# ROSEMAN FMS System

## Modular Car/Driver Fleet Gate Type-3

## #RID-FG3-XX

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## Installation Guide

**Ver. 2.0**

ROSEMAN
Fueling Simplicity

**Roseman engineering ltd**

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# Important Notice

Roseman Inc. 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. Roseman 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 Roseman 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. Roseman urges all trained Technicians , Supervisors and Managers to avail themselves of the newsletter by contacting " Roseman Support" <fuelsupport@Roseman.com> to be included on the subscription list.

**FCC Warning**

To comply with FCC requirements, a distance of at least 20cm between the equipment and all persons should be maintained during the operation of the equipment.

# 1. Introduction

## 1.1 Purpose

This Vehicle Subsystem Installation Manual is provided to assist you in installing the Modular Fleet Gate Type 3 (FG3). Review this manual prior to the installation of the FG3 to ensure proper installation practices. Incorrect installations are the major cause of system malfunctions.

The FG3 must be installed as described in this manual to ensure the reliability and proper operation of the system.

Please read this entire manual before starting your first installation.

## 1.2 System Overview

The Roseman FG3 is the integral component of the vehicle subsystem of the Roseman FMS System. To properly install and utilize the FG3 the following is required:

Roseman Fuel Management System Island Controllers

Pumps/dispensers modified using nozzle tags

WAF Receiver Upgrade Kit installed in the Island Controller

**Failure to use a shielded cable as described in this manual will void the warranty.**

## 1.3 Components Overview

This section describes the various components that operate as part of the Roseman System. Use this information 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
- Modular Fleet GateType 3 (FG3)
- Fuel inlet Antenna

### 1.3.1 Modular Fleet Gate (FG3)

The FG3 is a main component of the Fleet Journal system installed in the vehicle and stores the vehicle usage data, including each ride start and end times, initial and final odometer reading, maximum speed, and ride participants etc, provides the fleet manager full supervision and control over the use of all fleet vehicles.

The FG3 stores the vehicle usage data, this data is automatically transferred via the WAF unit to Fleet Journal application. The FG3 process the data and generates required reports for the use of the fleet manager.

The FG3 can be configured to record either odometer or engine hour readings; and gets its power from the vehicle's battery.

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

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

All the data is collected into a central data base server.

This document describes the installation procedures for the FG3 (2.4 GHz).

| Description | Part No. |
|---|---|
| Modular Fleet Gate Type 3 | RID-FG3-XX |

The FG3's power is supplied from the vehicle's battery. It requires either a 12 VDC or a 24 VDC system, and draws a maximum 150mA of current.

| | |
|---|---|
| **Note** | If you experience battery drain difficulties, we recommend the use of the Battery Brain, or similar devices, available via the automotive after-market. More information is available from http://www.batterybrain.com/batterybrain.pl. |

## 1.4 Required Tools

The following tools are required to complete the installation procedures:

- Screwdrivers
- Box wrenches
- Crimping tool
- Wire stripping tool
- Drill with a 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 (with foil shield and drain wire) cable (18 gauge min)
- 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

## 1.6 Wiring Instructions

The general procedures for wiring the FG3 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.**

# 2. Installation

Follow the installation instructions detailed in the following sections.

**Note** When performing wiring procedures, follow the instructions in *Wiring Instructions* on page 6.

## 2.1 FG3 Mounting Location Considerations

Before mounting the FG3, give thought to where best to place it. Consider the following four basic points:

- **Weather Protection** – Select a weather-protected location. The FG3 is not watertight. Water and/or moisture can seep in through the connectors causing permanent damage! Consider an area where it will not be exposed to water during vehicle operation or cleaning.
- **Cable Runs** – The Fuel Inlet Antenna is mounted in a Class I, Division I, and hazardous location. The wiring is intrinsically safe and therefore must not come within two inches of any existing wires or cable harness. Mounting the FG3 to minimize the FIA cable length makes it easier to adhere to this safety rule. The VIB also requires connections to power and ground, so it should be located in an area where you can tap into these sources easily.
- **Cable Routing** – It is important to 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. Examples of these areas are the drive shaft, fan blades, belts, adjustable steering column, alternators, fluorescent lighting, foot pedals, radiator, and engine and exhaust systems. Attempt to gather all conductors at a common point when routing cables, allowing the cables to travel to the FG3 in a group. The FG3 must be kept at least three feet from the fill pipe opening. This includes cases where the FG3 is mounted in the trunk, as that is not a vapor-sealed area. Wire loom is recommended for protection of the wiring.
- **Cable Clearance** – Maintain a minimum of 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 three 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 three 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. You must therefore ensure that there is complete separation between the transmitter wiring and any existing auto wiring. You must also avoid routing wires near the auto exhaust systems or fuel lines.

Mount the FG3 at least three running feet from the filler neck.

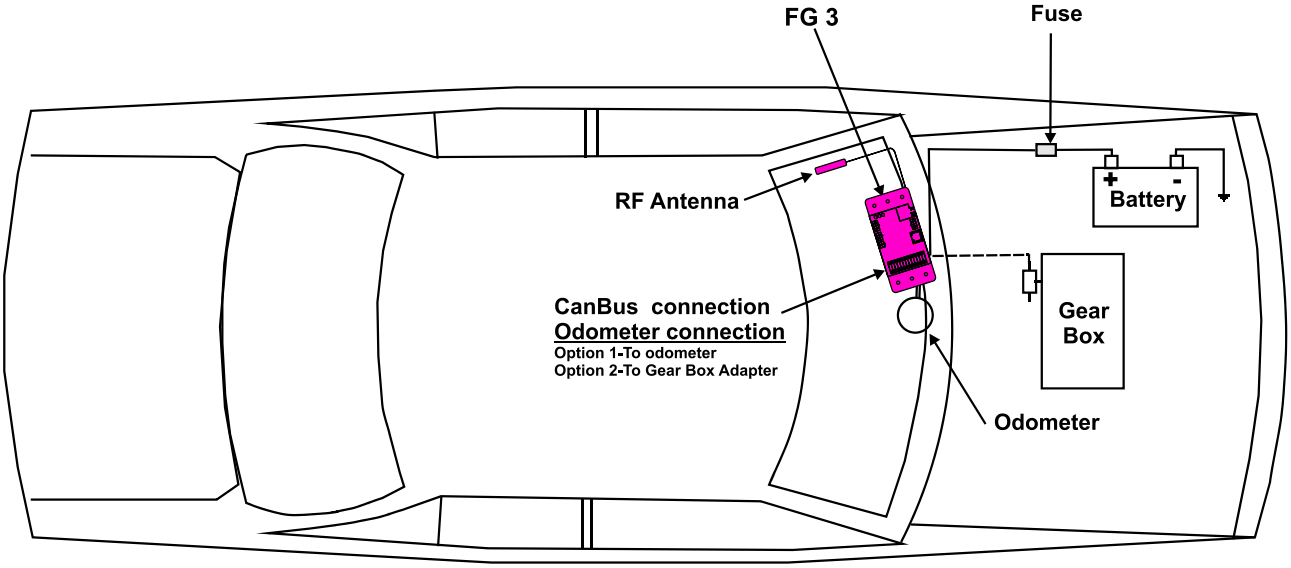



**Figure 1: Typical Vehicle Wire Routing**

# 3. FG3 Mounting and Installation

## 3.1 Mounting the FG3

1. After reviewing the recommendations listed in the Vehicle Devices Mounting Location Considerations, mount the FG3 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 three running feet from the filler neck.
   - For a truck or bus, the FG3 can be mounted inside the vehicle's electric enclosure.
2. Drill at least two 1/8" holes for the FG3 mounting. Use the FJ3 to mark the holes (refer to Figure 2: FG3 Wiring Diagram)
3. Figure 2The FJ3 should be mounted on the vehicle chassis, or any other metal portion of the vehicle whenever possible.

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

4. 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.

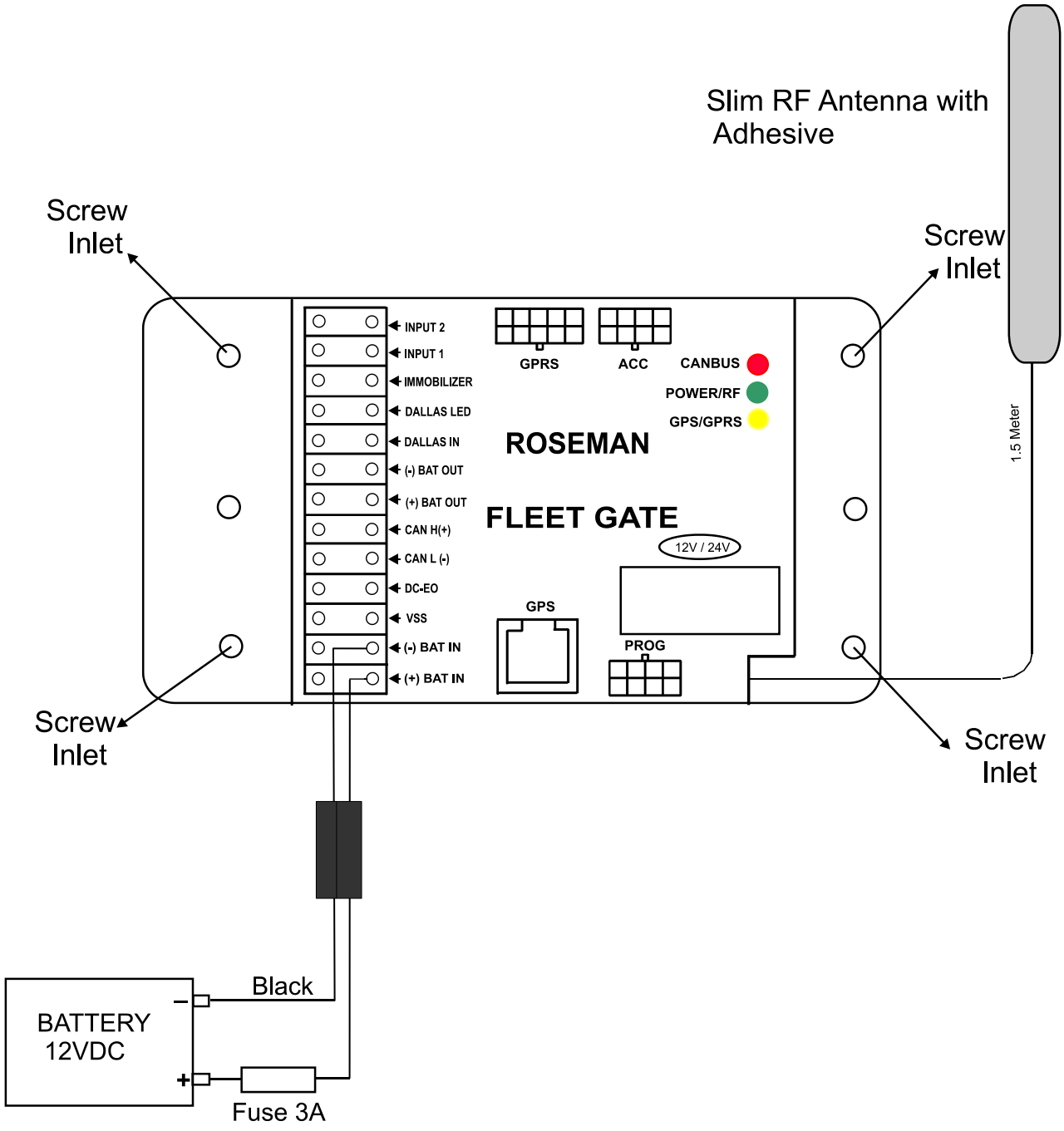



**Figure 2: FG3 Wiring Diagram**

## 3.2 Mount the RF Antenna

The RF Antenna must be mounted so that it is vertical and is able to “see” outside.

