

OPERATING INSTRUCTIONS

for the

AMBULANCE

AUXILIARY IDLE CONTROL MODULE

Exclusively for Ford Trucks with 7.3L DIT Diesel Engines

Powertrain Control Systems Division
Visteon Automotive Systems
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Part No. XC3F-12B639-DA



Section 1 INTRODUCTION

The Ambulance Auxiliary Idle Control Module, also called a base function Auxiliary Powertrain Control Module (APCM), is for use in Light Trucks equipped with 7.3L DIT Diesel engines. Each kit includes an Auxiliary Idle Control module, wiring harness, mounting bracket and hardware, operator's card, and this instruction booklet.

The APCM can be used to:

- Maintain battery charge
- Elevate engine speed for increased power output at idle
- Maintain charge automatically, without additional driver input

MODULE AND KEY DESCRIPTION

Refer to the diagram below for module functionality and key description.

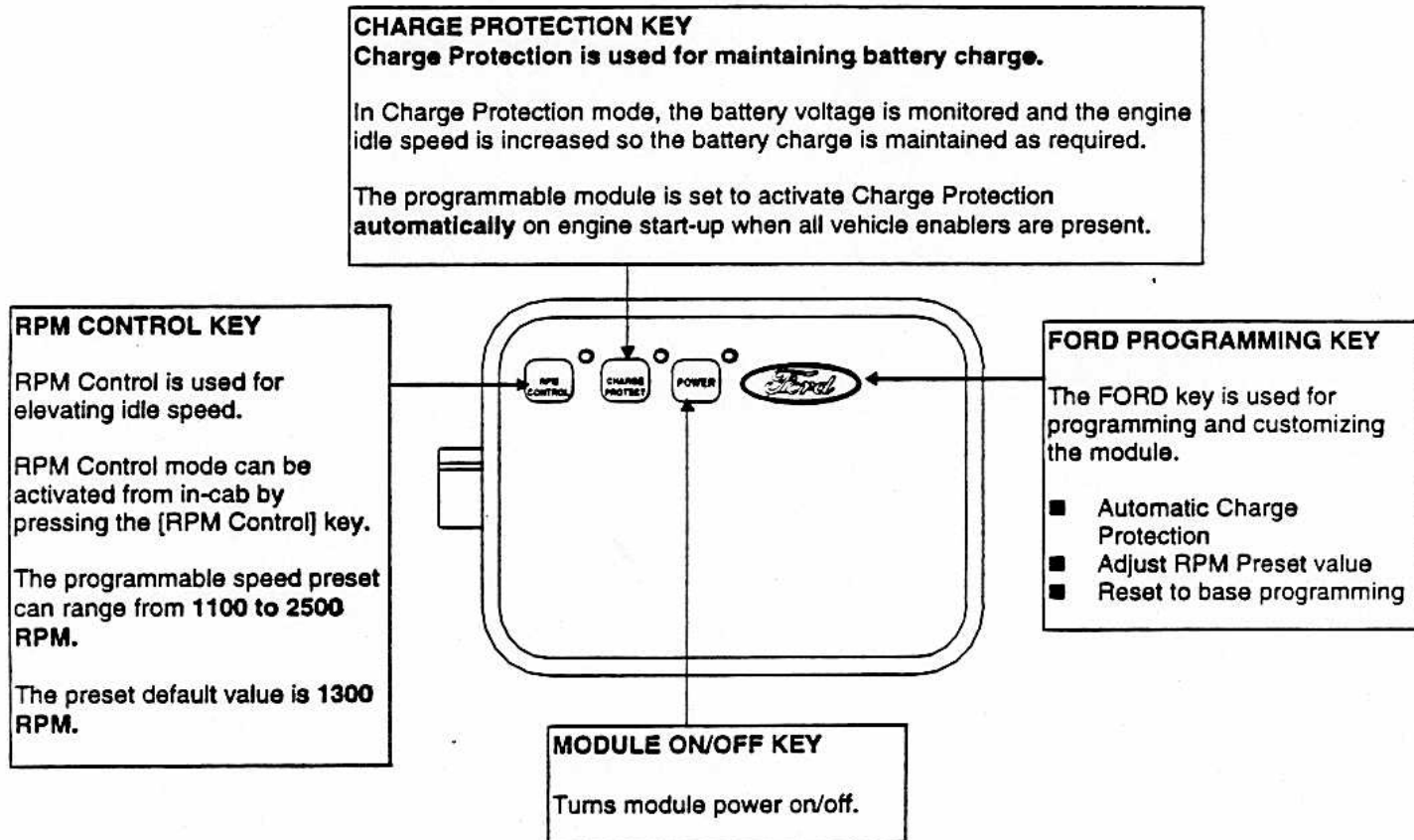


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This module is pre-programmed for Automatic Charge Protection. This means that on engine start-up, the Charge Protect light will flash. If all vehicle enabling conditions are met, Charge Protection mode will be entered automatically.*

