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## 1. Idle Shutdown Timer (General Overview)

The idle shutdown timer (IST) feature is designed to conserve fuel by automatically shutting down the engine during extended idle times.

The document will address unique idle shutdown timer functionality for MaxxForce® 11L and 13L.

To set up the Idle Shutdown Timer feature it is recommended that you use one of the example settings, referenced in the “Parameter Setup” section, and then modify only the specific parameters that will help meet your vehicle application.

### 1.1. Feature Codes

- N/A

## 2. Definitions/Acronyms

The following terms are referenced in this document:

- **CAP** – Cold Ambient Protection
- **DPF** – Diesel Particulate Filter
- **ECM** – Engine Control Module
- **ECT** – Engine Coolant Temperature
- **ESS** – Engine Shutdown System
- **IST** – Idle Shutdown Timer
- **PTO** – Power Take Off

## 3. Description and Operation

The idle shutdown timer is used to limit the amount of engine idle time by automatically shutting down the engine after a pre-programmed time has expired. Programmable parameters within the engine control module (ECM) determine the time and conditions required before the engine shuts down. Some parameters can be adjusted to suit the customer's needs.

### Idle Shutdown Sequence

Simplified, the idle shutdown sequence begins when the timer starts, followed by a visual and audible warning, and finally the engine shuts down. The following information describes the shutdown sequence in more detail.

#### 1. Idle Shutdown Timer Starts

The idle shutdown timer only starts after the vehicle is stationary; the engine is running and other "interlock" conditions (i.e. parking brake set, etc.) are met. These conditions vary depending on the configuration of the feature. Interrupting these interlocks will reset the impending engine shutdown sequence and the timer will restart.

#### 2. Idle Shutdown Warning

The idle shutdown warning occurs 30 seconds before the idle shutdown timer expires (i.e. 30 seconds before shutdown).

This happens if the engine has been idling for an extended period of time (time is programmable) while the vehicle conditions (described above) are met.

The amber "IDLE SHUT DOWN" indicator (if equipped) will flash in the gauge cluster for 30 seconds during the warning. An audible alarm will also sound. If a manual "reset" or "override" function (i.e. brake, clutch, etc.) is not activated, the engine will shut down.

**Note 1:** An override feature allows the brake and clutch to be programmed to stop the shutdown sequence until the vehicle is driven or the ignition key switch is cycled.

**Note 2:** The idle shutdown feature also has an additional (optional) tamper proofing feature which is used to prevent operators from bypassing an impending shutdown. Refer to the [Tamper Proofing](#) section for more information.

#### 3. Engine Shutdown

The idle shutdown timer expires and the idle shutdown feature shuts down the engine.

**Note 3:** The vehicle electrical system and accessories will remain active until the key switch is turned off.

## 3.1. Tamper Proofing

“Tamper Proofing” is included with the Idle Shutdown Timer feature. This feature monitors various inputs (i.e. driver pedals, vehicle speed, etc.) to prevent the driver from bypassing the idle shutdown timer. For example, the “reset” function will not be allowed if constant application of the brake pedal is detected.

Choose the “Idle Shutdown Timer Mode” (7400) parameter and select “mode 3” if “Tamper Proofing” is desired.

## 3.2. Operation

This section describes the idle shutdown functionality.

- Idle shut down can be disabled. Refer to the “Idle Shutdown Timer Mode” (7400) programmable parameter.
- Timer can be adjusted from 2 to 120 minutes. Refer to the “Idle Shutdown Time” related programmable parameters.
- “Tamper Proofing” is a customer option selected by the “Idle Shutdown Timer Mode” (7400) programmable parameter.
- Throttle pedal (application %) can be programmed to reset the timer. This is only allowed in mode 1 and 2 selected by the “Idle Shutdown Timer Mode” (7400) programmable parameter.
- Brake/clutch inputs can be programmed to stop the shutdown timer until the vehicle is driven or the ignition key switch is cycled. Refer to the “Refer to the “Idle Shutdown Timer – Override Enable” (7407) programmable parameter.
- Can be programmed to inhibit the idle shutdown based on engine coolant temperature. Refer to the “Minimum ECT for IST” (7413) and the “Maximum ECT for IST” (7412) programmable parameters.
- Can be programmed to inhibit the idle shutdown based on outside ambient air temperature for driver comfort. Refer to all “Ambient Temperature” related programmable parameters.
- Can be programmed to inhibit the idle shutdown based on percent (%) engine load. Refer to the “Maximum Engine Torque (%) for IST” (7409) programmable parameter. This is only allowed in mode 2 and 3 selected by the “Idle Shutdown Timer Mode” (7400) programmable parameter.

