

Upfitter Interface Module® +

H-AIM506-B-GR 2023 Ford F250-F600 Diesel Engines
H-AIM506-B-G3R 2023 Ford F250-F600 Gas Engines



Introduction

The AIM506 provides 2 major functions to facilitate the production of emergency vehicles. A fast idle feature that triggers from a number of configurable sources including battery voltage, parking brake and a discrete input. It provides 8 outputs which can be configured to turn on in response to a variety of vehicle data. These outputs are used to drive various external loads.

Installation Instructions

Disconnect the battery before proceeding with the installation.



WARNING
Disconnect the battery to
prevent setting a check engine
light.

It is the installer's responsibility to route and secure all wiring harnesses where they cannot be damaged by sharp objects, mechanical moving parts and high heat sources. Failure to do so could result in damage to the system or vehicle and create possible safety concerns for the operator and passengers.

It is important to avoid placing the module where it could encounter strong magnetic fields from high current cabling connected to motors, solenoids, etc. Also avoid radio frequency energy from antenna's or inverters next to the module. Finally, avoid high voltage spikes in vehicle wiring by always using diode clamped relays when installing upfitter circuits.

AIM506 Module

Remove the lower dash panel below the steering column and find a suitable location to mount the AIM506 module. Do not mount the module where it will be exposed to excessive heat. Do not mount the module until all wire harnesses are routed and secure. The last step of the installation is to mount the module.

Data Link Harness Installation

The Ford Super Duty has an OEM Gateway module located on the other side of the SYNC 4 module, which is behind the center console. Follow the steps below to access it:



Installation Instructions (continued)

1. Remove the RH instrument panel trim using a trim removal tool. The trim starts at the ignition switch and ends at the silver clip. The glove compartment can be opened to better access the back side of the trim.



2. Using a trim removal tool, pop out the upper right corner of the lower steering column close out panel. Position it away from the center stack.



3. Remove the 4 bolts (Size: 7mm) located at the top of the center stack.

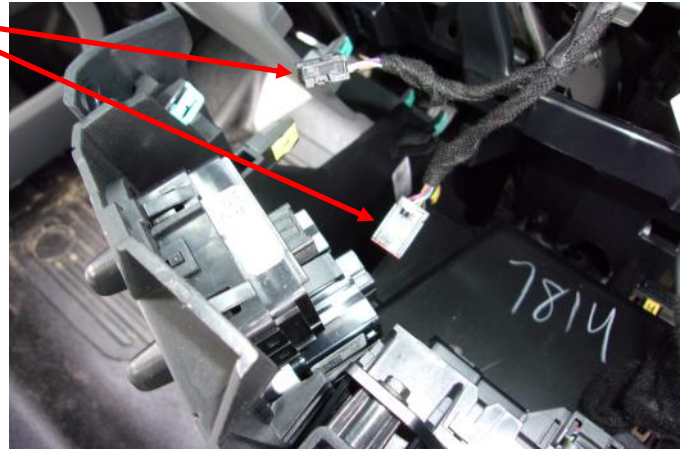


Installation Instructions (continued)

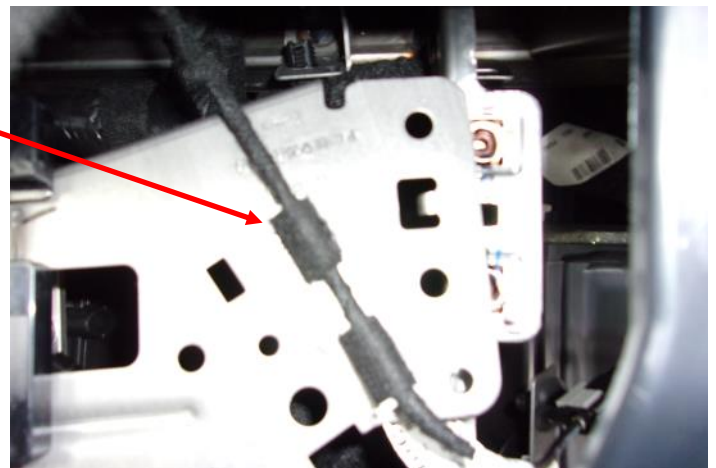
4. Release the clips on both sides of the center stack using a trim removal tool. Position the center stack away from the mounting points.



