Throttle Position Sensor. (TPS)

Symptoms:
You may have a single symptom or more as follows:
When starting a loud "clunk" is heard.
Occasionally when the engine is switched off, a loud clunk is heard. A soft "clunk" seems normal.
Hard to start when warm.

Probable Cause:
The TPS tells the electronic ignition the throttle position. The ignition timing, (spark advance) is based on this throttle position.
When the throttle is closed, as when starting the engine or at an idle, the ignition spark is retarded to fire after Top Dead Centre. (TDC).
This is necessary as the engine does not have enough momentum to continue raising the piston against the burning air/fuel mixture at a low RPM. So without retarding the ignition the combustion drives the piston back the way it came without reaching TDC.
If the starter is engaged it may be twisted against the sudden load. The one way clutch assembly stops the engine from turning backwards, with a loud CLUNK.
If this condition is allowed to continue, damage will result to the one way clutch and/or other starter parts.

Physical Location:
The TPS is mounted on the right hand side Carburetor. (Right hand side as you sit on the bike.)

![TPS Location](http://i265.photobucket.com/albums/ii216/poppa_/TPSconnectorundertank.jpg)

Equipment:
- A Volt/Ohm/Meter (VOM) Either a digital or analog.
- Two jumper wires with alligator clips.

The Test:
Set your idle first to about 1,000 rpm.

There are two places the TPS can be accessed:

Under the tank (It's the White/Black triangular connector)
http://i265.photobucket.com/albums/ii216/poppa_/TPSconnectorundertank.jpg

I like to disconnect the connector here and pass the black portion under the frame for easy access with the alligator clips and VOM.
2. Under the seat (It's the larger square connector) Requires more finesse, but good for a quick check without dismantling more of the bike. Use two common pins inserted into the plug with alligator clips and connect to the VOM.

CONNECTOR DETAIL
Don't use anything bigger than a common pin in the connector.
Measure the resistance across the Blue and Black wires. It should be between 4,000 and 6,000 ohms (4k - 6k)

Measure the resistance across the Yellow and Black wires coming from the TPS.
With the throttle closed the resistance should measure between 560 and 840 ohms. (0.560k - 0.840k)
With the throttle full open the resistance should measure between 3.01k and 4.51k ohms.

The Adjustment:
The TPS is rotated with the throttle closed. (You did set the idle before we started, right?)

The tamper proof adjusting screws require a special screwdriver so I replaced them with metric phillips screws.
Hint: replace one screw at a time while it's still on the carburetor or be VERY careful to align it correctly on re-assembly. If you get it back crooked and tighten it down, it will break.

Rotate the TPS until the resistance measured across the Yellow and Black wires at the connector is between 560 and 840 ohms. (I used 700 ohms.)

Tighten the screws to hold it in place.
CHECKING AND ADJUSTING THE THROTTLE POSITION SENSOR

NOTE:

- Before adjusting the throttle position sensor, the engine idling speed should be properly adjusted.

1. Inspect:
   - throttle position sensor

   a. Disconnect the throttle position sensor coupler.
   b. Connect the pocket tester (Ω × 1k) to the throttle position sensor.

   | Tester positive lead → blue ① |
   | Tester negative lead → black ② |

   c. Check the throttle position sensor resistance "R1".
      Out of specification → Replace the throttle position sensor.

   ![Throttle position sensor resistance “R1”](image)
   - 4 - 6 kΩ at 20°C (68°F)
   - (blue – black)

   d. Connect the pocket tester (Ω × 1k) to the throttle position sensor.

   | Tester positive lead → yellow ③ |
   | Tester negative lead → black ② |

   e. While slowly opening the throttle, check that the throttle position sensor resistance "R2" is within the specified range.
      Out of specification → Replace the throttle position sensor.

   ![Throttle position sensor resistance “R2”](image)
   - 0.56 ~ 0.64 kΩ to 3.01 ~ 4.51 kΩ at 20°C (68°F)
   - (yellow – black)

2. Adjust:
   - throttle position sensor angle

   a. Loosen the throttle position sensor screws ①.
   b. Turn the throttle position sensor in direction ⑤ or ⑤ until the specified closed throttle resistance is indicated on the pocket tester.