

New Circuit/System Testing for

Parasitic Draws

Components most likely to cause a parasitic draw on the 12V battery on GM models include switches, relays, LIN buses and control modules. A new voltage drop test in Service Information (SI) can help in determining which component may be causing a parasitic draw.



CONTINUED ON PAGE 2



Common Tire Concerns and Warranty Coverage

see page 4



Trailer Lighting Conditions with the In-Vehicle Trailing App

see page 8

New Circuit/System Testing for Parasitic Draws 1

Listen Up – 2021 Escalade Audio Technology 6

Pre-Delivery Inspection Forms Available on GlobalConnect App, No Longer in Service Information 7

Air Conditioning Compressor Failure 10

Bluetooth and Phone Projection TAC Worksheet 11

New Circuit/System Testing for Parasitic Draws

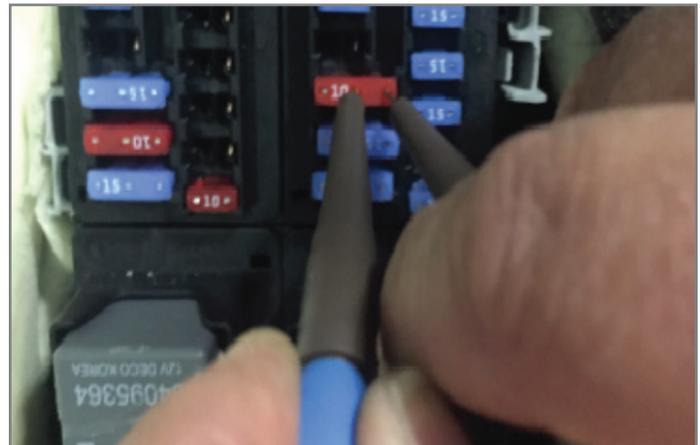
If there is an excessive load on the electrical system that is draining the battery after the ignition is turned off, review the Battery Electrical Drain/Parasitic Load Test document under 12V Charging and Starting > Diagnostic Information and Procedures in the Service Information. It features updated information on diagnostic aids, system verification and testing, including a new parasitic draw voltage drop test and a battery draw verification sheet to help with diagnosis.

Several tables have been added in SI that list the milliAmps (mA) value across the fuses in a fuse block. Use a DMM set to mV scale to check the voltage drop between the battery positive post and each leg of the battery junction block (if equipped) to determine which fuse block contains the draw.



Check voltage draw at the battery junction block to determine which fuse block contains the draw.

Once the fuse block feed with the highest draw has been identified, go to that fuse block and check voltage drop across fuses, excluding J-case type fuses, one at a time. For three-bladed fuses, the center of the fuse is the supply voltage for both sides of the fuse. Compare the reading to the corresponding fuse in the table. If voltage drop is found, refer to the Power Distribution Schematics to diagnose exactly which circuit of a suspected system is causing the high parasitic drain.



Check voltage drop across fuses.

TESTING SET UP

To begin diagnosis of a parasitic draw, it's important to properly set up the test. There are many things that can prevent the vehicle from completely going to sleep and passing the parasitic draw test.

1. Road test the vehicle and operate all accessories to check for proper operation.
2. Connect a 50 Amp inductive amp clamp to the negative battery cable that can read down to 1 mA.
3. With the ignition Off, open all doors, hood, trunk/liftgate (to gain access to all components and fuse blocks) and manually close all latches and switches.
4. Lock the vehicle with the key fob and move the fob a safe distance so it doesn't wake up the vehicle (distance depends on approach detection of the vehicle).
5. With all modules and components asleep, monitor the amperage. After approximately 10 minutes, amperage should drop to a stable value less than 20 mA.
 - If amperage is 40mA or higher, follow the fuse voltage drop test to identify the fuse(s) with an ongoing draw.
 - Measure all fuses and record voltage drop, fuse location, type and rating.
6. After all fuses are tested, identify the suspect circuits and calculate the amperage for each.

CONTINUED ON PAGE 3

If there are multiple control modules drawing amperage, work from the least complex component to the most. For example, for a drain on the Memory Seat Module, Body Control Module and Gateway Module, remove power to the Memory Seat Module first and verify if the other modules go to sleep properly. In many cases, a “satellite” module like the Memory Seat Module is the most likely to cause a system to wake up.

