Installation Instructions
1. Disconnect the vehicle battery.
2. Connect the gauge power requirements as shown in figures 2 & 3.
3. Wire all the components to the proper sources and senders. (See figures 2 & 3)
4. Reconnect the vehicle battery.
5. Power up the gauge and program the various gauge components (if needed). (See Gauge Operation Instructions)

FIGURE 1: Gauge Display Guide

- Check Engine Indicator
- High Beam Indicator
- Gauge Mounting Brackets - 4 in total, one on each corner of the gauge.
- Brake Indicator
- Left Turn Signal
- Temperature Warning Indicator
- Speedometer
- Tachometer (Not available on some models)
- Button - Used to operate gauge screen and programming menus and options.
- 4 Wheel Drive (4x4) Indicator
- Screen - Displays - mileage, programming options, menus, and other useful information.
- Right Turn Signal
- Low Fuel Indicator
- Fuel Level Gauge
- Temperature Gauge

WARRANTY - Speedhut Inc. warrants to the consumer for a period of 5 years from the date of purchase that this product will be free from defects in materials or workmanship. Speedhut warrants to the consumer for a “LIFE-TIME” that the product circuit board will be free from defects in materials or workmanship. This warranty is limited to the repair or replacement of Speedhut Inc products. Speedhut Inc is not responsible for special, incidental or consequential damages or costs incurred due to the failure of this product. Modification to the product, improper use or installation, accident, water damage, abuse, unauthorized repairs or alterations voids this warranty. Speedhut Inc disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by Speedhut Inc.

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CJ GPS Speedometer Cluster

FIGURE 2: Wiring Guide
See Figure #3 for more wiring info.

1. Blue wire with White Stripe - High Beam Indicator
2. Red wire with Green Stripe - Speed Sensor
3. Green wire with Orange Stripe - Left Turn Signal
4. Black (Double Pigtail paired with wire #6) - CAN High
5. Green wire with Red Stripe - Right Turn Signal
6. Black [White Striped] (Double Pigtail paired with wire #4) - CAN Low
7. Black wire - Brake Indicator
8. Red wire with Black Stripe - GPS Hot Start (Connect to +12VDC Non-Accessory Power).
9. Yellow wire with Black Stripe - Fuel Level Ground
10. Pink wire - Fuel Level Signal
11. Orange wire - 4x4 Indicator
12. Yellow wire with Red Stripe - Water Temp Signal
13. White (Triple Pigtail paired with wires #14 and #15) - Lighting Dimmer
14. Red (Triple Pigtail paired with wires #13 and #15) - +12VDC Switched (5 Amp Inline Fuse Recommended, Power Draw is 0.2 Amp)
15. Black (Triple Pigtail paired with wires #13 and #14) - Ground
16. Yellow wire with Black Stripe - Water Temp Ground
17. Yellow wire - Tachometer Signal (available on some models)
18. Black (Double Pigtail paired with wire #19) - EL Inverter
19. Black [White Striped] (Double Pigtail paired with wire #18) - EL Inverter
20. Purple Wire - Check Engine Indicator
21. Black [White Striped] (Double Pigtail paired with wire #22) - Buzzer Ground (available on some models)
22. Black (Double Pigtail paired with wire #21) - Buzzer Signal (available on some models)
CJ GPS Speedometer Cluster - Installation

FIGURE 3: Connection Guide
See Figure #2 for more wiring information and numbering.

