FUEL POINT

VEHICLE MODULE

INSTALLATION MANUAL

C35699

GASBOY INTERNATIONAL LLC

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REV. 03/28/03

INSTALLERS - IMPORTANT

In addition to installation information, this manual contains warnings, safeguards and procedures on the use and care of the Fuel Point System. Please leave this manual with the system owner after the installation is complete.

GASBOY INTERNATIONAL LLC LANSDALE, PA

IMPORTANT WARNINGS AND SAFEGUARDS

Gasoline and petroleum products are flammable. To avoid injury or death to persons or damage to equipment or property, follow these listed warnings and other warnings and precautions outlined in this manual when installing, using, or working around this equipment. Check with GASBOY Technical Services for compatibility of liquids with pump materials.

TURN OFF AND LOCK OUT ALL POWER TO PUMP BEFORE PERFORMING SERVICE, MAINTENANCE OR IN THE EVENT OF A FUEL SPILL.

All products must be installed by a qualified installer and used in conformance with all building, fire, and environmental codes and other safety requirements applicable to its installation and use, including, but not limited to, NFPA 30, NFPA 30A, NFPA 395 & NFPA 70. A qualified installer is familiar with fuel systems installations under the above stated building, fire, and environmental codes and other safety requirements for the particular type of installation.

This product is only part of a fuel dispensing system and additional equipment and accessories, such as, but not limited to, breakaway connectors, shear valves, pressure regulators, flow limiters, and other safety devices may be necessary to meet the applicable codes.

For maximum safety, we recommend that all employees be trained as to the location and procedure for turning off power to the entire system. Instructions regarding proper operation of the equipment along with the appropriate safety warnings should be posted in plain view at the fuel island.

Before performing service or maintenance (including changing of fuel filters or strainers) or in the event of a fuel spill, turn off and lock out all power to the system. In battery-powered pumps, disconnect power source. In submersible pump applications, turn off and lock out power at the master panel and close any impact valves to the submersible pump and any other dispensers which use that submersible pump. AC power can feed back into a shut-off dispenser when dispensers share a common submersible pump or starter relay. Also block islands so no vehicles can pull up to the dispenser when the dispenser is being worked on.

DO NOT use Teflon tape for any pipe threads in the product.

DO NOT use consumer pumps for pumping fuel or additives into aircraft.

DO NOT use commercial pumps for direct fueling of aircraft without filters and separators necessary to ensure product purity.

DO NOT use where sanitary design is required (for food products for human consumption) or with water-based liquids.

DO NOT smoke near the pump or when using the pump.

DO NOT use near open flame or electrical equipment which may ignite fumes.

DO NOT permit the dispensing of gasoline or other petroleum products into a vehicle with its motor running.

DO NOT permit the dispensing of gasoline or other petroleum products into unapproved containers or into approved containers in or on vehicles including trucks. All containers must be filled on the ground to prevent static discharge. Always use Approved and Listed hoses and nozzles with electric pumps and dispensers.

DO NOT block open the nozzle in any manner. Nozzles shall conform to UL and NFPA code requirements for attended or unattended service.

DO ensure that the pump is equipped with proper filters based on the product being dispensed and its intended use.

DO wear safety goggles and protective clothes when dispensing any liquid which may be potentially harmful or hazardous.

DO keep all parts of body and loose clothing clear of belts, pulleys, and other exposed moving parts at all times.

DO require washing and changing of clothes if fuel is spilled on a person or his/her clothing. Keep away from open flames, sparks, or people smoking.

DO provide a receptacle for catching product from pump/meter when servicing.

DO clean up product spills on the driveway. Turn off and lock out all power prior to cleanup.

DO insure pump is properly grounded.

DO insure hose is compatible with fluid being dispensed.

DO inspect hose, nozzle, and pump on a regular basis for wear, damage, or other conditions which may create a safety or environmental hazard.

DO make sure all pipe threads are properly cut and the inside reamed to remove burrs. Use UL classified gasoline-resisting compound on all joints of gasoline handling piping. Sealing compound must also be resistant to Gasohol (Ethanol and Methanol). Use gasoline-resistant pipe compound on male threads only; pipe compound used on female threads can be squeezed into the supply line where it can enter the product stream and become lodged in the pump or meter.

DO ensure that junction box covers are in place and properly tightened. Mating surfaces between the box and cover must be free of dirt, nicks, and scratches. All unused entries into the junction box must be properly plugged.

GASBOY INTERNATIONAL LLC.

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CONTENTS

Section 1

INTRODUCTION

PURPOSE

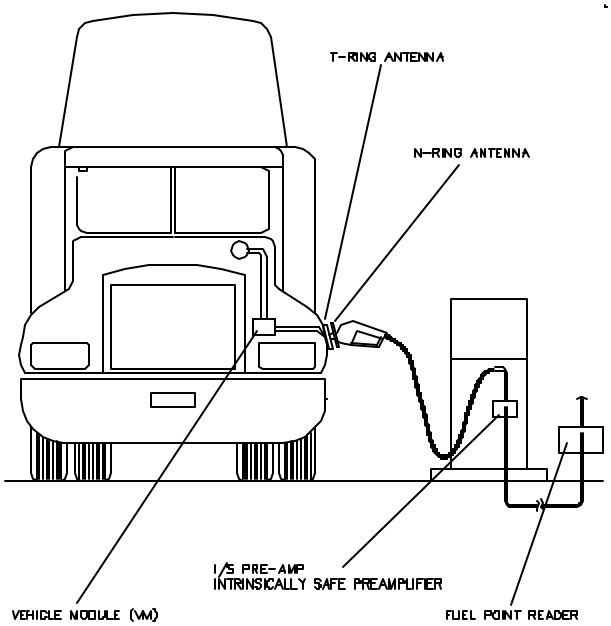
The GASBOY *Fuel Point Vehicle Module Installation Manual* is provided to assist you in installing your Fuel Point Vehicle Module (VM). This manual should be supplied to the installer prior to the installation of the VM to ensure proper installation. Faulty installations are the major cause of system malfunctions. The VM 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 installation.