BATTERY DRAW CUSTOMER VERIFICATION WORKSHEET

The new Customer Concern Verification Sheet (CCVS) Battery Draw worksheet may be helpful in isolating or duplicating a customer's concern. Use the information during the road test to verify operation according to the customer's description of the condition.

A link to the worksheet is included in the Battery Electrical Drain/Parasitic Load Test document in SI. The worksheet also can be found in GM GlobalConnect. From the Service apps, launch Service Forms and select CCVS Battery Draw.

All Customer Concern Verification Sheets (CCVS) have been designed to improve communications between service customers

and technicians. The more clearly concerns and related symptoms are understood, the more likely the concern will be fixed quickly and accurately.

SYSTEM OPERATION

When diagnosing a parasitic draw, keep in mind the power-down and wake-up process for most control modules.

After the ignition is turned off, the control modules will begin to go to sleep (shut off). However, not all control modules go to sleep at the same time. Some control modules may take up to 30 minutes or longer after turning the ignition off before going to sleep (e.g. Retained Accessory Power). Other components, such as EVAP, HVAC Afterblow, EV Battery Heater/Coolers, OnStar and Remote Keyless Entry (approach detection in keyless access vehicles), may periodically wake up control modules and then go back to sleep, depending on vehicle status. These are all normal conditions.

Most vehicle systems will go into the initial sleep cycle after 10 minutes. With periodic normal wake up cycles that will occur for approximately one second, it can take up to two hours before all systems power down completely. Typically, a vehicle will not have more than a 50mA parasitic draw during the initial power sleep cycle.

There are many things that can prevent the vehicle from completely going to sleep and passing the parasitic draw test, such as the key fob not moved away from the vehicle (for keyless access vehicles); the approach, exit, or delayed lighting not disabled; or HVAC Afterblow, which is enabled at the factory on some 2021 models, cannot be disabled. Some vehicles can have the power supply port changed to “ON” with the key off to allow for accessories to stay powered (e.g., phone charger). Ensure all aftermarket accessories are unplugged prior to testing. The use of a Digital Multimeter (DMM) set to Min/Max may help identify the normal spikes in the parasitic draws.

► Thanks to Ernest Haller

Customer Concern Verification Sheet - Battery Draw.
Service Advisor/Manager please gather this info from the customer (scan and attach if necessary):
On the dates leading up to the dead battery, please provide details on the trips and sleep cycles of the vehicle (include as many as trips taken)
Date vehicle started: <input type="text"/>
Time vehicle started: <input type="text"/>
Location of vehicle at start of trip: <input type="text"/>
How was vehicle started (Key, Remote Transmitter, or App): <input type="text"/>
Please describe vehicle access before and during vehicle start before trip (Utilized Key, Remote Transmitter, App, interior/exterior switches, hands free liftgate to access doors, trunk, hood, roof, etc.): <input type="text"/>
Miles driven during trip: <input type="text"/>
Time vehicle shut off: <input type="text"/>
Location of vehicle when shut off: <input type="text"/>
Please describe the vehicle access during and after vehicle shutdown (Utilized Key, Remote Transmitter, App, interior/exterior switches, hands free liftgate to access/lock doors, trunk, hood, roof, etc.): <input type="text"/>
CCVS Battery Draw worksheet

COMMON TIRE CONCERNS AND WARRANTY COVERAGE



As the weather turns colder in parts of the country, wreaking havoc on roads, chances for tire damage or irregular tire wear to occur become more prevalent. New GM vehicles include a new vehicle tire warranty that is included with the Bumper-to-Bumper New Vehicle Limited Warranty. But what tire conditions are covered or not covered under warranty?

Defective tires will be replaced on a pro rata adjustment basis based on the mileage on the tire. Proration applies to the cost of the tires only. Customers are not assessed any labor charges for tire replacement (mount and balance).

TIRE WEAR

Tire wear varies based on the tire type on the vehicle and customers' driving habits. Original Equipment (OE) tires installed on GM vehicles are evaluated for many different criteria, including handling, ride quality, load carrying and traction. Different types of tires will experience different rates of tread wear. Uneven or irregular wear from damaged, worn or misaligned suspension components may be covered if tire replacement is necessary due to



Uneven wear due to a faulty component

components covered under the New Vehicle Limited Warranty. Replacement tires must be claimed on the same job card as the defective components. A Tire Pre-Repair Authorization is required for the tire labor operation.

