

Mid-July 2017, Volume 19, No. 14

Driver Assistance Systems Gain Popularity on GM Models



Many new GM models have a number of driver assistance systems that work together to help avoid collisions or reduce vehicle damage. These systems do not replace the need for driver attention, but can assist in certain situations by braking the vehicle, maintain lane position, and warning of nearby vehicles, obstacles or pedestrians.

Here's an overview of the some of the more common driver assistance systems available on new GM models. Refer to the appropriate Service Information for diagnostic and repair instructions.

Collision/Detection System Settings

Many of the driver assistance systems can be turned on/off or their operation can be customized through the Settings menus on the infotainment system. Available Settings menus are dependent on vehicle equipment.

continued on page 2

CONTENTS

Driver Assistance Systems Gain Popularity on GM Models 1
MDI Manager and Data Bus Diagnostic Tool Software Updates 1
XT5 and Acadia Electrical Harness Conditions
Vibrations or Beeps? — Active Safety Seat Operation 5
GR8 Battery Tester/Charger Software Update 6
Volt and ELR with No Charge Condition7
Service Know-How7

MDI Manager and Data Bus Diagnostic Tool Software Updates

New diagnostic software updates are now available or being rolled out to GM dealerships across the country.

MDI Manager

The new MDI Manager software includes updates for the future CAN FD protocol that is necessary for the next generation of GM vehicle architecture.

CAN FD (CAN with Flexible Data-Rate) is an extension to the original CAN bus protocol. It's designed to make the Controller Area Network (CAN) faster, extending the useful data length from eight to 64 bytes for significantly higher data transmission rates.

continued on page 4

GM

Driver Assistance Systems Gain Popularity -

continued from page 1



To view the settings on most vehicles, go to Settings > Vehicle > Collision/Detection Systems.

Safety Alert Seat

The Safety Alert Seat provides a vibration in the driver's seat cushion to alert the driver of potential hazards, based on the serial data messages received from the control modules of other driver assistance systems. Safety Alert Seat components include the seat memory control module and left and right haptic seat motors. The two motors are located on the left and right side of the seat cushion. Depending on the alert, either the left, right, or both motors will activate.

Safety Alert Seat vibrations or audible beeps may be selected instead in the Settings menu on the infotainment system.

Lane Change Alert with Side Blind Zone Alert

The Lane Change Alert/Side Blind Zone Alert system is designed to detect other vehicles in the side blind zone of a vehicle or rapidly approaching that area to provide a warning to the driver before making a lane change. An amber warning symbol is displayed on the left or right side mirror when a vehicle is detected and the symbol flashes if a turn signal is activated on the same side as the detected vehicle.



Lane Change Alert/Side Blind Zone Alert warning symbol in side mirror

The side object sensor modules, which are also used by the Rear Cross Traffic Alert system, are located on each side of the vehicle behind the rear fascia and are not directly visible from outside the vehicle. The sensors use radar to determine the presence of objects nearby.

Lane Keep Assist with Lane Departure Warning

There are two stages of warning/intervention for the driver to help avoid collisions due to unintentional lane departures. The first stage is the steering input provided by the Lane Keep Assist system if the vehicle approaches a detected lane marking without using a turn signal in that direction. It does not continuously steer the vehicle. The system uses a camera to detect lane markings between 37 mph (60 km/h) and 112 mph (180 km/h). When the system is available to assist, the Lane Keep Assist indicator on the instrument cluster is green and when the system is providing assist, the indicator is amber.

The second stage is a warning chime or haptic seat vibration (if equipped with a Safety Alert Seat) if the system detects that the vehicle will cross the lane marking despite the steering input. If a haptic seat vibration occurs, it is on the same side of the seat as the lane departure direction. The system will not assist or provide an alert if it detects that the driver is actively steering.

The Lane Departure Warning system, on vehicles not equipped with Lane Keep Assist, also may help avoid collisions due to unintentional lane departures, but it does not provide steering input. The system provides a warning if the vehicle is crossing a detected lane marking without using a turn signal in the lane departure direction.

The front view camera module detects lane markings. The electric power steering uses a torque sensor to detect driver inputs and relays that information to the front view camera module. The electric power steering is used to provide steering input based on the forward looking sensor outputs, such as lateral offset of the vehicle, relative yaw angle and time to line crossing.

