



V3™ USERS MANUAL & INSTALLATION GUIDE



ELECTRONIC FLEET MANAGEMENT
www.zonarsystems.com

Zonar Systems V3™ Hardware Installation Tips For Professional Installers

Zonar Systems' equipment will provide years of reliable service if properly installed and maintained. Zonar equipment is typically installed in heavy vehicle applications and is often subject to extreme temperatures, dust, dirt, vibration, and shock. Proper installation is the critical first step to equipment longevity and optimal performance.

This guide is meant to be a general guideline for the professional installer and technician. While we attempt to point out the most common installation questions and issues; common sense, good housekeeping procedures, attention to detail, safety adherence, and technical competence of the professional installer are critical for a successful installation.

Please refer to your specific vehicle manufacturer guidelines for the installation of electrical components and wiring.

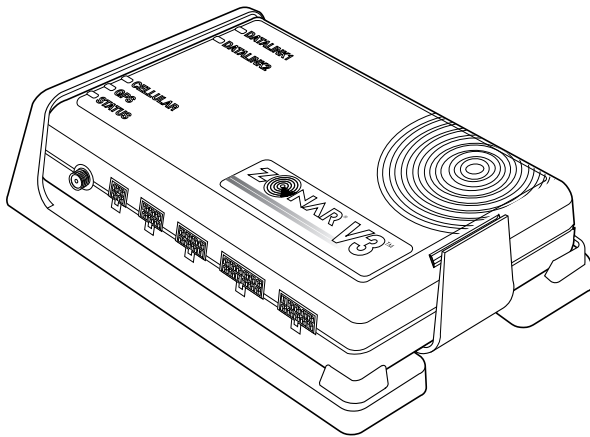
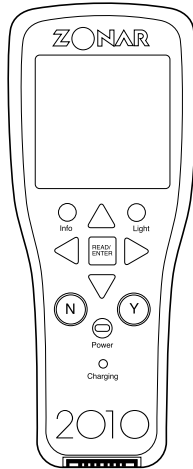
A professional team of Zonar support technicians and engineers are available to answer your installation questions. Contact Zonar at 1-877-843-3847 or by email at customercare@zonarsystems.com.

Thank you,



Andre J Horochiwsky
Technical and Training Manager – Zonar Systems

As Zonar Systems is continuously improving the Product, Zonar may make changes to the Product at any time which may not be reflected in this document.



EVIR® • V3™

Introduction	2
System Overview	4
V3 Equipment	5
Optional Equipment - EVIR®	6
General Guidelines	7
V3 Mounting Plate	8
V3 Pin Configuration	9
Power and Data Connections	10-11
4 Pin Cable Testing	12
GPS 4 Pin Power Cable Management	12
Wiring Guidelines	13
Antenna Installation	14
GPS VM and Tag Installation	15
GPS System Check	16
System Checklist	17
System Specifications	18
Equipment Dimensions	19-20
Installation Examples	21-22
System Installation Diagram	23
Discrete I/O System Installations	24-25
Warranty & Notices - FCC Compliance	26
Notes	27

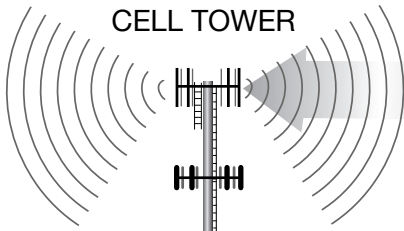
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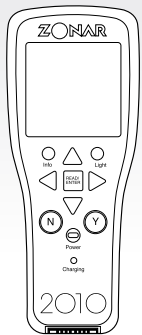
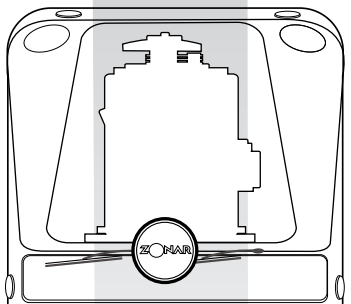
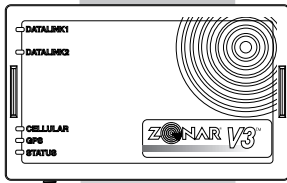
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SYSTEM OVERVIEW

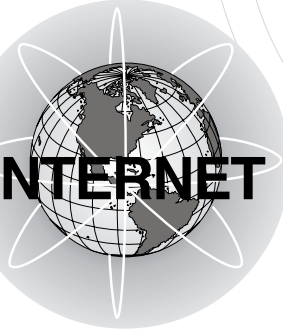


CELL TOWER

INTERNET



Real-Time Delivery of Engine Condition and Performance Data, Driver Performance and Location

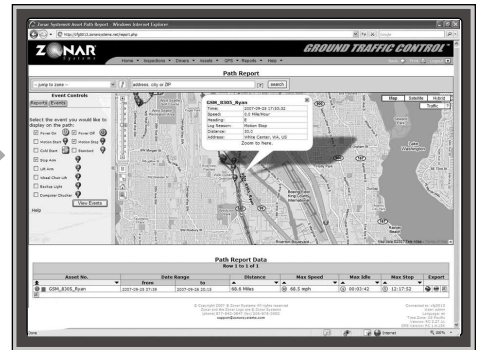


INTERNET



ZONAR Secure Servers Encrypted Data Transmissions

INTERNET



CUSTOMER On-Site Location

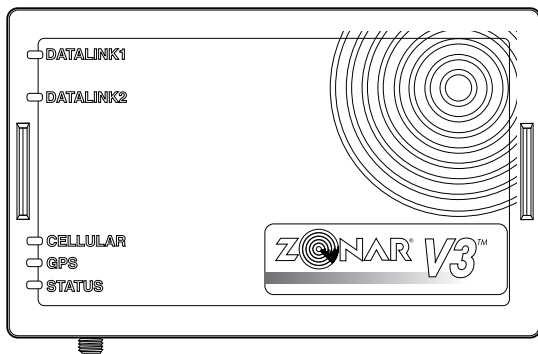
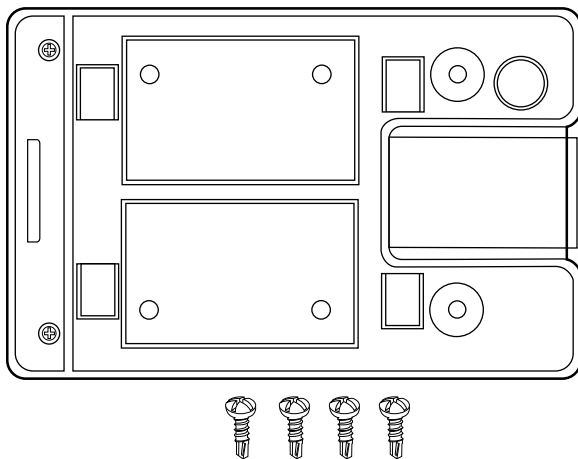
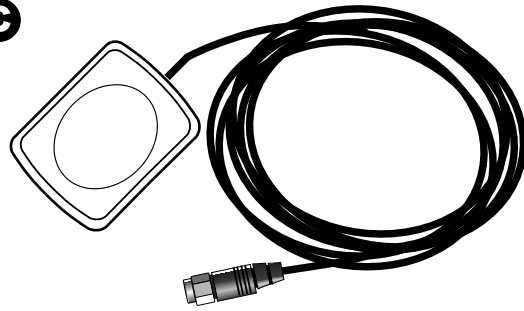
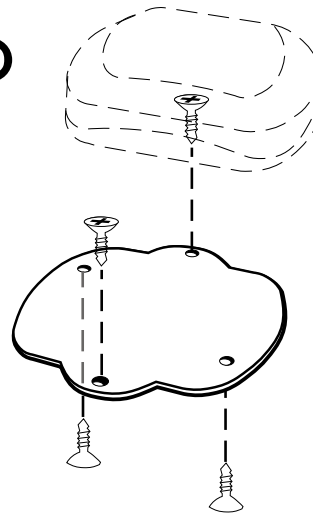


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Base Equipment

- A. V3 GPS Unit
- B. V3 Mounting Plate and Mounting Screws (Provided)
- C. GPS Antenna (Optional)
- D. GPS Antenna Aluminum Mount Plate and Screws (Optional - used for non-magnetic rooftop GPS Antenna installs)

Note: See page 14 for detailed information on GPS antenna requirements and recommendations.

A**B****C****D**

- A. 2010 RFID EVIR® Inspection Tool (Optional)
- B. GPS-VM Vehicle Mount (Optional) and Mounting Screws (Supplied)
- C. 2010 RFID Reader installed in GPS-VM (GPS-Vehicle Mount) - (Optional)
- D. Zone and Asset Tags (Optional)

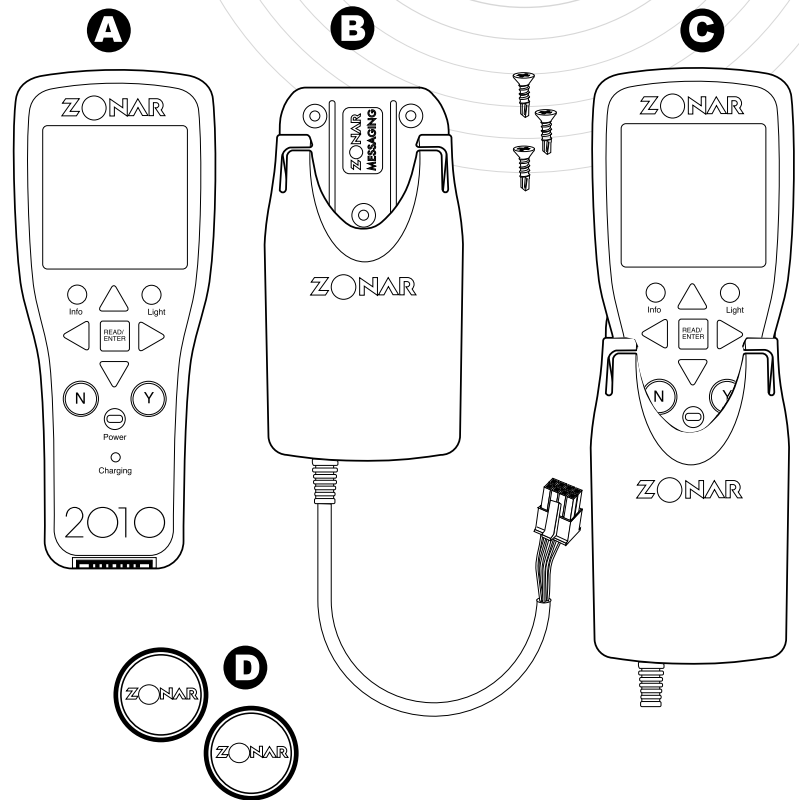


Fig. 6-1 - See Pages 19-20 for dimensions

Layout

- 1) V3 unit must be located a minimum of 8" from any person.
- 2) V3 has a temperature range of -40°C (-40°F) to +85°C (+185°F). Do not mount V3 in hot engine compartments or near hot exhaust components.
- 3) Lay all components out prior to installation to check for proper cable length and interference issues.
- 4) Avoid mounting Zonar equipment, antennas and wiring near other radio equipment (e.g., two-way radios), PA equipment and high energy electrical sources (e.g., cables, relays, amplifiers, etc.).

