INSTALLING THE YELLOW BOX

Background Information

Please read this entire installation guide before starting.

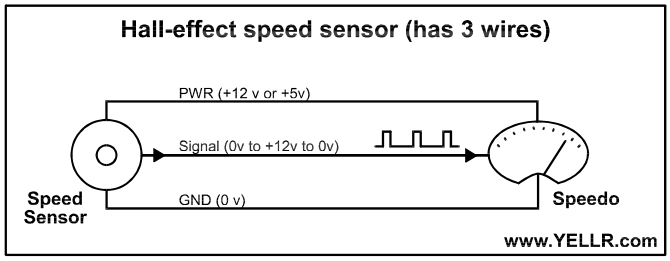
Your Yellow Box package includes;
- Yellow Box Speedo Recalibrator
- YB wiring harness
- Jumper plug (returns YB wiring to original speedo)
- Instructions

What is needed for the installation?
Installation is fairly straight forward. Most people do the installation themselves, usually takes 30 to 60 minutes. Soldering forms a better electrical connection and is our recommended method (see our "Soldering tips guide").

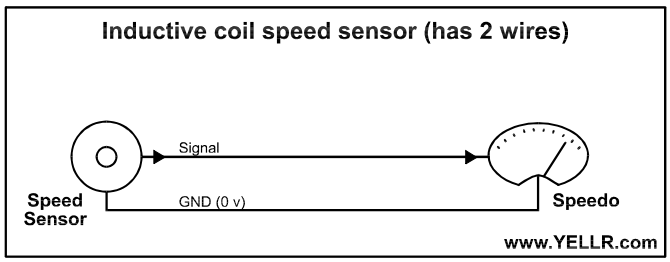
You will need **basic electrical & other tools;**
- Screwdriver, allen keys, etc.
- Wire cutters, wire stripper, sharp knife, or pliers.
- Soldering iron and fine solder.
- Electrical tape or heatshrink, some cable ties.
- Voltmeter or multimeter.
- Vehicle service manual or electrical wiring diagram is also helpful for locating the speed sensor.

Where does the Yellow Box Connect?
The Yellow Box connects after your vehicle speed sensor and enables you to correct the speed signal before the speedometer and/or other vehicle systems.

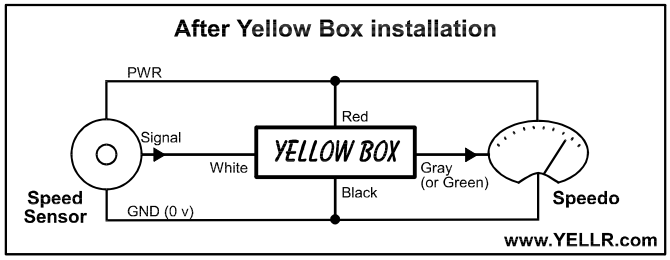
Hall-effect speed sensor (has three wires)
Diagram showing before the Yellow Box is connected.



Inductive coil type speed sensor (has two wires)
The other speed sensor type which is often used in BMW motorcycles, some cars and some trucks.



After the Yellow Box is connected
Speed sensor signal now passes through the Yellow Box, enabling the Yellow Box to correct the signal in real time.



Installation of the Yellow Box (Steps 1-6)

Step 1: Locate the vehicle speed sensor

In many motorcycles the speed sensor is located on the top or side of the transmission (gearbox/crankcase). The speed signal pulse is generated from the revolution of the crankshaft/gears.

In other motorcycles the speed sensor is located near the front sprocket. As the front sprocket rotates the sensor detects this and sends an electrical pulse to the speedo.

Many sportscars, pickups, utes, 4WDs, 2WDs and cars also use a 3-wire hall-effect type speed sensor. In these vehicles the speed sensor is usually located on or near the transmission or transfer case, toward the rear of the engine. There should be a 3-pole connector plug visible.

Some vehicles will connect the Yellow Box at a location not near the speed sensor. Such as into, near or after the ECM/ECU (engine control module) or PCM (powertrain control module), or other connection point.
(Refer to our "Vehicle specific installation guides").

Step 2: Prepare the vehicle wiring

To gain access to the speed sensor on **motorcycles** you may need to remove the left side fairings, the seat, and lift or remove the fuel tank. **Other vehicles** refer to the vehicle specific install guides, or follow the steps below if connecting at the speed sensor.

a. Use voltmeter to check each speed sensor wire
Power up your vehicle and measure the voltage on each of the 3 speed sensor wires. Push voltmeter probe into the speed sensor coupling 3-pole connector pins.

