GOVERNORS AMERICA CORP.®

SSW Series
1,2, & 3 Element Speed Switch

EGSA Electrical Generating Systems Association ISO 9001 CERTIFIED

1 INTRODUCTION

The SSW674, SSW675, and SSW676 are respectively one, two, and three element electronic speed switches. They are powered by a DC battery supply and receive engine speed information from a magnetic speed sensor.

Both the SSW675 and SSW676 senses and indicates a low speed setting (CRANK termination), and a high speed setting (OVERSPEED). The SSW676 has a third mid speed setting that can be used for several purposes such as paralleling indication, underspeed, or general auxiliary contacts. The single element SSW674 has a wide range of adjustment and can be used for any one of these three functions.

All speed elements activate discrete, internal relay contacts and LED indicators. The overspeed section of the SSW675 and SSW676 include TEST and RESET switches. An ouput voltage proportional to engine speed is provided to operate an external tachometer.

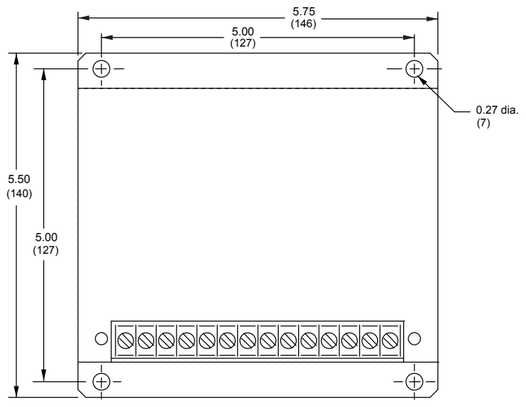
2 INSTALLATION

Mount in a cabinet, engine enclosure, or sealed metal box.

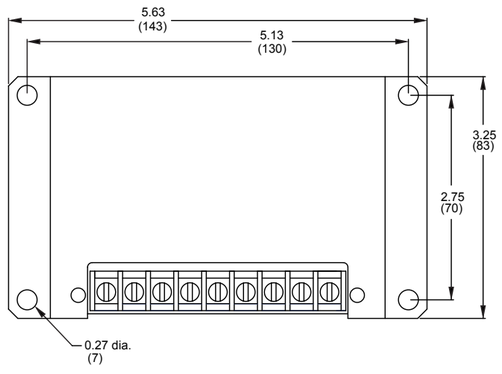
Vertical orientation allows for the draining of fluids in moist environments.

Avoid Extreme Heat

SSW675 & 676
Dimensions (in & mm)



SSW674
Dimensions (in & mm)



3 BASIC WIRING

To wire the SSW675 or SSW676, refer to SECTION 8 **Diagram 1**. To wire the SSW674, refer to SECTION 8 **Diagram 2**.

24V The unit is factory set for 24V operation. For 12V and 32V power systems see the table below.

To incorporate 12 volt and 32 volt power systems:

SSW674	
12V System	A jumper connection between Terminals 4 and 5 is required. See SECTION 8 **Diagram 2**.
SSW675 & SSW676	
12V System	A soldered wire jumper between posts E4 and E5 is required.
32V System	A soldered wire jumper between posts E4 and E6 is required.
NOTE	Posts E4, E5, and E6 are accessible through the top cover adjustment hole. See SECTION 8 **Diagram 1.**

NOTE When wiring the speed switch into the engine protection control system, proper wire sizes must be used. The speed switch relay contacts are rated for a maximum current of 5 amps. All other connections have less than 1 amp current flow each.

Connecting the Magnetic Speed Sensor:

The magnetic speed sensor connections MUST BE TWISTED AND/OR SHIELDED for their entire length. The speed sensor cable shield must only be connected to Terminal 2 on the SSW675 and SSW676, or Terminal 8 on the SSW674. The shield should be insulated to insure that no other part of it comes into contact with engine ground, otherwise stray signals may be introduced into the speed switch.

