Fleet Resource Manager In-Vehicle Device

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Installation Guide

Fleet Resource Manager In-Vehicle Device

VOIG0110

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VS-4500

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Product Safety Information

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Application Information

Fleet Resource Manager Packages		VS-4500	Internet Data Terminal	Forward Looking Radar	Driver Interface Unit	Antenna Cell/GPS	Antenna Satellite
	Basic Package	X				X	Optional
Driver Behavior	Performance	X				X	
	Safety (featuring VORAD)	X		X	X	X	
Fleet Health	Basic Diagnostics	X				X	
	Advanced Diagnostics	X				X	
Value Package	On-Highway Package	X	X			X	
	Construction Package	X				X	

VS-4500 Wireless Configuration

Select the wireless configuration of the VS-4500.

	Cellular Provider				Wi-Fi Type			Satellite
In-Vehicle Device	Verizon	Cingular	Sprint	ALLTEL	802.11	Bluetooth	ZigBee	Satellite
VS-4500								

Refer to “Antenna Type and Location” section for help with selecting the proper antenna for your vehicle.

Note: Wi-Fi and Satellite functionality is optional.

Installation Tools

Recommended Tools

- Basic Hand Tools

Reference Literature

- Installation Guide - VOIG0110
- Safety Package (featuring VORAD)
  - Installation Guide - VOIG0100
  - Troubleshooting Guide - VOTS0100
  - Service Manual - VOSM0100
  - Driver Instructions - VODR0100

Reference Drawings

- VS-4500 - VSDR-001-G
- Antenna - TBD
- Satellite - TBD

For more information within the U.S., Canada, and Mexico call 1-800-826-HELP (4357), or contact a local OEM dealer.

FCC RF Exposure Information

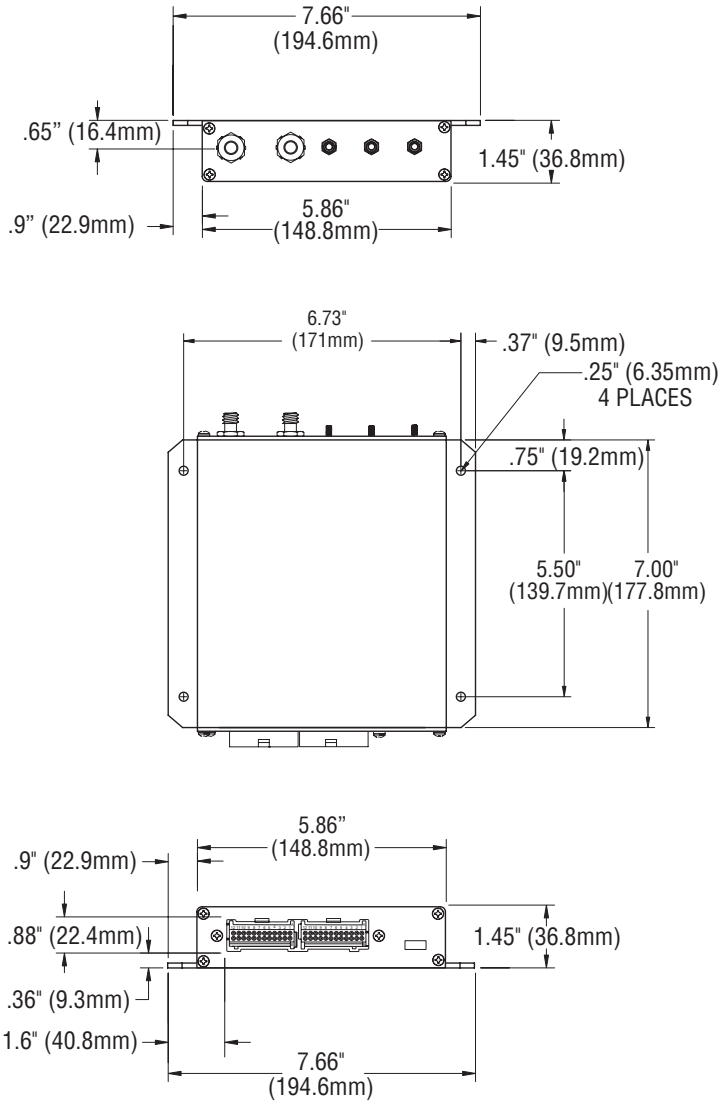
Warning: The antenna supplied with this device must be used for installation and operation. Substitution of other antennas must be approved by the manufacturer for compliance to radiation safety limits. The mounting of this device and antenna must be done by professional installers to ensure that the user or nearby persons will maintain at least 20 cm from the antenna in normal use.

Cautions: All persons must maintain a separation distance at least 20 cm from modem antenna when transmitter is operating to meet FCC RF exposure requirements.

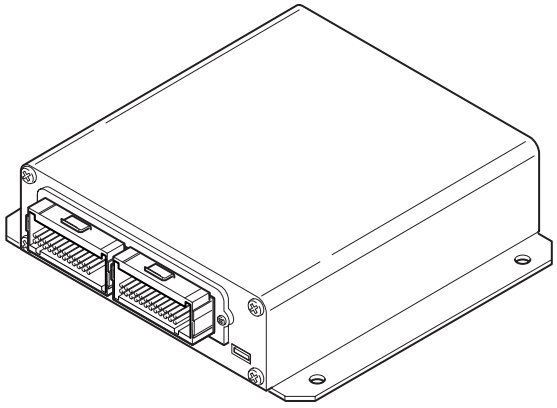
Space Claim

VS-4500 Dimensions

Note: All dimensions ± .010” (.25mm)

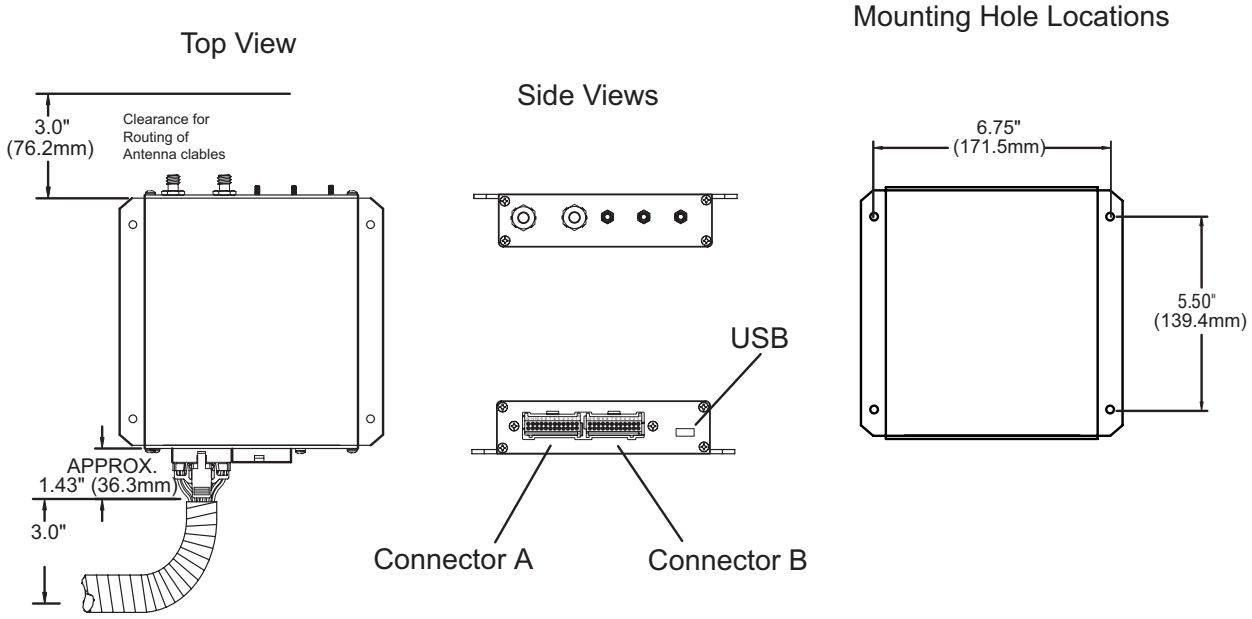


Mounting Requirements - VS-4500

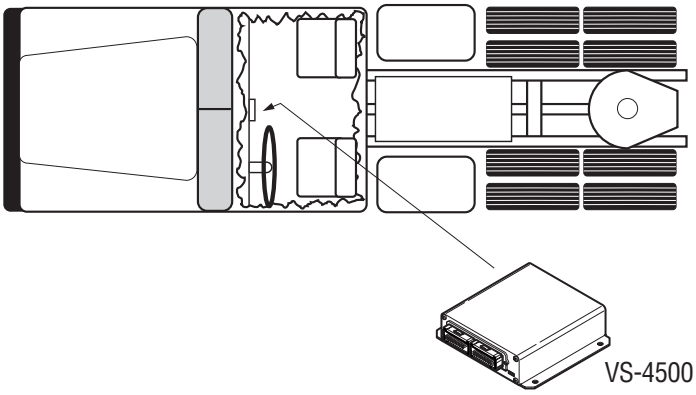


The VS-4500 wireless in-vehicle device uses GPS data to automatically determine location, driving direction, and speed then communicates that data to each fleet manager's PC.

Mounting Orientation



Typical Component Locations



Installation

The optional VS-4500 may be mounted in a variety of locations in the cab depending on preference. If the cab already has been designed for the VORAD® EVT-300 CPU, the VS-4500 may be mounted in the same location since the mounting footprint is identical, as long as the clearance requirements are met for the new connectors and harnesses.

Note: There are no "orientation" requirements for the VS-4500 like there are for the EVT-300 CPU.

Installation of the VS-4500 involves drilling four (4) mounting holes. Proceed as follows:

1. Locate the unit on a stable, vibration-free surface.
2. Position a template (if used), otherwise, use the VS-4500 as a guide.

Note: Before drilling, check for any wiring, hoses, or components that may be damaged by drilling and/or mounting hardware.

3. Drill four (4) holes using a 1/8" bit with a drill stop set for minimum depth.
4. Install to the mounting surface, using four (4) #10 star washers and four (4) #10 x 3/4" self-tapping screws.

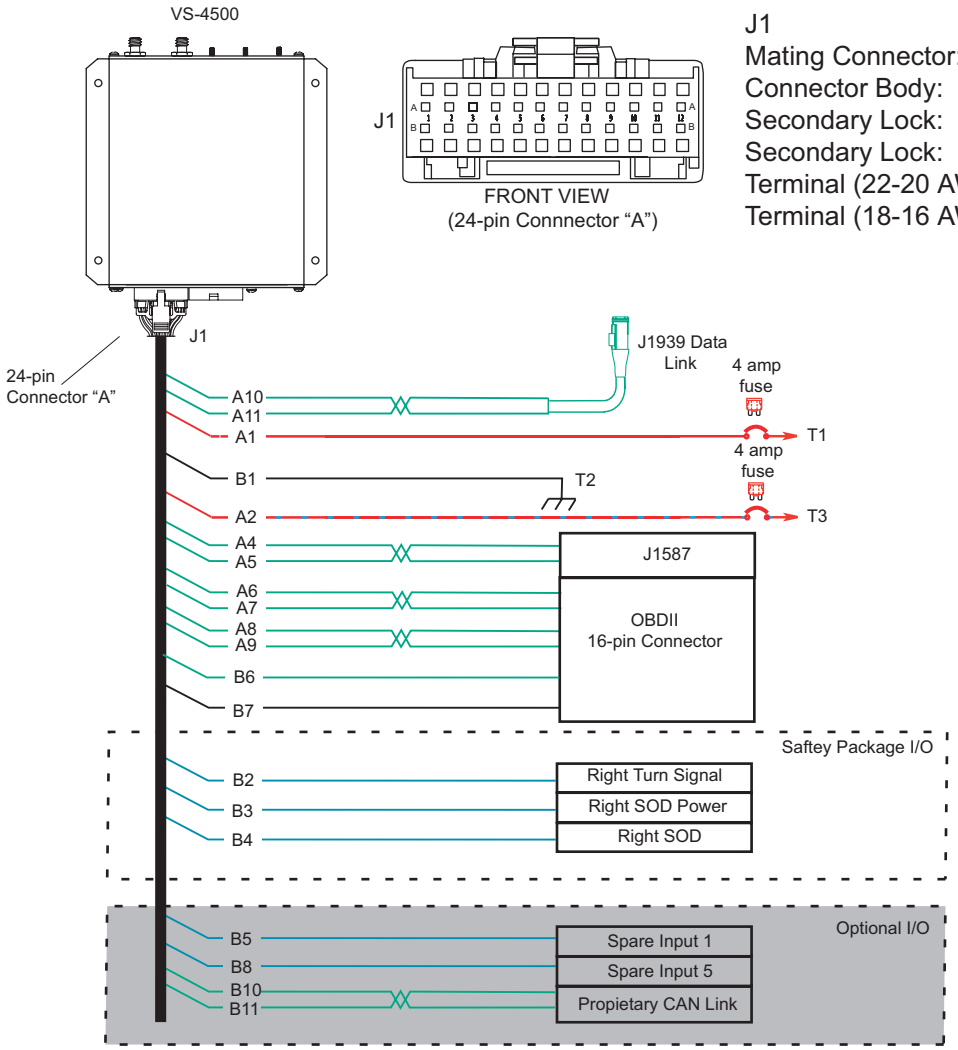
Alternative: Install using four (4) 1/8" screws, washers, and nuts.

