

1967-1968

Mustang

Installation Manual

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Welcome to the Team of 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

Remove Original Instrument Panel

- 1) Disconnect the battery before beginning the replacement of the new instrument panel.
- 2) Remove the 5 screws holding the instrument panel to the dash. Three screws are located at the top of the instrument panel and two screws are located at the bottom of the instrument panel. Save these screws to use when installing the new instrument panel.
- 3) Remove the nut from the stud located on the passenger side of the instrument panel. Save this nut to use when installing the new instrument panel.
- 4) Unscrew the speedometer cable from the back of the speedometer.
- 5) Unplug the wiper switch from the vehicle wire harness.
- 6) Unplug the two existing instrument panel wire harness connectors from the vehicle wire harness.
- 7) Remove the original instrument panel from the dash.
- 8) Remove the two screws attaching the wiper switch to the original instrument panel and then remove the wiper switch. Save the screws and wiper switch to use with the new instrument panel.

See Figure A and Figure B on the following page

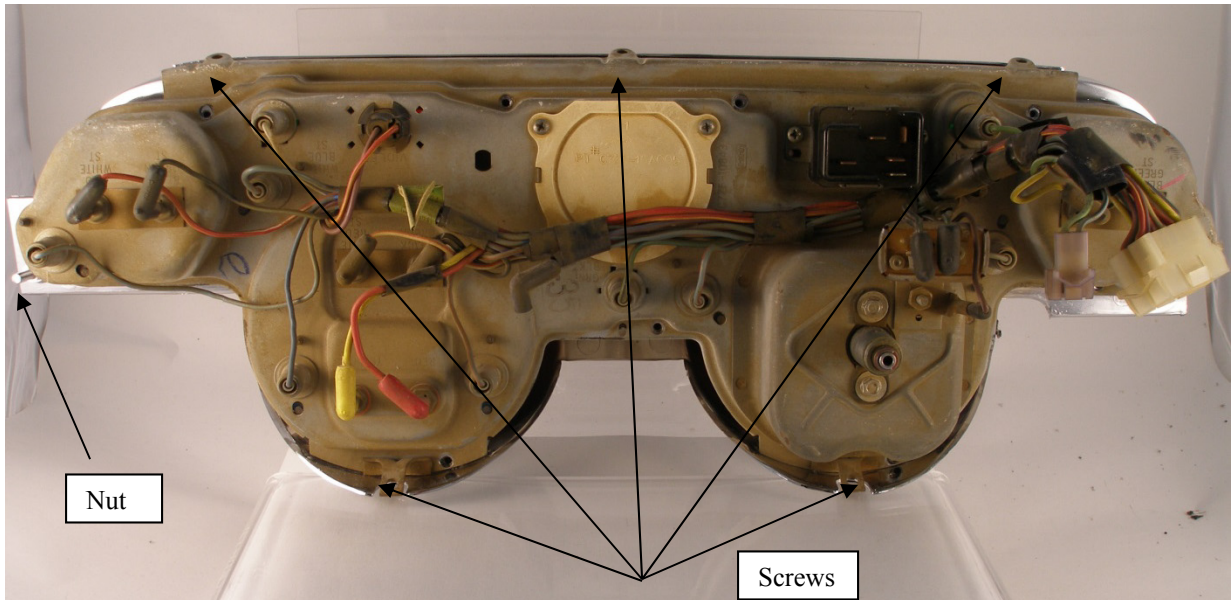


Figure A: Example of original instrument cluster removed from dash
(5 screws and 1 nut removed)

