

Battery Management System (BMS) Ford

The battery management system (BMS) monitors battery conditions and takes actions to extend battery life. If excessive battery drain is detected, the system may temporarily disable certain electrical features to protect the battery. Those electrical accessories affected include the rear defrost, heated/cooled seats, climate control fan, heated steering wheel, audio and navigation system. A message may be shown in the information displays to alert the driver that battery protection actions are active. These messages are only for notification that an action is taking place, and not intended to indicate an electrical problem or that the battery requires replacement.

Electrical accessory installation

To ensure proper operation of the BMS,
any electrical devices that are added to the vehicle should not have their ground connection made directly at the negative battery post.

A connection at the negative battery post can cause inaccurate measurements of the battery condition and potential incorrect system operation.

Note:

Electrical or electronic accessories added to the vehicle by the dealer or the owner may adversely affect battery performance and durability, and may also affect the performance of other electrical systems in the vehicle.

When a battery replacement is required, the battery should only be replaced with a Ford recommended replacement battery which matches the electrical requirements of the vehicle. After battery replacement, or in some cases after charging the battery with the external charger, the BMS requires eight hours of vehicle sleep time (key off with doors closed) to relearn the new battery state of charge. Prior to relearning the state of charge, the BMS may disable electrical features (to protect the battery) earlier than normal.

This is from a workshop manual

Charging System

The charging system is a negative ground system consisting of:

- a generator with an internal voltage regulator
- a charging system warning indicator
- a battery
- circuitry and cables
- a PCM

- a radial arm adapter (serviced separately from the generator)
- a battery current sensor (this is what's in the picture)
- a generator current sensor

The generator is driven by the accessory drive belt. When the engine is started, the generator begins to generate AC voltage which is internally converted to DC voltage. The DC voltage is controlled by the voltage regulator (located on the rear of the generator) and supplied to the battery. The PCM controls the voltage regulation set point, working with the generator internal voltage regulator over 2 control and communication circuits.

This vehicle is equipped with load shed strategy. The Body Control Module (BCM) monitors the battery state of charge using the battery current sensor attached to the negative battery cable and the battery open circuit voltage as measured by the BCM during 8 continuous hours of vehicle sleep time (ignition off with doors closed).

With the engine off and the ignition in the ACC, RUN or delayed accessory position, when the BCM determines the battery state of charge is low, a message is sent to shut down the audio/navigation system in order to save the remaining battery charge.

Under this condition:

- the Front Display Interface Module (FDIM) displays

SYS OFF TO SAVE BATT (without navigation) or BATTERY SAVER — SYSTEM OFF
PLEASE START THE ENGINE (with navigation).

- the Instrument Panel Cluster (IPC) message center may also display

TURN POWER OFF TO SAVE BATT (base message center) or TURN POWER OFF TO SAVE BATTERY
(optional message center) to notify the driver that battery protection actions are active.

- the battery indicator may also illuminate.

If the vehicle battery has been charged or battery replaced, it takes approximately 8 hours for the BCM to learn the new battery state of charge. During this 8 hour period, the vehicle must be undisturbed, with no doors opened or keyless entry buttons pressed. If the vehicle is used before the BCM is allowed to learn the new battery state of charge, engine off load shedding may occur earlier than normal and a message may be displayed.

If the vehicle has been jump started, engine off load shedding can still occur and a message may be

displayed until the BCM determines the battery state of charge is above 40%.

With the engine running, when the BCM and Power Steering Control Module (PSCM) voltage is low, a message is sent from the BCM to either minimize or shut down the climate controlled seats, rear defrost, heated mirrors and Dual Automatic Temperature Control (DATC) blower motor to improve system voltage. Under this condition, the IPC message center displays either LOW BATTERY LESS FEATURES (base message center) or LOW BATTERY FEATURES TEMPORARILY TURNED OFF (optional message center) to notify the driver that battery protection actions are active.

The BCM gets its info from the BMS.

Quelle: <https://lockdownsecurity.forumbee.com/t/m2gvh9/ford-trucks-bms-battery-monitoring-systems>