International® A26 (2017)

Overview: *Engine Speed Control - In Cab*

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General Overview: In-Cab Engine Speed Control

The In-Cab Auxiliary Engine Speed Control (AESC) feature allows the operator to set and maintain a constant engine speed without using the accelerator pedal.

This feature controls the engine speed with variable engine speed control or up to 6 preset speeds through the steering wheel cruise switches, inside the cab, to power auxiliary devices.

The document will address unique in-cab engine speed control functionality for the A26.

Description and Operation

> *NOTE: Refer to the vehicle operation and maintenance manual, as well as the A26 engine operation and maintenance manual, for additional information on operation and indications.*

The In Cab AESC provides the operator engine speed control to any installed auxiliary devices from inside the cab. This engine speed control is accomplished by utilizing the steering wheel cruise control switches.

Operation

The operational control of the in-cab engine speed control feature consists of three cruise control switches located on the steering wheel:

- **"Cruise On/Cruise Off"** switch allows the driver to enable or disable the in cab engine speed control preset functionality. The Cruise On switch also has an indicator light.
- **"Resume/Accel"** switch allows the operator to ramp up the engine or cycle through the presets.
- **"Set/Coast"** switch allows the operator to ramp down the engine or cycle through the presets.

The in-cab engine speed control will only operate if the cruise enable switch is ON, the vehicle speed is less than a programmable limit, the cruise control switches are not faulted, and other "interlock" conditions are met (i.e., vehicle speed, engine speed, and engine load are less than programmed values, etc.) are met.

Stationary Variable

Stationary Variable AESC

Stationary variable engine speed control allows the operator to select any engine speed within the AESC boundaries. This is done by increasing or decreasing the engine speed to the desired set point by using the set/coast switch and the resume/accel switch. The vehicle must not be moving to activate AESC when programmed to Stationary Variable Mode.

Stationary Variable AESC Setup

In addition to the main setup parameters (i.e. AESC Mode Selection, etc.) there are 3 specific stationary variable speed related AESC parameters; AESC Engine Speed Throttle Up Ramp Rate, AESC Engine Speed Throttle Down Ramp Rate, and AESC Bump Up/Down Step.

Stationary Variable Speed AESC Driver Interaction

In addition to the normal interlock conditions for all AESC operation, perform the following steps for stationary variable AESC operation:

1. Press the cruise on switch.

2. Press the set/coast switch to activate AESC. The current engine speed will be the AESC engine speed set point.

3. Press and hold the resume/accel switch to increase the engine speed set point. The engine speed will increase by the programmed AESC Engine Speed Throttle Up Ramp Rate. When the switch is released the current engine speed will become the set speed.

4. Press and hold the set/coast switch to decrease the AESC speed set point. The engine speed will decrease by the programmed AESC Engine Speed Throttle Down Ramp Rate. When the switch is released the current engine speed will become the set speed.

5. Press and release the resume/accel switch or the set/coast switch to increase or decrease the AESC engine speed set point by the programmed AESC Bump Up/Down Step.

6. Using the accelerator to increase engine speed and momentarily pressing the set/coast switch will set the current engine speed as the AESC engine speed set point.

7. If the AESC operation is interrupted (i.e. brake or clutch pressed, or accelerator pedal, a press of the resume/accel switch will return the engine to the previous AESC engine speed set point.

    The clutch, brake, or accelerator interruption described above is dependent on the programming of the AESC Disable with APS, AESC In-Cab Operator Interface, AESC Disable with Clutch, and the AESC Disable with Service Brake parameters.

Stationary Preset

Stationary preset engine speed control allows the operator to select up to 6 preset engine speeds while the vehicle is stationary. The preset speeds are selected using the set/coast switch or the resume/accel switch as described in the Stationary Preset Driver Interaction section.

Stationary Preset Setup

There are up to 6 specific preset engine speed parameters that can be programmed. The preset engine speed parameters are typically programmed in an increasing preset order.