- Power Draw = 0.2 Amp
- 3A to 5A Inline Fuse Recommended for +12 Accessory Power

- GPS Hot Start (#8 Red/Black Wire)
  - Connect to +12VDC non-accessory power.
  - (25 micro-amp draw) See Figure 8

- Brake Light [GND] (#7 Black)
- Fuel Level Ground Wire (#9 Yellow/Black)
- 4X4 Indicator [GND] (#11 Orange)
- Water Temperature Signal (#12 Yellow/Red)
  - Water Temperature Ground (#16 Yellow/Black)
- OBDII (See Figure 7 for details)
  - Wire Pair #18 and #19

- Speed signal (#2 Red/Green)
  - Connect to Speed Sender (See Figure 4)

- Right turn signal +12V pulse
- Left turn signal +12V pulse
- High beam wire +12V

- Power distribution cable
  - +12 Volts Accessory Power (#14 Red)
  - Ground (#15 Black)
  - +12 Volts Dash lighting (#13 White)
- 4X4 Indicator [GND] (#11 Orange)

- Tachometer Signal (#17 Yellow Wire)
  - (Available on some models)
  - Attach to included wire harness and connect to Tachometer signal out (See Figure 9)

- Check Engine [GND] (#20 Purple Wire)
  - (Available on some models)
  - Attach to included wire harness and connect to Temperature Sender (See Figure 6)

- Inclinometer Buzzer (#’s 21-22)
  - (Available on some models)
  - Wire Pair #18 and #19

- Inverter
  - +12 volts Dash lighting (white)
  - Ground (black)
  - Snap connection for dial lighting

Note: Mount the Inclinometer buzzer behind the dash board of the vehicle. Position it in a place that is ideal for the driver to hear the alarm over the sound of a loud engine.

Note: Tie together the +12VDC dash lighting wire (#13 white) to the +12VDC inverter white wire and connect to the same dash lighting source.

Dial Lighting Inverter Note: Single EL dial lighting inverter included with individual gauge. Multi-gauge EL dial inverter included with gauge set of 3 to 8 gauges.

***Protect any unused connectors. Damage to an unused connector could cause inverter failure.***
See Figures 2 and 3 for more wiring and installation information.

**FIGURE 4:** OPTIONAL Backup Speedometer Sender Connection  (Requires GPS signal for calibration, See Figure 8)

Connect to the speedometer pulse signal. Acceptable signals ranging from 1V - 100Volts.  500 - 250,000 pulses per mile.

**FIGURE 5:** Fuel Level Sender Connection  (see Gauge Operation Instructions for calibration instructions)

Note: When gauge power is off the pointer(needle) will remain in last powered position.

- Fuel sender output—(white)
- Fuel sender ground—(black)

Alternate ECU Setup: You can connect signal wire directly to the speedometer signal out on the vehicle’s ECU.

**FIGURE 6:** Temperature Sender Connection

Note: Fuel sender ground should be connected to the fuel level sender ground. If you do not have a fuel level sender ground connect to the chassis ground.

**FIGURE 7:** OBDII Setup

Does your vehicle support the CAN-BUS protocol?

1. Connect power distribution requirements as shown in Figures 2 & 3. (Make sure that the vehicle battery is disconnected)
2. Connect the black CAN high wire (#4) to the OBDII pin 6, Connect the white striped black CAN low wire (#6) to the OBDII pin 14.  
   [CAUTION: Do not connect to a powered OBDII system. Failure to do so will throw a check engine code.]
3. Mount gauge for easy viewing.

**FIGURE 8:** GPS Antenna and Hot Start Wire

1. Connect GPS receiver antenna into back of speedometer. 
2. For best performance, mount GPS antenna with as much view of sky as possible (preferably on the roof of the vehicle). The GPS antenna is waterproof and magnetic. If the car's roof is not accessible then mount the antenna on top of the vehicle's dash with as much exposure as possible to the sky through the window.
   NOTE: Antenna is able to receive signal through some thin materials i.e. wood, glass, fiberglass, and plastic. All types of metal will block the signal.
3. Hot start feature is optional. Connecting the hot start wire to constant +12volts allows GPS to quickly acquire satellites in less than 2 seconds. This feature saves your current satellite position within the speedometer enabling it to quickly restore your position on power up when Speedometer has been powered off.
   NOTE: Please note that if the speedometer has been powered off longer than 4 hours, it could take up to 1 minute to acquire signal due to the satellites moving significantly from your location. This is normal.
   Power Draw NOTE: The hot start current draw is extremely low (25 micro-amp) and will have virtually zero impact on a vehicle's battery charge. Hot start wire should be connected directly to battery +12volts and should remain powered 100% of the time.
Your vehicle ignition system will fall under one of these 4 ignition types. The type of ignition system will determine where the yellow tachometer signal wire (wire #17) is connected and what the number of pulses per revolution the tachometer should be set to.