The RF Antenna can be mounted by removing the protective layer from the adhesive back and attaching on the vehicle windshield.

In passenger cars, it is can usually be concealed behind the pillar molding on the side of the windshield. The same location can be used near the rear window if desired.

In busses, the RF Antenna can be mounted in the sign compartment area, provided that it is manufactured of fiberglass.

The antenna cannot 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 FG3 to the Battery or Power Source

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

  If your power source is the battery, run a wire from the battery to the FG3 and connect it to BATT (+). This wire requires a 3 amp fuse to protect the FG3.

## 3.4 Connect the FG3 to Ground

- To connect the FG3 to ground, you can connect it to the vehicle metal chassis, or to the negative (-) post on the vehicle's battery.
- If you are connecting to the vehicle battery:
  Prepare a black auto wire with a terminal on each end. Connect the black (-) cable from BATT (-) on the FG3 to the negative (-) terminal on the battery. Tie the wire to the vehicle frame.
- If you are connecting to the vehicle metal chassis:
  Connect a black ground cable from BATT (-) on the FG3 to one of the FG3’s mounting screws. Loop the cable end around the screw, between the screw head and the FG3 plate, and tighten the screw.
  Note this will connect the FG3 to ground only if the FG3 is affixed to the metal chassis of the car.

# 4. Wiring the Dual Input 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 as this will usually reduce risk of incorrect data due to ignition noise. Also, as with any electronic accessory, a good ground is imperative. Lack of proper ground could result in a ground loop condition which could affect the accuracy of the unit.

| | |
|---|---|
| **Note** | Roseman can provide you with an aftermarket catalog that details where to find the VSS+ wire, what color it is and how many pulses per mile the vehicle has. This is a good reference to use. |

## 4.2 Connect the Data Interface to the FG3

- The instructions for this procedure depend on the type of vehicle.
- To view how to capture vehicle data, refer to *Appendixes*

Appendix A –Capturing vehicle data
on page 38.

### 4.2.1 Connect the FG3 to odometer

There are two possible odometer connections:

Direct from either an electronic odometer or speedometer.

From a mechanical odometer via a Reed type odometer adaptor. Also known as a pulse transducer or “taxi tap”

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

### 4.2.2 Electronic Odometer or Speedometer

If the vehicle has electronic instrumentation, run a single wire from the vehicle speed sensor output VSS+ signal to the FG3 and connect to "VSS".

### 4.2.3 Reed Type Mechanical Adaptor

If the vehicle has a mechanical odometer, and you are using a Reed type adaptor, run two wires to the FG3 and connect to "BATT(+)" and "VSS".

### 4.2.4 Engine Hours

To record engine hours, run a single wire from the oil pressure sensor or any other sensor which is at a continuous "high" state while the engine is running. If you are using a single meter FG3, connect one wire to FG3 point VSS.

If you are using Dual input FG3 and only capturing hours, connect to FG3 point VSS.

**Note**

If you are using Dual input Vehicle and capturing hours by counter 2, connect the engine running signal wire to FG3 terminal VSS or the wire from the ignition switch.

In this case the FG3 will Power Off after the turning off the engine even if the ignition switch is On.

You have completed the FG3 installation. Please go to the instructions for programming the FG3.

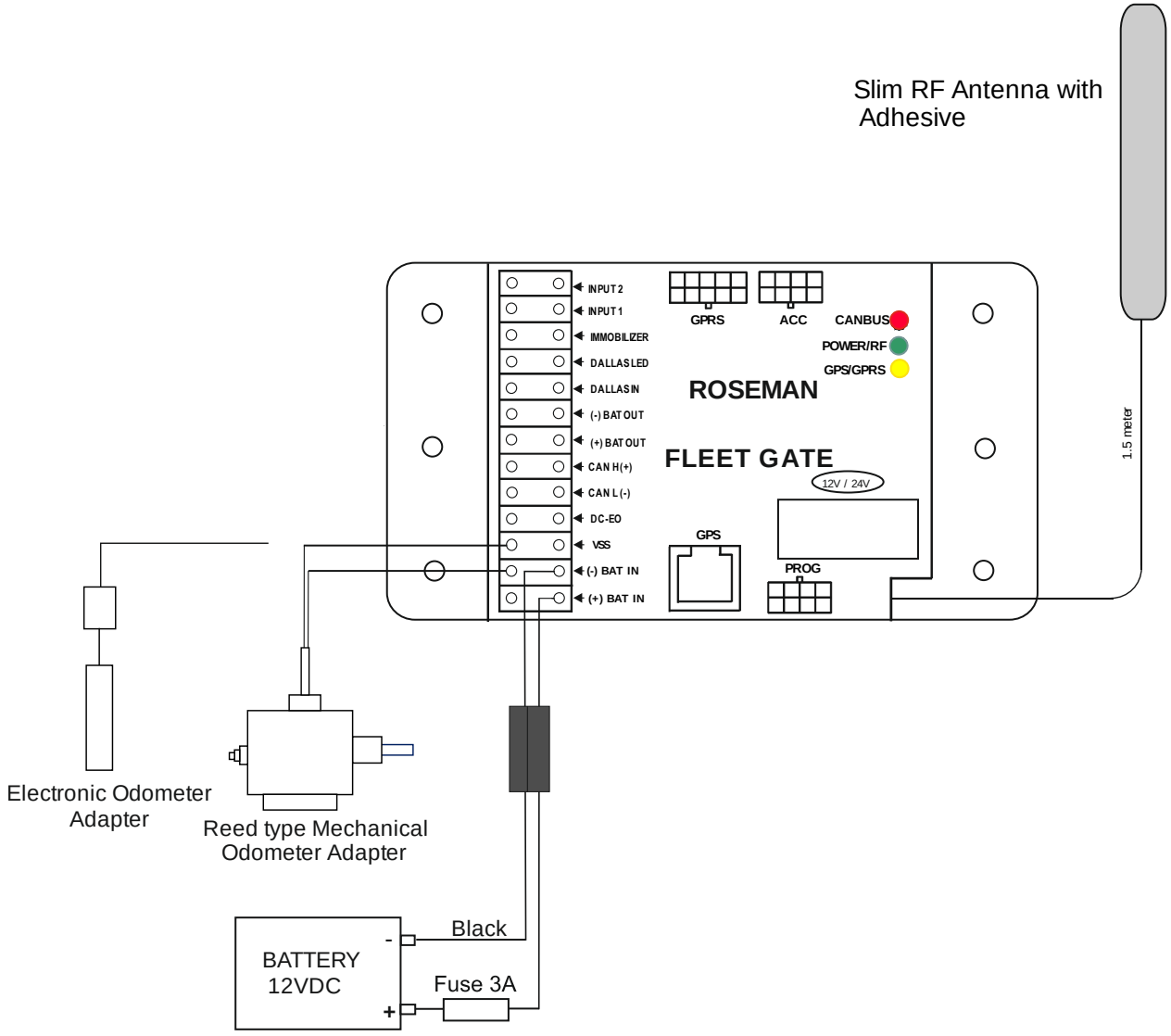



**Figure 3: FG3 wiring diagram for speed pulse**

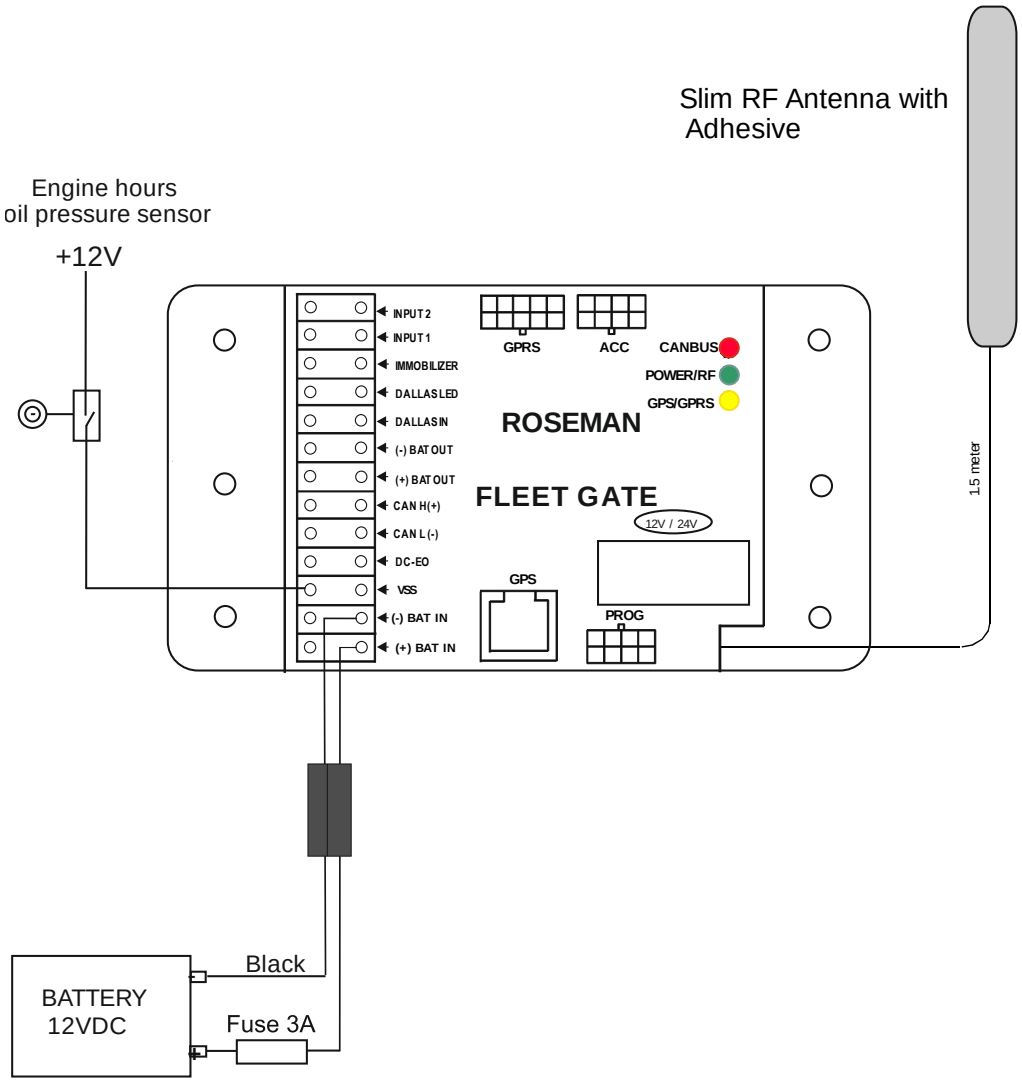



**Figure 4: FG3 wiring diagram for engine hour meter**

# 5. Wiring the CAN Bus Vehicles

## 5.1 Connect the Ignition Switch to the FG3

1. Run a wire from the vehicle ignition switch (or start/stop button on some hybrid models) to the DC-EO terminal on the FG3 (refer to Figure **5**: **Wiring** Diagram **for** FG3 with CAN Bus Interface for Light Duty Vehicles, Figure 6: Wiring Diagram for FG3 with CAN Bus Interface for Heavy Duty **Vehicles**, Figure 7: Wiring Diagram for FG3 with CAN Bus Interface (3-pin connector) for Heavy Duty **Vehicles**)
2. The FG3 needs a constant 12-24 volt signal at the BAT+ and BAT- terminals when the vehicle is on and 0 volts when the vehicle is off.

| | |
|---|---|
| **Note** | If the ignition wire is not connected, the FG3 will not function properly. If the wire is connected, and the FG3 is functioning properly, the FG3 will go into Sleep mode after turning off the ignition. There is a 30-minute delay between the Off state of the ignition and Sleep mode. |

## 5.2 Connect the Data Interface to the FG3

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 for electronic instrumentation, while heavy duty vehicles have an SAE J1939 connector. The following sections provide instructions for both types of vehicles. To view the connectors' pin out information, refer to Appendix B – CAN Bus Data Connectors on page 38.