Stationary Preset Driver Interaction

In addition to the normal interlock conditions for all AESC operation, perform the following steps for stationary preset AESC operation:

1. Press the cruise on switch.

2. Press either the set/coast switch or the resume/accel switch to activate AESC.

3. Pressing the resume/accel switch will select the next available AESC Preset Speed.

4. Pressing the set/coast switch will select the previous available AESC Preset Speed.

5. Interrupting AESC operation (i.e. clutch, brake, or accelerator) will return the engine to idle (AESC standby). If the set/coast switch is pressed, then the engine will go to preset 1. If the resume/accel switch is pressed, then the engine will go to preset 2.

   > *The clutch, brake, or accelerator interruption described above is dependent on the programming of the AESC Disable with APS, AESC In-Cab Operator Interface, AESC Disable with Clutch, and the AESC Disable with Service Brake parameters.*

Refer to the Stationary Preset Diagram for a general visual representation of how the operator interacts with the switches during stationary preset AESC operation.

Stationary Preset Notes

- Presets speeds that will not be used can be set to 0 rpm.

- If one of the AESC Preset Engine Speeds is programmed to 0 rpm, that setting will be skipped for the next available preset.

- If all ~~of the~~ remaining preset speeds are programmed to 0 rpm, the last preset speed will be maintained.

- The engine will accelerate the engine speed, ~~at the programmed AESC Engine Speed Throttle Up Ramp Rate parameter setting~~ when a preset speed is selected that is greater than the current engine speed.

- The engine will decelerate the engine speed, ~~at the programmed AESC Engine Speed Throttle Down Ramp Rate parameter setting~~ when a preset speed is selected that is less than the current engine speed.

In-Cab Engine Speed Control

- Pressing and holding either the set/coast switch or the resume/accel switch will not result in cycling through the preset speeds. **Stationary and Mobile Variable Preset Diagram**
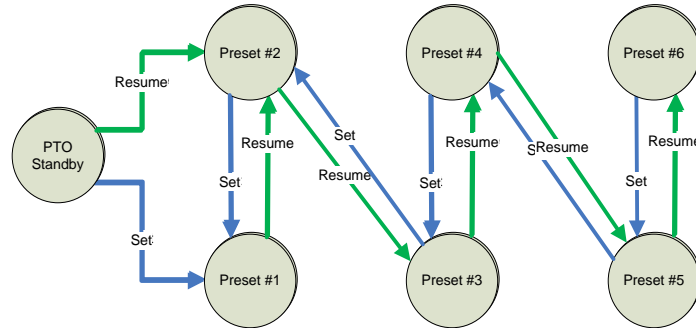
Mobile Variable

Mobile Variable Speed AESC Control

Mobile variable speed control permits a desired variable engine speed to be selected. The vehicle can be moving or stationary during AESC operation.

Mobile Variable Speed AESC Setup

There are two specific mobile variable speed related AESC parameters; AESC Vehicle Speed Kick Out, and AESC Vehicle Speed Limit.

Mobile Variable Speed AESC Driver Interaction

Functionality and setup is identical to Stationary Variable Speed AESC with the exception that a stationary vehicle is no longer required.

Feature Interaction

The In-Cab Engine Speed Control feature interacts with these engine features:

- Cruise Control. There is no interaction with cruise control; however, AESC uses the same switches (resume/accel & set/coast) as the cruise control feature.
- Engine Cooling Fan. It may not be desirable to have the fan cycling on & off during AESC operation therefore the fan can be programmed to keep it engaged at all times when AESC is active.
- Idle Shutdown Timer (IST)
- Road Speed Limiting (RSL)

Programmable Parameters

The following programmable parameters are required for auxiliary engine speed control. These parameters should be programmed to the engine speed control operation which will best suit 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 authorization.

There are multiple available AESC configurations. Please see the Parameter Setup section for a few examples and specific setup instructions.

Base Parameters for AESC Configurations.