GASBOY provides a toll-free number for customers and installers having any questions pertaining to the installation: 1-800-444-5529

SYSTEM OVERVIEW

Fuel Point adapts to Listed GASBOY fuel management systems for hassle-free fueling. System applications determine actual components required. Your system will consist of the following components:

- a GASBOY fuel management system (FMS) (Listed models 1000, 1000P, or 2000S CFN)
- Fuel Point Reader (FPR)
- Pumps/dispensers modified using Listed Dispenser and Hose Retrofit Kits (consisting of I/S Pre-amp and one or two hose retrofit kits)
- Vehicles equipped with materials from Vehicle Installation Kits
- Vehicle Module(s) (VM's)



Section 2

COMPONENT OVERVIEW

GENERAL

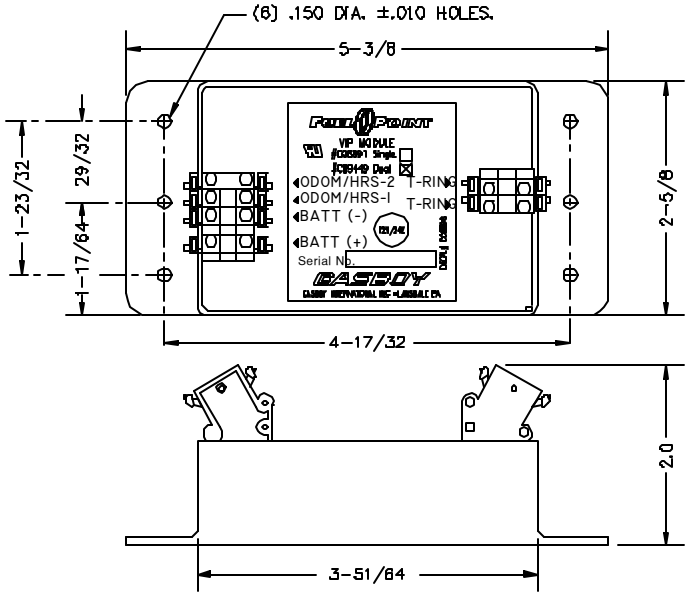
This section describes the various components that allow a vehicle to operate with the GASBOY Fuel Point System. Use this information to determine the equipment needed for your particular fleet of vehicles.

VEHICLE MODULE AND OPTIONAL COVER

The VM, or Vehicle Module, is a vehicle-mounted computer. It contains the system and vehicle identification information, fuel type authorization, transaction limitation code, odometer, and hours data.

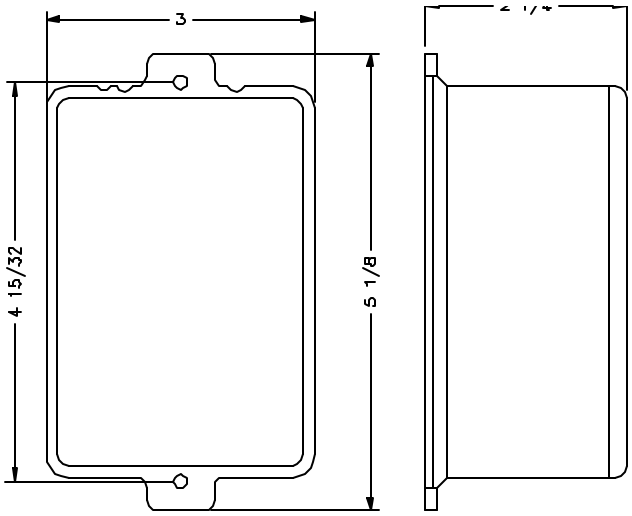
There are two types of VM: a single input, C08891 and a Dual Input, C09449. The Single Input VM can be configured to record either odometer or engine hour readings. The Dual Input VM can be configured to record two odometers, two hour meters, or a combination of the two. Each VM type supports two tank antenna rings for saddle tank applications.

The VM gets its power from the vehicle's battery. It can work on 12 VDC or 24 VDC systems and draws approximately 25 mA of current.



Dual Input VM, C09449 Shown

The VM is not water-tight. Water can seep in through the connectors causing permanent damage. However, if locating the VM in an area where it can be exposed to water during vehicle operation or cleaning is unavoidable, GASBOY offers a rubber cover, C09454, which provides minimal moisture protection.



TANK RINGS (T-RINGS)

The T-Ring is an antenna that mounts to the vehicle's fuel tank fill pipe. It connects to the VM with shielded cable and exchanges information with the Fuel Point Reader via an antenna mounted to a fuel dispensing nozzle. Two T-Rings are required for saddle tanks.

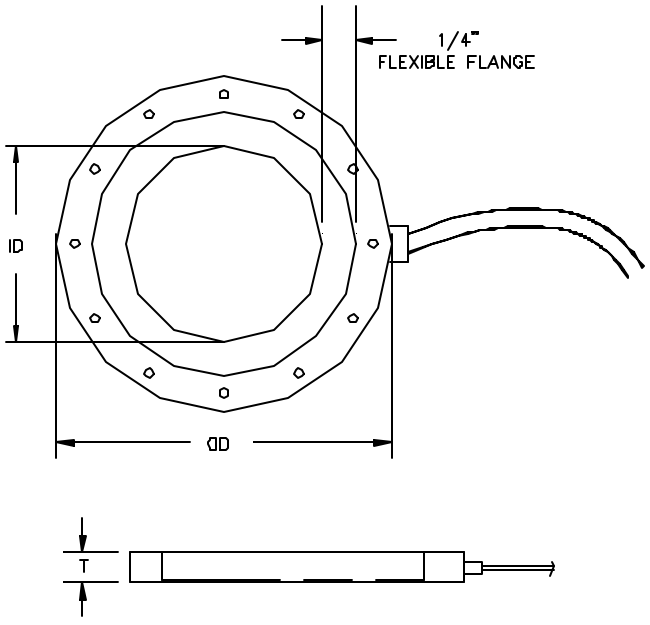
GASBOY provides many T-Ring sizes and styles to fit any application. The Standard (C08889) T-Ring fits most passenger cars, light trucks, and buses with 2-1/2" fill pipes. The C08894 T-Ring fits truck saddle tanks with 4-1/2" fill pipes. The Standard rings have a thin flexible flange inside a rigid outer ring that keeps them in place on the fill pipe. The Special T-Rings are used only when one of the Standard T-Rings won't fit, based on the dimension criteria mentioned below.

There are three points to consider when choosing a T-Ring:

- For the Standard T-Rings, the outside diameter of the fill pipe can be up to 5/16" larger than the inside diameter of the ring. For the Special T-Rings, the outside diameter of the fill pipe must be smaller than the inside diameter of the ring.
- The outside diameter of the ring must be smaller than the well or cavity that surrounds many fill pipes.
- The ring should be thin enough to allow the fuel cap to seat properly on the fill pipe.

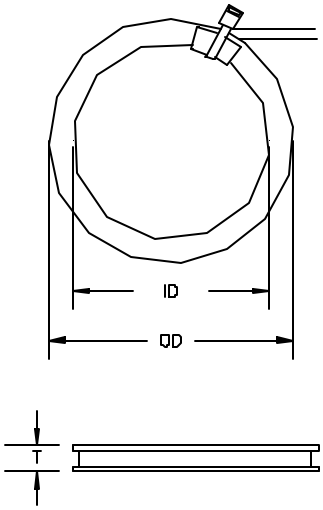
The illustrations and the tables that follow show the T-Ring part numbers and dimensions (in inches).