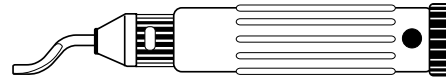


Electrical

- 1) **Consult the vehicle's manufacturer for specific installation guidelines. (HIGHLY RECOMMENDED for Multiplex electrical systems)**
- 2) All power leads (Red and White Power leads) must be connected to the vehicles protected circuitry (e.g. fuse panel, circuit breaker panel, protected circuits). Never electrically connect Zonar equipment to unprotected circuits (e.g. directly to battery).
- 3) It is also required that all power leads (Red and White Power leads) be protected with a 3 to 5 amp fuse and inline fuse holder (included) for optimal system protection.
- 4) Electrical fuses should be installed as close as possible to the source of power.

Drill Holes

- 1) Do not drill into the V3 unit. This will void the warranty.
- 2) Capture all drill chips during drilling operations. Do not allow chips to fall onto equipment, furnishings, etc.
- 3) Deburr all drill holes on both sides of drilled surface. Example deburr tool:



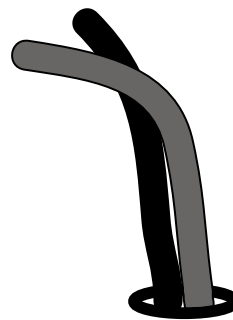
- 4) All drill holes must have a rubber grommet or similar anti-chaffing system installed to protect cable assemblies (e.g. plastic conduit).
- 5) Seal all penetration drill holes which may pass rain water.

Cable Management

- 1) Strain relieve and support all cable installations.
- 2) Avoid sharp bends and tight radius installations of cables.
- 3) Avoid moving components (e.g. doors, steering shafts, handles, fans, etc.).
- 4) Provide an adequate "Service Loop" i.e. "cable slack" to allow for servicing of equipment.
- 5) Avoid routing cables thru doors, windows, and other pinch points.
- 6) Avoid routing cables in high personnel traffic areas.
- 7) Avoid routing antenna cables near radio and PA equipment.

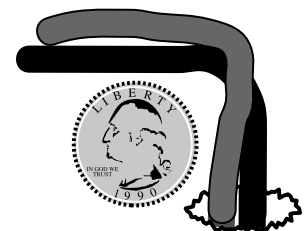
CORRECT

- Bend radius adequate
- Hole has grommet



INCORRECT

- Bend radius too tight
- Hole has sharp edges
- Hole has no grommet

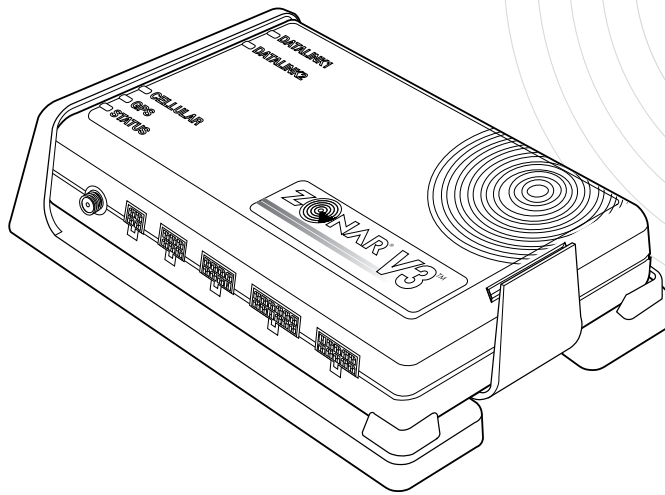


General Housekeeping

- 1) Capture all drill chips during drilling operations. Do not allow drill chips to fall onto electrical equipment, furnishings, heating ducts, etc. Magnets, sticky tape, vacuums, physical barriers, etc. may all be used to accomplish this task.
- 2) Remove excess sealant. Sealant should be debris/contaminant free (e.g. drill chips), consistent, and uniform in appearance.
- 3) Clip excess wire tie protrusions.



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V3 Mounting Plate & Unit

- 1) Follow all General Guidelines as specified on page 7
- 2) Mount onto interior flat surface large enough to accommodate footprint.
- 3) **Suggested mounting areas include horizontally atop dashboard under an angled windshield free of metallic obstructions (See Fig. 21-1) and overhead compartments with a clear non-metallic view of the sky (e.g. under a fiberglass roof or fairing). Verify placement acceptability with state DOT/law enforcement prior to installation. Enclosed areas require an external GPS.**
- 4) Do not install below windows or doors which open to the vehicle's exterior to prevent water damage.
- 5) Avoid mounting equipment in difficult to access areas. Avoid mounting in areas which do not allow for direct diagnostic LED viewing.
- 6) If enclosing in a radio-shielded area (e.g., metallic enclosure) an external GPS antenna may be necessary for proper operation and performance.
- 7) Avoid mounting Zonar Equipment, antennas and wiring near other radio equipment (e.g., two-way radios), PA equipment and high energy electrical sources (e.g., cables, relays, amplifiers, etc.).
- 8) Avoid mounting equipment in dirty, dusty, or damp areas (e.g. near floors and entrance ways).
- 9) Please take note of:
 - GPS (SN) – Found on white sticker on GPS unit
 - Vehicle or Asset Number (e.g. Bus #56)

Note: Your Zonar Customer Care Representative or Ground Traffic Control™ Administrator will need this information.

Orientation and Placement:

- 1) Horizontal with clear (non-metallic) view of sky
- 2) Zonar logo towards sky

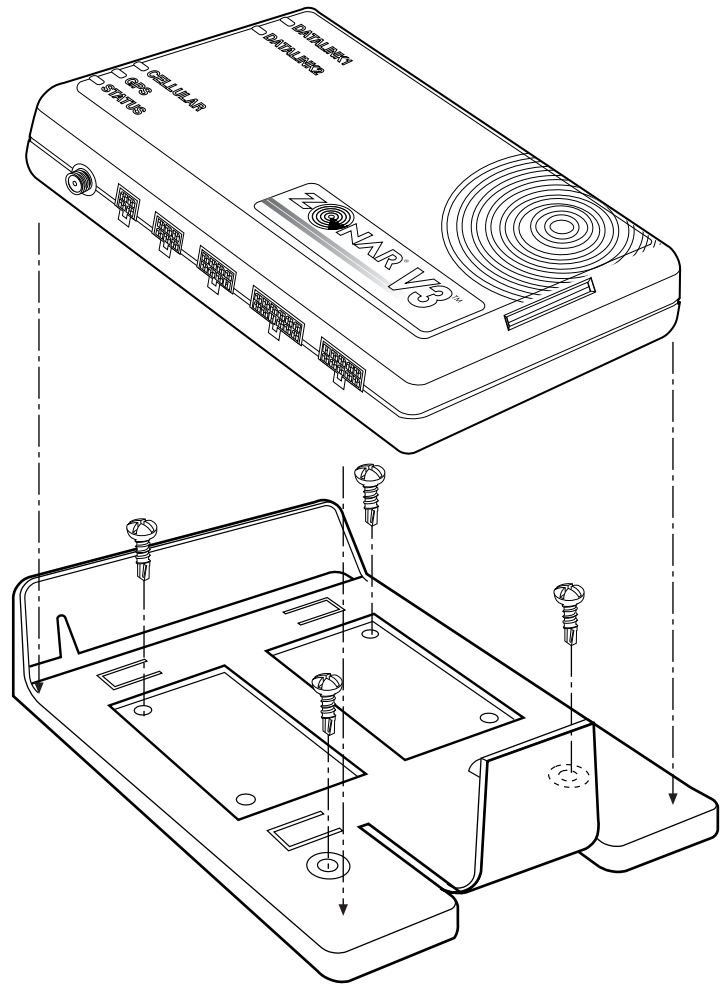
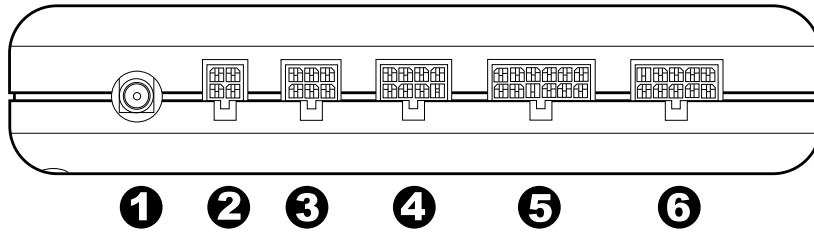


Fig. 8-1



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Fig. 9-1



1. External GPS antenna (Optional)
2. 4 Pin Power Input
3. 6 Pin Accessory
 - ZPass™
 - Virtual Trainer
4. 8 Pin GPS Vehicle Mount (Optional)
5. 12 Pin Discrete Input/Output (Optional)
6. 10 Pin ECM input (JBus 1708/1939 & OBDII equipped vehicles)



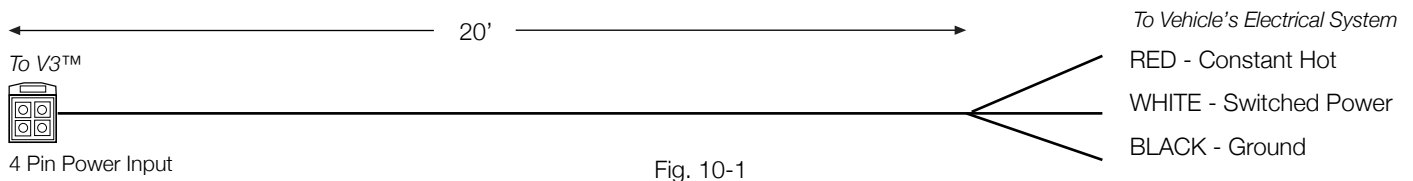
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Connecting to Vehicle Electrical and Data System

There are four primary methods to connect the V3™ to your vehicle's electrical and data system:

