NEW VINTAGE USA
DETROIT

64-1/2 -66 MUSTANG GAUGE KIT



SMALL BLOCK FORD GUIDE

QUICKSTART VIDEO WATCH THIS!!!

COYOTE INSTTALL GUIDE

TECH VIDEO PAGE

REV, TDATE

BRACKET INSTALLATION:

This kit will only fit the 66 style 5- hole panel. You can use this panel and combination in any 64-1/2-66 Mustang, but you must use the 66-style panel.

Depending on which one you have in the vehicle, start by removing the panel mounting screws.

When installing a 66 panel in a 64-1/2-65 you may have to drill the 2 lower mounting screws under the panel.



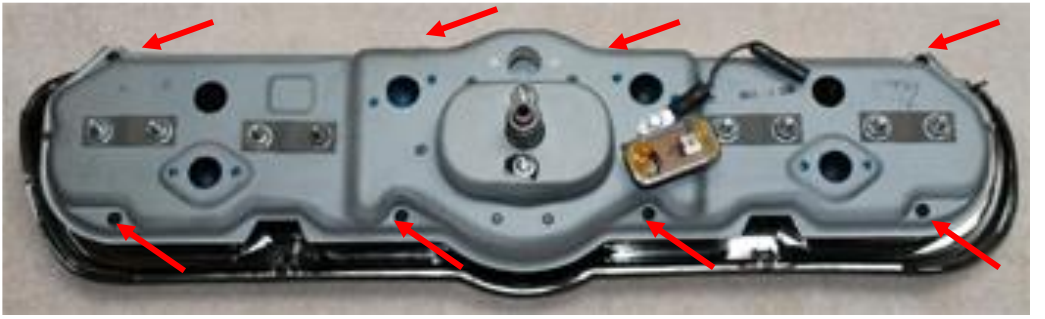


Reach your hand back in there and unscrew the speedo cable. Pull the cluster out, you will now have something like this.

Label each wire on the back of the cluster and remove, you can tap into some of these for turn signals, hi beam, etc in your new gauge kit.



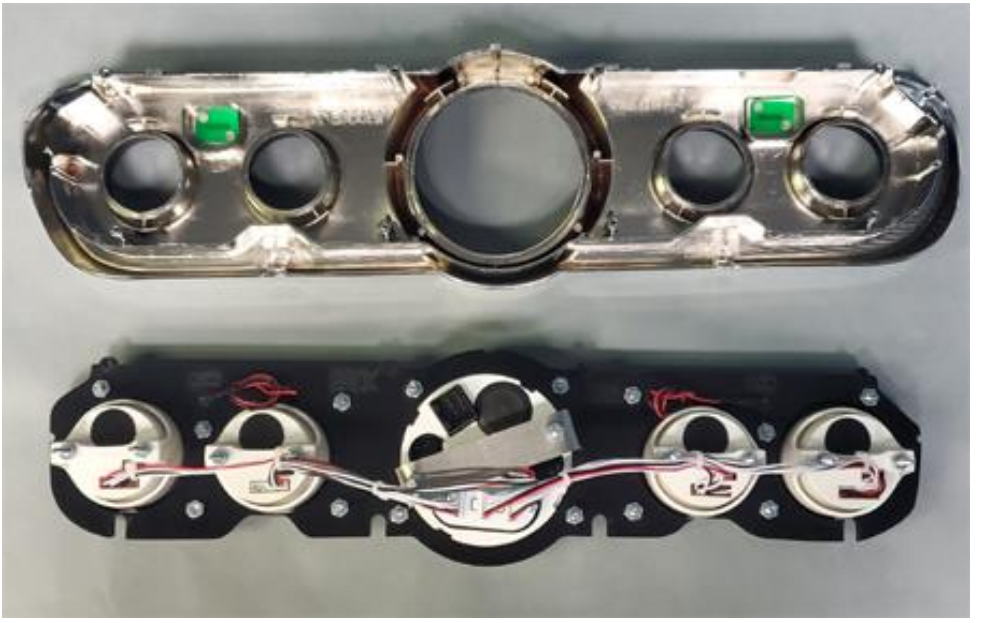
Remove the screws that hold the gauges and mental plate to the bezel. Separate parts



Clean up your old bezel or use a new one (They are inexpensive if you need one).

Install gauges in any position you like. Use back-clamps and snug down, but not final tight yet– you will be aligning them later.





At this time, you can plug in your 2" Direct-drive gauges (the ones with the cables. Use the diagrams in the following pages to plug into the correct ports**. IF THEY ARE NOT IN THE CORRECT PORTS THE GAUGES WILL NOT OPERATE PROPERLY.**

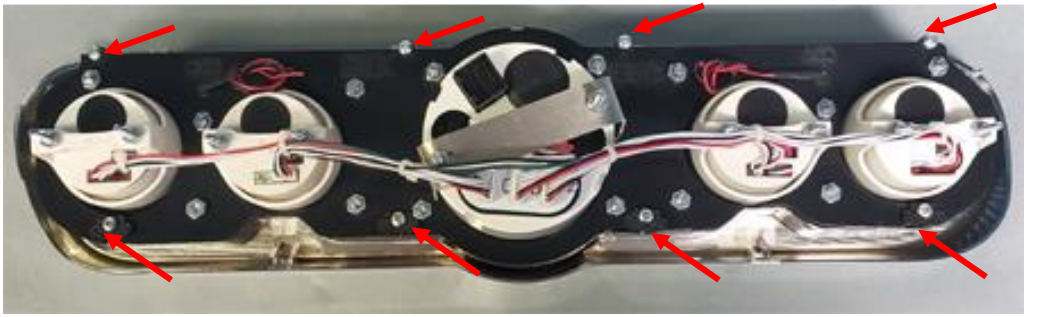
The Voltmeter is a standalone gauge and does not plug into the driver gauge (tach)

The red and black wires are Green LEDs for the turn signals. Black is ground, red is power. Wire these to the appropriate turn signal.

Install new gauge kit to panel. The turn signals should be at the top.

Use the LONG (6x 5/8) screws for the top

Use the SHORT (6x3/8) screws for the bottom





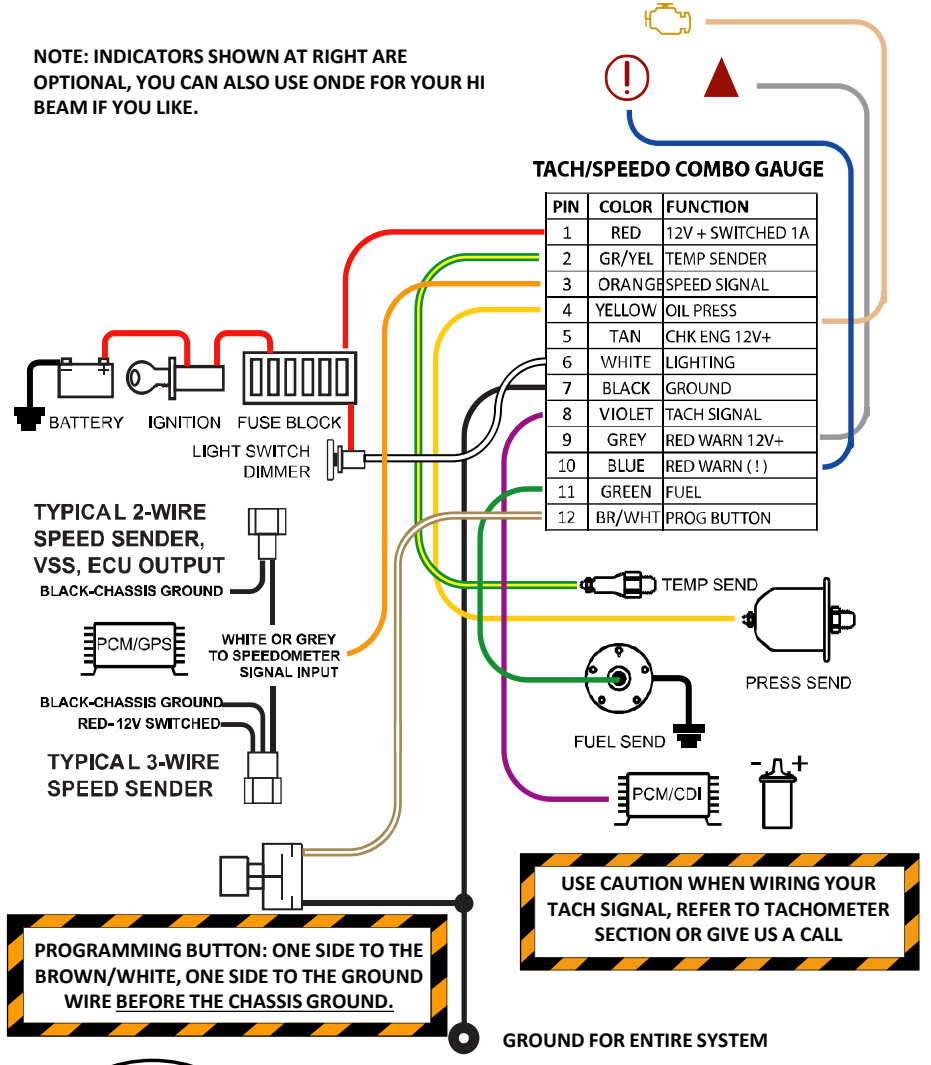
Use the spacers on the lower screws to hold the panel in place. There is a recessed hole, that should go down and index with the panel standoff.

