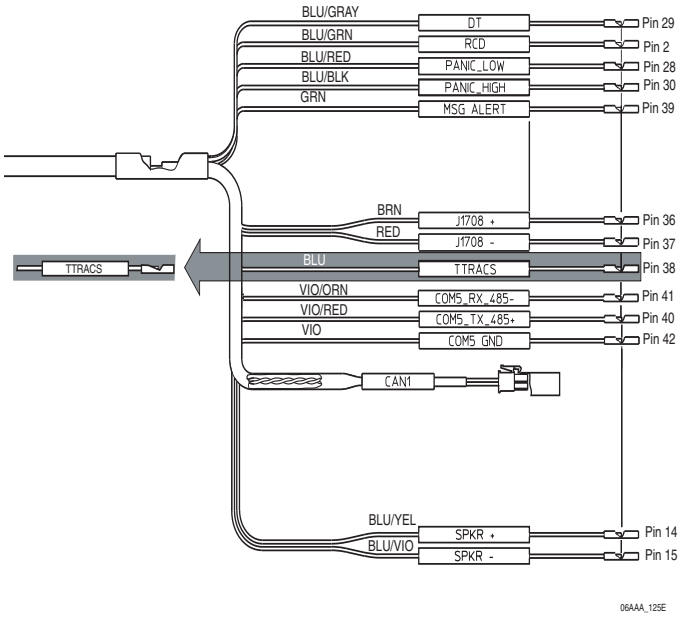


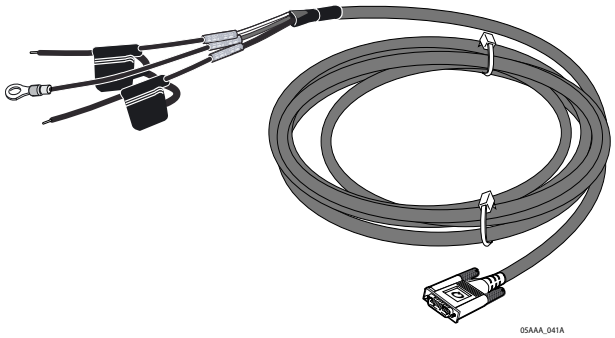
7. On the tractor, check connections and voltages between the blue Trailer Tracks wire (labelled TTRACS) of the accessory cable and the blue aux wire of the 7-way harness.

- If the connections and voltages are OK, go to step 9.
- If the connections and voltages are not OK, go to step 8.

8. Repair the connections.

- Return to step 3. of the Trailer Tracks asset management system verification flowchart.

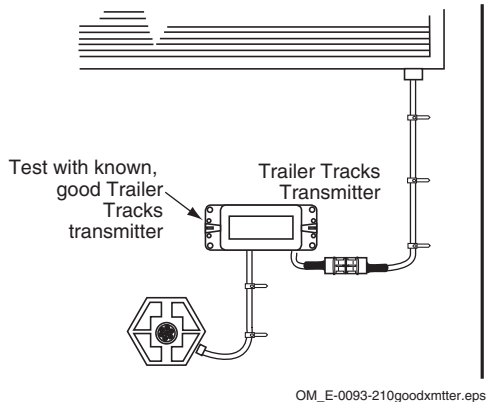




9. At the accessory cable, check that +12/24 VDC is present at pin 38 and using chassis ground.

- If +12/24 VDC is not present at pin 38, go to step 10.
- If +12/24 VDC is present at pin 38, go to step 11.

10. Replace accessory cable and return to step 3. of the Trailer Tracks asset management system verification flowchart.



11. Check for Trailer Tracks ID with a known good Trailer Tracks transmitter.

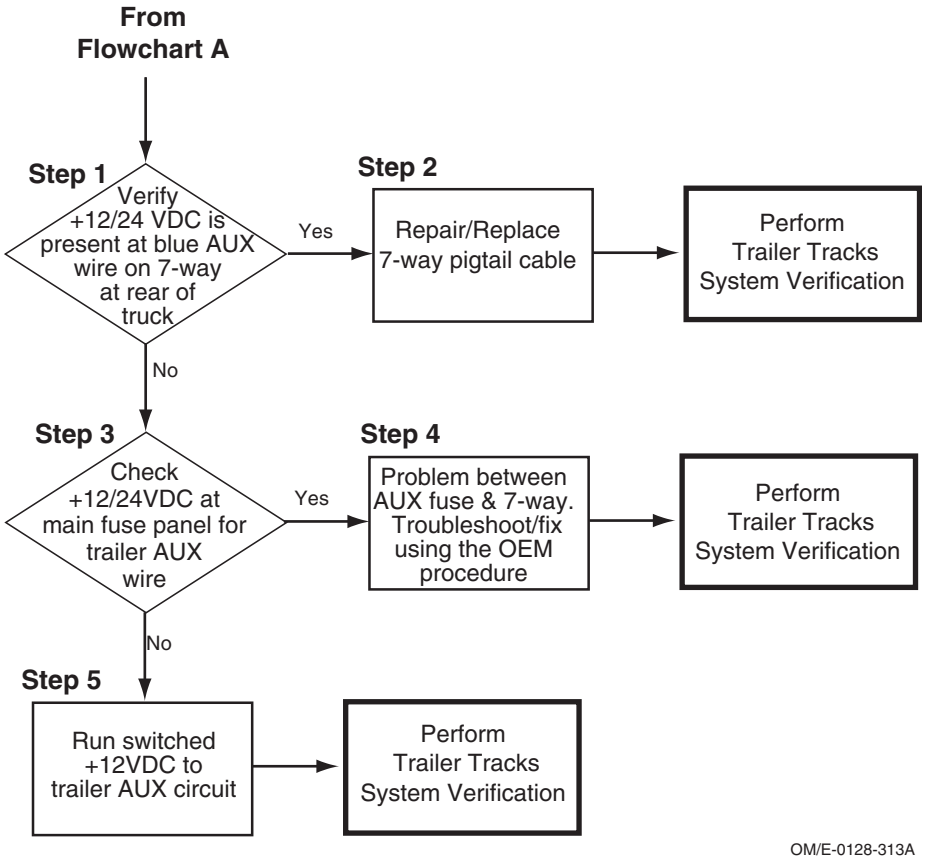
- If the ID appears, go to step 12.
- If the ID does not appear, call Omnitracs Customer Support at 800-541-7490.

12. Replace the Trailer Tracks transmitter.

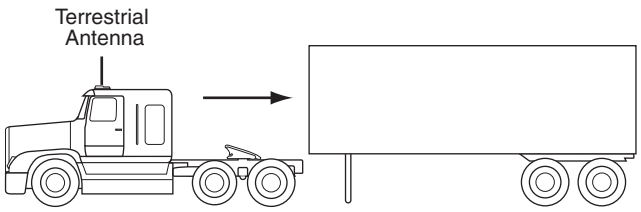
- Return to step 3. of the Trailer Tracks asset management system verification flowchart.

A1—+12/24 VDC Is Not at Pigtail

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Diagnostic Procedure A1—+12/24 VDC Is Not at Pigtail



Connect Tractor to Trailer and leave ignition ON.

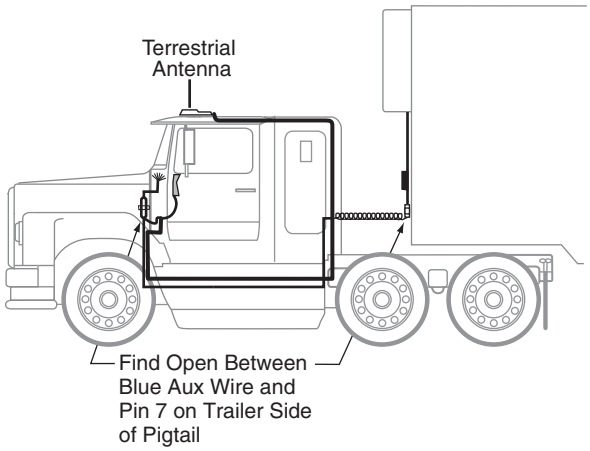
99AAE_070TDMQMCP

1. With the ignition ON, verify that +12/24 VDC is present at the blue aux wire (10-gauge) of the 7-way harness on the truck.

- If there is voltage present at the aux wire, go to step 2.
- If there is not voltage present at the aux wire, go to step 3.

Note

The power being supplied to the trailer aux wire should be protected by a 30A circuit breaker.



99AAE_085TQMCP

2. Locate and repair the open between the blue aux (10-gauge) wire of the 7-way harness and pin 7 on the trailer side of the pigtail.

Return to step 3. of the Trailer Tracks asset management system verification flowchart.

3. Check that +12/24 VDC is present at the main fuse panel for the blue aux wire (10-gauge).

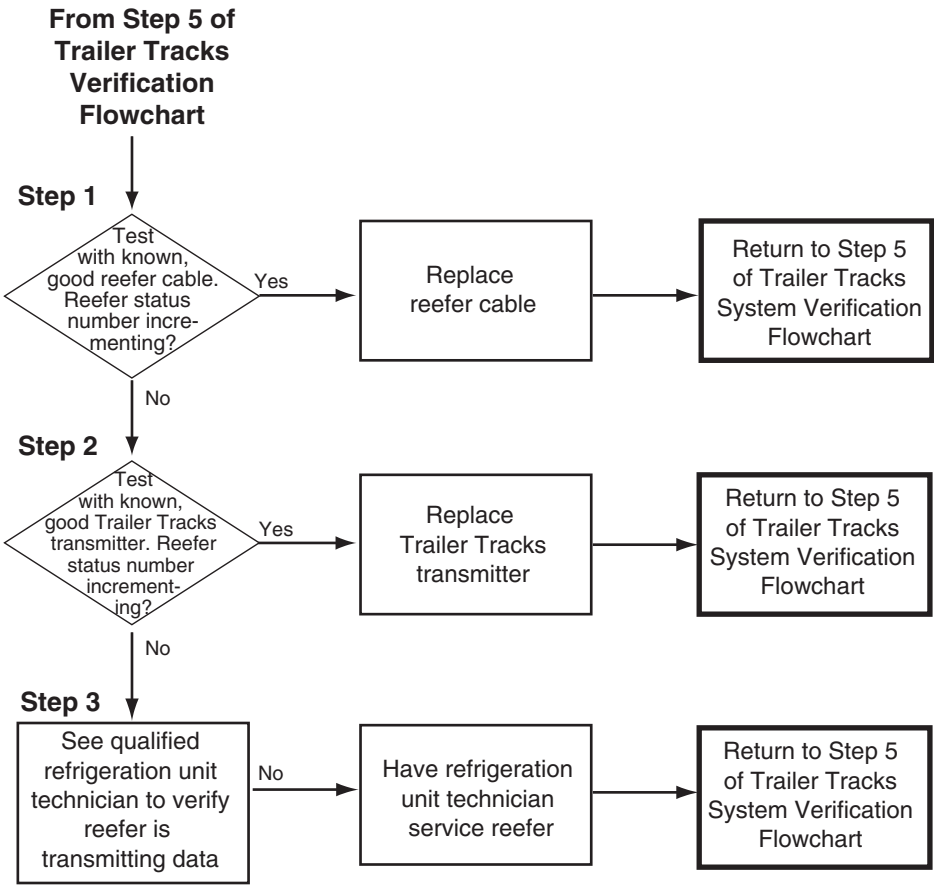
- If there is voltage present at the main fuse panel, go to step 4.
- If there is not voltage present at the main fuse panel, check the fuse and replace the fuse if necessary.
- If there is still not voltage after replacing the fuse, go to step 5.

4. There is a problem between the aux fuse and the 7-way harness. Troubleshoot and fix the problem using the OEM procedure and return to step 3. of the Trailer Tracks asset management system verification flowchart.

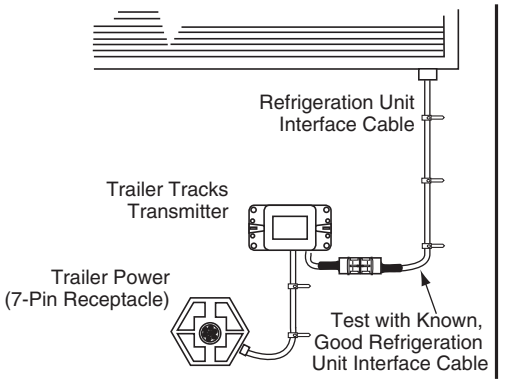
5. Run switched +12VDC to trailer aux circuit and return to step 3. of the Trailer Tracks asset management system verification flowchart.

B—Reefer Status Number Not Incrementing

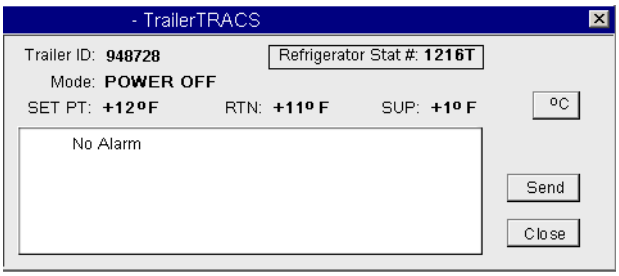
Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Diagnostic Procedure B—Reefer Status Number Not Incrementing



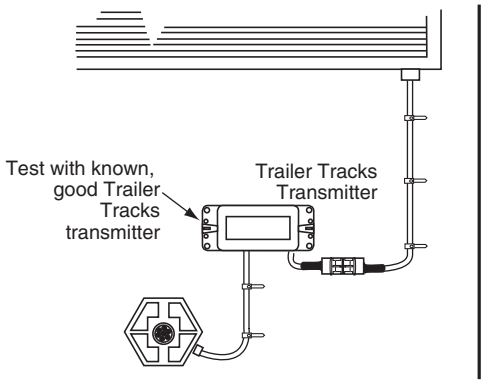
OM_E-0093-210frigcable.eps



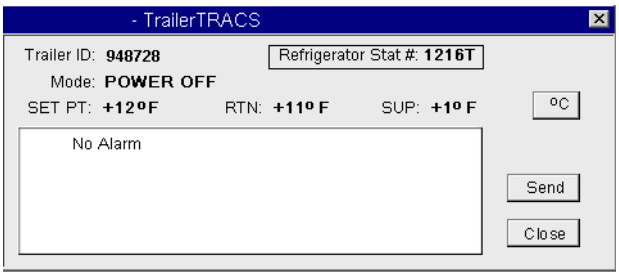
1. Test with a known good reefer cable.

Is the reefer status number incrementing? It should be incrementing approximately once a minute.

- If **yes**, replace the reefer cable and return to step 5. of the Trailer Tracks asset management system verification flowchart.
- If **no**, go to step 2.



OM_E-0093-210goodxmtter.eps



2. Test with a known good Trailer Tracks transmitter.

Is the reefer status number incrementing?

- If **yes**, replace the Trailer Tracks transmitter and return to step 5. of the Trailer Tracks asset management system verification flowchart.
- If **no**, go to step 3.

3. See a qualified refrigeration unit technician to verify the reefer is transmitting data.

- If the refrigeration unit is transmitting data, call Omnitracs Customer Support at 800-541-7490
- If the refrigeration unit is not transmitting data, have the refrigeration unit technician service the refrigeration unit. Then return to step 5. of the Trailer Tracks asset management verification flowchart.

23
Compact Display Unit (CDU) Diagnostic Procedures

These topics are covered in this chapter:

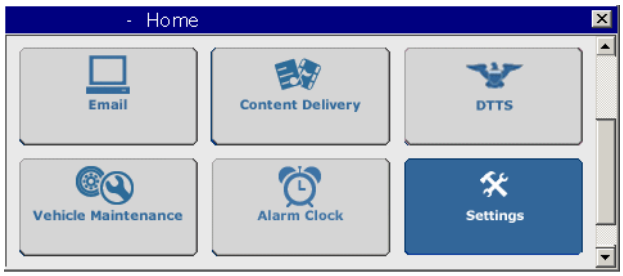
For technical questions, contact Omnitracs Customer Support.
Customer Support is staffed 24 hours a day, 365 days a year:

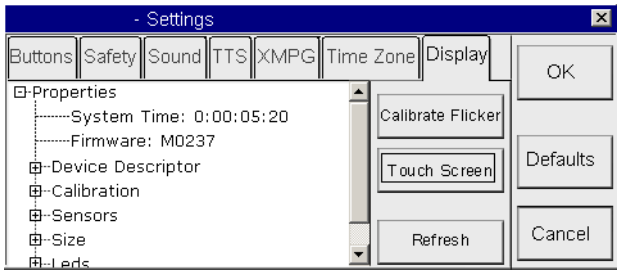
- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

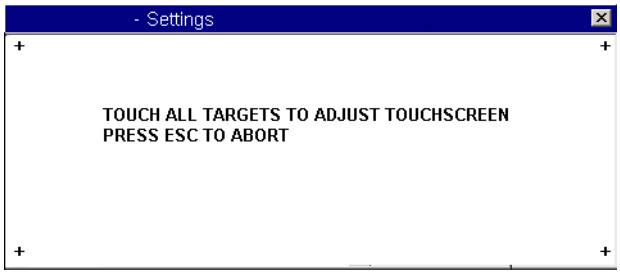
Calibrate the CDU

If you are touching any of the icons on the touchscreen and the screen is not responding quickly, the touchscreen may not be calibrated properly. To recalibrate the CDU touchscreen settings, from the Home screen:

- Tap the **Settings** icon.
- Tap the **Display** tab.
- Using the Display screen, tap the **Touch Screen** button.
- When the four targets display, carefully tap each of the **targets (+)** in the center.
- Press **Enter** when prompted.