Standard T-Ring



GASBOY P/N	ID	OD	T
C08889	2-1/16	3-1/2	3/8
C08894	4-1/8	5-3/4	7/16

Special T-Ring



GASBOY P/N	ID	OD	T
C09462	1-5/8	2-1/8	5/16
C09463	2-1/8	2-11/16	5/16
C09464	2-7/16	3	5/16
C09465	2-5/8	3-1/8	5/16
C09466	3	3-1/2	5/16
C09467	3-7/16	4-1/16	5/16
C09468	3-13/16	4-3/8	5/16
C08908	4-3/16	4-13/16	5/16
C08909	4-13/16	5-3/8	3/16
C08910	5-1/4	5-7/8	3/16

CAPTURING ENGINE HOURS AND ODOMETER INFORMATION

Engine Hours

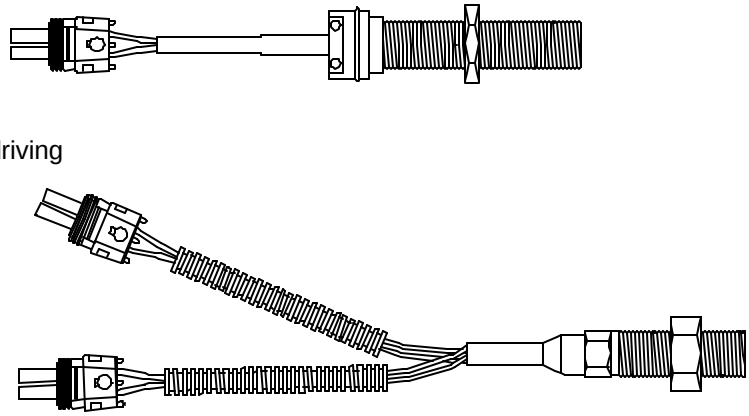
If the VM is to record engine hours, you will need to connect a length of shielded cable between the VM and a signal that is HOT (at the battery voltage) when the engine is running.

Odometer Sensors

If the VM is to record the vehicle's odometer, you will need to connect to an odometer sensor. The sensor converts the drive shaft movement into an electrical signal that can be processed by the VM. The three types of odometer sensors are described below. Mechanical speedometer transducers may be ordered through a local speedometer repair shop, through the vehicle manufacturer's parts distributor, or directly from the sensor manufacturer. Due to the wide variety of sensor types, GASBOY does not stock or supply sensors.

Electronic Odometer Sensor

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 VM. 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 VM 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.



Electronic Sensor - Single
Electronic Sensor - Dual

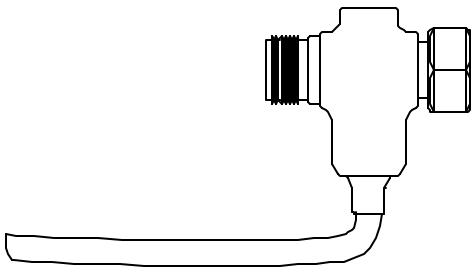
IMPORTANT

The vehicle's ABS system must not be used as a source for odometer pulses. Any Fuel Point Vehicle Modules currently installed must be disconnected from the ABS system immediately.

With electronic speed transducers, the connection should be made at one of these locations: at the buffered output side of any vehicle's control modules, such as the powertrain control module (PCM); or, if buffered output is not available, at the transmission's speed generator signal wire.

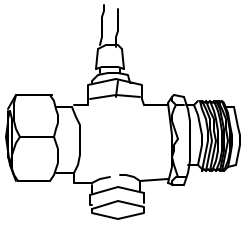
Hall-Effect Mechanical Sensor

If the vehicle has a mechanical cable that transfers the speedometer from the transmission to the dashboard, you will need a Hall-Effect sensor. Try to order the sensor with 18 gauge shielded cable of sufficient length to reach the VM without splicing. Refer to **Typical Cable Lengths** later in this section.



Reed Mechanical Sensor

Reed sensors are used in the same manner as Hall-Effect sensors, but operate on mechanical contacts rather than magnetics. For this reason they are considered a lower cost alternative and may be less accurate than the Hall-Effect types.



Sensor Sources

- Arthur Allen Manufacturing Corporation
  4985 North Elston Avenue
  Chicago, Illinois 60630
  (312) 777-1760
  Manufacturer of mechanical sensors

- Local speedometer/tachograph shops

- Vehicle manufacturer's part distributor

The source list above is for reference only and not an endorsement of the companies or their products.

CABLE, C08902

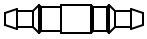
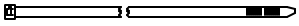
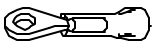
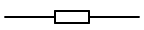
GASBOY recommends using 18 gauge twisted-pair shielded cable, Belden type 88760 or equivalent, for wire runs between the VM, T-Rings, and odometer sensor. GASBOY'S part number for this cable is C08902. The actual cable lengths required for a vehicle depend on many factors, such as vehicle type, number of tank rings, number and location of speedometer or hour meter pickups, individual installer's cable routing preference, and the location of the VM. Typical cable lengths are shown below. Follow the **Installation** portion of this manual if you need a more precise cable estimate.

Typical Cable Lengths (in Feet)

Vehicle Type	Each T-Ring	Each odometer or engine hour
Car	12	12
Light truck	12	12
Bus	15	12
OTR truck	20	20

VM INSTALLATION KIT (C06761)

Each vehicle requires one kit. This kit contains the miscellaneous hardware necessary for proper installation. If you order multiple kits, they may come in bulk packaging. The contents of the VM Installation Kit are shown below.

PART	PART NUMBER	DESCRIPTION
	C09445	QUIK CONNECT CONNECTOR
	C08898	LISTED OR R/C FUSE HOLDER
	C04044	LISTED OR R/C FUSE, 1 AMP
	C08879	TIEWRAP
	C08899	LISTED OR R/C BUTT CONNECTOR
	C09446	LISTED OR R/C RING TERMINAL
	C09447	TUBING, CORRUGATED PLASTIC
	068843	LOCKWASHER
	C09469	SELF-DRILL SCREW
	C70059	RESISTOR, 5.1K OHM 1/4W
	C09448	CLAMP, 1/8D NYLON

Vehicle Maintenance Manual

It is strongly recommended that you acquire the manufacturer's maintenance manual and wiring diagrams for the vehicle(s) that will be fitted with the Fuel Point components. They can be very helpful to refer to during installation, programming, and troubleshooting.

Section 3

INSTALLATION

TOOLS AND PARTS REQUIRED

Installation of the VM requires the following tools and additional parts:

- Electric drill
- Standard screwdriver
- Pliers
- Electrical tape
- Heat gun or mini-butane torch
- Crimp tool
- Rubber grommet assortment
- Ring terminal assortment *
- Butt connector assortment *

* These parts are required in addition to the components supplied with the C06761 VM Installation Kit. The GASBOY-supplied parts contain corrosion protection gel and they should be used whenever the GASBOY part number is called out in this section.