Electrical Requirements - VS-4500

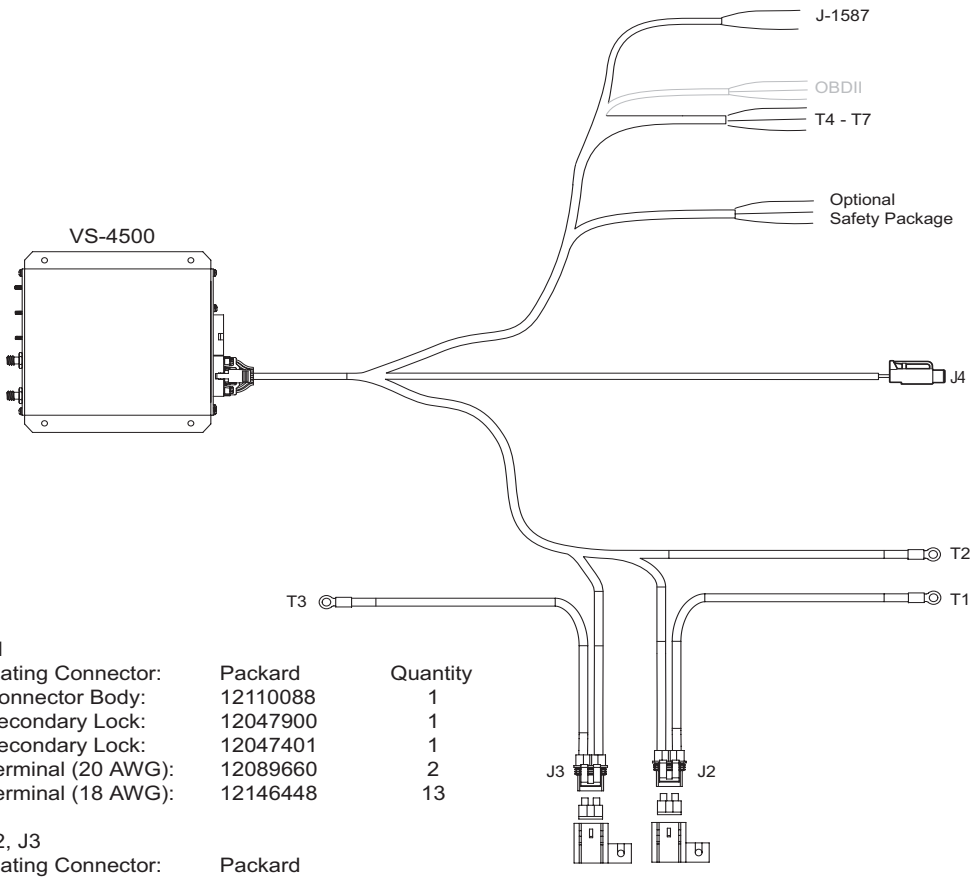
Power Requirements

- Operating Voltage: +9-32Vdc
- Power current: < 2 amps (average 1 amp)
- Recommended Fuse: 4 amp

Wiring Schematics



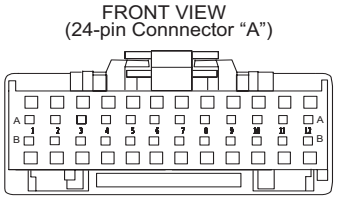
Wiring Harness



J1		
Mating Connector:	Packard	Quantity
Connector Body:	12110088	1
Secondary Lock:	12047900	1
Secondary Lock:	12047401	1
Terminal (20 AWG):	12089660	2
Terminal (18 AWG):	12146448	13

J2, J3		
Mating Connector:	Packard	
Connector Body:	12033769	1
Cover:	12033731	1
Terrminal:	12020156	2
4 Amp Fuse:	257004	1

J4		
Mating Connector:	Deutsch	
Connector Body:	DTM06-2S	1
Wedge:	WM-2S	1
Socket:	0462-201-20141	2

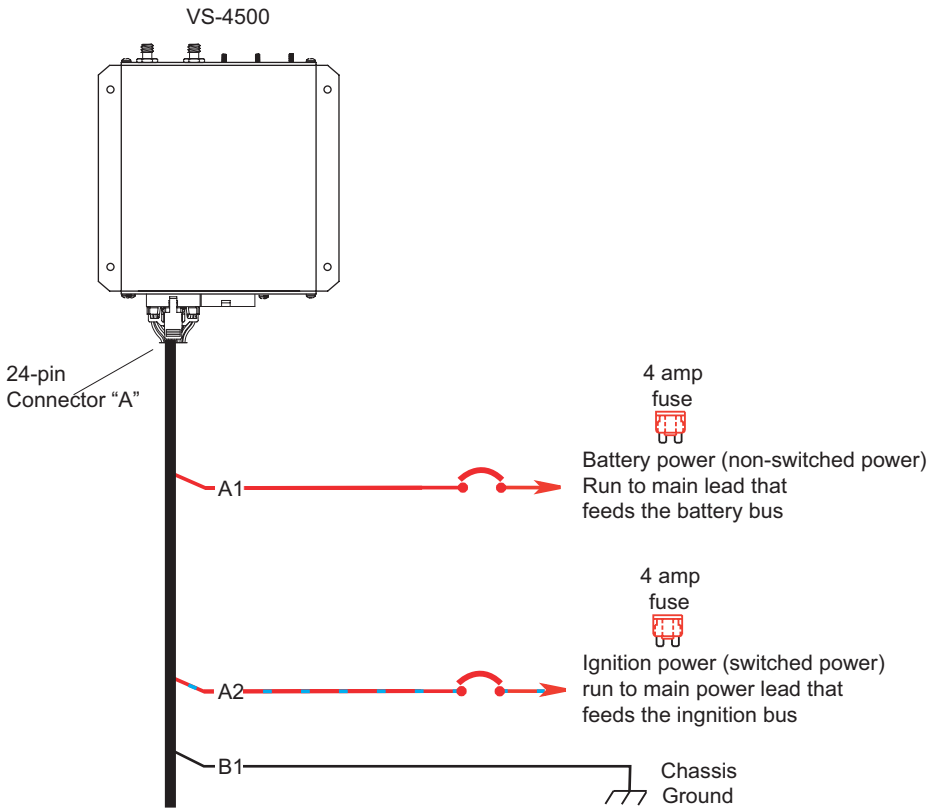


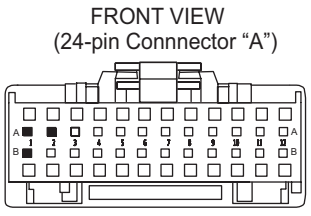
Notes:
All wires to be cross link GXL or equivalent unless otherwise specified.
Use approved J1939 cable.

Connector “A”

Cavity	Signal Name	Interface Lefel
A1	+Battery	+9-32 VDC NON-SWITCHED
A2	Ignition	+9-32 VDC SWITCHED
A3	+ Battery Backup	Isolated Battery
A4	J1587 +	Truck J1708 Link
A5	J1587 -	Truck J1708 Link
A6	J1850 +	OBDII
A7	J1850 -	OBDII
A8	ISO9141_2L	OBDII
A9	ISO9141_2K	OBDII
A10	CAN_HI	Truck J1939 Link
A11	CAN_LO	Truck J1939 Link
A12	J1939 Shield	Truck J1939 Link
B1	Ground	Chassis Ground
B2	Input 1	Right Turn Signal
B3	Input 2	Side Object Detection Sensor Vref
B4	Input 3	Side Object Detection Sensor Comm
B5	Input 4	Spare Input HI
B6	GM_CAN	J2411 SWC
B7	GM_CAN_GND	Chassis Ground
B8	Input 5	Spare Input LO
B9	--	--
B10	CAN_HI	Proprietary Link
B11	CAN_LO	Proprietary Link
B12	CAN Shield	Proprietary Link

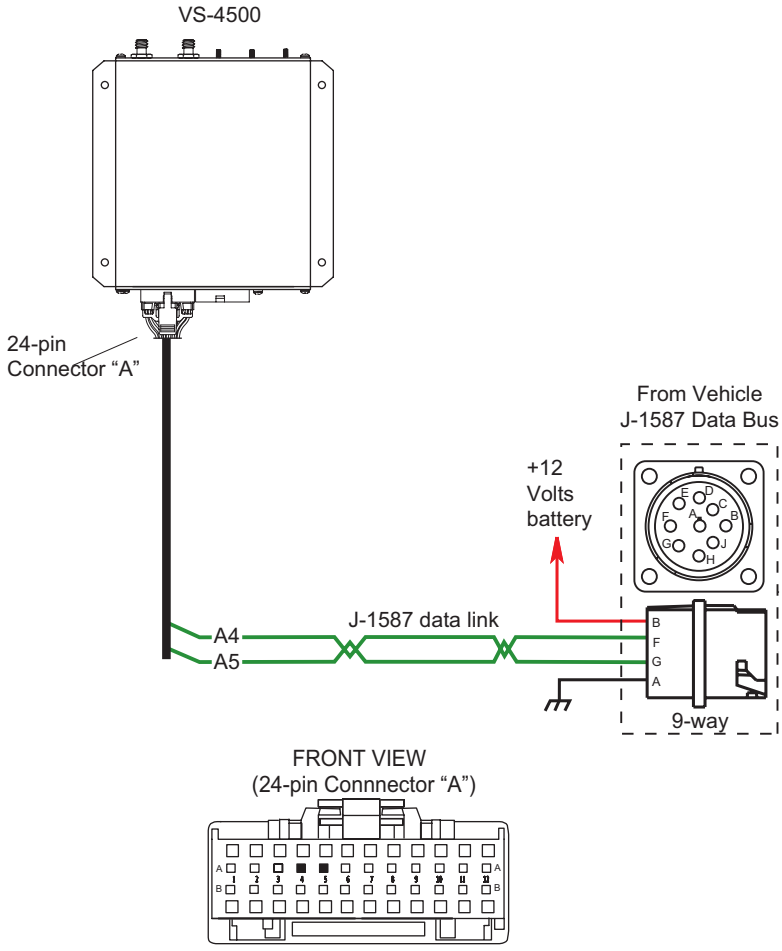
Power and Ground





Pin #	Description
J1-A1	+9-32VDC Non-Switched
J1-A2	+9-32VDC Switched
J1-B1	Chassis Ground

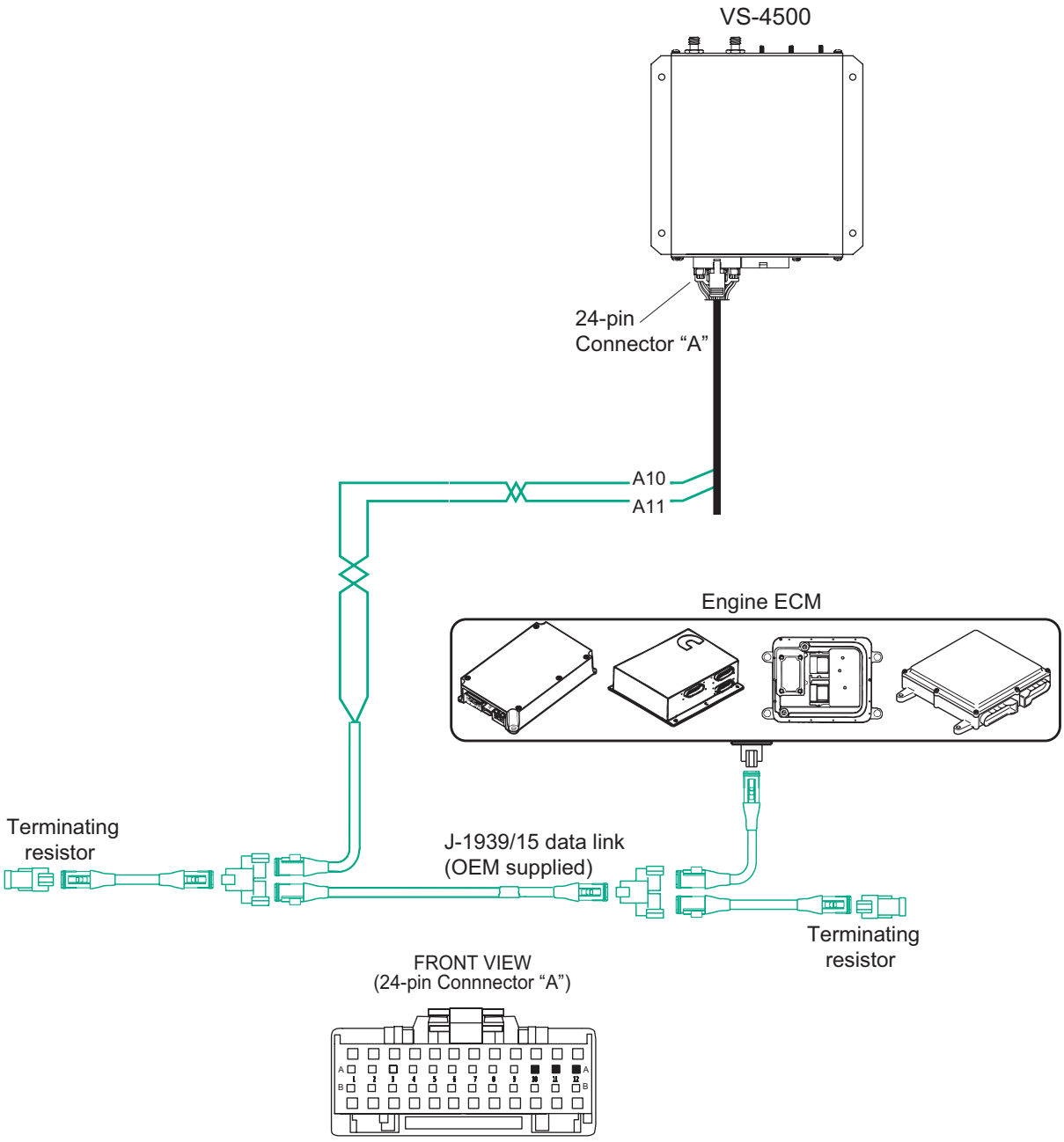
J1587



Note: Splice into existing J1587 data link on the vehicle.

Pin #	Description
J1-A4	J1587+
J1-A5	J1587-

J1939

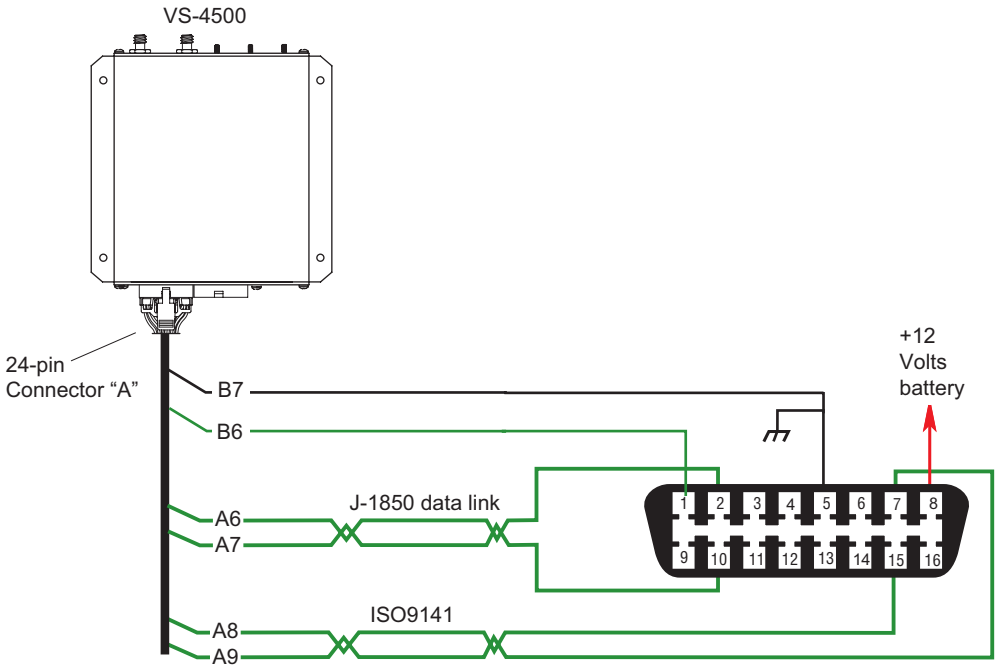


Note: The illustration above shows J1939/11, however J1939/15 (2-wire) can be used.

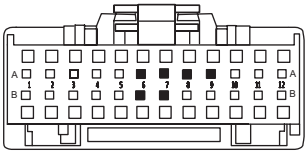
Pin #	Description
J1-A10	J1939+
J1-A11	J1939-
J1-A12	J1939_SHIELD (J1939/11 only)

OBDII

Note: For Class 1-4 or vehicles equipped with OBDII Data Bus.



