

General Service Bulletin (GSB):	Auto Start-Stop Operation, Knowledge & Technical Information
GSB Overview:	This communication provides technical information to aid in understanding the Auto Start-Stop system's normal operation and to prevent unnecessary diagnosis.
NOTE: This information is not intended to replace or supersede any warranty, parts and service policy, Work Shop Manual (WSM) procedures or technical training or wiring diagram information.	

Overview:

The Auto Start-Stop system helps improve fuel economy and reduce emissions with minimal impact to the driving experience.

When specific vehicle system conditions are met, the Auto Start-Stop system will activate by shutting the engine off, when the vehicle is at a complete stop, the brakes applied and the engine is at normal operating temperature. If these conditions are not met, the system will not activate.

Conditions such as: battery charging or heating and A/C requirements, may cause the engine to restart before releasing the brake pedal.

This feature has characteristics which may lead to questions from owners. The Owner's Manual provides an overview of the Auto Start-Stop system. It is recommended to review this feature with the customer and/or refer them to the Owner's Manual to provide an understanding of how the system operates.

Understanding Auto Start-Stop activation requirements and vehicle system control inputs will provide knowledge for sales, service, and the customer.

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System Indicators:

Vehicles equipped with Auto Start-Stop have a variation of the following indicators; Depending on the specific vehicle's instrument cluster and option content. Auto Start Stop system messages are displayed in the instrument cluster or message center. Refer to the owner's Manual for vehicle specific indicators.

Refer to the Owner Guide for Vehicle Specific Indicators



- Under normal operation, the **GREEN** indicator illuminates when the Auto Start-Stop is enabled.



- The **GREY** indicator illuminates when one or more vehicle system operating conditions necessary to activate the Auto Start-Stop system engine stop, are not within range of the auto start stop system requirements.



- A flashing **AMBER** indicator illuminates when a vehicle system concern is present and the driver needs to restart the vehicle manually.

Perform complete vehicle diagnostics when the amber indicator is illuminated. The driver can disable the Auto Start-Stop system using the deactivation switch (refer to the Owner's Manual for vehicle specific location and function). It is important to note that the Auto Start-Stop system is automatically enabled after every key cycle.

Typical Auto Start-Stop System Inputs (Input From Other Vehicle Systems)

Note: The following list does not include all possible inputs. Refer to the PID list in the scan tool datalogger.

- Vehicle speed is 0 kph (0 mph).
- Accelerator pedal is released.
- Brake pedal is applied
 - o Brake on/off switch activated (indicates ON).
- Clutch Pedal Cruise Control Deactivator Switch indicates the clutch pedal is released. Clutch Pedal in full TOP position of travel. (Manual Transmission only).
- Brake system pressure is approximately 482 kPa (70 psi) or greater.
- ABS is not active.
- Brake Booster vacuum is present and a vacuum change does not occur while the vehicle is stopped.
- Gear selector lever in 'N' Neutral for Manual Transmissions and 'D' Drive for Auto Transmissions.
- Battery temperature is between 5° C (41° F) to 60° C (140° F).
- A/C system is OFF, or there is no change in the A/C system request while the vehicle is stopped.
- If the A/C system is ON, ambient temperature should be less than 35° C (95° F).

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- Road grade while stopped is less than 15%.
- All doors remain closed and the occupied front seats have the seat belt latched.
- The 110v alternating current inverter (if equipped) is under 10w electrical load and the electrical load does not change while stopped.
- Trailer Harness is not connected.
- Tow/Haul mode is not active.
- 4WD (if equipped) is in the 2WD position and does not change while stopped.
- Electronic Locking Differential (ELD) (if equipped) is not engaged.
- In-car temperature is steady and no change is requested from the heating or A/C system.
- Engine coolant temperature is at the normal operating temperature.
- Max A/C or defrost is not selected.
- Blower fan control is at one speed setting and a speed change request does not occur while the vehicle is stopped.
- Rear defrost is not selected and a rear defrost request does not occur while the vehicle is stopped.
- Battery and charging system voltage is greater than 11.3 volts.
- Electrical load is less than 65 amps and a voltage or amperage load change does not occur while the vehicle is stopped.
- Steering wheel angle is less than 90° from the center position and a steering input change does not occur while the vehicle is stopped.
- Hill Start Assist is not active.
- Automatic transmission fluid temperature is less than 110° C (230° F).
- Fuel Level is greater than 1/8 full and the low fuel warning is not active.
- Auto Start-Stop system restarts are limited to 10, unless the vehicle speed exceeds 4 km/h (2.5 mph).
- Auto Start-Stop functionality operates independently only from vehicles equipped with Electronic Brake Boost (EBB).

