

Speed Sentinel™ SS503-CX 2014 Ford Transit Connect

Contact InterMotive for specific engine applications.

System Overview

Speed Sentinel is a programmable road speed limiter for Ford vehicles. Speed Sentinel is a micro-processor controlled unit that limits maximum vehicle speed but does not limit maximum engine output.

Speed Sentinel interfaces with the vehicle through the use of "Plug & Play" connectors that plug directly into the vehicle's factory OEM connectors. This method of installation reduces the installation time and improves the connection reliability.

Speed Sentinel has been designed with internal safeguards to ensure the safe operation of the vehicle. If it senses any unsafe or unknown condition it automatically reverts back to full driver control.

Optional Switch Controlled settings, preprogrammed by InterMotive, includes Optional Forced Engine Idle Functions - flip an operator installed switch and Speed Sentinel forces the engine to stay in idle mode as a theft deterrent.



IMPORTANT—READ BEFORE INSTALLATION

It is the installer's responsibility to route and secure all wiring harnesses where they cannot be damaged by sharp objects, mechanical moving parts and high heat sources. Failure to do so could result in damage to the system or vehicle and create possible safety concerns for the operator and passengers. Avoid placing the module where it could encounter strong magnetic fields from high current cabling connected to motors, solenoids, etc. Avoid radio frequency energy from antennas or inverters next to the module. Avoid high voltage spikes in vehicle wiring by always using diode clamped relays when installing upfitter circuits.

Installation Instructions

Disconnect vehicle battery before proceeding with the installation.

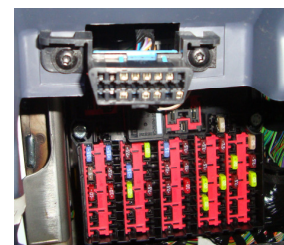


WARNING

Disconnect the battery to prevent setting a check engine light.

Data Link T-Harness

1. Locate the vehicle's OBDII Data Link Connector. It will be mounted on the left side of the dash panel above the fuse block.
2. Remove the OEM mounting screws for the OBDII connector. Plug the red connector from the Speed Sentinel Data Link Harness into the vehicle's OBDII connector. Ensure the connection is fully seated and secure connectors together with the supplied wire tie.
3. Mount the black connector from the Speed Sentinel Data Link Harness in the former location of the vehicle's OBDII connector.
4. Do **not** plug the white 6 pin connector into the Speed Sentinel module at this time.

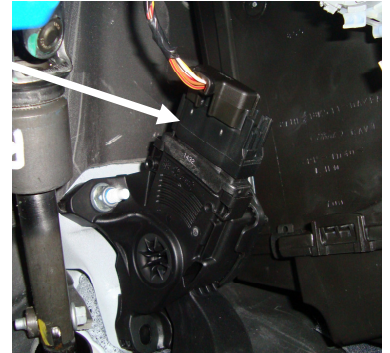


Speed Sentinel Module

Remove the lower dash panel below the steering column area and find a suitable location to mount the Speed Sentinel module. Locate the module in an area away from any external heat sources (engine heat, heater ducts, etc.). Do not mount the module until all wire harnesses are routed and secure. The last step of installation is to mount the module.

Accelerator Pedal Harness (Plug & Play)

1. Locate the accelerator pedal (APP).
2. Remove the OEM connector, push in the connector-locking tab and separate the connector from the pedal assembly.
3. Install the Speed Sentinel harness between the Accelerator Pedal Position sensor (APP) and the OEM APP connector.
4. Route and secure the harness to prevent contact with the drivers foot.
5. Attached the 12-Pin connector from the Pedal Harness to the SS503-CX module in the cavity label "Pedal."



LED Display Panel

Locate a suitable position on the dashboard, within view of the driver, for the mounting of the LED Display Panel. It must be within 36 inches of the module and allow room for the LED harness installation.



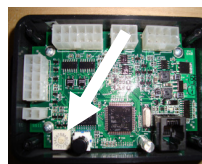
1. Drill a $\frac{3}{4}$ " hole in the dashboard where the center of the display will be located. Attach the 10-pin connector of the LED harness to the SS503-CX Control Module in the cavity labeled "Display".
2. Run the other end of the harness under the dash and out through the $\frac{3}{4}$ " hole. Plug the 6-pin connector of the display harness into the display panel. Ensure panel is level and secure using the supplied screws.