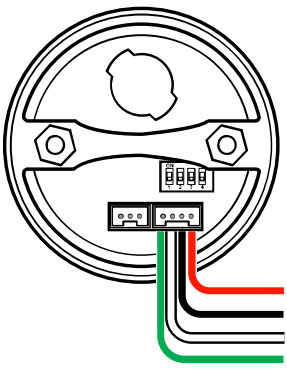
At this stage, your kit will look like this. Align the gauges to your liking. The holes have some play so you can rotate and move them slightly to get the alignment you want.
Tighten the back-clamps for final assembly.
Wire up kit as shown in the following pages and install into your dash. ENJOY!!



MASTER GAUGE WIRING

All programmable speedometers and tachometers with an OLED screen of any size are master gauges that can drive minor functions. The minor gauges are driven directly by the master and no additional connections are required. Wire as shown below and plug the minor gauges into their appropriate plug (B,C,D) on the back of the master gauge.





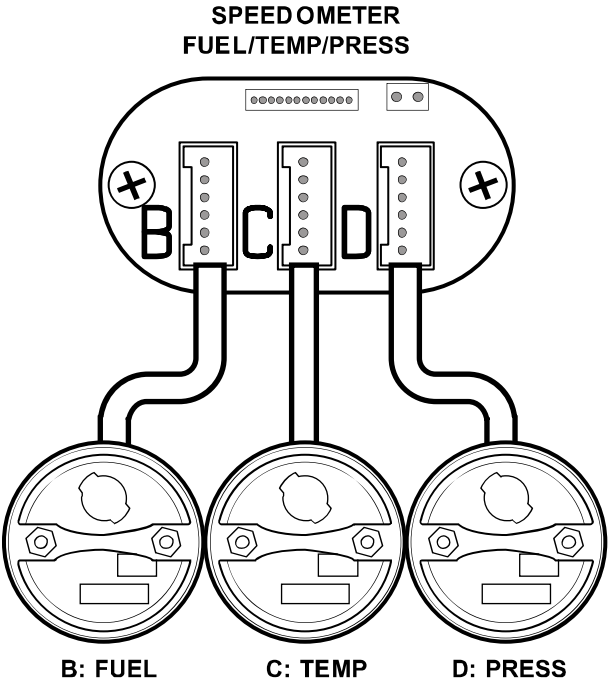
VOLTMETER

The voltmeter is a standalone unit and is not connected to the main driver gauge. Tie the red, black and white into your main harness. **DO NOT USE THE GREEN WIRE!**

MINOR GAUGE WIRING GAUGE KIT

All programmable speedometers and tachometers with an OLED screen of any size are master gauges that can drive minor functions. The minor gauges are driven directly by the master and no additional connections are required. Wire as shown below and plug the minor gauges into their appropriate plug (B,C,D) on the back of the master gauge.

Follow the diagram below to properly plug the minor gauges into the master units.



The B, C and D pins are used to connect the 2-1/16" gauges through the master gauge. All functions and lighting are done through this plug. Refer to the wiring diagram for each kit for proper wiring. Below is each plug's function and its corresponding input wire color. Pins C and D are the same on the speedo and tach.

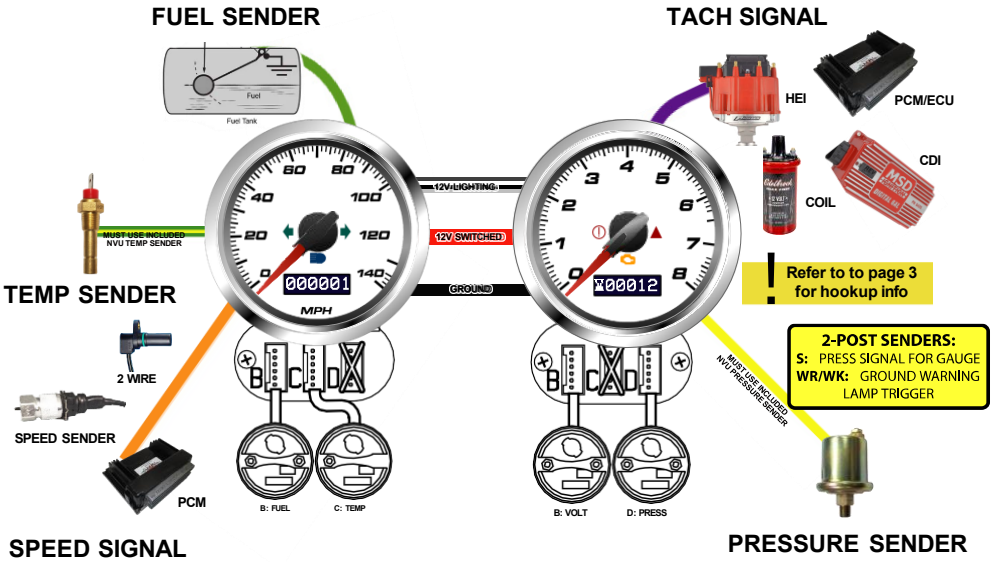
TACHOMETER/SPEEDO COMBINATION GAUGE:
B: PROGRAMMABLE FUEL (GREEN WIRE) Connects to your fuel sender. The input is programmable, please see the fuel gauge DIP switch settings later on page 34
C: WATER TEMPERATURE (YELLOW/GREEN WIRE) Connects to the NVU temperature sender.
D: OIL PRESSURE (YELLOW WIRE) connects to the oil pressure sender.
VOLTS is internal to the gauge and no wire is required. VOLTS can be displayed on the OLED screen if desired

SPEEDOMETER:
The speedometer is displayed on the OLED screen, toggle the screen using the remote button. Signal is on the ORANGE wire.

NEW VINTAGE USA RAPID INSTALL GUIDE

We designed this guide to help you get your gauges installed without getting into the Aux Features. A detailed guide can be found in the Phoenix Big Book Install Guide.

- **Begin Installation by mounting your Temp & Pressure senders and locating your Speed & Tachometer Signals.**



SPEEDOMETER & TACHOMETER SIGNAL TIPS

LT1: PCM Speedo may require 1K Pull up resistor of 12V switched & the signal wire. Set to 4000 PPM

LS: PCM Set Speedo to 4000 Pulses & Tach signal to 4 Cylinder(flip #5 switch to up position)

LT: Speed Signal:pin 14 (grey/blue) on transmission connector & Tach from coil + trigger Set to 1 Cyl

Coyote: Gen 1/2 used Ford Control Pack to output Speed & Tach, Gen 3 can grab Tach from Coil pack trigger wire and set to 1 CYL. GPS sender is best speed option for this application.