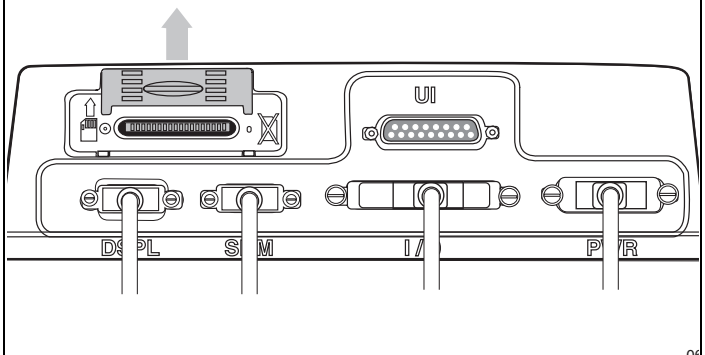
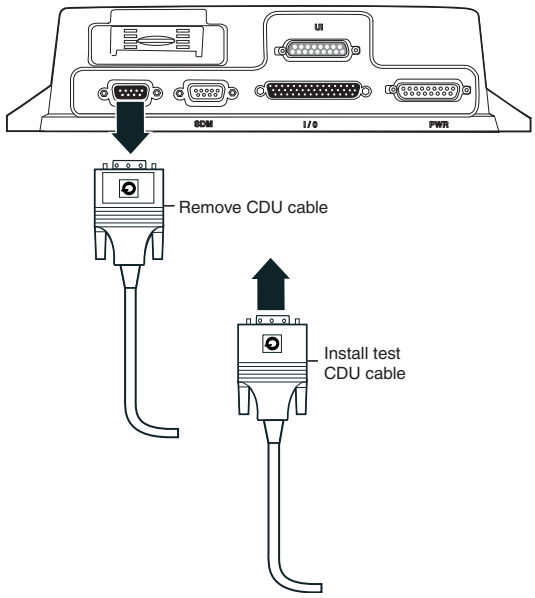


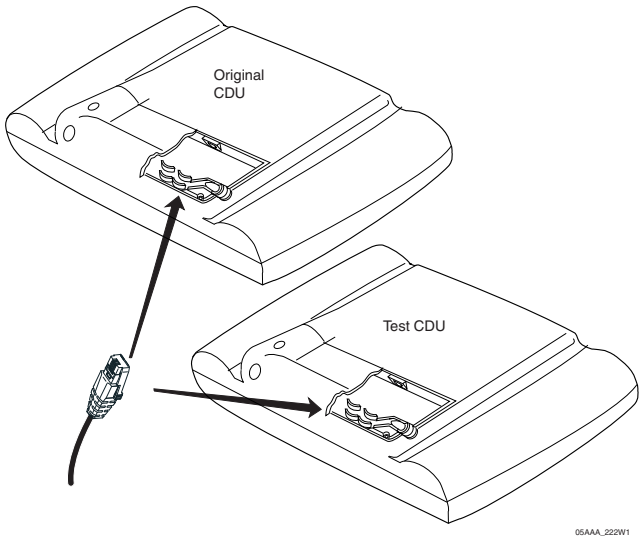




CDU is Blank Diagnostics

If the CDU is blank, do the following:

	1. Turn the vehicle ignition ON. Adjust the brightness controls. Does the display screen light up? • If **yes**, the screen is working properly. The diagnostic procedure is complete. • If the screen is dark or blank, go to step 2.
	**2.** Is the left-side LED on the MAS blinking blue every second? ***Note*** *The MAS LED blinks blue every second when the unit is awake and once every 12 seconds when it is asleep. For information concerning other LED colors and combinations, refer to Chapter 14.* • If yes, the MAS has truck power and is in a normal state. Go to step 3. • If no, go to Chapter 14.
	**3.** Reseat the display connectors on the MAS and CDU. Is the display working? • If yes, the diagnostic procedure is complete. • If no, go to step 4. **4.** Install a replacement CDU cable and recheck the display. • If the display is now working, the original cable was bad. Replace the CDU cable and perform the system verification in Chapter 4. • If the display is still not working, the original CDU cable is probably okay. Go to step 6.

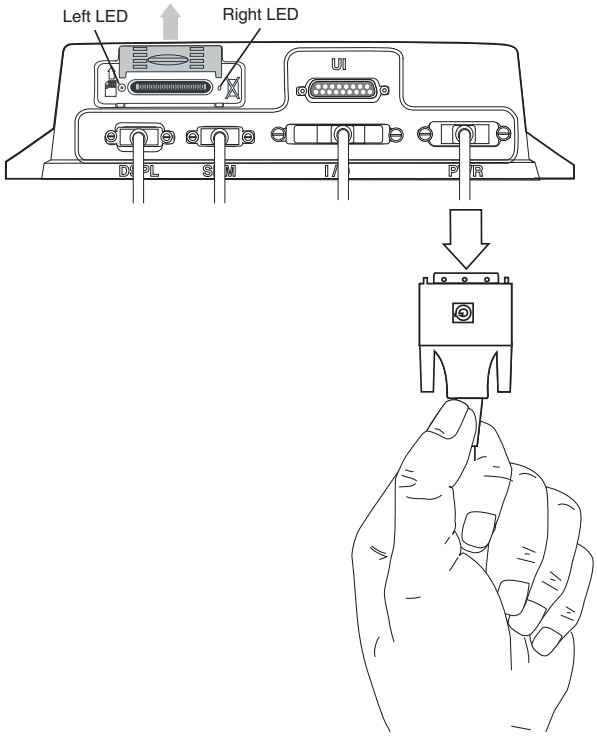


5. Test with a known good CDU.

- If the display is now working, the original CDU is bad. Replace the CDU and perform the system verification in Chapter 4.
- If the display is still not working, the original CDU was probably okay, go to step 6.

6. Unplug the accessory cable, then plug it back in again. Is the display now working?

- If the display is now working, the accessory cable is bad. Replace the accessory cable and perform the system verification in Chapter 4.



7. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

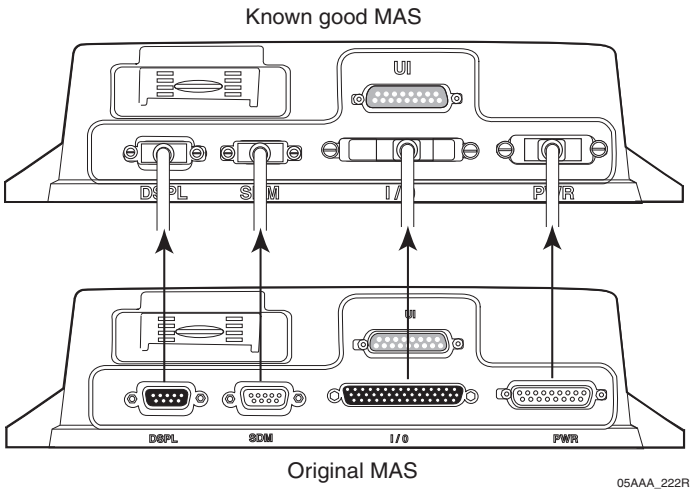
It usually takes about 10 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

If the display is still not working, go to step 8.



8. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

- If the display is now working, the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the display is still not working, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

24
Buzzer/RMWL Diagnostic Procedures

These topics are covered in this chapter:

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

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

Normal Performance

The buzzer and remote message waiting light (RMWL) signal the driver when an **Important** or Emergency message is sent to the vehicle.

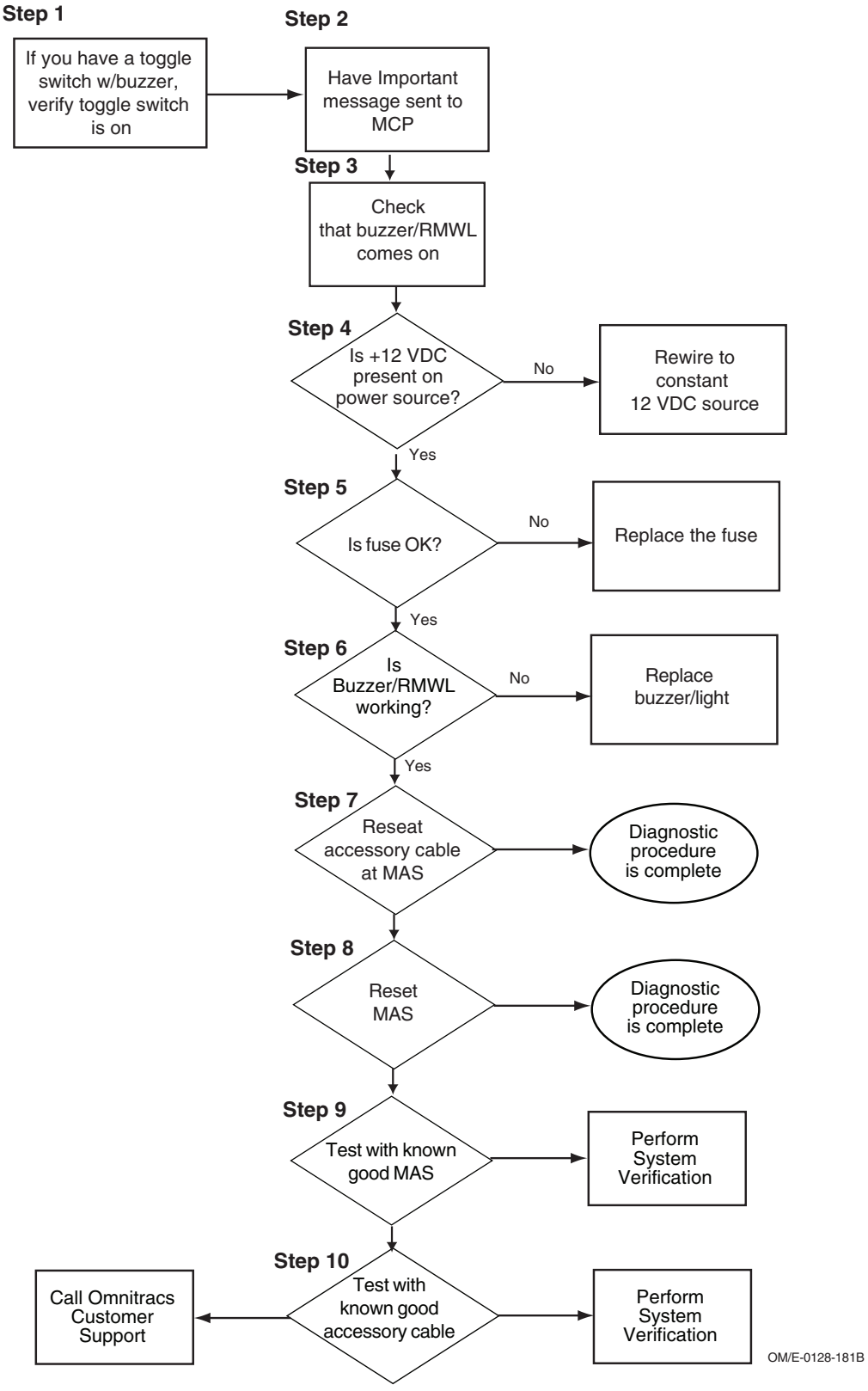
Abnormal Performance

If the buzzer and/or the RMWL does not buzz/light or constantly buzzes/lights, a problem exists that is most likely caused by one or more of the following:

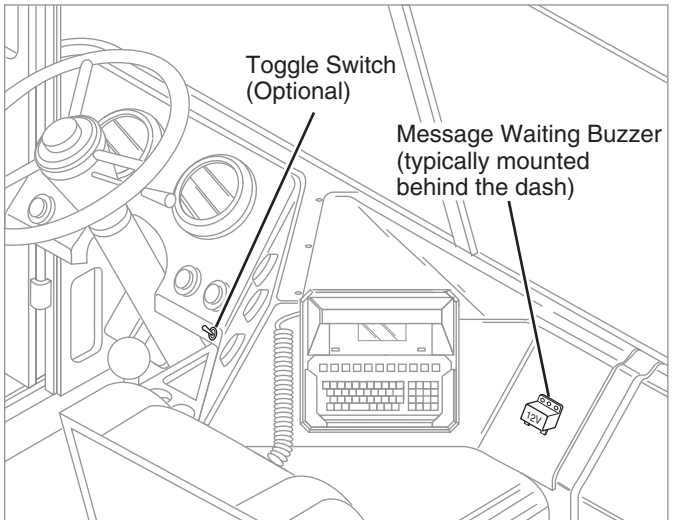
- Faulty buzzer
- Faulty light
- Faulty wire or connections
- Faulty mobile application server (MAS)

Buzzer/RMWL Won't Buzz/Light

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



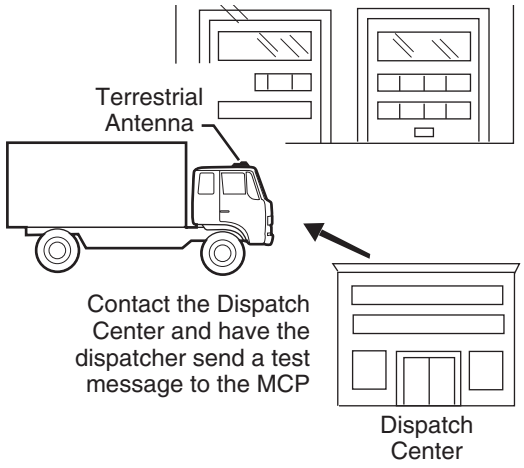
Diagnostic Procedure



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

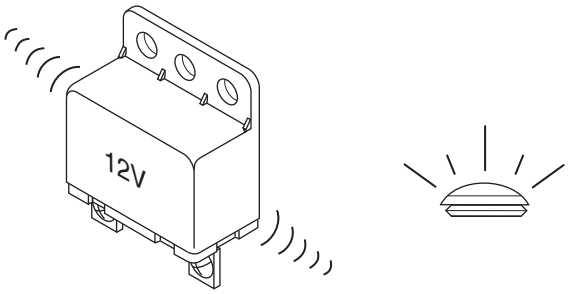
1. If you have a toggle switch with the buzzer, verify that the toggle switch is set to on.

- If it is on, go to step 2.
- If it is not on, turn it on and then go to step 2.



2. Have the dispatcher send an **Important** test message to the MCP100.

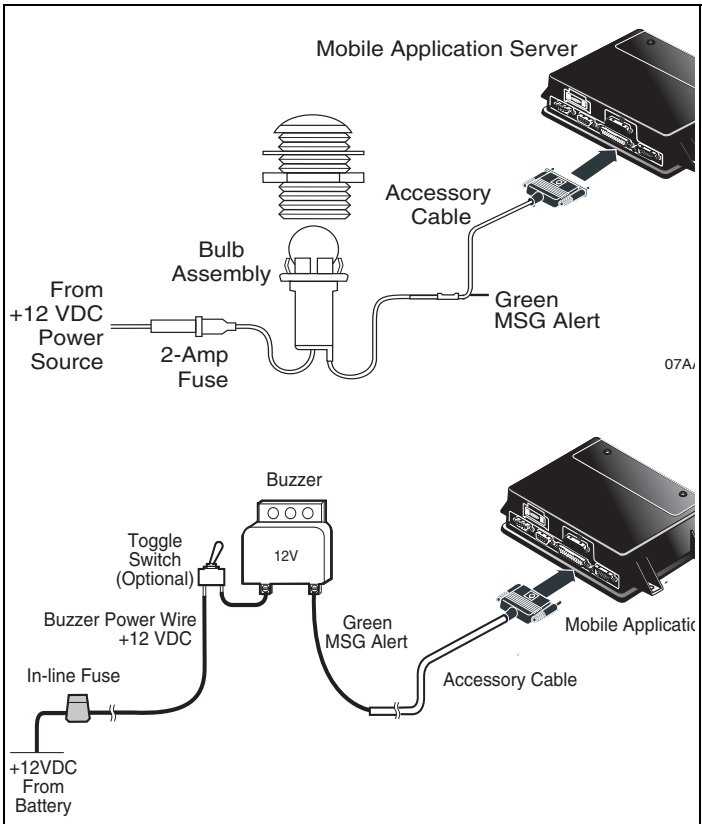
Do not read the message until the problem with the buzzer/RMWL is fixed.



Does Buzzer or RMWL come on?

3. Check the buzzer/RMWL.

- If it comes on, the problem is solved.
- If it does not come on, go to step 4.



4. Verify unswitched +12 VDC is present on the power source.

- If +12 VDC is present, go to step 5.
- If +12 VDC is not present, rewire the buzzer/RMWL to a constant +12/24 VDC source. Return to step 3. to repeat the troubleshooting process.

Note

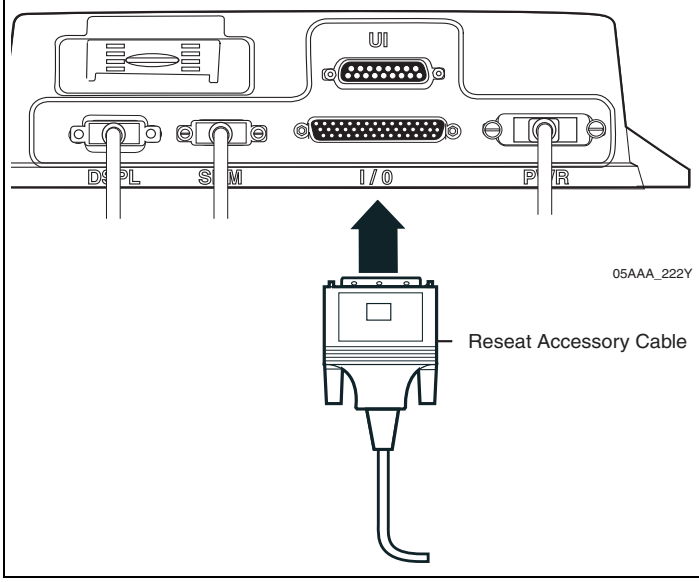
If an LED is used instead of a bulb, check the polarity of the LED circuit.

