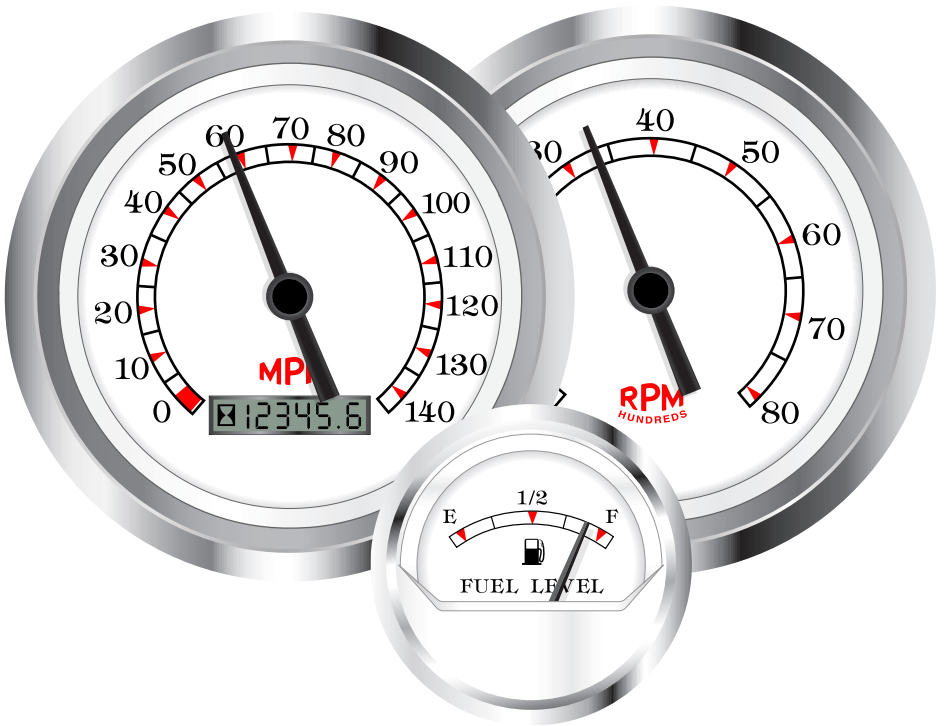




**NEW VINTAGE USA  
DETROIT**

## HERITAGE GAUGE KIT INSTALLATION INSTRUCTIONS



## INDEX

THE BASICS	pg.2
FUNCTIONS AND SENDERS	pg. 2
TACHOMETER OPERATION	pg. 6
SPEEDOMETER OPERATION	pg.4-5
TROUBLESHOOTING	pg.12
WIRING DIAGRAM	pg.7-10

Thank you for choosing New Vintage USA products. We strive to provide the finest quality and design components available on the market. If you need technical assistance, please call 248.850.5482 or email [info@newvintageusa.com](mailto:info@newvintageusa.com)

### New Vintage USA 5-Year Warranty

New Vintage USA warrants all merchandise against defects in workmanship and materials for 60 months. After the 60 month period, a pro-rated service fee of no more than 50% production costs may be applied. This warranty applies to all instrumentation products, excluding senders. The warranty does not apply to a product used in a manner for which it was not designed, or if it has been altered in any way.; New Vintage USA LLC is not responsible for any damage or costs associated with any product that has been purchased. This is a limited warranty as identified in the Magnuson-Moss Warranty Act of 1975.

### Warranty Service

Service can be obtained during the normal warranty period by contacting New Vintage and obtaining a Return Authorization Number (RZA#). New Vintage will repair or replace any item found to be defective and return ship to no cost via ground or post office services. Other shipping/international services will be applied at additional cost. Buyer is responsible for shipping to New Vintage for warranty repair. Return shipping will be the responsibility of the customer if the product is found to be damaged or out of warranty. An RZA number must be obtained and proper return/warranty form accompanied with the product.

