

Diagnosing Class 2 Data Bus Conditions

Data rides the bus in today's vehicles. The Class 2 bus is a single path that allows the computers, or modules, of a vehicle's subsystems, such as HVAC, steering wheel controls, remote keyless entry and vehicle theft deterrent, to communicate with one another.

When the modules, including the BCM, PCM and others, lose communication, a DTC usually will set. The key to diagnosing these conditions is to determine the root cause for each particular code. In many cases, there may be a bad connection at one of the modules. Finding that connection is where proper diagnosis comes into play.

By hooking up the Tech 2 to the Class 2 data bus, you are adding another module (or node) to the

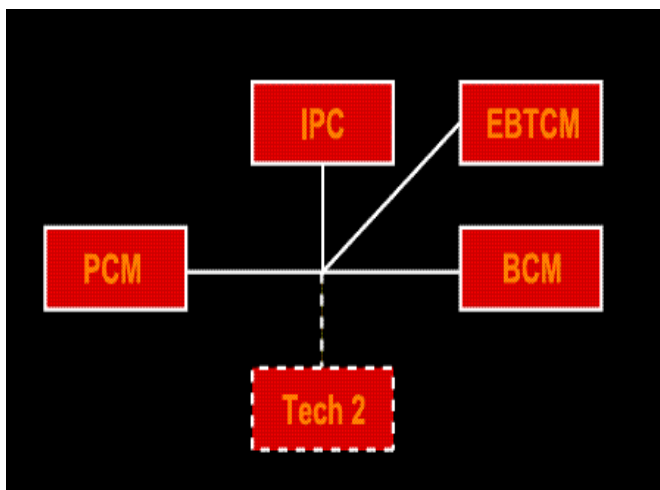


Class 2 bus. This allows the Tech 2 to communicate with all the other modules.

Stars and Loops

There are two main configurations that connect modules to the Class 2 bus. The star configuration connects each module by a single wire that comes from a central location. The loop configuration has two Class 2 wires connected to each module. There is no central location.

In a star configuration there are two different ways the Class 2 wires may be connected together. The first type of connection is soldered together in a central location. To isolate an



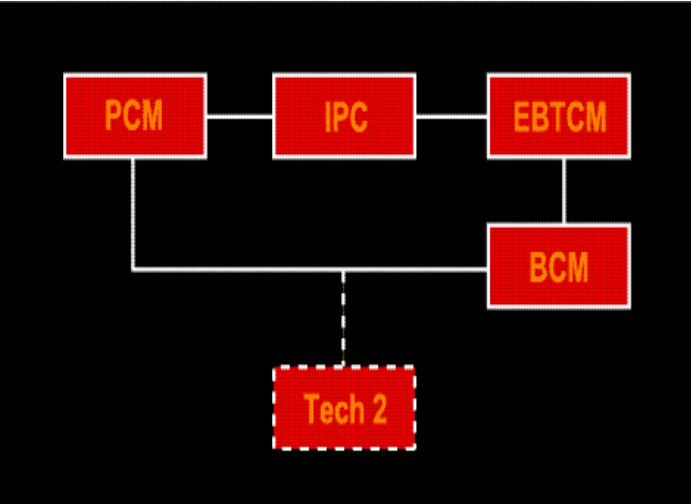
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individual module requires unsoldering the connection and then using a jumper wire to individually connect each module to the Tech 2. All the other modules will be isolated.

The second style connection has a removable "comb" that allows for easy access to each module. By pulling the star connector comb, the jumper wire can be used to individually connect each module to the



Tech 2 while isolating all the other modules. A DVOM also can be used to check for opens or shorts to ground on each individual circuit.

The disadvantage of the star configuration is if an open circuit develops, there is no way for the Class 2 system to compensate for the open. Because of the single wire, the affected module will be unable to communicate with the other modules.

The star configuration is most commonly used on trucks and various passenger cars, such as the Corvette.

The loop configuration has an advantage over the star configura-

tion if an open develops because the loop provides a back door. This allows communication to continue to an affected module.

The disadvantage is that there is no central location, so each module must be disconnected to isolate which wire is physically damaged.

The loop configuration is mostly used on large luxury vehicles, such as the Seville, DeVille, Park Avenue and Aurora.

There are also other possible configurations, or hybrids of the star and loop configurations.

Know Your Vehicle

If you don't know if a module is available on a vehicle, how do you know if it isn't

communicating on the Class 2 bus? That's why it's important to familiarize yourself with the modules that are available on a particular vehicle – and which modules communicate with one another.

