

**FuelFocus™ FMS System**

**Installation Guide**

**#RID-FG3-04-AW**

**Version 1.7 December 2016**

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## Important Notice

AssetWorks LLC cannot guarantee the RF Vehicle ID Box installation techniques discussed herein are complete and effective on every make, model and year of vehicle and equipment now in the marketplace or coming in the future. At times vehicle manufacturers make changes to the engine computer, wiring and/or electronics with new model years and in fact also during mid-year production. After market accessories may also impact the installation of the RF Vehicle ID Box. AssetWorks provides updates as soon possible after discovering installation challenges, new OBD types or anything effecting proper operation. We request feedback from the many very knowledgeable Automotive Technicians working with this technology. If installation issues arise with new model years or unique equipment we request immediate and detailed feedback so corrections and enhancement may be made in a timely fashion. Working together we can assure that the FuelFocus system remains the finest available. Information on updates and new programs or procedures will be made available via the Fuel Focus installation trainers, the newsletter and the customer support desk. AssetWorks urges all trained Technicians , Supervisors and Managers to avail themselves of the newsletter by contacting " AssetWorks Fuel Support" <fuelsupport@assetworks.com> to be included on the subscription list.



# 1 Introduction

## 1.1 Purpose

This FuelFocus® Vehicle Subsystem Installation Manual instructs how to install the Modular Fleet Journal Type 3 (FJ3). Review this manual prior to installing the FJ3. Incorrect installations may cause the system to malfunction.

**Read this entire manual before your first installation.**

## 1.2 System Overview

The AssetWorks FJ3 is the integral component of the AssetWorks FuelFocus® FMS System in the vehicle. The following are required to properly install and utilize the FuelFocus® FJ3:

- AssetWorks FuelFocus® Fuel Management System Island Controllers
- Pumps/dispensers modified using FuelFocus nozzle tags
- WAF Receiver Kit installed in the FuelFocus Island Controller



**A shielded cable is required, as described in the manual. Failure to use one will void the warranty.**

---

## 1.3 Components Overview

This section describes the various components that compose the AssetWorks FuelFocus® System, for you to determine the equipment needed for your particular fleet of vehicles.

Each Vehicle Unit includes the following components:

- SVID (Small Vehicle Identification Device) Type 3 (If applicable)
- Modular Fleet Journal Type 3 (FJ3)
- Fuel Inlet Antenna (FIA)
- FIA Adapter (if SVID is not used)

## 1.3.1 Modular Fleet Journal (FJ3)

The FJ3 is the main component of the Fleet Journal system installed in the vehicle. It stores the vehicle usage data, which includes the start and end times of a trip, beginning and ending odometer readings, maximum speed and more. This provides the fleet manager full supervision and control over the use of all fleet vehicles.

The FJ3 data automatically transfers to the Fleet Journal application via the WAF unit. Fleet Journal processes the data and generates the required reports for the fleet manager to use.

The FJ3 can be configured to record odometer and/or engine hour readings

The Vehicle data is uploaded in one of the following methods:

- 2.4GHz Wireless connection with fuel station controller.
- 2.4GHz Wireless VDC connection at parking lot, garage, etc.
- On line connection via cellular modem.

This document describes the installation procedures for the FJ3 (2.4 GHz).

Description	Part No.
Modular Fleet Journal Type 3	RID-FG3-04-AW

### Power Consumption

The FJ3 receives its power from the vehicle’s battery. The power requirements are:

Measure values	Average @ 12V	
Engine ON	27mA	34mA with hardwire FIA
Sleep	7mA	12mA with hardwire FIA

#### Note

If you experience battery drain, we recommend the use of an automotive “shut-down” timer or similar, available from the automotive aftermarket. This is commonly used on police/emergency and utility vehicles to prevent dead batteries due to drain from aftermarket installed electronics.



## 1.4 Required Tools

The following tools are required to complete the installation procedures:

- Screwdrivers
- Box wrenches
- Crimping tool
- Wire stripping tool
- Drill with 1/8" drill bit
- Heat gun (for heat-shrink insulation)

## 1.5 Required Materials

The following materials are required to complete the installation procedures:

- Two conductor twisted pair cable – 20 - 22 AWG with foil shield and drain wire
- Wire terminals. Do not use Scotch Locks.
- 3/8" inch self-tapping, sheet metal screws (Rittal SZ2487 or equivalent) with matching flat washers and split washers
- Grommets
- Three amp fuse and fuse holder
- Wire ties, wire solder and wire loom
- Heat shrink tubing
- Butt connectors for 20 - 22 AWG wire

## 1.6 Wiring Instructions

The general procedures for wiring the FJ3 are as follows:

- Using a wire stripping tool, remove insulation to bare 3/8" of wire.
- Press firmly on the connector locking tab.
- Insert the exposed wire end.
- Release the locking tab.
- Check to make certain the wire is held firmly in place and that the wire insulation is not pinched in the terminal.



**Use gasoline and oil-resistant wiring only. Route wires away from moving parts and the vehicle's exhaust system.**

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## 2 Installation

Follow the installation instructions detailed in the following sections.

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**Note** When performing wiring procedures, follow the instructions in *Wiring Instructions* on page 7.

---

### 2.1 Installation Considerations

Before mounting the FJ3 and SVID, determine the best place to install. Consider the following four basic recommendations:

- **Weather Protection** – Select a weather-protected location. ***The FJ3 is not waterproof.*** Consider an area where it will not be exposed to water/moisture, during vehicle operation or cleaning.
- **Cable Runs** – The Fuel Inlet Antenna (FIA) is mounted in a Class I, Division I hazardous location. The wiring is intrinsically safe, and therefore must not come within two inches of any existing wires or cable harness. Installing the FJ3 to minimize the FIA cable length makes it easier to adhere to this safety rule. The FJ3 also requires connections to power and ground, so it should be located in an area where you can readily access these sources easily.
- **Cable Routing** –Keep cables from coming in contact with moving parts, and away from parts that generate excessive heat, electrical noise, or areas that may impede safety. These areas include the drive shaft, fan blades, belts, adjustable steering column, alternators, fluorescent lighting, foot pedals, radiator, engine, exhaust system, and other dangerous areas. Try to gather all conductors at a common point when routing cables, routing the cables to the FJ3 in a group. The FJ3 must be kept at least three feet from the filler neck opening. This includes cases where the FJ3 is mounted in the trunk, as that is not a vapor-sealed area. Wire loom is recommended to protect the wiring.
- **Cable Clearance** – Keep the FJ3 and cables at least six (6) inches from devices with a strong magnetic field such as fan motors or speakers.

---

**Do not use an electric drill or any other electrically-powered tools within 3 feet of the filler neck or fuel tank, as this area is considered a Class I, Group D hazardous location.**

**Do not use a heat gun or any other heating device within 3 feet of the filler neck or fuel tank as this area is considered a Class I, Group D hazardous location.**



**The Fuel Inlet Antenna and its wiring are intrinsically safe. Ensure there is complete separation between the transmitter wiring and any existing auto wiring. Also avoid routing wires near the auto exhaust systems or fuel lines.**

**Mount the FJ3 at least 3 feet from the filler neck.**

**Water and/or moisture can seep in through the connectors causing permanent damage!**

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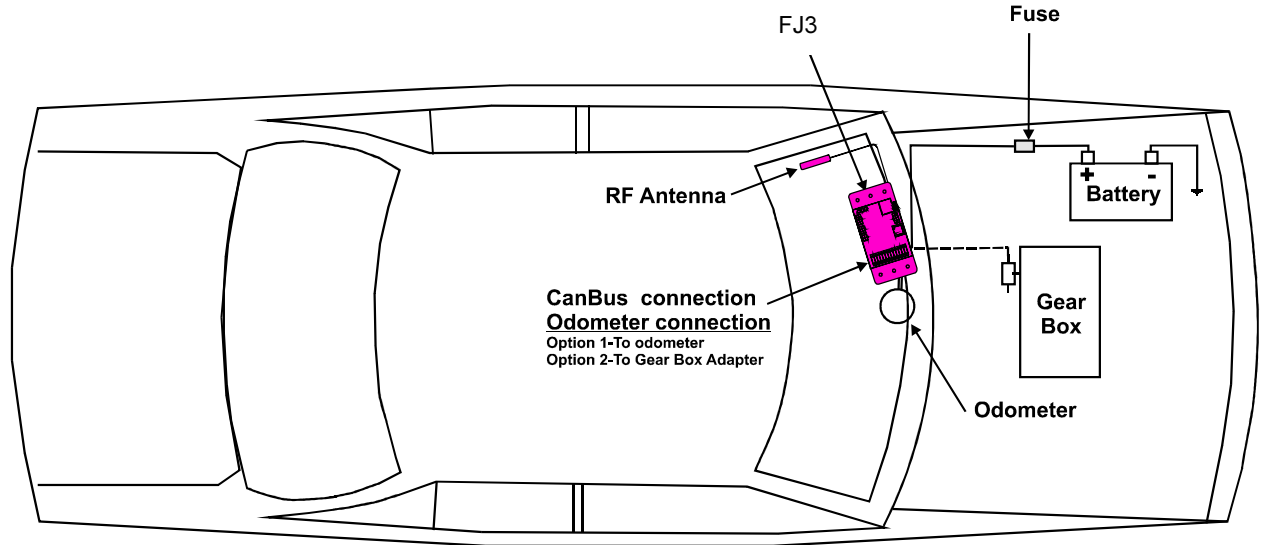


Figure 1: Typical Vehicle Wire Routing

## 3 FJ3 Installation

### 3.1 Mount the FJ3

1. After reviewing the recommendations listed in 2.1 “Installation Installation Considerations”, mount the FJ3 as follows:
  - If possible, mount it on the same side of the vehicle as the filler neck.
  - For a passenger car, the FJ3 can be mounted under the dashboard or in the trunk, provided that the unit is at least 3 feet from the filler neck.
  - For a truck or bus, the FJ3 can be mounted inside the vehicle's electric enclosure.
2. Drill at least two 1/8" holes for the FJ3 mounting. Use the FJ3 to mark the holes (see Figure 2: FJ3 Wiring Diagram)
- 3.
4. Figure 2 shows the FJ3 mounted on the vehicle chassis, or any other metal portion of the vehicle whenever possible.



**Do not use an electric drill or any other electrical power tool within 3 feet of the filler neck or fuel tank. This area is considered a Class I Group D hazardous location.**

---

5. Using the two 3/8" self-tapping mounting screws and two lock washers, mount the FJ3 to the vehicle frame. You must use two self-tapping sheet metal screws.

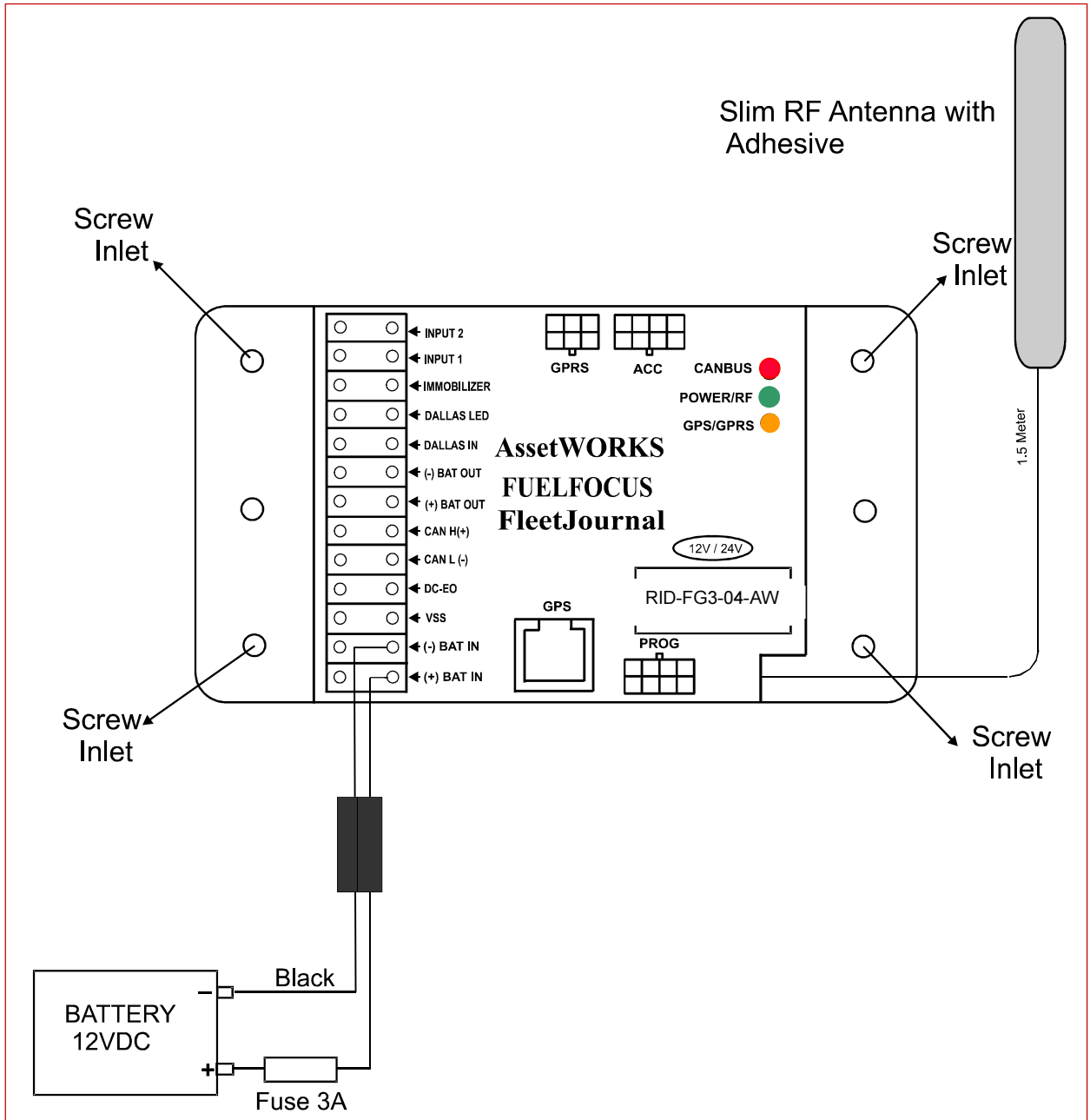


Figure 2: FJ3 Wiring Diagram

### 3.2 Mount the RF Antenna

The RF Antenna can be mounted by removing the protective layer from the adhesive back and attaching to the vehicle windshield. The same location can be used near the rear window if desired.

**Note:** Clean the windshield before mounting the antenna.

In busses, the RF Antenna can be mounted in the sign compartment area, if made of fiberglass.

**The antenna must not be concealed on all sides by metal.**

---

**Note** The RF Antenna should be fastened and secured appropriately. Do not coil the antenna wire.

---

### 3.3 Connect the FJ3 to the Battery or Power Source

Positive (+) connection can be from any 12 or 24 DC volt source.

1. If your power source is the battery, run a wire from the battery to the FJ3 and connect it to BATT (+). This wire requires a 3 amp fuse to protect the FJ3.

### 3.4 Connect the FJ3 to Ground

Connect the FJ3 to a ground, to the vehicle metal chassis, or to the negative (-) post on the vehicle's battery.

- When connecting to the vehicle battery:  
Prepare a black auto wire with a terminal on each end. Connect the black (-) cable from BATT (-) on the FJ3 to the negative (-) terminal on the battery. Tie the wire to the vehicle frame.
- When connecting to the vehicle metal chassis:  
Connect a black ground cable from BATT (-) on the FJ3 to one of the FJ3's mounting screws. Loop the cable end around the screw between the screw head and the FJ3 plate and tighten the screw.

---

**Note** This will connect the FJ3 to ground only if the FJ3 is affixed to the metal chassis of the car.

---



## 4 Wiring VSS or Pulse Vehicles

### 4.1 Locating the Vehicle Speed Sensor (VSS)

The VSS usually originates near the rear of the transmission case. From there it usually travels to the engine control computer, speedometer and the cruise control computer. Pick a location to tap the circuit near the engine control computer interface, reducing risk of incorrect data due to ignition noise. Also, as with any electronic accessory, a good ground connection is necessary. Improper grounding could result in a ground loop condition, which may affect the accuracy of the unit.

---

**Note** AssetWorks can provide you with an aftermarket catalog for VSS+ wire, its color, and how many pulses per mile the vehicle has.

---

### 4.2 Connect the Data Interface to the FJ3

The instructions for this procedure depend on the type of vehicle

To view how to capture vehicle data, refer to *the Fueling Options*

Either SVID [Fuel Inlet Antenna Connector P/N RID-IN-54]

Or Hardwire [Fuel Intel Antenna Connector P/N RID-EM-02]

Both options also require a Fuel Intel Antenna [P/N RVC-XX –XX]

### 4.3 SVID Mounting and Installation

#### 4.3.1 Mounting the Fuel Inlet Antenna (FIA)

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**Note** Use shielded cable type Olympic part # 2886 or equivalent, polypropylene insulated, twisted pair, aluminum Mylar shield, 20 – 22 AWG stranded tinned copper drain wire, chrome vinyl jacket. Temperature rating: -20°C to 60°C.

---



Connect the FIA coil before mounting, to avoid using the heat gun near the fuel tank. Before making this connection, plan on where you are going to mount the SVID. Then make sure you have clearance to pass the SVID from the filler neck to the mounting location.

If you do not have enough clearance, first position the FIA coil on the vehicle. Then pull the wire out to a safe distance (at least three feet from the fuel filler neck) to heat the shrink-wrap insulation. Then pull the wire back for final mounting.

---

Select a Fuel Inlet Antenna (FIA) with an internal diameter that allows it to fit snugly over the



filler neck. (A variety of sizes are available from AssetWorks.) Slide the FIA down over the filler neck and slide it back until it is securely in place. (See note)

The intrinsically safe FIA wires must be tie wrapped at various locations between the FIA and the SVID. One tie will be placed on the FIA wire, directly behind the antenna, to prevent the antenna from falling off the filler neck.

---

**Note**

The FIA must be placed no more than four inches from the filler neck opening. If the exposed portion of the filler neck pipe is longer than four inches, place a plastic tie behind the antenna to hold it in place. You may now install the odometer adaptor (if required) according to the manufacturer's instructions. Then proceed to "Mounting the SVID".

---

### 4.3.2 Mounting the SVID

The location of the SVID will be determined according to the device type.

SVID with external antenna is mounted in the vehicle trunk or behind the fuel tank.

---

**Important** The SVID should be mounted on the vehicle before performing the activation.

---

### 4.3.3 FIA to SVID

Connect each of the intrinsically safe FIA wires to the "T-Ring" points (Polarity is not important) at the SVID. Pass the SVID and its intrinsically safe cable to the selected mounting site. You must find a clear path to run the cable from the fuel tank to the selected SVID mounting site. You may use existing holes in the vehicle body. Make sure not to drill outer parts of the vehicle and not to cause any damage to the operation of vehicle. Use grommets to protect cable that you pass through holes. Remove plastic or rubber parts blocking the way. Make sure to re-install all removed parts after the wires have been passed through.



Do not use an electric drill or any other electrical power tools within 3 feet of the filler neck or fuel tank as this area is considered a Class I, Group D hazardous location.

---

## 4.3.4 SVID Installation

### 4.3.4.1 SVID Installation with external antenna wires on fuel tank

1. Install the Fuel Inlet Antenna – FIA ring on the fuel tank inlet. Select the FIA ring according to the vehicle type.
2. Route the FIA wires through a protective conduit under vehicle chassis to the SVID.



3. Clean the surface of the vehicle with alcohol; make sure to remove all grease and debris.
4. Remove the sticker on the back of the SVID device and stick it to the cleaned surface as shown.



5. Connect the SVID antenna wires with FIA wires using two suitable connectors.



## 4.3.4.2 SVID Installation With External Antenna Wires on the Vehicle Trunk

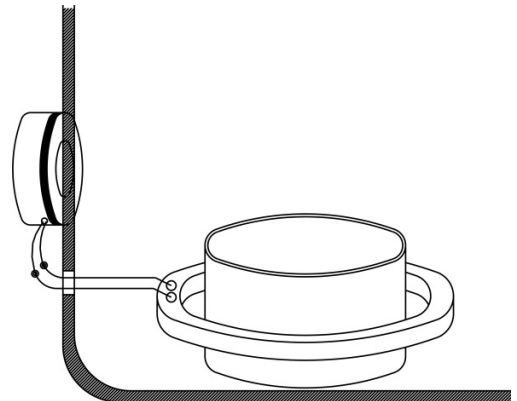
1. Install the fuel inlet antenna -FIA ring on the fuel tank inlet. Select a ring according to the vehicle type.



2. Drill 7mm hole in fueling compartment, insert a grommet, and insert the 2 wires. Install the SVID in the vehicle trunk behind the fuel inlet.

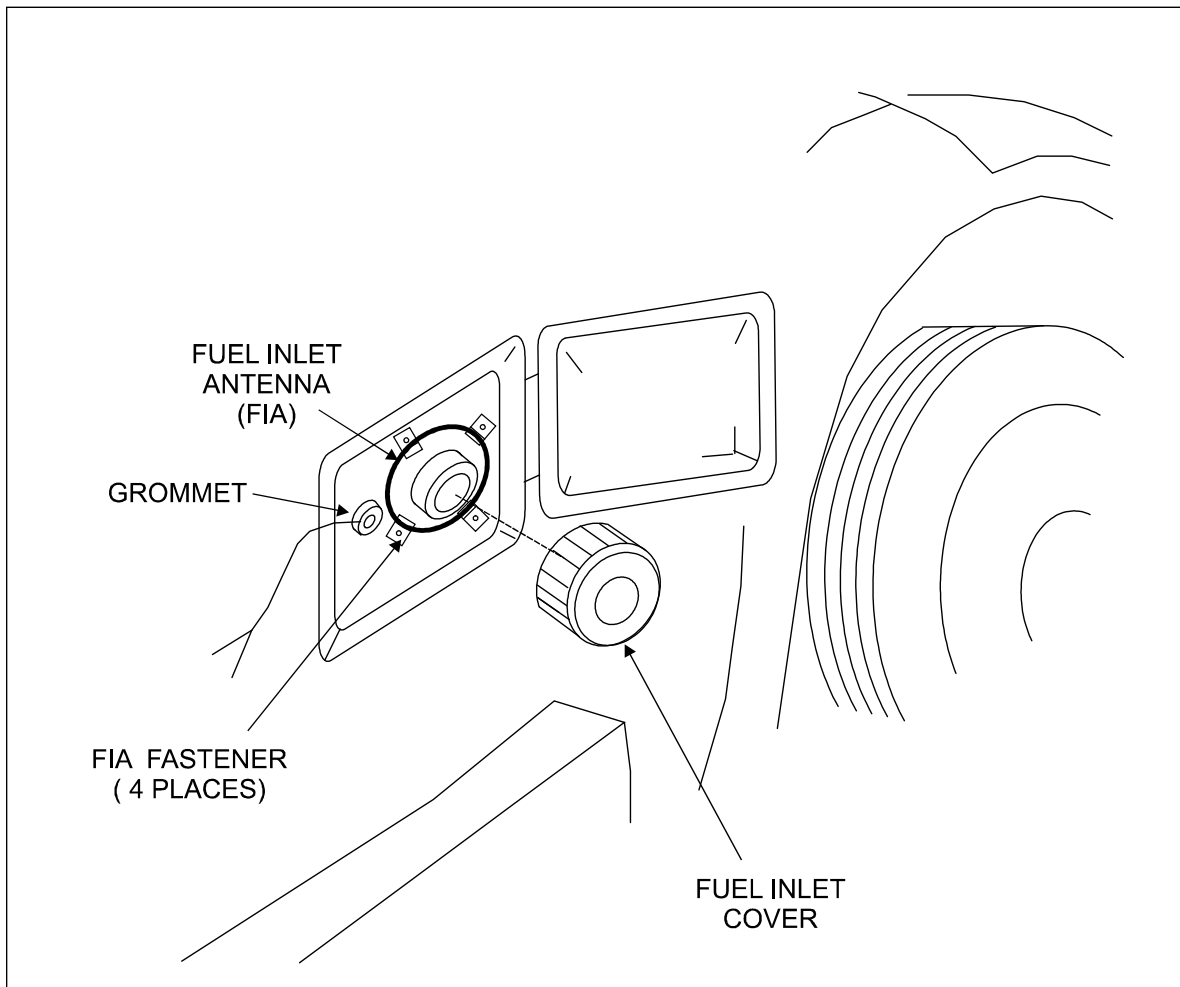


3. Clean the surface of the vehicle with alcohol. Make sure to remove all grease and debris.
4. Connect the SVID antenna wires to the FIA ring wires with two suitable connectors using crimping tool.

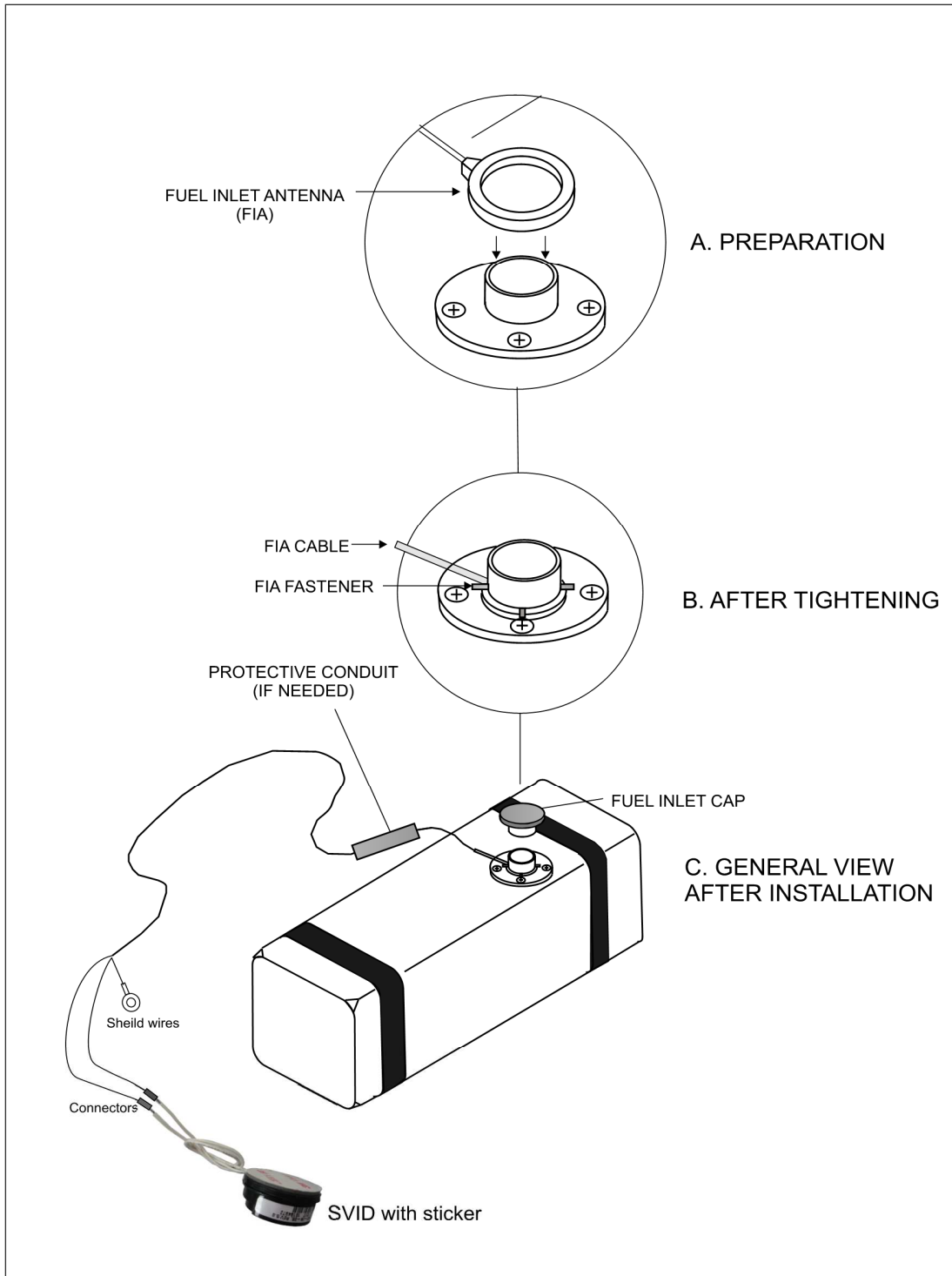




4.3.4.3 FIA Installation on a Light Duty Vehicle Fuel Tank



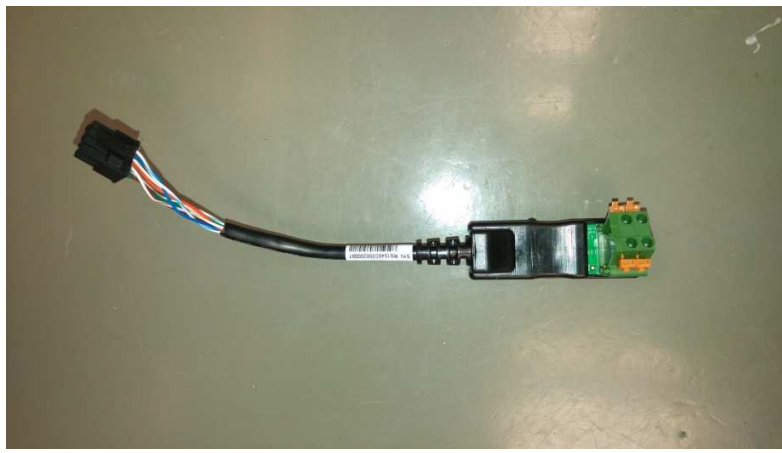
4.3.4.4 Installation on a Heavy Duty Vehicle Fuel Tank



## 4.4 Hardwire Fuel Inlet Antenna Connector Installation Instructions

FCC Compliance

FCC ID: 2AKAM2288



To install the Hardwire FIA:

1. Select a fuel inlet antenna diameter to fit the vehicle's fuel tank inlet [one size larger].
2. Install it using the dedicated snaps provided.
3. Make sure the fuel inlet antenna cable is long enough to reach the location where the FleetJournal 3 will be installed.