1) To maintain battery voltage: (This is Charge Protection mode)

- Press [CHARGE PROTECT] key
 - >> Charge Protect light flashes
 - >> Engine speed increases based on voltage requirement
 - >> Battery voltage is displayed on the screen

2) To get a high idle speed: (This is RPM Control mode)

- Press [RPM CONTROL] key
 - >> RPM Control light flashes
 - >> Engine idle speed is elevated to the preset value
 - >> Current engine speed (RPM) is displayed on the screen

To go back to normal idle:

You can do ANY ONE of the following:

- Press [CHARGE PROTECT] key when in Charge Protection mode
- Press [RPM CONTROL] key when in RPM Control mode
- Press [FORD] key
- Press brake or clutch pedal, take out of park, or release parking brake
- Press [POWER] key (module is turned off)

Vehicle Enabling Conditions* - ALL must be met for any high idle mode.

1. Set Parking Brake
2. Gear selector in PARK for automatic transmissions
3. Foot off clutch pedal for manual transmissions
4. Foot off service brake
5. Foot off accelerator pedal
6. Brake lights are connected and functional

Section 2 CHARGE PROTECTION MODE

Charge Protection is used for maintaining system voltage.

In Charge Protection mode, the system (battery) voltage is monitored and the engine speed, in RPM, is increased so the voltage is maintained and battery charged as required. Charge Protection mode can be activated from in-cab or programmed to activate automatically on engine start-up. Charge Protection is for stationary use only.

This module is pre-programmed for Automatic Charge Protection.

This means that on engine start-up, the Charge Protect light will flash.

If all vehicle enabling conditions are met, Charge Protection mode will be entered automatically.

BASIC OPERATION

Step 1 Ensure all vehicle enabling conditions are met.

1. Set parking brake
2. For Automatic Transmission, put gear shift lever in PARK
(For Manual Transmission, foot off clutch pedal)
3. Foot off service brake
4. Foot off accelerator pedal
5. Vehicle is stationary
6. Engine is started and at idle

Step 2 Activate Charge Protection.

- Press [CHARGE PROTECT] key
 - » Charge Protect Light will flash
 - » Engine speed will increase
 - » Nominal system voltage will be displayed on screen

Exiting Charge Protection

ANY ONE of the following will exit Charge Protection and return engine to idle.

- Press [CHARGE PROTECT] key
- Press [FORD] key
- Press [POWER] key
- Release parking brake
- Take vehicle out of PARK
- Foot on brake
- Foot on clutch pedal

AUTOMATIC CHARGE PROTECTION

Automatic Charge Protection will function only in vehicles equipped with Automatic Transmissions.

It is not required to press any additional keys on the module for activation.

Exiting Automatic Charge Protection

Automatic Charge Protection will be exited for the run cycle (meaning until the ignition is turned off and back on) by pressing the [CHARGE PROTECT] or the [FORD] key. Charge Protection will not happen "automatically" until the next run cycle. Charge Protection can still be entered by pressing the [CHARGE PROTECT] key.

Automatic Charge Protection can be exited temporarily with the [POWER] key or any of the vehicle enablers (tapping the brake, taking the vehicle out of park, releasing the parking brake). This means that when the state is restored (module power is back on, foot is off the brake, etc.) the vehicle will automatically resume Charge Protection.

Automatic Charge Protection can be programmed off completely by pressing the [CHARGE PROTECT] and [FORD] keys simultaneously for 3 seconds. Charge Protection can still be commanded with the [CHARGE PROTECT] key, but is not automatic. To program back on, reset default programming.

PLEASE NOTE FOR VEHICLES EQUIPPED WITH AFTERMARKET ALTERNATORS

The adaptive Charge Protection mode for 1999 MY E-Series (Econoline) is calibrated to optimize the voltage regulator output of Ford alternators. Vehicles with non-Ford alternators in Charge Protection Mode may experience battery undercharging or engine speeds that seem excessive.