Tremec Speed Senders: These senders produce a very low voltage that is not capable of driving an Aftermarket Speedo. Best bet is to install a 3 Wire Powered sender like part # 99006-04. This would mount on the passenger side opposite of the factory 2 wire. Measured mile to AUTOCAL.

TEMP & PRESSURE SENDING UNIT INSTALLATION TIPS

LS ENGINES: have a location above the oil filter that may have a 1/8" NPT port, or one can be tapped.
Its recommend to mount our TEMP SENDER in the water flow between the engine near the thermostat

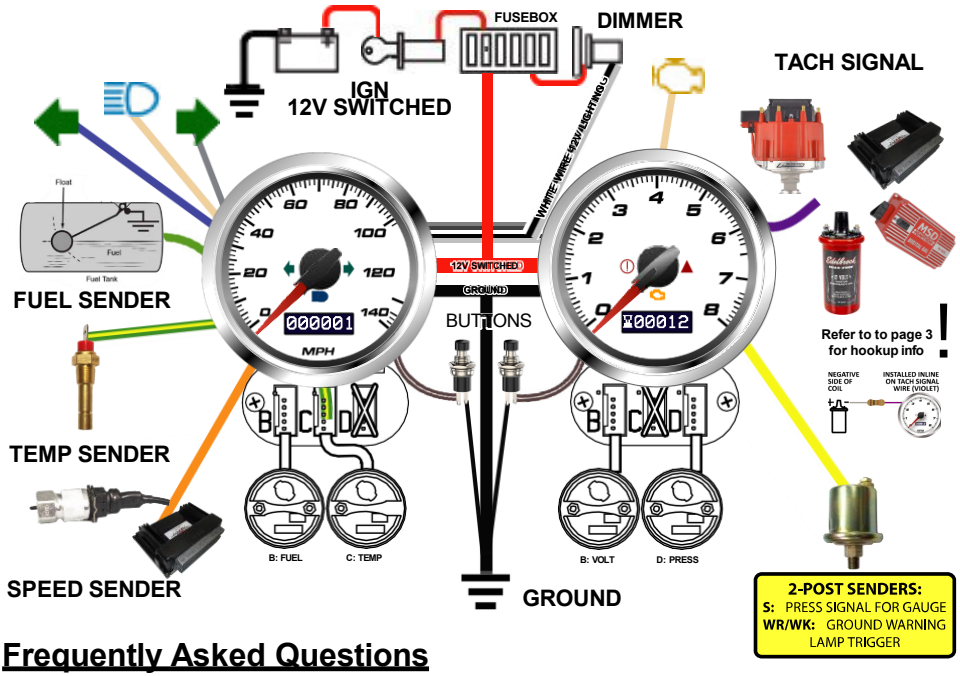
OIL PRESSURE: Chevy Small Block engines and some Fords will require a short length of pipe to clear the manifold.
Your hardware store should have brass 1/8" NPT pipe nipple with a 45 or 90-degree elbow to accomadate the pressure sender.
**If you received a 2 post Sender in your kit S:Signal & WR:Low pressure warning*

WIRING YOUR GAUGES

- Use a minimum of 20 gauge insulated, stranded wire, all connections should be connected with a crimp connection or solder and heat shrink.
- Keep speed signal wire(s) away from potential “noise” sources like ignition wires, tach signal wires, fan motors, pumps etc.
- Use a maximum of 5A fuse for the entire cluster, this is usually already in your fuse block
- Commonize wiring, ground power and lights can be common on all gauges and “daisy chained”

SIMPLIFIED GAUGE WIRING DIAGRAM

REFER TO BIG BOOK FOR MORE THROUGH DIAGRAMS



Frequently Asked Questions

Do my gauges have built in High Beam & turn signals?

- **YES, they are built into the Speedo & Tach dials, simply wire up as shown above to see them illuminate. We use a technique called "Dead fronting" to achieve this better than OE quality hidden indicator.**

Where are the lights in the 2" Gauges?

- **YES, they are built into the gauges circuitry! No need for bulbs!**

I am doing an LS install, do I need something special to mount the sending unit provided in my kit?

- **YES, you will need our LS Install kit to adpate Metric engine block to NPT thread of NVU senders.**

TACHOMETER CALIBRATION

TACHOMETERS SHIP SET TO 8 CYLINDER

Set according to your applications # of Cylinder found below

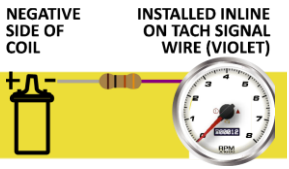


LS PCM: Tach Output wire
CDI BOX: Tach Output Wire
Coil on Plug: Trigger Wire





Standard Coil: Neg. Side of Coil
H**EI Ignition:** Dedicated Tach Output



POINTS SYSTEMS, PERTRONIX OR UNBRANDED SYSTEMS
WILL REQUIRE ADDITIONAL INPUT
PROTECTION USING INCLUDED 1K RESISTOR INLINE.

ADJUSTING THE CYLINDER SELECTION

To set the number of cylinders, hold in the button until the current setting is displayed. Scroll to the desired setting and hold until the confirmation message is visible. Select yes or no, and hold in the button until the setting is saved.

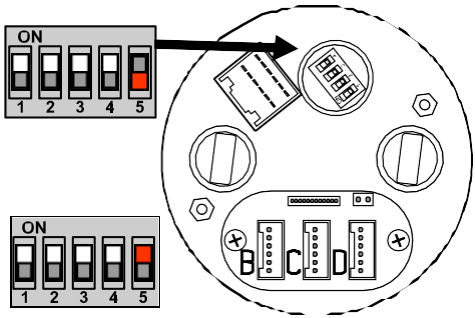


SETTING YOUR TACHOMETER DIPSWITCHES
REFER TO PAGE 12 AND 12-1/2 FOR FULL DETAILS

The first 4 DIP-switches have no effect on the tachometer #5 controls the input protection, please see below to prevent damage. Switch position shown in red for clarity.

CDI, HEI, AFTER MARKET EFI STANDARD IGNITION, POINTS **SWITCH 5 OFF (DOWN)**

LS ENGINES: This enables the built in 10K pull up resistor **SWITCH 5 ON (UP)**

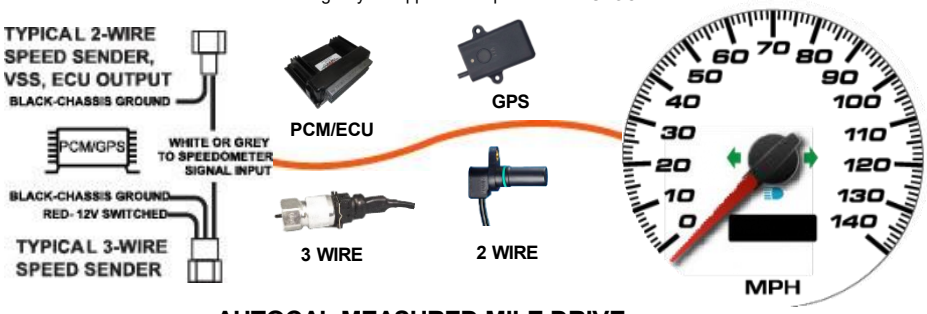


Rear of Gauge
(Switches locatedUnder black plug)

SPEEDO & FUEL CALIBRATION

SPEEDOS SHIP SET TO 16,000 PULSES

Set according to your applications puleses or AUTOCAL



AUTOCAL MEASURED MILE DRIVE

To enter AUTOCAL hold in the button before Key on, click button until AUTOCAL setting is displayed. Hold the button and the gauge will display "READY TO DRIVE" Click the button and drive ONE MILE, Pull over and hold button to Save!



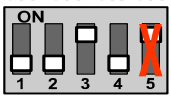
MANUALLY ADJUST THE SPEEDO CALIBRATION

To set the number of Pulses, click button until the Manual Calibrate setting is displayed. Click to the desired Pule setting and hold until the confirmation message is visible. Select yes or no, and hold in the button until the setting is saved.