---

**Note**

If necessary the cable may be extended. Use shielded cable type Olympic part # 2886 or equivalent, polypropylene insulated, twisted pair, aluminum Mylar shield, 20 – 22 AWG stranded tinned copper drain wire, chrome vinyl jacket. Temperature rating: -20°C to 60°C.

---

4. Solder and/or use moisture. To prevent connection problems in the future, proof the connections and if necessary shrink the tubing.



5. Install the FleetJournal 3. See Chapter 3 FJ3 Installation.
6. Connect the hardwire FIA connector to the FleetJournal 3 [FJ3] ACC connector.
7. Install the hardwire FIA on the FJ3 wall utilizing the magnetic base.
8. Plug the fuel inlet antenna wires into the green connection points next to each other.





#### 4.4.1 Troubleshooting

If the Hardwire FIA connection does not work [no proper signal], do the following:

1. Ensure that you are using a correct FIA and have a signal of at least 10 cm. If not replace the FIA.
2. If there is still no proper signal, replace the FIA wire connection.

---

**Note**

The Fuel Inlet Antenna Connector is a sealed unit and cannot be repaired in the field. Please return the defective units. Download an RMA from the AssetWorks PartWorks website.

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## 5 Connecting the FJ3 to the GPS Tracking Device [Optional]

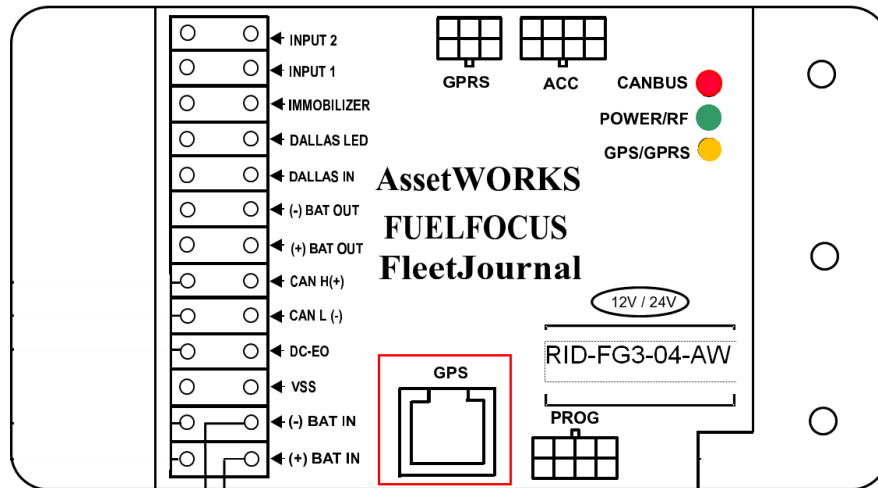
The GPS device tracks the location of vehicles in the field.



Figure 12 GPS Antenna Cable

To install the GPS tracking device:

1. Attach the RJ45 cable to the to the GPS connector on the FJ3.



2. Place the GPS antenna on the vehicle's dashboard near the windshield.

## 6 Driver ID [Optional]

### 6.1 Connecting the Driver ID

To identify the driver of the vehicle, connect the Tag Reader wires to the FJ3 as follows:

Wire Color	Connect to:
White	Dallas LED
Green	Dallas In
Black	(-) Bat Out
Red	(+) Bat In

See Figure 13

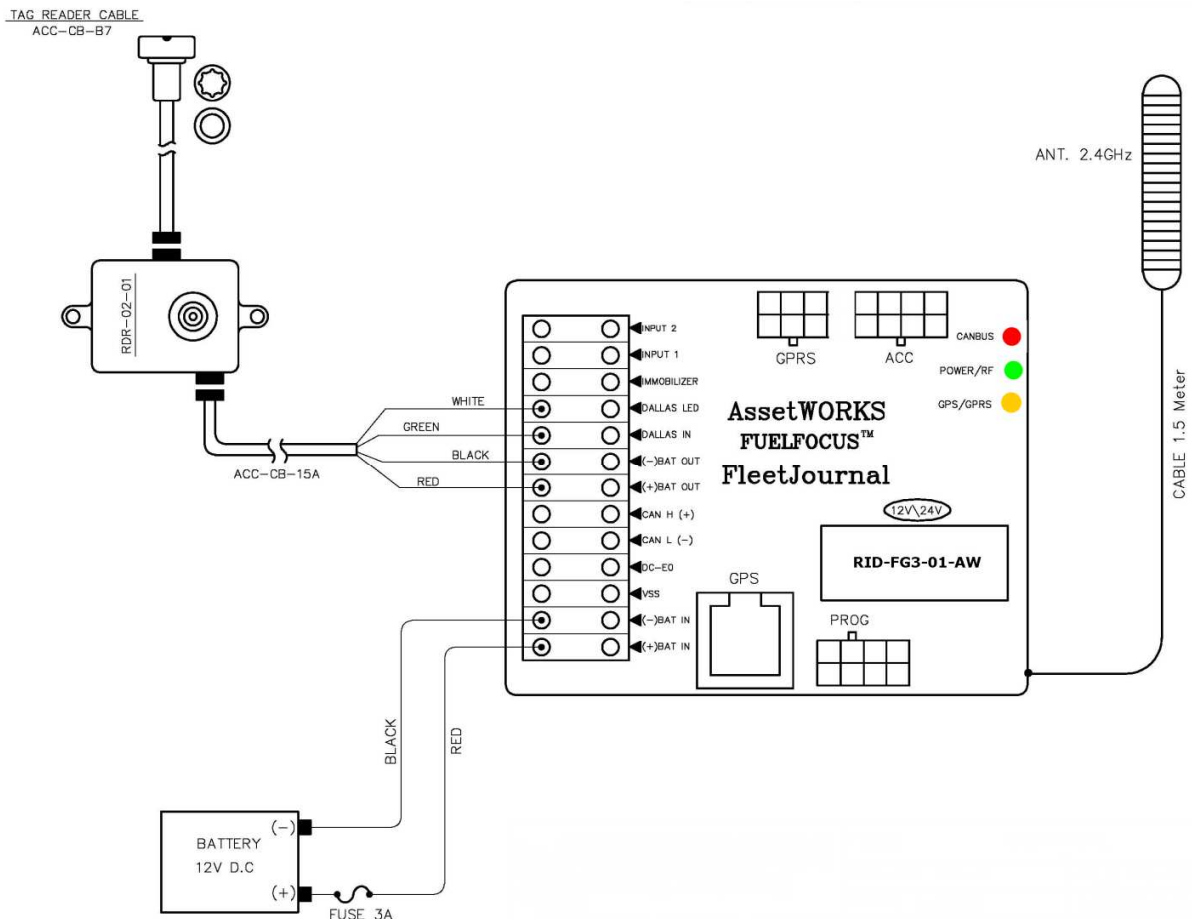


Figure 13: Connecting the Driver ID reader to the FJ3





## 6.2 Installing the Driver ID Reader [Tag Reader]

**Note:** Place the Tag reader on the dashboard so that the Dallas key can be easily read.

1. Wire the Tag Reader cables to the FJ3 – see section **Error! Reference source not found.**  
**Error! Reference source not found..**
2. Make a ½" hole on the dashboard for the Tag Reader.
3. Pull the Tag Reader through the hole.
4. Connect the Com. Cable ACC-CB-15A cable to the FJ3.



Figure 14 COM Cable ACC-CB-15A

5. Connect the Reader Cable ACC-CB-B7 to the Driver ID Reader.



Figure 15 Reader Cable ACC-CB-B7

**Important:** The Driver ID Reader should be **bright red** after connecting and installing it correctly. If there is a faint green light in the center of the Reader, this indicates that the Reader is not correctly installed. All the connectors should slide in smoothly, do **not** force them.



## 7 Appendices

### 7.1 Appendix A: Capturing Vehicle Data

#### 7.1.1 Connect the FJ3 an Odometer

There are two possible odometer connections:

- Direct from either an electronic odometer or a speedometer.
- From a mechanical odometer via a Reed type odometer adaptor. Also known as a pulse transducer or “taxi tap”

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**Note** If you are recording the vehicle's engine hours, you may skip this section and go on to section 7.1.4 Engine Hours.

---

#### 7.1.2 Electronic Odometer or Speedometer

If the vehicle has electronic instrumentation, run a single wire from the vehicle speed sensor output VSS+ signal to the FJ3 and connect it to "VSS".

#### 7.1.3 Reed Type Mechanical Adaptor

If the vehicle has a mechanical odometer, and using a Reed type adaptor, run two wires to the FJ3 and connect it to "BATT(+)" and "VSS".



### 7.1.4 Engine Hours

To record engine hours, run a single wire from the oil pressure sensor (or any other sensor that is at a continuous "high" state while the engine is running), to VSS.

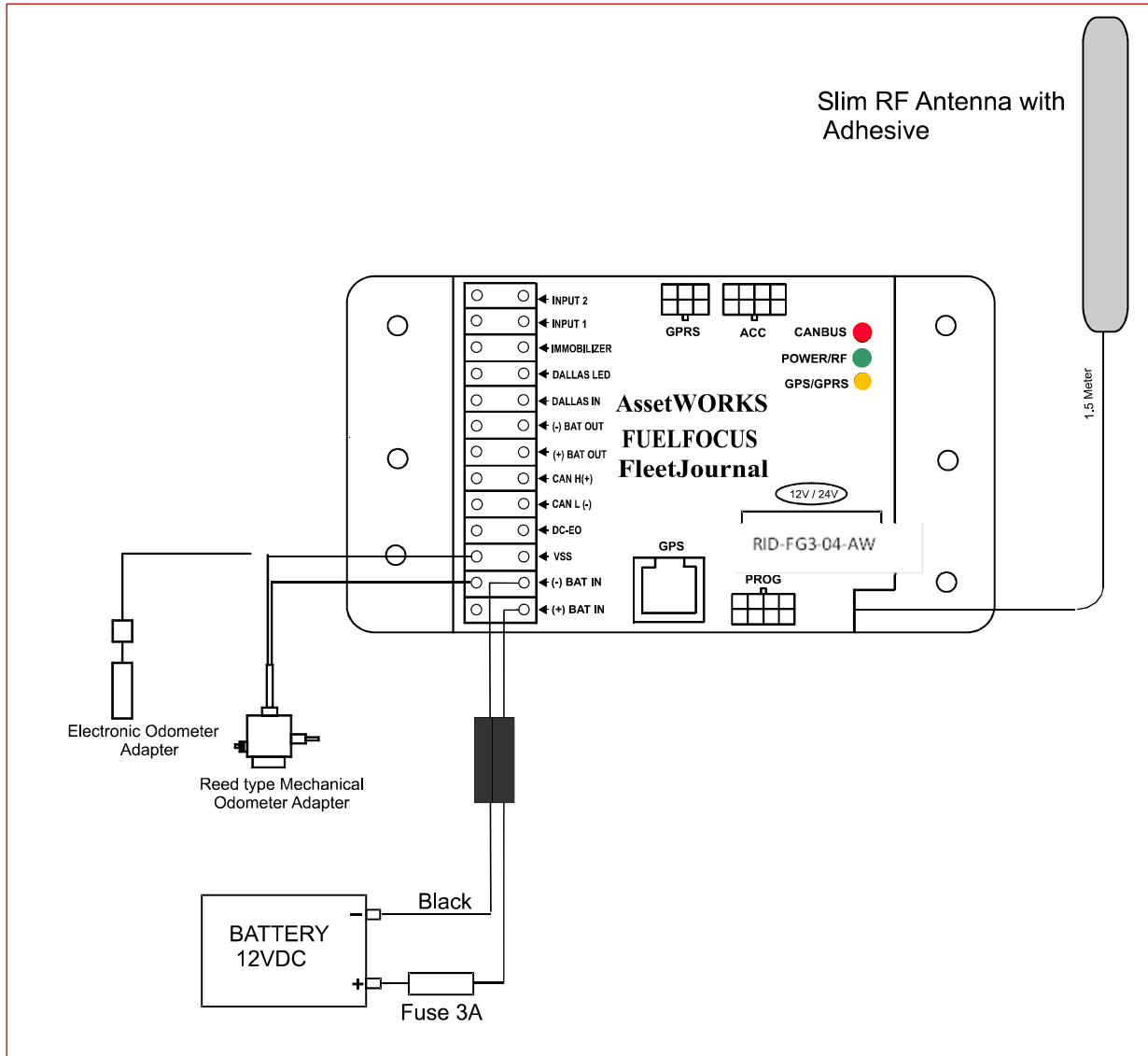


Figure 3: FJ3 Wiring Diagram for Speed Pulse

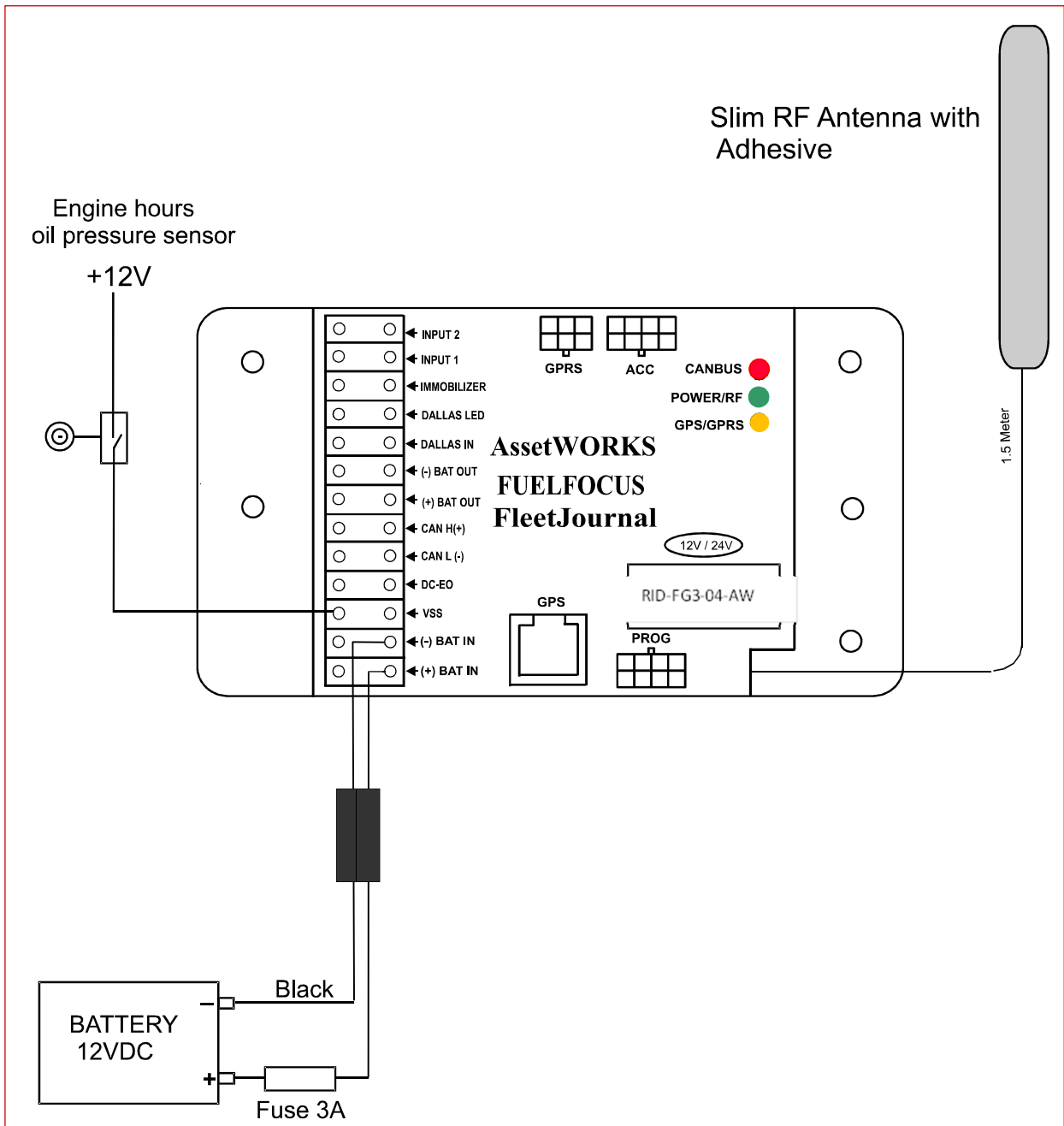


Figure 4: FJ3 Wiring Diagram for Engine Hour Meter

## 8 Wiring the CAN Bus Vehicles

### 8.1 Connect the Ignition Switch to the FJ3

1. Run a wire from the vehicle ignition switch (or start/stop button on some hybrid models) to the **DC-EO terminal** on the FJ3 (refer to Figure 5: Wiring Diagram for FJ3 with CAN Bus Interface for Light Duty Vehicles and Figure 6: Wiring Diagram for FJ3 with CAN Bus Interface for Heavy Duty Vehicles or Figure 7: Wiring Diagram for FJ3 with CAN Bus Interface (3-pin connector) for Heavy Duty Vehicles)
2. The FJ3 needs constant 12 or 24 volt power at the BAT+ and BAT- terminals

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**Note** FJ3 will not function properly if an ignition On/Off wire is not connected to the DC-EO terminal. FJ3 goes into Sleep mode (Power Save) 30 minutes after turning off the ignition.

---

### 8.2 Connect the Data Interface to the FJ3

The instructions for this procedure depend on the type of vehicle, whether it is a heavy duty vehicle or a light duty vehicle. Light duty vehicles have an OBD II connector, while heavy duty vehicles have a SAE J1939 connector. The following sections provide instructions for both types of vehicles.

To view the connectors' pin out information, refer to *Fueling Options*  
Either SVID [Fuel Inlet Antenna Connector P/N RID-IN-54]  
Or Hardwire [Fuel Intel Antenna Connector P/N RID-EM-02]  
Both options also require a Fuel Intel Antenna [P/N RVC-XX –XX]

### 8.3 SVID Mounting and Installation

#### 8.3.1 Mounting the Fuel Inlet Antenna (FIA)

---

**Note** Use shielded cable type Olympic part # 2886 or equivalent, polypropylene insulated, twisted pair, aluminum Mylar shield, 20 – 22 AWG stranded tinned copper drain wire, chrome vinyl jacket. Temperature rating: -20°C to 60°C.

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---

Connect the FIA coil before mounting, to avoid using the heat gun near the fuel tank. Before making this connection, plan on where you are going to mount the SVID. Then make sure you have clearance to pass the SVID from the filler neck to the mounting location.

If you do not have enough clearance, first position the FIA coil on the vehicle. Then pull the wire out to a safe distance (at least three feet from the fuel filler neck) to heat the shrink-wrap insulation. Then pull the wire back for final mounting.

---



Select a Fuel Inlet Antenna (FIA) with an internal diameter that allows it to fit snugly over the filler neck. (A variety of sizes are available from AssetWorks.) Slide the FIA down over the filler neck and slide it back until it is securely in place. (See note)

The intrinsically safe FIA wires must be tie wrapped at various locations between the FIA and the SVID. One tie will be placed on the FIA wire, directly behind the antenna, to prevent the antenna from falling off the filler neck.

---

**Note**

The FIA must be placed no more than four inches from the filler neck opening. If the exposed portion of the filler neck pipe is longer than four inches, place a plastic tie behind the antenna to hold it in place. You may now install the odometer adaptor (if required) according to the manufacturer's instructions. Then proceed to "Mounting the SVID".

---

### 8.3.2 Mounting the SVID

The location of the SVID will be determined according to the device type.

SVID with external antenna is mounted in the vehicle trunk or behind the fuel tank.

---

**Important** The SVID should be mounted on the vehicle before performing the activation.

---

### 8.3.3 FIA to SVID

Connect each of the intrinsically safe FIA wires to the "T-Ring" points (Polarity is not important) at the SVID. Pass the SVID and its intrinsically safe cable to the selected mounting site. You must find a clear path to run the cable from the fuel tank to the selected SVID mounting site. You may use existing holes in the vehicle body. Make sure not to drill outer parts of the vehicle and not to cause any damage to the operation of vehicle. Use grommets to protect cable that you pass through holes. Remove plastic or rubber parts blocking the way. Make sure to re-install all removed parts after the wires have been passed through.



Do not use an electric drill or any other electrical power tools within 3 feet of the filler neck or fuel tank as this area is considered a Class I, Group D hazardous location.

---

## 8.3.4 SVID Installation

### 8.3.4.1 SVID Installation with external antenna wires on fuel tank

6. Install the Fuel Inlet Antenna – FIA ring on the fuel tank inlet. Select the FIA ring according to the vehicle type.
7. Route the FIA wires through a protective conduit under vehicle chassis to the SVID.



8. Clean the surface of the vehicle with alcohol; make sure to remove all grease and debris.
9. Remove the sticker on the back of the SVID device and stick it to the cleaned surface as shown.



10. Connect the SVID antenna wires with FIA wires using two suitable connectors.





## 8.3.4.2 SVID Installation With External Antenna Wires on the Vehicle Trunk

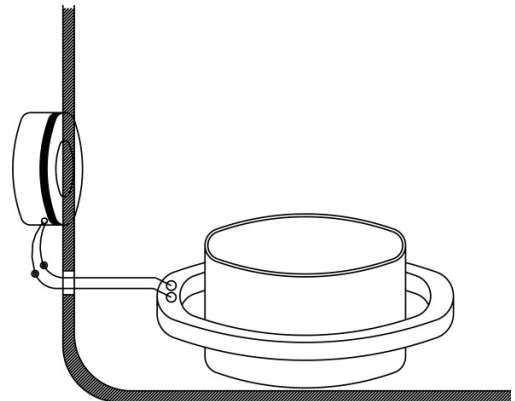
5. Install the fuel inlet antenna -FIA ring on the fuel tank inlet. Select a ring according to the vehicle type.



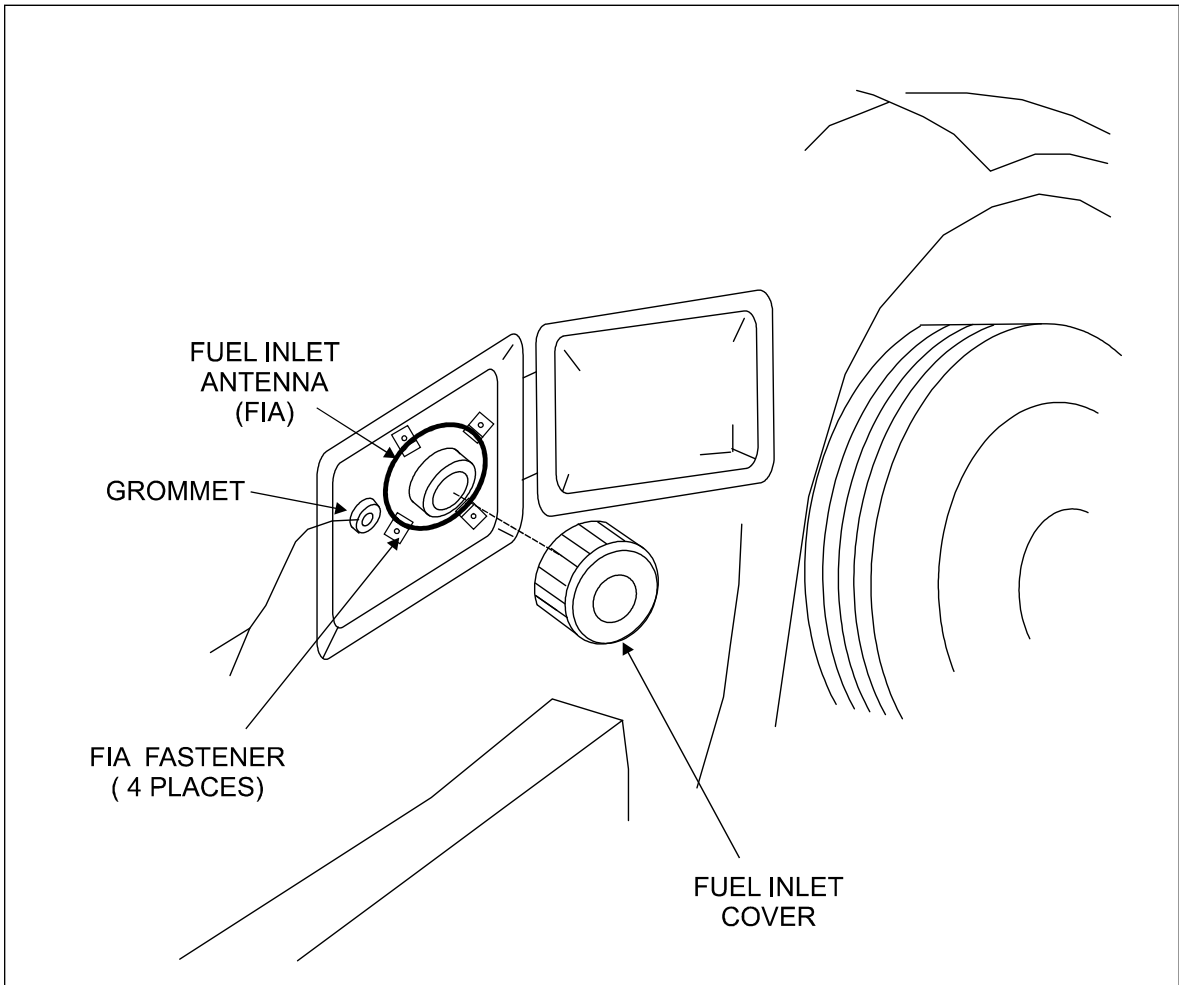
6. Drill 7mm hole in fueling compartment, insert a grommet, and insert the 2 wires. Install the SVID in the vehicle trunk behind the fuel inlet.