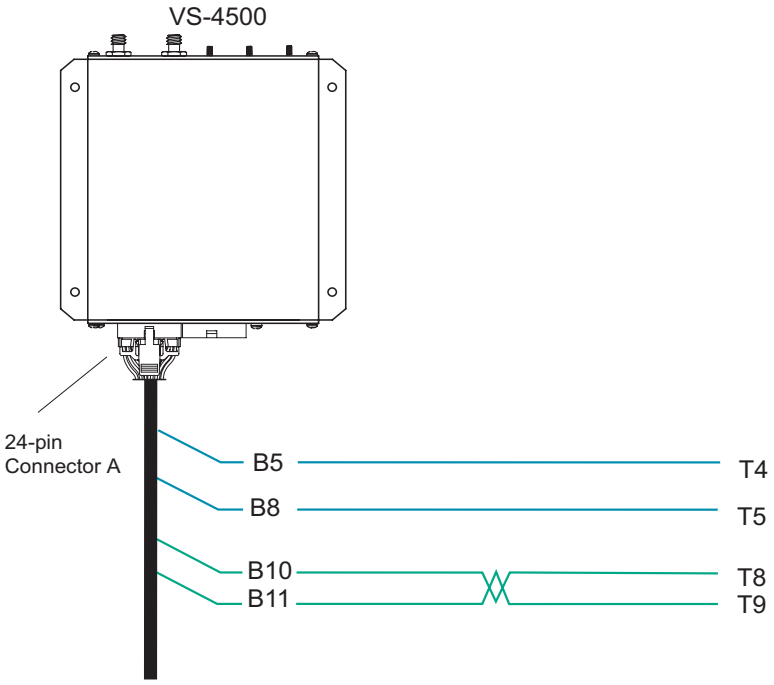
FRONT VIEW
(24-pin Connnector “A”)

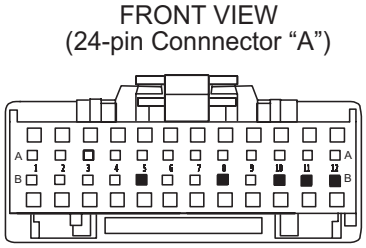


Pin #	Description
J1-A6	J-1850 +
J1-A7	J-1850 -
J1-A8	ISO 9141_2L
J1-A9	ISO 9141_2K
J1-B6	J2411 SWC
J1-B7	Chassis Ground

Spare I/O (optional)

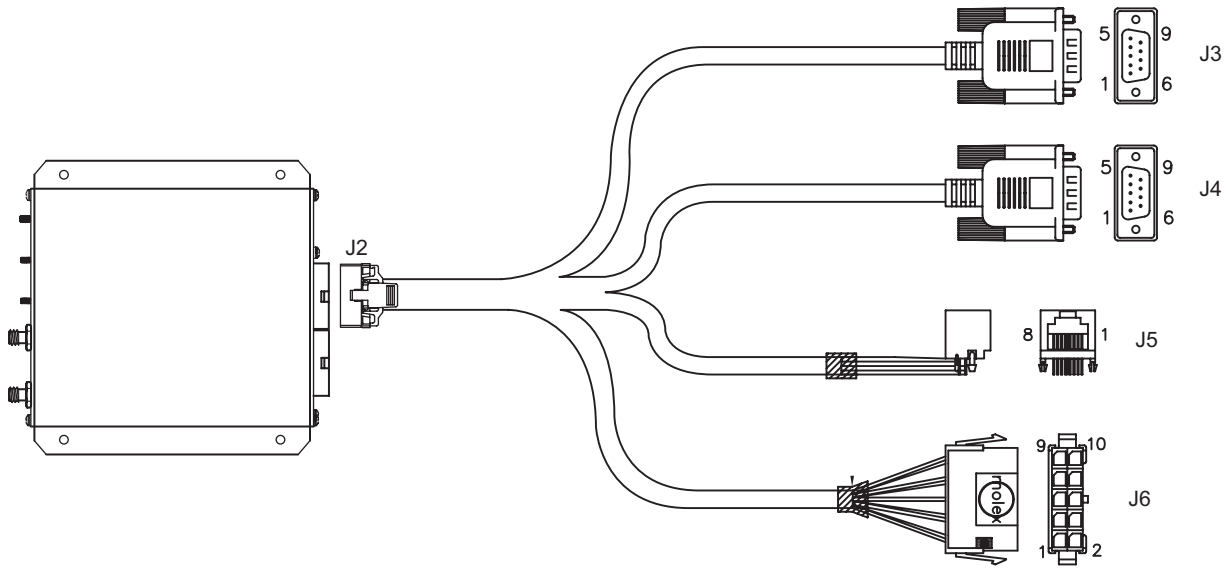
Note: The I/O on this page is for future expansion and is not available for use.



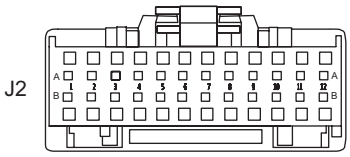


Cavity	Signal Name	Interface Level	Function
B5	Input 4	Spare Input HI	Configurable
B8	Input 5	Spare Input LO	Configurable
B10	CAN_HI	Proprietary Link	HI-Speed CAN Link
B11	CAN_LO	Proprietary Link	HI-Speed CAN Link
B12	CAN Shield	Proprietary Link	HI-Speed CAN Link

VS-4500 B Connection (optional)



FRONT VIEW
(24-pin Connnector “B”)



J2

Mating Connector:	Packard
Connector Body:	12160778
Secondary Lock:	12047900
Secondary Lock:	12047401
Terminal (22-20 AWG):	12089660
Terminal (18-16 AWG):	12146448

Connector	Description
J3	Standard DB9-Male
J4	Standard DB9-Male
J5	Molded RJ45, 8 Conductors
J6	Molex 10-pin

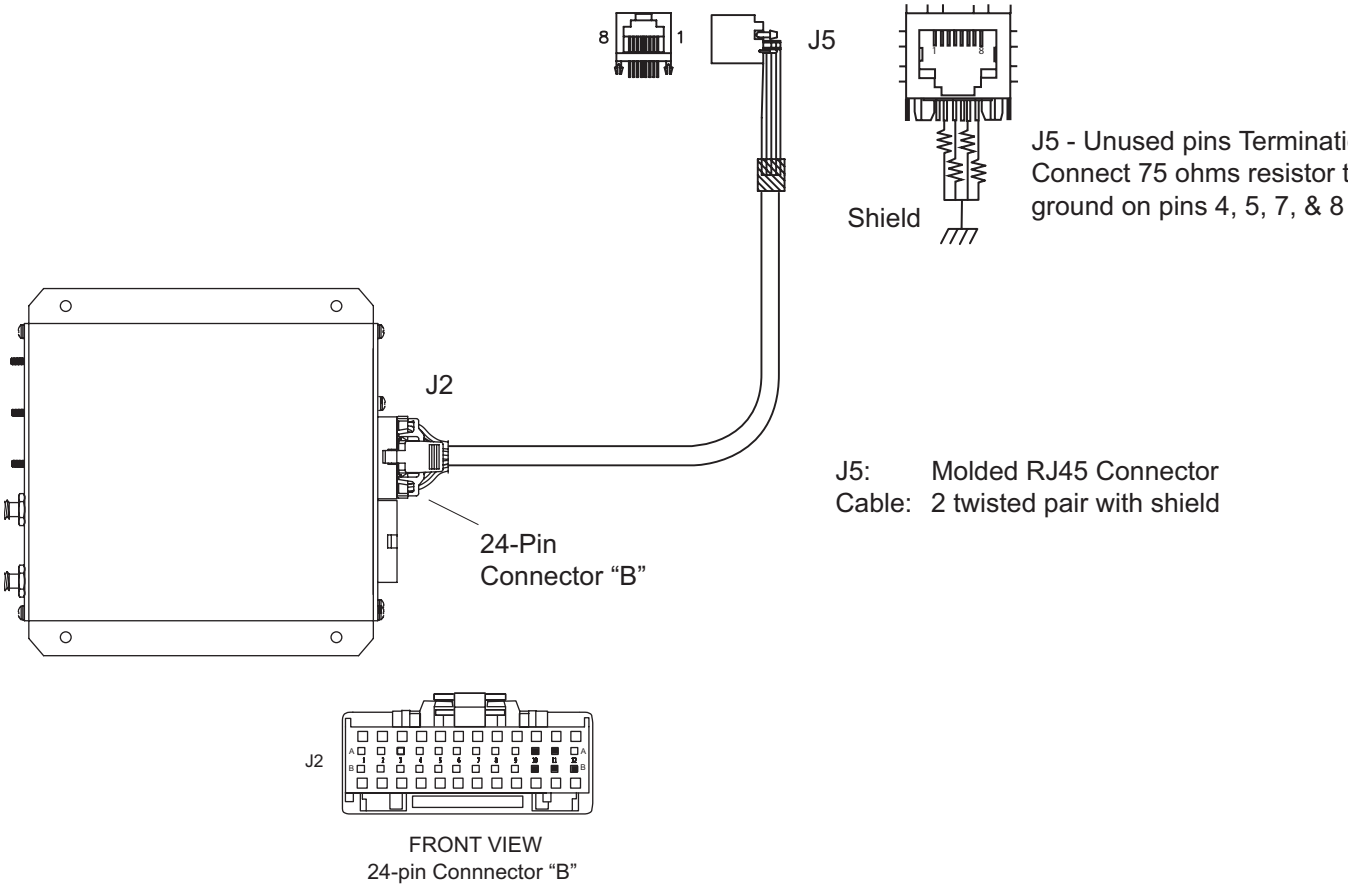
Interconnection Table on the following page.

Interconnection Table

Cavity	To	Code
A1	Ground	Chassis Ground
A2	ESER1_TXD	RS232
A3	ESER1_RTS	RS232
A4	ESER1_RXD	RS232
A5	ESER1_CTS	RS232
A6	SER1_12VDC	VBatt
A7	--	--
A8	--	--
A9	--	--
A10	TD +	Diff. Mode
A11	TD -	Diff. Mode
A12	--	--
B1	Ground	Chassis Ground
B2	ESER2_TXD	RS232
B3	ESER2_RTS	RS232
B4	ESER2_RXD	RS232
B5	ESER2_CTS	RS232
B6	SER2_12VDC	VBatt
B7	Output 1	Relay Driver
B8	Output 2	Relay Driver
B9	Relay_12VDC	Relay Power +12V
B10	RX +	Diff. Mode
B11	RX -	Diff. Mode
B12	Shield	Shield

Ethernet RJ45 (optional)

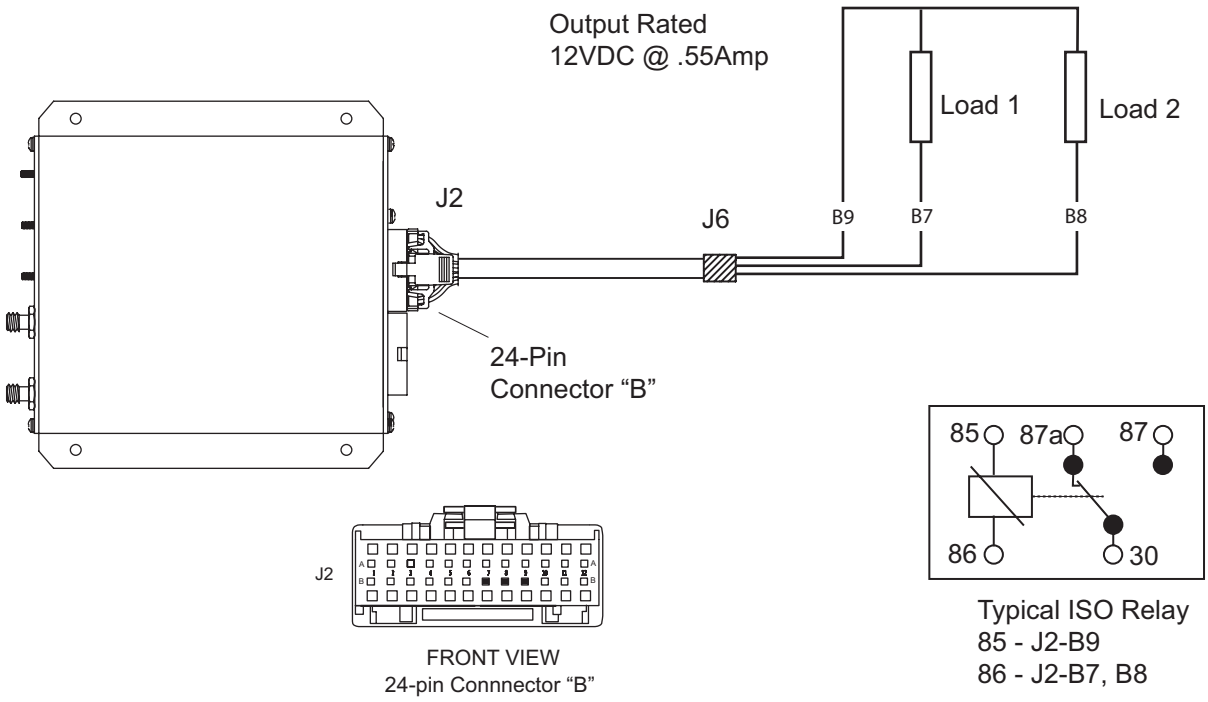
Note: Ethernet is an aftermarket option.



INTERCONNECTION TABLE		
From	**To**	**Description**
J2-A10	J4-1	TD +
J2-A11	J4-2	TD -
J2-B10	J4-3	RX +
J2-B11	J4-6	RX -
J2-B12	--	Shield

Spare Outputs

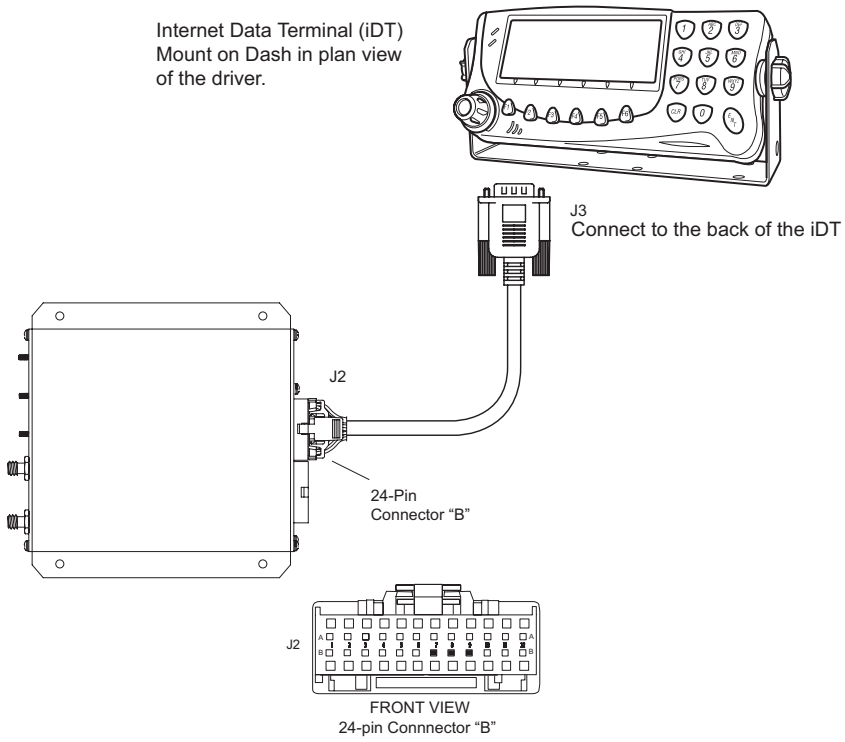
Note: The I/O on this page is for future expansion and is not available for use.



