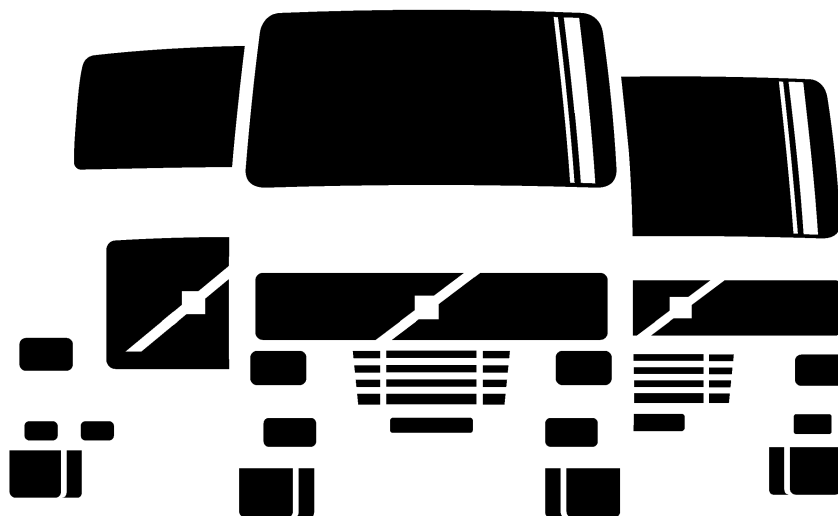


# Service Manual Trucks

Group **28**

MID 128 Fault Code Guide  
2007 Emissions  
VN, VHD VERSION2, VT



# Foreword

The descriptions and service procedures contained in this manual are based on designs and methods studies carried out up to October 2008.

The products are under continuous development. Vehicles and components produced after the above date may therefore have different specifications and repair methods. When this is believed to have a significant bearing on this manual, supplementary service bulletins will be issued to cover the changes.

The new edition of this manual will update the changes.

In service procedures where the title incorporates an operation number, this is a reference to an V.S.T. (Volvo Standard Times).

Service procedures which do not include an operation number in the title are for general information and no reference is made to an V.S.T.

Each section of this manual contains specific safety information and warnings which must be reviewed before performing any procedure. If a printed copy of a procedure is made, be sure to also make a printed copy of the safety information and warnings that relate to that procedure. The following levels of observations, cautions and warnings are used in this Service Documentation:

**Note:** Indicates a procedure, practice, or condition that must be followed in order to have the vehicle or component function in the manner intended.

**Caution:** Indicates an unsafe practice where damage to the product could occur.

**Warning:** Indicates an unsafe practice where personal injury or severe damage to the product could occur.

**Danger:** Indicates an unsafe practice where serious personal injury or death could occur.

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# Group 28

## Design and Function

### Engine Control System

The "Premium Tech Tool" (PTT) is the preferred tool for performing diagnostic work. Contact your local dealer for more information or visit "www.premiumtechtool.com".

### System Overview

Five electronic control modules are used; the Engine Management System (EMS) Module, Instrument Cluster Module (ICM), Vehicle Electronic Control Unit (VECU), Transmission Electronic Control Unit (TECU) and the Gear Selector Electronic Control Unit (GSECU). Together, these modules operate and communicate through the J1939 high speed serial data line to control a variety of engine and vehicle cab functions. The Engine Management System (EMS) Module controls fuel timing and delivery, fan operation, engine protection functions, engine brake operation, the EGR valve, and the turbocharger nozzle. The Vehicle Electronic Control Unit (VECU) controls cruise control functions, accessory relay controls and idle shutdown functions. The Instrument Cluster Module (ICM) primarily displays operational parameters and communicates these to the other ECU's. All have the capability to communicate over the J1587 normal speed data lines primarily for programming, diagnostics and data reporting.

In addition to their control functions, the modules have on-board diagnostic capabilities. The on-board diagnostics are designed to detect faults or abnormal conditions that are not within normal operating parameters. When the system detects a fault or abnormal condition, the fault will be logged in one or both of the modules' memory, the vehicle operator will be advised that a fault has occurred by illumination a malfunction indicator lamp and a message in the driver information display, if equipped. The module may initiate the engine shutdown procedure if the system determines that the fault could damage the engine.

In some situations when a fault is detected, the system will enter the "limp home" mode. The limp home mode allows continued vehicle operation but the system may substitute a sensor or signal value that may result in poor performance. In some instances, the system will continue to function but engine power may be limited to protect the engine and vehicle. Fault codes logged in the system memory can later be read, to aid in diagnosing the faults, with a diagnostic computer or through the instrument cluster display, if equipped. When diagnosing

an intermittent code or condition, it may be necessary to use a diagnostic computer connected to the Serial Communication Port.

Additional data and diagnostic tests are available when a diagnostic computer is connected to the Serial Communication Port.

For diagnostic software, contact your local dealer.

The Vehicle Electronic Control Unit (VECU) is mounted on a panel below the top dash access panel in the center of the dash on conventional models. The VECU is a microprocessor based controller programmed to perform several functions, these include:

- Driver controls
- Vehicle and engine speed controls
- Starter control
- Cab power
- Idle controls
- Broadcasting data on the serial data lines
- Trip data logging
- Diagnostic fault logging and password processing

The VECU performs these functions by monitoring the signals from sensors and switches, and data received over the serial data lines from the other ECU's. The VECU directly monitors the Throttle Position (TP) Sensor and Vehicle Speed Sensor (VSS).

The VECU also monitors the position or state of a number of switches to perform its control and diagnostic functions. They are:

- A/C Pressure Switch
- Air Suspension Height Control Switch
- Differential Lock Switch
- Engine Brake Switches
- Ignition Key Switch
- PTO Switches (if equipped)
- Service and Park Brake Switches
- Speed Control Switches (Set/Decel, Resume/Accel)
- 5th Wheel Slide Switch