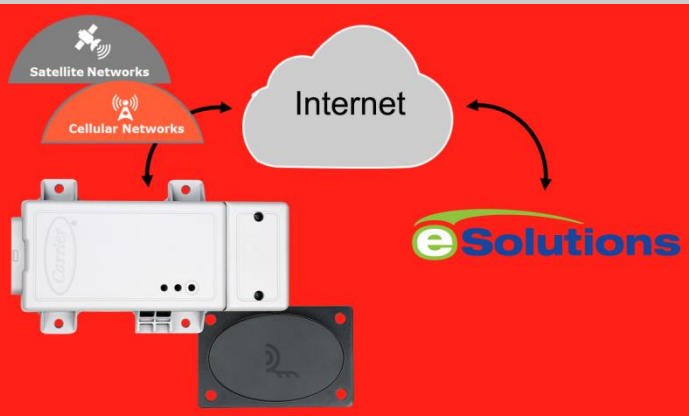
Carrier TRANSICOLD

Trailer & Rail Refrigeration



eSolutions

eSolutions™ Telematics Option Supra 60 Series Units Installation and Commissioning Manual

62-12110 Rev. A

eSolutions™ Telematics Option Supra 60 Series Units Installation and Commissioning Manual

 Printed in U. S. A - February 2020

Manual Revision History 62-12110

Rev.	Date	Reason for Release
	01/22/2020	Initial Release
A	02/13/2020	Add specific connector and pin location for 950MT (pages 5, 6, 7)

Table of Contents

1 Installation Instructions

⚠ WARNING

Unit may start automatically at any time even if the switch is in the OFF position. Use proper lockout/tagout procedures before inspection/servicing. All unit inspection/servicing by properly trained personnel only.

1.1 Parts

Table 1–1 Supra Installation Parts List

Quantity	Part Number	Part Description
1	12-00770-00	3G eSolutions Module
	12-00843-00	4G eSolution Module
1	02-00311-02	Dielectric Grease
1	68-08585-00	eSolutions Module Bracket
	68-08689-01	eSolutions Module Bracket (950/960 units only)
1	12-00844-00	Antenna / Bracket
4	34-60068-25	M6 Captive Head Screw 25mm
2	34-60324-30	M6 Round Head Screw with Thread Lock Compound
4	34-00944-05	M5 Flat Washer
4	34-01184-05	M5 Nylock Lock Nuts
1	22-03130-00	eSolutions Harness
10	58-00079-02	Wire Tie
10	58-05100-00	Sta-Strap, 8"
4	34-06051-104	Rivnut, M6
10	58-00701-07	1/4" Button Plug
1	22-03090-00	Power Harness
1	22-02336-02	5 Amp Fuse

NOTE

In order for eSolutions to communicate with the Summit Micro use in the Supra product line, an EPROM with DataTrak™ must be installed. As of January 2020, the latest part number for the EPROM is 12-00648-3D8.

1.2 Tools

The following tools are required for units that need bracket and harness mounting holes drilled into the frame:

- Right Angle Drill
- Drill bit: 0.397" (size X) for Rivnut holes
- Drill bit: 0.266" (size H) for push-in wire tie holes
- Rivnut installation tool
- Red glyptol varnish (07-00479-00). Used to protect the battery charger or alternator connection required for units without the 1RP plug.

1.2.1 Stripping Wire

Any wire stripping that is required shall be done with approved hand strippers. Below are two examples of approved hand strippers:

Figure 1.1 - Wire Strippers

1.2.2 Crimping

Hand crimp connections shall be made with proper tool. One such example is below.

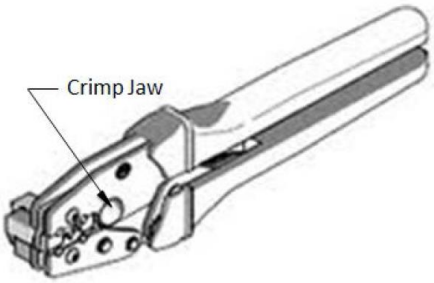


Figure 1.2 - Hand Crimper

1.2.3 Heat Shrink

- Glue lined heat shrink tubing shall always be carefully applied. Heat shall be added slowly as excessive temperatures can cause damage to low melting point insulation
- Check by visual inspection to make sure that there are glue rings presented all the way around both ends of the heat shrink tube as the indication of good seals.
- Splitting of heat shrink tubing due to over-temperature or over-shrinking is not allowable.
- Charring of the heat shrink tubing is also not allowable.
- Heat shrink tubing shall not be used in areas where there is vibration as it results in some loss of flexibility of the harness.

1.3 Schematics

The eSolutions wiring schematic and installation diagrams can be found in **Section 3**

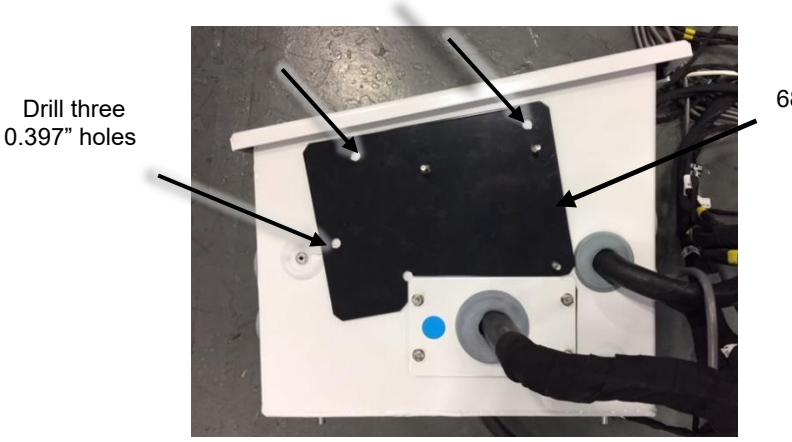
1.4 Installation

⚠ WARNING

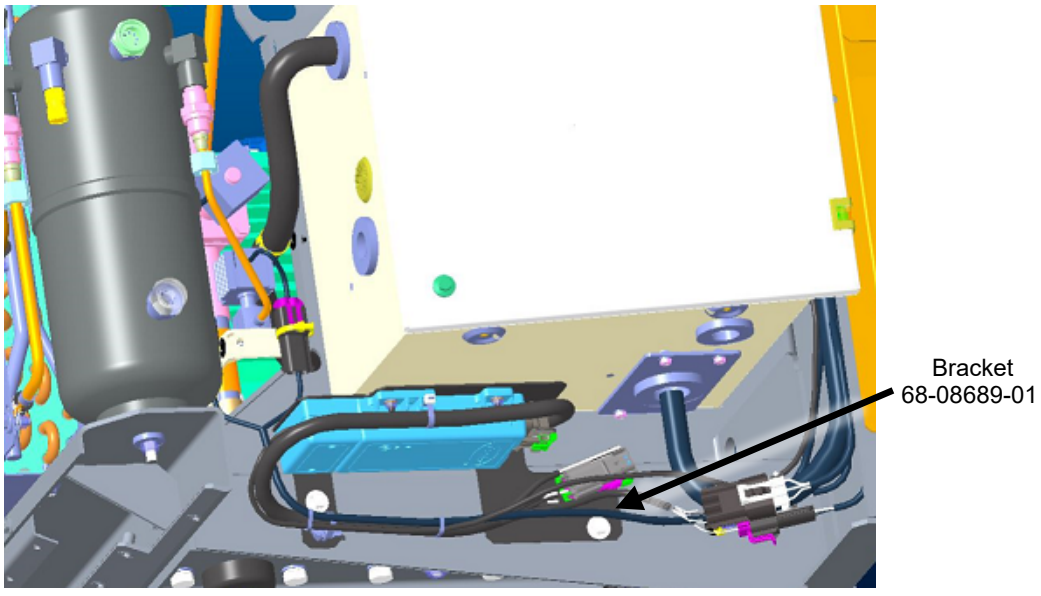
Unit may start automatically at any time even if the switch is in the OFF position. Use proper lockout/ tagout procedures before inspection/servicing. All unit inspection/servicing by properly trained personnel only.

1. Remove negative battery cable, lock out standby power if equipped
2. Remove roadside skin, condenser grille and top cover if equipped.
3. Install the mounting bracket and eSolutions module as follows:

   a. Place bracket 68-08632-00 under the control box as shown in Figure 1.3 below.



Supra 550, 650, 750, 850 and 60 Series Units



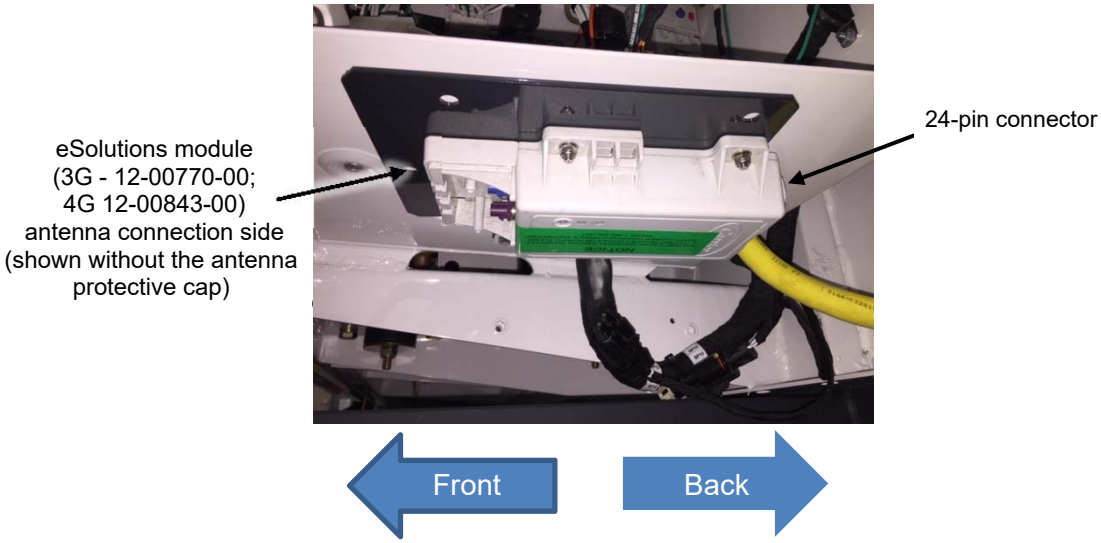
Supra 950 and 960 Units

Figure 1.3 - Control Box Removed from Frame for Clarity

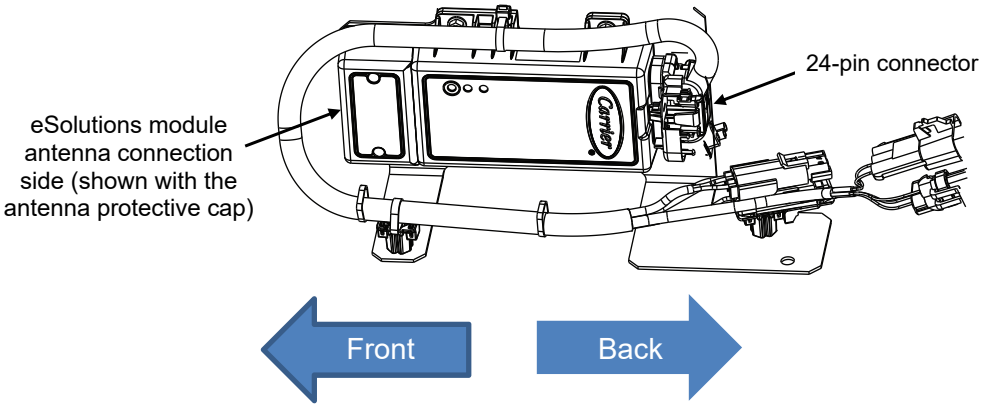
b. Mark the three mounting holes.
c. Remove the plate and prepare to drill the holes from the outside of the control box.

NOTE
Before drilling holes for the mounting plate, make sure no wires are in the area where the drill will breakthrough to the inside of the box.

d. Drill three 0.397" (Drill size X) holes in the bottom of the control box. Remove any burrs from drilling out of the control box.
e. Install three Rivnuts (34-06051-104) into the three holes.
f. Attach the mounting plate to the control box using three 34-01341-25 bolt
g. Install the eSolutions module to the mounting plate on the bottom of the control box using three M5 Nylock nuts (34-01184-05) and flat washers (34-00944-05).
h. Position the 24-pin connector towards the rear of the unit and the two antenna connections towards the front.



For Supra 5,6,7,8 units



For Supra 950MT and 960

Figure 1.4. - eSolutions Module Antenna Connection

1.4.1 Power Harness Installation

1. For Supra 560, 660, 760 ,860, 950MT and 960 units prior to serial number TFP91605321, install power harness (22-03090-00) as follows:

Figure 1.5 - Power Harness Installation

a. Remove the pass-through grommet on the control box as shown and install the 22-03090-00 harness.