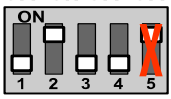


SETTING FUEL CALIBRATION- LOOK CLOSELY AT THE DIP-SWICTES FOR ORIENTATION #5 IS NOT USED FOR FUEL DON'T TOUCH!

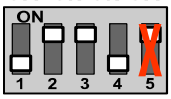
GM PRE-65
0-30
OFF-OFF-ON-OFF



GM PRE-65-89
0-90
OFF-ON-OFF-OFF



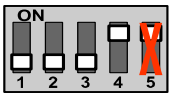
GM PRE-90-UP
40-250
OFF-ON-ON-OFF



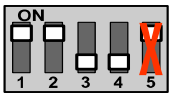
Fuel Gauge Ohm range is easily adjusted, simply flip the dipswitches into the positions as shown on the back of your Speedometer

#5 Switch HAS NO FUNCTION FOR FUEL

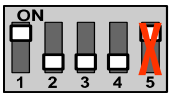
FORD/MOPAR 65-86
73-10
OFF-OFF-OFF-ON



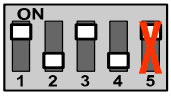
FORD 87-UP
20-145
ON-ON-OFF-OFF



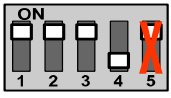
UNIVERSAL/SW
240-33
ON-OFF-OFF-OFF



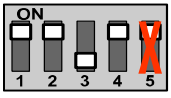
EARLY FORD
168-15
ON-OFF-ON-OFF

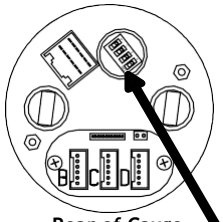


MOPAR 86-96
110-10
ON-ON-ON-OFF



MOPAR 97-UP
220-20
ON-ON-OFF-ON





Rear of Gauge
(Switches locatedUnder black plug)

INTRODUCTION

Thank you for choosing NVU for your build. NVU style features and function will make your ride's dash look and act the part you always wanted it to. NVU instruments are designed, coded, built and programmed right here in the Motor City, Detroit , MI USA and feature a 5- year warranty. Please take the time to read through this booklet and feel free to contact us with any questions you have before, during and after installation.

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NVU PHOENIX PLATFORM PLUG-AND-PLAY FEATURES

NVU Plug and play instruments are available in kits that have externally driven 2-1/16" gauges. The speedometer and tachometer are the master (driver) gauges and use data ports on the back to run the minor gauges. This simplifies installation and wiring dramatically not only saving time installing, but also prevents the need for troubleshooting loose connections, mis-wiring, etc. This system is analog driven and requires no additional boxes, driver or data inputs to operate.

Features from the standard Phoenix platform instruments are carried over to make installation and use easier with more features than ever. Plug and play system features:

Minor gauge "Plug and Play" – plug it in the master gauge- no more individual wires!

Phoenix features in addition to PNP :

Speedometer:
Odometer
Trip Odometer
Service mileage
Performance timers with 0-60, 1/8 and 1/4 mile functions
User settable (one time only in the 1st 100 miles) odometer mileage
Voltmeter display
One auxiliary input
Peak speed
MPH/Km/h toggle
Overspeed warning
Easy set-up menus
Digital filtering
GPS ready
Deadfronted (invisible when off) turn signals and hi beam indicators

Tachometer:
Sequential shift alert
Hourmeter
Service hours
Up to 2 additional auxiliary inputs
Peak RPM
Digital filtering
1,2,4,6,8,10,12 cylinder settings (custom options/ranges available)
Signal sources include, GM PCM, Coil, CDI box or other pulsed output
Deadfronted (invisible when off) warning indicators

PHOENIX SPEEDOMETERS

NVU Phoenix platform speedometers offer features found in complete clusters, OE instrument systems and data loggers, all in a standalone unit. While all of the features listed in this manual are available, they are not all required to be used. You can use \your speedometer simply as a way to monitor your speed or as a performance meter, its up to you. Some of the advanced features of the ---
- Phoenix platform speedometers:
- OLED high resolution display
- Drive-a mile self calibration
- Integration with OE and aftermarket speed signal and PCM outputs
- GPS input compatible
- Overspeed warning display (AMP Plug and commercial models)
- MPH/KPH speed toggle
- Performance meter 0-60, 1/8 and ¼ mile times/speed capture

Connections:
Speedometers are offered in either a studded or AMP plug connection. All of the wires on the AMP plug may be used depending on the application, check further in the manual for more details.

Terms when using the booklet:

Scroll: Pressing and releasing of the remote button to move through menu options.

Short push: Briefly holding the remote button and releasing it

Long Push: Holding in the remote button for 1 sec. or until a menu display changes.

With all of the features packed into NVU Phoenix platform speedometers, we had to divide them up into different menus. Your speedometer has a main "RUN" menu, and a "SETUP" menu. The RUN menu utilizes the features used during normal operation. The SETUP menu stores all of the items that are set-up during the installation process. (Items can be changed any time after if desired) and are separate to prevent inadvertently changing them during normal use.

During installation please contact NVU for questions/concerns, our qualified tech staff can help get you going.

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AUTOCAL (DRIVE A MILE SELF-CALIBRATION)
QUICK SET-UP

Check that your digital input filter is set to the proper input setting (see more later in manual if needed) all NVU speedometers are shipped with the input set on HIGH (suitable for most applications) with 16,000 PPM

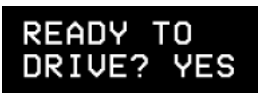
Enter the setup menu by holding in the remote button and turning on the key (start vehicle)



Scroll to auto calibrate (3RD ITEM)



Hold button until screen displays ready to drive? YES



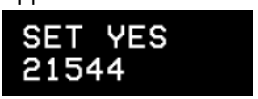
Hold in button until display shows counting 0



Drive exactly one mile(or KM), speed does not affect accuracy. You may or may not see action on the speedometer before or during calibration**. Display will start counting with the digits below increasing**. This is the speedometer counting the number of pulses it is receiving from the signal source. If the display does not count, check your signal source or input filter, the speedometer is not reading a signal



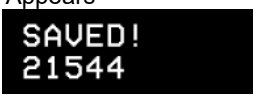
At the end of the mile (or KM) (vehicle can be moving or stationary) Hold the button in until SET YES appears





If **NO PULSES is displayed,** a signal was not read by the speedometer. Check your input filter selection and speed signal. See page 37 for signal troubleshooting. See page 11 for signal types. See page 9 for filter settings.

Hold in button until SAVED! Appears



The speedometer is now calibrated. Pressing the button will take you through the rest of the setup menu features. To resume normal operation turn off the key (vehicle) and restart.

INSTALLATION BASICS:

-Use a minimum of 20 gauge insulated, stranded wire, all connections should be connected with a crimp connection or solder and heat shrink.
-Keep speed signal wire(s) away from potential “noise” sources like ignition wires, tach signal wires, fan motors, pumps etc.
-Use a maximum of 5A fuse for the entire cluster, this is usually already in your fuse block
Commonize wiring, ground power and lights can be common on all gauges and “daisy chained”

SPEEDOMETER OPERATION MENUS

With all of the features packed into NVU Phoenix platform Speedometers, we have divided them into different menus. Your speedometer has a main “RUN” Menu, and a “SETUP” menu. The RUN menu utilizes the features used during normal operation. The SETUP menu stores all of the items that are setup During the installation process. Items can be changed any time after, if desired, And are separate to prevent inadvertently changing them during normal use.

RUN Menu Functions

Features can be accessed in the run menu during normal operation with the key on. To scroll to the various displays in the OLED screen,use a short push or tap of the remote button.

MAIN ODOMETER: Displays total distance travelled in miles or kilometers depending on the model. This display does not show tenths.



TRIP METER: Displays current trip distance
Press and hold the button and the odometer will reset to 0. This display will show tenths and will not have any zeros in front of the distance travelled.



Service – This is used to see when your next service interval is due (Oil Change, Tire Rotation…) The interval is set in the SETUP MENU in the next section. This screen is to display the interval remaining.