5. Disconnect the 2 connectors behind the center stack.



6. Detach the push-mount cable tie from the bracket and position the cable out of the way.

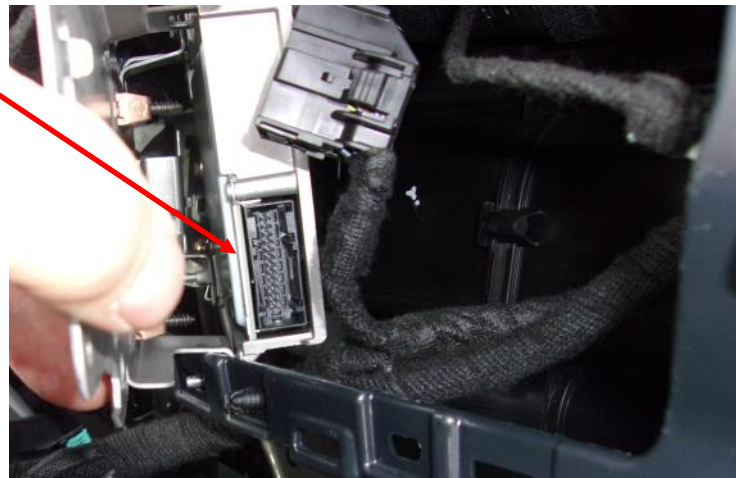


Installation Instructions (continued)

7. Remove the 4 bolts (Size: 7mm) and position the bracket away from the mounting points to access the Gateway Module. The Gateway Module is located behind the bracket.



8. Disconnect the Gateway Connector by pressing down on the tab and pulling the connector away from the module.



9. Install the Datalink Harness between the Gateway Module and the disconnected Gateway Connector.



10. Run the 6-pin connector of the datalink harness to the mounting location of the AIM506 module.

11. After the Datalink Harness is installed, reverse the installation procedure to reassemble.

Installation Instructions (continued)

Fast Idle

The fast idle system controls engine idle RPM in response to a number of triggers in order to increase electrical and mechanical output of the vehicle. By default, gas engines idle at 1500 RPM while diesel engines idle at 1200 RPM.

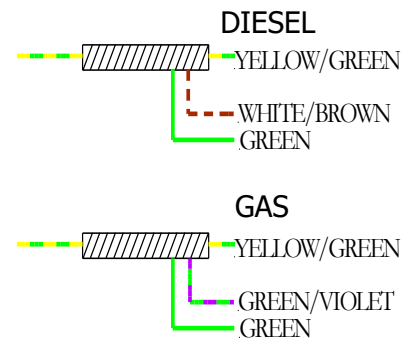
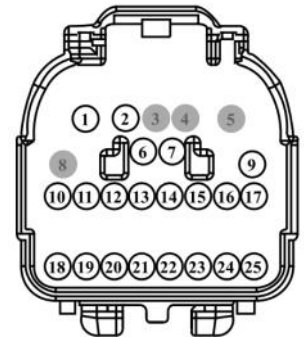
Fast Idle Engage Input (4-Pin Connector)

Attach the AIM506 Harness connector Pin #1 Green/White wire on the 4 pin connector to any equipment that provides a **ground signal when the fast idle needs to be engaged**. (PTO, pump, etc.)

Fast Idle SEIC connections

The Ford Super Duty can no longer Fast Idle over the CAN network. Beginning in 2023, the following connections must be made:

1. Locate the Customer Access 25-pin harness located behind the passenger kick panel.
2. The mating 25-pin pigtail is included with the vehicle and will be located in the vehicle's glovebox.
3. Using solder and heat shrink, connect the following wires together:
 - **Diesel:** White/Brown wire from the InterMotive SEIC harness to the White/Brown wire of the OEM 25-pin pigtail.
 - **Gas:** Green/Violet wire from the InterMotive SEIC harness to the White/Brown wire of the OEM 25-pin pigtail.
 - Yellow/Green wire from the InterMotive SEIC harness to the Yellow/Green wire (Pin 7) of the OEM 25-pin pigtail.
 - Green wire from the InterMotive SEIC harness to the Green/White wire (Pin 5) of the OEM 25-pin pigtail.
4. Plug the Yellow/Green wire from the InterMotive SEIC Harness into pin 1 of the 12 way connector on harness (840-00309).



Fast Idle Triggers		
Trigger Name	Trigger Conditions	Disable Conditions
Manual Engage Input	Fast Idle Engage Input wire activated	Fast Idle Engage Input wires not active
VBAT Low (if enabled)	VBAT < 12.5V (default)	VBAT > 13.5V for > 5 minutes (default)
Parking Brake (if enabled)	Parking Brake applied	Parking Brake Released

Fast Idle Preconditions

The following preconditions must be met prior to initiating Fast Idle operation:

- Vehicle speed zero
- Transmission in Park
- Accelerator pedal not applied
- Engine Coolant temperature less than 230°F
- Engine RPM must be greater than 200 and less than 2800
- Service Brake not applied
- Parking Brake must be applied if this feature is enabled

Pin Mode— AIM Application

Outputs can be configured from the factory for various modes, as described below. Momentary mode is the most commonly used, where an output is 'active' only when the proper conditions have been met.