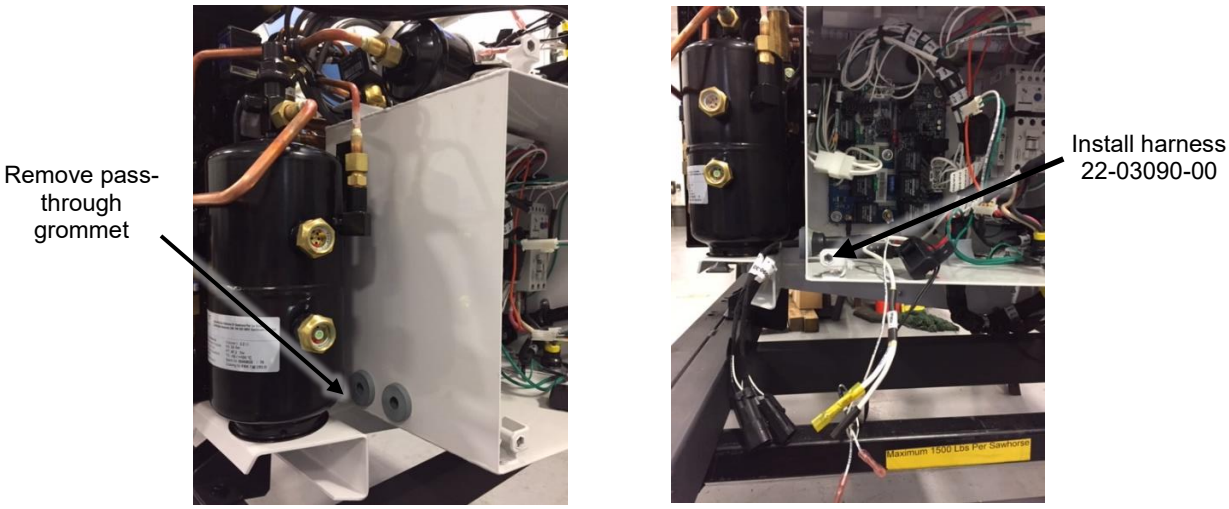


Figure 1.6 - Remove Pass-through and Install Harness

b. Locate/disconnect the 1J plug on the relay board and then locate pin 12 on the connector (950MT uses 3J-12).

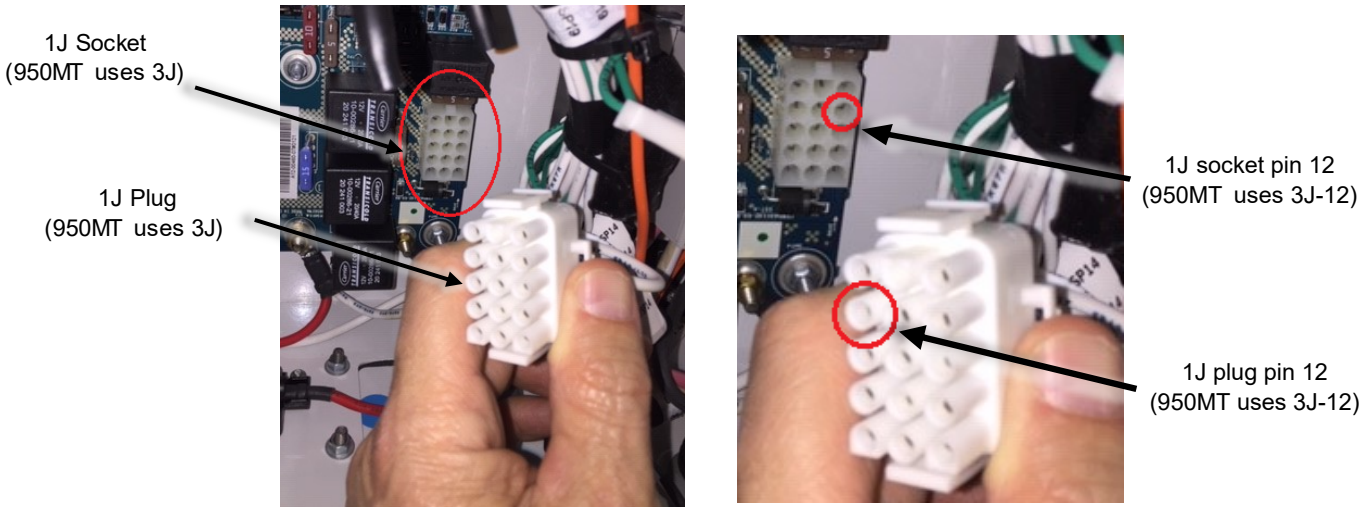


Figure 1.7 - Connector and Pin Locations - Supra 5, 6, 7, 8, 960 Only

c. Use pin extractor tool (07-00254-00) and remove the 1J-12 pin (Supra 5, 6, 7, 8, and 960 only).
d. Cut the terminal off the 1J-12 (3J-12 on 950MT only) wire as near to the terminal as possible. Strip the insulation off the wire 0.25".

Supra 950MT only - use pin extractor tool (07-00254-00) and remove the 3J-12 pin.

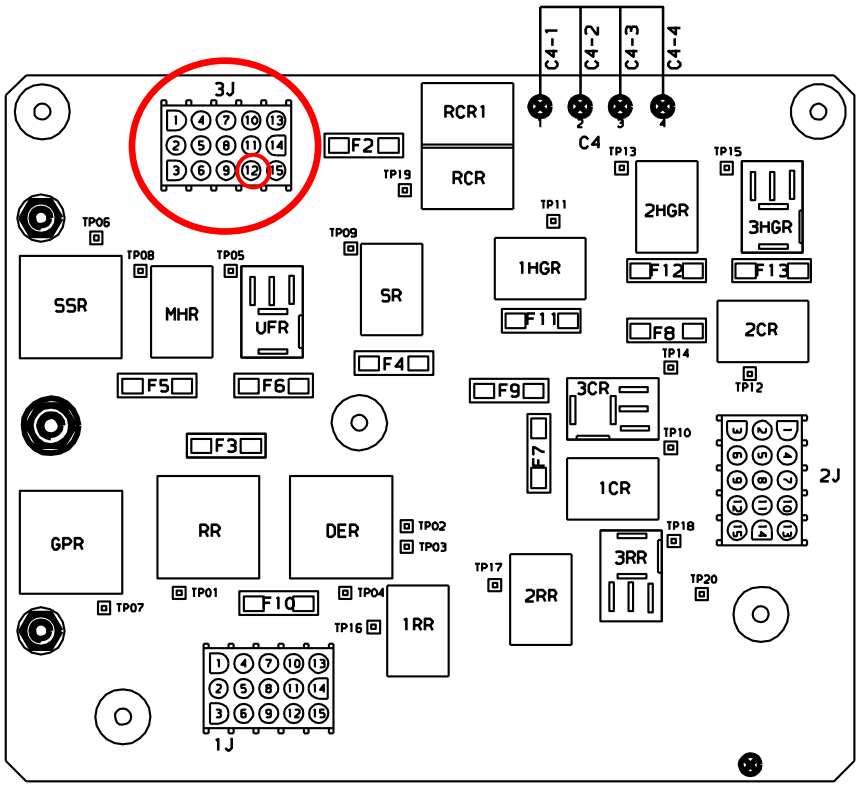


Figure 1.8 Control Relay Board View (950MT Units only)

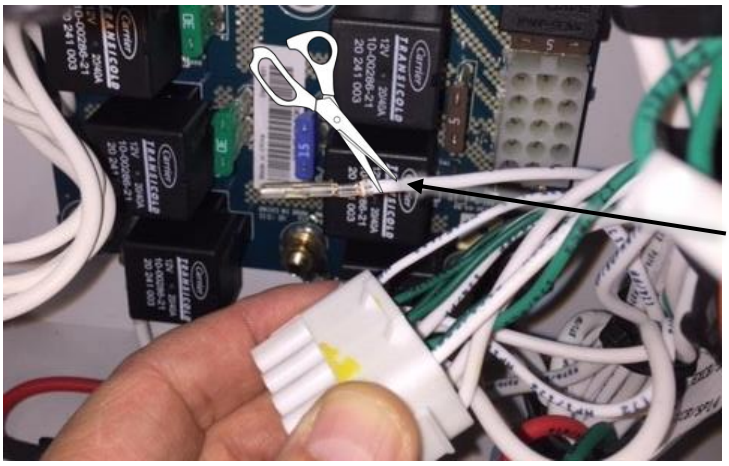


Figure 1.9 - Terminal Strip Insulation

e. Crimp the butt splice end of the 12 VDC switched power wire to the unit wire 1J-12 (3J-12 on 950MT only).

f. Insert the terminal end of the 12 VDC switched power wire into the 1J plug pin 12 position (3J-12 on 950MT only).

g. Plug in the 1J (3J on 950MT only) to the relay board.

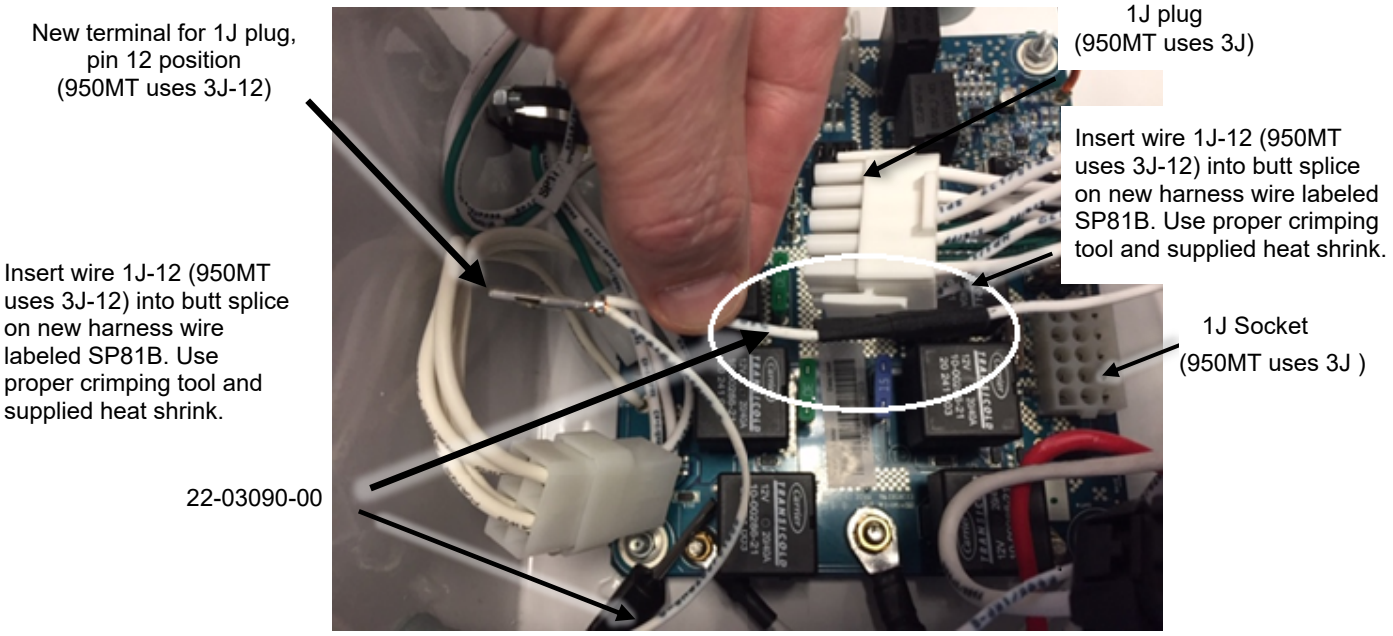


Figure 1.10 - Attaching Switched 12 VDC Power Wire

h. Locate the F27A/ST3 wire in the control box. Cut the black insulation off the end of the wire and strip insulation back 0.31". Insert the stripped end of the wire to the eSolutions harness wire labeled SP80B and crimp the butt splice and apply heat shrink. The remaining wire labeled SP80C is present for Fuel Heat if that option is used on the Supra.