## 3.2.1.1. Idle Shutdown Timer Starts:

To enter the idle shutdown timer sequence (clock starts counting), all of the following conditions must be true:

- Engine must be running.
- Vehicle must be stationary.
- Manual Diesel Particulate Filter (DPF) regeneration (“Parked Regeneration”) must be inactive.
- Must be in park (automatic transmission) or neutral gear position (automatic or manual transmission).
- Engine coolant operating temperatures must be between the customer programmable ECT limits. This range can be adjustable using “Minimum ECT for IST” (7413) and “Maximum ECT for IST” (7412).
- If the “Ambient Temperature Override” (7408) programmable parameter is enabled, the outside ambient air temperature must be between the customer programmable limits “Maximum Ambient Temperature” (7402) and Minimum Ambient Temperature (7403).
- If the “Idle Shutdown Timer Mode” (7400) programmable parameter is set to mode 1 (“Light Load PTO”), the Power Takeoff (PTO) and the Remote PTO must be inactive or in standby mode.
- If the “Idle Shutdown Timer Mode” (7400) programmable parameter is set to mode 2 (“No Load”) or mode 3 (“Heavy Load PTO with Tamper Proofing”), the engine reported fuel usage (load) must be less than 30%. The percent load is programmable by the “Maximum Engine Torque (%) for IST” (7409) programmable parameter.
- If the “Idle Shutdown Timer Mode” (7400) programmable parameter is set to mode 1 (“Light Load PTO”) or mode 2 (“No Load”), the accelerator pedal position must be less than 20% applied. This percentage is adjustable by the “Maximum Normalized Throttle Position (7414) parameter.

## 3.2.1.2. *Reset Idle Shutdown Timer:*

After the vehicle conditions (described above) are met to “start the timer”, any of the following conditions will reset the timer (clock) to 0. The reset function can be activated any time before the engine shuts down.

- Accelerator pedal movement. Refer to the “Maximum Normalized Throttle Position” (7414) programmable parameter.
- Brake pedal movement.
- Clutch pedal movement (Manual transmissions).
- Shift selector movement (Automatic transmissions).
- Parking brake movement.

**NOTE:** If one or more of the conditions above has caused the timer to “reset” and if the conditions to “start the timer” are still met, the timer will begin counting again.

## 3.2.1.3. *Idle Shutdown Override*

A manual override feature (if enabled) allows the driver to stop the timer (thereby preventing the impending engine shutdown) by pressing the brake or clutch. The override function can be activated any time before the engine shuts down.

The manual “override” function is different than the “reset” function as described in the previous section. When the driver performs the override, the timer will be stopped until the vehicle is driven or the ignition key is cycled.

Refer to the “Idle Shutdown Timer – Override Enable” (7407) programmable parameter for more information.

**Note 1:** An additional override feature can be selected to automatically prevent the engine from shutting down based on outside ambient temperature for driver comfort, if desired. Refer to the “Ambient Temperature Override” (7408) programmable parameter for more information.

**Note 2:** The manual override functionality is only allowed if the “Idle Shutdown Timer Mode” (7400) programmable parameter is set to “Mode 1” or “Mode 2”.

**Note 3:** The “Disabled Option” for the “Idle Shutdown Timer Mode” (7400) programmable parameter allows the customer to permanently disable the idle shutdown feature, such that idle shutdown will never occur regardless of vehicle conditions.

## 3.2.1.4. *Idle Shutdown Warning:*

The idle shutdown warning occurs 30 seconds before the engine shuts down. This happens if the engine has been idling for an extended period of time (time is programmable) while the vehicle conditions to “start the timer” are met.

The amber “IDLE SHUT DOWN” indicator (if equipped) will flash in the gauge cluster for 30 seconds during the warning. An audible alarm will also sound. If a manual “reset” or “override” function (i.e. brake, clutch, etc.) is not activated, the engine will shut down.