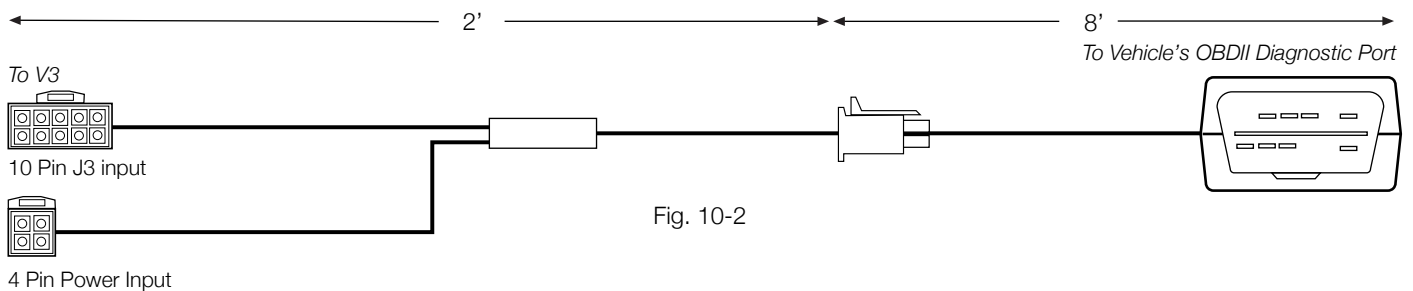
- 1) GPS 4 Pin Cable - Fig 10-1
- 2) Light Duty Cable - Fig. 10-2
- 3) MOAC-B Cable - Fig. 11-1
- 4) MOAC-T Cable - Fig. 11-2
 - A) Follow all general guidelines on page 7
 - B) See below for specific use

- 1) **GPS 4 Pin Cable P/N 10007:** Only use this method for equipment not equipped with OBDII, JBus 1708/1587 or JBus 1939 data buses. See pages 12-13 for wiring procedures



- A) Requires vehicle to physically move at least 5 MPH for at least 100 feet to properly complete new install checkout. If this is not performed GPS and discrete IO data will not be present in GTC until those thresholds are met

- 2) **Light Duty P/N 81008 with V3™ LD Breakout P/N 80999:** Use on light duty vehicle's equipped with OBDII diagnostic port.™



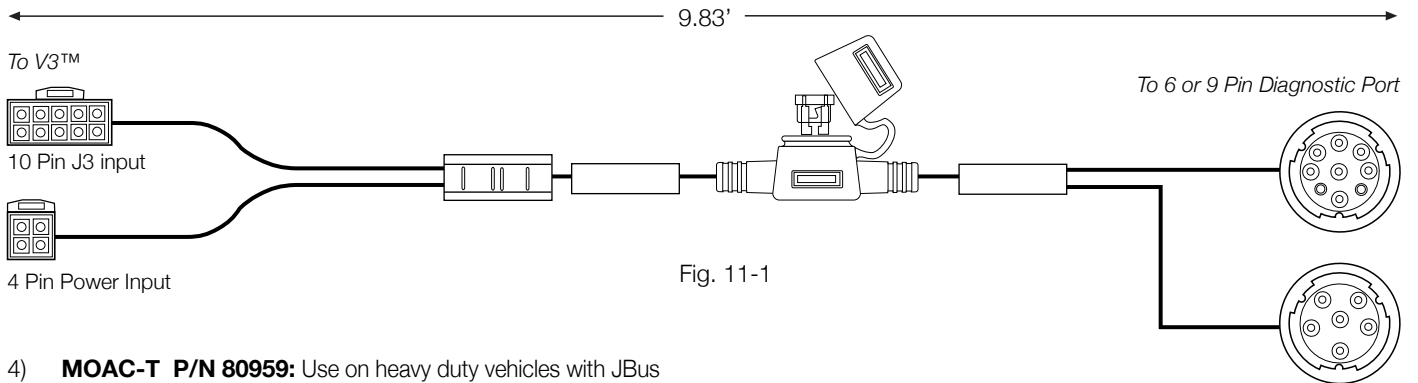
- A) Connect to OBDII diagnostic port with engine running. **Failure to perform this step may trigger a false check engine light on the dash on first engine start after installation.** This will require the fault to be manually cleared.
- B) Requires vehicle to physically move at least 5 MPH for at least 100 feet to properly complete new install checkout. If this is not performed GPS and discrete IO data will not be present in GTC until those thresholds are met



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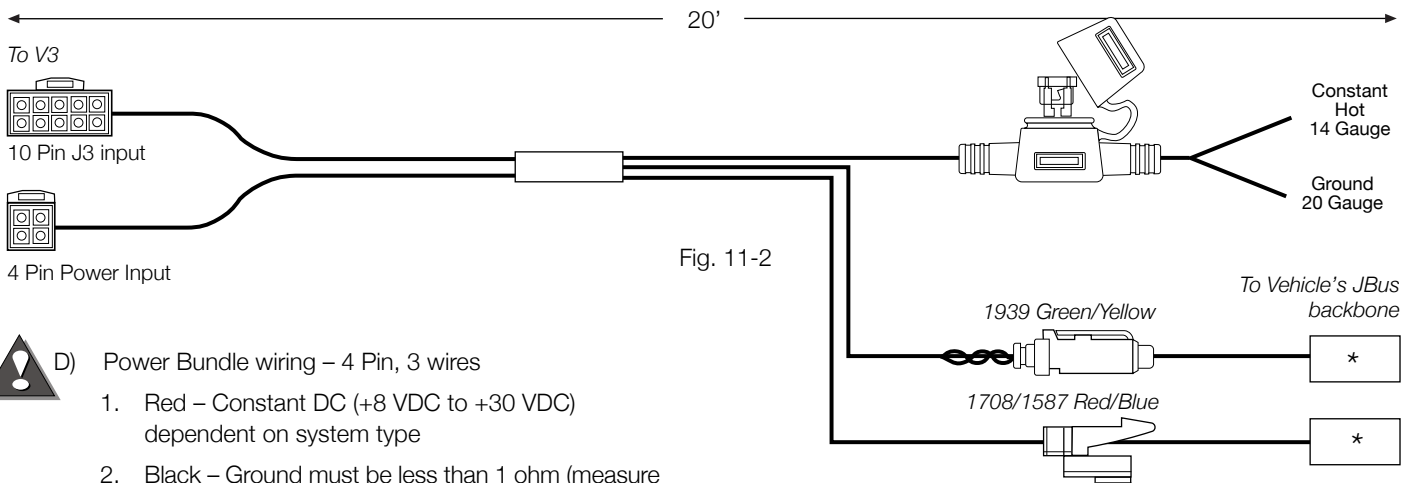
- 3) **MOAC-B P/N 80972:** Use on heavy duty vehicles with JBus 1708/1587 (older), or JBus 1939 (newer) data buses. Connects to 6 or 9 Pin Deutsch diagnostic port.

Note: Wire tie back and out of the way of the 6 or 9 pin connector that is **not** used.



- 4) **MOAC-T P/N 80959:** Use on heavy duty vehicles with JBus 1708/1587 (older) or JBus 1939 (newer) data buses. Connects to data network backbone.

- A) This cable requires specific adapters dependent on vehicle make/model/year. Contact Customer Care for additional information
- B) Visit www.zonarsystems.com/zsupport for vehicle specific installation instructions
- C) See pages 12-13 for wiring procedures



- D) Power Bundle wiring – 4 Pin, 3 wires
1. Red – Constant DC (+8 VDC to +30 VDC) dependent on system type
 2. Black – Ground must be less than 1 ohm (measure from 4 Pin connector to chassis attachment point)

Note: Wire tie back and out of the way of the data connector that is **not** used.

*Contact Zonar or visit www.zonarsystems.com/zsupport for proper adapter to connect to vehicle.



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GPS 4 Pin Power Cable

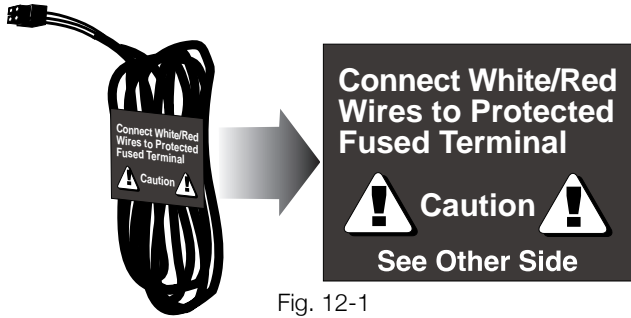


Fig. 12-1

- 1) a. Used on Non-JBus and non-OBDII installs.
b. Used on JBus installs with JBus switched Power Issues (as indicated by flashing "Status" LED with engine running).
- 2) Follow all General Guidelines as specified on page 7.
- 3) All power leads must be connected to the vehicles protected circuitry (e.g. fuse panel, circuit breaker panel, protected circuits). Never electrically connect Zonar equipment to unprotected circuits. (e.g. directly to battery).
- 4) It is also required that all power leads (Red and White leads) be protected with a 3 to 5 amp fuse and inline fuse holder (included) for optimal system protection.
- 5) Electrical fuses should be installed as close as possible to the source of power.
- 6) For Vehicles equipped with "noise kill" switches (late model school buses) – **Do not** wire any Zonar equipment to the "noise kill" circuitry
- 7) Power Bundle wiring – 4 Pin, 3 wires
 - a. Red – Constant DC (+8 VDC to +30 VDC), dependent on system type
 - b. Black – Ground must be less than 1 ohm (measure from 4 Pin connector to chassis attachment point)
 - c. White - Switched Power
 1. Engine running (+8 VDC to +30 VDC)
 2. Engine not running (0 VDC)
 3. Engine not running (key position ACC or Accessory Mode (0 VDC)



The White wire must be connected to a power source that is active only when the engine is running or the system will not track idle time properly.

Please contact the vehicle manufacturer for any specific electrical questions



If power cabling is not connected and powered as described in paragraph 7, one or more of the following conditions may occur, contact Zonar Customer Care for additional info:

- A. Cold Start flags (an indicator that a unit lost and regained constant power)
- B. Inaccurate idle and stop times
- C. Inaccurate hour meter data
- D. Inaccurate mileage data
- E. Missing path data
- F. Straight line data segments

Proper Use of DMM Probe for Testing 4 Pin Cable

- 1) Improper use of the DMM probe may damage the pins causing an intermittent connection.
- 2) Be sure the probe only makes contact with the outside edge of the female connector.
- 3) If the probe is inserted into the connector it may distort the pin and ruin the connection.

