Classic Instruments

3200
Cluster

Installation Manual

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Welcome from the Team at Classic Instruments!

   Our congratulations and appreciation for your purchase of one of the finest quality sets of specialty instruments ever produced! Your instrument set has been conceived, designed, and manufactured by Classic Instruments, Inc. in the U.S.A. Each instrument has been tested and certified for accuracy and quality before packaging and shipping.

   For trouble-free installation and operation follow the instructions exactly as outlined. Your instruments were assembled to precise specifications and although each has a seven (7) year warranty covering defective parts and workmanship – this warranty will not cover instruments or sender units which have been installed incorrectly.

   Follow our recommended procedures for installation and proper hookup to maintain the value and appearance of your instrument set during many future years of accurate and dependable service!

LIMITED WARRANTY

   Classic Instruments, Inc. (CI) warrants to the original purchaser that any CI product manufactured or supplied by CI will be free from defects in material and workmanship under normal use and service for a period of seven (7) years from date of purchase.

   Improper installation, use of sending units other than CI's or attempted repair or adjustments by other than CI shall void this warranty. Disassembly of any instruments or senders for whatever reason shall specifically void this warranty.

   It's always easy to look to a part for an issue with your set. Before you conclude that a part may be bad, thoroughly check your work. Today's semiconductors and passive components have reached incredibly high reliability levels, but there is still room for error in our human construction skills. However, on rare occasions a sour part can slip through. Please be aware that testing can usually determine if the part was truly defective or damaged by assembly or usage. Don't be afraid of telling us that you "blew it", we're all human and in most cases, replacement parts are very reasonably priced.

   Purchaser requesting a product to be repaired or replaced under warranty must first call CI at 1-800-575-0461 before the return of defective part. Send defective part to 826 Moll Drive, Boyne City, MI 49712, USA. Include a written description of the failure with defective part.

   Purchaser agrees and accepts that under no circumstances will a warranty replacement be furnished until CI has first received, inspected, and tested the returned part.

   All other warranties expressed or implied are hereby excluded including any implied warranty of merchandise and implied warranty of fitness for a particular purpose. The sole and exclusive remedy for breach of this warranty is limited to the replacement set forth above.

   It is expressly agreed that there shall be no further remedy for consequential or other type of damage, including any claim for loss of profit, engine damage or injury.
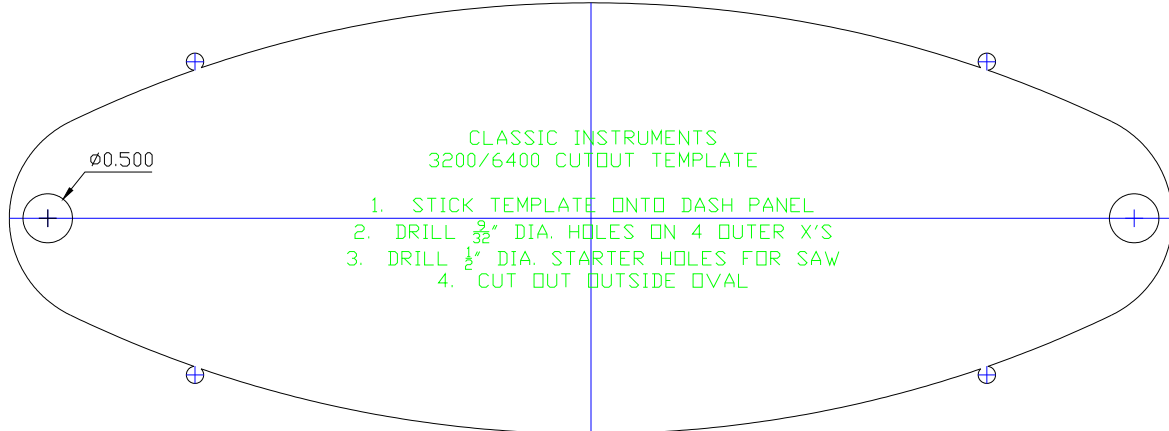
TECHNICAL ASSISTANCE
1-800-575-0461
OR
Visit our website for the latest in gauge design and updates to our installation manual

www.classicinstruments.com

Mount New Gauge Cluster

1) Cut your dash according to the template included with the gauge cluster.