### Missing items>Returns

Missing items/returns must be processed within 15 days of end user receiving the product. All returned must be shipped back to the place of purchase. Any return shipping costs to New Vintage are the responsibility of the purchaser. An RZA number must be obtained and proper return/warranty form accompanied with the product. A restocking fee not to exceed 10% may be applied to items that must be repackaged. Any item returned in a non-usable condition will be returned or charged to the customer.

Missing items must be reported within 15 days of receiving the product. Items found to be missing will be shipped via ground or postal service at no charge. Expedited/international shipping options are available at an additional charge. It is the policy of New Vintage to quickly replace any items that may be missing in a timely manner but not to overnight or expedite shipping in any way at no cost.



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NVU Heritage instrument series kits contain some of the most advanced technology on the market today. A unique blend of microprocessor controlled stepper motors, air core meters and rugged, durable cases and connections based on military, commercial and marine applications create kits that have all the features you want with a durable, long lasting structure. Individual gauges and kits are designed to work in conjunction with PCMs, senders and transducers.

### **Installation basics:**

Use at a minimum stranded wire with a thickness of 20ga

Keep wire, connectors, solder, heat shrink and zip ties available for installation

#8 ring terminals may be used to form studded connections.

Tie common connections together such as power, ground, lighting

Use 1A fuse for up to 8 gauges

Properly ground your gauge kit to a chassis ground and check the main black and battery grounds

Senders require a ground connection, ensure this ground is clean

Sender threads: Senders that are grounded through the base should not use sealant on the threads, this will degrade the ground to the sender. If sealant is required, use it at the top of the threads so the bottom threads will bite into the base material

Sender threads: All senders have a 1/8-27 pipe thread. If a different size is required, bushings that can adapt to other sized can be used as well as elbows and extensions to aid in fitment.

Speed senders (also covered later in this book)

The speedometer can operate from any input pulse sender (including GPS)

**LED LIGHTING:** All Heritage kits have LED backlit dials. The lighting required a 12V source to power the lamps. Connect the lighting to your parking lamp switch, not the stock rheostat. If dimming is desired, LED dimmers are available.

The LED lighting on the Heritage gauges is integrated to the circuit board. The blue night lighting of the Heritage gauges is accomplished by using blue LEDs on the circuit board

## 2-1/16" GAUGES:

All Heritage short sweep have a 90 degree sweep that operates on resistance to ground through a sender or voltage input (voltmeter only). You must use the senders included in the kit or a sender that matches the gauge.

### Connections:

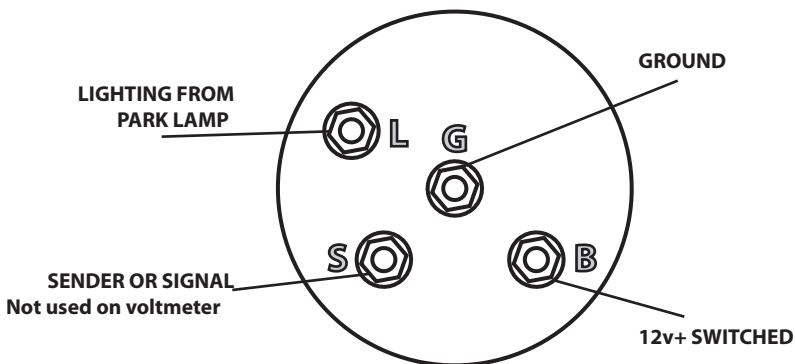
Per the drawing, wire power, ground, lights, signal to the appropriate connections. It is best to commonize or "daisy chain" the power, ground and light circuits and then lead the termination from one gauge. The sender/signal wire will run to its respective sender

**Oil Pressure:** The sender is a 240-33 ohm and matches the gauge, thread size is 1/8-27 NPT. This sender/range MUST be used for the gauge to operate properly. Install the oil pressure sender in an appropriate location, the use of adapter bushings, extensions, elbows, T-fittings may be required to achieve your desired mounting. This will not affect the performance of the sender or gauge and is normal procedure. You may use a sealing compound or tape to prevent leaks but keep the sealant near the top of the threads so the bottom will "bite" into the block and maintain a proper ground.