5. Check the fuse.

- If the fuse is okay, go to step 6.
- If the fuse is not okay, replace the fuse and return to step 3. to repeat the troubleshooting process.

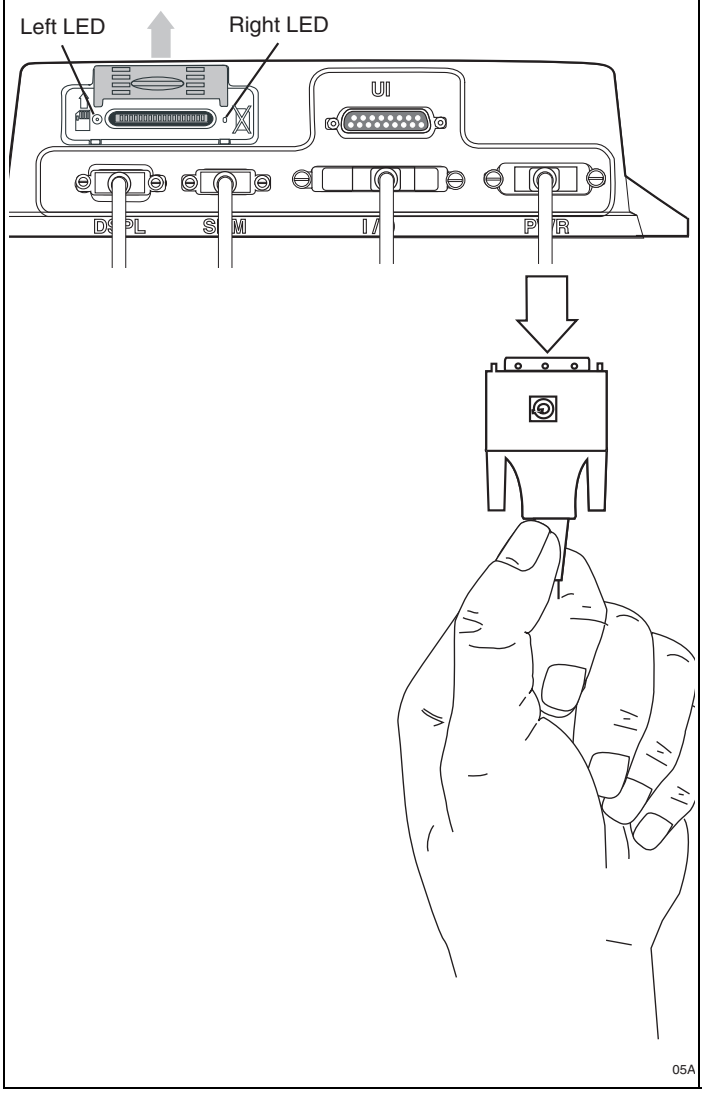
6. Verify the buzzer/RMWL are good. Disconnect the device's ground wire from the accessory cable's green MSG ALERT wire and ground it to the associated ground to where the buzzer/RMWL gets power.

- If the buzzer/RMWL is on, go to step 7.
- If the buzzer is off, it is bad. Replace the buzzer.
- If the RMWL is off, check the bulb. If the bulb is okay, replace the RMWL assembly.



7. Reseat the accessory cable at the MAS.

- If the buzzer/RMWL is okay now, the connection must have been loose. The diagnostic procedure is complete.
- If the buzzer/RMWL is still not okay, go to step 8.



8. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

It usually takes about 10 minutes for the LED indicators to go out.

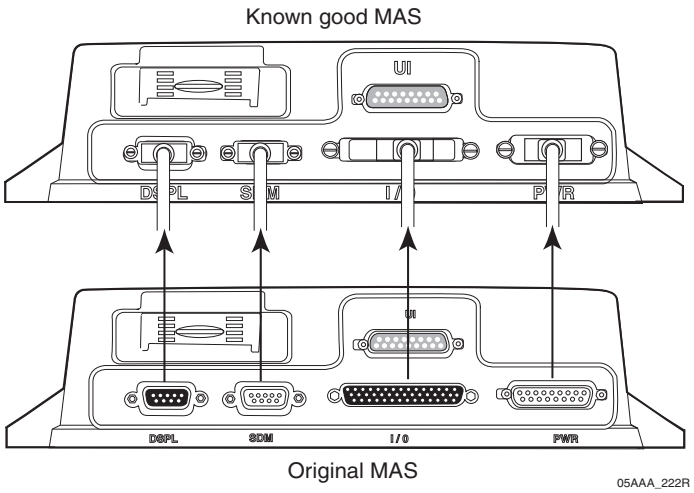
Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

Check to see if the buzzer/RMWL is now active.

- If the buzzer/RMWL is okay now, the diagnostic procedure is complete.
- If the buzzer/RMWL is still not okay, go to step 9.



9. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

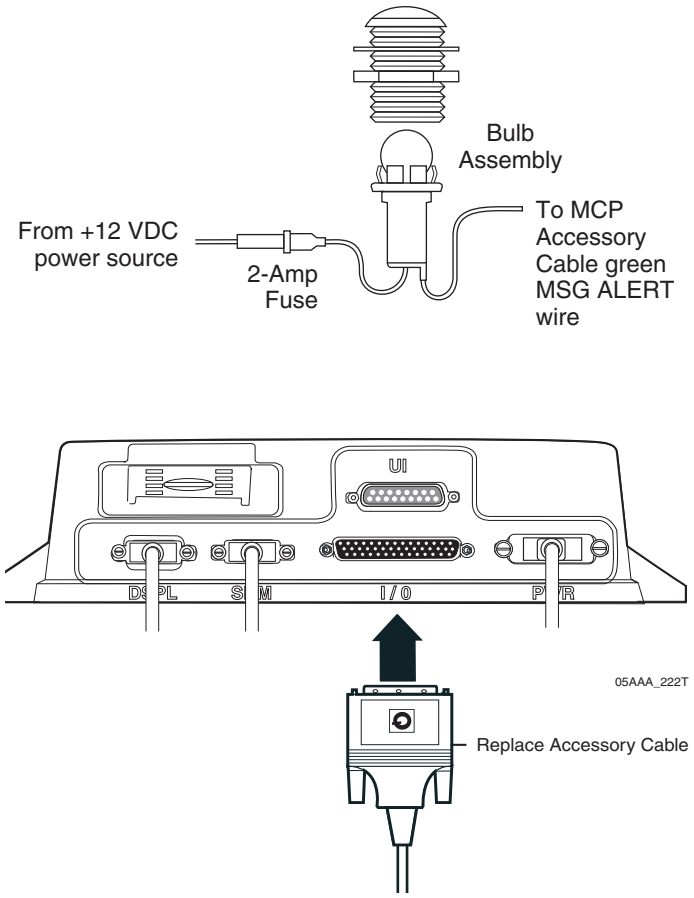
- If the buzzer/RMWL come on, the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the buzzer/RMWL still does not come on, go to step 10.



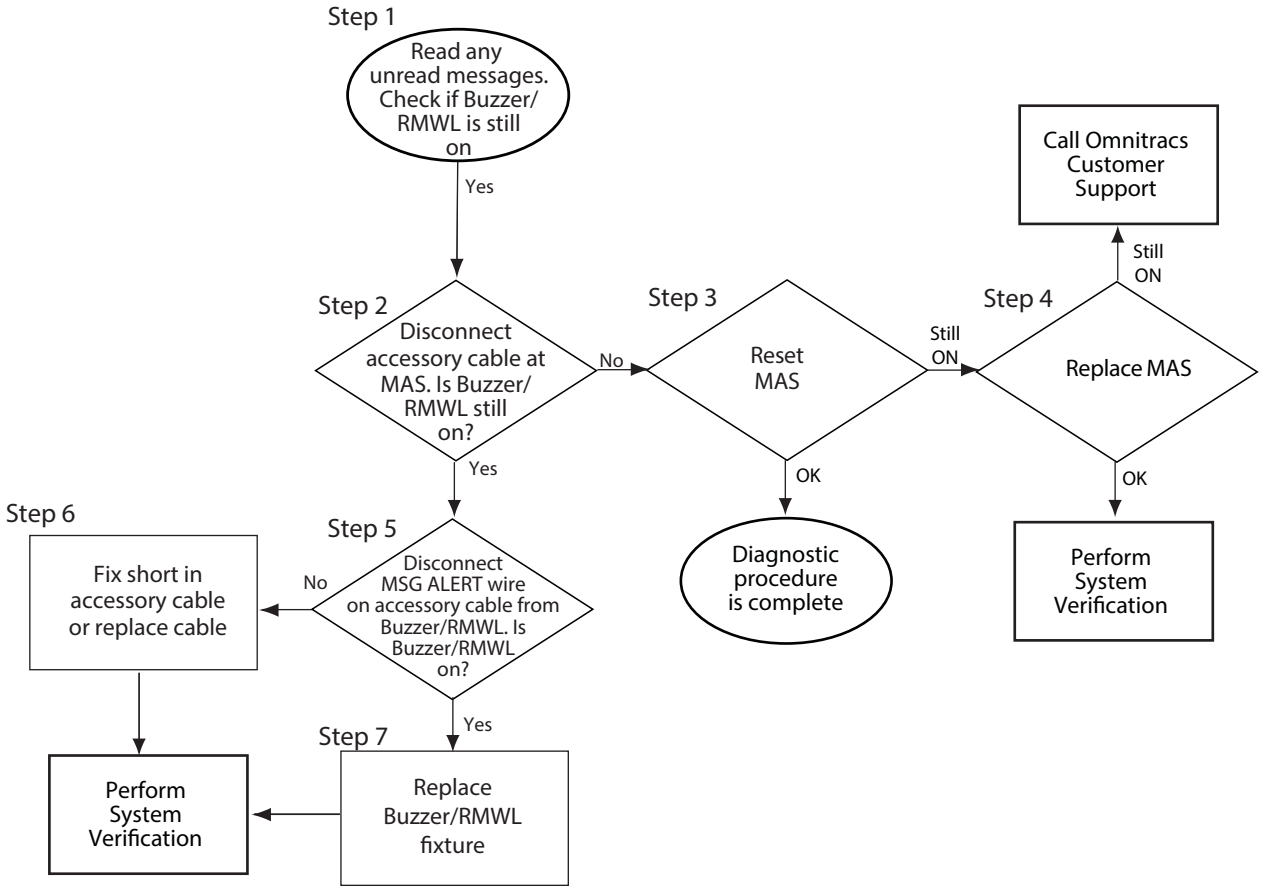
10. Test with a known good accessory cable.

- If the buzzer/RMWL is okay now, repair or replace the accessory cable and perform the system verification procedure in Chapter 4.
- If you are still having a problem with the buzzer/RMWL, call Omnitracs Customer Support and ask to have it enabled:

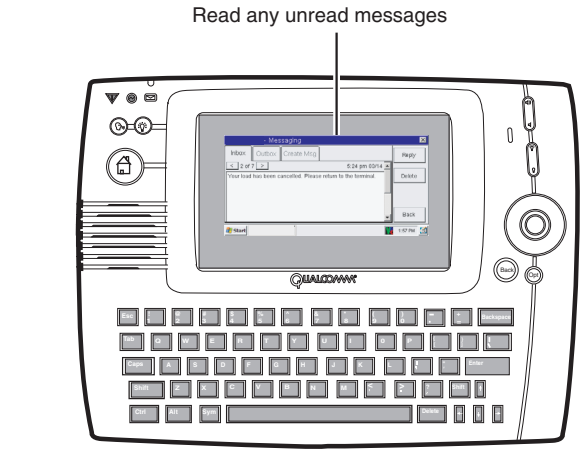
US: 800-541-7490
Canada: 800-863-9191

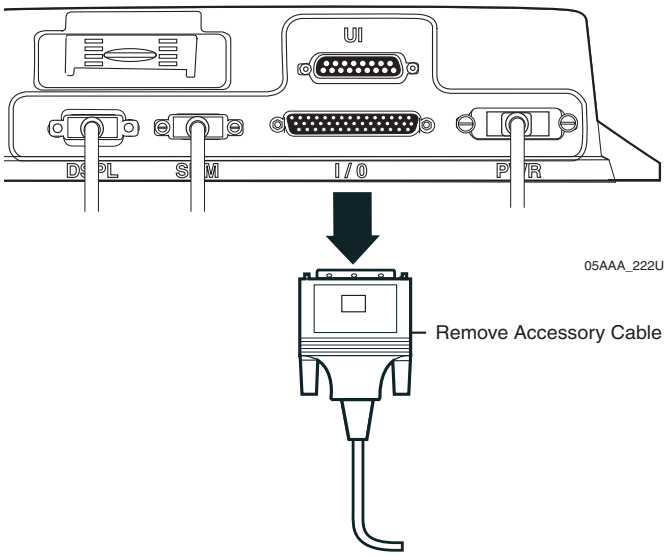
Buzzer/RMWL Constant Buzz/Light

Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.



Diagnostic Procedure

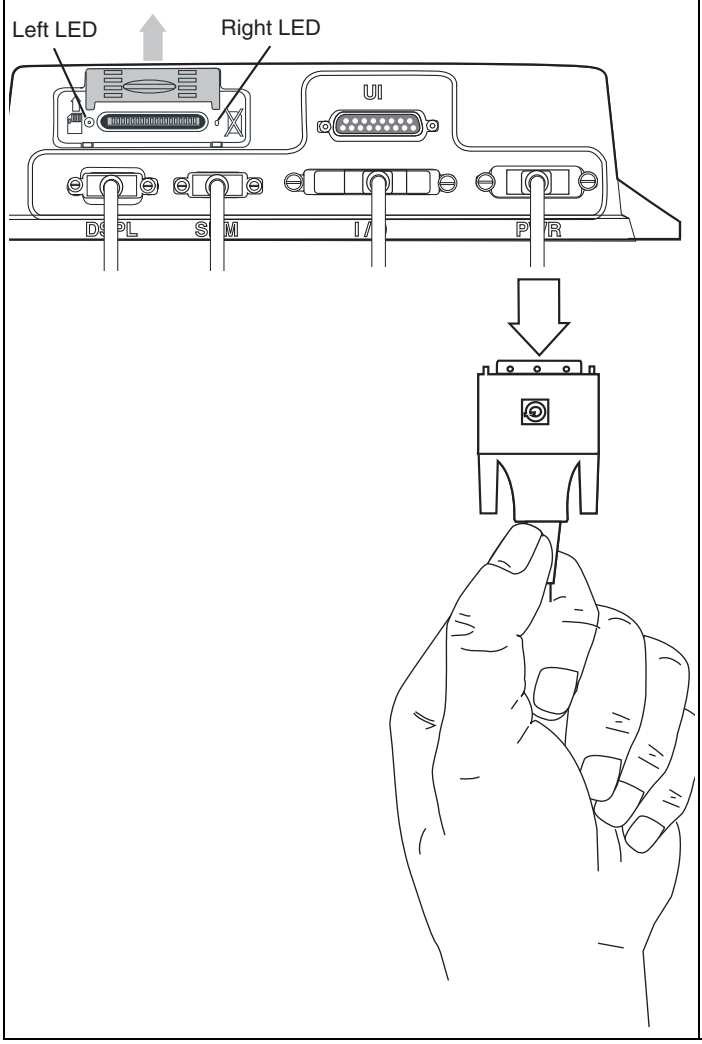




The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Read any unread messages. The buzzer/RMWL should go off?
   - If the buzzer/RMWL is off, the diagnostic procedure is complete.
   - If the buzzer/RMWL is still on, go to step 2.

2. Disconnect the accessory cable at the MAS. Is the buzzer/RMWL on or off?
   - If it is still on, go to step 5.
   - If it is off, go to step 3.



3. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

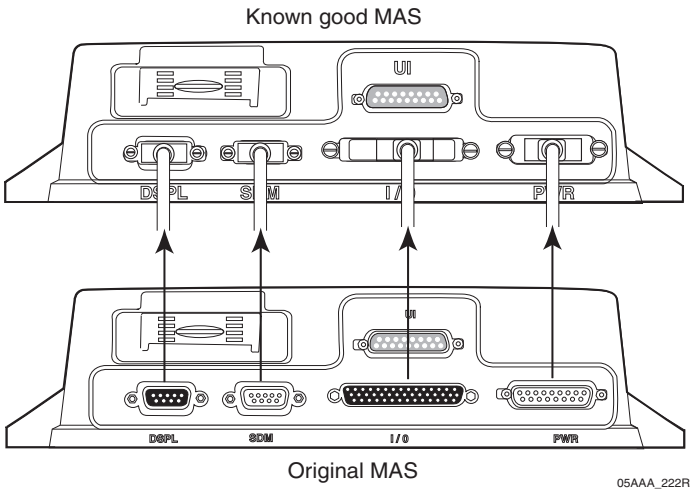
It usually takes about 10 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

- If the buzzer/RMWL is now off, the diagnostic procedure is complete.
- If the buzzer/RMWL stays on after the MAS boots up, go to step 4.



4. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

- If the problem is corrected, the MAS is faulty. Replace the MAS.