## 3.2.1.5. *Engine Shut Down:*

The idle shutdown feature shuts down the engine after the timer expires.

The timer expires when it has counted and reached the programmed “Idle Shutdown Time” parameter value. The factory setting is 5 minutes with the parking brake set, but this setting is customer programmable.

## 3.3. Feature Interaction

The idle shutdown timer (IST) feature interacts with the following engine features:

- Cold Ambient Protection (CAP) – If CAP is enabled, IST will be deactivated. Refer to the “Vehicle Setup” document for CAP programming.

## 4. Programmable Parameters

The following programmable parameters are available with the idle shutdown timer feature. These parameters should be programmed to limit engine idle time, but not in a way that may inconvenience drivers who rely on the engine for heat and air conditioning inside the cab, for example.

Parameters indicated as “Customer Programmable” can be adjusted differently than the production assembly plant setting to meet the customer’s needs. This adjustment can be done before or after the original sale. If the parameter is indicated as non-customer programmable, the parameter setting is preset from the factory and can’t be changed without dealer authorization.

Parameter Name	Description	Possible Values	Customer Programmable?	Recommended Setting
Idle Shutdown Type (7411)	This parameter may not be changed post-original equipment manufacturer (OEM) except through your authorized dealer.	0: Standard IST  <b>Note 1:</b> If set to 1, refer to the <a href="#">Legacy CARB IST</a> document.	NO	0
Idle Shutdown Timer Mode (7400)	This parameter determines the conditions that the Idle Shutdown Feature will be functional. This parameter may be changed through your authorized dealer. <ul style="list-style-type: none"> <li>If set to (0) – The idle shutdown timer is disabled. This means that the engine will not be shut down automatically by the idle shutdown feature.</li> <li>If set to (1) – The idle shutdown timer sequence will be prevented and the engine will not shut down while the PTO or any auxiliary engine speed control is actively ramping the engine above normal engine idle speed.</li> <li>If set to (2) – The engine may shutdown if PTO engine speed control is engaged depending on the programmed value of the “Maximum Engine Torque (%) for IST” (7409) parameter. This allows the engine to stay running, for example, if the operator desires to have the engine speed ramped up during PTO operation. This mode also prevents the operator from setting the engine speed with a minimum load (i.e. 10% engine torque) without actually engaging the PTO with the intent of bypassing the idle shut down timer.</li> <li>The engine may shutdown if PTO engine speed control is engaged. Puts the feature in “tamper proofing” mode. Refer to the <a href="#">Tamper Proofing</a> section for more information.</li> </ul>	0: Idle Shutdown Timer – “Disabled” Option  1: Idle Shutdown Timer – “Light Load PTO” Option  2: Idle Shutdown Timer – “No Load” Option  3: Idle Shutdown Timer – “Heavy Load PTO with Tamper Proofing” Option	NO	Customer Chosen (at point of purchase)
Idle Shutdown Time – No Park Brake Set (7401)	Sets the amount of engine idle time before the idle shutdown feature will initiate an engine shut down while the parking brake is not set.  While the Electronic Service Tool is connected, this time may be extended regardless of the parameter setting.	2 to 120 (minutes)	YES	15

