

International[®] A26 (2017)

Overview: *A26 Engine Brake by
Jacobs[®]*

TABLE OF CONTENTS

- General Overview: A26 Engine Brake by Jacobs® 1
- Description and Operation..... 1
 - OPERATION.....1
- Parameter Setup..... 3
- Programmable Parameters..... 5
- Frequently Asked Questions 7
- Definitions/Acronyms 7

General Overview: A26 Engine Brake by Jacobs®

The A26 Engine Brake 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 addresses unique Engine Brake functionality for vehicles with A26 engines.

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 A26 Engine Brake feature consists of two operator-controlled switches:

The ON/OFF switch allows the operator to enable or disable the system.

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

- Level 1: Low (33%)
- Level 2: Medium (66% or variable if the Programmable Parameter is selected to Smart Level)
- Level 3: High (100%)

Operation

When the enable switch is placed in the ON position, two visual indicators are displayed. The A26 Engine Brake ON/OFF switch LED and the yellow ENGINE BRAKE symbol in the gauge cluster turn ON.

The A26 Engine Brake feature will operate when the following interlock conditions are true:

- Cab mounted A26 Engine Brake ON/OFF switch ON.
- Vehicle Brake Control Mode (7000) not disabled.
- Clutch pedal released.
- Accelerator pedal fully released.
- No active Vehicle Speed Sensor (VSS) faults.
- No active truck or trailer Anti-lock Brake System (ABS) faults.
- Vehicle in gear.
- Vehicle speed greater than Engine Retarder Minimum Vehicle Speed parameter (7002).
- Oil temperature in calibrated operating range.

Vehicle Retarder Activation Modes:

The Vehicle Retarder activation modes (7000) parameter allows the customer to select one of five optional activation modes:

- Engine Brake Mode (0): Off/disabled
- Engine Brake Mode (1): Service Brake Latched
- Engine Brake Mode (2): Service Brake Coast
- Engine Brake Mode (3): Latched
- Engine Brake Mode (4): Smart Latched (Eaton AMT only)

Road Speed Limit (Option) (Max VS Limit)

The optional Road Speed Limit (RSL) feature allows the A26 Engine Brake to activate automatically during Accelerator Position Sensor (APS) operation to help maintain desired set speed.

Cruise Control (Option)

The optional Cruise Control feature allows the A26 Engine Brake by Jacobs® to activate automatically during cruise control operation to help maintain desired set speed.

Feature Interaction

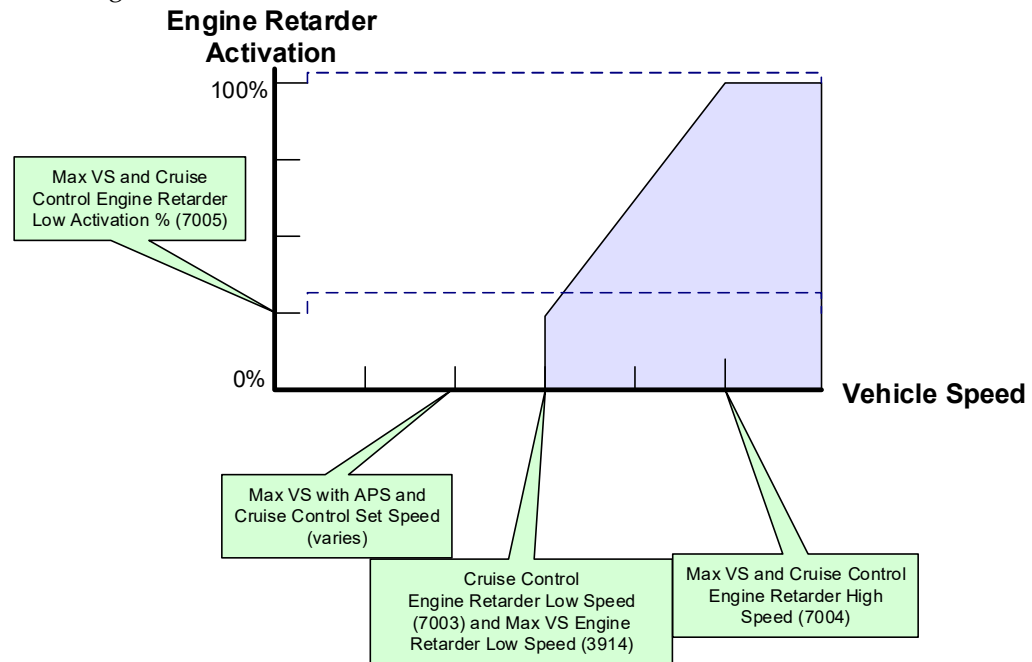
The A26 Engine Brake by Jacobs® feature interacts with the following engine features:

- Cruise Control - The A26 Engine Brake feature can be activated automatically during cruise control operation.
- Vehicle Speed Governor - Behaves similarly to the interaction between A26 Engine Brake and Cruise Control.
- Power Take-Off (AESC) - The A26 Engine Brake feature will not function in AESC mode.
- Eaton Ultrashift® Transmission - Requires specific parameter set-up.