## 5.3 Connect the FG3 to an OBD II Connector (Light Duty Vehicle)

If the vehicle has OBD II connector for electronic instrumentation, perform the following:

Run a twin wire cable from the vehicle connector to the FG3 as follows:

Connect the FG3 CAN-H to pin - 6 of the OBD II connector.

Connect the FG3 CAN-L to pin -14 of the OBD II connector.

**Note**

**Optional Power Supply Connection**

It is possible to supply the power to the FG3 from the OBD II connector as follows:

- Connect Pin 16 to BATT (+) on the FG3.
- Connect Pin 4 to BATT (-) on the FG3.

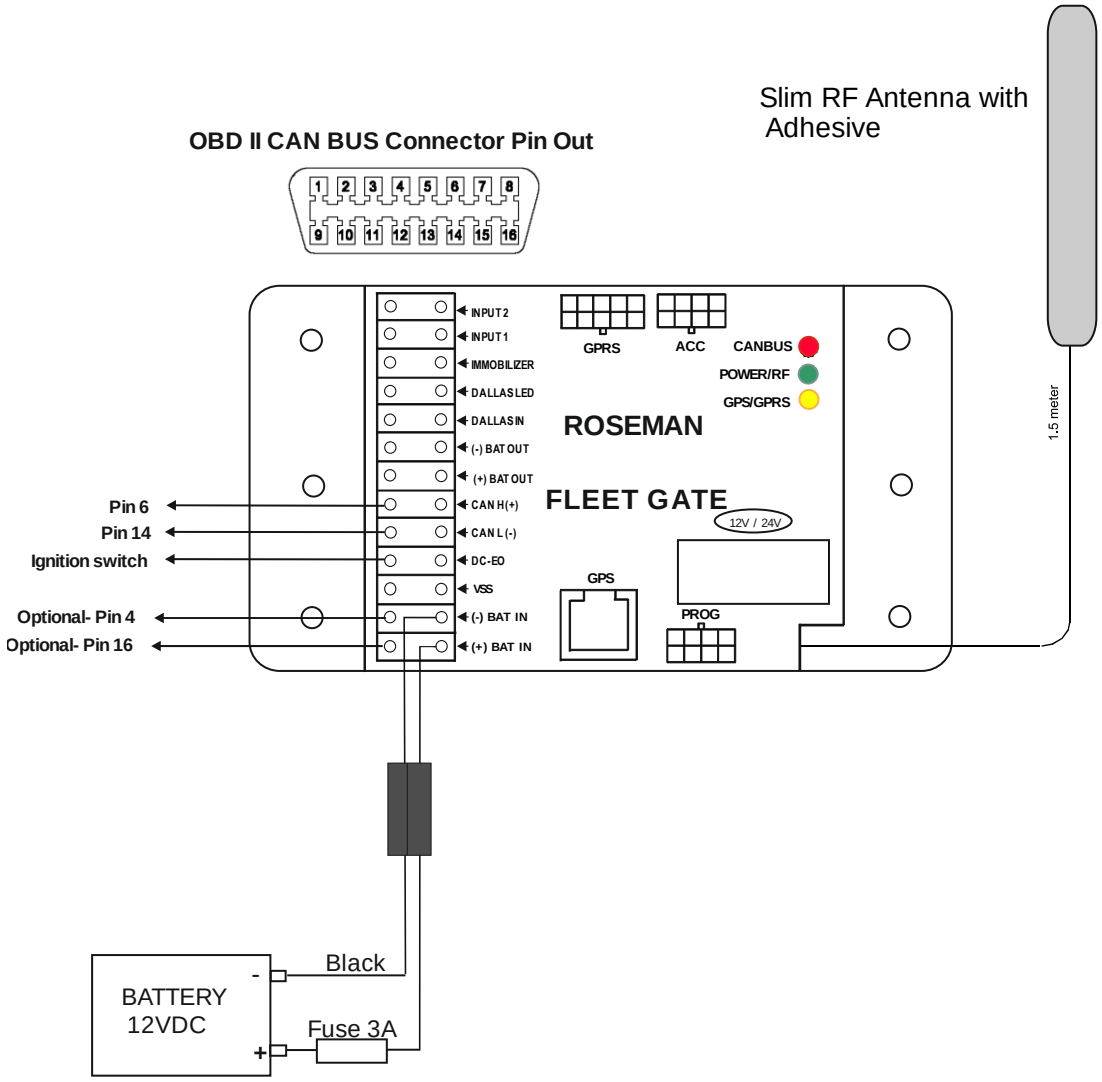



**Figure 5: Wiring Diagram for FG3 with CAN Bus Interface for Light Duty Vehicles**

### 5.3.1 Connect the FG3 to a J1939 Connector (Heavy Duty Vehicle)

If the vehicle has a 9 pin Deutsch connector for electronic instrumentation, perform the following:

Run a twin wire cable from the vehicle connector to the FG3 as follows:

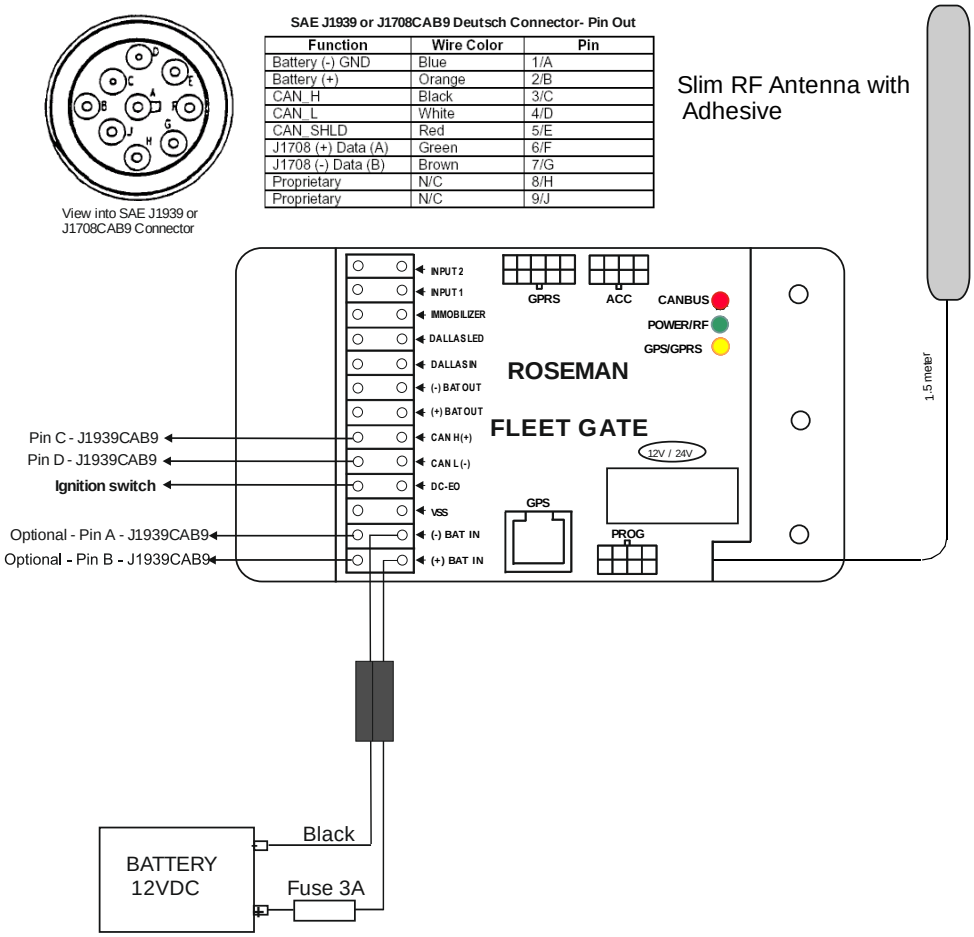
1. Connect the CAN_H Black wire from pin 3/C of the Deutsch connector to the FG3 point CAN_H.
2. Connect the CAN_L white wire from pin 4/D of the Deutsch connector to the FG3 point CAN_L.

**Note**

**Optional Power Supply Connection**

It is possible to supply the power to the FG3 from the J1939CAB9 connector as follows:

- Connect Pin 2/B to BATT (+) on the FG3.
- Connect Pin 1/A to BATT (-) on the FG3.




SAE J1939 or J1708CAB9 Deutsch Connector- Pin Out

| 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 |

**Figure 6: Wiring Diagram for FG3 with CAN Bus Interface for Heavy Duty Vehicles**

### 5.3.2 Connect the FG3 to a 3 pin J1939 Connector (Heavy Duty Vehicle)

If the vehicle has a 3 pin Deutsch connector for electronic instrumentation, perform the following:

Run a twin wire cable from the vehicle connector to the FG3 as follows:

1. Connect the CAN_H from pin B of the Deutsch connector to the FG3 point CAN_H.
2. Connect the CAN_L pin A of the Deutsch connector to the FG3 point CAN_L.
3. Connect pin C ground of the Deutsch connector to the FG3 point BATT (-).

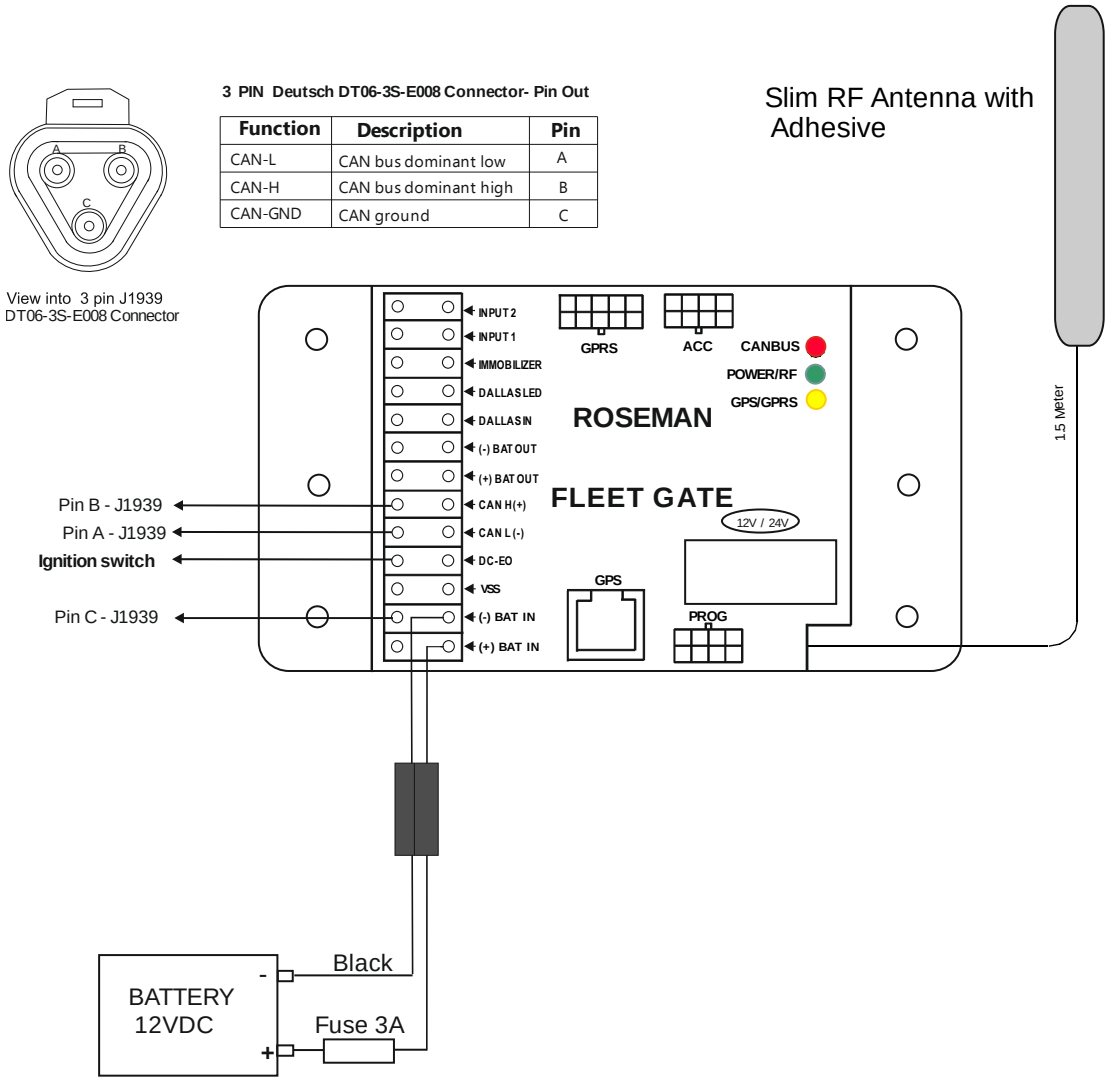



**Figure 7: Wiring Diagram for FG3 with CAN Bus Interface (3-pin connector) for Heavy Duty Vehicles**

# 6. Wiring the Dallas TAG reader set

## 6.1 Mounting the Vehicle Dallas TAG Reader Set

1. Mount the Dallas TAG Reader Combined under the vehicle dashboard.
2. Route the Grey Cable #ACC-CB-15A from FJ3 to TAG Reader Combined.
3. Mount the Cable Reader Dallas TAG #ACC-CB-B7 on the dashboard near the driver.

