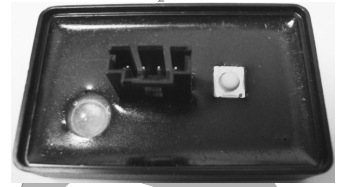


ACM401-A
Enables Fast Idle with PRPC
2009-2014 Ford E-Series and F-Series
Contact Intermotive for additional applications



Introduction

The ACM401-A enables the Advanced Fast Idle System (AFIS) when added to a PRPC501 system. It elevates the engine idle speed in response to a number of triggers in order to assist electrical or mechanical systems on the vehicle.

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.

Installation Instructions

Disconnect vehicle battery before proceeding with installation.



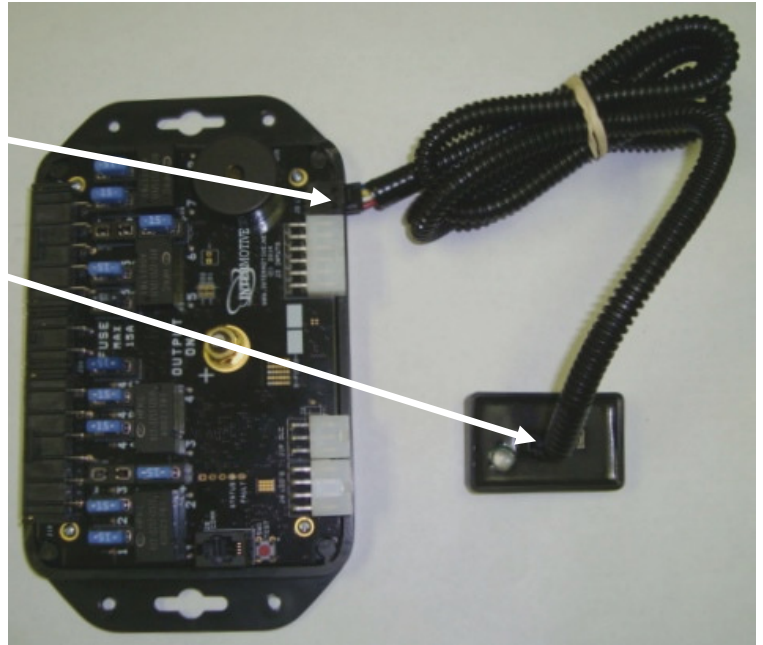
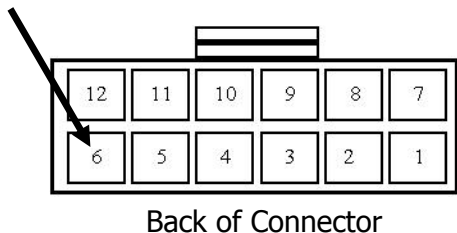
WARNING
Disconnect the battery to
prevent setting a check engine
light.

ACM401-A Module

Remove the lower dash panel below the steering column and find a suitable location to mount the module. Do not mount the module until all wire harnesses are routed and secure. The last step of the installation is to mount the module. Mount the module in an area away from any external heat sources (engine heat, heater ducts, etc.), Route the harnesses such that the tilt steering column does not contact them in the full down position. When installing the harnesses, leave several inches of take-out in order to remove the module if necessary.

ACM401-A Module (Continued)

1. Disconnect the 6-pin (J19) connector from the module.
2. Plug one end of the supplied harness into the J5 LIN connector on the PRPC Module.
3. Plug the other end of the harness into the mating connector on the ACM401-A module.
4. If the external trigger option has been enabled, input pin #6 on the J3 connector can be connected to a ground side switch to activate Fast Idle.



5. Plug the 6-pin (J19) connector into the module.

Post Installation System Operation Test

Perform the following tests before mounting the module, to allow viewing of the diagnostic LED, 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 and verify the system comes out of Fast Idle
3. If enabled, manually engage the AFIS trigger (Input 6) having aftermarket vehicle equipment ground the Input wire. Engine speed will increase to the set RPM level.
4. While Fast Idle is engaged, 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.
5. Place transmission shift lever in the "Neutral" position. The system must not activate Fast Idle.
6. If any of the above steps do not occur, check harness connections. Also, see diagnostics on the following pages.