Momentary: Output follows condition set but with a turn on delay, and a turn off delay. Setting 'On Delay' and 'Off Delay' to zero causes the output pin to simply "follow" the condition set being true (ON) and false (OFF).

Pin Mode	Momentary	Off Delay (s)	0	On Delay (s)	0
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Latching: This mode will latch an output pin ON, starting 'On Delay' seconds after the conditions are met, and will keep it ON even after the conditions are no longer true. It will then latch the output OFF, following 'Off Delay' seconds after the conditions are met again. Think of it as toggle on—toggle off. The simplest use would be when using a momentary button as the only input condition and setting the Delays to zero. Thus a load could be turned on by pushing a momentary button, and turned back off by pushing the button a second time.

Pin Mode	Latching	Off Delay (s)	0	On Delay (s)	0
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Time Hold: The output pin goes ON after the conditions become true, and stays ON for the selected 'On Time', regardless of the conditions. Off Time is Not Applicable.

Pin Mode	Time Hold	Off Time (s)		On Time (s)	0
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Time Delay: Output is turned ON after the selected 'delay' time after the conditions are met. It stays on for selected 'On time', regardless of input conditions.

Pin Mode	Time Delay	Delay (s)	0	On Time (s)	0
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Flashing—Momentary: Used for creating a flashing output. When conditions are met, output flashes. When conditions are no longer met, flashing stops. Flashing ON and OFF times (duty cycle) are controlled by entering the following values.

Pin Mode	Flashing - Momentary	Off Time (.1s)	0	On Time (.1s)	0
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Flashing - Latching: Same as above, except flashing will continue after conditions are no longer true, and will stop when conditions become true again—toggle ON, toggle OFF. Duty cycle is controlled by the ON and OFF times.

Pin Mode	Flashing - Latching	Off Time (.1s)	0	On Time (.1s)	0
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Key Off Operation: If Key Off operation is selected, outputs will continue to update once the key goes off. These outputs will continue to update until the vehicle goes to sleep.

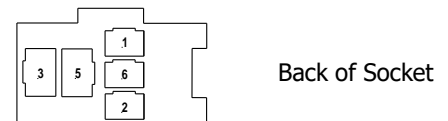
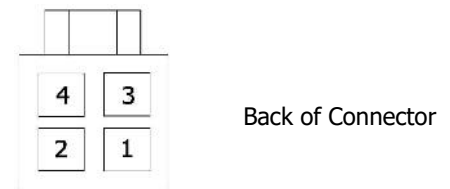
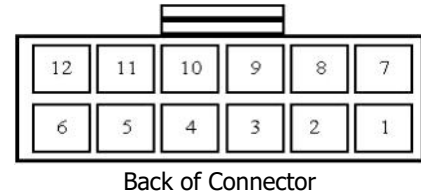
Key Off operation (AIM506 and AIM516)

AIM506 Output pin-out definition

Outputs 2 through 8 are configurable by InterMotive as either active high (12V) or active low (ground). Each of these outputs are rated at 1/2A and are intended to drive relay coils or other low current loads. Output 1 is a high current (8A max.) output and should be fused. The output sense for Output 1 (Pin #2 Purple wire on the 4 pin connector) depends on the input at Pin #4 (Tan wire) on the 4 pin connector (i.e., 12V on Pin #4 will output 12V on Pin #2 when Output 1 is active).

The 8 outputs are defined as follows:

- Pin #1 (Yellow/Green wire) SEIC Output
 - Pin #2 (Green wire) Output 2
 - Pin #3 (Gray wire) Output 3
 - Pin #4 (Blue wire) Output 4
 - Pin #5 N/C
 - Pin #6 N/C
 - Pin #7 (Red wire) fixed jumper to pin 12
 - Pin #8 (Brown wire) Output 5
 - Pin #9 (Orange wire) Output 6
 - Pin #10 (Pink wire) Output 7
 - Pin #11 (Yellow wire) Output 8
 - Pin #12 (Red wire) fixed jumper to pin 7
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- Pin #1 (Green/White wire) General Purpose Input 1 (Active Ground)
 - Pin #2 (Purple wire) Output 1
 - Pin #3 (Pink wire) General Purpose Input 2 (Active Ground)
 - Pin #4 (Tan wire) Output 1 Source
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- Pin #5 (White wire) Park Brake Output (Active Ground)



Connect the desired outputs to vehicle equipment as needed. Tape up unused leads. When connecting to relays, use relays with appropriate kick-back suppression, such as Digikey #PB682-ND. Unsuppressed relays will induce very high voltage spikes throughout modern vehicle's sensitive computer electronics and should not be used, per Ford, GM, SAE, etc.

