

2014 GENERAL INFORMATION

Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

SPECIFICATIONS

BODY CONTROL MODULE SCAN TOOL INFORMATION

Body Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Engine ON			
Accy/RAP Relay Command	-	On	The scan tool displays On or Off. This is the state of the Accy/RAP relay.
Accessory Relay Command	-	On	The scan tool displays On or Off. This is the state of the accessory relay.
All Door Lock Cmd.	-	Off	The scan tool displays On or Off. This is the state of the all door lock switch.
Ambient Light Sensor	-	Varies	This displays Volts. This is the current voltage at the ambient light sensor.
Ambient Light Status	-	Varies	The scan tool displays Night, Day, Unknown or Invalid. This is the state of the ambient light sensor.
Auto Hdlp. Disable Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the auto headlamp disable switch.
Backup Lamps	-	Off	The scan tool displays On or Off. This is the state of the backup lamps.
Batt. Low at Start	-	No	The scan tool displays Yes or No. Yes is displayed if the state of the battery charge is low during cranking.
Batt. Open Ckt. Tested	-	No	The scan tool displays Yes or No. Yes is displayed if the BCM senses an open battery circuit.
Batt. Open Ckt. Voltage	-	Varies	This displays Volts.
Batt. Voltage High Res.	-	Varies	This displays Volts.
Battery Current	-	Varies	This displays amps. This numeric value is the battery amperage.
Battery Sulfation Mode	-	Inactive	The scan tool displays Active or Inactive. This is the state of the battery sulfation mode.
Battery Voltage	-	Varies	This displays Volts. This is the current battery voltage.
Battery Voltage	-	Normal	This displays Normal or Out of Range. This

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			is the current state of the system voltage.
BPP Sensor	-	Varies	This displays Counts. This numeric value is the current brake pedal position.
BPP Sensor Reference	-	Varies	This displays Counts. This numeric value is the BPP sensor reference.
BPPS High During Learn	-	No	The scan tool displays Yes or No. Yes is displayed if the BPPS was high during BPP calibration.
BPPS Learned Home Position	-	Varies	This displays Counts. This numeric value is the BPP sensor learned home position.
BPPS Low During Learn	-	No	The scan tool displays Yes or No. Yes is displayed if the BPPS was low during BPP calibration.
BPPS Move During Learn	-	No	The scan tool displays Yes or No. Yes is displayed if the BPPS was moved during BPP calibration.
BPPS Status	-	Learned	The scan tool displays Invalid, Learned & Invalid, Undecided, Learning and Learned. This is the state of the BPPS calibration in the BCM.
Brake Applied Output Signal	-	Off	The scan tool displays On or Off. This is the state of the brake applied output signal.
BTSI Fault	-	Not Present	The scan tool displays Present or Not Present. Present is displayed if the BCM senses a brake transmission shift interlock (BTSI) fault.
Calculated Brake Pedal Position	-	Varies	This displays Counts. This numeric value is the current brake pedal position.
Content Theft Mode	-	Varies	The scan tool displays True or False. This is the mode of the content theft system.
Courtesy Lamp PWM Cmd.	-	Varies	This displays percent. This is the current dimming percentage of the courtesy lamps.
Crank Abort	-	False	The scan tool displays True or False. This is the state of the crank abort.
Cruise Control Switch	-	Off	The scan tool displays Off, On, Resume, Set, Error or Cancel. This is the current state of the cruise control switch.
Cruise Ctrl. LED Dimming Cmd.	-	Varies	This displays percent. This is the current dimming percentage of the cruise control indicator of the cruise switch.
CTD Status	-	Disarmed	The scan tool displays Disarmed, Armed, Arm Delay or Alarm Active. This is the state of the content theft deterrent (CTD) system.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Ctsy. Lamp Actv. Reason	-	Varies	The scan tool displays Off, Panic, Manual, Air Bag, Door Open, RFA, RFA Theft, Door Closed, Exit or Manual Defeat. This is the reason for courtesy lamp activation.
Current CTD Trigger	-	None	The scan tool displays None, Drvr. Door, Psgr. Door, LR Door, RR Door, Rear Closure, Mid Closure, Tonneau, Hood, Ignition, Intrusion, Inclination, Remote, Batt. Reconnect, Power Mode or Tamper.
Current Power Mode	-	Run	The scan tool displays Off, Accessory, Run or Crank Request. This is the state of the ignition switch.
Desired Battery Voltage	-	Varies	This displays Volts. This is the desired battery voltage.
Dimming Control Reference	-	Varies	This displays Volts. This is the dimming control reference voltage.
Dimming Control Signal	-	Varies	This displays percent. This is the dimming control percentage.
Dimming Control Signal	-	Varies	This displays Volts. This is the dimming control signal voltage.
Door Key Cyl. Unlock Switch	-	Inactive	This displays Active or Inactive. This is the state of the door key cylinder unlock switch.
Door Lock Requestor	-	Varies	The scan tool displays Power Lock, Door Key Cyl., Rear Closure, Emergency, Keyless Entry, Passive Keyless, Remote, Delayed Lock, Relocking, Anti-Lockout, Exterior Sw. or Auto Locks. This is the current state of the door lock request as monitored by the BCM.
Driver Door Ajar Sw.	-	Door Closed	The scan tool displays Door Ajar or Door Closed. This is the state of the driver door ajar switch.
Driver Door Lock Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the driver door lock switch.
Driver Door Open Sw.	-	Closed	The scan tool displays Open or Closed. This is the state of the driver door open switch.
Driver Door Unlock Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the driver door unlock switch.
Driver Identification	-	Varies	The scan tool displays Unknown or Driver 1-7. This is the current driver identification as monitored by the BCM.
Drvr. Door Unlock Cmd.	-	Off	The scan tool displays On or Off. This is the state of the driver door unlock system.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Drvr. 1 RVS Status	-	Varies	The scan tool displays On or Off. This is the state of the driver 1 RVS.
Drvr. 2 RVS Status	-	Varies	The scan tool displays On or Off. This is the state of the driver 2 RVS.
Estimated Battery Temp.	-	Varies	This displays °C (°F). This is the current estimated battery temperature.
Endgate Handle Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the endgate handle switch.
Endgate Lock Status	-	Unlocked	The scan tool displays Unlocked or Locked. This is the current state of the endgate lock.
Endgate Release Cmd.	-	Off	The scan tool displays On or Off. This is the current state of the endgate release.
Ext. Trunk/Liftglass Rel. Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the exterior trunk or liftglass release switch.
Flash to Pass Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the flash to pass switch.
Front Fog Lamp Relay Command	-	Off	The scan tool displays On or Off. This is the state of the front fog lamp relay system.
Front Fog Lamp Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the front fog lamp switch.
Fuel Economy Mode	-	Active	The scan tool displays Active or Inactive. This is the state of the fuel economy mode.
Hazard Lamp Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the hazard lamp switch.
Headlamp Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the headlamp switch.
High Beam Relay Command	-	Off	The scan tool displays On or Off. This is the state of the high beam relay.
High Beam Select Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the high beam select switch.
Hood Ajar Switch	-	Closed	The scan tool displays Ajar or Closed. This is the state of the hood ajar switch.
Hood Closed Switch	-	Active	The scan tool displays Active or Inactive. This is the state of the hood closed switch.
Hood Open Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the hood open switch.
Hood Switch Fault	-	Not Present	The scan tool displays Present or Not Present. Present is displayed if the BCM senses a hood switch fault.
Horn Relay Command	-	Off	The scan tool displays On or Off. This is the state of the horn relay.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

HS Comm. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the high speed communications command of the BCM.
Idle Boost Level 2 Counter	-	Varies	This displays a numeric value. This is the number of level 2 idle boosts.
Idle Boost Level 3 Counter	-	Varies	This displays a numeric value. This is the number of level 3 idle boosts.
Ign. Off/Run/Crank	-	Run	The scan tool displays Key In/Off, Key Out/ACC, Crank or Run. This is the state of the ignition switch.
Ignition Accessory/Run	-	Active	The scan tool displays Active or Inactive. This is the state of the ignition accessory/run.
Ignition Run/Crank	-	Active	The scan tool displays Active or Inactive. This is the state of the ignition run/crank.
Ignition Switch Fault	-	No	The scan tool displays Yes or No. Yes is displayed if the BCM senses an ignition switch fault.
Incandescent Dimming PWM Cmd.	-	Varies	This displays percent. This is the current incandescent dimming percentage.
Int. Trunk/Liftglass Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the interior trunk or liftglass release switch.
Key Capture Solenoid Cmd.	-	Off	The scan tool displays On or Off. This is the state of the key capture solenoid.
Key in Ignition	-	Yes	The scan tool displays Yes or No. This is the state of the key in ignition.
Key in Ignition Status	-	Key In	The scan tool displays Key In or Key Out. This is the state of the key in ignition.
LED Dimming PWM Cmd.	-	Varies	This displays percent. This is the current LED dimming percentage.
Left DRL Relay Cmd.	-	Off	The scan tool displays On or Off. This is the state of the left daytime running lamp (DRL) relay.
Left Rear Door Ajar Sw.	-	Door Closed	The scan tool displays Door Closed or Door Ajar. This is the state of the driver rear door ajar switch.
Left Turn Signal Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the left turn signal switch.
LF Turn Signal	-	Off	The scan tool displays On or Off. This is the state of the left front turn signal.
Liftgate Handle Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the liftgate handle switch.
Liftgate Lock Status	-	Unlocked	The scan tool displays Locked or Unlocked.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			This is the current state of the liftgate lock.
Liftgate Release Cmd.	-	Off	The scan tool displays On or Off. This is the state of the liftgate release.
Liftglass Release Cmd.	-	Off	The scan tool displays On or Off. This is the state of the liftglass release.
Low Beam Relay Command	-	Off	The scan tool displays On or Off. This is the state of the low beam relay.
LR Turn Signal	-	Off	The scan tool displays On or Off. This is the state of the left rear turn signal.
LR Window Enable Cmd.	-	Off	The scan tool displays On or Off. This is the state of the driver rear window enable system.
LR Window Up Cmd.	-	Off	The scan tool displays On or Off. This is the state of the driver rear window up request.
Off/Run/Crank Reference	-	Varies	This displays volts. This is the current off/run/crank reference voltage.
Off/Run/Crank Signal	-	Varies	This displays volts. This is the current off/run/crank signal voltage.
Parasitic Current	-	Varies	This displays amps. This is the state of the parasitic draw on the battery.
Park Brake Switch	-	Released	The scan tool displays Applied or Released. This is the state of the park brake switch.
Park Lamp Relay Cmd.	-	Off	The scan tool displays On or Off. This is the state of the park lamp relay.
Parklamp Switch	-	Off	The scan tool displays On or Off. This is the state of the park lamp switch.
Passenger Door Ajar Sw.	-	Door Closed	The scan tool displays Door Closed or Door Ajar. This is the state of the passenger door ajar switch.
Passenger Door Open Sw.	-	Closed	The scan tool displays Open or Closed. This is the state of the passenger door open switch.
Powertrain HS Comm. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the powertrain high speed communications command.
Prev. State of Charge	-	Varies	This displays percent. This was the previous state of charge of the battery.
Psgr. Door Lock Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the passenger door lock switch.
Psgr. Door Unlock Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the passenger door unlock switch.
Psgr. Door(s) Unlock Cmd.	-	Off	The scan tool displays On or Off. This is the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			state of the passenger doors unlock system.
Rain Sensor Signal	-	Off	The scan tool displays Off, Low Speed, High Speed, Sensor Failed, Ckt. Fault Low, Ckt. Fault High, No Glass or No BCM Data. This is the state of the rain sensor signal.
Rear Cargo Lock Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the rear cargo lock switch.
Rear Cargo Unlock Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the rear cargo unlock switch.
Rear Closure Cyl. Unlock Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the rear closure cylinder unlock switch.
Rear Closure Open Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the rear closure open switch.
Rear Closure Ajar Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the rear closure ajar switch.
Rear Doors Lock Cmd.	-	Off	The scan tool displays On or Off. This is the state of the rear doors lock system.
Rear Doors Unlock Cmd.	-	Off	The scan tool displays On or Off. This is the state of the rear doors unlock system.
Regulator Setpoint	-	Varies	This displays percent. This is the set point of the voltage regulator.
Remaining Starts 0	-	Varies	The scan tool displays True or False. True is displayed if there are no remaining starts.
Remote Start Attempts 0	-	Varies	The scan tool displays True or False. True is displayed if there are no remote start attempts.
RF Turn Signal	-	Off	The scan tool displays On or Off. This is the state of the right front turn signal.
Right DRL Relay Cmd.	-	Off	The scan tool displays On or Off. This is the state of the right daytime running lamp (DRL) relay.
Right Rear Door Ajar Sw.	-	Door Closed	The scan tool displays Door Closed or Door Ajar. This is the state of the passenger rear door ajar switch.
Right Turn Signal Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the right turn signal switch.
RR Turn Signal	-	Off	The scan tool displays On or Off. This is the state of the right rear turn signal.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

RR Window Down Cmd.	-	Off	The scan tool displays On or Off. This is the state of the passenger rear window down system.
RR Window Enable Cmd.	-	Off	The scan tool displays On or Off. This is the state of the passenger rear window enable system.
RR Window Up Cmd.	-	Off	The scan tool displays On or Off. This is the state of the passenger rear window up system.
Run Relay Command	-	Off	The scan tool displays On or Off. This is the state of the run relay.
Run Abort	-	False	The scan tool displays True or False. True is displayed if a run abort was executed.
Run Relay Command	-	Off	The scan tool displays On or Off. This is the state of the run relay.
Shift Lock Solenoid Command	-	Off	The scan tool displays On or Off. This is the state of the shift lock solenoid.
Start Up State of Charge	-	Varies	This displays percent. This was the last state of charge of the battery at start up.
State of Charge	-	Varies	This displays percent. This is the current state of charge of the battery.
State of Charge Low	-	No	The scan tool displays Yes or No. Yes is displayed if the state of charge of the battery is low.
Stop Lamp Relay Command	-	Off	The scan tool displays On or Off. This is the state of the stop lamp relay.
SWC Bank 1 Status	-	Idle	The scan tool displays Idle or Switch 1-10. This is the state of the steering wheel controls (SWC) bank 1.
SWC Bank 2 Status	-	Idle	The scan tool displays Idle or Switch 1-10. This is the state of the steering wheel controls (SWC) bank 2.
Tap Up/Down Switch	-	Off	The scan tool displays On, Off, Up or Down. This is the state of the tap up/down switch.
Theft LED	-	Off	The scan tool displays On, Off, Flash Slow or Flash Fast. This is the current state of the theft indicator.
Tonneau Release Cmd.	-	Off	The scan tool displays On or Off. This is the current state of the tonneau release.
Tow/Haul Mode Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the tow/haul mode switch.
			The scan tool displays Active or Inactive.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Traction Control Switch	-	Inactive	This is the state of the traction control switch.
Valet Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the valet switch.
Washer Relay Cmd.	-	Off	The scan tool displays On or Off. This is the state of the washer relay.
Windshield Washer Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the windshield washer switch.
Windshield Wiper Switch	-	Off	The scan tool displays Off, Intermittent, Low, High or Switch Fault. This is the state of the windshield wiper switch.
Wiper Delay Setting	-	Varies	This displays a numeric value. This is the wiper delay setting.
Wiper High Speed Relay Cmd.	-	Off	The scan tool displays On or Off. This is the state of the wiper high speed relay.
Wiper High Speed Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the wiper high speed switch.
Wiper Park Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the wiper park switch.
Wiper Relay Cmd.	-	Off	The scan tool displays On or Off. This is the state of the wiper relay.

Body Control Module Scan Tool Output Controls

Scan Tool Output Control	Description
Accy/RAP Relay	This output control is used to command the Accy/RAP relay On and Off.
Backup Lamps	This output control is used to command the backup lamps On and Off.
BPP Sensor Calibration	This output control is used to command the BCM to calibrate the brake pedal position (BPP) sensor to zero.
Courtesy Lamp	This output control is used to command the foot wells and courtesy lamps On and Off.
DRL	This output control is used to command the daytime running lamps On and Off.
Fog Lamps	This output control is used to command the fog lamps On and Off.
High Beams	This output control is used to command the high beam headlights On and Off.
Horn	This output control is used to command the horn On and Off.
Incandescent Dimming	The body control module (BCM) dims from 0-100 percent when you select INCREASE or DECREASE by 20 percent increments.
LED Dimming	The BCM dims the LED dimming from 0-100 percent when you select INCREASE or DECREASE by 20 percent increments.
Left Rear Window	This output control is used to command the left rear window Up and Down.
LF Turn Signal	This output control is used to command the left front turn signal On and Off.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Liftglass Release	This output control is used to command the liftglass release switch On and Off.
Lock Rear Doors	This output control is used to command the rear doors to lock.
Low Beams	This output control is used to command the low beam headlights On and Off.
LR Turn Signal	This output control is used to command the left rear turn signal On and Off.
Parking Lamps	This output control is used to command the parking lamps On and Off.
RF Turn Signal	This output control is used to command the right front turn signal On and Off.
Right Rear Window	This output control is used to command the right rear window Up and Down.
RR Turn Signal	This output control is used to command the right rear turn signal On and Off.
Run/Crank Relay	This output control is used to command the run/crank relay On and Off.
Setup SDM Primary Key in BCM	This output control is used to set up the SDM primary key into the BCM.
Shift Lock Solenoid	This output control is used to command the shift lock solenoid On and Off.
Unlock Rear Doors	This output control is used to command the rear doors to unlock.
Wiper High Speed Relay	This output control is used to command the wiper high speed relay On and Off.
Wiper Relay	This output control is used to command the wiper relay On and Off.
Wiper Washer Motor	This output control is used to command the wiper washer motor On and Off.

CHASSIS CONTROL MODULE SCAN TOOL INFORMATION

Chassis Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature/Vehicle is in Park or Neutral			
Desired Fuel Pressure	-	306.8 kPa (44.5 psi)	This displays kPa (psi). This is the desired fuel pressure.
Fuel Pump Command	-	On	The scan tool displays On or Off. This is the current state of the fuel pump command.
Fuel Pump Signal Command	-	Varies	This displays %. This is the commanded fuel pump signal measured in percentage.
Fuel Pressure Sensor	-	296.4-310.3 kPa (43-45 psi)	This displays kPa (psi). This is the current pressure at the fuel pressure sensor.
Fuel Pressure Sensor	-	4.90-5.01 Volts	This displays Volts. This is the fuel pressure sensor voltage.
Ignition 1 Signal	-	Varies	This displays Volts. This is the current ignition 1

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			signal.
LT Fuel Pump Trim	-	Varies	This displays a numeric value. This is the long term (LT) fuel pump trim.
ST Fuel Pump Trim	-	Varies	This displays a numeric value. This is the short term (ST) fuel pump trim.

Chassis Control Module Scan Tool Output Controls

Output Control	Description
Fuel Pressure Control	This output control is used to control the fuel pressure.
Fuel Pump	This output control is used to command the fuel pump ON and OFF.
Fuel Pump Trim Reset	This output control is used to reset the fuel pump trim.

Active Grille Air Shutter Scan Tool Data Parameters (If Equipped)

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature/Vehicle is in Park or Neutral			
Active Grille Air Shutter Position Command (Single Shutter System)	-	Varies	This displays %. This is the commanded active grille air shutter position.
Active Grille Air Shutter Position (Single Shutter System)	-	Varies	This displays %. This is the actual active grille air shutter position.
Active Grille Air Shutter 1 Position Command (Dual Shutter System)	-	Varies	This displays %. This is the commanded active grille air shutter position.
Active Grille Air Shutter 1 Position (Dual Shutter System)	-	Varies	This displays %. This is the actual active grille air shutter position.
Active Grille Air Shutter 2 Position Command (Dual Shutter System)	-	Varies	This displays %. This is the commanded active grille air shutter position.
Active Grille Air Shutter 2 Position (Dual Shutter System)	-	Varies	This displays %. This is the actual active grille air shutter position.

Active Grille Air Shutter Scan Tool Output Controls (If Equipped)

Output Control	Description
Active Grille Air Shutter System (Single Shutter System)	This output control is used to perform the Active Grille Air Shutter Actuator test. It is used to cycle the active grille air shutter open and closed. The test result will display pass or fail based on the ability of the louvers to cycle open and closed.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Active Grille Air Shutter 1 (Dual Shutter System)	This output control is used to perform the Active Grille Air Shutter Actuator test. It is used to cycle the active grille air shutter open and closed. The test result will display pass or fail based on the ability of the louvers to cycle open and closed.
Active Grille Air Shutter 2 (Dual Shutter System)	This output control is used to perform the Active Grille Air Shutter Actuator test. It is used to cycle the active grille air shutter open and closed. The test result will display pass or fail based on the ability of the louvers to cycle open and closed.

Exhaust Flow Control Valve Scan Tool Data Parameters (If Equipped)

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature / Vehicle is in Park or Neutral			
Exhaust Flow Control Valve Command	-	Open/Closed	Exhaust Flow Valve Commanded State
Exhaust Flow Control Valve Command	-	%	Exhaust Flow Valve Commanded Duty Cycle (0%-100%)
Exhaust Flow Control Valve Performance Mode	-	Active/Inactive	Exhaust Flow Valve Control Status
Exhaust Flow Control Valve Rumble Mode	-	Active/Inactive	Exhaust Flow Valve Control Status
Exhaust Flow Control Valve	-	Active/Inactive	Exhaust Flow Valve Control Status

Exhaust Flow Control Valve Scan Tool Output Controls (If Equipped)

Output Control	Description
Exhaust Flow Control Valve Command	This output control is used to cycle the exhaust flow control valve open and closed.

CCM Scan Tool Parameters for Trailer Brake Control System (If Equipped)

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine Idling at Normal Operating Temperature / Vehicle is in Park or Neutral			
ABS Active Signal	-	OK	The scan tool displays Ok/Not Ok. The scan tool displays Ok when no problems are found with the ABS Active Signal serial data message from the electronic brake control module to the chassis control module.
Antilock Braking System	-	Inactive	The scan tool displays Active/Inactive. The scan tool displays Inactive when the ABS system is not functioning.
Automatic Brake			The scan tool displays a number

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Control Gain Request From EBCM	-	0-100%	between 0-100%.
Automatic Brake Request From EBCM	-	No	The scan tool displays Yes/No. This is a request from the EBCM to apply the trailer brakes.
Automatic-Brake Torque	-		The scan tool displays a numerical value.
Automatic-Brake Torque Signal	-	Ok	The scan tool displays Ok/Not Ok. The scan tool displays Ok when no problems are found with the Automatic Brake Torque Signal serial data message to the chassis control module.
Automatic Braking Active Signal	-	Ok	The scan tool displays Ok/Not OK. The scan tool displays OK when no problems are found with the Automatic Braking Active Signal serial data message to the chassis control module.
Automatic Braking Event	-	Not Detected	The scan tool displays Detected/Not Detected. This parameter represents a command to apply the trailer brakes from the adaptive cruise control system.
Brake Master Cylinder Pressure Sensor	-	Varies	The scan tool will display brake fluid pressure in the master cylinder. The scan tool will display a kPa or psi signal received from the chassis control module.
Brake Pressure Signal	-	OK	The scan tool will display Ok/Not Ok. The scan tool will display a serial data message received from the chassis control module.
Brake Request from EBCM	-	Ok	The scan tool displays Ok/Not Ok. The scan tool displays Ok when no problems are found with the Brake Request signal serial data message from the electronic brake control module to the chassis control module.
Desired Trailer Brake Control Duty Cycle	-	0-100%	The scan tool displays a number between 0-100%. This number represents a duty cycle request signal from the chassis control module to the trailer brake power module.
Deviation Between			The scan tools displays a percentage

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Manual Trailer Brake Apply Request Signal 1 and 2	-	Varies	difference between the Apply Request Signal 2 and Redundant Request Signal 1.
Driver Initiated Brake Event	-	Not Detected	The scan tool displays Detected/Not Detected. The scan tool detects when the driver has applied the trailer brakes.
Induced Voltage by Trailer Brake Coil	-	0-20 V	The scan tool displays a voltage. This number represents the actual voltage supplied by the trailer brake power module to the trailer brakes.
Manual Trailer Brake Apply Request Signal 1	-	Varies	The scan tool displays a percentage. This represents a brake apply signal between the chassis control module and the trailer brake power module.
Manual Trailer Brake Apply Request Signal 2	-	Varies	The scan tool displays a percentage. This represents a brake apply signal between the chassis control module and the trailer brake power module.
Stop Lamp Signal	-	Not Requested	The scan tool displays Requested/Not Requested. This is the brake pedal position sensor signal from the BCM to the chassis control module.
Trailer Brake Automatic Control State	-	Normal	The scan tool displays Normal/Active/Temporarily Inhibited/Temporarily Limited/Permanently Failed/Communication Failed/Disabled by Calibration. This represents the operational state of the chassis control module.
Trailer Brake Control Duty Cycle	-	0-100%	The scan tool displays a percentage. This is the pulse width modulated output signal from the trailer brake power module to the trailer brakes.
Trailer Brake Control Output Circuit	-	Okay	The scan tool displays Unknown/Short to Battery/Short to Ground/Okay. This represents the state of health of the output circuit from the trailer brake power module to the trailer brakes.
Trailer Brake Control Output Circuit	-	0-20 V	The scan tool displays a voltage. This represents the voltage supplied by the trailer brake power module to the trailer brakes.