Non-warrantable tire wear conditions include damage from:

- Road hazards
- Driving with low tire pressure
- Improper tire repairs
- Extended driving on a flat tire
- Misuse, racing or vandalism
- Lack of maintenance
- Flat spotting caused by parking a vehicle for an extended period of time



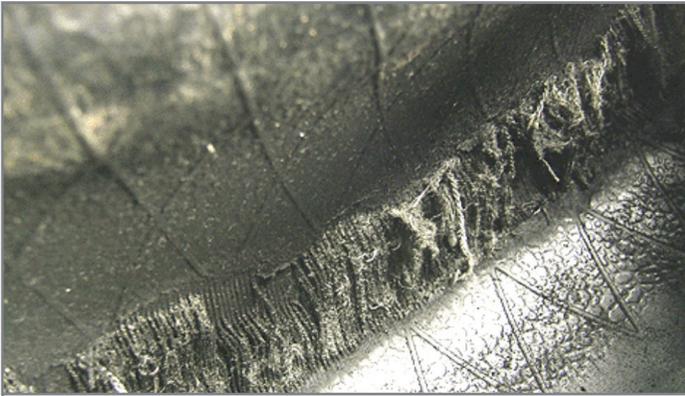
Improperly installed tire plug

CONTINUED ON PAGE 5

- Cold weather cracking on high performance summer tires
- Normal tire weathering

Inspection of tires replaced under warranty reveals that the most frequent non-warrantable condition claimed is road hazard, followed by improper wear. Here are some examples of returned tires with non-warrantable conditions.

Road Hazard – Tire with an air leak caused by a tire plug installed in a non-approved portion of the tire.



Interior shredding caused by extended driving with low air pressure.

Driving with Low Tire Pressure – Inside view of a tire shows shredding caused by extended driving with low air pressure. Interior tire damage may not be obvious on the exterior.

TIP: Remind customers to pay attention to an illuminated low tire pressure warning lamp on the instrument cluster and to follow recommended tire maintenance. Many GM models feature the Tire Fill Alert system that works with the Tire Pressure Monitoring System to provide visual and audible alerts outside the vehicle when inflating a tire to the recommended tire pressure.



Sidewall wear due to extended driving on a flat tire.

Extended Driving on a Flat Tire – Tire sidewall wear completely around the tire is due to extended contact with the road when the tire was completely flat.

Normal Tire Weathering – Superficial tire cracking is an example of normal tire weathering.



Normal superficial tire cracking

TIRE SEALANT AND INFLATOR KITS

GM's endorsement of the temporary use of tire sealant (as supplied with a GM inflator kit) may differ from individual tire manufacturers. GM has validated the temporary use of tire sealant for air leaks and, when used according to the instructions in the vehicle Owner's Manual, will cover the tire under the New Vehicle Limited Warranty.

Only tire sealant included with GM inflator kits should be used for temporary repair of tire air leaks. GM has tested this sealant and its compatibility with on-wheel-mounted tire pressure sensors. After inflator kit use, the wheel-mounted tire pressure sensor should be inspected for any damage and replaced or cleaned as needed.

TIRES COVERED UNDER WARRANTY

Original Equipment (OE) tires and Limited Product Option (LPO) tires installed during Pre-Delivery Inspection (PDI) are covered under the New Vehicle Limited Warranty. Tires replaced under warranty are covered for the remaining portion of the New Vehicle Limited Warranty.

Non-OE tires, tires on a vehicle after the New Vehicle Limited Warranty expires, and tires purchased by customers beyond the New Vehicle Limited Warranty are not covered. OE tires may still have prorated warranty coverage by the tire manufacturer once the New Vehicle Limited Warranty expires.

For additional information, including steps to complete tire warranty transactions as well as how to contact the GM Tire Program, refer to Bulletin #20-NA-159.

► Thanks to Tom Holecek and Scott Lewiston

LISTEN UP

2021 Escalade Audio Technology

The 2021 Escalade features industry-first AKG audio technology with an available 36-speaker AKG Studio Reference system that produces professional studio sound. AKG is known worldwide for microphones and headphones used by leading musicians in recording studios and live venues.