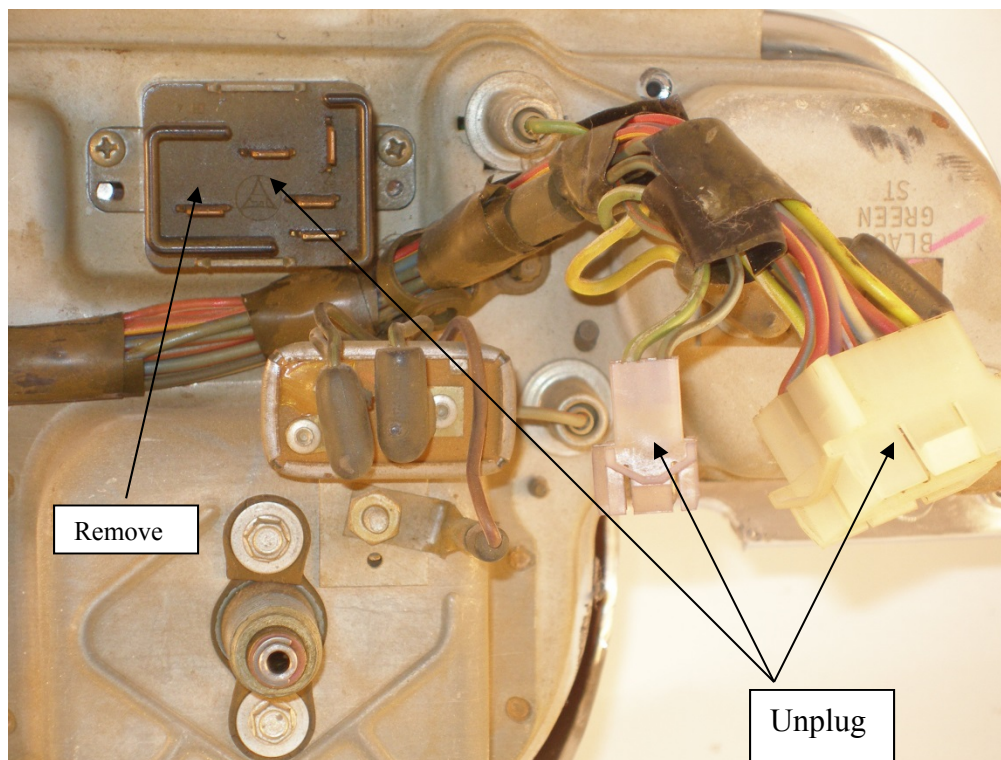


Figure B: Unplugged wiper switch and original instrument harness

Determine Speedometer Signal

Determine where you are going to get the speed signal for your speedometer.

If your transmission has a port where a mechanical speedometer cable was attached, you will need a pulse signal generator. The Ford style pulse signal generator is shown below in figure 1. The pulse signal generator produces 16 pulses per revolution and has three connection wires. When using a pulse signal generator, you will need to calibrate the speedometer according to the 16,000 pulse per mile (ppm) chart on page 15 of this manual. You will need to retain the gear and holder from the transmission end of the speedometer cable to use on the pulse signal generator.

If your transmission has an electronic vehicle speed sensor (VSS) or computer (ECM / PCM), you will need a speedometer signal interface, shown below in figure 2.

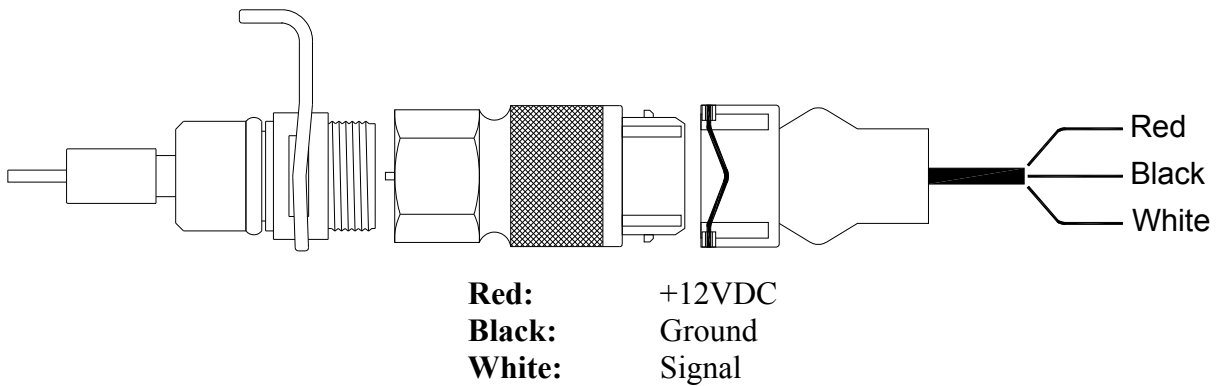


Figure 1: Ford style pulse signal generator [SN16F]