The recommendation is to use Charge Protection mode with Ford alternators. Otherwise, use RPM Control mode to control engine speed and charge the battery.

Section 3 RPM CONTROL MODE

RPM Control is used for elevating idle speed.

In RPM Control mode, the engine speed can be controlled between 1100 and 2500 RPM. There is one programmable RPM memory preset programmed initially to 1300 RPM.

Step 1 Ensure all vehicle enabling conditions are met.

1. Parking brake is set
2. For Manual Transmission, foot is off clutch pedal
3. For Automatic Transmission, gear shift lever is in PARK
4. Foot is off service brake
5. Foot is off accelerator pedal
6. Vehicle is stationary
7. Engine is started and idling

Step 2 Activate RPM Control Mode.

- Press [RPM CONTROL] key on module.
 - » RPM Control Light will flash
 - » Engine speed will increase to the desired RPM

Exiting RPM Control

ANY ONE of the following will exit RPM Control mode and return engine to idle.

- Press [RPM CONTROL] key
- Press [FORD] key
- Press [POWER] key
- Press brake
- Press clutch pedal
- Take vehicle out of PARK
- Release parking brake

Program a New RPM Preset Value

Make sure the vehicle is stationary (parking brake on and vehicle in park).

1. Increase the idle with the accelerator pedal to the desired engine speed and hold.
2. Press [RPM CONTROL] and [FORD] keys for 3 seconds to save current speed.
 - » RPM Control light will turn off when it is programmed successfully.

Section 4 PROGRAMMING THE MODULE

This section describes how to program the Ambulance Auxiliary Powertrain Control Module. There are three programming modes for customization to specific applications.

Reset Default Programming

Press the [CHARGE PROTECT], [RPM CONTROL], and [FORD] keys simultaneously for 5 seconds.

- » RPM Control light will flash once, then the Charge Protect light flashes when programmed successfully.
- » The default programming values are restored (Automatic Charge Protection ON and Preset 1300 RPM)

New RPM Preset Value

With the vehicle stationary (parking brake on and vehicle in park),

1. Increase the idle with your foot on the accelerator pedal to the desired engine speed and hold.
2. Press [RPM CONTROL] and [FORD] keys for 3 seconds to save current speed.
 - » RPM Control light will turn off when it is programmed successfully.
 - » The RPM preset speed can range from 1100 RPM to 2500 RPM.

Automatic Charge Protection Off/On

Program "Off" Automatic Charge Protection.

Press [CHARGE PROTECT] and [FORD] keys for 3 seconds to program off Automatic Charge Protection.

- » There is not an visual indication on the module when it is programmed off successfully.
- » When the ignition is turned off and back on, Charge Protection will not be entered automatically.

Program "On" Automatic Charge Protection.

Reset default programming with [CHARGE PROTECT], [RPM CONTROL], and [FORD] keys (see above).

Section 5 INSTALLATION

This section describes the installation of Auxiliary Idle Control Module.

The Installation Instruction sheet included in the kit describes the set-up of this module to the vehicle, including mounting bracket. Locate the mating 4-pin connector under the driver's side of the instrument panel and connect.

DO NOT CUT THE WIRING HARNESS for any reason. Cutting the harness can damage the communication lines.

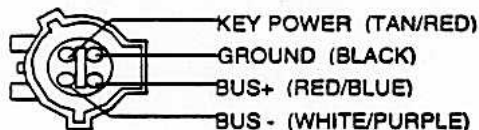
The APCM should be **MOUNTED IN-CAB ONLY**.