## Idle Shutdown Timer (IST)

<p>Idle Shutdown Time – Park Brake Set (7404)</p>	<p>Sets the amount of engine idle time before the idle shutdown feature will initiate an engine shut down while the parking brake is set.</p> <p>While the Electronic Service Tool is connected, this time may be extended regardless of the parameter setting.</p>	<p>2 to 255 (minutes)</p>	<p>YES</p>	<p>5</p>
<p>Ambient Temperature Override (7408)</p>	<p>This parameter prevents the idle shutdown feature from shutting down the engine based on outside air temperature for driver comfort.</p> <p>Up to 3 temperature values: "Intermediate", "Maximum" and "Minimum" can be selected to influence the activation of the Ambient Temperature Override feature.</p>	<p>0: Ambient Temperature Override Disabled</p> <p>1: Ambient Temperature Override Enabled</p>	<p>YES</p>	<p>Customer Chosen (at point of purchase)</p>
<p>Maximum Ambient Temperature Override (7402)</p>	<p>This parameter is part of the “Ambient Temperature Override” feature.</p> <p>The Idle Shutdown feature will not shut down the engine above this temperature.</p> <p>This allows the engine to stay running when temperatures are high in order to allow the air conditioning to function for driver comfort, for example.</p> <p><b>Required Parameter Settings:</b></p> <ul style="list-style-type: none"> <li>The “Ambient Temperature Override (7408)” feature must be “Enabled”</li> </ul>	<p>21 to 66 (deg C)</p>	<p>YES</p>	<p>100°F (38°C)</p>
<p>Minimum Ambient Temperature Override (7403)</p>	<p>This parameter is part of the “Ambient Temperature Override” feature.</p> <p>The Idle Shutdown feature not shut down the engine below this temperature.</p> <p>This allows the engine to stay running when temperatures are low in order to allow the engine to stay warm for engine protection, and to allow the heater to function for driver comfort, for example.</p> <p><b>Required Parameter Settings:</b></p> <ul style="list-style-type: none"> <li>The “Ambient Temperature Override (7408)” feature must be “Enabled.</li> </ul>	<p>-40 to 15 (deg C)</p>	<p>YES</p>	<p>45°F (7.2°C)</p>

## Idle Shutdown Timer (IST)

<p>Intermediate Ambient Temperature Override (7405)</p>	<p>This parameter adds functionality to the “Ambient Temperature Override” feature by enabling or disabling the use of the “Intermediate Ambient Temperature” feature functionality.</p> <p><b>Required Parameter Settings:</b></p> <ul style="list-style-type: none"> <li>• “Ambient Temperature Override (7408)” must be enabled.</li> <li>• “Intermediate Ambient Temperature” (7406) parameter must be set.</li> <li>• “Idle Shutdown Timer – Override Enable” (7407) must be enabled.</li> </ul> <p><b>Note 1:</b> If set to (1) “enabled” and the ambient temperature is between the “Minimum” and “Intermediate” temperatures, the driver may choose to manually override the idle shutdown timer by transitioning the brake or clutch switch.</p> <p>If the timer is “overridden”, the timer will remain stopped until the vehicle is moved (vehicle speed &gt;0) OR the ignition key is cycled.</p> <p><b>Note 2:</b> If set to (1) “enabled” and the ambient temperature is between the “Intermediate” and the “Maximum” temperatures, the driver may chose to reset the idle shutdown timer, but the timer will not be overridden.</p>	<p>0: Intermediate Ambient Temperature Override Disabled</p> <p>1: Intermediate Ambient Temperature Override Enabled</p>	<p>YES</p>	<p>Customer Chosen (at point of purchase)</p>
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## Idle Shutdown Timer (IST)

<p>Intermediate Ambient Temperature (7406)</p>	<p>This parameter is part of the “Intermediate Ambient Temperature Override” feature.</p> <p>This parameter can be used to select a minimum outside air temperature that a driver would not likely experience discomfort if the engine were to be shut down by the Idle Shutdown Timer feature.</p> <p><b>Required Parameter Settings:</b></p> <ul style="list-style-type: none"> <li>• “Ambient Temperature Override” (7408)</li> <li>• “Intermediate Ambient Temperature Override” (7405)</li> <li>• “Idle Shutdown Timer – Override Enable” (7407)</li> </ul> <p>Refer to “Example Programmed Values” for more information about this feature.</p> <p><b>Note 2:</b> This value must be set between the minimum and maximum “Ambient Temperature Override” parameter settings for the ambient temperature override functionality to operate correctly.</p>	<p>-40 to 38 (deg C)</p>	<p>YES</p>	<p>70°F (21°C)</p>
<p>Idle Shutdown Timer – Override Enable (7407)</p>	<p>This parameter allows the driver to reset or stop the idle shutdown timer by pressing either the clutch or the brake pedal.</p> <ul style="list-style-type: none"> <li>• If set to (0) – The driver will be allowed to reset the idle shutdown timer by pressing the brake, clutch, or accelerator pedal. Transitioning the shifter or parking brake will also reset the timer.</li> <li>• If set to (0) and the timer is “reset”, the timer will begin counting again starting at 0.</li> <li>• If set to (1) – The driver will be allowed to stop the idle shutdown timer by pressing the brake or clutch pedal.</li> <li>• If set to (1) and the timer is “overridden”, the timer will remain stopped until the vehicle is moved (vehicle speed &gt;0) OR the ignition key is cycled.</li> </ul> <p><b>Required Parameter Settings:</b></p> <ul style="list-style-type: none"> <li>• The “Idle Shutdown Timer Mode” (7400) must be set to “Mode 1” or “Mode 2”.</li> </ul>	<p>0: Brake/Clutch Override Off (Disabled)</p> <p>1: Brake/Clutch Override On (Enabled)</p>	<p>YES</p>	<p>Customer Chosen (at point of purchase)</p>

