V-Twin Mfg.
Speedometer Calibrator
Fits BT 5-SPEED TRANSMISSIONS
VT No. 36-0422

This is a custom application and rider safety depends on proper installation. This product should only be installed by a knowledgeable and trained motorcycle technician. V-Twin Mfg. accepts no responsibility for improper installation.

The speedometer calibrator allows owners of HD and Buell motorcycles equipped with stock electronic speedometer (those with LCD mileage displays) to correct the inaccurate speedometer and odometer readings. Typically these are caused by the installation of different transmission or wheel sprockets, early stock or aftermarket transmission gears ore rear tires with a diameter other than stock.

The speedometer calibrator allows the rider to correct t HD electronic speedometers easily and without special tools or expensive test equipment. Adjustment can be made between -29% and +69% In 1% increments.

The calibrators small size permits convenient mounting and sensitive components are sealed for protection against weather and vibration.

Caution: To prevent possible damage to motorcycle electrical system, disconnect battery ground lead from motorcycle frame prior to installing calibrator.

Installation instruction:

1. Place pressure on release clips and unplug wiring connector between speedometer and transmission sensor. Connector is usually located under the seat.
2. Attach male and female ends of connector to respective ends of Speedometer Calibrator and secure calibrator and wires to motorcycle. Rout wires to avoid stretching, pinching and chaffing against frame. Reconnect battery ground lead to frame.

Note: Calibrator features screw-eyes but can be mounted with wire ties if desired.
Caution: Improperly routed wires may wear and short against frame causing extensive damage to motorcycle electrical system and possible fire hazard.

3. Initial setting of adjustment screws should be “0” position.

Note: Slot in each screw has a small notch in one end. Notched end must point toward selected number. Screw can be rotated full 360° without damage.

Determine Calibration Percentage:

1. Determine amount of speedometer error. Most common methods are to compare speedometer reading to speedometer known to be accurate or compare odometer reading (mileage) to measure distance. Highway markers are usually accurate but reading from several different markers should be take n and compared or confirmation. Radar can also be used to determine actual speed. In case of gear change number of teeth on original and replacement sprockets can also be used to determine percentage of speedometer error.. Note that the formula for transmission and wheel sprockets are different.
2. Calculate percentage of speedometer error using one of the following formulas:

$$\frac{\text{Actual speed (or mileage) -Indicated speed (or mileage)}}{\text{Indicated speed (or mileage)}}$$

OR

$$\frac{\text{\# of teeth on new trans sprocket – of teeth on original sprocket}}{\text{\# of teeth on original trans sprocket}}$$

OR

$$\frac{\text{\# of teeth on original wheel sprocket - \# of teeth on new sprocket}}{\text{\# of teeth on original wheel sprocket}}$$

Note: Indicated speed or mileage refers to reading take n from inaccurate speedometer prior to the correction. Actual speed or mileage refers to reading taken from radar, accurate speedometer mileage markers or other source.

3. Calculate percentage of speedometer error using one of the following formulas:

$$\frac{\text{Actual speed (or mileage) – indicated speed or mileage}}{\text{Indicated speed (or mileage)}}$$

OR

$$\frac{\text{\# of teeth on new trans sprocket - \# of teeth on original sprocket}}{\text{\# of teeth on original trans sprocket}}$$

OR

$$\frac{\text{\# of teeth on original wheel sprocket - \# of teeth on new sprocket}}{\text{\# of teeth on original wheel sprocket}}$$

Note: Indicated speed or mileage refers to reading taken from inaccurate speedometer prior to the correction. Actual speed or mileage refers

to reading taken from radar accurate speedometer mileage markers or other source.

Examples:

1. Speedometer method – inaccurate speedometer reads 65 MPH. Actual speed is 75 MPH.
   Percentage Change:
   $\frac{75-65}{65} = \frac{+10}{65} = +15\%$

2. Odometer/mileage method = Odometer reading is 10.5 miles compared to actual distance traveled of 10.0 miles.
   Percentage Change:
   $\frac{10.0 - 10.6}{10.6} = \frac{-0.6}{10.6} = -.6\%$

3. Gearing method = original 32 tooth transmission sprocket was changed to 34 tooth sprocket.
   Percentage change:
   $\frac{34-32}{32} = \frac{2}{32} = +6\%$

   OR

   Original 70 tooth wheel sprocket was changed to 65 tooth sprocket.
   $\frac{70-65}{70} = \frac{5}{70} = +7\%$

Note: Calibration percentage will be positive (“+”) if actual speed/mileage is greater than indicated speed/mileage Percentage will be negative (“-”) if actual speed/mileage is less than indicated speed/mileage. If gearing method is used percentage will be positive (”+”) If new transmission sprocket has more teeth than old sprocket negative (“-”). If new transmission sprocket has fewer teeth than old sprocket . Also using gearing method percentage will be negative (“-”) if new wheel sprocket has more teeth than old sprocket positive (“+) If new wheel sprocket has fewer teeth than original sprocket.

Adjustment Speedometer Calibrator:
After calculating calibration percentage turn adjustment screw to obtain correct percentage.
Note: Scale of adjustment screw on left reads in increments of 10%. In other words setting left screw at the “2” position results in a +20% change in speedometer/odometer reading. Scale of adjustment screw at “2” position results in +2% change in speedometer/odometer reading. Setting of left screw plus setting of right indicates total calibration change. As mentioned previously slot in each screw has a small notching one end. Notched end must point toward selected number.

Confirm Calibration Accuracy:
Install seat and confirm that the seat and hardware do not contact speedometer Calibrator or wiring. Road test motorcycle and verify speedometer accuracy using radar or speedometer or odometer method described previously.
Note: Speedometer calibrator remains attached to motorcycle. Removing calibrator returns speedometer to stock calibration factor.

Fine Tuning:
Speedometer calibrator can e fine tuned should initial setting prove inaccurate (error will usually be small). For instance odometer indicates 106 miles traveled over actual distance of 100 miles. Initial vibration percentage was + 39%.

1. Use following formula to calculate final correction percentage:
   $\frac{\text{Actual mileage}}{\text{Indicated mileage}} \times (100 + \text{initial calibration \%}) - 100 = \text{Final Correction \%}$

   OR

   $\frac{100}{106} \times (100+39) = 100 = 0.94 \times 139 - 100 + 130.66 - 100 + 30.56\%$

2. Reset calibrator to + 31%.