Rear Cross Traffic Alert

To help enhance driver visibility when the vehicle is in Reverse, the Rear Cross Traffic Alert will warn of traffic approaching from either direction by displaying a red alert on either side of display screen of the Rear Vision Camera. There will also be an audible warning or seat vibration warning.

The side object sensor modules send out a serial data message to activate the warnings when an object is detected in the rear cross traffic zone. The system operates when vehicle speed is 6 mph (10 kph) or less and is designed to detect objects moving at speeds up to 22 mph (36 kph).

The system will only alert on objects of interest that pose a potential collision with the vehicle. It will not alert to stationary objects, such as signs or parked cars.

On many vehicles, the Rear Cross Traffic Alert system can be turned off with the Parking Assist button. If equipped, turning off Parking Assist and Rear Cross Traffic Alert will also turn off the Rear Automatic Braking system.

Forward Collision Alert

The Forward Collision Alert system may help to avoid or reduce the harm caused by a front-end collision. Forward Collision Alert is a warning system and does not apply the brakes.

The system uses the front view camera module to issues a warning to the driver when a potential collision risk exists. When the system detects a vehicle in the path ahead, the green Vehicle Ahead indicator is illuminated on the instrument cluster. When approaching a vehicle ahead too quickly, the system provides a red flashing

Driver Assistance Systems Gain Popularity -

continued from page 2

alert on the windshield and rapidly beeps or provides a haptic warning (if equipped with the Safety Alert Seat). It also has a tailgating feature that illuminates the Vehicle Ahead indicator in amber if following another vehicle much too closely.



Forward Collision Alert/Following Gap button (top) and Lane Keep Assist button (center)

In addition, a page on the Driver Information Center Info menu on some vehicles shows the Following Distance, indicated in seconds, to the vehicle ahead. If no vehicle is detected, dashes are displayed.

The front view camera module is located behind the windshield, looking out at the road ahead to detect vehicles directly



Following Distance indicator on the Driver Information Center

ahead. The system detects vehicles within a distance of approximately 197 ft. (60 m) and operates at speeds above 5 mph (8 km/h). If the vehicle has Adaptive Cruise Control (ACC), it can detect vehicles to distances of approximately 360 ft. (110 m) and operates at all speeds.

The driver can select the warning gap time (the time between the vehicle and a detected vehicle), also called the alert sensitivity, used by the system by pressing the Following Gap/Forward Collision Alert button on the steering wheel. The timing can be set to Far, Medium, or Near.

The driver can select between audible or haptic alerts in the vehicle personalization menus. The Forward Collision Alert system can also be turned on or off through the vehicle personalization menus. Go to Settings > Vehicle > Collision/Detection Systems.

Forward/Reverse Automatic Braking

Forward Automatic Braking, which includes Intelligent Brake Assist, will detect a vehicle ahead that is traveling in the same direction that the vehicle may be about to crash into. It can provide a boost to braking or automatically brake the vehicle to help avoid or lessen the severity of a collision when driving in a forward gear. Depending on the situation, the vehicle may automatically brake moderately or hard. Forward Automatic Braking can only occur if a vehicle is detected, as shown by the Vehicle Ahead indicator being illuminated. The system works when driving in a forward gear between 5 mph (8 km/h) and 50 mph (80 km/h), or on vehicles with Adaptive Cruise Control, above 2 mph (4 km/h). It can detect vehicles up to approximately 197 ft. (60 m).

The system uses the active safety control module, vehicle direction camera, radar sensor module – long range, radar sensor module – short range left front, and radar sensor module – short range right front, to determine if an imminent collision risk exists.

The Reverse Automatic Braking system detects if the vehicle is backing too fast to avoid a collision and may automatically brake hard to a stop. In conjunction with the backing warning system, if the driver does not respond to the audible or haptic alerts while driving in Reverse, the system will automatically brake the vehicle to a stop.

Pressing the brake pedal after the vehicle comes to a stop will release Reverse Automatic Braking. It may be necessary to release the electronic parking brake. When it is safe to do so, pressing the accelerator pedal firmly at any time will override Reverse Automatic Braking.

Front Pedestrian Braking

The Front Pedestrian Braking system is designed to help avoid or reduce the harm caused by front-end crashes with nearby pedestrians when driving in a forward gear. It's a feature subset of Forward Automatic Braking. No added components are required. The system displays an amber indicator when a nearby pedestrian is detected directly ahead. When approaching a detected pedestrian too quickly, it provides a red flashing alert on the windshield and rapidly beeps and provides a boost to braking or automatically brakes the vehicle.