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Trailer Brake Power Control Module	-	De-Energized	The scan tool displays Energized/De-Energized. This represents the state of the trailer brake power module.
Trailer Brake Power Control Module Battery Voltage	-	Varies	The scan tool displays a voltage. This represents the battery voltage supplied to the trailer brake power module.
Trailer Brake Type	-	Undefined	The scan tool displays Undefined when a trailer is not connected to the vehicle. The scan tool displays Electromagnetic Brakes or Electrohydraulic Brakes when a trailer is connected to the vehicle. The type displayed is based on what is detected by the chassis control module.
Trailer Brake User Gain	-	Varies	The scan tool displays percent of full gain setting. The scan tool displays 0-100%. Each full gain setting represents an increment of approximately 10 percent of full gain setting. Approximately 40% will be indicated with a gain setting of 4.0, 65% will be indicated with a gain setting of 6.5, etc.
Trailer Brake User Gain Switch	-	Varies	The scan tool displays percent of full gain setting. The scan tool displays 0-100%. Each full gain setting represents an increment of approximately 10 percent of full gain setting. Approximately 40% will be indicated with a gain setting of 4.0, 65% will be indicated with a gain setting of 6.5, etc.
Vehicle Speed	-	Varies	The scan tool displays 0-327 km/h (0-204 mph). The scan tool displays 0 km/h (0 mph) when the vehicle is not moving. This is the vehicle speed serial data message from the ECM.
Vehicle Stability Enhancement System Signal	-	Ok	The scan tool displays Ok/Not Ok. The scan tool displays Ok when no problems are found with the Vehicle Stability Enhancement System signal to the chassis control module.
			The scan tool displays Ok/Not Ok.

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Wheel Speed Signal	-	Ok	The scan tool displays Ok when no problems are found with the Wheel Speed signal from the EBCM to the chassis control module.
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CCM Scan Tool Parameters for Vehicle Level Control (If Equipped)

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
Left Rear Vehicle Level Position Sensor	-	.25-4.75 Volts	This displays Volts. This is the level position sensor voltage.
Right Rear Vehicle Level Position Sensor	-	.25-4.75 Volts	This displays Volts. This is the level position sensor voltage.
Vehicle Level Control Compressor Over Temperature	-	No	This displays Yes or No. This will display Yes if the compressor is overheated.
Excessive Compressor Activity	-	No	This displays Yes or No. This will display Yes if the compressor activity is excessive.
Vehicle Level Control Status	-	Normal	This displays Normal/Uneven Surface or Hoisted/Overloaded/Failed.
Vehicle Level Control Compressor	-	Varies	This displays On or Off. This will display if the compressor is on or off.
Vehicle Level Control Exhaust Valve	-	Varies	This displays Open or Closed. This will display if the exhaust valve is open or closed.
Vehicle Level Control Pressure Sensor	-	.4-4.8 Volts	This displays Volts. This is the level control pressure sensor voltage.
Vehicle Leveling Sensors Supply Voltage	-	4.9-5.1 Volts	This displays Volts. This is the leveling sensors supply voltage.
Vehicle Level Control Pressure Sensor Supply Voltage	-	4.9-5.1 Volts	This displays Volts. This is the level control pressure sensor supply voltage.
Vehicle Level Trim Height Status	-	Learned/Not Learned	This displays if the level trim height status

CCM Scan Tool Output Controls for Vehicle Level Control (If Equipped)

Output Control	Description
Suspension Position Sensor Trim Height	This output control is used to learn the trim height.

Vehicle Level Control Compressor Relay	This output control is used to command the compressor ON and OFF.
Vehicle Level Control Exhaust Valve	This output control is used to command the exhaust valve ON and OFF.

COMMUNICATION INTERFACE MODULE SCAN TOOL INFORMATION

Vehicle Communication Interface Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON			
GPS Data:			
• Dead Reckoning Calibration Status	-	Calibrated or Not Calibrated	Indicates the dead reckoning calibration status.
• Position Calibration Method	-	Varies	Indicates the method used to determine current location. (0) GPS, (1) Wheel Speed Dead Reckoning only, (2) Combined Wheel Speed and GPS, (3) Gyro only, (4) Combined Gyro and GPS, (5) No Fix
• Month	-	MM	This displays the current month.
• Day	-	DD	This displays the current day of the month.
• Year	-	YY	This displays the current year.
• Hour	-	HH	This displays the GPS current hour (24 hour format - GMT).
• Minute	-	MM	This displays the GPS current minute.
• Second	-	SS	This displays the GPS current second.
• GPS Signal	-	Varies	The scan tool displays Yes or No. Yes is displayed if there is a GPS signal received by the vehicle communication interface module.
Signal Strength Data:			
• Current Transceiver Identifier	-	Varies	The scan tool displays a 2-5 digit value. This is the transceiver identification number.
• GSM Signal Strength	-	Varies	The scan tool displays 0-127. This is the vehicle communication interface module signal strength.
• Signal Type	-	Digital	This is the signal type received by the vehicle communication interface module.
Bluetooth Data:			

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• Bluetooth	-	Enabled	Indicates if the Bluetooth system is enabled or disabled.
• Bluetooth Link Status	-	Varies	Indicates the current link status. (0) Unconnected, (1) connected / Idle, (2) Call active, (3) 3 way calling active
• Bluetooth Link Quality	-	Varies	The scan tool displays a decimal value between 0 and 255.
• Bluetooth Phone to Telematics Communication Interface Control Module Authentication Status	-	Active or Inactive	Displays the bluetooth phone to vehicle communication interface module authentication status.
• Bluetooth Phone to Telematics Communication Interface Control Module Communication Status	-	Active or Inactive	Displays the bluetooth phone to vehicle communication interface module status.
• Bluetooth Phone Voice Recognition Status	-	Active or Inactive	Displays the bluetooth phone to voice recognition status.

Vehicle Communication Interface Module Scan Tool Output Controls

Output Control	Description
B1000 Information	This shows the data recorded when DTC B1000 was set in the vehicle communication interface module.
Green Indicator	The vehicle communication interface module illuminates the green LED when ON is selected.
Phone Call Test	When ON is selected, vehicle communication interface module commands OnStar® to connect to the OnStar® Center.
Red Indicator	The vehicle communication interface module illuminates the red LED when ON is selected.
Preferred Roaming List Update	The vehicle communication interface module performs a preferred roaming list (PRL) update when this is selected.
Remote Vehicle Speed Limiting Reset	This function resets the speed limiting feature.

DIGITAL RADIO RECEIVER SCAN TOOL INFORMATION

Digital Radio Receiver Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON/Engine OFF/Radio ON		
Battery Voltage	Varies	This displays volts. This is the voltage input supplied to the digital radio receiver.
Ignition Counter	Varies	This displays the number of times the ignition has

		been cycled from the OFF to ON position.
Power Mode	Run	The scan tool displays Reserved, Off Battery Save, Off Asleep, Off Awake, Unlock, RAP Unlock, Accessory, Run, Crank or RAP. The status of the vehicle power mode (ignition switch).

DOOR LOCK CONTROL MODULE SCAN TOOL INFORMATION (DRIVER DOOR LOCK/WINDOW SWITCH)

Driver Door Switch Scan Tool Data Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON			
Battery Voltage Signal	-	Varies	This displays volts. This is the voltage input supplied to the driver door switch.
Door Key Cyl. Unlock Switch	-	Idle	The scan tool displays Idle or Unlock. This is the state of the driver door key cylinder unlock switch.
Door Lock Actuator Cmd.	-	Off	The scan tool displays Off, Unlock or Lock. This is the state of the door lock actuator.
Driver Door Ajar Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the driver door ajar switch.
Driver Door Open Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the driver door open switch.
Driver LF Window Switch	-	Off	The scan tool displays Off, Up, Down, Express Up or Express Down. This is the state of the driver left front window switch.
Driver LR Window Switch	-	Off	The scan tool displays Off, Up, Down, Express Up or Express Down. This is the state of the driver left rear window switch.
Driver RF Window Switch	-	Off	The scan tool displays Off, Up, Down, Express Up or Express Down. This is the state of the driver right front window switch.
Driver RR Window Switch	-	Off	The scan tool displays Off, Up, Down, Express Up or Express Down. This is the state of the driver right rear window switch.
Memory Recall Switches	-	Varies	This displays volts. This is the voltage input supplied to the driver door memory recall switches.
			This displays volts. This is the voltage

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Memory Switch 12V Ref.	-	Varies	input supplied to the driver door memory switch.
Memory Switch Backlight	-	Varies	The scan tool displays %. This is the intensity of the backlighting in the memory switch.
Mirror 5 Volt Reference	-	ON	The scan tool displays On or Off. This is the state of the voltage reference circuit to the mirror.
Mirror Fold Switch	-	Idle	The scan tool displays Idle, Extend or Retract. This is the state of the mirror fold switch.
Mirror Motor	-	Idle	The scan tool displays Idle, Invalid, Up, Down, Left and Right. This is the state of the mirror motor.
Mirror Horizontal Position	-	Varies	This displays volts. This is the voltage input supplied to the mirror horizontal position.
Mirror Select Switch	-	Idle	The scan tool displays Idle, Right or Left. This is the state of the mirror select switch.
Mirror Vertical Position	-	Varies	This displays volts. This is the voltage input supplied to the mirror vertical position.
Rear Window Sw. 12V Ref.	-	Varies	This displays volts. This is the voltage input supplied to the rear window switch.
Seat Back Heat Mode Ind. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat back heat mode indicator.
Seat Back Heat Mode Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the seat back heat mode switch.
Seat Cool Mode Ind. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat cool mode indicator.
Seat Cool Mode Switch	-	Off	The scan tool displays On or Off. This is the state of the seat cool mode switch.
Seat Heat High Ind. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat heat high indicator.
Seat Heat Medium Ind. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat heat medium indicator.
Seat Heat Low Ind. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat heat low indicator.
Seat Heat Mode Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat heat mode.
Seat Heat Mode Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the seat heat mode

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			switch.
VIN Learned	-	Yes	The scan tool displays Yes or No. This is the state of the driver door switch VIN programming.
Window Lockout Switch	-	Off	The scan tool displays On or Off. This is the state of the driver door window lockout switch.
Window Lockout Switch Indicator Command	-	Off	The scan tool displays On or Off. This is the state of the driver door window lockout switch indicator.
Window Switch Backlight	-	Varies	The scan tool displays %. This is the intensity of the backlighting in the window switch.

Driver Door Switch Scan Tool Output Controls

Scan Tool Output Control	Description
Door Deadbolt Lock/Unlock	This command will lock and unlock the driver door dead bolt actuator.
Door Lock/Unlock	This command will lock and unlock the driver door lock actuator.
Front Window Motor	This test will command the front window both up and down.
Heated Seat Indicators	This will command the heated seat indicators ON and OFF.
Integrated Sw. Backlighting Test	The scan tool commands the % intensity of the integrated switches backlighting.
Mirror Fold	This will command the driver mirror to fold and unfold.
Mirror Heater	This will command the driver mirror heater ON and OFF.
Mirror Left/Right	This will command the driver mirror left and right.
Mirror Up/Down	This will command the driver mirror up and down.
Non-Integrated Sw. Backlighting Test	The scan tool commands the % intensity of the non-integrated switches backlighting.
Power Window Motor Programming	This will enable the driver power window motor to be programmed.
Puddle/Courtesy Lamp	This will command the courtesy lamps ON and OFF.
Window Lockout Indicator	This will command the window lockout indicator ON and OFF.

DOOR LOCK CONTROL MODULE SCAN TOOL INFORMATION (PASSENGER DOOR LOCK/WINDOW SWITCH)

Passenger Door Switch Scan Tool Data Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON			
			This displays volts. This is the voltage

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2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Battery Voltage Signal	-	Varies	input supplied to the passenger door switch.
Door Key Cyl. Unlock Switch	-	Idle	The scan tool displays Idle or Unlock. This is the state of the passenger door key cylinder unlock switch.
Door Lock Actuator Cmd.	-	Off	The scan tool displays Off, Unlock or Lock. This is the state of the door lock actuator.
Memory Switch 12V Ref.	-	Varies	This displays volts. This is the voltage input supplied to the passenger door memory switch.
Memory Switch Backlight	-	Varies	The scan tool displays %. This is the intensity of the backlighting in the memory switch.
Mirror 5-Volt Reference	-	ON	The scan tool displays On or Off. This is the state of the voltage reference circuit to the mirror.
Mirror Horizontal Position	-	Varies	This displays volts. This is the voltage input supplied to the mirror horizontal position.
Mirror Vertical Position	-	Varies	This displays volts. This is the voltage input supplied to the mirror vertical position.
Passenger Door Ajar Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the passenger door ajar switch.
Passenger Door Open Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the passenger door open switch.
Passenger Window Switch	-	Off	The scan tool displays Off, Up, Down, Express Up or Express Down. This is the state of the driver left front window switch.
Rear Window Sw. 12V Ref.	-	Varies	This displays volts. This is the voltage input supplied to the rear window switch.
Seat Back Heat Mode Ind. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat back heat mode indicator.
Seat Back Heat Mode Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the seat back heat mode switch.
Seat Cool Mode Ind. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat cool mode indicator.
Seat Cool Mode Switch	-	Off	The scan tool displays On or Off. This is the state of the seat cool mode switch.

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Seat Heat High Ind. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat heat high indicator.
Seat Heat Medium Ind. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat heat medium indicator.
Seat Heat Low Ind. Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat heat low indicator.
Seat Heat Mode Cmd.	-	Off	The scan tool displays On or Off. This is the state of the seat heat mode.
Seat Heat Mode Sw.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the seat heat mode switch.
VIN Learned	-	Yes	The scan tool displays Yes or No. This is the state of the passenger door switch VIN programming.
Window Switch Backlight	-	Varies	The scan tool displays %. This is the intensity of the backlighting in the window switch.

Passenger Door Switch Scan Tool Output Controls

Scan Tool Output Control	Description
Door Deadbolt Lock/Unlock	This command will lock and unlock the passenger door dead bolt actuator.
Door Lock/Unlock	This command will lock and unlock the passenger door lock actuator.
Front Window Motor	This test will command the front window both Up and Down.
Heated Seat Indicators	This will command the heated seat indicators ON and OFF.
Integrated Sw. Backlighting Test	The scan tool commands the % intensity of the integrated switches backlighting.
Mirror Fold	This will command the passenger mirror to fold and unfold.
Mirror Heater	This will command the passenger mirror heater ON and OFF.
Mirror Left/Right	This will command the passenger mirror left and right.
Mirror Up/Down	This will command the passenger mirror up and down.
Non-Integrated Sw. Backlighting Test	The scan tool commands the % intensity of the non-integrated switches backlighting.
Power Window Motor Programming	This will enable the driver power window motor to be programmed.
Puddle/Courtesy Lamp	This will command the courtesy lamps ON and OFF.

SEAT MEMORY CONTROL MODULE SCAN TOOL INFORMATION

Memory Seat Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON			

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Driver Seat Front Vertical Sensor	-	Varies	This displays Volts. This is the voltage supplied to the driver seat front vertical sensor.
Driver Seat Horizontal Sensor	-	Varies	This displays Volts. This is the voltage supplied to the driver seat horizontal sensor.
Driver Seat HVC Level	-	High	The scan tool displays High, Medium or Low. This is the current level of the driver heated seat or the heated cooled seat.
Driver Seat HVC Mode	-	Off	The scan tool displays Off, Back & Cushion, Back Only or Cool. This is the current mode of the driver heated seat or the heated cooled seat.
Driver Seat Rear Vertical Sensor	-	Varies	This displays Volts. This is the voltage supplied to the driver seat rear vertical sensor.
Driver Seat Recline Sensor	-	Varies	This displays Volts. This is the voltage supplied to the driver seat recline sensor.
Front Vertical Downward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the front vertical downward switch.
Front Vertical Motor Downward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the front vertical motor downward.
Front Vertical Motor Upward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the front vertical motor upward.
Front Vertical Upward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the front vertical upward switch.
Horizontal Forward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the horizontal forward switch.
Horizontal Motor Forward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the horizontal motor forward.
Horizontal Motor Rearward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the horizontal motor rearward.
Horizontal Rearward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the horizontal rearward switch.
Lumbar Downward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the lumbar downward switch.
			The scan tool displays Active or Inactive.

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Lumbar Forward Switch	-	Inactive	This is the state of the lumbar forward switch.
Lumbar Horizontal Sensor	-	Varies	This displays Volts. This is the voltage supplied to the lumbar horizontal sensor.
Lumbar Inflation Value	-	Varies	This displays Volts. This is the voltage stored in memory for the lumbar inflation.
Lumbar Vertical Sensor	-	Varies	This displays Volts. This is the voltage supplied to the lumbar vertical sensor.
Lumbar Motor Downward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the lumbar motor downward.
Lumbar Motor Forward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the lumbar motor forward.
Lumbar Motor Rearward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the lumbar motor rearward.
Lumbar Motor Upward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the lumbar motor upward.
Lumbar Rearward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the lumbar rearward switch.
Lumbar Upward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the lumbar upward switch.
Lumbar Vertical Position	-	Varies	This displays Volts. This is the voltage stored in memory for the lumbar vertical position.
Lumbar Vertical Sensor	-	Varies	This displays Volts. This is the voltage supplied to the lumbar vertical sensor.
Massage Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the massage switch.
Lumbar Vertical Position	-	Varies	This displays Volts. This is the voltage stored in memory for the lumbar vertical position.
Memory 1 Adj. Pedals Position	-	Varies	This displays Volts. This is the voltage stored in memory for the position of the adjustable pedals.
Memory 2 Adj. Pedals Position	-	Varies	This displays Volts. This is the voltage stored in memory for the position of the adjustable pedals.
Passenger Seat HVC Mode	-	Off	The scan tool displays Off, Back & Cushion, Back Only or Cool. This is the current mode of the passenger heated seat or

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			the heated cooled seat.
Rear Vertical Downward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the rear vertical downward switch.
Rear Vertical Motor Downward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the rear vertical motor downward.
Rear Vertical Motor Upward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the rear vertical motor upward.
Rear Vertical Upward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the rear vertical upward switch.
Recline Forward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the recline forward switch.
Recline Motor Forward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the recline motor forward.
Recline Motor Rearward	-	Inactive	The scan tool displays Active or Inactive. This is the state of the recline motor rearward.
Recline Rearward Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the recline rearward switch.
Seat Front Vertical Position	-	Varies	This displays Volts. This is the voltage stored in memory for the seat front vertical position.
Seat Horizontal Position	-	Varies	This displays Volts. This is the voltage stored in memory for the seat horizontal position.
Seat Rear Vertical Position	-	Varies	This displays Volts. This is the voltage stored in memory for the seat rear vertical position.
Seat Recline Position	-	Varies	This displays Volts. This is the voltage stored in memory for the seat recline position.

Memory Seat Module Scan Tool Output Controls

Scan Tool Output Control	Description
Clear Column Softstops	This output control is used to clear the steering column softstops stored in memory.
Front Up/Down	This output control is used to command the driver seat motor Up and Down.

Learn Column Softstops	This output control is used to program the steering column softstops.
Lumbar Forward/Rearward	This output control is used to command the driver seat lumbar forward and rearward.
Lumbar Up/Down	This output control is used to command the driver seat lumbar Up and Down.
Rear Up/Down	This output control is used to command the driver seat rear Up and Down.
Recline Forward/Rearward	This output control is used to command the driver seat reclining forward and rearward.
Seat Forward/Backward	This output control is used to command the driver seat forward and backward.
Telescope In/Out	This output control is used to command the telescope in and out.
Tilt Up/Down	This output control is used to command the tilt Up and Down.

DRIVER SEAT AND PASSENGER SEAT HEATER CONTROL MODULE SCAN TOOL INFORMATION

Heated Seat Module Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Driver Seat Back Heat Status	Inactive	The scan tool displays Active/Inactive. This is the state of the driver seat back heat.
Driver Seat Cushion Heat Status	Inactive	The scan tool displays Active/Inactive. This is the state of the driver seat cushion heat.
Driver Seat HVC Level	Varies	The scan tool displays High, Medium or Low. This is the current level of seat heating as requested by the heated seat switch.
Driver Seat HVC Mode	Varies	The scan tool displays Off, Back& Cushion, Back Only or Cool. This is the current mode of operation for the driver seat.
Passenger Seat Back Heat Status	Inactive	The scan tool displays Active/Inactive. This is the state of the passenger seat back heat.
Passenger Seat Back Heat Status	Inactive	The scan tool displays Active/Inactive. This is the state of the passenger seat cushion heat.
Passenger Seat HVC Level	Varies	The scan tool displays High, Medium or Low. This is the current level of seat heating as requested by the heated seat switch.
Passenger Seat HVC Mode	Varies	The scan tool displays Off, Back& Cushion, Back Only or Cool. This is the current mode of operation for the passenger seat.
Seat Heat Supply Voltage	Inactive	The scan tool displays Active or Inactive. Active is displayed when the module commands seat heating ON.

ELECTRONIC BRAKE CONTROL MODULE SCAN TOOL INFORMATION

Electronic Brake Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON			
ABS Active	-	No	The scan tool displays Yes or No. Yes is displayed if the ABS system is engaged.
ABS Failed	-	No	The scan tool displays Yes or No. Yes is displayed if there is an ABS fault.
Battery Voltage Signal	-	B+	This displays volts. This is the voltage status of the electronic brake control module (EBCM).
Brake Booster Vacuum	-	kPa	The scan tool displays the vacuum pressure in the power brake booster.
Brake Fluid Level Status	-	OK	The scan tool displays OK or Low. This is the state of the brake fluid level.
Brake Pressure Sensor Input	Engine running	0 Volts at rest	The scan tool displays 0 Volts at rest and 0.1-2 volts with the brake applied.
BPP Signal	-	Released	The scan tool displays Applied or Released. This is the state of the brake pedal.
Delivered Torque	-	0%	The scan tool displays 0-100%. The scan tool displays the duty cycle of the delivered torque PWM signal. The duty cycle of the signal is used to transmit how much engine torque the ECM is delivering. Normal values are between 10 and 90 percent duty cycle.
DRP Active	-	No	The scan tool displays Yes or No. This is the state of the dynamic rear proportioning (DRP).
DRP Disabled	-	No	The scan tool displays Yes or No. This is the state of the dynamic rear proportioning (DRP).
Engine Drag Control Failed	-	No	The scan tool displays Yes or No. The state of the engine drag control depends on the state of traction of the tires and engine RPM.
LF Wheel Speed Sensor	-	0 km/h (0 mph)	This displays km/h (mph). This is the current speed of the left front wheel speed sensor.
LF Inlet Solenoid Command	-	Off	The scan tool displays On or Off. On is displayed when the left front inlet valve solenoid is commanded on.
LF Outlet Solenoid Command	-	Off	The scan tool displays On or Off. On is displayed when the left front outlet valve solenoid is commanded on.

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LR Wheel Speed Sensor	-	0 km/h (0 mph)	This displays km/h (mph). This is the current speed of the left rear wheel speed sensor.
LR Inlet Solenoid Command	-	Off	The scan tool displays On or Off. On is displayed when the left rear inlet valve solenoid is commanded on.
LR Outlet Solenoid Command	-	Off	The scan tool displays On or Off. On is displayed when the left rear outlet valve solenoid is commanded on.
Panic Brake Assist Failed	-	No	The scan tool displays Yes or No. The state of the panic brake assist depends on the state of traction of the tires and engine RPM.
Pump Motor Command Voltage	-	Varies	This displays Volts. This is the voltage status of the EBCM pump motor command.
Requested Torque	-	0%	The scan tool displays 0-10%. The scan tool displays the duty cycle of the Requested Torque PWM signal. The duty cycle of the signal is used to transmit how much engine torque the EBCM is requested.
RF Inlet Solenoid	-	Off	The scan tool displays On or Off. On is displayed when the right front inlet valve solenoid is commanded on.
RF Outlet Solenoid	-	Off	The scan tool displays On or Off. On is displayed when the right front outlet valve solenoid is commanded on.
RF Wheel Speed Sensor	-	0 km/h (0 mph)	This displays km/h (mph). This is the current speed of the right front wheel speed sensor.
RR Inlet Solenoid Command	-	Off	The scan tool displays On or Off. On is displayed when the right rear inlet valve solenoid is commanded on.
RR Outlet Solenoid Command	-	Off	The scan tool displays On or Off. On is displayed when the right rear outlet valve solenoid is commanded on.
RR Wheel Speed Sensor	-	0 km/h (0 mph)	This displays km/h (mph). This is the current speed of the right rear wheel speed sensor.
Steering Wheel Position	-	Varies	This displays degrees. This is the signal received from the steering angle sensor.
TCS Active	-	No	The scan tool displays Yes or No. This is the state of the traction control system (TCS).

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

TCS Failed	-	No	The scan tool displays Yes or No. This is the state of the traction control system (TCS).
VSES Active	-	No	The scan tool displays Yes or No. The scan tool displays Yes when VSES is active, and No when VSES is inactive.
VSES Actuator Commanded	-	Varies	This displays amps. This is the amount of current applied to the VSES actuator.
VSES Actuator Feedback Signal	-	Varies	This displays amps. This is the amount of current applied to the VSES actuator feedback signal.
VSES Failed	-	No	The scan tool will display Yes or No depending on the state of the ABS indicator.
Yaw Rate Sensor	-	Varies	This displays Volts. The voltage varies depending on the angle of the vehicle.

Electronic Brake Control Module Scan Tool Output Controls

Scan Tool Output Control	Description
ABS Motor Test	This is used in order to command the ABS pump motor On or Off.
Automated Bleed	This is used in order to bleed ABS hydraulics. Refer to <u>Anti-lock Brake System Automated Bleed</u> .
Brake Press. Sen. Calibration	This is used in order to calibrate the brake pressure sensor.
LF Inlet Valve Solenoid	Commands the solenoid ON and OFF.
LF Outlet Valve Solenoid	Commands the solenoid ON and OFF.
LR Inlet Valve Solenoid	Commands the solenoid ON and OFF.
LR Outlet Valve Solenoid	Commands the solenoid ON and OFF.
RF Inlet Valve Solenoid	Commands the solenoid ON and OFF.
RF Outlet Valve Solenoid	Commands the solenoid ON and OFF.
RR Inlet Valve Solenoid	Commands the solenoid ON and OFF.
RR Outlet Valve Solenoid	Commands the solenoid ON and OFF.
Steering Angle Sensor Centering	This is used to center the steering angle sensor.
VES Test	This is used to test the variable effort steering (VES) actuator.

