

# MaxxForce<sup>®</sup> 11 and 13 (2007-2009)

Overview: *Engine Retarder*

# TABLE OF CONTENTS

**General Overview: Engine Retarder..... 1**  
**Description and Operation..... 1**  
    OPERATION.....1  
**Programmable Parameters..... 2**  
**Parameter Setup..... 3**  
**Frequently Asked Questions ..... 5**  
**Definitions/Acronyms ..... 5**

## General Overview: Engine Retarder

The Engine Retarder feature is used to supplement the function of the primary braking system. This feature helps to decelerate the vehicle and maintain a steady speed on declines.

This document will address the unique Engine Retarder functionality for the MaxxForce® 11 and 13.

## Description and Operation

The Engine Retarder feature is activated by pressing the service brake pedal or by releasing the accelerator pedal which is dependent upon customer programming.

The Engine Retarder feature consists of two operator control switches: Engine Retarder ON/OFF switch and the level selection switch.

The Engine Retarder ON/OFF switch allows the operator to enable or disable the engine retarder system.

This level selection switch allows the operator to select from three retarder level settings:

Level 1: Low

Level 2: Medium

Level 3: High

## Operation

When the enable switch is placed in the ON position, two visual indicators are displayed. The Engine Retarder ON/OFF switch LED and the yellow ENGINE BRAKE symbol in the gauge cluster turns ON.

The Engine Retarder feature will operate when the following interlock conditions are satisfied:

- Cab mounted Engine Retarder ON/OFF switch must be set to ON.
- Vehicle Retarder Control Mode (7000) must not be disabled.
- Clutch pedal must be released.
- Accelerator pedal must be fully released.
- There must be no active vehicle speed sensor (VSS) faults.
- Vehicle must be in gear.
- Vehicle speed must be greater than the value of the Engine Retarder Minimum Vehicle Speed parameter (7002).

## Service Brake Option

The Vehicle Retarder Control Mode (7000) parameter allows the customer to select one of two optional modes of service brake pedal activation:

- Mode (5): Enabled – Active While Service Brake is Applied
- Mode (8): Enabled – Remains On After Service Brake Released

### Cruise Control Option

The Cruise Control optional feature allows the Engine Retarder to activate automatically during cruise control operation to help maintain the desired set speed.

### Feature Interaction

The Engine Retarder feature interacts with the following engine features:

- Cruise Control – The Engine Retarder feature can be activated automatically during cruise control operation.
- Engine Retarder – The engine fan will be ON (100%) when the Engine Retarder is active if the Engine Retarder level selection switch is set to “High”.
- Vehicle Speed Governor – Behaves similarly to the interaction between Engine Retarder and Cruise Control.
- Power Take-Off (PTO) – The Engine Retarder feature will not function in PTO mode.
- Eaton Ultrashift® Transmission – Requires specific parameter set-up.

## Programmable Parameters

The following programmable parameters are available with the Engine Retarder feature. Full benefits of this feature will be realized when programming is done based on the vehicle conditions expected.

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
Vehicle Retarder Control Mode (7000)	<p>This parameter determines the conditions that the Engine Retarder feature will be functional.</p> <p>If set to (0) - The Engine Retarder functionality is disabled.</p> <p>If set to (4) - The Engine Retarder is active 2 seconds after the accelerator pedal is released (See Note 1).</p> <p>If set to (5) - The Engine Retarder is active after the service brake pedal has been pressed and remains pressed (See Note 2). Also, the accelerator pedal must not be pressed.</p> <p>If set to (8) - The Engine Retarder is active while the service brake is pressed. It remains active after the service brake has been released until the clutch or accelerator is pressed.</p>	<p><b>0:</b> Disable</p> <p><b>4:</b> Engine Brake Latched</p> <p><b>5:</b> Engine Brake Coast</p> <p><b>8:</b> Exhaust Brake – Service Brake Latched</p> <p><b>Note 1:</b> The time is programmable by parameter (7008).</p> <p><b>Note 2:</b> The time is programmable by parameter (7001).</p>	YES	Customer Chosen