DETERMINE VM MOUNTING LOCATION

When determining the best place to mount the VM, there are four basic criteria to follow:

- **Select a weather-protected location.** The VM is not water-tight. Water can seep in through the connectors causing permanent damage. Therefore, it should not be located in an area where it can be exposed to water during vehicle operation or cleaning. If, after careful consideration, the only place to mount the VM is in a partially exposed area, GASBOY offers a rubber cover, C09454, which provides minimal moisture protection.

- **Consider cable runs.** Because the T-Ring is mounted in a Class I, Division I, hazardous location, its wiring is intrinsically safe and therefore cannot come within two inches of any existing wires or cable harness. Mounting the VM to minimize the T-Ring cable length makes it easier to adhere to this safety rule. The VM also requires connections to power and ground, so it should be located in an area where you can tap into these lines.

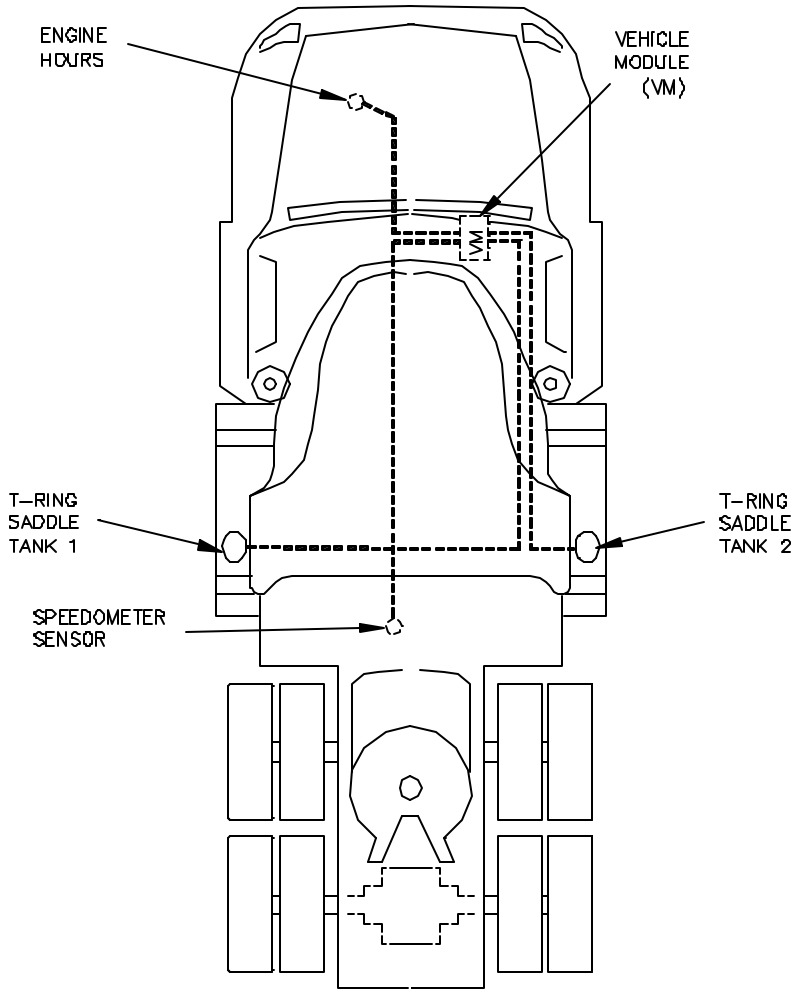
  When routing cables, it is important to keep them from coming in contact with moving parts, and keep away from parts that generate excessive heat, or areas that may impede safety. Some of these areas may be: drive shaft, fan blades, belts, adjustable steering column, foot pedals, radiator, and exhaust system.

  When routing cables, it makes for a neater installation if they can come to a common point, then travel the rest of the way to the VM in a group.

- **Maintain minimum three feet from fill pipe opening.** The VM must be kept at least three feet from the fill pipe opening. This distance must be adhered to even if the VM is mounted in the trunk, as that is not a vapor-sealed area.

- **Maintain minimum 6 inches from strong magnetic fields.** The VM should be at least 6 inches from devices with a strong magnetic field such as fan motors or speakers.

TYPICAL VEHICLE WIRE ROUTING



IMPORTANT

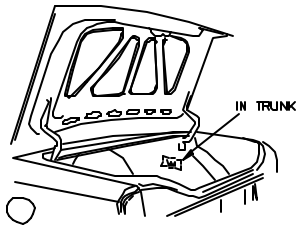
The vehicle's ABS system must not be used as a source for odometer pulses. Any Fuel Point Vehicle Modules currently installed must be disconnected from the ABS system immediately.

With electronic speed transducers, the connection should be made at one of these locations: at the buffered output side of any vehicle's control modules, such as the powertrain control module (PCM); or, if buffered output is not available, at the transmission's speed generator signal wire.

Some typical VM mounting locations are:

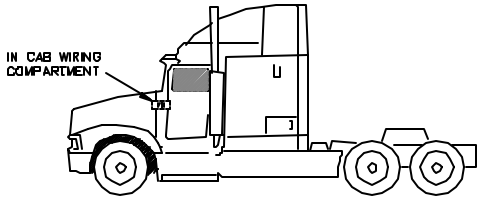
Passenger Car

In trunk or under dashboard



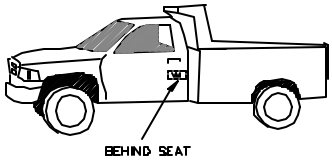
Over-The-Road Truck

Under dashboard or inside electrical panel



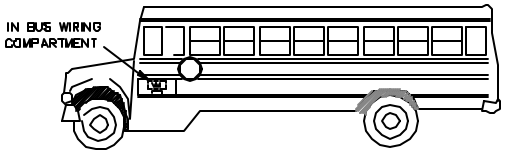
Light Truck

Under dashboard or behind seats



Bus

Under dashboard or inside electrical panel



MOUNT THE VM

Mount the VM using two C09469 drill screws at two diagonal outer holes. A pilot hole is not needed with these screws.

Important: *The rest of this section explains the wiring connections to the VM. Whenever wiring must pass through or around sharp metal or plastic, use rubber grommets or C09447 corrugated tubing to protect the wires. Use a tie wrap to keep the corrugated tubing secure.*

RUN T-RING CABLE

The T-Rings are supplied with approximately 12 inches of wire, and therefore, must be extended using C08902 cable in order to reach the VM.