K20 ENGINE CONTROL MODULE: SCAN TOOL INFORMATION (LLT)**Engine Control Module Scan Tool Data**

Parameter	System State	Expected Value	Description
This is a comprehensive list. Not all parameters listed are available for all applications. Base Operating Conditions: Engine Idling/Radiator Hose Hot/Park or Neutral/Closed Loop			
5 V Reference 1, 2, 3 or 4	Engine Idling	5 Volts	This parameter displays the voltage sensed on the 5 V reference circuits at the control module. The scan tool will display a higher value at higher voltage. The scan tool will display a lower value at lower voltage.
5 V Reference 1, 2, 3 or 4 Circuit Status	Engine Idling	OK	This parameter will display OK if the circuit is good or Malfunction if a short to ground, short to B+ is present.
A/C Compressor Clutch Relay Command	Engine Idling	Off	This parameter displays when the A/C Compressor Clutch relay is commanded ON or OFF.
A/C Compressor Clutch Relay Control Circuit High Voltage Test Status	Engine Idling	OK	This parameter displays the status of the relay control circuit. It can display OK, Malfunction or Not Run.
A/C Compressor Clutch Relay Control Circuit Low Voltage Test Status	Engine Idling	OK	This parameter displays the status of the relay control circuit. It can display OK, Malfunction or Not Run.
A/C Compressor Clutch Relay Control Circuit Open Test Status	Engine Idling	OK	This parameter displays the status of the relay control circuit. It can display OK, Malfunction or Not Run.
A/C Disabled - A/C Pressure Out of Range	A/C ON	No	This parameter displays whether the A/C pressure is out of range for normal operation as determined by the control module.
A/C Disengage 1-8 History	A/C ON	Reason for A/C Disengagement	The parameter displays reason for the last 8 air conditioning (A/C) compressor disengagements in order from 1 to 8 with 8 being the most recent. There

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			are 8 possible causes for the A/C compressor to disengage.
A/C High Side Pressure Sensor	A/C OFF	0.75-1.5 Volts*	This parameter displays the voltage signal from the A/C high side pressure sensor input to the control module. * Varies with temperature, humidity, and altitude.
	A/C ON	1.3-2.5 Volts*	
A/C High Side Pressure Sensor	A/C OFF	450-827 kPa (65-120 psi)*	This parameter displays the pressure from the A/C high side pressure sensor signal circuit to the control module. * Varies with temperature, humidity, and altitude.
	A/C ON	827-2, 350 kPa (120-341 psi)*	
A/C OFF for WOT	A/C ON	No	This parameter displays whether the control module is commanding the A/C compressor clutch relay OFF for wide open throttle (WOT).
A/C Request Signal	A/C ON	No	This parameter displays the state of the A/C request input to the control module from the heating, ventilation, and air conditioning (HVAC) controls.
Accelerator Pedal Position	Engine Idling	0-100 %	This parameter displays the angle of the accelerator pedal position (APP) as calculated by the control module using the signals from the APP sensors.
Accelerator Pedal Position When Engine Overspeed Detected	Engine Idling	%	This parameter displays the accelerator pedal position (APP) observed upon initial detection of an overspeed condition. This value will be updated upon each overspeed condition.
Air/Fuel Equivalence Ratio Command	Engine Idling	Varies:1	This parameter should display 1.0 when in Closed Loop fuel control.
			This parameter displays an 'undefaulted' fuel rail pressure relative to manifold

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Alternative Fuel Rail Pressure Sensor	Ignition ON	kPa	vacuum. This is intended for gaseous fuel injection alternative fuel applications (CNG/LPG Mono-Fuel and Bi-Fuel).
Ambient Air Temperature	Engine Idling	Varies	This parameter displays temperature from the input of the Intake Air Temperature Sensor.
Ambient Air Temperature	Ignition ON	°C (°F) Varies	This parameter displays the outside air temperature as calculated by the control module.
Ambient Air Temperature When Recommended Maximum Fuel Alcohol Content Exceeded	-	°C (°F)	This parameter displays the ambient air temperature when the recommended maximum fuel alcohol content was exceeded.
Ambient Humidity	Ignition ON	%	This parameter displays the current ambient humidity level.
APP Sensor 1	Accelerator pedal not actuated	0.98 Volts	This parameter displays the actual voltage on the accelerator pedal position (APP) sensor 1 signal circuit as measured by the control module.
	Accelerator pedal fully actuated	4.25 Volts	
APP Sensor 1 and 2	Ignition ON	Agree	This parameter displays Disagree if the control module detects the signal voltage from APP sensor 1 is not in correct relationship to APP sensor 2. The scan tool displays Agree under the normal operating conditions.
APP Sensor 1 Circuit Status	Engine Idling	OK	APP Sensor 1 Out of Range indicates that the sensed accelerator pedal position 1 sensor value is currently out of range or that a Malfunction has been detected based upon the sensed accelerator pedal position 1 sensor value being out of range
			This parameter contains the

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2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

APP Sensor 1 Learned Applied Position	Ignition ON	78 %	learned maximum (fully applied) accelerator pedal position relating to absolute accelerator pedal position (no correction or normalization based upon learned minimum or maximum positions) from accelerator pedal position sensor 1.
APP Sensor 1 Learned Released Position	Ignition ON	0.98 Volts	This parameter indicates the accelerator pedal sensor 1 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the calibration.
APP Sensor 1 Position	Pedal Released	0 %	This parameter contains the displacement determined from accelerator pedal position sensor 1 (corrected and normalized based upon its learned minimum and maximum positions).
	Pedal Fully Applied	99 %	
APP Sensor 2	Ignition ON	Volts	This parameter contains the accelerator pedal position sensor 2 analog input as a percentage of its reference voltage
APP Sensor 2	Accelerator pedal not actuated	0.49 Volts	This parameter displays the actual voltage on the accelerator pedal position (APP) sensor 2 signal circuit as measured by the control module.
	Accelerator pedal fully actuated	2.14 Volts	
APP Sensor 2 Circuit Status	Ignition ON	OK	APP Sensor 2 Out of Range indicates that the sensed accelerator pedal position 2 sensor value is currently out of range or that a malfunction has been detected (and latched) based upon the sensed accelerator

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			pedal position 2 sensor value being out of range
APP Sensor 2 Learned Applied Position	Ignition ON	78 %	This parameter contains the learned maximum (fully applied) accelerator pedal position relating to absolute accelerator pedal position (no correction or normalization based upon learned minimum or maximum positions) from accelerator pedal position sensor 2.
APP Sensor 2 Learned Released Position	Ignition ON	0.49 Volts	This parameter indicates the accelerator pedal sensor 2 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the engine control module.
APP Sensor 2 Position	Pedal Released	0 %	This parameter contains the displacement determined from accelerator pedal position sensor 2 (corrected and normalized based upon its learned minimum and maximum positions).
	Pedal Fully Applied	100 %	
APP Sensors	Pedal Released	0 %	This parameter contains the accelerator pedal position resulting directly from the settling of differences of the accelerator pedal position sensors (prior to any compensation to determine driver intent).
	Pedal Fully Applied	99 %	
Autostart/Autostop Disable Mode	-	Active	This parameter displays "Active" when all conditions for allowing the autostart/autostop mode are present (no inhibit conditions exist), this parameter displays "Inactive" when all

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			conditions for allowing the autostart/autostop mode are not present.
Autostart Inhibit Reason Autostart/Autostop Malfunction	Engine Idling	No	This parameter displays that a immediate stop was commanded due to a Autostart/Autostop malfunction.
Autostart Inhibit Reason	Engine Idling	No	The scan tool displays Yes if one of the following Autostart Inhibit Reason is detected. Control Function Active, Crank Abort, Driver Exited Vehicle, ECM Malfunction, ECM Request, Engine Coolant Temperature Out of Range, Hood Ajar, Hybrid/EV Power Conditions, Hybrid/EV Battery Pack Contactor Open, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Not Commanded, Run/Crank Not Active, System Malfunction, Transmission Range.
			This parameter displays Yes if one of the following Autostart Reason is detected. A/C Request, Acceleration Request, Accelerator Pedal Pressed, Auxiliary Transmission Fluid Pump Not Available, Brake Booster Weak Vacuum, Brake Pedal Released, Clutch Pedal Applied, Control Function Active, Drive Motor Inverter Temperature High, Drive Motor Temperature High, Driver Exited Vehicle, ECM Request, Engine Coolant

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Autostart Reason	Engine Idling	No	Temperature Out of Range, Hood Ajar, Hybrid/EV Battery Module Voltage Low, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Temperature, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Ignition Switch Start, Inclination, Invalid Data Received, Low Voltage Battery Discharge Current High, Low Voltage Battery State of Function Low, Low Voltage Battery State of Health Low, Low Voltage Battery Voltage Low, Maximum Autostop Time Exceeded, Minimum Engine Run Time Not met, Reduced Engine Power Active, Remote Vehicle Start Request, Stop/Start Select Switch, System Malfunction, System Optimization, System Voltage Low, TCM Demand, Tow/Haul Mode Switch ON, Transmission Fluid Temperature Out of Range, Transmission In Reverse, Transmission Range, Vehicle Speed Too High.
			The scan tool displays Yes if one of the following Autostop Disable Reason is detected. 12 V Start Counter Exceeded, A/C Request, Acceleration Request, Accelerator Pedal Pressed, Auxiliary Transmission Fluid Pump Not Available, Brake Booster Weak Vacuum, Brake Pedal

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Autostop Disable Reason	Engine Idling	No	Released, Clutch Pedal Applied, Control Function Active, Drive Motor Inverter Temperature High, Drive Motor Temperature High, ECM Request, Engine Coolant Temperature Out of range, Engine Speed High, Generator Load High, Hood Ajar Hybrid/EV Battery Module Voltage Low, Hybrid/EV Battery Pack Power Low, Hybrid/EV Battery Pack State of Charge Low, Hybrid/EV Battery Pack Temperature, Hybrid/EV Battery Pack Voltage Low, Hybrid/EV Propulsion System Inactive, Idle Boost Mode Active, Ignition Switch Start, Intake Manifold Weak Vacuum, Invalid Data Received, Low Voltage Battery Discharge Current High, Low Voltage Battery State of Charge Low, Low Voltage Battery State of Function Low, Low Voltage Battery State of Health Low, Low Voltage Battery Temperature Out of Range, Low Voltage Battery Voltage Low, Maximum Vehicle Stop Time Exceeded, Minimum Engine Run Time Not Met, Reduced Engine Power Active, Remote Vehicle Start Request, Run/Crank Not Active, Stop/Start Select Switch, System Optimization, System Voltage Low, TCM Request, Tow/Haul Mode Switch ON, Transmission Fluid Temperature Out of Range, Transmission in Reverse,
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2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			Transmission Range, Vehicle Inclination, Vehicle Speed Threshold Not Reached, Vehicle Speed Too High, Wheel Slip Detected.
Axle Torque	Engine Idling		This parameter displays the Axle Torque value sent from the hybrid control processor (HCP) to the ECM and anti-lock brake system (ABS) module.
BARO	Engine Idling	65-104 kPa (8-16 psi)	This parameter displays the barometric pressure. The control module uses the barometric pressure sensor input for fuel control to compensate for altitude differences.
BARO Sensor	Engine Idling	2.5-4.0 Volts	This parameter displays the barometric pressure sensor voltage.
Boost Pressure	Engine Idling	kPa	This parameter shows the Turbocharger boost pressure in kPa.
Boost Pressure Sensor	Engine Idling	kPa	This parameter shows the Turbocharger boost pressure in kPa.
Boost Pressure Sensor	-	Volts	This parameter displays the turbocharger boost pressure sensor in voltage.
Brake Booster Pressure Sensor	Engine Idling	Volts	This parameter displays the brake booster vacuum pressure analog input as a percentage of its reference voltage.
Brake Booster Pressure Sensor	Engine Idling	kPa	This parameter displays the undefaulted, unfiltered brake booster vacuum pressure measured by a sensor.
Brake Pedal Position Circuit Signal	Ignition ON	Closed	This parameter displays the serial data message of the brake signal from the electronic brake and traction control module (EBTCM).
Brake Pedal Position Circuit	-	Released	This parameter displays the displacement of the brake

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Signal			pedal.
Brake Pedal Position Sensor	Ignition ON	%	This parameter displays the displacement of the brake pedal, where 0% corresponds to the brake pedal being released and 100% corresponds to the brake pedal being fully applied.
Brake Pedal Position Sensor	Ignition ON	Volts	This parameter displays the brake pedal position as indicated by the analog sensor as a percentage of its reference voltage.
Brake Pedal Position Sensor Fully Released Learn Status	Ignition ON	Complete	This parameter displays the brake pedal fully released learn position status.
Brake Pedal Position Sensor Learned Released Position	Ignition ON	Volts	This parameter displays the position learned for the brake pedal position sensor when the brake pedal is fully released.
Brake Pedal Position Sensor Signal	Ignition ON	Released	This parameter displays the serial data message of the brake position sensor signal from the electronic brake and traction control module (EBTCM).
Calculated Air Flow	Engine Idling	G/S	This parameter contains the mass airflow determined from the speed density (MAP based) calculation of air mass per cylinder.
Calculated BARO	Engine Idling	kPa/psi 97.2 kPa/14.1 psi at idle	This parameter contains an estimate of barometric pressure, used to correlate with sensed ambient air pressure in the Barometric Pressure Correlation Diagnostic.
Calculated Catalyst Temperature or Calculated Catalyst Temperature Bank 1 or Bank 2	Engine Idling	Approximately 552°C (1026°F)	This parameter contains the estimated catalyst temperature (as a function of engine speed, engine airflow, and fuel ethanol percentage) for use in the oxygen sensor and catalyst monitor

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			diagnostic algorithms.
Calculated Engine Oil Temperature	Engine Idling	105°C (221°F)	This parameter displays the estimated engine oil temperature (as a function of engine coolant temperature and other parameters).
Calibration History Buffer	Ignition ON	Unlocked	This parameter displays locked when the buffer has been locked against further updates due to detection of a non-production calibration.
Calibration Verification Number History 1-10	Ignition ON	#	This parameter displays the history entries for the primary calibration part in the controller.
Camshaft Position Active Counter	Ignition ON	Counts	This parameter displays a rolling count of the number of primary cam position sensor pulses.
Camshaft Position Sensor	Engine Idling	0 RPM	This parameter displays the speed of the engine as calculated by the signal from a camshaft position (CMP) sensor. This parameter will always display 0 unless a condition with the CKP sensor or CKP reluctor exists. If a CKP condition exists the control module will use a valid CMP sensor signal to determine engine speed and crank/camshaft position.
Camshaft Position Signal Output Circuit High Voltage Test Status	Engine Idling	OK	This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is shorted to voltage.
Camshaft Position Signal Output Circuit Low Voltage Test Status	Engine Idling	OK	This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			Camshaft Position Signal Output Circuit is shorted to ground.
Camshaft Position Signal Output Circuit Open Test Status	Engine Idling	OK	This parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is open.
Catalyst Monitor Complete	Engine Idling	Yes/No	This parameter indicates the status of the Catalyst. The scan tool displays YES when the diagnostic is complete. And NO if the diagnostic has not run or a malfunction is detected in the catalyst.
Catalyst Monitor Complete This Ignition Cycle	Engine Idling	Yes/No	This parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test.
Catalyst Monitor Enabled	Engine Idling	Yes/No	The scan tool displays YES when the Catalyst Monitor is Enabled. If the scan tool displays NO this could indicate a malfunction in the Catalyst Monitor circuit.
Catalyst Monitor Enabled this Ignition Cycle	Engine Idling	Yes-No	This parameter displays the monitor enable status during the current driving/monitoring cycle.
Catalyst Monitor Not At Idle Test Conditions Met	Engine Idling	Yes/No	This parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test.
Catalyst Monitor Test Counter or	Engine Idling	Counts	This parameter contains the number of repeated results of the catalyst monitor diagnostic test that have been performed since a code clear

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Catalyst Monitor Test Counter Bank 1 or 2			(used to determine if a sufficient number of tests have run to report a passing condition).
Catalyst Monitor Test Result or Catalyst Monitor Test Result Bank 1 or 2	Engine Idling	No Decision/Failed/Passed	This parameter indicates the status of the catalyst monitor diagnostic. Multiple tests may run before the diagnostic reports a "Pass" or "Fail" and will be tracked by Catalyst Monitor Diagnostic Test Counter. When this Parameter reports a "Pass" or "Fail", the diagnostic is complete for the current trip and will not attempt any further tests.
Catalyst Monitor Test State	Engine Idling	Active/Inactive	This parameter indicates the status of the catalyst monitor diagnostic by displaying active or inactive. This test will only run with the engine at idle.
Change Engine Oil Indicator Command	Ignition ON	Off	This parameter sends a signal through the serial communication to inform the driver to change the engine oil. It is based on a calibrated amount of time.
Charge Air Cooler Coolant Pump Relay Command	Ignition ON	Off	This parameter displays the commanded state of the intercooler pump relay command.
Charge Air Cooler Coolant Pump Relay Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control circuit is shorted to voltage.
Charge Air Cooler Coolant Pump Relay Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			circuit is shorted to ground.
Charge Air Cooler Coolant Pump Relay Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the charge air cooler coolant pump control circuit. The parameter displays Malfunction if the charge air cooler coolant pump control circuit is open.
Clutch Pedal Starter Inhibit Switch (If Equipped)	Engine Idling	On	This parameter displays ON when the clutch pedal is released.
Clutch Pedal Switch (If Equipped)	Engine Idling	Released	This parameter displays the state of the clutch pedal as determined by the control module from the clutch pedal switch.
Cold Startup	Ignition ON	No	This parameter displays whether the engine meets the conditions for a cold startup during the present ignition cycle. The scan tool displays Yes when the conditions for a cold startup are met during the ignition cycle. The scan tool displays No when the conditions for a cold startup are not met during the present ignition cycle. Conditions for a cold startup require the coolant temperature and the intake air temperature to be below a predetermined temperature and within a certain range of each other. These conditions must occur after the engine was warmed up to a specific temperature during the previous ignition cycle.
Component Monitor Complete	Ignition ON	Yes/No	This parameter displays Yes when the Component Monitor is Complete. The engine control module looks at many input and output components to make this determination. If a

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2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			malfunction is detected the scan tool will display No.
Component Monitor Enabled	Ignition ON	Yes/No	This parameter displays Yes when Component Monitor is Enabled. And No when it is not Enabled.
Cooling Fan Command	-	%	This parameter displays the amount of fan power commanded as a percentage of the total fan power available.
Cooling Fan Motor Command	-	%	This parameter displays the commanded duty cycle for the cooling fan.
Cooling Fan Relay 1 Command	Ignition ON	On	This parameter displays the commanded state of the fan relay 1 control circuit. The cooling fan relay 1 should be ON when the scan tool indicates the FC Relay 1 Command is ON. The cooling fan relay 1 should be OFF when the scan tool indicates the FC Relay 1 Command is OFF.
Cooling Fan Relays 2 and 3 Command	Ignition ON	On	This parameter displays the commanded state of the fan relay 2 output.
Cooling Fan Relay 1 Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is open.
Cooling Fan Relay 1 or 2 and 3 Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the cooling fan relay control circuit. The parameter displays Malfunction if the cooling fan relay control circuit is shorted to voltage.
Cooling Fan Relay 1 or 2 and 3 Control Circuit Low	Ignition ON	OK	This parameter displays the state of the cooling fan relay control circuit. The parameter displays

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2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Voltage Test Status			Malfunction if the cooling fan relay control circuit is shorted to ground.
Cooling Fan Speed	Ignition ON	Varies	This parameter displays the current state of the cooling fan speed. (For example OFF, Low, Medium or High) rather than rotational speed.
CPP Learn Status	Ignition ON	Learned	This parameter displays the status of the procedure used to learn the clutch pedal fully applied position.
CPP Learned Apply Position	Ignition ON	Volts	This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is fully applied during the associated learn procedure.
CPP Learned Release Position	Ignition ON	Volts	This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is released.
CPP Sensor	Ignition ON	Volts	This parameter displays the clutch pedal position sensor analog input as a percentage of its reference voltage.
CPP Sensor	Ignition ON	%	This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is fully applied during the associated learn procedure.
Crank Request Signal	Ignition switch not in the crank position	No	This parameter displays whether the ignition switch has been cycled to the crank position requesting the control module to activate the starter relay.
	Ignition switch in the crank position	Yes	
Crankshaft Position Active Counter	Engine Idling	0-255 Counts	This parameter displays an incrementing counter when the control module receives a signal from the crankshaft position sensor (CKP).
			This parameter displays the position learned for the

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2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Crankshaft Position Learned Apply Position	Ignition ON	Volts	clutch pedal position (CPP) sensor when the clutch pedal is fully applied during the associated learn procedure.
Crankshaft Position Learned Release Position	Ignition ON	Volts	This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is released.
Crankshaft Position Resync Counter	Engine Idling	0 Counts	This parameter displays the number of times the control module has to resynchronize with the CKP sensor. The parameter will begin to increment if the control module does not detect a CKP reference pulse. The parameter will reset to 0 after the ignition is switched OFF.
Crankshaft Position Sensor	Engine Idling	RPM	This parameter displays engine speed.
Crankshaft Position Sensor	Ignition ON	Volts	This parameter displays the displacement of the clutch pedal (corrected and normalized based upon its learned released and fully applied positions), where 0% corresponds to the clutch pedal being released and 100% corresponds to the clutch pedal being fully applied.
Crankshaft Position Sensor	Ignition ON	%	This parameter displays the clutch pedal position sensor analog input as a percentage of its reference voltage.
Crankshaft Position Signal Output Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the crankshaft position signal output circuit. The parameter displays Malfunction if the crankshaft position signal output circuit is shorted to voltage.
Crankshaft Position Signal			This parameter displays the state of the crankshaft position signal output circuit.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Output Circuit Low Voltage Test Status	Ignition ON	OK	The parameter displays Malfunction if the crankshaft position signal output circuit is shorted to ground.
Crankshaft Position Signal Output Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the crankshaft position signal output circuit. The parameter displays Malfunction if the crankshaft position signal output circuit is open.
Crankshaft Position Variation Learn	Ignition ON	Not Learned	This parameter displays if the crank angle learned this key cycle.
Crankshaft Position Variation Learn Crank Pulse to Cylinder Count	Ignition ON	Counts	This parameter displays the number of attempts to learn the crank angle sensing error (CASE) during the current key cycle.
Crankshaft Position Variation Learn Crank Pulse to Cylinder Count	Ignition ON	Agree	This parameters displays the number of crank pulses observed over an engine cycle did not equal the number of cylinders for the engine at some point during the CASE learn cycle.
Crankshaft Position Variation Learn Required Engine Speed	Ignition ON	In Range	This parameter displays that the engine speed required to complete the CASE learn process has not been achieved.
Crankshaft Position Variation Learn Status	Ignition ON	Complete	This parameter displays the status of the crank angle sensing error (CASE) learn algorithm.
Cruise Control	Cruise ON	Active	This parameter displays the status of the cruise control system as determined by the control module.
Cruise Control Cancel Switch	Cruise ON	Inactive	This parameter displays the status of the cruise control cancel switch.
Cruise Control Disengage 1-		Reason for Cruise	The parameter displays the last 8 cruise control disengages in order from 1 to 8, with 8 being the most

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8 History	Cruise ON	Disengagement	recent. There are approximately 30 possible causes for the cruise control to disengage.
Cruise Control Inhibit Reason	Cruise OFF	Off	The parameter displays the reason the cruise control system cannot engage.
	Cruise ON	Park/Neutral	
Cruise Control ON/OFF Switch	Cruise ON	On	The engine control module (ECM) monitors the signal circuit of the cruise control switch. A closed switch is displayed as ON.
Cruise Control Resume/Accelerator Switch	Cruise ON	On	The scan tool displays ON, when the cruise ON/OFF switch is ON and the resume/accel (+) button is pressed, the ECM detects a predetermined voltage value for the resume/accel. switch.
Cruise Control Set/Coast Switch	Cruise ON	On	The scan tool displays ON, when the cruise ON/OFF switch is ON and the ECM detects a predetermined voltage value for the set/coast (-) switch.
Cruise Control Switch	Cruise ON	Inactive	The engine control module (ECM) monitors the signal circuit of the cruise control switch. A closed switch is displayed as Active.
Current Gear	Transmission in Park/Neutral	P/N	This parameter displays the transmission gear commanded by the transmission control module.
	Transmission not in Park/Neutral	Reverse/1st-5th	
Current Gear When Engine Overspeed Detected	Engine Idling	Varies	This parameter displays the transmission actual gear observed upon initial detection of an overspeed condition.
Cycles of Misfire Data	Engine Running	0-3, 000 counts	This parameter displays the number of cylinder firing events recorded by the control module.
			The scan tool displays a range of 0-255 counts. This

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2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Cylinder 1, 2, 3, 4, 5, 6, 7, 8 Current Misfire Counter	Engine Idling	Counts	parameter displays the number of misfires that have been detected during the last 255 cylinder firing events. The counters may normally display some activity, but the activity should be nearly equal for all of the cylinders, and in low numbers.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 History Misfire Counter	Engine Running	Counts	The scan tool displays a range of 0-65, 535 counts. The misfire history counters display the total level of misfire that has been detected on each cylinder. The misfire history counters will not update or show any activity until a misfire DTC P0300 has become active. The misfire history counters will update every 255 cylinder firing events.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to voltage.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is shorted to ground.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the injector control circuit. The parameter displays Malfunction if the injector control circuit is open.
Cylinder 1, 2, 3, 4, 5, 6, 7 or 8 Injector Flow Identifier	Ignition ON	OK	This parameter displays the End of Line Injector Adjustment (EIA) for the fuel injector. This value shall be used by the ECM for adjustment to actual fuel

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			injected quantity compared to nominal for the injector.
Cylinder 1-6 Injector Control Circuit Status	Engine Idling	OK	This parameter displays the state of the fuel injector control circuit.
Cylinder 1-6 Injector Disabled Misfire Detected	Engine Idling	No	This parameter displays the injector that has been disabled by the misfire catalyst converter protection calibration.
Cylinder 1-6 Knock Detected	Engine Idling	No	This parameter displays yes if a knock has been detected in an individual cylinder.
Deceleration Fuel Cut-Off	Engine Idling	Inactive	This parameter displays the status of the operating mode of the control module used to turn OFF the fuel injectors and the EVAP canister purge valve during certain deceleration conditions.
Desired Boost Pressure	-	kPa	This parameter displays the desired turbocharger boost pressure.
Desired ECT	Ignition ON	°C (°F)	This parameter displays the desired engine coolant temperature in degrees.
Desired Exhaust Camshaft Position or Desired Exhaust Camshaft Position Bank 1 or 2	Engine Idling	0 Degrees	This parameter displays the desired exhaust camshaft angle as commanded by the control module.
	Engine speed at 2000 RPM	10 Degrees	
Desired Fuel Rail Pressure	Engine Idling	Varies 3.4 mPa to 5.5 mPa (500 to 800 psi)	This parameter displays the desired Fuel Rail Pressure commanded by the control module.
Desired Idle Speed	Engine Idling	Approximately 650 RPM	This parameter displays the desired engine idle speed as commanded by the control module. The desired idle speed varies depending on engine load.
Desired Intake Camshaft Position or Desired Intake Camshaft Position Bank 1 or 2	Engine Idling	0 Degrees	This parameter displays the desired intake camshaft angle as commanded by the control module.
	Engine speed at 2000 RPM	10 Degrees	

