Component Procedures: Instrument Cluster / Carrier

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Parts and Labor (itype_189)

Parts

Qualifier	Part #	Name	Price	Note
Instrument Cluster > Without?	22861797	Instrument Cluster	212.27	
Instrument Cluster > With Ac?	22861797	Instrument Cluster	212.27	
Lock Cylinder	20765510	Lock Cylinder	0.00	

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Remove & Replace	Instruments & Gauges > Instrument Cluster, R&?	B	0.4	0.2
Remove & Replace	Instruments & Gauges > Instrument Cluster, R&?	B	0.8	0.6

Instrument Cluster (Article 11011)

Figure 1: Displays and Gauges Block Diagram

Displays Test

Certain instrument cluster features are tested when the ignition is turned ON in order to verify the features are working properly. The following occurs when the ignition is turned ON:

- The ABS indicator illuminates briefly.
- The battery indicator illuminates briefly.
- The brake indicator illuminates briefly.
- The door ajar indicator illuminates briefly.
- The oil pressure low indicator illuminates briefly.
- The security indicator illuminates briefly.
- The service vehicle soon indicator illuminates briefly.
- The tire pressure low indicator illuminates briefly.
- The electronic stability control service indicator illuminates briefly.
- The electronic stability control off indicator illuminates briefly.

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 a High Speed CAN-Bus signal to the body control module (BCM). The BCM then sends the information via a Low Speed CAN-Bus signal to the instrument cluster to display the engine coolant temperature. The engine coolant temperature gauge defaults to cold or below if:

- The ECM detects a malfunction in the engine coolant temperature 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.

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 a High Speed CAN-Bus signal to the BCM. The BCM then sends the information via a Low Speed CAN-Bus signal to the instrument cluster to display the fuel level. If the fuel level falls under 11% the driver information center display displays the low fuel level message. The fuel gauge defaults to empty if:

- The ECM detects a malfunction in the fuel level sensor circuit.

Speedometer

The instrument cluster displays the vehicle speed based on the information from the ECM. The ECM sends the vehicle speed information via a High Speed CAN-Bus signal to the BCM. The BCM then sends the vehicle speed information via a Low Speed CAN-Bus signal to the instrument cluster in order to display the vehicle speed, either in kilometers or miles, based on the vehicle requirements. The speedometer defaults to 0 km/h (0 MPH) if:

Tachometer

The instrument cluster displays the engine speed based on the information from the ECM. The ECM converts the data from the engine speed sensor to an engine revolution signal. The ECM sends the engine speed information via a High Speed CAN-Bus signal to the BCM. The BCM then sends the information via a Low Speed CAN-Bus signal

to the instrument cluster to display the engine speed. The tachometer defaults to 0 RPM if:
- The ECM detects a malfunction in the engine speed sensor circuit.
Driver Information Center Display
In the lower middle of the instrument cluster, an additional display is installed. Its task is to give additional information, such as an odometer or error codes. This part of the instrument cluster is available in 4 different variants, mostly depending on the assembled engine. For further information refer to Driver Information Center (DIC) Description and Operation .

Instrument Cluster Replacement (Article 11047)

Callout Component Name
Preliminary Procedure Remove the instrument panel cluster trim plate. Refer to Instrument Panel Cluster Trim Plate Replacement .
Preliminary Procedure
Remove the instrument panel cluster trim plate. Refer to Instrument Panel Cluster Trim Plate Replacement .
1 Instrument Panel Cluster Fasteners (Qty: 4) Caution: Refer to Fastener Caution . Tighten 2.5 Nm (22 lb in)
2.5 Nm (22 lb in)
2 Instrument Panel Cluster Assembly Procedure Disconnect the electrical connections. Refer to Control Module References for programming and set up information.
Procedure
- Disconnect the electrical connections.
- Refer to Control Module References for programming and set up information.

Multifunction Auxiliary Gauge Replacement (w/ UMG) (Article 11048)

Callout Component Name
1 Front Floor Console Front Cover Refer to Front Floor Console Front Cover Replacement .
2 Multifunction Auxiliary Gauge Fasteners (Qty: 4) Caution: Refer to Fastener Caution . Tighten 2.5 Nm (22 lb in)
2.5 Nm (22 lb in)
3 Multifunction Auxiliary Gauge Assembly Procedure Refer to Control Module References for programming and set up information.
Procedure
Refer to Control Module References for programming and set up information.

All Technical Service Bulletins (itype_100)

Tsbs
- Information on Inappropriate Warranty Claims Submitted for Damaged Radios and Instrument Panel Clusters (IPCs) (08-08-44-015H, 2016/12/19)
- IPC Odometer Programming Method Quick Reference Guide (07-08-49-020R, 2023/09/21)

Instrument Cluster Programming and Setup (Article 10743)

Special Tools
EL-49642 - SPS Programming Support Tool
For equivalent regional tools, refer to Special Tools .
- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. Install the EL-49642 - SPS programming support tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.
Replace and Program ECU or Reprogram ECU
To program a replacement or an existing ECU, perform the following procedure:

- Install EL-49642 - SPS programming support tool .
- Access the Service Programming System (SPS) and follow the on-screen instructions.
- On the SPS Supported Controllers screen, select P16 Instrument Cluster - Programming and follow the on-screen instructions.
- On the SPS Supported Controllers screen, select P16 Instrument Cluster - Setup and Configuration and follow the on-screen instructions.
- At the end of programming, choose the “Clear All DTCs” function on the SPS screen.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:
- DO NOT turn the ignition OFF. Ensure that all ECU, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
- Attempt to reprogram the ECU.
- If the ECU can still not be programmed, turn the ignition OFF for at least one minute.
- Turn the ignition ON and attempt to reprogram the ECU. The ECU should program.
- If the ECU still cannot be programmed, replace the ECU.

Warranty Information (itype_119)

Tsbs

- Information on Inappropriate Warranty Claims Submitted for Damaged Radios and Instrument Panel Clusters (IPCs) (08-08-44-015H, 2016/12/19)