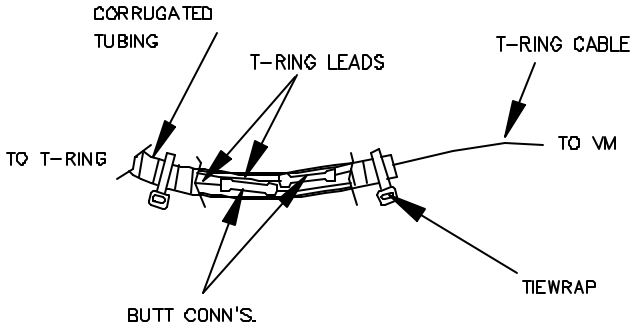
1. Starting at the VM location, run the C08902 cable to the fuel tank fill pipe. When routing the cable to the fill pipe, be sure to keep it at least two inches from any other wires in order to preserve the intrinsic safety. The cable should also be routed away from moving parts, parts that get hot, or parts that may impede safety. If the fill pipe is surrounded by a metal or plastic shroud, a hole must be drilled to allow the cable to pass through. Since power tools cannot be used in a Class I, Division I location, you must remove the shroud, take it to a safe place, drill the hole, then re-attach the shroud.

2. When installing T-Rings on a truck with flat saddle tanks, the cable must be protected if people walk or stand on the tank. Run the cable through a length of brake tubing, securing it to the tank straps using C08897 tie wraps.

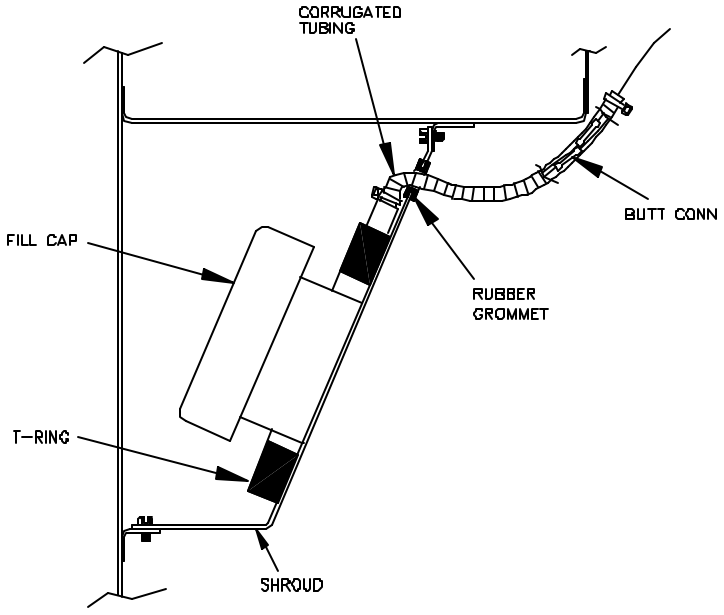
3. At the fill pipe end of the cable, strip off about 2 inches of outer insulation. Peel back the foil and cut it where it exits the insulation. Cut the drain wire back also. Strip off 1/4 inch of insulation from each wire of the cable and 1/4 inch from each wire of the T-Ring. Crimp a C08899 butt connector onto each T-Ring wire. Crimp the other end of the butt connectors to the cable. You don't need to match any wire colors because there is no polarity on the T-Ring circuit. The butt connectors shrink to form a moisture-tight seal around the wires when heated. Use a heat gun, miniature butane torch, or cigarette lighter to shrink and seal the butt connectors.

WARNING! When heating the shrink connectors, pull the T-Ring cable to position the connectors at least 3 feet from the fill pipe opening to avoid an explosion.

4. Cover the T-Ring wires and connections with a 12-inch piece of C09447 corrugated tubing. Add a C08897 cable tie to keep the tubing in place.



5. Remove the fuel cap. Press the T-Ring over the fill pipe. Replace the fuel cap, making sure it seals properly onto the fill-pipe. If the fuel cap bottoms-out on the T-Ring prior to sealing on the fill-pipe, a thinner T-Ring must be used. Pull the cable slack back to the VM location and cut the cable, leaving about 12" slack.



6. Repeat Steps 2 through 5 if using a second saddle tank T-Ring. Use C08879 cable ties throughout, to keep the cables in place on the vehicle.

RUN ENGINE HOURS CABLE (SKIP IF RECORDING ODOMETER ONLY)

To record engine hours, a length of C08902 cable must be connected between the VM and a point in the vehicle that provides a HOT (battery voltage) signal while the engine is running, and an OFF (zero volts) when the engine is off. Check the vehicle's wiring diagram to determine the best connection point.

1. Starting at the VM location, run the C08902 to where the HOT engine-on signal is found. At the signal end of the cable, strip off 2 inches of outer insulation. Peel back and cut the foil. As only the white wire is needed, cut off the drain wire and black wire. If you are tapping off of the fuse block, use an appropriate connector from your stock. If you are splicing into an existing wire, follow one of the recommended crimping methods, A or B, described in **Engine Hour and Electronic Odometer Crimping Instructions**.
2. Pull the cable slack back to the VM location and cut the cable, leaving about 12" of slack. Use C08879 cable ties throughout the length of the cable to keep it secured to the vehicle. The connections to the VM side will be performed later in this section.

RUN ELECTRONIC ODOMETER CABLE (SKIP IF RECORDING HOURS ONLY)

If the vehicle contains an electronic sensor, it is usually found where the transmission or transaxle connects to the drive shaft. If the electronic sensor is not easily accessible, you may be able to tap into the odometer signal on a wire harness from the vehicle computer or electronic dash. Check the vehicle's wiring diagram to determine the correct speedometer connection point.

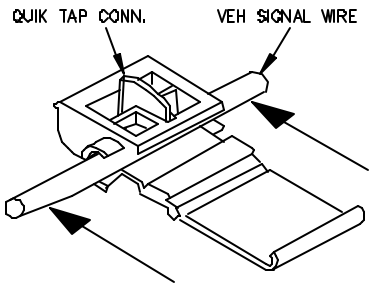
1. Starting at the VM location, run the C08902 to where the electronic odometer signal is found. At the signal end of the cable, strip back 2 inches of outer insulation. Peel back and cut the foil. As only the white wire is needed, cut off the drain wire and black wire. Follow one of the crimping methods, A or B, described in **Engine Hour and Electronic Odometer Crimping Instructions**.
2. Pull the cable slack back to the VM location and cut the cable, leaving about 12" of slack. Use C08879 cable ties throughout the length of the cable to keep it secured to the vehicle.

ENGINE HOUR AND ELECTRONIC ODOMETER CRIMPING INSTRUCTIONS

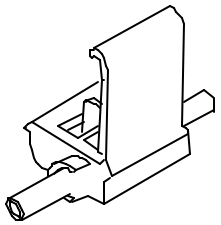
The methods used to connect to the engine hour and electronic odometer signals are dependent upon the gauge of the existing wiring. Use method A if the existing wiring is 16-18 gauge, and method B if it is 20-22 gauge. In either case, only the white wire from the C08902 cable is needed. Cut the black wire, drain wire, and foil shield after removing about 2" of outer cable jacket.

