

Throttle Position Sensor Guide

By: Kiwi

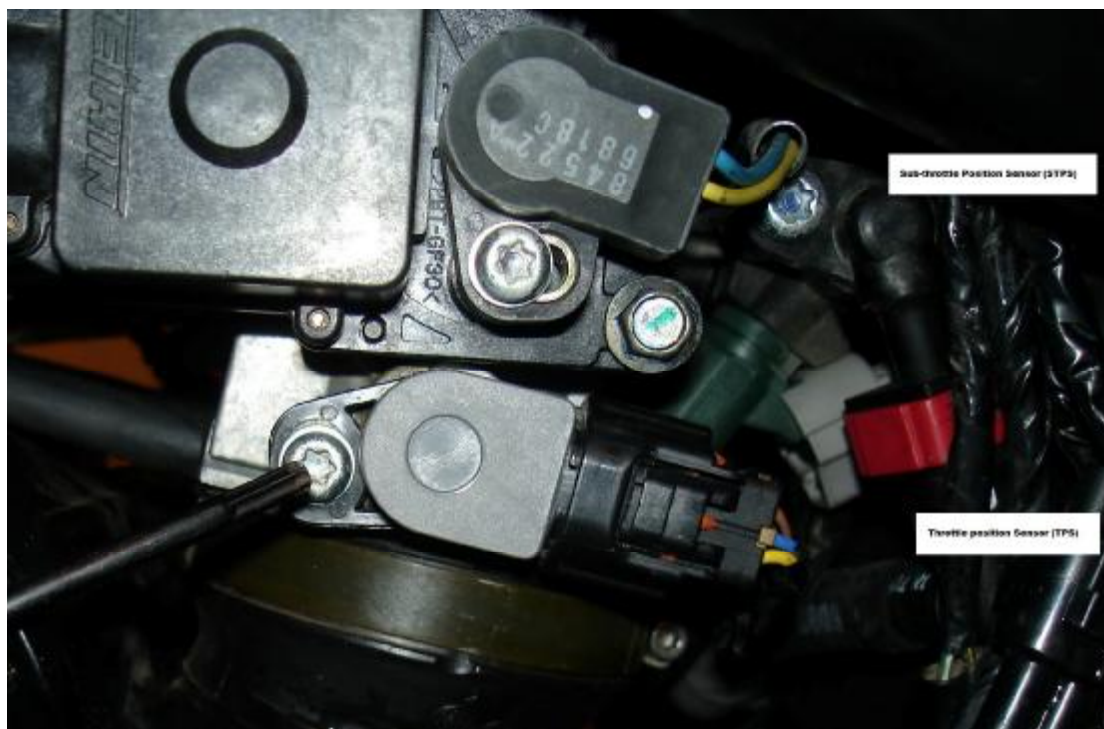
Many owners complain of "throttle jerkiness" or hesitation in the lower RPM range and the sensation of engine surging with a steady throttle below 5000 RPM. If you are experiencing this problem then after checking the chain adjustment (a common cause of jerkiness) or throttle body sync (another) then you should check and adjust if required, the Throttle Position Sensor (TPS).

Tools Required

- Digital Multimeter
- Throttle Position Sensor Setting Adapter Kawasaki P/N: 57001-1538
- T25 TORX Screw Driver

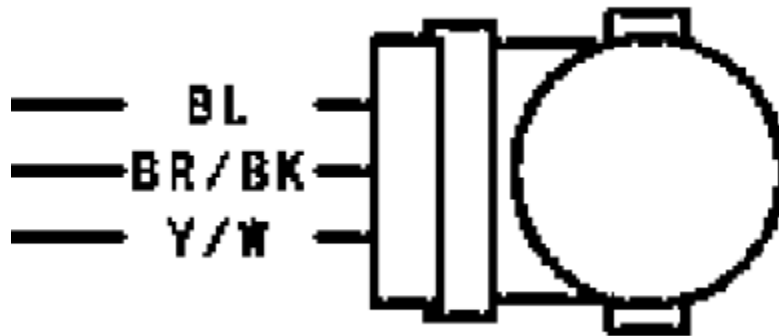
When adjusting the throttle position sensor, use a digital voltage meter which can be read to the third decimal place. The DC voltage accuracy must be less than $\pm 0.05\%$ reading and ± 4 digits at 1 volt DC.

Component Location



The Throttle Position Sensor (TPS – lower sensor) and Sub-Throttle Position Sensor (STPS – upper sensor) are located on the left hand side of the throttle body. Removal of the LHS fairings is required for owners of the Ninja 650R (ER-6F).