NOTE
See Tools: Stripping Wire, Crimping, Heat Shrink

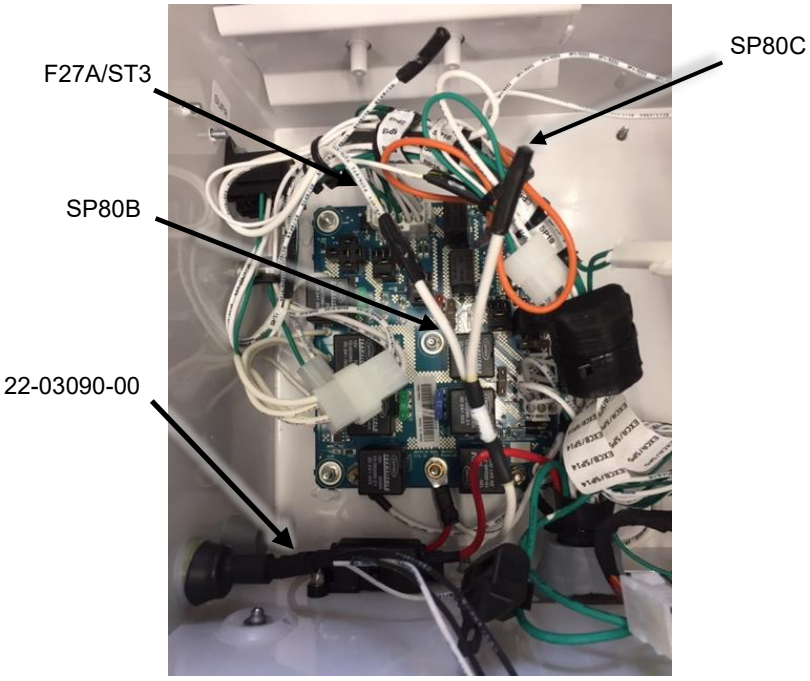


Figure 1.11 - Attaching Constant 12 VDC Power Wire

i. Attach the ground wire from harness 22-03090-00 to the low voltage ground stud in the control box.

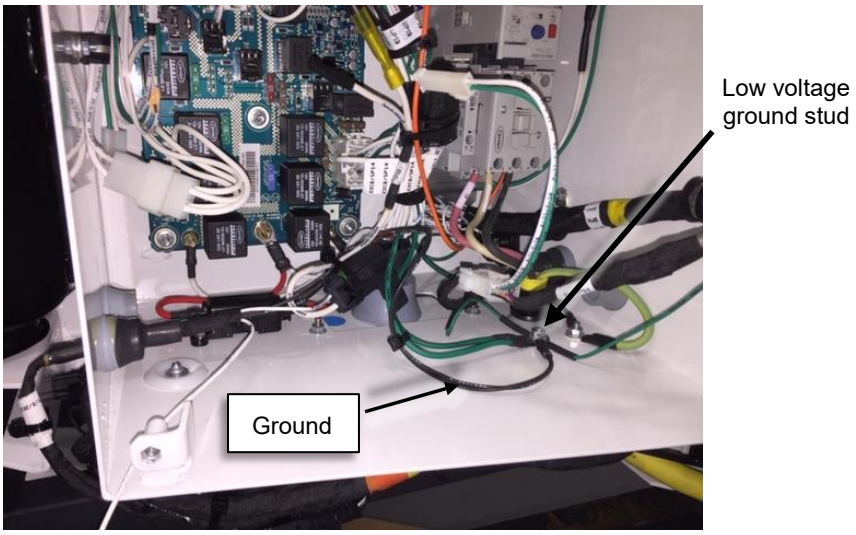


Figure 1.11 - Attaching Ground Wire from Harness

NOTE
When stacking the ground lugs, they should be positioned in a manner that seating interference is avoided

j. Attach Ty-Wrap (54-00079-02) and secure the harness (22-03090-00) inside the control box.

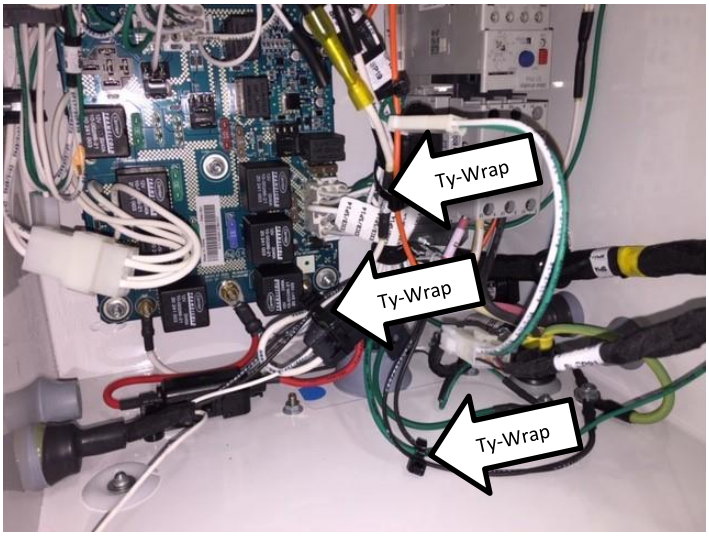


Figure 1.12 - Ty-Wrap Placement

2. Install the 22-03130-00 harness for Supra 5,6,7,8 and 950/960 prior to serial number TFP91605321 as follows:

   a. Apply dielectric grease (02-00311-02) to the 24-pin connector on the eSolutions harness and plug to the eSolutions module
   b. Plug in 2RP plug (on the 22-03130-00 harness) to the 1RP plug (on the 22-03090-00 harness).
   c. Plug in SATPWR plug (on the 22-03130-00 harness) to SATPWR plug (on the 22-03090-00 harness).
   d. Plug in SATCOM plug (on 22-03130-00 harness) to Serial Port plug (SPA, SPB, SPC on the unit harness)

NOTE
Reference Figure 1.14 for illustration of correct configuration.

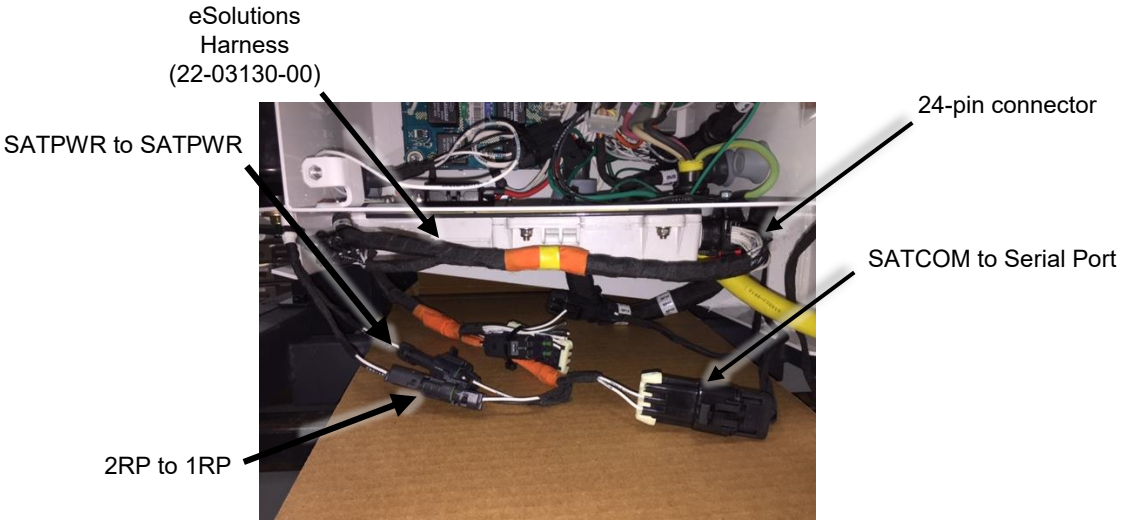


Figure 1.13 - Plugging in eSolutions

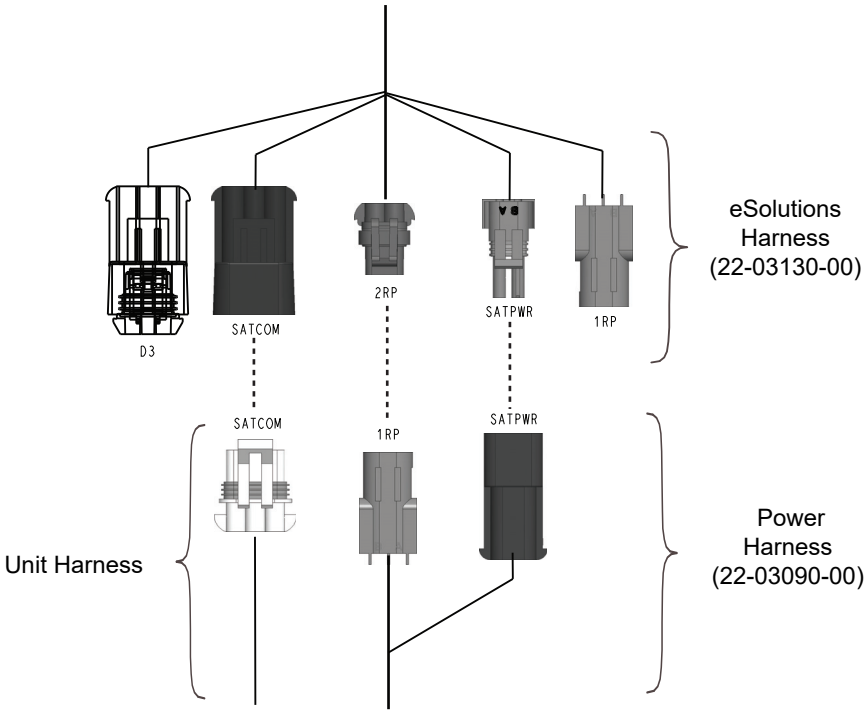


Figure 1.14 - Power and Communication for all Supra 5,6,7,8 and 960 Units before S/N TFP91605321

For 960 Units after Serial Number TFP91605321

For Supra 960 after serial number TFP91605321 only, connect the eSolutions module harness to the mating unit engine harness connectors and all applicable options (fuel sensor, door switch, power control switch, etc.)

1. Connect the eSolutions module harness (22-03130-00) to the mating unit engine harness connectors and all applicable options (fuel sensor, door switch, power control switch, etc.). See Figure 1.15.

NOTE

Anti-fretting dielectric grease (P/N 02-00311-02) must be applied to each electrical connection.

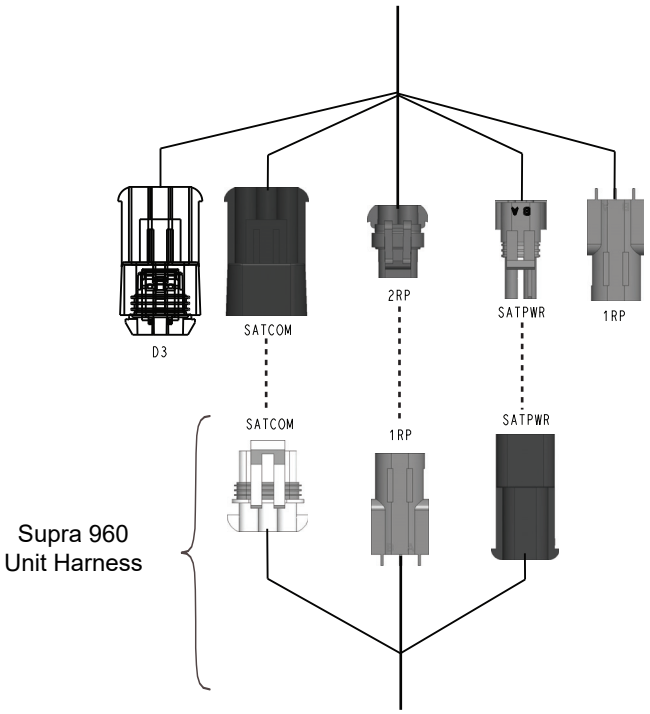


Figure 1.15 - Power and Communication for 960 Units after S/N TFP91605321

2. Check all harness securing locations to make sure that harness is neatly secured with no loose sections or potential chafing points.
3. Reinstall unit doors.
4. Reconnect unit negative battery cable.
5. Commission the eSolutions system and verify proper operation. Refer to **Section 2.**