## 6.2 Connecting the FJ3 to Dallas TAG reader set

1. Connect the 4 wire grey cable #ACC-CB-15A to FJ3 terminals as follows:
   - Connect the White wire to DALLAS LED terminal
   - Connect the Green wire to DALLAS IN terminal
   - Connect the Black wire to (-) BAT OUT terminal
   - Connect the Red wire to (+) BAT OUT terminal
2. Connect the 4 pin connector of cable #ACC-CB-B7 to TAG Reader Combined as shown.

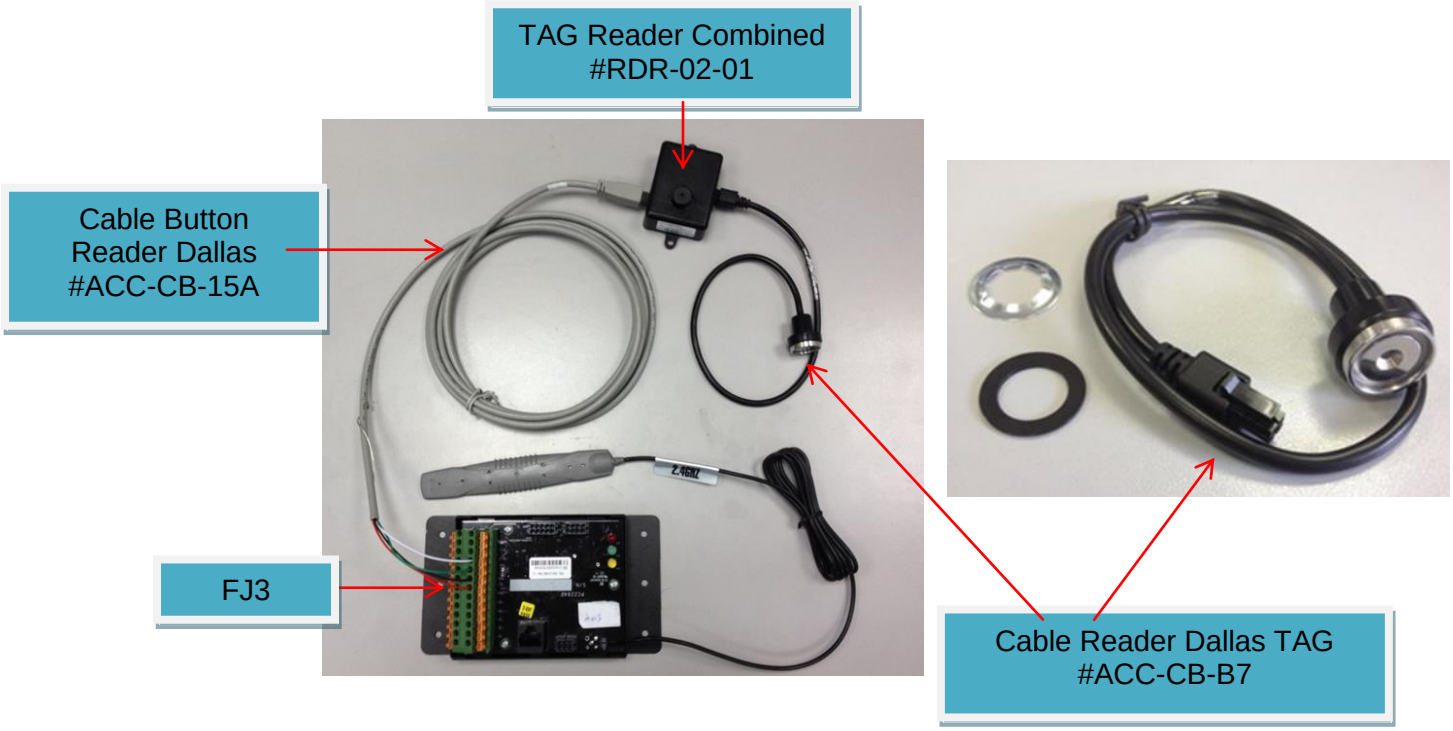



**Figure 8: Wiring Dallas TAG Reader Set**

## 6.3 Installation of the Dallas TAG Reader

**6.3.1** Drill a ½ "(12.7 mm) diameter hole on the dashboard near the driver.

**6.3.2** Insert the Cable Reader Dallas TAG #ACC-CB-B7 into the hole and route it under the dashboard by attaching the black washer and securing ring to the dashboard as shown.