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Desired Throttle Position	Engine Idling	%	Commanded Throttle Actuator Control.
Distance Since DTC Cleared	Engine Idling	0 Km/mi	This parameter displays in kilometers or miles the distance traveled since a DTC was cleared.
Distance Since First Malfunction	Engine Idling	0 Km/mi	This parameter displays in kilometers or miles the distance traveled since a Malfunction occurred.
Distance Since Last Malfunction	Engine Idling	0 Km/mi	This parameter displays the distance accumulated since last malfunction was captured. This parameter is only meaningful within the context of a failure record or freeze frame.
Distance Since Last Oil Level Warning	Engine Idling	0 Km/mi	This parameter displays in kilometers or miles the distance traveled since the last oil level warning Malfunction occurred.
Distance Since Last Oil Pressure Warning	Engine Idling	0 Km/mi	This parameter displays in kilometers or miles the distance traveled since the last oil pressure warning Malfunction occurred.
Distance Since Recommended Maximum Fuel Alcohol Content Exceeded	Engine Idling	0 Km/mi	This parameter displays in kilometers or miles the distance Since Recommended Maximum Fuel Alcohol Content Exceeded.
Distance This Driving Cycle	Ignition ON	km / miles	This parameter displays the distance a vehicle has traveled in the current driving cycle.
Distance with MIL On	Ignition ON	km / miles	This parameter displays the accumulated distance driven with the malfunction indicator lamp (MIL) on.
Drag Control Status	Vehicle Moving	Active/Inactive	EDC Active (Drag Active) control mode is indicated when the requested torque signal is above the driver requested value while the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			traction control system signal input is active.
Driver Requested Axle Torque	Engine Idling		This parameter displays a (desired) output value after comparing engine load as an input to the hybrid control processor and engine control module.
Drop-Throttle Detected while Traction Control Active	Engine Idling	No	This parameter displays if the Drop Throttle Control Mode is active while the Traction Control System Data Control Signal input is active.
Drop-Throttle Status	Engine Idling	Inactive	This parameter displays the Drop Throttle Control Mode is active when the Requested Torque Signal indicates greater than 90 percent duty cycle while the Traction Control System Data Control Signal input is active.
ECM Authentication Status	Ignition ON	Valid	ECM Authentication Status indicates the result of the comparison between the last received immobilizer response and the expected response calculated into the ECM.
ECM Challenge Status	Ignition ON	Valid	This parameter displays the immobilizer system status of the ECM challenge. This indicates whether the currently calculated ECM challenge is valid.
ECM in Immobilizer Fail Enable Mode	Ignition ON	Yes / No	This parameter displays that a serial communication failure has been detected after the receipt of the correct VTD password.
ECM Response Source	Ignition ON	Ignition Switch Start	ECM Response Source indicates the source used to calculate the ECM response.
Economy Mode Indicator	Ignition ON	Off	This parameter indicates the status of the serial data signal used to illuminate the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Command			economy mode indicator lamp.
ECT Sensor	Ignition ON	88 to 105°C (190 to 221°F)	This parameter displays the temperature of the engine coolant based on input to the control module from the engine coolant temperature (ECT) sensor.
ECT vs. IAT Sensor Temperature at Last ECT vs. RCT Malfunction Detection	Ignition ON	Agree	This parameter displays that the temperature values of the ECT and IAT sensors did not agree at the time of the most recent failure of the ECT/RCT rationality diagnostic.
EGR/Camshaft Position Monitor Complete	Ignition ON	Yes/No	This parameter displays the status of the EGR/Camshaft Position Monitor. The parameter will display Yes when the EGR/Camshaft Position Monitor is complete.
EGR/Camshaft Position Monitor Complete This Ignition Cycle	Engine Idling	Yes/No	This parameter displays Yes or No of the completion status during the current driving/monitoring cycle of emission related monitors.
EGR/Camshaft Position Monitor Enabled	Ignition ON	Yes/No	This parameter displays the status of the EGR/Camshaft Position Monitor. The parameter will display Yes when the EGR/Camshaft Position Monitor is Enabled.
EGR/Camshaft Position Monitor Enabled This Ignition Cycle	Engine Idling	Yes/No	This parameter displays Yes or No of the completion status during the current driving/monitoring cycle of emission related monitors.
			This parameter displays the reason for the source of the Regulated Voltage Control (RVC) override command. RVC lowers system operating voltage to reduce system electrical load and improve fuel economy

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Electric Power Management Inhibit Reason	Engine Idling	None	performance. The following is a list of possible reasons: • None • Control Function • Active/Fuel System • On-board Diagnostic System • Air Flow Measurement System • Cylinder Deactivation System • System Transmission Control Module
Engine Autostopped	-	No	This parameter displays the status of the internal combustion engine (ICE) in vehicles incorporating ICE autostart/stop functionality.
Engine Calibration Part Number History 1-10	Ignition ON	#	This parameter displays the engine calibration part number history.
Engine Controls Ignition Relay Command	Ignition ON	Off	This parameter displays the state of the control circuit for control module power relay as commanded by the control module.
Engine Controls Ignition Relay Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to voltage.
Engine Controls Ignition Relay Controls Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to ground.
			This parameter displays the state of the Engine Controls

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Engine Controls Ignition Relay Controls Circuit Open Test Status	Ignition ON	OK	Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is open.
Engine Controls Ignition Relay Feedback Signal	Ignition ON	12.0-14.9 Volts	This parameter displays the voltage available at the engine controls ignition relay terminal of the engine control module.
Engine Coolant Thermostat Heater Command	Ignition ON	%	This parameter displays the commanded duty cycle for the engine coolant thermostat.
Engine Coolant Thermostat Heater Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is shorted to voltage.
Engine Coolant Thermostat Heater Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is shorted to ground.
Engine Coolant Thermostat Heater Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the engine coolant thermostat heater control circuit. The parameter displays Malfunction if the engine coolant thermostat heater control circuit is open.
Engine Load	Engine Idling	25-45 %	This parameter displays the calculated engine load in percent based on inputs to the control module from various engine sensors.
	Engine speed at 2, 500 RPM	40-60 %	
Engine Load During Misfire History 1-10	Ignition ON	%	This parameter displays the engine load during the last misfire event.
			This parameter displays the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Engine Off	-	No	status of the internal combustion engine (ICE) in vehicles incorporating ICE autostart/stop functionality.
Engine OFF Time	Engine Idling	0:00:00 Seconds - Varies	This parameter displays the amount of time that has elapsed since the engine was last cycled OFF.
Engine Oil Absolute Pressure Sensor	Engine Idling	kPa/PSI	This parameter displays the undefaulted, unfiltered measured engine oil pressure read by an oil absolute pressure sensor.
Engine Oil Level Switch	Engine Idling	OK	This parameter displays the status of the engine oil level switch as determined by the control module. The control module uses this information to turn on the low engine oil lamp if the engine oil level remains approximately 1 quart low for a sufficient amount of time. The scan tool will display Low when the engine oil level is low. The scan tool will display OK when the engine oil level is correct.
Engine Oil Life Remaining	Engine Idling	0-100 %	This parameter displays the percent of engine oil life remaining. The controller calculates the engine oil life by monitoring engine load, coolant temperature, and engine speed.
Engine Oil Pressure	Engine Idling	kPa/PSI	This parameter displays the actual engine oil pressure measured by a sensor.
Engine Oil Pressure Control Solenoid Valve Command	Ignition ON	High Pressure/Low Pressure	This parameter displays the commanded state of the variable displacement oil pump output.
Engine Oil Pressure Control Solenoid Valve Control			This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Circuit High Voltage Test Status	Ignition ON	OK	parameter displays Malfunction if the engine oil pressure control solenoid valve control circuit is shorted to voltage.
Engine Oil Pressure Control Solenoid Valve Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the engine oil pressure control solenoid valve control circuit is shorted to ground.
Engine Oil Pressure Control Solenoid Valve Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the engine oil pressure control solenoid valve control circuit. The parameter displays Malfunction if the engine oil pressure control solenoid valve control circuit is open.
Engine Oil Pressure Sensor	Engine Idling	OK	This parameter displays the engine oil pressure as determined by engine oil pressure sensor.
Engine Oil Temperature Sensor	Ignition ON	C° (°F)	This parameter displays engine oil temperature as measured by a sensor connected to the ECM.
Engine Oil Temperature When Engine Overspeed Detected	Engine Idling	Temperature	This parameter displays the temperature of the engine oil as determined by the control module.
Engine Overspeed	Engine Idling	Not Present	This parameter displays if an Engine Overspeed is Present or Not Present.
Engine Overspeed Counter	Ignition ON	Counts	This parameter displays the accumulated number of engine overspeed detection events.
Engine Run Time	Engine Idling	0:00:00 Increments when the engine is operating	This parameter displays the time elapsed since the engine was started.
			This parameter displays the status of the internal

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Engine Running	-	No	combustion engine (ICE) in vehicles incorporating ICE autostart/stop functionality.
Engine Serial Number	Ignition ON	#	This parameter displays the engine serial number.
Engine Shutdown Counter - Excessive Idle Time	Ignition ON	Counts	This parameter displays the count of engine shutdowns due to excessive idle time.
Engine Shutdown Counter - High Coolant Temperature	Ignition ON	Counts	This parameter displays the count of engine shutdowns due to high coolant temperature.
Engine Shutdown Counter - Low Coolant Level	Ignition ON	Counts	This parameter displays the count of engine shutdowns due to low coolant level.
Engine Shutdown Counter - Low Oil Level	Ignition ON	Counts	This parameter displays the count of engine shutdowns due to low oil level.
Engine Speed	Engine Cranking	Greater than 60 RPM	This parameter displays the speed of the engine crankshaft rotation from information received from the crankshaft position (CKP) sensor. If there is a CKP sensor DTC, the ECM calculates the engine speed from one of the camshaft position (CMP) sensors.
	Engine Idling	550-700 RPM	
Engine Speed During Misfire History 1-5	Ignition ON	RPM	This parameter displays the last 5 engine speeds during misfire events.
Engine Speed When Engine Overspeed Detected	Engine Idling	RPM	This parameter displays the engine speed observed upon initial detection of an overspeed condition. This value will be updated after each overspeed condition.
Engine Stalled	Ignition ON	No	This parameter displays that the internal combustion engine has stopped running unintentionally.
Engine Starting	Ignition ON	No	This parameter displays that the internal combustion engine is being started (in transition from engine OFF to engine running).

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Engine Stopping	Ignition ON	No	Engine Stopping indicates that the internal combustion engine is stopping (in transition from engine running to engine off OR in transition from engine running to engine failed).
Engine Torque Command	Engine Idling		This parameter displays the commanded predicted engine torque value, which is the torque request for the slow response air path (control of the throttle).
EVAP Malfunction History	Engine Running	None	This parameter displays the result of the evaporative emission (EVAP) system as determined by the control module. The scan tool will display the following: • None • Excess Vacuum • Purge Valve Leak • Small Leak • Weak Vacuum • No Test Result
EVAP Monitor Complete	Engine Running	Yes/No	This parameter displays if the most recent evaporative emissions diagnostic test is complete.
EVAP Monitor Complete This Ignition Cycle	Engine Running	Yes/No	This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
EVAP Monitor Enabled	Engine Running	Yes/No	This parameter displays if the evaporative emissions diagnostic test is enabled.
EVAP Monitor Enabled This Ignition Cycle	Engine Running	Yes/No	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
EVAP Purge Solenoid Valve Command	Engine Idling	%	This parameter displays the commanded duty cycle for the canister purge output.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

EVAP Purge Solenoid Valve Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is shorted to voltage.
EVAP Purge Solenoid Valve Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is shorted to ground.
EVAP Purge Solenoid Valve Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is open.
EVAP Vent Solenoid Command	Engine Idling	Not Venting	This parameter displays the state of the control circuit for evaporative emission (EVAP) vent solenoid as commanded by the control module.
EVAP Vent Solenoid Valve Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is shorted to voltage. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
EVAP Vent Solenoid Valve			This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Control Circuit Low Voltage Test Status	Ignition ON	OK	vent solenoid control circuit is shorted to ground. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
EVAP Vent Solenoid Valve Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is open. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
Exhaust Camshaft Position	Engine Idling	°	This parameter displays the position of the exhaust camshaft in terms of degrees of camshaft rotation (retard) from the park position (a value of zero represents the park position).
Exhaust Camshaft Position Active Counter or Exhaust Camshaft Position Active Counter Bank 1 or 2	Engine Idling	0-255	This parameter displays an incrementing counter when the control module receives a signal from the exhaust camshaft position (CMP) sensor.
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status or Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status Bank 1 or 2	Engine Idling	OK	This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to voltage.
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status or Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage	Engine Idling	OK	This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to ground.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Test Status Bank 1 or 2			
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status or Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status Bank 1 or 2	Engine Idling	OK	This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is open.
Exhaust Camshaft Position or Exhaust Camshaft Position Bank 1 or 2	Engine Idling	0 Degrees	This parameter displays the actual exhaust camshaft position in degrees.
	Engine speed at 2000 RPM	10 Degrees	
Exhaust Camshaft Position Command or Exhaust Camshaft Position Command Bank 1 or 2	Engine Idling	20 %	This parameter displays the on-time or duty cycle of the exhaust camshaft position (CMP) actuator solenoid valve as commanded by the control module.
	Engine speed at 2000 RPM	50 %	
Exhaust Camshaft Position Variance or Exhaust Camshaft Position Variance Bank 1 or 2	Engine Idling	0 Degrees	This parameter displays in degrees, the difference between the desired exhaust camshaft position and the actual exhaust camshaft position.
	Engine speed at 2000 RPM	0 Degrees	
Extended Travel Brake Pedal Position Signal	Engine Idling	Released	This parameter displays the status of the Extended Travel Brake Pedal Position sensor.
Extended Travel Brake Pedal Switch	Ignition ON	Released	This parameter displays the undebounced / undefaulted state of the extended travel brake switch input to the ECM
Freeze Frame DTC	Ignition ON	#	This parameter displays the diagnostic trouble code (DTC) that caused the freeze frame to be stored.
Fuel Alcohol Content	Engine Idling	%	This parameter displays the percentage of alcohol in the fuel. The value is calculated by the ECM using the fuel composition sensor input.
Fuel Alcohol Content When Recommended Maximum			This parameter displays a percentage of Fuel Alcohol Content When

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Fuel Alcohol Content Exceeded	Engine Idling	%	Recommended Maximum Fuel Alcohol Content Exceeded.
Fuel Composition Learn	Engine Idling	Inactive	This parameter displays Active or Inactive. Active will be displayed if the ECM is learning the alcohol content of the fuel.
Fuel Composition Sensor	Engine Idling	Hz	This parameter displays the frequency of the fuel composition sensor input. This value can be used to determine fuel composition or sensor malfunction.
Fuel Consumed Since Recommended Maximum Fuel Alcohol Content Exceeded	Engine Idling	Liters	This parameter displays in Liters the Fuel Consumed Since Recommended Maximum Fuel Alcohol Content Exceeded.
Fuel Control Loop Status	Engine Idling	Closed	Fuel Closed Loop Active indicates that oxygen sensor 1 of each bank is being used as feedback to adjust the amount of fuel delivered to the engine.
Fuel Economy	Engine Idling	Liters per Hour	This parameter displays the instant fuel consumption rate of the engine in liters per hour.
Fuel Economy Mode	Ignition ON	Inactive	This parameter indicates if the economy mode algorithm has activated economy mode.
Fuel Economy Mode Request	Ignition ON	Off	This parameter indicates if the driver of the vehicle has requested economy mode by pressing the economy mode switch.
Fuel Economy Mode Switch	Ignition ON	OK	This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is shorted to voltage.
			This parameter displays the state of the fuel economy

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Fuel Economy Mode Switch	Ignition ON	OK	mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is shorted to ground.
Fuel Economy Mode Switch	Ignition ON	OK	This parameter displays the state of the fuel economy mode switch circuit. The parameter displays Malfunction if the fuel economy mode switch circuit is open.
Fuel Economy Mode Switch	Ignition ON	Volts	This parameter displays the economy mode switch reference voltage.
Fuel Enrichment-Hot Catalyst	Engine Running	Inactive	Fuel Enrichment Catalyst Protection Active indicates fuel is being added to cool the catalytic converter.
Fuel Enrichment-Hot Coolant	Engine Running	Inactive	Hot Coolant Enrichment Active indicates that the conditions to enable hot coolant enrichment are active and that a richer than stoichiometric air/fuel ratio is being commanded in order to help cool the engine when a system malfunction is causing the engine to run at extreme temperatures.
Fuel Injector Driver Supply Voltage	Ignition ON	Volts	This parameter displays the injector driver circuit boost supply voltage.
Fuel Level Sensor	Ignition ON	Volts	This parameter displays the unfiltered fuel level sensor analog input for the primary fuel tank as a percentage of its reference voltage.
Fuel Level Sensor Left Tank (If Equipped)	Ignition ON	0-5 Volts	This parameter displays the voltage signal received by the control module from the secondary fuel level sensor in the left side of the fuel tank.
			This parameter displays the percentage of time that the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Fuel Level Sensor Reference Command	Engine Idling	%	power supply for the fuel level sensor is on. This percentage is minimized when the fuel has high ethanol content and is maximized when the fuel has low ethanol content.
Fuel Level Sensor Right Tank (If Equipped)	Ignition ON	0-5 Volts	This parameter displays the voltage signal received by the control module from the primary fuel level sensor in the right side of the fuel tank.
Fuel Pressure Regulator Control Circuit Command	Engine Cranking or Running	On	This parameter displays the commanded state of the fuel pressure regulator 1 low side output (the output is considered to be commanded ON if the regulator is enabled while the engine is running or cranking).
Fuel Pressure Regulator Control Circuit High Voltage Test	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pressure regulator control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pressure Regulator Control Circuit Low Voltage Test	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pressure regulator control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
			This parameter displays the status of the output driver for the fuel pressure regulator control circuit. The scan tool

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Fuel Pressure Regulator Control Circuit Open Test Status	Ignition ON	OK	will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.
Fuel Pressure Regulator High Control Circuit Command	Engine Idling	%	This parameter displays the commanded duty cycle for the fuel pressure regulator 1 solenoid output.
Fuel Pressure Regulator High Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pressure regulator high control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pressure Regulator High Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pressure regulator high control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
Fuel Pressure Regulator High Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pressure regulator high control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.
			For Port Fuel Injected (PFI) systems, this Parameter

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Fuel Pressure Sensor	Engine Idling	kPa/PSI	displays fuel rail pressure at the engine. For high pressure fuel systems, this Parameter indicates the low side fuel pressure before the high pressure pump.
Fuel Pressure Sensor	-	Volts	This parameter displays the fuel supply pressure sensor analog input as a percentage of its reference voltage.
Fuel Pump Enable Command	Ignition ON	On	This parameter displays the commanded state of the fuel pump output (the output is considered to be commanded ON if its duty cycle is not zero).
Fuel Pump Enable Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pump Enable Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
Fuel Pump Enable Circuit Open Test Status	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Fuel Pump Relay Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is shorted to voltage.
Fuel Pump Relay Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is shorted to ground.
Fuel Pump Relay Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the fuel pump relay control circuit. The parameter displays Malfunction if the fuel pump relay control circuit is open.
Fuel Rail Pressure Regulator Command (If Equipped)	Engine idling	36 Degrees	The scan tool displays in degrees, the Fuel Rail Pressure Regulator ON time as commanded by the control module.
Fuel Rail Pressure Sensor	Engine Idling	1.9-5.0 MPa/279-725 PSI	This parameter displays the high side fuel pressure after the high pressure pump.
Fuel Rail Pressure Sensor	Engine Idling	0 to 5 Volts	This parameter displays the voltage signal received by the control module from the fuel rail pressure (FRP) sensor.
Fuel Rail Pressure Sensor Initial Learn	-	Complete	This parameter displays the if the Fuel Rail Pressure Sensor First Time Adaptation is Complete
Fuel Rail Pressure Sensor Learn	-	Active	This parameter displays the current state of the fuel rail pressure sensor learn condition.
			This parameter displays the reason for the fuel rail pressure sensor learn to be inhibited. These include: Assembly Plant Mode

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Fuel Rail Pressure Sensor Learn Inhibit	-	No	Counter Not Programmed, Assembly Plant Suspension, Barometric Pressure Sensor DTC, Barometric Pressure Too Low, Clutch Pedal Applied, Clutch Pedal Position Sensor DTC, Desired Fuel Rail Pressure Too Low, DTC Present, Engine in Catalyst Warm-Up Mode, Engine Not Synchronized, Engine Stopped, Fuel Pressure Spike, Fuel Level Too Low, Fuel Pressure Regulator Control Circuit DTC, Fuel Pump Control Function Active, Fuel Pump is Off, Fuel Rail Pressure Control Function Active, Fuel Rail Pressure Sensor DTC, Fuel System in Open Loop Operation, Fuel Temperature Out of Range, Idle Test Failed, Injector Flow Test in Progress, Intake Air Temperature Too Low, Low Pressure Fuel System Malfunction, Low Pressure Fuel System Pressure Too Low, Minimum Engine Run Time Not Met, Minimum Normal Fuel Pressure Control Time Not Met, Minimum Run Time, Time After New Engine Mode Not Met, Minimum Time After Drive Not Met, Minimum Time for Released Accelerator Pedal Not Met, New Engine Mode, Not in Control of Idle Speed, Other Diagnostics Active, Sensor Reading Too High Test Failed, Some Cylinders Are Turned Off, Stuck Sensor Test Failed, Vehicle Speed
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2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			Too High
Fuel Rail Pressure Sensor Learn Status	-	Complete	This parameter displays several signals associated with the status of the power mode and starter systems.
Fuel Rail Pressure Sensor Learned Value	-	kPa	This parameter displays the fuel rail pressure learned value at the fuel rail pressure sensor.
Fuel System Monitor Complete	Engine Idling	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non-continuous legislated emission related monitor.
Fuel System Monitor Complete This Ignition Cycle	Ignition ON	No	This parameter displays the completion status of the fuel system monitor during the current driving / monitoring cycle.
Fuel System Monitor Enabled	Engine Idling	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non-continuous legislated emission related monitor.
Fuel System Monitor Enabled This Ignition Cycle	Ignition ON	No	This parameter displays the enable status of the fuel system monitor during the current driving / monitoring cycle.
Fuel Tank Pressure Sensor	Ignition ON, engine OFF	kPa/psi	This parameter displays the pressure/vacuum inside the fuel tank. A negative value indicates a vacuum, while a positive value indicates a pressure.
Fuel Tank Pressure Sensor	-	mmHg / in H2O	This parameter displays the fuel tank pressure in mmHg/in H2O at the fuel tank pressure sensor.
			This parameter displays the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Fuel Tank Pressure Sensor	Ignition ON, engine OFF	0-5 Volts	voltage signal received by the control module from the fuel tank pressure (FTP) sensor.
Fuel Tank Rated Capacity	Ignition ON	Varies	This parameter displays the capacity of the fuel tank in liters or gallons. The rated capacity displayed by the scan tool will varies with vehicle type.
Fuel Trim Cylinder Balance Test or Fuel Trim Cylinder Balance Test Bank 1-2	Ignition ON	Inactive	This parameter indicates the current state of the fuel trim cylinder balance test.
Fuel Trim Cylinder Balance Test Counter or Fuel Trim Cylinder Balance Test Counter Bank 1-2	Ignition ON	Counts	This parameter displays the number of Air Fuel Imbalance Monitor tests that have been performed since a code clear or non volatile memory (NVM) reset.
Fuel Trim Cylinder Balance Test Status Bank 1-2	Ignition ON	No Result	This parameter indicates the current state of the fuel trim cylinder balance test.
Fuel Trim Learn	Engine Idling	Enabled	This parameter displays Enabled when conditions are appropriate for enabling long term fuel trim corrections. This indicates that the long term fuel trim is adapting continuing amounts of short term fuel trim. If the scan tool displays Disabled, then long term fuel trim will not respond to changes in short term fuel trim.
Fuel Trim Learn	-	Enabled	This parameter displays if the fuel trim learn is enabled.
Fuel Trim Memory Cell	Engine Idling	Counts 0 250	This parameter displays long term fuel corrections that is active based upon the current operating conditions (MAP, engine speed, purge duty cycle, A/C compressor state, and transmission range).
			This parameter displays the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Fuel Trim Memory Cell	-	#	intake air temperature (measured by a sensor located near the throttle body) recorded at power-up (Run/Crank transition from low to high).
Fuel Trim System Test State	Engine Idling	Complete	This parameter displays the current state of the fuel adjustment system diagnostic.
Fuel Trim System Test State	-	Complete	This parameter displays the state of the fuel trim system test.
Fuel Volatility	Engine Idling	Varies	This parameter indicates the rate the fuel can be vaporized in the cylinder as calculated by the control module. The scan tool will display HIGH when the fuel volatility is high. The scan tool will display LOW when the fuel volatility is low.
Generator F Terminal Signal	Engine Idling	0-100 %	This parameter displays the amount of generator ON-time as commanded by the control module. The higher the percentage the greater the generator output.
Generator Indicator Command	Engine Idling	On	This parameter displays On or Off associated with the status of the generator.
Generator L Terminal Circuit High Voltage Test Status	Engine Idling	OK	This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is shorted to voltage.
Generator L Terminal Circuit Low Voltage Test Status	Engine Idling	OK	This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is shorted to ground.
			This parameter displays the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Generator L Terminal Circuit Open Test Status	Engine Idling	OK	state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is open.
Generator L-Terminal Command	Engine Idling	0-100 %	This parameter displays the control modules commanded state of the voltage regulator on the generator.
Heated Catalyst Monitor Complete	Engine Idling	Yes	This parameter indicates the status of the heated catalyst. The scan tool displays Yes when the diagnostic is complete. And No if the diagnostic has not ran or a malfunction is detected in the heated catalyst.
Heated Catalyst Monitor Enabled	Engine Idling	Yes	This parameter indicates the status of the heated catalyst monitor diagnostic. Catalyst Monitor Test Running indicates Yes or No when the heated catalyst monitor diagnostic is actively running a test.
Hood Position Switch	Ignition ON	Closed	This parameter displays the current position of the hood.
HO2S Sensor 1 or HO2S Bank 1 Sensor 1 or Bank 2 Sensor 1	Engine Idling	0.00-1.00 Volts	This parameter displays the voltage output from the HO2S to the control module. A lower voltage indicates a lean exhaust, while a higher voltage indicates a rich exhaust.
HO2S Sensor 2 or HO2S Bank 1 Sensor 2 or Bank 2 Sensor 2	Engine Idling	0.00-1.00 Volts	This parameter displays the voltage output from the HO2S to the control module. A lower voltage indicates a lean exhaust, while a higher voltage indicates a rich exhaust.
HO2S Heater Sensor 1 or HO2S Heater Bank 1 Sensor 1 or Bank 2 Sensor 1	Engine Idling	mA	This parameter display the current feedback for the oxygen sensor heater output for sensor 1.
HO2S Heater Sensor 2			This parameter display the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

or HO2S Heater Bank 1 Sensor 2 or Bank 2 Sensor 2	Engine Idling	mA	current feedback for the oxygen sensor heater output for sensor 2.
HO2S Heater Command or HO2S Heater Command Bank 1 or 2 Sensor 1 or 2	Engine Idling	Off	This parameter display the state of the HO2S heater control circuit as commanded by the control module.
HO2S Heater Command Bank 1 or 2 Sensor 1 or 2 Heater Command	Engine Idling	0-100 %	This parameter displays the HO2S heater ON time in percentage, as commanded by the control module.
HO2S Heater Control Circuit High Voltage Test Status or HO2S Heater Control Circuit High Voltage Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to voltage.
HO2S Heater Control Circuit High Voltage Test Status or HO2S Heater Control Circuit High Voltage Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to voltage.
HO2S Heater Control Circuit Low Voltage Test Status or HO2S Heater Control Circuit Low Voltage Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to ground.
HO2S Heater Control Circuit Low Voltage Test Status or HO2S Heater Control Circuit Low Voltage Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to ground.
HO2S Heater Control Circuit Open Test Status or HO2S Heater Control Circuit Open Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			is open.
HO2S Heater Control Circuit Open Test Status or HO2S Heater Control Circuit Open Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is open.
HO2S/Heater Monitor Complete This Ignition Cycle	Engine Idling	Yes/No	This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
HO2S Heater Monitor Enabled	Ignition ON	No	This parameter displays the current state of the HO2S heater monitor.
HO2S/Heater Monitor Enabled This Ignition Cycle	Engine Idling	Yes/No	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
Humidity Sensor Intake Air Temperature Signal	Ignition ON	Hz	This parameter displays the frequency of the humidity sensor's intake air temperature (IAT) sensor input.
IAT Sensor 1	Ignition ON	-39° to +140°C (-38° to +284°F)	This parameter displays the temperature of the air entering the air induction system based on input to the control module from the intake air temperature (IAT) sensor.
IAT Sensor 2	Engine Idling	Hz	This parameter displays the frequency of the humidity sensor's intake air temperature (IAT) sensor input to the engine control module.
IAT Sensor 2	-	°C (°F)	This parameter displays the temperature of the air entering the engine as calculated by the control module based on the input from the intake air temperature (IAT) sensor 2. The scan tool will display a