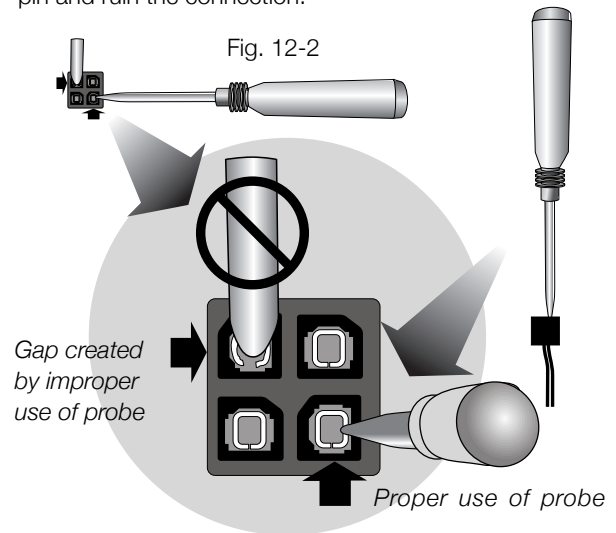


Fig. 12-2

Wiring Guidelines for Unterminated Power and Ground Leads - 4 Pin and MOAC-T

The authorized method for power termination on the Zonar V3™ system is the use of Add-a-Circuit fuse taps. Whenever possible, use fuse taps for power termination. If, due to the particular make/model/year of the vehicle being installed, fuse taps cannot be used then the poke and weave method of termination can be utilized. All wiring terminations **MUST** be fused regardless of Add-a-Fuse tap or poke and weave method of installation.

When installing fuse taps, ensure that the fuse tap seats fully in the correct location. If another fuse, a relay, or any other object in the fuse panel prevents the fuse tap from seating fully, relocate the fuse tap. It is not permissible for the fuse tap to rub or make contact with other items in the fuse panel. In addition, you must be able to re-secure the fuse panel cover or door once the fuse tap is installed. Whenever possible, use an empty location in the fuse panel that does not have an existing fuse. If it is not possible to use an empty location, ensure that the existing fuse is placed in the correct location on the fuse tap. See Fig. 13-1

Whenever it is not possible to utilize Add-a-Circuit fuse taps then the poke and weave method must be used.

- 1) First locate the proper wire where the poke and weave method is to be installed. Strip 3/4" to 1" of insulation from the wire in the vehicle to be installed. Spread the wire strands apart as shown. See Fig. 13-2
- 2) Strip 1" to 1 1/2" of insulation from the wire in the fused link to be installed. See Fig. 13-3
- 3) Insert the wire from the fused link into the spread wire in the vehicle. Wrap around the wire several times. See Fig. 13-4
- 4) Cover the exposed wires with several wraps of electrical tape or mastic. Place one wire tie over the electric tape over the exact location where the wires are 'wrapped' together. Place another wire tie 1" to 2" from the first wire tie, to secure the two wires together and as stress relief. See Fig. 13-5



CAUTION: Zonar has approved two tap types of fuses. Use of other brands is not authorized.

- A. LitteFuse brand: Add-a-Circuit
- B. Bussman brand: Add-a-Fuse
- C. Do not install the above listed fuse kits in fuse panel locations greater than 10 amps.

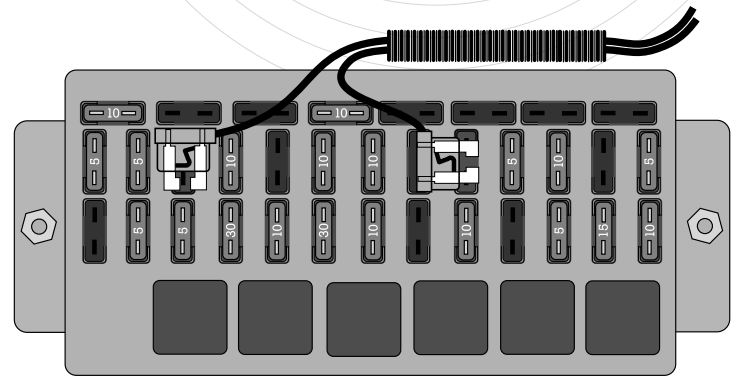


Fig. 13-1

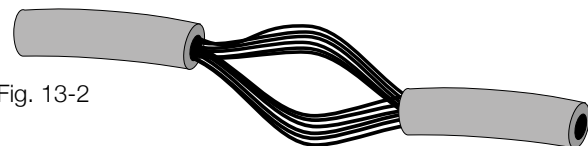


Fig. 13-2

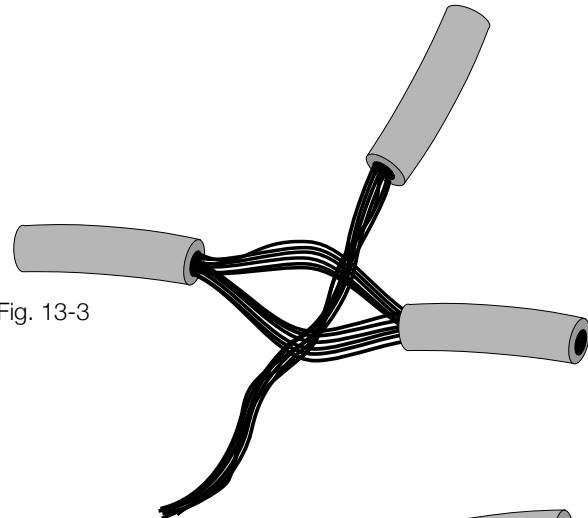


Fig. 13-3

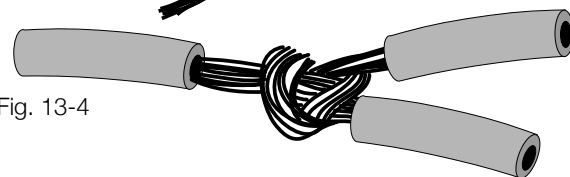


Fig. 13-4

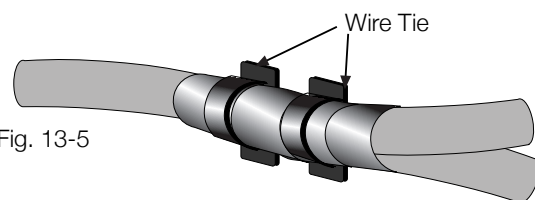
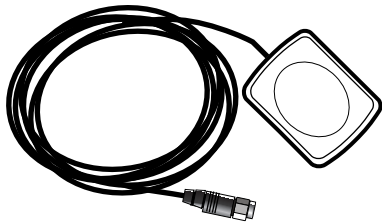


Fig. 13-5



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External GPS Antenna (Optional)



- 1) External antennas are generally only necessary if the V3™ GPS unit is enclosed in a radio signal interfering area (e.g. metallic box, under seats, on dashboards with flat windshields, and in cabs or cockpits constructed primarily from metallic material).
- 2) Follow all General Guidelines as specified on page 7.
- 3) May be magnetically mounted or mounted via optional aluminum plate and screw for non-magnetic surfaces, see Fig. 14-2.
- 4) Suggested installation point - centerline of vehicle roof, minimize cable run to prevent wind and carwash damage.
- 5) Ensure a clear antenna view of the open sky.
- 6) Maintain a minimum of 6 inches from any rooftop edge or ledge, see Fig. 14-1.
- 7) Drill, deburr, grommet, weather seal, cable thru hole as required. Drill hole size - 1/2" (.500"); grommet size - 3/8" (.375").

Note: For optimal system performance Zonar recommends rooftop mounting with a clear view of the sky.

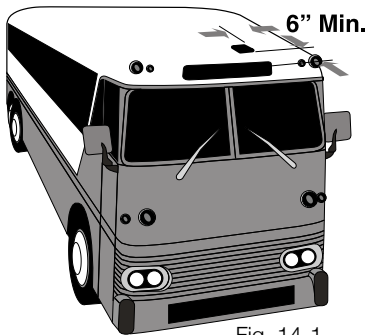


Fig. 14-1

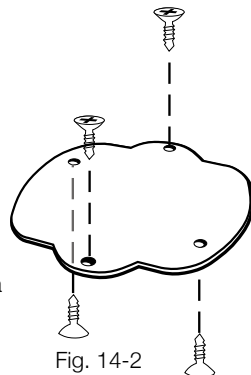
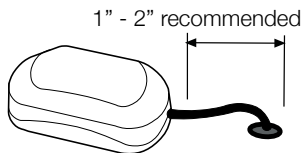


Fig. 14-2

Optional GPS Antenna
Mount Plate & Screws

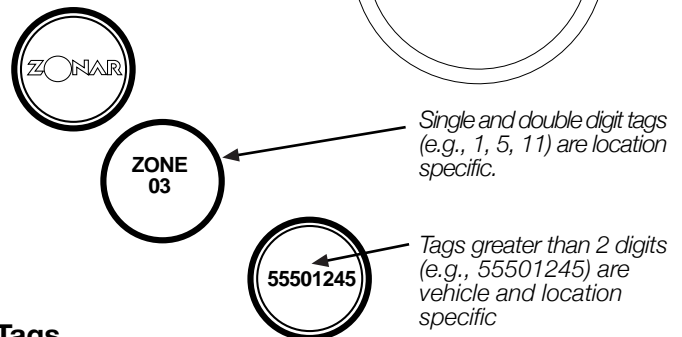
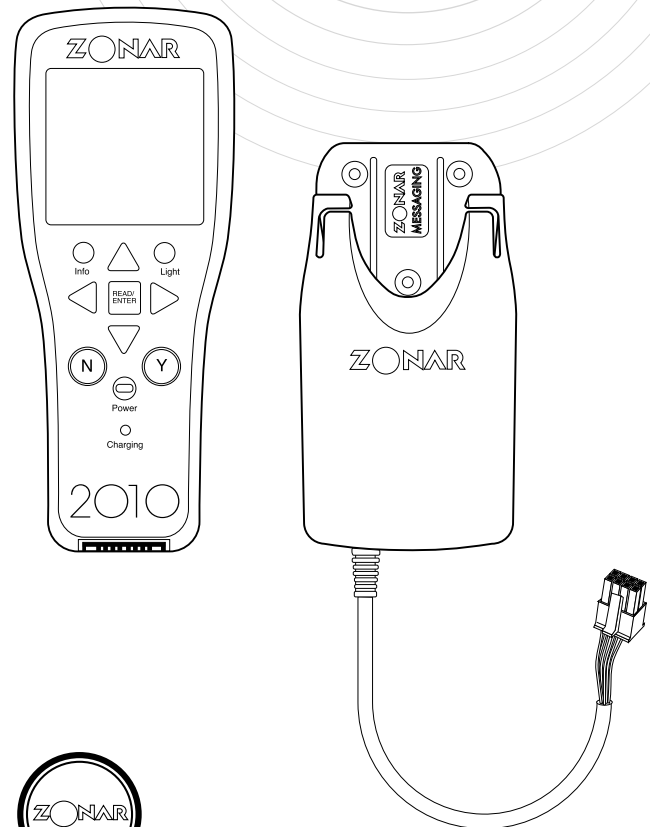
GPS VM (Vehicle Mount) and 2010

- 1) Follow all General Guidelines as specified on page 7.
- 2) Mount onto interior flat surface large enough to accommodate footprint.
- 3) Do not install below windows or doors which open to the vehicles exterior to prevent water damage.
- 4) Avoid mounting equipment in difficult to access areas.
- 5) Avoid mounting equipment in dirty, dusty, or damp areas (e.g. near floors and entrance ways).
- 6) Mount vertically to ensure good electrical connection between 2010 and VM.
- 7) Ensure 2010 unit can be easily inserted / removed without interference.
- 8) Mount high in vehicle; avoid driver's leg and arm rest areas. This also minimizes the chance of the mount being used as a holder for non Zonar equipment.(e.g. glasses, pens, pencils, etc.).
- 9) Retention (Adhesive or Screw):
 - A) Adhesive install part number 80133: Clean and dry the surface before placing the mounting plate. To obtain optimum adhesion, the surface must be clean and dry. The best surface cleaning solvent is an isopropyl alcohol/water mixture (rubbing alcohol). Remove the backing from the peel and stick. Press and hold mounting position for 10 seconds to assure good adhesion.