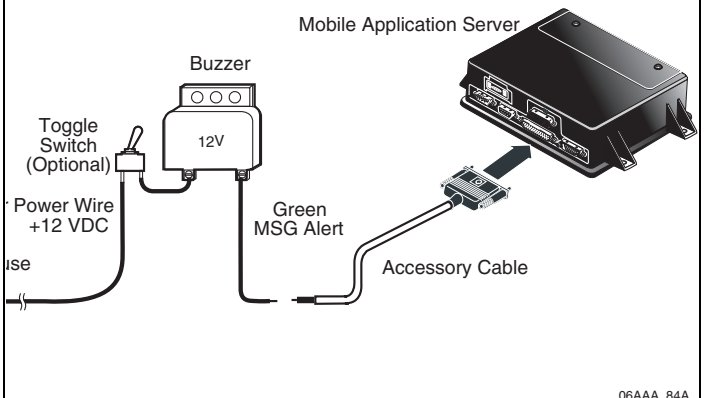
Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the problem continues, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191



5. Disconnect the buzzer/RMWL wiring from the accessory cable's green MSG ALERT wire. Is the buzzer/RMWL on or off?

- If it is still on, there is a short in the buzzer/RMWL wiring. Go to step 7.
- If it is now off, there is a short in the accessory cable. Go to step 6.

6. Replace the accessory cable and perform the system verification in Chapter 4.

7. Replace the buzzer/RMWL fixture and perform the system verification in Chapter 4.

25
Panic Button Diagnostic Procedures

These topics are covered in this chapter:

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

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

Normal Performance

The panic button allows the driver to notify the Omnitracs NOC and the company dispatcher when an emergency situation exists. When the driver presses the panic button, a priority notification is sent to the NOC and the company dispatcher.

Abnormal Performance

If the panic button does not work properly, it will either transmit a false panic notification when the panic button is **not** pressed or no panic notification will be sent when the panic button is pressed.

The problem is most likely caused by one or more of the following:

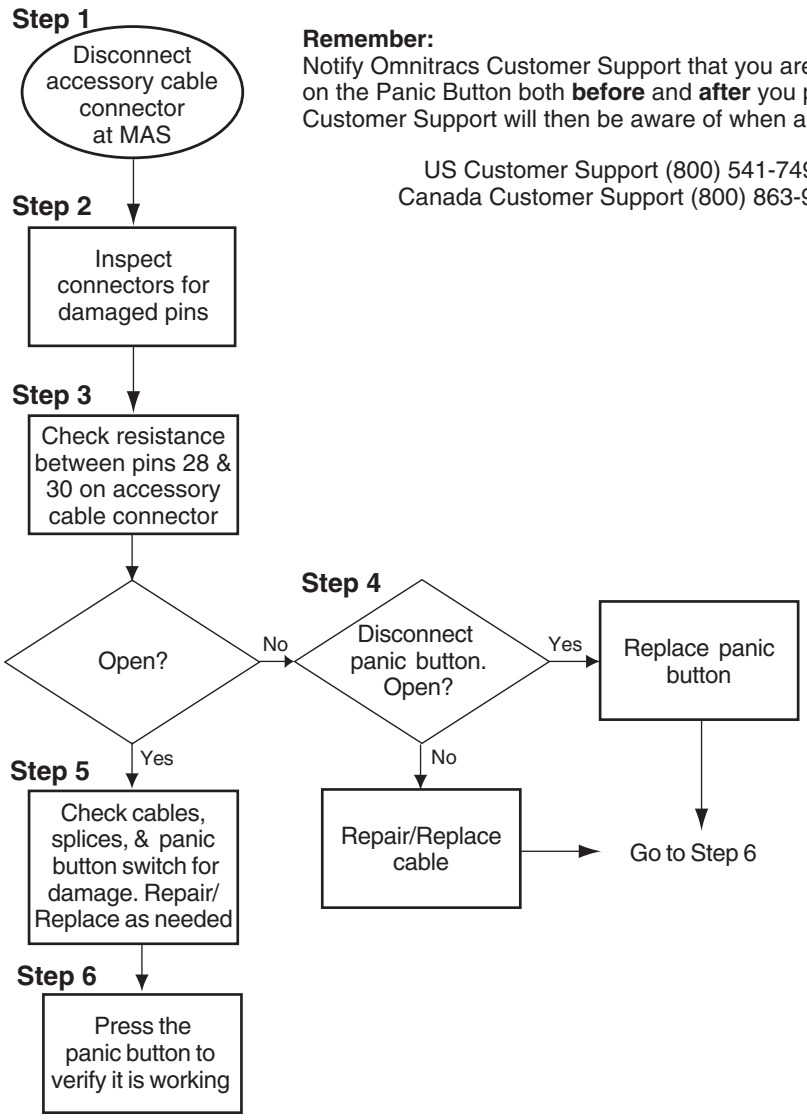
- Panic button is not enabled
- Faulty accessory cable wiring
- Faulty wire connections
- Faulty panic button

False Panic Message

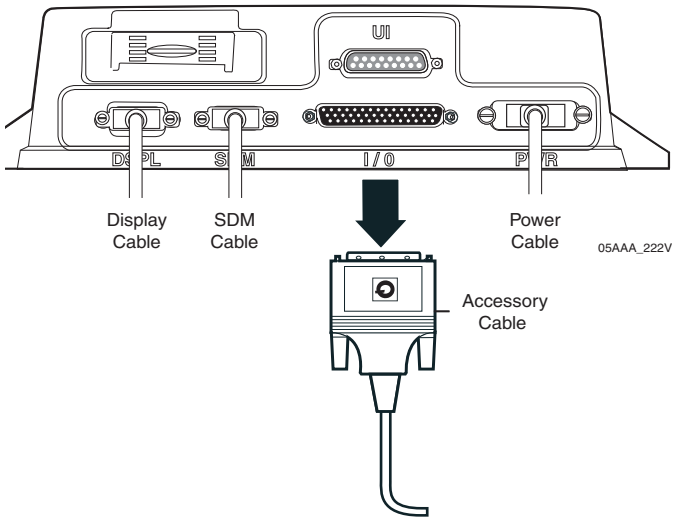
Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.

Remember:
Notify Omnitracs Customer Support that you are working
on the Panic Button both **before** and **after** you perform this procedure.
Customer Support will then be aware of when an alarm is a test and when it is real.

US Customer Support (800) 541-7490
Canada Customer Support (800) 863-9191

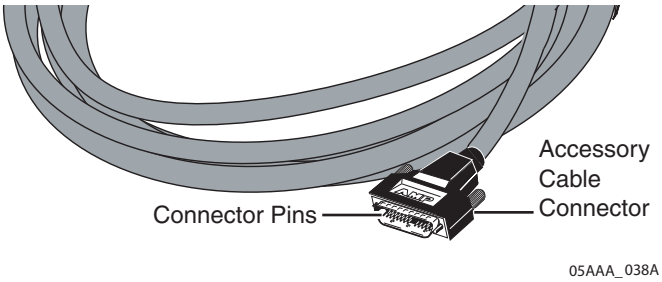


Diagnostic Procedure

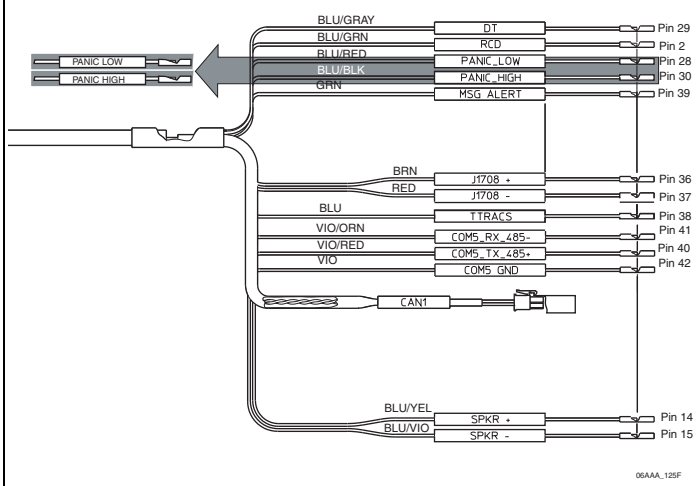


The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

1. Disconnect the accessory cable connector at the mobile application server (MAS).

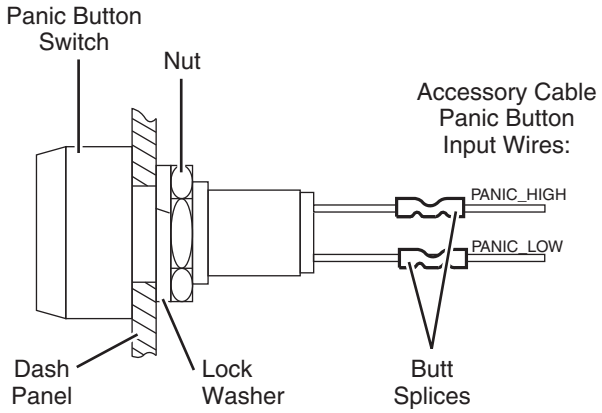


2. Inspect the accessory cable connector pins for damage or corrosion.



3. Using a digital voltmeter (DVM), check the resistance between pins 28 and 30 on the accessory cable connector at the MAS.

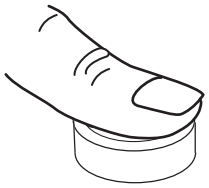
- If the circuit is open, go to step 5.
- If the circuit is closed, go to step 4.



4. Disconnect the panic button from the accessory cable and check the resistance again.

- If the panic button circuit is open, repair or replace the panic button and go to step 6.
- If it is closed, replace the accessory cable and go to step 6.

5. Check the cables, wire splices, and panic button for damage. Any of these could cause intermittent false panic notifications. If there is damage, repair or replace the part(s) as necessary and go to step 6.



6. Press the new or repaired panic button. Does it work properly?

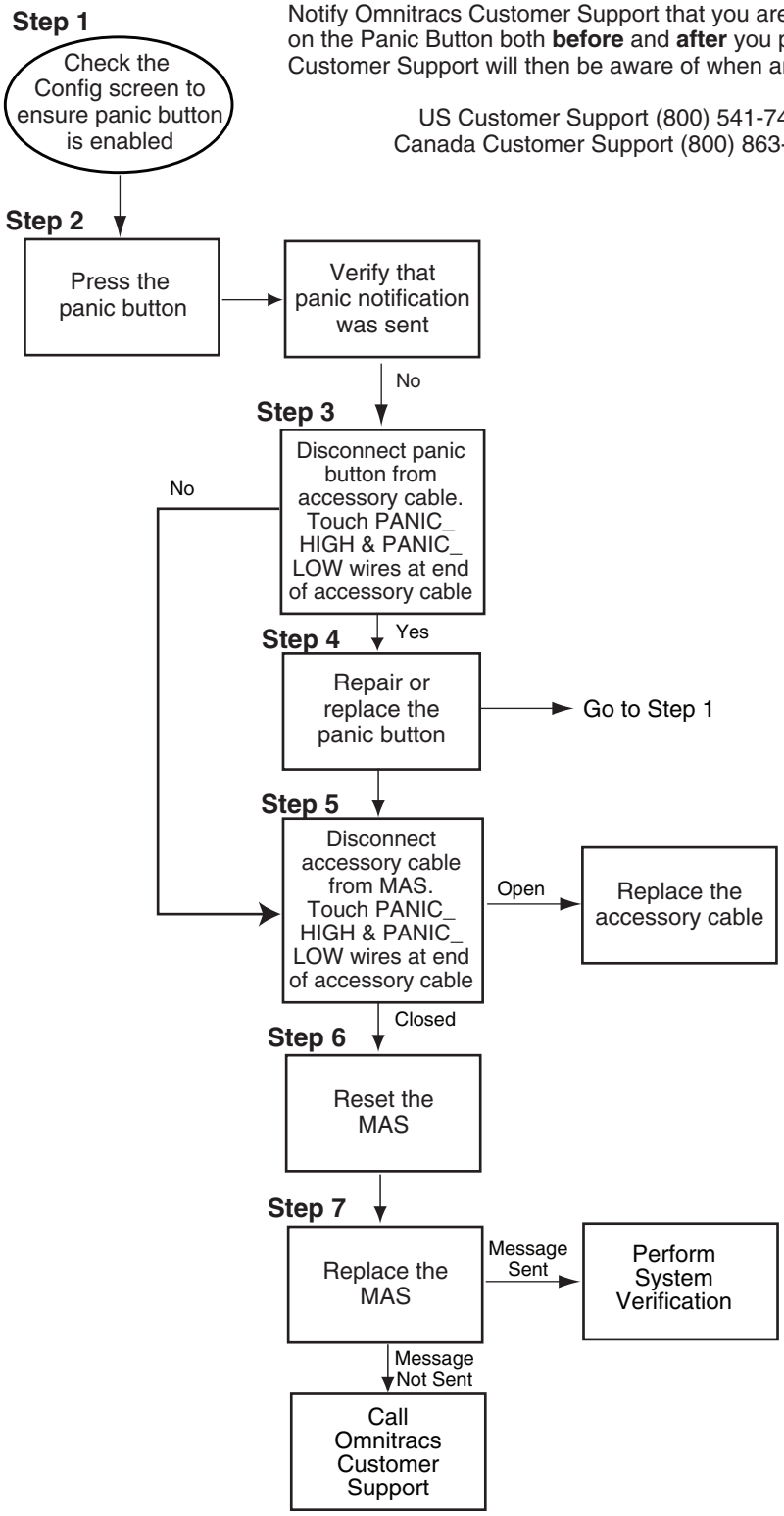
- If **yes**, perform the system verification procedure in Chapter 4. Notify Omnitracs Customer Support that you are finished with the test.
- If **no**, notify Omnitracs Customer Support about the problem.

No Panic Message

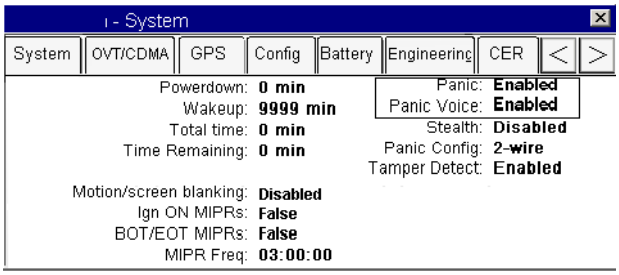
Refer to the pages following this flowchart
for a detailed, step-by-step diagnostic procedure of this process.

Remember:
Notify Omnitracs Customer Support that you are working
on the Panic Button both **before** and **after** you perform this procedure.
Customer Support will then be aware of when an alarm is a test and when it is real.

US Customer Support (800) 541-7490
Canada Customer Support (800) 863-9191



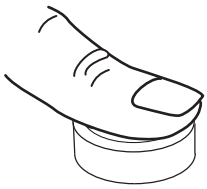
Diagnostic Procedure



The steps in this procedure match the steps on the flowchart on the previous page. The steps are not always sequential—you may be instructed to skip steps.

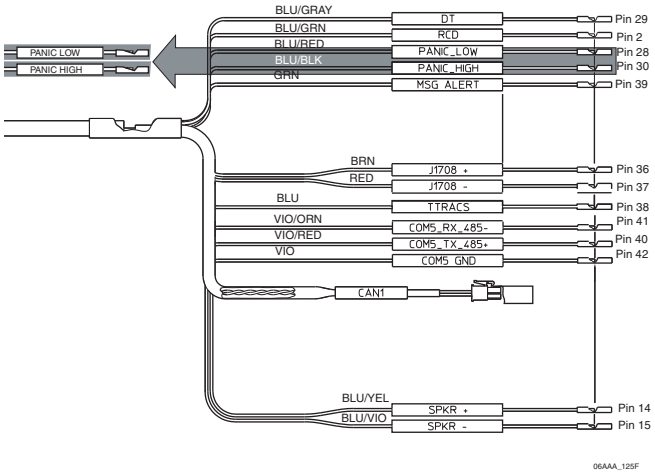
1. From the Home screen, touch the **System** icon. Touch the **Config** tab. Check that PANIC is enabled and Panic Config is 2-wire.

Call Omnitracs Customer Support to let them know you will be testing the panic button.



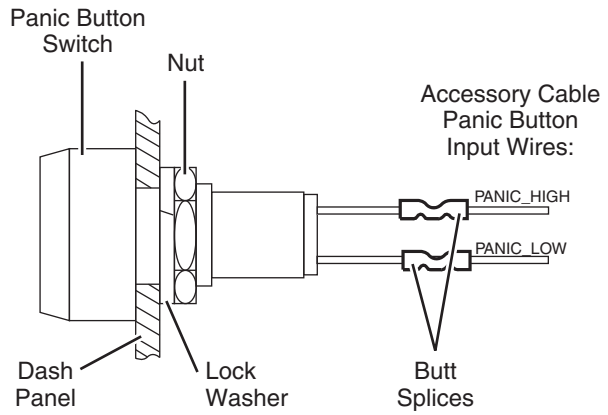
2. Press the panic button. Message should show in Outbox and a TTS notification will play. Was the message sent?

- If **yes**, perform the system verification procedure in Chapter 4.
- If **no**, go to step 3.