Method A for 16-18 Gauge Wiring

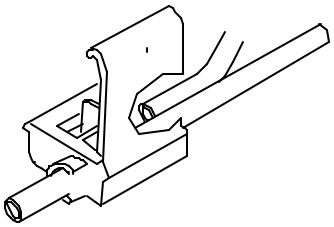
1. Unsnap a C09445 quick tap connector to the flat position and place the vehicle's signal wire into the through-section of the connector. The connector is gel-filled for corrosion protection.



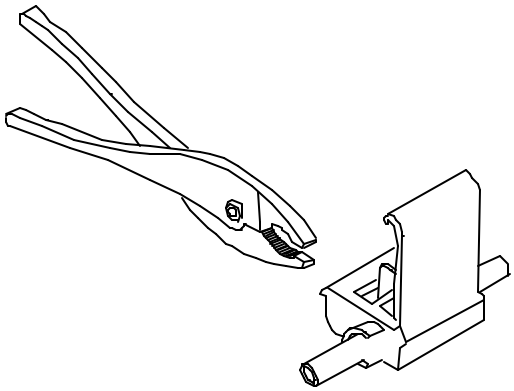
2. Close the connector to a 90^{o} position to keep the wire in place.



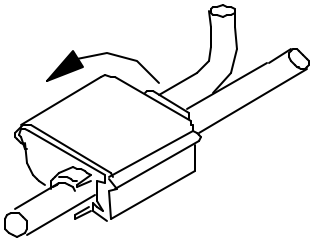
3. Insert the white wire from the C08902 cable into the butt-section of the connector.

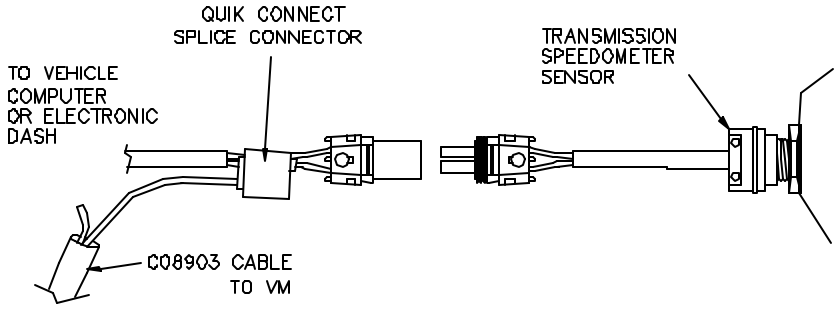


4. Using pliers, squeeze the quick tap connector so that the metal piece presses into both wires.



5. Snap the cover onto the connector.



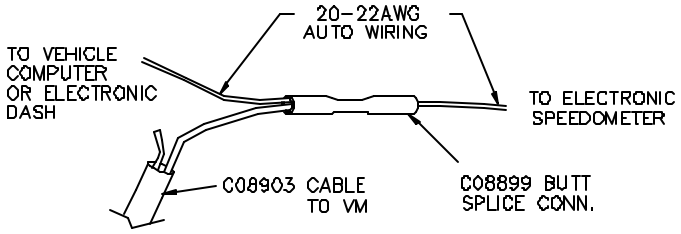


Typical Application Using Crimp Method A

Method B for 20-22 Gauge Wiring

1. Cut the vehicle's signal wire and strip off about 1/4" of insulation from each end, and 1/4" from the white wire of the C08902 cable. Twist the C08902 wire and one of the vehicle wires together.

2. Crimp a C08899 butt connector onto the twisted wires. Crimp the other side of the connector onto the other cut vehicle wire. The butt connector shrinks to form a moisture-tight seal around the wires when heated. Use a heat gun, miniature butane torch, or cigarette lighter to shrink and seal the butt connector.



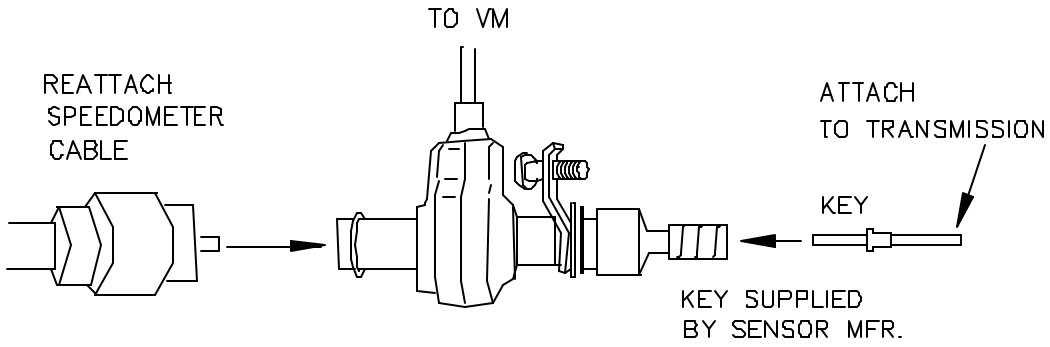
WARNING! When heating the shrink connector, make sure it is positioned at least 3 feet from fuel lines or batteries, in order to avoid an explosion.

RUN MECHANICAL SENSOR CABLE (SKIP IF USING ODOMETER SENSOR OR RECORDING HOURS)

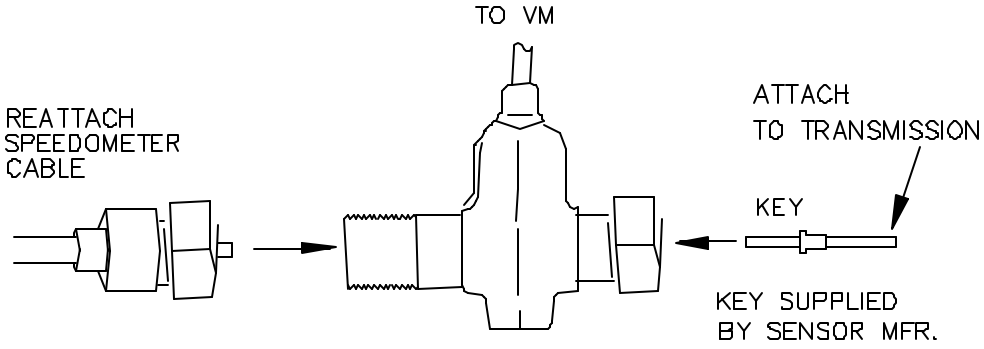
If the vehicle gets its odometer signal from a mechanical speedometer cable, you will need to purchase a mechanical speedometer sensor. This sensor is mounted where the mechanical cable exits the transmission. Try to order the sensor with enough cable length to reach the VM without splicing. If you are unable to purchase a sensor with long enough cable, you will need to splice a length of C08902 cable to a two-wire sensor or two lengths of C08902 cable to a three-wire sensor.