A chart like the following example may help you determine which particular modules should be present in a vehicle and what DTCs may set. Look at the RPO codes to determine if an option is included on the vehicle and has the related module. For instance, if a vehicle is equipped with optional memory seats, it would have a Memory Seat Module (MSM).

One additional note to keep in

Module Setting DTC	Module which is not communicating			
	EBTCM	IPC	BCM	PCM
EBTCM	N/A	–	–	–
IPC	U1041	N/A	U1064	U1016
BCM	–	–	N/A	U1016
PCM	U1041	–	U1064	N/A

Note: "N/A" = DTC Not Available from a module that is not communicating on the bus
Note: "–" = No DTC set



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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 bulletin 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.

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mind while performing diagnosis is to always check the service history of the vehicle. Just as with a doctor and patient, it's important to learn as much as you can about what type of service repairs have been made to the vehicle before it has come to your dealership.

Class 2 Diagnostic Circuit Check

The Tech 2's Diagnostic Circuit Check selection offers two features that can help narrow down the search for the culprit of a Class 2 condition. From the Tech 2 main menu, select Diagnostics, then Diagnostic Circuit Check.

The Class 2 DTC Check function will tell you what modules are currently communicating on the Class 2 bus.

With the ignition in the run position, allow all the modules a chance to power up. The modules that are currently communicating on the Class 2 bus will show up on the Tech 2 screen. Any modules that are not currently communicating on the Class 2 bus will not be listed.

The Class 2 DTC Check also tells you which modules currently have DTCs stored in them. The DTC Check function does not indicate what the DTC is, only that there is or is not a DTC currently stored.

A module will set a DTC, for example, when it is not communicating with another module from which it is expecting data. Check the other modules that are supposed to communicate with the module that set the code to determine where to

focus your diagnosis. Only those modules that are expecting information from the failed module will set a DTC.

For instance, if the PCM and IPC both set a U1064 DTC, you would find that both modules need information from the BCM and have set a code to tell you about it. DTC U1064 indicates a loss of communications from the BCM. The EBTMC would not set the U1064 DTC because it is not expecting any data from the BCM.

The Class 2 Message Monitor function on the Tech 2 also can provide insight into the operation of each module. This function can be used to check for communication with each individual module. If communication with each module can be established, all modules will be listed as active on the Tech 2 screen. But a module that isn't talking or communicating won't be active, and won't be listed on the screen. It's important at this point to know which modules are on a particular vehicle.

A module will be listed as Active, meaning it is currently communicating on the Class 2 bus, or Inactive, meaning that it isn't. Inactive status indicates there is an intermittent condition with the module or wiring that causes the module to communicate and then to stop communicating.

More Diagnostic Techniques

In addition to the Class 2 Diagnostic Circuit Check, there are some additional diagnostic tech-

niques that can be used when diagnosing a Class 2 related condition.

For example, to look for a short to voltage, measure the voltage from cavity 2 of the DLC to a good chassis ground, with the ignition on. The Class 2 bus uses a voltage range of zero to seven volts DC. When using a DVOM in normal DC volts position, it should read a voltage lower than five volts. A peak Min-Max reading will capture a voltage of almost seven volts, with anything higher indicating a short to voltage.

Cycle the ignition on/off/on again if the readings seem inconclusive. Let the modules power off for about 30 seconds before turning the key back on. The ignition on input will wake up a lot of modules at once and flood the Class 2 bus with messages. Under these conditions, there should be a lot of activity on the DVOM.

If a short to ground is suspected, disconnect the battery negative terminal and measure the resistance from cavity 2 of the DLC to the disconnected negative battery cable. If the resistance is less than 350 Ohms, check for a short to ground in the serial data line or in one of the modules.

Of course, all connections should be checked and verified as well. Look for backed up pins. And remember, crimp over the wire strands, not the insulation. The key here is communication, and the modules can't communicate if the line of communication is broken or faulty.

- Todd Traver contributed to this article.

Tools



Terminal Picks Available in Kit

As we told you in the October 1999 issue, a set of electrical terminal picks is included in the J-38125 Terminal Repair Kit. Since then, there have been a number of requests to purchase the picks separately. Now you can.

Kent-Moore has just released J-44690, which includes 10 picks, a handy storage box, and an instruction sheet which includes a complete, current application chart. You can purchase a set by calling 1-800-345-2233.