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
Aux Throttle Control - Mode (75001)	This parameter determines the conditions that the Engine Speed Control (AESC) feature will be functional. Set this parameter to enable AESC operation and to choose which inputs are used for control. • **If set to (0)** – The AESC functionality is disabled. • **If set to (2)** – Only the in-cab inputs will be able to control AESC. • **If set to (3)** – Both remote and in-cab inputs will be able to control AESC **(See Note 1 & 2)**. • **If set to (1)** – Only the remote AESC inputs will be able to control AESC **(See Note 2)**. **Note 1:** The last input received will take priority when Mode 3 is selected. **Note 2:** Mode 1 and the remote portion of Mode 3 are discussed in the Remote Engine Speed Control document.	**0**: Disable **1**: Remote Operation Only **2**: In Cab Operation Only **3**: Remote and In Cab Operation	YES	Customer Chosen
Aux Throttle Control – In Cab AESC Mode (75021)	Set this parameter after selecting In-Cab Or Remote and In-Cab Operation to determine which AESC mode is active. • **If set to (0)** – The switches will not be used. Refer to the Remote Engine Speed Control document. • **If set to (1)** – The switches will be used to select up to 6 preset engine speeds. Refer to the Stationary Preset section for more information. • **If set to (2)** – The switches will be used to adjust the engine speed variably. Refer to the Stationary Variable section for more information. • **If set to (3)** – The switches will be used to adjust the engine speed to a desired set point to allow for vehicle movement. Refer to the Mobile Variable section for more information.	**0**: None **1**: Stationary Preset **2**: Stationary Variable 3: Mobile Variable.	YES	Customer Chosen

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
Aux Throttle Control - Preset Minimum Engine Speed Activation (CRUISE ON) (75223)	This parameter is used to select a specific engine speed that the engine will ramp to immediately after CRUISE ON is pressed. **Note 1:** This feature is selected by programming a value above normal engine idle speed. If selected, this parameter must be set properly to ensure optimal equipment performance. **Note 2:** To disable this functionality, set this parameter to normal low engine idle speed.	Low Idle – High Idle (rpm)	YES	Customer Chosen **(See Note 1 & 2)**
Aux Throttle Control - Maximum Engine Speed (75082)	The maximum engine speed that can be reached using any AESC controls. **Note 1:** This parameter must be set properly to protect AESC related equipment.	Low Idle – High Idle (rpm)	YES	Customer Chosen **(See Note 1)**
Aux Throttle Control - Engine Speed Limit with VSS Fault (75183)	This parameter sets the maximum engine speed allowed when an active vehicle speed sensor (VSS) fault exists and AESC engine speed control is active. Above this engine speed, AESC cannot be activated, however; if this engine speed is exceeded while in AESC then AESC will be deactivated. This parameter might be useful in preventing the operator from over speeding or over loading the equipment.	Low Idle – High Idle (rpm)	YES	Customer Chosen
Aux Throttle Control - Disable with APS (75132)	Set this parameter to determine how the accelerator pedal interacts with active AESC operation. • **If set to (0)** – Pressing the accelerator pedal will not change the engine speed. • **If set to (1)** – Choose this setting to allow the operator to increase the engine speed up to the (7520) parameter setting using the accelerator pedal without disengaging the AESC function. • **If set to (2)** – Pressing the accelerator pedal will deactivate AESC operation **(See Note 2)**. **Note 1:** If setting (1) is chosen, the Aux Throttle Control - APS Maximum Engine Speed Override Limit. (7520) parameter must also be programmed. **Note 2:** The Aux Throttle Control – In Cab Operator Interface (7503) parameter must be set to (0) for this parameter setting to be recognized by the feature.	0: APS Is Ignored **1:** APS Overrides ATC Set Speed **2:** APS Disables ATC	YES	Customer Chosen **(See Note 1)**
Aux Throttle Control – In Cab Operator Interface (75031)	Select this parameter when accelerator, brake or clutch is desired to be ignored during engine speed control operation. • **If set to (0)** – The accelerator, brake, and clutch are inputs used for AESC operation. • **If set to (1)** – The accelerator, brake, and clutch will be ignored during AESC operation. **Note:** Use parameters (7510), (7511) and (7513) to provide the specific input options.	**0:** Off **1:** On	YES	Customer Chosen