Setting Vehicle Speed Limit(s)

Two speeds can be set up and used to limit the vehicle speed. Which speed is selected at any given time will depend on if the transmission is in a forward gear or in reverse. If in reverse, the speed is set to 3 MPH; if in a forward gear, speed is set to 55 MPH from the factory or can be changed by rotating the rotary switch located under the lid of the module. (see below.)

Primary (forward) speed setting is set from the factory (rotary switch set to "0" position). This speed can be changed by rotating the switch according to the table.

Remove the lid of the module. With power disconnected from the module, locate the rotary switch and adjust the speed limit according to the chart shown. Factory-set Limit can be adjusted in 1 mph increments. Contact InterMotive for programming information.



WARNING



The Speed Sentinel II control module must be disconnected from the vehicle battery power during rotary switch adjustment.

0* = factory set (user specified)	8 = 45mph
1 = 10mph	9 = 50mph
2 = 15mph	A = 55mph
3 = 20mph	B = 60mph
4 = 25mph	C = 65mph
5 = 30mph	D = 70mph
6 = 35mph	E = 75mph
7 = 40mph	F = 80mph

Reconnect vehicle battery

Accelerator Pedal Calibration (required)

Note: Accelerator pedal calibration has changed from previous instructions. Use the following calibration technique for all Speed Sentinel modules with firmware versions 1.2.0.0 and higher.

Prior to calibration, ensure the following:

- Speed Sentinel pedal harness is in place and plugged into module.
 - Data Link connector is **disconnected** from module.
 - Key on, engine off.
1. Hold down the Black calibration button on the Speed Sentinel module and plug in the 6 pin Data Link connector.
 2. When Red fault light LED illuminates continuously, release calibration button.
 3. When Red fault LED flashes off and then back on, press and hold accelerator pedal to the floor.
 4. When Red fault LED goes off, calibration is complete and pedal can be released.

If the Red fault LED starts flashing, the calibration was unsuccessful. Repeat Steps 1-4.

Once calibration is complete, connect a scan tool and check for diagnostic trouble codes (DTC's). If codes are present, they must be cleared prior to delivery of vehicle.

Module Mounting

Ensure all harnesses are properly connected and routed and are not hanging below the dash area. Mount the Speed Sentinel module using screws or double sided tape. Reinstall all removed panels.

Post Installation Instructions

The following checks must be performed prior to releasing the vehicle to the driver.

1. Test drive the vehicle to verify proper Speed Sentinel operation. The Speed Sentinel must limit vehicle speed at the preset speed limit and pass the following steps:
2. When the Speed Sentinel engages (Green LED will illuminate) and the vehicle speed is limited, press the accelerator pedal to wide-open throttle and verify that vehicle speed has been limited.
3. Ensure that the preset speed is set to the desired limit. (See the Setting Vehicles Speed Limit(s) of the installation instructions for the adjustment procedure).
4. Passing Mode (if enabled) - With vehicle running and locked at limited speed in forward direction (flat terrain preferable) move the pedal from wide open throttle to closed throttle 3 times in a 3 second span. Speed limiting should be suspended for about 10 seconds, then reenabled.
5. If the vehicle is equipped with cruise control, verify that cruise control is operational when vehicle speed is below the limited speed and not operational during speed limiting.
6. If equipped with system override input, verify the Speed Sentinel activates when chosen equipment is activated.
7. Verify vehicle's speed is limited to 3 MPH in reverse gear.
8. Verify that the check engine light has not been set. Turning the ignition switch to the "on" position with the accelerator pedal unplugged during installation will set a check engine light.

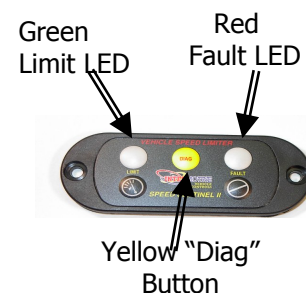
If any of these checks do not pass, recheck all connections per installation instructions. If necessary, call InterMotive Technical Support at (530) 823-1048



Calibration Button Fault LED

Checking Speed Sentinel II for Diagnostic Trouble Codes

- If the Speed Sentinel II has a stored fault code, the "fault" LED on the dash panel and module will blink twice a second and codes can be retrieved by entering diagnostic mode.
- If the Speed Sentinel II requires calibration with the vehicle, the "fault" LED will blink on for two seconds and off for a half second. See the Accelerator Pedal Calibration section of the Installation Instructions for the accelerator pedal calibration.
- If the Speed Sentinel II has an internal programming fault, the "fault" LED will blink on/off rapidly. Call InterMotive for assistance.