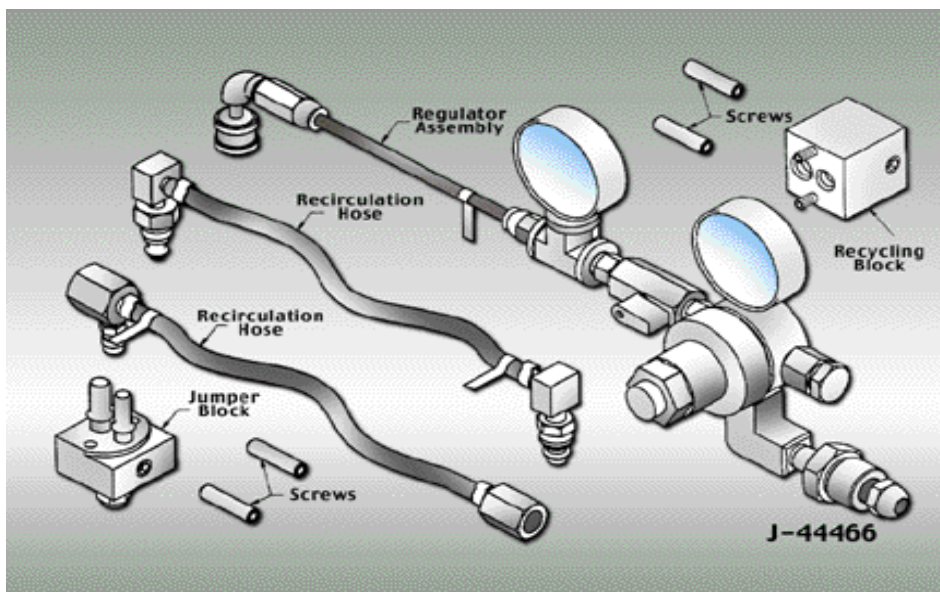
These picks have been designed to release terminals from their connectors without damage. Pick number 15313892 is also included to release the front locks on the new GT style connections. Never attempt to remove a terminal without the proper pick.

- Ron Cannatti

Tools

Fuel Injector Cleaning

Earlier this year you received two bulletins (99-06-01-022 for CPI and 00-06-04-003 for CSFI) regarding driveability conditions related to stuck fuel injector poppet valves. The conditions affect the CPI and CSFI systems used on truck engines which utilize a central metering unit to supply fuel to individual injectors.



In certain areas of the country, impurities in the fuel supply can be deposited on the injector poppet balls, seats or pintles. When an injector sticks either open or closed, the engine may be hard to start or won't start, and may have rough idle after start. The SES light may also come on. Injector replacement is not a correction for this concern.

A new Injector Cleaner kit J-44466 and Fuel System Cleaner canister J-35800-A have been released to help service fuel injectors in affected vehicles. The kit includes hookup hoses for the CPI systems and hookup hoses and blocks for the CSFI systems.

The bulletins contain complete procedures and also itemize the additional tools and supplies you will need.

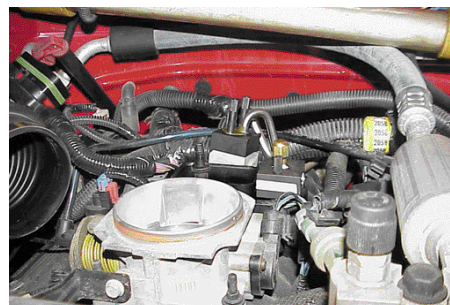
These are only the highlights -- follow the steps in the appropriate bulletin. The exact procedure varies slightly depending on the model being serviced.

CPI System

In this procedure you will separate

the fuel supply and return lines at the existing underbody

junction points. One hose of the J-44466 kit attaches to the supply and return lines on the tank side of the junction. This hose forms a closed loop so fuel pumped from the gasoline tank is directed back to the tank without reaching the engine. The other hose forms a loop on the engine side. A service fitting in this hose permits connecting your J-35800-A fuel canister. When regulated shop air is connected to the can-



Using recycling block -- Jumper block attached to metering body; recycling block attached to fuel supply and return lines

from the kit to connect the nitrogen tank from your Evaporative Emission Test Cart J-41413 to the metering body.



Using recirculation hose -- Jumper block attached to metering body; recirculation hose visible in foreground

ister, it will supply a mixture of gasoline and Top Engine Cleaner directly to the CPI system on the engine.

Allow the engine to idle on the cleaner mixture until the supply is depleted and the engine stalls.

CSFI System

With the fuel pipes removed at the metering body, you will create a closed loop between the fuel supply and return lines in the engine compartment using tools from the J-44466 kit. On some vehicles, you will use the recirculation hose, and on others you will use the recycling block. The instructions tell you which one is required for the specific vehicle.