The available 36-speaker AKG Studio Reference system is powered by three amplifiers that deliver 28 channels, offering an immersive listening experience. The standard AKG Studio system includes 19 speakers and a large enclosed subwoofer, powered by a 14-channel amplifier.

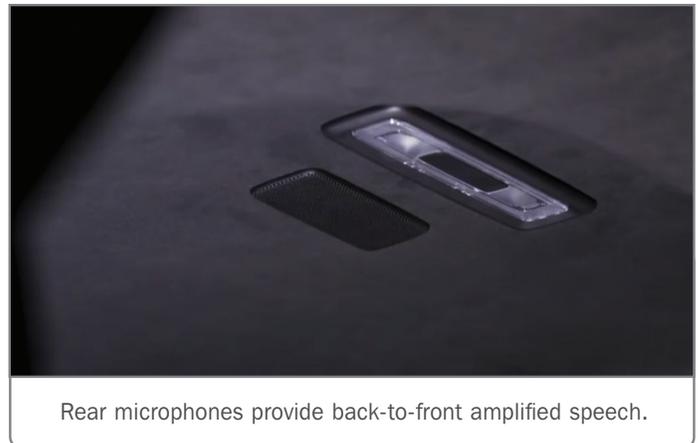


AKG technology also enables other advanced features, including:

- Front Passenger Volume Control – Front-seat passengers can take charge of their personal audio experience with a dedicated volume control for each front seat (included with the 36-speaker Studio Reference system).
- Audio Rendering for Navigation – Turn-by-turn navigation instructions feature audio prompts exclusively from the audio system's left- or right-hand speakers, with the prompt moving nearer to the driver as the turn gets closer.
- Conversation Enhancement – Communication within the vehicle is enhanced for front and rear passengers using the embedded microphones and 19-speaker or 36-speaker system.

CONVERSATION ENHANCEMENT

Communication between front seat and 3rd-row seat passengers in larger vehicles like the Escalade is made easier with the Conversation Enhancement system, or In Car Communication (ICC) system. Using microphones and AKG speakers for front and rear passengers, the system provides amplified speech between the passengers for enhanced listening capability. Interior microphones capture the voices of the driver and front passenger and naturally blend them with the audio played to the second and third rows. On the available 36-speaker system, the rear microphones can project the conversation from the rear back to the front of the vehicle as well.



The system uses two channels for microphone inputs. Performance Audio RPO UQP (19-speaker system) uses one channel for front-to-rear amplified speech and two front cabin digital array microphones. Premium Audiofile Audio RPO UQH (36-speaker system) uses both channels for front-to-rear and rear-to-front amplified speech and two front cabin and one third-row seat digital array microphone.

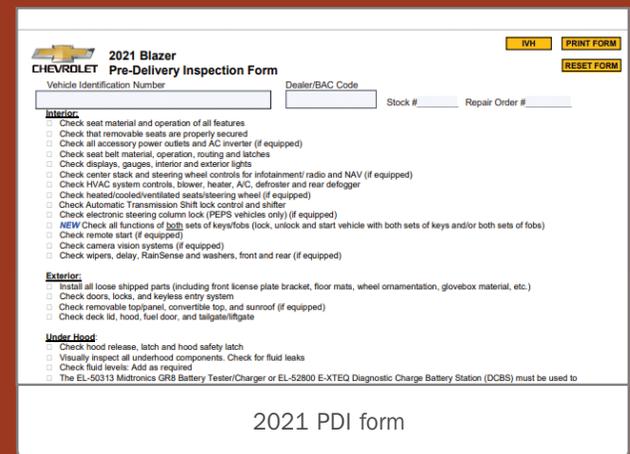
The radio utilizes three digital array microphones: driver, passenger and rear. Each array contains four independent voice-type microphones. These microphones are connected through a high speed Automotive Audio Bus (A2B) with the master chip housed in the radio. The microphones are positioned between the radio and the amplifier on the bus. These microphones will support speech recognition and hands free calling in addition to In Car Communication.

CONTINUED ON PAGE 7

Pre-Delivery Inspection Forms

Available on GlobalConnect App, No Longer in Service Information

Dealership personnel looking for the Pre-Delivery Inspection (PDI) forms for current GM vehicles will find them through the PDI Forms app on GM GlobalConnect. PDI forms can no longer be accessed through the Service Information.