Note: Adhesive optional (not included in order). Use red rectangular adhesive if you deem necessary.
 - B) Screw install: **Only use Zonar supplied hardware.** Use of non Zonar screws generally leads to interference issues and scratching of the 2010 unit. Use preventative measures to capture & remove metallic chips that are created during the installation of self-tapping screws. Metallic chips may short the contact pins inside the Vehicle Mount (VM) that mate with the contact pins of the 2010.

Capture – Insert clean paper towel or clean shop towel dam inside VM when installing self-tapping screws. Carefully remove temporary dam to minimize the possibility of dropping metallic chips into the Vehicle Mount (VM).

Chip removal – After dam removal, follow-up with stick magnet (must be electrically insulated to prevent shorting pins), compressed canned air, or mini-vac to ensure no chips remain.
- 10) Drill, deburr and grommet cable thru hole as required.



Tags

- 1) Please refer to the Tag Location Installation Guide for tag number to vehicle zone information. If you cannot locate this document, please call Zonar Support toll free 1-877-843-3847
- 2) Whenever possible, avoid installing tags in cold/wet/damp conditions. Ideal application range is: 70°F to 100°F (21°C to 38°C)
- 3) Clean and dry the surface prior to placement. To obtain optimum adhesion, the surface must be clean and dry. The best surface cleaning solvent is an isopropyl alcohol/water mixture (rubbing alcohol). Remove the backing from the peel and stick. Press and hold mounting position for 10 seconds to assure good adhesion.
- 4) Consistency between vehicles is key to a professional installation. If you or the customer are unsure where to place any tag, call a Zonar Customer Service Representative for assistance prior to installation.
- 5) Minimum spacing between tags is 3" to reduce the likelihood of read interference



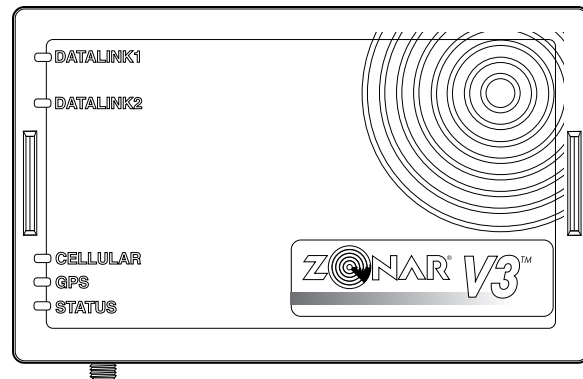
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System Check: Minimum Requirements - GPS

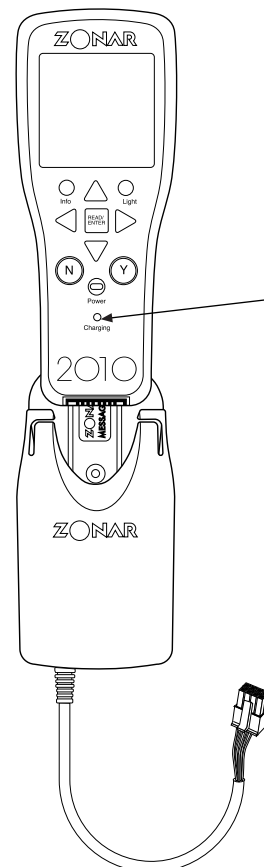
- 1) At a minimum, the installer must perform a "System Check" to verify proper installation
- 2) This procedure covers the minimum requirements for a system installer. If at all possible a full and complete checkout using Zonar's Ground Traffic Control™ website should be performed. Not all installers will have access to this area, check with a Zonar Customer Service representative if in doubt
- 3) Turn Key On/Engine running, within 2 minutes:
 - A) GPS Green LED: LED should be solid within 2 minutes or less. Blinking indicates acquiring satellites, Solid indicates satellite acquired. GPS antenna must have a clear view to sky. Do not proceed further until GPS LED is solid
 - i. Orange - Internal GPS antenna is being utilized
 - ii. Green - External GPS antenna is being utilized
 - B) GSM cellular Green LED: LED should be solid within 2 minutes. If blinking, ensure GSM antenna is secure, has a clear view to the sky and area has cellular coverage
 - C) STATUS Green LED: Solid
V3™ Model if blinking-
 - i. Check J3 connection at GPS unit and vehicle connector. Check integrated 4 Pin power pigtail at GPS unit
 - ii. If J3 cable and 4 Pin power pigtail check good, install stand alone 4 Pin power cable
 - D) Data Link1:
 - i. Single green blink 1 x per second if J1708/J1587 data is present.
 - ii. Single red blink per second if J1708/J1587 is not present.
 - E) Data Link2:
 - i. Single green blink 1 x per second if J1939 data is present
 - ii. Single red blink per second if J1939 is not present
- 4) Turn Key Off, within 2 minutes:
 - A) Data Link1: Disregard
 - B) Data Link2: Disregard
 - C) GSM Green LED: Disregard
 - D) GPS Green LED: Disregard
 - E) STATUS Green LED: Blinking (Solid may indicate a problem, check white lead. Call your Zonar Customer Service Representative if in doubt)
- 5) Turn key to accessory position with the engine off. Status LED must not be solid

Note 1: A proper and complete system/LED functional check requires the engine to be running

Note 2: Vehicles installed with non JBus cables (4 Pin power cable and lightduty/OBDII) require the vehicle to physically move at least 5 MPH for a distance of at least 100 feet to properly complete a new install checkout. If this is not performed GPS and discrete I/O data will not be present in GTC until those thresholds are met.



System Check – Minimum Requirements – 2010 / GPS Vehicle Mount



- 1) Insert 2010 RFID Reader into GPS-VM (Vehicle Mount)
- 2) Ensure 2010 "Charging" indicator (located below power button on 2010) illuminates Green, a slight delay is normal
- 3) See page 17 "EVIR System Checkout" for additional requirements



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Customer:	Yard:	Date:	Asset #:
Installer:	Location:	GPS ID:	
Vehicle Odometer Value:	Vehicle I.D. (e.g., Vin, Plate#, Make, Model, Year)		
Vehicle Hour Meter value (if monitoring engine hours)			

System Check	Yes/No	Notes
General Layout		
General condition - components level, even, straight, etc?		
System layout conforms to your established standard?		
Clearance check - Vehicle Mount to 2010 Hand Held?		
Drilling and Cutting		
All drill holes grommited (or otherwise protected), deburred, sealed (weather penetrations only)		
All chips captured?		
Vehicle Mount vacuumed and visually verified to be free of drill chips or other debris?		
Cable Management		
All cables properly ran (no tight radius, no interference, strain relieved, supported, service looped)?		
Electrical		
System hookup complies to your established standard?		
Red lead voltage verified? (12V constant)		
White lead voltage verified? Engine on-12V, engine off-OV, key-accessory position with engine off-OV		
Black lead continuity verified? (Grounded to vehicle chassis)		
Verify crimp integrity?		
Verify fuse holder and fuse installation?		
GPS/J3 System checkout		
GPS/J3 LED light check? (engine on/engine off) (key in accessory position)		
Verify GPS position uploaded to GTC website?*		
EVIR® System checkout		
Asset tag verification scan		
Zone tag verification scan? (2010 display = physical location)		
Inspection properly uploaded to GTC?		
Post Job		
Key accounted for?		
Vehicle secure?		
Lights, electrical off?		
All debris, refuse, chips removed?		

**For 4 Pin or OBDII installed vehicles: Requires vehicle to physically move at least 5 MPH for at least 100 feet to properly complete new install checkout. If this is not performed GPS and discrete IO data will not be present in GTC until those thresholds are met*

INSTALLER SIGNATURE

Date



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Important Notice

It is the Owner's sole responsibility to install and use the Zonar products in a manner that will not cause accidents, personal injury or property damage. For the purposes of this notice, "Owner", "you" and "your" means the party (including any person authorized by that party to use and/or install the Product) that has either: (a) purchased the Product; or (b) leased the Product from Zonar Systems, Inc or its related companies. The Owner of this product is solely responsible for observing safe driving practices. The choice, location, and installation of all components of the Product is critical. If installation is not correct, the Product may not perform at its designed potential or specifications. If in doubt, consult your vehicle's manufacturer.

System Specifications

V3™

- Operating Temp -40C to +85C
- DC Input range, 8Vdc to 30Vdc

GPS Receiver

- Hybrid GPS/SBAS engine (WAAS, EGNOS, MSAS)
- Very high sensitivity receiver
- Rapid acquisition of satellites
- GPS signal acquisition, tracking and navigation
- On board GPS data storage