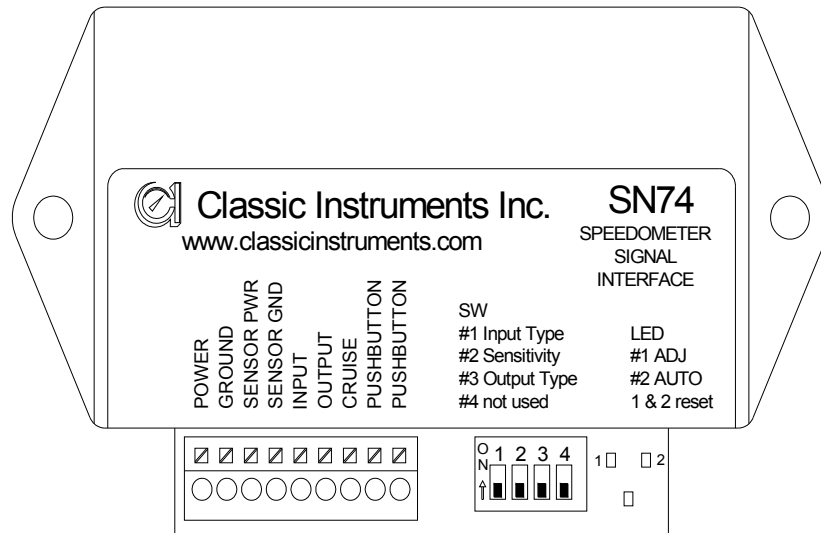


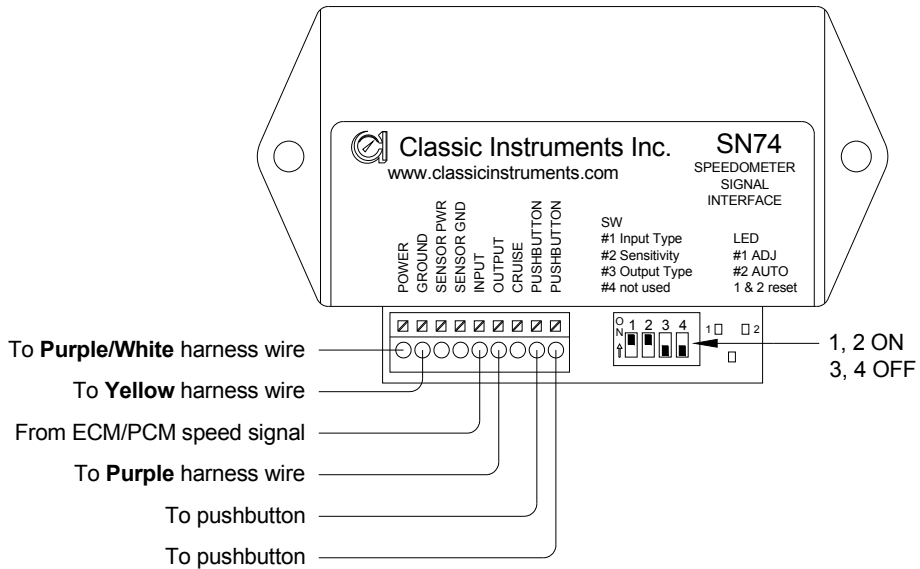
Figure 2: Speedometer signal interface [SN74]

Wiring the Speedometer

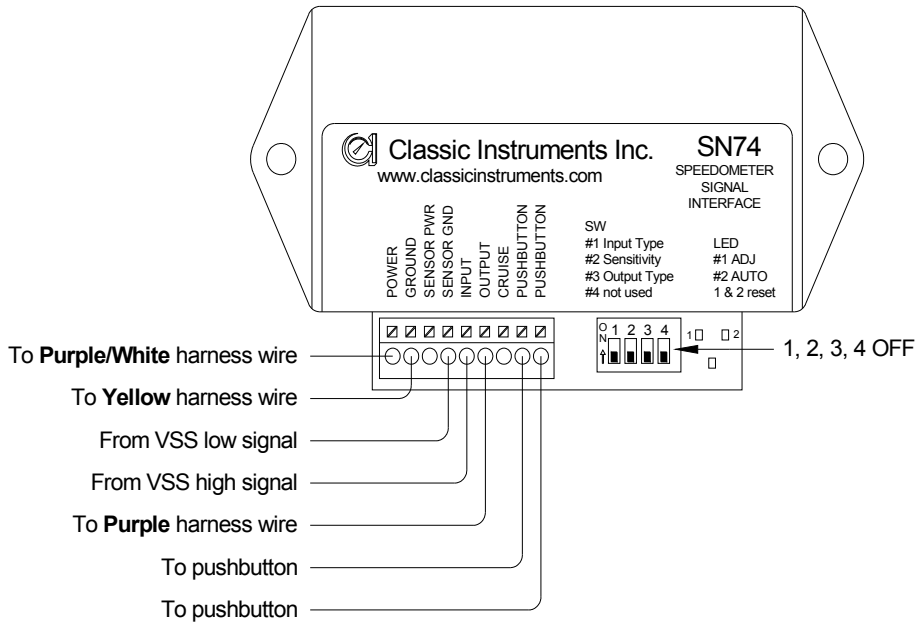
- 1) Connect +12VDC from the accessory side of the ignition switch to the **Pink/White** wire on the speedometer connector (position F) of the instrument wire harness. If accessory of ignition is not available, connect to a switched and dedicated fuse on the fuse panel. This will help prevent interference to the speedometer from the power source.
- 2) Connect the red wire from the pulse signal generator OR “Power” from the SN74 to the **Purple/White** wire on the speedometer connector (position C) of the instrument wire harness.
- 3) Connect a dedicated chassis ground (i.e. don’t stack with any other ground wires) to the **black/white** wire on the speedometer connector (position E) of the instrument wire harness. This will help prevent interference to the speedometer from the ground.
- 4) Connect the black wire from the pulse signal generator OR “Ground” from the SN74 to the **yellow** wire on the speedometer connector (position A) of the instrument wire harness.
- 5) Connect the white wire from the pulse signal generator OR “Output” from the SN74 to the **purple** wire on the speedometer connector (position B) of the instrument wire harness.
- 6) If using the SN74 speedometer signal interface:
 - A. Connect one wire of the transmission VSS to the SN74 “Sensor GND” and the other wire of the transmission VSS to the SN74 “Input”.