SYSTEM SETTINGS

The rear-to-front portion can be turned off by selecting Settings > System > Conversation Enhancement and selecting Rear Microphone Off. The In Car Communication system can be turned on or off using the infotainment system settings or the Conversation Enhancement button on the left side of the steering wheel.



System settings can be changed using the infotainment system.

TIP: The Conversation Enhancement system is disabled when any door, liftgate, window or sunroof is opened.



A white icon indicates the system is inactive due to an open door, liftgate, window or sunroof.

When the system is turned on, but inactive, a white icon is displayed in the instrument cluster. When the system is active, the icon is green.

► Thanks to Hassan Abdallah and Matt Bunting

Many customers consider the condition of a vehicle during delivery as a direct reflection on the dealership's quality of service and commitment to customer satisfaction. Since the Special Inspection Items on the PDI forms are specific to each model and can change periodically, it's important to always use the most current forms when performing a PDI.

To access the latest PDI forms:

1. Select the App Center tab to display all applications available through GlobalConnect.
2. To view only Service Department apps, check the Service box on the Departments drop-down menu.

CONTINUED ON PAGE 8

Trailer Lighting Conditions with the In-Vehicle Trailering App

If the trailer lighting on customers' trailers connected to some 2019-2020 Silverado and Sierra models does not operate as expected, such as inoperative lighting, improper trailer detection, or intermittently flashing lights with the vehicle off, the cause may be related to either the trailer or the truck. Proper diagnosis requires determining the operation of the trailer wiring as well as the components on the truck.



The K68 Trailer Lighting Control Module controls all trailer lighting.

2019-2020 Silverado and Sierra models equipped with the in-vehicle trailering app (Trailer Information Indicator, RPO U1D) use the K68 Trailer Lighting Control Module to control all trailer lighting as well as additional features like trailer detection, trailer theft alert and trailer lighting circuit diagnostics, such as trailer bulb out detection and over-current.

2019 VS. 2020 MODELS

2019 models with RPO U1D control trailer lighting through pulse width modulated (PWM) voltage. The trailer park and stop/turn signal lamp control circuits must draw at least 55mA of total current to be detected as a trailer or the Trailer Lighting Control Module will not control the lighting circuits to the trailer.

2020 models with RPO U1D control trailer lighting through pulse width modulated (PWM) voltage to the stop/turn signal and backup lamps only. The park lamps use an internal printed circuit board (PCB) relay to control the park lamp circuit, which enables additional output current for the park lamps. As on the 2019 models, the trailer stop/turn signal lamp control circuits must draw at least 55mA of total current to be detected as a trailer or the Trailer Lighting Control Module will not control the lighting circuits to the trailer.



PDI Forms app link on GlobalConnect

3. Select the Pre-Delivery Inspection Forms app and then select the Launch link to open the app.
4. A shortcut to the app can be saved by selecting the app and then selecting Add to My Shortcuts.

PDI PROCESS

Currently, the PDI Forms link provides access to PDI forms for 2018-2021 Buick, Cadillac, Chevrolet and GMC models. The availability of the forms is updated with each model year.



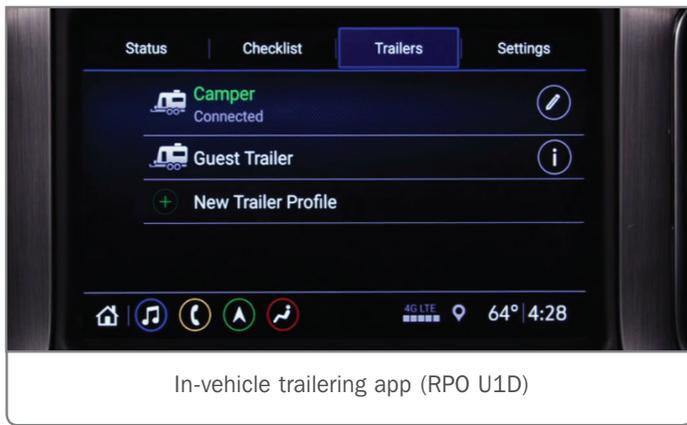
PDI forms are available for 2018-2021 Buick, Cadillac, Chevrolet and GMC models.

Additional information about proper PDI procedures can be found in Bulletin #03-00-89-006R. It covers the PDI process and specific aspects to check on vehicles, such as transport mode, tire pressure, battery check and charge, compass calibration, OnStar, and interior items as well as reviews vehicle storage guidelines.