**6.3.3** Connect the 4 pin connector of the Cable Reader Dallas TAG to the TAG Reader Combined as shown.

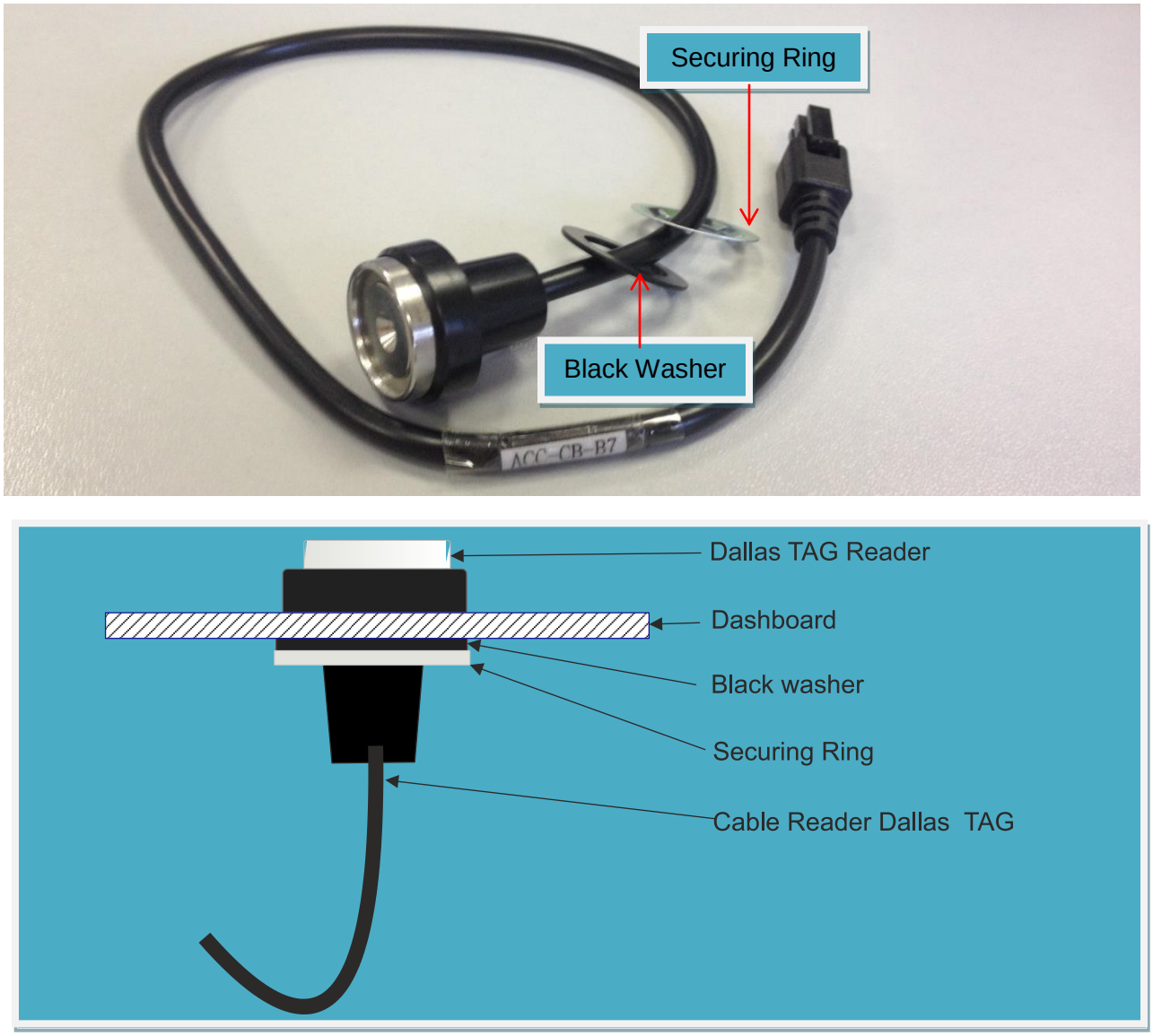



**Figure 11: Cable Dallas TAG Reader Installation**

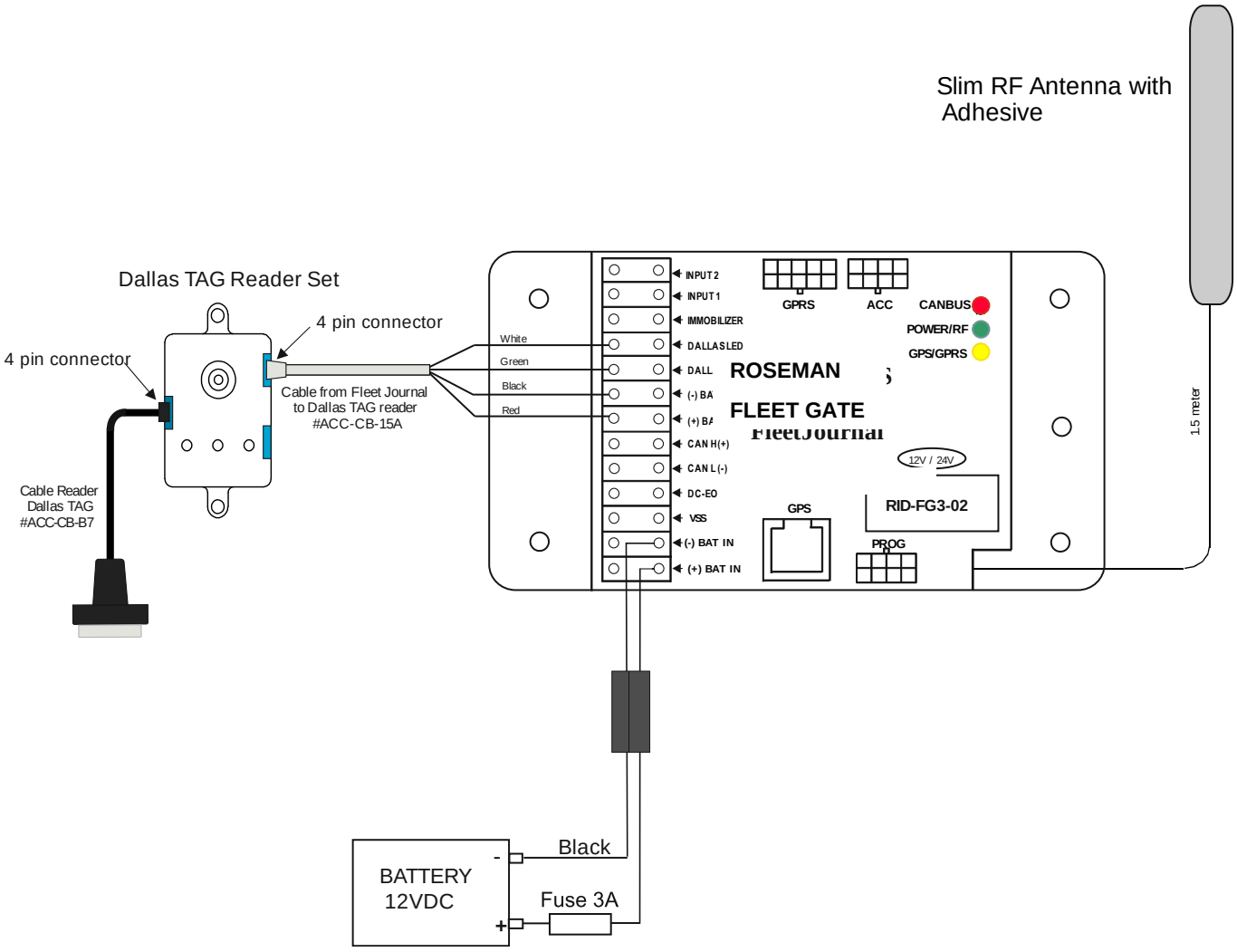



**Figure 12: Wiring Diagram for FJ3 to Dallas Tag Reader (4 pin connectors)**

# 7. Wiring the J1708 Vehicles

## 7.1 Connect the Ignition Switch to the FG3

Run a wire from the vehicle ignition switch (or start/stop button on some hybrid models) to the DC-EO terminal on the FG3 (refer to Figure 2).

**Note** If the ignition wire is not connected, the FG3 will not function properly. If the wire is connected, and the FG3 is functioning properly, the FG3 will go into Sleep mode after turning off the ignition. There is a 30-minute delay between the Off state of the ignition and Sleep mode.

## 7.2 Connect the Data Interface to the FG3

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 Appendixes*

*Appendix* A –Capturing vehicle data
on page 38.

### 7.2.1 Connect the FG3 to a J1708 CAB9 Connector

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

Run a twin wire cable from the vehicle connector to the FG3 as follows:

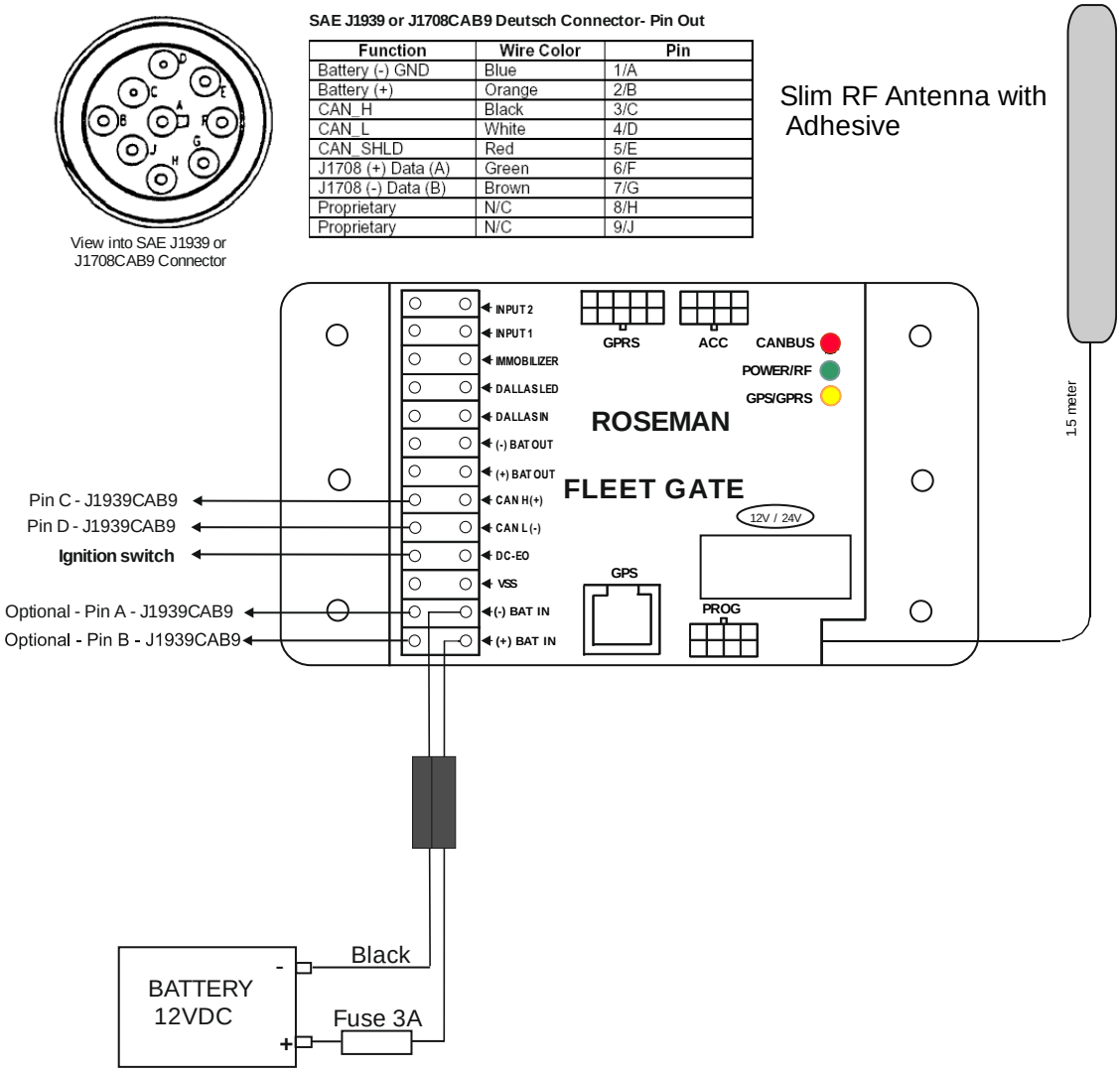
1. Connect the J1708 Data link (+) wire from pin - F of the Deutsch connector.
2. Connect the J1708 Data link (-) wire from pin - G of the Deutsch connector.

**Note**

**Optional Power Supply Connection**

It is possible to supply the power to the FG3 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 FG3.
- Connect Pin 1/A to BATT (-) on the FG3.




SAE J1939 or J1708CAB9 Deutsch Connector- Pin Out

| 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 |

**Figure 9: Wiring Diagram for FG3 to J1708CAB9 (9 pin) connector**

### 7.2.2 Connect the FG3 to an J1708 CAB Connector

If the vehicle has a 6 pin Deutsch connector for electronic instrumentation, perform the following:

Run a twin wire cable from the vehicle connector to the FG3 as follows:

1. Connect the J1708 Data link (+) wire from pin - A of the Deutsch connector.
2. Connect the J1708 Data link (-) wire from pin - B of the Deutsch connector.

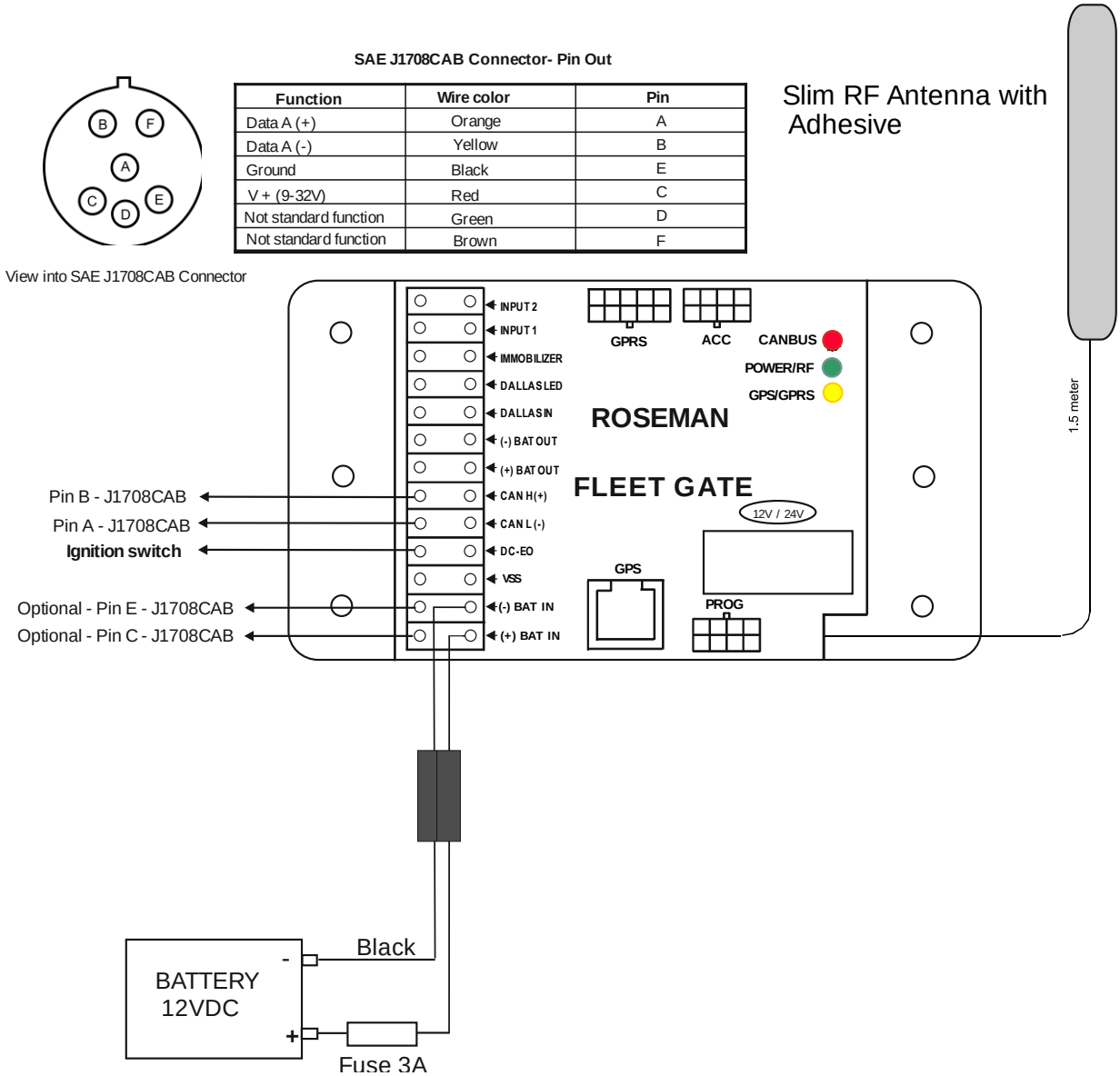
**NOTE:** Optional Power Supply Connection refer to Figure 8.

## Optional Power Supply Connection

**Note**

There is a possibility to connect the power supply to the FG3 from the J1708CAB connector if pin C has 12 – 24 volts with the ignition in the off position:

- Connect Pin C to BATT (+) on the FG3.
- Connect Pin E to BATT (-) on the FG3.




| Function | Wire color | Pin |
|---|---|---|
| Data A (+) | Orange | A |
| Data A (-) | Yellow | B |
| Ground | Black | E |
| V + (9-32V) | Red | C |
| Not standard function | Green | D |
| Not standard function | Brown | F |

**Figure 10: Wiring Diagram for FG3 to J1708CAB (6 pin) connector**

# 8. Completion of Installation

## 8.1 Verify Installation

When installation is complete, verify that the GREEN LED on the FG3 is blinking every second. This indicates good power and grounding.