When the service interval has been reached, the SERVICE REQUIRED warning will display at vehicle startup. The interval can be reset in the SETUP menu.



MPH : This will display your current Miles per Hour you are traveling



KPH: This will display the current Kilometers per Hour you are traveling



Peak SPEED: This will display the highest speed achieved since last reset Press and hold the button and the odometer will reset to 0.



Performance Timers- Displays 1/4 and 1/8 mile time and trap speed as well as 0-60 time. Enter the performance mode you wish to measure, Hold the button until the dialog to start is displayed, enter yes to start or no to reset. Start driving. (Professional driver only on a closed course)

SETUP MENU

The setup menu contains menus used for functions not used during normal operation. These features are in this sub-menu to avoid inadvertently changing them during normal operation.

While the vehicle is off press and hold the button. Turn the vehicle on. The odometer will display “SETUP MENU” Short pushes on the button will scroll through these, long hold of the button will select the item. . To exit the SETUP menu turn off the vehicle and restart. You may operate the speedometer in setup mode if required the speedometer will operate to make fine tuning easier.



SERVICE RESET (Push and hold button to enter) This is used to reset service interval if you have saved any (Oil Changes, Tire Rotations, Tune Ups…) You can Set service intervals later in this menu (Service Set section).

Short push to scroll, long push to select



MANUAL CALIBRATE: (Push and hold button to enter) Manual calibration of the speedometer is used to manually enter the pulse setting. You must know the pulse setting of the speed signal to use this feature. Common uses are on OE (pre-configured) senders, GM PCMs GPS senders. Note: using this method will usually get you close enough and fine tuning or auto calibration may be required. Although many speed senders are standard output, various gear ratios and tire sizes will change the pulse settings depending on the vehicle build. The speedometer will accept between 2,000-250,000 PPM. See next page for a chart with common pulse settings.



To enter the manual calibration mode, hold the button until the current pulse setting is shown. NVU ships all speedometer with a 16,000 PPM setting. If the number shown is not 16,000 the speedometer has already been auto-calibrated by the end user. If the pulse count shows zero, the previous autocal attempts resulted in not receiving a speed signal, check you sender and input filter.



Continued, next page:

MANUAL CALIBRATE, CONTINUED:
The current pulses will be shown, with the first number highlighted. To change that number short push scrolling will increase the digit. Stop on the number required and hold the button to select the next number and follow the same sequence until all numbers are correct and your are on the last digit to the right



The final dialog box will display asking to set. Select Y to accept, N to cancel. Hold the button on Y and the setting will be saved. The speedometer is now manually calibrated.



AUTO CALIBRATE
This feature allows the speedometer to automatically calibrate the speedometer by driving a measured mile (or kilometer). See quick setup earlier in this manual for instructions.

INPUT FILTER:
The digital filter in the speedometer is used to properly read the signal from virtually any pulsed source. Enter the filter by holding the button. Scroll to the filter selection desired, refer to the chart below. Select L, M or H (Low, Medium, High). Hold the button to select FILTER, set yes or no, hold to select, saved! Will display to indicate a successful session. You can change this at any time to adjust as needed or to experiment for the best results for your application.



SOURCE	TYPICAL PPM	SIGNAL TYPE	INPUT FILTER SET
GM PCM (ALL)	4,000	5-12V HALL EFFECT	5V=M, 12V=H
AFTERMARKET 3 WIRE	16,000	12V HALL EFFECT	H
AFTERMARKET 2 WIRE	8,000 OR 16,000	AC SINEWAVE	L
OE 2 WIRE (GM)	40,000	AC SINEWAVE	L
NV4500	108,000	AC SINEWAVE	L
TREMEC	16,000 OR 40,000	LOW AC SINEWAVE	L
GPS SENDER	8,000 OR 16,000	VARIES	5V=M, 12V=H

OVERSPEED Available on AMP-Plug and commercial Units only. The overspeed warning will display and flash an overspeed warning on the OLED display



To set the overspeed enter the setup menu and scroll to overspeed. Hold in the button to enter the menu. The current setting will be displayed:



To change the overspeed setting, scroll to YES, then hold the button, the current warning level will be shown with the first digit highlighted. To change the digit, tap the button to increase the number. To move to the next number, hold the button until the next is highlighted. Proceed with the same procedure until all 3 digits are changed. On the last number hold until the display shows the speed and set? YES. The saved speed will be shown. If there is an error you can select NO or turn off the gauge and no changes will be made. To have the warning be inoperable, set the warning level to zero.



SET ODOMETER:

The set odometer function is a one-time setting that the end user can change during the first 100 miles of operation. The user can set the mileage to the existing vehicle mileage to maintain a proper vehicle record. Once the mileage passed 100 miles, the feature will no longer be available. To enter the set odometer menu, scroll to set odometer and hold in the button. You will see one time set ? yes. Hold in the button.



000000 will be shown with the first digit highlighted. To change the digit, tap the button to increase the number. To move to the next number, hold the button until the next is highlighted. Proceed with the same procedure until all digits are changed. On the last number hold until the display shows the mileage set YES? Hold in the button and SAVED! Will appear. Turn off and restart the vehicle, mileage is now set.



SPEED SIGNALS AND TYPES OF SPEED SENDERS

In general, there are going to be 3 tyles of speed senders:

HALL EFFECT: 3 wires, power, ground signal. This is usually a cable-replacement type. Our GPS speed senders are also hall effect.

2-WIRE A/C SINEWAVE: These can be OE integrated into the transmission or a cable replacement style. 2 wires, one is the signal, one is ground, which are reversable. **YOU CANNOT SPLIT A 2 WIRE SIGNAL TO RUN 2 ITEMS** (speedo, cruise)

ECU/CONTROLLER: If you are using a PCM or controller to run your automatic transmission, it will have a speed signal coming out, it will vary from manufacturer to manufacturer. Check out our Tech tip article from the QR code below for details.

SPEED SENDER TECH PAGE

POWERTRAIN SPECIFIC INSTALL GUIDES

ONLINE TROUBLESHOOTING GUIDES

TECH VIDEO PAGE



GM Style screw-on speed sender



Ford Style screw-on speed sender



Integrated speed sender



Typical speed sender location



PCMs computers, ECM

GAS TACHOMETERS:

Refer to the instructions on page 12-1/2 for each signal type. Use the QR codes below to learn more about tachometer connections and videos on set-up.

TACHOMETER CONNECTION ARTICLE

TECH VIDEO PAGE

AFTERMARKET HIGH ENERGY IGNITION SYSTEM
Aftermarket distributors **"MSD" boxes, CDI**, etc**. ALWAYS HAVE TACH OUTPUT DO NOT CONNECT TO THE COIL OR DAMAGE WILL RESULT**.

DIESEL TACHOMETERS:

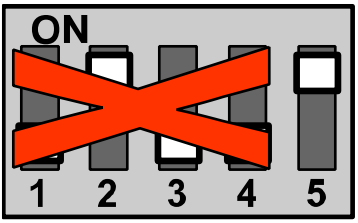
CRANK TRIGGERS, DIESEL, ETC. If you are looking at this page and have a diesel tach, you are looking at the wrong book. Please refer to your Diesel tachometer booklet as the wiring and set-up is different.

TACHOMETER SIGNALS AND SET UP
5-DIP-SWITCH TACHOMETERS ONLY

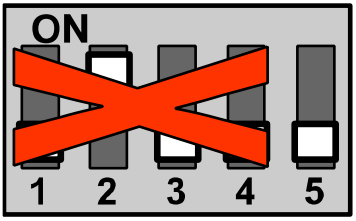
#5 controls the input protection, please see below to prevent damage. Switch position shown in white for clarity.

THE FIRST 4 SWITCHES DO NOT AFFECT THE TACHOMETER READING ON TACVHOMETERS WITH AN OLED SCREEN.