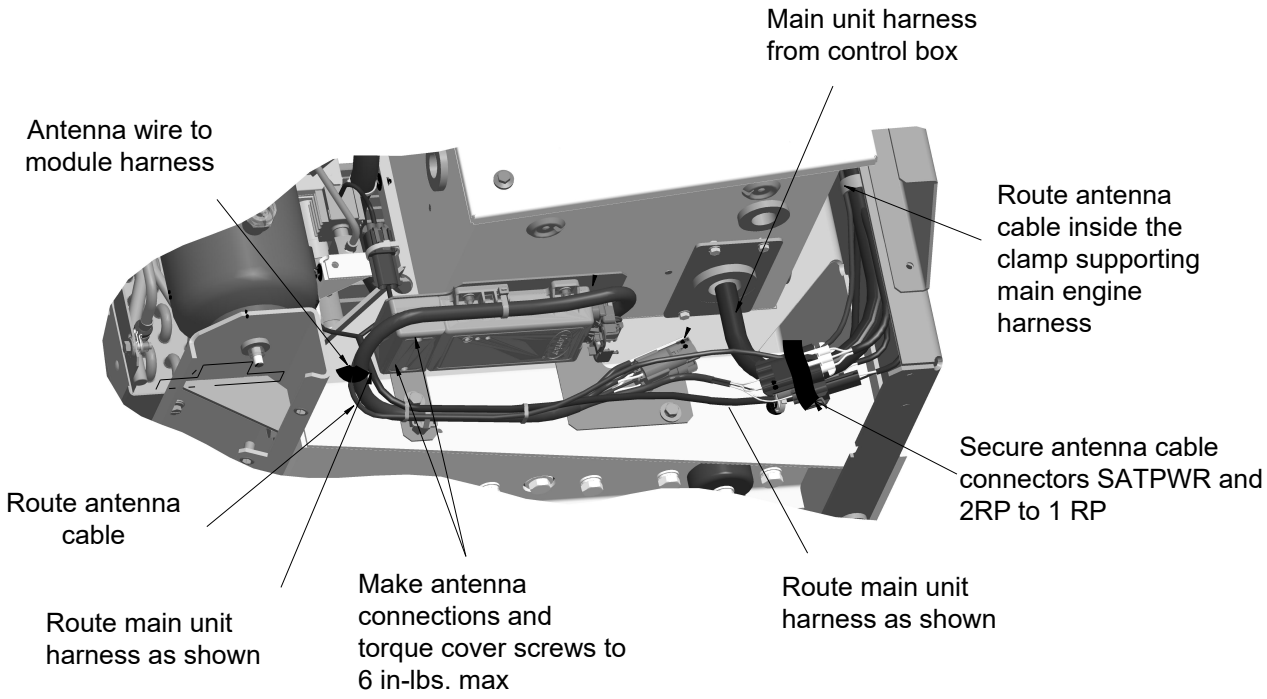


Figure 1.16 - Harness Routing - 950/960 MT Units only

Antenna Installation

1. Use two self-tapping screws (34-01276-08) to secure the antenna (12-00844-00) to the top of the Supra frame as shown below.

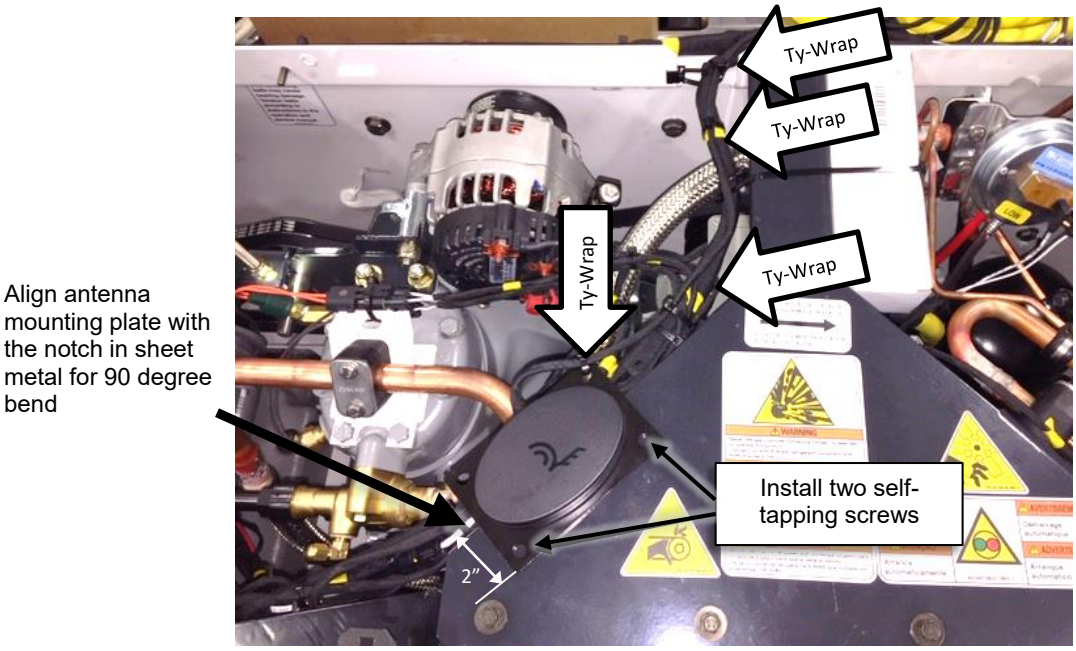


Figure 1.17 - Installing the Antenna (560, 660, 760 and 860 Units)

NOTE

There are two thicknesses of sheet metal below the Y bracket on top of the unit. Move the antenna in 2” from the edge to avoid the two thicknesses.

2. Route the antenna harness as shown in the illustrations below and secure.

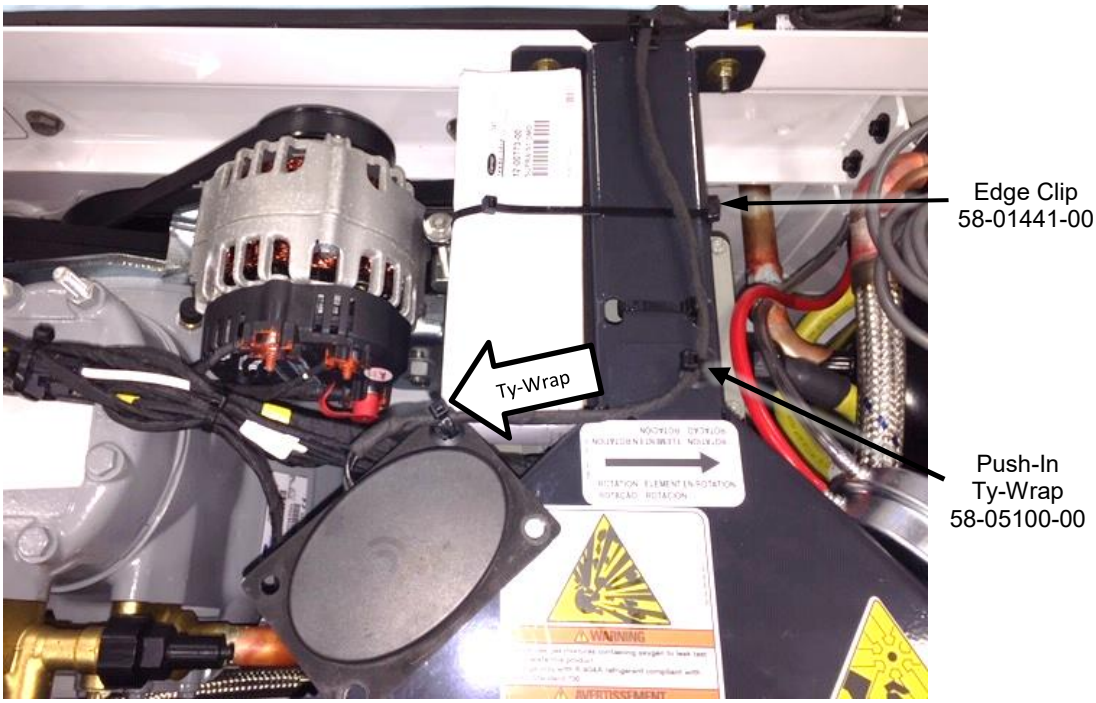


Figure 1.18 - Routing the Antenna (560 and 660 Units)

3. Secure the remainder of the antenna harness and the eSolutions harness as shown in the series of pictures.

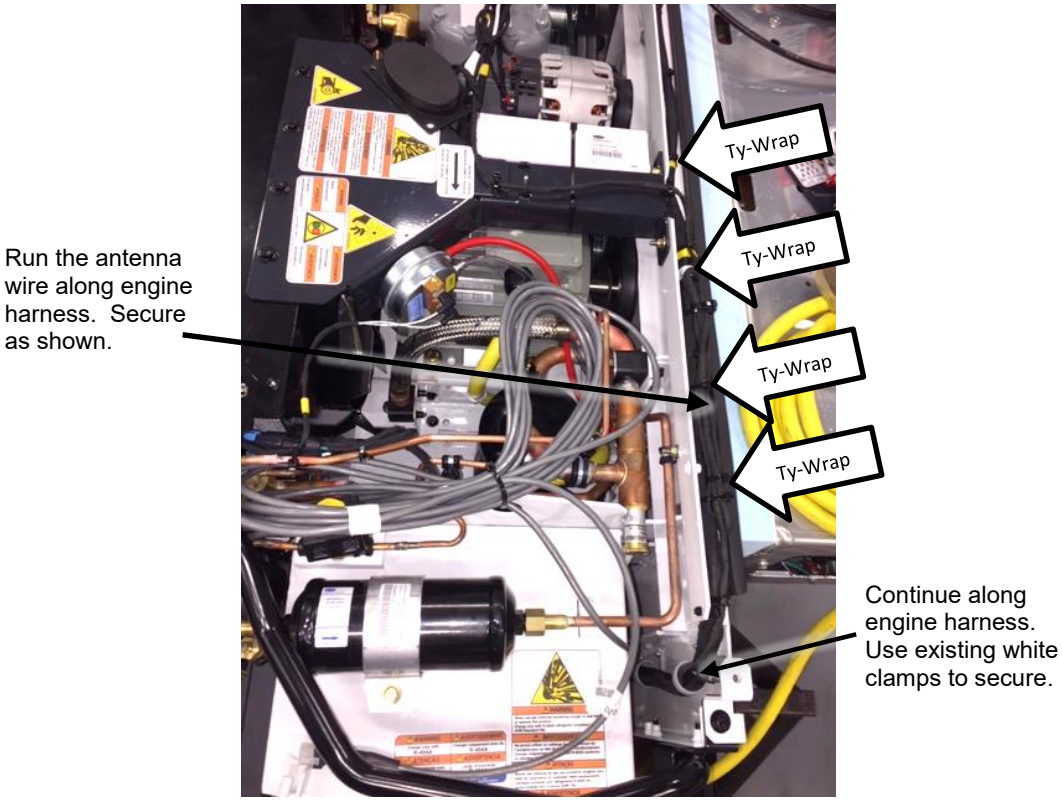


Figure 1.19 - Securing the Antenna (560,660,760,860)

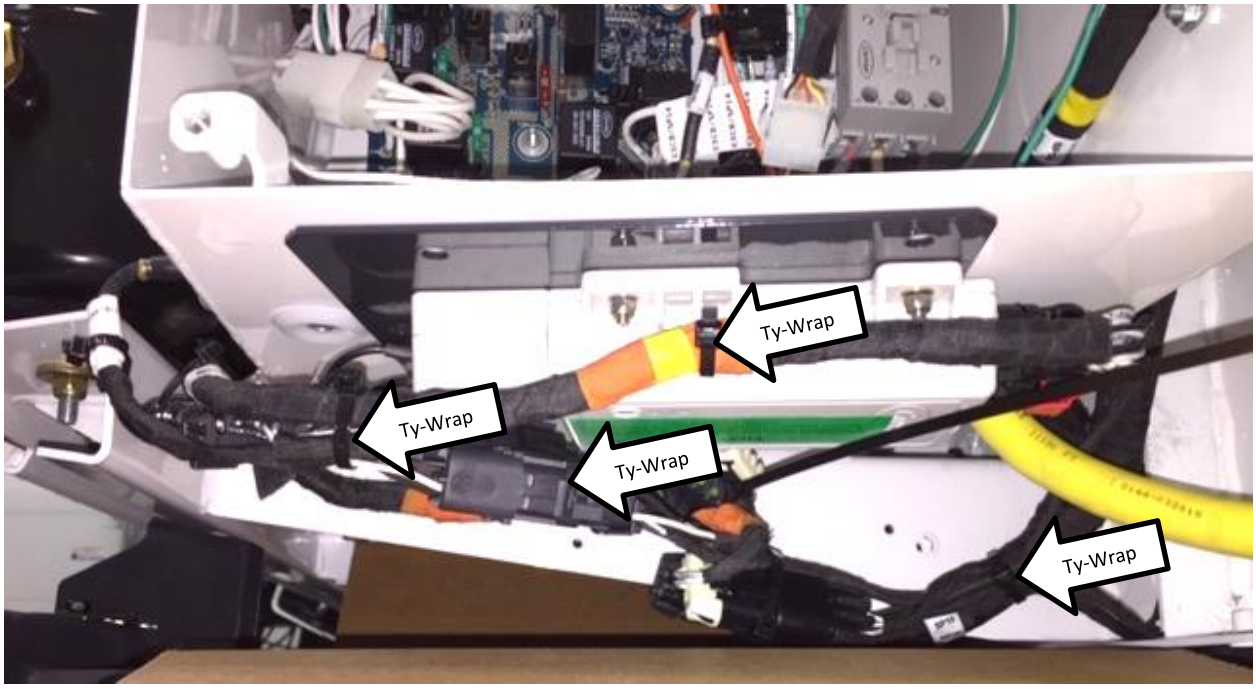


Figure 1.20 - Ty-Wrap Locations (760 and 860 Units)

Edge clip
(58-01428-00)

Run the antenna wire along engine harness. Secure as shown.