Type #1 (single coil) - Up until the 1990’s tachometers picked up the signal from the (-) side on a single ignition coil, reading every pulse sent to all the cylinders. For example, an 8 cylinder (4 stroke) engine fires 4 spark plugs per revolution or all 8 spark plugs in 2 revolutions. Connecting the yellow wire to the negative side of the single coil on an 8 cylinder results in picking up 4 sparks in 1 revolution (see diag. 1). This type of ignition was used pre-dominantly until the 1990’s and distributes sparks to each spark plug. In some vehicles during the 90’s the coil and distributor merged into one unit, but it is the same ignition system - one coil that distributes sparks to all cylinders. When connecting the yellow wire to this style of ignition you will be picking up all cylinder sparks (see diag. 5).

Type #2 (coil pack) - (diag. 2) is used in the 96 Mustang V8 with twin coil packs. Coil pack #1 (C1) controls the firing of 4 spark plugs and coil pack #2 (C2) controls the remaining 4 spark plugs. 2 or more separate coils are within each coil pack assembly. In this example each of the 2 coils within each coil pack sends sparks to 2 cylinders at the same time. When one cylinder is firing in the compression stroke, it’s paired cylinder is “waste” firing in the exhaust stroke. Each separate coil within the pack is controlled by it’s own trigger wire. In other words, if you hooked up the yellow wire to one coil trigger wire within one coil pack, it will see only a fraction of the total engine sparks (see diag. 5).

Type #3 (coil on plug) – An individual coil is placed directly on top of each spark plug eliminating the spark plug wires. The yellow wire, when hooked up to any coil, will pick up only 1 pulse per 2 revolutions or 1/2 pulse per 1 revolution (see dia 3). For this type of ignition the yellow wire from the tachometer will connect to the trigger wire on one of the coils. Typically there will be 3 or 4 colored wires coming off of each coil. The trigger wire will be the wire that changes color from one coil to the next. For example, all coils may have red, gray and black wires coming off of them, but the fourth wire will be blue on one coil and green on the next coil.

Type #4 (tach output from ECU) Some vehicles will have a tachometer output wire coming from the ECU. The yellow wire from our tachometer can receive signal from the ECU by following diagram 4. 4.7k Ω resistor and shrink tubing are included with gauge.

Important note: Connecting the tachometer to the wrong wire will NOT damage the tachometer or your ignition.

<table>
<thead>
<tr>
<th>Type #1 ignitions</th>
<th>Type #2- Coil Packs</th>
<th>Type #3- Coil on Plug</th>
<th>Aftermarket ignitions / tach output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow wire connects to:</td>
<td>Yellow wire connects to:</td>
<td>Yellow wire connects to:</td>
<td>Yellow wire connects to:</td>
</tr>
<tr>
<td>negative side of coil.</td>
<td>negative side of coil (some cars) or</td>
<td>negative side of coil (some cars) or</td>
<td>tachometer output terminal</td>
</tr>
<tr>
<td>12 cyl = 6 Pulses / rev</td>
<td>coil control wire (some cars) or</td>
<td>coil control wire (some cars) or</td>
<td>12 cyl = 6 Pulses / rev</td>
</tr>
<tr>
<td>10 cyl = 5 Pulses / rev</td>
<td>coil trigger wire (some cars).</td>
<td>coil trigger wire (some cars).</td>
<td>10 cyl = 5 Pulses / rev</td>
</tr>
<tr>
<td>8 cyl = 4 Pulses / rev</td>
<td>1 Pulses / rev. (as a good starting point)</td>
<td>1/2 Pulses / rev. (as a good starting point)</td>
<td>8 cyl = 4 Pulses / rev</td>
</tr>
<tr>
<td>6 cyl = 3 Pulses / rev</td>
<td>(see Tachometer Calibration)</td>
<td>(see Tachometer Calibration)</td>
<td>6 cyl = 3 Pulses / rev</td>
</tr>
<tr>
<td>4 cyl = 2 Pulses / rev</td>
<td></td>
<td></td>
<td>4 cyl = 2 Pulses / rev</td>
</tr>
<tr>
<td>(see Tachometer Calibration)</td>
<td></td>
<td>(see Tachometer Calibration)</td>
<td>(see Tachometer Calibration)</td>
</tr>
</tbody>
</table>
GPS SPEEDOMETER:
When the gauge is powered on, it will begin to search for satellites to acquire a GPS signal.