Then you will use the metering body jumper block and regulator assembly

Using your J-39021 Injector/Coil Balance Tester, you will energize one injector at a time. If any injector is stuck shut, the pressure from the nitrogen tank will open it. Once all the injectors are unstuck, you can connect the J-35800-A canister filled with a mixture of gasoline and Top Engine Cleaner and idle the engine until the cleaner in the canister is depleted.

Both Systems

Before returning the vehicle to the customer, add a prescribed amount of Port Fuel Injector Cleaner to the fuel remaining in the gasoline tank. Provide the customer with the remainder of the PFI Cleaner to add at the next fill-up. And advise the customer to change brands of fuel.

– Tom Bierbower and Ron Minoletti contributed to this article.

	U.S.	Canada
Top Engine Cleaner	1050002	992872
Port Fuel Injector Cleaner	12345104	10953467

On-Board Diagnostic (OBD) System Inspection for State Inspection/ Maintenance (I/M) Programs

PROGRAM TIMING

The U.S. Environmental Protection Agency (EPA) has issued regulations for inspecting the On-Board Diagnostic (OBD) system as a part of the state emission inspections in basic and enhanced Inspection/Maintenance (I/M) programs. These inspections apply to all 1996 model year and newer passenger cars and light trucks.

Sometime this year, the EPA will issue a final ruling on when states will be required to perform OBD system inspections. The OBD system inspections will likely be mandated within the next 1-2 years.

Some states have opted for early implementation of the OBD system inspections. The early inspections include testing both on an advisory basis as well as actual testing. States performing inspections on an advisory basis will not reject vehicles for not being I/M ready.

The Canadian province of British Columbia is planning to implement similar testing set to begin on September 1, 2000. Canadian inspections will apply to all 1998 model year and newer passenger cars and light trucks.

DEALING WITH MIL AND DTC

When a vehicle's on-board diagnostic system detects a condition that could result in excessive emissions, the control module turns on the malfunction indicator lamp (MIL) and stores a DTC associated with the condition. Diagnosis and repair is necessary in order to meet the I/M OBD system inspection requirement. Follow the diagnostic procedure used for the appropriate driveability condition when diagnosing a condition reported from a state I/M program.

VERIFYING TEST COMPLETED

Verify that the vehicle passes all of the diagnostic tests associated with the displayed system status before returning the vehicle to the customer. The I/M System Status selection is included in the scan tool System Info menu.

Each system requires at least one diagnostic test, and sometimes several. The results of these tests are reported by a DTC. A system monitor is complete



According to the I/M System Status screen, with a mixture of Yes and No indications, this vehicle is not ready to be tested by an I/M station.

when either all of the DTCs comprising the monitor have run and passed, or any one of the DTCs comprising the monitor has illuminated the MIL.

Completed "Yes" Indication -- Once all of the tests are completed, the I/M System Status display will indicate YES in the Completed column. For example, when the HO2S Heater test indicates YES, all of the oxygen sensor heaters have been diagnosed. If the vehicle has four heated oxygen sensors, all four heater circuits have been diagnosed.

Completed "No" Indication -- The I/M System Status will indicate NO under the Completed column when any of the required tests for that system have not run. The following conditions will set the I/M System Status indicator to NO:

- The vehicle is new from the factory and has not yet been driven through the necessary drive conditions to complete the tests.



With all 'flags' set to YES, this vehicle is ready for I/M testing.

- The battery has been disconnected or discharged below operating voltage.
- The control module power or ground has been interrupted.
- The control module has been reprogrammed.
- The control module DTCs have been cleared as part of a service procedure.

TESTING GUIDELINES

The EPA has not finalized the regulations for the OBD system inspections. States choosing to start inspections early will use the following guidelines as a basis for their testing. The I/M OBD system inspection consists of a visual check of the MIL operation and an electronic examination of the OBD system.

Visual Check -- Proper MIL operation is determined by a visual inspection during the instrument panel bulb check and by viewing the commanded state of the MIL with a scan tool while the engine is running.

Electronic Examination -- The electronic examination will include inspecting for any MIL-illuminating DTCs and viewing the status of the readiness monitors for the emission control systems. In addition to passing or failing the I/M OBD system inspection, vehicles can be rejected for certain conditions.

INTERPRETING TEST RESULTS

Pass -- A vehicle passes the OBD inspection if the proper MIL operation is observed, there are no MIL-illuminating DTCs, and all of the I/M readiness monitors are completed.

Fail -- A vehicle fails the OBD inspection if the MIL is not operating correctly, there is one or more MIL-illuminating DTCs stored in the control module, or the data link connector (DLC) is missing, tampered with, or inoperable.