OR

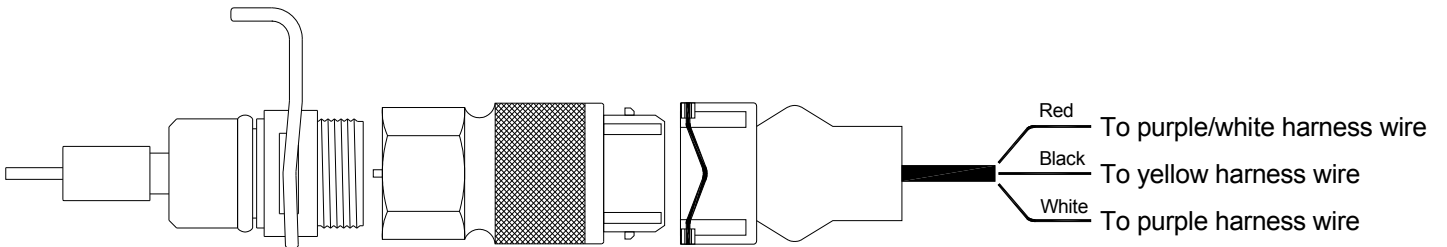
- B. Connect the speed signal wire from the ECM / PCM to the SN74 “Input”.



ECM/PCM Speed Signal Wiring



Electronic VSS Speed Signal Wiring



Pulse Signal Generator Wiring

Determine Tachometer Signal

STANDARD POINTS & CONDENSER SYSTEM

Signal comes from the negative side of the coil (usually marked as “-“).

GMC – HEI (High Energy Ignition System)

Signal comes from the “TACH” terminal on coil side of distributor cap.

MSD (Multiple Spark Discharge System)

Signal comes from the TACH post on the MSD box. If there isn't a MSD box, the signal comes from the negative side of the coil. If the tachometer does not respond correctly, your MSD system may require a MSD TACH adapter. Part No. 8910 or 8920. Contact MSD to find out which adapter you should use for your application.

VERTEX MAGNETO SYSTEM

Signal comes from the “KILL” terminal on side the of Vertex magneto body. An external adapter such as an MSD Pro Mag Tach Converter #8132 may be required.

ACCEL IGNITION COILS

Signal comes from the negative side of the coil. CAUTION! Some Accel ignition coils require the tach signal wire to be connected to the “+” terminal on the coil! PLEASE carefully read Accel's instructions before connecting ignition coil.

MALLORY IGNITION

Signal comes from the negative terminal side of coil (usually marked as “-“).

IMPORTANT! Some Mallory ignition systems may require you to adjust the tachometer selector switch to be set at the 4-cylinder setting (rather than the 8-cylinder setting). The selector switch is located on the backside of the tachometer case.

ECM TACHOMETER SIGNAL

Signal comes from the computer. When using this type of signal, you may need to set the tachometer to a 4-cylinder setting regardless of the actual cylinders on the engine. Signals below 8V amplitude require the use of either the SN76 tach adapter or a 1K .25W pull-up resistor installed between the signal and power post of the tachometer. See Table 2 for settings.

MULTIPLE COIL IGNITION SYSTEMS

A tach adapter is required for these ignition systems. A tach signal driver such as the MSD #8913, which produces a 12V square wave signal, is recommended. Please check with manufacturer for your specific application.

NOTICE: *For all other ignition systems please look at the owner's manual for that system.*

Wiring the Tachometer

- 1) Connect switched +12VDC power to the **pink** wire on the power/lighting connector (position H) of the instrument wire harness.
- 2) Connect a good chassis ground to the **black** wire on the power/lighting connector (position J) of the instrument wire harness.
- 3) Connect the tachometer signal to the **white** wire on the signal connector (position J) of the instrument wire harness.
- 4) Set the tachometer dip switches to the appropriate cylinder setting for your signal. Refer to Table 2 and Figure 3 below.