CLASSIC INSTRUMENTS
3200/6400 CUTOUT TEMPLATE

1. STICK TEMPLATE ONTO DASH PANEL
2. DRILL $\frac{9}{32}$" DIA. HOLES ON 4 OUTER X'S
3. DRILL $\frac{1}{2}$" DIA. STARTER HOLES FOR SAW
4. CUT OUT OUTSIDE OVAL

ø0.500

2) Temporarily remove the bezel and glass from the rest of the cluster by removing the 4 nuts from the bezel studs.
3) Insert the instrument cluster (minus the glass and bezel) into the opening cut in the dash from the back side of the dash.
4) Insert the glass into the cluster opening.
5) Mount the bezel to the dash by aligning the 4 studs in the bezel with the 4 9/32" diameter holes cut in the dash (from the template).
6) If using a metal dash, install the O-ring around the perimeter of the cluster. The O-ring should go on the outside of the bezel studs.
7) Tighten the bezel to the cluster using the 4 nuts removed from step 2. This will pinch the dash between the bezel and the cluster.

Instrument Cluster Wiring

Speedometer Wiring with SN16 Signal

1) Always disconnect the positive lead from the vehicle battery before wiring any gauge.
2) Connect the **Black / White** wire of the speedometer wire harness to the <u>black</u> wire of the SN16 pulse signal generator.
3) Connect the **Purple** wire of the speedometer wire harness to the <u>white</u> wire of the SN16 pulse signal generator.
4) Connect the **Red / White** wire of the speedometer wire harness to the <u>red</u> wire of the SN16 pulse signal generator.
5) Connect the **Black** wire of the speedometer wire harness to a good chassis ground.
6) Connect the **Pink** wire of the speedometer wire harness to a switched +12VDC power source.
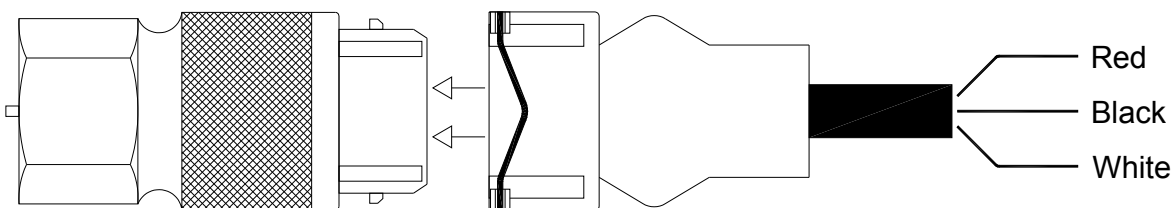
Red: +12VDC (*to red / white wire of speedometer harness*)
Black: Ground (*to black / white wire of speedometer harness*)
**White**:   Signal (*to purple wire of speedometer harness*)

SN16 Signal Calibration

1) Turn off power to the speedometer.
2) Set the 12 dip switches on the back of the speedometer to their default position (*5, 6, 7, 8 OPEN, all others CLOSED*).
3) Check the current speedometer calibration at a <u>known</u> 60mph by pacing a vehicle with a calibrated speedometer or by using a GPS.
4) Note what the speedometer is indicating at a <u>known</u> 60mph.
5) Look up what the speedometer was indicating on the 16,000 PPM calibration chart and set the speedometer dip switches according to the chart. The dip switches shown on the chart should be the ONLY switches set to OPEN. All other dip switches should be set to CLOSED.
6) The speedometer should now be accurate. The dip switches must be set back to the default setting in order to use the calibration chart on future calibrations.

Default speedometer dip switch setting (5, 6, 7 and 8 OPEN):
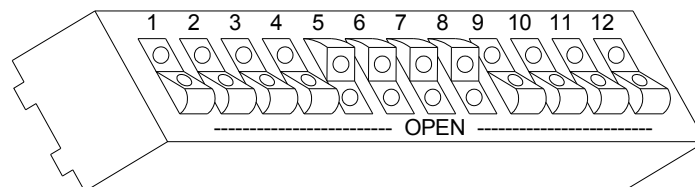
16,000 PPM Speedometer Calibration Chart
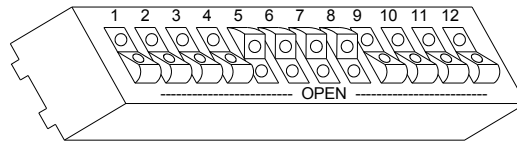
(Default Dip Switch Setting)   (Switch 5 6 7 8 OPEN)

Set speedometer switches **5 6 7 8 OPEN**, all others closed (*code for 16,000 PPM*). Drive vehicle at 60mph. If the speedometer reads other than 60, turn off power & set switches per chart below.