APCM MODULE HARNESS CONNECTORS

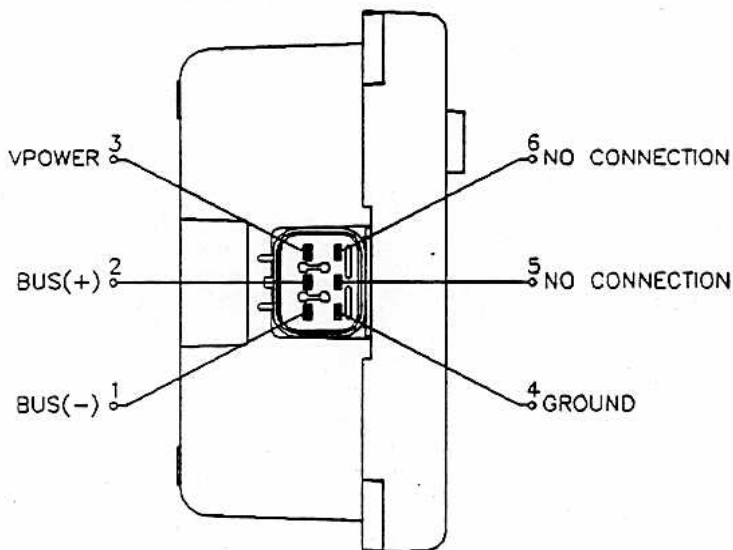
Vehicle Side: Ford Part No. E8EB-14A464-BZA



Module Side: Ford Part No. F3LB-12624-ZB



Module Connector Electrical Pin-Out



Section 6 DIAGNOSTICS AND TROUBLESHOOTING

PROBLEM OR SYMPTOM	ACTION
No backlight on FORD key or POWER key	Check power and ground lines.
APCM doesn't go into Automatic Charge Protection mode on start up. Light next to RPM Control key or Charge Protect key blinks briefly but does not stay lit.	Ensure that ALL of the enabling conditions are met: a) Parking brake set b) Clutch engaged (foot off) or transmission in PARK c) Foot off accelerator d) Brake lights connected and functional With APCM turned off, use NGS Tester to determine if there are any brake or clutch pedal fault codes. Check communication lines for one open or shorted. Cut SCP wires can cause this error. Replace wiring harness.

Section 7 FUNCTIONAL SPECIFICATION

VEHICLE REQUIREMENTS	
Enablers required to activate high-idle modes	<ul style="list-style-type: none"> - Parking brake engaged - Vehicle in PARK or clutch engaged (foot off) - Service brake off - Foot off accelerator - Brake lights connected and functional
Disablers allowing multiple ways of returning to idle	<ul style="list-style-type: none"> - Press brake or clutch pedal - Release parking brake - Take vehicle out of PARK - Deselect APCM function - Turn off power to APCM
CHARGE PROTECTION MODE	
Adaptive "Charge Protection"	<ul style="list-style-type: none"> - System voltage maintained - Engine RPM is adjusted according to voltage requirements
Programmable automatic activation of Charge Protection	<ul style="list-style-type: none"> - Automatic transmission is required - Default is Charge Protection is ON
Minimum activation RPM for Charge Protection	<ul style="list-style-type: none"> - 1100 RPM (1999 MY Econoline) - 1200 RPM (1999 MY F-Series) - 1300 RPM (Previous Model Years E/F-Series)
Maximum charge rate RPM	<ul style="list-style-type: none"> - 2500 RPM
RPM CONTROL MODE	
Selectable idle speed operation	<ul style="list-style-type: none"> - Preset RPM maintained with closed-loop engine speed control
Programmable RPM memory	<ul style="list-style-type: none"> - 1 setpoint
Minimum programmable RPM	<ul style="list-style-type: none"> - 1100 RPM
Maximum programmable RPM	<ul style="list-style-type: none"> - 2500 RPM
Default programmable RPM	<ul style="list-style-type: none"> - 1300 RPM

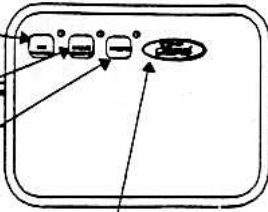
Ambulance Auxillary Idle Control Module Quick Reference Guide

[RPM CONTROL] key is used for elevating idle speed.

[CHARGE PROTECT] key is used for maintaining battery charge.

[POWER] key is used for turning off/on the module.

[FORD] key is used for programming and deactivation.



Programming the Module

1) Reset Default Programming

- Press the [CHARGE PROTECT], [RPM CONTROL], and [FORD] keys simultaneously for 5 seconds.
- The default values are restored: Automatic Charge Protection is ON and RPM preset is 1300 RPM.

2) Program New RPM Preset Value

- With the vehicle stationary (parking brake on and vehicle in park), increase the idle with the accelerator pedal to the desired speed.
- Press [RPM CONTROL] and [FORD] keys for 3 seconds to save. RPM Control light turns off when it is programmed successfully.
- The preset speed can range from 1100 RPM to 2500 RPM.

