A-AFIS420VSX-B Fast Idle System
2009-2019 Ford E-Series, all engines
2009-2010 Ford F-250 - F-550, all engines
2014-2020 Ford F53/F59, 6.8L engine
2014-2016 Ford Transit Connect
2009-2023 Chevrolet Express / GMC Savana
2015-2023 Chevrolet Silverado / Sierra
2011-2014 American General MV-1 4.6L
2016-2023 Isuzu NPR, gas only
2019 Chevy LCF (Low Cab Forward Trucks)
2019 International CV

Introduction

The AFIS420VSX-B is a Fast Idle system that elevates engine idle RPM based on a number of "triggers". The vehicle must be in Park for Fast Idle to engage. There are three different engine RPM settings which can be selected by grounding different control inputs. The three different RPM values can be independently set during installation.

Options

AFIS420VSX-B — Single OBDII connector Data Link Harness

AFIS420VSX-BP — Two connector "T" Data Link harness

AFIS420VSX-BIP — Two connector white panel mount "T" Data Link harness

AFIS420VSX-BW — Input 1 default speed is: 1500—RPM Gas/1500—RPM Diesel

Installation Instructions

Disconnect vehicle battery before proceeding with installation.

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

### IMPORTANT—READ BEFORE INSTALLATION

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. Avoid placing the module where it could encounter strong magnetic fields from high current cabling connected to motors, solenoids, etc. Avoid radio frequency energy from antennas or inverters next to the module. Avoid high voltage spikes in vehicle wiring by always using diode clamped relays when installing upfitter circuits.

AFIS420VSX-B Module

Remove the lower dash panel below the steering column area and find a suitable location to mount the AFIS420VSX-B module. Locate the module in an area away from any external heat sources (engine heat, heater ducts, etc.). Do not actually mount the module until all wire harnesses are routed and secure. The last step will be to mount the module.

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AFIS420VSX-B Data Link Harness

1. Locate the vehicle's OBDII Data Link Connector which is mounted below the lower left dash panel.

2. Plug the Red connector from the AFIS420VSX-B Data Link Harness into the vehicle OBDII connector. Ensure the connection is fully seated and secure with the supplied wire tie.

3. Secure the AFIS420VSX-B Data Link harness so that it does not hang below the lower dash and plug the (4-pin connector) from the Data Link Harness into the 4-Pin connector on the AFIS420VSX-B module.
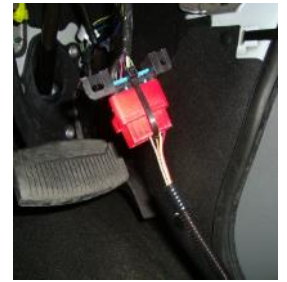
AFIS420VSX-BP/BIP "T" Data Link Harness

1. Locate the vehicle OBDII Data Link Connector. It will be mounted below the lower left dash panel.

2. Remove the mounting screws for the OBDII connector. Plug the Red connector from the AFIS420VSX-BP Data Link Harness into the vehicle's OBDII connector. Ensure the connection is fully seated and secure with the supplied wire tie.

3. Mount the Black pass through connector from the AFIS420VSX-BP Data Link Harness in the former location of the vehicle's OBDII connector.

4. Secure the AFIS420VSXP-B Data Link harness so that it does not hang below the lower dash and plug the 4-pin connector from the Data Link Harness into the 4-Pin connector on the AFIS420VSX-B module.

AFIS Harness (8-Pin Connector) - Fast Idle Engage Inputs

Engage Input 1

Attach the AFIS Harness connector Pin #8 Green wire to any equipment that provides a ground signal when the fast idle needs to be engaged. (PTO, pump, etc….)

Note: The "sense" of the Green wire can be programmed (see below). This alternatively allows equipment which provides a 12V "active" signal to be connected to this input.

Engage Input 2

Attach the AFIS Harness connector Pin #7 White wire to any equipment that provides a ground signal when the fast idle needs to be engaged. (PTO, pump, etc….)

Engage Input 3

Attach the AFIS Harness connector Pin #5 Yellow wire to any equipment that provides a ground signal when the fast idle needs to be engaged. (PTO, pump, etc….)

If multiple engage inputs are active, the lower number has priority. Auto triggers will have the lowest priority and will only trigger if none of the inputs are active.