Vehicles that have failed the I/M OBD system inspection will require service using standard procedures located in the service information for the applicable vehicle.

Rejected -- A vehicle is rejected if any of the I/M readiness monitors is not completed or the DLC cannot be located or is inaccessible.

WHAT TO DO WITH A REJECTED VEHICLE

General Motors Service Operations has published a supplement titled Inspection/Maintenance (I/M) Emissions Diagnostic Manual OBD II. This supplement, part number GMPT/00-IM240, will be sent out to all dealerships in the United States and Canada this summer.

The information in this manual is intended to aid technicians in servicing vehicles that have been rejected by the I/M test stations for not being I/M ready. This information will assist technicians in completing the I/M readiness monitors in order to allow the vehicle to pass an I/M OBD system inspection.

- Morgan Chemello

TAC Tips

DeVille / Seville Navigation System Detailed Mapping and GPS Interference

2000 DeVille, DHS and DTS and Seville SLS and STS models offer an in-depth navigation system that utilizes Global Positioning System (GPS) technology and offers detailed mapping for most areas. However, the system does have some limitations that should be explained to owners.

Detailed Mapping

For the U.S. market, General Motors utilizes one of the leading map database suppliers to provide map data information to support the navigation system in the Cadillac DeVille and Seville. Unfortunately, the database supplier faces the monumental task of detailing every road in every town of every state. This effort is not yet complete.

There are detailed and non-detailed areas in the database. Detailed areas include all roads and points of interest. Non-detailed areas include only major road information.

Users of the navigation system may have concerns when traveling into non-detailed areas and require a high level of detail information that is not yet available. They will be able to travel through these areas utilizing major road information. Other manufacturers who offer a navigation system are faced with similar concerns from their customers.

As the navigation system evolves, the map media will be updated accordingly. Dealers should consult their Area Sales Manager for any schedule and/or costs involved in any future updates.

Navigation System Interference

The navigation system available on 2000 DeVille and Seville models also may be adversely affected due to clutter on the rear package shelf. Specifically, communication with the ground positioning sensor could be diminished if items are stored on the package shelf. Reduced communication of the ground positioning sensor will not allow the system to properly update actual vehicle locations.

In some instances customers may see discrepancies in the indicated distances traveled in the navigation system when compared to actual odometer readings.

Most discrepancies involve low speed movement of the vehicle, usually under about four miles per hour. Speeds this slow will not register on the speedometer. If the vehicle is moving very slowly, such as when in a traffic jam, there may be a difference between

what the navigation system reads and the speedometer.

Any items that may obstruct proper operation of the ground positioning sensor should be removed from the rear package shelf to ensure that the navigation system updates vehicle information as much as possible.

2000 DeVille, Seville 4T80E Transmission Harsh Garage Shift

Some 2000 Cadillac DeVille and Seville models equipped with the 4T80E transmission may experience a harsh garage shift due to a stored powertrain DTC or the ultra low emission package.

Any of the following DTC's will cause the PCM to command high line pressure resulting in a possible harsh garage shift. The MIL may not always be illuminated when a DTC is present. Check the "since cleared" and "this ignition" diagnostic screens too. Check for these DTCs:

P0121	P0122	P0123
P0502	P0503	P0560
P0562	P0563	P0601
P0602	P0603	P0604
P0705	P0716	P0717
P0731	P0732	P0733
P0734	P0748	P0751
P0752	P0756	P0757
P1121	P1122	P1621
P1811	P1820	P1822
P1823	P1825	P1842
P1843	P1845	

Vehicles built for California and Massachusetts are calibrated for ultra-low emissions. Engine speed at start-up is approximately 1200 rpm for 30 to 40 seconds. A harsher garage shift will occur in these vehicles than at a normal idle. No repair for harsh garage shift should be attempted on these vehicles unless the concern is exhibited after the engine attains a normal idle.

Before any transmission repair is attempted a system review must be performed and any engine DTC that is set must be corrected, not just cleared. Only after any engine DTC is corrected can transmission diagnosis be performed. Be sure to follow DTC diagnostic procedures as outlined in the service manual. If a DTC is not set, a snap shot of the harsh shift should be recorded for additional technical assistance.

If the problem persists after correcting any DTC(s), examine the transmission electrical components. Inspect the wiring harness assembly for any pinches, nicks or cuts. Check the input speed sensor bolt for the proper torque and check the wire to make sure it is not being pinched. Also inspect the pressure control solenoid and the transmission fluid pressure switch assembly for proper function.

Note: When the lower control valve

body is removed from the transmission a new manual shift shaft retainer (part ID 915 in the service manual) must be installed during assembly.