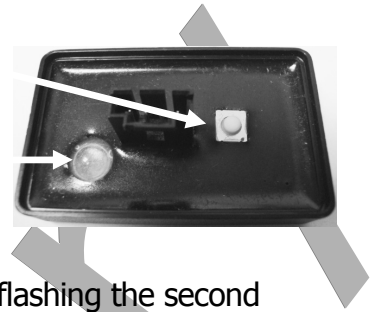
The ACM401-A is properly installed only if it passes all of the above steps.

Diagnostics

To display **Diagnostic Trouble Codes** on the ACM401-A module, perform the following procedure:

1. Have the ignition in the Off position.
2. Continuously press the button on the ACM401-A module while turning the ignition to the On position.
3. Continue to press the button for 5-10 seconds until the amber LED turns On and Off.
4. The button can be released.
5. A 2-digit code is displayed by flashing the first digit, waiting one second, flashing the second digit, and then waiting four seconds before another code is displayed.
6. These codes are real time codes and may change due to changes on the vehicle.

The definitions for the codes are in the table below:

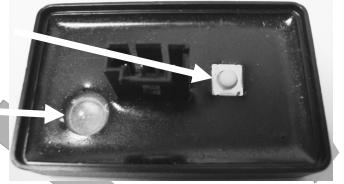


Code	Meaning
1-1	Safety Conditions Met, Ready for First Fast Idle
2-1	Manual Engage Trigger
2-3	Park Brake Trigger (if enabled)
2-4	VBAT Trigger
2-5	AC Trigger
2-7	Heater Boost Trigger
2-8	Input 6 Trigger
2-9	Diagnostic Heater Boost RPM Adjust
2-10	Diagnostic Default RPM Adjust
3-1	RPM too High for Fast Idle (< 2800)
3-2	RPM too Low for Fast Idle (> 200)
3-3	Gear / Clutch Position Incorrect for Fast Idle
3-4	Vehicle Speed Incorrect for Fast Idle
3-5	Service Brake Incorrect for Fast Idle
3-6	Transmission Fluid Temp too High for Fast Idle (> 250 F)
3-7	Safety Condition Violated (TR or Key Cycle Required)
3-8	Engine Coolant Temperature too High for Fast Idle (> 230 F)
3-9	Ford CAN Network Comm Failure
3-10	PB Required and Not Set

Diagnostics (Continued)

To aid in troubleshooting intermittent concerns, the ACM401-A system stores the last five Fast Idle Stop Codes. Thus, if a Fast Idle operation terminates unexpectedly, the technician can determine the cause. To display **Fast Idle Stop Codes** on the LED on the ACM401-A module, perform the following procedure:

1. Have the ignition in the On Position.
2. After the Amber LED on the ACM401-A module turns On and Off, press and hold the button down for 10+ seconds.
3. After the Amber LED starts flashing, release the button.
4. A 2-digit code is displayed by flashing the first digit, waiting one second, flashing the second digit, and then waiting four seconds before another code is displayed.
5. After the last five Stop Codes have been displayed, the Amber LED will flash and normal operation will resume.
6. The definitions for the codes are in the table below.



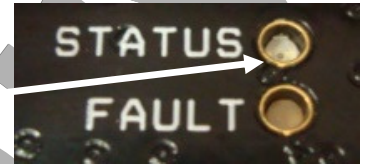
Code	Meaning
1-2	Fast Idle Stopped due to Vehicle Speed
1-4	Fast Idle Stopped due to Transmission Fluid Temperature (> 250 F)
1-5	Fast Idle Stopped due to RPM (>2800)
1-7	Fast Idle Stopped due to Gear \ Clutch Position
1-8	Fast Idle Stopped due to Service Brake
1-9	Fast Idle Stopped due to Engine Coolant Temperature (> 230 F)
1-10	VBAT Trigger Deactivated
1-13	Heater Boost Trigger Deactivated
1-14	Park Brake Trigger Deactivated
1-15	Input 6 Trigger Deactivated