Speedometer Reading	OPEN SWITCH	Speedometer Reading	OPEN SWITCH
40 MPH	8 9 11 12	80 MPH	4 5 6 10 12
41 MPH	7 10 12	81 MPH	4 5 6 8
42 MPH	7 8	82 MPH	4 5 6 8 9 11 12
43 MPH	7 8 9 11 12	83 MPH	4 5 6 7 10
44 MPH	6 10	84 MPH	4 5 6 7 8
45 MPH	6 8	85 MPH	4 5 6 7 8 9 11 12
46 MPH	6 8 9 11 12	86 MPH	3 10 12
47 MPH	6 7 10 12	87 MPH	3 8
48 MPH	6 7 8	88 MPH	3 8 9 11 12
49 MPH	6 7 8 9 11 12	89 MPH	3 7 10 12
50 MPH	5 10	90 MPH	3 7 8
51 MPH	5 8	91 MPH	3 7 8 9 11 12
52 MPH	5 8 9 11 12	92 MPH	3 6 11 12
53 MPH	5 7 10 12	93 MPH	3 6 8
54 MPH	5 7 8	94 MPH	3 6 8 9 11 12
55 MPH	5 7 8 9 11 12	95 MPH	3 6 7 10 12
56 MPH	5 6 10 12	96 MPH	3 6 7 8
57 MPH	5 6 8	97 MPH	3 6 7 8 9 11 12
58 MPH	5 6 8 9 11 12	98 MPH	3 5 10 12
59 MPH	5 6 7 10 12	99 MPH	3 5 8
60 MPH	5 6 7 8	100 MPH	3 5 8 9 11 12
61 MPH	5 6 7 8 9 11 12	101 MPH	3 5 7 10 12
62 MPH	4 10 12	102 MPH	3 5 7 8
63 MPH	4 8	103 MPH	3 5 7 8 9 11 12
64 MPH	4 8 9 11 12	104 MPH	3 5 6 10 12
65 MPH	4 7 10	105 MPH	3 5 6 8
66 MPH	4 7 8	106 MPH	3 5 6 8 9 11 12
67 MPH	4 7 8 9 11 12	107 MPH	3 5 6 7 10 12
68 MPH	4 6 10 12	108 MPH	3 5 6 7 8
69 MPH	4 6 8	109 MPH	3 5 6 7 8 9 11 12
70 MPH	4 6 8 9 11 12	110 MPH	3 4 10 12
71 MPH	4 6 7 10 12	111 MPH	3 4 8
72 MPH	4 6 7 8	112 MPH	3 4 8 9 11 12
73 MPH	4 6 7 8 9 11 12	113 MPH	3 4 7 10 12
74 MPH	4 5 10 12	114 MPH	3 4 7 8
75 MPH	4 5 8	115 MPH	3 4 7 8 9 11 12
76 MPH	4 5 8 9 11 12	116 MPH	3 4 6 10 12
77 MPH	4 5 7 10 12	117 MPH	3 4 6 8
78 MPH	4 5 7 8	118 MPH	3 4 6 8 9 11 12
79 MPH	4 5 7 8 9 11 12	119 MPH	3 4 6 7 10 12

Speedometer Wiring with SN74Z Signal Interface

1) Connect the <u>red / white</u> wire of the speedometer harness to the SN74Z terminal marked **+12 VOLTS**.

2) Connect the <u>black / white</u> wire of the speedometer harness to the SN74Z terminal marked **GROUND**.

3) Connect the <u>red wire</u> of a Classic Instruments SN16 pulse signal generator to the SN74Z terminal marked **SENDER +**. *If you are not using a pulse signal generator, this terminal is not used.*

4) Connect [1] one wire of an electronic transmission's vehicle speed sensor (VSS), [2] one wire of a 2-wire pulse signal generator or [3] the <u>black</u> wire of a Classic Instruments SN16 pulse signal generator to the SN74Z terminal marked **SENDER -**.