There are three indicator LEDs on the FG3 (refer to Figure 2) a RED, GREEN and YELLOW LED :

| LED COLOR | FUNCTION | INDICATION |
|---|---|---|
| **RED** | **CAN BUS** | When no data received blinks every 2 sec.<br>When data received blinks according to the data rate |
| **GREEN** | **Power and RF** | RF transmission - Fast blinking<br>Power ON- Blinks every second |
| **YELLOW** | **GPS/GPRS** | |

**Note**

During normal operations, the green LED also blinks every time an RF message is received, indicating that the FG3 is communicating with the WAF or VDC antenna.

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

In addition the green LED blinks every time an **RF** message is received. (Indicating the FG3 is communicating with the WAF or VDC antenna)

When the FG3 is set to Hour counter and the input VSS set on, red LED is on.

(Indicating good communication with the vehicle/equipment).

## 8.2 Post Installation Steps

- The next step is to program the FG3 For instructions, refer to the *FG3 Programming Guide*.

# 9. Preparation and Programming

## 9.1 Preparation Steps

| | |
|---|---|
| **Note** | Make sure that the WAF is connected to the laptop or PC otherwise when opening the software it will not open and terminate. |

1. Connect the USB cable from the programmer tool to your laptop (Refer to Figure10).
2. Run the Fleet Journal Application software from your laptop (Refer to page 31).
3. Use the Technician SVID Activation device and place it near the Fuel Inlet Antenna – FIA (Refer to Figure11).

You can use the activator only while the Fleet Journal Application is ON

4. Press and Hold the SVID green activation button and verify that the red led is blinking (The red led will blink approximately 5 seconds). When the red led will appear solid meaning that SVID activation is completed successfully. The SVID Serial Number has been transmitted to the Fleet Journal Application software.

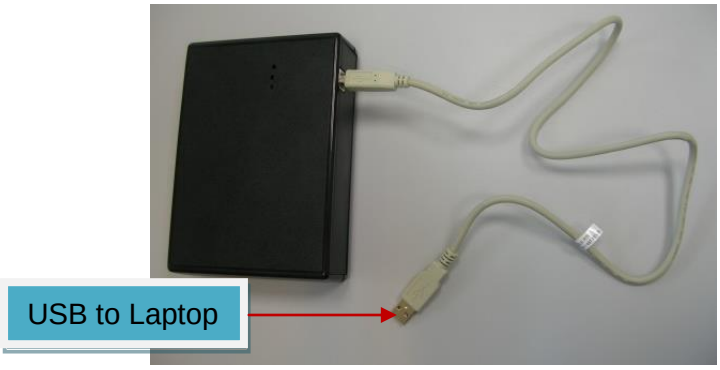



**Figure 11: FJ3 Programmer**

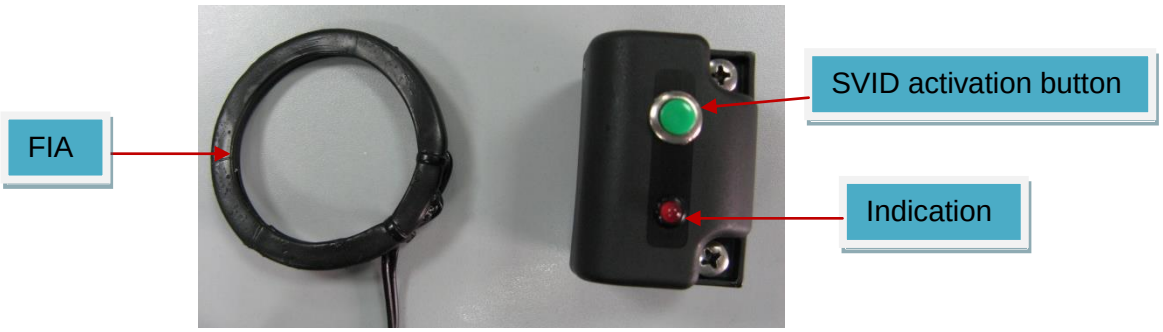
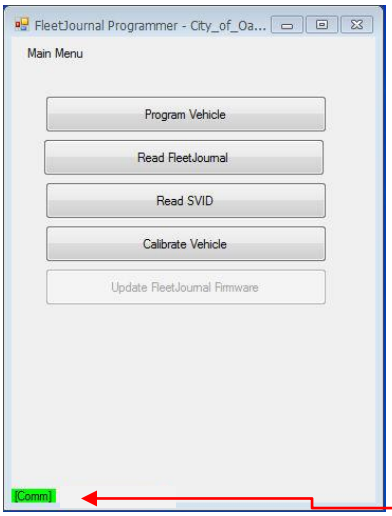


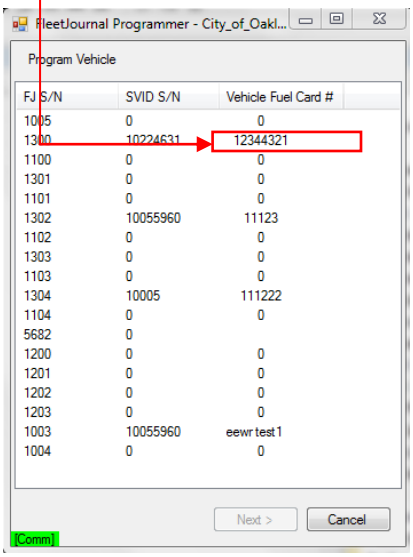

**Figure 11: Technician SVID Activation Device**

## 9.2 Programming Steps

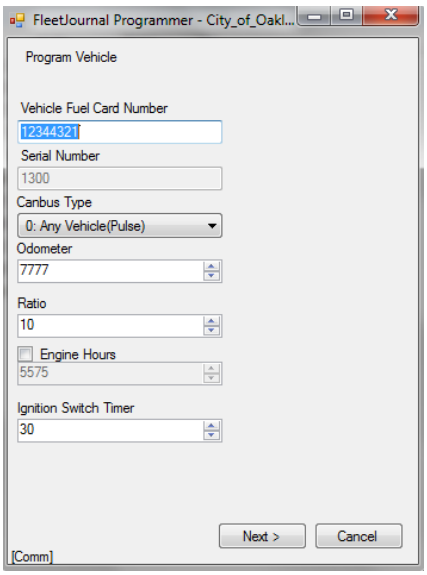
1. The Main Menu screen appears showing the following menu items:
   - Program Vehicle
   - Read FleetJournal
   - Read SVID
   - Calibrate Vehicle
   - Update FleetJournal Firmware
2. Verify the WAF is connected [comm] shows green.



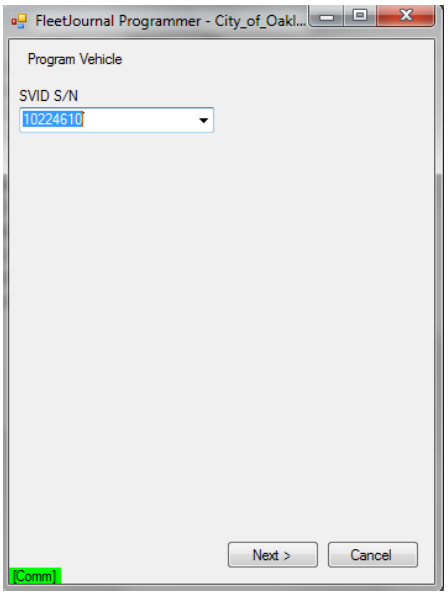

3. Single click on the Program Vehicle menu item and the following screen appears showing the devices serial numbers that are in range of the antenna.
4. Select the FJ3 Serial Number that you want to program and single click on it.
5. Click Next to continue.



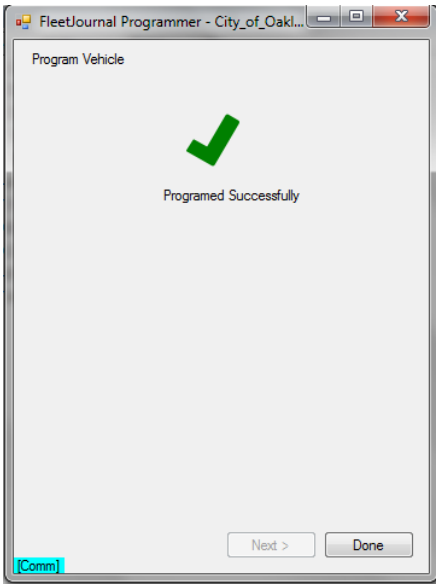
6. A
   after clicking the **Next** button, the following screen will appear.
7. Fill in the details that apply to the vehicle that being is programmed (Example):
   - Vehicle Fuel Card Number: 12344321
   - Canbus Type: 0-Any Vehicle (Pulse)
   - Odometer: 7777
   - Ratio:10
   - Ignition switch timer: 30 min
8. Click **Next** button to continue.




9. The following screen will appear. Select the SVID serial number that you want to program and click the **Next** button to continue.

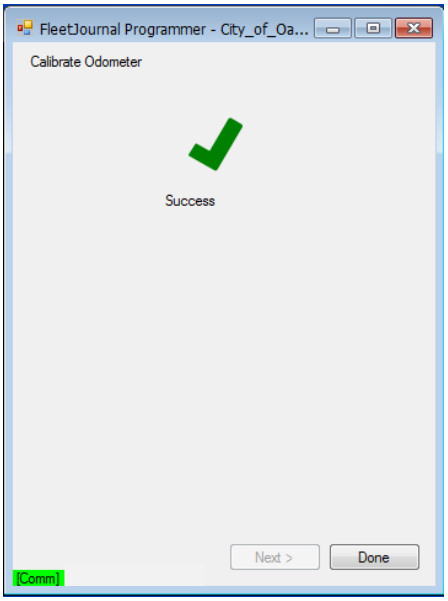


10. The following screen appears showing that the programming has completed successfully.

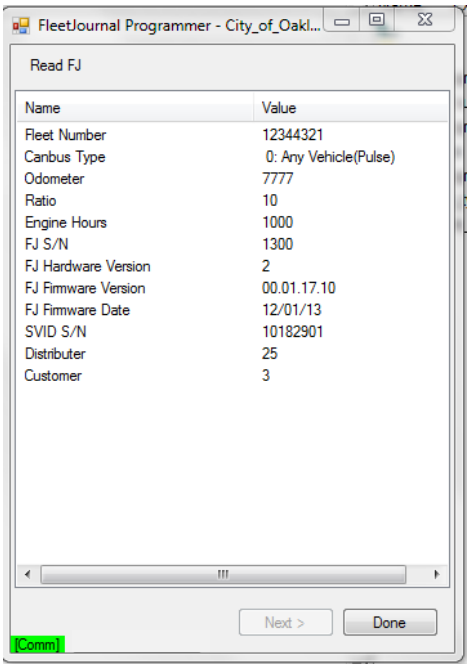



11. Double click on **Calibrate Vehicle** menu and the following screen will appear.
12. Fill in the details for the vehicle to be calibrated:
    - Last Programmed Odometer
    - Current Odometer
    - Dashboard reading
    - Current Engine Hours
    - Dashboard Engine Hours
13. To do a Ratio calculation place a √ in the "Recalculate Ratio" box and the software automatically will recalculate the ratio.
14. Click **Next** to continue

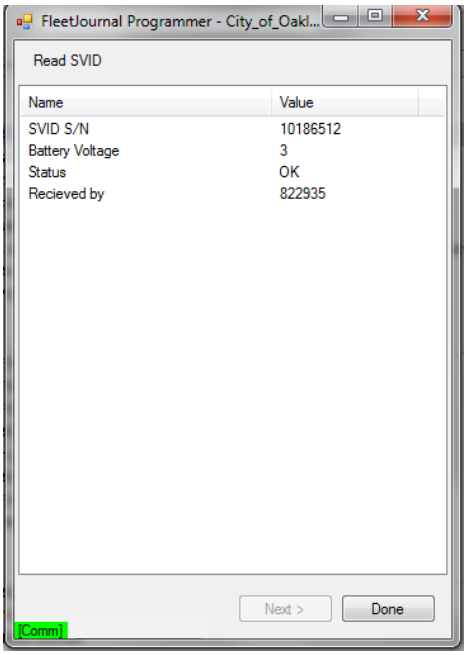
15. The following screen will appear showing that the odometer calibration has completed successfully.