For vehicles that may remain in dealership storage for an extended period of time, refer to the latest version of Bulletin #09-00-89-002.

► Thanks to Melissa Swank and Heather Ball

CONTINUED ON PAGE 9

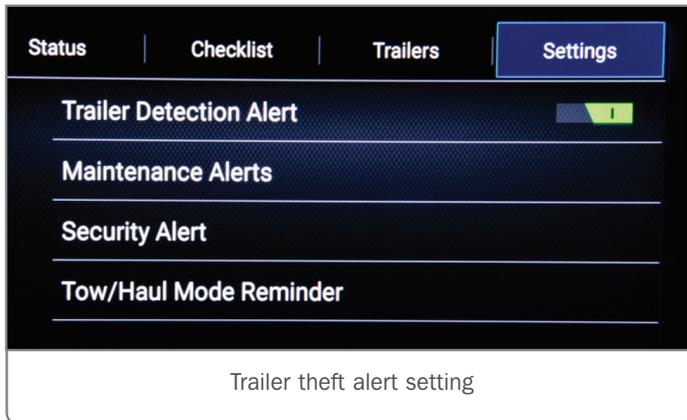


In-vehicle trairling app (RPO U1D)

FLASHING TRAILER LIGHTS

One lighting issue that may concern customers is how often the trailer lights flash as part of the trailer detection and/or trailer theft features. The Trailer Lighting Control Module periodically pulses the lighting circuits of the trailer to verify it is still connected when the vehicle ignition is off.

If the periodic trailer light flashing when the vehicle is parked is objectionable to a customer, refer to Bulletin #20-NA-198 for information on a calibration update to the Trailer Lighting Control Module. After the update is completed, the trailer lights will only flash once every 42 minutes when the trailer theft feature is turned off. If the trailer theft alert is on in the trailer app settings, the timing of the trailer light flashing will not change as the system needs to continuously monitor the trailer connection.



Trailer theft alert setting

TRAILER SIMULATOR TEST TOOL

To determine the proper operation of the Trailer Lighting Control Module, connect the EL-52641 Trailer Simulator Test Tool to the truck's 7-way connector. The Trailer Lighting Control Module will detect the test tool and enable the trailer lighting outputs. With the tool connected, turn on the vehicle ignition to operate all the lights: park, LT/RT turn, stop and reverse. If the lights on the test tool illuminate in correlation with the lights on the vehicle and there are not any DTCs or warning messages displayed on the Driver Information Center (DIC), the truck is operating as designed and no repairs should be performed to the components on the truck.

TIP: When the vehicle ignition is turned off while the Trailer Simulator Test Tool is connected, the trailer lighting LEDs on the tool may flicker/flash randomly. This is normal and is part of the Trailer Lighting Control Module's trailer detection/trailer theft feature.

TRAILER WIRING

A trailer that has wiring that is in very poor condition may result in several DTCs set against the trailer lighting circuits along with DIC warning messages. In some cases, the poor wiring may even open the Trailer Lighting Control Module fuse F74UA or F82UA on the vehicle. If this occurs, verify that the customer's trailer wiring (if available) is in good working condition. If the truck functions properly after using the Trailer Simulator Test Tool, the cause rests with the trailer. Trailer-related lighting issues are not covered under warranty.

Here are some tips that may help the customer/trailer supplier understand and correct any trailer-related issues.

- Some trailers use a trailer-mounted control module to operate some or all of the trailer lights. These trailers may use the B+ circuit from the trailer connector to power the trailer lighting circuits. These trailers may not always be detected by the Trailer Lighting Control Module and may set faults. Load resistors could be added in parallel to the detectable lighting circuits of the trailer to increase current draw. Another option is to rewire the trailer to eliminate the trailer-mounted control module and have the circuits wired directly to the trailer lamps.
- Some non-DOT approved LED lamps may not draw enough current for the Trailer Lighting Control Module to detect a trailer when connected and, as a result, the Trailer Lighting Control Module will not enable the lighting circuits to the trailer. Changing one or more trailer lamps on the detectable circuits to incandescent bulbs or DOT-approved LED lamps will increase current draw while maintaining full functionality of the Trailer Lighting Control Module. Adding a load resistor in parallel to the detectable lighting circuits of the trailer also will increase current draw.
- Some aftermarket accessories, such as trailer-mounted cameras, are incompatible with PWM voltage and may not function correctly when connected to the trailer lighting circuits of the vehicle. The lighting control circuits can be wired to control a relay, in which the relay will provide stable voltage to the customer's aftermarket accessory.