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			low value when the air temperature is low, and a high value when the air temperature is high.
IAT Sensor 3	-	°C (°F)	This parameter displays the temperature of the air entering the engine as calculated by the control module based on the input from the intake air temperature (IAT) sensor 3. The scan tool will display a low value when the air temperature is low, and a high value when the air temperature is high.
Idle Speed Correction	Ignition ON	RPM	This parameter displays the engine idle speed correction within a restricted range to address complaints of vehicle vibration.
Ignition 1 Signal	Ignition ON	B+	This parameter displays B+ when the control module detects a voltage at the ignition 1 input terminal.
Ignition Accessory Signal	Ignition ON	On	This parameter displays On when the control module detects a voltage at the ignition accessory input terminal.
Ignition Coil 1, 2, 3, 4, 5, 6, 7 or 8 Control Circuit High Voltage Test Status	Engine Running	OK	This parameter displays the state of the Ignition control circuit. The parameter displays Malfunction if the Ignition control circuit is shorted to voltage.
Ignition Coil 1, 2, 3, 4, 5, 6, 7 or 8 Control Circuit Low Voltage Test Status	Engine Idling	OK	This parameter displays the state of the Ignition control circuit. The parameter display Malfunctions if the Ignition control circuit is shorted to ground.
Ignition Coil 1, 2, 3, 4, 5, 6, 7 or 8 Control Circuit Open Test Status	Engine Idling	OK	This parameter displays the state of the Ignition control circuit. The parameter displays if Malfunction the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			Ignition control circuit is open.
Ignition Coil Supply Voltage or Ignition Coil Supply Voltage Bank 1 or 2	Engine Idling	On	This parameter displays ON when voltage is supplied to the Ignition coil.
Ignition Cycles Since Recommended Maximum Fuel Alcohol Content Exceeded	Engine Idling	Counts	This parameter displays the number of Ignition Cycles since Recommended Maximum Fuel Alcohol Content Exceeded.
Ignition Cycles with Malfunction Since 1st Malfunction	Ignition ON	Counts	This parameter contains the number of ignition cycles with a failure reported since the first ignition cycle with a failure reported.
Ignition Cycles Without Completed Test Since 1st Malfunction	Engine Idling	Counts	This parameter displays the number of ignition cycles without a pass or a failure reported since the first ignition cycle with a failure reported.
Ignition Cycles Without Malfunction Since Last Malfunction	Engine Idling	Counts	This parameter displays the number of ignition cycles with a pass reported and no malfunctions reported since the first ignition cycle with a malfunction reported.
Ignition Cycles without Malfunction Since Last Malfunction	Ignition ON	Counts	This parameter contains the number of ignition cycles with a pass reported and no failures reported since the first ignition cycle with a failure reported.
Ignition Off Time	Ignition ON	hh:mm:ss	This parameter displays the time that the ignition has been OFF.
Ignition Timing	Engine Idling	Degrees	This parameter displays the final spark advance in terms of a crankshaft angle.
Immobilizer Auto Learn Counter	Ignition ON	Counts	This parameter displays the number of auto-learn cycles that have been successfully completed within the immobilizer system.
			This parameter displays the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Immobilizer Automatic Learn Timer	Ignition ON	h/m/s	time elapsed within the current auto-learn cycle within the immobilizer system.
Immobilizer ECM Identifier	Ignition ON	OK	This parameter displays that the immobilizer control module (ICM) has received the correct powertrain identifier.
Immobilizer Environment Device 1-4	Ignition ON	OK	This parameter displays that the associated device is OK or unknown or its identification is pending to the immobilizer control module (ICM).
Immobilizer Fuel Disable	Ignition ON	Inactive	This parameter displays if the vehicle is immobilized by the ECM.
Immobilizer Module Environment Identification	Ignition ON	Inactive	This parameter displays that the ICM has not received the powertrain identifier or has received the wrong powertrain identifier.
Immobilizer Module Fuel Disable	Ignition ON	Inactive	This parameter displays if the vehicle is immobilized by the ICM.
Immobilizer Module Identification	Ignition ON	Complete	This parameter indicates that the ICM has not received the powertrain identifier or has received the wrong powertrain identifier.
Immobilizer Module Security Code Programmed	Ignition ON	Yes	This parameter indicates that the ICM security code has been programmed (i.e., the immobilizer device is locked).
Immobilizer Password Learn	Ignition ON	Active/Inactive	Learning Enabled indicates that learning of immobilizer code information is enabled.
Immobilizer Password Learn Scan Tool Delay	Engine Idling	Active/Inactive	Scan tool Learn Delay Active indicates that the security code has been accepted but the scan tool learn delay is active and will not allow learning enabled, programming security code

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			or resetting security code.
Immobilizer Password Programmed	Ignition ON	Yes	This parameter indicates that the ICM password has been programmed.
Immobilizer Post-Release Passive State	Ignition ON	Active / Inactive	This parameter displays that the immobilizer algorithm is in the post release passive state.
Immobilizer Post-Release State	Ignition ON	Active / Inactive	This parameter displays that the immobilizer algorithm is in the post release passive state.
Immobilizer Pre-Release State	Ignition ON	Active / Inactive	This parameter displays that the immobilizer algorithm is in the pre release active state.
Immobilizer Release State	Ignition ON	Active / Inactive	This parameter displays that the immobilizer algorithm is in the release active state.
Immobilizer Security Code Accepted	Engine Idling	Yes/No	Security Code Accepted displaying Yes indicates that the received security code is correct.
Immobilizer Security Code Function	Engine Idling	Present/Not Present	This parameter indicates if the ECU supports the immobilizer security code strategy.
Immobilizer Security Code Lockout	Engine Idling	Yes/No	Security Code Lockout Active indicates that the security code has not passed and lockout is active.
Immobilizer Security Code Lockout Active Timer	Engine Idling	ms	This parameter displays the time elapsed since the immobilizer security code lockout has been activated either due to a battery disconnect or an incorrect immobilizer security code being entered.
Immobilizer Security Code Programmed	Ignition ON	Yes/No	Security Code Programmed indicates that the security code has been programmed.
Immobilizer Security Code Programming Counter	Ignition ON	Counts	This parameter displays the number of times a new immobilizer security code has been programmed

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			through secure access. This counter can only be incremented.
Immobilizer Security Code Reset Counter	Ignition ON	Counts	This parameter displays the number of times the immobilizer security code has been reset to the default value through secure access. This counter can only be incremented.
Immobilizer Security Information Programmed	Ignition ON	Yes/No	This parameter displays the status of the immobilizer system.
Immobilizer Security Level	Ignition ON	#	This parameter displays the current immobilizer security level. If the correct security code is entered, the security level will remain at or be reset to a level of 10. If an incorrect security code is entered, the security level will be set to a level of 9.
Immobilizer Transponder Identification	Ignition ON	Active / Inactive	This parameter displays that the transponder identification process is active within the ICM.
Immobilizer Transponder Key	Ignition ON	OK	This parameter displays that the transponder key is correct for the ICM.
Immobilizer Transponder Key Identification	Ignition ON	OK	This parameter displays that the transponder key identification process is active within the ICM.
Immobilizer System Status	Ignition ON	Varies	This parameter displays the status of the immobilizer system, the following maybe displayed. Standby, Immobilized at Startup, Immobilized, No Response, Immobilized Negative Response, Immobilized, Incorrect Response, Post-Release State, Pre-Release State, Release State.
Immobilizer Valid Response	Ignition ON	ms	This parameter displays the actual time observed for a

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Received Time			valid immobilizer response.
Initialized Fuel Alcohol Content	Ignition ON	%	This parameter displays the initialized fuel composition to be used as a starting point for the fuel composition algorithm.
Injector Duty Cycle or Injector Duty Cycle Bank 1 or 2	Engine idling	0.82-1.50 ms	This parameter displays the amount of fuel injector ON time or pulse width as commanded by the control module.
Inspection/Maintenance Drive Cycle Complete	Engine Idling	Yes/No	Inspection/Maintenance Drive Cycle Complete means that all required components of the standard drive cycle have completed.
Inspection/Maintenance Drive Cycle Idle Time Complete	Engine Idling	Yes/No	Inspection/Maintenance Drive Cycle Idle Time Complete indicates that the engine idle time requirement is complete.
Inspection/Maintenance Drive Cycle Idle Timer	Engine Idling	hh:mm:ss	This parameter displays the Inspection/Maintenance Drive Cycle Idle Timer.
Inspection/Maintenance Drive Cycle Propulsion System Active Time Complete	Engine Idling	Yes/No	This parameter displays the Inspection/Maintenance Drive Cycle Propulsion System Active Time Complete. The parameter displays Yes when the Inspection/Maintenance Drive Cycle Propulsion System Active Time is Complete.
Inspection/Maintenance Drive Cycle Propulsion System Active Timer	Engine Idling	hh:mm:ss	This parameter displays the total accumulated time in which the propulsion system has been active after the 1st time the engine is started.
Inspection/Maintenance Drive Cycle Vehicle Speed Time Complete	Engine Idling	Yes/No	This parameter displays Yes when the Vehicle Speed Time Complete indicates that the vehicle has been above 25 mph for five minutes.
			This parameter displays the total accumulated time in

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Inspection/Maintenance Drive Cycle Vehicle Speed Timer	Engine Idling	hh:mm:ss	which the vehicle speed has been greater than 25 mph after the 1st time the engine is started.
Intake Air Humidity Sensor	Engine Idling	%	This parameter displays the raw duty cycle signal from the relative humidity sensor electronics, which represents the relative humidity of the intake air.
Intake Camshaft Position	Engine Idling	°	This parameter displays the position of the intake camshaft for bank 1 in terms of degrees of camshaft rotation (advance) from the park position (a value of zero represents the park position).
Intake Camshaft Position Active Counter or Intake Camshaft Position Active Counter Bank 1 or 2	Engine Idling	0-255	This parameter displays an incrementing counter when the control module receives a signal from the intake camshaft position (CMP) sensor.
Intake Camshaft Position Actuator Oil Pressure	Engine Idling	kPa	This parameter displays the oil pressure at the intake camshaft position actuator.
Intake Camshaft Position Actuator Oil Pressure Sensor	Engine Idling	Volts	This parameter displays the intake camshaft position actuator pressure sensor in voltage.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status or Intake Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status Bank 1 or 2	Engine Idling	OK	This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to voltage.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status or Intake Camshaft Position Actuator Solenoid Valve	Engine Idling	OK	This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Control Circuit Low Voltage Test Status Bank 1 or 2			ground.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status or Intake Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status Bank 1 or 2	Engine Idling	OK	This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is open.
Intake Camshaft Position or Intake Camshaft Position Bank 1 or 2	Engine Idling	0 Degrees	This parameter displays the actual intake camshaft position in degrees.
	Engine speed at 2000 RPM	10 Degrees	
Intake Camshaft Position Commanded or Intake Camshaft Position Commanded Bank 1 or 2	Engine Idling	20 %	This parameter displays the ON-time or duty cycle of the intake camshaft position (CMP) actuator solenoid valve as commanded by the control module.
	Engine speed at 2000 RPM	50 %	
Intake Camshaft Position Variance or Intake Camshaft Position Variance Bank 1 or 2	Engine Idling	0 Degrees	This parameter displays in degrees, the difference between the desired intake camshaft position and the actual intake camshaft position.
	Engine speed at 2000 RPM	0 Degrees	
Intake Manifold Pressure	Engine Idling	kPa/psi	This parameter displays the engine intake manifold vacuum pressure calculated as the difference between ambient air pressure (barometric pressure) and intake manifold absolute pressure (MAP).
Intake Manifold Tuning Control Valve Control Circuit Command	Ignition ON	On	This parameter displays the commanded state of the intake manifold tuning valve output.
Intake Manifold Tuning Control Valve Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the intake manifold tuning control valve control circuit. The parameter displays Malfunction if the intake manifold tuning control valve control circuit

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			is shorted to voltage.
Intake Manifold Tuning Control Valve Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is shorted to ground.
Intake Manifold Tuning Control Valve Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is open.
Intake Manifold Tuning Control Valve Feedback Signal	Ignition ON	%	This parameter displays the duty cycle of the PWM feedback from the intake manifold tuning electronics, which represents the position of the intake manifold tuning valve.
Intake Manifold Tuning Control Valve Learn	Ignition ON	Inactive	This parameter displays that the intake manifold tuning electronics are currently learning the hard stop position for the intake manifold tuning valve.
Intake Manifold Tuning Control Valve Position	Ignition ON	Closed	This parameter displays whether the intake manifold tuning valve is in an open, closed or intermediate position based upon the PWM feedback from the intake manifold tuning electronics.
Intake Rocker Arm Solenoid Valve 1-2 Command	Engine Idling	Off	This parameter displays the intake rocker arm solenoid valve command ON/OFF status.
Intake Rocker Arm Solenoid Valve 1-2 Command	Engine Idling	High Lift/Low Lift	This parameter displays the intake rocker arm solenoid valve command status.
			This parameter displays the state of the intake rocker arm

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Intake Rocker Arm Solenoid Valve 1-2 Control Circuit High Voltage Test Status	Engine Idling	OK	solenoid valve control circuit. The parameter displays Malfunction if the intake rocker arm solenoid valve circuit is shorted to voltage.
Intake Rocker Arm Solenoid Valve 1-2 Control Circuit Low Voltage Test Status	Engine Idling	OK	This parameter displays the state of the intake rocker arm solenoid valve control circuit. The parameter displays Malfunction if the intake rocker arm solenoid valve control circuit is shorted to ground.
Intake Rocker Arm Solenoid Valve 1-2 Control Circuit Open Test Status	Engine Idling	OK	This parameter displays the state of the intake rocker arm solenoid valve control circuit. The parameter displays Malfunction if the intake rocker arm solenoid valve control circuit is open.
ISS/OSS Supply Voltage	Engine Idling	OK	This parameter displays the state of the ISS/OSS Supply Voltage circuit.
Knock Retard	Engine Idling	0 Degrees	This parameter indicates the amount of spark advance the control module removes from the ignition control (IC) spark advance in response to the signal from the knock sensors.
Long Fuel Pump Trim	-	#	This parameter displays a numeric value. This is the long term (LT) fuel pump trim.
Long Term Fuel Trim or Long Term Fuel Trim Bank 1 or 2	Engine Idling	0 %	This parameter displays the commanded Long Term Fuel Trim correction by the control module for cruise and acceleration conditions.
Long Term Fuel Trim Test Average or Long Term Fuel Trim Test	Engine Idling	0 %	This parameter displays the filtered long term closed loop fuel correction. This value is compared to thresholds to determine if the fuel adjustment system diagnostic

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Average Bank 1 or 2			is passing or failing or if an excess purge vapor test should be executed.
Long Term Fuel Trim Test Average without Purge or Long Term Fuel Trim Test Average without Purge Bank 1 or 2	Engine Idling	0 %	This parameter displays the filtered non purge long term closed loop fuel correction. This value is compared to thresholds to determine if the fuel adjustment system diagnostic is passing, failing or indeterminate during normal purge-OFF operation as well as during the intrusive excess purge vapor test.
Low Engine Oil Level Indicator Command	Engine Idling	Off	The scan tool displays On or Off. This is the state of the low engine oil level indicator as monitored by the ECM.
Low Engine Oil Pressure Indicator Command	Engine Idling	Off	This parameter displays the commanded state of the low EOP lamp control circuit by the control module.
MAF Performance Test	Engine Idling	OK	This parameter displays the status of the MAF performance test by the engine control module. The scan tool will display OK if no malfunction is found. The scan tool will display malfunction if the engine control module detects a malfunction during the test.
MAF Sensor	Engine Idling	3.0-8.3 g/s	This parameter displays in grams per second, the measured quantity of air flowing into the engine during all operating conditions.
	Engine speed at 2, 500 RPM	11.88 g/s	
MAF Sensor	Engine Idling	2, 000-2, 500 Hz	The scan tool displays a range of 0-65, 555 hertz. This parameter displays the frequency signal input to the control module, and represents measured quantity of air flowing into the engine

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			during all operating conditions.
MAF When Engine Overspeed Detected	Engine Idling	g/s	This parameter indicates the quantity calculated by the control module based on a signal from the MAF sensor at the time an overspeed was detected.
MAP Performance Test 1	Engine Idling	OK	MAP Test 1 Residual Out of Tolerance indicates that the filtered MAP Test 1 residual (the difference between the measured intake manifold pressure and the intake manifold pressure predicted from the intake manifold model using the mass airflow predicted from the throttle model) exceeds a failure threshold.
MAP Performance Test 2	Engine Idling	OK	MAP Test 2 Residual Out of Tolerance indicates that the filtered MAP Test 2 residual (the difference between the measured intake manifold pressure and the intake manifold pressure predicted from the intake manifold model using the measured mass airflow) exceeds a failure threshold.
MAP Sensor	Engine Idling	kPa/psi	This parameter displays the actual engine intake manifold absolute pressure (MAP).
MAP Sensor	Engine Idling	0.4-2.0 Volts	The parameter displays The MAP sensor voltage as it measures the change in the intake manifold pressure which results from engine load and speed changes. As the intake manifold pressure increases, the air density in the intake also increases and additional fuel is required.
Maximum Engine Speed			This parameter displays the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

When Engine Overspeed Detected	Engine Idling	RPM	Maximum Engine Speed When Engine Overspeed Detected.
MIL Command	Engine Idling	Off	This parameter displays the commanded state of the malfunction indicator lamp (MIL) control circuit by the control module.
MIL Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is shorted to voltage.
MIL Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is shorted to ground.
MIL Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is open.
MIL Requested	Engine Idling	No	This parameter displays the reason the engine control module illuminated the MIL. The scan tool will display Yes when the MIL is requested as a result of an A or B type DTC. The scan tool will display No if the MIL is illuminated for another reason, such as transmission DTCs.
MIL Requested by DTC	Engine Idling	No	This parameter indicates the reason the control module illuminated the MIL. The scan tool will display YES when the MIL is requested as a result of an A or B type DTC. The scan tool will display NO if the MIL is illuminated for another reason, such as transmission

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			DTCs.
Misfire Diagnostic Engine Load	Engine Idling	%	This parameter displays the engine load used within the misfire diagnostic (calculated as the ratio of the mass of air predicted to be in the cylinder two firing events into the future to the maximum possible mass of air in the cylinder based on the current ambient air pressure and charge temperature).
Misfire Diagnostic Engine Speed	Engine Idling	RPM	This parameter displays the engine speed used within the misfire diagnostic. This engine speed is the maximum engine speed observed over the previous engine cycle.
Misfire Engine Load History 1-5	Engine Idling	%	This parameter displays the specific engine load when the engine was operating for one of the last five misfire events.
Misfire Engine Speed History 1-5	Engine Idling	RPM	This parameter displays the specific engine speed when the engine was operating for one of the last five misfire events.
Misfire Monitor Complete	Engine Idling	Yes/No	This parameter displays the status of the Misfire Monitor. The parameter will display Yes when the Misfire Monitor is Complete.
Misfire Monitor Complete This Ignition Cycle	Ignition ON	No	This parameter displays the completion status of the misfire monitor during the current driving / monitoring cycle.
Misfire Monitor Enabled	Engine Idling	Yes/No	This parameter displays the status of the Misfire Monitor. The parameter will display Yes when the Misfire Monitor is Enabled.
			This parameter displays the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Misfire Monitor Enabled This Ignition Cycle	Ignition ON	No	enable status of the misfire monitor during the current driving / monitoring cycle.
Neutral Position Sensor	-	%	This parameter displays the current state of the neutral position sensor in degrees.
Number of Calibration History Events Stored	Ignition ON	Counts	This parameter displays the history entries for the primary calibration in the controller.
Number of DTC(s)	Engine Idling	0	This parameter indicates the number of diagnostic trouble codes (DTCs).
O2S/HO2S Monitor Complete	Engine Idling	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Complete This Ignition Cycle	Engine Idling	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Enabled	Engine Idling	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Enabled This Ignition Cycle	Engine Idling	Yes/No	This parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
			This parameter displays the

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Odometer at Engine Shutdown - Excessive Idle Time	Ignition ON	km / miles	odometer reading at an engine shutdown due to excessive idle time.
Odometer at Engine Shutdown - High Coolant Temperature	Ignition ON	km / miles	This parameter displays the odometer reading at an engine shutdown due to high coolant temperature.
Odometer at Engine Shutdown - Low Coolant Level	Ignition ON	km / miles	This parameter displays the odometer reading at an engine shutdown due to low coolant level.
Odometer at Engine Shutdown - Low Oil Level	Ignition ON	km / miles	This parameter displays the odometer reading at an engine shutdown due to low oil level.
Odometer When Engine Overspeed Detected	Engine Idling	km/miles	This parameter displays the kilometers or miles of the Odometer When Engine Overspeed Detected.
Oil Level Warning Counter City	Ignition ON	Counts	This parameter displays a rolling count of oil level debounce events for the city calibration.
Oil Level Warning Counter Country Road	Ignition ON	Counts	This parameter displays a rolling count of oil level debounce events for the country road calibration
Oil Level Warning Counter Highway	Ignition ON	Counts	This parameter displays a rolling count of oil level debounce events for the highway calibration.
Output Shaft Speed Sensor	Engine Idling	RPM	This parameter displays the transmission output speed.
Park/Neutral Position Switch (If Equipped)	Engine Idling	Park/Neutral	This parameter indicates the range selection of the automatic transmission as calculated by the control module based on input from the PNP switch. The scan tool will display, In Gear, Park or Neutral depending on the PNP switch position.
			This parameter indicates if the control module has detected conditions appropriate to operate in

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Power Enrichment	Engine Idling	Inactive	Power Enrichment mode. The scan tool will display Active if the mode is in operation, and Inactive if the mode is not in operation. The control module enters Open Loop operation and increases injector pulse width when in power enrichment mode.
Power Mode	Engine Idling	Run	This parameter displays the state of the System Power Mode. This signal is based upon the state of the system power mode received over serial communication from the vehicle electronics. If the serial data signal not received, the Parameter will display Off.
Radiator Coolant Temperature Sensor	-	Varies C° (F°)	This parameter displays the undefaulted radiator coolant temperature measured by a sensor located in the coolant outlet of the radiator.
RCT vs. IAT Sensor Temperature at Last ECT vs. RCT Malfunction Detection	Engine Idling	Agree	This parameter displays that the temperature values of the RCT and IAT sensors did not agree at the time of the most recent failure of the ECT/RCT rationality diagnostic.
Recommended Maximum Fuel Alcohol Content	Engine Idling	%	This parameter displays the percentage of the Recommended Maximum Fuel Alcohol Content.
Recommended Maximum Fuel Alcohol Content Exceeded	Engine Idling	No	This parameter displays Yes or No if the Recommended Maximum Fuel Alcohol Content Exceeded.
Recommended Maximum Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded	Engine Idling	%	This parameter displays the percentage of the Recommended Maximum Fuel Alcohol Content When Recommended Maximum Fuel Alcohol Content Exceeded.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Reduced Engine Power	Engine Idling	Inactive	This parameter displays Active if the control module is commanding reduced engine power due to a throttle actuator control (TAC) system condition.
Reduced Engine Power History	Engine Idling	Throttle Malfunction, Cooling Fan Malfunction, Engine Over-temperature Protection Active, Engine Oil Temperature Too High, Remote Vehicle Speed Limiting, Engine Calibration Malfunction, Engine Oil Life, High Pressure Fuel System Malfunction	This parameter displays the last reason that Powertrain has illuminated the Reduced Engine Power (REP) indication.
Redundant Odometer Memory	Engine Idling	Present	ECU Odometer Programmed indicates if the ECU odometer value has been programmed.
Refueling Events Since Recommended Maximum Fuel Alcohol Content Exceeded	Engine Idling	Counts	This parameter displays the number Refueling Events Since Recommended Maximum Fuel Alcohol Content Exceeded.
Remaining Fuel in Tank	Engine Idling	%	This parameter displays the total fuel level as a percentage of the rated capacity of the fuel tank.
Remaining Fuel in Tank	Engine Idling	Liters/Gallons	This parameter displays the actual total fuel volume contained in the fuel tank.
Remote Vehicle Start Disable History 1-8	Engine Cranking	Reason for RVS Disable	These parameters displays the last eight reasons the control module disabled remote vehicle start (RVS).
Remote Vehicle Start Request Signal	Ignition ON	Off	Remote Vehicle Start Request indicates the state of the request received over serial communication from the remote vehicle start (RVS) system to start the vehicle in remote mode.
			This parameter displays the Replicated Transmission

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Replicated Transmission OSS Signal	Ignition ON	RPM	Output Speed (Replicated TOS) received from the Transmission Control Module.
Reverse Inhibit Solenoid Actuator Command	Ignition ON	Allowed	This parameter displays that the driver is inhibited from shifting into reverse.
Reverse Inhibit Solenoid Actuator Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is shorted to voltage.
Reverse Inhibit Solenoid Actuator Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is shorted to ground.
Reverse Inhibit Solenoid Actuator Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the reverse inhibit solenoid actuator control circuit. The parameter displays Malfunction if the reverse inhibit solenoid actuator control circuit is open.
Reverse Position Switch	Engine Idling	Off	This parameter displays if the manual transmission shifter is in reverse.
Secondary Air Injection Monitor Enabled	Engine Idling	Yes	This parameter displays the status of the secondary air injection monitor.
Secondary Air Injection Pressure	Engine Idling	kPa	This parameter displays the normalized secondary air injection system pressure.
Secondary Air Injection Pressure Sensor	Engine Idling	kPa	This parameter displays the unfiltered secondary air injection system pressure.
Secondary Air Injection	Engine Idling	Volts	This parameter displays the secondary air injection system pressure analog input

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Pressure Sensor			as a percentage of its reference voltage.
Secondary Air Injection Pressure Sensor Variance	Engine Idling	kPa	This parameter displays the weighted average pressure error (difference between the predicted and actual secondary air injection system pressure) during the secondary air injection on test (phase 1).
Secondary Air Injection Pump Relay Command	Engine Idling	Off	This parameter displays the commanded state of the secondary air injection pump output.
Secondary Air Injection Pump Relay Control Circuit High Voltage Test Status	Engine Idling	OK	This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is shorted to voltage.
Secondary Air Injection Pump Relay Control Circuit Low Voltage Test Status	Engine Idling	OK	This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is shorted to ground.
Secondary Air Injection Pump Relay Control Circuit Open Test Status	Engine Idling	OK	This parameter displays the state of the secondary air injection pump relay control circuit. The parameter displays Malfunction if the secondary air injection pump relay control circuit is open.
Secondary Air Injection Solenoid Valve Command	Engine Idling	Off	This parameter displays the commanded state of the secondary air injection valve output.
Secondary Air Injection Solenoid Valve Control Circuit High Voltage Test	Engine Idling	OK	This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Status			Malfunction if the secondary air injection solenoid valve control circuit is shorted to voltage.
Secondary Air Injection Solenoid Valve Control Circuit Low Voltage Test Status	Engine Idling	OK	This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is shorted to ground.
Secondary Air Injection Solenoid Valve Control Circuit Open Test Status	Engine Idling	OK	This parameter displays the state of the secondary air injection solenoid valve control circuit. The parameter displays Malfunction if the secondary air injection solenoid valve control circuit is open.
Short Term Fuel Pump Trim	-	#	This parameter displays a numeric value. This is the short term (ST) fuel pump trim.
Short Term Fuel Trim or Short Term Fuel Trim Bank 1 or Bank 2	Engine Idling	-5 % to +5 %	This parameter displays the short-term correction to the fuel delivery by the control module in response to oxygen sensor 1 or 2. If the oxygen sensor indicates a lean air/fuel mixture, the control module will add fuel increasing the short term fuel trim above 0. If the oxygen sensor indicates a rich air/fuel mixture, the control module will reduce fuel decreasing the short term fuel trim below 0.
Short Term Fuel Trim Test Average or Short Term Fuel Trim Test	Engine Idling	%	This parameter display's the filtered short term closed loop fuel correction. This value is compared to thresholds to determine if the fuel adjustment system

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Average Bank 1 or Bank 2			diagnostic is passing or failing or if an excess purge vapor test should be executed.
Skip Shift Solenoid Actuator Command	Ignition ON	No Skip	This parameter indicates that the skip shift solenoid is commanded on, inhibiting the driver from shifting up to one of the next highest gears.
Skip Shift Solenoid Actuator Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is shorted to voltage.
Skip Shift Solenoid Actuator Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is shorted to ground.
Skip Shift Solenoid Actuator Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the skip shift solenoid actuator control circuit. The parameter displays Malfunction if the skip shift solenoid actuator control circuit is open.
Specific Humidity	Ignition ON	%	This parameter shows the current specific humidity level.
Start-Up ECT	Ignition ON	-39° to +140°C (-38° to +284°F)	This parameter displays the temperature of the engine coolant on start-up based on input to the control module from the ECT sensor.
Start-Up IAT Sensor or Start-Up IAT Sensor 1 or 2	Ignition ON	-39° to +140°C (-38° to +284°F)	This parameter displays the temperature of the intake air at start in the air induction system based on input to the control module from the IAT sensor.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Starter Relay Command	Ignition switch not in the crank position	Off	This parameter indicates whether the control module is commanding the starter relay to go On or Off.
	Ignition switch in the crank position	On	
Starter Relay Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to voltage. This parameter may not change if the scan tool is used to command the relay control circuit On.
Starter Relay Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to ground. This parameter may not change if the scan tool is used to command the relay control circuit On.
Starter Relay Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is open. This parameter may not change if the scan tool is used to command the relay control circuit On.
Supercharger Bypass Solenoid Valve Command	Ignition ON	%	This parameter displays the commanded duty cycle for the supercharger boost solenoid output.
Supercharger Bypass Solenoid Valve Control			This parameter displays the state of the supercharger bypass solenoid valve control circuit. The

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Circuit High Voltage Test Status	Ignition ON	OK	parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is shorted to voltage.
Supercharger Bypass Solenoid Valve Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is shorted to ground.
Supercharger Bypass Solenoid Valve Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the supercharger bypass solenoid valve control circuit. The parameter displays Malfunction if the supercharger bypass solenoid valve control circuit is open.
Supercharger Inlet Pressure	Engine Idling	kPa	This parameter displays the supercharger inlet vacuum pressure calculated as the difference between ambient air pressure (barometric pressure) and supercharger inlet absolute pressure (SCIAP).
Supercharger Inlet Pressure Sensor	Engine Idling	kPa	This parameter displays the unfiltered supercharger inlet absolute pressure (SCIAP).
Supercharger Inlet Pressure Sensor	Engine Idling	Volts	This parameter displays the supercharger inlet absolute pressure (SCIAP) analog input as a percentage of its reference voltage.
SVS Indicator Command	Ignition ON	Off	This parameter displays that the Service Vehicle Soon lamp is being commanded on due to the failure of a non emission related diagnostic test.
System Off	Ignition ON	No	This parameter displays that the vehicle is waiting for a

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			key crank to happen (key crank not done yet).
TAC Forced Engine Shutdown	Ignition ON	No	This parameter indicates the status of the TAC motor by the control module. The scan tool will display Yes if the engine has been shut down due to a throttle control fault.
TAC Motor	Ignition ON	Enabled	This parameter indicates the status of the throttle actuator control (TAC) motor driver in the control module. The scan tool will display Enabled if TAC motor operation is allowed. The scan tool will display Disabled if the control module detects a condition that affects TAC motor operation.
TAC Motor Command	Ignition ON	%	This parameter displays the commanded duty cycle for the throttle actuator output.
TCC/Cruise Control Brake Pedal Switch	Ignition ON	Applied / Released	This parameter indicates the state of the TCC/Cruise Control Brake Pedal Switch.
Throttle Body Idle Air Flow Compensation	Engine Idling	%	This parameter displays the percent compensation of the Learned Airflow Variation Calibration. This value indicates the current amount of airflow compensation in response to engine intake airflow restrictions. It can also be used as feedback for the Learned Airflow Adapts Reset Trigger Device Control.
Throttle Position	Ignition ON	0-100 %	This parameter displays the desired throttle position angle commanded by the control module.
Throttle Position Performance Test	Engine Idling	OK	Throttle Position Residual Out of Tolerance indicates that the filtered throttle position residual (the product

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			of the MAF residual and the MAP Test 1 residual) exceeds a failure threshold.
Throttle Position Sensor 1	Ignition ON	3.7-4.3 Volts	This parameter displays the actual voltage on the TP sensor 1 signal circuit as measured by the control module.
Throttle Position Sensor 1 Learned Minimum	Ignition ON	0.51 Volts	This parameter displays the learned minimum value of throttle position (TP) sensor 1 as recorded by the control module during the last learn procedure.
Throttle Position Sensor 1 or 2 Position	Ignition ON	%	This parameter displays the actual voltage on the TP sensor 2 signal circuit as measured by the control module.
Throttle Position Sensor 2	Ignition ON	0.5-0.8 Volts	This parameter displays the voltage signal sent to the control module from TP sensor 2 of the throttle assembly. The TP sensor 2 is a range of values indicating a low voltage when the throttle is closed to a high voltage when the throttle plate is fully open.
Throttle Position Sensor 2 Learned Minimum	Ignition ON	0.51 Volts	This parameter displays the learned minimum value of TP sensor 2 as recorded by the control module during the last learn procedure.
Throttle Position Sensors 1 and 2	Ignition ON	Agree	This parameter displays Disagree when the control module detects that TP sensor 1 voltage signal is not within the correct relationship to TP sensor 2. The scan tool displays Agree under the normal operating conditions.
Tire Size	Ignition ON	Rev/km	This parameter displays the vehicle tire circumference in centimeters.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Torque Delivered Signal	Vehicle Moving	/Lb/Ft	This parameter displays the engine torque based upon the airflow through the engine and the torque losses due to spark retard and fuel shutoff. Since this is a steady state engine torque, it does not include the inertial component of engine torque.
Torque Management Ignition Timing Retard	Engine Idling	Degrees	This parameter displays the total spark retard (in terms of a crankshaft angle).
Torque Request Inhibit - Fuel	Engine Idling	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit - Ignition Timing	Engine Idling	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit - Ignition Timing Advance	Engine Idling	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit - Minimum Idle	Engine Idling	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit - Minimum Torque	Engine Idling	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit - TAC	Engine Idling	No	This parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit - TAC Limit	Engine Idling	No	This parameter displays the existing condition in the ECM causing the transmission torque request

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			to be limited.
Total Engine Overspeed Time	Engine Idling	ms	This parameter displays the Total Engine Overspeed Time.
Total Knock Retard	Engine Idling	0°	This parameter displays how much ignition spark timing is being retarded due to all control systems monitored by the control module.
Total Misfire	Engine Idling	0	This parameter displays the total number of cylinder firing events that the control module detected as misfires for the last 200 crankshaft revolution sample period.
Traction Control Status	Ignition ON	Inactive	This parameter displays Active if the electronic brake and traction control module (EBTCM) is commanding traction control.
Transmission Fluid Temperature Sensor	Ignition ON	°C (°F)	This parameter displays the undefaulted, unfiltered transmission oil / fluid temperature measured by a sensor.
Turbocharger 1 Turbine Inlet Valve Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the turbocharger 1 turbine inlet valve control circuit. The parameter displays Malfunction if the turbocharger 1 turbine inlet valve control circuit is shorted to voltage.
Turbocharger 1 Turbine Inlet Valve Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the turbocharger 1 turbine inlet valve control circuit. The parameter displays Malfunction if the turbocharger 1 turbine inlet valve control circuit is open.
Turbocharger 1 Turbine Inlet Valve Duty Cycle	Ignition ON	%	This parameter displays the commanded duty cycle for the turbocharger 1 turbine inlet valve in a percentage.
			This parameter displays the commanded duty cycle for

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Turbocharger Bypass Solenoid Valve Command	Ignition ON	%	the turbocharger bypass solenoid valve in a percentage.
Turbocharger Bypass Solenoid Valve Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the turbocharger bypass solenoid valve control circuit. The parameter displays Malfunction if the turbocharger bypass solenoid valve control circuit is shorted to voltage.
Turbocharger Bypass Solenoid Valve Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the turbocharger bypass solenoid valve control circuit. The parameter displays Malfunction if the turbocharger bypass solenoid valve control circuit is shorted to ground.
Turbocharger Bypass Solenoid Valve Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the turbocharger bypass solenoid valve control circuit. The parameter displays Malfunction if the turbocharger bypass solenoid valve control circuit is open.
Turbocharger Wastegate Solenoid Valve Command	Ignition ON	%	This parameter displays the commanded duty cycle for the turbocharger wastegate solenoid valve in a percentage.
Turbocharger Wastegate Solenoid Valve Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the turbocharger wastegate solenoid valve control circuit. The parameter displays Malfunction if the turbocharger wastegate solenoid valve control circuit is shorted to voltage.
Turbocharger Wastegate			This parameter displays the state of the turbocharger wastegate solenoid valve

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Solenoid Valve Control Circuit Low Voltage Test Status	Ignition ON	OK	control circuit. The parameter displays Malfunction if the turbocharger wastegate solenoid valve control circuit is shorted to ground.
Turbocharger Wastegate Solenoid Valve Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the turbocharger wastegate solenoid valve control circuit. The parameter displays Malfunction if the turbocharger wastegate solenoid valve control circuit is open.
Upshift Indicator Command	Vehicle Moving	Off	This parameter displays On when commanded by the engine control module.
Variable Valve Lift Low Lift Disable History 1-8	Engine Idling	Varies	This parameter displays the reason for the last 8 variable valve lift disable history reasons.
			This parameter lists the reason the variable valve lift low lift may be inhibited. These include; 4WD Low State Invalid, A/C Compressor Clutch On, Acceleration Request, Brake Booster Pressure Sensor DTC, Brake Booster Weak Vacuum, Calculated Torque, Camshaft Position Sensor DTC, Control Function Active, Crankshaft Position Sensor DTC, ECT, ECT Sensor DTC, Engine Controls Ignition Relay DTC, Engine Not Synchronized, Engine Off, Engine Oil Pressure, Engine Oil Pressure Control Solenoid Valve Stuck Off, Engine Oil Pressure Control Test Active, Engine Oil Pressure Sensor DTC, Engine Oil Temperature,

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Variable Valve Lift Low Lift Inhibit - Reason	Engine Idling	Varies	Engine Overtemperature Protection, Engine Power Not Requested, Engine Speed, Engine Torque Capacity, Fuel Alcohol Content Learn In Progress, Fuel Alcohol Content Too High, Fuel System Disabled, Green Engine Mode, HO2S 2 Test, Hot Coolant Mode, Hybrid/EV Powertrain Control Module Request, IAT Sensor DTC, Ignition Voltage, MAP Sensor DTC, Maximum Throttle Exceeded, Minimum Time After TAC DTC, Misfire DTC, Oil Aeration. On-Board Diagnostic System, Rocker Arm Solenoid Valve DTC, RPM Limit, TAC System DTC, Transmission Gear, Transmission Range, Transmission Shifting, Vehicle Speed Too Low, VSS DTC.
Variable Valve Lift System Command	-	Low Lift	This parameter displays the current state of the variable valve lift system command.
Vehicle Speed Sensor	Vehicle Moving	Km/h mph	This parameter displays the speed of the vehicle as calculated by the transmission control module (TCM) from information received from the vehicle speed sensor (VSS).
Vehicle Speed When Engine Overspeed Detected	Engine Idling	Km/h mph	This parameter displays the Vehicle Speed When Engine Overspeed Detected.
VIN Programming Counter	Ignition ON	Counts	This parameter displays the number of times the VIN has been programmed. This counter can only be incremented.
			This parameter indicates the number of warm up cycles

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Warm Ups Since DTC Cleared	Engine Idling	Counts	that have occurred Since DTCs were cleared. The scan tool will display a higher counts as more warm up cycles have occurred since the DTCs were cleared.
Warm Ups without Emission Malfunctions	Engine Idling	Counts	This parameter displays the number of OBD defined warm up cycles since the last emissions related (fault type A or B) fail report or MIL request. Emissions related DTCs are cleared from memory when this counter reaches 40.
Warm Ups without Non Emission Malfunctions	Engine Idling	Counts	This parameter displays the number of OBD defined warm up cycles since the last non emissions related (fault type C) fail report. Non emissions related DTCs are cleared from memory when this counter reaches 40.
Weight Percent Water in Air	Engine Idling	%	This parameter displays the calculated value of weight per cent water (specific humidity) in the intake air.
Wide Open Throttle	Engine Idling	No	This parameter displays the throttle status commanded by the control module. The scan tool will display Yes if the vehicle throttle is commanded to 100 percent.
Wide Open Throttle	Ignition ON	No	This parameter displays the desired throttle position exceeds a WOT threshold (selected specifically for service).

Engine Control Module (ECM) Scan Tool Output Controls

Output Control	Description
This is a comprehensive list. Not all output controls listed are available for all applications.	
A/C Compressor Clutch Relay	This device control is used to override the state of the air conditioning compressor output.
Autostart/Autostop	This device control is used to override the internal combustion engine (ICE) running state.

Brake Pedal Position Learn	This device control is used to reset the brake pedal fully released learned position to its initialized value after a brake system repair.
Compression Test	This device control is used to set up the internal combustion engine for a compression test. The fuel pump, fuel injectors, and spark are all disabled. The throttle is opened to a Wide Open Throttle (WOT) position. For conventional engine vehicles, the extended crank feature is not active, and for strong hybrid vehicles, the Hybrid Powertrain Control Module is configured to crank at the speed specified in the device control command. Engine cranking is completely controlled by the technician either through the ignition key or through a remote starter switch as applicable. The device control limits and rejects will apply normally upon entry to the device control. Once the device control is active, the limits will be monitored (to prevent unwanted starter operation, for example), but in the case of a limit exceeded or a tester disconnect, device control of the fuel and spark will not be released until the Power Mode switches to Accessory or OFF. This will prevent unexpected fuel and spark operation in the case of a device control abort.
Cooling Fan Relay 1	This function activates the cooling fan relay 1. The normal commanded state of the fan relay is NONE. The relay command status can also be monitored on the scan tool data parameter Cooling Fan Relay 1 Command. The control module allows cooling fan relay control when the following conditions are met: • The Ignition is ON or the engine is running. • A/C compressor operation is not requested. • The engine coolant temperature is less than 106°C (224°F).
Cooling Fan Relay 1, 2 and 3	This function activates the cooling fan relay 1, 2 and 3. The normal commanded state of the fan relays is NONE. The relay command status can also be monitored on the scan tool data parameters Cooling Fan Relay 1 Command and Cooling Fan Relays 2 and 3 Command. The control module allows cooling fan relay control when the following conditions are met: • The Ignition is ON or the engine is running. • A/C compressor operation is not requested. • The engine coolant temperature is less than 106°C (224°F).
Cooling Fan 2 and 3	This function activates the cooling fan relay 2 and relay 3. The normal commanded state of the fan relays is NONE. The relay command status can also be monitored on the scan tool data parameter 2 and 3 Command. The control module allows cooling fan relay control when the following conditions are met: • The Ignition is ON or the engine is running. • A/C compressor operation is not requested. • The engine coolant temperature is less than 106°C (224°F).

2014 GMC Acadia Denali

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Crankshaft Position Variation Learn	This device control is used to activate the crankshaft position variation learn algorithm which calculates the reference pulse correction factors for the misfire diagnostic.
Cylinder Power Balance	NOTE: The Misfire Current and Misfire History parameters may not increment when using this function. This function disables the selected fuel injector. The normal commanded state is None. The scan tool initiates the test when the following conditions are met: • The engine is operating and the engine idle is stable. • The vehicle speed is 0 km/h (0 mph). • There are no DTCs set for the vehicle speed sensor. If the fuel injector was disabled for 30 seconds, fuel injector control is not allowed again on the same fuel injector for 60 seconds.
Depressurize Fuel System	When the low pressure fuel pump is used in conjunction with a separate high pressure fuel pump for Direct Injection (DI) engines, this device control can be used to reduce the high fuel pressure to a low working level. The high fuel pressure control shall monitor the low pressure "Fuel Pump Device Control with Engine Running" such that when the low pressure pump is commanded OFF the high pressure pump will be controlled to a low pressure value. This combination shall be held until either the FPMR device control is released or the engine stalls.
Engine Controls Ignition Relay	This device control is used to override the state of the Powertrain Relay.
Engine Coolant Thermostat Heater	This device control is used to override the state of the Engine Coolant Thermostat Heater.
Engine Oil Life Reset	This DID contains the engine oil remaining life determined from an algorithm based upon the effective engine revolutions and the distance driven since the last oil change. This DID may be used to reset the engine oil remaining life to 100 % after an oil change or to any other value when replacing a control module.
Engine Oil Pressure Control Solenoid Valve	This device control is used to override the state of the variable displacement oil pump. When the variable displacement oil pump is turned on, the oil pump will be commanded to a low pressure state.
Engine Speed	This function controls the idle speed override in 25 RPM, 100 RPM, and 500 RPM increments, from the base idle speed to 1, 400 RPM. The scan tool initiates the test when the following conditions are met: • The transmission is in park or neutral. • The engine speed is less than 1, 000 RPM. The engine speed will remain in the commanded state until cancelled by

	the scan tool.
EVAP Purge/Seal	NOTE: The EVAP Purge and Vent Solenoid Command parameters may not change states when using this output control. This function activates both the EVAP purge solenoid valve and EVAP vent solenoid to seal the EVAP system. When activated, the purge valve is commanded to 0 percent and the vent valve is commanded ON, Not-venting. The normal commanded state for both solenoids is None. Both of the solenoids remain in the commanded state until cancelled by the scan tool or the FTP sensor exceeds -24 mm Hg (-12 inch H20).
EVAP Purge Solenoid Valve	NOTE: The EVAP Purge Solenoid Command parameter may not change states when using this output control. This function controls the evaporative emission (EVAP) purge solenoid valve. The normal commanded state is NONE. The system will increase or decrease the amount of purge by changing the duty cycle of the purge valve in 10 percent increments within a range of 0-100 percent. The system remains in the commanded state until cancelled by the scan tool or the fuel tank pressure (FTP) sensor exceeds -24 mm Hg (-12 inch H20).
EVAP Test	This device control is used to activate the evaporative emissions service bay test.
EVAP Vent Solenoid Valve	NOTE: The EVAP Vent Solenoid Command parameter may not change states when using this output control. This function controls the EVAP vent solenoid. The normal commanded state is NONE. When commanded ON, the vent valve switches to Not-venting. The system remains in the commanded state unless one of the following conditions occur: - Cancelled by the scan tool - The EVAP canister purge solenoid is more than 0 percent, and the FTP sensor exceeds -24 mm Hg (-12 inch H20).
Exhaust Camshaft Position Actuator or Exhaust Camshaft Position Actuator Bank 1	This device control is used to override the state of the exhaust cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (retard for exhaust camshaft) from the park position (a camshaft position of zero represents the park position).
Exhaust Camshaft Position Actuator or Exhaust Camshaft Position	This device control is used to override the state of the exhaust cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (retard for exhaust camshaft) from the park position (a camshaft position of zero represents the park position).