1999 GMC Denali and Cadillac Escalade Intermittent Battery Drain

There may be an intermittent battery drain on 1999 GMC Denali and Cadillac Escalade models that may not be able to be duplicated in the dealership. This condition may be caused by the OnStar system recognizing theft system activation.

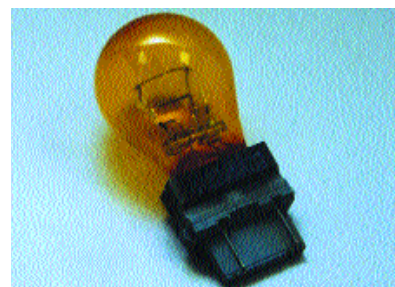
For vehicles that are enrolled and have a currently active OnStar account, press the OnStar button on the OnStar button assembly and request a reconfiguration to disable OnStar's automatic theft notification feature.

It's very important to communicate to the customer that this reconfiguration will permanently disable the OnStar automatic theft notification feature.

For vehicles without a currently active OnStar account, remove the blue VIU connector and remove the wire located in cavity e10. Cut the terminal off the end of this wire and tape the remaining wire back to the OnStar harness. Then reconnect the blue VIU connector.

Again, it's very important to communicate to the customer that this will permanently disable the OnStar automatic theft notification feature.

— GM Technical Assistance Center



DRL Light Bulbs -- Correction

The April issue included information about the Daytime Running Lamp (DRL) in the Oldsmobile Intrigue and the Buick Regal and Century, which uses the turn signal. Lamps for these applications use a heat-resistant base.

The number given in the April article was incorrect. The correct number for the heavy duty bulb is Sylvania 4157KNA.

— Ed.

Automatic A/C Control Operation

Automatic air conditioning is a great convenience. Available on many passenger cars and trucks, it keeps the interior of the vehicle comfortable regardless of the ambient temperature once it's set by the driver.

Customers should be informed, however, that certain criteria must be met in order for the A/C system (either single or dual zone) to operate automatically.

To cool the vehicle, the temperature setting must be at

least one degree higher than the coldest allowable setting. If the coldest setting is 60 F, for example, the control must be set to 61 F or higher to maintain automatic operation. And to warm the vehicle, the temperature setting must be at least one degree lower than the warmest allowable setting.

The A/C system will operate in the manual mode, not the automatic mode, when the driver air conditioning controls are set in the full hot or full cold positions.

The system also is in the manual mode when the driver air conditioning controls are in

non-automatic blower speed control positions.

The fan speed selector must be in the automatic position. Any driver input to increase or decrease fan speed will switch the system to manual operation.

If these conditions are not met, the system is operating in the manual mode.

In the manual mode, all indicators of automatic operation, including lights and/or messages, will be off. The Buick Regal, for example, has an LED indicator that illuminates when the A/C system is in the auto-

matic mode. The LED will not light up if the system is in the full hot or full cold selection because the system is operating in the manual mode, not the automatic mode.

It's important to know how the automatic A/C system operates to eliminate the possibility of unnecessarily replacing an HVAC control head or other component that is operating properly.

Check service bulletin 99-01-39-007 for more details about automatic A/C control operation.

– Wayne Zigler

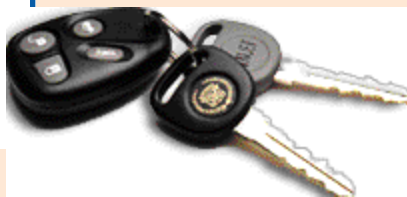
Remote Keyless Entry Operating Conditions

Affected vehicles: 2000 Chevrolet Impala and Monte Carlo; Pontiac Bonneville; Buick LeSabre and Park Avenue; Cadillac DeVille, Eldorado, Seville

On these vehicles with remote keyless entry system, the first press of the unlock button unlocks the driver door. A second press unlocks the remaining doors. Some customers may comment that this does not happen, or may happen intermittently.

If the unlock button is pushed too soon, the system will not respond and the remaining doors will not unlock. Remind the customer that it's necessary to wait one second between button pushes. This is a normal operating condition and does not require component replacement.

– Gary McAdam



GMC Envoy now using Aluminum Liftgate

Beginning in early May and continuing through the end of the 2000 model year, all GMC Envoys are being built with aluminum liftgates. Envoys with the aluminum liftgate have option code TB7 on the SPID label. Envoys with code TB4 have a steel liftgate.

