

# MaxxForce<sup>®</sup> 11 and 13 (2010)

Overview: *Cruise Control*

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## General Overview: Cruise Control

The Cruise Control feature controls vehicle speed. Cruise Control offers driving comfort by providing a method for the operator to set and maintain a constant vehicle speed without using the accelerator pedal. This is especially useful when the operator is required to operate vehicle at a constant speed.

Adaptive Cruise Control is an available option that integrates within the normal Cruise Control system. Adaptive Cruise Control allows the cruise control to maintain a safe vehicle following distance on the highway by controlling engine speed, engine brake, and vehicle brakes. This allows the operator to utilize the Cruise Control system for longer periods of time achieving an increase in fuel economy.

This document will address the unique Cruise Control and Adaptive Cruise Control functionality for the MaxxForce® 11 and 13.

## Description and Operation

### Operation

The Cruise Control feature uses two switches to control the six main Cruise Control functions (Resume, Set, Accel, Coast, Bump Up/Down, and On/Off).

- The first switch is the ON/OFF switch that allows the operator to enable or disable the system. If equipped, the ON switch LED indicator turns ON and the text message “CRUISE” appears in the gauge cluster when the system is enabled.
- The second switch is the RESUME/ACCEL - SET/COAST switch that allows the operator to increase or decrease the vehicle speed set point. The text message “CRUISE SET” appears in the gauge cluster when the Cruise Control is active and set. Cruise control buttons functionally operate different depending on if the button is momentarily pressed or if the button is pressed and held.

*SET/COAST is labeled SET/CRUISE on some models; however, SET/COAST will be used in this document*

*These same controls (RESUME/ACCEL and SET/COAST) are also used for the engine speed control Power Take-off (PTO). Therefore, commands from the switches may become part of PTO if the vehicle is traveling at lower speeds and conditions are appropriate for PTO operation. See PTO I feature documents for further details.*

### To activate cruise control

- The cruise enable switch (CRUISE ON) must be set to ON.
- Vehicle speed should be above the Minimum Cruise Control Speed parameter setting and below the Maximum Cruise Control Speed parameter setting.

### To set cruise control

- With cruise enable switch set to ON, accelerate to the desired vehicle speed.

**NOTE-** Failure to operate the cruise enable switch properly or pressing the switch too long will prevent cruise ON operation.

- Momentarily press and release SET/COAST to select the current vehicle speed as the Cruise Control set speed.

### To increase or decrease cruising speed

- Press and hold RESUME/ACCEL to accelerate the vehicle and increase the current Cruise Control set speed.
- Press and hold SET/COAST to decelerate the vehicle and decrease the current cruise control set speed.
- Momentarily bump RESUME/ACCEL to incrementally increase the Cruise Control set speed.
- Momentarily bump SET/COAST to incrementally decrease the Cruise Control set speed.

### To deactivate cruise control

- Press the service brake or clutch pedal.
- Press CRUISE switch OFF.

### To resume cruise control

- Momentarily press and release RESUME/ACCEL to reactivate Cruise Control to the previous set speed.

**NOTE** - The cruise switch must be ON and cruise must have been previously set.

*The Cruise Control system should never be used on roads where you cannot drive safely at a steady speed, including city streets, winding roads and sharp curves, downhill grades, poor road conditions, such as gravel, dirt, ice or wet surfaces (wet surfaces may increase the risk of hydroplaning), or in fog, heavy rain or snowy conditions. These conditions may cause wheel slippage and loss of vehicle control, resulting in property damage, personal injury or death. Consult the Vehicle Operator's Manual for applicable details regarding use and operation.*

## Adaptive Cruise Control Functions (if equipped)

Adaptive Cruise Control (ACC) is available in various unique systems including Bendix Wingman Advanced, Bendix VORAD, and Wabco OnGuard. Each system provides alternative methods of ACC operation.

Adaptive Cruise Control operates with the vehicle cruise control to maintain a set speed; the system can also intervene as needed, to help maintain a set following

distance behind the forward vehicle. Using a radar sensor mounted to the front of the vehicle, the ACC reacts to vehicles moving in the same direction

■ *The system should not respond to side-to-side moving or oncoming traffic.*

**Bendix Wingman-** Bendix Wingman Advanced provides ACC operation through accelerator pedal position, engine brake, and vehicle brakes. Wingman Advanced can provide audible and visual alerts when road obstructions are detected. Wingman Advanced also can provide collision mitigation to alert and intervene when a possible collision is detected. Cruise control does not need to be On for Wingman Advanced collision mitigation to intervene.

**Bendix VORAD-** Bendix VORAD can provide ACC operation through SmartCruise. SmartCruise adjusts the vehicle cruise control system in order to match the speed of detected traffic ahead allowing the vehicle to maintain a safe following distance. VORAD can also provide a Collision Warning System. The Collision Warning System provides audible and visual alerts to warn the driver when following distances become unsafe. The Collision Warning System also provides side object detection to warn of unsafe lane changes. Cruise control does not need to be On for Bendix VORAD Collision Warning System to function.

**Wabco OnGuard-** OnGuard can provide ACC operation through accelerator pedal position, engine brake, and vehicle brakes. OnGuard can provide audible and visual alerts when an unsafe following distance or possible collision is detected. OnGuard also provides a Collision Warning System to alert the driver when a possible collision is detected. Cruise control does not need to be On for OnGuard Collision Warning System to intervene.