**Water Temperature:** The temperature sender is a Datcon style "low match" sender with a 240-33, the thread size is 1/8-27 NPT. This sender/range MUST be used for the gauge to operate properly. Install the sender in a location that the probe will be in the coolant. The most common locations are in the cylinder head or intake manifold BEFORE the thermostat.

**Fuel level:** The fuel level gauge in this kit is a 0-90 ohm input. It is designed to operate properly with a GM style fuel level sender. 0 ohms empty, 90 ohms full. If your kit included a fuel sender, it will be a 0-90 ohm with adjustable length for universal use. Follow the instructions with the sender for installation details. This fuel gauge will also operate on any OE 0-90 GM fuel sender.

**Voltmeter:** The voltmeter measures vehicle voltage. Do not connect directly to the battery, the voltmeter should be reading running system voltage. **Jump the sender post to the 12V+ power to read vehicle voltage**



## TACHOMETER

GEN II Tachometers accept a wide variety of signals from many sources. Knowing where you will be picking up your signal will aid in setting up and programming your tachometer. You can pick up your tach signal easily by following the instructions and charts below:  
Traditional coil: Points or electronic ignition (HEI)- Typically tachometer is connected to the ground side of the coil, this is where the signal comes in to charge and release the coil with each firing. The programmable tachometer also has an hour-meter to allow tracking of vehicle use for maintenance and a digital tachometer, tap the button during normal operation to cycle through these two LCD window options.

## WIRING

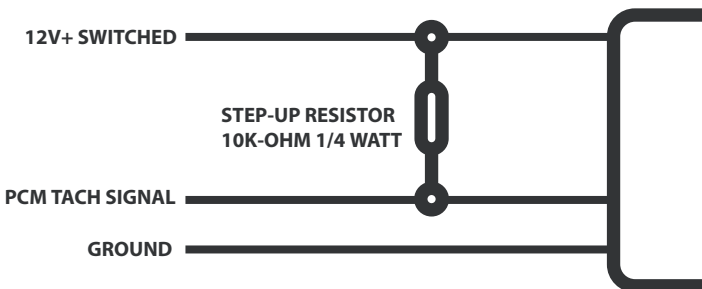
Use a good grade stranded automotive grade wire of at least 20 GA. Each connection should be soldered and shrink-wrapped or connected with covered butt connectors. While soldering butt connectors is not mandatory it can't hurt. Follow the chart below for wiring schematic:

TACHOMETER WIRING	
COLOR	USE
RED	SWITCHED 12V POWER
BLACK	GROUND
GREEN	LED BACKLIGHTING
YELLOW	OPEN COLLECTOR SHIFT OUTPUT #1
BROWN	OPEN COLLECTOR SHIFT OUTPUT #2
GRAY	OPEN COLLECTOR SHIFT OUTPUT #3
WHITE	REMOTE RESET BUTTON:CONNECT TO 12V SWITCHED
BLUE	SIGNAL FROM SIGNAL SOURCE

**Coil On Plug (COP)** ignitions are the same as above but the cylinder selection should be set to 1 cylinder as the signal will be picked up on one coil and the tachometer believes it is reading a one cylinder engine.

**Electronic HEI or CDI box:** Capacitive Discharge Ignitions (CDI or commonly called MSD) have a tachometer output terminal on the box itself or on the distributor. This emits a 5V or 12V square wave, much like a speedometer signal. Many newer HEI ignitions have a hall effect signal output, simply labeled TACH.

**PCM or ECM (computer)** Most PCMs (Powertrain Control Modules) Have a tachometer output signal. All GM PCMs have a tach output with a 4 cylinder signal. It is also an open collector which requires a pull up resistor to convert it to a 12V square wave. Install a 10K, ¼ watt resistor as shown below to operate your tachometer on a GM PCM.