3) Program Automatic Charge Protection

- Press [CHARGE PROTECT] and [FORD] keys for 3 seconds to program off Automatic Charge Protection.
- Repeat this step to turn back on.

Ford Part No. XC3F-12B639-BA

Does the user need to be in RPM Control mode to program a new preset?
NO. Either will work.

Is the range 1300 or 1200?

All ranges are allowed (650 to 3000). Actual speed is limited by EEC to 1100 (E) or 1200 (F).

Date:		
Test Engineer:		KEY
Vehicle (Year, Model, Trans):		[RPM] = Press [RPM Control] key.
Vehicle Tag Number:		[CP] = Press [Charge Protect] key.
Strategy/Calibration:		[Power] = Press [Power] key.
APCM Hardware Version:		[Ford] = Press [Ford] key
APCM Software Version:		ACP = Automatic Charge Protection

STEP	PROCEDURE	EXPECTED OBSERVATION
1	Set vehicle enablers.	
	a Set parking brake.	
	b Put vehicle in Park.	
	c Foot off brake and accelerator pedal.	
	d Foot off clutch (manual transmission).	
2	Start engine.	All LEDs will flash on then off. The 'POWER' LED stays lit.
3	Test Charge Protection function.	
	a After 3 seconds, automatically enters into Charge Protect mode	Enters CHARGE PROTECT mode. Idle speed increases. CP LED blinks.
	b Press [CHARGE PROTECT].	Exits Automatic Charge Protect for the run cycle.
	c Press [CHARGE PROTECT].	Enters CP. Checks the 'CHARGE PROTECT' key.
	d Press [FORD].	Exits CP. Checks the 'FORD' key.
	e Press [CHARGE PROTECT].	Enters CP.
	f Press [POWER].	Exits CP. Module is powered off. Checks the 'POWER' key.
	g Press [POWER]. Press [CHARGE PROTECT].	Enters CP
	h Release parking brake.	Exits CP. Checks one vehicle disabling condition.
	i Engage parking brake.	
4	Test RPM Control function.	
	a Press [RPM CONTROL].	Enters RPM Control mode. Idle speed increases to 1300 RPM. RPM LED blink
	b Press [FORD].	Exits RPM CONTROL mode.
	c Press [RPM CONTROL].	Enters RPM.
	d Press [RPM CONTROL].	Exits RPM
	e Press [RPM CONTROL].	Enters RPM.
	f Press [POWER].	Exits RPM
	g Press [POWER]. Press [RPM CONTROL].	Enters RPM.
	h Depress brake pedal with foot.	Exits RPM. Checks one vehicle disabling condition.
	i Foot off brake pedal.	
5	Program off Automatic Charge Protection.	
	a Key off. Restart engine.	
	b After 3 seconds, automatically enters into Charge Protect mode	Enters CHARGE PROTECT mode. Idle speed increases. CP LED blinks.
	c Press [CHARGE PROTECT].	Exits CP
	d Hold [CHARGE PROTECT] and [FORD] for 3 seconds.	Programs off Automatic Charge Protection (ACP) until programmed on..
	e Key off. Restart engine.	All LEDs will flash on then off.
	f Wait 10 seconds.	Vehicle should not go into Automatic Charge Protection mode.
	g Reset ACP by pressing [RPM CONTROL], [CHARGE PROTECT], and [FORD] for 5 seconds	Resets to default programming. Automatic Charge Protection is ON.
	h Press [CHARGE PROTECT].	Exits CP
6	Program RPM Control Preset to Another Value	
	a Foot on accelerator pedal. Adjust speed to >1500 RPM and maintain.	
	b Hold [RPM CONTROL] and [FORD] for 3 seconds. Release keys when RPM light turns off.	Programs the memory preset to current RPM value.
	c Press [RPM CONTROL].	Enters RPM CONTROL mode. Idle speed increases to new value. RPM LED b
	d Press [FORD].	Exits RPM CONTROL
7	Program APCM to reset to default settings.	
	a Press [RPM CONTROL], [CHARGE PROTECT], and [FORD] for 5 seconds	This resets the module to default programming: - Automatic Charge Protection (ACP) is on - RPM Preset is 1300 RPM
	b After 3 seconds, automatically enters into Charge Protect mode	
	c Press [CHARGE PROTECT].	Exits CP.
	d Press [RPM CONTROL].	Enters RPM CONTROL mode. Idle speed increases to 1300. RPM LED blinks.
	e Press [FORD].	Exits RPM CONTROL
8	END OF TEST.	