Parameter Setup

A26 Engine Brake by Jacobs® Example

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



Cruise Control Engine Brake, Engine Retarder vs. Vehicle Speed

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

- Max VS and Cruise Control Engine Retarder Low Activation % (7005) (default = 35%)
- Cruise Control Engine Retarder Low Speed (7003) (default = 4 mph)
- Max VS Engine Retarder Low Speed (3914) (default = 4.97 mph)
- Max VS and Cruise Control Engine Retarder High Speed (7004) (default = 6 mph)

Cruise Control Setup

When the cruise set speed is 55 mph and 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 A26 Engine Brake by Jacobs® at 35% as programmed in the Max VS and Cruise Control Engine Retarder Low Activation % (7005) parameter. When vehicle speed reaches 61 mph (set speed + 6 mph) Max VS and Cruise Control Engine Retarder High Speed (7004) parameter is satisfied and the feature will activate the Engine Brake at 100%.

Maximum Vehicle Speed (Max VS) Setup

When Max VS (79002) is set to 55 mph and vehicle speed reaches 59 mph (set speed + 4 mph), Max VS Engine Retarder Low Speed (3914) parameter is satisfied and the feature will activate the A26 Engine Brake by Jacobs® at 35% as programmed in the Max VS and Cruise Control Engine Retarder Low Activation % (7005) parameter. When vehicle speed reaches 61 mph (set speed + 6 mph) Max VS and Cruise Control Engine Retarder High Speed (7004) parameter is satisfied and the feature will activate the Engine Brake at 100%.

Engine Brake 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 Max VS and Cruise Control Engine Retarder High Speed (7004) reaching a maximum value of 100%.

A26 Engine Brake by Jacobs® Applications

This section describes one feature application and how programmable parameters can be effectively configured for this application. This is not a comprehensive list and does not include all possible applications an owner/operator might encounter.

Please review the Description and Operation, and Programmable Parameters sections for a better understanding of how various engine parameters may be best configured for your vehicle.

| Programmable Parameter Setup | | |
|---|---------|--------|
| Parameter | Value | Units |
| Vehicle Retarder Control Mode (7000) | 4 | |
| Engine Retarder - Brake Pedal Delay (7001) | 0.5 | Sec |
| Engine Brake - Accelerator Pedal Delay (7008) | 0.8 | Sec |
| Engine Retarder Minimum Vehicle Speed (7002) | 10 | mph |
| Cruise Control Engine Retarder Low Speed (7003) | 4 | mph |
| Max VS and Cruise Control Engine Retarder High Speed (7004) | 6 | mph |
| Max VS and Cruise Control Engine Retarder Low Activation % (7005) | 35 | % |
| Cruise Control Engine Retarder Enable (7006) | ON | On/Off |
| Smart Engine Brake Level Enable (7013) | Enabled | |
| Max VS Engine Retarder Low Speed (3914) | 4.97 | mph |

Programmable Parameters

The following programmable parameters are available with the A26 Engine Brake by Jacobs® feature. The 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 original production 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 |
|---|--|---|-----------|--|
| Max VS Engine Retarder Low Speed (39140) | (Optional Feature) This parameter sets the vehicle speed above the Maximum Vehicle Speed Limit (79002) at which the Engine Retarder will activate at the programmed Maximum Vehicle Limit (79002) and Cruise Control Engine Retarder Low Activation % (70052) parameter setting. | 0 - 130.5 mph | Yes | Default 4.97 mph Value should = Cruise Control Engine Retarder Low Speed (7003) value if Max road speed and Max CC VS are the same value. |
| Vehicle Retarder Control Mode (70006) | This parameter determines the conditions that the Engine Brake feature will be functional. If set to (0) - The Engine Brake functionality is disabled. If set to (1) - The Engine Brake is active programmable time after service brake has been pressed (See Note 2). Also, the accelerator pedal must not be pressed. If set to (2) - The Engine Brake is active programmable time after the service brake pedal has been pressed and remains pressed (See Note 2). If set to (3) - The Engine Brake is active programmable time after the accelerator pedal is released (See Note 1). If set to (4) - The Engine Brake will transition between Mode 1- Service Brake Latched and Mode 3-Latched. The mode transitions are determined by the road grade. This allows the truck to use the more fuel-efficient service brake latched mode on flat terrain and transition to the more aggressive braking mode in steep hills. | 0: Disable 1: Service Brake Latched 2: Coast 3: Latched 4: Smart Latched Note 1: The time is programmable by parameter (70082). Note 2: The time is programmable by parameter (70012). Note 3: Smart Latched should only be used on Eaton AMT trucks | YES | Customer Chosen |
| Engine Retarder - Brake Pedal Delay (70012) | This parameter sets the delay time for the (optional) service brake pedal activated Engine Brake. Note: The Engine Brake mode must be set to Service Brake Latched or Coast (Mode 1, 2, or 4). | 0 to 300 seconds | YES | 0.5 seconds |