**Alternator:** You can pick up a signal from your diesel or other system by tapping into the W terminal on the alternator. The Pulses Per Revolution (PPR) can be adjusted to “dial-in” the gauge using a known tachometer reading.

**Crank, cam or other engine mounted trigger:** There are several other ways to pick up a tachometer signal on a vehicle without an ignition system or an engine that does not have a traditional system. A sender can be installed on the crankshaft, flywheel or camshaft. Many diesel engines already have such devices and can be tapped into for reading engine speed. These senders usually have 2 wires, one ground, and one signal. Be sure to tap into the signal wire. To calibrate the signal you will either need to know the number of pulses per revolution or you can manually calibrate the tachometer using a known speed source to adjust as needed.

### DIP SWITCH SELECTION CHART

TACHOMETER INPUT TYPE	DIP-SWITCH SEL.	USES
NEG. SIDE OF COIL	ON-ON-OFF	TRADITIONAL COIL
HALL EFFECT (HEI LOW)/MAG PICKUP	ON-ON-ON	COIL WITH DIGITAL OUTPUT (MODERN HEI)
ALTERNATOR W INPUT	ON-ON-OFF	ALTERNATOR OR CRANK TRIGGER
CDI BOX OR PCM INPUT	OFF-OFF-OFF	MSD OR SIMILAR IGNITION BOX

**NOTE: NEVER HAVE SWITCH 3 IN ON POSITION WHEN USING COIL DAMAGE WILL RESULT  
PCM/LS TACH: USE PULL UP RESISTOR AND HALL EFFECT SIGNAL**

#### To set the PPR (Pulses Per Revolution)

Enter the configuration menu by:

-Turn on the key, the tachometer will start its full sweep self-calibration, as the pointer approaches zero, tap the programming button.

Then cycle through the menu items by pressing programming button until you reach **Set Pulses Per revolution**

The image shows a digital LCD display with the text '5E PPR' in a stylized, segmented font. The '5' is the largest and most prominent digit, followed by 'E', 'P', 'P', and 'R'.

# CYLINDER	PPR
1	0.5
2	1
4	2
6	3
8	4
10	5
12	6

-Hold button in for 3 seconds.

-LCD will display 5 digits, the first will be flashing. After a few seconds the flashing number will move on to the next digit. When you approach the correct position press the button to advance the number. Wait a few seconds and it will move on to the next position, set and repeat for each position required. Once all digits are set, the display will flash indicating successful programming.

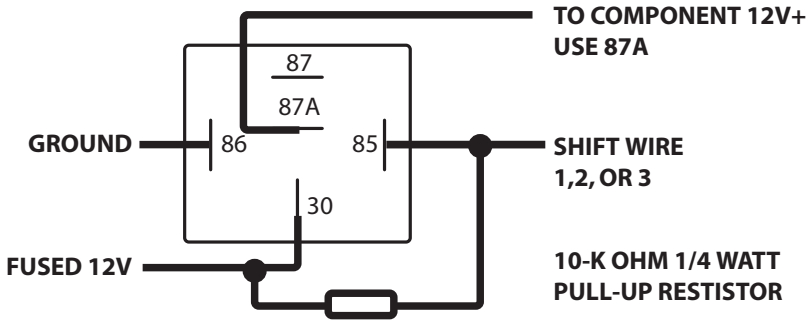
-Push button momentarily while digits are flashing to confirm the setting.

-LCD will show DONE

-LCD will return to hours

#### Operating and setting the shift outputs.

The GENII tachometers have 3 set-able shift outputs. Each is an open collector-off which is designed for use on heavy equipment and military vehicles for speed and shift outputs to controllers. These outputs can be easily converted to different uses using NVU shift adapters or a collection of inexpensive relays and a few resistors. The outputs can control nitrous application shutoff, rev limiters or an external shift light. See the diagrams below for uses of the shift outputs and how to install them as needed.



