# MaxxForce® 11 and 13 (2010)

## Overview: *Idle Shutdown Timer (including Certified Clean Idle)*

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## General Overview:  Idle Shutdown Timer

The Idle Shutdown Timer (IST) feature is designed to automatically shut down the engine during extended idle time periods. This feature is used to allow the engine to comply with California Air Research Board (CARB) emission requirements.

> *Effective January 1, 2008, engines built for vehicles <u>registered</u> in California or a CARB opt-in state must be certified under the new California Idle Reduction Rule (CCR Title 13 Section 1956.8 (a)(6)).*

This feature can be configured to help meet the Certified Clean Idle Program requirements; however, the vehicle owner or operators are ultimately responsible for idle restriction compliance. The regulations for each location are outside the scope of this document.

| Code | Emission Compliance Description |
|------|-------------------------------|
| **12WZC** | 5 Min., Tamper-Proof Engine Shutdown System, Complies With California Clean Air Regulations, Does Not Certify Engine for Low-NOx Extended Idling. NOTE: This feature is no longer available for ProStar, 8600, 7600 and 7700 models.  For these models the MaxxForce 11 and 13 engines now qualify as Low NOx Idle Engines under CARB. |
| **12WZD** | Engine Shutdown System Exempt Vehicles, Complies With California Clean Air Regulations. NOTE: This feature is only available for International truck applications that will allow a vehicle to be qualified as vocationally exempt. |
| **12WZE** | Federal Does Not Comply With California Clean Air Regulations. **NOTE:** This feature is for any vehicle that meets current federal EPA standards but is not required to meet CARB regulations. |
| **12WZB** | Low NOx Idle Engine, Complies with California Clean Air Regulations; Includes "Certified Clean Idle" Decal on Hood. |
| **12WZJ** | Low NOx Idle Engine, Complies with California Clean Air Regulations; Includes "Certified Clean Idle" Decal on Drivers Door. |
|  |  |

This document will address unique idle shutdown timer functionality for the MaxxForce® 11 and 13.

## Description and Operation

The IST is used to limit the amount of engine idle time by automatically shutting down the engine after a programmable parameter time limit has expired.

The IST system starts the timer sequence only after the vehicle is stationary; the engine is running and other interlock conditions (i.e. parking brake set, etc.) are met. The IST sequence can be reset by interrupting these interlocks during the impending

engine shutdown sequence. **A** visual indication in the instrument panel and an audible warning will sound thirty seconds before engine shutdown occurs. This will continue until the engine shuts down or the idle shutdown timer is reset.

The following two "Operation" sections describe the functionality of the Standard IST and Certified Clean Idle IST systems.

*This feature will shut down the engine, but the vehicle electrical system and accessories will remain active until the key switch is turned off.*

## Operation – Standard IST

### Idle Shutdown Warning

The idle shutdown warning occurs 30 seconds before the idle shutdown timer expires (i.e. 30 seconds before shutdown). The red idle shut down indicator (if equipped) will flash in the gauge cluster for 30 seconds and an audible alarm will sound during the warning. If a manual reset or override function (i.e. brake, clutch, etc.) is not activated, the engine will shut down.

*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.*

*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.*

### Engine Shutdown

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

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

### Tamper Proofing

Tamper Proofing is included with the IST feature. This feature monitors various inputs (i.e., driver pedals, vehicle speed, etc.) to prevent the driver from overriding the idle shutdown timer.

*For further information on this programmable option for the IST system please see the applicable table under the "Programmable Parameter" section.*

### Idle Shutdown Timer Reset

When specific vehicle operating conditions are met to "start the idle shutdown 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.
- Brake pedal movement.

- Clutch pedal movement (Manual transmissions).
- Shift selector movement (Automatic transmissions).
- Parking brake movement.

> *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.*

## Idle Shutdown Override

The manual override feature (if enabled) allows the driver to stop the timer (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.

The manual override functionality is only allowed if the "Idle Shutdown Timer - Mode" programmable parameter is set to "Mode 1" or "Mode 2". The "Disabled Option" for the "Idle Shutdown Timer Mode" programmable parameter allows the customer to permanently disable the idle shutdown feature, such that idle shutdown will never occur regardless of vehicle conditions.

> *The override feature can be selected to automatically prevent the engine from shutting down based on outside ambient temperature for driver comfort, if desired.*

## Feature Interaction

The IST feature interacts with the Cold Ambient Protection (CAP) feature. If the CAP feature is active and actively running, the IST feature will be deactivated.