Write down or mark with tape/texta or **draw a schematic indicating what each wire does** (as below).

INSTALLING THE YELLOW BOX

Voltage measure the 3 wires of hall-effect speed sensor;
- Wire 1 = **power** (constant +12 volt, or +5 volt)
- Wire 2 = **ground** (main vehicle earth)
- Wire 3 = **speed signal wire** (measures 0 volts then 12 volts (or 5 volts) as the wheel is rotated) square wave.

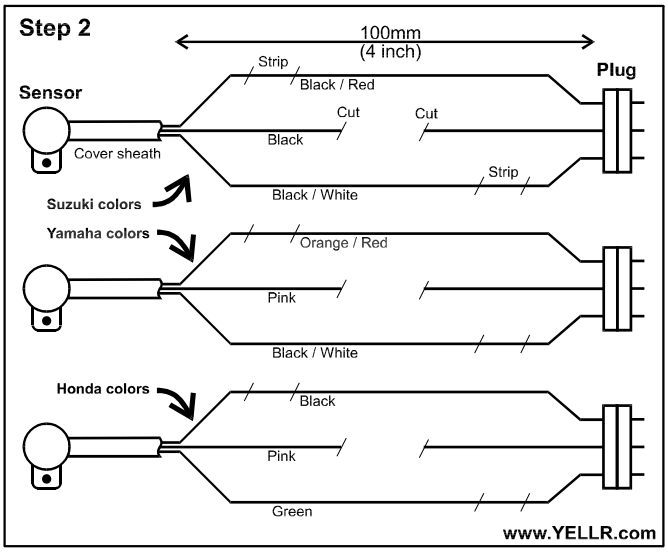
b. Remove the speed sensor from the vehicle
Remove/unplug the entire speed sensor coupling (sensor and wiring up to the first connector). Release the plastic catch/locking mechanism of the connector. Unscrew the sensor pickup. Removal makes it easier to produce good electrical connections.

c. Splicing the speed sensor wires
Closely examine the diagrams below showing how to prepare the speed sensor wires. See **page 1 diagrams** showing before and after the Yellow Box is connected.

With your removed speed sensor coupling on your workbench carefully strip back the outer cover sheath to gain access the 3 sensor wires. You need about 100mm (4 inches) to make it easier.

Splice the 3 wires of the hall-effect speed sensor;
- Wire 1 = **power** = **score this wire** (don't cut)
- Wire 2 = **ground** = **score this wire** (don't cut)
- Wire 3 = **speed signal wire = cut twice,** as shown in diagram below, leaving a 20mm (3/4 inch) gap.

Note! STRIP and CUT EXACTLY as shown below.

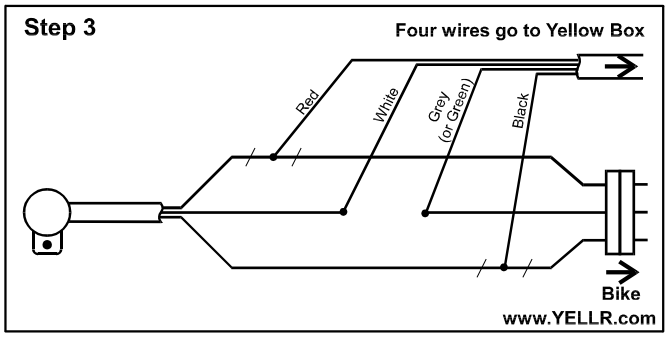


The wiring colors indicated above are for some Suzuki, Yamaha and Honda motorcycles. Your wiring colours may be different. Please check the **electrical diagram** in your vehicle's service manual and then confirm each wire with a **voltmeter.**

Step 3: Connect the Yellow Box

The Yellow Box wiring harness has four wires;

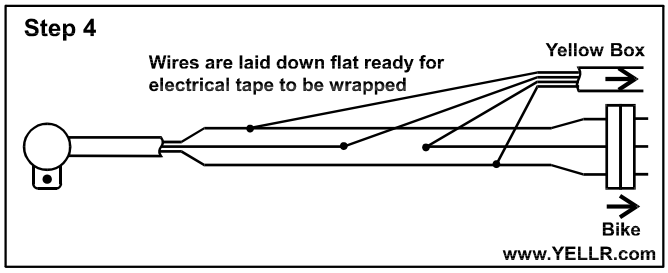
- **YB RED** = **Power** = speed sensor power (5 or 12 V)
- **YB BLACK** = **Ground** = speed sensor ground
- **YB WHITE** = speed **signal IN** (comes from sensor)
- **YB GRAY** = speed **signal OUT** (goes to speedo)



You must connect the Yellow Box wires exactly as shown above, or your speedo may not work properly. Carefully **compare your work** to the Step 2 and Step 3 pictures, and with the before and after diagrams on page 1.