From	Description	Function
J2-B7	Output 1	Configurable
J2-B8	Output 2	Configurable
J2-B9	12 VDC	+12 VDC

Internet Data Terminal (optional)

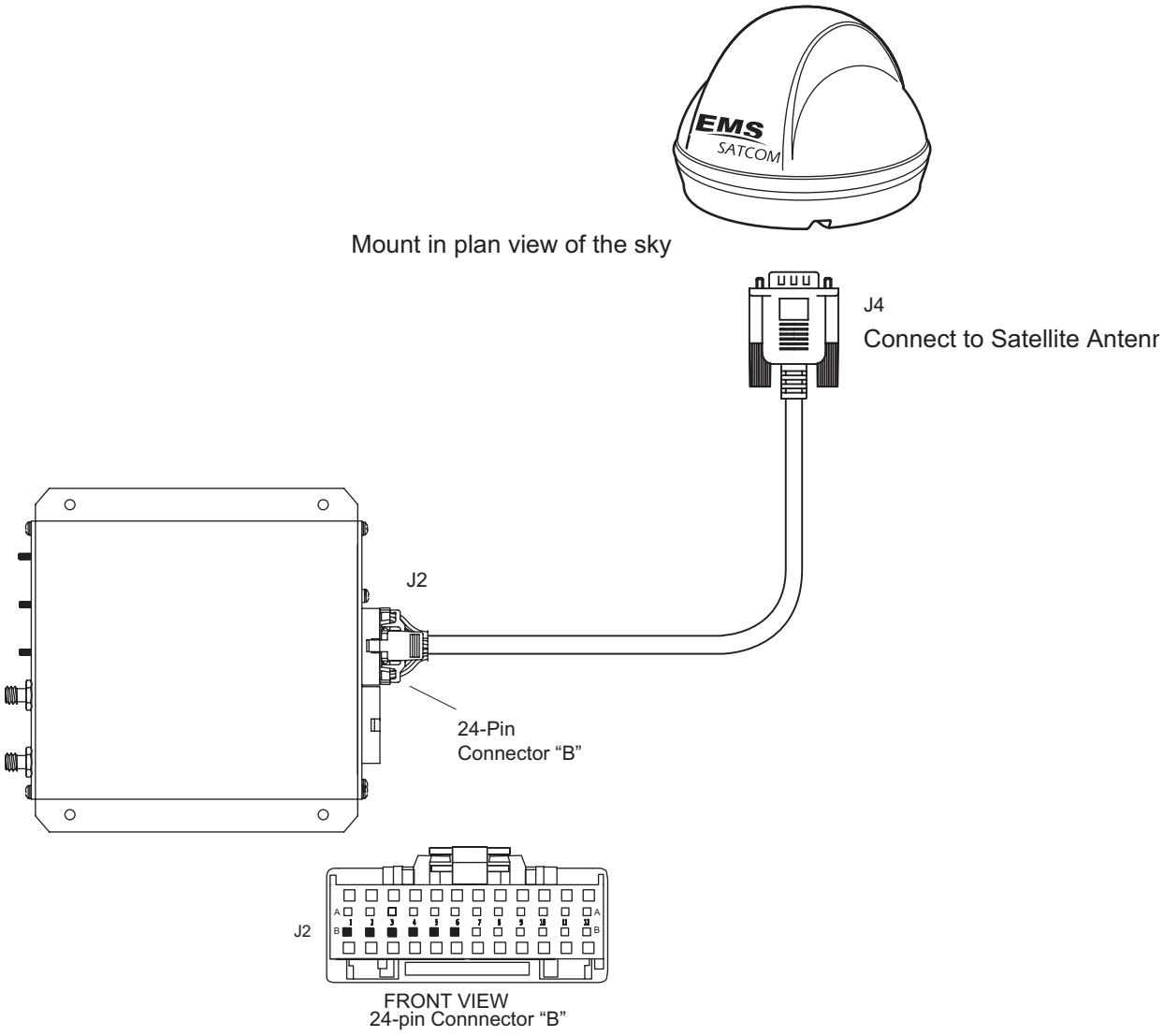
Note: This is an aftermarket option and is required for two-way communication and driver logs.



INTERCONNECTION TABLE		
From	**To**	**Description**
J2-A1	J3-5	Ground
J2-A2	J3-3	ESER1_TXD
J2-A3	J3-7	ESER1_RTS
J2-A4	J3-2	ESER1_RXD
J2-A5	J3-8	ESER1_CTS
J2-A6	J3-9	SER1_12VDC

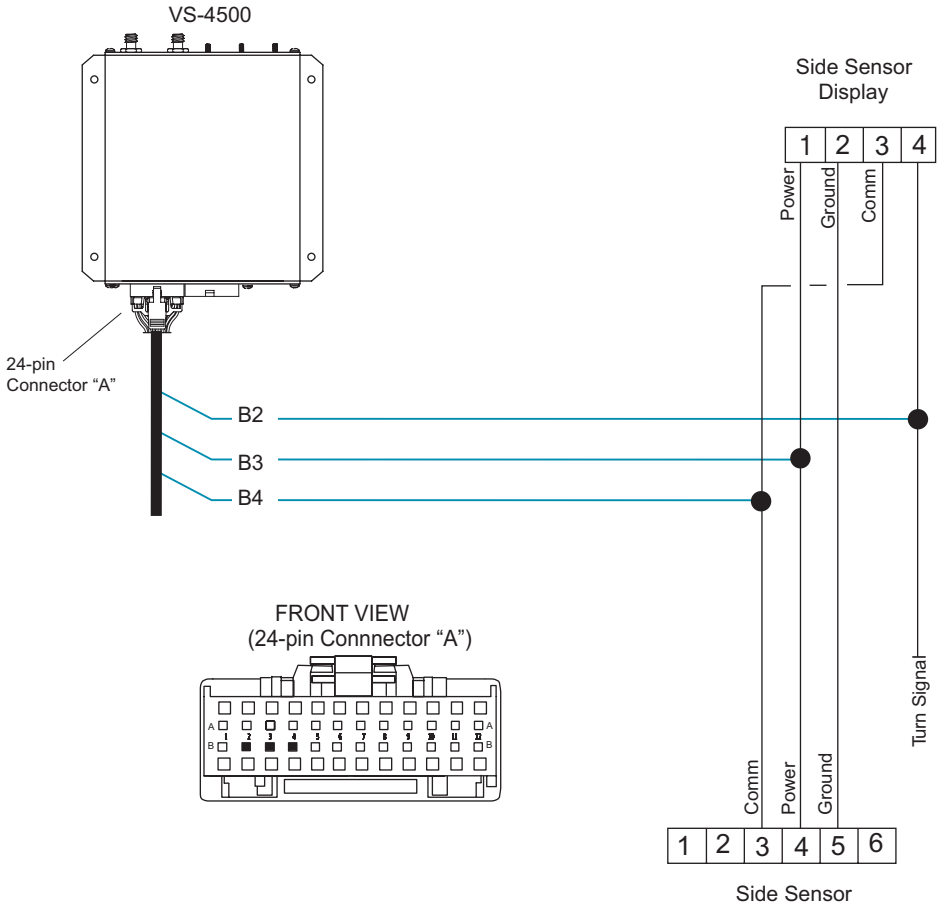
Satellite Antenna (optional)

Specifications	
Size	8” (20 cm) x 6” (15 cm)
Weight	3 lbs (1.4 Kg)
Power	10-16 VDC
Receive Mode	170 mA
Transmit Mode	3.3 A 250 ms
Power	0.5 mA
Interface	
Connectivity	RS 232
Application	GSM
Inputs/Outputs	2 Serial
Environment	
Operating	-40 C to +50 C
	-40 F to +122 F
Humidity	100% Relative Humidity



INTERCONNECTION TABLE		
From	**To**	**Description**
J2-B1	J4-5	Ground
J2-B2	J4-3	ESER2_TXD
J2-B3	J4-7	ESER2_RTS
J2-B4	J4-2	ESER2_RXD
J2-B5	J4-8	ESER2_CTS
J2-B6	J4-9	SER2_12VDC

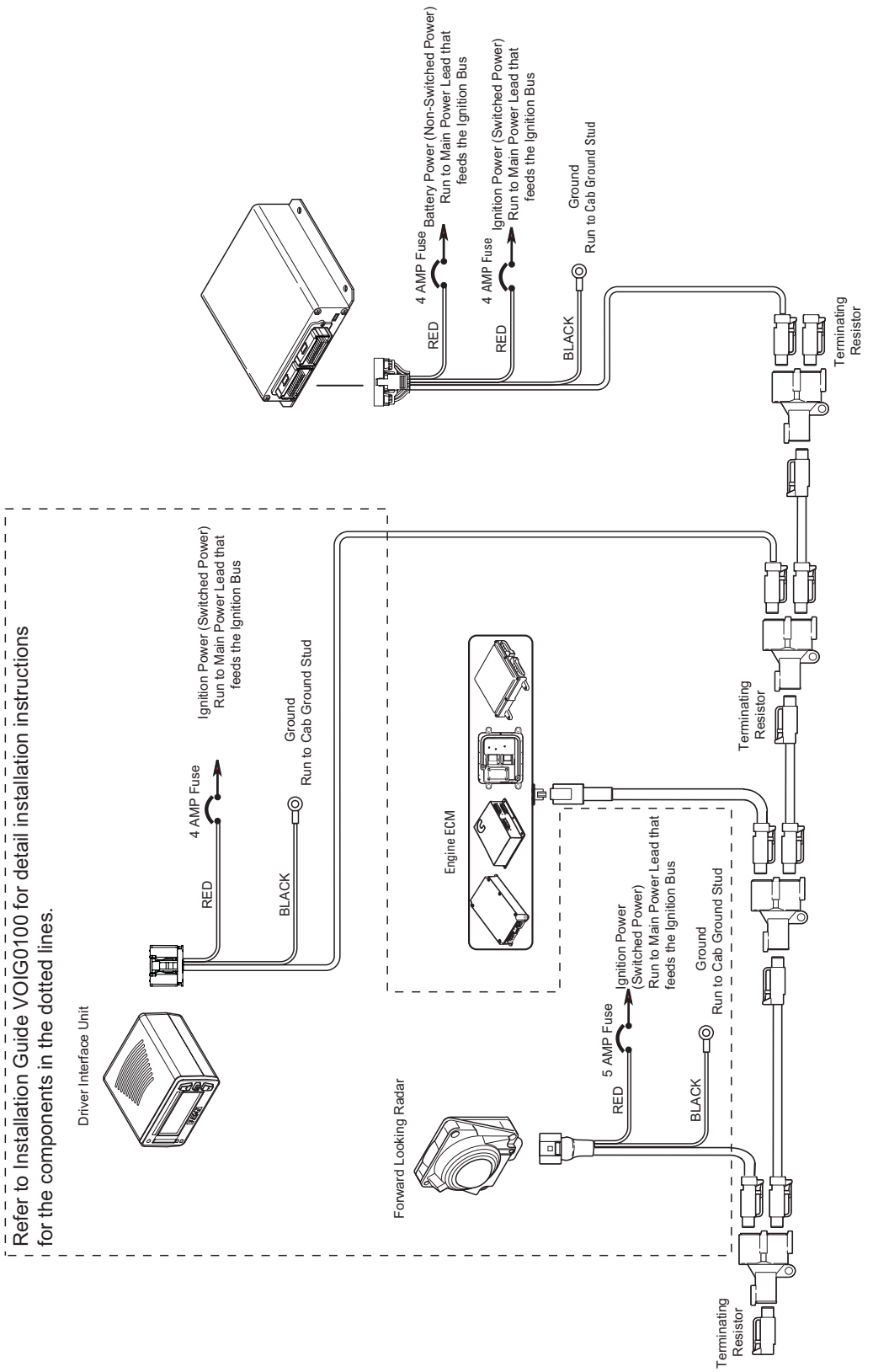
Safety Package
Side Sensor (optional)



Power and Ground

Pin #	Description
J1-B2	Right_Turn
J1-B3	Right_SOD_Power
J1-B4	Right_SOD

Safety Package (optional)



Antenna Type and Location

Antenna Installation

The VS-4500 antenna must be positioned properly and have an unobstructed view, particularly from metal objects. This is critical to ensure accurate information is received by the antenna. Also, the antenna cables should be installed in a location where wiring will not be damaged by pinch points.

⚠ WARNING

All persons must be at least 8 inches (200mm) from the modem antenna when transmitter is operating to meet FCC RF exposure requirements.

The VS-4500 systems use both GPS and Modem (Cellular) antenna. There are multiple antenna options to accommodate any type of vehicle.

Antenna Options

	Glass Mount	Sloped Glass	Permanent Mount (3/4" holes drilled)	Dual Band (Cellular)	Tri-Band (Cellular & GPS)	Quad-Band (Cellular, GPS, and WiFi	Supports Diversity	Satellite
Option A	**X**	**X**		**X**				
Option B			**X**		**X**			
Option J			**X**		**X**			
Option E	**X**	**X**			**X**			
Option F			**X**			**X**		
Option G	**X**	**X**	**X**			**X**	**X**	
Option H			**X**			**X**	**X**	
Satellite								**X**

Note: Option B can be mounted to a mirror bracket if required.

Option A (Cellular)

Option A includes a magnetic-mount GPS receiver and a two-piece glass-mount cellular antenna. This antenna is used when a customer does not want any holes drilled into the vehicle.