GSM/GPRS Transceiver

- GSM (2G) 850/900/1800/1900 MHz
- WCDMA (3G) 850/1900 MHz

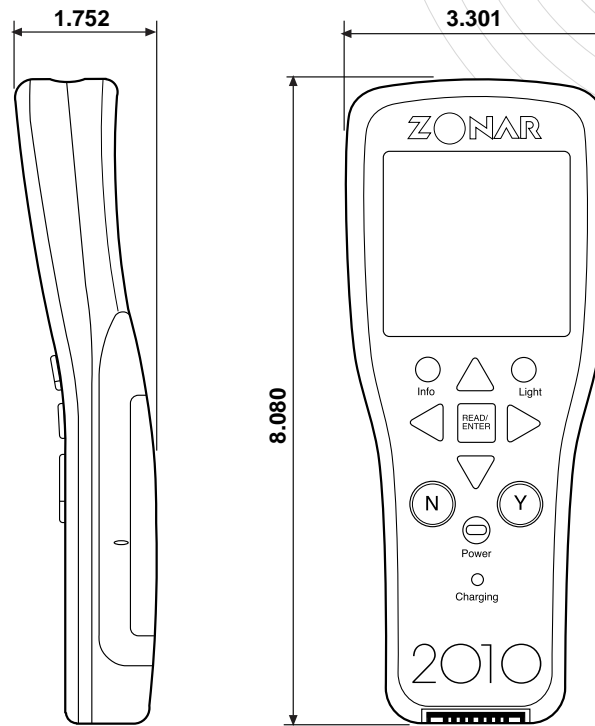
Approved External GPS Antennas

- San Jose SM-19 - GPS

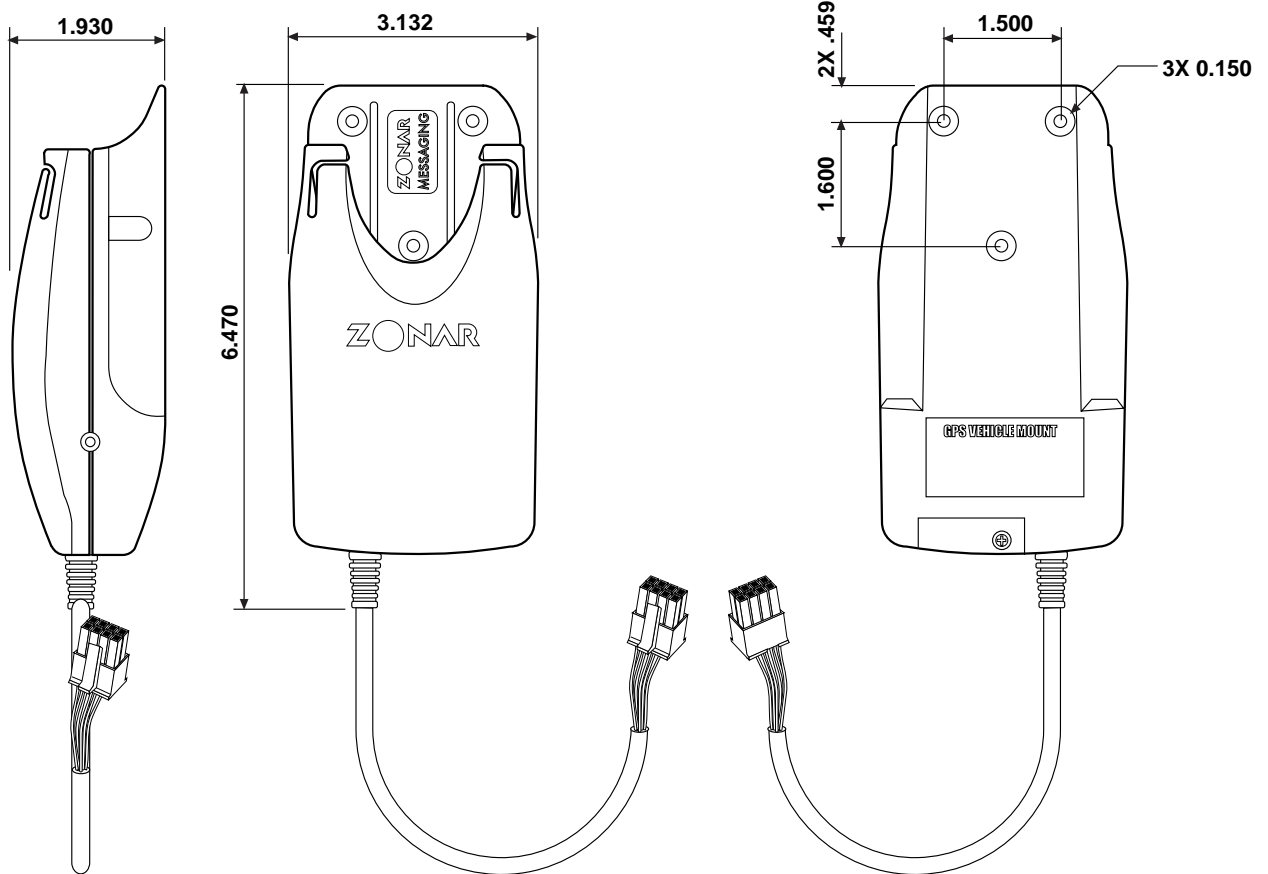


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2010 READER



VEHICLE MOUNT

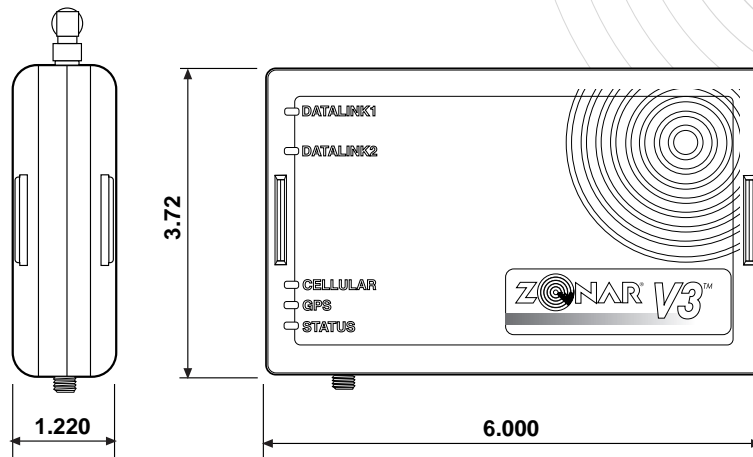


DIMENSIONS IN INCHES

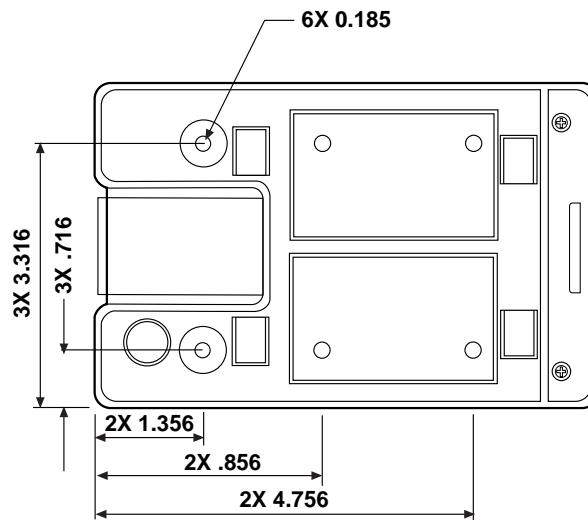
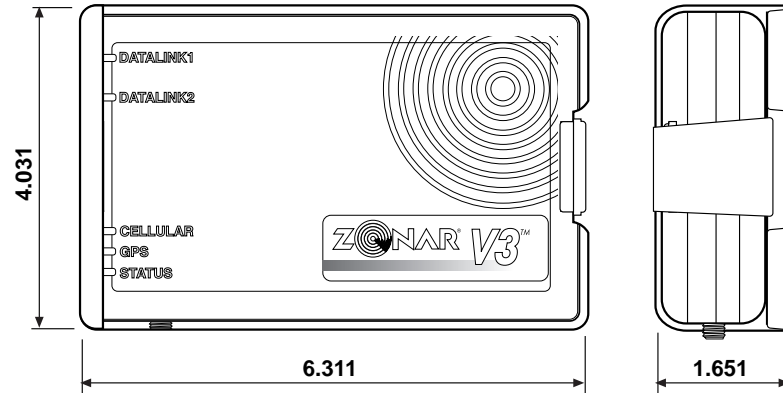


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V3™



V3™ MOUNT



DIMENSIONS IN INCHES

Typical Installation

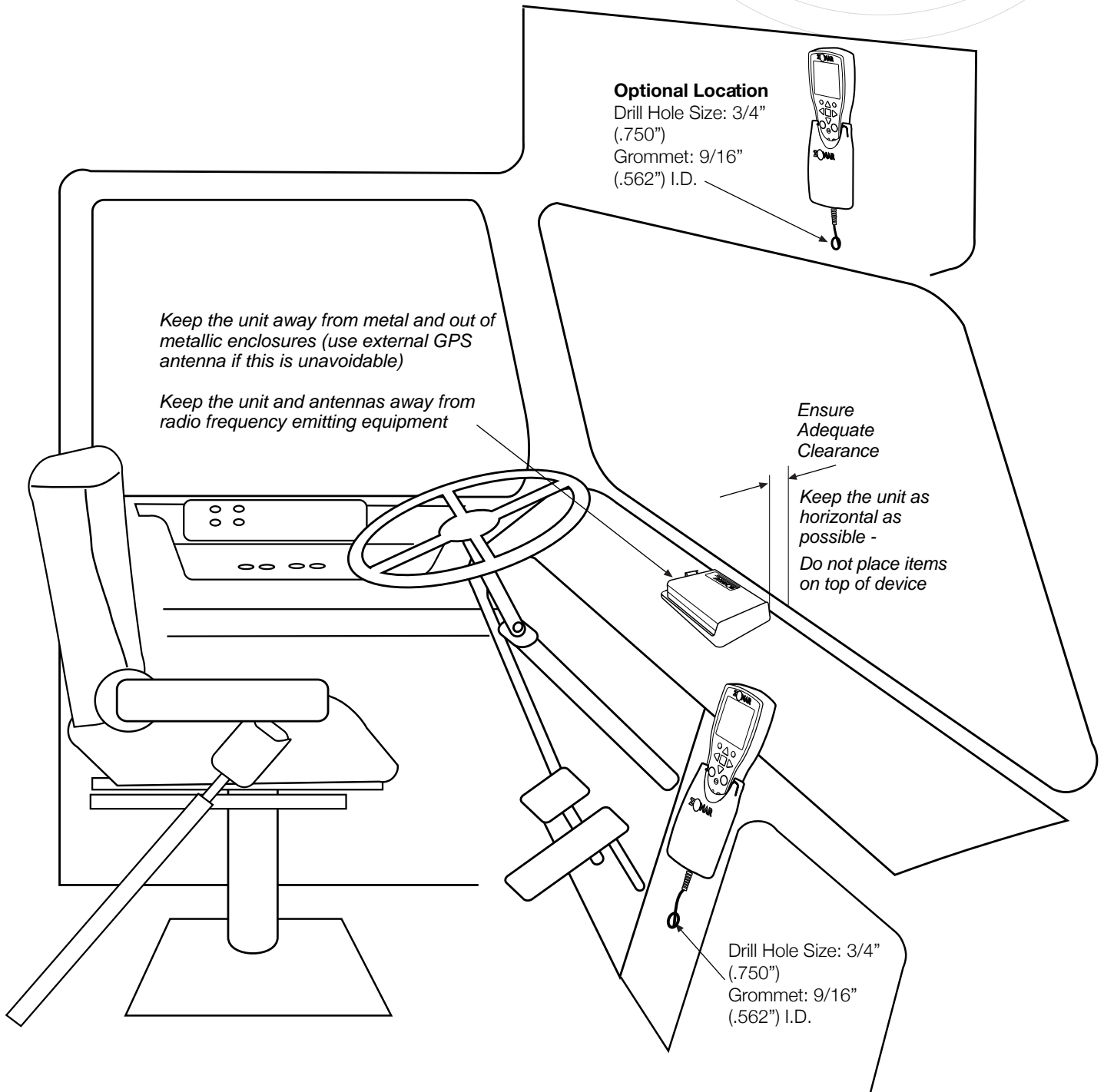
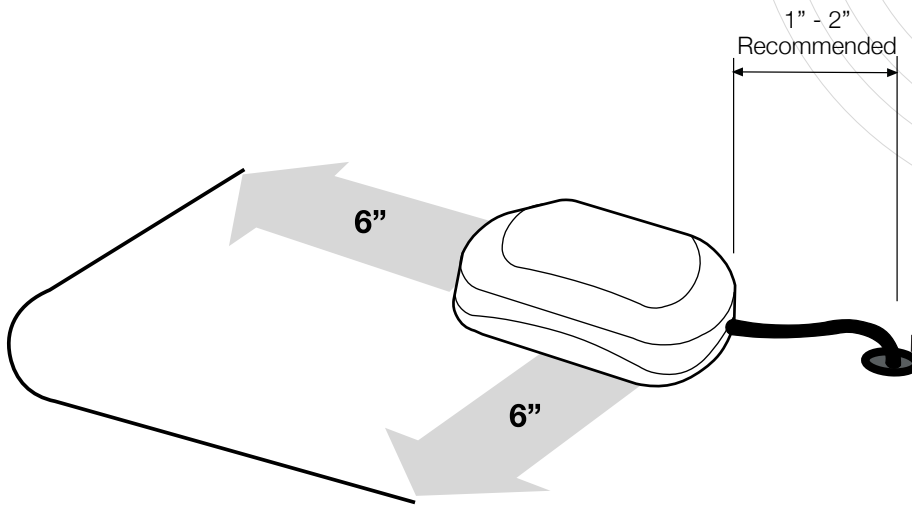
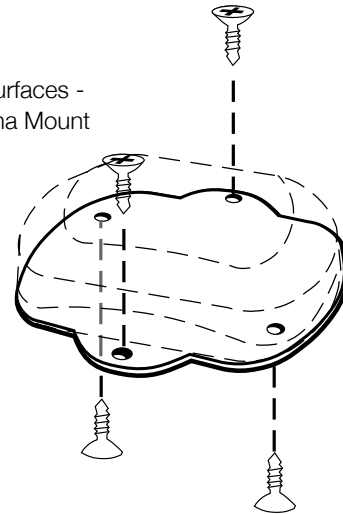


