INTERMOTIVE VEHICLE CONTROLS

An ISO 9001:2008 Registered Company

Speed Sentinel II™

Programmable Road Speed Limiter

SS501-A, SS501-AX

Ford E Series 2005-2008

Ford F250-F550 Series 2008-2010

Ford Crown Victoria 2005-2008

Contact InterMotive for specific engine applications.

- Single or dual speed limit modes.
- Vehicle speed can be set from 10-80 mph.
- Maximum engine output up to set speed.
- Flexible – speed setting can be changed.
- "Plug & Play" installation – installs in a few minutes.
- Dynamic Load Response – adjusts for varying road terrains.
- Optional Switch Control Forced Engine Idle Function – forces engine to stay in idle mode as a theft deterrent.
- Optional Switch Control electronic override for Emergency Vehicles when in Code 3 mode.

Contact Intermotive for installation and activation of optional Switch Control modes.

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System Overview

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

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

Speed Sentinel II can be set up for either single or dual speed operation.

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

System controlled electronic override of Speed Sentinel II is available for Emergency Vehicles when in code 3 mode.

Installation Instructions

WARNING
Disconnect the battery to prevent setting a check engine light.

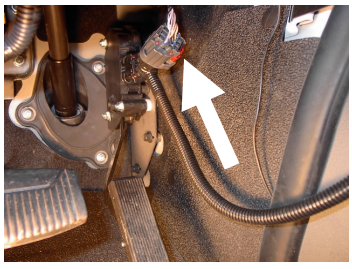
Disconnect vehicle battery before proceeding with installation

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.

Speed Sentinel II Module

Remove the lower dash panel below the steering column area and find a suitable location to mount the Speed Sentinel II module. 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 T– Harness



1. Locate the accelerator pedal (APP).
2. Remove the OEM connector by sliding back the red safety lock, push in the connector-locking tab and separate the connector from the pedal assembly.
3. Install the Speed Sentinel II T-harness between the Accelerator Pedal Position sensor (APP) and the OEM APP connector.
4. Ensure that the red sliding lock is fully seated in the locked position on both connectors.
5. Route and secure the harness to prevent contact with the driver's foot.
6. Attach the 8-Pin connector from the Pedal harness to the SS501 Module in the cavity labeled "Pedal".

LED Display Panel (SS501-A only. SS501-AX does not include the LED Display Panel)

1. 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.
2. Drill a ¾" hole in the dashboard where the center of the display will be located. Attach the 10-pin connector of the LED harness to the Control Module in the cavity labeled "Display".
3. Run the other end of the harness under the dash and out through the ¾" hole. Plug the 6-pin connector of the display harness into the display panel. Ensure panel is level and secure using the supplied screws.

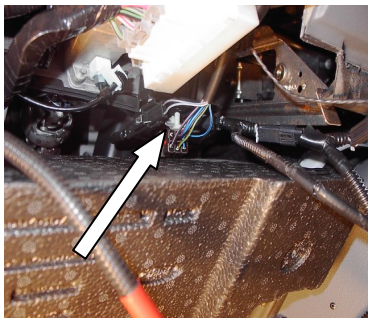
Data Link Harness

1. Locate the vehicle OBDII Data Link Connector. It will be mounted below the lower dash panel.
2. Remove the mounting screws for the OEM Data Link Connector.
3. Plug the red connector from the Speed Sentinel II Data Link T- Harness into the OEM Data Link Connector.
4. Ensure the connection is fully seated and secure with the supplied wire tie.
5. Mount the black connector from the Speed Sentinel II Data Link Harness in the former location of the OEM connector.
6. Attach the black ground wire with eyelet to a chassis ground.
7. Secure the Data Link Harness so that it does not hang below the lower dash panel.
8. Plug the 6-pin connector from the Data Link Harness into the Speed Sentinel II Control Module in the cavity labeled "Data Link".

Cruise Control Inhibit (Vehicle equipped with cruise control)

Note: If the vehicle does not have cruise control, skip to the Setting Vehicle Speed Limit(s) section.