5) Connect [1] one wire of an electronic transmission's vehicle speed sensor (VSS), [2] one wire of a 2-wire pulse signal generator, [3] the <u>white</u> wire of a Classic Instruments SN16 pulse signal generator or [4] a Computer (*ECM / PCM*) generated speed signal to the SN74Z terminal marked **SPEEDO IN**.

6) Connect the <u>purple</u> wire of the speedometer harness to the SN74Z terminal marked **OUTPUT**.

7) [Optional:] The SN74Z terminal marked **CRUISE** puts out an 8,000 pulse per mile 12-volt square wave signal that can be used as a signal source for a cruise control, lockup converter, etc…

8) Connect two wires from a momentary contact pushbutton to the two terminals on the SN74Z marked **BUTTON**. *A pushbutton is also mounted to the SN74Z that can be used <u>in place of</u> a remote button attached to the BUTTON terminals.*
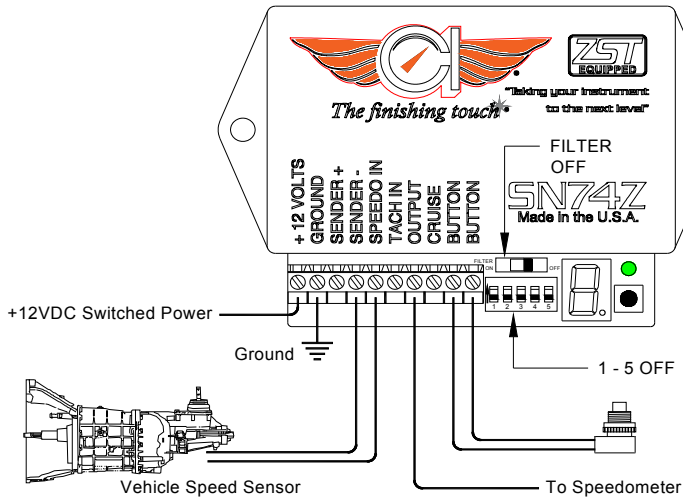
Wiring Diagrams on Following Page
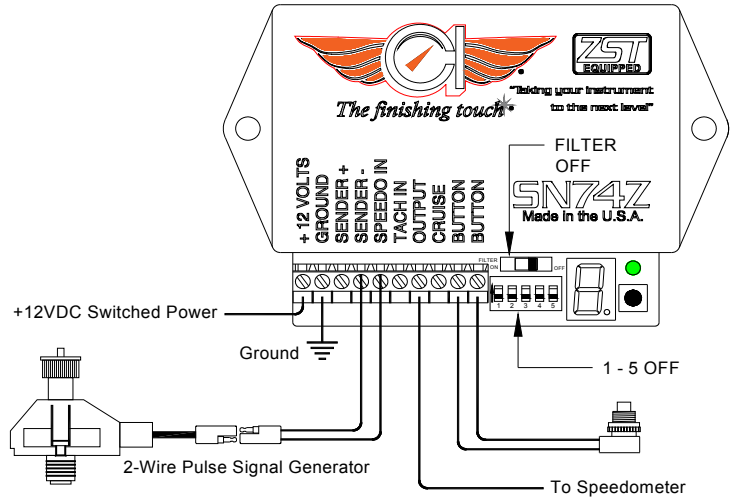
Figure 1: Vehicle Speed Sensor (VSS) Connection

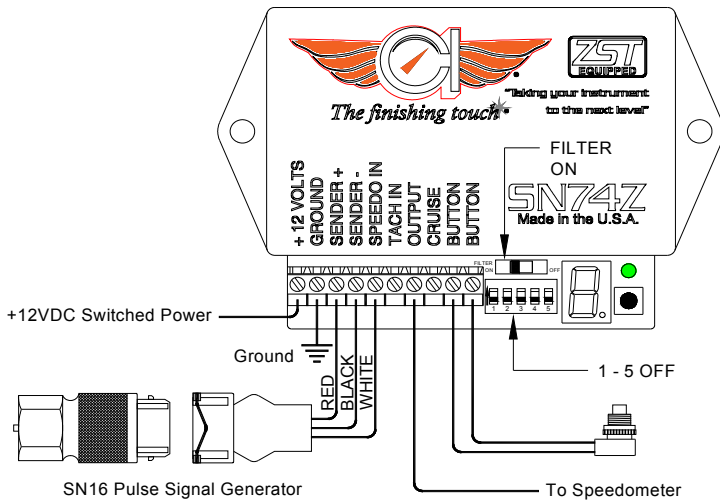**Figure 2**: 2-wire Pulse Signal Generator Connection