Note: Some ECM tachometer signals require the tachometer to be set at the 4-cylinder setting regardless of the actual cylinders on the engine.

| Number of Cylinders | Tachometer Dip Switch Setting |
|----------------------------|--------------------------------------|
| 4 | 1 & 2 OPEN |
| 6 | 2 & 3 OPEN |
| 8 | 2 OPEN |

Table 2: Tachometer Setup
(Set dip-switches from Table to OPEN, all others CLOSED)

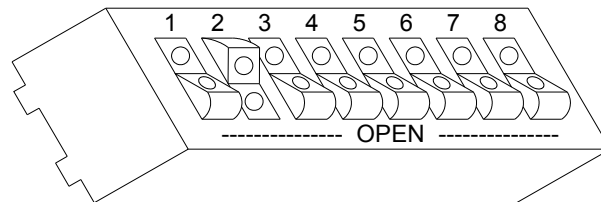


Figure 3: Dip switches on back of tachometer
(Figure shows the factory preset 8 cylinder setting)

Wiring the Temperature Gauge

- 1) Install the Classic Instruments temperature sender in the intake manifold of the engine. The threads of the sender are tapered and should not require additional sealant. Do not use Teflon tape on the threads of the sender. If necessary, a small amount liquid Teflon pipe sealer may be used. A good ground is essential between the temperature sender and the engine block for proper gauge operation. Use of Teflon tape on the sender threads may degrade the ground contact between the sender and the engine.
- 2) Connect the temperature sender to the **dark green** wire on the signal connector (position A) of the instrument wire harness. See Figure 4 below.
- 3) The temperature gauge uses the same power and ground used for the tachometer. If you have already connected them, no other connections are necessary. Otherwise, see step 1 & 2 of wiring the tachometer section.

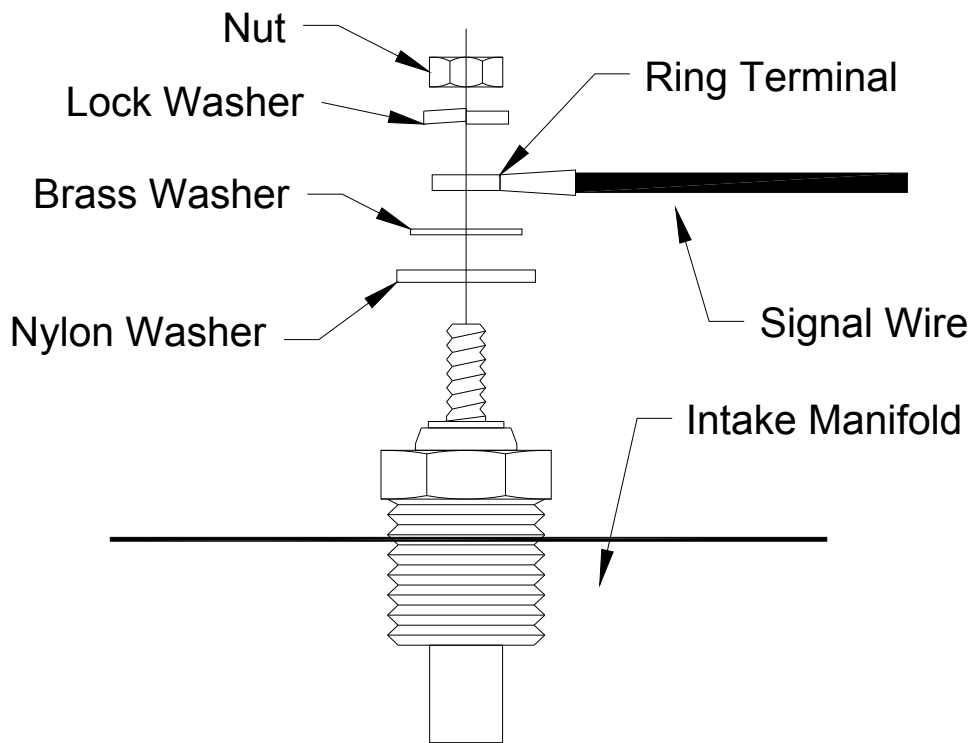


Figure 4: Connecting the temperature sender

Wiring the Oil Pressure Gauge

- 1) Install the Classic Instruments oil pressure sender in the engine block. Ford engine installations require the use of the 3-piece brass bushing kit which includes a thread adapter, 45 degree elbow and 1 inch extension. The threads of the sender and bushing kit are tapered and should not require additional sealant. Do not use Teflon tape on the threads of any part of the sender. If necessary, a small amount liquid Teflon pipe sealer may be used. A good ground is essential between the oil pressure sender and the engine block for proper gauge operation. Use of sealants on the sender threads may degrade the ground contact between the sender and the engine.
- 2) Connect the oil pressure sender to the **dark blue** wire on the signal connector (position B) of the instrument wire harness. See Figure 5 below.
- 3) The oil pressure gauge uses the same power and ground used for the tachometer. If you have already connected them, no other connections are necessary. Otherwise, see step 1 & 2 of wiring the tachometer section.

