

2022 CHEVROLET CORVETTE SERVICE MANUAL

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Instrument Cluster Description and Operation

The instrument cluster is a multifunction module that provides the vehicle operator with information that is critical to vehicle operation, such as vehicle speed, engine RPM, and coolant temperature, using an interactive LCD display. The instrument cluster is highly reconfigurable, with four different themes available for selection. The instrument cluster also provides the operator with operational warnings and message through various indicators and the driver information center. Because the instrument cluster is an LCD display, driver information center elements are located in various zones of the display, depending on how the instrument panel is configured.

Indicators and Warning Messages

Refer to Indicator/Warning Message Description and Operation.

Engine Coolant Temperature Gauge

The instrument cluster displays the engine coolant temperature as determined by the engine control module (ECM). The ECM sends the engine coolant temperature information via serial data to the body control module (BCM). The BCM then sends the information via a serial data to the instrument cluster to display the engine coolant temperature.

Fuel Level Gauge

The instrument cluster displays the fuel level based on the information from the ECM. The ECM converts the data from the fuel level sensors to a fuel level signal. The ECM sends the fuel level signal via serial data to the BCM. The BCM then sends the information via serial data to the instrument cluster to display the fuel level. If the fuel level falls under 11% the instrument cluster will illuminate the low fuel level indicator. The fuel gauge defaults to empty if:

- The ECM detects a malfunction in the fuel level sensor circuit.
- The BCM detects a loss of serial data communications with the ECM.
- The instrument cluster detects a loss of serial data communications with the BCM.

Speedometer

The instrument cluster displays the vehicle speed based on the information from the ECM. The ECM sends the vehicle speed information via serial data to the BCM. The BCM then sends the vehicle speed information via serial data to the instrument cluster to display the vehicle speed.

Odometer

The instrument cluster displays the vehicle odometer in the driver information center. The ECM send a distance rolling count message via serial data to the body control module (BCM). The BCM uses this information to calculate the vehicle odometer. This odometer value is then sent to the instrument cluster. The instrument cluster does not calculate the odometer.

The odometer value is stored in multiple modules. The instrument cluster is a secondary storage module for the odometer, while the BCM is the primary storage and accumulator.

In addition to storing the odometer value for the vehicle, the instrument cluster and the BCM store the VIN. Software checks are performed to ensure these modules, and their stored odometer information, can not be move or transferred between different vehicles.

Tachometer

The instrument cluster displays the engine speed based on the information from the ECM. The ECM converts the data from the crankshaft position sensor to an engine revolution signal. The ECM sends the engine speed information via serial data to the BCM. The BCM then sends the information via serial data to the instrument cluster to display the engine speed.

Compass

The vehicle compass information is gathered through the Telematics Communication Interface Control Module. The Telematics Communication Interface Control Module determines vehicle direction and communicates this with the BCM through serial data. The BCM sends the compass information to the Instrument Cluster via serial data, where it is displayed.

Outside Air Temperature

The outside air temperature (OAT) can be viewed on the Info Display Module . The Info Display Module shows the outside air temperature as a damped value. The time and rate of the temperature update is based on an algorithm in the instrument cluster. Factors such as last temperature reading, current temperature reading, length of time the vehicle was off, current vehicle speed, and the distance driven effect when the displayed temperature is updated. To get the vehicle to display the most accurate temperature faster, drive the vehicle. Constant moving traffic will update the display to the correct temperature more quickly than stop and go traffic.

The OAT uses a filter routine to minimize false updates due to engine heat or road heat.

Vehicle Outside

- Vehicle parked more than 2 hours: The OAT updates to the current sensor reading
- Vehicle parked less than 2 hours AND the new reading is LESS than the vehicle shutdown reading: The OAT updates to the current reading.
- Vehicle parked less than 2 hours AND the new reading is MORE than the vehicle shutdown reading: The vehicle will startup with the shutdown reading. As the vehicle is driven at speeds over 19 mph (30km/h) the filter counter starts to count up. When vehicle speed is under 19 mph (30km/h) the filter counter counts down. Once the counter reaches a predetermined maximum, the old OAT is updated to the current OAT reading.
- Example 1: Vehicle is OFF for 1 hour, OAT is 70 degrees F (21 degrees C). The ambient temperature has increased during the shut down to 74 degrees F (23 degrees C). The vehicle is started, OAT will still be displayed at 70 degrees F (21 degrees C), the driver drives at a stable speed over 19 mph (30km/h) for a minimum of 3 to 8 minutes with no stops, OAT display updates to current temp of 74 degrees F (23 degrees C).
- Example 2: Vehicle is shutoff for 1 hour, OAT is 70 degrees F (21 degrees C). The outside temperature has increased during the shut down to 74 degrees F (23 degrees C). The vehicle is started, OAT will still be clamped at 70 degrees F (21 degrees C). However, this time the driver is in heavy city traffic driving for 10 minutes of speeds below 19 mph (30km/h), then drives on the highway at speeds above 19 mph (30km/h) for a minimum of 2 to 6 minutes. The OAT display updates to the current temp of 74 degrees F (23 degrees C). This time it took longer to update because of all the stop and go driving below 19 mph (30km/h).

Since the OAT sensor is in the grille, the values must be filtered to prevent them from updating to false readings when there is engine heat or road heat.

Vehicle in Warm Garage

- If the vehicle is started in a garage that is warmer than the outside temperature, it may take some time to update to the new cooler ambient temperature. It may take up to 10 minutes to reach the new ambient temperature.
- Example 1: Vehicle is OFF for short time, or for overnight. Heated garage temp is 70 degrees F (21 degrees C). The outside temperature has decreased during the shut down to 60 degrees F (16 degrees C). The vehicle is started, OAT will register 70 degrees F (21 degrees C) (heated garage temperature). When driven outside the OAT will start to update lower to 60 degrees F (16 degrees C) as the sensor cools off, should take less than 8 minutes.
- Example 2: Same as above: Vehicle is OFF for short time, or for overnight. Heated garage temp is 70 degrees F (21 degrees C). The outside temperature has decreased during the shut down to 60 degrees F (16 degrees C). The vehicle is started, OAT will register 70 degrees F (21 degrees C) (heated garage temperature). However, this time, the driver does heavy city traffic driving for 10 minutes of speeds below 19 mph (30km/h), then gets on the highway at speeds above 19 mph (30km/h) for at least 2 minutes. When driven outside, the OAT will start to update lower to 60 degrees F (16 degrees C) as the sensor cools off. This should take less than 10 minutes to reach 60 degrees F (16 degrees C).

Instrument Cluster Configuration

The instrument cluster is highly interactive and reconfigurable. The operator can select from four different display configurations (Drive, Tour, Sport, or Track) and each of these configuration may contain one, two, or three separate display zones. Regardless of which configuration is selected, the vehicle odometer and PRNDL are always displayed in the lower left and lower right corners of the display. For further explanation of the instrument cluster, refer to the OWNER'S & ACCESSORIES MANUAL.