Front Pedestrian Braking can detect and alert to pedestrians in a forward gear at speeds between 5mph (8km/h) and 50 mph (80 km/h). During davtime driving. the system detects pedestrians up to a distance of approximately 40 m (131 ft.). Pedestrians must be at least 31.5



Front Pedestrian Braking amber indicator displays when a pedestrian is detected nearby.

inches (80 cm) tall to be detected. During nighttime driving, system performance is very limited.

The Front Pedestrian Braking system can be set to Alert and Brake, Alert, or Off using the vehicle personalization menus. Go to Settings > Vehicle > Collision/Detection Systems.

For additional information, check out the latest Emerging Issues seminar. It includes a new series on Active Safety Systems.

TIP: For more information about GM Active Safety Systems, log in to GM GlobalConnect and, in a new tab, go to gmglobalinfotainmentlibrary.com. On the left side of the screen, select the Active Safety link.

Thanks to Katul Patel

XT5 and Acadia Electrical Harness Conditions

Some 2017 XT5 and Acadia models may have several intermittent electrical conditions, including inoperative power door locks, inoperative power windows using the driver's door controls. Retained Accessory Power (RAP) will not turn off the radio when the driver's door is opened, or the engine will not turn off. There may be several DTCs set.

If these conditions are found, check the following areas on the driver's side of the vehicle:

- Missing lower A-pillar body-side plugs. There should be two body plugs, about 1-inch (2.54 cm) in diameter, in the door opening on the body side. Replace any body plugs that are missing.
- Check that connector X500 of the driver's door-to-body harness is fully seated on the inside of the lower A-pillar. If the connector is not seated properly, check for signs of corrosion. Water may collect in the bottom section of the connector if not fully seated.
- Remove the interior kick panel on the driver's side to check connector X200 on the inside of the lower A-pillar for any water intrusion .:

There also may be a water concern with the HVAC drain hose, resulting in wet carpet on the passenger's side floor. If the drain hose is plugged. water could spill over the splash shield and drip onto the Body Control



Module (BCM), which can affect the operation of several electrical

components and lead to a number of electrical conditions, such as improperly operating turn signals, flashing hazard lights. and Driver Information Center messages.





Connector X200

I-Shaft to Body Harness Contact

Repair the harness as

Wire damage may occur due to body harness contact with the steering intermediate shaft.

necessary. Move and secure the harness away from the intermediate shaft.

Thanks to Tom Burlingame

MDI Manager and Data Bus Diagnostic Tool Software Updates - continued from page 1

The new software is being released through a staggered rollout to GM dealerships. The initial rollout included all GM dealerships in Michigan and Ohio. Additional dealers will be added every Monday, with completion of the rollout in October.

A user will be prompted to install the MDI/MDI 2 Manager software when clicking the SPS or GDS2 icon in TIS2Web. It is recommended to update all MDIs and Service computers at the same time to avoid incompatibility issues.

Data Bus Diagnostic Tool

GM Customer Care & Aftersales also recently began distributing Data Bus Diagnostic Tool software update version 1.30.923 through TIS2Web. The update allows the tool to simultaneously monitor up to three dual-wire CAN busses as well as corrects some Device IDs. To download the software, click the GDS 2 icon on the TIS2Web home page.

Any questions about the software updates should be directed to the Techline Customer Support Center (TCSC) at 1-800-828-6860 (English) or 1-800-503-3222 (French).



Thanks to Chris Henley

Vibrations or Beeps? – Active Safety Seat Operation

The Active Safety Seat available on many 2013-2018 GM models provides a vibration, or haptic warning, in the driver's seat cushion to alert the driver of the direction of potential hazards. It's part of a growing collection of safety systems included on new GM models and works in conjunction with features such as Forward Collision Alert, Lane Departure Warning, Front Pedestrian Braking, Parking Assist, Rear Cross Traffic Alert and others.



Either the left, right, or both haptic motors will activate to provide a vibration warning.

The Active Safety Seat uses two haptic signal motors in the left and right side of the driver's seat cushion to provide the vibration warning. Depending on the alert, either the left, right, or both motors will activate.

The K40D Seat Memory Control Module (MSM) receives serial data messages from other modules and provides a voltage output to turn on the haptic signal motors. The Seat Memory Control Module will pulse the left, right, or both motors the number of pulses requested over serial data. The module monitors the circuits for open, short to ground, and short to voltage conditions and will set DTCs if a problem is detected.