Engage Input 1—Fast Idle Pin-8 Trigger, Active: Ground or 12V signal Enable/Disable

The module is configured from the factory for an active ground fast idle trigger. To change this to an active 12V trigger:

Turn the key on, place the transmission in neutral, apply the Service Brake, pull out on the Park Brake release and apply the Park Brake four times within 5 seconds. Upon successful reprogramming, the LEDs will flash as a confirmation. The user must cycle the key for the change to take affect. Repeat to reverse back to a ground trigger.

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VBAT Low Fast Idle Trigger Disable, Black wire loop

The system is configured from the factory for Fast Idle to be triggered when the battery voltage (VBAT) drops below 12.5V. If the VBAT Low Fast Idle Trigger is not needed, it can be disabled by cutting the Black wire (loop) on the 8-Pin connector between Pin #1 & Pin #3.
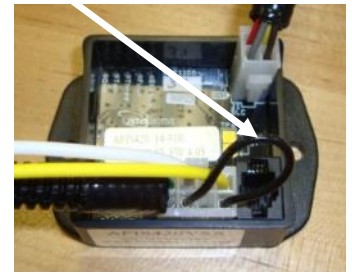
Configurable Idle Speed (Gray wire)

The AFIS420VSX-B allows the user to change the fast idle RPM for each fast idle input during installation. Any speed can be selected between 900 RPM and 2000 RPM in 50 RPM increments when reconfiguring. The default speeds are as follows:

- Input 1—1500 RPM Gas/1200 RPM Diesel
- Input 2—1750 RPM Gas/1000 RPM Diesel
- Input 3—950 RPM Gas/900 RPM Diesel

1. Locate the Gray wire Pin 4 in the 8 pin Molex connector.

2. Pull the wire out of the loom to expose the bare copper end.

3. Place the vehicle in Fast Idle by grounding the selected Engage Input wire. Only the active idle input will be adjusted. NOTE: With the engine in Fast Idle, momentarily grounding the Gray wire (RPM Configuration input) increases the idle speed by 50 RPM. When the idle speed reaches the maximum allowable speed for the particular engine, it will roll back to approximately 900 RPM. Wherever the user stops, this RPM becomes the new default Fast Idle speed, even through key cycles.

4. Repeat this operation for each of the three Engage Input wires as desired.

5. After the vehicle is set to the desired fast idle speeds, insert the end of the Gray wire into the harness tubing and use tape to secure.
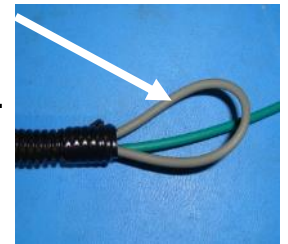
All Auto Triggers (VBAT and PB) share the same idle speed configuration as Input 1. Input 1 idle speed can also be reconfigured when in one of these triggers.

AFIS420VSX-BW option

The AFIS420VSX-BW is identical to the AFIS420VSX-B except that Input 1's default speed is:

- 1500—RPM Gas/1500—RPM Diesel

Park Brake Fast Idle Trigger Enable/Disable

The AFIS420-VSX-B module is configured from the factory for Fast Idle **not** to be triggered when the Park Brake is applied. If the Park Brake Fast Idle trigger is needed, it can be enabled (or disabled) by the following procedure:

1. With key on, place the transmission in neutral.

2. Apply the Park Brake and press the Service Brake three times within 5 seconds.

Upon successful reprogramming, the on-board LEDs will briefly flash as a confirmation. Cycle the key for the change to take affect.

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Post Installation System Operation Test

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

1. Place transmission in Park and start the engine. **Note**: Vehicle may enter Fast Idle if Battery Voltage (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. If the Parking Brake Fast Idle trigger is enabled, apply the Parking Brake. The engine speed will increase to the set RPM level. Release the Parking Brake. Verify the system comes out of Fast Idle
3. One at a time, manually engage all three Fast Idle Inputs by having aftermarket vehicle equipment ground the Input wires. Engine speed will increase to the set RPM level.
4. If this does not occur, check harness connections. Also, see diagnostics below.
5. While Fast Idle engaged, keep the Input wire grounded, and depress the Service Brake for 1 second. Fast idle will temporarily disengage anytime the Service Brake is depressed, but will automatically reengage after approximately 2 seconds once the Brake pedal is released.
6. Place transmission shift lever in the "Neutral" position. (Input wire still grounded). The system must not activate Fast Idle.