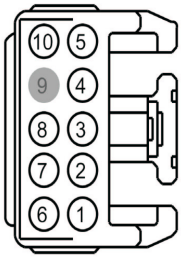
Ford E Series (2005-2009)



1. Locate the brown 6-pin Ford connector (C218B) on the lower right side of the steering column.
2. Locate the light blue/black wire in pin #6 (2006-09) or pin #4 (2005) (Ford Circuit #151).
3. Attach the brown wire Pin 5 from the 8-pin "Auxiliary" connector to this circuit as a parallel tap using solder and heat shrink tubing.
4. Route and secure the brown wire.
5. Insert the 8-pin Auxiliary connector into the Speed Sentinel II module in the cavity labeled "Auxiliary".

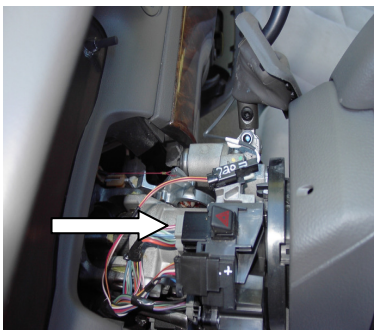
Ford E-Series (2010-2016)

1. Locate the gray 10-pin Ford connector (C218B) on the lower right side of the steering column.
2. Locate the white wire in pin #3.
3. Attach the brown wire Pin 5 from the 8-pin "Auxiliary" connector to this circuit as a parallel tap using solder and heat shrink tubing.
4. Route and secure the brown wire.
5. Insert the 8-pin Auxiliary connector into the Speed Sentinel II module in the cavity labeled "Auxiliary".



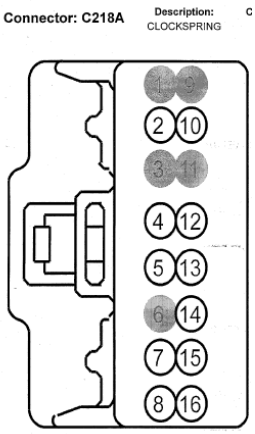
Connector C218B

Crown Victoria (2005-2008)



1. Remove both upper and lower steering column finish covers.
2. Locate Ford connector (C218A).
3. Locate the light blue/black wire in pin #13 (Ford Circuit #151).
4. Attach the brown wire Pin 5 from the 8-pin "Auxiliary" connector to this circuit as a parallel tap using solder and heat shrink tubing.
5. Route and secure the brown wire.
6. Insert the 8-pin Auxiliary connector into the Speed Sentinel II module in the cavity labeled "Auxiliary".

Cruise Control Inhibit (continued)



Ford F Series 2008-2010

1. Remove both upper and lower steering column finish covers.
2. Locate the black 16-pin Ford connector (C218A) on the upper left side of the steering column.
3. Locate the White wire in pin #15.
4. Attach the brown wire Pin 5 from the 8-pin "Auxiliary" connector to this circuit as a parallel tap using solder and heat shrink tubing.
5. Route and secure the brown wire.
6. Insert the 8-pin Auxiliary connector into the Speed Sentinel II module in the cavity labeled "Auxiliary".

Setting Vehicle Speed Limit(s)

Single/Dual mode: Speed Sentinel II can be set up for single or dual mode operation. In the dual speed mode, two speeds can be set up and used to limit the vehicle. Speed selection is determined by a discrete input voltage level at J3/pin7. A +12Vdc input on this pin selects Speed #2. If no voltage is present on this input, Speed #1 (primary) is selected. The Speed #1 setting is selected by the user using the rotary switch.

For single-speed mode, the rotary switch setting refers to the actual speed selection. In dual-speed mode, the switch setting refers to the primary speed (#1). The secondary speed (#2) is set by the factory (per customer specifications).

- Remove the lid of the Speed Sentinel II module. With power disconnected from the module, locate the rotary switch and adjust the speed limit according to the chart shown below.

⚠ WARNING ⚠

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

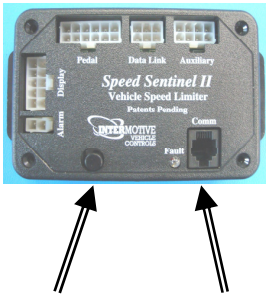
0* = Factory set (user specified)	**8 = 45mph**
1 = 10mph	**9 = 50mph**
2 = 15mph	**A = 55mph**
3 = 20mph	**B = 60mph**
4 = 25mph	**C = 65mph**
5 = 30mph	**D = 70mph**
6 = 35mph	**E = 75mph**
7 = 40mph	**F = 80mph**

* Speed Limit can be adjusted in 1 mph increments. Contact InterMotive for programming information.