NOTE: In the Low-Series "Ambulance APCM", Automatic Charge Protection will work in vehicles equipped with manual transmissions.

Programming Mode for the Auxiliary Powertrain Control Module

Press and hold [RPM CONTROL], [CHARGE PROTECT] & [FORD] keys for 3 seconds. When in programming mode, you will observe "1" on the screen.

Press [FORD] key to move to the next menu and to exit programming mode.

Press any ARROW key to toggle between the options in each menu.

MENU 1

Menu 1 is for
MANUAL RPM
CONTROL

"." will be blinking.

If ON: You see "vRMP
^RMP". Arrow keys
will change the
engine speed up or
down.

If Off: You don't see
"vRMP ^RMP".
Pressing the arrow
keys will have no
effect.

MENU 2

Menu 2 is for
CHARGE PROTECTION

"v" will be blinking.

If ON: You see
"CHARGE".
Pressing [Charge
Protect] key will
activate Charge
Protection mode.

If Off: You don't see
"CHARGE".
Charge Protection
mode is inactive.
Pressing [Charge
Protect] key will
have no effect.

MENU 3

Menu 3 is for
RPM CONTROL

"RPM" will be blinking.

If ON: You see another
"RPM". Pressing
[RPM Control] then
[Ford] key will activate
RPM Control mode.

If Off: You don't see another
"RPM". RPM Control
mode is inactive.
Pressing [RPM
Control] key will have
no effect.

MENU 4

Menu 4 is for
AUTOMATIC MODE

If BASE: Automatic modes
are inactive.
Requires customer
to press keys to
activate high idle
modes.

If A CP: Automatic Charge
Protection mode is
active.

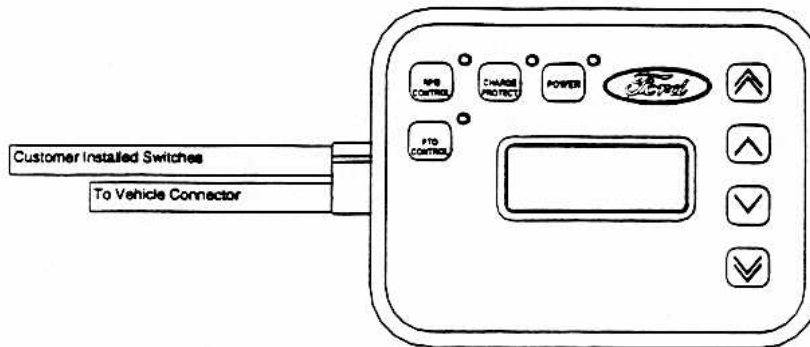
If A Sr: Automatic RPM
Control mode is
active.

AUXILIARY POWERTRAIN CONTROL MODULE NEW VS. PREVIOUS FUNCTIONS

1999 Auxiliary Idle Module - Full Function

Availability: 2/99

Key Vehicle Program: F-Series Super Duty



FUNCTIONS

NEW Remote Control/Activation

- Remote RPM Control for on/off high idle
- Remote Charge Protection for on/off battery protection
- Remote Custom RPM Control for adjustable idle speed
- Remote PTO operation can be done by programming "Custom RPM and PTO Linked"

NEW Power Take-Off

- PTO Control output for activating both the PTO solenoid and PTO circuit to EEC.
- PTO Control lower limit for maximum clutch engagement (PTO won't turn on unless below this RPM)
- PTO Control upper limit for overspeed (PTO turns off when above this RPM)
- RPM and PTO Control can be linked to work together (turns on PTO and elevates idle together)

Carryover Functions

- Battery Charge Protection
- High Idle Control (adjustable, programmable settings)
- LCD RPM/Voltage Readout
- RPM Control for high engine idle speed (can use for stationary PTO applications)
- Automatic Charge Protection and Automatic RPM Control for high idle engagement on start-up