By default, all outputs are active low and configured as follows:

- Output #1 (Purple wire) Engine Cranking
- Output #2 (Green wire) TR = Park
- Output #3 (Gray wire) Any Door Open
- Output #4 (Blue wire) Park Brake Off
- Output #5 (Brown wire) Ignition On
- Output #6 (Orange wire) Engine Running
- Output #7 (Pink wire) Park Brake On
- Output #8 (Yellow wire) TR = Reverse

Reconnect the vehicle battery

During VIN acquisition: Scrolling LED's between LED1 and LED5 indicate an error occurred while acquiring the VIN.

Verify that the chassis is supported by this product. If work was recently performed on this chassis, the VIN may have been cleared in the PCM.

A lit LED between LED 1 and LED 5 will indicate the following:

LED 1	Manufacturer Error
LED2	Model Error
LED3	Engine Error
LED4	Model Year Error
LED5	VIN Error

Post Installation System Operation Test

Perform the following tests before actually mounting the module, to allow easy viewing of the diagnostic LED's, if needed.

1. Place transmission in Park and start the engine. **Note:** Vehicle may enter Fast Idle if VBAT is low. Either wait to see if the battery charges and Fast Idle stops, or place a charger on the vehicle to disable the VBAT low trigger to allow testing of other triggers.
2. Manually engage the Fast Idle Input by having aftermarket vehicle equipment ground the Input wire. Engine speed will increase to the set RPM level. If this does not occur, check harness connections. Also see diagnostics below.
3. When Fast Idle is engaged, keep the Input wire grounded, and depress the Service Brake for 1 second. Fast idle will temporarily disengage anytime the Service Brake is pressed, and will automatically reengage after approximately 2 seconds once the Brake pedal is released.
4. Place transmission shift lever in the "Neutral" position. (Input wire still grounded). Verify the vehicle does not go into Fast Idle.

If the AIM506 fails any of the above tests, check harnesses and review instructions, or check diagnostics below. If necessary, call InterMotive Technical Support at (530) 823-1048.

Post Installation System Operation Test (continued)



Diagnostics

Diagnostic mode is entered by momentarily pressing the Red "Test" button on the module. The module provides diagnostic LEDs which illuminate according to the following table. To exit this mode simply cycle the key or momentarily press the "Test" button again.

Fast Idle Status Codes

Status Codes provide the current status of the Fast Idle system. The on-board "Status" LED will flash a 2-digit code as shown in the table. The first digit will flash, wait one second, flash the second digit, then wait four seconds before the next code. The Status Codes continue to flash until the module is reset (cycle key), or the test input is momentarily grounded again.

LED #	Diagnostic Mode LED Descriptions
1	Output 1 is On
2	Output 2 is On
3	Output 3 is On
4	Output 4 is On
5	Output 5 is On
6	Output 6 is On
7	Output 7 is On
8	Output 8 is On
9	Fast Idle Input Active
10	Not Used
STATUS	Continuously flashes two digit status codes. See Status Code table

AFIS Status Codes	
Status Code	Description
1-1	Ready for fast idle
2-4	Triggered: VBAT Low
2-8	Triggered: Engage Input
2-9	Triggered: Parking Brake
3-1	RPM > 2800
3-2	RPM < 200
3-3	TR not = to PARK
3-4	VSS not = to 0 MPH
3-5	Service Brake applied
3-6	TFT > 250°F
3-7	Need to apply PB
3-8	ECT > 230°F

AIM506 Module Mounting

Ensure all harness are properly connected and routed, and are not hanging below the dash area. Mount the AIM506 module using screws or double sided tape. Reinstall the lower dash panel.