16. Double click the **Read FleetJournal** menu item and the following screen will appear showing the details about what was programmed on the vehicle.



17. Double click on the **Read SVID** menu item and the following screen will appear showing the Battery Voltage and Status.



# 10. Flashing Tool

## 10.1 Purpose

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

## 10.2 Preparation steps

1. Connect a serial D type cable from the Flashing tool to your computer
2. Connect the Flashing tool to a 12V Power Supply
3. Locate the application on your computer to a new directory

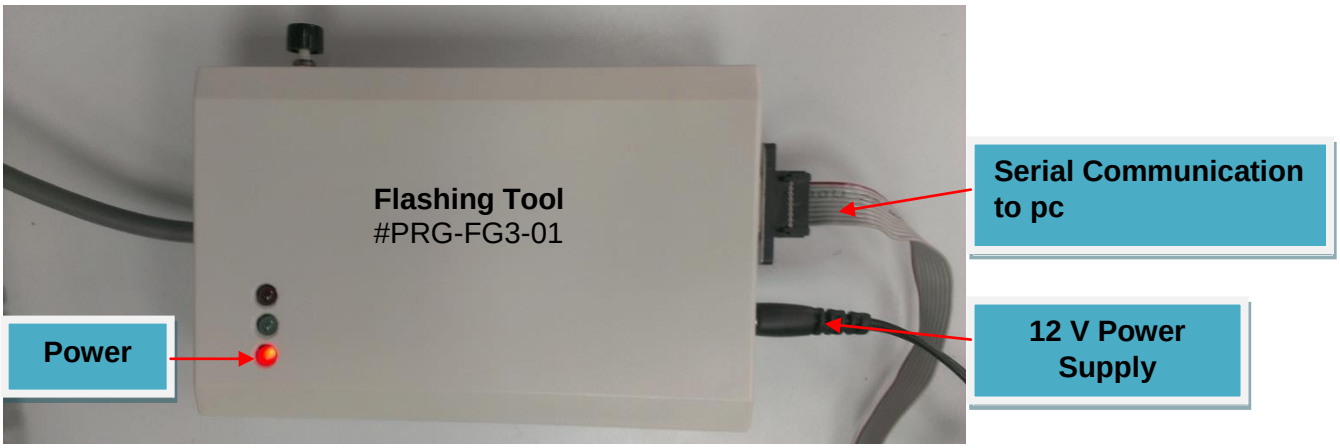
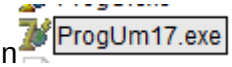


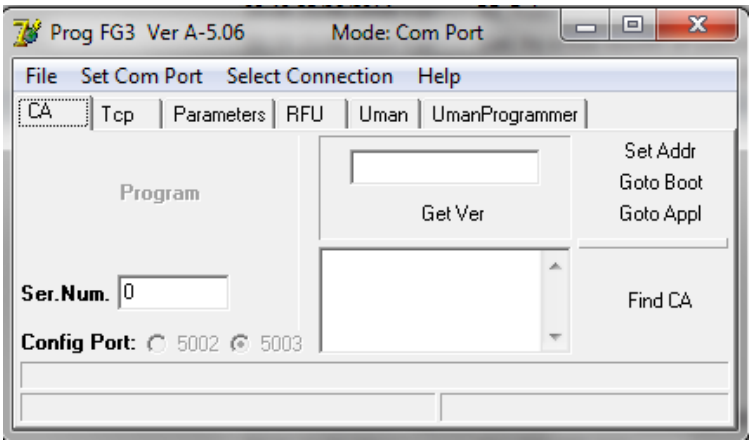

**Figure 12: Flashing Tool Preparation**

# 10.3 Updating version

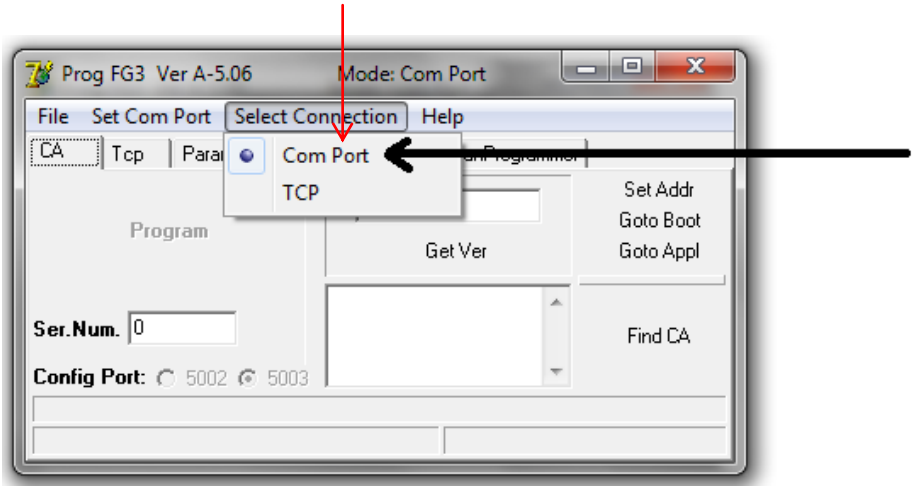
**Verify that the Flashing Tool program files has been installed on your comuter**

Double click on icon 

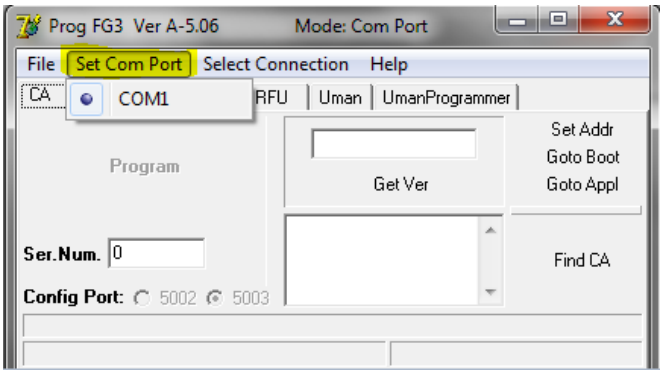

1. Prog FG3 Ver. 5.06 screen will appear



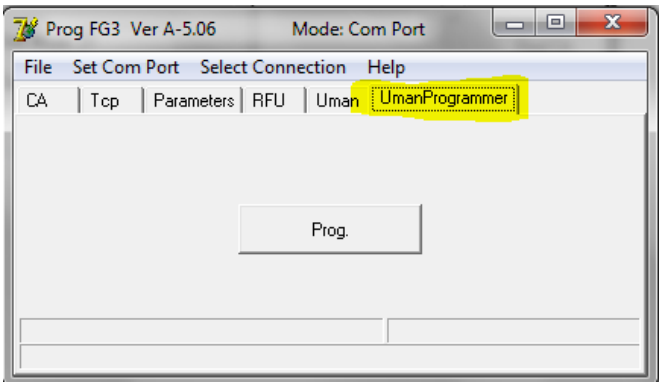

2. Click select Connection >Com Port



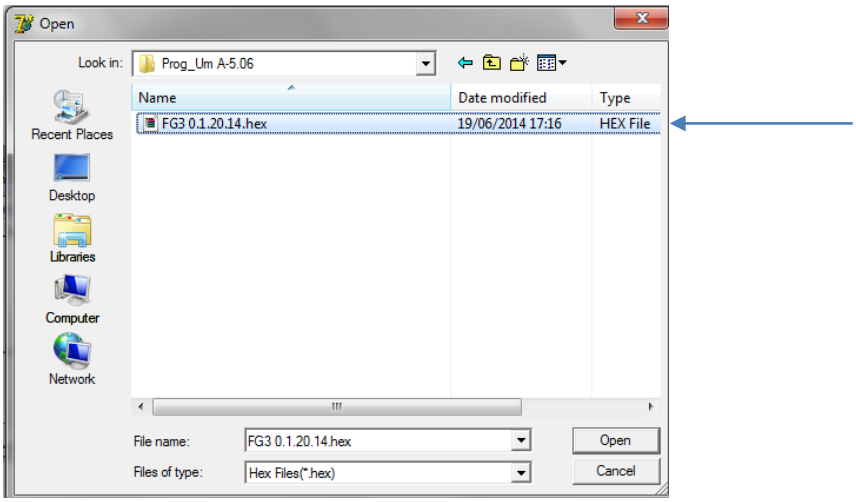
3. Click Set Com port  selcet an available com of your comuter for example com3



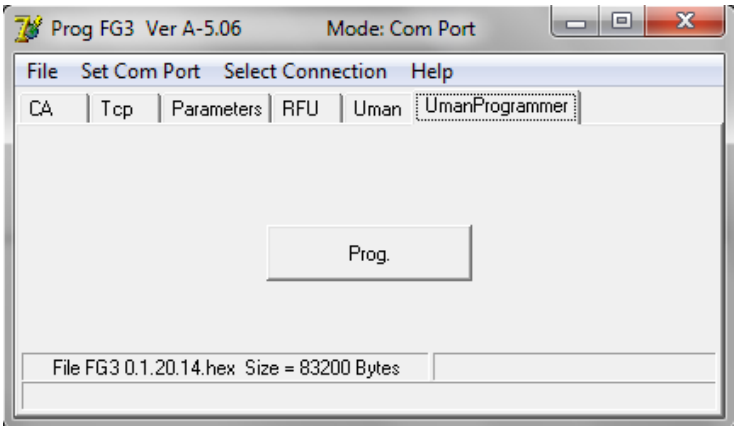

4. Click File>Open



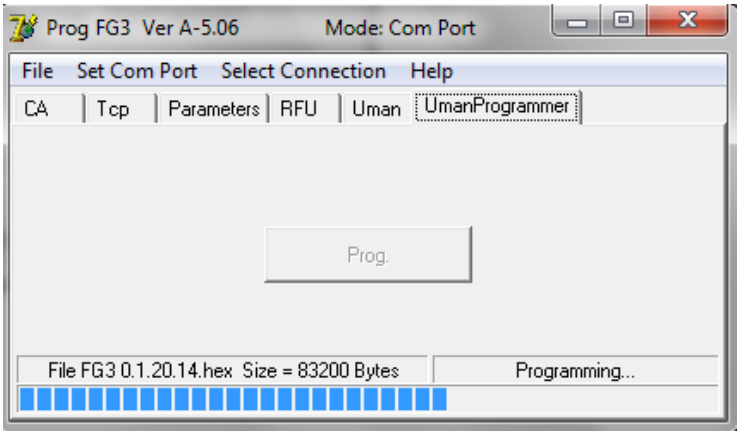

5. Open file screen will apppear
- Select the required FG 0.1.20.14 hex file
- Click Open Buttom to continue



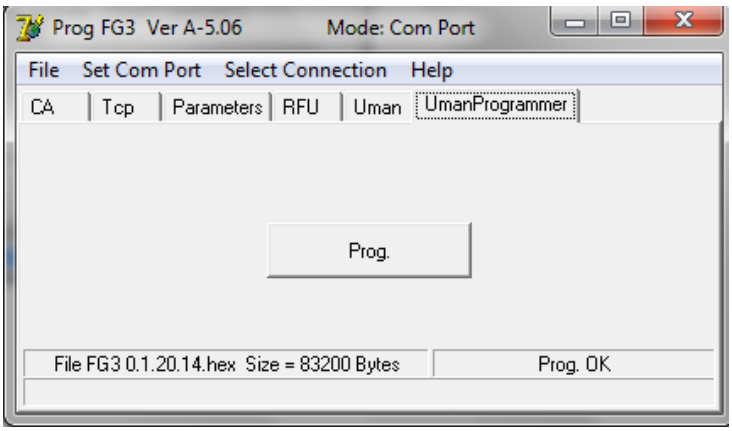
6. Press The Prog bottun and the following screen will appear.