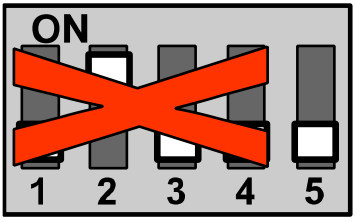
LS PCM CONNECTION: Switch #5 ON (UP). This enables the internal pull-up resistor. Set to 4 cylinder.
*****YES, SET IT TO 4 CYLINDER EVEN THOUGH YOU MAY HAVE 8******



MSD BOX, CDI BOX, MOST AFTERMARKET EFI SYETEMS. Switch #5 OFF (DOWN). This is the protected high-energy circuit.
Pull tach signal from the TACH OUTPUT on the box or ECU.
DO NOT CONNECT TO THE COIL OR DAMAGE WILL RESULT.



HEI, STANDARD IGNITION, POINTS, STANDARD COIL. Switch #5 OFF (DOWN). This is the protected high-energy circuit.
Connect to the negative side of the coil. If you are running any sort of aftermarket ignition box, DO NOT CONNECT TO THE COIL OR DAMAGE WILL RESILT.



Points systems, Pertronix or unbranded systems may require additional input protection using a 1k resistor inline. This is separate and in addition to the #5 switch in the off position. Install a 1K minimum 1W resistor in the violet tach wire.

If you are unsure of which connection and input to use, please contact us and we are more than happy to help!

INSTALLATION BASICS:

-Use a minimum of 20 gauge insulated, stranded wire, all connections should be connected with a crimp connection or solder and heat shrink.
-Keep speed signal wire(s) away from potential “noise” sources like ignition wires, tach signal wires, fan motors, pumps etc.
-Studded speedometers use #8 studs, use applicable eye terminals for wiring.
-Use a maximum of 5A fuse for the entire cluster, this is usually already in your fuse block
Commonize wiring, ground, power and lights can be common on all gauges and “daisy chained”

OLED DISPLAY TACHOMETERS WITH ANALOG POINTERS

With all of the features packed into NVU Phoenix platform tachometers, we have divided them into different menus. Your tach has a main “RUN” Menu, and a “SETUP” menu. The RUN menu utilizes the features used during normal operation. The SETUP menu stores all of the items that are setup during the installation process. Items can be changed any time after, if desired, and are separate to prevent inadvertently changing them during normal use.

RUN Menu Functions

Features can be accessed in the run menu during normal operation with the key on. To scroll to the various displays in the OLED screen, use a short push or tap of the remote button.

BLANK SCREEN: We have included a blank screen option to give the user an opportunity to not display any information.



HOURMETER: Displays the total hours the vehicle has been running. This is not resettable. This function is useful to track servicing the vehicle especially when idling for long periods is common such as in commercial, fleet and emergency vehicles, or when a speedometer or odometer is not used in the vehicle.



SERVICE HOURS: User resettable hourmeter to track engine use similar to a trip odometer. It is identified by the SH on the left side of the screen



This can be reset just like a trip odometer, while in this screen hold down the set button until zero is displayed. The hours will count up from there. This can be reset at any time and can also be used for tracking time to a destination as well as servicing the vehicle.



PEAK RPM is displayed on the following screen. This will store and allow the user to view the peak RPM achieved since the last reset.



This can be reset any time by holding in the programming button until all zeros are displayed. This may be reset at any time and the last peak RPM will be stored until reset.



BOOT or SETUP MENU. This area of the tachometer is used during set-up and any of the settings can be changed at any time. The items in the setup menu are “hidden” in this sub-menu to avoid inadvertently changing settings during normal use. To enter the setup menu, hold in the button while turning on the key (you do not have to start the vehicle if you do not want to). The setup menu screen will be displayed. To exit the setup menu, turn the key off, and restart normally.



SET CYLINDERS Allows the user to set the tachometer to accommodate different number of cylinders for their vehicle. See notes on connecting to GM PCMs for later in this manual if required. Tachometers ship from the factory pre-set for 8 cylinders, all set up for 4 stroke engines. Custom ranges and inputs are available for diesel and 2-stroke engines.



To set the number of cylinders, hold in the button until the current setting is displayed. Scroll to the desired setting and hold until the confirmation message is visible. Select yes or no, and hold in the button until the setting is saved.



INPUT FILTER. Generally this setting does not require any adjustment. You may change the settings if you are having difficulty with noise in your signal or sharp spikes. To enter the filter mode, hold in the button until the settings are shown. There are 3 options low “L” medium ”M” and high “H”. You can experiment to see if the filters aid your signal. The changes can be made with the vehicle running so you can see the difference in settings.
To change the setting, scroll to L, M or H and hold in the button. Once you are at the desired setting, hold in the button until the confirmation message is displayed, and select Yes or NO, hold in the button to select. SAVED! will confirm the setting has been changed and now the filter is set.



SHIFT ALERT. The shift alert is built-into the OLED display and will give the driver a warning of when to shift based on RPM. The alert is a 3 stage display, warning 1,000 and 500 RPM before the shift point, and the actual shift point. This can be used to pre-set shift points for optimal horsepower, mileage or to prevent over-revving the engine, it is up to the driver to decide how they would like it to be set up. The shift alert can also be disabled by setting to zero RPM.

SHIFT ALERT, CONTINUED. To enter the shift alert menu, hold in the button while at the screen.
The current shift point will be displayed (0000 for no shift alert). Tap the button to change the first digit which will be highlighted. Each tap will advance the digit by one number.
Hold the button in to advance to the next digit and follow the same sequence until you have the desired setting.
At the last digit, once satisfied, hold in the button to enter the verification menu. Select YES or NO and hold in the button. Once saved, the display will show the current shift setting and SAVED!



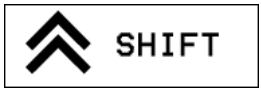
HOW THE SHIFT ALERT DISPLAYS INFORMATION: This is active all of the time when in any menu window during normal operation. For the setting above, 5,500 RPM, the display with indicate the engine is 1,000 RPM before the shift point with a single arrow on the screen:



500 RPM before the shift point 2 arrows will be displayed:



At the desired, set shift point, the screen will invert creating a highly visible sign that the engine is at the RPM designated to shift, the word SHIFT will display:



The arrows will operate in the inverse as RPM decreases. The shift point setting can be changed at any time desired, or disabled by setting the shift alert to all zeros (0000).

TACHOMETER SPEED. Adjusts the pointer speed of the tachometer. The default is **STREET** (dampened) you can speed it up by selecting the **SPORT** mode (undampened). Hold in the button to enter the menu, select the speed, hold once you have the speed selected. **SPEED SET (STREET/SPORT)** will appear. The tachometer speed is set.



ANALOG MINOR GAUGE SENDERS AND SIGNALS

Senders are the part of the gauge system that send a signal to the gauge to be possible, then displayed on the dial face. There are 4 types of senders, resistance bases pressure, temperature and level (fuel), voltage input pressure transducers, and pulsed speed inputs.

TEMPERATURE SENDERS Signal type is resistance to ground. Resistance DECREASES as temperature rises. All NVU Phoenix temperature gauges use a High-Match temperature sender. The sender will read between 500-1000 ohms at room temperature. Both low and high read gauges use the same sender. **You must use this sender with NVU gauges, OE senders will not operate properly. Do not use Teflon tape to seal, we recommend liquid sealer for a good ground.**

PRESSURE SENDERS are resistance to ground signal. All NVU pressure senders are possible,, 0-100 PSI regardless of the pressure range.

PRESSURE TRANSDUCERS Send a voltage signal to the gauge to be read and are not senders.. possible, a linear .5V-4.5V signal can be read by any transducer gauge. There are typically 3 wires to the transducer, signal, ground and 5V power (from the gauge or module).

FUEL LEVEL SENDERS are also resistance to ground. A float arm rotates on a rheostat in the fuel tank and changes the resistance as the float arm moves. This is also available in a tube type sender. The ranges can be various depending on the OE manufacturer. You **ALWAYS** need to match the fuel gauge to the sender.. Use a stock sender, if possible, to make things easier on yourself. Please see DIP switch settings in this booklet (PAGE 34) for a full listing of stock ranges.

ALL ABOUT SENDERS TECH ARTICLE

FUEL SENDER TECH ARTICLE

AUXILLARY INPUTS

Phoenix platform instruments feature add-on functions that can be displayed directly on the OLED screen as needed. This can be accomplished by adding an NVU pressure or temperature sender. Custom options are available, feel free to contact us for your needs.