Reconnect vehicle battery

Accelerator Pedal Calibration (required)

Attention!
Accelerator pedal calibration has changed from previous instructions. Use the following calibration technique for all Speed Sentinel II modules with Firmware version 1.2.0.0 and above.



Calibration Button

Fault LED

Prior to calibration, ensure the following:

1. Speed Sentinel II pedal harness is installed
2. Data Link connector is NOT installed at module
3. Key on, engine off

Calibrate:

1. Hold down the black calibration button on the Speed Sentinel II module and plug in the 6 pin Data Link connector.
2. When red fault light LED illuminates continuously, release the 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 to the OBD II and check for diagnostic trouble codes (DTC's). If any 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 II module, ensuring the module in is an area away from any external heat sources (engine heat, heater ducts, etc.). Mount the module using screws or double sided tape and reinstall all removed panels.

Post Installation Instructions

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

Note: If module is set for dual-speed mode, ensure Speed Sentinel II operation is checked at each speed as described below.

1. Test drive the vehicle to verify proper Speed Sentinel II operation. The Speed Sentinel II must limit vehicle speed at the preset speed limit and pass the following steps:
2. When the Speed Sentinel II 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 Setting Vehicle Speed Limit(s) of the installation instructions for the adjustment procedure).
4. Check passing mode operation by going from wide-open throttle to closed throttle three times in a three-second span. The Speed Sentinel II passing mode will allow a temporary override of speed limiting. The override lasts for 10 seconds then resumes limiting vehicle speed. If enabled, the green LED will flash once after prove out. Passing mode is optional and may be removed by contacting InterMotive Technical Support.
5. If the vehicle has cruise control, check the cruise control operation and inhibit. Verify that cruise control is operational when vehicle speed is below the limited speed and not operational during speed limiting.
6. 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.

Submit product registration at www.intermotive.net

Leave in vehicle
Operating Instructions
Speed Sentinel II™
SS501-A, SS501-AX
Ford E Series 2005-2008
Ford F250-F550 2008-2010
Ford Crown Victoria 2005-2008

The Speed Sentinel II 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 throttle pedal will not increase the speed of the vehicle. If the throttle is pushed beyond the maximum speed, the Speed Sentinel II will maintain the preset speed.

The Speed Sentinel II will maintain vehicle speed on varying terrain, much like a cruise control. However, while coasting down hills, the vehicle can exceed the limit since Speed Sentinel II does not apply the vehicle brakes. When the Speed Sentinel II 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.

Optional passing mode allows for a short-time override of the limited speed (for use in passing at critical moments). To verify passing mode is programmed, an extra "blink" on the green LED during prove out indicates passing mode is programmed. Passing mode is entered by going from wide-open throttle to idle three times in a three second span. The override lasts for 10 seconds then resumes limited vehicle speed. For SS501-AX (no LED panel), the passing mode function has to be performed in order to be verified.

The Speed Sentinel II 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 mode will only activate while the Speed Sentinel II is limiting vehicle speed. To remove Speed Sentinel II from this mode: Release and reapply the accelerator pedal to reactivate control of the accelerator pedal. This mode can be disable anytime after it's activated.

Optional Dual Speed mode allows 2 speeds to be limited by a flip of a switch. For instance, a truck with a snow plow may have a primary speed limited at 55 MPH, but when the plow is down, the vehicle is limited to 20MPH.

NOTE: Do NOT press and hold the accelerator pedal all the way to the floor while Speed Sentinel II is active and limiting speed. If the Speed Sentinel II 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 II becomes disabled.

Checking Speed Sentinel II for Diagnostic Trouble Codes

- If the Speed Sentinel II has a stored fault code, the "fault" LED will blink twice a second and codes can be retrieved by entering diagnostic mode. Refer to Entering Diagnostic Mode section.
- 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. Refer to the accelerator pedal calibration section
- 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. 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 code will not 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.

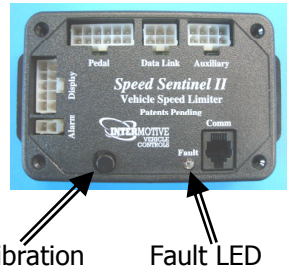
Clearing codes:

- Place the vehicle in Park.
- Press the yellow "Diag" button and at the same time pump the service brake three times.