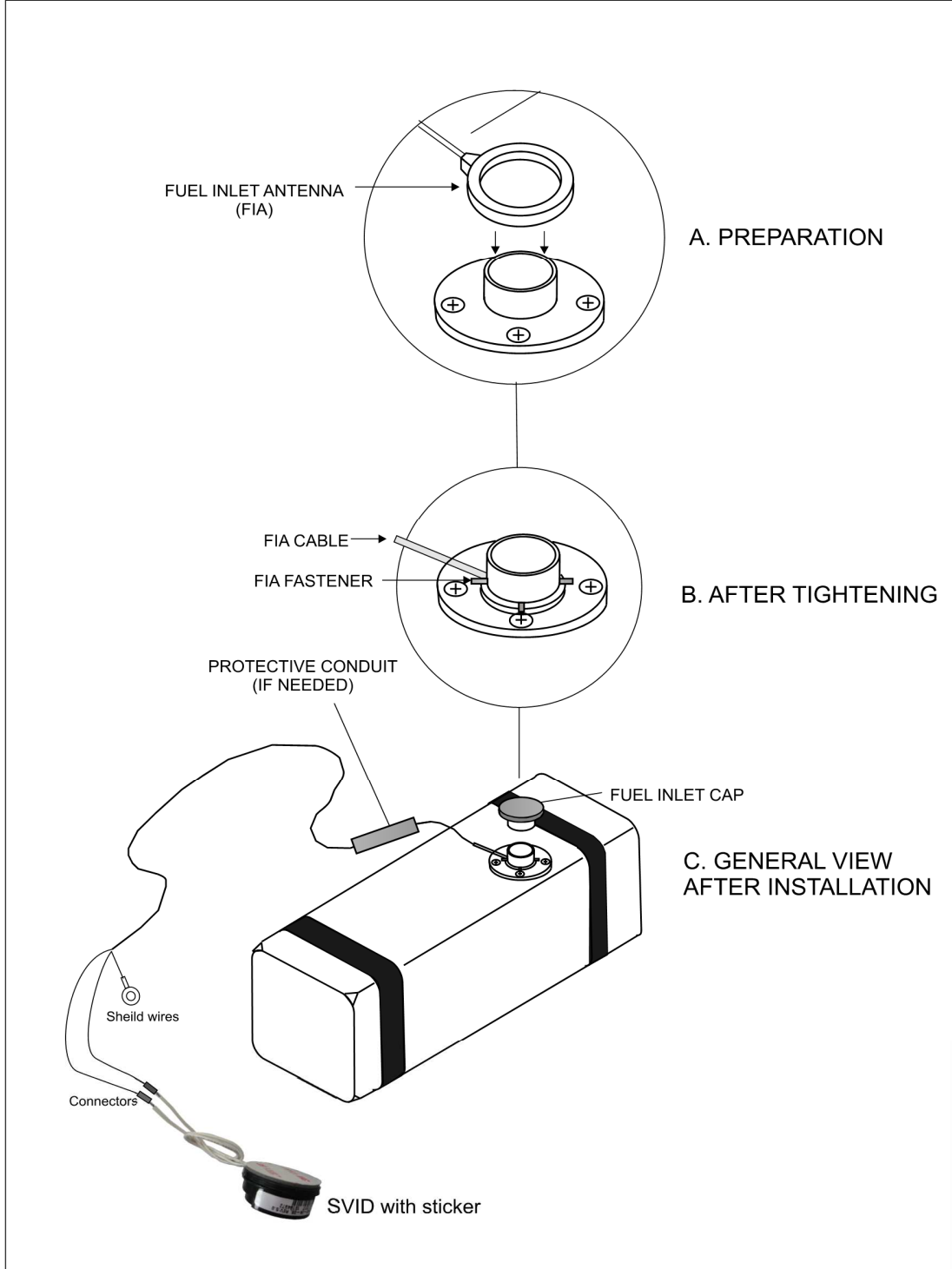
7. Clean the surface of the vehicle with alcohol. Make sure to remove all grease and debris.
8. Connect the SVID antenna wires to the FIA ring wires with two suitable connectors using crimping tool.



8.3.4.3 FIA Installation on a Light Duty Vehicle Fuel Tank



8.3.4.4 Installation on a Heavy Duty Vehicle Fuel Tank





To install the Hardwire FIA:

9. Select a fuel inlet antenna diameter to fit the vehicle's fuel tank inlet [one size larger].
10. Install it using the dedicated snaps provided.
11. Make sure the fuel inlet antenna cable is long enough to reach the location where the FleetJournal 3 will be installed.

---

**Note**

If necessary the cable may be extended. Use shielded cable type Olympic part # 2886 or equivalent, polypropylene insulated, twisted pair, aluminum Mylar shield, 20 – 22 AWG stranded tinned copper drain wire, chrome vinyl jacket. Temperature rating: -20°C to 60°C.

---

12. Solder and/or use moisture. To prevent connection problems in the future, proof the connections and if necessary shrink the tubing.



13. Install the FleetJournal 3. See Chapter 3 FJ3 Installation.

14. Connect the hardwire FIA connector to the FleetJournal 3 [FJ3] ACC connector.

15. Install the hardwire FIA on the FJ3 wall utilizing the magnetic base.

16. Plug the fuel inlet antenna wires into the green connection points next to each other.





### 8.4.1 Troubleshooting

If the Hardwire FIA connection does not work [no proper signal], do the following:

3. Ensure that you are using a correct FIA and have a signal of at least 10 cm. If not replace the FIA.
4. If there is still no proper signal, replace the FIA wire connection.

---

**Note**

The Fuel Inlet Antenna Connector is a sealed unit and cannot be repaired in the field. Please return the defective units. Download an RMA from the AssetWorks PartWorks website.

---

## 9 Connecting the FJ3 to the GPS Tracking Device [Optional]

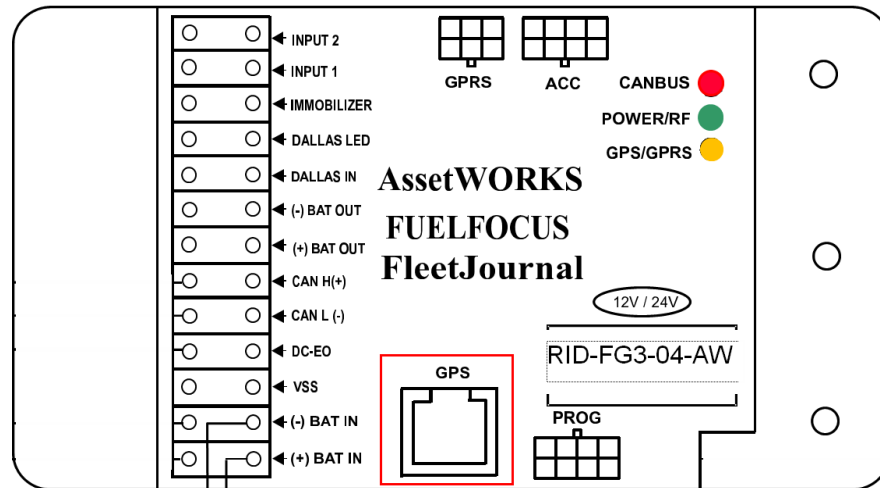
The GPS device tracks the location of vehicles in the field.



**Figure 12 GPS Antenna Cable**

To install the GPS tracking device:

3. Attach the RJ45 cable to the to the GPS connector on the FJ3.



4. Place the GPS antenna on the vehicle's dashboard near the windshield.



# 10 Driver ID [Optional]

## 10.1 Connecting the Driver ID

To identify the driver of the vehicle, connect the Tag Reader wires to the FJ3 as follows:

Wire Color	Connect to:
White	Dallas LED
Green	Dallas In
Black	(-) Bat Out
Red	(+) Bat In

See Figure 13

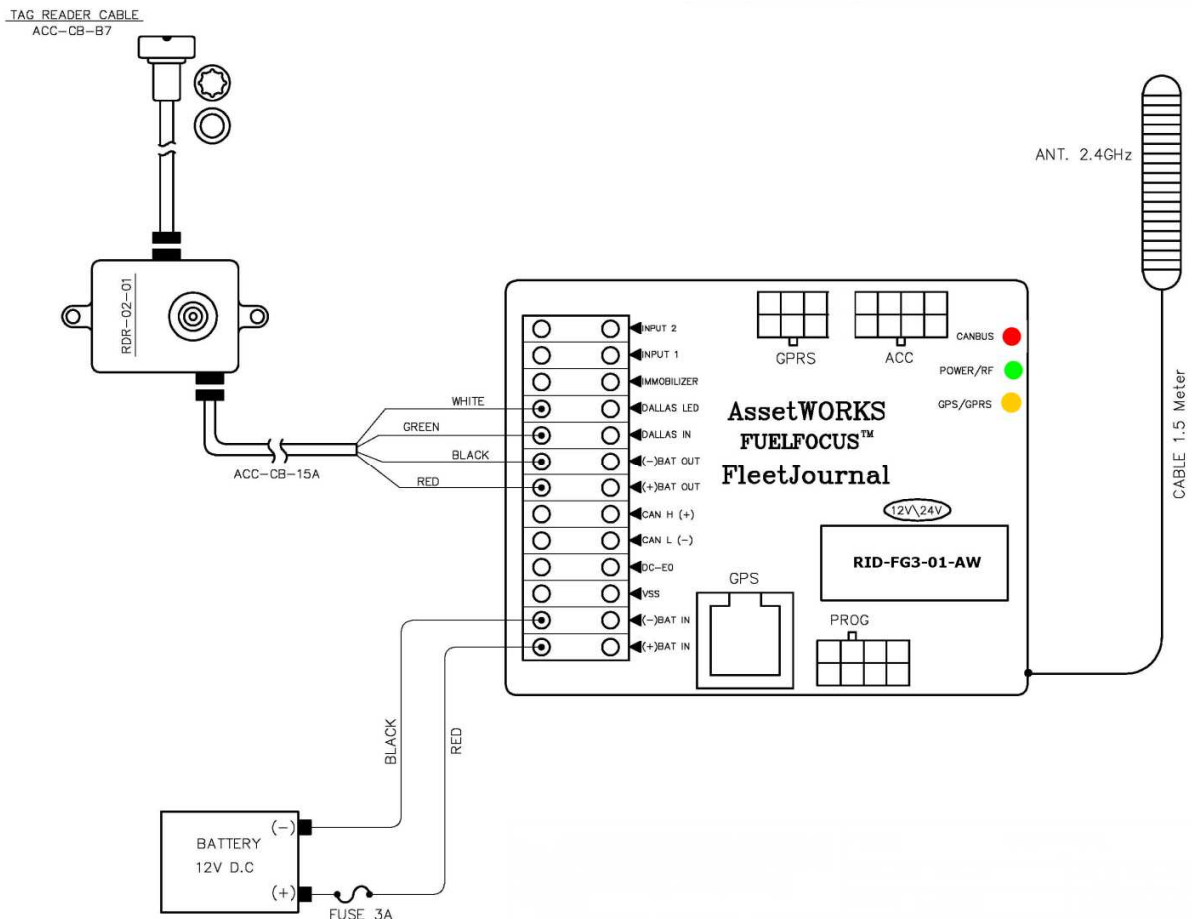


Figure 13: Connecting the Driver ID reader to the FJ3



## 10.2 Installing the Driver ID Reader [Tag Reader]

**Note:** Place the Tag reader on the dashboard so that the Dallas key can be easily read.

6. Wire the Tag Reader cables to the FJ3 – see section **Error! Reference source not found.**  
**Error! Reference source not found.**
7. Make a ½" hole on the dashboard for the Tag Reader.
8. Pull the Tag Reader through the hole.
9. Connect the Com. Cable ACC-CB-15A cable to the FJ3.



Figure 14 COM Cable ACC-CB-15A

10. Connect the Reader Cable ACC-CB-B7 to the Driver ID Reader.



Figure 15 Reader Cable ACC-CB-B7

**Important:** The Driver ID Reader should be **bright red** after connecting and installing it correctly. If there is a faint green light in the center of the Reader, this indicates that the Reader is not correctly installed. All the connectors should slide in smoothly, do **not** force them.



# 11 Appendices

## 11.1 Appendix A: Capturing Vehicle Data

### 11.1.1 Connect the FJ3 to an OBD II Connector (Light Duty Vehicle)

If the vehicle has an OBD II connector, perform the following:

1. Run a twin wire cable from the vehicle connector to the FJ3.
2. Connect the FJ3 CAN\_H to pin 6 of the OBD II connector.
3. Connect the FJ3 CAN\_L to pin 14 of the OBD II connector.

---

#### Optional Power Supply Connection

**Note** It is possible to supply the power to the FJ3 from the OBD II connector as follows:

- Connect Pin 16 to BATT (+) on the FJ3.
  - Connect Pin 4 to BATT (-) on the FJ3.
-

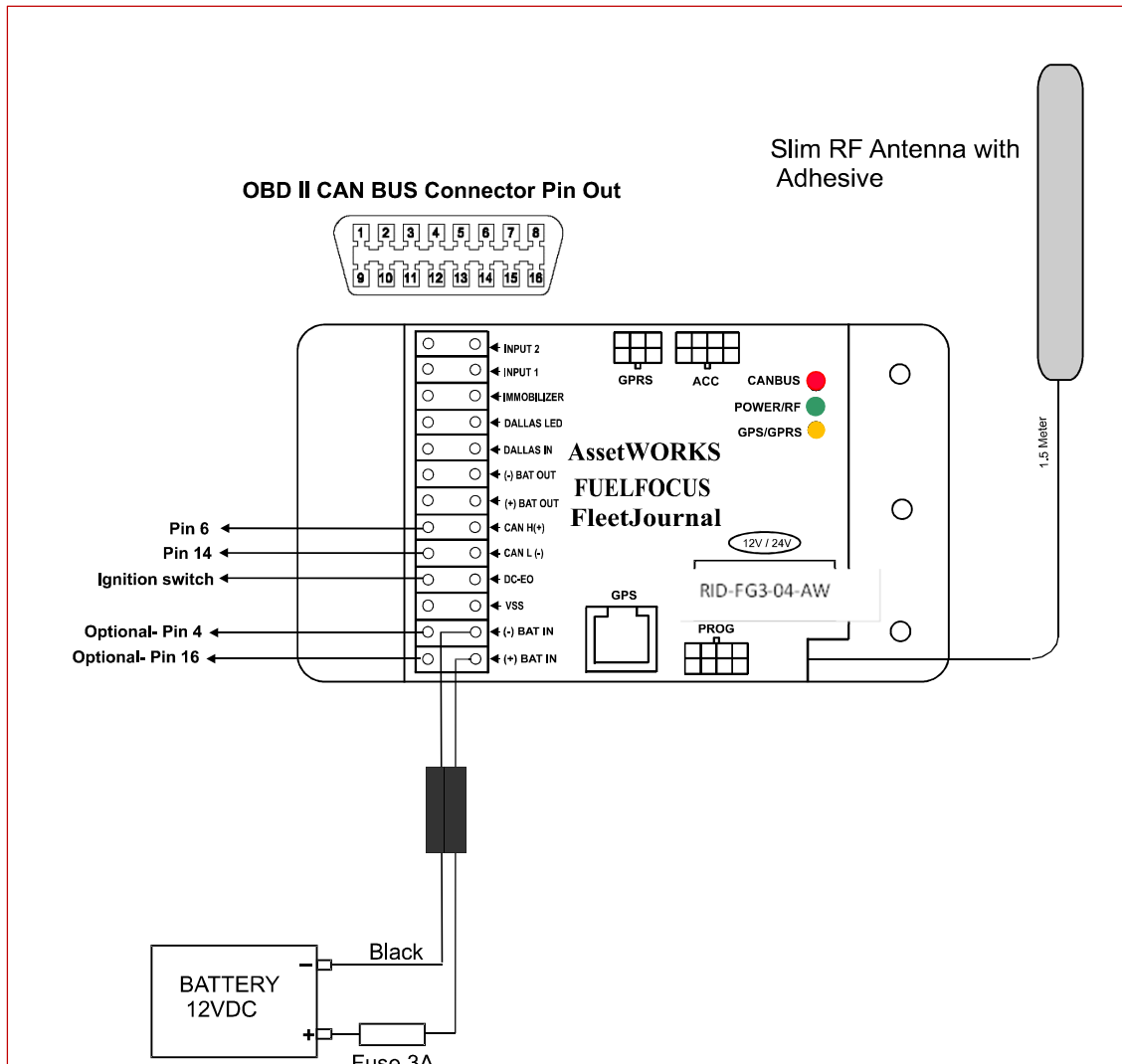


Figure 5: Wiring Diagram for FJ3 with CAN Bus Interface for Light Duty Vehicles

### 11.1.2 Connect the FJ3 to a J1939 Connector (Heavy Duty Vehicle)

If the vehicle has a 9-pin Deutsch connector, perform the following:

1. Run a twin-wire cable from the vehicle connector to the FJ3.
2. Connect the CAN\_H Black wire pin 3/C of the Deutsch connector to the FJ3 point CAN\_H.
3. Connect the CAN\_L White wire pin 4/D of the Deutsch connector to the FJ3 point CAN\_L.

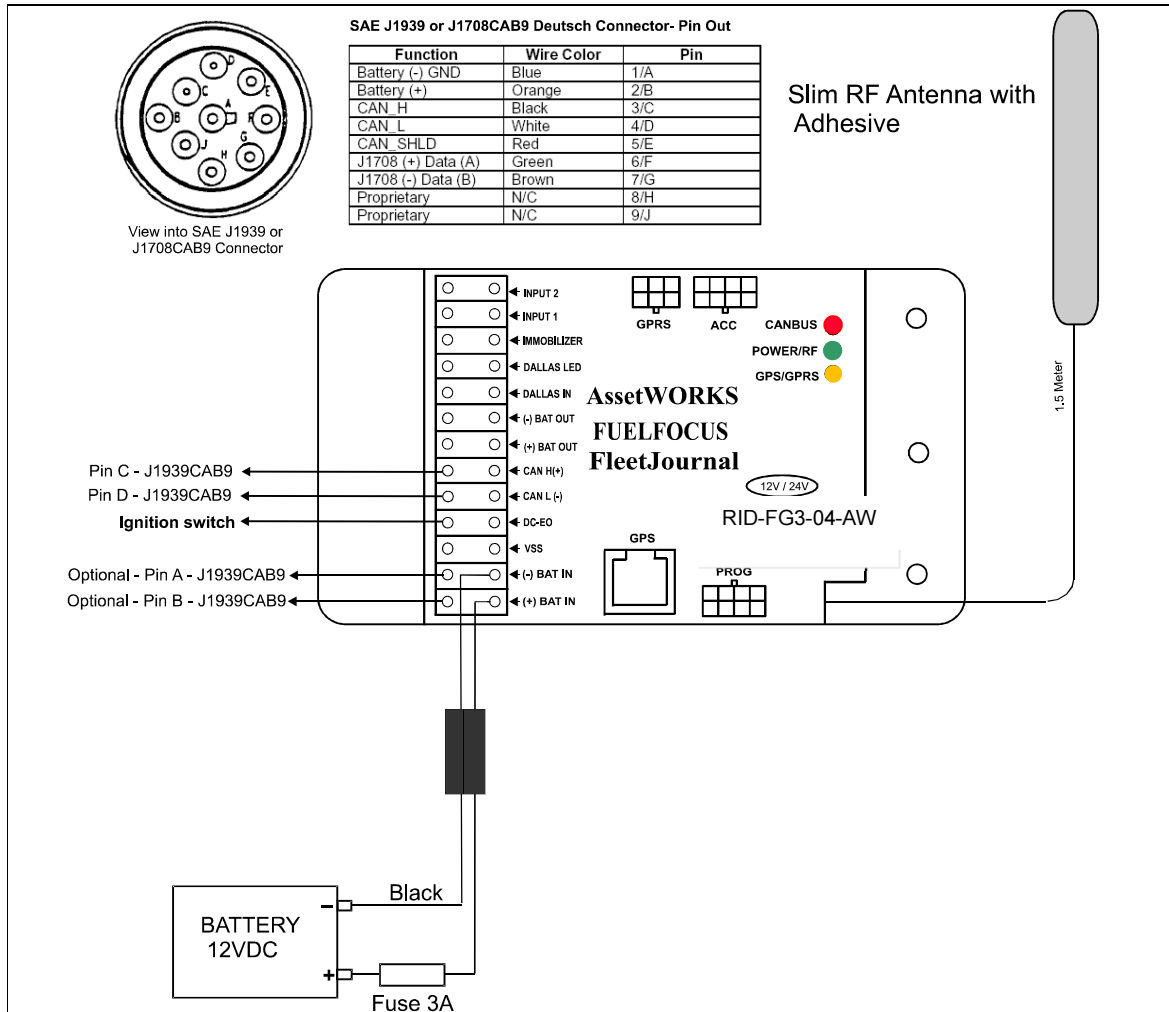


**Optional Power Supply Connection**

It is possible to supply the power to the FJ3 from the J1939CAB9 connector as follows:

**Note**

- Connect Pin 2/B to BATT (+) on the FJ3.
- Connect Pin 1/A to BATT (-) on the FJ3.



**Figure 6: Wiring Diagram for FJ3 with CAN Bus Interface for Heavy Duty Vehicles**



### 11.1.3 Connect the FJ3 to a 3 pin J1939 Connector (Heavy Duty Vehicle)

If the vehicle has a 3-pin Deutsch connector, perform the following:

1. Run a twin-wire cable from the vehicle connector to the FJ3.
2. Connect the CAN\_H pin B of the Deutsch connector to the FJ3 point CAN\_H.
3. Connect the CAN\_L pin A of the Deutsch connector to the FJ3 point CAN\_L.
4. Connect the ground pin C of the Deutsch connector to the FJ3 point BATT (-).

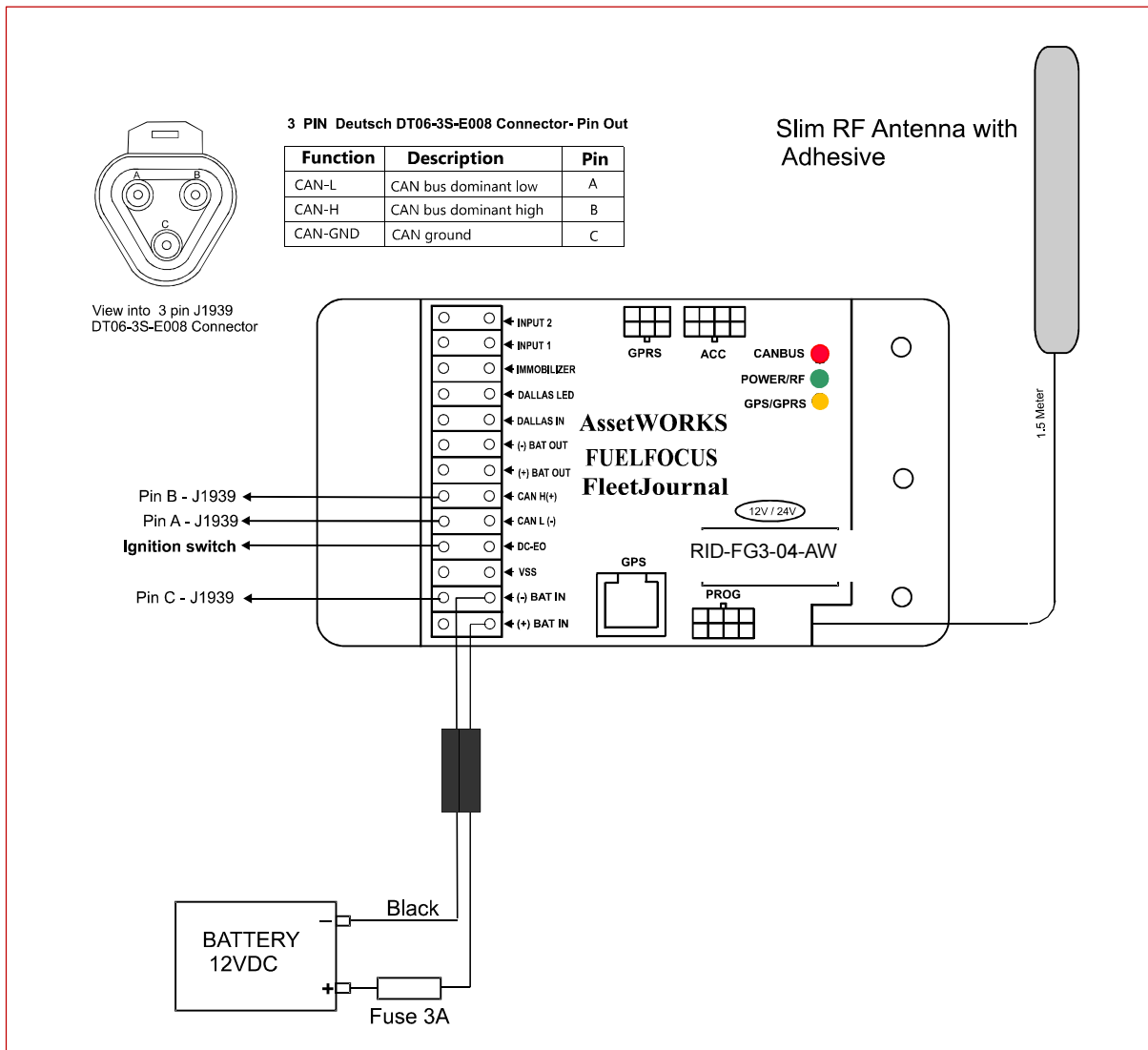


Figure 7: Wiring Diagram for FJ3 with CAN Bus Interface (3-pin connector) for Heavy Duty Vehicles



## 12 Wiring J1708 Vehicles

### 12.1 Connect the Ignition Switch to the FJ3

Run a wire from the vehicle ignition switch to the DC-EO terminal on the FJ3 (see Figure 2).

---

**Note** FJ3 does not function properly if an ignition On/Off wire is not connected. FJ3 goes into Sleep mode 30 min after turning off the ignition.

---

### 12.2 Connect the Data Interface to the FJ3

The instructions for this procedure depend on the type of the connector equipped with the vehicle – whether it is a J1708 CAB9 (9 pin) connector or a J1708 CAB (6 pin) connector. The following sections provide instructions for both types of vehicles.

To view the connectors' pin-out information, refer to *the Fueling Options*

*Either* SVID [Fuel Inlet Antenna Connector P/N RID-IN-54]

Or Hardwire [Fuel Intel Antenna Connector P/N RID-EM-02]

Both options also require a Fuel Intel Antenna [P/N RVC-XX –XX]

### 12.3 SVID Mounting and Installation

#### 12.3.1 Mounting the Fuel Inlet Antenna (FIA)

---

**Note** Use shielded cable type Olympic part # 2886 or equivalent, polypropylene insulated, twisted pair, aluminum Mylar shield, 20 – 22 AWG stranded tinned copper drain wire, chrome vinyl jacket. Temperature rating: -20°C to 60°C.

---



Connect the FIA coil before mounting, to avoid using the heat gun near the fuel tank. Before making this connection, plan on where you are going to mount the SVID. Then make sure you have clearance to pass the SVID from the filler neck to the mounting location.

If you do not have enough clearance, first position the FIA coil on the vehicle. Then pull the wire out to a safe distance (at least three feet from the fuel filler neck) to heat the shrink-wrap insulation. Then pull the wire back for final mounting.

---

Select a Fuel Inlet Antenna (FIA) with an internal diameter that allows it to fit snugly over the





filler neck. (A variety of sizes are available from AssetWorks.) Slide the FIA down over the filler neck and slide it back until it is securely in place. (See note)

The intrinsically safe FIA wires must be tie wrapped at various locations between the FIA and the SVID. One tie will be placed on the FIA wire, directly behind the antenna, to prevent the antenna from falling off the filler neck.

---

**Note**

The FIA must be placed no more than four inches from the filler neck opening. If the exposed portion of the filler neck pipe is longer than four inches, place a plastic tie behind the antenna to hold it in place. You may now install the odometer adaptor (if required) according to the manufacturer's instructions. Then proceed to "Mounting the SVID".

---

### 12.3.2 Mounting the SVID

The location of the SVID will be determined according to the device type.

SVID with external antenna is mounted in the vehicle trunk or behind the fuel tank.