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Typical Auto Start-Stop System Input Changes That May Initiate An Engine Start While Stopped

Note: The following list does not include all possible inputs. Refer to the PID list in the scan tool datalogger.

- Battery voltage drops below 11.3 volts.
- Brake system pressure drops to less than 482 kPa (70 psi), or the brake system pressure is indicating the brakes have been released.
- Clutch Pedal Position Switch indicates Clutch Pedal is fully depressed (Clutch Pedal is in full bottom position) (Manual Transmission only).
- Additional brake system vacuum is requested.
- Rear defrost is switched on (engine restarts after 30 seconds).
- HVAC system is in A/C or Heat modes.
- Blower Fan speed request is changed.
- Electronic Automatic Temperature Control (EATC) temperature setting is changed.
- 2016 MY and prior: Gear selector position is moved to any gear except P (Park) (moving to P (Park) allows the shutdown to continue).
- 2017 MY and forward: Gear selector position is not in P (Park), N (Neutral), D (Drive), or S (Sport Modes).
- Accelerator pedal is pressed.
- 110v inverter electrical load greater than 10W is detected.
- Vehicle electrical load is increased to greater than 70 amps.
- Vehicle is operating in 4H or 4L mode.
- Steering wheel is turned rapidly or is at a sharp angle.
- Vehicle speed of greater than 4 km/h (2.5 mph) for more than 2 seconds has not occurred.
- Elevation is approximately above 3,048 m (10,000 ft).
- Pressing the Auto-Start-Stop button with the engine automatically stopped.

An explanation for disabling the Auto Start Stop feature may be displayed within the Instrument Cluster. For example:

- *Engine On due to Accessory Usage* – Engine may be on to support high demand for electrical accessories, such as operating power windows, rear defroster or when using the power point
- *Deactivated by Driver* – You have disabled the Start Stop Feature
- *Auto Start Stop Press Brake to Start Engine* – The engine needs to be restarted, press the brake pedal to start.
- *(various message in cluster)* – refer to Owner's Manual for listed action.

Diagnosing The Auto Start-Stop System:

Note: The scan tool Battery Management System (BMS) reset PID only resets the battery's time-in-service and not the battery State Of Charge (SOC). To update the battery SOC, the vehicle must be driven or allowed to sit (cold soak) more than 6 hrs.

REFERENCES:

- For Auto Start-Stop system operation and features, refer to the Owner's Manual, table of contents – Unique Driving Characteristics – Auto Start-Stop.
- For engine control system descriptions and operation and the diagnostic procedures, refer to the PC/ED Manual - Section 1 Powertrain Control Software - Auto Start-Stop.
- For a specific vehicle's description and operation and diagnostic procedures, refer to Workshop Manual Section 303.

NOTE:

- Auto Start-Stop Vehicles utilize an Enhanced Flooded Battery (EFB) or Absorbed Glass Mat (AGM) type of battery. Auto Start-Stop Vehicles require an approved/specific battery associated for that vehicle. Replacing an Auto Start-Stop battery with a non-approved battery, may cause drivability concerns, Auto Start-Stop functional concerns, and/or shortened battery life.

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Additional References:

Start Stop Video Overview for F-150 - Other vehicles similar operation

http://fordtube.dealerconnection.com/video.php?video_key=bd8ed7a6405d3562638858b674cc6c70

Start-Stop Video Overview for Ford Cars and SUV's

http://fordtube.dealerconnection.com/video.php?video_key=b4973d599ec3f0fc7737b8aeaefc869b