Haptic Warnings

Depending on how a vehicle is equipped, it may have a number of active safety systems. Here's the typical operation of the Active Safety Seat with some of the most popular safety systems:

- Front and Rear Parking Assist When an object is first detected, both motors will pulse twice. If a potential collision is detected, both motors will pulse five times.
- Lane Departure Warning When the vehicle crosses a lane marking, either the left or right motor will pulse three times, depending on the departure direction. The Lane Keep Assist feature, which provides steering input, does not activate the Active Safety Seat.
- Forward Collision Alert Both motors will pulse five times.
- **Rear Cross Traffic Alert** When backing up, if rear cross traffic is detected, either the left or right motor will pulse three times, depending on which side the traffic is detected.

Alert Type Setting

If there is a concern about the operation of the Active Safety Seat in various driving situations, the Alert Type setting should be checked in the vehicle personalization menu to ensure the seat haptic warning is turned on. The driver can select to receive the Active Safety Seat haptic warning or audible alerts (beeps). The setting to turn the Active Safety Seat on/off can be found in the vehicle personalization menus using the infotainment controls. Go to Settings > Vehicle > Collision/ Detection Systems > Alert Type.



Check the Alert Type setting.

Systems > Alert Type. TIP: Check the Alert Type setting in the service lane with the customer before the vehicle is left with the service de-



Haptic signal motors are located on either side of the driver's seat cushion.

System Diagnosis

partment.

Always check for any set DTCs (B172E – Driver Seat Cushion Left Rear Haptic Alert Motor Control Circuit; B172F – Driver Seat Cushion Right Rear Haptic Alert Motor Control Circuit) when diagnosing the Active Safety Seat. Do not replace the haptic signal motors unless diagnosis clearly points toward the motors as the cause of the condition. If there aren't any DTCs set, first check the Alert Type setting in the vehicle personalization menus.

If the haptic signal motors are to be replaced, remove the driver's seat cushion cover and pad to access the motors and electrical connectors.

Once the haptic signal motors are replaced, the Memory Seat Control Module should be cleared of any DTCs. It is not required to reflash or set up the module.

Thanks to Daryl Funds

TEEH LINK

GM TechLink is published for all GM retail technicians and service consultants to provide timely information to help increase knowledge about GM products and improve the performance of the service department.

Publisher:

John Meade GM Customer Care and Aftersales

Editor:

Lisa G. Scott GM Customer Care and Aftersales

Technical Editor:

Mark Spencer mspencer@gpstrategies.com

Production Manager: Marie Meredith

Creative Design:

5by5 Design LLC Set dkelly@5by5dzign.com

Fax number: 1-248-729-4704

Write to:

C TechLink PO Box 500 Troy, MI 48007-0500

GM TechLink on the Web: GM GlobalConnect

General Motors service tips are intended for use by professional technicians, not a "do-it-yourselfer." They are written to inform those technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions and know-how to do a job properly and safely. If a condition is described, do not assume that the information applies to your vehicle or that your vehicle will have that condition. See a General Motors dealer servicing your brand of General Motors vehicle for information on whether your vehicle may benefit from the information.

Inclusion in this publication is not necessarily an endorsement of the individual or the company.

Copyright© 2017 General Motors All rights reserved.

GR8 Battery Tester/Charger Software Update

The latest software update (EL-50313-40) for the EL-50313 Midtronics GR8 Battery Tester/Charger is now available for download. The software should be accessed through GM GlobalConnect from the Service Workbench selection of "Special Tools & Software Updates."

The EL-50313 Battery Tester/Charger must be used in diagnosing battery replacements and maintaining batteries on new vehicles in dealership inventory. The tool generates a warranty code on a printed slip that captures critical information about the battery's condition.

The software release is free for GM dealerships and provides the following updates for the GR8 Battery Tester/Charger:

- Allow for entry of Isuzu VIN format for medium-duty trucks.
- Enable 8-digit entry for repair orders.
- Reduces the maximum battery charge time to 90 minutes. The display on the GR8 will still show an estimated time of up to 3 hours and should be ignored. The tool will print out a short ticket with a maximum estimated time. The results ticket printed out will show the actual test/charge time on the Charge Time line.
- Previous CCA entry is automatically cleared from memory to prevent an invalid test.
- The font used for warranty code printouts makes it easier to distinguish between U and V, which has caused some confusion in the past.
- Some menus have been shortened by removing unused selections.

