

372: Central electronic module (CEM)

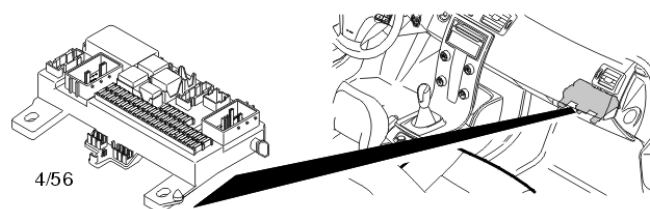
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**PRINT****372: Central electronic module (CEM)**

Control module

Signals

System overview**Control module**

The role of the central electronic module (CEM) is to act as a bridge between the low and high speed sections of the controller area network (CAN) and the data link connector (DLC).

It also manages the following functions:

- alarm
- lock
- immobilizer
- headlamps
- headlamp range adjustment (certain markets)
- parking lamps
- front fog lamps
- rear fog lamps
- back-up lamp
- high level stop lamp

- turn signal lamps
- wiper/washer windshield/rear window/headlights (wiper/washer for rear window only C30/V50)
- headlamp washer
- roof hatch
- rain sensor
- horn
- clock
- seat belt reminder
- interior roof lighting
- sun visor lighting
- courtesy/glove compartment lighting
- cargo compartment lighting
- fuel level
- fuel pump
- corrosion preventative fuel tank (only B4184S8)
- rear windshield heating
- electrically heated seats
- memory function for power seats
- power supply (generator control)
- starter motor
- current limiting
- LEDs in doors for lock indication (only C70)
- LEDs in switch roof movement (2008-) (only C70)
- alcolock (option 2009-)
- secondary battery (2010-, only vehicles with the function automatic start/stop of engine)
- regenerative charging (only in vehicles with the brake energy regeneration function 201020-)
- daytime running lights (from structure week 201044, option).

The control module is below the glove compartment on the passenger side. The entire control module is removed from the car during replacement.

A car configuration file is stored in the central electronic module (CEM). This file contains information about:

- the VIN of the car
- the structure week
- the equipment level of the car.

When replacing the central electronic module (CEM), the VIN cannot be read off until the software has been downloaded from the Volvo central database.

The central electronic module (CEM) communicates with directly connected components and with other control modules and components via serial communication and the control area network (CAN).

The control module contains two processors. One is connected to both the high and low speed sections of the controller area network (CAN). The other is only connected to the low speed section.

The central electronic module (CEM) uses built in diagnostics to check all activations and the input and output signals. A diagnostic trouble code (DTC) is stored if the control module detects a fault. In certain cases, the incorrect signal is replaced with a substitute value. Other control modules use the network to report to the central electronic module (CEM) if they have diagnostic trouble codes (DTCs) stored. This function is used when reading off diagnostic trouble codes (DTCs) without VIDA.

Any diagnostic trouble codes (DTCs) are stored in the

control module memory. This information can be read off using VIDA via the data link connector in the vehicle.

The easiest way to check if the central electronic module (CEM) is grounded and receiving power is to activate the hazard warning signal flasher. The central electronic module (CEM) is powered if the function operates.

For further information, also see Signal specifications.

Signals

The table below summarizes the input signals to and output signals from the central electronic module (CEM). The signal types are divided into directly connected signals, serial communication and controller area network (CAN) communication.

Input signals	Output signals
<p>Directly connected:</p> <ul style="list-style-type: none"> ■ Horn switch ■ Trunk lid, unlocking ■ Deadlocking switch ■ Stop lamp switch ■ Fuel tank filler cap, unlocking ■ Private locking switch ■ Control signal for doors/hatches (x6) ■ Blower fan, re-supply ■ Twilight sensor ■ Sun sensor ■ Fuel level sensor ■ The DC/AC converter fuel tank (only B4184S8) ■ Fuel level sensor (AWD) 	<p>Directly connected:</p> <ul style="list-style-type: none"> ■ Parking lamps ■ License plate lighting ■ Brake light ■ Dipped beam ■ Passenger compartment lighting ■ Fog tail lamps ■ Hazard warning signal flasher indicator lamp ■ Shift lock ■ High level stop lamp ■ PAD-warning light (passenger airbag disconnected warning lamp) ■ PAE-warning light (warning light activated airbag passenger) (2008-)

- Seat belt buckle sensor, rear (x3)
- Supplemental Restraint System Module (SRS), collision output signal
- Hazard warning signal flasher switch
- Vicinity signal, ignition key
- Dip switch
- Sun roof speed signal
- Washer fluid level sensor
- Fuel pump, re-supply
- Brake fluid level switch
- Reverse gear sensor
- Parking brake switch
- Clutch pedal sensor (5 cylinder petrol engines with manual transmissions)
- Clutch pedal switch (diesel engines with manual transmissions)
- Accelerator pedal (AP) position sensor
- Battery temperature sensor (replaced by software starting from structure week 200605)
- Outside temperature gauge
- Light switch module (LSM)
- Secondary battery (2010-, only on vehicles with the function automatic start/stop of engine).