Figure 3: SN16 Pulse Signal Generator Connection
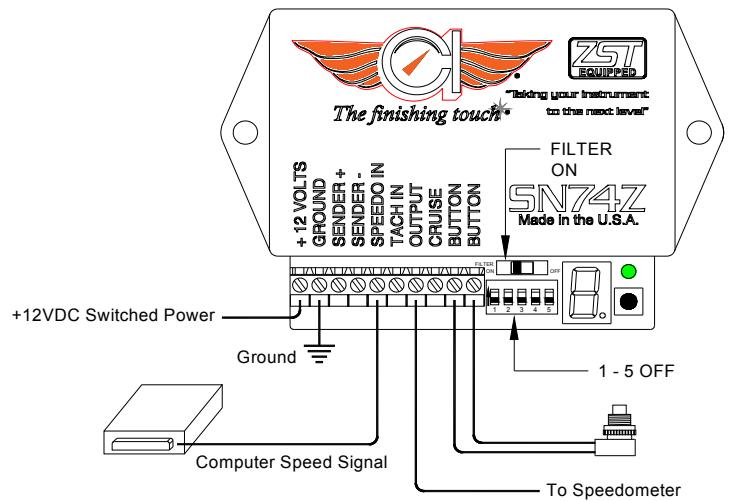
Figure 4: ECM/PCM Speed Signal Connection

SN74Z Dip Switch Settings

- Dip Switch #1:
  - Set switch #1 ON to set the output to 8,000 pulses per mile (ppm). *(Classic Instruments speedometers that have 8 dip switches on the back require 8,000 ppm)*
  - Set switch #1 OFF to set the output to 16,000 pulses per mile (ppm). *(Classic Instruments speedometers that have 12 dip switches on the back require 16,000ppm)*
- Filter Switch:
  - Set the Filter Switch ON for square wave speed signals such as ECM / PCM speed signals or SN16 / SN16F pulse signal generator signals.
  - Set the Filter Switch OFF for sine wave speed signals such as OEM vehicle speed sensor (VSS) signals or SN96 / SN95 pulse signal generator signals. *(sine wave signal sensors always have 2 wires)*
- Dip Switches #2 - #5 are NOT used

Speedometer Dip Switch Settings

Classic Instruments speedometers have a row of rocker switches on the back that are used to calibrate the speedometer in certain applications. However, if you are using a SN74Z, the speedometer rocker switches are not used to calibrate the speedometer.

- o Switches **5, 6, 7, 8 OPEN** *(pushed in away from the number side of the switch)*. All other switches **(1, 2, 3, 4 & 9, 10, 11, 12) CLOSED** *(pushed in toward the number side of the switch)*.

SN74Z Speedometer Calibration Modes

There are three calibration modes you can use to calibrate the SN74Z. Use whichever mode seems easiest for your application. It is not necessary to perform all calibration modes.

Instant Calibration Mode

- Start with vehicle power off.
- Press and <u>hold</u> the calibration button and start the engine. *Once the engine is running, release the button.*
- The LED digit will display **C**, indicating entry into module select mode.
- After a few seconds, the LED digit will display **S**, **r** or **F**. Tap the button to cycle round robin through these setup options. Press and <u>hold</u> the button when the LED digit displays **S** *(indicating setup for speedometer applications)*.
- Release the button when the LED digit displays **C**, indicating entry into calibration mode.
- Tap the button to change the LED digit to **1** indicating instant calibration mode. *Continuing to tap the button will cycle round robin through the calibration modes 1, 2, 3 and F.*
- Press and <u>hold</u> the button with the LED digit indicating **1** until the **1** starts blinking.
- Begin driving at 30 mph based on GPS or a pace car. *(The green LED on the SN74Z should blink indicating that it is getting a signal)*.
- While driving steady at that speed, press and <u>hold</u> the button until the LED digit changes back to **C** *(to confirm that calibration is saved)*.
- The speedometer should now begin reading 30 mph.
- Press and <u>hold</u> the button while the LED digit displays **C** to exit calibration mode. *(Tap the button to cycle round robin through the calibration modes again if you would like to perform another calibration)*.