When the egnine is stopped, adjust the gap between the magnetic speed sensor and the ring gear teeth. The gap should not be smaller than 0.020 in. (0.45 mm). Usually, backing out the speed sensor 3/4 turn after touching the ring gear tooth will result in a satisfactory gap. The magnetic speed sensor voltage should be at least 1 VRMS while cranking. During operation, 5 to10 VRMS is recommended.

4 ADJUSTMENTS

NOTE All elements are factory set at the maximum setting. Turning the adjustment counterclockwise will lower the set point.

The tachometer output is factory set at its minimum setting. Turning the adjustment clockwise increases the current output.

Crank Termination (SSW675 and SSW676)

Manual Reset	The unit is factory set for manual reset. To reinitiate engine cranking, battery power must be removed and then reapplied. Crank the engine and simultaneously turn the CRANK adjustment slowly counterclockwise until the proper crank termination speed is reached. When the cranking termination set point is reached, the green CRANK LED will illuminate.
Automatic Reset	Automatic reset can be selected by removing the 82K ohm resistor located between posts E1 and E2 on the circuit board. See SECTION 8 **Diagram 1**.

Parallel/Auxiliary (SSW676 Only)

Raise the engine speed to the desired mid speed set point. Turn the PARALLEL adjustment counterclockwise until the parallel relay energizes and the green PARALLEL LED illuminates. The parallel relay will automatically reset when the engine speed falls to 6% below the set point.

Overspeed (SSW675 or SSW676)

Raise the engine speed to 10% below the desired overspeed set point. Press and hold the OVERSPEED TEST button on the top of the unit. This lowers the overspeed setting by 10%.

Turn the OVERSPEED adjustment counterclockwise until the overspeed relay energizes and the red OVERSPEED LED illuminates.

Reset the overspeed relay by pressing the RESET button. Allow the engine to stop, then remove battery power from the unit.

Readjust the engine speed to the normal operating speed with the governor speed control.

Adjustment (SSW674)

The range of adjustment of the overspeed set point is from 200 to 10,000 Hz. For settings below 2,500 Hz., solder a jumper wire between posts E3 & E4 located below the adjustments and to the right.

A. Raise the engine speed to the desired overspeed alarm point.

B. Turn the speed adjustment countercockwise until the relay energizes and the red overspeed LED lights.

C. Lower the engine speed to the normal operating speed.

The SSW674 is shipped from the factory configured so that the internal relay latches when the set speed is reached. Power must be removed from the unit to reset the relay.

If an automatic reset (nonlatching relay) is desired, cut the jumper wire between the two posts located below the adjustments and to the left. With the jumper between E1 & E2 removed, the SSW674 relay will reset when the engine speed falls below set speed.

It is recommended that each speed switch setting be checked periodically when maintenance is being performed on the engine. The overspeed set point can be tested by pressing the TEST button.

5 TACHOMETER OUTPUT

OUTPUT SIGNAL RANGE	MODEL
0 - 1 mA	SSW675, SSW676
0 - 20 mA	SWS674

Rotate the TACH CAL adjustment clockwise to increase the current, and counterclockwise to decrease the current. Adjust until the speed reading corresponds to a standard tachometer. Stop the engine and adjust the tachometer zero point if necessary. Recheck the maximum setting. If a meter movement less that 1 mA is used, a fixed series resistor is required.

6 TROUBLESHOOTING

PROCEDURE	RESULT
Remove the tachometer connections. Apply DC power and an input speed signal to the speed switch. Measure the voltage on the TACH OUT Terminal as the speed input frequency is varied. An increase in frequency should cause a voltage increase.	If the voltage is proportional to frequency, check the wiring to the relays.
	If the voltage is not proportional to frequency, check the output of the magnetic speed sensor.
	If the speed sensor is operating, and the relays are wired correctly, the unit is defective.