Fig. 21-1



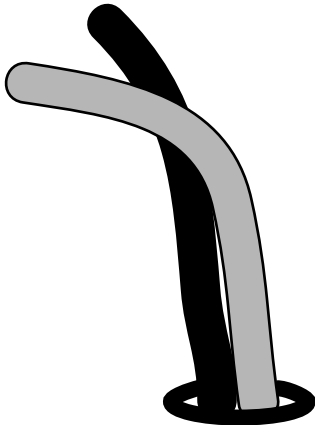
- Allow a minimum of 6 inches from any edge or ledge
- Drill hole size: 1/2" (.500")
- Grommet 3/8" (.375") I.D.
- Drill, deburr, grommet, weather seal, cable thru hole as required

For Non-Magnetic Surfaces -
Optional GPS Antenna Mount
Plate & Screws



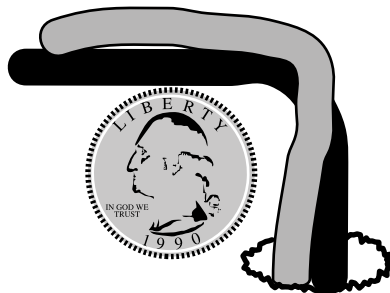
CORRECT

- Bend radius adequate
- Hole has grommet

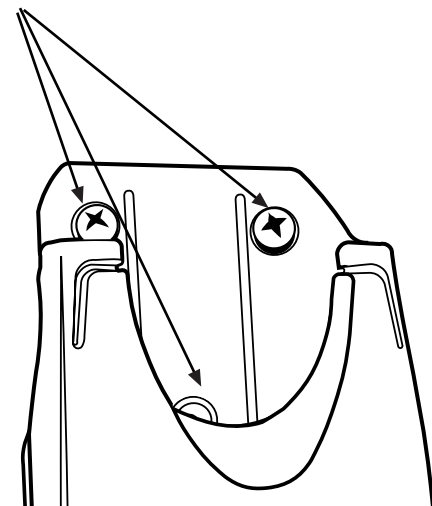


INCORRECT

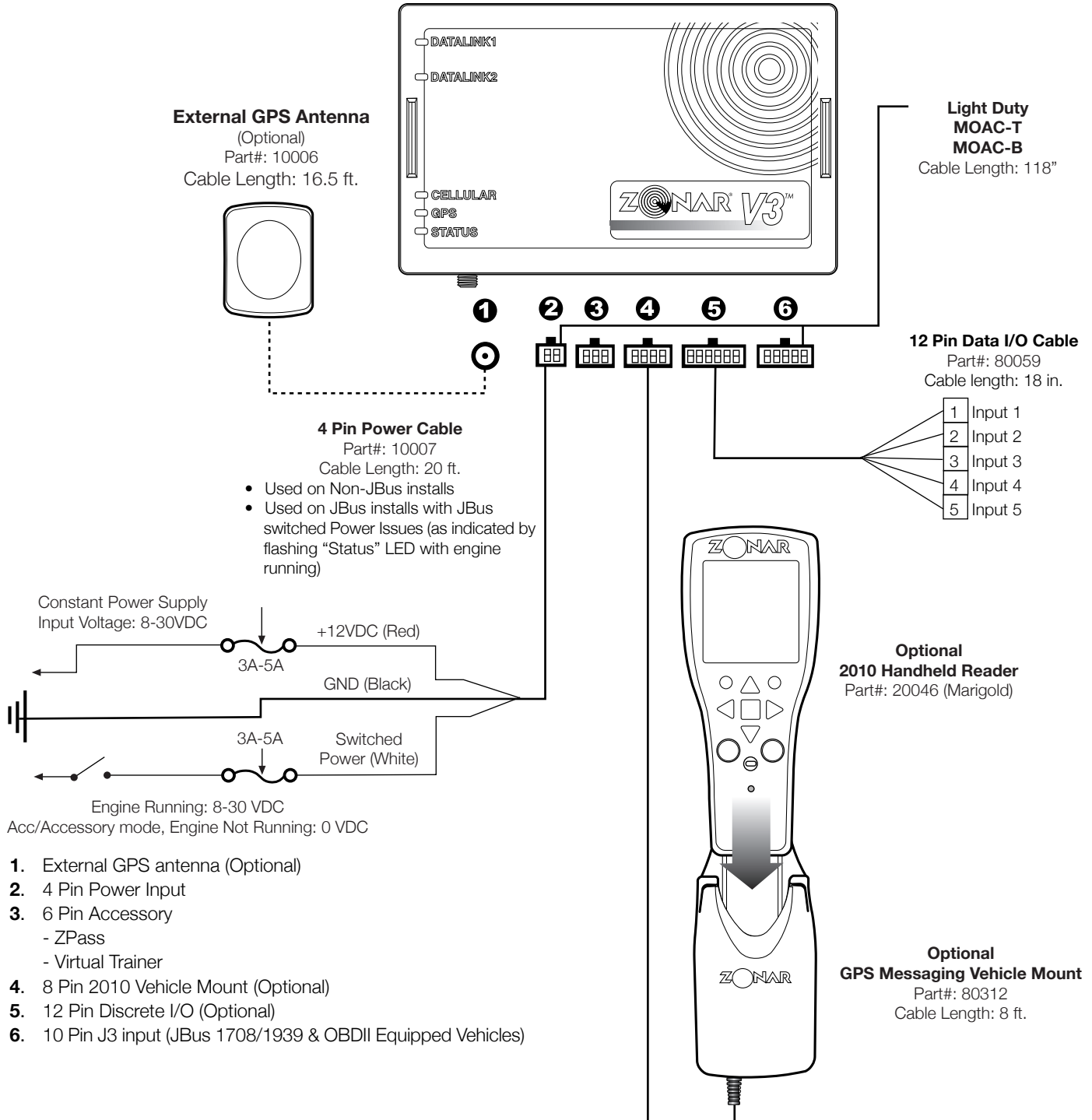
- Bend radius too tight
- Hole has sharp edges
- Hole has no grommet



- Use Zonar supplied screws to prevent scratches to 2010



Zonar V3™
Part#: 10079



External GPS Antenna
(Optional)
Part#: 10006
Cable Length: 16.5 ft.

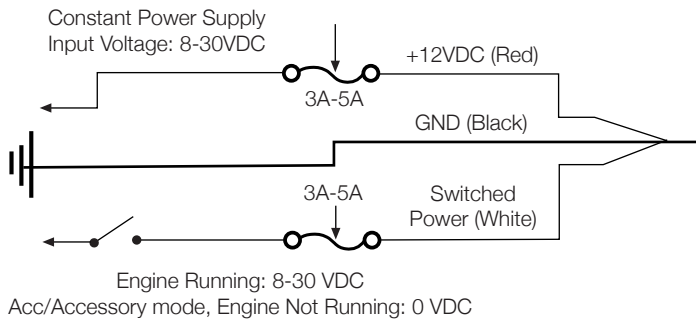
Light Duty MOAC-T MOAC-B
Cable Length: 118"

4 Pin Power Cable
Part#: 10007
Cable Length: 20 ft.

- Used on Non-JBus installs
- Used on JBus installs with JBus switched Power Issues (as indicated by flashing "Status" LED with engine running)

12 Pin Data I/O Cable
Part#: 80059
Cable length: 18 in.

- 1 Input 1
- 2 Input 2
- 3 Input 3
- 4 Input 4
- 5 Input 5



1. External GPS antenna (Optional)
2. 4 Pin Power Input
3. 6 Pin Accessory
 - ZPass
 - Virtual Trainer
4. 8 Pin 2010 Vehicle Mount (Optional)
5. 12 Pin Discrete I/O (Optional)
6. 10 Pin J3 input (JBus 1708/1939 & OBDII Equipped Vehicles)

Optional 2010 Handheld Reader
Part#: 20046 (Marigold)

Optional GPS Messaging Vehicle Mount
Part#: 80312
Cable Length: 8 ft.

Fig. 23-1

Zonar Discrete I/O System

The purpose of this schematic is to tap onto an existing switched device control circuit if the voltage requirement (8 to 30VDC) is sufficient.