3. Disconnect the panic button from the accessory cable and touch the PANIC_HIGH and PANIC_LOW wires together.

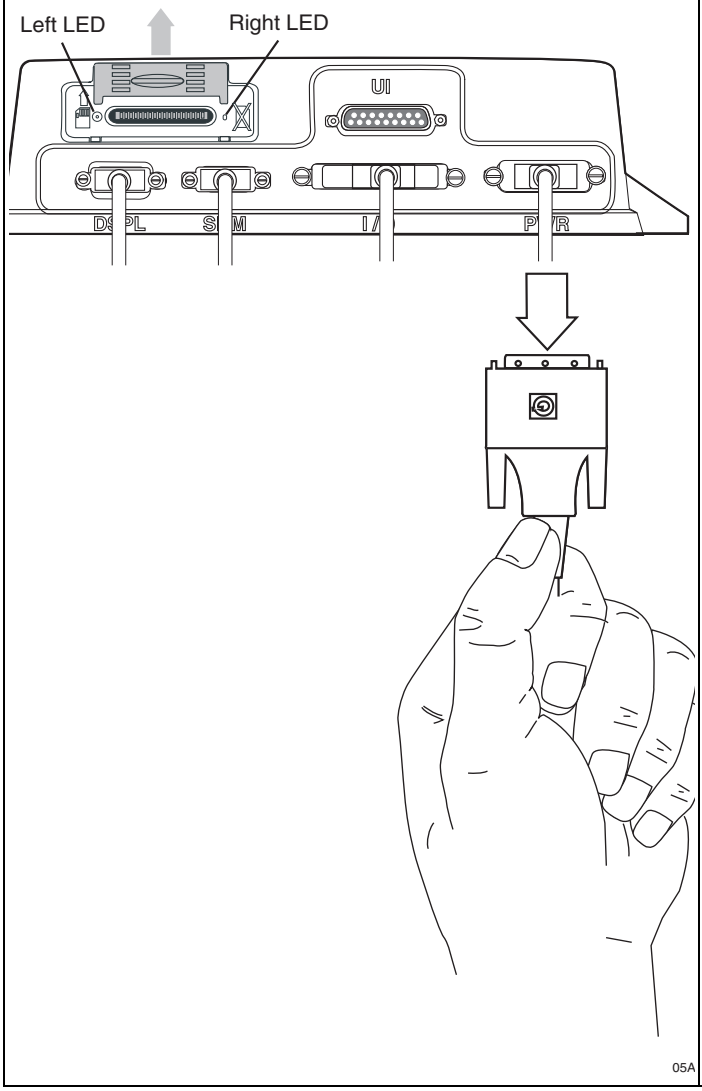
- If the panic message was sent, go to step 4.
- If no panic message was sent, go to step 5.



4. Repair or replace the panic button. Return to step 1.

5. Disconnect the accessory cable from the MAS. With PANIC_LOW and PANIC_HIGH still shorted together, check the resistance on the MAS end of the accessory cable—pins 28 and 30.

- If the circuit is open, replace the accessory cable and retest.
- If the circuit is closed, go to step 6.



6. Reset the MAS by disconnecting the power cable. Wait for the MAS LED indicators to go out.

Note

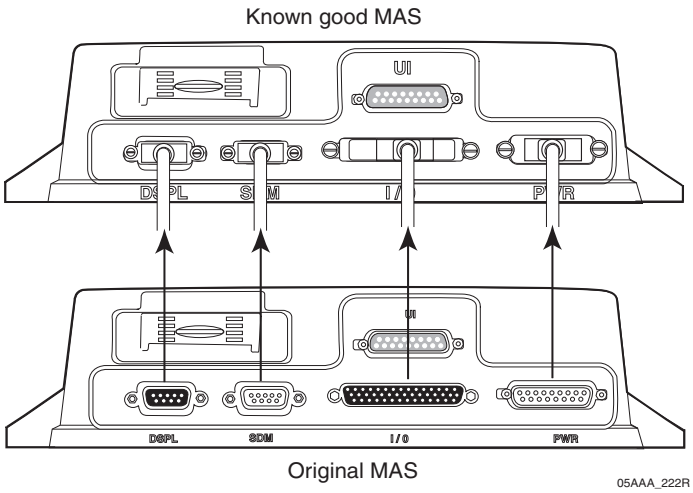
It usually takes about 10 minutes for the LED indicators to go out.

Once all LED indicators are off, reconnect the power cable to the MAS and turn ON the ignition. The unit will take 5 minutes to boot up.

Note

In a normal operating environment, the left side LED should be BLINKING BLUE and the right side LED should be OFF.

Go to step 7.



7. Test with a known good MAS as follows:

Disconnect all of the cables from the original MAS and attach them to the known good MAS. Turn ON the ignition. The unit will take 5 minutes to boot up.

Press the panic button. Was the panic message sent?

- If the panic message was sent, the MAS is faulty. Replace the MAS.

Note

Before sending a faulty MAS back to Omnitracs, remove the backup battery and install it in the replacement MAS. A replacement MAS does not come with a backup battery.

After the replacement MAS is installed, reconnect all components and perform the system verification procedure in Chapter 4.

- If the panic message was not sent, call Omnitracs Customer Support:

  US: 800-541-7490
  Canada: 800-863-9191

26
In-Cab Printing Diagnostic Procedures

These topics are covered in this chapter:

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

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

Normal Performance

The printer prints a hardcopy of the chosen screen display.

Abnormal Performance

If the printer does not work the problem is most likely caused by one or more of the following:

ACTION	POSSIBLE CAUSES	SOLUTION
Pressing “O” or “CTRL-P” does not display the Confirmation pop-up screen	Printer is not enabled	Call Omnitracs Customer Support to enable printer
	Your OS or software versions does not support printing	Upgrade your OS or software to current version
Pressing “O” or “CTRL-P” displays confirmation pop-up screen, but pressing “Yes” to print does not print the message	Faulty or incorrect wire configuration (see *Printer Requirements* on page 26-3)	Check data cable and power cable connections
	Faulty printer	Follow RMA process to return printer to O’Neil (see*RMA Process* on page 26-3)
	Incorrect printer configuration	Press and hold the red button for 8 seconds, then check that print out shows correct printer requirements (see *Printer Requirements* on page 26-3)
No power to printer	Blown fuse	Replace fuse
	Power source	Check ignition power and ground. Fix as necessary

Printer Requirements

PRINTER	REQUIREMENTS
Baud Rate	9600
Hand-shaking	None
Time out	Never

RMA Process

RMAs are used whenever equipment must be returned to O'Neil. The RMA process involves three steps:

1. Request an RMA from O'Neil Printers.
2. O'Neil arranges shipment of a replacement component to you.
3. Return a failed component to the address specified by O'Neil.

For general questions:

- Call: (800) 796-6345 (U.S. and Canada only) or (949) 458-0500
- E-mail: *info@oneilprinters.com*
- Website: *www.oneilprinters.com*

For technical support:

- Contact: Ken Yauney, Manager, O'Neil Printer Support: *ken.yauney@oneilprinters.com* or (800) 796-6345 x 302

27
In-Cab Scanner Diagnostic Procedures

These topics are covered in this chapter:

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

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

Normal Performance

The scanner sends a scan of a bill of lading or other paperwork associated with pick-ups and deliveries.

Abnormal Performance

If the scanner does not work, and you have followed the *Installation Checklist* on page 27-2, call your dispatch center or Omnitracs Customer Support.

Installation Checklist

1. Move the unit into the Customer Portal Operational Profile with scanning and customer-preferred applications (one time only).
2. Install hardware in the desired location using the dual lock fastener or holster option. Refer to the *MCP100 Installation Guide* for additional installation information.
3. Calibrate the scanner.
4. Scan a document.
5. Retrieve scanned documents using the portal.

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.

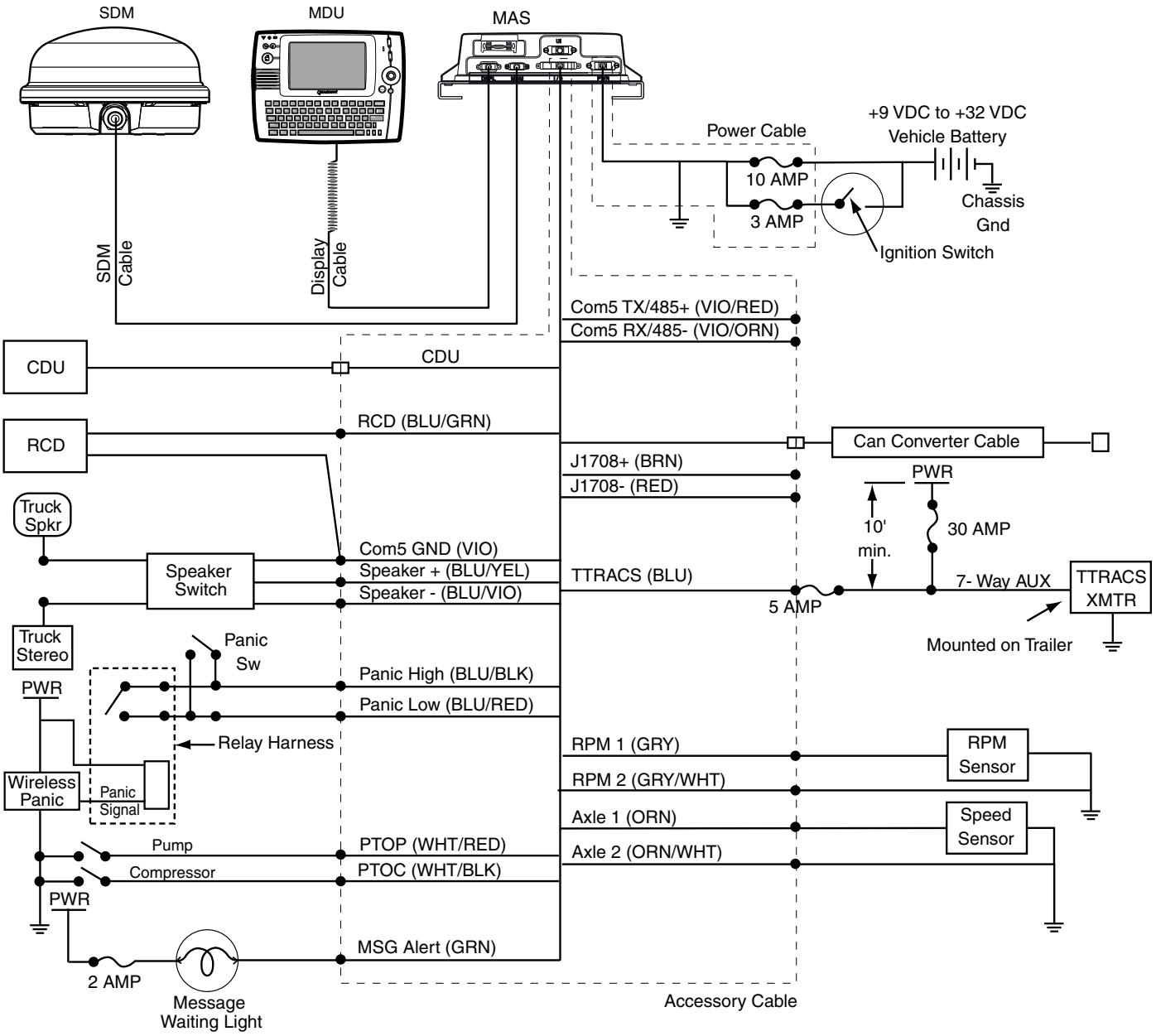
A
Wiring Diagrams and Charts

Topics in this appendix provide wiring diagrams and pin description charts for the MCP100 and accessories.

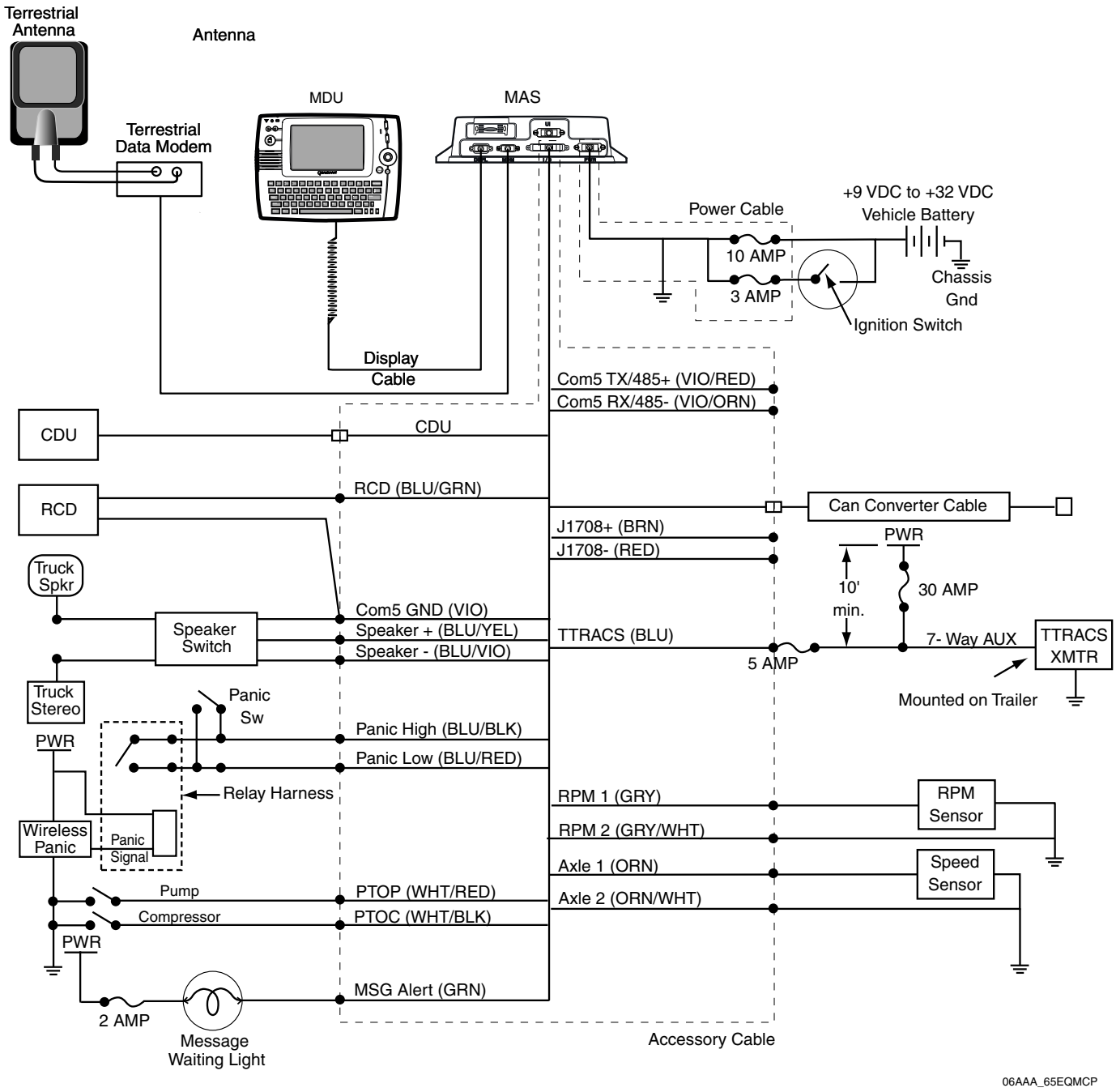
For technical questions, contact Omnitracs Customer Support.
Customer Support is staffed 24 hours a day, 365 days a year:

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

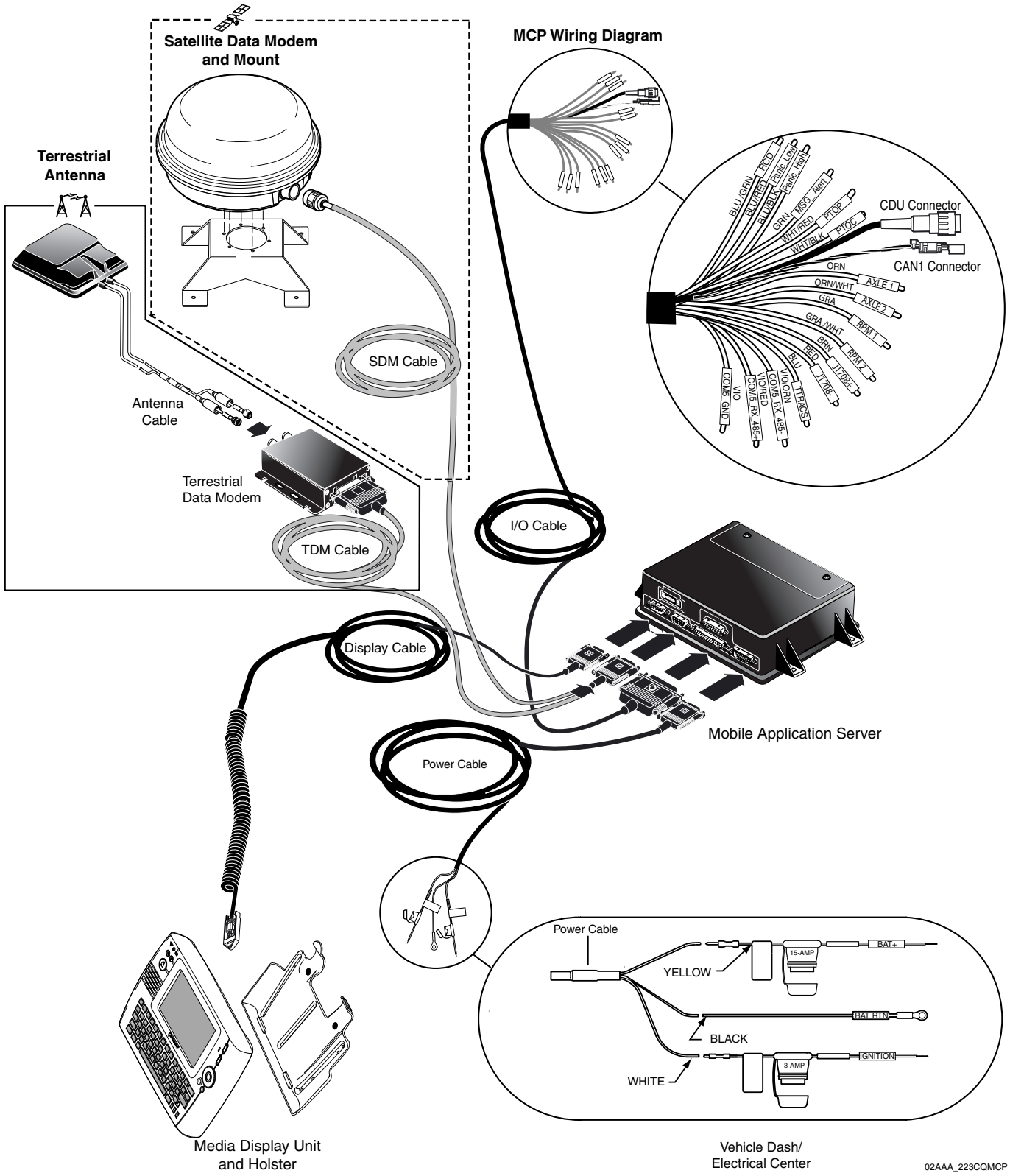
Omnitracs Satellite MCP100 Electrical Diagram