The AFIS420VSX-B is properly installed only if it passes all of the above steps.

Module Mounting

Ensure all harnesses are properly connected and routed, and are not hanging below the dash area. Mount the AFIS420VSX-B module using screws or double sided tape and reinstall all removed panels

Diagnostics

Diagnostic mode is entered by momentarily shorting the two gold "Test" pads together on the module. The module provides diagnostic LEDs which illuminate according to the following table. To exit this mode, cycle the key or momentarily ground the "Test" pad again.
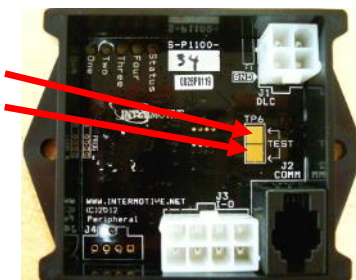
Fast Idle Status Codes

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 half a second, flash the second digit, then wait one second 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	On when fast idle is engaged
2	On when any input trigger wire is active
3	On when Gray RPM set wire is grounded
4	On when the Parking Brake is applied with the parking brake trigger enabled
STATUS	Continuously flashes two digit status codes. See Status Code table

AFIS Status Codes	
Status Code	**Description**
1-1	Ready for fast idle
2-3	Triggered: Parking Brake
2-4	Triggered: VBAT Low
2-7	Triggered: Engage Input 2
2-8	Triggered: Engage Input 1
2-9	Triggered: Engage Input 3
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
3-7	Unsafe; Need to cycle TR
3-8	ECT > 230ºF

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LEAVE IN VEHICLE
Operating Instructions A-AFIS420VSX-B
2009-2019 Ford E-Series, all engines
2009-2010 Ford F-250 - F-550, all engines
2014-2020 Ford F53/F59, 6.8L engine
2014-2016 Ford Transit Connect
2009-2023 Chevrolet Express / GMC Savana
2015-2023 Chevrolet Silverado / Sierra
2011-2014 American General MV-1 4.6L
2016-2023 Isuzu NPR, gas only
2019 Chevy LCF (Low Cab Forward Trucks)
2019 International CV

System Operation

The Advanced Fast Idle System (AFIS) elevates engine idle speed in response to a number of triggers in order to assist electrical or mechanical systems on the vehicle.

Fast Idle may be initiated by either a manual trigger (Input wire being grounded), a low battery voltage (low VBAT) condition, or if enabled, by setting the Park Brake.

Fast Idle will only occur when the required preconditions are met, as listed below. Fast Idle operation will be terminated by a loss of any of the preconditions, or removal of the trigger(s).

Fast Idle Triggers		
Trigger Name	**Trigger Conditions**	**Disable Conditions**
Manual Engage	Fast Idle Engage Green wire grounded **Or** 12V input enabled (based on setting)	Fast Idle Engage Green wire not grounded **Or** not 12V (based on setting)
VBAT Low	VBAT < 12.5V	Precondition Violation
Parking Brake	Parking Brake applied (If Enabled)	Parking Brake Released

Fast Idle Preconditions

All of 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 must be less than 230ºF
- Engine RPM must be greater than 200 and less than 2800.
- Service Brake not applied

The following options are configurable at the factory for OEM customers. The default values are shown.
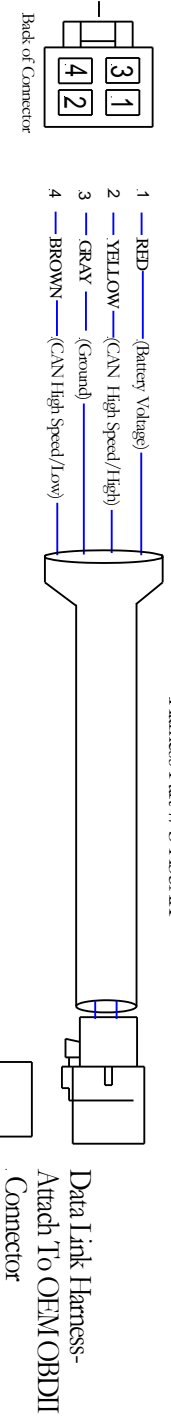
AFIS420VSX-B