7 SPECIFICATIONS

CE RoHS

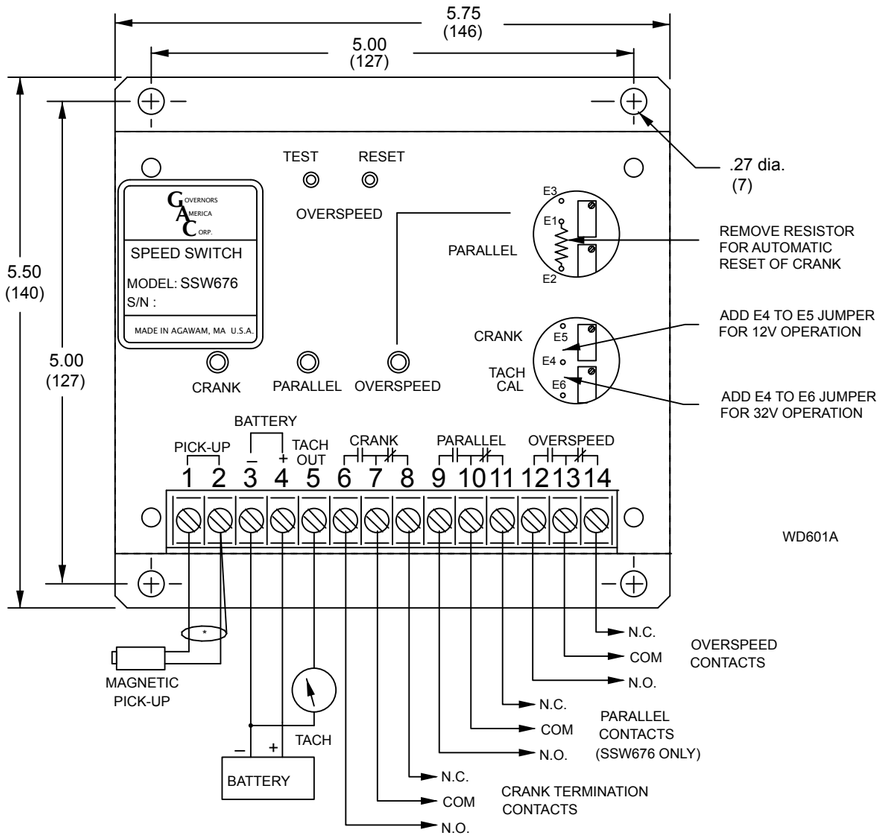
PERFORMANCE	
Input Impedance	> 5K ohms
Response Time	< 50 msec
CRANK Termination (SSW675/676) Set Point Range Set Point Repeatability Reset	 300 to 2300 Hz 5% above 1000 Hz over temperature range Automatic or Manual (remove power)
PARALLEL (SSW676 Only) Set Point Range Set Point Repeatability Reset	 1600 to 7200 Hz 1% above 2000 Hz over temperature range Automatic at 6% below set point
OVERSPEED (SSW675/676) Set Point Range Set Point Repeatability Reset Test	 2300 to 10000 Hz 1% overt temperature range Reset button or Manual (remove power) Lowers set speed by 10%
Tachometer Signal (SSW674) (SSW675/676)	0 to 20 mA 0 to 1 mA
Set Point Range (SSW674 Only)	200 to 10000 Hz
Relay Contact Ratings	5 Amps
POWER INPUT	
Supply	10 to 32 VDC (Reverse Voltage Protected)
Polarity	Negative Ground, Case Isolated
Power Consumption	300 mA
Speed Sensor Signal	1.0 to 120 VAC RMS
ENVIRONMENTAL	
Ambient Temperature	-40° to 180°F (-40 to 80°C)
Relative Humidity	up to 95%
All Surface Finishes	Fungus Proof and Corrosion Resistant
RELIABILITY	
Vibration	5G @ 20 - 500 Hz
Testing	Functionally Tested
PHYSICAL	
Dimension	See SECTION 8 Diagram 1 or 2
Weight (SSW674) (SSW675/676)	0.6 lbs (0.30 kg) 1.2 lbs (0.54 kg)
Mounting	Any position, Vertical Preferred

* SEE OTHER SIDE FOR SECTION 8

GOVERNORS AMERICA CORP.®
720 Silver Street,
Agawam, MA 01001 USA
info@governors-america.com
www.governors-america.com

SSW675 & SSW676

DIAGRAM 1



SSW674

DIAGRAM 2