LEAVE IN VEHICLE Upfitter Interface Module® +

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H-AIM506-B-G3R 2023 Ford F250-F600 Gas Engines

System Operation

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Fast Idle

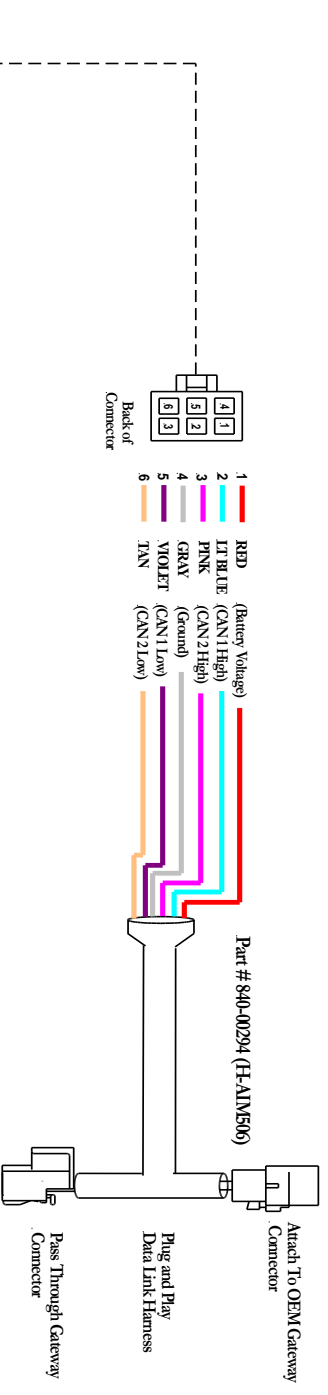
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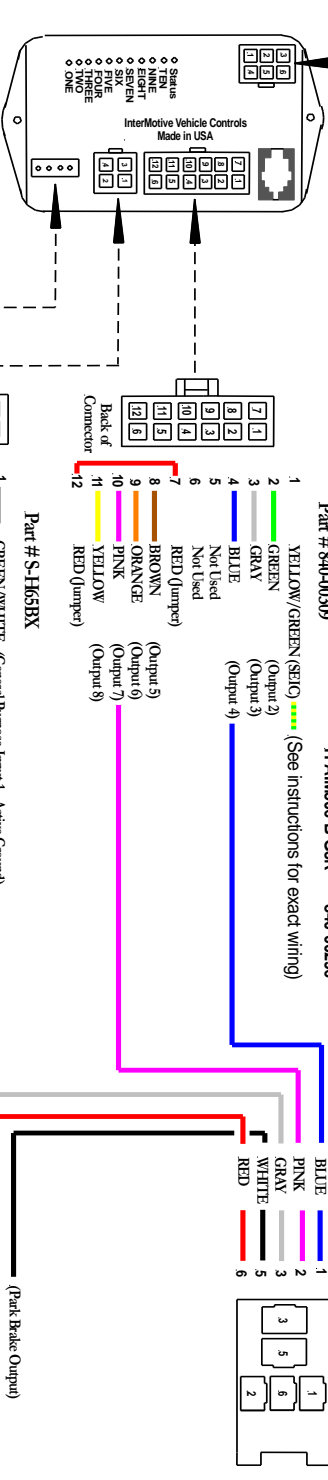
Fast Idle Preconditions

The following preconditions must be met prior to initiating Fast Idle operation:

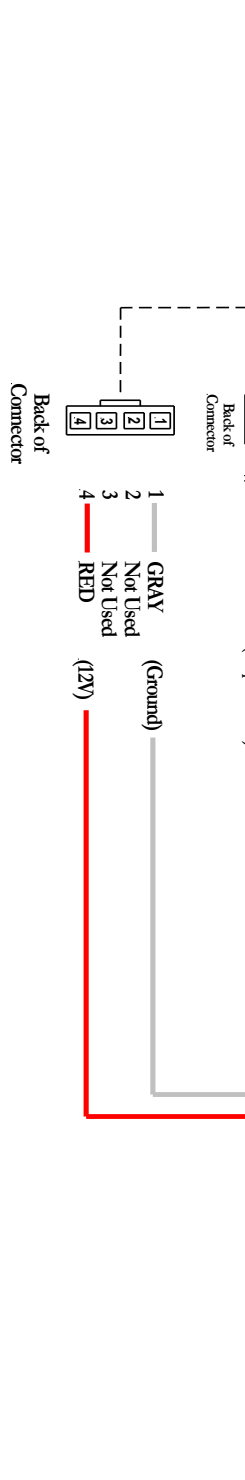
- Vehicle speed zero
- Transmission in Park
- Accelerator pedal must not be applied
- Engine Coolant temperature less than 230°F
- Engine RPM must be greater than 200 and less than 2800
- Service Brake not applied
- Parking Brake must be applied



SEIC Harness Part Numbers:
 H-AIM506-B-GR 840-00058
 H-AIM506-B-G3R 840-00296



AIM506B S-M1211-111



Submit product registration at www.InterMotive.net

If the AIM506 fails any step in the Post Installation Test, review the installation instructions and the loaded configuration by running the Graphical User Interface application. If necessary, call InterMotive technical support at (530) 823-1048.