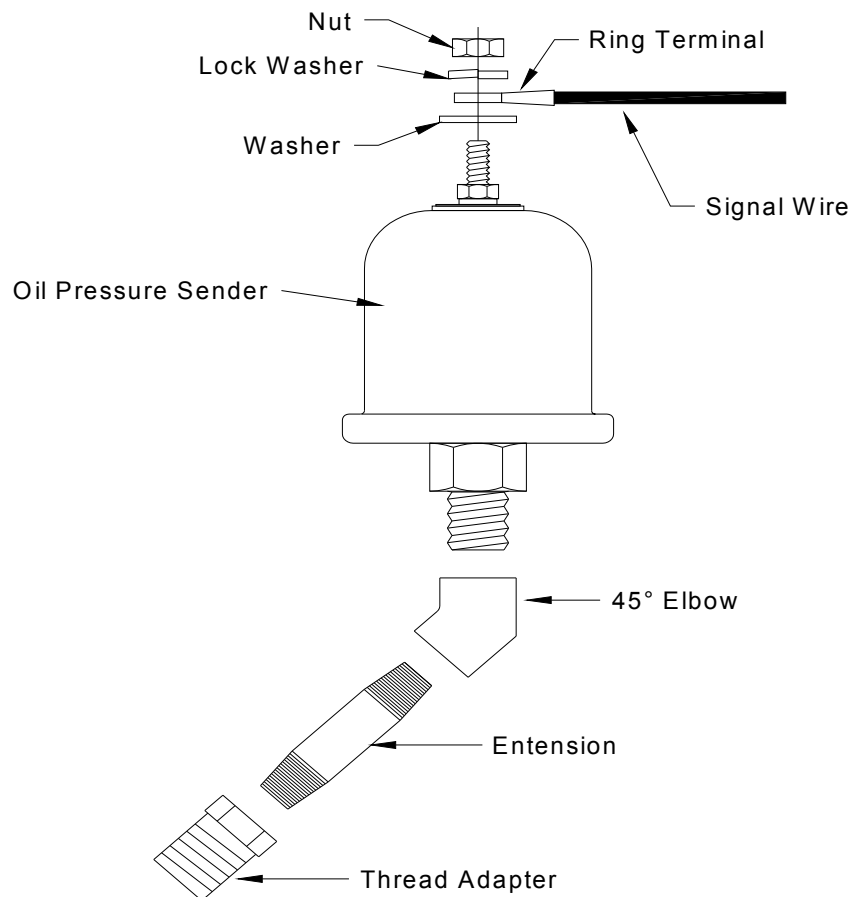


Figure 5: Connecting the oil pressure sender

Wiring the Fuel Level Gauge

- 1) The fuel level gauge in your instrument cluster is designed to work with the stock sending unit in your 1967 – 1968 Mustang. The stock fuel level sender generates an ohm range of 78 ohms at empty and 10 ohms at full. Connect the stock fuel level sender to the **tan** wire on the signal connector (position D) of the instrument wire harness.
- 2) The fuel level gauge uses the same power and ground used for the tachometer. If you have already connected them, no other connections are necessary. Otherwise, see step 1 & 2 of wiring the tachometer section.

Wiring the Turn Signals

- 1) Connect the vehicle's right turn signal wire to the **blue** wire on the signal connector (position G) of the instrument wire harness.
- 2) Connect the vehicle's left turn signal wire to the **light blue** wire on the signal connector (position F) of the instrument wire harness.

Wiring the High Beam Indicator

- 1) Connect the vehicle's high beam indicator signal wire to the **light green** wire on the signal connector (position E) of the instrument wire harness.