---

**Important**

The SVID should be mounted on the vehicle before performing the activation.

---

### 12.3.3 FIA to SVID

Connect each of the intrinsically safe FIA wires to the "T-Ring" points (Polarity is not important) at the SVID. Pass the SVID and its intrinsically safe cable to the selected mounting site. You must find a clear path to run the cable from the fuel tank to the selected SVID mounting site. You may use existing holes in the vehicle body. Make sure not to drill outer parts of the vehicle and not to cause any damage to the operation of vehicle. Use grommets to protect cable that you pass through holes. Remove plastic or rubber parts blocking the way. Make sure to re-install all removed parts after the wires have been passed through.



Do not use an electric drill or any other electrical power tools within 3 feet of the filler neck or fuel tank as this area is considered a Class I, Group D hazardous location.

---

## 12.3.4 SVID Installation

### 12.3.4.1 SVID Installation with external antenna wires on fuel tank

11. Install the Fuel Inlet Antenna – FIA ring on the fuel tank inlet. Select the FIA ring according to the vehicle type.
12. Route the FIA wires through a protective conduit under vehicle chassis to the SVID.



13. Clean the surface of the vehicle with alcohol; make sure to remove all grease and debris.
14. Remove the sticker on the back of the SVID device and stick it to the cleaned surface as shown.



15. Connect the SVID antenna wires with FIA wires using two suitable connectors.



## 12.3.4.2 SVID Installation With External Antenna Wires on the Vehicle Trunk

9. Install the fuel inlet antenna -FIA ring on the fuel tank inlet. Select a ring according to the vehicle type.

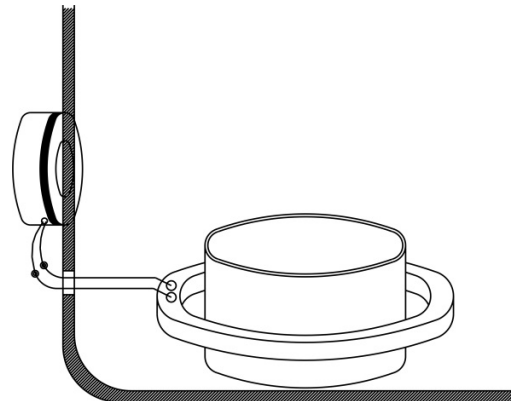


10. Drill 7mm hole in fueling compartment, insert a grommet, and insert the 2 wires. Install the SVID in the vehicle trunk behind the fuel inlet.

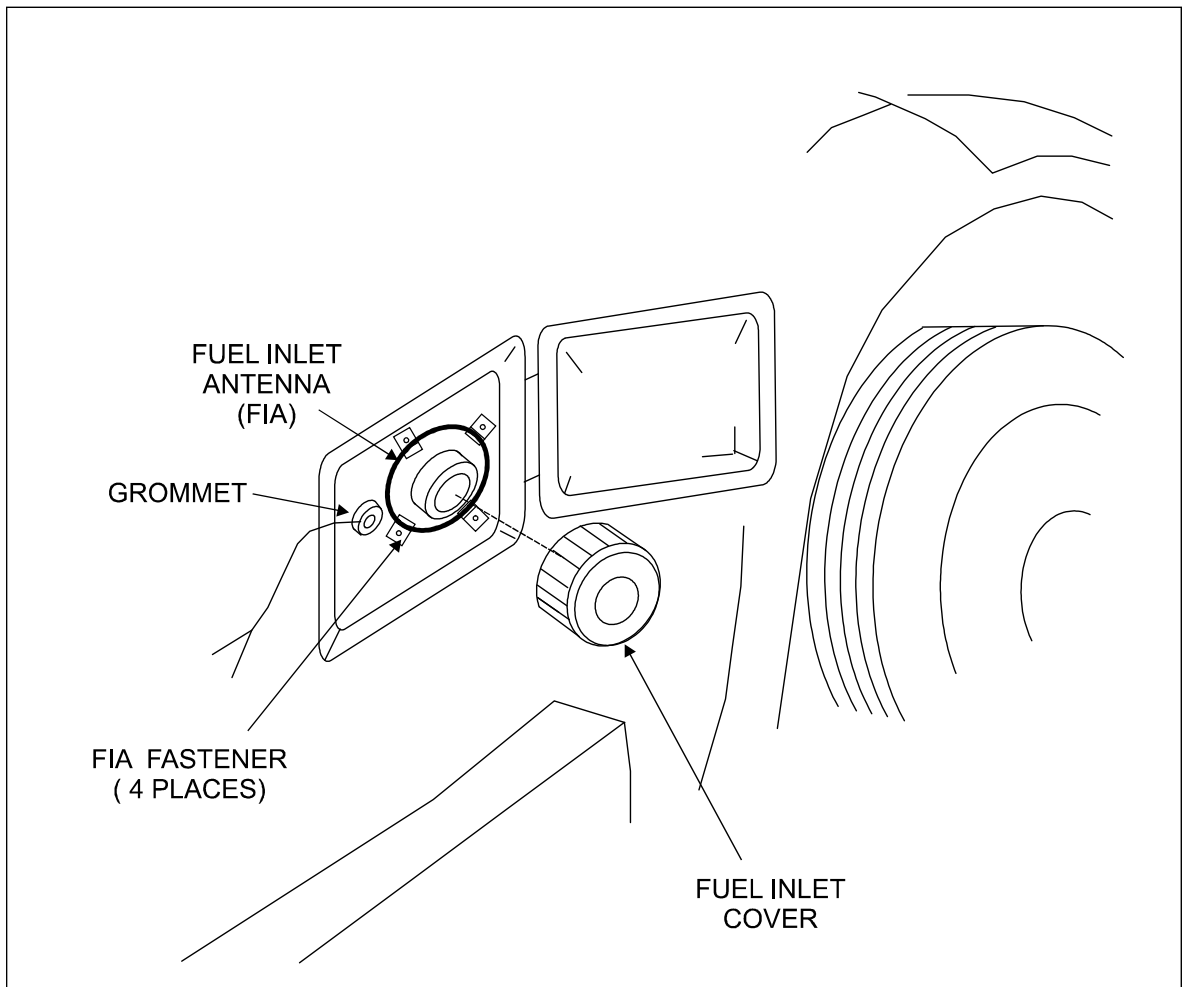


11. Clean the surface of the vehicle with alcohol. Make sure to remove all grease and debris.

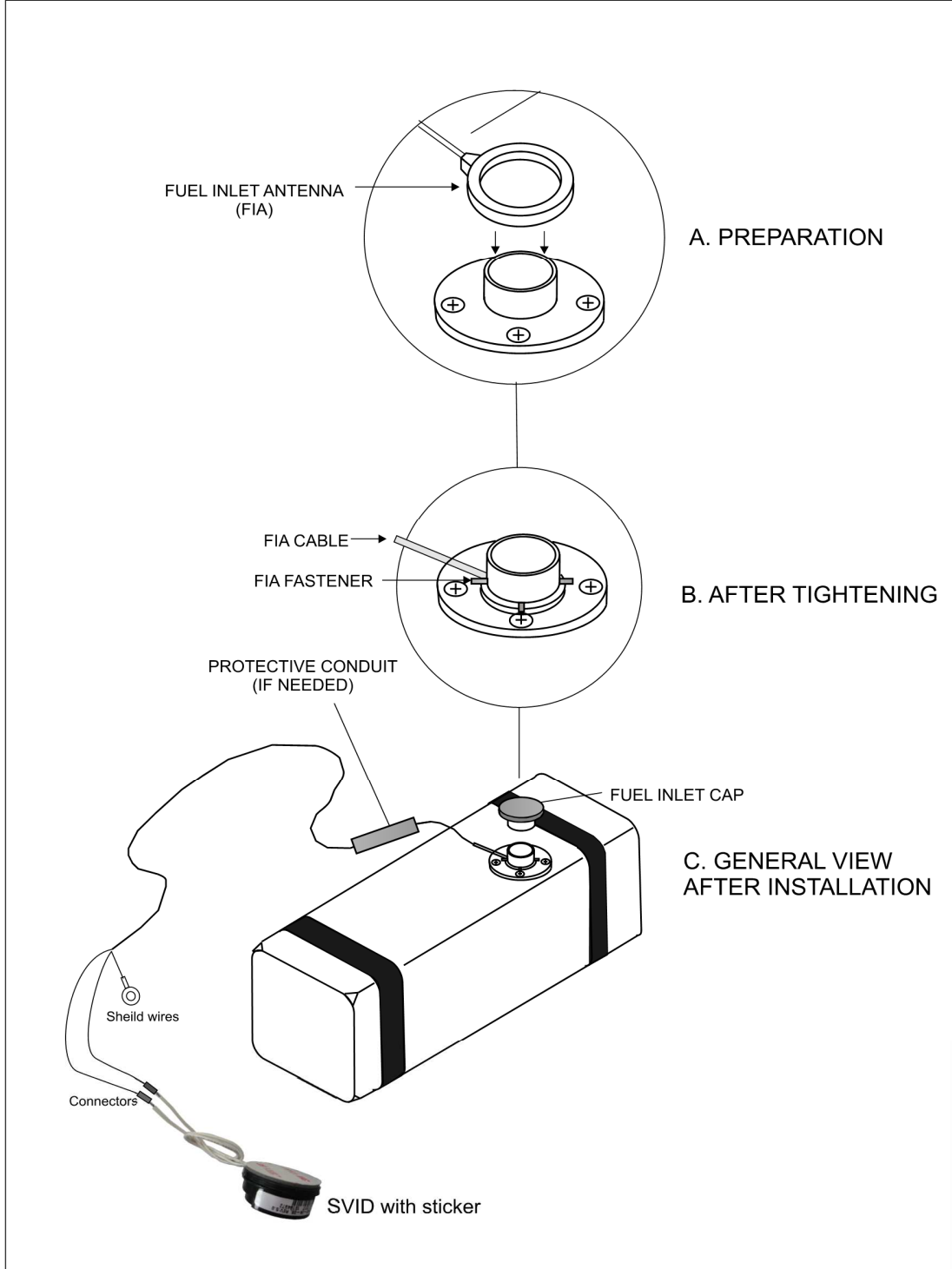
12. Connect the SVID antenna wires to the FIA ring wires with two suitable connectors using crimping tool.



12.3.4.3 FIA Installation on a Light Duty Vehicle Fuel Tank



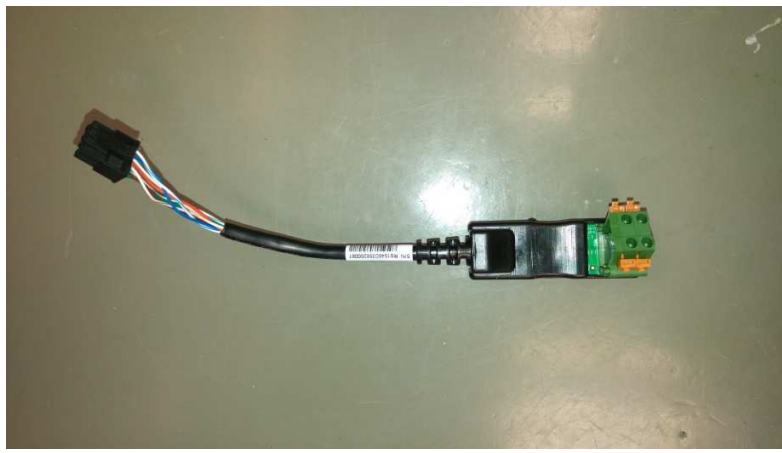
12.3.4.4 Installation on a Heavy Duty Vehicle Fuel Tank



## 12.4 Hardwire Fuel Inlet Antenna Connector Installation Instructions

FCC Compliance

FCC ID: 2AKAM2288



To install the Hardwire FIA:

17. Select a fuel inlet antenna diameter to fit the vehicle's fuel tank inlet [one size larger].
18. Install it using the dedicated snaps provided.
19. Make sure the fuel inlet antenna cable is long enough to reach the location where the FleetJournal 3 will be installed.

---

**Note**

If necessary the cable may be extended. Use shielded cable type Olympic part # 2886 or equivalent, polypropylene insulated, twisted pair, aluminum Mylar shield, 20 – 22 AWG stranded tinned copper drain wire, chrome vinyl jacket. Temperature rating: -20°C to 60°C.

---

20. Solder and/or use moisture. To prevent connection problems in the future, proof the connections and if necessary shrink the tubing.



21. Install the FleetJournal 3. See Chapter 3 FJ3 Installation.

22. Connect the hardwire FIA connector to the FleetJournal 3 [FJ3] ACC connector.

23. Install the hardwire FIA on the FJ3 wall utilizing the magnetic base.

24. Plug the fuel inlet antenna wires into the green connection points next to each other.





### 12.4.1 Troubleshooting

If the Hardwire FIA connection does not work [no proper signal], do the following:

5. Ensure that you are using a correct FIA and have a signal of at least 10 cm. If not replace the FIA.
6. If there is still no proper signal, replace the FIA wire connection.

---

**Note**

The Fuel Inlet Antenna Connector is a sealed unit and cannot be repaired in the field. Please return the defective units. Download an RMA from the AssetWorks PartWorks website.

---



## 13 Connecting the FJ3 to the GPS Tracking Device [Optional]

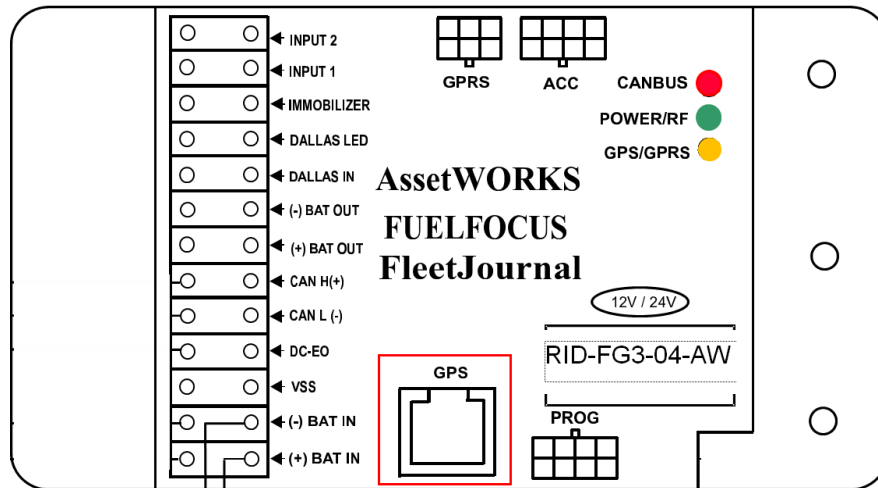
The GPS device tracks the location of vehicles in the field.



Figure 12 GPS Antenna Cable

To install the GPS tracking device:

- Attach the RJ45 cable to the to the GPS connector on the FJ3.



- Place the GPS antenna on the vehicle's dashboard near the windshield.

# 14 Driver ID [Optional]

## 14.1 Connecting the Driver ID

To identify the driver of the vehicle, connect the Tag Reader wires to the FJ3 as follows:

Wire Color	Connect to:
White	Dallas LED
Green	Dallas In
Black	(-) Bat Out
Red	(+) Bat In

See Figure 13

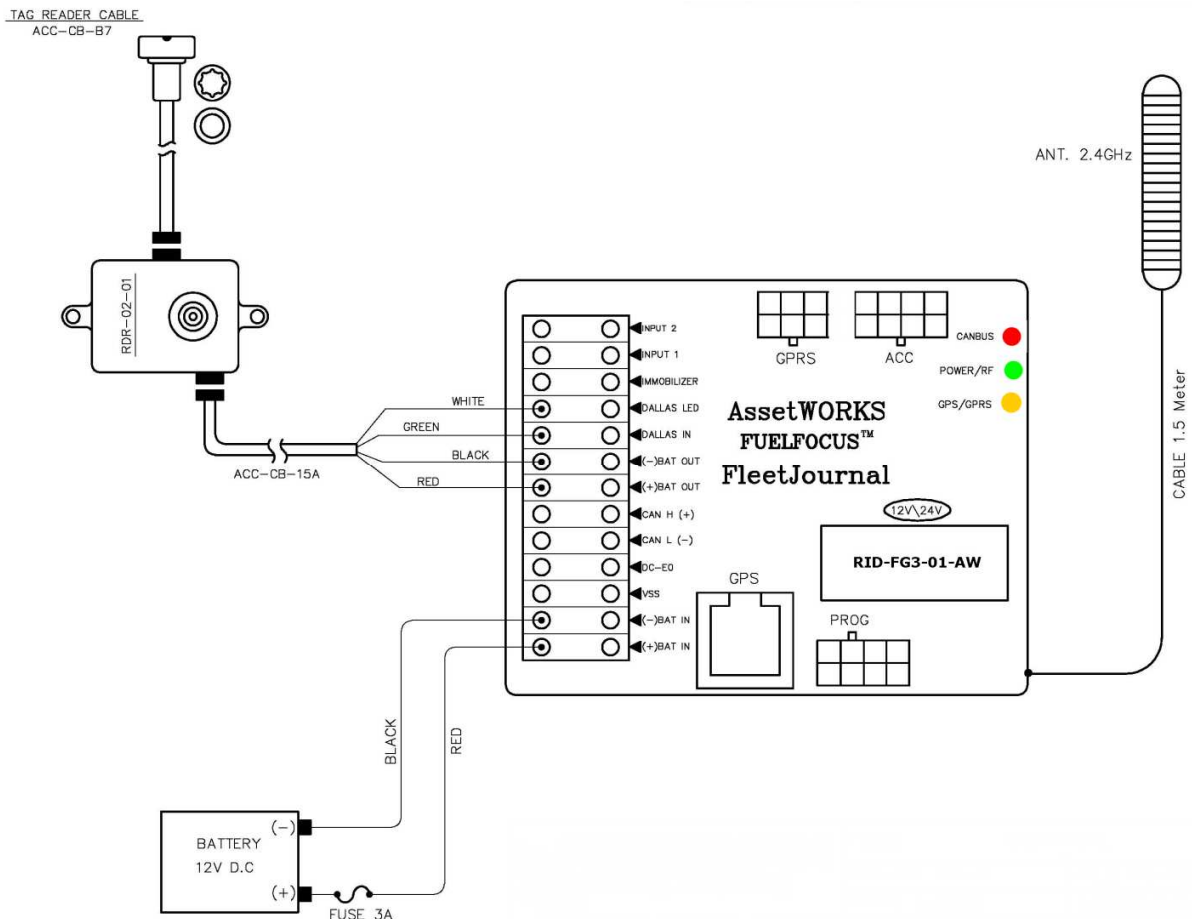


Figure 13: Connecting the Driver ID reader to the FJ3



## 14.2 Installing the Driver ID Reader [Tag Reader]

**Note:** Place the Tag reader on the dashboard so that the Dallas key can be easily read.

11. Wire the Tag Reader cables to the FJ3 – see section **Error! Reference source not found.**  
**Error! Reference source not found.**
12. Make a ½" hole on the dashboard for the Tag Reader.
13. Pull the Tag Reader through the hole.
14. Connect the Com. Cable ACC-CB-15A cable to the FJ3.



Figure 14 COM Cable ACC-CB-15A

15. Connect the Reader Cable ACC-CB-B7 to the Driver ID Reader.



Figure 15 Reader Cable ACC-CB-B7

**Important:** The Driver ID Reader should be **bright red** after connecting and installing it correctly. If there is a faint green light in the center of the Reader, this indicates that the Reader is not correctly installed. All the connectors should slide in smoothly, do **not** force them.



## 15 Appendices

### 15.1 Appendix A: Capturing Vehicle Data

#### 15.1.1 Connect the FJ3 to the J1708 CAB9 Connector

If the vehicle has 9 pin Deutsch connector, perform the following:

1. Run a twin wire cable from the vehicle connector to the FJ3.
2. Connect the J1708 Data link (+) wire from pin F of the Deutsch connector.
3. Connect the J1708 Data link (-) wire from pin G of the Deutsch connector.

---

#### Optional Power Supply Connection

**Note**

It is possible to supply the power to the FJ3 from the J1708CAB9 if pin 2/B has 12-24 volts with the ignition in the off position:

- Connect Pin 2/B to BATT (+) on the FJ3.
  - Connect Pin 1/A to BATT (-) on the FJ3.
- 



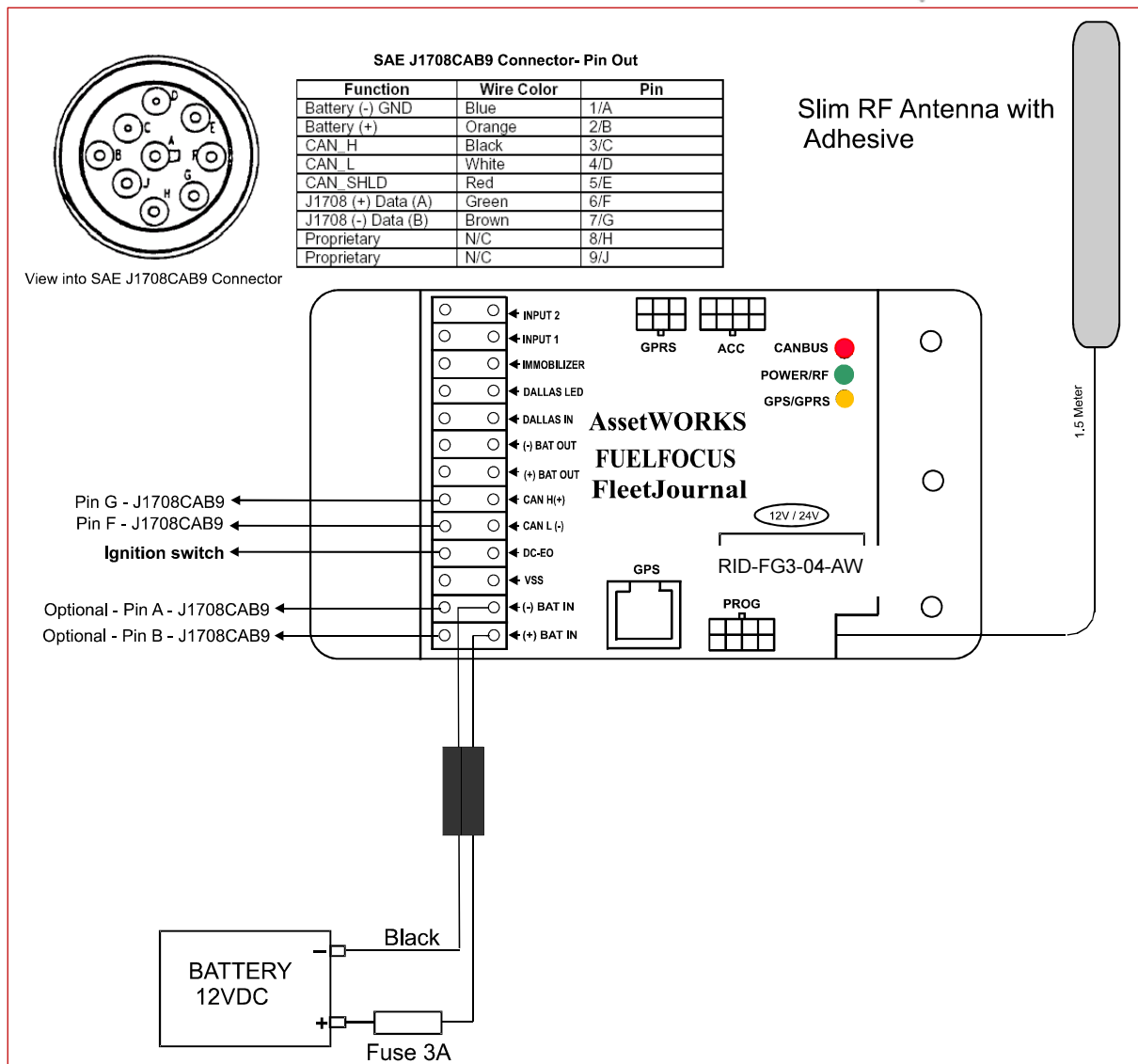


Figure 8: Wiring Diagram for FJ3 to J1708CAB9 (9 pin) connector



### 15.1.2 Connect the FJ3 to the J1708 CAB Connector

If the vehicle has a 6-pin Deutsch connector, perform the following:

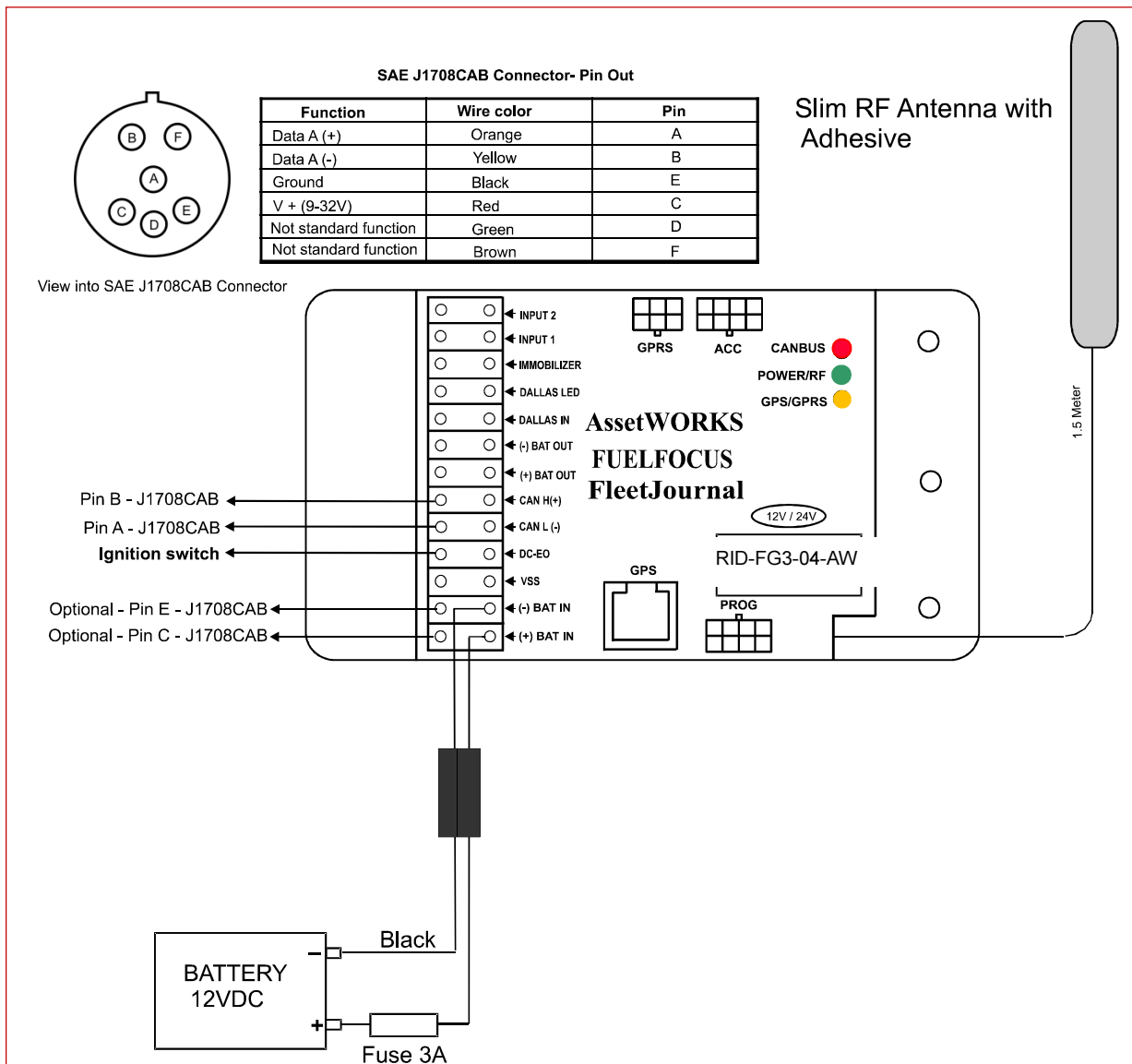
1. Run a twin-wire cable from the vehicle connector to the FJ3.
2. Connect the J1708 Data link (+) wire from pin A of the Deutsch connector.
3. Connect the J1708 Data link (-) wire from pin B of the Deutsch connector.