7. Verify that the status bar is in progress




8. Verify that the Prog. is O.K



## 10.4 Flashing Steps

1. Connect the two connectors of the flashing tool # PRG-FG3-01 to the FJ3 as shown:
   - Connect the 4 pin plug to TPMS connector
   - Connct the 6 pin plug to the PROG connector
2. Ensure that the FJ3 has 12V
3. Press the Black Flasing  Push Button for 2 seconds  verify that the green led is flikering during the flasing process  and when the flashing has terminated it comes solid

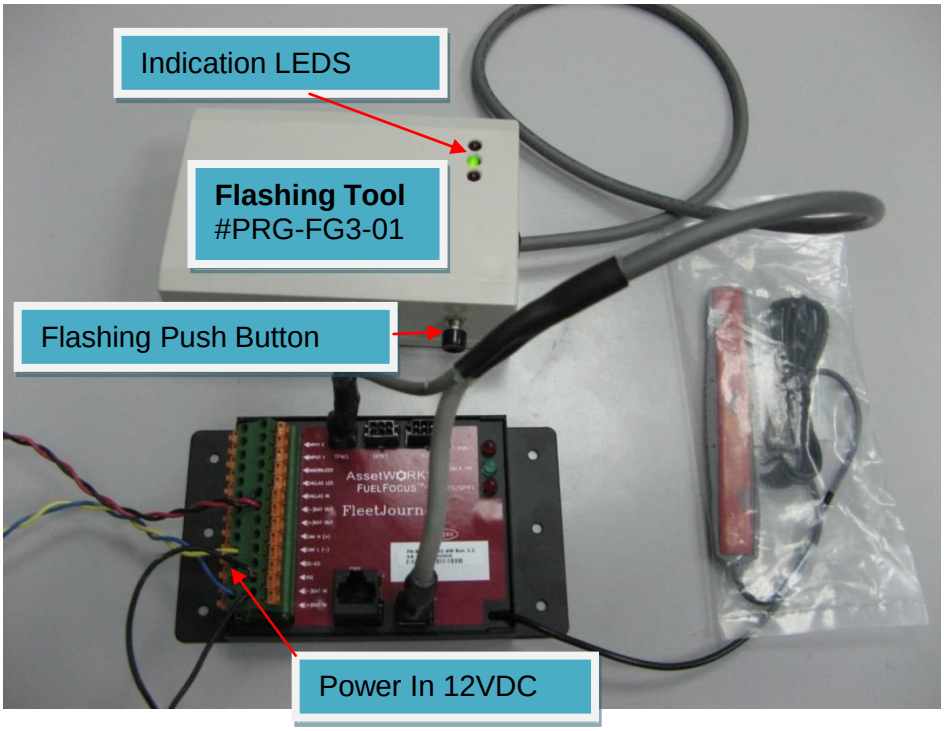



**Figure 13: Flashing Tool connections**

There are 2 indicator LEDs on the Flashing Tool a GREEN LED and RED LED:

| LED COLOR | FUNCTION | INDICATION |
|---|---|---|
| **RED** | **Power** | Flickers when  the power  is connected to the Flashing Tool |
| **GREEN** | **Flashing** | ▪ After pressing the e black push button The green flickers while the Flash tool  is connected to the FJ3<br>▪ the green is solid while the flashing is completed successfully |

# 11. Appendixes

## 11.1 Appendix A –Capturing vehicle data

### 11.1.1 Capturing Odometer and Engine Hours Information

If the FG3 is to record the vehicle's odometer, you will need to obtain a pulse relevant to the vehicle's speed. This can be accomplished by either 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 will be needed to convert the mechanical turns of the speedometer cable into electronic pulses that the FG3 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.

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

The Roseman VDC enables online wireless capture of odometer and/or engine hour readings from vehicles equipped with the Roseman Vehicle Identification Fleet Gate (FG3). This data capture occurs when a vehicle passes within range of the Wireless Automated Fueling (WAF) Receiver installed in a parking area or at the fuel island. The pertinent vehicle data is transmitted to a local PC, which has the Roseman proprietary VSU application installed and running and will transmit it to the FleetFocus™ application client server in REALTIME via TCP/IP protocol.

### 11.1.3 Vehicle Speed Sensor (VSS)

In order for a pulse counting FG3 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, or the "electronic brain", found in all modern day vehicles, engineers needed a way to report operational data to this computer for processing. This is where sensors come in. There are sensors to measure just about everything; pressure, speed, temperature, fluid levels, and so on. A sensor simply converts one type of information into another, or more specifically, one type of energy into another. The end result is used by the computer for calculations.

In almost all cases, the vehicle's speed signal is generated at the output shaft of the transmission. This shaft turns at a speed which is directly proportional to the vehicle speed. There are usually two different types of sensors found at this location. The first type, and by far the most common, 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. As the magnets' lines of force cut through the inductor, a voltage, or pulse is induced in the circuit. So, the end result is a signal which pulsates, or oscillates at a speed directly proportional to vehicle speed. The second type of sensor, which is probably more modern, but less common, is the Hall Effect sensor. The Hall Effect sensor works much the same as the variable reluctance sensor, but instead of an inductor, the Hall Effect sensor is a tiny solid state switch which is activated by a magnetic force. The end result is a smaller and lighter sensor generating a cleaner signal.

There are many ways to identify the vehicle speed signal. We will discuss a few of these:

#### 11.1.3.1 Using an Oscilloscope

By far the easiest way to view and identify the VSS signal is with an Oscilloscope. This tool allows you to actually see a picture of the signal.

#### 11.1.3.2 Using a Multi-Meter to measure frequency (Hz)

This is the easiest way to measure the speed signal without the use of a scope. There are some things to watch out for, however. At rests, the meter may give incorrect readings. This is because the meter uses A/C coupling to measure frequency, and if it picks up some noise, it may try to measure it to determine its frequency. The important thing is to measure frequency while the vehicle is moving. The frequency will increase proportionately to vehicle speed. If the measurements seem to bounce around, you probably don't have the correct circuit.

#### 11.1.3.3 Using a Multi-Meter to measure A/C Voltage

This is yet another way to verify the VSS circuit. This method works poorly however, with Hall Sensor outputs. The reason for this is that a Hall Sensor's output does not vary in amplitude, only frequency. Almost all 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. Usually this is enough data to determine if you have the right circuit.

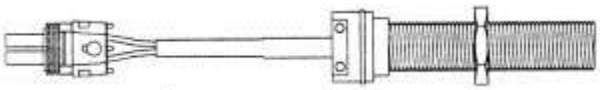
If you are using an A/C Multimeter to test a variable reluctance sensor, which are by far the most common, it will work very well. As with frequency, the A/C voltage should fluctuate in direct proportion to the vehicle speed.

Once the VSS circuit has been identified, the next step is to determine the number of pulses per mile which are emitted from the sensor. In order to determine the speed and mileage, the VIB must know how many pulses are emitted for a mile traveled. Fortunately, there are only a few different calibration values. For example, almost all Ford and Chrysler products emit 8000 pulses per mile. Chevrolet commonly uses 4000 or 2000 at the control module, and 96000 at the transmission.

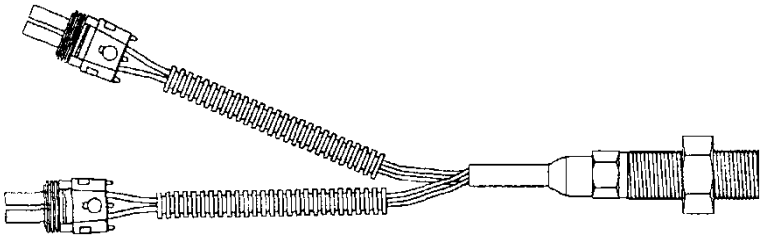
### 11.1.3.4 Electronic Odometer Adapter

If the vehicle is equipped with an electronic sending unit controlling the dashboard speedometer, you need to simply connect a wire between the signal line and the FG3. If the vehicle's electronic odometer line is also driving additional equipment, such as a cruise control module or trip computer, there might not be enough signal strength to add the FG3 to this line. In this case, you will need to replace the single sensor with a dual-output sender, or add an additional single sender to the unused sender port that is provided on some vehicles.

*For connection instructions please refer to vehicle manufacturer*.



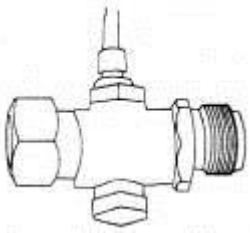
**Single Electronic Adaptor**



**Dual Electronic Adaptor**

### 11.1.3.5 Reed Type Mechanical Adaptor

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



# 11.2 Appendix B – CAN Bus Data Connectors

## 11.2.1 Vehicle OBD-II Connector J1962

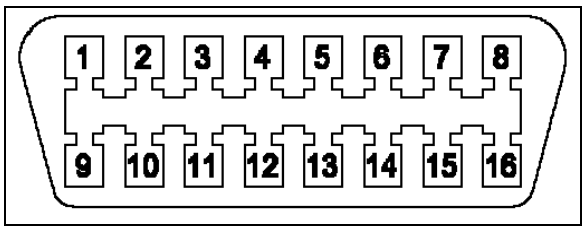


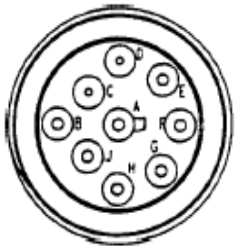

**Figure 12: Car Diagnostic Connector (female)**

| 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**

### 11.2.2 SAE J1939 Data Interface Connector

| 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 13: SAE J1939 Model 1708CAB9**

### 11.2.3 3 PIN J1939 Data Interface Connector

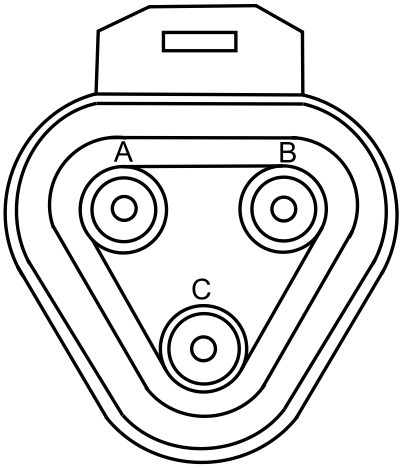



**Figure 14: 3-pin Deutsch J1939 DT06-3S-E008**

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

# 11.3 Appendix C – J1708 Data Connectors

## 11.3.1 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 |

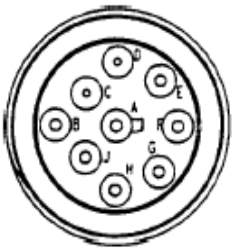



**Figure 15: SAE J1708 Model 1708CAB9**

### 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 |

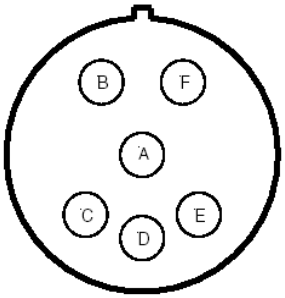



**Figure 16: SAE J1708 Model 1708CAB**

## 11.4 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**

To comply with FCC requirements, a distance of at least 20cm between the equipment and all persons should be maintained during the operation of the equipment.

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.