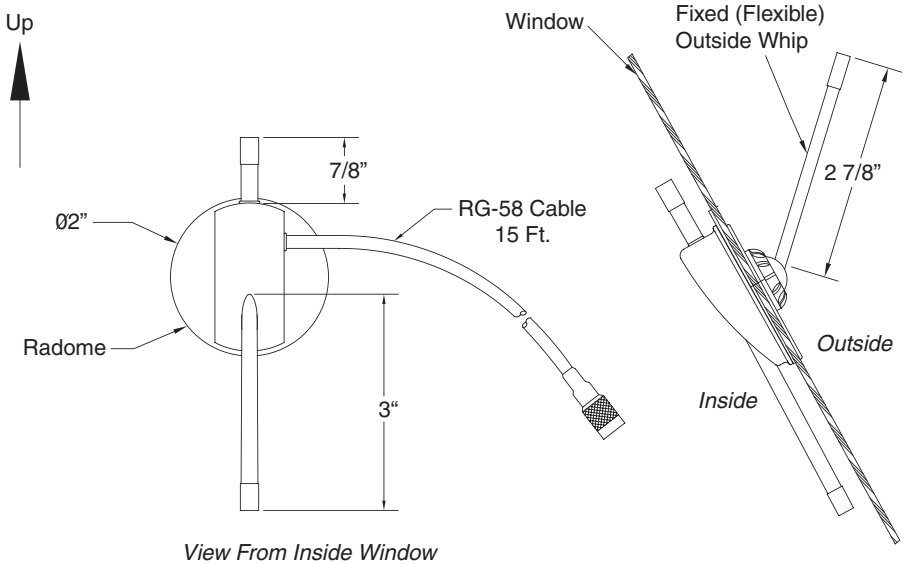
The two piece glass-mount cellular antenna should be located on a window where it will not interfere with existing vehicle equipment (i.e. windshield wipers or rear window defroster). Clean the windshield with alcohol thoroughly before installation.

Note: In colder weather, it is recommended to run the vehicle's defroster in order to warm the windshield prior to installation.

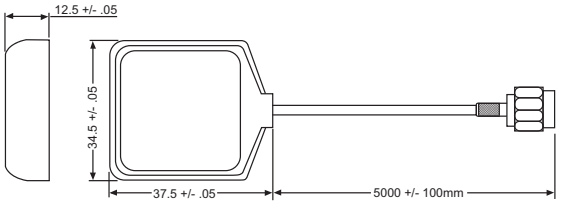
The magnetic-mount GPS receiver must have a clear view of the sky. Use split loom and silicone to protect the cable and apply silicone to the magnetic base to prevent movement and ensure a water-tight seal.

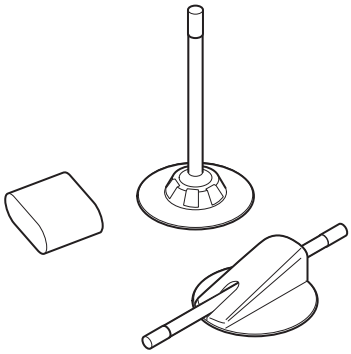
Route antenna cabling to avoid pinch points to avoid component failure.

Antenna option A is very similar to option E. The main difference is option A is made up using two antennas and is more flexible.



View From Inside Window





Option B (Combination GPS and Cellular)

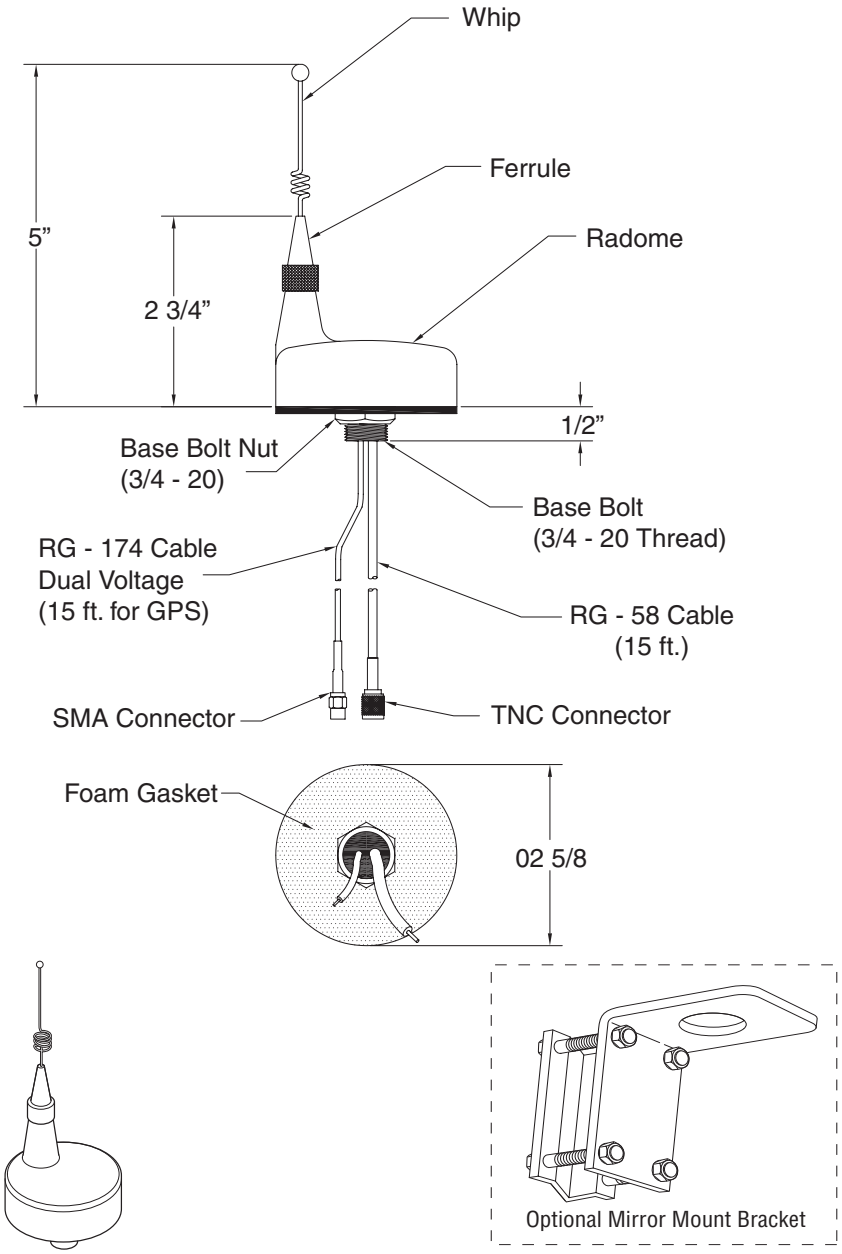
Option B is a combination antenna containing both Cellular (COM) and GPS components. It is installed by drilling a 3/4” (19mm) hole into the roof of the vehicle. Remove the metal shavings and secure the antenna from inside the vehicle with the nut. Apply silicone around hole to prevent leaking.

Typical antenna locations:

- Centered on the cab roof
- On mirror mount bracket; this avoids vehicle clearance problems.

Note: Mirror mount bracket sold separately. Contact a local sales representative to order.

Antenna option B is very similar to option J. The main difference is option B can be mounted on a mirror bracket if required. Option J does not have a whip and is used if tampering is an issue.



Option E (Glass Mount Combination)

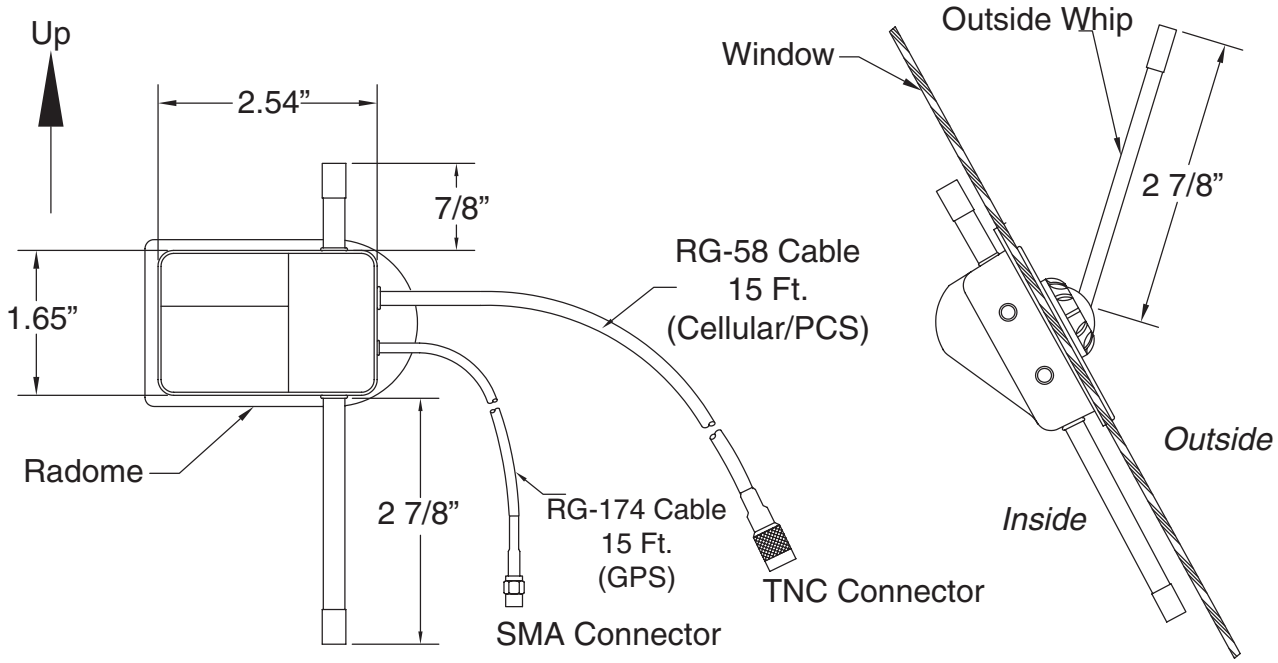
Option E is a glass-mount combination antenna containing both Cellular (COM) and GPS components. This antenna is only for vehicle's with a sloped window greater than 45° and is typically installed on the passenger side.

The antenna should be located on the window where it will not interfere with existing vehicle equipment (i.e. windshield wipers or rear window defroster). Clean the windshield with alcohol thoroughly before installation.

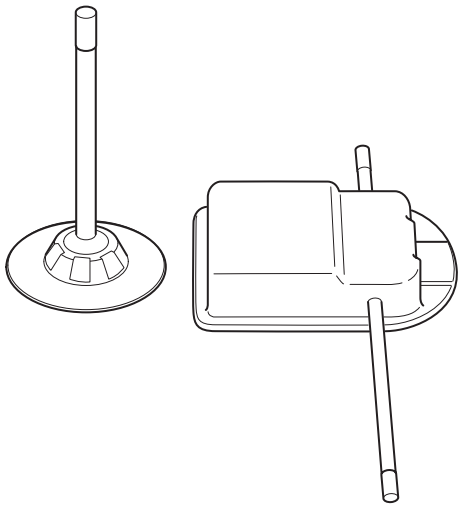
Note: In colder weather, it is recommended to run the vehicle's defroster in order to warm the windshield prior to installation.

Route antenna cabling to avoid pinch points to avoid component failure.

Antenna option E is very similar to option A. The main difference is option E combines two antennas into one which makes installation simple.



View From Inside Window

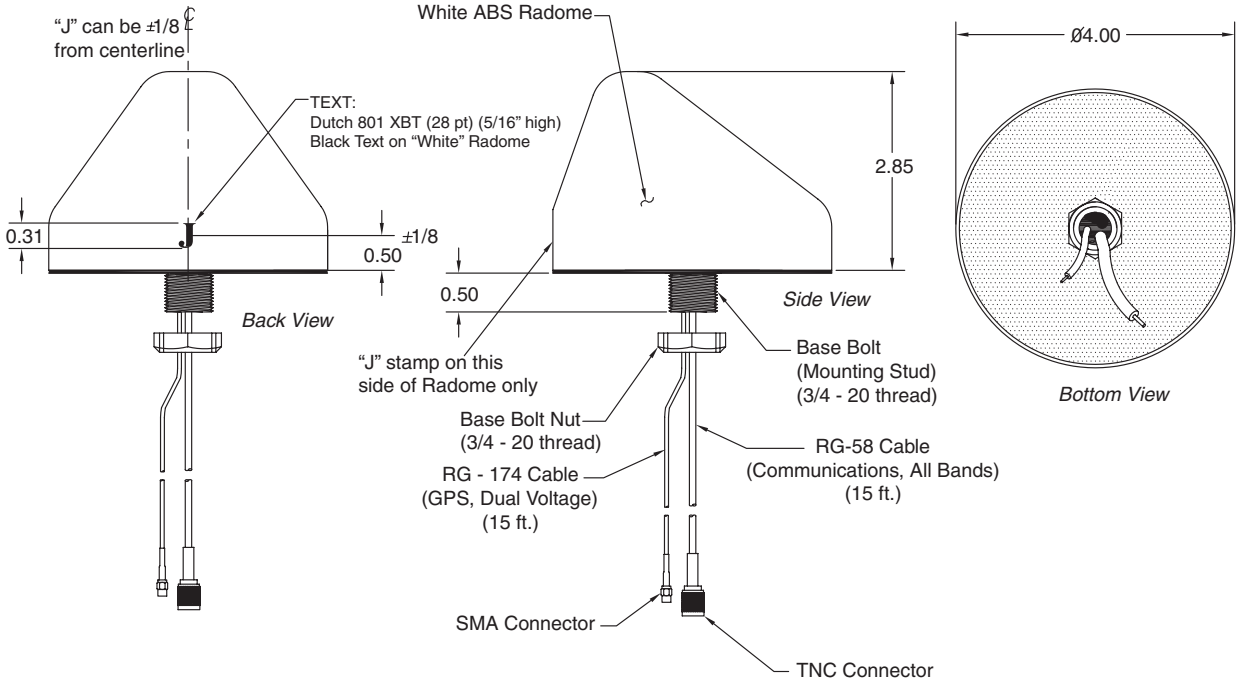


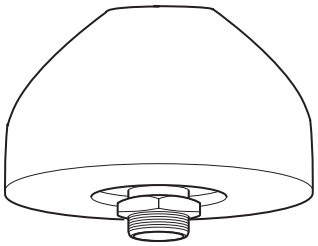
Option J (Speciality Antenna)

Option J is a combination antenna containing both Cellular (COM) and GPS components. This speical application antenna is used to address clearance issues. It is 2-1/2” (64mm) high and 3-1/2” (89mm) wide.

It is installed by drilling a 3/4” (19mm) hole into the roof of the vehicle above the rear-view mirror (access the underside of the roof by removing the interior dome light) or in front of the ladder reck. Remove metal shavings and secure the antenna from inside the vehicle with the nut. Apply 100% clear slilicone around the hole to prevent leaking.

Antenna option J is very similar to option B. The main difference is option B can be mounted on a mirror bracket if required. Option J does not have a whip and is used if tampering is an issue.