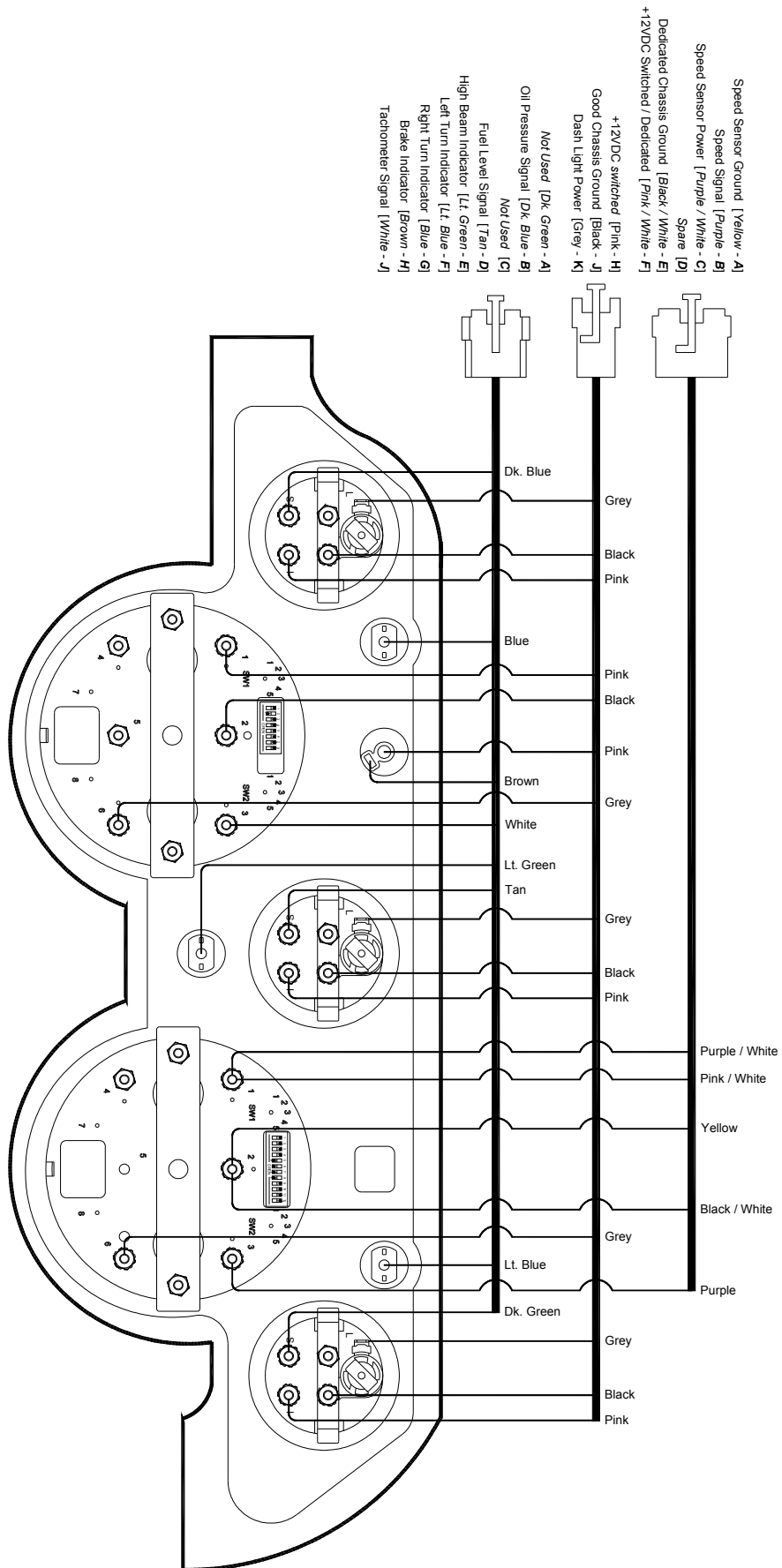
Wiring the Brake Light Indicator

- 1) Connect the **brown** wire on the signal connector (position H) of the instrument wire harness to the emergency brake signal wire or switch.

Wiring the Dash Lights

- 1) Connect the vehicle's dash light power wire to the **grey** wire on the power / lighting connector (position K) of the instrument wire harness.

Instrument Panel Wire Harness



Calibrating the Speedometer

SN16F Pulse Signal Generator Signal

IMPORTANT: Calibrate your speedometer before completely mounting your instrument panel. (*You will need to adjust dip switches on the back of the speedometer to complete the calibration*) Be sure the 12 dip switches on the back of the gauge are set to the default setting (5, 6, 7, 8 OPEN) before performing the calibration road test.

- 1) To check your speedometer reading, follow and pace another car (with an accurate speedometer) to a speed of 60 MPH true road speed. A GPS navigation system can also be utilized for this purpose.
- 2) Determine the speed you are reading on your speedometer when the pace car is at 60 MPH or you register 60 MPH on your GPS.
- 3) Refer to the 16-pulse speedometer 16,000 ppm calibration chart on page 15 for adjustments. Find the MPH you were reading while pacing a car with an accurate speedometer or GPS reading. Note the dip switch positions in the second column.
- 4) Turn the ignition off. Set the dip switches identified in the second column to OPEN (pushed in away from the numbered side). All other switches should be CLOSED (pushed in toward the numbered side).
- 5) Your speedometer should now read the same as the pace car of GPS.