Entering Diagnostic Mode

- Diagnostic mode is entered by pressing and releasing the yellow "diag" button on the LED display panel. Once in diagnostic mode, all codes will be displayed by the blinking "fault" LED.
- The codes will be displayed as blink codes. For example, if there is 1 blink, a short pause, and then 2 blinks, the code is 1 2. These two sets of blinks are combined to form the code.
- A zero will have no blink, so when the vehicle is safe (ready to be active) it will blink once every three seconds. Diagnostic codes will change depending on the safe status of the vehicle.

LED Code	Terminal Code	VSS state	Drive Train state	Service Brake state
1 - 0	10	> 0	In Drive	Not applied
1 - 1	11	> 0	In Drive	Applied
1 - 2	12	> 0	Not In Drive	Not applied
1 - 3	13	> 0	Not In Drive	Applied
1 - 4	14	= 0	In Drive	Not applied
1 - 5	15	= 0	In Drive	Applied
1 - 6	16	= 0	Not In Drive	Not applied
1 - 7	17	= 0	Not In Drive	Applied
1 - 8	18	> 0	In Drive	Not applied
1 - 9	19	> 0	In Drive	Applied
1 - 10	1A	> 0	Not In Drive	Not applied
1 - 11	1B	> 0	Not In Drive	Applied
1 - 12	1C	= 0	In Drive	Not applied
1 - 13	1D	= 0	In Drive	Applied
1 - 14	1E	= 0	Not In Drive	Not applied
1 - 15	1F	= 0	Not In Drive	Applied



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Leave in vehicle Speed Sentinel™ SS503-CX Operating Instructions 2014 Ford Transit Connect

Operating Instructions

The Speed Sentinel is a road speed limiter, which limits maximum vehicle speed to a preset limit. Once the driver attains the limited speed, any additional input on the accelerator pedal will not increase the speed of the vehicle. Holding the pedal down will cause Speed Sentinel to maintain vehicle speed at the preset limit, even on varying terrain, much like a cruise control. However, while coasting down hills, the vehicle can exceed the limit since Speed Sentinel does not apply the vehicle brakes.

When vehicle reaches the limited speed, the green LED (limit) on the LED Display will illuminate to show that maximum speed has been achieved. If the red LED is illuminated, a fault code is present and should be reported to the fleet manager.

Speed Sentinel also has an optional passing mode, which allows for a short-time override of the limited speed (can be used in passing at critical moments). To verify passing mode is enabled, an extra "blink" on the green LED during key-on prove out indicates passing mode is programmed. Passing mode is entered by pushing the accelerator pedal all the way to the floor and back, three times in a three second span while Speed Sentinel is limiting the vehicle speed. The override allows the driver to control vehicle speed in excess of the preset limit for 10 seconds, after which Speed Sentinel resumes control.

Speed Sentinel also has a mode that will return the engine to base idle if the service brake is applied at the same time as the accelerator pedal this will only activate while the Speed Sentinel is limiting vehicle speed. To resume normal operation, release and reapply the accelerator pedal. This mode can be disabled anytime after it's activated.

Speed Sentinel allows either of 2 speeds to be selected based on direction of travel. Reverse speed is preprogrammed at factory while forward speed can be set by user.

Should the Speed Sentinel II detect a fault while in operation, control of the vehicle returns to driver if going in the forward direction. If in reverse, vehicle reverts to engine idle (i.e. no throttle). A key cycle is required to reset the fault (if not permanent).

NOTE: Do NOT press and hold the accelerator pedal all the way to the floor while Speed Sentinel is active and limiting speed. If the Speed Sentinel is disabled for any reason, it will stop limiting speed and the driver will immediately be in control of the accelerator. Sudden acceleration may occur if the pedal is held all the way to the floor, and Speed Sentinel becomes disabled.

Checking Speed Sentinel II for Diagnostic Trouble Codes

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- If the Speed Sentinel II requires calibration with the vehicle, the "fault" LED will blink on for two seconds and off for a half second. Call InterMotive for assistance.
- If the Speed Sentinel II has an internal programming fault, the "fault" LED will blink on/off rapidly. Call InterMotive for assistance.