Proper use of shift output function to trigger a 12v source using a relay. Use 87A (normally closed) to power accessory. Open collector signal will power relay to open circuit during operation with pull up resistor. When OC signal ceases, relay will close triggering relay

### SETTING SHIFT OUTPUTS

Enter the configuration menu by:

- Turn on the key, the tachometer will start its full sweep self-calibration, as the pointer approaches zero, tap the programming button,
- Hold the button for 3 seconds

Then cycle through the menu items by pressing programming button until you reach SET S1, set S2 or set S3



All 3 shift points are configured in the same manner; tap the button to scroll to the shift setting you desire. To turn off a setting set the RPM to maximum on dial or a value the engine will never operate at.

Once you are on the shift lamp number you desire:

- Hold button in for 3 seconds.
- LCD will display 5 digits, the first will be flashing. After a few seconds the flashing number will move on to the next digit. When you approach the correct position press the button to advance the number. Wait a few seconds and it will move on to the next position, set and repeat for each position required. Once all digits are set, the display will flash indicating a successful programming.
- Push button momentarily while digits are flashing to confirm the setting.
- LCD will show DOnE
- LCD will return to hours

### SPEEDOMETER

The GENII electronic programmable speedometer is one of the most advanced speedometers available on the market today. It will accept most any speed signal from any sender. The unit can be programmed manually by entering the PPM (pulses Per Mile) or by driving a measured mile (or Kilometer)

Use a good grade stranded automotive grade wire of at least 20 GA. Each connection should be soldered and shrink-wrapped or connected with covered butt connectors. While soldering butt connectors is not mandatory it can't hurt. Follow the chart below for wiring schematic:

## SPEEDOMETER WIRING

COLOR	USE
RED	SWITCHED 12V POWER
BLACK	GROUND
GREEN	LED BACKLIGHTING
YELLOW	OVERSPEED OUTPUT (OPTIONAL)
BROWN	NOT USED
GRAY	NOT USED
WHITE	REMOTE SWITCH RESET BUTTON:CONNECT TO 12V SWITCHED
BLUE	SIGNAL FROM SPEED SOURCE

### SPEEDOMETER PROGRAMMING

All GENII speedometers have functions you come to expect from NVU. Speedometer accept signals from most any speed sender, GPS sender or PCM output up to 64,000 Pulses Per Mile (PPM) This should suffice for most applications. Speedometers also have programmable service intervals that can allow for proper vehicle maintenance. While a carryover from fleet vehicles, the overspeed output can also be programmed to trigger a lamp at a certain speed.

The speedometer can be programmed by driving a measured mile or manually. If you know the proper pulse count, manual calibration is recommended, If you prefer to set the speedo manually to start then do your measured mile that is also a good way to get on the road quickly. Below is a chart of signal inputs and rough PPM settings.

SPEED SENDER PPM VALUES	
SIGNAL TYPE	PPM
3 WIRE HALL EFFECT SENDER	16,000
2-WIRE SENDER (CABLE OUTPUT)	8,000
GPS SENDER	8,000 OR 16,000
GM PCM	4,000
2 WIRE OE INTEGRATED SENDER	40,000

### SPEEDOMETER SIGNALS

All GENII speedometers will accept a speed signal from just about any speed signal sender or PCM output. Below is a brief description of each signal type followed by a chart for input DIP-Switch settings for optimum use. NOTE: if you have a speedometer that is functioning but may have erratic movement at certain speeds, experimentation with switching DIP-Switch 1 and 2 may help with stabilizing the pointer readout. This will not cause any damage when properly reading from a speed signal source.

#### HALL EFFECT SENDER

This type of sender is identified by having 3 wires. The sender uses power and ground to create a square wave signal which is alternating positive and negative. The speedometer reads each alternating "pulse". These are commonly used on cable-output senders which replace the traditional cable on the transmission.