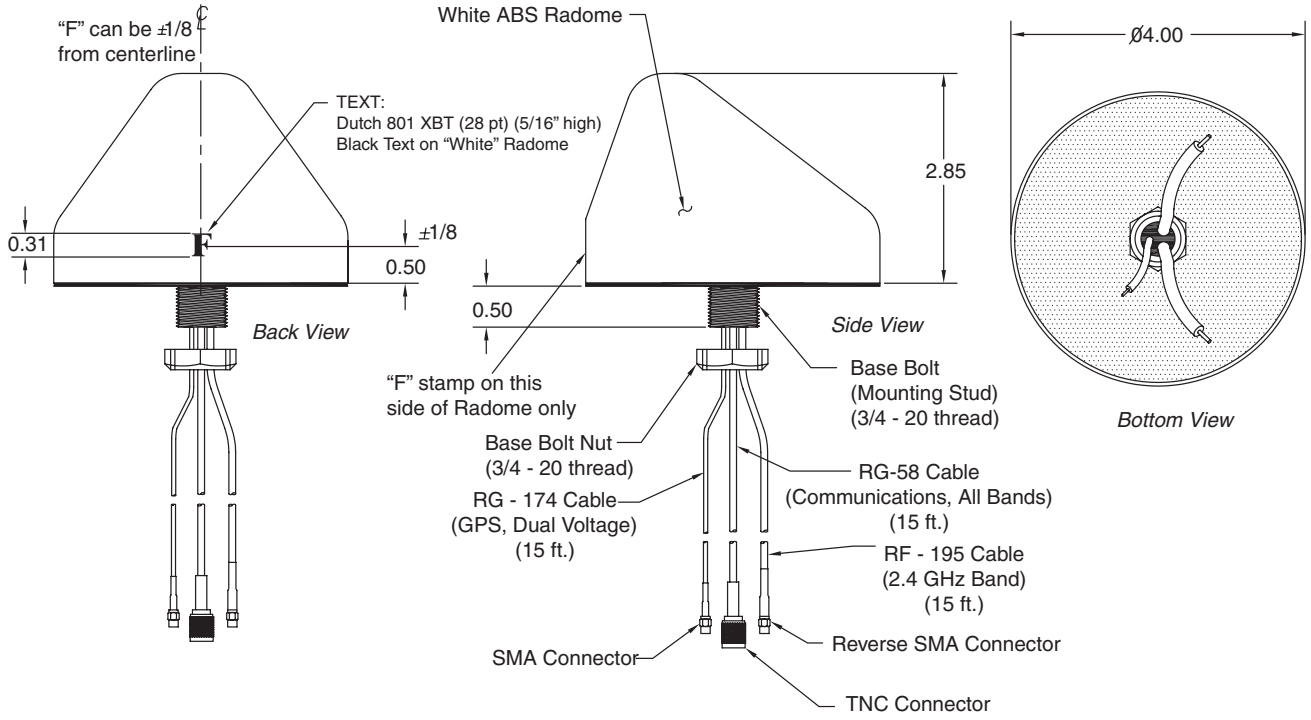


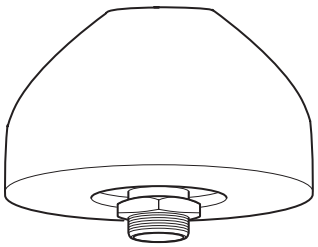


Option F (Specialty Antenna)

Option F is a combination antenna containing both Cellular (COM), GPS components, and RF (WLAN). This speical application antenna is used to address clearance issues. It is 2-1/2" (64mm) high and 3-1/2" (89mm) wide.

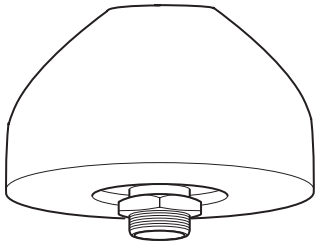
It is installed by drilling a 3/4" (19mm) hole into the roof of the vehicle above the rear-view mirror (access the underside of the roof by removing the interior dome light) or in front of the ladder reck. Remove metal shavings and secure the antenna from inside the vehicle with the nut. Apply 100% clear slilicone around the hole to prevent leaking.

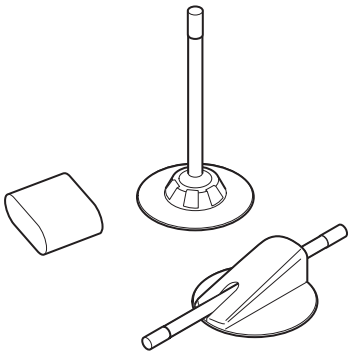




Option G (Supports Diversity)

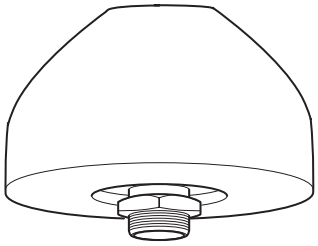
Option G supports diversity because it includes two antennas, option A & F.

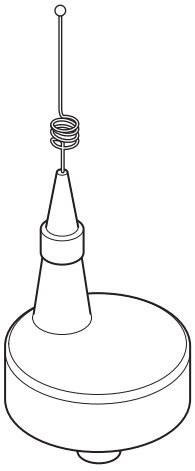




Option H (Supports Diversity)

Option G supports diversity because it includes two antennas, option B & F.





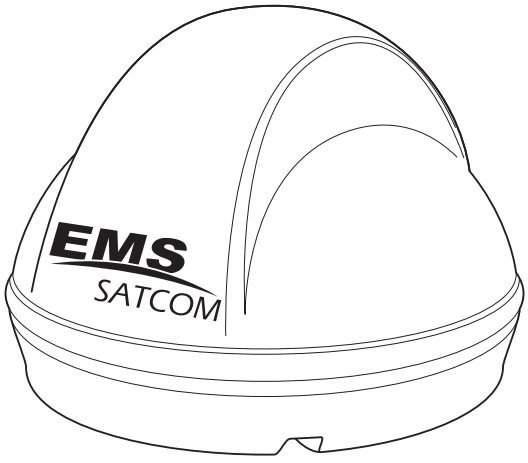
Satellite Antenna (optional)

The Satellite Antena is an option when customers demand constant communication with their fleet. The satellite can be used on its own or as a backup. The satellite packet data terminal is a peripheral for Fleet Resource Manager tracking and monitoring applications.

- Offers the only near real-time satellite position updates
- The device can receive and send updates immediately
- Broadcast capable
- Built-in serial I/O
- Offers a small compact format
- The antenna is sealed and certified for extreme environmental conditions
- The equipment works everywhere in Canada, United States, Mexico, and Central America
- The patented antenna is Omnidirectional
- EMS leases a switch directly from MSV (Mobile Satellite Ventures)
- Compliment to cellular coverage
- Transmits data when there is not any cell coverage
- Operates on MSV MSAT-1 Network

Specifications

- Omni Antenna
- GPS and L-band
- No moving parts
- No maintenance
- 5.8”H x 7.8”W



Retrofit Information

Retrofit Recommended Practices

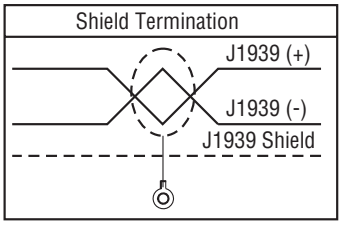
Body builder electrical systems that are to be interconnected with the VS-4500 electrical system should adhere to the latest recommendations of SAE J1292. In addition to SAE J1292, the following recommendations should be followed:

1. All wiring terminals should be properly insulated to prevent "short circuits". All terminals should be of insulation grip design to provide a reliable connection and to prevent terminal fatigue.
2. Terminals and splices that are connected outside the body should be moisture resistant design. Molded insulator for ring terminals should be used. Molded connector/insulators are recommended for use with blade or pin type terminals.
3. Wires must be routed to provide at least 3” (75mm) clearance to moving parts, unless positively fastened or protected by conduit.
4. Wire routing should avoid areas where temperatures exceed 80° C [180°F] and a minimum clearance of 6” (150mm) should be maintained from exhaust system components. Where compliance with this requirement is not possible, heat insulation and heat shields are required.
5. Wire routing and component mounting (switches, relays, etc.) should be located to be easily removed for service. Do not surround the components with body structure that will prevent removal for service.
6. Wiring to all circuit components (switches, relays, etc.) in exposed locations shall provide a drip loop to prevent moisture from being conducted into the device via the wire connection.
7. Routing wiring into wheel splash areas should be avoided. When such routing cannot be avoided, adequate clipping or protective shielding is required to protect wiring from stone and ice damage.
8. Routing wires under the frame side-members or at points lower than the bottom frame flange should be avoided to prevent damage to the wires in off-road operations.
9. The wire retainers and grommets installed by the assembly plant are designed to accommodate only the OEM installed wires. Additional wiring or tubing must be retained by additional clips. When added wires to tubes are routed through sheet metal panels, new holes must be used (with adequate wire protection and sealing).
10. All wiring connections to components of the factory-installed system must be accomplished by using the correct mating wire termination. Connections on studs and ground connections must use ring type terminations.
11. When it is necessary to splice wires, the splice must be adequately crimped to provide a good mechanical and electrical connection. Double wall heat shrink tubing should be used where the outer wall will provide adequate electrical insulation and the inner wall melts and seals the splice from the environment.
12. **Never add another circuit or splice into the ignition or battery power supplies.** The fuses and circuit breakers installed at the assembly plant are designed to protect the wiring and electrical components from overloads. Never remove a factory installed fuse or circuit breaker and replace with a high value device. If the added electrical device causes "fuse blow", or circuit breaker cycling, it indicates the total load is too high for the factory-installed circuit protection and requires revisions in the added circuit; not an increase in fuse or circuit breaker size. In this case, the device cannot be added directly to the circuit, but must be connected through a separate hang-on switch or relay of the correct capacity, using added wiring of the correct gauge. Failure to adopt this precaution will lead to switch contacts burning. The following wire table suggests wire gauges for various maximum current draws and will aid in the selection of the correct wire size. The current capacity of a given wire varies with temperature and type of insulation, but the following values are generally acceptable. If the total electrical load on the circuit, after the addition of electrical equipment, is less than the fuse protection in that circuit or less than the capacity of some limiting component (switch, relay, etc.), the items to be added can be connected directly to that circuit. The connection points and allowable loads are normally found in the owner's manual. However, you may want to contact the OEM.

Wire Gauge	Maximum Current Capacity (Crosslink Polythlene Copper Wire)
20	14 Amps
18	18 Amps
16	24 Amps
14	34 Amps
12	42 Amps
10	58 Amps
8	80 Amps
6	110 Amps

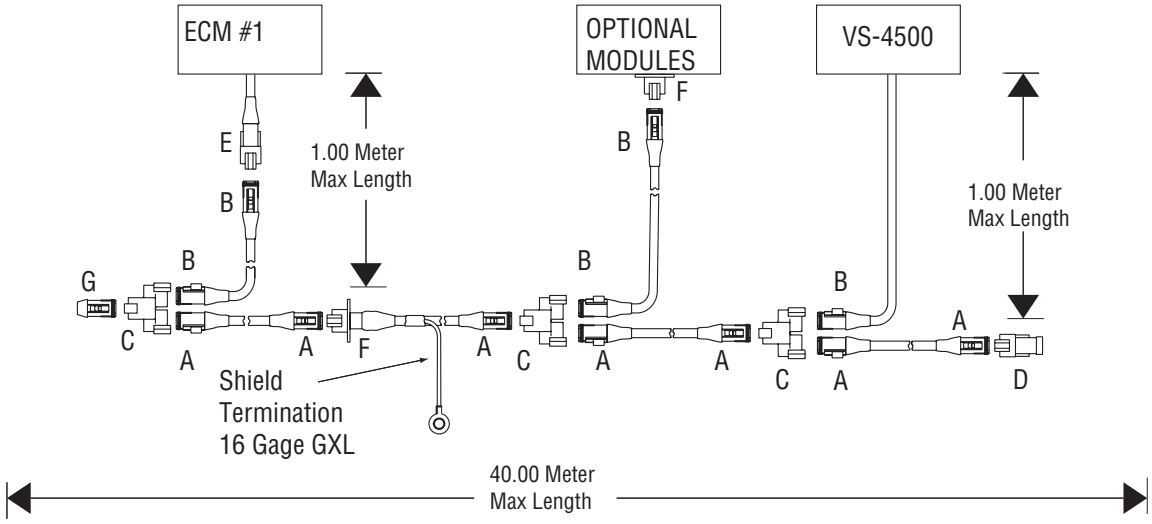
J1939/11 Data Link Detail

Recommended Cable Manufacturer	Cable Part Number	Round	J1939 (+) (PIN "A") Color	J1939 (-) (PIN "B") Color	J1939 (PIN "C") Shield
Champlain	23-00013-001	Yes	Yellow	Green	N/A
Champlain	23-00028-001	No	Yellow	Green	N/A
Raychem	2021D0311	No	Yellow	Green	N/A
Raychem	2021D0001	No	Yellow	Green	N/A
Raychem	2021D0301	Yes	Yellow	Green	N/A
BICC Brand-Rex	T-14945	Yes	Yellow	Green	N/A



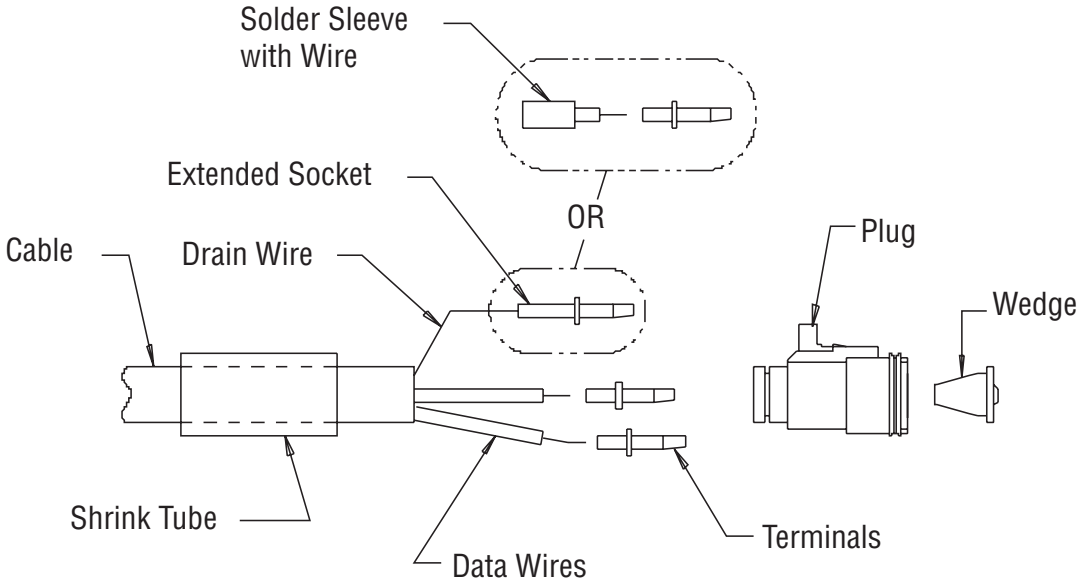
** If an additional wire is added to the drain for insertion into the connector, no shield terminal is used and the signal terminal quantity is 3. If the drain wire is to be directly inserted into the connector, then a shield terminal is used and the signal terminal quantity is 2.

