

MaxxForce[®] 11 and 13 (2007-2009)

Overview: *Idle Shutdown Timer*
(*Non-CARB Certified Engines*)

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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 local idle requirements. This feature will assist the owner or operator in setting a balance between fuel consumption and driver comfort.

Effective January 1, 2008, engines built for vehicles registered 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 these requirements; however, the vehicle owner or operator is ultimately responsible for idle restriction compliance. The regulations for each location are outside the scope of this document.

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 pre-programmed 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.

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

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.

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 Timer Programmable Options

Programmable options for the idle shutdown timer include:

- Idle shut down can be disabled.
- Idle shutdown timer can be adjusted from 2 to 120 minutes
- Tamper Proofing is a customer option selected in the Idle Shutdown Timer Mode programmable parameter.
- Throttle pedal (application %) can be programmed to reset the timer.
- Brake/Clutch inputs can be programmed to stop the shutdown timer until the vehicle is driven or the ignition key switch is cycled.
- Can be programmed to inhibit the idle shutdown based on engine coolant temperature.
- Can be programmed to inhibit the idle shutdown based on outside ambient air temperature for driver comfort.
- Can be programmed to inhibit the idle shutdown based on percent (%) engine load.

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.
- If the ambient temperature override programmable parameter is enabled, the outside ambient air temperature must be between the customer programmable limits of maximum ambient temperature and minimum ambient temperature.
- If the idle shutdown timer mode 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 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%.
- If the idle shutdown timer mode 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.

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

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.

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.

The manual override functionality is only allowed if the idle shutdown timer mode parameter is set to Mode 1 or Mode 2.

The disabled option for the idle shutdown timer mode parameter allows the customer to permanently disable the idle shutdown feature, such that the idle shutdown will never occur regardless of vehicle conditions.

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 engine 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. 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 Value	Description	Possible Values	Cust Pgrm	Recommended Settings
Idle Shutdown Type (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 1: CARB IST Enabled Note 1: If set to 0, refer to this IST document. Note 2: If set to 1, refer to the CARB IST document.	NO	0: CARB IST Disabled Program Support
Idle Shutdown Timer Mode (7400)	This parameter determines the conditions under which the idle shutdown feature will be functional. <ul style="list-style-type: none"> ▪ If set to 0 - The idle shutdown timer is disabled. ▪ 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 speeds control is actively ramping the engine above normal engine idle speed. ▪ 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 % for IST parameter (7409). 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 (e.g., 10% engine torque) without actually engaging the PTO with the intent of bypassing the idle shutdown timer. ▪ 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. 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	Program Support

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
Idle Shutdown Time - 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. Note 1: While the Electronic Service Tool is installed, this time may be extended regardless of the parameter setting.	2 - 120 (minutes)	YES	15
Idle Shutdown Time 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. Note 1: While the Electronic Tool Service is connected, this time may be extended regardless of the parameter setting. Move to interactions 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. Up to 3 temperature values: Intermediate, Maximum and Minimum can be selected to influence the activation of the Ambient Temperature Override feature.	0: Disabled 1: Enabled	YES	Customer Selected (at point of purchase)
Maximum Ambient Temperature Override (7402)	This parameter is part of the Ambient Temperature Override feature. The idle shutdown feature will not shut down the engine above this temperature. 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. Required Parameter Settings: <ul style="list-style-type: none"> The Ambient Temperature Override (7408) feature must be enabled. 	-40°F (-40°C) to 302°F (150°C)	YES	100°F (38°C)
Minimum Ambient Temperature Override (7403)	This parameter is part of the Ambient Temperature Override feature. The Idle Shutdown feature will not shut down the engine below this temperature. 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. Required Parameter Settings: <ul style="list-style-type: none"> 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)	<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>Required Parameter Settings:</p> <ul style="list-style-type: none"> Ambient Temperature Override (7408) must be enabled. Intermediate Ambient Temperature (7406) parameter must be set. Idle Shutdown Timer – Override Enable (7407) must be enabled. <p>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.</p> <p>If the timer is overridden, the timer will remain stopped until the vehicle is moved (vehicle speed >0) OR the ignition key is cycled.</p> <p>Note 2: 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: Disabled</p> <p>1: Enabled</p>	YES	Customer Selected (at point of purchase)
Intermediate Ambient Temperature (7406)	<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>Required Parameter Settings:</p> <ul style="list-style-type: none"> Ambient Temperature Override (7408) Intermediate Ambient Temperature Override (7405) Idle Shutdown Timer – Override Enable (7407) <p>Refer to Example Programmed Values for more information about this feature.</p> <p>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.</p>	-40°F (-40°C) to 302°F (150°C)	YES	70°F (21°C)
Idle Shutdown Timer – Override Enable (7407)	<p>This parameter allows the driver to reset or stop the idle shutdown timer by pressing either the clutch or the brake pedal.</p> <p>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. If set to (0) and the timer is reset, the timer will begin counting again starting at 0.</p> <p>If set to (1) – The driver will be allowed to stop the idle shutdown timer by pressing the brake or clutch pedal.</p> <p>If 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.</p> <p>Required Parameter Settings:</p> <p>The Idle Shutdown Timer Mode (7400) must be set to Mode 1 or Mode 2.</p>	<p>0: Disabled</p> <p>1: Enabled</p>	YES	Customer Selected (at point of purchase)