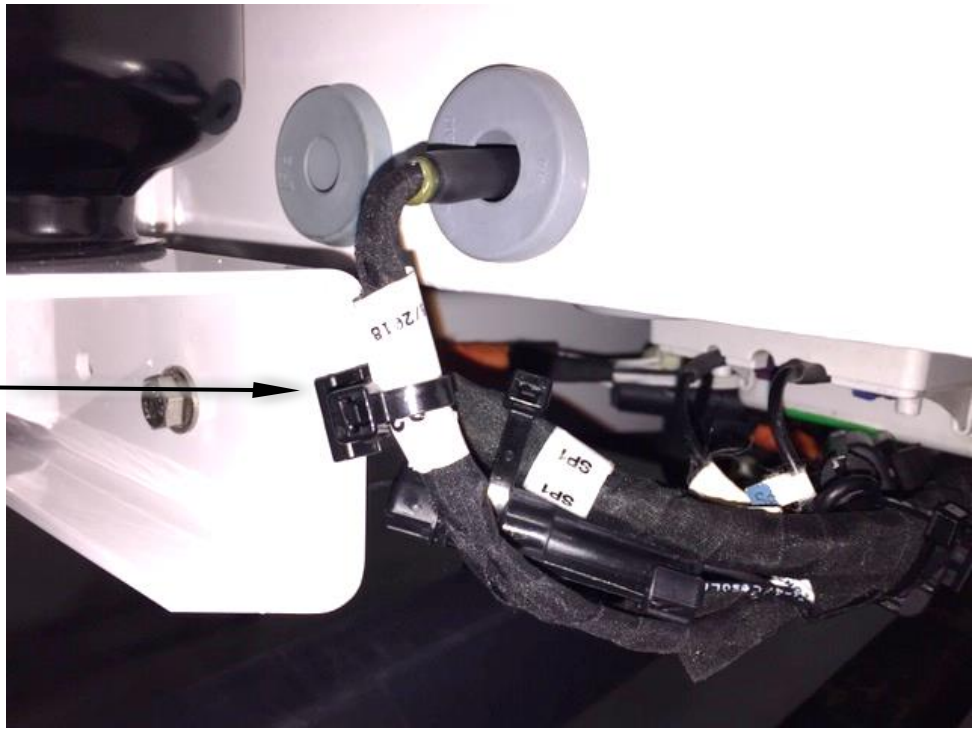


Figure 1.21 Edge Clip Placement (760 and 860 Units)

Figure 1.22 - Antenna Installation (950 and 960 units)

Route antenna harness along existing harness and secure with ty-wraps every 6 to 8”

Figure 1.23 - Routing and Securing the Antenna Harness (950 and 960 units)

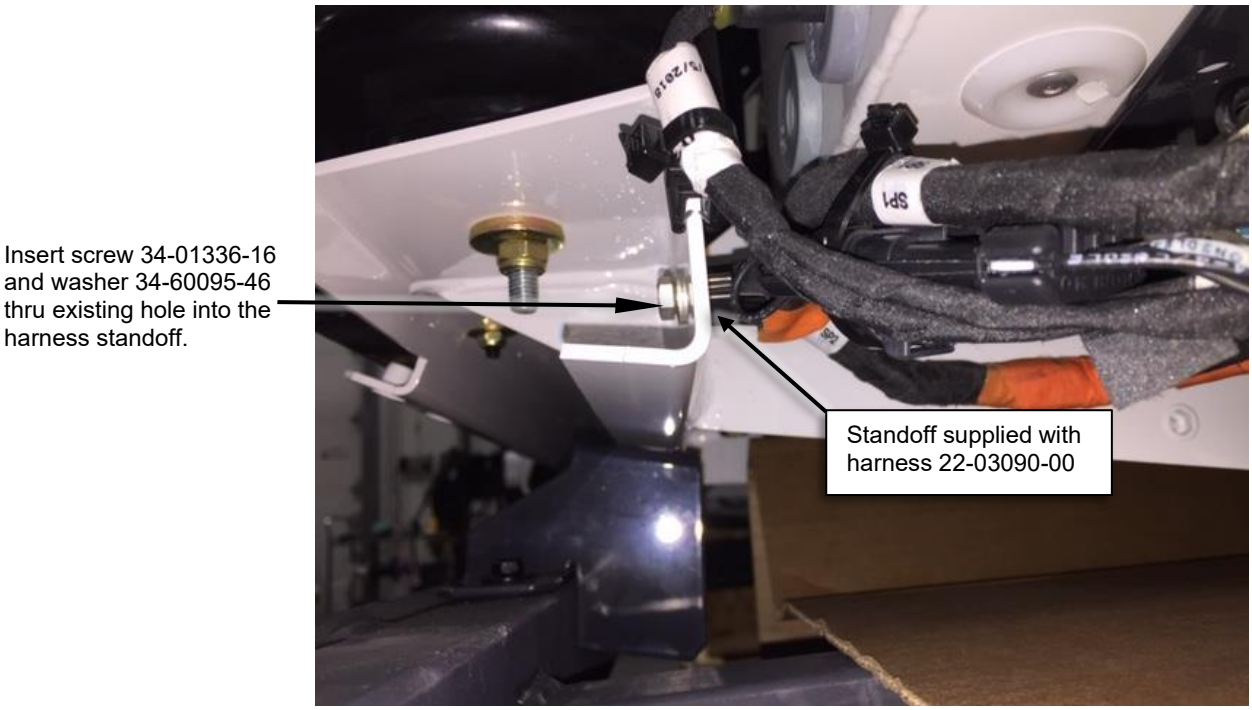


Figure 1.24 - Fasten the Standoff

4. Plug in the antenna wires to the eSolutions module.

   Follow the color code:
   - Blue connector to blue receptacle
   - Violet connector to violet receptacle

   Reinstall the protective cap on the antenna end of the eSolutions module with two T10 screws.

Figure 1.25 - Plug in Antenna Wires and Replace Protective Cap

1.5 Options

Installation instructions are provided with each option kit. Refer to schematics in Section 3 for additional information.

1.5.1 Fuel Level Sensor (eSolutions)

Either the Carrier OEM Ultrasonic fuel level sensor 12-00675-00 or the eSolutions fuel level sensor 12-00787-50 can be installed if it is connected to the eSolutions harness. When the FLS is connected this way, the sensor will provide readings only when the SROS is in the START/RUN position. Follow the instructions provide with the respective kit to install the sensor.

Figure 1.26
Carrier OEM fuel level sensor 12-00675-00

Figure 1.27
eSolutions fuel level sensor 12-00787-50

1.5.2 Remote Door Switch

The remote door switch kit is the standard CTD kit 76-00578-05. If the door switch is connected to the eSolutions harness, the system can work with either normally open switch, or normally closed. If the door switch is connected to the unit, no door activity will be recorded on the eSolutions website.

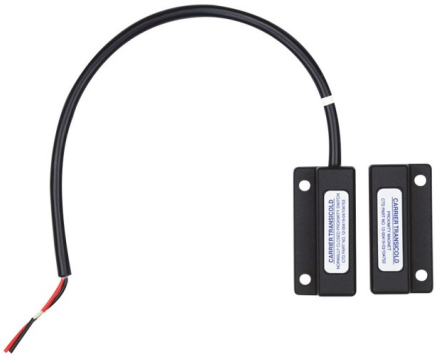


Figure 1.28 - Remote Door Switch

1.5.3 Remote Temperature Sensors

The remote temperature sensors can be installed if they are connected directly to the eSolutions harness. Use temperature sensor (Carrier part number 76-00910) and follow instructions in the field install kit.

Figure 1.29 - eSolutions Remote Temperature Sensor

2. Field Commissioning eSolutions System

⚠ CAUTION

The eSolutions Module must have >12.2 VDC for a minimum of 15 minutes before it can be commissioned. This will ensure that if the unit went into hibernation due to a low battery, the eSolutions module will be awake and will communicate properly.

NOTE

Before commissioning the eSolutions system, ensure the following:

- Summit software must have DataTrak®.
- The proper Fleet Code must be available before commissioning the system with uCon. The Fleet Code is email from Carrier Transicold after the customer's Service Plan is ordered on TransCentral.

NOTE

Field commissioning should be done outdoors to ensure proper cellular/satellite signal.

2.1 Commissioning Cable

- Commissioning Cable (07-00559-00SV) is required for commissioning.
- The commissioning cable includes the serial (9-Pin) to USB adapter which is required for Windows 10 operating systems (07-00503-00).

NOTE

In order to download and install the USB adapter proper driver, make sure your laptop is connected to the Internet when you plug in the USB adapter.

2.2 Configuration Setup on a Laptop

- uCon: Communications program used for laptops running Vista, Windows 7 or later and is a free down- load.
- HyperTerminal: Communications program included with Microsoft Windows 98, 2000 and XP which is used to monitor communications between the laptop and the eSolutions module.

Procedures for configuring laptops running Microsoft Vista, Windows 7 or later, and Windows 98, 2000 and XP are detailed below.

2.2.1 Configuring Vista, Windows 7 or Later

First, download a free copy of uCon from the following website: http://www.umonfw.com/ucon/index.html

1. Click the word <Download Here> and follow the directions to download the uCon program.
2. Save the file to the Desktop. If necessary, add <.exe> file extension.
3. Once you have completed the installation of the uCon program and have a desktop icon on your computer, double click the icon to open the program.
4. Disconnect the RP plug (or adapter cable) from the engine harness.
5. Reconnect the unit negative battery cable (if still disconnected).
6. Reconnect the RP plug, and look for green and amber LED on the eSolutions module. This LED will only flash the first time.
7. Remove the Console Cap from the 4-wire console connector on the eSolutions harness.
8. Connect the commissioning cable 4-wire connector to console connector.
9. Connect a Serial to USB adapter to the 9-pin connector on the commissioning cable.
10. Connect the USB adapter to the USB port on laptop.
11. Start uCon. Double click the uCon icon on your desktop to start the program.

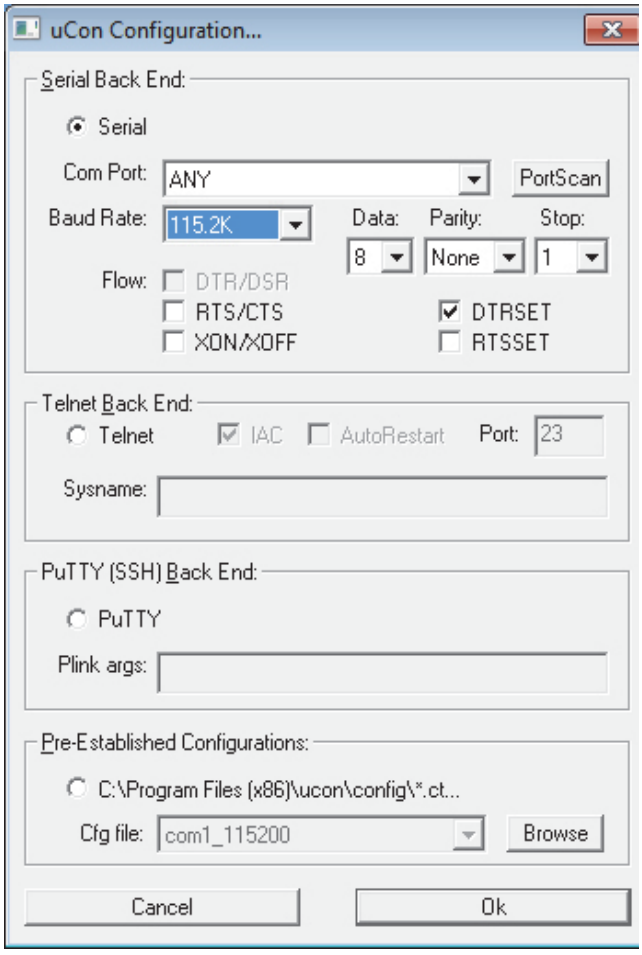


Figure 2.1 uCon Parameters

12. Configure uCon with the following parameters (refer to **Figure 2.2**):
    - Serial
    - Set Com Port: ANY
    - Set Baud Rate: 115.2K
    - Data: 8
    - Parity: None
    - Stop: 1
    - Flow: DTRSET
13. Click OK

2.2.2 Configuring Windows 98, 2000 and XP

1. Click <Start>, <Programs>, <Accessories>, <Communications>.
2. Click <HyperTerminal> (the program, not the folder).
3. Enter “115200” in the Connection Description window and then click on the icon you wish to represent this configuration. This icon will now appear under the HyperTerminal folder in the menu and can be used start the program in the future.
4. Click <OK>.