How it works:
Every speedometer (standalone and 3-1) has one auxiliary input wire on the harness. Please see the wiring diagram for that particular unit/kit configuration.

Every Tachometer (standalone and 3-1) and speedo/tach combo gauge has 2 auxiliary inputs. Each is on the AMP plug. Please see the wiring diagram for that particular unit/kit configuration.

All 3 inputs have the same features and menu settings. There are 3 types of inputs standard and all are resistance to ground.

1. TEMPERATURE. All standard auxiliary inputs for temperature run from a standard NVU hi-match temperature sender part number 99320-04. You must use this sender to monitor any temp readings. This sender is separate from any other sender you are using to monitor any other setting on the gauge itself. (You cannot "split" a sender signal.). Custom ranges are available at additional cost-contact us for more details.

2. PRESSURE All standard axillary inputs for pressure operate from a standard NVU pressure sender 0-100 PSI, 240-33 ohm part number 90100-04. This range works well for anything that uses at least 40% of the scale. (no less than 40 PSI). If you need a different range, custom inputs are available, call us for more details.

Sender grounds: The above sender operate by varying the resistance to ground through the base of the sender (threads). If you are monitoring the temperature or pressure by attaching to a non-metal surface (plastic, rubber or insulated line) You will require a floating ground sender. This has an additional terminal for grounding the unit.

SETTING UP THE AUXILLARY INPUTS

Install sender as needed, run wire (20 ga min) to the appropriate input wire. To set up the functions using the OLED display screen, the vehicle does not need to be running.

Enter the SETUP menu by holding in the programming button while turning on the key.



Scroll to AUX INPUT SETUP or AUX 2 SETUP





Speedometers use AUX Input (Green wire) ONLY
Tachometers and speedo/tachs use AUX INPUT (Green/yellow) and AUX 2 (Yellow wire)

Customs and specialty instruments please check your wiring diagram.

Once you have entered the specified input setting, scroll to the desired reading you would like to display on the OLED screen.

AUX INPUT SELECTION	AUX 2 INPUT SELECTION	DISPLAY ON OLED SCREEN	SENDER USED
AUX INPUT NOT USED	AUX 2 NOT USED	NOT VISIBLE	
AUX INPUT OIL TEMP	AUX 2 OIL TEMP	168 °F	TEMPERATURE 99320-04
AUX INPUT TRANS TEMP	AUX 2 TRANS TEMP	167 °F	TEMPERATURE 99320-04
AUX INPUT WTR TEMP	AUX 2 WTR TEMP	168 °F	TEMPERATURE 99320-04
AUX INPUT OIL PRESS	AUX 2 OIL PRESS	45 PSI	PRESSURE 99100-04
AUX INPUT FUEL PRESS	AUX 2 FUEL PRESS	45 PSI	PRESSURE 99100-04
AUX INPUT BOOST	AUX 2 BOOST	46	PRESSURE 99100-04

AUXILLARY INPUTS CONTINUED

Once you are on the desired function to be displayed, press and hold the programming button until the INPUT SET screen is displayed.



This can be changed at any time, just follow the preceeding setup process. You may now continue on to other programming features or you can restart the instrument. You must turn the power off and nd re-cycle the power before setting will take effect. You do not have to start the vehicle, just simply turn the key off and back on again.

NORMAL OPERATION

The auxiliary inputs are designed to be just that, additional instrument features that you may or may not need to be viewing at all times. To view a particular input while using the instruments, tap the programming button to scroll to the display you would like to view. It will remain visible until the button is depressed again.

MORE INFORMATION

The additional inputs are designed to measure temperature and pressure using NVU (or equivalent) senders. The temperature or pressure of virtually anything can be measured, for example Trans temp is shown on the display with a “T” this can be for anything you like, axles, trans, t-case, its up to you, so keep your mind open when it comes to the vitals you would like to watch.

SETTING UP THE DISPLAY ICONS

Icons can be displayed on the screen for various warning inputs from many sources. To display an icon a GOOD GROUND signal is required (grounding the wire will activate the selected icon)

Some outputs are 12v+, which will not operate the icon signal. To achieve this, a relay will be required (not included). Open collector or non-grounding signals may require a pull-down resistor (not included)

When the icon is activated, it will over-ride the current display and show the icon for approximately 60 seconds before going back to normal operation.

Enter the SETUP menu by holding in the programming button while turning on the key.



Scroll to ICON1 SETUP or ICON 2 SETUP



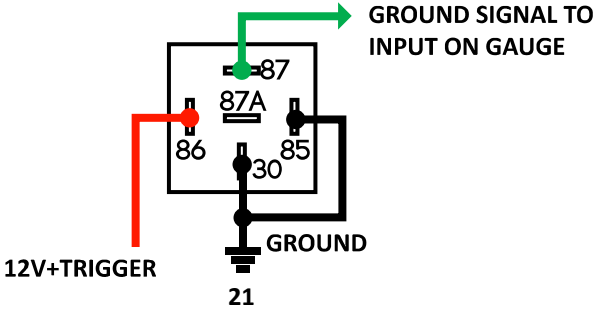


AUXILLARY ICONS CONTINUED

Speedometers use AUX Input (Green wire) ONLY
Tachometers and speedo/tachs use AUX INPUT (Green/yellow) and AUX 2 (Yellow wire)
Customs and specialty instruments please check your wiring diagram.
Hold the button down for about 1 second, you can now scroll through the different choices.
Once you have entered the specified input setting, scroll to the desired reading you would like to display on the OLED screen.
When you are at the desired choice, hold the button until the screen says the icon name and YES. If it is not the correct icon you can select no with a tap of the button, To confirm YES or NO hold the button for approximately 1 second until the screen goes to the SAVED or CONFIRMED screen.
To turn off all of the icons select NOT USED.

ICON 1 Cruise		ICON 1 Trac Ctrl	
ICON 1 Glow Plug		ICON 1 Chk Eng	
ICON 1 Armed	ARMED	ICON 1 Fog Lights	
ICON 1 4x4	4X4	ICON 1 Aux Lights	
ICON 1 4 High	4 HIGH	ICON 1 Low Coolant	
ICON 1 4 Low	4 LOW	ICON 1 Warning	WARNING
ICON 1 4x4 Lock	4X4 LOCK	ICON 1 Open	OPEN
ICON 1 Airbag			

HOW TO SET UP A RELAY TO CONVERT A 12v+ OUTPUT TO A GROUND TRIGGER FOR THE GAUGE.

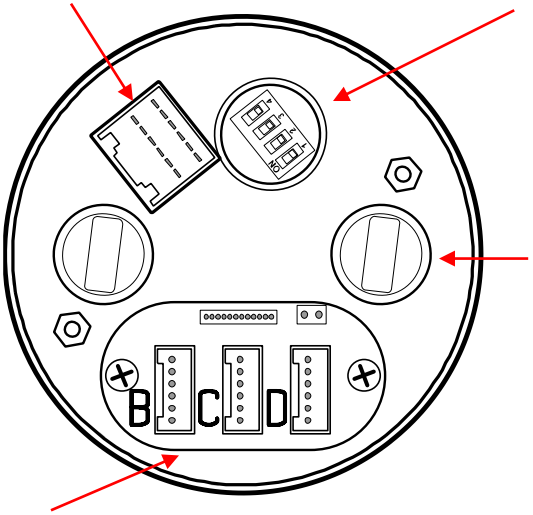


THE BACK OF YOUR GAUGE PROGRAMMABLE WITH OLED SCREEN AND PORTS

All programmable speedometers and tachometers with an OLED screen of any size are master gauges that can drive minor functions. The minor gauges are driven directly by the master and no additional connections are required.

AMP PLUG SOCKET :

USE the NVU universal AMP plug and wire as shown in the proper diagram. NVU uses the same plug for all gauges so some wires may not be used in your application.