#### Optional Power Supply Connection

The power supply can be connected to FJ3 from the J1708 CAB connector, if pin C provides 12 – 24 volts with the ignition in the off position:

**Note**

- Connect Pin C to BATT (+) on the FJ3.
- Connect Pin E to BATT (-) on the FJ3.



**Figure 9: Wiring Diagram for FJ3 to J1708CAB (6 pin) connector**





## 16 Completion of Installation

### 16.1 Verify Installation

Upon completing installation, verify that the GREEN LED on the FJ3 is blinking every second. This indicates good power and grounding.

There are three indicator LEDs on the FJ3 (see Figure 2 on page 11) one green LED, one red LED and one orange LED:

LED COLOR	FUNCTION	INDICATION
RED	CANBUS	<ul style="list-style-type: none"> <li>Blinks every second when no data received.</li> <li>Blinks according to the data transfer rate when receiving data.</li> </ul>
GREEN	Power and RF	RF transmission - Fast blinking Power ON - Blinks every second
ORANGE	GPS/GPRS	Blinks when GPS unit is connected and data from the GPS is transmitted

During normal operations, the green LED also blinks every time an RF message is received, indicating that the FJ3 is communicating with the WAF or VDC antenna.

**Note**

After power up, the green LED blinks every second. (Indicating power and ground are connected).

The green LED also blinks every time an **RF** message is received. (Indicating the FJ3 is communicating with the WAF or VDC antenna)

When FJ3 is set to Hour counter using the VSS input, the red LED is on. (This indicates good communication with the vehicle/equipment.)



## 17FJ3 Flashing Tool

### 17.1 Purpose

The FJ3 Flashing Tool is part of the FuelFocus Vehicle Subsystem. These instructions explain how to upload a new FJ3 version for the flashing tool and how to program the FJ3 after the new version has been loaded.

### 17.2 Preparation steps

1. Connect a USB cable from the Flashing tool to your computer
2. Connect the Flashing tool to a 12V Power Supply
3. Locate the flashing tool software on your computer - ProgCa\_UmArm.exe

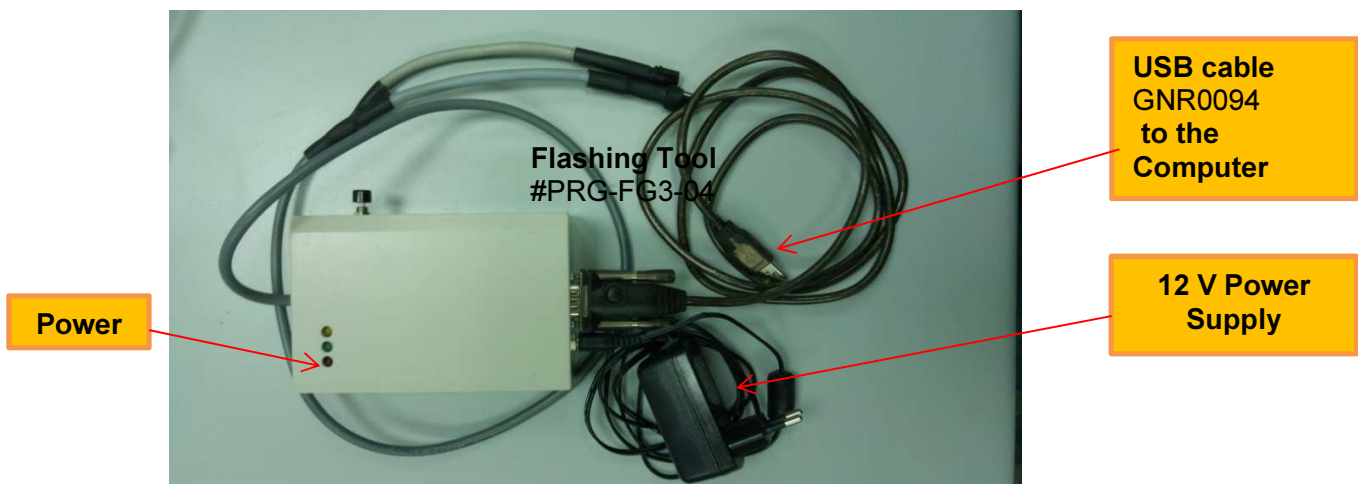


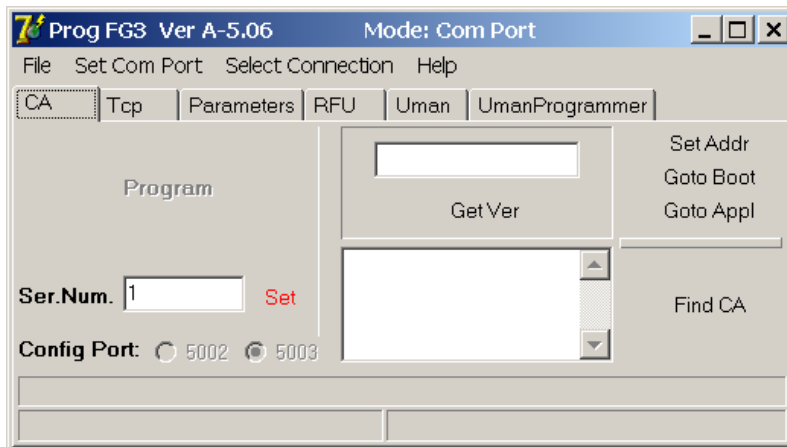
Figure 10: Flashing Tool Preparation

### 17.3 Updating the FJ3 Flash Tool Version

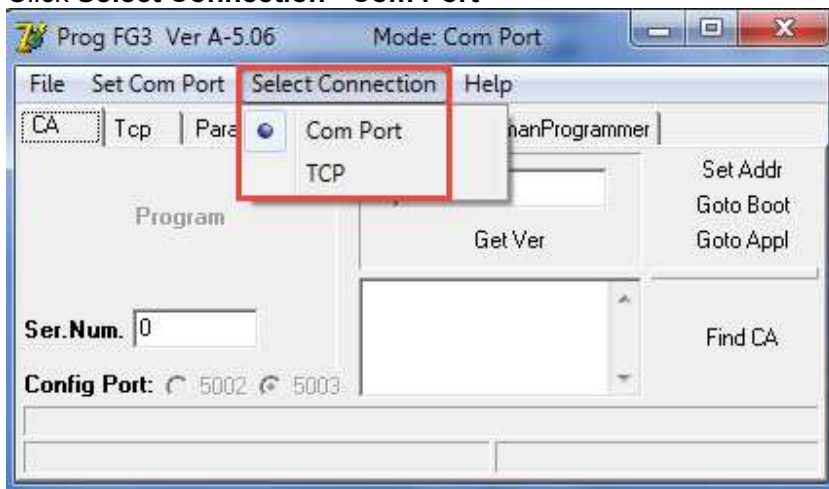
1. Verify that the Flashing Tool program files have been installed on your computer



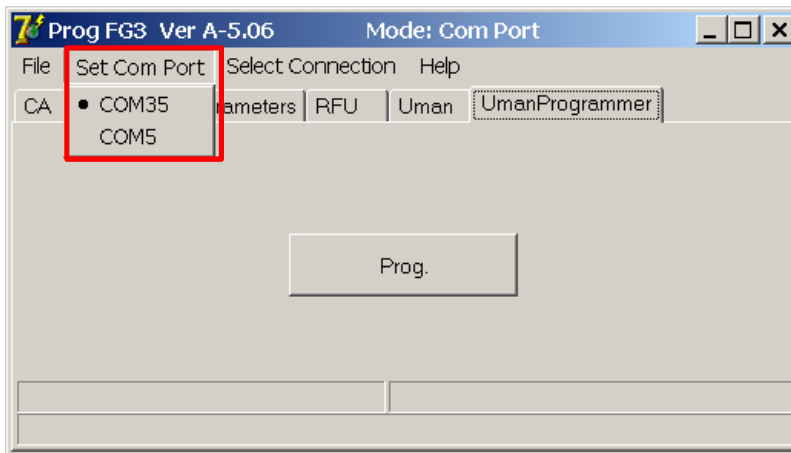
2. Double click `ProgUm5_06.exe` icon or `ProgCa_UmArm.exe`. The Prog FG3 Ver A-5.06 window is displayed.



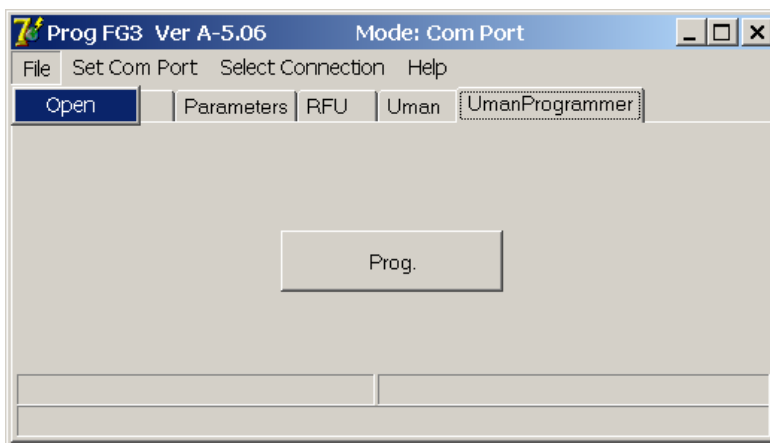
3. Click **Select Connection >Com Port**



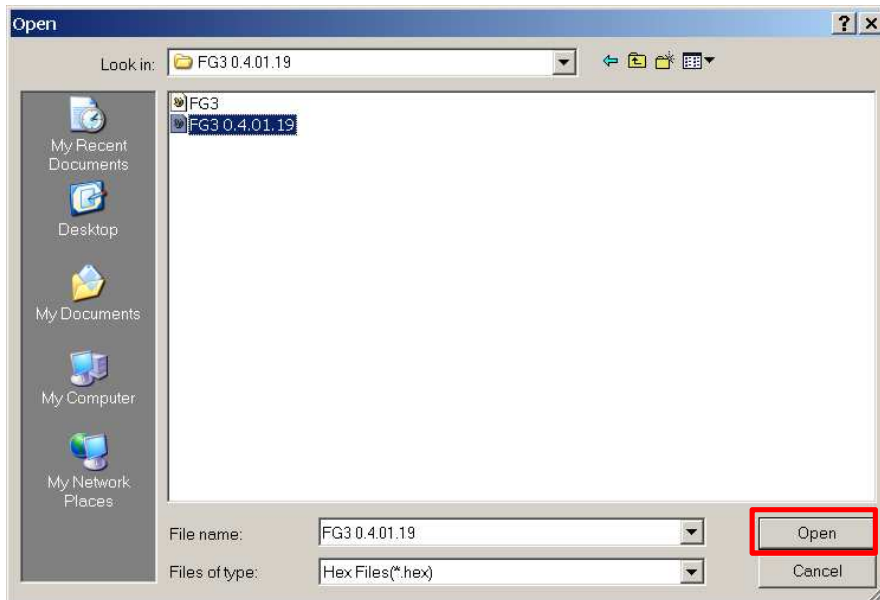
4. Click **Set Com Port** and select an available port on your computer, such as **COM35**.



5. Click **File > Open**



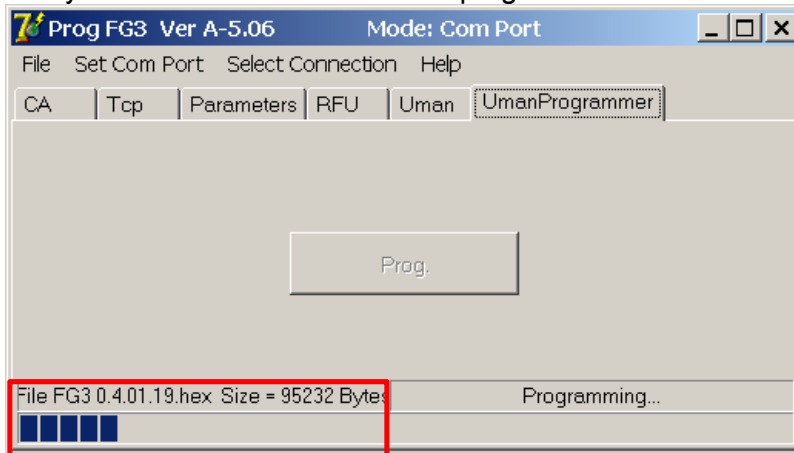
6. The **Open** file dialog box is displayed.
  - a. Select the FG3 hex file, for example: FG3 0.4.01.19.hex
  - b. Click **Open** to continue.



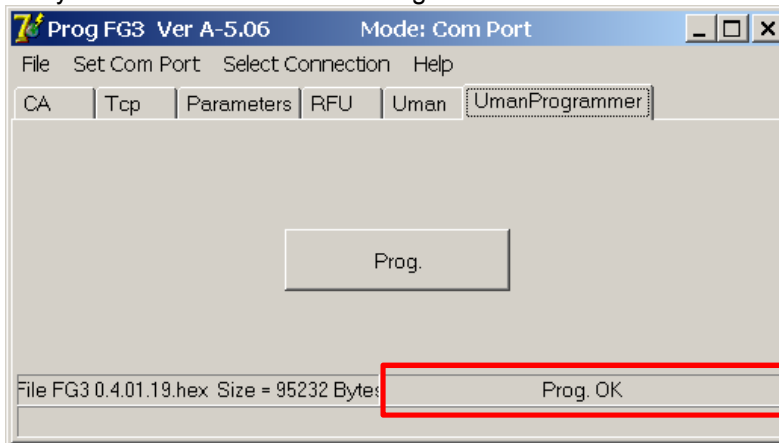
Click **Prog** to start the updating process.



Verify that the status bar shows the progress.



8. Verify that the status bar shows Prog. OK



## 17.4 Instructions for Flash Tool FJ3 Box V1

FOR FJ3 with p/n RID-FG3-04-AW you will use both cables from the Flash Tool

1. Connect the two cables of the Flash Tool # PRG-FG3-04 to the FJ3 as shown:
  - Connect the 4 pin plug to TPMS connector
  - Connect the 6 pin plug to the PROG connector
2. Ensure that the FJ3 has 12V by validating the red light is lit on the flash tool
3. Press the black flash push Button for 2 seconds. The green light will blink during the flashing process. When flashing is complete, the green light will stay lit (solid).

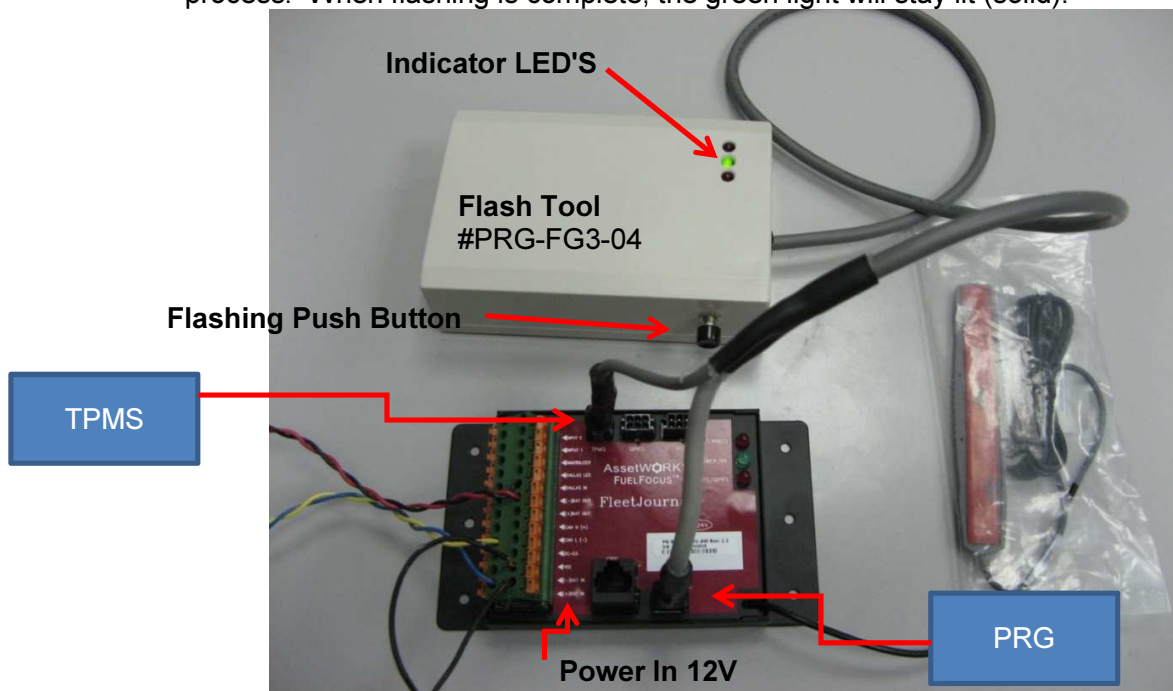


Figure 11 Flash Tool Connections

## 17.5 Instructions for Flash Tool FJ3 Box V4 and Above

For FJ3 with - p/n RID-FG3-04–AW and up with a single 6-pin PRG cable:

1. Connect the 6-pin plug of the Flash Tool # PRG-FG3-04 to the FJ3 into the PRG connector.
2. Ensure that the FJ3 has 12V by validating the red light is lit on flash tool
3. Press the black flash push Button for 2 seconds. The green light will blink during the flashing process. When flashing is complete, the green light stays lit (solid).

GREEN LED and RED LED on the Flashing Tool:

LED COLOR	FUNCTION	INDICATION
RED	Power	Blinks when the Flash Tool is receiving power
GREEN	Flashing	<ul style="list-style-type: none"> <li>• After pressing the black push button, the green LED blinks while the Flash tool is connected to the FJ3</li> <li>• The green LED turns solid after flashing completes successfully</li> </ul>



## 18 Fueling Options

- *Either* SVID [Fuel Inlet Antenna Connector P/N RID-IN-54]
- *Or* Hardwire [Fuel Intel Antenna Connector P/N RID-EM-02]

Both options also require a Fuel Intel Antenna [P/N RVC-XX –XX]

### 18.1 SVID Mounting and Installation

#### 18.1.1 Mounting the Fuel Inlet Antenna (FIA)

---

**Note**

Use shielded cable type Olympic part # 2886 or equivalent, polypropylene insulated, twisted pair, aluminum Mylar shield, 20 – 22 AWG stranded tinned copper drain wire, chrome vinyl jacket. Temperature rating: -20°C to 60°C.

---



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Connect the FIA coil before mounting, to avoid using the heat gun near the fuel tank. Before making this connection, plan on where you are going to mount the SVID. Then make sure you have clearance to pass the SVID from the filler neck to the mounting location.

If you do not have enough clearance, first position the FIA coil on the vehicle. Then pull the wire out to a safe distance (at least three feet from the fuel filler neck) to heat the shrink-wrap insulation. Then pull the wire back for final mounting.

---

Select a Fuel Inlet Antenna (FIA) with an internal diameter that allows it to fit snugly over the filler neck. (A variety of sizes are available from AssetWorks.) Slide the FIA down over the filler neck and slide it back until it is securely in place. (See note)

The intrinsically safe FIA wires must be tie wrapped at various locations between the FIA and the SVID. One tie will be placed on the FIA wire, directly behind the antenna, to prevent the antenna from falling off the filler neck.

---

**Note**

The FIA must be placed no more than four inches from the filler neck opening. If the exposed portion of the filler neck pipe is longer than four inches, place a plastic tie behind the antenna to hold it in place. You may now install the odometer adaptor (if required) according to the manufacturer's instructions. Then proceed to "Mounting the SVID".

---



### 18.1.2 Mounting the SVID

The location of the SVID will be determined according to the device type.  
SVID with external antenna is mounted in the vehicle trunk or behind the fuel tank.

---

**Important** The SVID should be mounted on the vehicle before performing the activation.

---

### 18.1.3 FIA to SVID

Connect each of the intrinsically safe FIA wires to the "T-Ring" points (Polarity is not important) at the SVID. Pass the SVID and its intrinsically safe cable to the selected mounting site. You must find a clear path to run the cable from the fuel tank to the selected SVID mounting site. You may use existing holes in the vehicle body. Make sure not to drill outer parts of the vehicle and not to cause any damage to the operation of vehicle. Use grommets to protect cable that you pass through holes. Remove plastic or rubber parts blocking the way. Make sure to re-install all removed parts after the wires have been passed through.



---

Do not use an electric drill or any other electrical power tools within 3 feet of the filler neck or fuel tank as this area is considered a Class I, Group D hazardous location.

---

## 18.1.4 SVID Installation

### 18.1.4.1 SVID Installation with external antenna wires on fuel tank

16. Install the Fuel Inlet Antenna – FIA ring on the fuel tank inlet. Select the FIA ring according to the vehicle type.
17. Route the FIA wires through a protective conduit under vehicle chassis to the SVID.



18. Clean the surface of the vehicle with alcohol; make sure to remove all grease and debris.
19. Remove the sticker on the back of the SVID device and stick it to the cleaned surface as shown.



20. Connect the SVID antenna wires with FIA wires using two suitable connectors.

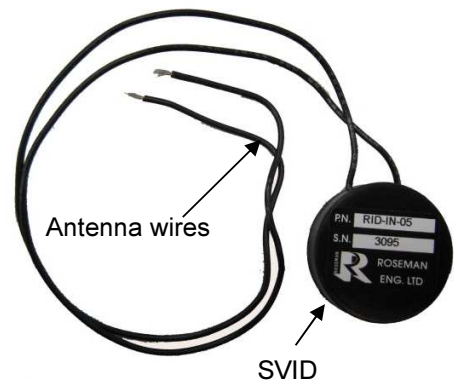


**18.1.4.2 SVID Installation With External Antenna Wires on the Vehicle Trunk**

13. Install the fuel inlet antenna -FIA ring on the fuel tank inlet. Select a ring according to the vehicle type.

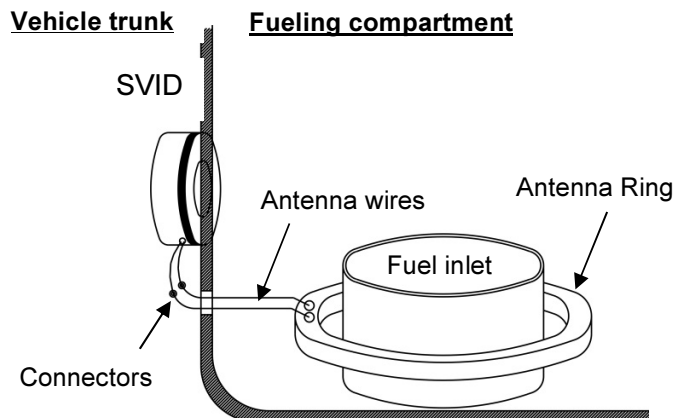


14. Drill 7mm hole in fueling compartment, insert a grommet, and insert the 2 wires. Install the SVID in the vehicle trunk behind the fuel inlet.

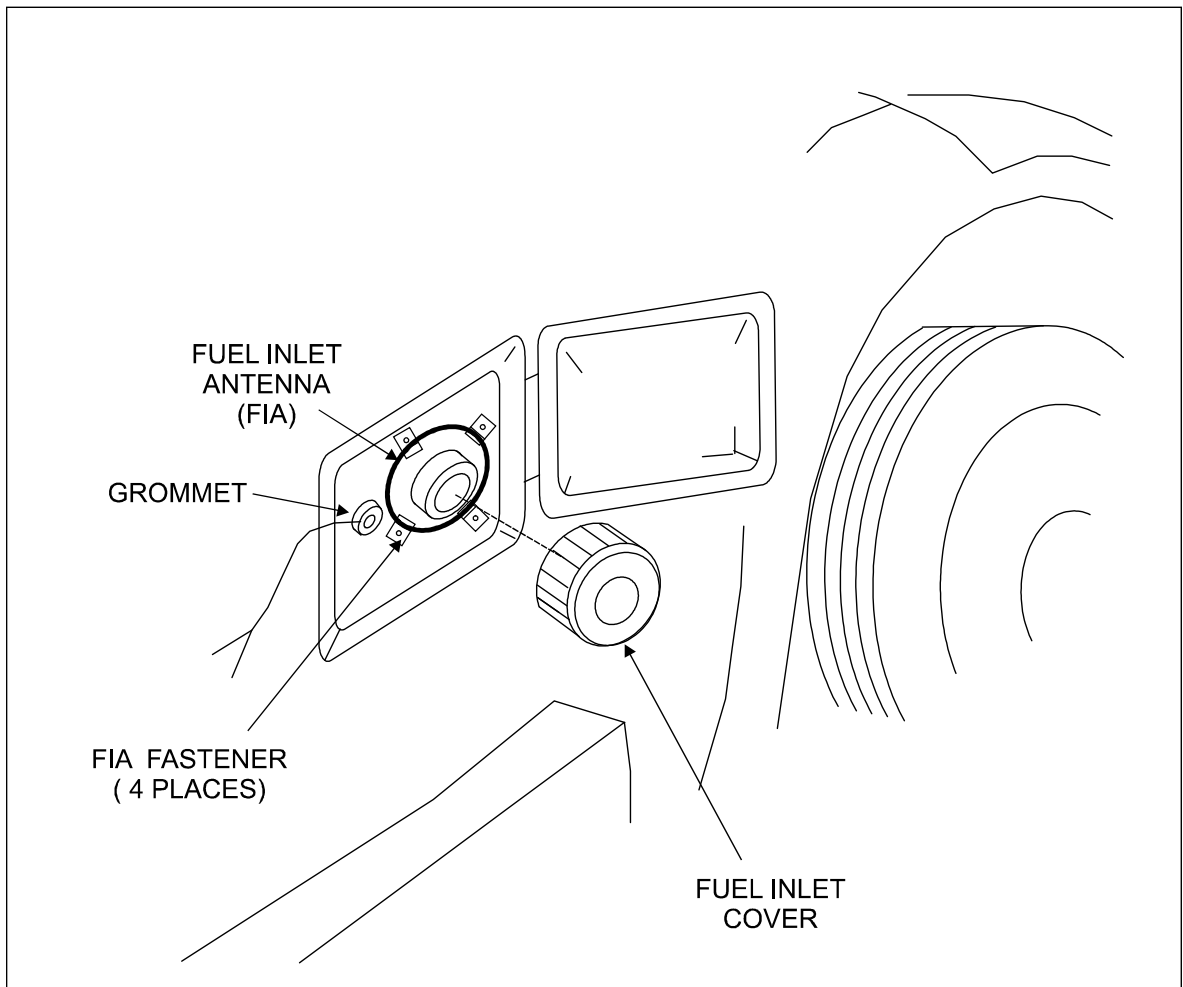


15. Clean the surface of the vehicle with alcohol. Make sure to remove all grease and debris.

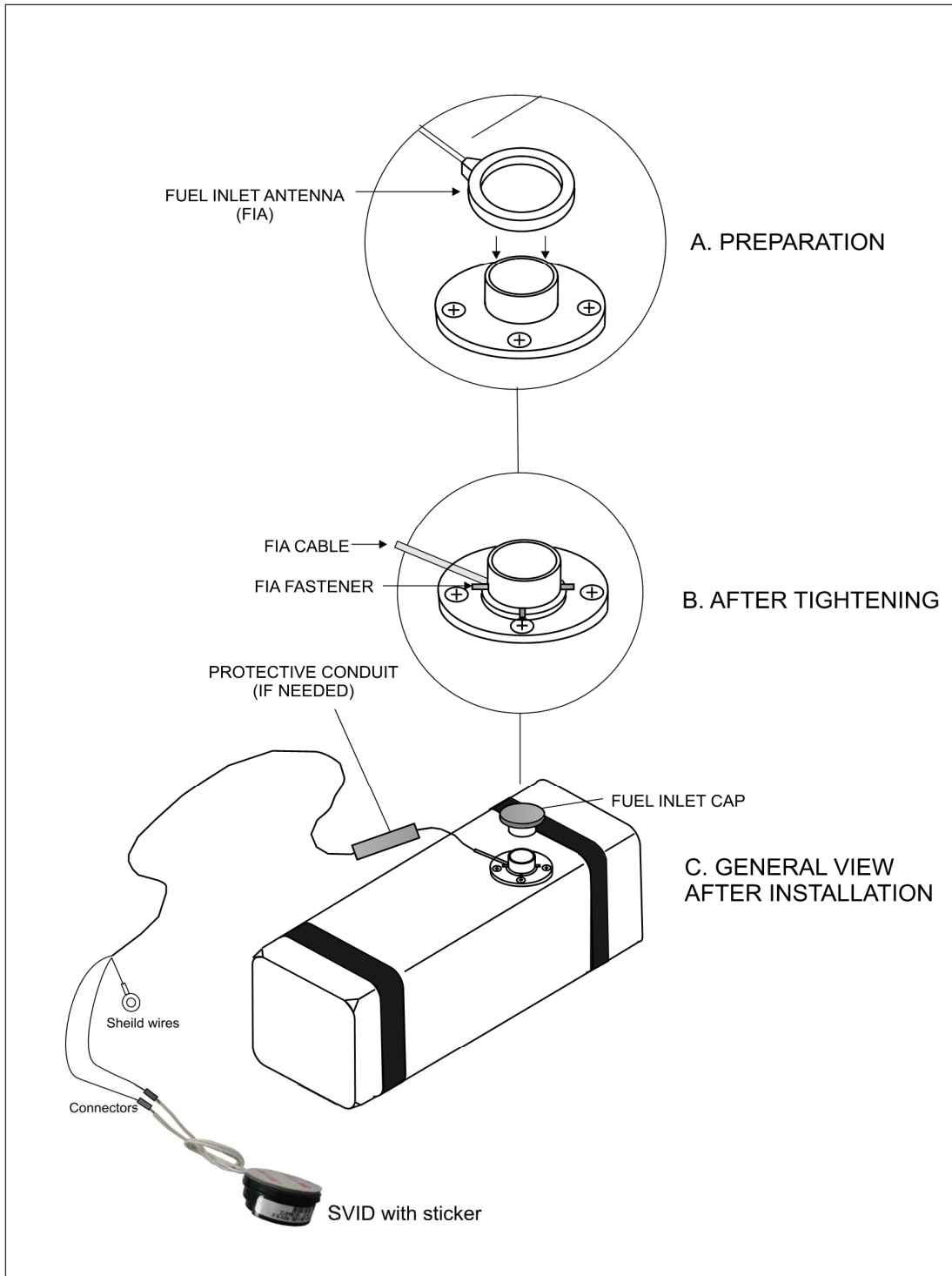
16. Connect the SVID antenna wires to the FIA ring wires with two suitable connectors using crimping tool.