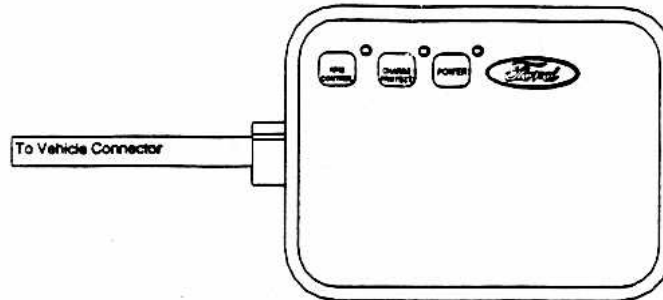
NOTE FOR ALL APCM TYPES

- Requires 7.3L diesel engine
- For stationary use only
- Kit includes module, wire harness, mounting bracket, and instruction manuals
- Kit is shipped in box to vehicle assembly plants, box is placed on front seat

1999 Ambulance Auxiliary Idle Module

Availability: 2/99

Key Vehicle Program: Econoline E350/Super Duty

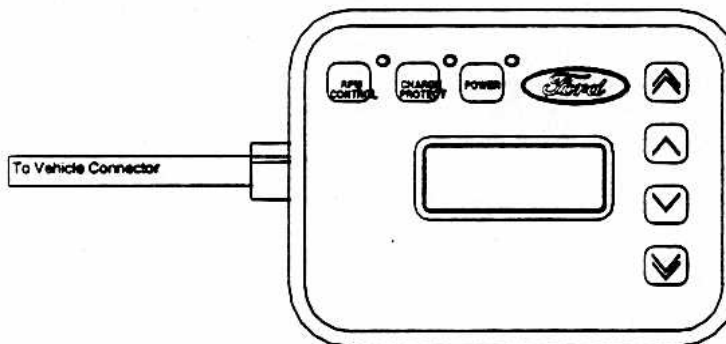


FUNCTIONS

- Automatic Charge Protection for high idle on start-up (programmable on/off)
- RPM Control with one memory preset (programmable)

Carryover Auxiliary Powertrain Control Module

This is available today and will be replaced by 1999 models.

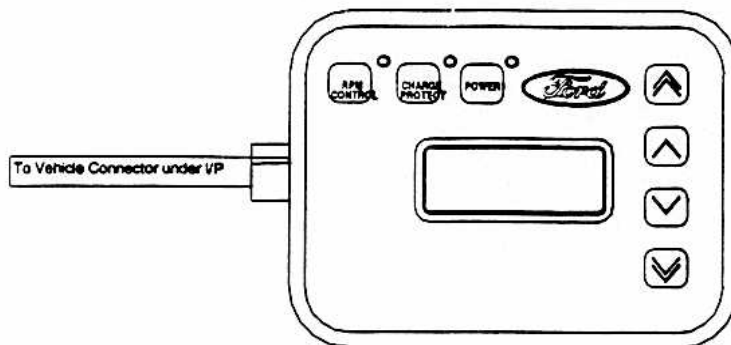


FUNCTIONS

- Battery Charge Protection
- High Idle Control (adjustable, programmable settings)
- LCD RPM/Voltage Readout
- RPM Control for high engine idle speed (can use for stationary PTO applications)
- Automatic Charge Protection and Automatic RPM Control for high idle on start-up (No operator input is required, can 'hide' module, good for ambulance & cold weather applications)

QUICK REFERENCE

Programming the Auxiliary Powertrain Control Module



PROGRAMMING AUTOMATIC CHARGE PROTECTION

1. Press and hold (RPM CONTROL), (CHARGE PROTECT), AND (FORD) keys for 3 seconds.
2. When in programming mode, you should see a blinking "." and 1 on the screen.
3. Press the (FORD) key 3 times. You should see the word "BASE".
4. Press any ARROW key to toggle to the "A Cp" option.
5. Press the (FORD) key to exit programming mode.

The APCM is now programmed for Automatic Charge Protection.

Verify that when all vehicle's enabling conditions* are met, the engine speed elevates automatically and system voltage is displayed.

PROGRAMMING AUTOMATIC RPM CONTROL

1. Repeat steps 1-4 above.
2. Use arrow key to select "A Sr" option (Automatic Selectable RPM).
3. Press the (FORD) key to exit programming mode.

The APCM is now programmed for Automatic RPM Control.

Verify that when all vehicle's enabling conditions* are met, the engine speed elevates automatically to preset #1 (double up arrow) and current engine speed is displayed.

* Vehicle Enabling Conditions

- Set parking brake
- Gear lever in park (automatics)
- Foot off clutch pedal (manuals)
- Foot off brake
- Foot off accelerator pedal
- Brake lights connected and functional,
- Applicable vehicle sensors are functional (i.e., no fault codes)