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
Aux Throttle Control - Disable with Clutch (75102)	Choosing this feature will allow the operator to deactivate AESC operation when the clutch pedal is pressed **(See Note 1)**. Otherwise the clutch pedal is ignored and will not deactivate the AESC. **Note 1:** The Aux Throttle Control – In Cab Operator Interface (7503) parameter must be set to (0) for this parameter to be recognized by the feature.	**0:** Clutch is Ignored **1:** Clutch Disables AESC	YES	Customer Chosen
Aux Throttle Control - Disable with Service Brake (75110)	Choosing this feature will allow the operator to deactivate AESC operation when the brake pedal is pressed. Otherwise the brake pedal is ignored and will not deactivate the AESC. **Note 1:** The Aux Throttle Control – In Cab Operator Interface (7503) parameter must be set to (0) for this parameter to be recognized by the feature.	**0:** Service Brake is Ignored **1:** Service Brake Disables AESC	YES	Customer Chosen
Aux Throttle Control - Speed Controlled to Engine Load (75301)	This parameter selects whether the AESC engine speed control is limited or deactivated if an engine load threshold is reached. • **If set to (0)** – Engine speed control deactivated if the engine speed reaches the Aux Throttle Control - Maximum Engine Load (7519) parameter setting. • **If set to (1)** – Engine speed limited if the engine speed reaches the Aux Throttle Control - Maximum Engine Load (7519) parameter setting.	**0:** Off **1:** On	YES	A setting of 1 is recommended.
Aux Throttle Control - Maximum Engine Load (75193)	The engine speed control will be limited or deactivated if this parameter value is reached. Note 1: The functionality of this parameter is dependent on the Aux Throttle Control - Engine Load Limit Select (7530) parameter setting.	Set between 30 and 100% based on the recommendations for the AESC equipment.	YES	A setting of 100% is recommended.
Aux Throttle Control - Maximum Engine Load Time (75272)	This parameter sets the time that the AESC will remain active while the engine load is at a maximum threshold.	Set between 0 and 32 seconds.	YES	A setting of 5 seconds is recommended.
Aux Throttle Control - Engine Speed Throttle Up Ramp Rate (75072)	This parameter sets the speed at which the engine will attempt to increase the engine speed. **Note 1:** The engine only attempts to increase the engine speed at this rate because actual engine changes are influenced by other factors such as engine load and available engine power. **Note 2:** This parameter should be set to provide a smooth transition to the desired engine speed to accommodate applicable AESC equipment.	1 – 1500 RPM	YES	100 rpm/sec (default)

Parameter Value	Description	Possible Values	Cust Pgrm	Recommended Settings
Aux Throttle Control - Engine Speed Throttle Down Ramp Rate (75243)	This parameter sets the speed at which the engine will attempt to decrease the engine speed. **Note 1:** The engine only attempts to decrease the engine speed at this rate because actual engine changes are influenced by other factors such as engine load and available engine power. **Note 2:** This parameter should be set to provide a smooth transition to the desired engine speed to accommodate applicable AESC equipment.	1 – 1500 RPM	YES	100 rpm/sec (default)
Auxiliary Engine Speed Control - Maximum Vehicle Speed (75010)	This parameter is the maximum vehicle speed that the AESC will be allowed to operate. **Note 1:** Set this parameter to the maximum vehicle speed that is desired in AESC mode.	0 – 20 mph	YES	Customer Chosen **(See Note 1)**
Auxiliary Engine Speed Control - Vehicle Speed Limit (75213)	This parameter is the vehicle speed limit that the AESC will be allowed to operate. **Note 1:** Set this parameter to the maximum vehicle speed that is desired in AESC mode.	0 – 20 mph	YES	Customer Chosen **(See Note 1)**
Cruise Control/AESC On/Off Switch Input Selection (99262)	This parameter selects the source for the Cruise Control/AESC On/Off Switch. ▪ **If set to (0) –** The Cruise Control/AESC On/Off Switch signal is sensed from a hardwired input. ▪ **If set to (1) –** The Cruise Control/AESC On/Off Switch is sensed on the J1939 data link.	**0:** Hardwired Input **1:** Can	YES	Customer Chosen
Cruise Control **Set/Coast** Switch Input Selection (99272)	This parameter selects the source for the Cruise Control Resume/Accelerate Switch. ▪ **If set to (0) –** The Cruise Control Resume/Accelerate Switch signal is sensed from a hardwired input. ▪ **If set to (1) –** The Cruise Control Resume/Accelerate Switch is sensed on the J1939 data link. ▪ **If set to (2) –** The Cruise Control Resume/Accelerate Switch is sensed on both the hardwired input and the J1939 data link	**0:** Hardwired Input **1:** Can **2:** Both	YES	**2:** Both
Cruise Control Resume/Accelerate Switch Input Selection (99282)	This parameter selects the source for the Cruise Control Resume/Accelerate Switch. ▪ **If set to (0) –** The Cruise Control Resume/Accelerate Switch signal is sensed from a hardwired input. ▪ **If set to (1) –** The Cruise Control Resume/Accelerate Switch is sensed on the J1939 data link. ▪ **If set to (2) –** The Cruise Control Resume/Accelerate Switch is sensed on both the hardwired input and the J1939 data link.	**0:** Hardwired Input **1:** Can **2:** Both	YES	**2:** Both