#### AC SINE WAVE SENDER

Commonly referred to as a pulse generator. This unit is identified by 2 wires, one is a ground one is the signal. This type of sender also is commonly used to replace the cable on the transmission. This type creates an AC sine wave signal, which has 2 components: amplitude and frequency. The sender generates an AC voltage, typically between 8-18 volts which is the strength, or amplitude. The rate that the voltage alternates (AC like in your home) is the frequency, which is the "pluses" the speedometer reads.



## MAGNETIC PICKUP

This sender is the exact same as the AC sine wave pulse generator above but it is usually installed in the transmission at the factory. The sender or "pick-up" bolts into the transmission and a reluctor (toothed) ring spins below it. As each tooth passes a "pluse" of AC voltage is generated and is sent to the speedometer. This type of sender also must generate 8-18v to operate properly. There are also variants on this sender that mount on the axle or driveshaft but the principle is the same.

## PCM/COMPUTER

Very popular in the past decade, most OE and aftermarket PCMs will read the speed signal from the speed sender and output a speed signal (often called VSS or vehicle speed signal). It is usually a 5V square wave (hall effect) and sometimes an AC sine wave. The connection is the same, simply run the VSS signal to the speed sender input on the speedometer.

## GPS SENDER

This type reads the vehicle position and calculates speed, then a microprocessor directs the unit to send the appropriate number of pulses to the speedometer unit. The only thing to do when setting up this type of sender is to make sure the speedometer and GPS unit are in sync with the proper number of pulses. For example, your GPS unit outputs 8,000 PPM (Pulses Per Mile) you need to set the speedometer manually to 8,000 PPM so that they are both at the same setting.

SPEEDOMETER INPUT TYPE	DIP-SWITCH SEL.	USES
ANY SIGNAL WITH 12V LOGIC PULSE (ECU, PCM)	ON-ON-OFF	PCM W/12V WAVE
MAGNETIC PICKUP (2-WIRE OR OE SPEED SENDER) 2.1V MIN	ON-ON-ON	AC SINE WAVE
HALL EFFECT SENDER (3-WIRE)	ON-ON-OFF	HALL EFFECT OR PCM
LS ENGINES USE 12V LOGIC OR HALL EFFECT	-	-
S1 CAN BE OFF IF ERRATIC AT HIGH SPEED	-	-
S2 OFF MAY AID IN STABILITY	-	-

## SETTING THE SPEEDOMETER

To make any changes to the speedometer the Configuration menu must be accessed. Enter the configuration menu by:

-Turn on the key, the speedometer will start its full sweep self-calibration, as the pointer approaches zero, tap the programming button, the LCD will light to indicate the button is functioning.

Hold the button for 3 seconds

You can now scroll through the different functions in the menu to access the area you will be making changes that you may need to. The Speedometer has 3 main menu functions:

Clear trip Odometer

Set high speed indicator: Optional, commercial and military feature.

ConFI9 Configuration menu: Used in programming and setting functions

To enter any of the menus above hold in the button for 3 seconds while in that mode.

## CLEAR TRIP ODOMETER

Hold button 3 seconds  
Trip ODO resets to zero  
LCD returns to OD display

## HIGH SPEED INDICATOR(optional)

HS-Ind Set high speed indicator  
Hold button 3 seconds  
LCD 3 digits displayed xxx  
Push button momentary to increment each digit in turn.  
All digits flash after last digit is set  
Push button momentary while digits flash to confirm set.  
LCD displays donE  
LCD returns to total ODO.

## CONFIGURATION MENU



Configuration menu

Hold button 3 seconds  
Push button momentary to scroll through each menu (below) in turn:



Clear service counter-OPTIONAL



Set service counter-OPTIONAL



Set pulses per mile calibration USE IF PPM IS KNOWN



Drive to set pulses per mile calibration.-MOST COMMON CALIBRATION PROCEDURE

Hold button 3 seconds will go each above sub-setup menu

## CLEAR SERVICE COUNTER

Use this function to clear out the service warning from the speedometer once the service interval has been reached (miles)

ClrSEr Clear service counter

Hold button 3 seconds, LCD display ClrSEr flashes

Hold button while digits flash to confirm clear .