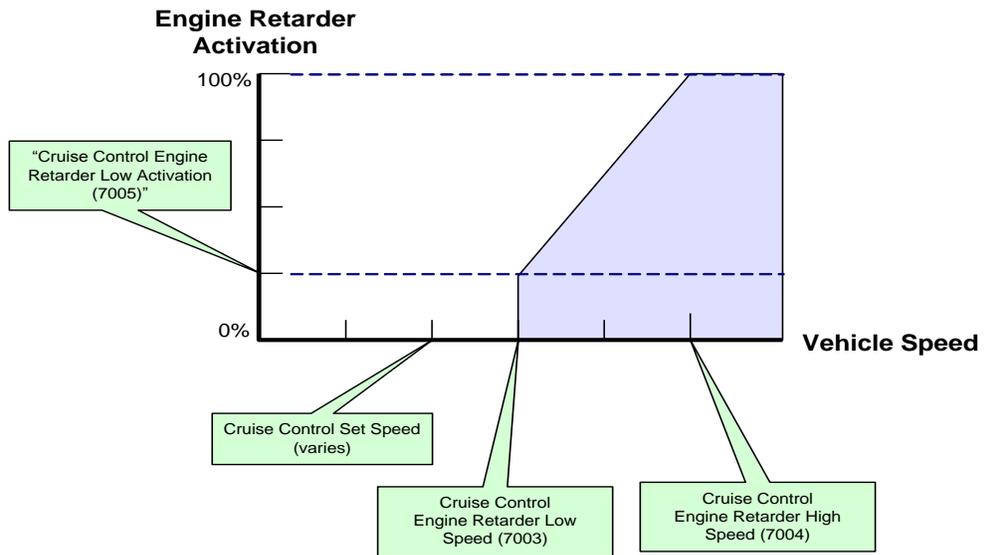
Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
Engine Retarder – Brake Pedal Delay (7001)	This parameter sets the delay time for the (optional) service brake pedal activated Engine Retarder. <b>Note:</b> The Vehicle Retarder Control Mode (7000) must be set to (5) Enabled – Active While Service Brake is Applied for this parameter to be recognized by this feature.	0 to 300 seconds	YES	0 seconds
Engine Retarder – Accelerator Pedal Delay (7008)	This parameter sets the delay time for (optional) accelerator pedal activated Engine Retarder. <b>Note:</b> The Vehicle Retarder Control Mode (7000) must be set to (4) Enabled – Normal Engine Retarder for this parameter to be recognized by this feature.	0 to 300 seconds	YES	2 seconds
Engine Retarder Minimum Vehicle Speed (7002)	This parameter sets the minimum vehicle speed limit) that the Engine Retarder can be activated. <b>Note:</b> If a minimum vehicle speed for Engine Retarder engagement is NOT desired, this parameter should be set to (0).	0 to 127.5 MPH	YES	10 MPH
Cruise Control Engine Retarder Enable (7006)	<b>(Optional Feature)</b> This parameter enables the cruise control related Engine Retarder functionality.	<b>0:</b> Disabled <b>1:</b> Enabled	YES	Customer Chosen
Cruise Control Engine Retarder Low Speed (7003)	<b>(Optional Feature)</b> This parameter sets the vehicle speed above the cruise set speed at which the Engine Retarder will activate at the programmed Cruise Control Engine Retarder Low Activation (7005) parameter setting.	0 to 127.5 MPH	YES	4 MPH <b>Note:</b> This should be set higher than the Cruise Over Speed (7605) parameter value.
Cruise Control Engine Retarder High Speed (7004)	<b>(Optional Feature)</b> This parameter sets the programmed speed (above the cruise set speed) at which the engine Retarder will activate at 100%.	0 to 127.5 MPH	YES	6 MPH
Cruise Control Engine Retarder Low Activation (7005)	<b>(Optional Feature)</b> This parameter sets the activation percent (%) that the engine Retarder feature starts at the Cruise Control Engine Retarder Low Speed (7003) parameter setting.	0 to 100%	YES	

## Parameter Setup

### Engine Retarder Example

The graph below illustrates the vehicle speed (MPH) and the corresponding Engine Retarder activation percentage % (in blue) where cruise control activated Engine Retarder is occurring.

## Cruise Control Engine Retarder Graph



The following programmable parameters, shown in the graph, are customer adjustable. Default settings are used in this example:

- Cruise Control Engine Retarder Low Activation (7005) (default = 10%)
- Cruise Control Engine Retarder Low Speed (7003) (default = 4 MPH)
- Cruise Control Engine Retarder High Speed (7004) (default = 6 MPH)

When the cruise set speed is 55 MPH and the vehicle speed reaches 59 MPH (set speed + 4 MPH), the Cruise Control Engine Retarder Low Speed (7003) parameter is satisfied and the feature will activate the Engine Retarder at 10% as programmed in the Cruise Control Engine Retarder Low Activation (7005) parameter. When the vehicle speed reaches 61 MPH (set speed + 6 MPH) the Cruise Control Engine Retarder High Speed (7004) parameter is satisfied and the feature will activate the Engine Retarder at 100%.

Engine Retarder activation percentage increases as vehicle speed increases above the cruise set speed only between the programmed parameter settings for Cruise Control Engine Retarder Low Speed (7003) and Cruise Control Engine Retarder High Speed (7004) reaching a maximum value of 100%.

### Engine Retarder Applications

This section describes one feature application and how the programmable parameters can be effectively configured for this 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 might be best configured to your vehicle.

Programmable Parameter Setup		
Parameter	Value	Units
Vehicle Retarder Control Mode (7000)	4	
Engine Retarder - Brake Pedal Delay (7001)	0	Sec
Engine Retarder - Accelerator Pedal Delay (7008)	2	Sec
Engine Retarder Minimum Vehicle Speed (7002)	10	MPH
Cruise Control Engine Retarder Low Speed (7003)	4	MPH
Cruise Control Engine Retarder High Speed (7004)	6	MPH
Cruise Control Engine Retarder Low Activation (7005)	10	%
Cruise Control Engine Retarder Enable (7006)	ON	On/Off

## Frequently Asked Questions

### Will the Engine Retarder activate with Cruise Control engaged?

Yes, if the Cruise Control Engine Retarder Enable (7006) programmable parameter is "Enabled" and the related parameters are set correctly, the Engine Retarder will activate automatically to help maintain the desired cruise control set speed.

### Can I install an Engine Retarder if my truck is not originally equipped with one?

Yes, but it may be expensive as some internal engine components may need to be swapped out.

### What would be appropriate programmable parameter settings for an over the road application of the Engine Retarder feature?

Set the following values: Vehicle Retarder Control Mode (7000) parameter to "Enabled" active while service brake is applied and the Cruise Control Engine Retarder Enable (7006) to "Enabled". Leave all other parameters at their default settings.

## Definitions/Acronyms

The following terms are referenced in this document:

Acronym	Definition
HP	Horsepower
PTO	Power Take-Off
RPM	Revolutions Per Minute
VSS	Vehicle Speed Sensor