1. To splice cable to lengthen the sensor wires, strip back about 2 inches of outer cable jacket from the sensor and the cable. Peel back and cut off the foil shield and drain wire. Strip 1/4" of insulation from each of the wires. Crimp the wires together using C08899 butt connectors. Use a heat gun, miniature butane torch, or cigarette lighter to shrink and seal the butt connectors. Take note of the wire colors so you know how to connect them at the VM end.

2. Detach the speedometer cable from the transmission, being careful not to lose any O-ring that may be present. Install the O-ring onto the mechanical sensor and attach it to the transmission. Check for fluid leaks. Attach the speedometer cable onto the mechanical sensor. Run the cable to the VM location and cut the cable, leaving about 12" of slack. Use C08879 cable ties throughout the length of the cable to keep it secured to the vehicle.



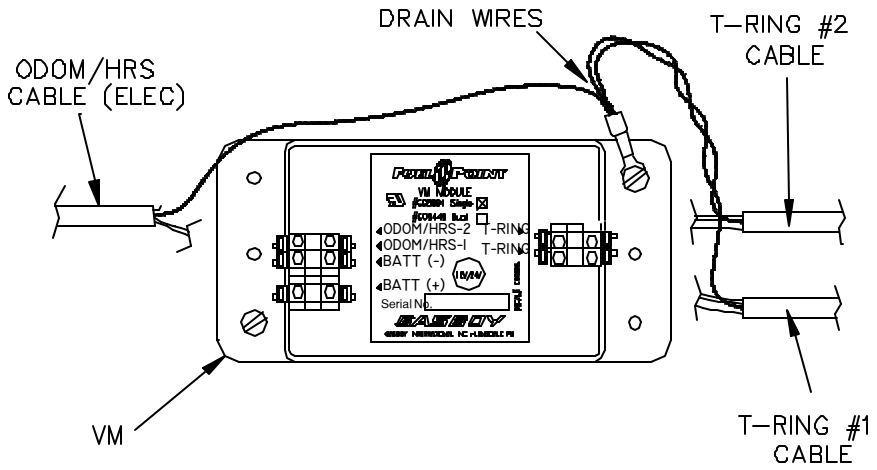
O-Ring Transmission Connection



Threaded Transmission Connection

SECURE ALL DRAIN WIRES

1. Strip back 6 inches of outer jacket from the T-Ring cable(s). Cut the foil back. Strip back 4 inches of insulation from the engine hour and/or odometer signal cables. Cut the foil back. Twist all of the T-Ring, engine hour, and speedometer signal cable drain wires together. Crimp a ring terminal from your stock onto the twisted drain wires. Attach the wires to a chassis ground point near the VM. If necessary, crimp an extension wire to lengthen the drain wire assembly. Use a 068843 lockwasher both above and below the ring terminals. You can use one of the existing VM mounting holes as the drain wire ground point, as long as it is mounted on a metal surface with a good chassis ground. The resistance between the drain wire ground point and the negative battery terminal should be less than 20 ohms. If more than 20 ohms is measured, you will need to run a wire between the drain wire point and the negative battery terminal. Wrap the bare drain wires with electrical tape to prevent an accidental short to nearby live components.



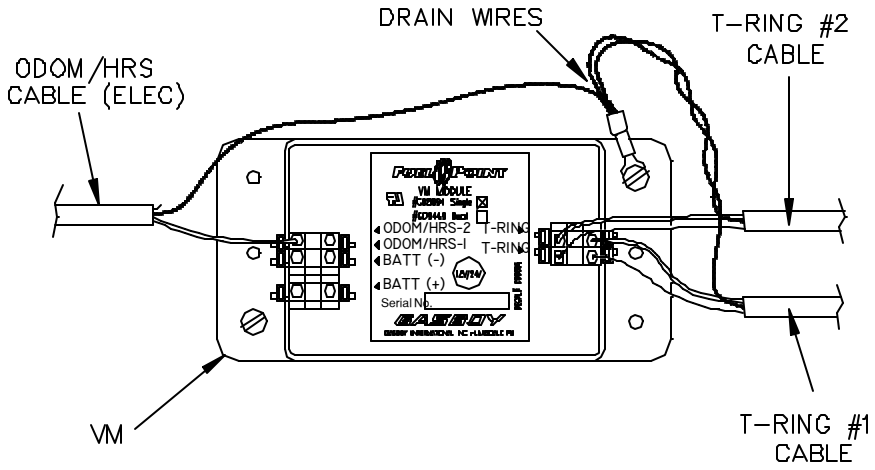
USING THE VM WIRE CONNECTORS

1. To insert wires into the VM connectors, strip back 1/2" of insulation. Twist the strands together. Using a small blade screwdriver, push down on the orange tab while inserting the wire into the hole near the tab you are pushing. Release the tab so it springs back into place. Gently tug on the wire to verify it is held firmly.

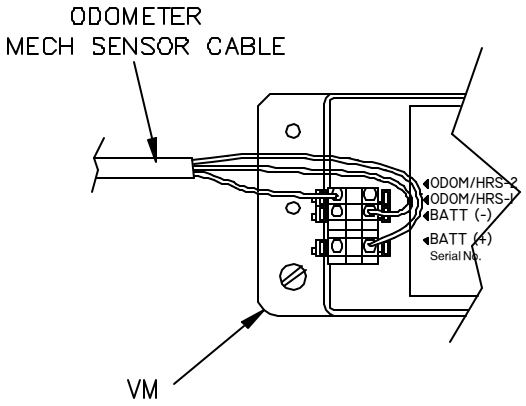
CONNECT T-RING AND SIGNAL WIRES

1. Strip and insert the T-Ring wires into the VM **T-RING** connectors. The VM can handle up to two T-Rings. When looking at the VM so the T-Ring connectors are on the right, the two outside vertical holes are for one T-Ring and the two inside vertical holes are for another. There is no polarity on the T-Ring wires.

2. Strip and insert the engine hours and/or odometer signal wires into the VM **ODOM/HRS 1** and **ODOM/HRS 2** connectors. For a dual VM that will be used for recording both odometer and engine hours, always use ODOM/HRS1 for the odometer and ODOM/HRS2 for the hours input.



For mechanical sensors, there may be a power, ground, and signal wire needed. Check with the sensor manufacturer for wire color code. Those connections can be made on the VM's unused **BATT (+)**, **BATT (-)**, and **ODOM/HRS** connectors.