The aluminum liftgate will move to the GMC Jimmy Diamond Edition with the start of 2001 production until the end of December 2000. It's important to keep in mind whether the vehicle has the aluminum or steel liftgate if bodywork is needed.

The aluminum liftgate also uses different supports (struts) with different part numbers than the steel liftgate. The left support part number is 15013439 and the right support part number is 15013440. Check the part numbers to ensure the correct supports are used.

– Dan Oden

Moisture-Sensing Wiper Operation

AFFECTED VEHICLES: All with the moisture-sensing system

The moisture sensing wiper system monitors the moisture on the windshield and automatically adjusts the wiper speed accordingly. The driver can place the system in standby mode by moving the

wiper control to any of the five levels within the intermittent area.

In standby mode, several events occur:

- When the ignition is turned on (wiper control in intermittent range), the wipers perform a single initial wipe to notify the driver that the moisture-sensing system is on standby.

- So long as the mois-

ture sensing remains in the standby system mode, the wipers will make a single "phantom" wipe occasionally to remind the driver that the system is still functioning.

These single initial and reminder wipes occur with the windshield either wet or dry. They are normal operation and do not indicate a malfunction.

– Sandra Kelley

10-Cut Key Cutting Information

The 10-cut, double-sided keys of 2000 model year vehicles now use five characters as an identifier for the key codes. New 10-cut key code information is required when making new keys for all 2000 passenger cars and trucks, with a few exceptions.

In 1999 and earlier model years, the key codes used four characters as an identifier. The 2000 Cadillac Catera and Eldorado, Chevrolet Camaro and Lumina, Pontiac Firebird and medium-duty trucks still use the four character codes. When making a key for these models, use the key code information for 1999 model year vehicles.

In order to make a key for a 2000 model, a new five character code is needed.

Contact your dealership's key cutting equipment manufacturer's representative for a copy of their 2000 model year 10-cut key code information. 2000 model year key code information also is available by calling GM SPO ParTech at 1-800-433-6961 and speaking with a ParTech analyst about the 2000 key code book.

Check out service bulletin 99-00-89-011 for more details about new key cutting information for 10-cut keys.

– Jerry Garfield

Bulletins – May 2000

This review of service bulletins released through mid-May lists the bulletin number, superseded bulletin number (if applicable) subject and models.

GENERAL INFORMATION:

99-00-84-021B; Replaces 99-00-84-021A; Expediting Parts; 2000 and Prior Passenger Cars and Trucks

00-00-89-007; March 2000 Bulletin Summary; 2001 and Prior Passenger Cars and Trucks

00-00-89-008; Replaces 16-01-01B; Recreational (Dinghy) Towing; 1995-2000 Chevrolet Cavalier, 1997-2000 Chevrolet Malibu, 1995-98 Oldsmobile Achieva, 1997-99 Oldsmobile Cutlass, 1999-2000 Oldsmobile Alero, 1995-2000 Pontiac Grand Am, 1995-2000 Pontiac Sunfire, With Hydra-Matic® 4T40-E or 4T45-E Automatic Transaxle (RPOs MN4, MN5) or 5-Speed Manual Transaxle (RPOs MK7, MJ1), 1999-2000 Cadillac Escalade, 1988-2000 Chevrolet and GMC Light Duty Trucks, 1991-1994 Oldsmobile Bravada, 1996-2000 Oldsmobile Bravada

00-00-89-010; May 2000 Labor Time Guide Updates; 1996-2001 Passenger Cars and Trucks

HVAC:

99-01-38-006A; Replaces 99-01-38-006; J-43600 ACR 2000 Essential Refrigerant Recovery/Recharge Equipment; 1993-2000 Passenger Cars and Light Duty Trucks with R-134a Refrigerant

STEERING:

00-02-36-002A; Replaces 00-02-36-002; Deletion of Variable Effort Steering Description; 1999-2000 Chevrolet Corvette

SUSPENSION:

00-03-07-003; Vehicle Pulls/Leads

Left or Right When Applying Brakes (Replace Steering Idler Arms and Reset Alignment); 1994-98 Chevrolet and GMC L Van Models

00-03-08-001; Front Stabilizer Shaft Mounting Stud Breakage (Install New Stud/Bolt and Nut); 1997-2000 Chevrolet and GMC F6-7 T-Series Medium Duty Tilt Models

BRAKES:

00-05-24-001; Snow Intrusion Into Rear Drum Brake Assemblies (Replace Rear Brake Assembly Backing Plates); 1985-87 Buick Somerset, 1985-89 Buick Skyhawk, 1985-98 Buick Skylark, 1985-88 Cadillac Cimarron, 1985-2000 Chevrolet Cavalier, 1985-88 Oldsmobile Firenza, 1985-91 Oldsmobile Cutlass Calais, 1992-98 Oldsmobile Achieva, 1985-94 Pontiac Sunbird, 1985-98 Pontiac Grand Am, 1995-2000 Pontiac Sunfire