> **NOTE**
> Communications Port 1 is the most common for a laptop. Some laptops may use Communications Port 2. USB to serial converts require that you check with your

5. In COM1 Properties, use the following Port Settings.

Table 2–1 COM Settings, HyperTerminal

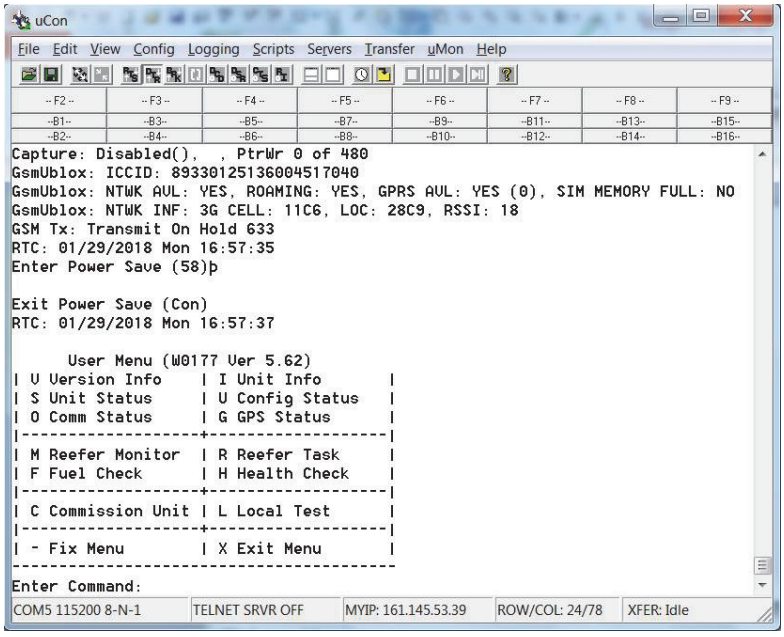
Parameter	Settings
Bits Per Second	115200
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

6. Click the <OK> button.
7. Click File>Save As. Enter the name “115200” and save the setup file on your desktop.
8. A HyperTerminal session called “115200” has now been setup and can be used in the future to communicate with the eSolutions System.

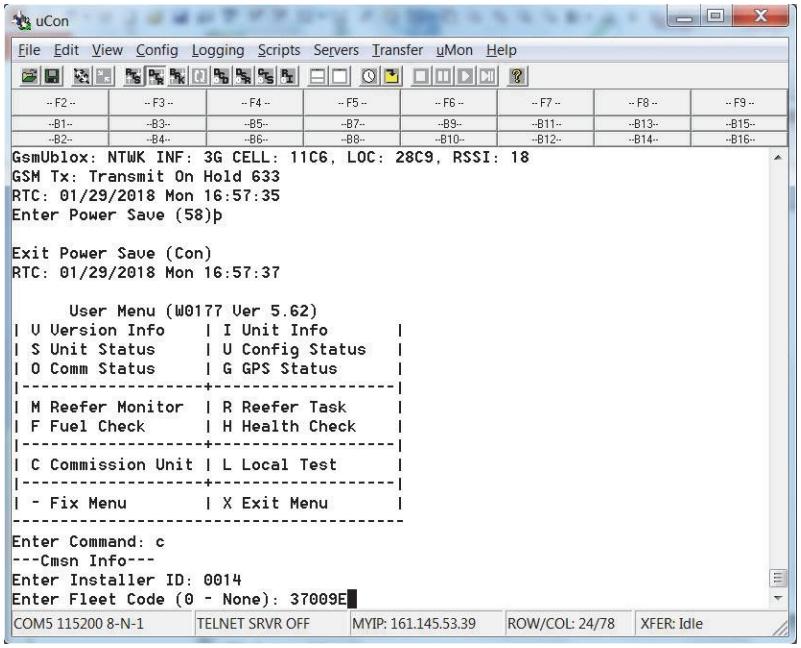
2.3 Commissioning the Unit

> **NOTE**
> Periodic software revisions may change some of the screen options that are displayed during commissioning. The eSolutions software version is displayed on the eSolutions User Menu. These instructions display modified screens as software versions *starting with software version 5.62.*

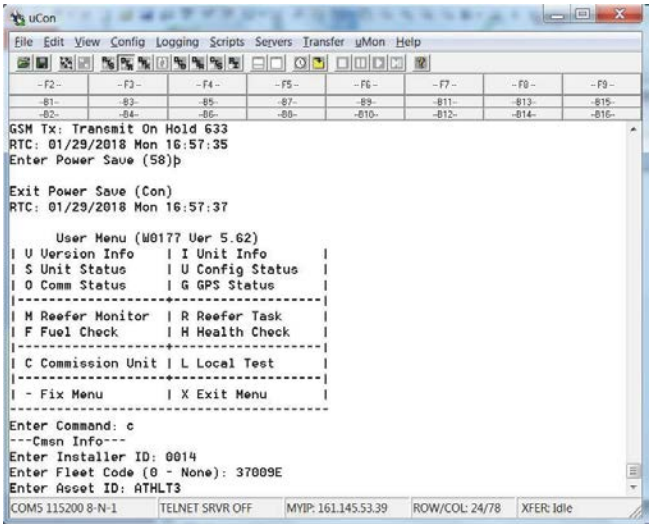
1. Open the uCon (or HyperTerminal) application and press the space bar. The eSolutions user menu will open. At this point you are connected to the eSolutions module.



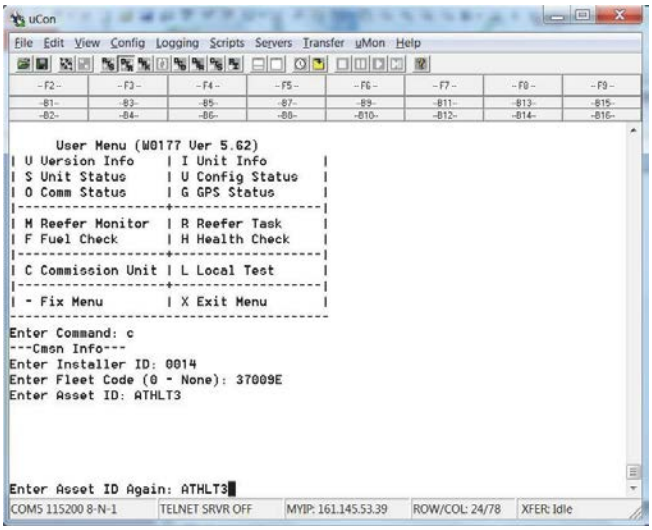
2. From the User menu, press <C> to commission unit. Enter Installer ID: 0014



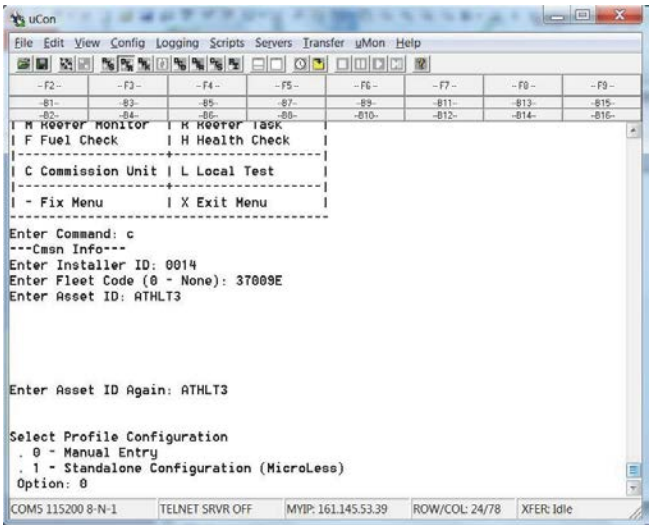
3. Enter Fleet Code:
   - The fleet code is specific for each company created in eSolutions.
   - The fleet code is provided by Carrier Transicold email address: esolutions@carrier.utc.com.
4. Press Enter.



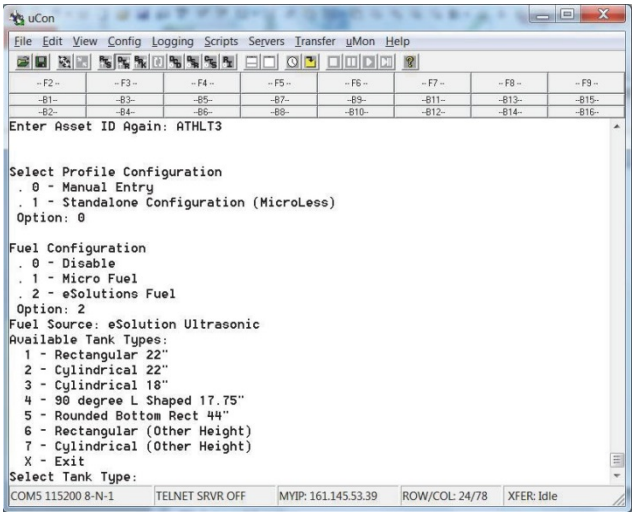
5. Enter the Asset ID. This is usually the trailer number. Press Enter.



6. Enter the Asset ID (usually the trailer number) again and press Enter.



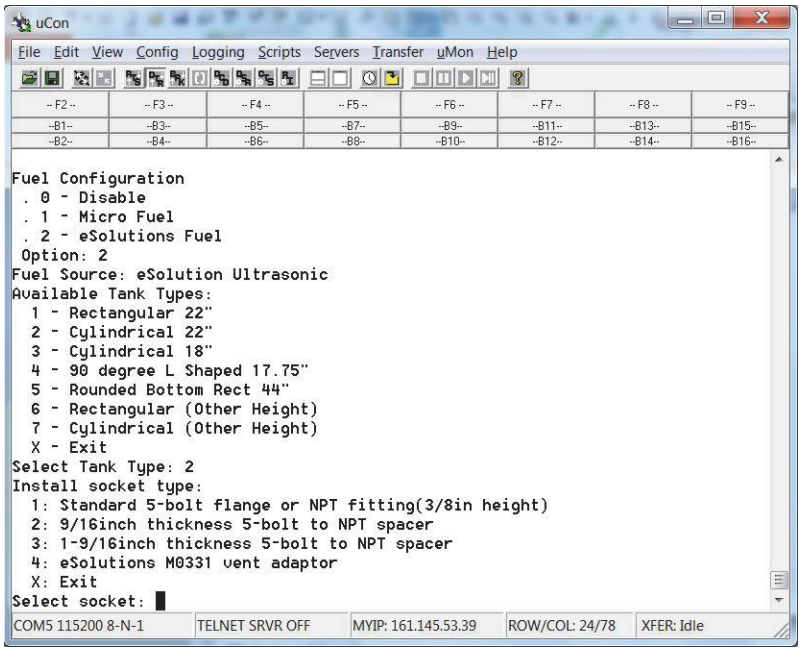
7. Select Profile Configuration. Select <0> unless special instructions are provided by Carrier Transicold.