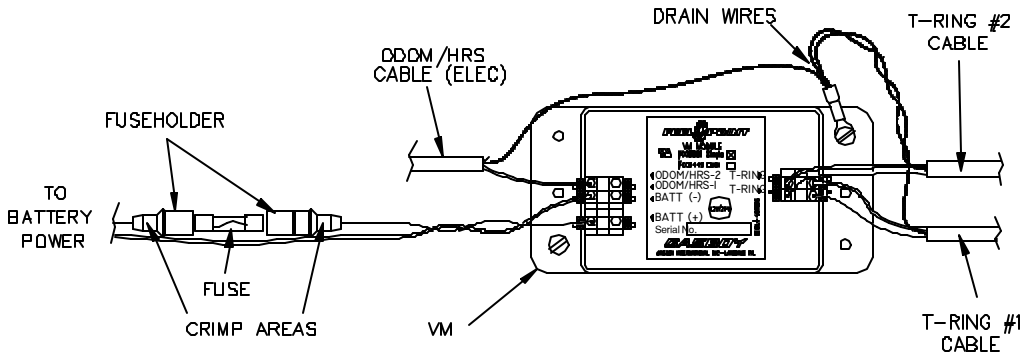
CONNECT THE POWER

1. Good power and ground connections are critical for proper VM operation. Run separate 18 gauge wires from the battery positive and negative terminals to the VM. Do not branch off power from other equipment or circuits. Use C09446 ring terminals to connect to the battery. If available, use different colors for the **+** and **-** wires. Also, try to use those same colors for the entire fleet. It will make future servicing that much easier.

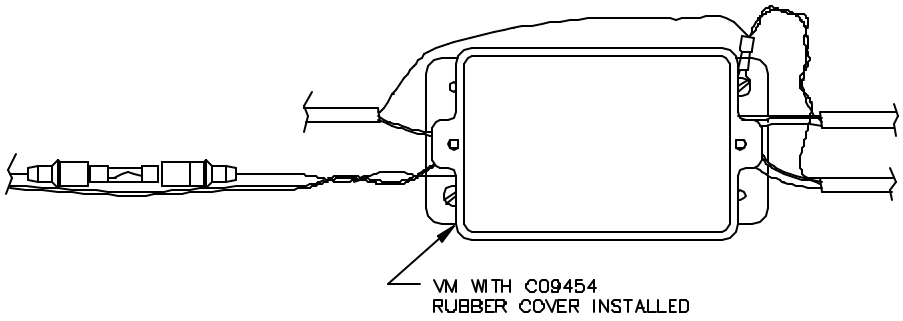
2. Strip and insert the battery ground wire into one of the VM holes marked **BATT (-)**.

3. Pull the two halves of the C08898 fuseholder apart. Strip, insert, and crimp the power wire into one of the fuseholder halves. Strip, insert and crimp a 12" length of 18 gauge wire into the other fuseholder half. Strip and insert the 12" wire into one of the VM holes marked **BATT (+)**.

4. Push the C04044 fuse into one of the fuseholder halves. Push the other fuseholder half onto the fuse until it stops.



5. If the VM is mounted in an area where it may be affected by moisture, install a C09454 cover. Push the cover over the VM, being careful that the wires don't pull out of the VM. You may secure the cover using two C09469 drill screws.



PROGRAMMING AND TESTING

Refer to the Vehicle Module Programming Manual C35700 for instructions to program, calibrate, and troubleshoot the VM.

WARRANTY

General Statements:

Gasboy International LLC. warrants all new equipment manufactured by Gasboy against defective material and/or workmanship, for the warranty period specified below, when the equipment is installed in accordance with specifications prepared by Gasboy.

This warranty does not cover damage caused by accident, abuse, Acts of God, lack of surveillance of automatic recording systems, negligence, mis-application, faulty installation, improper or unauthorized maintenance, installation or use in violation of product manuals, instructions, or warnings. Under no circumstance shall Gasboy be liable for any indirect, special, or consequential damages, losses, or expenses to include, but not limited to, loss of product, loss of profits, litigation fees, or the use, or inability to use, our product for any for any purpose whatsoever.

Parts Only - During the warranty period, Gasboy will, at its option, repair or replace defective parts returned transportation prepaid to its factory.

On-Site Labor Included - Gasboy will also provide, within the Continental United States and during the warranty period, the services of an Authorized Service Representative (ASR) for on-site repair or replacement of defective parts.

Replacement Parts - Any system components that are not part of the original system order, including Island Card Readers, Pump Control Units, etc., are considered replacement parts.

Equipment	Term	Coverage
Commercial Pumps and Dispensers Full-Cabinet Consumer Pumps	One year from date of installation or 18 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.	Parts and Labor.
Small Transfer Pumps, Meters, Pressure Regulators	One year from date of installation or 18 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.- Excepting the Model 2020 Hand Pump, which has a 90-day warranty from date of GASBOY International's invoice.	Parts Only.
Keytrol	One year from date of installation or 18 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.	Parts and Labor.
Fuel Management Systems: - CFN/ Profit Point - Series 1000/Fleetkey - TopKAT - Fuel Point Readers (sold with new systems)	One year from date of start-up or 15 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.- The basic warranty only applies to systems which have been started up by a Gasboy Authorized Service Representative (ASR).	Parts and Labor.
Additional Fuel Point Items: - Fuel Point Readers sold for retrofitting existing systems. - Fuel Point vehicle and dispenser components.	One year from date of start-up or 15 mos. from date of Gasboy International's invoice to the purchaser, whichever comes first.	Parts Only.
Encoders, Embossers, Modems, CRTs, and Logger Printers	Purchased with Fuel Management System (Encoders, Embossers only): 90 days from the date of start-up by a Gasboy ASR, or 180 days from date of Gasboy International's invoice, whichever occurs first. Purchased with Fuel Management System (Modems, CRTs, and Logger Printers only): Matches system warranty. Purchased Separately: 90 days from date of Gasboy International's invoice to the purchaser.	Purchased with System (Encoders, Embossers only): Parts only. Purchased with System (Modems, CRTs, Logger Printers only): Matches system warranty. Purchased Separately: Parts Only.
Air Diaphragm Pumps	Three years from date of purchase (for full warranty description, see Price List).	Parts Only.
Items not manufactured by Gasboy (ex. automatic nozzles, hoses, swivels, etc.)	Not warranted by Gasboy International (consult original manufacturer's warranty).	Not Applicable.
Replacement Parts	One year from date of Gasboy International's invoice to the purchaser.	Parts Only.

To the extent permitted by law, this warranty is made in lieu of all other warranties, expressed or implied, including warranties of freedom from patent infringement, or merchantability, or fitness for a particular purpose, or arising from a course of dealing or usage of trade. No one is authorized to vary the terms of the warranty nor may anyone make any warranty of representation, or assume any liability other than that herein stated, in connection with the sale described herein. The acceptance of any order by Gasboy International is expressly made subject to the purchaser's agreement to these conditions.

GASBOY

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