## Operation – Certified Clean Idle Program

Heavy-duty trucks operating in the State of California (and others) are limited in the amount of time that they may sit at idle. Trucks that meet the specifications of the Certified Clean Idle program must display a compliance sticker to exceed these restrictions in some instances. This section explains the functionality of the Certified Clean Idle IST system under this program.



**Certified Clean Idle label**

### Idle Shutdown Timer

This section describes the idle shutdown functionality which is unique to Certified Clean Idle engine emissions.

- Customers cannot disable the idle shutdown feature.
- Tamper proofing is always enabled regardless of the idle shutdown timer mode selection.
- Idle shutdown will be disabled if the engine coolant operating temperature is below 60°F (non-programmable).
- (Customer adjustable parameter) IST timer can be adjusted from 2 to 15 minutes.

### 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 type must be above 60°F (16°C).
- The engine reported fuel usage (load) must be less than 30%.
- Customer Selectable Option: If the PTO option is enabled by the idle shutdown timer mode programmable parameter, the power take off (PTO) and the remote PTO must be inactive or in standby mode.

### 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.
- Brake pedal movement.
- Clutch pedal movement (manual transmissions).
- Shift selector movement (automatic transmissions).
- Parking brake movement.

*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.*

### Idle Shutdown Override

The manual override feature (if enabled) allows the driver to stop the timer (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.

> *The override feature can be selected to automatically prevent the engine from shutting down based on outside ambient temperature for driver comfort, if desired.*

### Idle Shutdown Warning

The idle shutdown warning occurs 30 seconds before the idle shutdown timer expires (i.e. 30 seconds before shutdown). The red idle shut down indicator (if equipped) will flash in the gauge cluster for 30 seconds and an audible alarm will sound during the warning. If a manual reset or override function (i.e. brake, clutch, etc.) is not activated, the engine will shut down.

> *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.*
>
> *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.*

### Engine Shutdown

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

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

### Tamper Proofing

Tamper Proofing is included with the IST feature. This feature monitors various inputs (i.e., driver pedals, vehicle speed, etc.) to prevent the driver from bypassing the idle shutdown timer.

> *For further information on this programmable option for the IST system please see the applicable table under the "Programmable Parameter" section.*

### Feature Interaction

The IST feature interacts with the Cold Ambient Protection (CAP) feature. If the IST feature is active and running, the CAP feature will be deactivated.

## Programmable Parameters

The following programmable parameters are available with the IST and Certified Clean Idle engine emissions. 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. 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.

### Standard IST Parameters

| Parameter Value | Description | Possible Values | Cust Pgrm | Recommended Settings |
|---|---|---|---|---|
| Engine Idle Shutdown CARB (7411) | This parameter is based on the emission calibration. This parameter may not be changed post-original equipment manufacturer (OEM) except through your authorized dealer. | **0:** CARB IST Disabled<br>**1:** CARB Enabled<br>**Note 1:** If set to 0, refer to this section.<br>**Note 2:** If set to 1, refer to the Certified Clean Idle section. | NO | 0: CARB IST Enabled Program Support |
| Idle Shutdown Timer Mode (7400) | This parameter determines the conditions under which the idle shutdown feature will be functional.<br>▪ **If set to 0** – The idle shutdown timer is disabled.<br>▪ **If set to 1** – The idle shutdown timer sequence will be prevented and the engine will not shut down while the Power Take Off (PTO) or any auxiliary engine speeds control is actively ramping the engine above normal engine idle speed.<br>▪ **If set to (2)** – The engine may shutdown if PTO engine speed control is engaged depending on the programmed value of the Idle Shutdown Timer - Maximum Engine Torque % parameter (7409). This allows the engine to stay running 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 (e.g., 10% engine torque) without actually engaging the PTO with the intent of bypassing the idle shutdown timer.<br>▪ **If set to 3** – The engine may shutdown if PTO engine speed control is engaged. Puts the feature in tamper proofing mode. Refer to the tamper proofing section for more information. | **0:** Idle Shutdown Timer – Disabled Option.<br>**1:** Idle Shutdown Timer – Light Load PTO Option<br>**2:** Idle Shutdown Timer – No Load Option<br>**3:** Idle Shutdown Timer – Heavy Load PTO with Tamper Proofing Option | YES | Customer Selected (at point of purchase) |
| Idle Shutdown Timer – No Park Brake Set (7401) | Sets the amount of engine idle time before the idle shutdown feature will initiate an engine shutdown while the parking break is not set.<br>**Note 1:** While the Electronic Service Tool is installed, this time may be extended regardless of the parameter setting. | 2 – 120 (minutes) | YES | 15 |