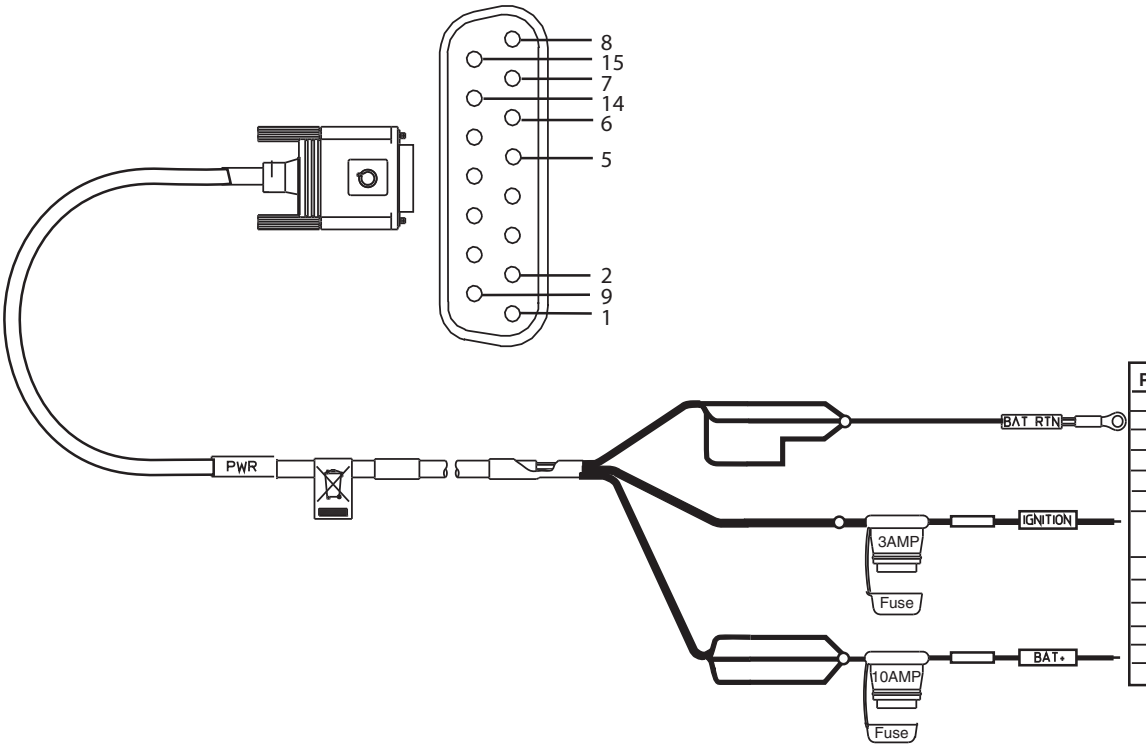
Omnitracs Terrestrial MCP100 Electrical Diagram



Omnitracs MCP100 Wiring Diagram



Power Cable Pin Callouts

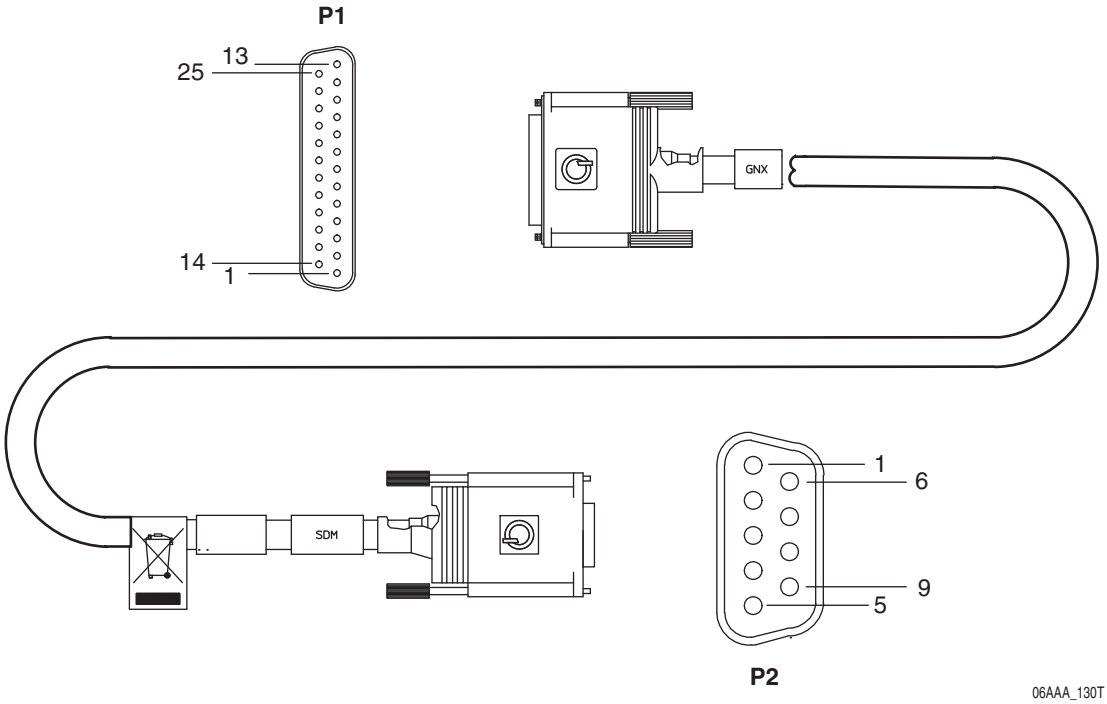


PIN	SIGNAL	COLOR
8	(BAT RTN)	BLACK
15	(BAT RTN)	BLACK
7	(BAT RTN)	BLACK
14	(BAT RTN)	BLACK
6	(ID)	
5	(IGNITION) Switched 12VDC	WHITE
2	(BAT+) 12 VDC	YELLOW
9	(BAT+) 12 VDC	YELLOW
1	(BAT+) 12 VDC	YELLOW

06

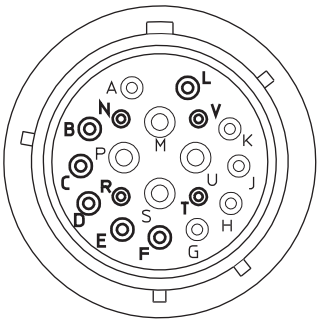
Terrestrial Data Modem (TDM) Cable 25-Pin Connector Callouts

P1	SIGNAL	P2
24	PWR	8
25	PWR	9
5	LOOP/RTN	5
6	RTN	6
7	TAMPER	7
17	RTC_BACKUP	
1	MDM_TX+/COM1_TX+	1
2	MDM_TX-/COM1_TX-	2
4	MDM_RX+/COM1_RX+	4
3	MDM_RX+/COM1_RX+	3