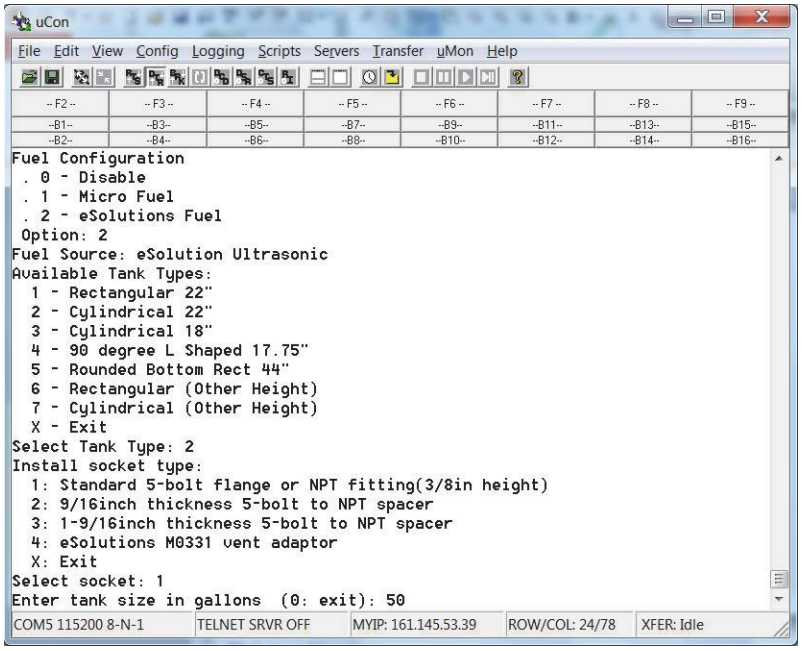
8. Fuel Configuration:
   - <0> = No fuel level sensor
   - <1> = The fuel level sensor is attached to the unit engine harness
   - <2> = The fuel level sensor is attached to the eSolutions harness

NOTE
For Supra products choose either <0> or <2> depending on the application

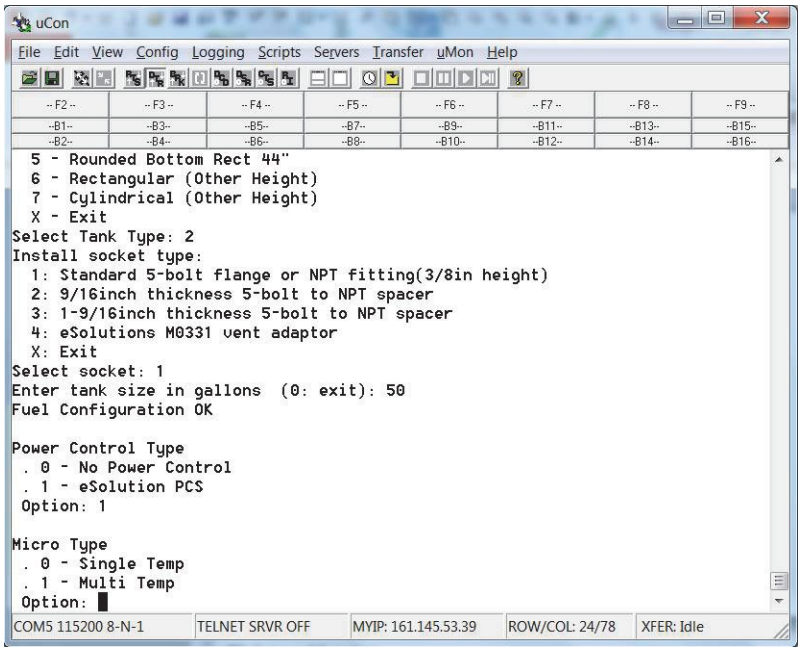
9. Enter appropriate fuel tank type.



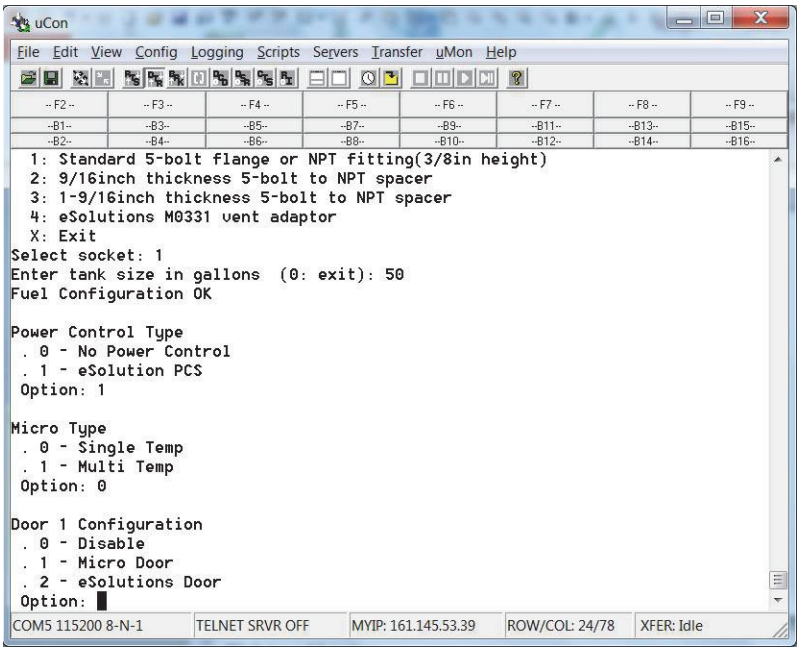
10. Install Socket Type:
    - <1> = Bolts on with the standard 5-bolt flange (no adapter) or standard NPT thread into tank (no adapter).
    - Or choose appropriate adapter style.



11. Enter tank size in gallons and press <Enter>.

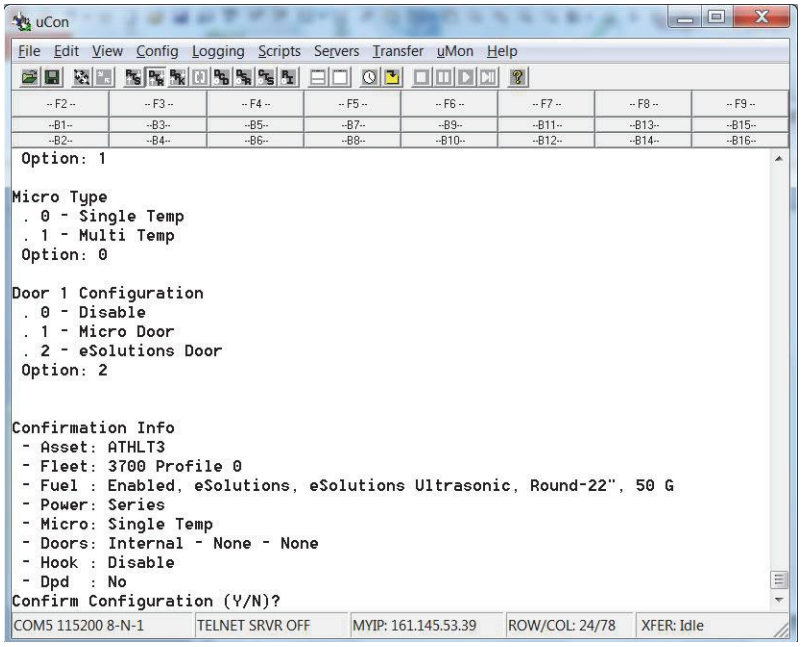


- Power Control Type: enter <0> = No Power Control
- Micro Type: enter <0> = Single Temp



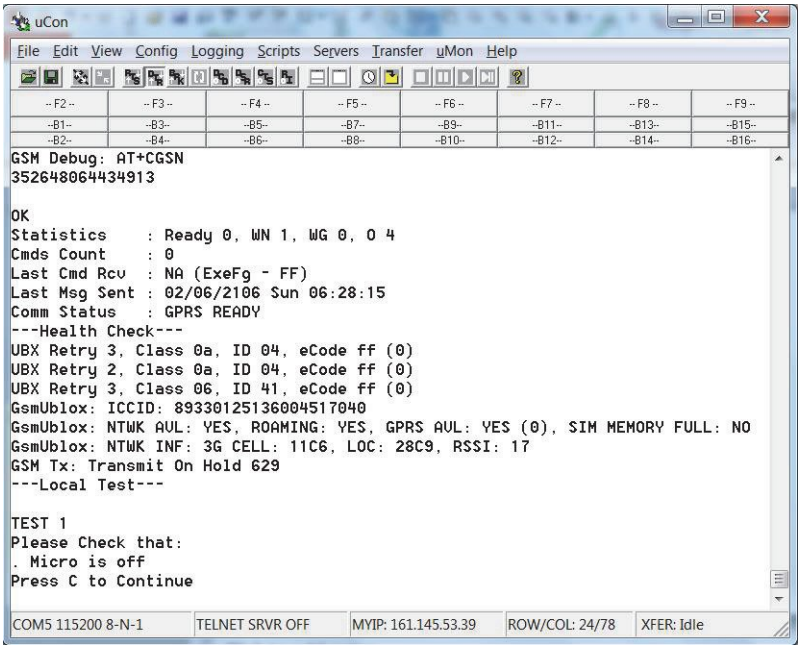
12. Door 1 Configuration:
    - <0> = No door switch is attached
    - <1> = Door switch is attached to the unit engine harness
    - <2> = Door switch is attached to the eSolutions harness

NOTE
For Supra products choose either <0> or <2> depending on the application



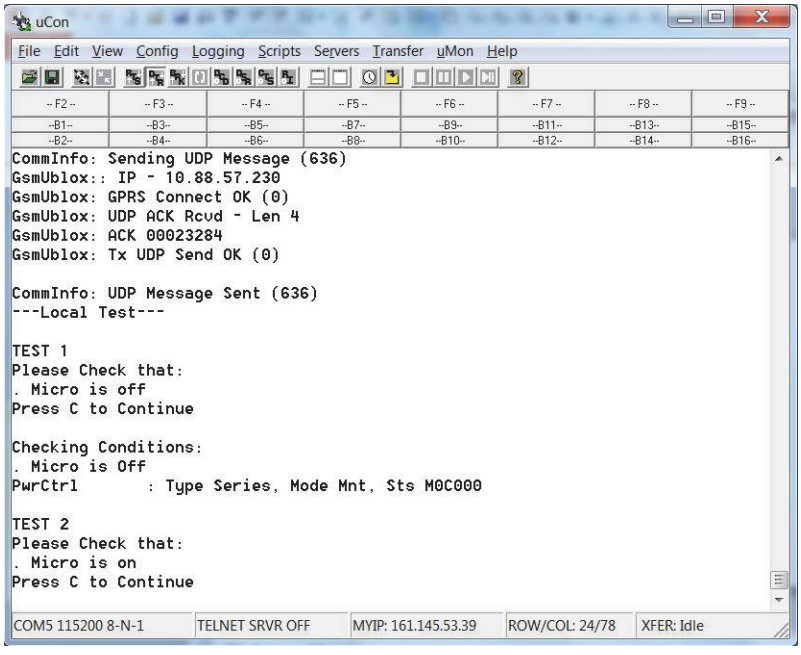
13. Configuration Info: Verify eSolutions configuration:
    - <Y> = To continue commissioning

2.3.1 Test 1



a. Verify that the Micro is OFF. The micro needs to be completely OFF with no temperatures displayed.
b. Press <C> to continue.

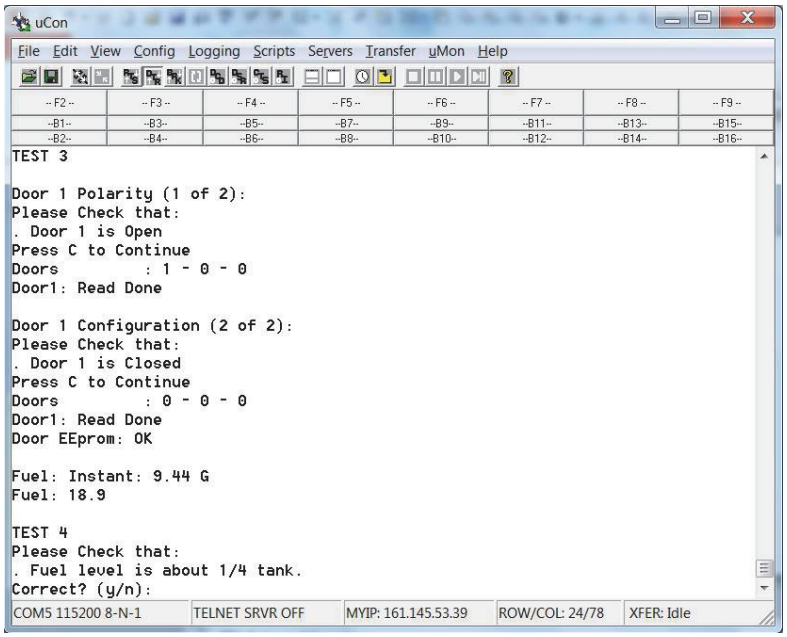
2.3.2 Test 2



a. Verify the Micro is ON. The Micro needs to be completely ON. Wait until temperatures are displayed.
b. Press <C> to continue.
c. Text will be displayed in uCon program. If communication is established between eS and Summit micro, then uCon will display:

Micro: Summit Micro Detected

2.3.3 Test 3



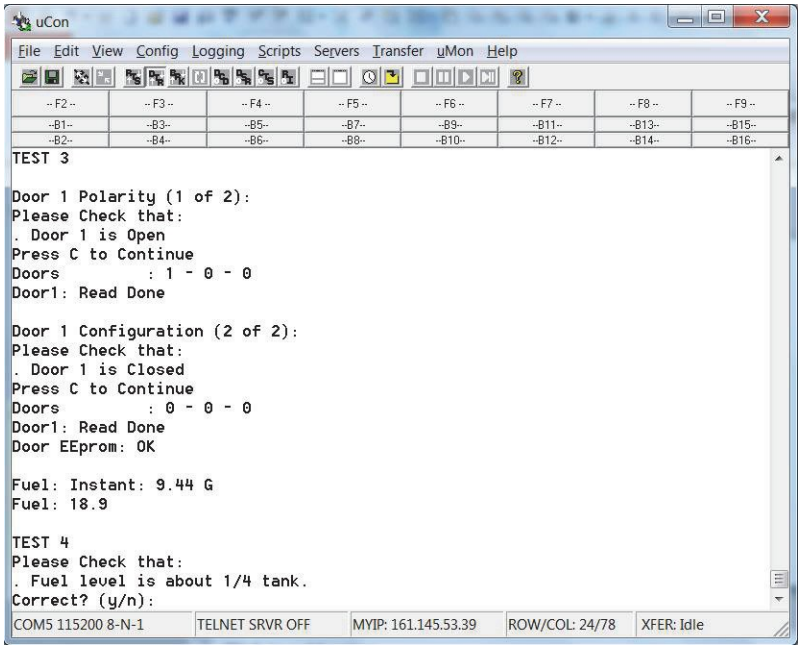
Door 1 Polarity (1 of 2). Verify the door is open.

a. Press <C> to continue.
b. Door 1 Polarity (2 of 2). Verify the door is closed.
c. Press <C> to continue.