| Parameter Value | Description | Possible Values | Cust Pgrm | Recommended Settings |
|---|---|---|---|---|
| Idle Shutdown Timer with Park Brake Set (7404) | Sets the amount of engine idle time before the idle shutdown feature will initiate an engine shutdown while the parking brake is set.<br><br>**Note 1:** While the Electronic Tool Service is connected, this time may be extended regardless of the parameter setting. Move to interactions<br><br>**Note 2:** If this parameter is set to 5 minutes and certain vehicle conditions are satisfied, the engine will shut down in 5 minutes. remove | 2 to 255 (minutes) | YES | 5 |
| Ambient Temperature Override (7408) | This parameter prevents the idle shutdown feature from shutting down the engine based on outside air temperature for driver comfort.<br><br>Up to 3 temperature values: Intermediate, Maximum and Minimum can be selected to influence the activation of the Ambient Temperature Override feature. | 0: Disabled<br>1: Enabled | | Customer Selected (at point of purchase) |
| Maximum Ambient Temperature Override (7402) | This parameter is part of the Ambient Temperature Override feature.<br><br>The idle shutdown feature will not shut down the engine above this temperature.<br><br>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.<br><br>*Required Parameter Settings:*<br>• The Ambient Temperature Override (7408) feature must be enabled. | -40°F (-40°C) to 302°F (150°C) | YES | |
| Minimum Ambient Temperature Override (7403) | This parameter is part of the Ambient Temperature Override feature.<br><br>The Idle Shutdown feature will not shut down the engine below this temperature.<br><br>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.<br><br>*Required Parameter Settings:*<br>• The Ambient Temperature Override (7408) feature must be enabled. | -40°F (-40°C) to 302°F (150°C) | YES | 45°F (7.2°C) |

| Parameter Value | Description | Possible Values | Cust Pgrm | Recommended Settings |
|---|---|---|---|---|
| Intermediate Ambient Temperature Override (7405) | This parameter adds functionality to the Ambient Temperature Override feature by enabling or disabling the use of the Intermediate Ambient Temperature feature functionality.<br><br>*Required Parameter Settings:*<br>• Ambient Temperature Override (7408) must be enabled.<br>• Intermediate Ambient Temperature (7406) parameter must be set.<br>• Idle Shutdown Timer – Override Enable (7407) must be enabled.<br><br>**Note 1:** 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.<br><br>If the timer is overridden, the timer will remain stopped until the vehicle is moved (vehicle speed >0) or the ignition key is cycled.<br><br>**Note 2:** If set to (1) enabled and the ambient temperature is between the Intermediate and the Maximum temperatures, the driver may choose to reset the idle shutdown timer, but the timer will not be overridden. | **0:** Disabled<br>**1:** Enabled | YES | Customer Selected (at point of purchase) |
| Latched Override Intermediate Ambient Temperature (7406) | This parameter is part of the Intermediate Ambient Temperature Override feature.<br><br>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.<br><br>*Required Parameter Settings:*<br>• Ambient Temperature Override (7408)<br>• Intermediate Ambient Temperature Override (7405)<br>• Idle Shutdown Timer – Override Enable (7407)<br>Refer to Example Programmed Values for more information about this feature.<br><br>**Note 1**: This value must be set between the minimum and maximum Ambient Temperature Override parameter settings for the ambient temperature override functionality to operate correctly. | -40°F (-40°C) to 302°F (150°C) | YES | 70°F (21°C) |
| Idle Shutdown Timer – Override Enable (7407) | This parameter allows the driver to reset or stop the idle shutdown timer by pressing either the clutch or the brake pedal.<br><br>**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.<br><br>When set to (0) and the timer is reset, the timer will begin counting again starting at 0.<br><br>**If set to (1)** – The driver will be allowed to stop the idle shutdown timer by pressing the brake or clutch pedal.<br><br>When set to (1) and the timer is overridden, the timer will remain stopped until the vehicle is moved (vehicle speed >0) OR the ignition key is cycled.<br><br>*Required Parameter Settings:*<br>The Idle Shutdown Timer – System Mode (7400) must be set to Mode 1 or Mode 2. | **0:** Disabled<br>**1:** Enabled | YES | Customer Selected (at point of purchase) |

| Parameter Value | Description | Possible Values | Cust Pgrm | Recommended Settings |
|---|---|---|---|---|
| Maximum Engine Torque (%) for IST (7409) | The Idle Shutdown feature will be prevented from shutting down the engine if the engine load is above this value. This allows the engine to stay running if the operator desires to operate the PTO at or near idle speed. 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. *Required Parameter Settings:* <ul><li>The Idle Shutdown Timer – System Mode parameter must be set to Mode 2 or Mode 3.</li></ul> | 0 to 100% | YES | 30 |
| Maximum ECT for IST (7412) | The engine coolant temperature must be below this value for Idle Shutdown to occur. This allows the engine to stay running during extreme temperatures to protect the engine from damage. | -40°F (-40°C) to 302°F (150°C) | YES | 302°F (150°C) |
| Minimum Engine ECT for IST (7413) | The engine coolant temperature must be below this value for Idle Shutdown to occur. This allows the engine to stay running during extreme temperatures to protect the engine from damage. | -40°F (-40°C) to 302°F (150°C) | YES | 60°F (16°C) |