After a GPS signal is acquired the screen will display “GPS ACTIVE”.

When the GPS signal is active the following displays and menus will be available:

Clock

Clock feature. Time is acquired from GPS satellites. User only needs to adjust the hour setting for his/her time zone.

Press and hold button to set clock hours. (color will invert)
Toggle through am / pm hours until correct time is reached.
Release button for several seconds and time is stored. (color will return to normal)

Elevation

Elevation feature is acquired from GPS satellites and shows the current elevation from sea level in feet or meters depending on model.

Speed

Speed feature shows mph or kmh in display

Direction

Shows the current direction

Note: Default direction is North(N). Correct direction is displayed only when moving.
Follow these steps below for all menu items:

1. Press and hold button down while turning on gauge power to enter the calibration menu.
2. A quick button press will toggle LCD screen through all the available menu settings and display.
3. Press and hold to select the menu item (2-3 seconds).
4. Press and hold button to change setting.

**MENU**
1. TACH CAL.
2. FUEL CAL.
3. SET MILES
4. ABOUT

Use the “TACH CAL.” menu to calibrate the TACHOMETER Pulses Per Rev (PPR) [available on some models]:
Repeatedly press the button to toggle through the following PPR options:
(Press and hold to set a selected PPR)

<table>
<thead>
<tr>
<th>PPR</th>
<th>Empty</th>
<th>Full</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>1.0</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>1.5</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>2.0</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>2.5</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>3.0</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>4.0</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>5.0</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>6.0</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
</tbody>
</table>

Use the “FUEL CAL.” menu to calibrate the the ohm range for the FUEL LEVEL:
Repeatedly press the button to toggle through the following OHM ranges:
(Press and hold to set a selected Ohm range)

<table>
<thead>
<tr>
<th>OHMS</th>
<th>Empty</th>
<th>Full</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-30</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>30-70</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>70-10</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>10-180</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>180-16</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>16-0</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>0-30</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>30-240</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>240-33</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>33-90</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>90-0</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>0-16</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>16-158</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
</tbody>
</table>

How to calibrate the FUEL LEVEL gauge to custom Ohm Range:
After toggling through the Ohm ranges there will be an “EMPTY” option and a “Full” option.

**EMPTY option:** While your fuel tank is empty press and hold to set.
**FULL option:** While your fuel tank is full press and hold to set.

<table>
<thead>
<tr>
<th>OHMS</th>
<th>Empty</th>
<th>Full</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-90</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
<tr>
<td>90-0</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
<td>TOGGLE TO CHANGE. HOLD TO SELECT.</td>
</tr>
</tbody>
</table>

Use the “Set Miles” menu to set the Odometer miles:
Repeatedly press the button to toggle through the digits:
(Press and hold to cycle the numbers 0-9)
To save: do not press the button for 5 seconds.

Use the “About” screen to view manufacturing date and other diagnostic information: