

Computers and Control Systems: Initial Inspection and Diagnostic Overview

Flash Electrically Erasable Programmable Read Only Memory

FLASH ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY (EEPROM)

Description

The flash electrically erasable programmable read only memory (EEPROM) is contained in an integrated circuit (IC) internal to the PCM. The EEPROM contains the vehicle strategy including calibration information specific to the vehicle, and is capable of being programmed or flashed repeatedly.

As part of the calibration there is an area referred to as the vehicle identification (VID) block. The VID block is programmed when installing a new PCM as described under Programming the VID Block for a Replacement PCM. Failure to carry out this procedure may generate fault code P1635 or P1639. The VID block in an existing PCM can also be tailored to accommodate various hardware or parameter changes made to the vehicle since production. Failure to carry out this procedure properly may generate fault code P1635, Tire/Axle Ratio out of Acceptable Range. An incorrect tire/axle ratio is one of the main causes for fault code P1639. This is described under Making Changes to the VID Block and also under Making Changes to the PCM Calibration. The VID block contains many items used by the strategy for a variety of functions. Some of these items include the VIN, octane adjust, fuel octane, fuel type, vehicle speed limit, tire size, axle ratio, the presence of speed control, and four wheel drive electronic shift-on-the-fly (ESOF) versus manual shift-on-the-fly (MSOF). Only items applicable to the vehicle hardware and supported by the VID block will display on the diagnostic tool.

When changing items in the VID block, the strategy places range limits on certain items such as tire and axle ratio. The number of times the VID block may be reconfigured is limited. When this limit is reached, the diagnostic tool displays a message indicating the need to flash the PCM again to reset the VID block.

Each of the procedures described below use the Worldwide Diagnostic System (WDS). Programming can be carried out by a local Ford dealer or any non-Ford facility. There are other enhanced diagnostic tools that may have programming capabilities available. Refer to the manufacturer's user manual for details.

Programming the VID Block for a Replacement PCM

A new PCM contains the latest strategy and calibration level for a particular vehicle. However, the VID block is blank and will need programming. There are two procedures available. The first is an automatic data transfer from the old PCM to the new PCM, and the second is manual data entry into the new PCM.

Automatic data transfer is carried out if the old PCM is capable of communicating. This is done by the use of a diagnostic tool to retrieve data from the old PCM before removing it from the vehicle. The stored data can now be downloaded to the new PCM after it has been installed.

Manual data entry must be carried out if the old module is damaged or incapable of communicating. Remove and install a new PCM. Using a compatible diagnostic tool, select and carry out the Module/Parameter programming, referring to the manufacturer's user manual. Make certain that all parameters are included. Failure to properly program tire size in revolutions per mile, (rev/mile = 83,360 divided by the tire circumference in inches), axle ratio, 4x4/4x2, and/or MSOF/ESOF may result in codes P1635 and P1639. You may be instructed to contact the As-Built Data Center for the information needed to manually update the VID block with the diagnostic tool. Contact the center only if the old PCM cannot be used or the data is corrupt. For Ford and L-M technicians, contact your National Hotline or the Professional Technician Society (PTS) web site for As-Built data. Non-Ford technicians use the Motorcraft website at www.motorcraft.com. From the Motorcraft homepage, use the search function to find the Module Programming or As Built Data.

For Ford and L-M technicians, check the Programmable Module Installation link on the PTS website for quick Programmable Module data information by vehicle when using the WDS or New Generation Star (NGS).

Making Changes to the VID Block

A PCM which is programmed may require changes to be made to certain VID information to accommodate the vehicle hardware. Refer to PCM/Module Reprogramming on the diagnostic tool.

Making Changes to the PCM Calibration

At certain times, the entire EEPROM needs to be completely reprogrammed. This is due to changes made to the strategy or calibration after production, or the need to reset the VID block because it has reached its limit. Refer to PCM/Module Reprogramming on the diagnostic tool.