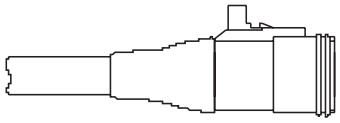
Ref.	Body	Signal Terminals (QTY)	Shield Terminal (QTY)	Wedge	Function
A	DT06-3S-P032	0462-201-1631 (3) **	0462-221-1631 (1) **	W3S-1939-P012	Through Connector
B	DT06-3S-P032	0462-201-1631 (3) **	0462-221-1631 (1) **	W3S-P012	Stub Connector
C	DT04-3P-P007	N/A	N/A	N/A	"T" Receptacle
D	DT04-3P-P006	N/A	N/A	N/A	120 Ohm Termination
E	DT04-3P-E008	0460-202-1631 (3) **	0460-247-1631 (1) **	W3P	ECU Receptacle
F	DT04-3P-LE08	0460-202-1631 (3) **	0460-247-1631 (1) **	W3P-1939	Flang Receptacle
G	DT06-3S-P006	N/A	N/A	N/A	120 Ohm Termination



SAE J1939/11 Recommended Cable Termination Procedure

1. Remove cable outer jacket approximately 1” (25mm).
2. Remove foil from exposed wires to within 2” (2mm) from cable jacket.
3. Strip insulation from data wires .25” (7mm).
4. Attach extended wire barrel socket contact to the drain wire or attach adhesive filler solder sleeve and wire to drain wire per manufacturer’s recommendations. For the solder sleeve option, cut the wire on the solder sleeve to a length of 1” (25mm) and strip the insulation back .25” (7mm).
5. Crimp the appropriate terminal on each data wire and solder sleeve wire or the extended socket per the manufacturer’s recommendations.
6. Slide the adhesive filler shrink tube over the cable end.
7. Install the terminals into the connector body per the manufacturer’s instructions.
8. Install the wedge in the front of the connector body per the manufacturer’s instructions.
9. Apply the shrink tube to the end of the connector body per the manufacturer’s instructions.

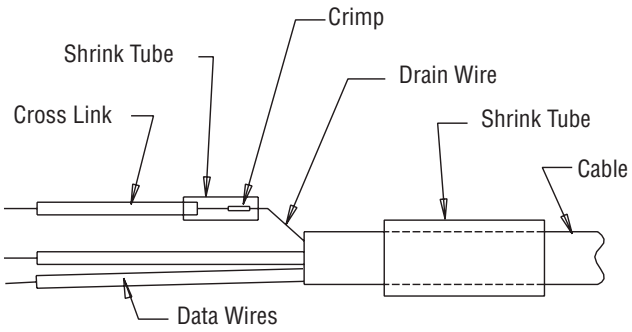


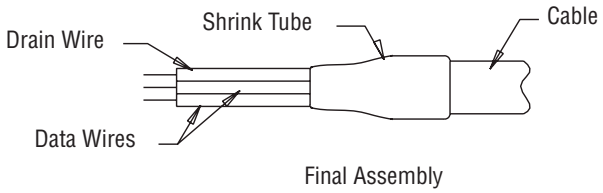


Final Assembly

SAE J1939/11 Recommended Cable Splice Procedure

1. Remove cable outer jacket approximately 1-1/2” to 4” (40 to 100mm).
2. Remove foil shield from exposed wires to within 1/16” (2mm) from cable jacket.
3. Strip insulation from data wires .25” (7mm).
4. Attach X-link wire to drain wire with crimp slice per manufacturer’s recommendation.
5. Slide adhesive filled shrink tube over crimp splice.
6. Slide adhesive filled shrink tube over cable end.

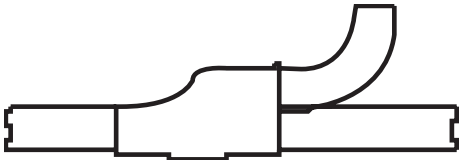




Final Assembly

Existing Drain Wire Splice/Sealing Method

1. Remove cable outer jacket approximately 1-1/2” to 4” (40 to 100mm)
2. Remove foil shield from exposed wires to within 1/16” (2mm) from cable jacket.
3. Strip insulation from data wires .25” (7mm).
4. Crimp stub branch lines and drain wire to main backbone data lines and drain wire.
5. Cover each splice with insulation shrink tubing.
6. Wrap unshielded area with shielding material.
7. Apply adhesive filled shrink tube to splice junction.
8. For shield termination, crimp maximum 16 gauge GXL wire to drain wire.



J1939/15 (lite) Data Link Detail

Maximum 131 feet (40 meters) Length.

Maximum 10 feet (3 meters) stub length.

Maximum 10 modules on segment.

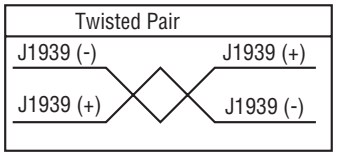
Twisted pair (18 or 20 AWG) with 1 twist per inch.

120 Ohm terminating resistors must be used.

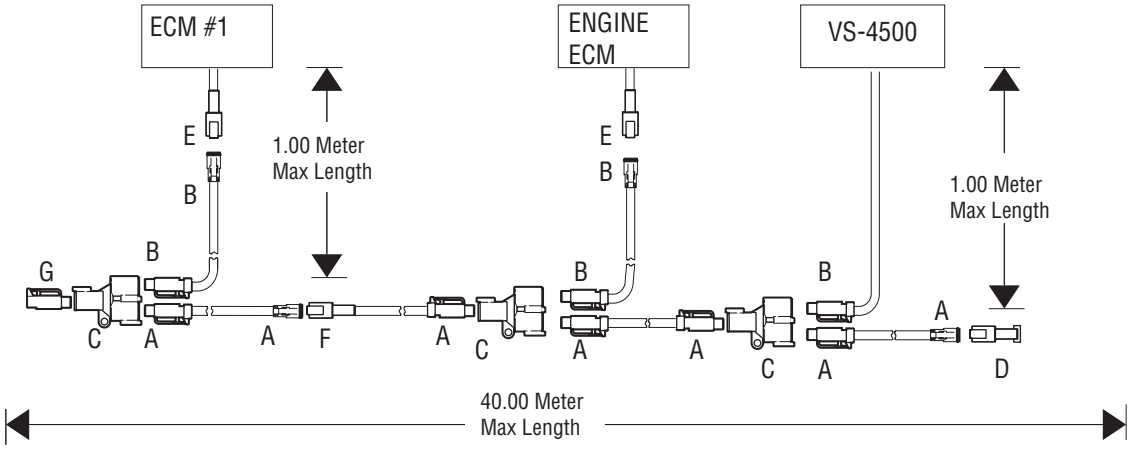
Connector at ECU is not defined.

The third pin for shield is not used in 'in-line' and T-connectors.

Recommended Cable Manufacturer	Cable Part Number	Round	J1939 (+) (PIN "A") Color	J1939 (-) (PIN "B") Color
Champlain	J1939/15	Yes	Yellow	Green

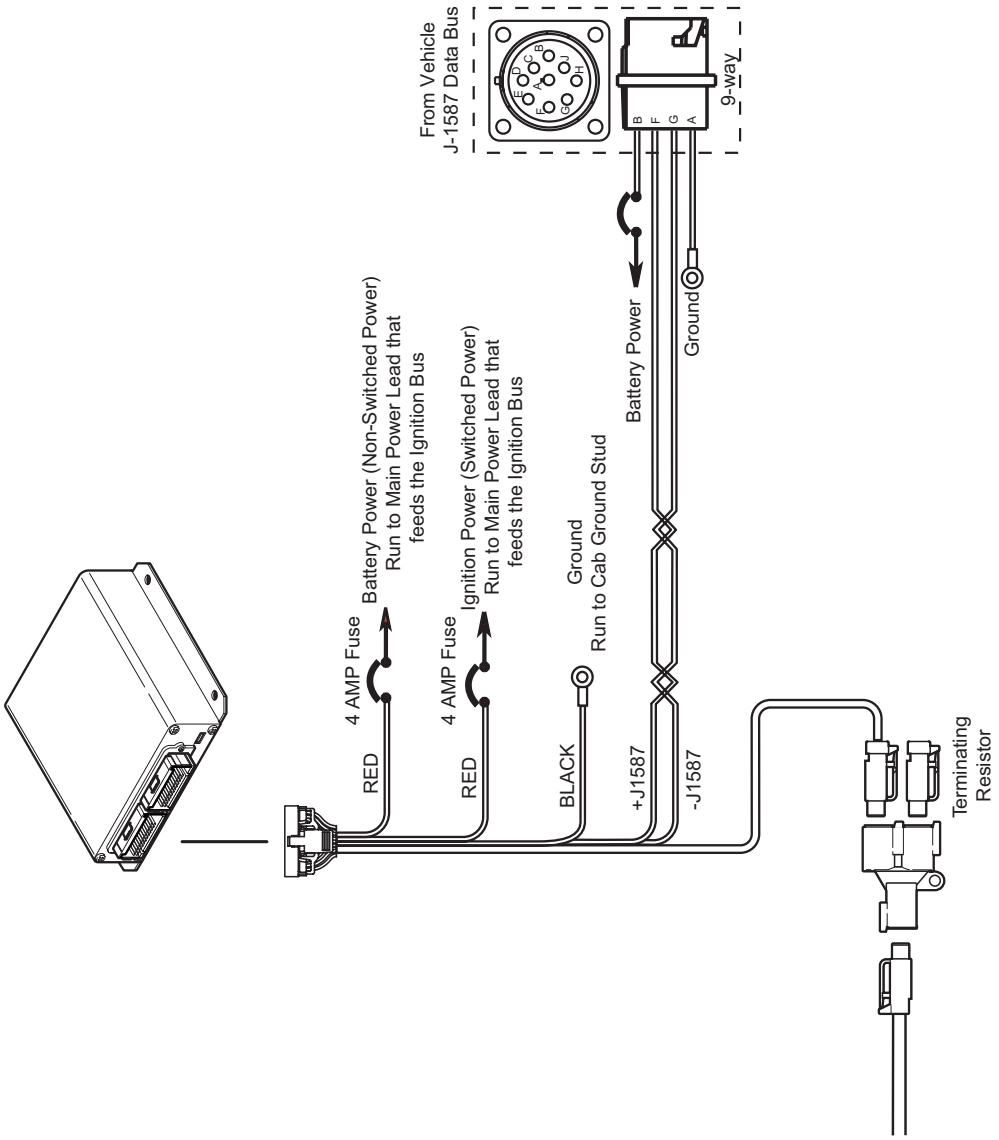


Ref.	Body	Signal Terminals (QTY)	Wedge	Function
A	DTM06-2S	0462-201-20141 (2) **	WM-2SB	Through Connector
B	DTM06-2S	0462-201-20141 (2) **	WM-2S	Stub Connector
C	DTM04-2P-P007	N/A	N/A	"T" Receptacle
D	DTM04-2P-EP10	N/A	WM-2PB	120 Ohm Termination
E	DTM04-2P	0460-202-20141 (2) **	WM-2P	ECU Receptacle
F	DTM04-2P	0460-202-20141 (2) **	WM-2PB	Through Receptacle
G	DTM06-2S-EP10	N/A	N/A	120 Ohm Termination