Software Download

To download the software update from the GM Special Tools website:

- Go to the Software Downloads menu on the home page
- Select GR8 Battery Tester Software Update V4.9.5.

The new version of software can be identified on the bottom of the printout slip with the last letter being P. The previous version ended in O.

Example of new printout:

Version: 192-675P

Example of previous printout:

Version: 192-6750

 $\textcircled{\sc blue}$ Thanks to Chuck Berecz and Gary McCraw



EL-50313 Battery Tester/Charger



Select GR8 Battery Tester Software Update V4.9.5.

Volt and ELR with No Charge Condition

2011-2014 Chevrolet Volt and 2014 Cadillac ELR models may not charge and have DTC P0AA6 (Hybrid/EV Battery Voltage System Isolation Lost) set in the Hybrid/EV Powertrain Control Module 2 (HPCM2). These conditions may be caused by a loss of Hybrid/EV Battery Pack coolant or a loss of high voltage isolation within the battery. This is one of the most common issues seen on the first generation Voltec system.

The Volt and ELR have a high voltage isolation monitor feature where the Battery Energy Control Module (BECM) high voltage isolation monitor circuit tests the resistance between the high voltage positive and negative direct current (DC) bus and chassis ground. The HPCM2 requests the BECM to perform the test.

If these conditions are present, the "Service Hybrid Battery Charging System" message may be displayed on the Driver Information Center, the charge status indicator on top of the instrument panel may be amber, and the Check Engine lamp may be illuminated.

In addition to DTC P0AA6, the following DTCs may be set:

- DTC P1FFF (System Isolation / Coolant Level Sensor Fault -Hybrid/EV Battery Charging System Disabled) may be set in the HPCM2
- DTC P1E00 (Hybrid/EV Powertrain Control Module 2 Requested MIL Illumination) may be set in the ECM.

DTC P0AA6 signals a loss of isolation detected within the battery pack itself. This is fundamentally different from the P1AF0, P1AF2, or P1E22 loss of isolation DTCs for the larger high voltage system.

DTC P1FFF is an umbrella code that prevents charging for many reasons, but it will always set with another DTC when codes are first read on a vehicle. DTC P1FFF by itself does not point to the issue that needs to be addressed.

DTC P1E00 is the HPCM2 request to the ECM to illuminate the Check Engine lamp.

Check the Coolant Level

Check for any loss of coolant by inspecting the coolant level in the



The coolant level in the reservoir should be between the top of the label (1) and the bottom of the low fill line (2).

underhood high voltage battery coolant reservoir. The coolant level should be between the top of the label (1) and the bottom of the low fill line (2). See illustration.

Also remove the drain plug for the battery pack to see if any water/ coolant drains out, indicating a coolant leak in the battery pack. Refer to PIC5920G for more information.



TIP: If cool-

High voltage battery pack coolant rubber inspection plug (1)

ant is found

inside the high voltage battery pack, the entire pack will need to be replaced. This is a very rare condition. Contact the GM Technical Assistance Center if any moisture is found during the drain plug inspection. The battery pack is currently on restriction.

Latest Calibrations

If a coolant leak is not observed, update the HPCM2 and BECM with the latest calibrations in TIS2Web. The revised calibrations are designed to improve the measurement accuracy of the internal loss of isolation DTC P0AA6. This is the more common repair for this DTC. The HPCM2 and the BECM work in conjunction to monitor and control the battery pack.

The BECM programming procedure is unique. It's important to wait for service programming to fully complete with the checkered flag, as each of the four Battery Interface Control Modules (BICMs) are subsequently flashed once the status bar reaches 100%. Remain patient as this programming could take an additional ten minutes.

If DTC P1FFF does not clear after programming, attempt a secured high voltage code clear, as a function of the HPCM2.

The special labor operation listed in PIC5920G as well as normal programming updates for the HPCM2 and BECM are covered under the Voltec warranty period (8 years/100,000 miles).

S Thanks to Lane Rezek

Service Know-How

10217.09V - Emerging Issues - September 14, 2017

The latest service topics from Brand Quality and Engineering are reviewed, including the first segment of a new series on Active Safety Systems and a look at Diesel Particulate Filter regeneration on new diesel engines.

To view Emerging Issues seminars:

- Log into www.centeroflearning.com.
- Enter Emerging Issues in the Search box.
- · Select the desired Emerging Issues seminar course title.
- Click the Launch button.