Parameters for Variable Engine Speed AESC Configurations.

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Aux Throttle Control - Bump Up/Down Step (75253)	This parameter sets the following: The amount of increase in engine speed after RESUME/ACCEL is momentarily pressed. The amount of decrease in engine speed after SET/COAST is momentarily pressed.	0 – 500 RPM	YES	25 rpm

Parameters for Preset Engine Speed AESC Configurations.

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Aux Throttle Control - Preset Engine Speed Select (75281)	This parameter sets the first selected preset level (1, 2, 3, 4, 5, or 6) when remote Preset AESC is activated. **Note 1:** This parameter can only have six valid preset values as 1, 2, 3, 4, 5 or 6.	**0:** Off (0) **1:** Preset Speed 1 **2:** Preset Speed 2 **3:** Preset Speed 3 **4:** Preset Speed 4 **5:** Preset Speed 5 **6:** Preset Speed 6	YES	Customer Chosen
Aux Throttle Control - Engine Speed 1 (SET/ COAST) (75052)	This parameter sets the running engine speed set point that will be maintained when the first AESC preset speed is selected OR when SET/COAST is pressed. **Note 1:** Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be between the following settings: • Aux Throttle Control - Preset Engine Speed Activation (CRUISE ON) (75223) • Aux Throttle Control - Maximum Engine Speed (75082)	YES	Customer Chosen **(See Note 1)**
Aux Throttle Control - Engine Speed 2 (RESUME/ ACCEL) (75062)	This parameter sets the running engine speed set point that will be maintained when the first AESC preset speed is selected OR when RESUME/ACCEL is pressed. **Note 1:** Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be between the following settings: • Aux Throttle Control - Preset Engine Speed Activation (CRUISE ON) (75223) • Aux Throttle Control - Maximum Engine Speed (75082)	YES	Customer Chosen **(See Note 1)**

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
Aux Throttle Control - Preset Engine Speed 3 (75143)	This parameter sets the running engine speed set point that will be maintained when the third AESC preset speed is selected. **Note 1:** Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be between the following settings: • Aux Throttle Control - Preset Engine Speed Activation (CRUISE ON) (75223) • Aux Throttle Control - Maximum Engine Speed (75082)	YES	Customer Chosen **(See Note 1)**
Aux Throttle Control - Preset Engine Speed 4 (75153)	This parameter sets the running engine speed set point that will be maintained when the third AESC preset speed is selected. **Note 1:** Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be between the following settings: • Aux Throttle Control - Preset Engine Speed Activation (CRUISE ON) (75223) • Aux Throttle Control - Maximum Engine Speed (75082)	YES	Customer Chosen **(See Note 1)**
Aux Throttle Control - Preset Engine Speed 5 (75163)	This parameter sets the running engine speed set point that will be maintained when the third AESC preset speed is selected. **Note 1:** Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be between the following settings: • Aux Throttle Control - Preset Engine Speed Activation (CRUISE ON) (75223) • Aux Throttle Control Maximum Engine Speed (75082)	YES	Customer Chosen **(See Note 1)**
Aux Throttle Control - Preset Engine Speed 6 (75173)	This parameter sets the running engine speed set point that will be maintained when the third AESC preset speed is selected. **Note 1:** Presets speeds that will not be used can be set to 0 rpm. Refer to the Stationary Preset section for more information.	Range must be between the following settings: • Aux Throttle Control - Preset Engine Speed Activation (CRUISE ON) (75223) • Aux Throttle Control -	YES	Customer Chosen **(See Note 1)**