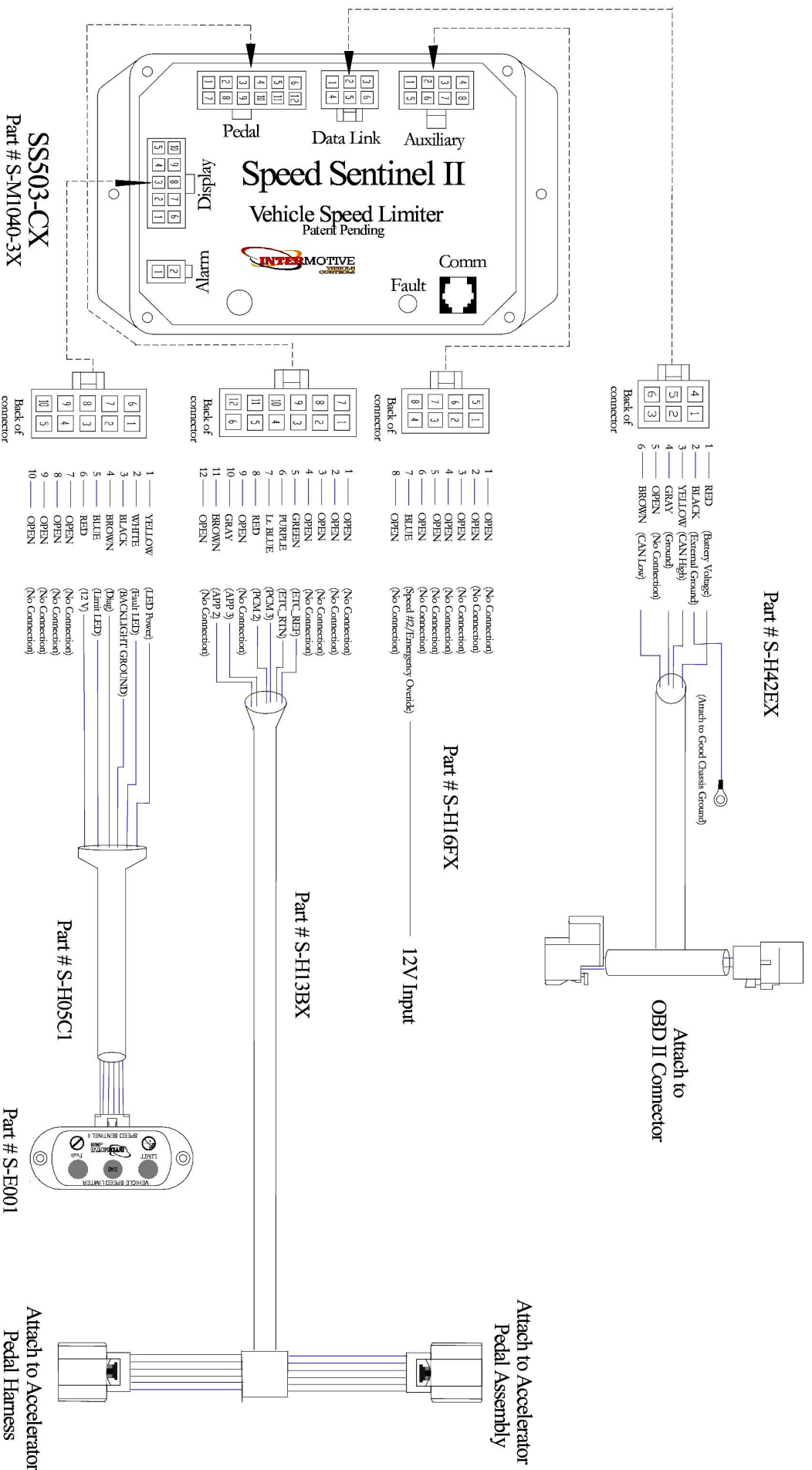
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1 - 6	16	= 0	Not In Drive	Not applied
1 - 7	17	= 0	Not In Drive	Applied
1 - 8	18	> 0	In Drive	Not applied
1 - 9	19	> 0	In Drive	Applied
1 - 10	1A	> 0	Not In Drive	Not applied
1 - 11	1B	> 0	Not In Drive	Applied
1 - 12	1C	= 0	In Drive	Not applied
1 - 13	1D	= 0	In Drive	Applied
1 - 14	1E	= 0	Not In Drive	Not applied
1 - 15	1F	= 0	Not In Drive	Applied

Contact InterMotive for assistance with codes and diagnostics of the Speed Sentinel II.

U.S. Patent #9,469,261



If the Speed Sentinel II fails any step in the post installation test, review the installation instructions and check all connections.
If necessary, call InterMotive Technical Support at (530) 823-1048.