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
Maximum Engine Torque (%) for IST (7409)	<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>Required Parameter Settings:</p> <ul style="list-style-type: none"> The Idle Shutdown Timer Mode parameter must be set to Mode 2 OR Mode 3. 	0 to 100%	YES	30%
Maximum ECT for IST (7412)	<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>	-40°F (-40°C) to 302°F (150°C)	YES	302°F (150°C)
Minimum Engine ECT for IST (7413)	<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>	-40°F (-40°C) to 302°F (150°C)	YES	60°F (16°C)
Maximum Normalized Throttle Position (7414)	<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>Required Parameter Settings:</p> <ul style="list-style-type: none"> The Idle Shutdown Timer Mode (7400) parameter must be set to Mode 1 or Mode 2. 	0% to 1%	NO	Program Support

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 Timer - No Park Brake Set (7401)	Set the value to 15
Idle Shutdown Timer with 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°F (38°C)
Minimum Ambient Temperature Override (7403)	Set the value to 45°F (7.2°C)
Intermediate Ambient Temperature Override (7405)	Select Enabled
Intermediate Ambient Temperature (7406)	Set the value to 70°F
Idle Shutdown Timer - Override Enabled (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
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 (10°C) (between Minimum and Intermediate), the driver may choose to manually override the idle shutdown timer by transitioning the brake or clutch switch.

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.

However, if the ambient temperature is 75°F (23.8°C) (between Maximum and Intermediate) the driver may only reset the idle shutdown timer.

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.

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 Timer - No Park Brake Set (7401)	Set the value to 15
Idle Shutdown Timer with Park Brake Set (7404)	Set the value to 5
Ambient Temperature Override (7408)	Select Disabled
Idle Shutdown Timer - Override Enabled (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 (150°C)
Minimum Engine ECT for IST (7413)	Set the value to 60°F (15.5°C)

Frequently Asked Questions

How do I change a CARB certified engine to an updated Standard IST?

There is a request form located in the "Vehicle Information" section on ISIS which must be filled out and submitted by an authorized dealer. Only an authorized dealer can change the emissions setting. NOTE: The form is specific to the vehicle identification number (VIN) of the vehicle.

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.

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?

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.

Definitions/Acronyms

The following terms are referenced in this document:

Acronym	Definition
CAP	Cold Ambient Protection

CARB	California Air Resources Board
DPF	Diesel Particulate Filter
ECM	Engine Control Module
ECT	Engine Coolant Temperature
ESS	Engine Shutdown System
IST	Idle Shutdown Timer
OEM	Original Equipment Manufacturer
PTO	Power Take Off