Step 4: Protect your wiring connections

Now you will cover each solder join area with electrical insulating tape or heatshrink.



The diagram below shows the wires layed down flat - this is why we put 20mm (3/4 inch) between each connection, so now we can wrap electical insulating tape around this entire "bare" section to make it neat and safe again. Overlap the tape as you wrap it, check the other wiring in your vehicle and do it like that.

Be sure there are no bare wires sticking out from the tape (that might touch metal parts of the vehicle) and that no wires touch each other where they are not supposed to. Feel free to wrap tape around any wire that will make the installation neater and safer.

INSTALLING THE YELLOW BOX

Step 5: Secure Yellow Box and route wires

a. Secure the Yellow Box
We recommend you mount/secure your Yellow Box in a reasonably dust free, dry area. Mount it **away from** high heat sources like the exhaust or engine, away from electrical spike generating sources like the ignition system, the battery and battery charging system, regulator/rectifier, spark plugs, etc.

Usually the **best location** is under the **passenger seat** in motorcycles.

b. Route the Yellow Box harness wires
Route the wires away from high heat sources, anything that moves and any potential electro-magnetic generating sources (electrical noise/interference sources), and as described for the Yellow Box above.

Note! Speed sensors with a +5 volt power supply are more susceptible to electrical interference. Take extra care where you secure your Yellow Box and harness wiring with a +5 volt system.

This precaution is recommended due to the very high sensitivity of modern speedometer systems. Potential electrical noise may be just strong enough to register in modern speedometer systems if something changes from the factory vehicle, ie. an aftermarket product.

Step 6: Testing and take it for a spin!

Testing and Calibration
Refer to “Using the Yellow Box” for special test modes. Refer “Calibrating the Yellow Box” for how to determine your total speedometer error and set your correction.

Suggestion for Step 5 above
To make testing and calibration easier you may wish to **delay** the “secure step” and leave your Yellow Box in a place where you can easily get to the switches needed for calibration. After calibration is complete, you may seal the switches and move it to a more secure location.

Optional switches covering
The Yellow Box switch contacts are gold plated and weather resistant. In some cases you may wish to seal/cover the switches for extra protection against the weather and fine dust build-up. Choose an **easy to remove** option.

Switch sealing options include; hobby hot-melt glue (not industrial strength), silicone sealant, store in a plastic bag or zip-seal bag, or use 3M removable adhesive strips (Command brand).

Problems?

All Yellow Boxes are tested during and after manufacture Most problems are be caused by an incorrect installation. Refer to the “Using the Yellow Box” for the special test modes you can use to check all your wiring connections.

Yellow Box never lights up, with ignition on… This means there is no power to the Yellow Box. Check you have the YB power (red wire) and ground (black wire) connected properly and the right way around. Check for bad connections on these wires. The Yellow Box will not be damaged by reverse connection for a few minutes.

It lights up ok, but the speedo doesn’t work… Make sure it is not in a special test mode. Check you have connected the YB harness IN (white wire) and OUT wire (grey, or green wire) the correct way around. Check for bad connections on these wires. Incorrect connection will not damage the Yellow Box or damage the speedo.

The speedo reads way high, or way low... If the speedo seems normal but reads very low or very high, you may have in kph/mph conversion mode. Check switch setting.

I think some switches don’t work… Test the switches, all On and all Off. Flick switches back and forth to clean.

The Yellow Box has a high quality switch with gold plated contacts, but dirt or moisture (over a long time) may still cause switch malfunction. You may **clean the switches** with a spray of total-evaporation electrical spray solvent (non-residue), then work the switches forward and back about 20 times, repeat.

The speedo jumps/fluctuates sometimes... Check where you have secured your Yellow Box and routed the YB harness wires. Refer **Step 5** above. The quality of the power supply may also be a factor, see below. Check for bad connections on all YB harness wires, solder your connections.

Speedo drops out, reads zero sometimes... Check your connections, solder your connections. The power supply quality may also be a factor, see below.

The Yellow Box **power supply quality** is important. It needs to be a clean, filtered source that is not subject to voltage fluctuations or electrical spikes.

The speed sensor power is the best power source for the Yellow Box. Any other source may not be filtered. If you must use another power source try adding a **filter capacitor** (25 volt, 470 uF) across the red and black YB wires, into the connector pins at the Yellow Box unit itself. This should help to filter any low quality power source.