NOTE

The door switch can be either normally open or normally closed. The commissioning process will configure itself for each sensor.

2.3.4 Test 4



Fuel Level Test: uCon will read the fuel level sensor and verify the current fuel level in the tank. Enter <Y> or <N> accordingly.

> **NOTE**
> Technician must visually verify fuel level during this test.
>
> **NOTE**
> At this point, the unit should still be running after Test 2.

2.3.5 Commissioning Complete

Press <C> to continue

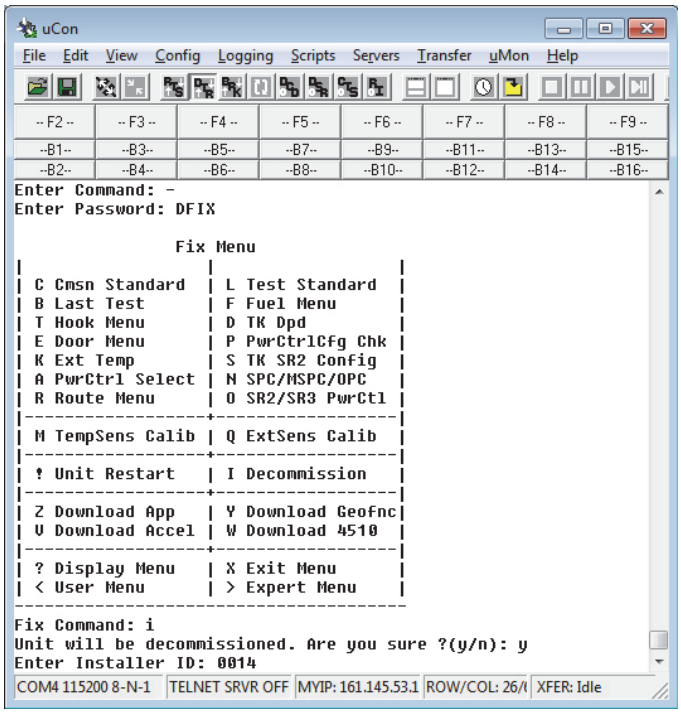
2.4 Decommissioning a Unit

A unit can be decommissioned from the Fix menu.

a) At the Start menu enter Command "-" and Enter Password "DFIX" to open the Fix menu.

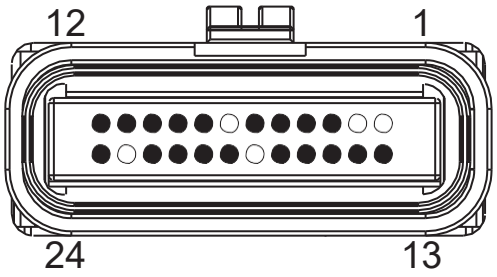
b) Fix Command "I" will initiate decommission

c) Verify decommission by entering **Y**es / **N**o. Enter Installer ID 0014



3. Wire Harness Connector Pinout

Table 3–1 DP24



DP24 Terminal	Component
3	SP-2 (GND)
4	CONSOLE-D (OFF signal)
5	SATPWR-A Switched PWR
6	TEMP1 (Remote Temp Sensor 1)
8	SATCOM-B (TX)
9	SATCOM-A (RX)
10	D3-C
11	DS-A
12	TEMP3 (Remote Temp Sensor 3)
13	TEMP-2 (Remote Temp Sensor 2)
14	FLS-A (+) (12VDC)
15	THS (Trailer Hook Switch)
16	FLS-C (SIG)
17	CONSOLE-C (GND)
19	FLS-B (-) (GND)
20	CONSOLE-A (PC TX)
21	CONSOLE-B (PC RX)
22	GND (Sensor)
24	SP-1 (Constant PWR)
Unused Terminals: 1, 2, 7, 18, 23	

Table 3–2 Console (4-pin)

CONSOLE Terminal	Component
A	DP24-20 (PC TX)
B	DP24-21 (PC RX)
C	DP24-17 (GND)
D	DP24-4 (OFF Signal)
Unused Terminals: None	

Table 3–3 Console Cap (4-pin)

CONSOLE CAP 4-pin	Component
A	C CAP-C (Jumper)
C	C CAP-A (Jumper)
Unused Terminals: B, D	

Table 3–4

Table 3–5 SATPWR (2-pin)

SATPWR Terminal	Component
A	DP24-5 (Switched PWR)
Unused Terminals: B	

Table 3–6 SATCOM (3-pin)

SATCOM Terminal	Component
A	DP24-9 (eSolutions RX)
B	DP24-8 (eSolutions TX)
Unused Terminals: C	

Table 3–7 D3 (3-pin)

D3 Terminal	Component
A	SP-2 -> DP24-3 (GND)
B	SP-1 -> DP24-24 (Constant Power)
C	DP24-10 (Data signal)
Unused Terminals: None	

Table 3–8 1RP (2-pin)

1RP Terminal	Component
A	SP-2 -> DP24-3
B	SP-1 -> DP24-24
Unused Terminals: None	

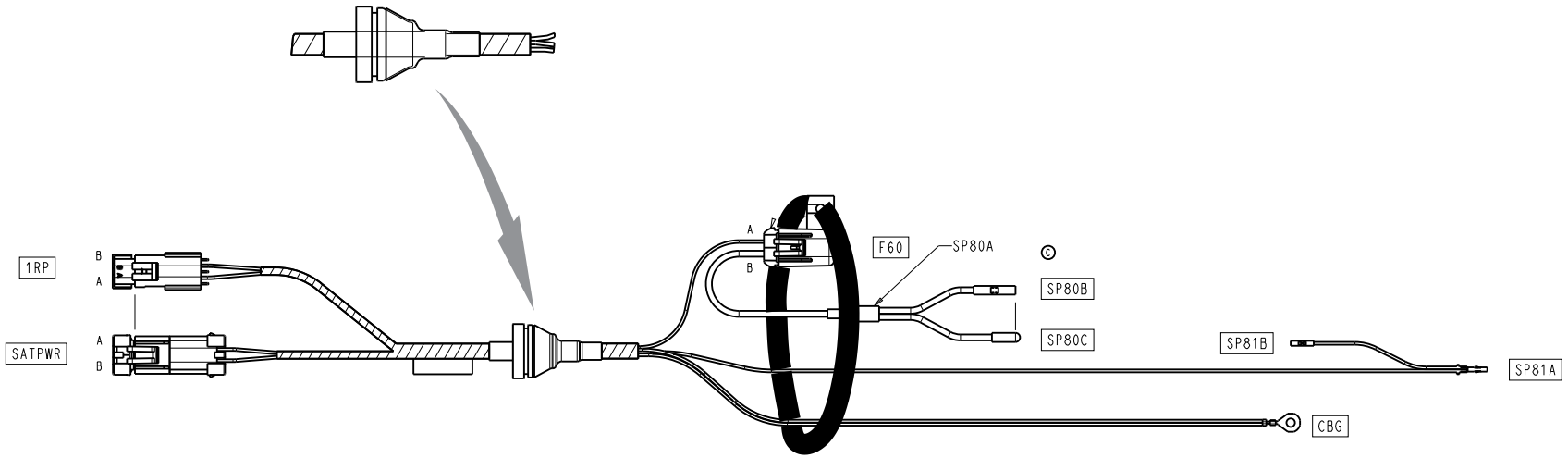
Table 3–9 2RP (2-pin)

2RP Terminal	Component
A	SP-2 -> DP24-3
B	SP-1 -> DP24-24
Unused Terminals: None	

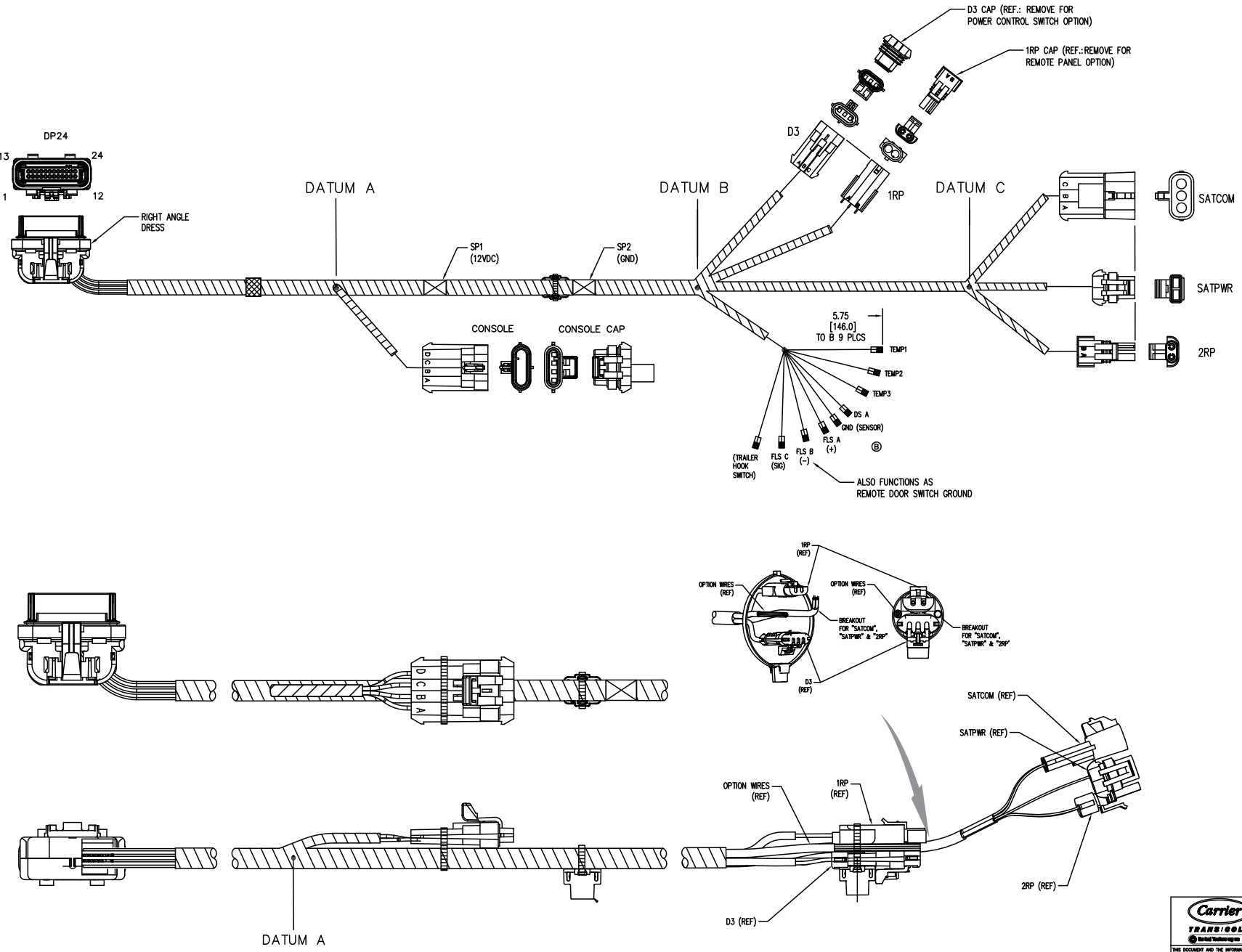
Table 3–10 Splice Points

SP	Component
SP-1 (+12 VDC)	DP24-24, D3-A, 1RP-B, 2RP-B (Constant PWR)
SP-2 (GND)	DP24-3, D3-B, 1RP-A, 2RP-A (GND)

3.1 eSolution Wire Harness



3.2 eSolution Wire Harness



Carrier TRANSICOLD

Carrier Transicold Division
P.O. Box 4805
Syracuse, New York 13221
USA

TITLE: HARNESS E-SOLUTIONS TELEMATICS NA

SIZE	DRAWING NO.	REV
D	22-03130	B
NEXT DRAWING	NONE	SCALE

⚠ **WARNING:** Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information, go to
www.P65warnings.ca.gov/diesel

Specifications are subject to change without notice.
Consult your Carrier Transicold representative for details on warranty coverage.

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