18.1.4.3 FIA Installation on a Light Duty Vehicle Fuel Tank



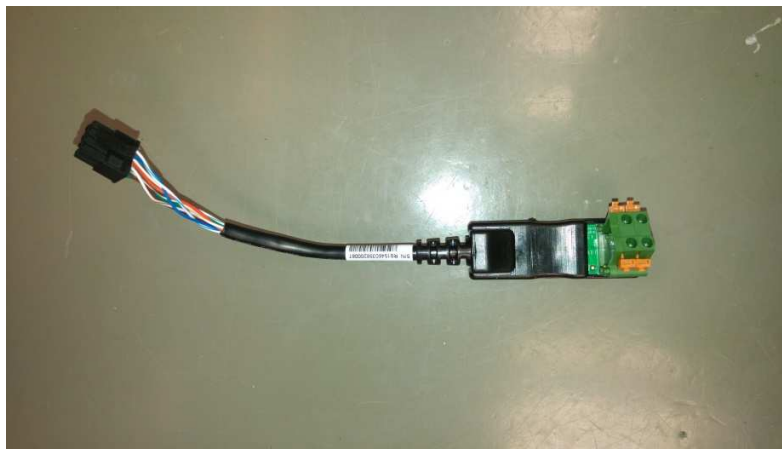
18.1.4.4 Installation on a Heavy Duty Vehicle Fuel Tank



## 18.2 Hardwire Fuel Inlet Antenna Connector Installation Instructions

FCC Compliance

FCC ID: 2AKAM2288



To install the Hardwire FIA:

25. Select a fuel inlet antenna diameter to fit the vehicle's fuel tank inlet [one size larger].
26. Install it using the dedicated snaps provided.
27. Make sure the fuel inlet antenna cable is long enough to reach the location where the FleetJournal 3 will be installed.

**Note**

If necessary the cable may be extended. Use shielded cable type Olympic part # 2886 or equivalent, polypropylene insulated, twisted pair, aluminum Mylar shield, 20 – 22 AWG stranded tinned copper drain wire, chrome vinyl jacket. Temperature rating: -20°C to 60°C.

28. Solder and/or use moisture. To prevent connection problems in the future, proof the connections and if necessary shrink the tubing.



29. Install the FleetJournal 3. See Chapter 3 FJ3 Installation.

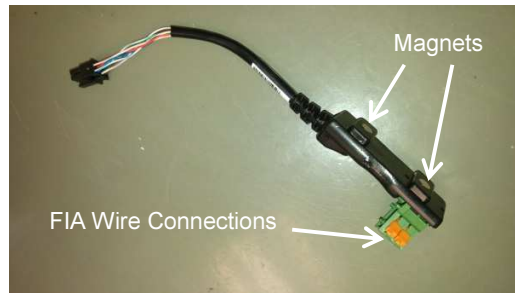
30. Connect the hardwire FIA connector to the FleetJournal 3 [FJ3] ACC connector.

31. Install the hardwire FIA on the FJ3 wall utilizing the magnetic base.

32. Plug the fuel inlet antenna wires into the green connection points next to each other.







### 18.2.1 Troubleshooting

If the Hardwire FIA connection does not work [no proper signal], do the following:

7. Ensure that you are using a correct FIA and have a signal of at least 10 cm. If not replace the FIA.
8. If there is still no proper signal, replace the FIA wire connection.

---

**Note**

The Fuel Inlet Antenna Connector is a sealed unit and cannot be repaired in the field. Please return the defective units. Download an RMA from the AssetWorks PartWorks website.

---

## 19 Connecting the FJ3 to the GPS Tracking Device [Optional]

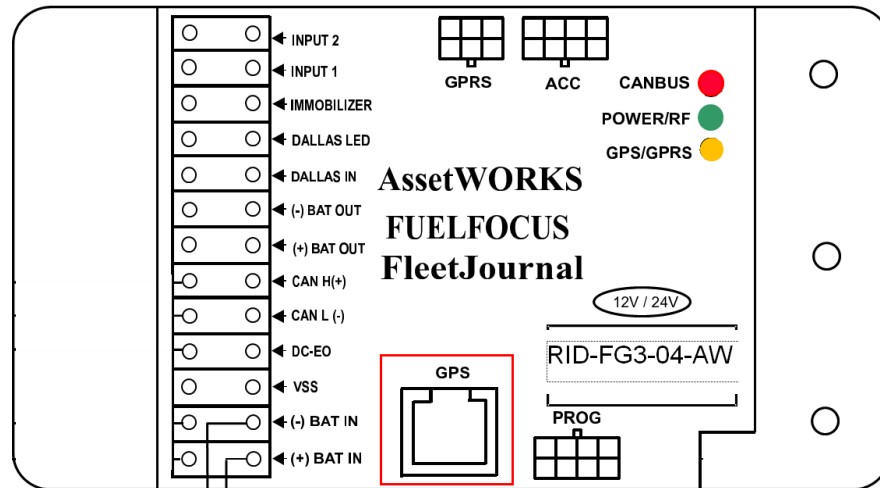
The GPS device tracks the location of vehicles in the field.



Figure 12 GPS Antenna Cable

To install the GPS tracking device:

7. Attach the RJ45 cable to the to the GPS connector on the FJ3.



8. Place the GPS antenna on the vehicle's dashboard near the windshield.

## 20 Driver ID [Optional]

### 20.1 Connecting the Driver ID

To identify the driver of the vehicle, connect the Tag Reader wires to the FJ3 as follows:

Wire Color	Connect to:
White	Dallas LED
Green	Dallas In
Black	(-) Bat Out
Red	(+) Bat In

See Figure 13

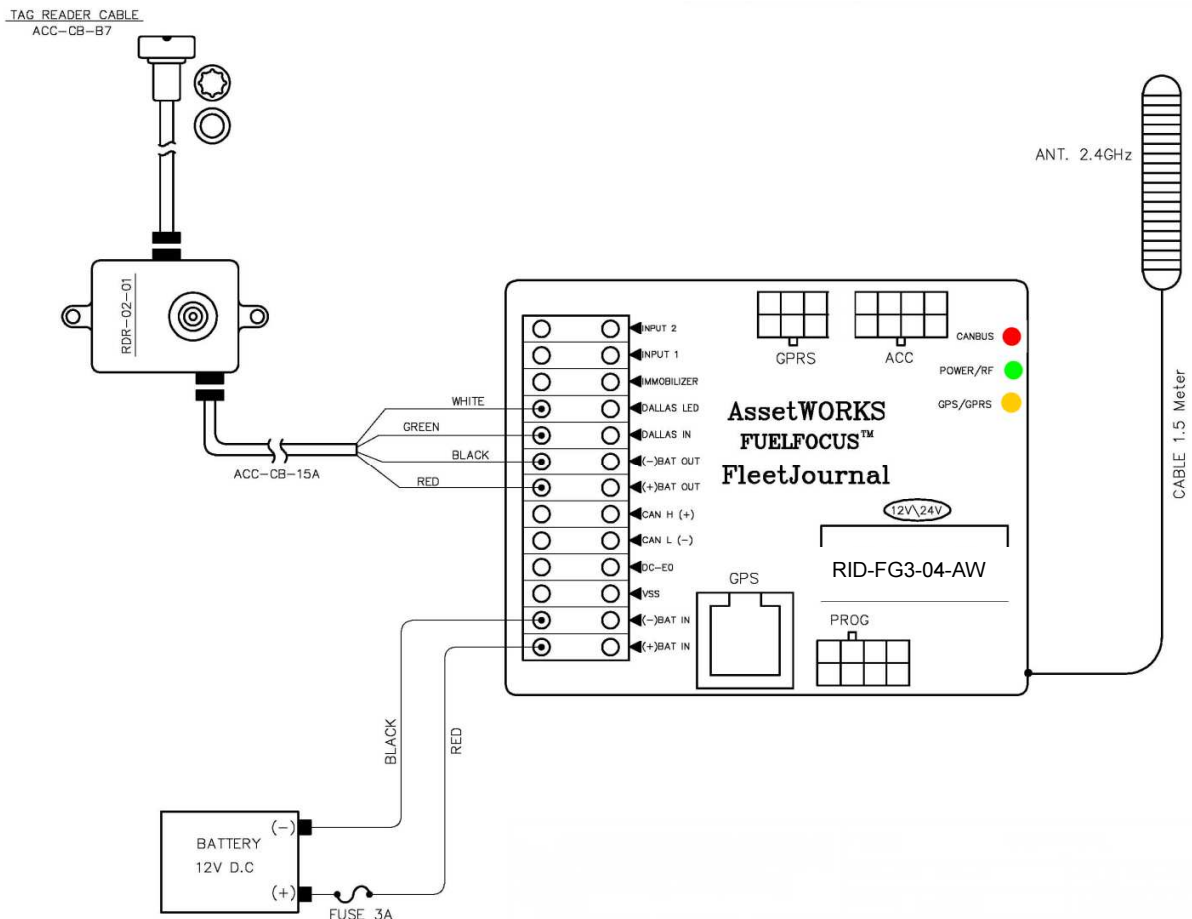


Figure 13: Connecting the Driver ID reader to the FJ3



## 20.2 Installing the Driver ID Reader [Tag Reader]

**Note:** Place the Tag reader on the dashboard so that the Dallas key can be easily read.

16. Wire the Tag Reader cables to the FJ3 – see section **Error! Reference source not found.**  
**Error! Reference source not found..**
17. Make a ½" hole on the dashboard for the Tag Reader.
18. Pull the Tag Reader through the hole.
19. Connect the Com. Cable ACC-CB-15A cable to the FJ3.



Figure 14 COM Cable ACC-CB-15A

20. Connect the Reader Cable ACC-CB-B7 to the Driver ID Reader.



Figure 15 Reader Cable ACC-CB-B7

**Important:** The Driver ID Reader should be **bright red** after connecting and installing it correctly. If there is a faint green light in the center of the Reader, this indicates that the Reader is not correctly installed. All the connectors should slide in smoothly, do **not** force them.



## 21 Appendices

### 21.1 Appendix A: Capturing Vehicle Data

#### 21.1.1 Capturing Odometer and Engine Hours Information

If the FJ3 is to record the vehicle's odometer, you will need to obtain a pulse relevant to the vehicle's speed. You can accomplish this either by utilizing an Odometer Adaptor or by receiving electronic pulses from the vehicle speed sensor (VSS) output. If your vehicle has a cable driven speedometer, a transducer is needed to convert the mechanical turns of the speedometer cable into electronic pulses that the FJ3 can read. Transducers may be ordered through a local speedometer repair shop, through the vehicle manufacturer's parts distributor, or directly from the sensor manufacturer.

#### 21.1.2 Vehicle Data Collection (VDC) - Option

The AssetWorks VDC enables online wireless capture of odometer and/or engine hour readings from vehicles equipped with the AssetWorks Vehicle Identification Fleet Gate (FJ3). This data capture occurs when a vehicle passes within range of the Wireless Automated Fueling (WAF) Receiver installed in a parking area or at a fuel island. The vehicle data is transmitted to a local PC, which has the AssetWorks proprietary VSU application, and will transmit it to the FleetFocus™ application server via TCP/IP protocol.

#### 21.1.3 Vehicle Speed Sensor (VSS)

For FJ3 pulse counting to function properly, it requires an accurate speed signal from the vehicle. This section provides a quick overview of what a speed signal is, and how to identify a speed signal.

With the introduction of the electronic control module (ECM/ECU) found in all modern vehicles, engineers use sensors to report operational data to this computer for processing.

In most cases, the vehicle's speed signal is generated at the transmission output shaft. The shaft turns at a speed directly proportional to the vehicle speed. Two different sensor types are commonly found at this location. The most common type is called a variable reluctance sensor. This is a fancy name for a series of magnets mounted to "shag", which spins past an inductor or coil. A voltage or pulse is induced in the circuit as the magnets' lines of force cut through the inductor. The end result is a signal that pulsates or oscillates at a speed directly proportional to vehicle speed. The more modern but less common type of sensor is the Hall Effect sensor, which works like the variable reluctance sensor, uses a tiny solid state switch that is activated by a magnetic force. This result is a smaller and lighter sensor, generating a cleaner signal.

There are many ways to identify the vehicle speed signal:

##### 21.1.3.1 Using an Oscilloscope

Using an Oscilloscope is the easiest way to view and identify the VSS signal. It shows a picture of the signal.



### 21.1.3.2 Using a Multi-Meter to Measure Frequency (Hz)

This is the easiest way to measure the speed signal without the use of a scope, but watch out for some things. The meter may give incorrect readings at rest. The meter uses A/C coupling to measure frequency, so it may try to measure noise to determine its frequency. It is most important to measure frequency while the vehicle is moving. The frequency increases proportionately to vehicle speed. If the measurements seem to bounce around, you probably don't have the correct circuit.

### 21.1.3.3 Using a Multi-Meter to Measure A/C Voltage

This is another way to verify the VSS circuit. This method works poorly with Hall Sensor outputs. This is because a Hall Sensor's output varies in frequency but not amplitude. Most A/C Multimeters display voltage in RMS, which is about 70% of the peak value of the A/C waveform. Since the peak voltage is constant with a Hall Sensor, you will see only two readings; the reading while the vehicle is stationary, and the reading while it is in motion. This is usually enough data to determine if you have the right circuit.

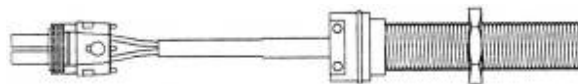
Using an A/C Multimeter to test a variable reluctance sensor, which are the most common, will work very well. As with frequency, A/C voltage should fluctuate in direct proportion to the vehicle speed.

Upon identifying the VSS circuit, then determine the number of pulses per mile that the sensor emits. To determine the speed and mileage, the VIB must know how many pulses are emitted for a mile traveled. There are only a few different calibration values. **Most Ford and Chrysler products emit 8000 pulses per mile. Chevrolet commonly uses 4000 at the control module, and 96000 at the transmission.**

### 21.1.3.4 Electronic Odometer Adapter

If the vehicle is equipped with an electronic sending unit controlling the dashboard speedometer, simply connect a wire between the signal line and the FJ3. If the vehicle's electronic odometer line is also driving additional equipment, such as a cruise control module or trip computer, there may not be enough signal strength to add the FJ3 to this line. In this case, you must replace the single sensor with a dual-output sender, or add an additional single sender to the unused sender port provided on some vehicles.

*For connection instructions please refer to vehicle manufacturer.*



**Figure 16 Single Electronic Adaptor**



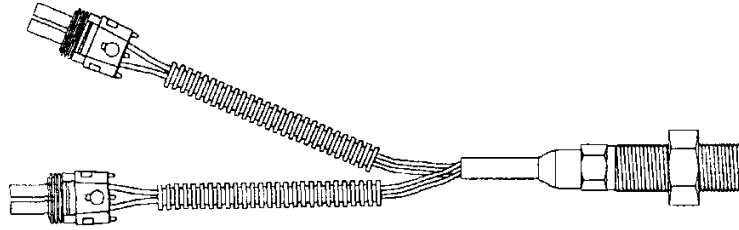


Figure 17 Dual Electronic Adaptor

#### 21.1.3.5 Reed Type Mechanical Adaptor

A mechanical pulse Transducer (or taxi Tap) is required if the vehicle utilizes a mechanical cable between the dashboard speedometer and the transmission. Try to order the sensor with an 18 gauge shielded cable of sufficient length to reach the ID Box without splicing. Consult AssetWorks on approved vendors for these *transducers*.

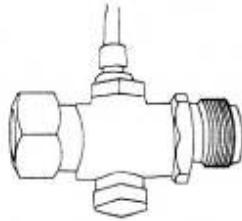


Figure 18 Reed Type Mechanical Adaptor

## 21.2 Appendix B: CAN Bus Data Connectors

### 21.2.1 Vehicle OBD-II Connector J1962

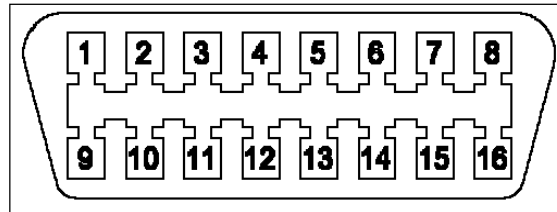


Figure 19: Car Diagnostic Connector (female)

Pin No.	Description
1	Manufacturer mandated
2	J1850 Bus+
3	Manufacturer mandated
4	Car ground
5	Signal ground
6	CAN High (J-2284)
7	ISO 9149-2 K output
8	Manufacturer mandated
9	Manufacturer mandated
10	J1850 Bus
11	Manufacturer mandated
12	Manufacturer mandated
13	Manufacturer mandated
14	CAN Low (J-2284)
15	ISO 9149-2 L output
16	Battery (+) voltage

Table 1: OBD-II Connector J1962 – Pin Description

### 21.2.2 SAE J1939 Data Interface Connector

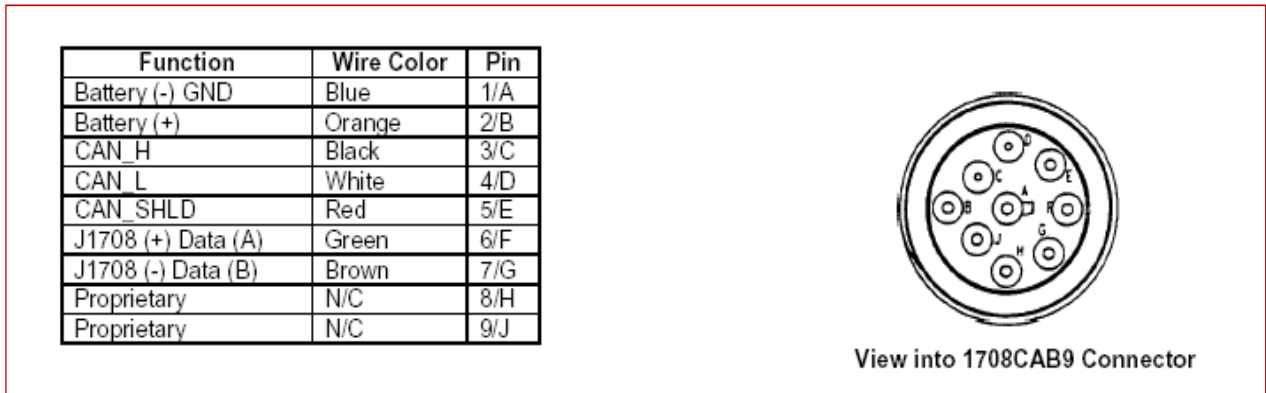


Figure 20: SAE J1939 Model 1708CAB9

### 21.2.3 3 PIN J1939 Data Interface Connector

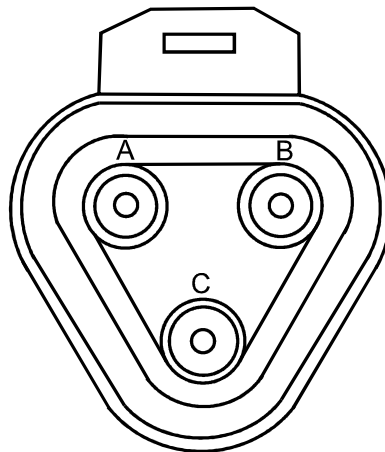


Figure 21: 3-pin Deutsch J1939 DT06-3S-E008

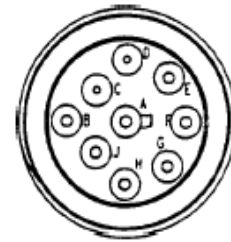
Pin No.	Description
A	CAN bus line, dominant Low (J-1939)
B	CAN bus line, dominant High (J-1939)
C	CAN ground (Car ground)

## 21.3 Appendix C: J1708 Data Connectors

### 21.3.1 SAE J1708 Data Interface Cables

#### Option 1: SAE J1708 Model 1708CAB9

Function	Wire Color	Pin
Battery (-) GND	Blue	1/A
Battery (+)	Orange	2/B
CAN_H	Black	3/C
CAN_L	White	4/D
CAN_SHLD	Red	5/E
J1708 (+) Data (A)	Green	6/F
J1708 (-) Data (B)	Brown	7/G
Proprietary	N/C	8/H
Proprietary	N/C	9/J



View into 1708CAB9 Connector

Figure 22: SAE J1708 Model 1708CAB9

#### Option 2: SAE J1708 Model 1708CAB

Function	Wire Color	Pin
Data A (+)	Orange	A
Data B (-)	Yellow	B
Ground	Black	E
V + (9-32 volts)	Red	C
No standard function	Green	D
No standard function	Brown	F