Setting Fast Idle RPM Speeds (Without a Laptop)

The ACM401-A module has two separate configurable RPM settings (heater boost and the default setting). The heater boost is triggered on engine start-up and aids in warming up the engine quickly. The default setting is triggered by low battery voltage, air conditioner On (if enabled), Parking Brake On (if enabled), or an external switch input (if enabled). The two settings are changed by doing the following procedure:

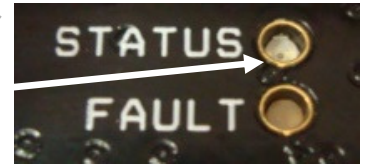
• Default RPM

1. On the PRPC module, momentarily press the Red test button on the module **FOUR** times with the ignition in the On position. The on-board Yellow Status LED will blink **FOUR** times in this diagnostic mode.
2. The vehicle RPM will increase to the currently configured setting.
3. To raise the RPM by 50, momentarily ground Input 6 until the desired RPM is set.
4. When desired RPM is set, press the Red button test button **TWO** more times until the Status LED stops flashing.



• Heater Boost RPM

1. On the PRPC module, momentarily press the Red test button on the module **FIVE** times with the ignition in the On position. The on-board Yellow status LED will blink **FIVE** times in this diagnostic mode.
2. The vehicle RPM will increase to the currently configured setting.
3. To raise the RPM by 50, momentarily ground Input 6 until the desired RPM is set.
4. When desired RPM is set, press the Red button test button **ONE** more time until the Status LED stops flashing.



Making Changes to the Default Configuration:

Default Settings

Default and Heater Boost RPM: 1500 (1200 Diesel)

VBAT Low: 12.5V

VBAT High: 13.6V

VBAT Run On Time: 6 Minutes

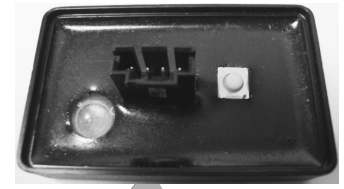
Parking Brake Trigger: Enabled

A/C Trigger: Enabled

Fast Idle Trigger on Input 6: Disabled

Note: All settings are configurable using the PRPC Programming Utility. Please contact Intermotive at (530) 823-1048 for detailed instructions on how to make these changes.

**LEAVE IN VEHICLE
Operating Instructions
ACM401-A Fast Idle System
Enables Fast Idle with PRPC
2009-2014 Ford E-Series and F-Series**



System Operation

The ACM401-A enables the Advanced Fast Idle System (AFIS) when added to a PRPC501 system. It elevates the 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 (if enabled), a low battery voltage (low VBAT) condition, Heater Boost, AC Trigger (if enabled) or by setting the Park Brake (if enabled). 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 (If Enabled)	Input 6 wire grounded	Input 6 wire not grounded
VBAT Low	VBAT < 12.5V (Configurable)	VBAT > 13.6V (Expired VBAT Run on Timer)
Parking Brake (If Enabled)	Parking Brake applied	Parking Brake Released
A/C On (If Enabled)	A/C turned On	Precondition Violation
Heater Boost	Ambient Air Temperature Below 70° F and Engine Coolant Temperature below 170° F	Engine Coolant Temperature Above 170° F

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 230°F
- Engine RPM must be greater than 200 and less than 2800
- Service Brake not applied

Note: During Fast Idle, the battery voltage should slowly increase until it reaches the upper set point (13.6V). Fast Idle will continue for 6 more minutes with the battery voltage at or above 13.6V before shutting off. This ensures the battery is fully charged.

Default Settings (All settings are configurable using the PRPC Programming Utility)

Default and Heater Boost RPM: 1500 (1200 Diesel)

VBAT Low: 12.5V

VBAT High: 13.6V

VBAT Run On Time: 6 Minutes

Parking Brake Trigger: Enabled

A/C Trigger: Enabled

Fast Idle Trigger on Input 6: Disabled