Real-Time Calibration Mode

- Start with vehicle power off.
- Press and <u>hold</u> the calibration button and start the engine. *Once the engine is running, release the button.*
- The LED digit will display **C**, indicating entry into module select mode.
- After a few seconds, the LED digit will display **S**, **r** or **F**. Tap the button to cycle round robin through these setup options. Press and <u>hold</u> the button when the LED digit displays **<u>S</u>** *(indicating setup for speedometer applications)*.
- Release the button when the LED digit displays **C**, indicating entry into calibration mode.
- Tap the button to change the LED digit to **2** indicating real-time calibration mode. *Continuing to tap the button will cycle round robin through the calibration modes 1, 2, 3 and F.*
- Press and <u>hold</u> the button with the LED digit indicating **2** until the **2** starts blinking.
- Begin driving a known speed. *(The green LED on the SN74Z should blink, indicating that it is getting a signal).*
- Press and <u>hold</u> the button to change the speed shown on the speedometer. The first time the button is pressed and held, the speed shown on the speedometer will increase. The second time the button is pressed and held, the speed shown on the speedometer will decrease.
  - The SN74Z will alternate increasing or decreasing the speed shown on the speedometer each time the button is pressed. Press and hold the button to fine tune the speed shown on the speedometer.
- Once the speedometer is reading the correct speed, wait 8 seconds without pushing the button *(in order to save the calibration)*. The LED digit will change back to **C** to confirm calibration is saved.
- Press and <u>hold</u> the button while the LED digit displays **C** to exit calibration mode. *(Tap the button to cycle round robin through the calibration modes again if you would like to perform another calibration).*

- Start with vehicle power off.
- Press and <u>hold</u> the calibration button and start the engine. *Once the engine is running, release the button.*
- The LED digit will display **C**, indicating entry into module select mode.
- After a few seconds, the LED digit will display **S**, **r** or **F**. Tap the button to cycle round robin through these setup options. Press and <u>hold</u> the button when the LED digit displays **S** *(indicating setup for speedometer applications)*.
- Release the button when the LED digit displays **C**, indicating entry into calibration mode.
- Tap the button to change the LED digit to **3** indicating marked mile calibration mode. *Continuing to tap the button will cycle round robin through the calibration modes 1, 2, 3 and F.*
- Press and <u>hold</u> the button with the LED digit indicating **3** until the **3** starts blinking.
- Begin driving a known mile. *(The green LED on the SN74Z should blink, indicating that it is getting a signal)*.
    - When driving the known mile, the speedometer will not indicate any speed. This is normal.
- At the end of the known mile, press and <u>hold</u> the button until the LED digit changes back to **C** to confirm calibration is saved.
- Press and <u>hold</u> the button while the LED digit displays **C** to exit calibration mode. *(Tap the button to cycle round robin through the calibration modes again if you would like to perform another calibration).*
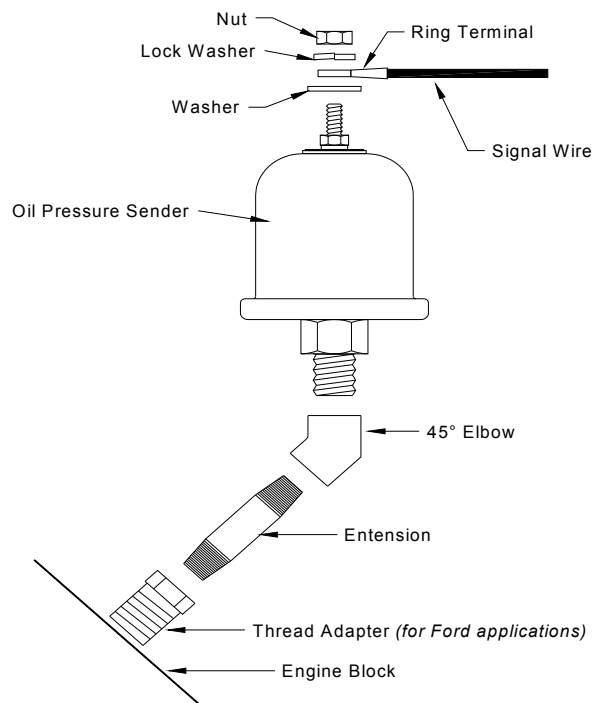