| Parameter Value | Description | Possible Values | Cust Pgrm | Recommended Settings |
|--|--|--|-----------|---|
| Engine Retarder - Accelerator Pedal Delay (70082) | This parameter sets the delay time for (optional) accelerator pedal activated Engine Brake or Smart Latched. Note: The Engine Brake mode must be set to Latched (Mode 3) or Smart Latched (Mode 4). | 0 to 300 seconds | YES | 0.8 seconds |
| Engine Retarder Minimum Vehicle Speed (70022) | This parameter sets the minimum vehicle speed limit the Engine Brake can be activated. Note: If a minimum vehicle speed for Engine Brake engagement is NOT desired, this parameter should be set to (0). | 0 to 130.5 mph | YES | 10 mph |
| Cruise Control Engine Retarder Enable (70061) | (Optional Feature) This parameter enables the cruise control related Engine Brake functionality. | 0: Disabled 1: Enabled | YES | Enabled |
| Cruise Control Engine Retarder Low Speed (70032) | (Optional Feature) This parameter sets the vehicle speed above the cruise set speed at which the Engine Brake will activate at the programmed Cruise Max VS and Cruise Control Engine Retarder Low Activation % (70052) parameter setting. | 1 to 130.5 mph | YES | 4 mph Note: This should be set higher than the PCC Maximum Positive Offset (76191) parameter value. |
| Max VS and Cruise Control Engine Retarder High Speed (70042) | (Optional Feature) This parameter sets the programmed speed (above the cruise set speed and Max Vehicle Speed) at which the engine brake will activate at 100%. | 0 to 130.5 mph | YES | 6 mph |
| Max VS and Cruise Control Engine Retarder Low Activation % (70052) | (Optional Feature) This parameter sets the activation percent (%) the engine brake feature starts at the Cruise Control Engine Retarder Low Speed (70032) and Max VS Engine Retarder Low Speed (39140) parameter setting. | 0 to 100% | YES | 35% |
| Road Speed Limit Engine Brake Activation Enable (70110) | (Optional Feature) When enabled the engine brake will activate when the truck exceeds the maximum programmed vehicle speed plus the (70032) brake enable low speed offset. It also allows the customer to determine if the driver can disable the brake with the accelerator pedal in vehicle over speed situations. | 0 - Disabled 1- Enabled, accelerator pedal will disable brake 2- Enabled, accelerator pedal will NOT disable brake | NO | 2 |
| | | | | |

| Parameter Value | Description | Possible Values | Cust Pgrm | Recommended Settings |
|--|---|--|-----------|----------------------|
| Engine Brake Switch Override of CC/RSL Engine Brake Activation (70120) | (Optional Feature) This parameter determines if the retarder On/Off level switch will affect the operation of the retarder during Cruise Control (CC) when Road Speed Limiting (RSL) is active. | 0- Switch off will allow CC/RSL brake activation. 1- Switch off will only disable CC brake activation. 2- Switch off will only disable RSL brake activation. 3- Switch off will disable both CC and RSL brake activation. | NO | 1 |
| Smart Engine Brake Level Enable (70131) | (Optional Feature) When enabled the Engine Retarder switch can be left in the level 2-(Medium) position and will automatically change engine braking level by switching to an acceleration-based brake level. This allows the driver to descend long hills with varying grades and not have to manually switch brake levels to maintain vehicle speed. This feature is optimized for Eaton AMT transmissions. | 0-Disabled 1- Enabled | NO | 0 |
| Engine Brake Switch 1 Input Selection (99302) | This parameter selects how the ECM sees the switch for setting Source addresses. <ul style="list-style-type: none"> If set to (0) - The switch input is supplied on a hardwired circuit If set to (1) - The switch input is supplied on the data link. | 0: Enabled with Hardwire input 1: Enabled with CAN input | YES | Customer Chosen |

Frequently Asked Questions

Will the A26 Engine Brake by Jacobs® activate with Cruise Control engaged?

Yes, if the Cruise Control Engine Retarder Enable (70061) programmable parameter is "Enabled" and the related parameters are set correctly, the Engine Brake will activate automatically to help maintain the desired cruise control set speed.

Can I install the A26 Engine Brake by Jacobs® if my truck is not originally equipped with one?

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

Definitions/Acronyms

The following terms are referenced in this document:

| Acronym | Definition |
|---------|--------------------------------|
| HP | Horsepower |
| AESC | Auxiliary Engine Speed Control |
| VS | Vehicle Speed |
| rpm | Revolutions Per Minute |
| VSS | Vehicle Speed Sensor |
| APS | Accelerator Position Sensor |