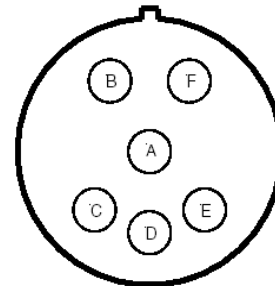


Figure 23: SAE J1708 Model 1708CAB

## 21.4 Appendix D: Wiring for Speed Pulse

### 21.4.1 Speed Pulse Wiring

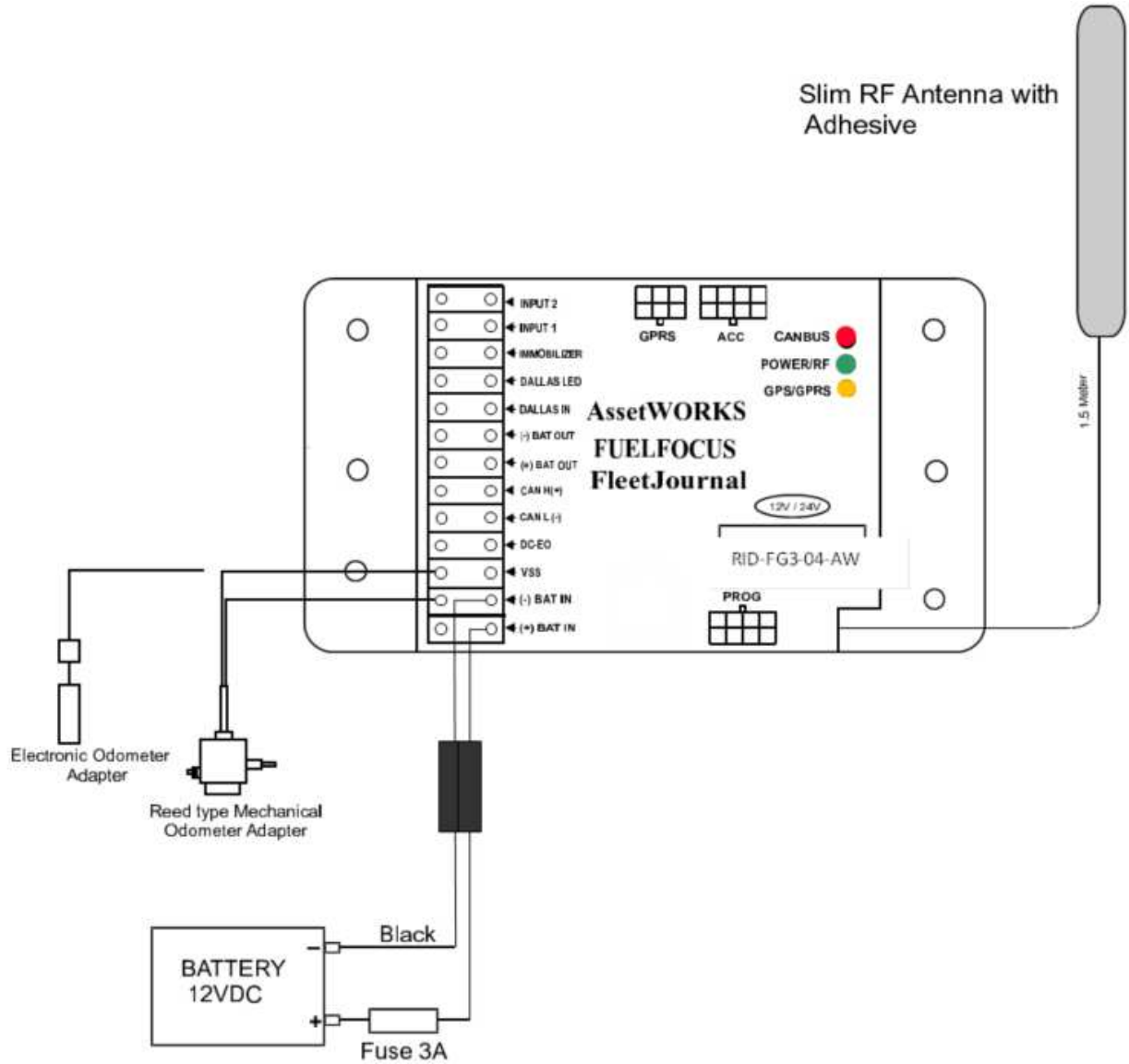


Figure 24 Wiring Diagram for Speed Pulse



21.4.2 Speed Pulse Wiring with Passive GPS

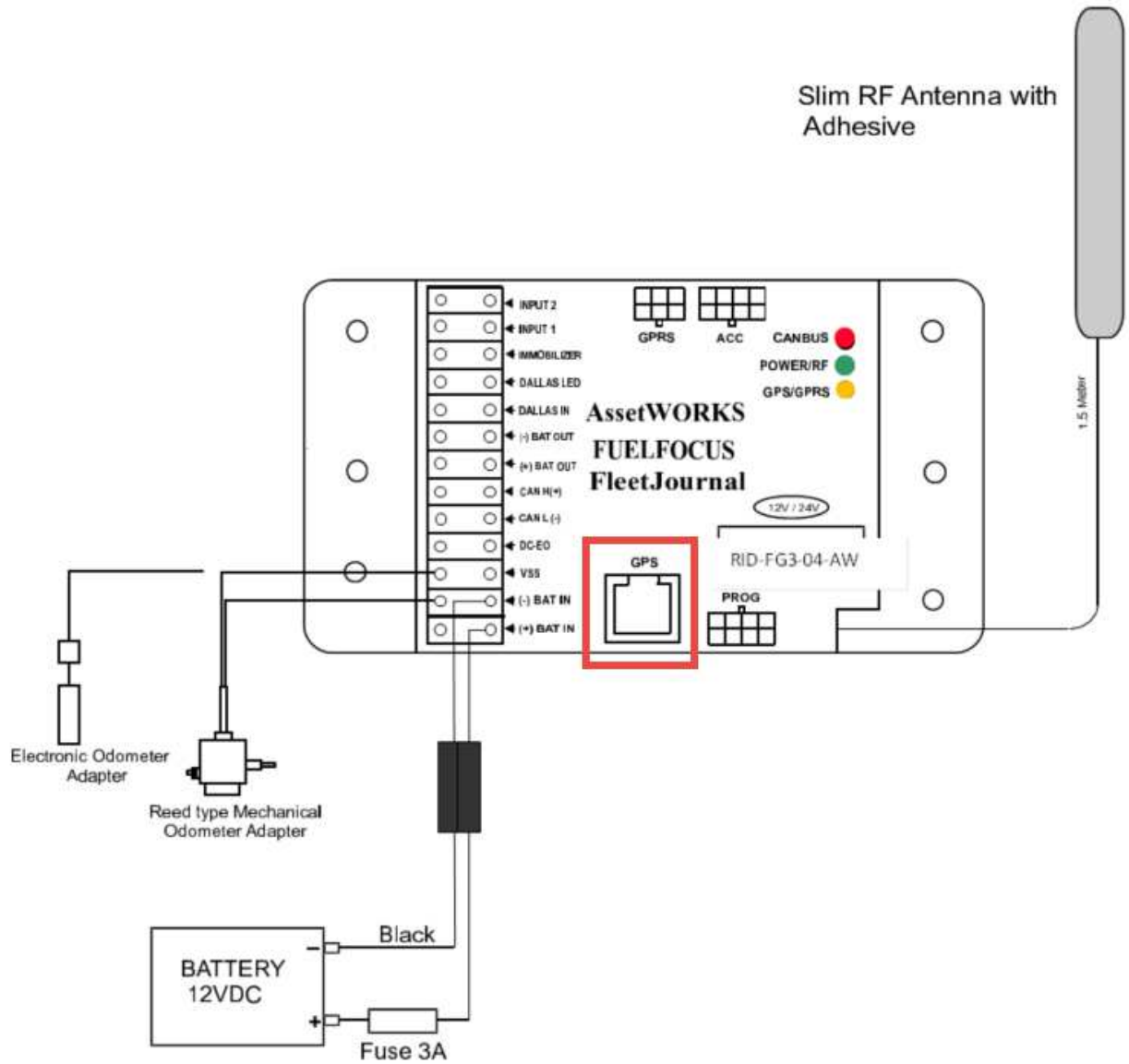
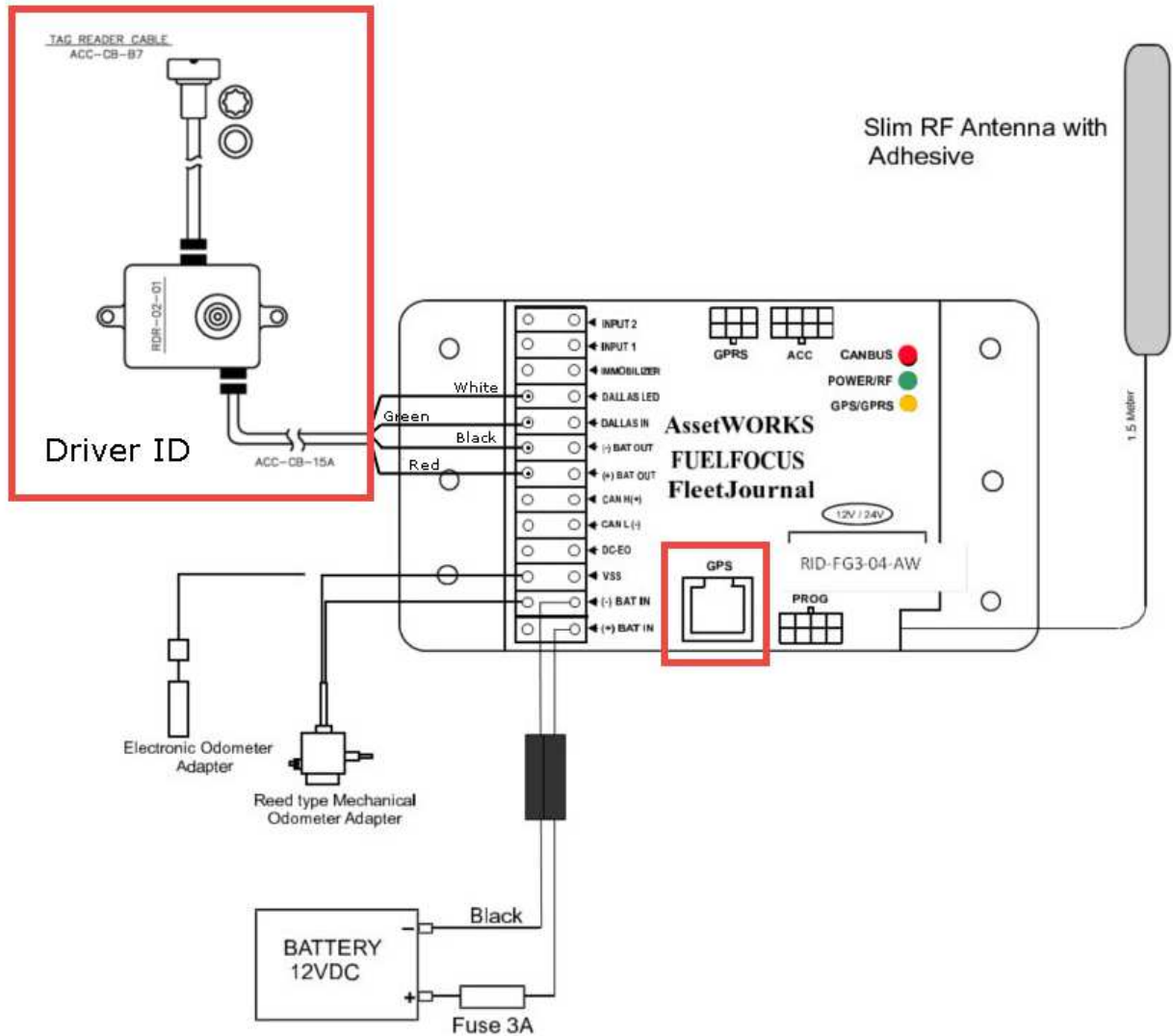


Figure 25 Wiring Diagram for Speed Pulse with Passive GPS



**21.4.3 Speed Pulse Wiring with Passive GPS and Driver ID**



**Figure 26 Wiring Diagram for Speed Pulse with Passive GPS and Driver ID**



## 21.5 Appendix E: Wiring the CAN Bus for Light Duty Vehicles

### 21.5.1 CAN Bus: Light Duty Vehicles

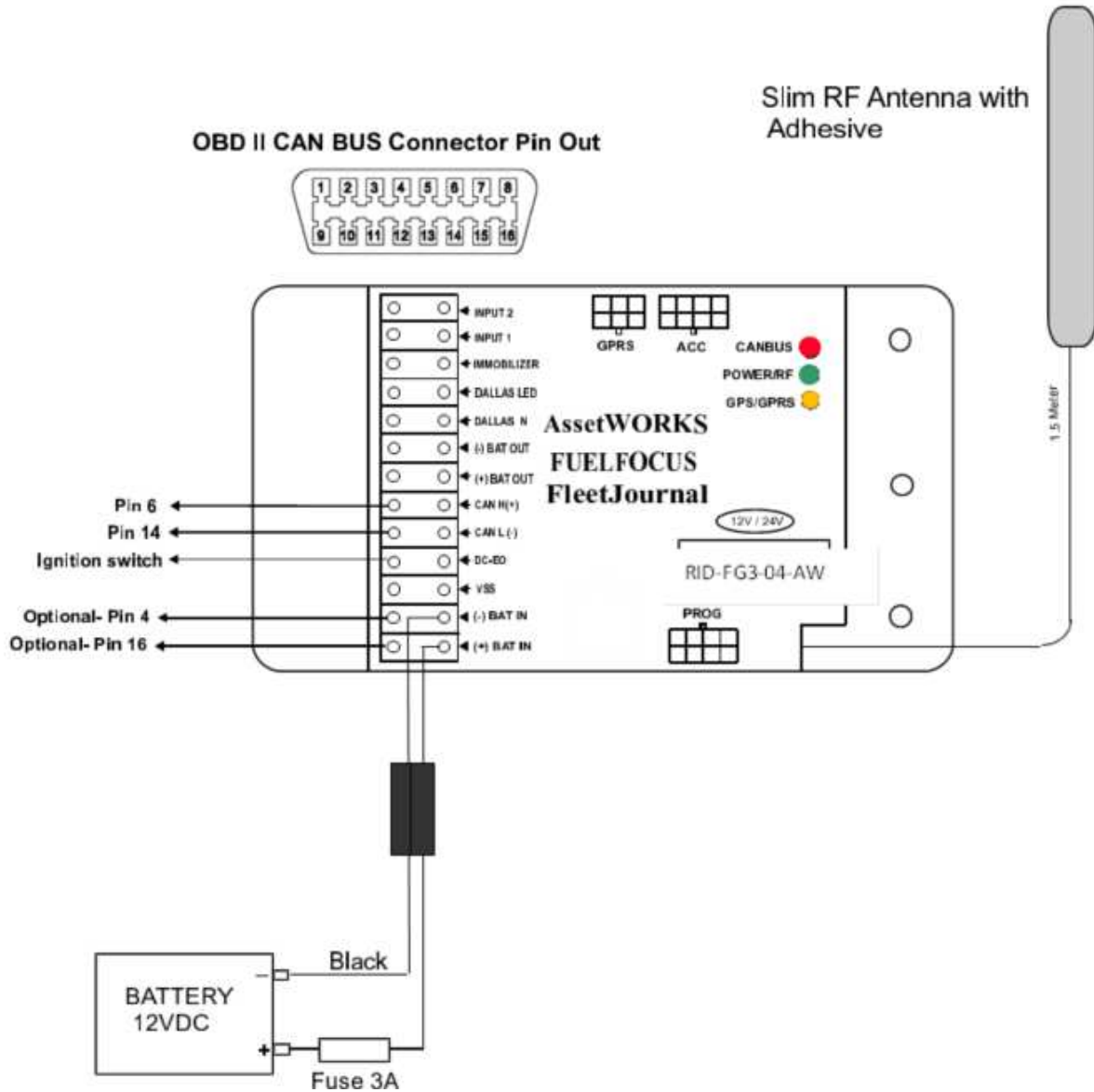


Figure 27 Wiring for the CAN Bus Interface for Light Duty Vehicles





21.5.2 CAN Bus: Light Duty with Passive GPS

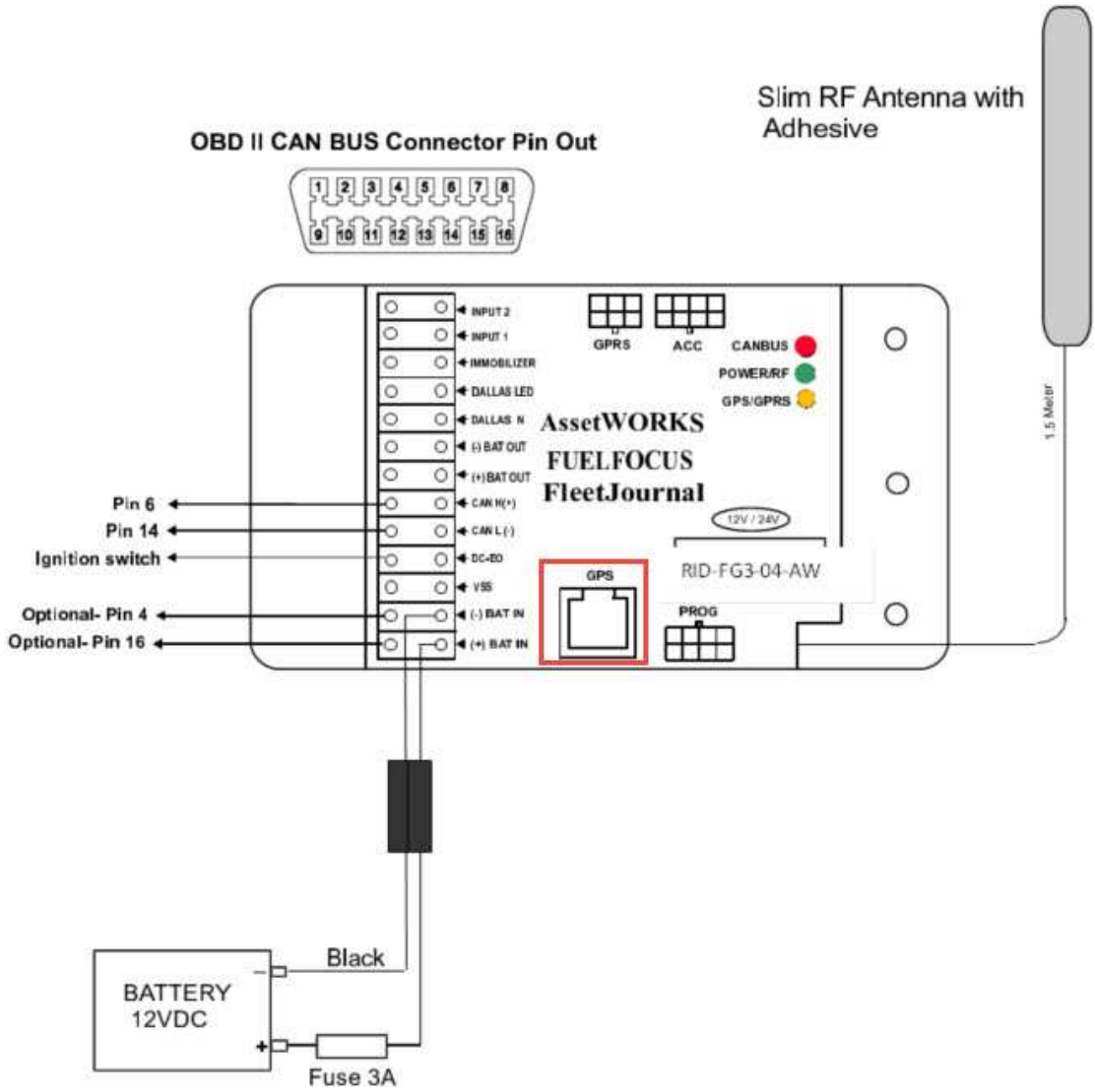


Figure 28 Wiring for the CAN Bus Interface for Light Duty Vehicles with Passive GPS



21.5.3 CAN Bus: Light Duty with Passive GPS and Driver ID

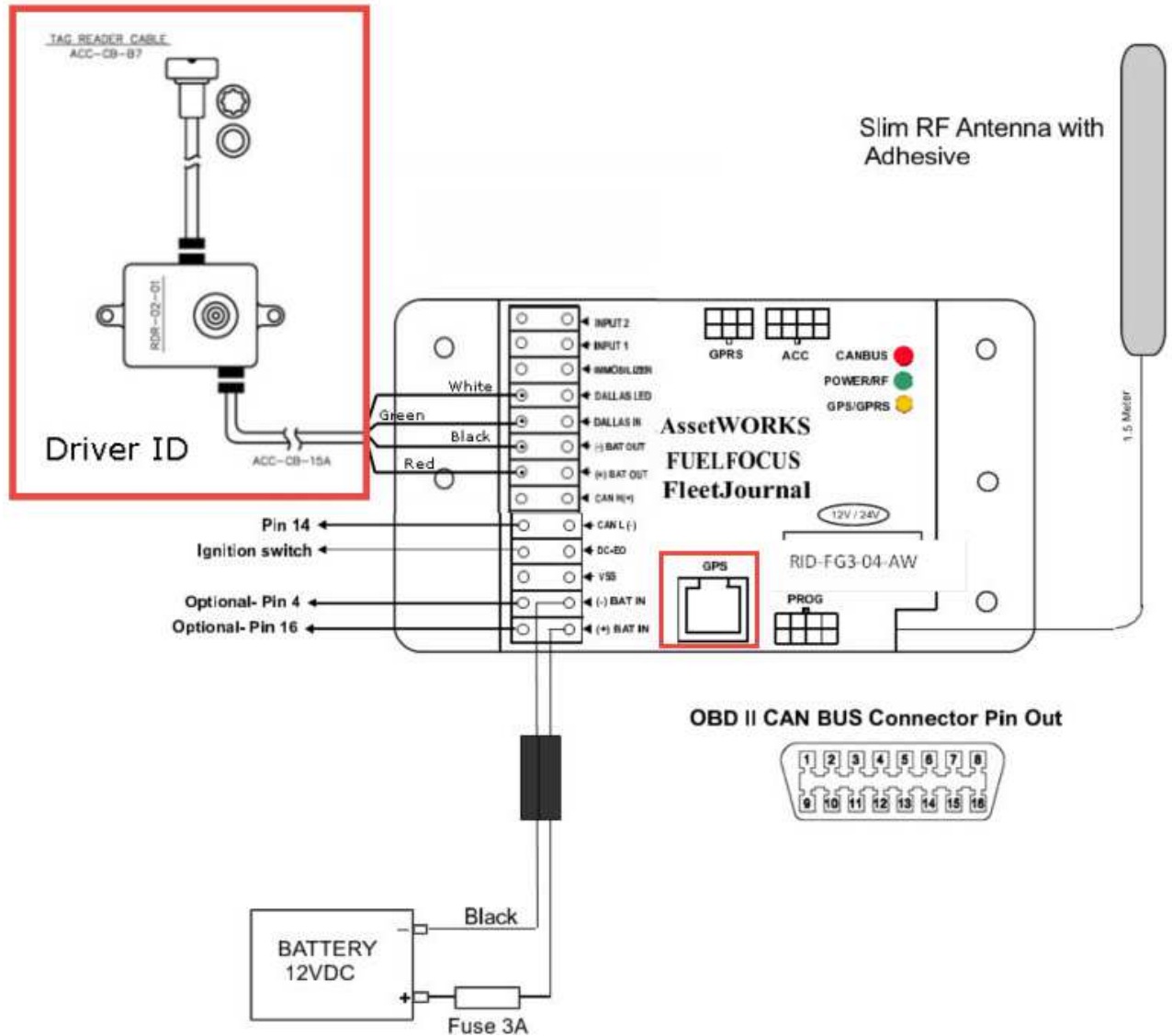


Figure 29 Wiring for CAN Bus Interface for Light Duty Vehicles with Passive GPS and Driver ID



## 21.6 Appendix F: Wiring the CAN Bus for Heavy Duty Vehicles

### 21.6.1 CAN Bus: Heavy Duty Vehicles

#### 21.6.1.1 CAN Bus Heavy Duty Vehicles with SAEJ1939 Connector

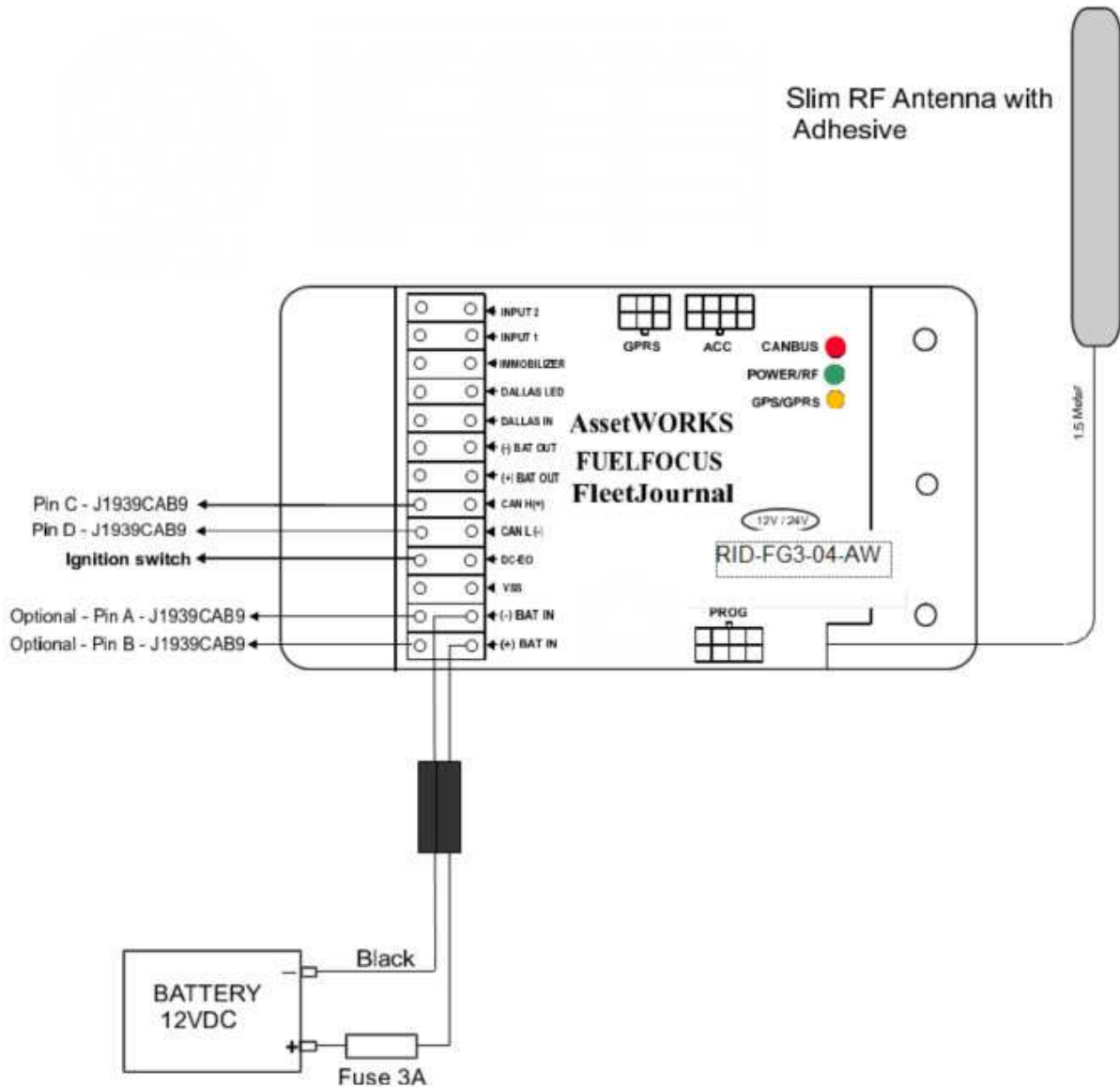


Figure 30 Wiring for CAN Bus Heavy Duty Vehicles with SAEJ1939 Connector



21.6.1.2 CAN Bus Heavy Duty Vehicles with [Triangular] 3-pin Deutsch Connector

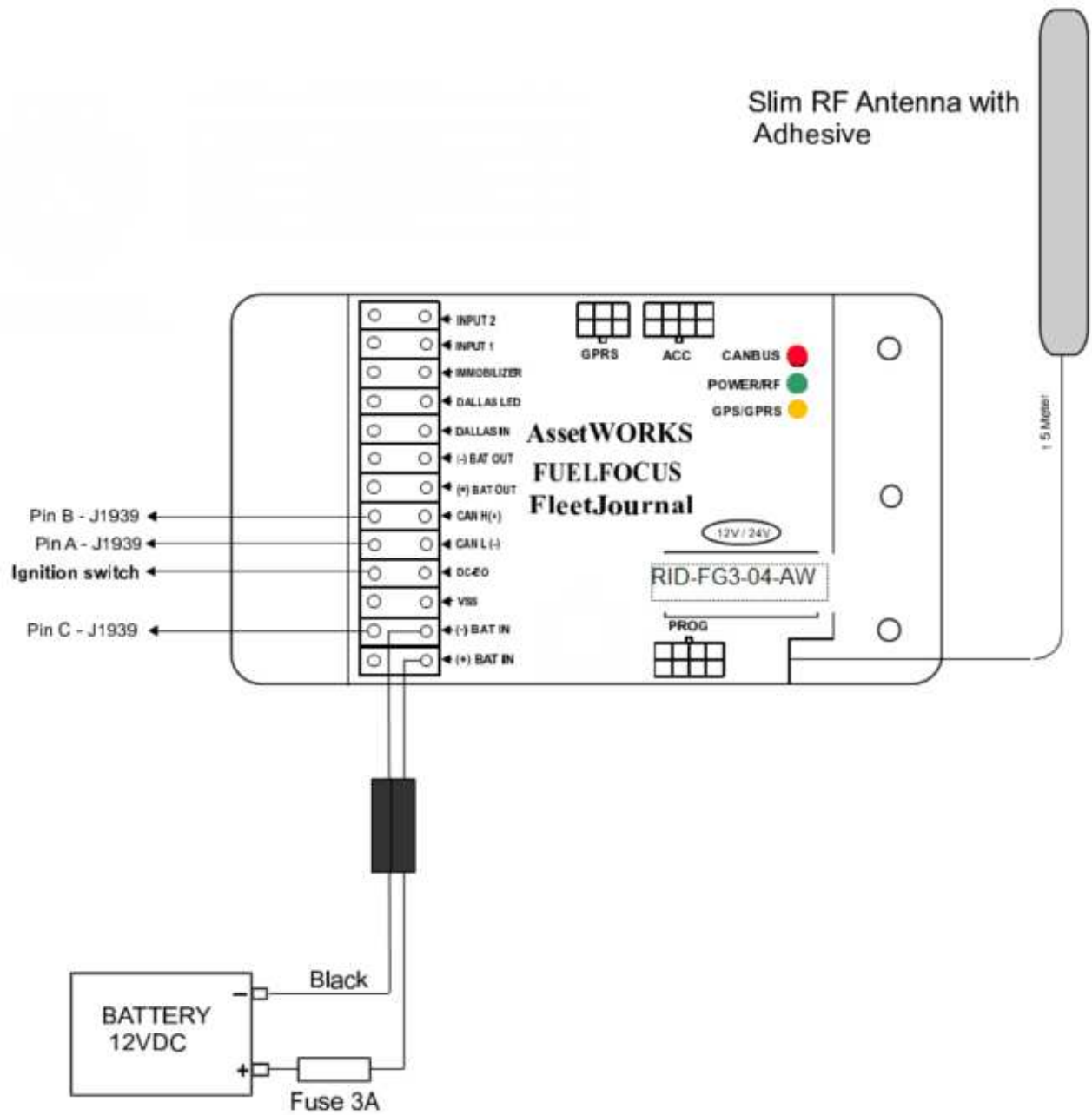
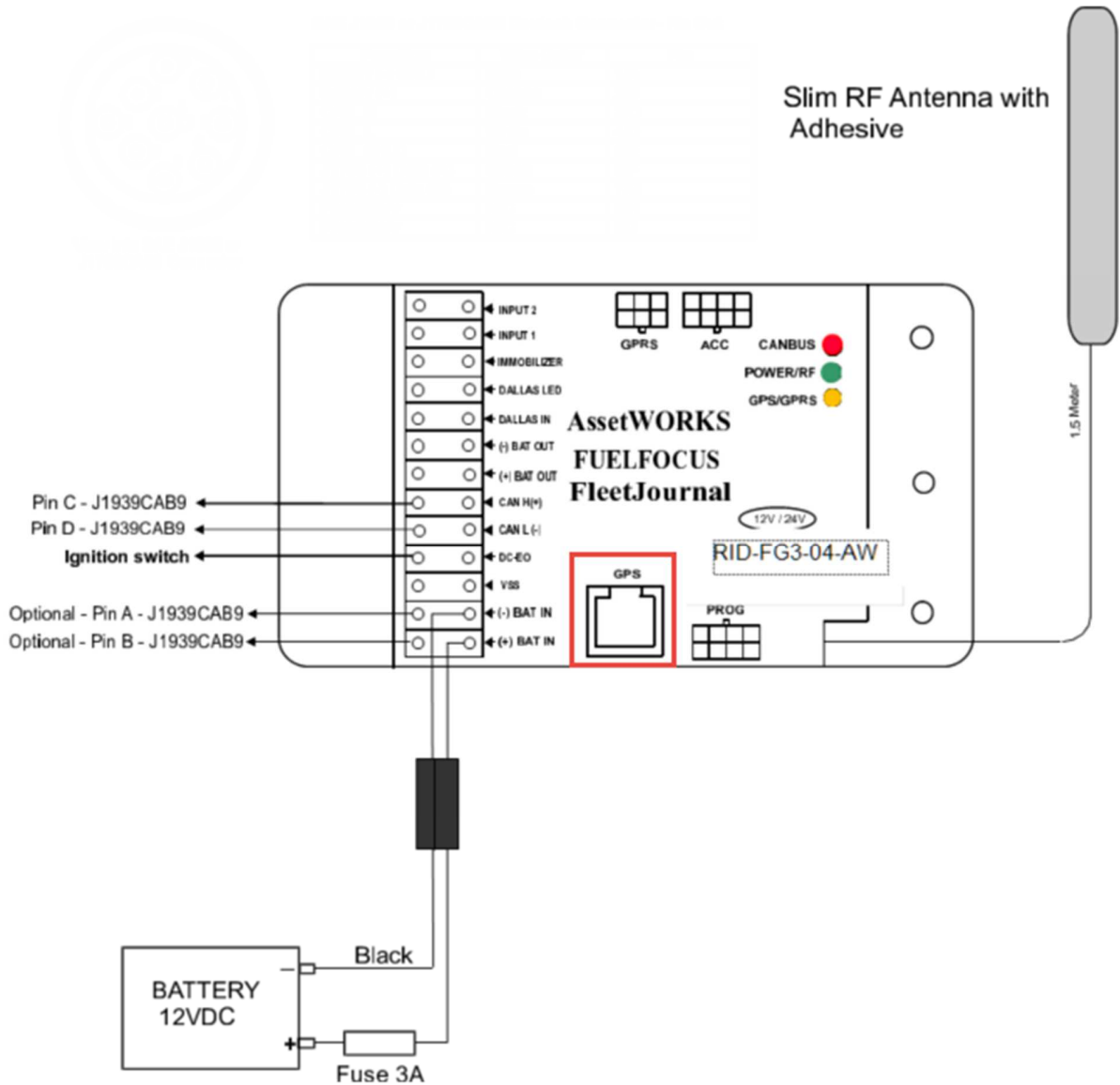