**NOTE-** For further information, refer to the appropriate Vorad, Wabco, or Wingman User Guide.

## **Adaptive Cruise Control Operation**

Adaptive Cruise Control is an integrated combination of three features:

- ACC with braking (engine or vehicle brakes)
- Alerts
- Collision mitigation technology

The ACC feature includes the following components:

- Driver Interface Unit (DIU)
- Radar sensor
- Automatic Traction Control (ATC) and Anti-lock Braking System (ABS)

## **Adaptive Cruise Control with Braking**

When cruise control is set and the system is maintaining a set following distance between the ACC equipped vehicle and the forward vehicle:

- If the forward vehicle slows down below cruise control set speed, the system should intervene, as necessary, in this order:
  1. Reduce the engine speed
  2. Apply the engine brake
  3. Apply the vehicle brakes
- If the forward vehicle slows below cruise control set speed, but then accelerates and the ACC system did not use the vehicle brakes, the system will automatically accelerate back to the original cruise control set speed, and again maintain a set following distance behind the forward vehicle.

*Adaptive Cruise Control operates along with normal cruise control; all typical features associated with cruise control will continue to operate properly. Parameters set for cruise control operation are fully supported by the ACC feature.*

## Alerts

Adaptive Cruise Control provides the operator with audible and visual alerts regardless of cruise control state.

## Collision Mitigation Technology

Adaptive Cruise Control collision mitigation technology is designed to react to the presence of moving forward vehicles whether or not cruise control is set. Collision mitigation interventions can be up to two-thirds of the vehicle's braking capacity. The system provides the driver with an alert before an intervention occurs.

*The operator must immediately act to potentially avoid or lesson the severity of a collision.*

## Feature Interaction

Cruise Control feature interacts with the following engine features:

- PTO- There is no direct interaction with PTO, but it is important to understand that Cruise Control and PTO use the same switches. Refer to the PTO feature document for more information.
- Cruise Control and Accelerator Pedals - The Maximum Cruise Control Speed and the Accelerator Vehicle Speed Limit parameters can be set independently to influence driver behavior.
- MaxxFace Engine Brake by Jacobs® - The engine brake functionality related to Cruise Control is described in the Engine Brake features document.
- Gear Down Protection (GDP) - Vehicle speed may be limited by GDP, dependent upon operating conditions. Refer to the GDP feature document for more information.

- ProShift feature- Cruise Control speed settings may be affected by the ProShift feature. Refer to the ProShift feature document for more information.

## Programmable Parameters

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
Cruise Control Mode (7600)	Select this parameter to switch ON or OFF the cruise control feature.	0: Disable 1: Enable	YES	Customer Chosen
Cruise Control Vehicle Speed Low Limit (7603)	This parameter sets the lowest vehicle speed at which the Cruise Control feature may remain active or be activated.	25 to 100 mph	YES	Customer Chosen
Cruise Control Vehicle Speed High Limit (7604)	This parameter sets the highest vehicle speed at which the Cruise Control feature may remain active or be activated.	45 to 127 mph	YES	Customer Chosen
Cruise Control Increment/Decrement (7612)	This parameter sets the value used to increment or decrement the Cruise Control Set Speed.	1 to 10 mph	YES	1 mph
Cruise Control Engine Retarder Enable (7006)	<b>(Optional Feature)</b> This parameter enables the cruise control related Engine Retarder functionality.	0: Disabled 1: 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 brake will activate at the programmed "Cruise Control Engine Retarder Low Activation (7005)" parameter setting.	1 to 20 MPH Default-5	YES	Customer chosen
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 brake will activate at 100%.	1 to 20 MPH Default-8	YES	Customer chosen
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	Customer chosen

## Parameter Setup

### Cruise Control Application

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 should 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 Cruise Control parameters might be best configured to the vehicle.

### Cruise Control Example

Set programmable parameters to the values shown in the table below:

Parameter Name	Action Required
Cruise Control Mode (7600)	Set to 1 (ON)
Cruise Control Vehicle Speed Low Limit (7603)	Set to 30 mph
Cruise Control Vehicle Speed High Limit (7604)	Set to 75 mph
Cruise Control Increment/Decrement (7612)	Set to 1 mph

### Cruise Control Engine Retarder Example

Set programmable parameters to the values shown in the table below:

Parameter Name	Action Required
Cruise Control Mode (7600)	Set to 1 (ON)
Cruise Control Vehicle Speed Low Limit (7603)	Set to 30 mph
Cruise Control Vehicle Speed High Limit (7604)	Set to 75 mph
Cruise Control Increment/Decrement (7612)	Set to 1 mph
Cruise Control Engine Retarder Enable (7006)	Set to 1 (ON)
Cruise Control Engine Retarder Low Speed (7003)	Set to 3 MPH
Cruise Control Engine Retarder High Speed (7004)	Set to 5 MPH
Cruise Control Engine Retarder Low Activation (7005)	Set to 50%
In this example the cruise control is set at 65 MPH. The Engine Brake will function at 50% application when the vehicle cruise speed has reached 68 MPH. When the vehicle cruise speed has reached 70 MPH, the Engine Brake will then operate at 100% application.	

## Frequently Asked Questions

### Can the MaxxFace® Engine Brake by Jacobs® feature be used to help Cruise Control maintain the vehicle speed?

Yes, the Cruise Control automatic engine brake feature engages the MaxxFace® Engine Brake by Jacobs® at a programmable speed above Cruise Control maximum vehicle speed. This allows for better speed control and can reduce vehicle brake system wear. The engine brake On/Off switch and engine brake setting switch will not impact cruise control functions when activated. Refer to the MaxxFace® Engine Brake by Jacobs® feature document for more information.

## Definitions/Acronyms

The following terms are referenced in this document:



Acronym	Definition
<b>ABS</b>	Anti-lock Braking System
<b>ACC</b>	Adaptive Cruise Control
<b>ATC</b>	Automatic Traction Control
<b>DIU</b>	Driver Interface Unit
<b>APS</b>	Accelerator Pedal Position Sensor