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

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

Note: The SS501-AX does not include the LED Display Panel.
Fault Codes can be read at the module by pressing and releasing the calibration button and reading the Fault LED.



U.S. Patent #9,469,261

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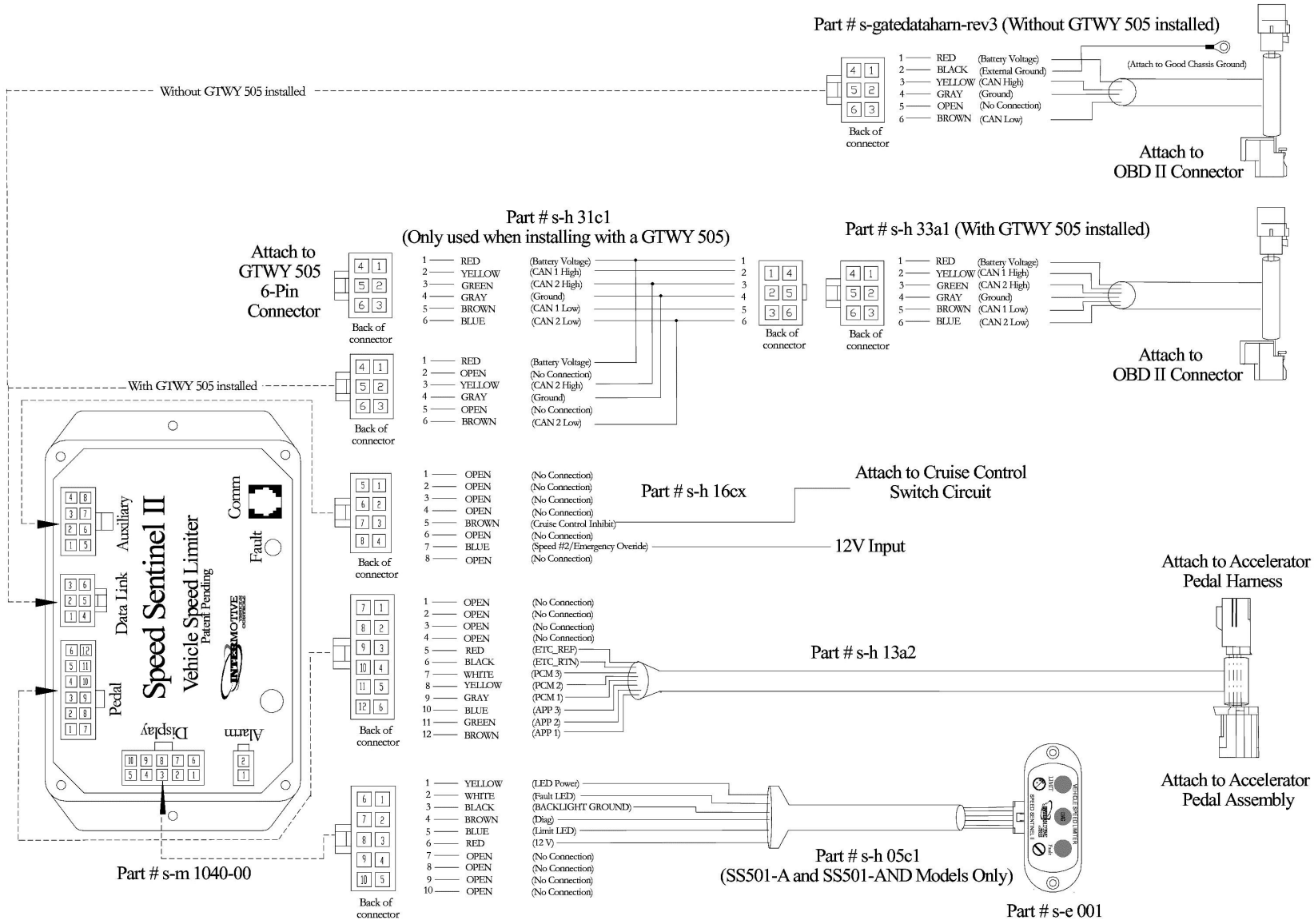

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If the SS501-A fails any step in the Post Installation Test, review the installation instructions and check all connections. If necessary, call

InterMotive technical support @ (530) 823-1048

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