WARNING:

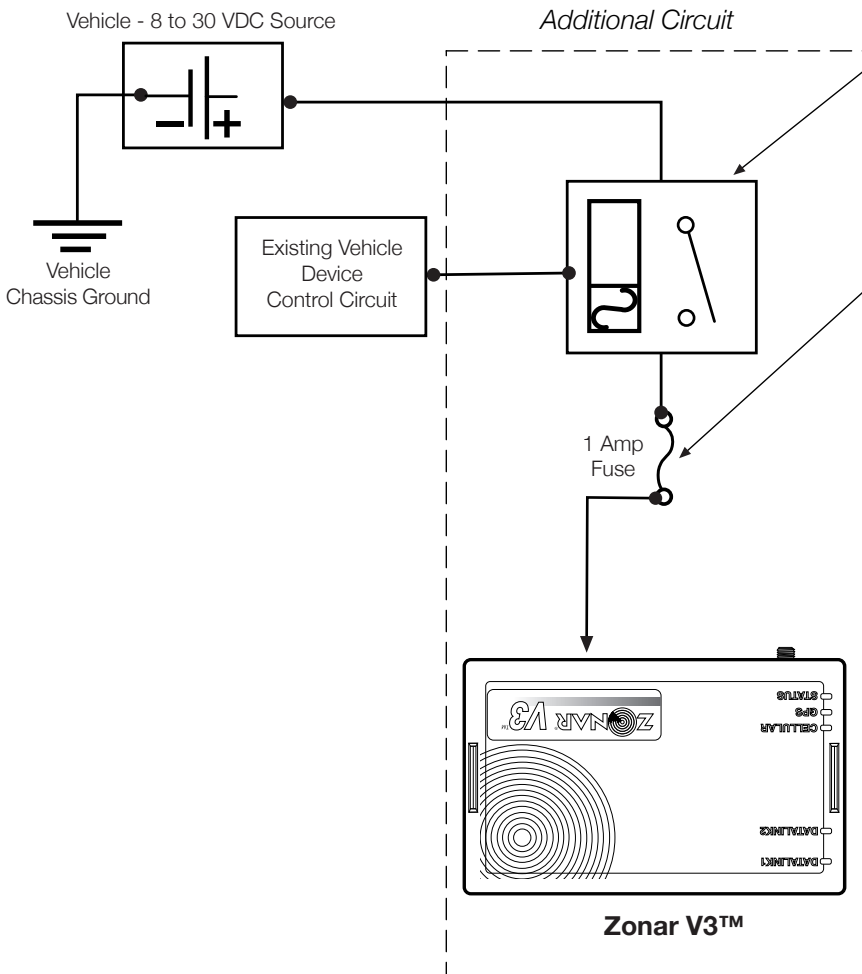
Observe all general and specific warnings in regards to electrical installations at the beginning of this guide.

When in doubt consult the specific vehicles manufacturer for electrical installation instructions.

Do not connect to multiplex wiring.

Zonar 18" Discrete I/O Wiring Details

- 5 Inputs (depending on application, all inputs may not be used)
- 20 AWG wire gauge



When the existing device circuit activation falls outside of the power requirements (8 to 30VDC for the discrete I/O input, a relay may be added to adapt and activate the I/O inputs correctly.

Optional Fuse (Not Supplied)

Note: The monitored vehicle circuit should always be electrically protected. In the event this circuit is not properly electrically protected, install 1 Amp fuse as indicated to the left. Electrical fuses should be installed as close as possible to the source of power.

Notes:

- 1) Suggested uses -
Door: Open/Closed
Plow: Up/Down
PTO: On/Off
Sweeper: On/Off
Light: On/Off
Arm: In/Out
- 2) Do not connect to pulsing, flashing, or high cycle circuits (e.g., Flashers, Foot Brake, Turn Signals). Doing so may result in higher data rate fees.
- 3) Do not connect to sub-3 second cycling circuits.
- 4) Activity states: 0 Volts (Normally - Stowed, Off, Retracted), 8-30 Volts (Temporarily - Deployed, On, Extended).
- 5) Route all cables and wiring away from high voltage and RFI circuits. These may induce false signals.

Fig. 24-1



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Zonar Discrete I/O System

The purpose of this schematic is to add a relay controlled by the existing vehicle controlled circuit such that it enables the correct voltage to the discrete I/O inputs.



WARNING:

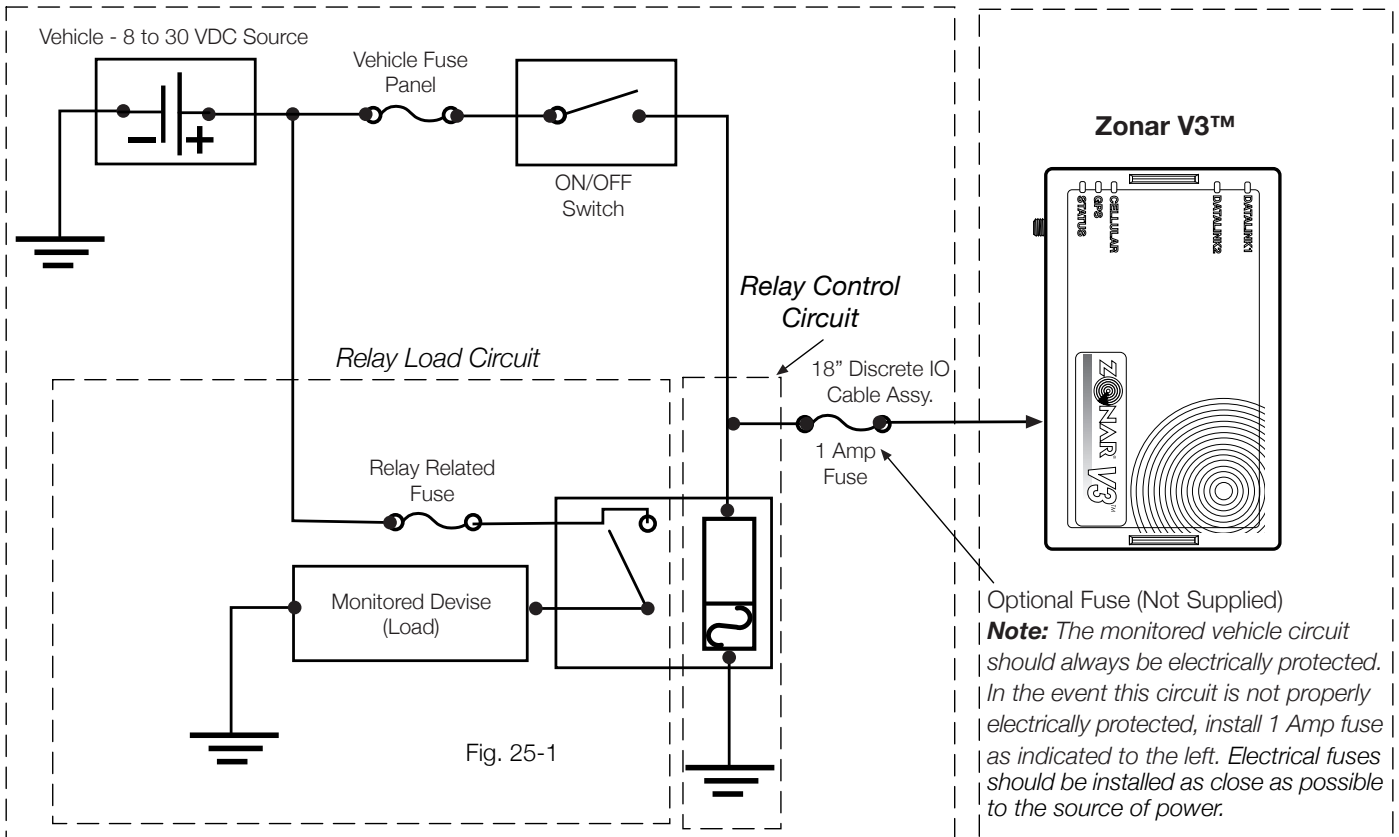
Observe all general and specific warnings in regards to electrical installations at the beginning of this guide.

When in doubt consult the specific vehicles manufacturer for electrical installation instructions.

Do not connect to multiplex wiring. Existing Circuit

Zonar 18" Discrete I/O Wiring Details

- 5 Inputs (depending on application, all inputs may not be used)
- 20 AWG wire gauge



Notes:

- 1) Suggested uses -
Door: Open/Closed
Plow: Up/Down
PTO: On/Off
Sweeper: On/Off
Light: On/Off
Arm: In/Out
- 2) Do not connect to pulsing, flashing, or high cycle circuits (e.g., Flashers, Foot Brake, Turn Signals). Doing so may result in higher data rate fees.
- 3) Do not connect to sub-3 second cycling circuits.
- 4) Activity states: 0 Volts (Normally - Stowed, Off, Retracted), 8-30 Volts (Temporarily - Deployed, On, Extended).
- 5) Route all cables and wiring away from high voltage and RFI circuits. These may induce false signals.



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Limited Warranty

LIMITED WARRANTY: Zonar warrants that the Hardware provided under this agreement is free from all material defects in workmanship under normal use and service. Zonar's warranty period for its Hardware is as follows:

- V3 Product Line - 5 Years
- EVIRTM - 3 Years
- All Other Hardware - 1 Year

The above warranty periods run from the date of shipment. Provided that the Hardware is used and handled as intended, Zonar will replace any failed or functionally impaired Hardware with equivalent Hardware in terms of performance and functionality.

This warranty does not apply to any Hardware that has been misused, altered, willfully abused or that has been damaged due to improper installation by the customer. † Hardware installations must follow Zonar's equipment specific installation guidelines. † If product returned is determined to be damaged due to any of the aforementioned circumstances, the Customer will be charged the price of a refurbished unit plus shipping and handling.

CUSTOMER'S SOLE AND EXCLUSIVE REMEDY AND ZONAR'S ENTIRE OBLIGATION UNDER THESE LIMITED WARRANTIES for defective equipment is the repair and replacement of the equipment free of charge by Zonar. Zonar shall not be liable to Customer or any third party for any general, special, punitive, incidental, indirect or consequential damages, or any lost profits or business, arising out of Zonar's Subscription Agreement.



FCC Compliance Statement (Part 15.19) IC Compliance Statement (RSS-210)

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada (IC). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.



Warning: (Part 15.21)

Changes or modifications not expressly approved by Zonar Systems could void the user's authority to operate the equipment.



Caution: RF Exposure (OET Bulletin 65)

To comply with FCC RF exposure requirements for mobile transmitting devices, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20cm (8 Inches) from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Use only supplied and approved antenna's. Use of unauthorized antenna's or modifications could impair signal quality, void your warranty and/or result in violation of FCC regulations.



Industry Canada Compliance Statements

"This device has been designed to operate with an antenna having a maximum gain of [5] dB. Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is [50] ohms."

"To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication."

"The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website, www.hc-sc.gc.ca/rpb."