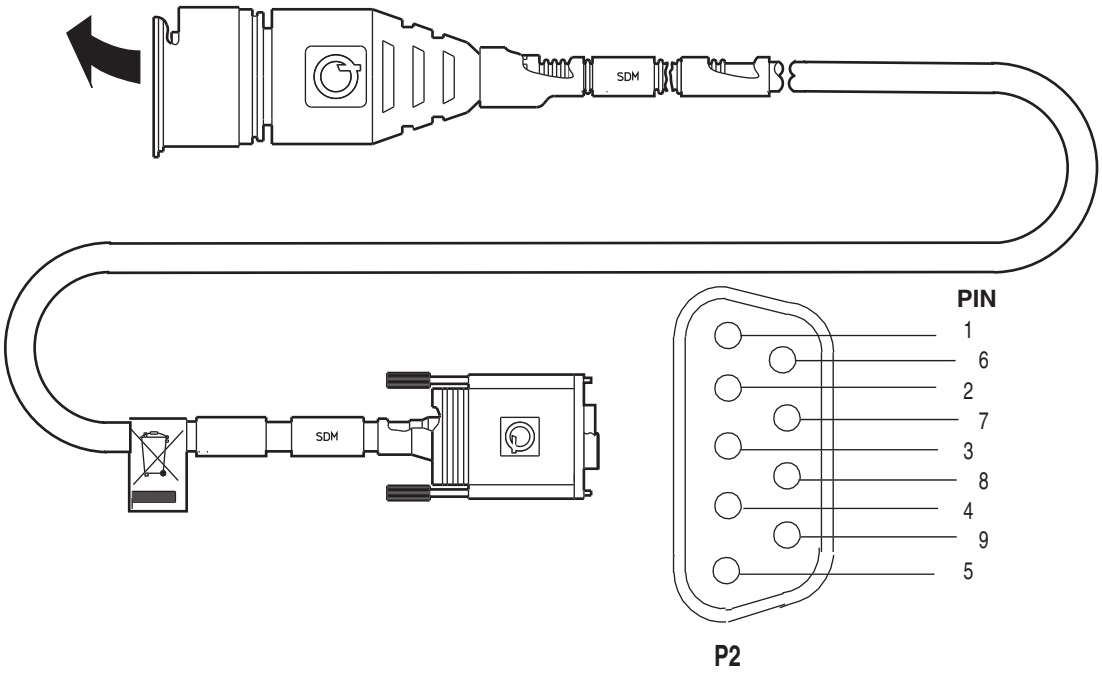


Satellite Data Modem (SDM) Cable 9-Pin Connector Callouts

P1

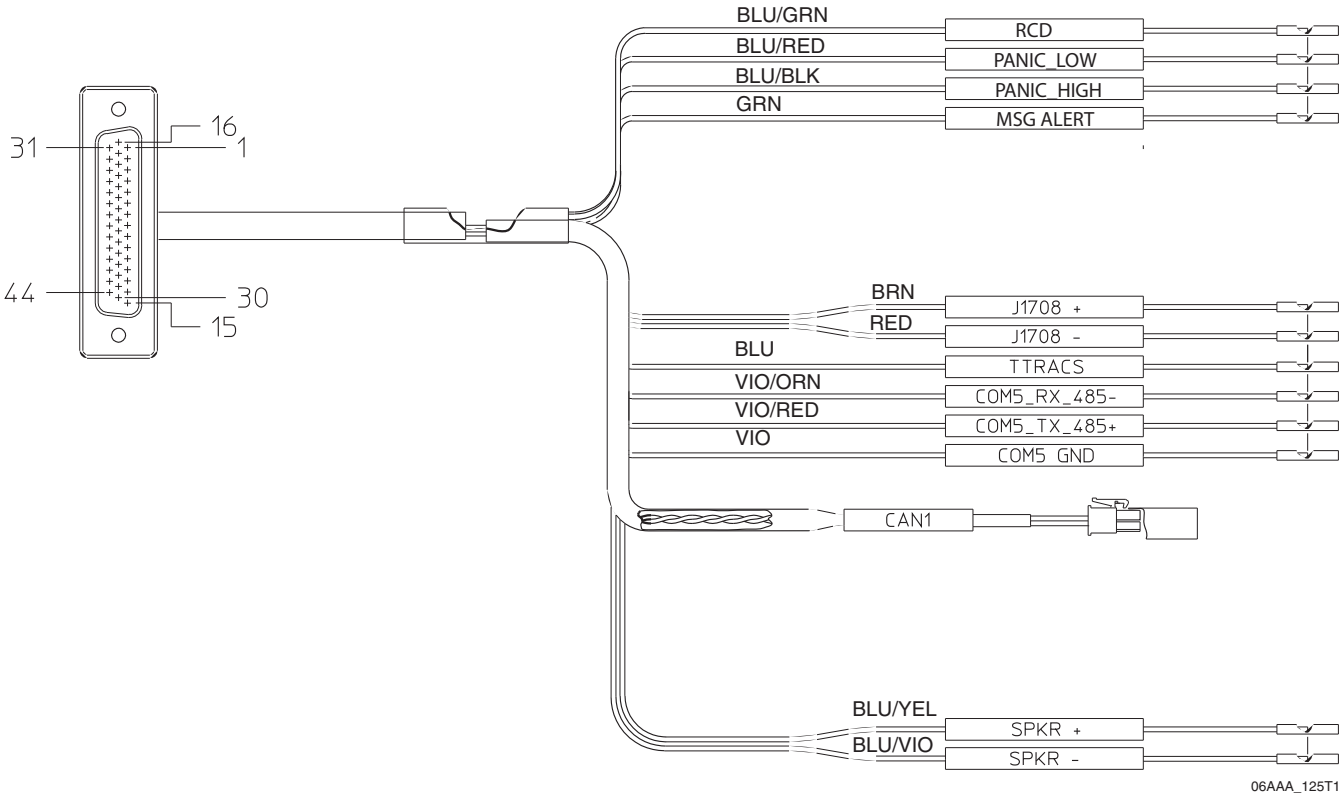


P1	SIGNAL	P2
L	Drain	
V	RX-	3
N	RX+	4
T	TX-	2
R	TX+	1
B	TAMPER	7
F	RTN	6
E	RTN	5
C	PWR 9.9-11.5VDC	8
D	PWR 9.9-11.5VDC	9

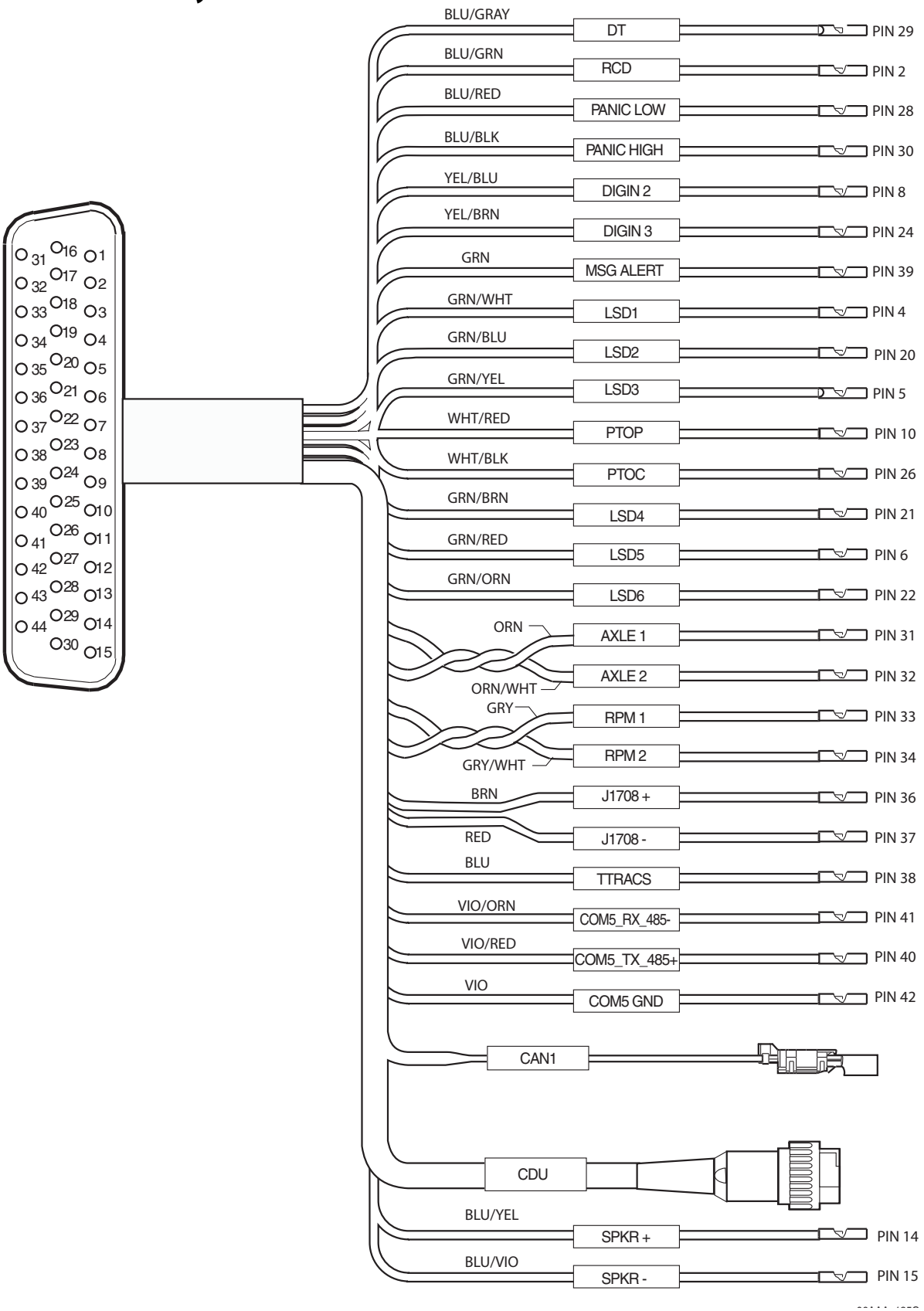


06AAA_130

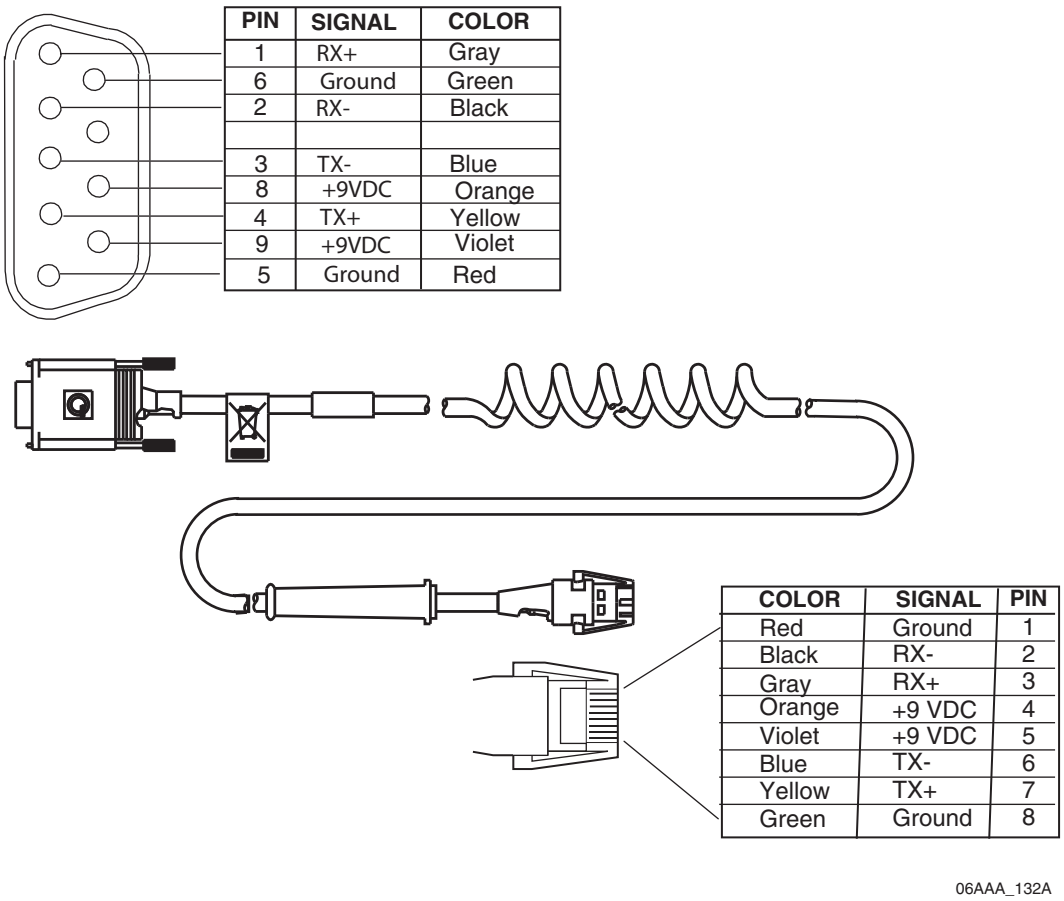
Standard Accessory Cable Pin Callouts



Full Function Accessory Cable Pin Callouts



Media Display Unit (MDU) Connector Pin Callouts

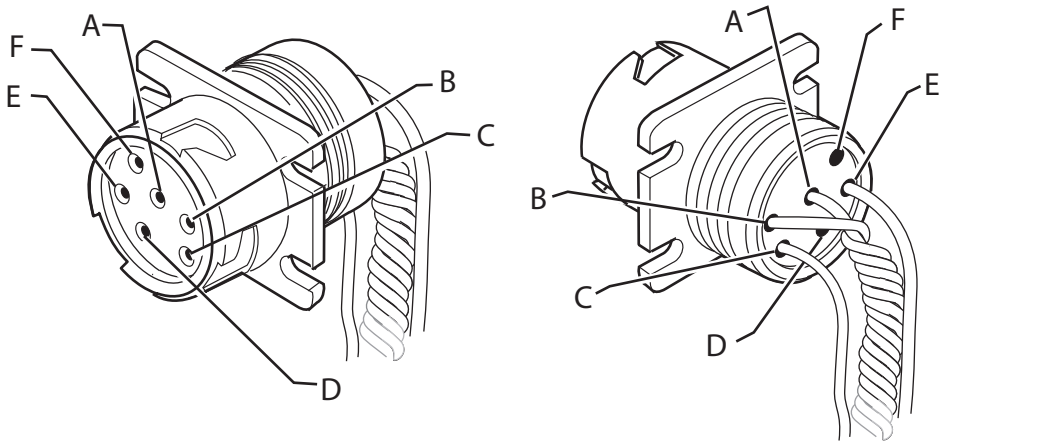


PIN	SIGNAL	COLOR
1	RX+	Gray
6	Ground	Green
2	RX-	Black
3	TX-	Blue
8	+9VDC	Orange
4	TX+	Yellow
9	+9VDC	Violet
5	Ground	Red

COLOR	SIGNAL	PIN
Red	Ground	1
Black	RX-	2
Gray	RX+	3
Orange	+9 VDC	4
Violet	+9 VDC	5
Blue	TX-	6
Yellow	TX+	7
Green	Ground	8

06AAA_132A

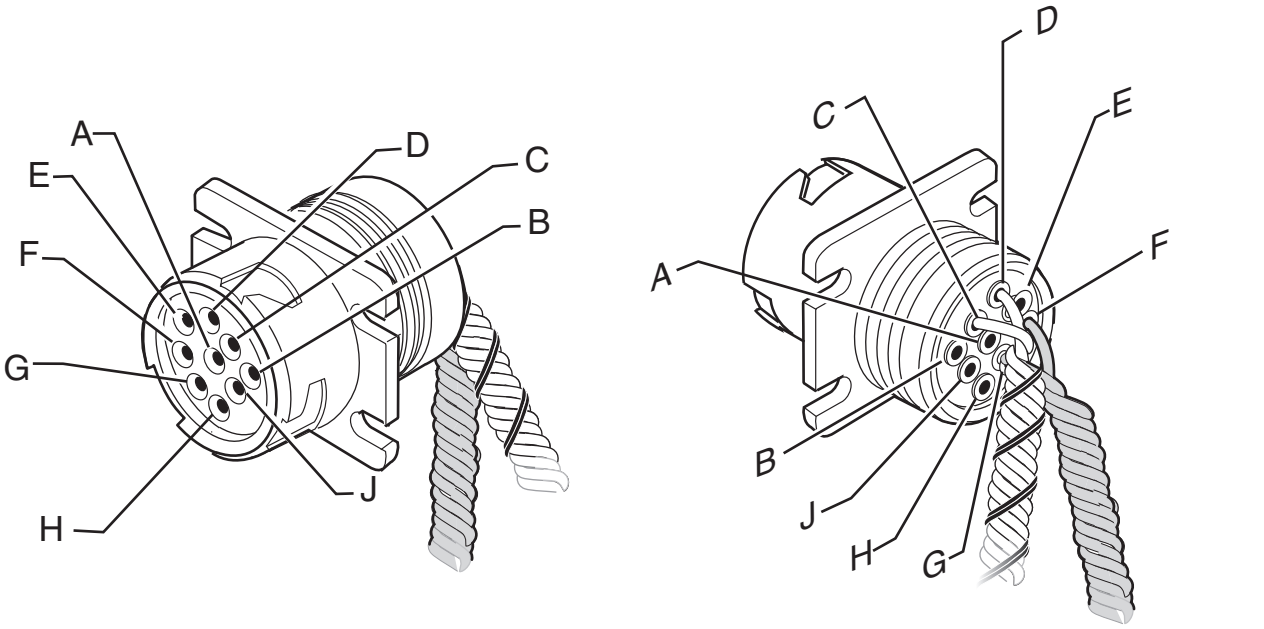
Six-pin Data Link Connector Pin Callouts



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

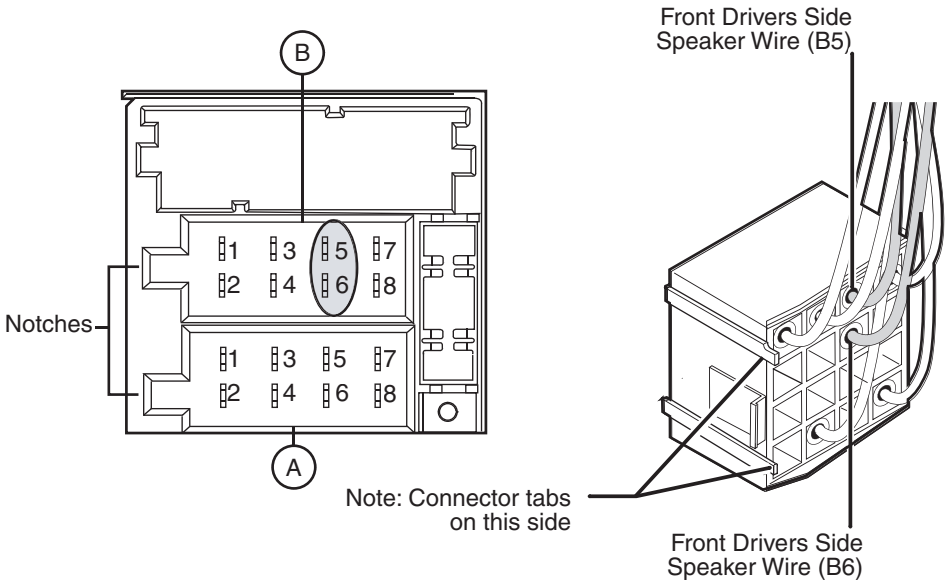


08AAA_051

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

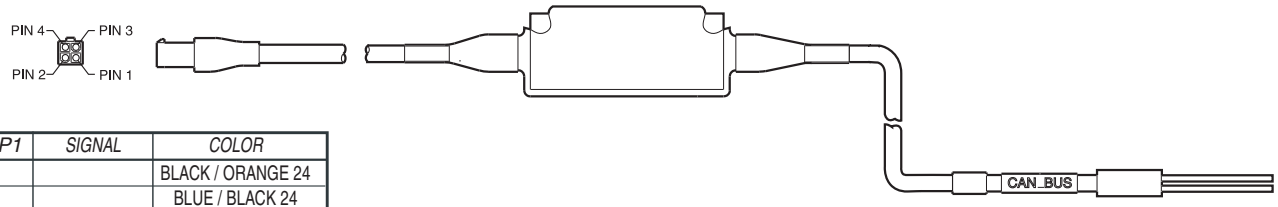
Common Radio and Harness



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 Converter Cable Pin Callouts

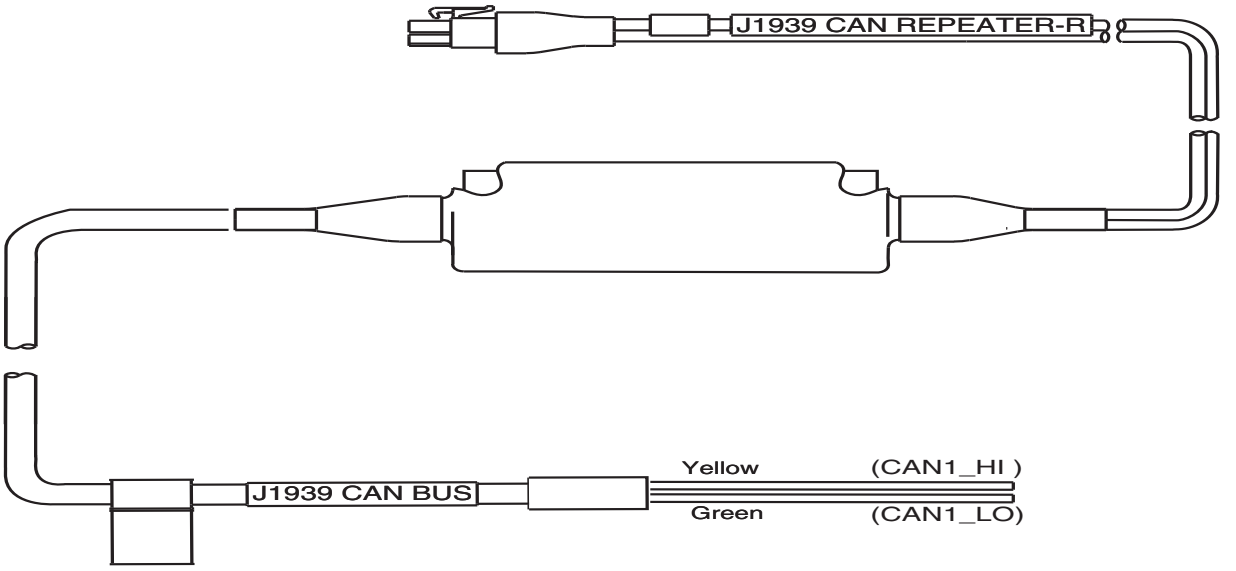


P1	SIGNAL	COLOR
		BLACK / ORANGE 24
		BLUE / BLACK 24
1	CAN_B (TX)	BLACK / BLUE 24
2	CAN_A (RX)	ORANGE / BLACK 24
3	CAN_D (PWR)	BLACK / RED 22
4	CAN_C (GND)	BLACK 22

P	SIGNAL	COLOR
	CAN_H	YELLOW
	CAN_L	GREEN

08AAA_045

CAN Repeater Cable Pin Callouts



B
Environmental and Power Requirements

Topics in this appendix provide environmental and power requirements for the MCP100 and accessories.

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

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

MCP100 Environmental and Power Requirements

Condition	Requirement
Operating Temperature	-30° C to 70° C (-22° F to 158° F)
Vibration/Shock	Mobile application server (MAS) does not have a shock tray. Neither the antenna nor satellite data modem (SDM) should be mounted to any member/support directly connected to the chassis, such as a headache rack.
Humidity	
 SDM	Weatherproof.
 Terrestrial data modem (TDM)	Not watertight. DO NOT get wet.
MAS	Not watertight. DO NOT get wet.
Media display unit (MDU)	Not watertight. Turn over immediately if liquids are spilled on it.
Compact display unit (CDU)	Not watertight. Turn over immediately if liquids are spilled on it.
Power	+9 to +32 Volts DC
 Operating at +12V using CDU, RCD, and speaker switch cable only—no accessories.	MCP100 draws a maximum of 1.8 amps from the battery (24 W).
Operating at +12V without using CDU.	MCP100 draws a maximum of 1.5 amps.
Asleep using CDU, RCD, and speaker switch cable only—no accessories.	MCP100 draws 60–70 mA.
Asleep without using CDU.	MCP100 draws 60–70 mA.
 Operating at +12V using CDU, RCD, and speaker switch cable only—no accessories.	MCP100 draws a maximum of 1.6 amps from the battery (12 W).
Operating at +12V without using CDU.	MCP100 draws a maximum of 1.12 amps.
Asleep using CDU, RCD, and speaker switch cable only—no accessories.	MCP100 draws 110 mA.
Asleep without using CDU.	MCP100 draws 110 mA.

C
Standard RMA Procedure

Topics in this appendix provide the Omnitracs standard Return Material Authorization (RMA) procedure and policies for use in the United States only. It applies to current Omnitracs 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 website at *www.myqualcomm.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.
- Omnitracs arranges shipment of a replacement component to you.
- You return a failed component to the address specified by Omnitracs.

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 Omnitracs within 14 days.

How to Obtain an RMA Number

There are two ways to obtain an RMA number:

- Visit our website at *www.myqualcomm.com* and then log into the Customer Portal. See *Creating an RMA On-line* on page C-4. Access for customers only.
- Call Omnitracs Customer Support at (800) 541-7490 and request an RMA number.

Our website provides customers with forms and the option for RMAs on-line. If you call Omnitracs 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 Omnitracs with the following information.

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

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 via ground service within two business days. If you require expedited delivery, you will need to include your shipper account number (this is your FedEx or UPS account number) when requesting the RMA. The cost of expedited shipping will be billed to your account number directly. If express delivery is critical, please call 1-800-541-7490, Option 4 to confirm inventory availability.

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 Omnitracs 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. If the unit is an MVPc, 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, Omnitracs MAS, MAS200
- Outdoor Unit, Omnitracs SDM, WIB200
- MVPc, DU/EDU, Omnitracs MDU, DIU200
- 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 Omnitracs Service Center.

Failure Description. A complete description of the problem associated with the failed component. Please be specific. Omnitracs 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 Omnitracs 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 website. This is for customers only.

1. Log on to *www.myqualcomm.com*. You will see the Customer Portal website.
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 website.

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)
- Omnitracs Mobile Application Server (MAS)
- Mobile Application Server 200 (MAS200)
- Outdoor Unit (ODU)
- Omnitracs Satellite Data Modem (SDM)
- Wireless Interface Box 200 (WIB200)
- MVPc
- Display Unit/Enhanced Display Unit (DU/EDU)
- Omnitracs Media Display Unit (MDU)
- Display Interface Unit 200 (DIU200)
- 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
- Tethered Transmitter
- T2 external battery—DO NOT return to Omnitracs unless specifically requested by an Omnitracs 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.
- Omnitracs Remote Control Device (RCD)
- Omnitracs MAS/MAS200 battery—DO NOT return to Omnitracs unless specifically requested by an Omnitracs representative. Proper disposal of defective or dead lead-acid batteries is the responsibility of the Omnitracs 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 Omnitracs 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 Omnitracs at the following address. Make sure that the RMA number is marked clearly on the outside of the box.