Parameter Value	Description	Possible Values	Cust Pgrm?	Recommended Settings
		Maximum Engine Speed (75082)		

Parameter Setup

Possible In-Cab AESC Applications

The In-Cab AESC feature is application specific. This section briefly describes one example of in-cab AESC configuration and operation. This configuration will likely need to be modified to meet the needs of the actual application that the owner/operator requires.

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

EXAMPLE A – Typical In-Cab AESC Scenario

In this example, the operator requires two preset engine speeds while the vehicle is stationary. The presets are activated via the cruise control switches.

Adjust parameters as follows:

Parameter Name	Action Required
Aux Throttle Control - Mode (75001)	Select 2: Enabled – In Cab Operation Only
Aux Throttle Control – In Cab AESC Mode (75021)	Select 1: Stationary Preset
Aux Throttle Control - Preset Engine Speed 1 (Set/Coast) (75052)	Set this to 900 rpm
Aux Throttle Control - Preset Engine Speed 2 (Resume/Accel) (75062)	Set this to 1100 rpm
Cruise Control **Set/Coast** Switch Input Selection (99272)	Set this to Both
Cruise Control Resume/Accelerate Switch Input Selection (99282)	Set this to Both

Operation:

1. Activate the AESC by pressing the cruise on switch on the steering wheel.

2. Activate the 1st preset engine speed (900 rpm) by pressing the set/coast switch.

3. Activate the 2nd preset engine speed (1100 rpm) by pressing the resume/accel switch.

EXAMPLE B – In-Cab AESC with Variable Speed Control Scenario

In this example, the operator requires the engine speed to be able to ramp up and down within a range of engine speeds while the vehicle is stationary. The engine speed is controlled through the cruise control switches.

Adjust parameters as follows:

Parameter Name	Action Required
Aux Throttle Control - Mode (75001)	Select 2: Enabled – In Cab Operation Only
Aux Throttle Control - In Cab AESC Mode (75021)	Select 1: Stationary Preset
Cruise Control Set/Coast Switch Input Selection (99272)	Set this to Both
Cruise Control Resume/Accelerate Switch Input Selection (99282)	Set this to Both

Operation:

1. Activate the AESC by pressing the cruise on switch on the steering wheel.

2. Increase the current engine speed by pressing and holding the resume/accel switch. Release the switch when the desired engine speed is reached.

3. Decrease the current engine speed by pressing and holding the set/coast switch. Release the switch when the desired engine speed is reached.

Frequently Asked Questions

How many presets can I configure in the in-cab AESC feature?

Six preset engine speeds can be programmed if Stationary Preset mode is selected. Refer to the stationary preset section for more information.

My application requires a ramp in rather than step increments for engine speed control. Can I do this with in cab AESC?

Yes, refer to Example B in the parameter setup section for details.

My application uses external AESC controls (located outside the cab). How do I set these up?

An example of this application is described in the remote engine speed control document.

Definitions/Acronyms

The following terms are referenced in this document:

Acronym	Definition
AESC	Auxiliary Engine Speed Control
APS	Accelerator Pedal Sensor
ATC	Aux Throttle Control
ECM	Engine Control Module
IST	Idle Shutdown Timer
PTO	Power Take Off
RSL	Road Speed Limiting
VSS	Vehicle Speed Sensor