## Idle Shutdown Timer (IST)

<p>Maximum Engine Torque (%) for IST (7409)</p>	<p>The Idle Shutdown feature will be prevented from shutting down the engine if the engine load is above this value.</p> <p>This allows the engine to stay running, for example, if the operator desires to operate the PTO at or near idle speed.</p> <p>This parameter also prevents the operator from setting the engine speed with a minimum load (i.e. 10% engine torque) without actually engaging the PTO with the intent of bypassing the idle shut down timer.</p> <p><b>Required Parameter Settings:</b></p> <ul style="list-style-type: none"> <li>The "Idle Shutdown Timer Mode" parameter must be set to "Mode 2" OR "Mode 3".</li> </ul>	<p>30 to 100%</p>	<p>YES</p>	<p>30</p>
<p>Maximum ECT for IST (7412)</p>	<p>The engine coolant temperature must be below this value for Idle Shutdown to occur.</p> <p>This allows the engine to stay running during extreme temperatures to protect the engine from damage.</p>	<p>-40 to 150 (deg C)</p>	<p>YES</p>	<p>302°F (150°C)</p>
<p>Minimum ECT for IST (7413)</p>	<p>The engine coolant temperature must be above this value for Idle Shutdown to occur.</p> <p>This allows the engine to stay running during extreme temperatures to protect the engine from damage.</p>	<p>-40 to 150 (deg C)</p>	<p>YES</p>	<p>60°F (16°C)</p>
<p>Maximum Normalized Throttle Position (7414)</p>	<p>Sets the pedal percent (%) movement required before the idle shutdown timer will be reset.</p> <p>If this parameter is set to 0.5, for example, then the accelerator pedal must be moved 50% of maximum travel before the pedal will be recognized by the engine and the idle shutdown timer will be reset.</p> <p><b>Required Parameter Settings:</b></p> <ul style="list-style-type: none"> <li>The "Idle Shutdown Timer Mode" (7400) parameter must be set to "mode 1" or "mode 2".</li> </ul>	<p>0 to 1</p>	<p>YES</p>	<p>0.2</p>

## 5. Parameter Setup

This section describes only a few possible applications of the feature and how the programmable parameters can be effectively configured for each application. This is not a comprehensive list, and does not include all possible applications that an owner/operator might encounter.

Please review the description and operation section and the programmable parameters for a better understanding of how the various engine parameters and the idle shutdown timer mode might be best configured for your vehicle.

**(Example A) – Customer desires to extend engine idle as much as possible to allow the HVAC to keep the driver comfortable during extreme weather conditions:**

In this example, let’s assume that the customer desires to keep the engine idling as much as possible without having to manually “reset” the timer in order to maintain cabin heat or air conditioning. This might be considered an “Over the road” or “Sleeper” engine idle application.

One way to accomplish this is to use the ambient temperature override feature. Adjust parameters as follows:

Parameter Name	Action Required
Idle Shutdown Timer Mode (7400)	Select “Mode 1”
Idle Shutdown Time – No Park Brake Set (7401)	Set the value to “15”
Idle Shutdown Time – Park Brake Set (7404)	Set the value to “5”
Ambient Temperature Override (7408)	Select “Enabled”
Maximum Ambient Temperature Override (7402)	Set the value to “100”
Minimum Ambient Temperature Override (7403)	Set the value to “45”
Intermediate Ambient Temperature Override (7405)	Select “Enabled”
Intermediate Ambient Temperature (7406)	Set the value to “70°F”
Idle Shutdown Timer – Override Enable (7407)	Select “Enabled”
Maximum Engine Torque (%) for IST (7409)	Set the value to “30%”
Maximum ECT for IST (7412)	Set the value to “302°F”
Minimum ECT for IST (7413)	Set the value to “60°F”
Maximum Normalized Throttle Position (7414)	Set the value to “0.2”

Given the above parameter settings, the feature will automatically override (prevent) the engine idle shutdown if the temperature falls below 45°F (7.2°C) or above 100°F (38°C). These factory preprogrammed temperature settings are customer adjustable.