## Certified Clean Idle Parameters

| Parameter Value | Description | Possible Values | Cust Pgrm | Recommended Settings |
|---|---|---|---|---|
| Engine Idle Shutdown CARB (7411) | This parameter is based on the emission calibration. This parameter may not be changed post-original equipment manufacturer (OEM) except through your authorized dealer. This parameter enables the CARB mode for CARB specific market vehicles. Under CARB mode, the following threshold values change: <ul><li>The minimum engine coolant temperature required for IST activation is set to 60 °C (140°F) with CARB mode disabled and 16 °C (60°F) with CARB mode enabled</li><li>The maximum ambient temperature under which IST will function is set to Engine Idle Shutdown Maximum Intake Air Temperature (7402) with CARB mode disabled and 150° C (302°F) with CARB mode enabled</li><li>The minimum ambient temperature for IST activation is set to Engine Idle Shutdown Minimum Intake Air Temperature (7403) with CARB mode disabled and –40 ° C (-40°F) with CARB mode enabled</li></ul> The IST time is set to 15 minutes with parking brake disengaged and five minutes with parking brake engaged | **0:** CARB IST Disabled **1:** CARB Enabled **Note 1:** If set to 0, refer to the Standard IST section. **Note 2:** If set to 1, refer to this section. | NO | 1: CARB IST Enabled Program Support |

| Parameter Value | Description | Possible Values | Cust Pgrm | Recommended Settings |
|---|---|---|---|---|
| Idle Shutdown Timer Mode (7400) | This parameter determines the conditions under which the idle shutdown feature will be functional.<br><br>▪ **If set to 0** – The idle shutdown timer is disabled.<br>▪ **If set to 1** – The idle shutdown timer sequence will be prevented and the engine will not shut down while the Power Take Off (PTO) or any auxiliary engine speeds control is actively ramping the engine above normal engine idle speed.<br>▪ **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 % parameter (7409). This allows the engine to stay running 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 (e.g., 10% engine torque) without actually engaging the PTO with the intent of bypassing the idle shutdown timer.<br>▪ **If set to 3** – The engine may shutdown if PTO engine speed control is engaged. Puts the feature in tamper proofing mode. Refer to the tamper proofing section for more information. | **0:** Idle Shutdown Timer – Disabled Option.<br>**1:** Idle Shutdown Timer – Light Load PTO Option<br>**2:** Idle Shutdown Timer – No Load Option<br>**3:** Idle Shutdown Timer – Heavy Load PTO with Tamper Proofing Option | NO | Program Support |
| Idle Shutdown Timer – No Park Brake Set (7401) | Sets the amount of engine idle time before the idle shutdown feature will initiate an engine shutdown while the parking break is not set.<br>**Note 1:** While the Electronic Service Tool is installed, this time may be extended regardless of the parameter setting. | 2 – 15 (minutes) | YES | 15 |
| Idle Shutdown Timer with Park Brake Set (7404) | Sets the amount of engine idle time before the idle shutdown feature will initiate an engine shutdown while the parking brake is set.<br>**Note 1:** While the Electronic Tool Service is connected, this time may be extended regardless of the parameter setting. Move to interactions<br>**Note 2:** If this parameter is set to 5 minutes and certain vehicle conditions are satisfied, the engine will shut down in 5 minutes. remove | 2 to 5 (minutes) | YES | 5 |

## Parameter Setup

N/A

## Frequently Asked Questions

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

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

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

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

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

Yes, but only through your authorized dealer.

**My Idle Shut Down warning light and the audible alarm has been activated. Can I prevent the engine from shutting down?**

Yes, the driver can 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.

## Definitions/Acronyms

The following terms are referenced in this document:

| Acronym | Definition |
|---------|------------|
| CAP | Cold Ambient Protection |
| ECM | Engine Control Module |
| ECT | Engine Coolant Temperature |
| IST | Idle Shutdown Timer |
| OEM | Original Equipment Manufacturer |
| PTO | Power Take Off |