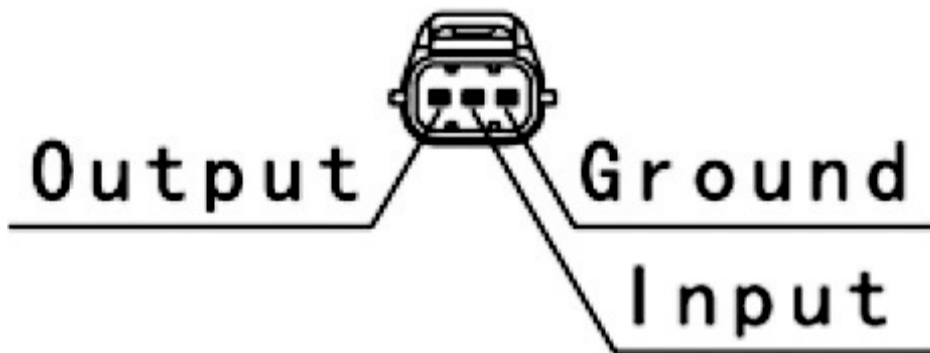
Throttle Position Sensor Wiring Diagram



Key:

- BL – Blue (input – connector middle wire)
- BR / BK – Brown / Black (ground – top wire)
- Y / W – Yellow / White (output – bottom wire)

Throttle Position Sensor Connector





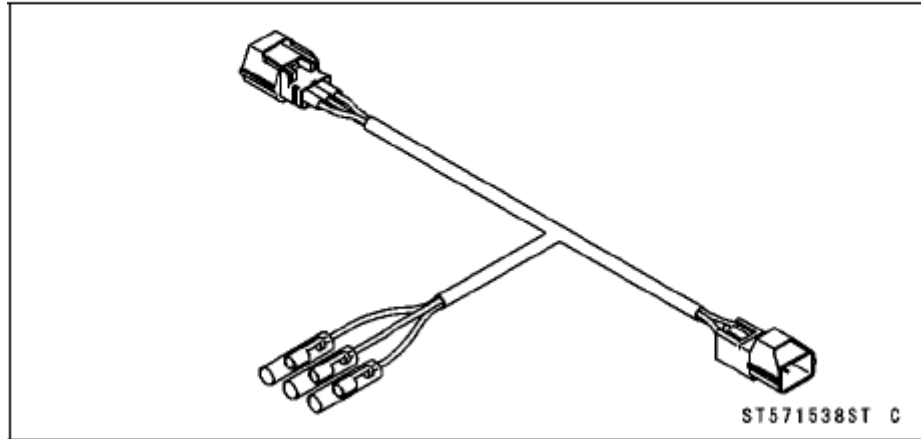
TPS Input Voltage Check

Make sure the battery is fully charged. If available, connect up the Throttle Position Sensor Setting Adapter Kawasaki P/N: 57001-1538. This item connects between the Throttle Body connector and the bike wiring loom connector, it provides a convenient means of checking input and output voltages with a multimeter.

The adapter costs approximately \$20.00 US and is available from your Kawasaki Dealer. If the adapter is not available then a similar setup can be cobbled

together using 3 lengths of solid wire with a male and female connector on each end. Be careful not to let the wires touch each other.

Throttle Sensor Setting Adapter: 57001-1538



With the ignition switched on, check the TPS input voltage between the **Ground** wire (Brown / Black – top wire) and the **Input** wire (Blue – middle wire). The Kawasaki Service manual states that it should be between 4.75 volts DC and 5.254 volts DC.

If the input voltage is less than 4.75 volts DC then check the battery voltage. A fully charged battery is critical to the correct measurement of the TPS input voltage. A fully charged battery should read between 12.6 and 12.8 volts with the ignition and all accessories switched off.

If the battery voltage is OK check the connectors and wiring to the ECU, if this is OK then check the ECU ground and/or the ECU power supply.

TPS Output Voltage Check

Start and warm up the engine, adjust idle to 1300 rpm, then shutdown (turn off) the engine. With the ignition switched back on check the TPS output voltage between the **Ground wire** (Brown / Black – top wire) and the **Output wire** (Yellow / White – bottom wire).

The Kawasaki Service manual states that:

With the throttle at the idle position the TPS output voltage should be between 1.073 volts DC and 1.077 volts DC.

With the throttle at the full throttle position the TPS output voltage should be between 4.29 volts DC and 4.49 volts DC.

If the output voltage is outside of this range, check the TPS resistance. With the ignition off and the connector to the TPS disconnected check the resistance between the **Ground pin** (top) and the **Input pin** (middle). The Kawasaki Service Manual states that it should be between 4 and 6 k Ω (kilo-ohms)

If the TPS resistance is out of range replace the TPS.

Information from Kawasaki K-Tech News indicates that there is a relationship between the measured TPS input voltage and output voltage. As an example if the input is near 4.76 volts DC the maximum throttle output should be about 4.04 volts. If the input is near 4.99 volts DC the maximum throttle output should be about 4.22 volts DC.

If the TPS input voltage and TPS resistance are within range but the TPS output voltage remains outside of range then adjust the TPS.

TPS Adjustment

With the ignition switched on monitor the TPS output voltage between the **Ground wire** (Brown / Black – top wire) and the **Output wire** (Yellow / White – bottom wire). Loosen the TPS TORX screw and rotate the TPS counter-clockwise to increase output voltage or clockwise to decrease output voltage.

Adjust the sensor so that the output voltages are within the specified voltage range. Once the sensor is properly adjusted, tighten the TORX screw while holding the sensor.

Turn the throttle from closed to full open more than two times and measure the output voltage again, if the output voltage is not within the specified range, re-adjust the sensor.

Engine idle speed may change after TPS adjustment, if required start and warm up the engine, adjust idle to 1300 rpm.

Sub-Throttle Position Sensor (STPS) Adjustment

This guide doesn't cover adjustment of the STPS however input voltage, output voltage and resistance checks are similar. Simply put if all voltages and resistances are within specified ranges then loosen the STPS TORX screw and rotate the STPS counter-clockwise to reduce fast idle rpm.

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