LCD displays donE, LCD returns to display total ODO.

## SET SERVICE COUNTER-OPTIONAL

Use this function to set the speedometer to alert service intervals (change oil every 3,000 miles, rotate tires, etc)

SetSEr Set service counter

Hold button 3 seconds

LCD displays 6 digits xxxxxx, Push button momentary to increment each digit in turn.

All digits flash after last digit is set, Push button momentary while digits flash to confirm set.

LCD displays donE, LCD returns to total ODO.

## MANUALLY INPUT PULSES PER MILE.

Use this method of calibration when you know the pulses per mile.

The image shows a seven-segment LCD display with the text 'SETPPU' in a digital font. The 'S' is on the left, followed by 'E', 'T', 'P', 'P', and 'U' on the right.

SetPPU Set pulses per mile calibration

Hold button 3 seconds

LCD display 6 digits xxxxxx

Push button momentary to increment each digit in turn.

All digits flash after last digit is set

Push button momentary while digits flash to confirm set.

LCD displays donE

LCD returns to total ODO.

## CALIBRATE SPEEDOMETER BY DRIVING A MILE (OR KILOMETER FOR KPH)

The image shows a seven-segment LCD display with the text 'dt5PPU' in a digital font. The 'd' is on the left, followed by 't', '5', 'P', 'P', and 'U' on the right.

Set Pulses Per Mile by driving a measured mile or KM (KPH)

Hold button 3 seconds

LCD displays current PPM, ships with 8,000 ppm. Segment at left will flash to indicate calibration mode.

Drive vehicle exactly 1 mile, odometer will count up pulses as you drive. If the numbers do not count up the speedometer is not receiving a signal from the VSS source.

Stop car after driving

Hold button 3 seconds

LCD displays donE

## NOTES:

## **TROUBLESHOOTING**

Gauge troubleshooting is a scientific process that is very easy to do provided the steps are done in sequence to understand where the fault lies. The one thing to remember is that all gauge systems consist of 3 components:

The gauge

The wire from gauge to signal source

The sender or signal source

Any of these 3 items can cause the gauge to be inaccurate or inoperable, it is a system of components and once we understand which part of the system is in fault we can resolve the issue and get you back on the road.

Check the obvious:

Do all of the gauges have 12 power and ground? Does the illumination turn on?

All full sweep gauges will do a full-sweep self-calibration at start up. All short sweep gauges will power up and pointers will hop up off of the pegs. Voltmeters should read voltage with the key powered on.

## **TESTING MINOR GAUGE FUNCTIONS:**

### **OIL PRESSURE, TEMPERATURE, FUEL (240-33 AND 73-10)**

Disconnect the sending unit wire from the sender

Power the unit up

The gauge should read its lowest value

Ground the sending unit wire, the gauge should peg at its highest value.

Gauge pegs> sending unit fault, check sender impedance and make sure it is grounded

Gauge does not peg> perform same check at gauge by grounding the sender stud/wire on the back.

Check the sending unit resistance to ensure you are receiving the proper signal.

### **FUEL (0-90, 0-30, 10-180)**

Disconnect the sending unit wire from the sender

Power the unit up

The gauge should read its highest value

Ground the sending unit wire, the gauge should peg at its lowest value.

Gauge pegs> sending unit fault, check sender impedance and make sure it is grounded

Gauge does not peg> perform same check at gauge by grounding the sender stud/wire on the back.

Check the sending unit resistance to ensure you are receiving the proper signal.

## **VOLTMETERS**

### **FULL SWEEP:**

Check that the sender wire is receiving full voltage.

### **SHORT SWEEP:**

The gauge reads through its internal circuitry and no additional sender/pick-up wire is required. Check that the gauge itself is properly grounded and powered up