

RigMaster Power International

Technical Customer Support

All Digital Speed Sensor Modules: LED's, function and Troubleshooting

Digital Speed Sensor Description & Function (All Digital Speed Sensors)

The Speed Sensor is a small plastic box (about twice the width of your thumb) with 4 wires attached to the wiring harness near the Power Module. The first version had no LED indicator; the subsequent versions had 2 LED's then a Single LED. The Speed Sensor Module reads a voltage from the back of the alternator (on the Red/Orange wire) and tells the Power Module whether the engine is "cranking" or "running" (using the Green/Yellow wire).

Digital speed sensor module connections & operation:

- **White wire.**
Connection: "T" connection to the J1 top right white wire
Function: 12V Power Supply.
- **Black wire.**
Connection: "T" connection to the J1 black wire (3rd wire under the white wire).
Function: Ground wire
- **Red/Orange wire.**
Connection: From Speed Sensor to the back of the alternator.
Function: Voltage sensing from alternator.
- **Green/Yellow wire.**
Connection: "T" connection to the J4 green/yellow wire.
Function: Tells computer if engine is cranking or running. (0.05V AC cranking, 5V AC Running)

The speed sensor module is looking for a voltage "**RISE**" through 5, 6, 7 DC volts on the Red/Orange wire when it will change the signal to the computer on the green/yellow wire from "cranking" to "running". The alternator must provide a DC voltage "**RISE**" on the Red/Orange wire during the starting process, **simply "jumping" battery voltage into the Red/Orange wire does not produce "running" signal.**

LG7-105K Speed Sensor (T4-6K & LG200K – produced since 2015)

This section deals with the **LG7-105K** Speed Sensor Module (produced on Kohler engine units since 2015). These sensors may be used with 60 amp alternators (from **RMP14-6** to **MTS-T4-6**) or 170 amp alternators (any **LG200**). This sensor has a single LED capable of showing Blue, Green or Red. It is labeled "Version 5.2.1" (or higher), its plastic casing may be any color.

This sensor will function with either LG or T4-6 models; the only difference is whether or not the Red wire is installed from the positive power terminal on the wall of the engine cabinet to the back of an LG200 alternator which makes it function as an LG200 speed sensor.

An L.E.D. light on the side of the sensor indicates which function the sensor is performing:

-  Blinking Blue LED = Cranking
-  Solid Green LED = Running
-  Solid Red LED (LG200 only) = Problem with Voltage Red/Orange wire from alternator

Troubleshooting:

- **Engine runs for 10 seconds with the starter motor engaged then shuts down;**

Check volts on Red/Orange wire at speed sensor, possible connection issue, slipping Alternator belt, failing alternator.

- Engine cranks for a split second and stops;

Low battery volts possibly due to extremely cold climate, possible connection problem or speed sensor failure.

- Engine starts and runs for 2 seconds, then stops with no LED's illuminated;

Check white wire connection at Speed Sensor.

- Engine cranks sporadically;

Power module ground interruption.

***Note: Alternator must function for the speed sensing system to work. Alternator and belt problems will affect the Speed Sensor's operation, be sure the belt is tensioned properly and not slipping.**

LG7-104 and RP7-107 Speed Sensors with 2 LED's (Blue and Red) (2014)

This section deals with a small number of **LG7-104** and **RP7-107** Speed Sensors that were produced in 2014. This sensor has 2 LED's (Blue and Red) which indicates which function the sensor is performing:

-  Red LED = Power ON
-  Blinking Blue LED = Cranking
-  Solid Blue LED = Running

Troubleshooting:

- Blue LED blinks once with the Run solenoid engagement then shows a series of blinks as it runs for 3 seconds and dies then blue LED goes out and the Red LED will show;
Voltage problem on the Red/Orange wire from the back of the alternator.

- Cranks and runs for 2 seconds then shuts off, no LED's are shown;
White or black wire connection is a problem.

- Red LED shows, Blue LED blinks once before cranking then blinks once while running, then engine shuts off;
Green/Yellow wire connection is a problem.

***Note: Alternator must function for the speed sensing system to work. Alternator and belt problems will affect the Speed Sensor's operation, be sure the belt is tensioned properly and not slipping.**

Units upgraded to a digital sensor from old style 'Thread & Locknut' sensor at flywheel

To troubleshoot a unit whose old style 'thread and locknut' speed sensor has been converted to a digital speed sensor, you must start by double checking the 4 wire connections of the Speed Sensor Module to the wiring of the Power Module (computer) under your bunk.

3 of the 4 speed sensor wires are "T" connections at the harness:

1. White wire "T" connects to the J1 top right white wire.

2. Black wire "T" connects to the black wire which is the 3rd wire under the white wire.
3. Green/Yellow wire "T" connects to the Green/Yellow wire on the J4 connector.

This leaves the 4th Speed sensor module wire which is the Red/Orange wire:

The red/orange wire from the speed sensor module needs to receive a voltage from the back of the alternator so we're using the old piece of wire that goes through the floor of the cabin and down into the engine cabinet where the old speed sensor used to plug into. The speed sensor connection to this wire is not a "T" connection.

This Red/Orange wire is located at (or may have been cut from) the J4 connector (beside the Green/yellow wire), it should be cut away from the J4 connector and joined directly to the red/orange wire at the speed sensor module instead. (when finished, there will be a short piece of Red/Orange wire hanging from the J4 connector that goes nowhere, should be taped to itself).

The speed sensor kit also has a short piece of red/orange wire with 2 connectors – one end joins where the old sensor used to plug into the harness at the engine and the other end replaces the plug that was on the back of the alternator. The new plug on the back of the alternator has a short length of white wire which is the "exciter wire" for the alternator which needs to be connected to the original wire that was in this position in the old connector.

For LG200 model RigMasters (they have a 170 amp alternator, no generator) there is a Red 3rd wire on the back of the alternator that brings 12V from the positive power terminal on the wall of the engine cabinet to the Alternator as a "battery voltage reference" that causes a rise in voltage in the Red/Orange wire.

Troubleshooting:

- Does this 3 times: Engine starts and runs for 10 seconds with starter engaged then stops, display says "cranking";

Check if Red/Orange wire still connected to Power Module (should be cut), check volts on Red/Orange wire. Both of these have descriptions above.

- Engine cranks for a split second then quits;

Low battery volts or "battery reference volts" not getting to sensor (LG200 red wire), happens more commonly in very cold weather.

- Red LED or you measured 0 volts on Red/Orange wire at Speed Sensor;

Alternator not charging, alternator belt slipping, Red "battery 12 volts reference" wire on back of alternator no volts.

- Cranks for 2 seconds and stops;

White wire connection at Power Module J1 white wire

- T4-6, V-10 with 60 amp alternator only - Cranks briefly "cranking" is shown on display, then "Running" is shown on display but engine not running;

Red wire (3rd wire) has been connected to the back of the 60 amp alternator which causes battery volts to be given to Red/Orange wire going to the Speed Sensor module. The "Red" wire, which is "battery reference volts", (3rd wire on the back of the alternator) should only be installed on LG200 model alternators (170 amp alternators)