Input 1: 1500 gas / 1200 Diesel
Input 2: 1750 gas / 1000 Diesel
Input 3: 950 gas / 900 Diesel
VBAT Low: 12.5V
Parking Brake Trigger: Disabled

AFIS420VSX-BW

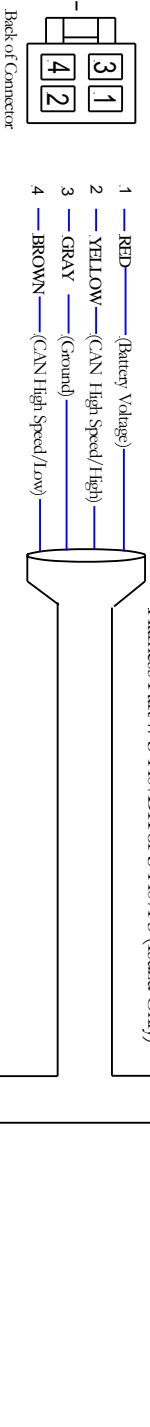Identical to AFIS420VSX-B except:
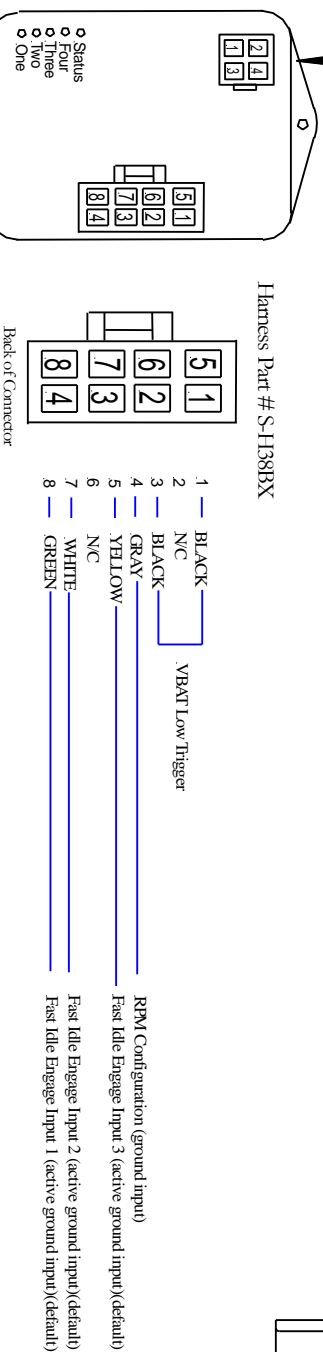Input 1: 1500 gas / 1500 Diesel

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AFIS420VSX-B
Part# S-M1100-32

Status
Four
Three
Two
One

Back of Connector

Back of Connector

Harness Part # S-H38BX

Back of Connector

AFIS420VSX-B Data Link Harness
Harness Part # S-H35AX

1 — RED — (Battery Voltage)
2 — YELLOW — (CAN High Speed/High)
3 — GRAY — (Ground)
4 — BROWN — (CAN High Speed/Low)

Data Link Harness-
Attach To OEM OBDII
Connector

AFIS420VSX-BP Data Link Harness
Harness Part #S-H07DX or S-H07F3 (Isuzu Only)

1 — RED — (Battery Voltage)
2 — YELLOW — (CAN High Speed / High)
3 — GRAY — (Ground)
4 — BROWN — (CAN High Speed/Low)

Pass Through OBDII
Connector

1 — BLACK
2 — NC ⎤
3 — BLACK ⎦ VBAT Low Trigger
4 — GRAY — RPM Configuration (ground input)
5 — YELLOW — Fast Idle Engage Input 3 (active ground input)(default)
6 — NC
7 — WHITE — Fast Idle Engage Input 2 (active ground input)(default)
8 — GREEN — Fast Idle Engage Input 1 (active ground input)(default)

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If the AFIS420VSX-B fails any step in the Post Installation Test, review the installation instructions and check all connections.
If necessary, call InterMotive Technical Support at (530) 823-1048.