DIP SWITCHES:

Used to adjust fuel range on speedometers. See fuel gauge chart later in this booklet. Remove the black plastic cover to access this if needed. See DIP switch settings later in this booklet

LIGHT SOCKETS:

The sockets hold NVU bright white LED 194 bulbs. They are replaceable if needed. If you need to replace a bulb, the LEDs are polarity sensitive and have to be installed properly to operate. If you find the bulb will not light, turn it 180 degrees and reinstall. LEDS are not dimmable using a standard dimmer. Wire into your parking lamp circuit and use an LED dimmer if required

DRIVER SOCKETS:

This applies to 5 and 6 gauge kits with NVU PNP technology. 2, 3 and 4 gauge kits will not use the driver features. Refer to each wiring diagram. Plug the appropriate gauge into the socket and it will function through the master driver unit.

The B, C and D pins are used to connect the 2-1/16" gauges through the master gauge. All functions and lighting are done through this plug. Refer to the wiring diagram for each kit for proper wiring. Below is each plug's function and its corresponding input wire color. Pins C and D are the same on the speedo and tach.

SPEEDOMETER:

B: PROGRAMMABLE FUEL (GREEN WIRE) Connects to your fuel sender. The input is programmable, please see the fuel gauge DIP switch settings on page 34

C: WATER TEMPERATURE (YELLOW/GREEN WIRE) Connects to the NVU temperature sender.

D: OIL PRESSURE (YELLOW WIRE) Connects to NVU pressure sender .

TACHOMETER:

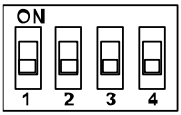
B: VOLTS No input wire required, internal to gauge

C: WATER TEMPERATURE (YELLOW/GREEN WIRE) Connects to the NVU temperature sender.

D: OIL PRESSURE (YELLOW WIRE) Connects to NVU pressure sender .

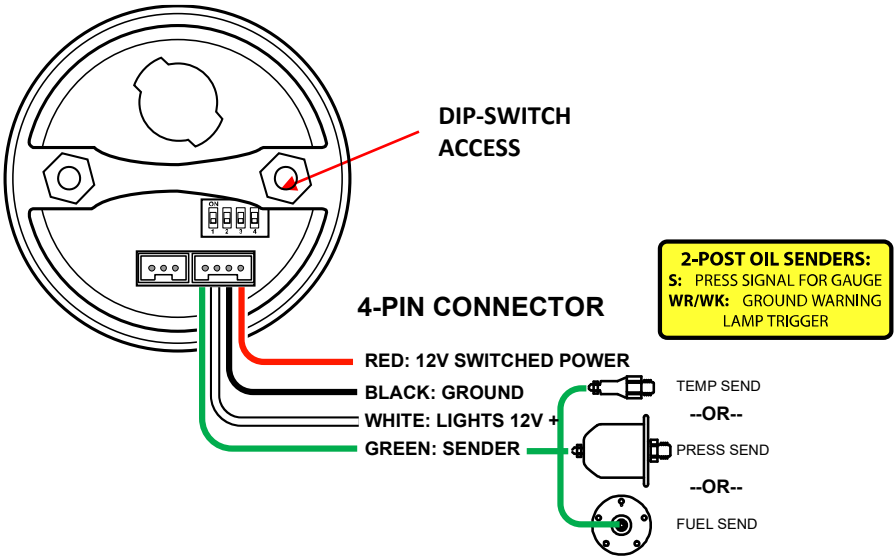
ANALOG INPUT MINOR GAUGES

DIP switches are used on the back of some of the gauges to set ranges for your application. This can be changes at any time but in general They are set at the factory or on-site during installation and are left in that position for the life of the vehicle.
When setting DIP switches, ON should be in the up position.



FUEL GAUGE:

All fuel gauges are programmable by the DIP switches on the driver gauge or the 2-1/16" gauge itself. All fuel gauges and ranges are identical on all instruments. Set the switches as shown in the chart below for your application.

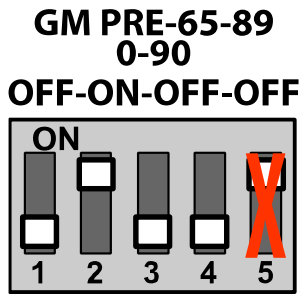


ANALOG INPUT	INPUT Ω	1	2	3	4
OIL PRESS 0-100 PSI	240-33	OFF	OFF	OFF	OFF
WATER TEMPERATURE	500-19	OFF	OFF	ON	ON
OIL/TRANS TEMP	500-19	OFF	ON	OFF	ON
VOLTAGE	10-18V	OFF	ON	ON	ON

SENDER TYPE MAKE/YEAR	RANGE E-F Ω	1	2	3	4
EARLY GM/FORD PRE-65	0-30	OFF	OFF	ON	OFF
GM 65-89	0-90	OFF	ON	OFF	OFF
GM 90S-UP	40-250	OFF	ON	ON	OFF
FORD/AMC/MOPAR 65-86	73-10	OFF	OFF	OFF	ON
FORD 87-UP	20-145	ON	ON	OFF	OFF
UNIVERSAL/SW	240-33	ON	OFF	OFF	OFF
CUSTOM/EARLY FORD	168-15	ON	OFF	ON	OFF
MOPAR 86-96	110-10	ON	ON	ON	OFF
MOPAR 97-UP	220-20	ON	ON	OFF	ON

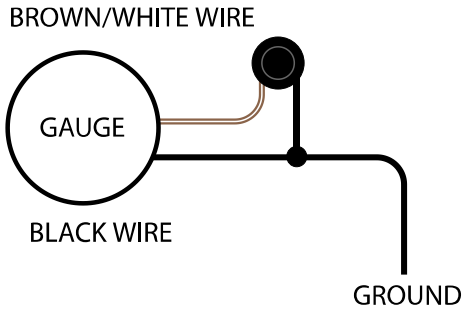
USEFUL ITEMS:

How do I adjust the DIP-switches?
It's easy, simply power down the gauges, access the black cover on the above listed gauge and change the DIP-Sitches. Below is an image of the cover location.
NOTE:
1. Look closely at the numbers on the DIP-switches to see the orientation. Depending on the gauge, the switch may not be oriented right-side up.
2. the 5th DIP switch has no effect on the fuel gauge, **DO NOT MOVE THIS 5th switch.**



What are these black buttons?
These are the remote programming buttons that are used to set up your gauges. They are remote to maintain a seal in the front of the gauges and clean up the real glass lens and show off the design of the gauges. Our military and marine customers require a sealed front.

How do I hook these up?
One wire goes to the brown/white, the other ties into your gauge ground wire. Tie this in the BLACK ground wire on the **gauge between the gauge and ground.**



Clean Power and Ground
With today's sensitive electronics a clean power and ground source are the best way to make sure your gauges work properly, we have a great article coving this, just use the QR code.

CLEAN POWER AND GROUND ARTICLE

EMI (Electromagnetic interference)
This is the most common thing we see with out of spec electronics or insufficient connections in your vehicle. Since 2020 this has really become an epidemic in the aftermarket with knock-off electronic components. We have found a way to trace it down though, use the QR code at right and check it out:

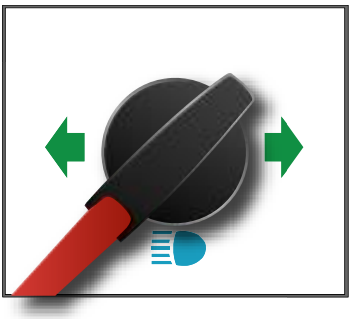
EMI AND HOW TO STOP IT!

Room for more useful stuff

BUILT-IN INDICATORS

YES, THEY ARE IN THERE! We use deadfronting to hide the indicators so you can't see them when they are off! They are optional, you don't have to use them if you do not want to or are using the OE location indicators in your dash.

They are just LEDs that turn on when 12V+ is applied to the appropriate wire. There is not any circuitry or triggering involved, they are just bulbs. That's pretty much it!



FUEL SENDER TECH ARTICLE

F.A.Q. PAGE

ONLINE TROUBLESHOOTING GUIDES

TECH VIDEO PAGE

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