SN74 Speedometer Signal Interface Signal

- 1) Connect switched +12VDC to "POWER"
- 2) Connect chassis ground to "GROUND"
- 3) Connect the red wire from a SN16 pulse signal generator to "SENSOR PWR". *(if not using the SN16, do not use this connection)*
- 4) Connect the black wire from a SN16 pulse signal generator OR one wire from the built-in transmission VSS (2-wire) to "SENSOR GND". *(if using an ECM speed signal, do not use this connection)*
- 5) Connect the white wire from a SN16 pulse signal generator OR one wire from the built-in transmission VSS (2-wire) OR the ECM speed signal to "INPUT"
- 6) Connect "OUTPUT" to the signal connection of the speedometer.
- 7) Connect "CRUISE" to the signal input for a cruise control module *(if needed)*. The cruise control signal is 8,000 pulses per mile (PPM).
- 8) Connect one lead from the momentary pushbutton to each of the two "PUSHBUTTON" connections.
- 9) Determine the default pulse setting for the speedometer (Classic Instruments speedometer with 8 dip switches is 8,000ppm, Classic Instruments speedometer with 12 dip switches is 16,000ppm)
- 10) If speedometer dip switches are not in the default position, set them at this time (8,000ppm speedometer 2 6 7 8 OPEN, 16,000ppm speedometer 5 6 7 8 OPEN)
- 11) Set switches on the module according to the chart below based on the speed signal you will be using.

| Signal Source | Gauge Type | Switch Setting |
|--------------------------------------|----------------------|------------------|
| SN16 Pulse Signal Generator [3-wire] | 8-Pulse (8,000ppm) | 1 2 3 ON – 4 OFF |
| | 16-Pulse (16,000ppm) | 1 2 ON – 3 4 OFF |
| VSS [2-wire] | 8-Pulse (8,000ppm) | 3 ON - 1 2 4 OFF |
| | 16-Pulse (16,000ppm) | 1 2 3 4 OFF |
| ECM [1-wire] | 8-Pulse (8,000ppm) | 1 2 3 ON – 4 OFF |
| | 16-Pulse (16,000ppm) | 1 2 ON – 3 4 OFF |

Switch 1 – OFF = Vehicle Speed Sensor signal, ON = Computer or SN16 signal
 Switch 2 – OFF = high sensitivity, ON = low sensitivity
 Switch 3 – OFF = 16,000ppm signal output, ON = 8,000ppm signal output
 Switch 4 – *Not Used*

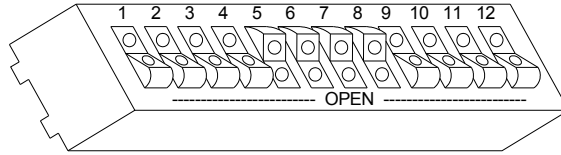
Marked Mile Calibration Mode
(Use When Calibrating for the First Time)

- 1) Start with the vehicle power / engine off. Push and hold the pushbutton while starting the engine.
- 2) When the engine is running, release the pushbutton.
- 3) The red LED labeled “1” on the module will be lit (indicating real-time calibration mode).
- 4) Tap the pushbutton. The red LED labeled “1” will turn off and the red LED labeled “2” will turn on (indicating marked mile calibration mode).
- 5) Push and hold the pushbutton with red LED “2” lit until LED “2” starts blinking
(approximately 5 seconds)
- 6) Begin driving a known mile. *(The green LED between the red LEDs should blink once you start moving indicating that the module is getting a signal.)*
- 7) When driving the known mile, the speedometer will not indicate any speed. This is normal.
- 8) At the end of the known mile, press and hold the pushbutton until the red LED “2” turns off.
(approximately 5 seconds)

Real-Time Calibration Mode
(For Fine Tuning the Speedometer Calibration)

- 1) Start with the vehicle power / engine off. Push and hold the pushbutton while starting the engine.
- 2) When the engine is running, release the pushbutton.
- 3) The red LED labeled “1” on the module will be lit (indicating real-time calibration mode).
- 4) Push and hold the pushbutton with red LED “1” lit until LED “1” starts blinking.
(approximately 5 seconds)
- 5) Drive a known speed using a GPS or by pacing another car. *(The green LED between the red LEDs should blink once you start moving indicating that the module is getting a signal.)*
- 6) Press and hold the pushbutton to change the speed show on the speedometer. The first time the pushbutton is pressed and held, the speed shown on the speedometer will increase. The second time the pushbutton is pressed and held, the speed shown on the speedometer will decrease. *Note: Changes in speed will happen slowly. The button will need to be held longer if a large change of speed is required.*
- 7) The pushbutton will alternate between increasing or decreasing the speed shown on the speedometer each time it is pressed. Press and hold the pushbutton to fine tune the speed shown on the speedometer.
- 8) Once the correct speed on the speedometer has been achieved, wait *at least* 8 seconds without pushing the pushbutton, then turn power to the module off in order to save the calibration.

16-Pulse Speedometer 16,000 PPM 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, 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 |

Mount New Instrument Panel

- 1) Insert wiper switch into new instrument panel. Make sure the non-slotted mounting holes of the switch are toward the bottom of the new instrument panel. Use the original two screws saved from the original instrument panel to fasten the wiper switch to the new instrument panel.
- 2) Attach the original wiper switch plug to the back of the wiper switch.
- 3) Mount the new instrument panel to the dash using the 5 mounting screws and nut that were removed from the original instrument panel.

See mounting diagram below