Omnitracs - RMA Receiving
C/O Baja Freight Forwarders, Inc.
8662 Siempre Viva Road
San Diego, CA 92154

RMA #: _____

(800) 541-7490

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

"Past Due" Equipment

Omnitracs 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 Omnitracs. Customers are responsible for returning the failed equipment to Omnitracs within fourteen (14) days after receiving the RMA number.

If the failed items are not received within this time period, Omnitracs 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 Omnitracs 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 Omnitracs. When all the past due components are received by Omnitracs or paid in full, Omnitracs 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.

C a u t i o n

Never open the Communication Unit; MAS; MAS200; or ODU, ACU, SDM, and WIB200 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 and MAS200 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 Omnitracs. 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, Omnitracs Mobile Application Server, or Mobile Application Server 200 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, Omnitracs MCP100, or MCP200 (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 Omnitracs 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, Omnitracs Mobile Application Server, or a Mobile Application Server 200) 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 OMNITRACS, THE COMPONENT(S) SET FORTH WILL BE PERMANENTLY REMOVED FROM THE OMNITRACS 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. Omnitracs 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 MCP100 Using Secure Digital Cards

An MCP100 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.

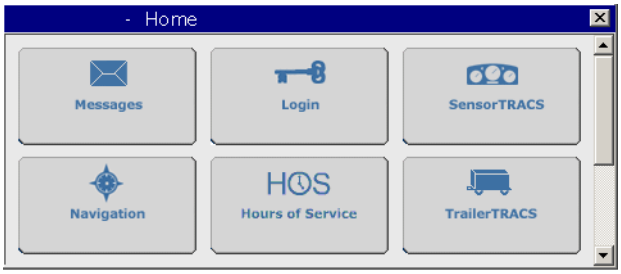
Topics in this appendix provide specific instructions for checking the software versions installed on the MCP100 and upgrading the MCP100 using SD cards.

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

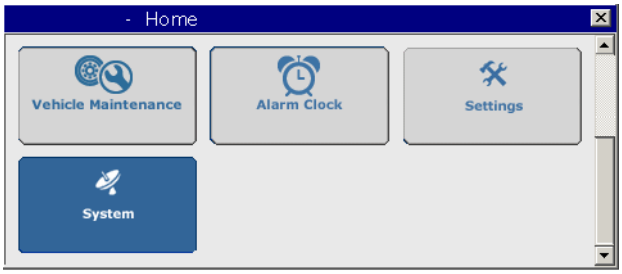
- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

Checking the Software Versions Installed

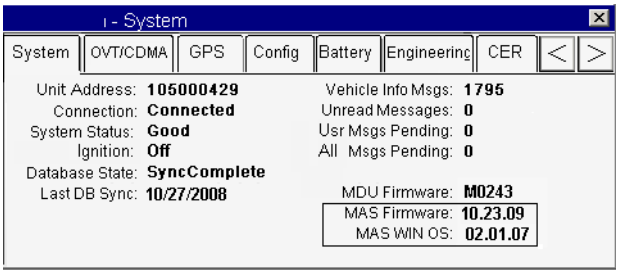
Shortly after you power up the MCP100, the user interface screen displays.



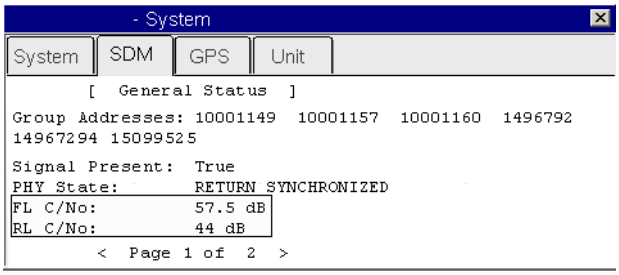
1. Scroll down to the **System** icon and tap the icon.



2. Tap the **System** tab to access system information about the MCP100.
   - MAS, MAS Win OS, SDM, and MDU firmware version numbers are listed here.

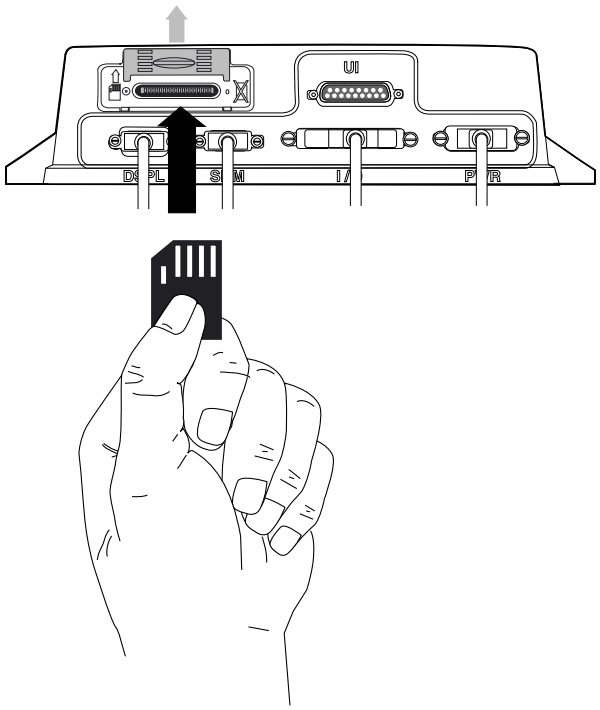


3. Tap the SDM tab to access the SDM version.



SD Card Instructions

- Most brands of SD card work with the MCP100.
  - 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 Omnitracs website, or you can check with an Omnitracs representative for more information on where to get the software and how the files need to be organized.



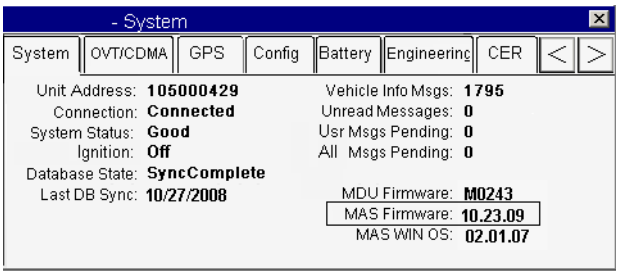
05AAA_222X5

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.

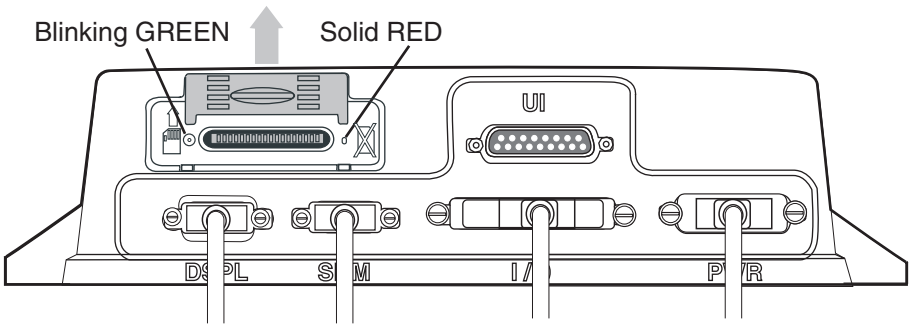


Upgrading the MAS Operating System and MAS Software

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.

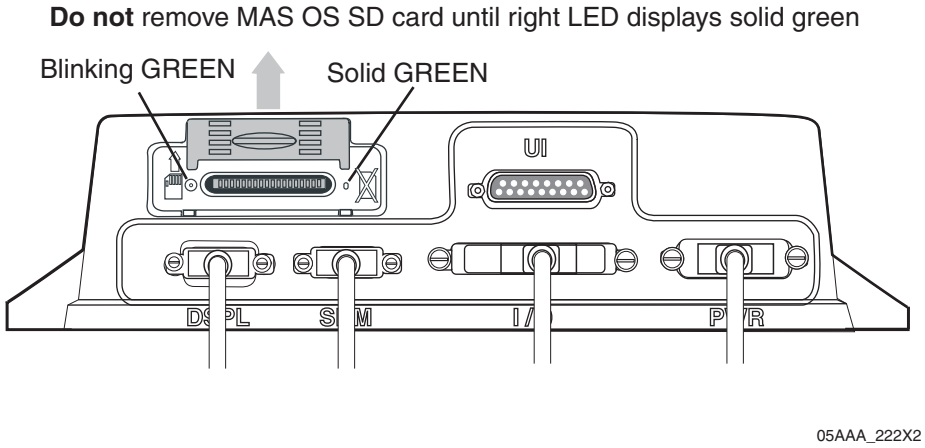
1. You **must** disconnect power for 10 minutes or until all LEDs go out.
2. Insert the SD card labelled, MAS Operating System, with label side down/metal strips facing up.
3. Ensure the MAS internal battery is installed and connected.
4. Apply external power by connecting the power cable to the MAS. 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.



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

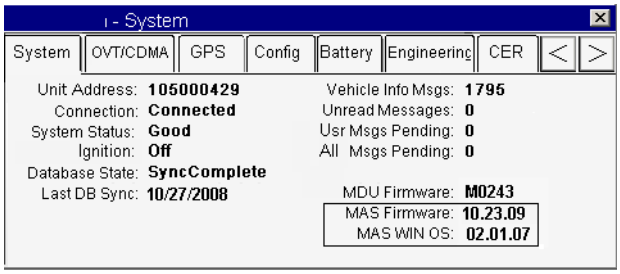
8. After approximately one minute, normal upgrade indicators are:
   - LED to the left of the SD card slot is blinking green.
   - MDU screen shows, PLEASE WAIT, LOADING.

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.

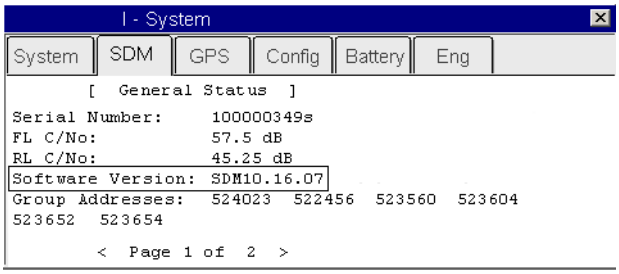


The upgrade is now complete.

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.

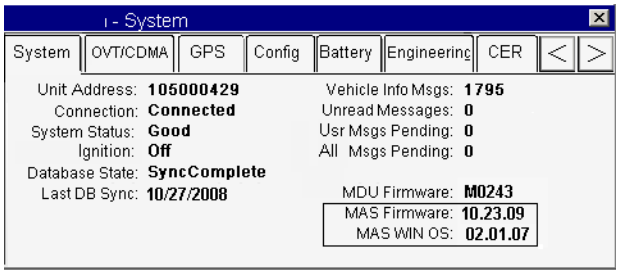


5. Once the SDM software version has updated, remove the SD card.

   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
Component and Document Information

Topics in this appendix provide document control numbers (DCNs) and material control numbers (MCNs) for the different documents and MCP100 components referred to in this guide.

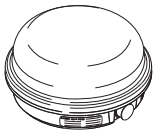
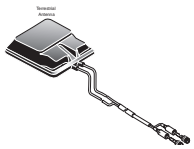
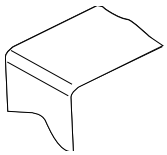
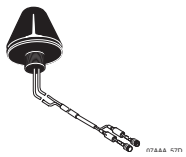
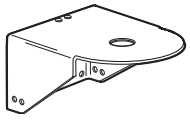
For technical questions, contact Omnitracs Customer Support.
Customer Support is staffed 24 hours a day, 365 days a year:

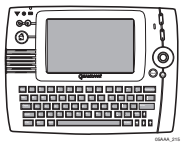
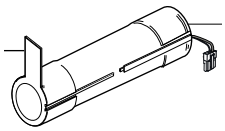
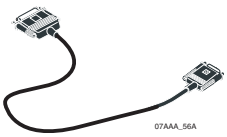
- In the United States, call 800-541-7490
- In Canada, call 800-863-9191

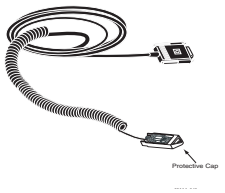
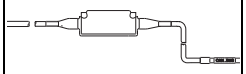
DCNs for Documents Referenced in this Guide

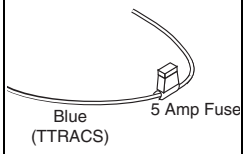
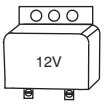
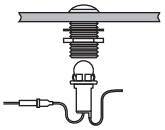
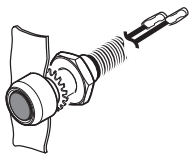
Document Name	DCN
Outdoor Unit Mount Installation Guide	TL80-6270-1
MCP100 Installation Guide	80-J4866-2
How to Use the Wireless Panic Button Remote Transmitter (Visor Card)	80-J6060-1

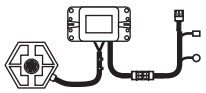
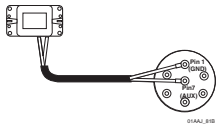
MCP100 System Component MCNs Referenced in this Guide

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-J9619-A42		
CAN repeater cable		CV90-J9954-A42		

System component	Illustration	Latest MCN	Alternate MCNs	Notes
5 amp fuse (for Trailer Tracks)		65-53011-1		
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		

System component	Illustration	Latest MCN	Alternate MCNs	Notes
Trailer Tracks system for reefer		10-53481-2	10-52525-6	
Trailer Tracks system for dry van		10-53481-1	10-52525-4	
Protective Film Kit 10 pack, MDU		65-J9040-1		Screen protector

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 Omnitracs-recommended Torque Wrench Referenced in this Guide

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

Glossary

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

Bad MCP Status. When an MCP100 fault has been detected, the Status field will display 10000/10001, 12000/12001, 13000/13001, or 22000/22001.

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 MCP100 cannot use the J1708/1587 data link for Performance Monitoring input. After sensor calibrations have been determined, the dispatch computer operator needs to send the calibration numbers to the MCP100. *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 Omnitracs-provided navigation application for the MCP100 system.

Configuration Screen. This screen shows how the MCP100 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 MCP100 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, Performance Monitoring performance monitoring system, Trailer Tracks asset management 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 MCP100.

GPS. *See* Global Positioning System.

GPS Screen. The display unit screen shows the status of the MCP100 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. MCP100 screen that displays information you will need to check the Performance Monitoring parameters. This screen can be accessed in the Performance Monitoring application at the Installer tab.

J1708/1587 Network. The MCP100 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 MCP100 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 MCP100 that “tells” it to understand input from the J1708/1587 bus and define driving thresholds.

J1939 Network. The MCP100 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 MCP100 has been set up to look at J1939 data via the J1939 data link. The dispatch computer operator must send a message to the MCP100 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 Omnitracs part number.

MCN. *See* Material Control Number.

MCP100. *See* Mobile Computing Platform.

MCP100 Serial Number (Unit Address). Located on the connector plate of the mobile application server (MAS). The MCP100 System screen also has this information.

MDU. *See* Media Display Unit.

Media Display Unit (MDU). The standard display unit for the MCP100. 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 MCP100 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 100 (MCP100). A two-way, mobile information system that allows dispatchers and drivers to send and receive text messages, and also provides vehicle location and performance data.The MCP100 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 Omnitracs 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 MCP100 has lost contact with the data satellite and is searching for the satellite signal.

Odometer Screen. The MCP100 display unit screen that displays the life-to-date (LTD) value and sensor calibration information. This screen can be accessed in the Performance Monitoring application at the Odometer tab.

Omnitracs Dispatch Software (QTRACS® system). The software on the trucking company's dispatcher computer. This is the dispatcher's interface with the MCP100. It allows the dispatcher to send and receive information, request MCP100 location information, and perform other dispatcher functions. The dispatch computer communicates with the NMC via a modem over a commercial or leased telephone line.

Omnitracs 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.

Optional Accessories. Any of these may be installed for the MCP100:

- 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 (Performance Monitoring system and Trailer Tracks asset management 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 Omnitracs Network Management Computer and the company dispatcher when an emergency situation exists.

Performance Monitoring System. An accessory of the MCP100 that allows companies to collect vehicle trip and performance data.

Positioning System. *See* Global Positioning System.

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

Printer. Provides the driver with a hard copy of the MCP100 forward or return message screen display.

RCD. *See* Remote Control Device.

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

Remote Control Device (RCD). A small device 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 MCP100 over-the-air and load applications.

Software Version. *See* MCP100 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 MCP100 to the J1708/1587 data link, as well as other vehicle inputs and optional system devices. This cable provides the necessary wiring for optional system features such as display screen disabling, performance monitoring system, Trailer Tracks asset management 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 MCP100. 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 MCP100 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 MCP100 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 MCP100 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 MCP100 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 MCP100 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 MCP100 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 MCP100 that “tells” it to understand input from the traditional sensors and define speed and RPM.

Trailer Tracks Asset Management System. An optional MCP100 feature that allows dispatch to monitor trailer connects and disconnects. The Trailer Tracks asset management system can also monitor the refrigeration unit of the trailer.

TTS. *See* Text-to-Speech.

Unit Address. *See* MCP100 Serial Number (Unit Address).

Vehicle Information Systems (VIS). *See* Performance Monitoring system and Trailer Tracks asset management system.