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Actuator Bank 2	
Exhaust Camshaft Position Actuator Solenoid Valve or Exhaust Camshaft Position Actuator Solenoid Valve Bank 1	This device control is used to override the state of the exhaust cam phase solenoid output.
Exhaust Camshaft Position Actuator Solenoid Valve or Exhaust Camshaft Position Actuator Solenoid Valve Bank 2	This device control is used to override the state of the exhaust cam phase solenoid output.
Fuel Composition Reset	NOTE: Do not use this output control unless the actual alcohol content of the fuel in the tank is 10 percent or less. This will reset the learned alcohol composition to 0 percent in the engine control module (ECM).
Fuel Control Loop Status	This function controls the heated oxygen sensor (HO2S) loop status. The commanded states include NONE, OPEN, and CLOSED. The normal commanded state is NONE. The loop status changes as commanded, OPEN or CLOSED. The system remains in the commanded state until cancelled by the scan tool.
Fuel Injector Balance Test (If Available)	This function enables the fuel injector in order to verify the correct fuel injector flow. The ECM will pulse the selected fuel injector when the following conditions are met: • All instruction on the scan tool is complete. • A fuel injector is selected. • The ignition is ON with the engine OFF. The selected fuel injector can only be flowed/pulsed once per ignition cycle.
Fuel Pressure	This function allows control of the fuel rail pressure (FRP) regulator which is integral to the high pressure fuel pump. The system will Increase or Decrease the fuel rail pressure in increments, as commanded within an approximate range of 1862-17, 237 kPa (270-2500 psi). The scan tool initiates the test when the following conditions are met: • The engine is operating • The ignition voltage is 10-18 V • The vehicle speed is 0 mph • DTC P0700 is not set

	The system remains in the commanded state for about 30 seconds or until cancelled by the scan tool or the ECM detects a vehicle speed.
Fuel Pressure Regulator	NOTE: As this is an electrical circuit test, a regulator solenoid commanded to ON does not necessarily equate to the regulator state at maximum fuel pressure. This device control is intended for use on a Direct Injection (DI) high pressure fuel supply system to activate the fuel pressure regulator at ignition ON, engine OFF. Both the low side and high side of the regulator are controlled together. Commanding the regulator to ON will modulate the high side driver to a calibratable Maximum Duty Cycle.
Fuel Pump Enable	This function controls the fuel pump. The normal commanded state is NONE. The scan tool initiates the test when the following conditions are met: • There are no vehicle speed sensor DTCs set. • The vehicle speed is 0 km/h (0 mph). When commanded ON/OFF, the engine control module (ECM) turns the fuel pump ON/OFF. If the engine is running and the fuel pump is commanded OFF, the engine will stall. The system remains in the commanded state for about 2 seconds or until cancelled by the scan tool or the ECM detects a vehicle speed.
Fuel Pump Speed	This device control is used to override the normal control of the fuel pump output. The device control is a service diagnostic aid that is used to determine if the fuel pump system is functioning properly. Different limit checks are used when the engine is and is not running for the operation of the fuel pump.
Fuel Rail Pressure	This device control is intended for use on a Direct Injection (DI) high pressure fuel supply system to override the commanded fuel high pressure output from the powertrain controller.
Fuel Trim Enable	This function disables the control modules ability to learn new fuel trim parameters. The commanded states are NONE, ENABLED, DISABLED. The normal commanded state is NONE. The system remains in the commanded state until cancelled by the scan tool.
Fuel Trim Reset	This function is used to reset the learned fuel trim values to their initial values.
Generator L-Terminal	Commands the generator L terminal ON and OFF.
Heater Coolant Pump	This device control is used to override the state of the heater core pump relay output.
	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

HO2S Heater Sensor 1 or HO2S Heater Bank 1 Sensor 1	used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Sensor 2 or HO2S Heater Bank 1 Sensor 2	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Bank 2 Sensor 1	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Bank 2 Sensor 2	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Learn	This device control is used to trigger the reset of the learned resistances for the oxygen sensor heaters following a replacement in service. The learned resistances are reset to a calibration used to prevent overheating of the sensors until more accurate resistances may be learned following an extended engine OFF time (typically 12 or more hours).
Idle Ignition Timing	Disables and enables idle spark advance with the engine running.
Idle Learn	This function allows the throttle position and the idle speed to be relearned by the ECM, once the following conditions have been met. • The ignition is ON with the engine OFF. • The ECT is between 5-85°C (41-185°F). • No throttle actuator control (TAC) system DTCs are set.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Ignition Timing Retard	This device control is used to retard the spark angle from the software calculated spark angle. For example, if the software calculated spark angle was 15 degrees advanced and this device control requested a 3 degree retard, the commanded spark angle that would be delivered would be 12 degrees advanced.
Intake Air Heater	This device control is used to override the state of the intake air heater.
Intake Camshaft Position Actuator or Intake Camshaft Position Actuator Bank 1	This device control is used to override the state of the intake cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (advance for intake camshafts) from the park position (a camshaft position of zero represents the park position).
Intake Camshaft Position Actuator or Intake Camshaft Position Actuator Bank 2	This device control is used to override the state of the intake cam phase output. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (advance for intake camshafts) from the park position (a camshaft position of zero represents the park position).
Intake Camshaft Position Actuator Solenoid Valve or Intake Camshaft Position Actuator Solenoid Valve Bank 1	This device control is used to override the state of the intake cam phase solenoid output.
Intake Camshaft Position Actuator Solenoid Valve or Intake Camshaft Position Actuator Solenoid Valve Bank 2	This device control is used to override the state of the intake cam phase solenoid output.
Intake Rocker Arm Solenoid Valve 1-2 or 1 and 2	When the engine is running, this device control may be used to command intake valve opening to low or high (high being default when the solenoid is not energized) valve lift mode either in cylinder pairs or as a system.
Malfunction Indicator Lamp (MIL)	This function controls the malfunction indicator lamp (MIL). The normal commanded state is NONE. When commanded ON/OFF, the ECM turns the MIL ON/OFF. The system remains in the commanded state until cancelled by the scan tool.
Mass Air Flow Sensor Supply Voltage	This device control is used to override the state of the mass air flow sensor supply voltage output.
Misfire Graphic	This function clears the misfire graphics from the scan tool.
Oil Life Reset	This output control is used to reset the engine oil life monitor from 0 to 100 %.
Remote Vehicle Start Disable History Reset	This function clears the remote vehicle start (RVS) disable history. When RESET is selected the reason the control module did not allow RVS in the last 8 attempts is cleared.
Secondary Air Injection Pump	This device control is used to turn the AIR Pump ON or OFF.

Relay	
Secondary Air Injection Solenoid Valve	This device control is used to turn the AIR Valve ON or OFF.
Secondary Air Injection Test	This device control is used to trigger the secondary air injection (SAI) diagnostic service bay test, which causes the on board SAI diagnostic to execute until it is completed or aborted.
Starter Relay (If Available)	Commands the starter relay ON and OFF.
Throttle Position	This device control is used to override the commanded throttle position.
Throttle Sweep	This function moves the Throttle plate slowly from a closed position to wide open position, aiding diagnosis of TAC motor.
Turbocharger Bypass Solenoid Valve	This device control is used to control the duty cycle for the turbocharger A compressor bypass.
Turbocharger Wastegate Solenoid Valve	This device control is used to control the duty cycle for the turbocharger A wastegate.

FRONT AND REAR PARKING ASSIST CONTROL MODULE SCAN TOOL INFORMATION

Front and Rear Parking Assist Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine OFF/Parking Assist ON			
System Voltage	-	11-14 V	The scan tool displays V. This is the current battery voltage.
Parking Assist System Status	-	Enable	The scan tool displays Disabled, Enabled, Inhibited or Failed. This is the state of the parking assist system.
Parking Assist Chime	-	Varies	The scan tool displays On or Off. On is displayed if there is an object within the measuring range of the object sensors and the audible alert has been requested.
Calculated Transmission Range	Transmission in reverse	Reverse	The scan tool displays Park, Reverse, Neutral, Drive or Unknown depending on the state of the commanded gear.
Parking Assist Switch	-	Inactive	The scan tool displays the current state of the parking assist switch.
Advanced Parking Assist Switch	-	Inactive	The scan tool displays the current state of the automatic parking assist switch.
Parking Assist Sensors	-	On	The scan tool displays On or Off.
Parking Assist Attached Object Status	-	None	The scan tool displays if the front and rear parking assist control module has detected an object is attached to the rear of the vehicle.
Parking Space Length	-	0	The scan tool displays the length of the detected parking space in cm.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Parking Assist Disable History 1	-	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Parking Assist Disable History 2	-	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Parking Assist Disable History 3	-	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Parking Assist Disable History 4	-	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Parking Assist Disable History 5	-	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.
Parking Assist Disable History 6	-	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			This is the state of the park assist disable history.
Parking Assist Disable History 7	-	Varies	The scan tool displays None, Manual Disable, Park Brake Applied, Trailer or Other Attached Object, Excessive Speed in Reverse, No or Invalid Sensor Signals, Sensor Disturbance, Sensors Dirty, Sound Signal Return Time Not Plausible. This is the state of the park assist disable history.

Parking Assist Control Module Scan Tool Output Controls

Output Control	Description
Parking Assist Switch LED	The front and rear parking assist control module illuminates the LED of the parking assist switch when commanded from the scan tool.

FRONT VIEW CAMERA MODULE SCAN TOOL INFORMATION

Front View Camera Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Ignition ON/Engine OFF/Lane Departure Warning ON			
System Voltage	-	Varies	The scan tool displays the system voltage depending of the current battery voltage.
System Power Mode	-	Varies	The scan tool displays Off, Accessory, Running, Cranking or Undefined. This is the state of the ignition switch.
Power Mode Controlled by Backup Device	-	Varies	The scan tool displays Off, Accessory, Running or Cranking depending of the current power mode.
Frontview Camera System Status	-	Varies	The scan tool displays Normal, Malfunction or Undefined depending on the state of the lane departure warning system.
Frontview Camera Calibration Status	-	Varies	The scan tool displays Not Calibrated, Calibrated, Dynamically Calibrated or Undefined. This is the current state of the calibration.
Frontview Camera Learn Mode Status	-	Varies %	The scan tool displays varies percentage between 0-100% depending on the state of the frontview camera learn mode.
Lane Departure Warning Status	-	Varies	The scan tool displays Off, Disabled, Not Ready to Assist, Ready to Assist, Malfunction, Unknown or Undefined depending on the state of the lane departure warning system.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Lane Departure Warning Switch Status	-	On	The scan tool displays On or Off depending on the state of the lane departure warning switch.
Lane Departure Warning Indicator Status	-	Varies	The scan tool displays Off, On, Malfunction, Unknown or Undefined depending on the state of the lane departure warning system.
Forward Collision Alert Function Status	-	Varies	The scan tool displays Off, On, Malfunction, Unknown or Undefined depending on the state of the lane departure warning system.
Intelligent Light Ranging Status	-	Varies	The scan tool displays Off, Disabled, Malfunction, Enabled, Unknown or Undefined depending on the state of the intelligent light ranging system.
Automatic High Beam Activation Status	-	Varies	The scan tool displays Disabled, Enabled or Undefined depending on the state of the automatic high beam assist system.
Following Distance Indicator Status	-	Varies	The scan tool displays Off, Disabled, Not Ready to Assist, Ready to Assist or Undefined depending on the state of the following distance indicator status.
Frontview Camera Disable History 1-4	-	Varies	The scan tool displays Empty, Lane Departure Warning Indicator Malfunction, Lane Departure Warning Switch Malfunction, Sensors Obstructed, Accelerator Pedal Position Out of Range, Driven Wheel Speed Signal Invalid, Non-Driven Wheel Speed Signal Invalid, Brake Pedal Moderate Travel Signal Invalid, Brake Pedal Initial Travel Position Achieved, Lost Communication with Steering Wheel Angle Sensor Module, Invalid Data Received From Steering Wheel Angle Sensor Module, Forward Collision Alert Switch Malfunction, Clutch Pedal Position (CPP) Sensor Performance, Transmission Gear Engaged, Acceleration Sensor Longitudinal Signal, Invalid Data Received From Yaw Rate Sensor Module, Power Mode Controlled by Backup Device, System Power Mode, Overvoltage, Undervoltage or Undefined depending on the history data of the frontview camera disable history.

Front View Camera Module Scan Tool Output Controls

Output Control	Description
Clear Disable History Data	The frontview camera control module clears all disable history buffers when commanded from the scan tool.
Forward Collision Alert Switch	The frontview camera control module switches the forward collision alert system to Near, Medium or Far when commanded from the scan tool.
High Beams	The frontview camera control module switches the high beams On or Off when commanded from the scan tool.
Lane Departure Warning Indicator	The frontview camera control module switches the lane departure warning indicator On or Off when commanded from the scan tool.
Lane Departure Warning Switch	The frontview camera control module switches the lane departure warning system On or Off when commanded from the scan tool.
Vehicle Direction Camera Learn	The frontview camera control module initializes the service point calibration of the frontview camera and switches into the learn mode when commanded from the scan tool.

HEATING, VENTILATION AND AIR CONDITIONING CONTROL MODULE SCAN TOOL INFORMATION**HVAC Control Module Scan Tool Data Parameters**

Parameter	Expected Value	Definition
Operating Conditions: Engine ON		
A/C Evap. Temperature Sensor	Varies	This displays °C (°F). This is the current temperature at the A/C evaporator temperature sensor.
A/C Head Pressure	Normal	The scan tool displays Normal or Out of Range. This is the state of the A/C head pressure.
A/C LED	Off	The scan tool displays On or Off. This is the state of the air conditioning indicator.
AC Permission	Granted	The scan tool displays Granted or Withheld.
A/C Request	No	The scan tool displays Yes or No. Yes is displayed if the air conditioning is requested.
A/C Switch	Inactive	The scan tool displays Active or Inactive. This is the state of the A/C switch.
Ambient Air Temperature	Normal	The scan tool displays Normal or Out of Range. This is the state of the ambient air temperature.
Air Inlet Dr Actual	Varies	This displays Counts. This is the current numeric value of the air inlet door as monitored by the HVAC module.
Air Inlet Dr Commanded	Varies	This displays Counts. This is the numeric value of the air inlet door as commanded by the HVAC module.
Air Inlet Motor Drive	Varies	The scan tool displays Stop, Ambient Air, Increase, Recirculate or Decrease. This is the state of the air inlet motor.
Auto Switch	Inactive	The scan tool displays Active or Inactive. This is the state of the auto switch.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Aux. Blower Motor PWM	Varies	This displays percent. This is the percentage of power supplied to the auxiliary blower motor.
Aux. Mode Door Actual	Varies	This displays Counts. This is the current numeric value of the auxiliary mode door as monitored by the HVAC module.
Aux. Mode Door Commanded	Varies	This displays Counts. This is the numeric value of the auxiliary mode door as commanded by the HVAC module.
Aux. Temp. Dr. Motor Command	Varies	This displays Counts. This is the numeric value of the auxiliary temperature door motor as commanded by the HVAC module.
Aux. Temp. Dr. Motor Position	Varies	This displays Counts. This is the numeric value of the auxiliary temperature door position as monitored by the HVAC module.
Battery Voltage	Normal	The scan tool displays Normal or Out of Range. This is the state of the system voltage.
Battery Voltage Signal	Varies	This displays Volts. This is the battery voltage signal supplied to the HVAC module.
Blower Motor Speed Command	Varies	This displays percent. This is the percentage of power supplied to the blower motor.
Blower Speed	Off	The scan tool displays Normal or Off. This is the state of the blower motor speed.
Coolant Temperature	Varies	This displays °C (°F). This is the current temperature of the engine coolant.
Engine Coolant Temp	Normal	The scan tool displays Normal or Out of Range. This is the state of the engine coolant temperature.
Engine Running	Yes	The scan tool displays Yes or No. Yes is displayed if the engine is running.
Fan Down Button	Inactive	The scan tool displays Active or Inactive. This is the state of the fan down switch.
Fan Up Button	Inactive	The scan tool displays Active or Inactive. This is the state of the fan up switch.
Front Defrost LED	Off	The scan tool displays On or Off. This is the state of the front defrost indicator.
Front Defrost Switch	Inactive	The scan tool displays Active or Inactive. This is the state of the front defrost switch.
Ign. Cycles Since last DTC	Varies	This displays a numeric value. This is the number of ignition cycles since the last HVAC module DTC.
Inside Air Temp. Sensor	Varies	This displays °C (°F). This is the current temperature of the vehicle interior.
Left Sunload Sensor	Varies	This displays Counts. This is an approximate value at the left sunload sensor.
Left Temp Dr Actual	Varies	This displays Counts. This is the current numeric value of the driver temperature door as monitored by the HVAC

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

		module.
Left Temp. Dr. Commanded	Varies	This displays Counts. This is the numeric value of the driver temperature door as commanded by the HVAC module.
Left Temp. Setting	Varies	This displays °C (°F). This is the temperature setting of the driver side area.
LH AC Duct Actual	Varies	This displays °C (°F). This is the current temperature of the driver side duct area.
LH AC Duct Desired	Varies	This displays °C (°F). This is the desired temperature of the driver side duct area.
LH Heater Actual	Varies	This displays °C (°F). This is the current temperature of the driver side duct area.
LH Heater Duct Desired	Varies	This displays °C (°F). This is the desired temperature of the driver side duct area.
Low Pressure Switch	Closed	The scan tool displays Open or Closed. This is the state of the low pressure switch.
Mode Door Actual	Varies	This displays Counts. This is the current numeric value of the mode door as monitored by the HVAC module.
Mode Down Switch	Inactive	The scan tool displays Active or Inactive. This is the state of the mode down switch.
Mode Dr. Motor Command	Varies	This displays Counts. This is the numeric value of the mode door as commanded by the HVAC module.
Mode Select Position	Off	The scan tool displays Off, Auto, Defrost, Heater, Htr./Def., Bi-Level or Panel. This is the current position of the HVAC mode select.
Mode Switch Pos.	Varies	The scan tool displays Invalid, Auto, Panel, Bi-Level, Heater, Htr./Def. or Defrost. This is the state of the HVAC mode switch.
Mode Up Switch	Inactive	The scan tool displays Active or Inactive. This is the state of the mode up switch.
On/Off Switch	Inactive	The scan tool displays Active or Inactive. This is the state of the on/off switch.
Outside Air Temp. Filtered	Varies	This displays °C (°F). This is the filtered value of the outside air temperature.
Outside Air Temp. Raw	Varies	This displays °C (°F). This is the raw value of the outside air temperature.
Rear Defrost LED	Off	The scan tool displays On or Off. This is the state of the rear defrost indicator.
Rear Defrost State	Off	The scan tool displays On or Off. This is the state of the rear defrost system.
Rear Defrost Switch	Inactive	The scan tool displays Active or Inactive. This is the state of the rear defrost switch.
Recirculation LED	Off	The scan tool displays On or Off. This is the state of the recirculation indicator.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Recirculation Switch	Inactive	The scan tool displays On or Off. This is the state of the recirculation switch.
RH AC Duct Actual	Varies	This displays °C (°F). This is the current temperature of the passenger side duct area.
RH AC Duct Desired	Varies	This displays °C (°F). This is the desired temperature of the passenger side duct area.
RH Heater Actual	Varies	This displays °C (°F). This is the current temperature of the passenger side duct area.
RH Heater Duct Desired	Varies	This displays °C (°F). This is the desired temperature of the passenger side duct area.
Right Sunload Sensor	Varies	This displays Counts. This is an approximate value at the right sunload sensor.
Right Temp Dr Actual	Varies	This displays Counts. This is the current numeric value of the passenger temperature door as monitored by the HVAC module.
Right Temp. Dr. Commanded	Varies	This displays Counts. This is the numeric value of the passenger mode door as commanded by the HVAC module.
Right Temp. Setting	Varies	This displays °C (°F). This is the temperature setting of the passenger side area.

HVAC Control Module Scan Tool Output Controls

Scan Tool Output Control	Description
A/C Request	This command allows you to turn the A/C Relay On and Off. When the A/C Relay is commanded On, the A/C compressor clutch should be engaged.
Afterblow Option	The rear HVAC/RSA module will illuminate all indicators and display segments on the module display.
Air Inlet Door	When Outside is selected, the HVAC control module commands the recirculation actuator toward the outside air position. When Recirc is selected, the HVAC control module commands the recirculation actuator toward the recirculation position. This is shown through a command of On and Off.
All Status LEDs	All HVAC status LEDs illuminate when ON is selected and turn off when OFF is selected.
Auxiliary Air Temp. Door	When Cold is selected, the HVAC control module commands the rear air temperature actuator to the full cold position. When Hot is selected, the HVAC control module commands the rear air temperature actuator to the full hot position.
Auxiliary Blower Motor	When ON is selected, the HVAC control module commands the blower motor relay ON and an increase or decrease of air. When OFF is selected, the HVAC control module commands the blower motor relay OFF.
Auxiliary Mode Door	When ON is selected, the HVAC control module commands the blower motor relay ON and an increase or decrease of air. When OFF is selected, the HVAC control module commands the blower motor relay OFF.

Blower Motor	When ON is selected, the HVAC control module commands the blower motor relay ON and a command to increase or decrease air. When OFF is selected, the HVAC control module commands the blower motor relay OFF.
Instant OAT Update	This command updates the outside air temperature.
Left Temp. Door Position	This commands the right temperature door position from Cold to Hot.
Mode Door Position	When A/C is selected, the HVAC control module commands the mode actuator to the panel position. When Defrost is selected, the HVAC control module commands the actuator to the defrost position.
Rear Defog Request	The BCM must receive a Rear Defog request from the HVAC control module in order to enable the output control. The BCM de-energizes the Rear Defog relay located in the I/P BEC when OFF is selected. The relay remains de-energized until ON is selected.
Recalibrate All Motors	When ON is selected, all air temp and mode actuators have the capability to perform a recalibration.
Right Temp. Door Position	This commands the right temperature door position from Cold to Hot.

INFLATABLE RESTRAINT PASSENGER PRESENCE SYSTEM SCAN TOOL INFORMATION

Passenger Presence System Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Battery Voltage	Varies	This displays volts. This is the voltage input supplied to the passenger presence system.
Passenger Classification	Empty	The scan tool displays Unknown, Calibrating, Empty Seat, Small 1, Small 2, Large or Preload. This is the state of the passenger seat, as monitored by the passenger presence system.
Passenger Status	No Info	The scan tool displays No Info., Valid, Invalid Class., Invalid Pos., Invalid Data or Inval. Class& Pos.
Power Mode	Run	The scan tool displays Off, Accessory, Run or Crank Request. This is the state of the ignition switch.
PPS Enable Status	Enabled	The scan tool displays Disabled or Enabled. This is the status of the PPS Enable.
PPS Fault Status	No Fault	The scan tool displays No Fault, Plant Mode, Fault, Mismatch or Barrier. This is the status of the PPS Fault monitor.
PPS Primary Key	Varies	The scan tool displays the PPS primary key.
Primary Key Status	Valid	The scan tool displays Unknown, Valid or Invalid. This is the state of the primary key.
Received Primary Key	Varies	The scan tool displays the primary key received.
SDM Enable Status	Enabled	The scan tool displays Enabled or Disabled. This is the state of the SDM.

INFLATABLE RESTRAINT SENSING AND DIAGNOSTIC MODULE SCAN TOOL INFORMATION**Supplemental Inflatable Restraint Scan Tool Data Parameters**

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Active Switch	Enabled	The scan tool displays Enabled or Disabled. This is the state of the SIR active switch.
Active Switch	Learned	The scan tool displays Learned or Unlearned. Learned is displayed if the SIR learned the active switch.
Battery Voltage Signal	Varies	This displays volts. This is the voltage input supplied to the SDM.
Driver Seat Belt Switch	Unbuckled	The scan tool displays Buckled or Unbuckled. This is the state of the driver seat belt.
Driver Seat Belt Type	Varies	The scan tool displays Switch or Sensor. This is the type of driver seat belt.
Driver Seat Position Sensor	Enabled	The scan tool displays Enabled or Disabled. This is the state of the driver seat position sensor.
Driver Seat Position Sensor	Learned	The scan tool displays Learned or Unlearned. Learned is displayed if the SIR learned the driver seat position sensor.
Driver Seat Position Sensor	Varies	The scan tool displays Rearward or Forward. This is the positional state of the drive seat.
Loop 1-12	Enabled	The scan tool displays Enabled or Disabled. This is the state of the SIR loop.
Loop 1-12	Learned	The scan tool displays Learned or Unlearned. Learned is displayed if the SIR has that number loop learned.
Loop 1-12 Type	Varies	The scan tool displays Not Used, LF Stage 1, RF Stage 1, LF Stage 2, RF Stage 2, LF Preten., RF Preten., LF Side Bag, RF Side Bag, Lt. Roof Stage1, Rt. Roof Stage1, Lt. Roof Stage2, Rt. Roof Stage2, Lt. Roof Stage3 or Rt. Roof Stage3. This is the type of loop.
Passenger Seat Belt Switch	Unbuckled	The scan tool displays Buckled or Unbuckled. This is the state of the passenger seat belt.
PPS Options	Varies	The scan tool displays Not Present, Manual, Auto or Auto. + Man. This is the current enabled option of the passenger presence system.
PPS Status	Enabled	The scan tool displays Enabled or Disabled. This is the state of the passenger presence system.
PPS Status	Learned	The scan tool displays Learned or Unlearned. Learned is displayed if the SIR has learned the passenger presence system.
Primary Key Status	Valid	The scan tool displays Unknown, Valid or Invalid. This is the state of the primary key of the SDM.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Psg. Seat Belt Sensor	Enabled	The scan tool displays Enabled or Disabled. This is the state of the passenger seat belt sensor.
Psg. Seat Belt Sensor	Learned	The scan tool displays Learned or Unlearned. Learned is displayed if the SIR learned the passenger seat belt sensor.
Psg. Seat Belt Sensor	Varies	This displays mA. This is the amount of current supplied to the passenger seat belt sensor.
Psg. Seat Belt Type	Varies	The scan tool displays Switch or Sensor. This is the type of passenger seat belt.
Psg. Seat Position Sensor	Enabled	The scan tool displays Enabled or Disabled. This is the state of the passenger seat position sensor.
Psg. Seat Position Sensor	Learned	The scan tool displays Learned or Unlearned. Learned is displayed if the SIR learned the passenger seat position sensor.
Psg. Seat Position Sensor	Inactive	The scan tool displays Rearward or Forward. This is the positional state of the passenger seat.
Received Primary Key	Valid	The scan tool displays Unknown, Valid or Invalid. Valid is shown if the primary key received from the BCM matches the SDM primary key.
Received VIN Digits 2-5	Varies	The scan tool displays the Secondary Key which includes digits 2 through 5 of the VIN that the BCM sends to the SDM.
Received VIN Digits 6-7	Varies	The scan tool displays the Secondary Key which includes digits 6 and 7 of the VIN that the BCM sends to the SDM.
Rollover Sensor	Enabled	The scan tool displays Enabled or Disabled. This is the state of the rollover sensor.
Rollover Sensor	Learned	The scan tool displays Learned or Unlearned. Learned is displayed if the SIR learned the rollover sensor.
Run/Crank	Active	This displays volts. This is the current power mode of the SDM.
Sensor 1-6	Enabled	The scan tool displays Enabled or Disabled. This is the state of the sensor.
Sensor 1-6	Learned	The scan tool displays Learned or Unlearned. Learned is displayed if the SIR has that sensor learned.
Sensor 1-6 Type	Learned	The scan tool displays Not Used, EFS LF, EFS Center, EFS RF, SIS Left Row 1, SIS Right Row 1, SIS Left Row 2 or SIS Right Row 2. This is the type of SIR sensor.
SDM Primary Key	Varies	The scan tool displays the primary key that the SDM has stored to memory.
SIR Warning Indicator	Inactive	The scan tool displays On or Off. This is the status of the SIR warning indicator.