Figure 31 Wiring for the CAN Bus Heavy Duty Vehicles with [Triangular] 3-pin Deutsch Connector

**21.6.2 CAN Bus: Heavy Weight with Passive GPS**

**21.6.2.1 CAN Bus Heavy Duty Vehicles with SAEJ1939 Connector with Passive GPS**



**Figure 32 Wiring for CAN Bus Heavy Duty Vehicles with SAEJ1939 Connector and Passive GPS**



21.6.2.2 CAN Bus Heavy Duty Vehicles with [Triangular] 3-pin Deutsch Connector with Passive GPS

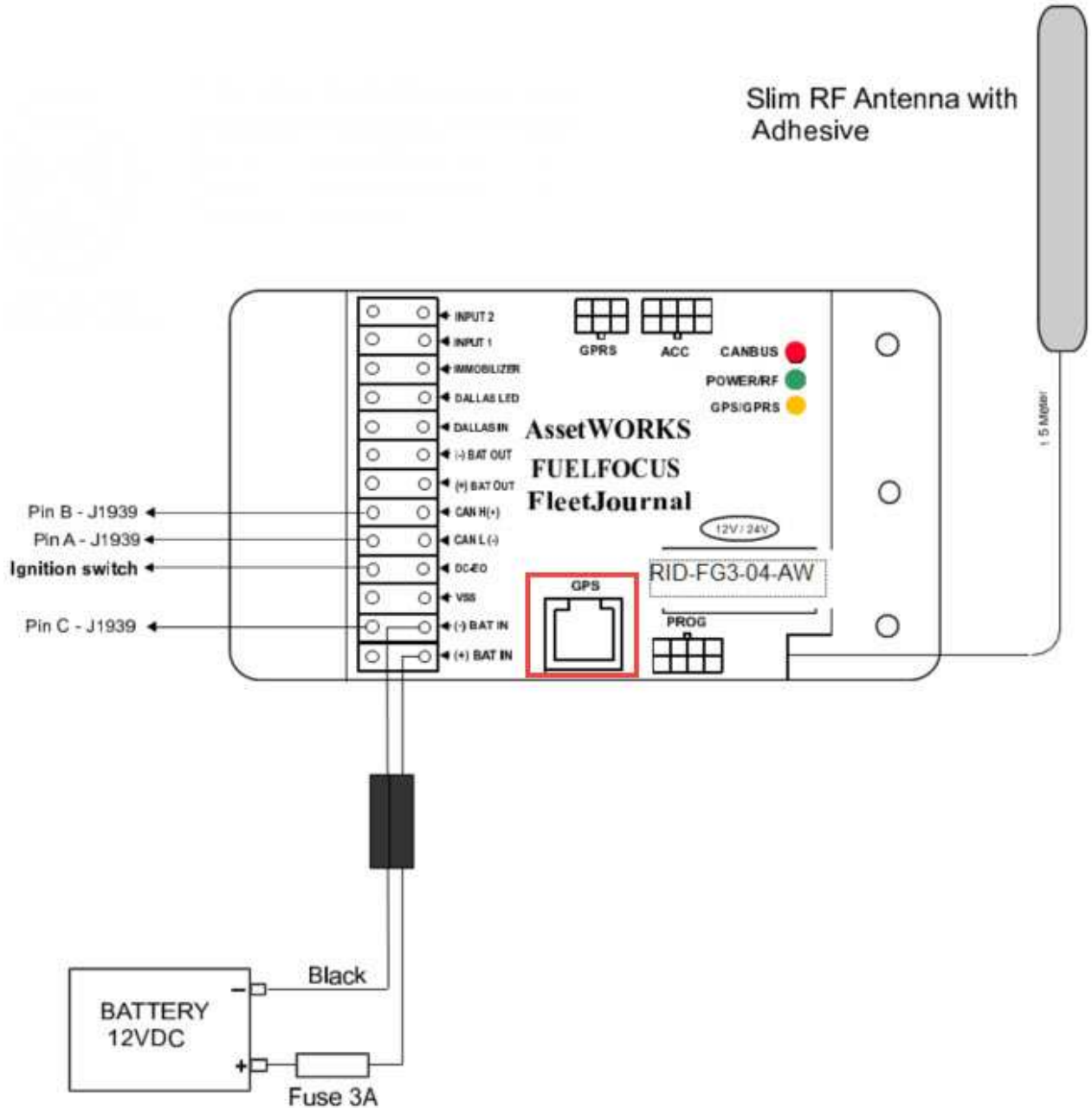
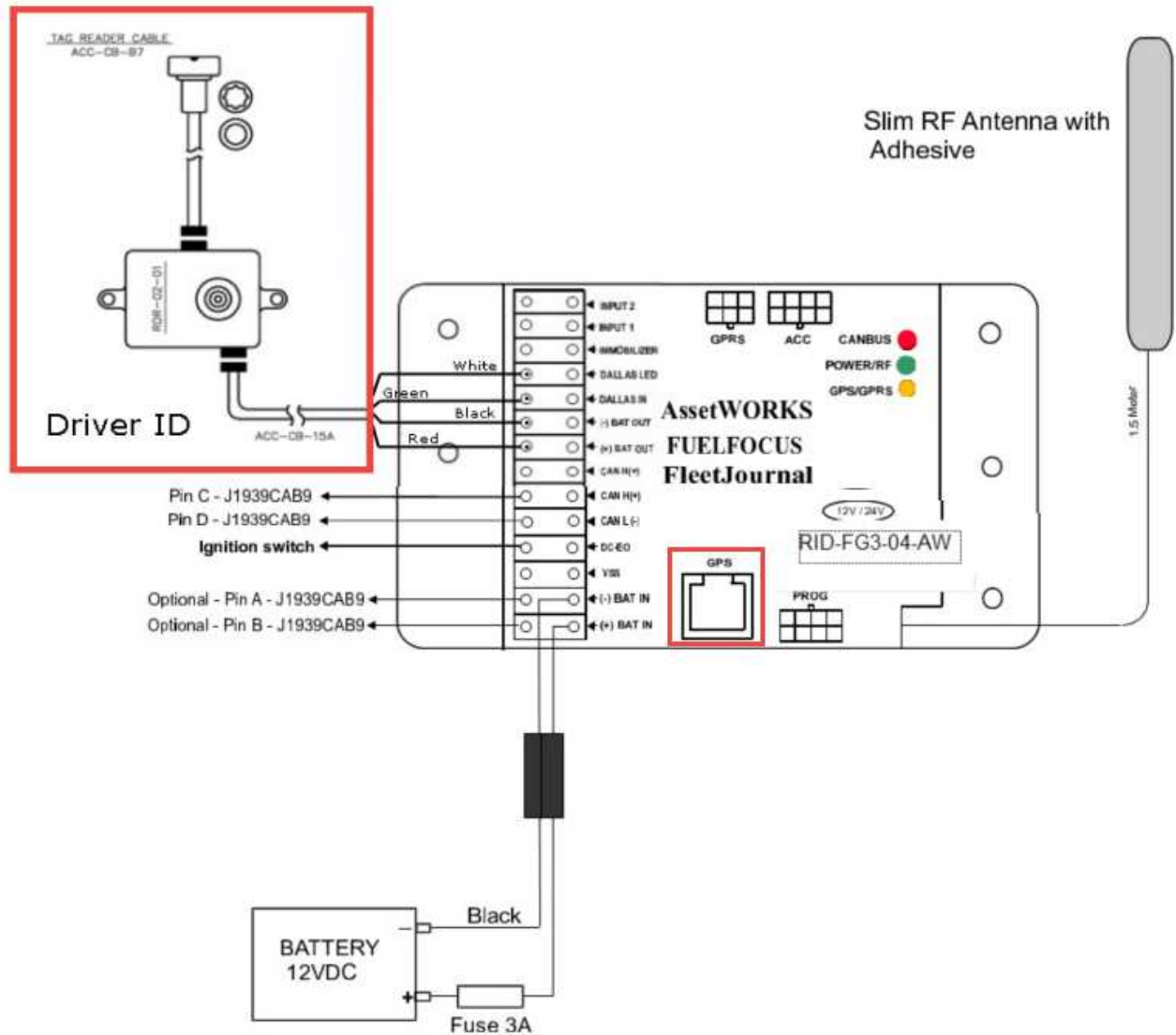


Figure 33 Wiring for the CAN Bus Heavy Duty Vehicles with [Triangular] 3-pin Deutsch Connector with Passive GPS

**21.6.3 CAN Bus: Heavy Weight with Passive GPS and Driver ID**

**21.6.3.1 CAN Bus Heavy Duty Vehicles with SAEJ1939 Connector with Passive GPS and Driver ID**



**Figure 34 Wiring for CAN Bus Heavy Duty Vehicles with SAEJ1939 Connector with Passive GPS and Driver ID**



21.6.3.2 CAN Bus Heavy Duty Vehicles with [Triangular] 3-pin Deutsch Connector with Passive GPS and Driver ID

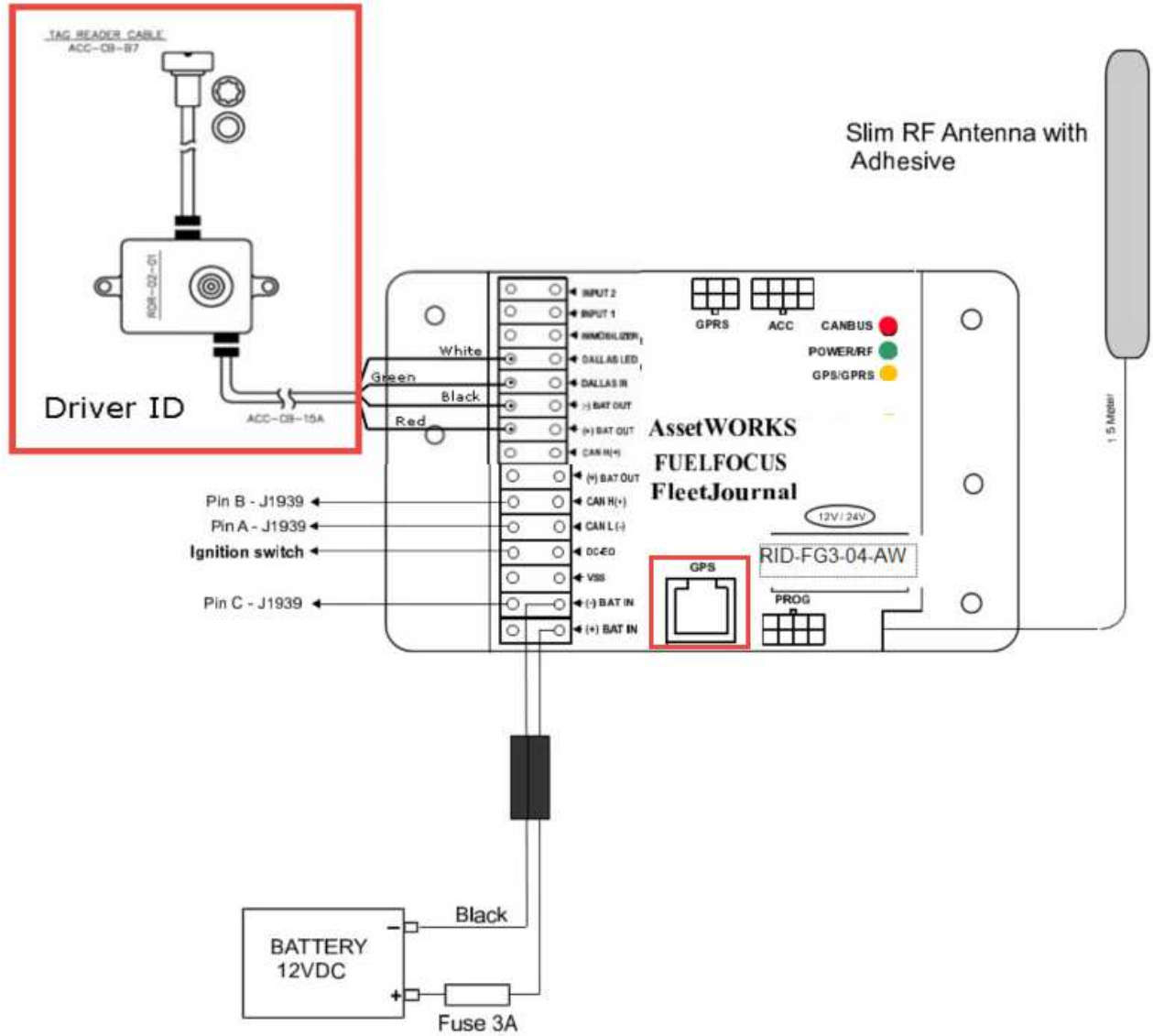


Figure 35 Wiring for the CAN Bus Heavy Duty Vehicles with [Triangular] 3-pin Deutsch Connector with Passive GPS and Driver ID





## 21.7 Appendix G: Wiring the J1708CAB [6-pin] Connector

### 21.7.1 Wiring for the J1708CAB [6-pin] Connector

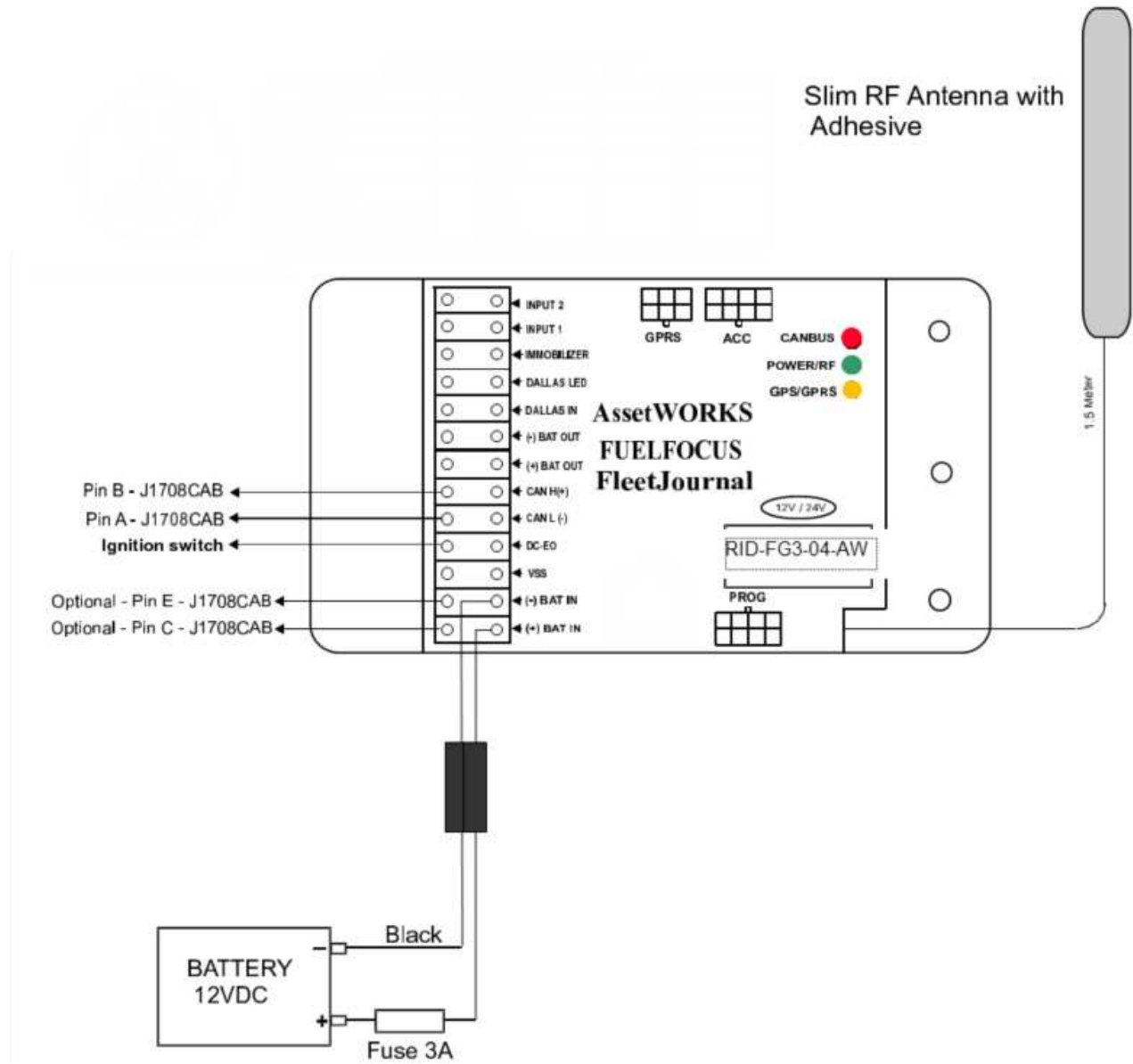
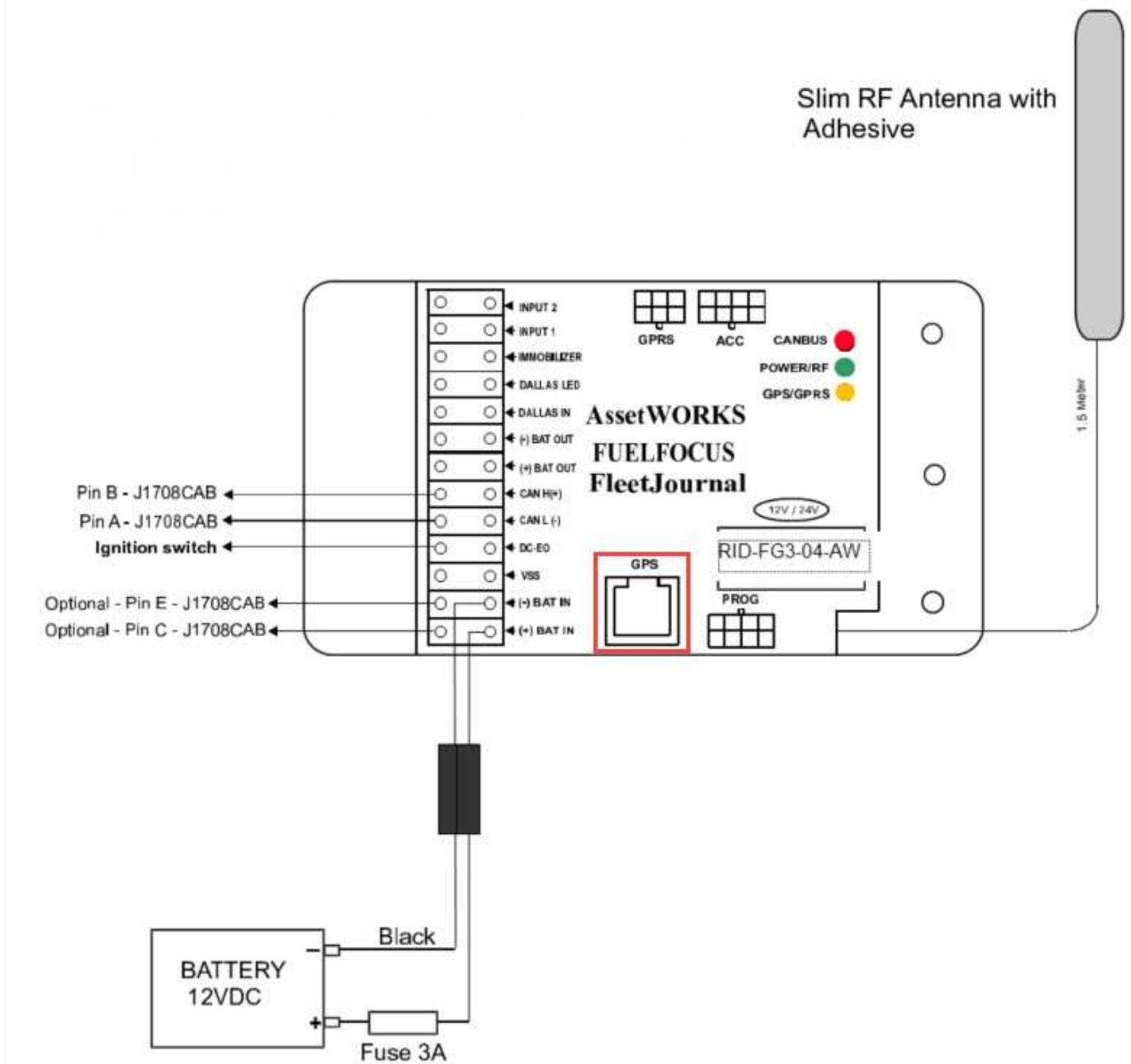


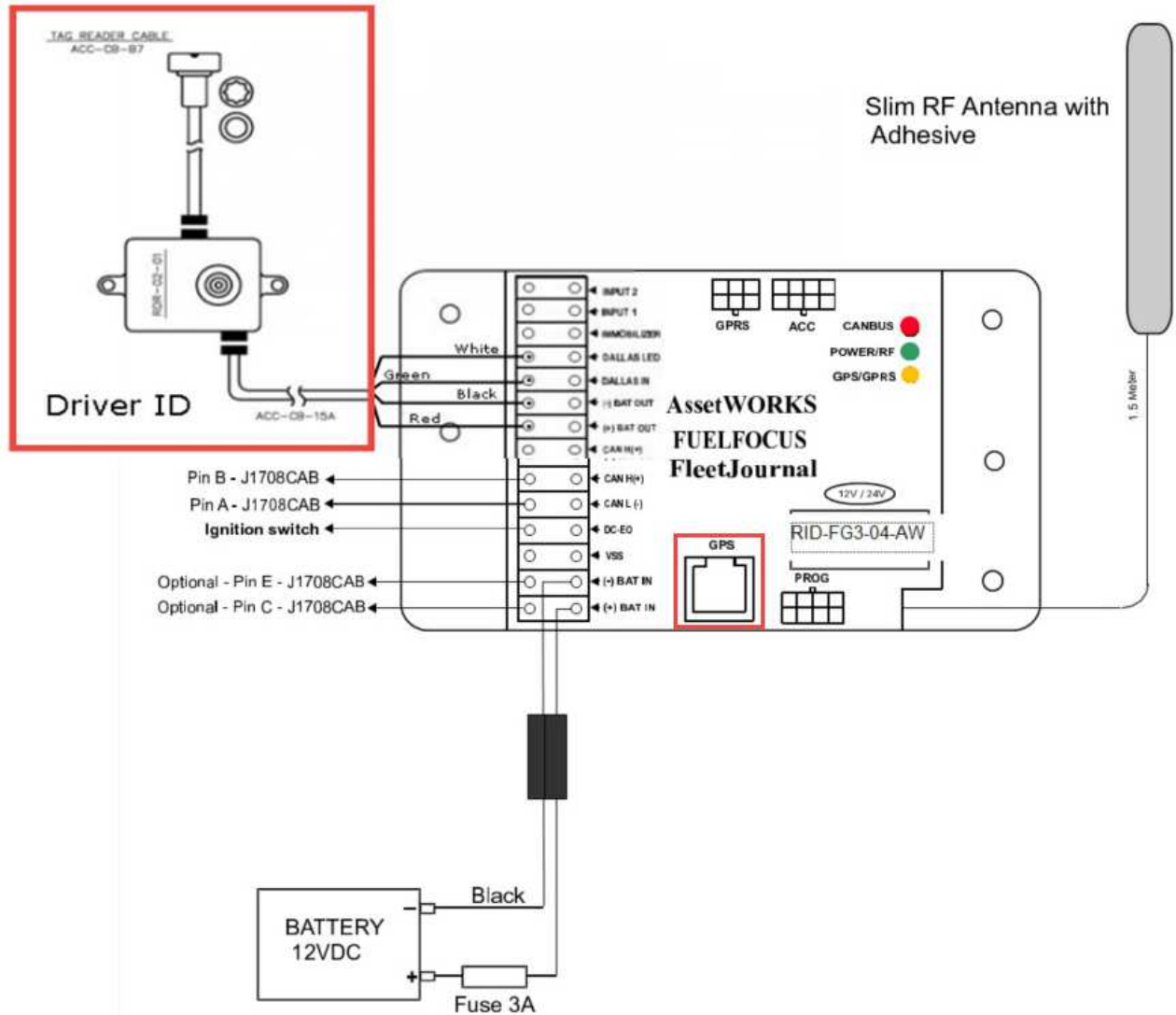
Figure 36 Wiring for the J1708CAB [6-pin] Connector

**21.7.2 Wiring for the J1708CAB [6-pin] Connector with Passive GPS**



**Figure 37 Wiring for the J1708CAB [6-pin] Connector with Passive GPS**

**21.7.3 Wiring for the J1708CAB [6-pin] Connector with Passive GPS and Driver ID**



**Figure 38 Wiring for the J1708CAB [6-pin] Connector with Passive GPS and Driver ID**



## 21.8 Appendix H: The FCC Wants You to Know

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if the equipment not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- a) Reorient or relocate the receiving antenna.
- b) Increase the separation between the equipment and receiver.
- c) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- d) Consult the dealer or an experienced radio/TV technician.



### FCC Warning

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

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