Main Gauge Connector Wiring

1) Always disconnect the vehicle battery before wiring any gauge.
2) Connect <u>dash light power</u> (*use of an LED dimmer is recommended*) to position **1** of the Main plug.
3) Connect the <u>high beam</u> indicator power to position **2** of the Main plug.
4) Connect the <u>right turn</u> indicator power from the vehicle's turn signal switch to position **3** of the Main plug.
5) Connect the <u>left turn</u> indicator power from the vehicle's turn signal switch to position **4** of the Main plug.
6) Connect the <u>water temperature signal</u> wire to position **5** of the Main plug.
7) Connect the <u>oil pressure signal</u> wire to position **6** of the Main plug.
8) Connect the <u>fuel level signal</u> wire to position **7** of the Main plug.
9) Connect a <u>good chassis ground</u> to position **8** of the Main plug.
10) Connect a good <u>+12VDC switched power source</u> to position **9** of the Main plug.

Oil Pressure Sender Installation
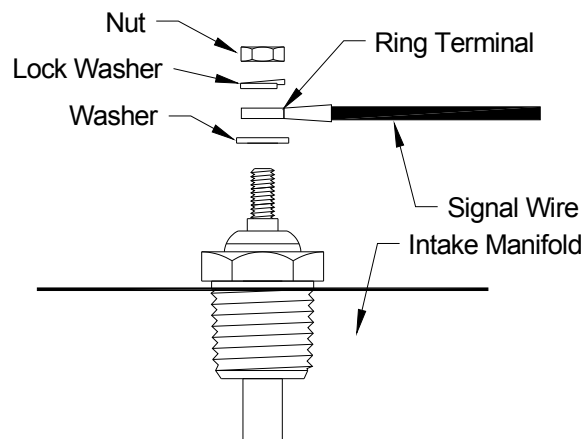
(Part No. SN52)

1) Disconnect battery before installation.
2) Only install Classic Instruments sending units when the engine is COLD.
3) DO NOT use Teflon tape on the threads. These threads are slightly tapered and designed to be self-sealing. The sender uses the threads for its ground connection and sealant may cause a poor ground causing inaccurate readings. If supplemental sealant is needed, we recommend using Loctite C5-A anti-seize. This is a copper based anti-seize which will allow a good electrical connection for the sender ground.
4) Connect a wire from the top terminal of the oil pressure sender to position **6** of the Main plug.

Nut
Lock Washer
Washer
Ring Terminal
Signal Wire
Oil Pressure Sender
45° Elbow
Entension
Thread Adapter *(for Ford applications)*
Engine Block

Temperature Sender Installation

(Part No. SN22, SN23, SN24 & SN25)

1) Disconnect battery before making any connections.
2) Install the Classic Instrument's temperature sending unit only when the engine is COLD!
3) DO NOT use Teflon tape on the threads. These threads are slightly tapered and designed to be self-sealing. The sender uses the threads for its ground connection and sealant may cause a poor ground causing inaccurate readings. If supplemental sealant is needed, we recommend using Loctite C5-A anti-seize. This is a copper based anti-seize which will allow a good electrical connection for the sender ground.
4) Install the temperature sender into the intake manifold of your engine if possible. Installing the sender in the engine cylinder head may cause inaccurate temperature readings.
5) Connect a wire from the top terminal of the temperature sender to position **5** of the Main plug
6) Tighten until snug. DO NOT OVER TIGHTEN!

Nut
Lock Washer
Washer
Ring Terminal
Signal Wire
Intake Manifold

Instrument Cluster Wiring Diagram

OIL

TEMP

VOLT

FUEL

Good Chassis Ground [Black - **1**]

Optional Signal Ground [Black / White - **2**]

+12VDC switched [Pink - **3**]

Optional Signal Power [Red / White - **4**]

Speed Signal [Purple - **5**]

Not Used [**6**]

Speedometer Harness

Pink

Red / White

Purple

Black / White

Black

Main Plug

+12VDC switched [**9**]

Good Chassis Ground [**8**]

Fuel Level Signal [**7**]

Oil Pressure Signal [**6**]

Water Temperature Signal [**5**]

Left Turn Indicator [**4**]

Right Turn Indicator [**3**]

High Beam Indicator [**2**]

Dash Light Power [**1**]