Refer to #PIT5747A and Bulletin #20-NA-198 for additional information on trailering lighting.

▶ Thanks to Kevin Minor



EL-52641 Trailer Simulator Test Tool



Air Conditioning Compressor Failure

The air conditioning may not be getting cold enough or is blowing warm air on some 2018-2020 Malibu and 2019-2020 XT4 models. The A/C compressor on these models may have failed due to a combination of low refrigerant and/or PAG oil.



Cracked A/C compressor housing

Prior to replacing the A/C compressor, confirm that the compressor is seized. Check the housing for signs of cracks and the clutch/hub for any damage.



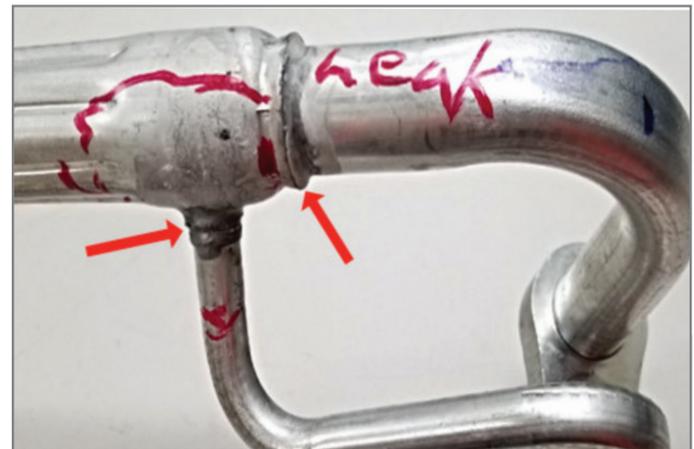
Damaged rubber on the clutch hub.

The rubber of the clutch hub may be torn or separated (on Malibu models with the 1.5L engine, RPO LFV, and 2.0L engine, RPO LTG) or the clutch hub may show signs melted rubber (RPO L3T).

In addition, try to manually rotate the hub/shaft near the center bolt. If it does not rotate freely or the compressor is seized, replace the compressor and complete the oil balancing procedure before checking for any A/C system leaks.

CHECKING FOR LEAKS

If the hub/shaft rotates freely and there are not any signs of cracks or damage, inspect the A/C system for leaks. Possible leaks may be found at the Internal Heat Exchanger (IHX) welds, the condenser – including the receiver and dehydrator cap – and the joints and connections.



IHX weld leak

One other possible leak area is the A/C compressor hose. On Malibu models, check if the hose is rubbing against the fan shroud and exhaust manifold.

If leaks are not found in these areas, continue leak testing the rest of the A/C system following the procedures in the appropriate Service Information.

For additional information, refer to Bulletin #20-NA-224.

► Thanks to Christopher Semanisin

Bluetooth and Phone Projection TAC Worksheet

Before calling the GM Technical Assistance Center (TAC) for any Bluetooth or phone projection (Apple CarPlay and Android Auto) concerns, TAC has released a template to follow when opening a TAC Dealer Case Management (DCM) case.

The template, along with a diagnostic worksheet, are provided in #PIC6423. It lists the information technicians and service consultants should gather from both the customer and the vehicle before and during diagnosis of Bluetooth or phone projection conditions.

The worksheet includes information that can help with verifying a connection over Android Auto, Apple CarPlay or Bluetooth; checking the device operating system version; and if the condition occurs when the vehicle is parked or when driving.

The template covers the information needed by TAC to help with diagnosis, such as the connection method and if the device is newly paired or reconnecting. It also reviews audio quality concerns when streaming music or making a phone call.

For additional information, refer to #PIC6423.

► Thanks to Ryan Dorland



Follow the TAC template for any Bluetooth or phone projection concerns.

TECH 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:
Michael O'Hare
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
dkelly@5by5dzn.com

Write to:
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. All information contained herein is based on the latest information available at the time of publication and is subject to change without notice.

Copyright© 2020 General Motors. All rights reserved.