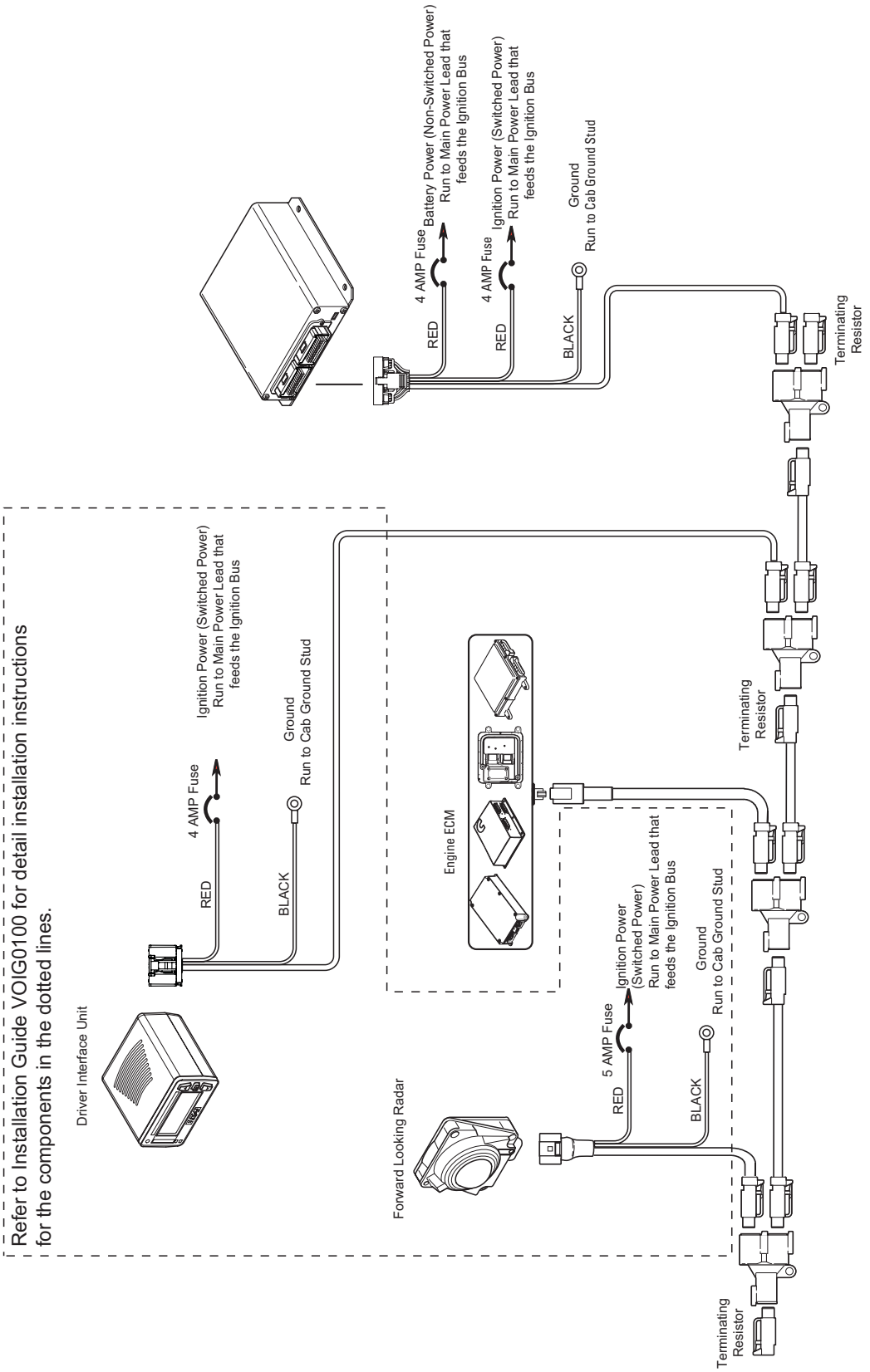


Wiring Schematics

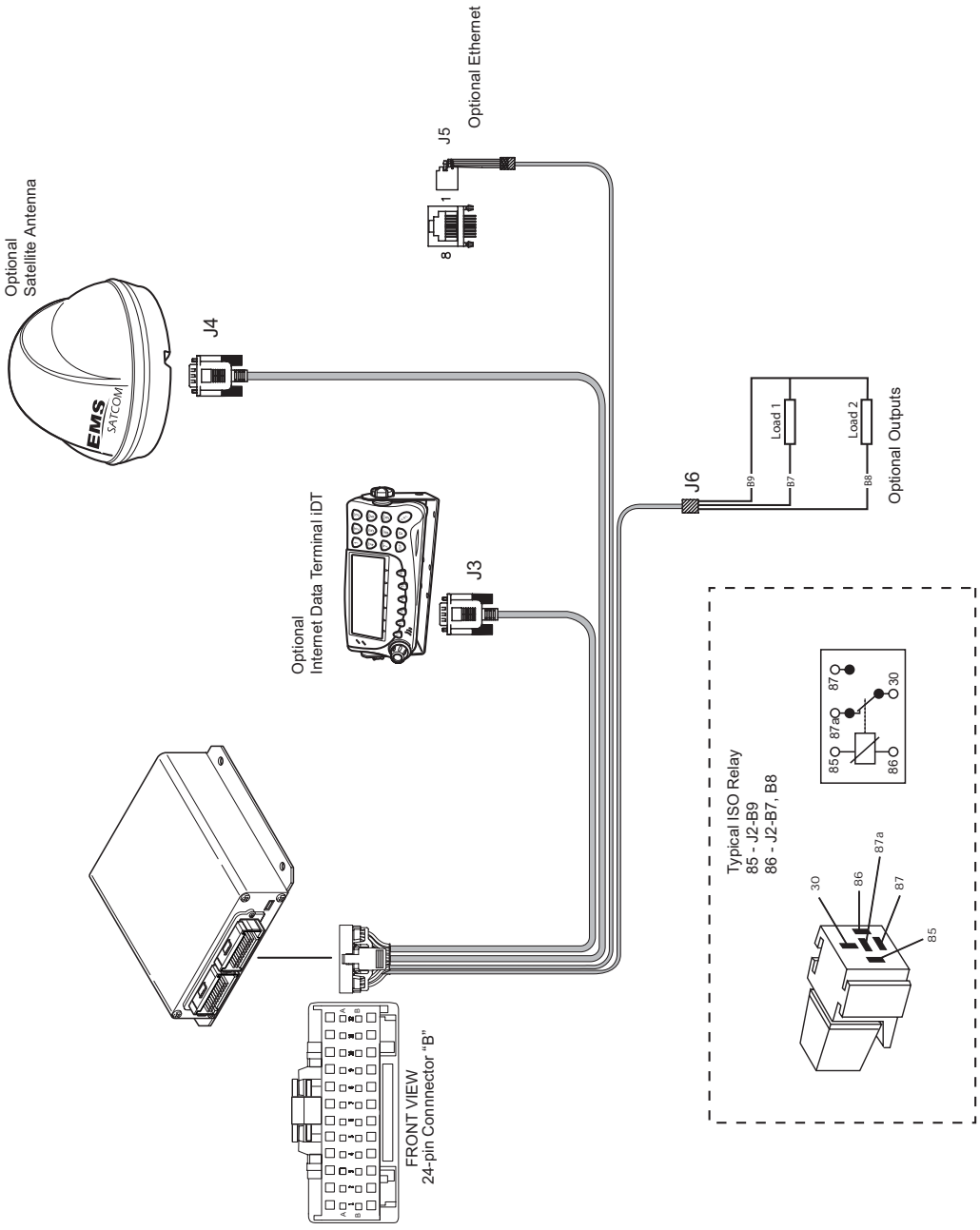
Fleet Resource Manager System
VS-4500 In Vehicle Device



VS-4500 with Safety Package

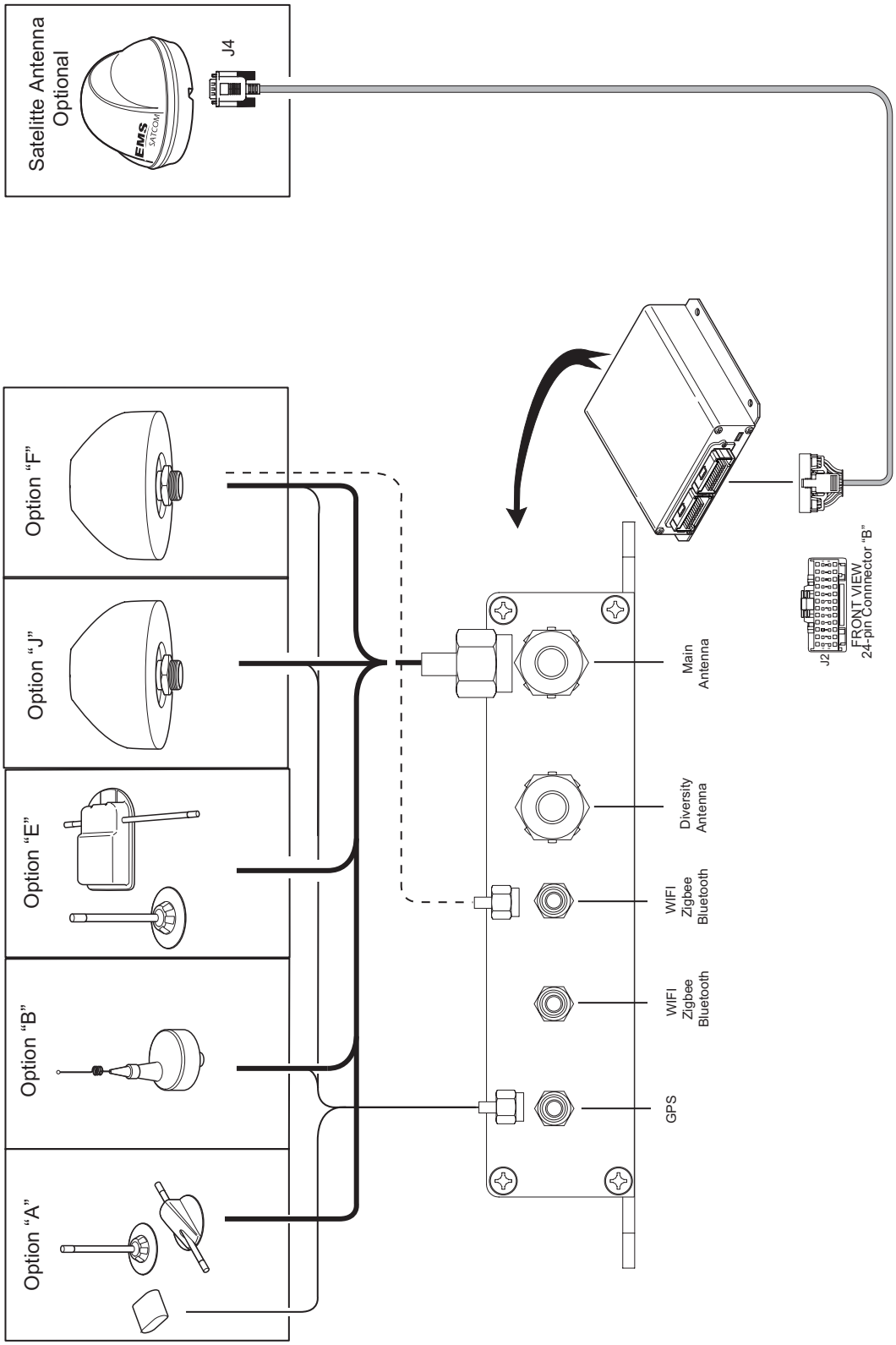


VS-4500 Optional Telematic Connections

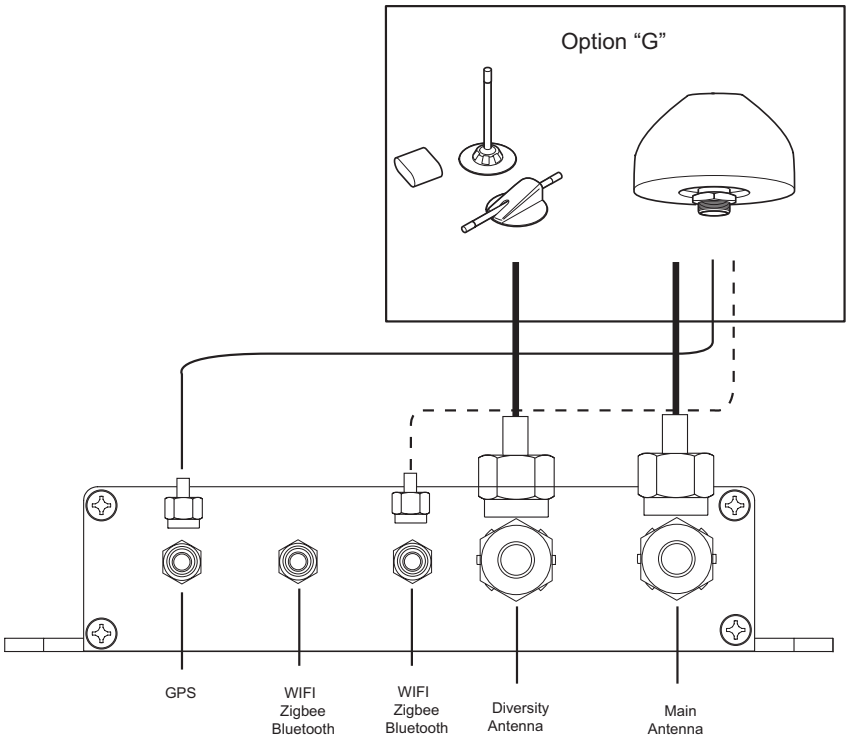


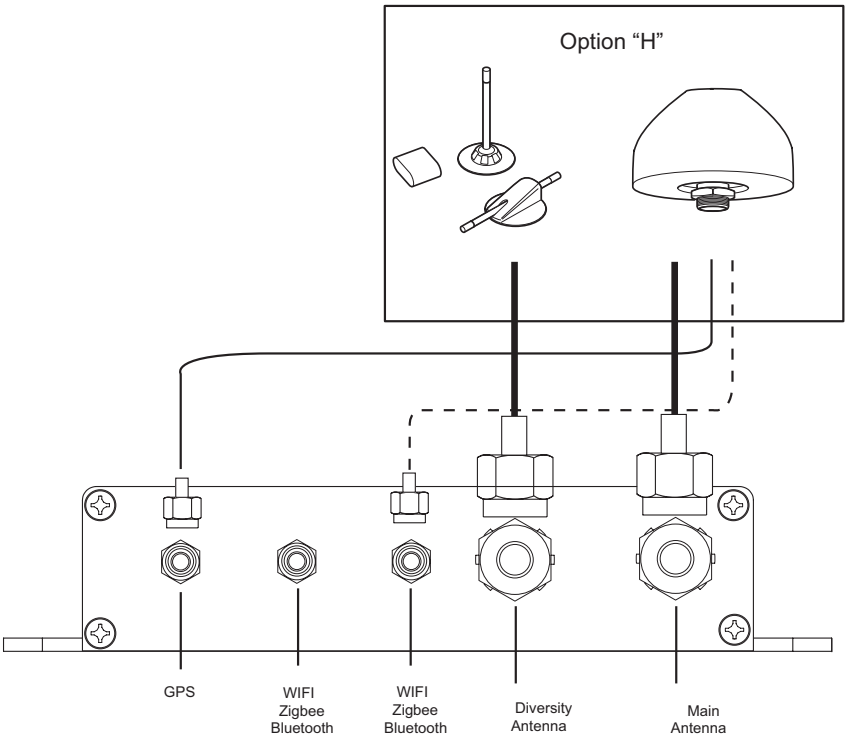
Antenna Connections

Note: The Main Antenna is for one cellular antenna.



Note: The Diversity Antenna will provide better cellular coverage because two antennas are used to improve signal quality.





Connector Pin Descriptions

Connector “A” 24-pin Packard

Cavity	Signal Name	Interface Level	Type
A1	+Battery	+9-32 VDC NON-SWITCHED	Power
A2	Ignition	+9-32 VDC SWITCHED	Power
A3	+ Battery Backup	Isolated Battery	Power
A4	J1587 +	Truck J1708 Link	Comm
A5	J1587 -	Truck J1708 Link	Comm
A6	J1850 +	OBDII	Comm
A7	J1850 -	OBDII	Comm
A8	ISO9141_2L	OBDII	Comm
A9	ISO9141_2K	OBDII	Comm
A10	CAN_HI	Truck J1939 Link	Comm
A11	CAN_LO	Truck J1939 Link	Comm
A12	J1939 Shield	Truck J1939 Link	Comm
B1	Ground	Chassis Ground	Power
B2	Input 1	Right Turn Signal	I
B3	Input 2	Side Object Detection Sensor Vref	O
B4	Input 3	Side Object Detection Sensor Comm	I
B5	Input 4	Spare Input HI	I
B6	GM_CAN	J2411 SWC	Comm
B7	GM_CAN_GND	Chassis Ground	Ground
B8	Input 5	Spare Input LO	I
B9	--	--	--
B10	CAN_HI	Proprietary Link	Comm
B11	CAN_LO	Proprietary Link	Comm
B12	CAN Shield	Proprietary Link	Comm

Connector “B” 24-pin Packard

Cavity	To	Code	Type
A1	Ground	Chassis Ground	O
A2	ESER1_TXD	RS232	O
A3	ESER1_RTS	RS232	O
A4	ESER1_RXD	RS232	I
A5	ESER1_CTS	RS232	I
A6	SER1_12VDC	VBatt	O
A7	--	--	--
A8	--	--	--
A9	--	--	--
A10	TD +	Diff. Mode	Comm
A11	TD -	Diff. Mode	Comm
A12	--	--	--
B1	Ground	Chassis Ground	O
B2	ESER2_TXD	RS232	O
B3	ESER2_RTS	RS232	O
B4	ESER2_RXD	RS232	I
B5	ESER2_CTS	RS232	I
B6	SER2_12VDC	VBatt	O
B7	Output 1	Relay Driver	O
B8	Output 2	Relay Driver	O
B9	Relay_12VDC	Relay Power +12V	O
B10	RX +	Diff. Mode	Comm
B11	RX -	Diff. Mode	Comm
B12	Shield	Shield	Comm

Vendor Contact Information

AMP/Tyco
Harrisburg, PA
Tel: 800-522-6752
http://www.tycoelectronics.com/

Champlain Cable Corporation
175 Hercules Drive
Colchester, Vermont 05446
Tel: 800.451.5162
http://www.champcable.com/

Deutsch
LADD Industries
4849 Hempstead Station Dr.
Kettering, OH 45429
Tel: 800.223.1236
http://www.laddinc.com

Littelfuse World Headquarters
800 E. Northwest Highway
Des Plains, IL 60016
Tel: 847.824.1188
Fax: 847.391.0894
http://www.littelfuse.com

Molex
2222 Wellington Court
Lisle, IL 60532-1682
Tel: 800.78MOLEX
http://www.molex.com

Packard
Delphi Connection Systems
5725 Delphi Drive
Mail Station 483.400.301
Troy, MI 48098
Tel: 800.610.4835
http://www.delphisecure2.com/site/home/homemain.asp

Packard Distributor
Power & Signal Group
World Headquarters
4670 Richmond Road
Suite 120
Cleveland, OH 44128
Tel: 800.722.5273 or 216.378.6600
http://www.powerandsignal.com

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