ENGINE/PROPULSION SYSTEM:

00-06-01-010; Timing Chain Tensioner Installation Procedure; 1998-99 Chevrolet Malibu, 1998-2000 Chevrolet Cavalier, 1999-2000 Oldsmobile Alero, 1998-2000 Pontiac Grand Am, Sunfire, With 2.4L Engine (VIN T – RPO LD9)

00-06-01-011; No Oil Indicated on Dipstick (Replace Dipstick Tube and Dipstick); 1996-99 Chevrolet Camaro, 1996-99 Pontiac Firebird, With 3.8L V6 Engine (VIN K – RPO L36)

00-06-02-003; Premature Fan Clutch Engagement (Replace Radiator Shutter Engine Coolant Sensor); 1996-2000 Chevrolet and GMC B6-7 Medium Duty School Bus Models with 3116/3126 Caterpillar® Diesel Engines and Radiator Shutters (RPO V04)

00-06-04-015; New Design Quick-Connect Fuel Line Fittings; 2000 Chevrolet Cavalier, Malibu, 2000 Oldsmobile Alero, 2000 Pontiac Grand Am, Sunfire

00-06-04-016; Hard Start or No Start, Possible DTC P1345 (Check Cam Sensor Alignment/Replacement Procedure); 1999-2000 Chevrolet and GMC Medium Duty C6, C7 and B7 Models with 7.4L Engine (VINs B, D – RPOs L21, LP4)

00-06-04-018; Rough Idle After Start, Hard Start, or No Start (Replace Fuel Tank Fill Pipe Assembly/Clean SCPI Poppet Valves); 1997-1999 Chevrolet and GMC M/L Van, 1998-2000 Chevrolet and GMC G Van, 1999-2000 Chevrolet and GMC C/K Models (Silverado and Sierra), With 4.3L, 5.0L, or 5.7L Gasoline Engine (VINs W, X, M, R – RPOs L35, LF6, L30, L31) Built Prior to VIN Breakpoint or Production Date

00-06-05-001; Boom Type Noise During Engine Warm-Up (Install Exhaust Dampener Assembly); 1996-2000 Chevrolet and GMC M/L Van

BODY AND ACCESSORIES:

00-08-50-002; Driver/Passenger Seat Wear at Outboard Recliner Hinge Area (Add Protector Cover/Replace Seat Cushion Trim Cover); 1994-97 Chevrolet and GMC S/T Pickups and 2 Door Utility Models with Front Reclining Bucket Seats or 60/40 Bench Seats (RPOs AV5 or AM6)

00-08-58-002; Road or Water Noise in Rear Seat Area (Add Additional Sound Deadening Material); 1998-99 Chevrolet Malibu, 1998-99 Oldsmobile Cutlass

RESTRAINTS:

00-09-40-002; Front Seat Shoulder Belt is Slow to Retract When Not in Use, or Not Long Enough (Replace Both Front Seat Shoulder Belt Retractors); 1997-99 Chevrolet Malibu, 1997-99 Oldsmobile Cutlass

TechLink on the Web

In response to reader comments, we announced in May that we're considering a permanent *TechLink* Web site. Before that can happen, we need your input.

You can do that in one of two ways. First, there is this simple, 5-question survey. You can fill it out and fax it to 1-248-649-5465.

Or, better yet, go to the sample Web site at www.gmtechlink.com and fill out the survey while you're there.

We'll be tabulating the results soon, so please send in your survey. Thanks for taking the time to let us know what you think.

Fill out this questionnaire on-line at www.gmtechlink.com or copy this page and fax it to 1-248-649-5465.

1. What is your job?

- ☐ A. Technician
- ☐ B. Service Consultant
- ☐ C. Service Manager
- ☐ D. Other

2. Which of the following best describes your business?

- ☐ A. Retail Dealership
- ☐ B. Fleet
- ☐ C. Other Service Facility
- ☐ D. GM Wholesale Organization

3. Would you like to see GM TechLink available on the Internet?

- ☐ A. Yes
- ☐ B. No

4. If GM TechLink were available on the Internet, where would you most likely access it from?

- ☐ A. Dealership
- ☐ B. Home
- ☐ C. Both

5. Would you like to see GM TechLink expanded to cover more service issues?

- ☐ A. Yes
- ☐ B. No