- Seat belt reminder
- Fuel tank filler cap, unlocking
- Turn signal lamps
- Malfunction indicator lamp (MIL).
- Alarm LED
- Mass movement sensor module (MMS), or ultrasonic sensor module (IMS), voltage supply
- Steering Column Lock Module (SCL), wake-up (does not apply to USA/CDN market for 2009-).
- Engine control module (ECM), stimulation
- Dimmer switch, instrument lighting
- Trunk lid, unlocking
- Receiver, power supply
- Sun roof, closing signal
- Frequency signal, electrical additional heater
- Frequency signal blower fan
- Indicator lamp, deadlock
- Passenger seat sensor, supply voltage
- Fuel pump, relay
- Infotainment relay
- Rear windshield washer, relay
- High beam, relay
- Front windshield washer, relay
- Rear demist, relay
- Extended power supply, relay
- Passenger compartment lighting (power supply)
- Reversing lamp, relay
- Ignition switch interlock, relay
- Front fog lamps, relay
- Headlamp washer, relay
- Horn, relay
- Tailgate wiper, relay
- Light switch module (LSM)
- LEDs in doors for lock indication (only C70)
- LEDs in switch roof movement (only C70, 2008-)
- Humidity sensor, voltage supply (option, only ECC 2008-)
- Alcolock, voltage supply (option 2009-)

	<ul style="list-style-type: none"> ■ Daytime running lights, relay (from structure week 201044, option)
<p>Via serial communication:</p> <ul style="list-style-type: none"> ■ Gas discharge lamp module (GDL) (2 pcs.) (optional equipment) (S40/V50 -200719, C30/C70 -200945) ■ Remote control receiver ■ Rain sensor module (RSM) (optional extra) ■ Steering Column Lock Module (SCL) (does not apply to USA/CDN market for 2009-). ■ Siren control module (SCM) (optional extra) ■ Start control module (SCU) ■ Wiper motor module (WMM) ■ Sun roof module (SRM) ■ Humidity sensor (option, only ECC 2008-) ■ Battery monitoring sensor (7/240), with signals about the battery's (main battery) status. Only on vehicles with the function brake energy regeneration 201020- (for D4164T the battery monitoring sensor is connected to Engine control module (ECM)). 	<p>Via serial communication:</p> <ul style="list-style-type: none"> ■ Gas discharge lamp module (GDL) (2 pcs.) (optional equipment) (S40/V50 -200719, C30/C70 -200945) ■ Remote control receiver ■ Rain sensor module (RSM) (optional extra) ■ Steering Column Lock Module (SCL) (does not apply to USA/CDN market for 2009-). ■ Siren control module (SCM) (optional extra) ■ Start control module (SCU) ■ Wiper motor module (WMM) ■ Sun roof module (SRM) ■ Humidity sensor (option, only ECC 2008-) ■ Battery monitoring sensor (7/240), with signals such as start key position and diagnostic commands. Only on vehicles with the function brake energy regeneration 201020- (for D4164T the battery monitoring sensor is connected to Engine control module (ECM)).
<p>Via Controller Area Network (CAN) communication:</p> <ul style="list-style-type: none"> ■ Accessory electronic module (AEM) (optional extra) ■ Brake control module (BCM) ■ Climate control module (CCM) ■ Combustion preheater module (CPM) (optional extra) ■ Driver door module (DDM) ■ Driver information module (DIM) ■ Engine control module (ECM) ■ Electrical power steering module (EPS) ■ Infotainment control module (ICM) ■ Passenger door module (PDM) ■ Phone module (PHM) (optional extra) ■ Power seat module (PSM) (optional extra) ■ Supplemental restraint system module (SRS) ■ Steering wheel module (SWM) ■ Transmission control module (TCM) (optional extra) ■ Trailer module (TRM) (optional extra). 	<p>Via Controller Area Network (CAN) communication:</p> <ul style="list-style-type: none"> ■ Accessory electronic module (AEM) (optional extra) ■ Brake control module (BCM) ■ Climate control module (CCM) ■ Combustion preheater module (CPM) (optional extra) ■ Driver door module (DDM) ■ Driver information module (DIM) ■ Engine control module (ECM) ■ Electrical power steering module (EPS) ■ Infotainment control module (ICM) ■ Passenger door module (PDM) ■ Phone module (PHM) (optional extra) ■ Power seat module (PSM) (optional extra) ■ Supplemental restraint system module (SRS) ■ Steering wheel module (SWM) ■ Transmission control module (TCM) (optional extra) ■ Trailer module (TRM) (optional extra).

- Convertible Roof Module (CRM) (only C70)
- Headlamp Control Module (HCM) (S40/V50 200720-, C30/C70 200946-)

- Convertible Roof Module (CRM) (only C70)
- Power seat module, left (PSL) (only C30/C70)
- Power seat module, right (PSR) (only C30/C70)
- Headlamp Control Module (HCM) (S40/V50 200720-, C30/C70 200946-)

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