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## Flash Electrically Erasable Programmable Read Only Memory (EEPROM)

### Description

The EEPROM is contained in an integrated circuit internal to the powertrain control module (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 DTC 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 DTC P1635, Tire/Axle Ratio out of Acceptable Range. An incorrect tire/axle ratio is one of the main causes for DTC 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 vehicle identification number (VIN), octane adjust, fuel octane, fuel type, vehicle speed limit, tire size, axle ratio, the presence of speed control, and 4-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 is displayed on the scan 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 scan tool displays a message indicating the need to flash the PCM again to reset the VID block.

On selected vehicles equipped with permanent DTC reporting capabilities, neutral profile correction should be learned after a PCM replacement in order to activate the misfire monitor. This can be accomplished using the Misfire Monitor Neutral Profile Learn function on the scan tool.

Programming can be carried out by a local Ford dealer or any non-Ford facility. Refer to the scan tool manufacturer's instruction manual for details.

### Neutral Profile Correction

In order for the misfire detection system to function properly, any mechanical inaccuracies in the crankshaft position (CKP) sensor must be learned by the PCM. This information is stored in non-volatile memory (NVM) in the PCM. It is not cleared when the keep alive memory (KAM) is reset.

Neutral profile learning is accomplished using the scan tool any time a PCM is replaced. It should also be relearned any time the CKP sensor is replaced or major engine repairs have been completed.

To determine if the neutral profile learning has been completed, check the MP\_LRN parameter identification (PID) using the scan tool. The PID should read YES if the neutral profile learning has been completed. If the PID reads NO, complete the neutral profile learning prior to diagnosing any misfire DTCs.

### Programming the VID Block for a Replacement PCM

The VID block on a replacement PCM is blank and requires 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 using a scan tool to retrieve data from the old PCM before removing it from the vehicle. The stored data can be downloaded to the new PCM after it has been installed.

Carry out manual data entry if the old PCM is damaged or incapable of communicating. Remove and install a new PCM. Using a compatible scan tool, select and carry out the module/parameter programming, referring to the scan tool manufacturer's instruction manual. Make certain that all parameters are included. Failure to

properly program tire size in revolutions per mile, (rev/mile equals 63,360 divided by the tire circumference in inches), axle ratio, 4x4/4x2, and/or MSOF/ESOF may result in DTCs 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 scan tool. Contact the center only if the old PCM cannot be used or the data is corrupt. For Ford and Lincoln Mercury technicians, contact your National Hotline or the Professional Technician Society (PTS) website for As-Built data listed under the Service Publications Index. Non-Ford technicians use the Motorcraft® website at [www.motorcraft.com](http://www.motorcraft.com). From the Motorcraft® homepage, use the search function to find the Module Programming or As-Built Data.

For Ford and Lincoln Mercury technicians, check the Programmable Module Installation link on the PTS website for quick Programmable Module data information by vehicle.

## **Making Changes to the VID Block**

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

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