If the ambient temperature is 50°F (between “Minimum” and “Intermediate”), the driver may choose to manually override (**See Note 1**) the idle shutdown timer by transitioning the brake or clutch switch. However, if the ambient temperature is 75°F (between “Maximum” and “Intermediate”) the driver may only reset (**See Note 2**) the idle shutdown timer.

**Note 1:** If the timer is manually overridden, the timer will remain stopped until the vehicle is moved (vehicle speed >0) OR the ignition key is cycled.

**Note 2:** If the timer is “reset”, the timer will begin counting again starting at 0. If the timer is not reset, the engine will shut down.

**Note 3:** If the “Intermediate Ambient Temperature Override” parameter is “disabled”, the following functionality will apply:

- Engine idle shutdown will be automatically prevented if the temperature falls below 45°F (7.2°C) or above 100°F (38°C).
- Manual resets and override functionality (if enabled) will only be allowed between 45°F (7.2°C) and 100°F (38°C).

**(Example B) – Customer desires to limit the engine idle as much as possible to conserve fuel:**

In this example, let’s assume that the customer desires to prevent the engine from idling as much as possible in order to conserve fuel. This might be considered a “Fuel Economy Day Trip” engine idle application.

One way to accomplish this is to adjust parameters as follows:

Parameter Name	Action Required
Idle Shutdown Timer Mode (7400)	Select “Mode 3”
Idle Shutdown Time – No Park Brake Set (7401)	Set the value to “15”
Idle Shutdown Time – Park Brake Set (7404)	Set the value to “5”
Ambient Temperature Override (7408)	Select “Disabled”
Idle Shutdown Timer – Override Enable (7407)	Select “Disabled”
Maximum Engine Torque (%) for IST (7409)	Set the value to “30%”
Maximum ECT for IST (7412)	Set the value to “302°F”
Minimum ECT for IST (7413)	Set the value to “60°F”
Maximum Normalized Throttle Position (7414)	Set the value to “0.2”

## 6. Frequently Asked Questions

**Q. Can I operate a power take off (PTO) device on a vehicle equipped with an idle shutdown timer?**

A. Yes, the “Idle Shutdown Timer Mode” (7400) programmable parameter can be adjusted to allow PTO operation.

**Q. Can I restart the engine immediately after the idle shutdown timer feature has shut the engine down?**

A. Yes, just cycle the key switch and restart the engine. Normal idle shutdown functionality will be reactivated if conditions are met.

**Q. I want to change my idle shut down timer mode but the service tool will not allow. Can I change the mode?**

A. Yes, but only through your authorized dealer.

**Q: My “Idle Shut Down” warning light and the audible alarm have been activated. Can I prevent the engine from shutting down?**

A. Yes, the feature allows the driver to perform a manual “reset” to restart the timer any time before the engine shuts down by pressing the brake, clutch, or accelerator pedal.

In addition, if the “Idle Shutdown Timer – Override Enable” (7407) parameter is set to “enabled”, the driver is allowed to perform a manual “override” which stops the timer by pressing the brake or clutch. If overridden, the timer will remain stopped until the vehicle is driven or the ignition key is cycled.

## Idle Shutdown Timer (IST)

**Q: I'd like to leave my truck running for heating or air conditioning comfort. Can I set up the feature to automatically prevent the engine from shutting down based on outside air temperature?**

A. Yes, just "enable" the "Ambient Temperature Override" (7408) parameter. Additional ambient temperature related parameters (referenced in this document) can be adjusted for even more options. By the factory settings, this feature will automatically prevent engine shutdown if the temperature falls below 45°F (7.2°C) or above 100°F (38°C). These temperature values can be adjusted by the customer.