Supplemental Inflatable Restraint Scan Tool Output Controls

Scan Tool Output Control	Description
Setup New SDM	This output control is used to set up a new SDM.
Setup SDM Primary Key in BCM	This output control is used to set up a new SDM primary key in the BCM.

AIRBAG VEHICLE ROLLOVER SENSOR SCAN TOOL INFORMATION**Rollover Sensor Scan Tool Data Parameters**

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Average Speed	Varies	This displays km/h (mph). This is the average speed of the vehicle.
Battery Voltage Signal	Varies	This displays volts. This is the voltage input supplied to the rollover sensor.
Current Power Mode	Run	The scan tool displays Off, Accessory, Run or Crank Request. This is the state of the ignition switch.
Engine Virtual Device	Present	The scan tool displays Present or Not Present.
Primary Key Status	Valid	The scan tool displays Unknown, Valid or Invalid. This is the state of the primary key.
Received Primary Key	Varies	The scan tool displays the primary key received.
ROS Occupant Containment Req.	Enable	The scan tool displays Reserved, Disable or Enable.
ROS Primary Key	Varies	The scan tool displays the ROS primary key.
SDM Occupant Containment Status	Enabled	The scan tool displays Disabled or Enabled.
Vehicle Speed Status	Valid	The scan tool displays Valid or Invalid. This is the state of the vehicle speed.

Rollover Sensor Scan Tool Output Controls

Scan Tool Output Control	Description
Setup New ROS	This procedure should be used after a new rollover sensor has been installed.

INSTRUMENT CLUSTER SCAN TOOL INFORMATION**Instrument Panel Cluster Scan Tool Data Parameters**

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON			
Battery Voltage	-	Varies	This displays volts. This is the voltage input supplied to the instrument panel

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			cluster.
Brake Fluid	-	OK	The scan tool displays OK or Low. This is the state of the brake fluid level.
Brake Fluid Switch	-	Varies	This displays volts. This is the voltage status of the brake fluid switch.
DIC Fuel Info.	-	Inactive	The scan tool displays Active or Inactive. This is the state of the DIC Fuel Info. switch.
DIC Information Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the DIC Information switch.
DIC Personalization	-	Off	The scan tool displays Active or Inactive. This is the state of the DIC Personalization switch.
End Model Part Number	-	Numeric	This displays the part number of the instrument panel cluster.
Ignition 1 Input	-	Active	The scan tool displays Active or Inactive. This is the state of the Ignition 1 input to the instrument panel cluster.
Ignition Cycle Counter	-	Varies	The scan tool displays counts. This is the number of times the ignition has been cycled from the OFF to ON position.
Odo/Trip Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the odometer/trip switch.
Passenger Seatbelt Indicator Commanded	-	Off	This displays On or Off. This is the commanded state of the passenger seatbelt indicator.
Passenger Seatbelt Indicator Status	-	Off	This displays On or Off. This is the state of the passenger seatbelt indicator.
Set/Reset Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the set/reset switch.
Washer Fluid Level	-	OK	The scan tool displays OK or Low. This is the state of the washer fluid level.

Instrument Panel Cluster Scan Tool Output Controls

Scan Tool Output Control	Description
Dimming	The IPC dims from 0-100% when you select INCREASE or DECREASE by 20% increments.
Display Test	The instrument panel cluster (IPC) illuminates all of the display segments when you select On.
Display(s) Test	The instrument panel cluster (IPC) sweeps all gauges when you select On.

LIFTGATE CLOSE ACTUATOR MOTOR CONTROL MODULE SCAN TOOL INFORMATION**Liftgate Module Scan Tool Data Parameters**

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition ON			
Air Bags Deployed	-	No	This displays Yes or No. Yes is displayed if the any of the air bags deployed during the last open or close history data.
Battery Voltage Signal 2	-	Varies	This displays volts. This is the voltage input supplied to the liftgate module.
Calibration	-	Varies	This displays Yes or No. Yes is displayed if a calibration cycle occurred during the last open or close history data.
Crank Signal Present	-	Varies	The scan tool displays Yes or No. This was the last state of the crank signal in the open or close history data.
Door Lock Status	-	Varies	The scan tool displays Locked or Unlocked. This was the last state of the door locks in the open or close history data.
Fault Active	-	Varies	This displays Yes or No. Yes is displayed if a fault was active in the open or close history data.
Hall Sensor Feed Status	-	No Output	The scan tool displays No Output or Short to Ground. This is the state of the hall sensor feed circuit.
Hall Sensor Feed Status (history data)	-	Varies	The scan tool displays No Output or Short to Ground. This was the last state of the hall sensor feed circuit in the open or close history data.
Interrupted	-	Varies	This displays Yes or No. Yes is displayed if the liftgate system was interrupted during an open or close cycle.
LGM Clutch Actuator Cmd.	-	Inactive	This displays Active or Inactive. This is the commanded state of the liftgate module clutch actuator.
LGM Disable Switch	-	Inactive	This displays Active or Inactive. This is the state of the liftgate disable switch.
LGM Disable Switch (history data)	-	Inactive	This displays Active or Inactive. This was the last state of the liftgate disable switch during the last open or close history data.
LGM Front Control Switch	-	Inactive	This displays Active or Inactive. This is the state of the front control switch of the liftgate module.
			This displays Active or Inactive. This is

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2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

LGM Full Open Switch	-	Inactive	the state of the full open liftgate switch.
LGM Latch Fault	-	Varies	This displays Yes or No. Yes is displayed if there was a latch fault in the open or close history data.
LGM Latch Motor Cinch Cmd.	-	Inactive	This displays Active or Inactive. This is the commanded state of the latch motor cinch.
LGM Latch Pawl Sw.	-	Inactive	This displays Active or Inactive. This is the state of the latch pawl switch.
LGM Latch Ratchet Sw.	-	Inactive	This displays Active or Inactive. This is the state of the latch ratchet switch.
LGM Latch Motor Release Cmd.	-	Inactive	This displays Active or Inactive. This is the commanded state of the latch motor release.
LGM Latch Sector Sw.	-	Inactive	This displays Active or Inactive. This is the state of the latch sector switch.
LGM Motor Closed Cmd.	-	Inactive	This displays Active or Inactive. This is the commanded state of the liftgate motor closing.
LGM Motor Open Cmd.	-	Inactive	This displays Active or Inactive. This is the commanded state of the liftgate motor opening.
LGM Open/Close Position Learned	-	Yes	The scan tool displays Yes or No. This is the state of the liftgate module open/close position programming.
LGM Position Out of Range	-	Varies	The scan tool displays Yes or No. Yes is displayed if the liftgate position was out of range in the last open or close history data.
Liftgate Ajar Switch	-	Inactive	The scan tool displays Active or Inactive. This is the state of the liftgate ajar switch.
Liftgate Handle Sw. Status	-	Inactive	The scan tool displays Active or Inactive. This is the state of the liftgate handle switch.
Liftgate Handle Sw. Status (history data)	-	Inactive	The scan tool displays Active or Inactive. This was the last state of the liftgate handle switch in the open or close history data.
Liftglass Ajar Switch	-	Varies	The scan tool displays Ajar or Closed. This was the last state of the liftglass ajar switch in the open or close history data.
Module Over Current Detected	-	Varies	The scan tool displays Yes or No. Yes is displayed if the liftgate module detected an over current condition in the last open or close history data.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

No Signal	-	Varies	The scan tool displays Yes or No. Yes is displayed if the liftgate module detected a no signal condition in the last open or close history data.
Object Detection Sensor Status	-	Active	The scan tool displays Active or Inactive. This is the state of the object detection sensor.
Object Detection Sensor Status (history data)	-	Varies	The scan tool displays Active or Inactive. This was the last state of the object detection sensor in the open or close history data.
Object Sensor Supply Voltage	-	3-3.5 V	This displays volts. This is the voltage input supplied to the object sensor.
Obstacle Detected in Liftgate	-	Varies	This displays Yes or No. Yes is displayed if an obstacle was detected in the last open or close history data.
System Operation Status	-	Varies	This displays OK or Not OK. OK is displayed if the system operation was normal during the last open or close history data.
System Voltage	-	Varies	This displays OK or Out of Range. This was the state of the system voltage during the last open or close history data.
Temperature Out of Range	-	Varies	This displays Yes or No. Yes is displayed if the system temperature was out of range during the last open or close history data.
Theft Armed	-	Varies	This displays Yes or No. This was the status of the theft system during the last open or close history data.
Vehicle In Park	-	Varies	This displays Yes or No. Yes is displayed if the vehicle was in Park during the last open or close history data.
Vehicle Speed Too Fast	-	Varies	This displays Yes or No. Yes is displayed if the vehicle speed exceeded the maximum predetermined speed during the last open or close history data.

Liftgate Module Scan Tool Output Controls

Scan Tool Output Control	Description
LGM Open/Close Test	This will command the liftgate to open and close and to relearn the liftgate travel limits.

RADIO SCAN TOOL INFORMATION

Radio Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Antenna Module	Enabled	This scan tool displays Enabled or Disabled. This is the state of the antenna module.
Auxiliary Audio Input	Present	The scan tool displays Present or Not Present. This is the state of the auxiliary audio input.
DRR	Present	The scan tool displays Present or Not Present. This is the state of the DRR.
Ign. Cycles Since last DTC	Varies	The scan tool displays the number of ignition cycles since the last DTC.
Phone Signal	Present	The scan tool displays Present or Not Present. This is the state of the phone signal.
Power Mode	Run	The scan tool displays Off, Accessory, Run or Crank Request. This is the state of the ignition switch.
Power Mode Config.	Normal Mode	The scan tool displays Bench Mode or Normal Mode. This is the configuration of the power mode.
Signal Strength	Varies	This displays dBuV. This is the signal strength of the radio.
Theft Armed	Learned VIN	The scan tool displays Learned VIN or No VIN. This is the state of the VIN programming in the radio.
Theft Lock Status	Inactive	The scan tool displays Active or Inactive. This is the state of the theft lock system.
Video Display	Varies	The scan tool displays Present or Not Present. This is the state of the video display.

Radio Scan Tool Output Controls

Scan Tool Output Control	Description
Left Front Speaker	Commanding the speaker ON will turn OFF all speakers except this speaker. Commanding the speaker OFF will turn OFF all speakers.
Left Rear Speaker	Commanding the speaker ON will turn OFF all speakers except this speaker. Commanding the speaker OFF will turn OFF all speakers.
Right Front Speaker	Commanding the speaker ON will turn OFF all speakers except this speaker. Commanding the speaker OFF will turn OFF all speakers.
Right Rear Speaker	Commanding the speaker ON will turn OFF all speakers except this speaker. Commanding the speaker OFF will turn OFF all speakers.

REAR DIFFERENTIAL CLUTCH CONTROL MODULE SCAN TOOL INFORMATION

The rear differential clutch control module (CCM) Scan Tool Data List contains all the clutch control module system related parameters that are available on the scan tool. The parameters in the list are arranged in alphabetical order. The column, "Data List," indicates the location of the parameter within the scan tool menu selections.

Use the CCM Scan Tool Data Lists as directed by a diagnostic table or in order to supplement the diagnostic procedures. Begin all the diagnostic procedures with the CCM Diagnostic Starting Point. Use the CCM Scan Tool Data Lists only after the following is determined:

- There is no published DTC procedure or published symptom procedure for the customer concern.
- The DTC or symptom diagnostic procedure indicated by the diagnostic system check does not resolve the customer concern.

The DTC or symptom diagnostic procedure indicated by the diagnostic system check does not resolve the customer concern.

The ID Information menu is located on the CCM main screen.

Rear Differential Clutch Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Definition
Operating Conditions: Ignition is ON, engine OFF and vehicle is stationary			
Accelerator Pedal Position sensor	-	D	The scan tool displays a percent of pedal opening position. The scan tool displays a range from 0 to 100%.
Battery Volts	-	Varies	The scan tool displays volts. The scan tool displays a range from 0 to 25.5 volts.
Est. RDS Coupling Spd. Variation	-	Varies	The scan tool displays 1/min. The scan tool indicates a range from -640 to 635 RPMs.
Est. RDS Coupling Spd. Variation	-	Varies	The scan tool displays deg C. The scan tool indicates a range from -40 to 215 deg C.
LF Wheel Speed Sensor	-	0	The scan tool displays 0-160 km/h (0-99.5 mph). The scan tool displays 0 km/h (0 mph) when the vehicle is not moving or is moving at speeds less than or equal to 0 km/h (0 mph).
LR Wheel Speed Sensor	-	0	The scan tool displays 0-160 km/h (0-99.5 mph). The scan tool displays 0 km/h (0 mph) when the vehicle is not moving or is moving at speeds less than or equal to 0 km/h (0 mph).
Rear Drive Solenoid Cmd.	-	Varies	The scan tool displays deg C. The scan tool indicates a range from -40 to 215 deg C.
Rear Drive System Temperature sensor	-	Varies	The scan tool displays deg C. The scan tool indicates a range from -40 to 215 deg C.
Rear Drive Torque Command	-	0-100%	The scan tool displays N-m. The scan tool displays a range from 0 to 2550 N-m.
RF Wheel Speed Sensor	-	0	The scan tool displays 0-160 km/h (0-99.5 mph). The scan tool displays 0 km/h (0 mph) when the vehicle is not moving or is

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

			moving at speeds less than or equal to 0 km/h (0 mph).
RR Wheel Speed Sensor	-	0	The scan tool displays 0-160 km/h (0-99.5 mph). The scan tool displays 0 km/h (0 mph) when the vehicle is not moving or is moving at speeds less than or equal to 0 km/h (0 mph).
Vehicle Speed	-	Varies	The scan tool displays 0-1024 km/h (0-636 mph). The scan tool displays 0 km/h (0 mph) when the vehicle is not moving.

Rear Differential Clutch Control Module Scan Tool Output Controls

Scan Tool Output Control	Description
CCM RDS Matching ID	This 2 digit rank can be found on the connector that plugs into the rear differential clutch control module, from the clutch.

REMOTE CONTROL DOOR LOCK RECEIVER SCAN TOOL INFORMATION

Remote Control Door Lock Receiver Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Key Fob 1 Battery Status	OK	The scan tool displays OK or Low. This is the state of the Fob 1 battery.
Key Fob 1 Function	None	The scan tool displays None, Lock, Driver Door Unlock, All Doors Unlock, Unlatch Rear Closure, Actuate Left Sliding Door, Actuate Right Sliding Door, Panic Alarm, Fuel Door Unlatch, Power Window Control, Folding Top Control, Remote Vehicle Start, Stop Engine, Program Key Fobs, Locate Vehicle Alarm, Rear Body Closure Close, Rear Body Closure Open, Rear Body Closure Stop, Dead Lock All Doors, Rear Body Closure Start or Stop Left Sliding Door Motion. This is the state of the Fob 1 command as monitored by the RCDLR.
Key Fob 1 Status	Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the Fob 1 is programmed into the RCDLR.
Key Fob 2 Battery Status	OK	The scan tool displays OK or Low. This is the state of the Fob 2 battery.
		The scan tool displays None, Lock, Driver Door Unlock, All Doors Unlock, Unlatch Rear Closure, Actuate Left Sliding Door, Actuate Right Sliding Door, Panic Alarm, Fuel Door Unlatch, Power Window Control, Folding Top Control, Remote Vehicle Start,

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Key Fob 2 Function	None	Stop Engine, Program Key Fobs, Locate Vehicle Alarm, Rear Body Closure Close, Rear Body Closure Open, Rear Body Closure Stop, Dead Lock All Doors, Rear Body Closure Start or Stop Left Sliding Door Motion. This is the state of the Fob 2 command as monitored by the RCDLR.
Key Fob 2 Status	Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the Fob 2 is programmed into the RCDLR.
Key Fob 3 Battery Status	OK	The scan tool displays OK or Low. This is the state of the Fob 3 battery.
Key Fob 3 Function	None	The scan tool displays None, Lock, Driver Door Unlock, All Doors Unlock, Unlatch Rear Closure, Actuate Left Sliding Door, Actuate Right Sliding Door, Panic Alarm, Fuel Door Unlatch, Power Window Control, Folding Top Control, Remote Vehicle Start, Stop Engine, Program Key Fobs, Locate Vehicle Alarm, Rear Body Closure Close, Rear Body Closure Open, Rear Body Closure Stop, Dead Lock All Doors, Rear Body Closure Start or Stop Left Sliding Door Motion. This is the state of the Fob 3 command as monitored by the RCDLR.
Key Fob 3 Status	Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the Fob 3 is programmed into the RCDLR.
Key Fob 4 Battery Status	OK	The scan tool displays OK or Low. This is the state of the Fob 4 battery.
Key Fob 4 Function	None	The scan tool displays None, Lock, Driver Door Unlock, All Doors Unlock, Unlatch Rear Closure, Actuate Left Sliding Door, Actuate Right Sliding Door, Panic Alarm, Fuel Door Unlatch, Power Window Control, Folding Top Control, Remote Vehicle Start, Stop Engine, Program Key Fobs, Locate Vehicle Alarm, Rear Body Closure Close, Rear Body Closure Open, Rear Body Closure Stop, Dead Lock All Doors, Rear Body Closure Start or Stop Left Sliding Door Motion. This is the state of the Fob 4 command as monitored by the RCDLR.
Key Fob 4 Status	Learned	The scan tool displays Learned or Not Learned. Learned is displayed if the Fob 4 is programmed into the RCDLR.
Front Tire Pressure on Placard	Varies	This displays Counts.
Last Key Fob Detected	Varies	The scan tool displays None, Fob 1, Fob 2, Fob 3, Fob 4 or Fob 5. This was the last Fob used, as monitored by the RCDLR.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Left Front Tire Pressure Sensor Mode	Varies	The scan tool displays Learn Mode - Remotely Triggered, Re-measure, Drive, Powering Down, Wake-up or Learn Mode - Pressure Triggered. This is the state of the left front pressure sensor.
Left Front Tire Pressure Status	Normal	The scan tool displays Unknown, Normal, Low, Flat Tire or High. This is the state of the left front tire pressure.
Left Front Tire Pressure Sensor Status	Normal	The scan tool displays Normal or Failed. This is the state of the left front tire pressure sensor.
Left Front Tire Pressure	Varies	This displays kPa (psi). This is the amount of pressure in the left front tire.
Left Front Tire Pressure Sensor Battery Status	OK	The scan tool displays OK or Low. This is the state of the battery in the left front tire pressure sensor.
Left Rear Tire Pressure Sensor Mode	Varies	The scan tool displays Learn Mode - Remotely Triggered, Re-measure, Drive, Powering Down, Wake-up or Learn Mode - Pressure Triggered. This is the state of the left rear pressure sensor.
Left Rear Tire Pressure Status	Normal	The scan tool displays Unknown, Normal, Low, Flat Tire or High. This is the state of the left rear tire pressure.
Left Rear Tire Pressure Sensor Status	Normal	The scan tool displays Normal or Failed. This is the state of the left rear tire pressure sensor.
Left Rear Tire Pressure	Varies	This displays kPa (psi). This is the amount of pressure in the left rear tire.
Left Rear Tire Pressure Sensor Battery Status	OK	The scan tool displays OK or Low. This is the state of the battery in the left rear tire pressure sensor.
Rear Tire Pressure on Placard	Varies	This displays Counts.
Right Front Tire Pressure Sensor Mode	Varies	The scan tool displays Learn Mode - Remotely Triggered, Re-measure, Drive, Powering Down, Wake-up or Learn Mode - Pressure Triggered. This is the state of the right front pressure sensor.
Right Front Tire Pressure Status	Normal	The scan tool displays Unknown, Normal, Low, Flat Tire or High. This is the state of the right front tire pressure.
Right Front Tire Pressure Sensor Status	Normal	The scan tool displays Normal or Failed. This is the state of the right front tire pressure sensor.
Right Front Tire Pressure	Varies	This displays kPa (psi). This is the amount of pressure in the right front tire.
Right Front Tire Pressure Sensor Battery Status	OK	The scan tool displays OK or Low. This is the state of the battery in the right front tire pressure sensor.
Right Rear Tire Pressure Sensor Mode	Varies	The scan tool displays Learn Mode - Remotely Triggered, Re-measure, Drive, Powering Down, Wake-up or Learn Mode - Pressure Triggered. This is the state of the right rear pressure sensor.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Right Rear Tire Pressure Status	Normal	The scan tool displays Unknown, Normal, Low, Flat Tire or High. This is the state of the right rear tire pressure.
Right Rear Tire Pressure Sensor Status	Normal	The scan tool displays Normal or Failed. This is the state of the right rear tire pressure sensor.
Right Rear Tire Pressure	Varies	This displays kPa (psi). This is the amount of pressure in the right rear tire.
Right Rear Tire Pressure Sensor Battery Status	OK	The scan tool displays OK or Low. This is the state of the battery in the right rear tire pressure sensor.
Selected Front Tire Type	Varies	The scan tool displays No Tire Type, Standard Load, Extra Load, Load Range C, Load Range D or Load Range E. This is the type of front tires used on the vehicle.
Selected Rear Tire Type	Varies	The scan tool displays No Tire Type, Standard Load, Extra Load, Load Range C, Load Range D or Load Range E. This is the type of rear tires used on the vehicle.
Tire Pressure Monitoring Indicator	Off	The scan tool displays On or Off. This is the state of the TPM indicator.
Tire Pressure Monitoring System Status	Enabled	The scan tool displays Enabled or Disabled.
Vehicle Speed	Varies	The scan tool displays km/h or mph.

Remote Control Door Lock Receiver Scan Tool Output Controls

Scan Tool Output Control and Configuration/Reset Functions	Description
Key Fob Button Test	The RCDLR monitors the incoming RF communications to ensure all keyless entry transmitter functions are operating properly. The scan tool displays which buttons have been pressed on transmitters 1 and 2 since the last time the memory was cleared.
Copy and Restore TPM Information	This procedure copies existing setup information from the module.
Erase All Key Fobs	This procedure erases all transmitters and begins the programming process.
Next Available Slot	This procedure programs transmitters to the next slot available slot in the module.
Key Fob 1	Adds a transmitter to slot 1.
Key Fob 2	Adds a transmitter to slot 2.
Key Fob 3	Adds a transmitter to slot 3.
Key Fob 4	Adds a transmitter to slot 4.
Tire/Type/Pressure Selection	The scan tool displays the selections for load range and air pressure.
Tire Pressure Sensors	

Learn | Places the module in Indicator Sensor Learn mode.

THEFT DETERRENT MODULE SCAN TOOL INFORMATION

Theft Deterrent Module Scan Tool Data Parameters

Parameter	Expected Value	Definition
Operating Conditions: Ignition ON		
Auto Learn Counter	Varies	This displays Counts. This is the number of times the auto learn procedure was carried out by the TDM.
Auto. Learn Timer	Varies	This displays minutes. This is the amount of minutes the TDM took to auto learn.
Battery Reconnect	No	The scan tool displays Yes or No. Yes is displayed if the battery was recently reconnected.
Fleet Vehicle	No	The scan tool displays Yes or No. Yes is displayed if the vehicle is a fleet vehicle.
Fuel Continue	No	The scan tool displays Yes or No.
Fuel Disable Ignition Off	Yes	The scan tool displays Yes or No. Yes is displayed if the fuel is disabled during ignition OFF.
Fuel Disable Timeout	No	The scan tool displays Yes or No. Yes is displayed if the fuel disable timed out.
Ignition Voltage Signal	Present	The scan tool displays Present or Not Present. Present is displayed if there is an ignition voltage signal to the TDM.
Immobilization	Inactive	The scan tool displays Active or Inactive. This is the state of the immobilizer system.
Immobilizer Programmed	Yes	The scan tool displays Yes or No. This is the state of the immobilizer system programming.
Incorrect VIN 1	No Error	The scan tool displays Unknown, No Error, ECM/PCM, TCM, EBCM, DSCC, TBCM, ESCM, ASCM, BCM, BCM Aux., SDM, PPS, ROS, PIDM, IPC, DIC, HUD, Chime, Radio, Amp., CDX, RSA, DRR, Onstar, HVAC, RCC, DDM, PDM, LRDM, RRDM, LGM, PSDM, MSM, HVSM, RCDLR, SOD, TDM or SCLM. The module displayed has an incorrect VIN programmed into that module.
Incorrect VIN 2	No Error	The scan tool displays Unknown, No Error, ECM/PCM, TCM, EBCM, DSCC, TBCM, ESCM, ASCM, BCM, BCM Aux., SDM, PPS, ROS, PIDM, IPC, DIC, HUD, Chime, Radio, Amp., CDX, RSA, DRR, Onstar, HVAC, RCC, DDM, PDM, LRDM, RRDM, LGM, PSDM, MSM, HVSM, RCDLR, SOD, TDM or SCLM. The module displayed has an incorrect VIN programmed into that module.
		The scan tool displays Unknown, No Error,

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Incorrect VIN 3	No Error	ECM/PCM, TCM, EBCM, DSCC, TBCM, ESCM, ASCM, BCM, BCM Aux., SDM, PPS, ROS, PIDM, IPC, DIC, HUD, Chime, Radio, Amp., CDX, RSA, DRR, Onstar, HVAC, RCC, DDM, PDM, LRDM, RRDM, LGM, PSDM, MSM, HVSM, RCDLR, SOD, TDM or SCLM. The module displayed has an incorrect VIN programmed into that module.
Incorrect VIN 4	No Error	The scan tool displays Unknown, No Error, ECM/PCM, TCM, EBCM, DSCC, TBCM, ESCM, ASCM, BCM, BCM Aux., SDM, PPS, ROS, PIDM, IPC, DIC, HUD, Chime, Radio, Amp., CDX, RSA, DRR, Onstar, HVAC, RCC, DDM, PDM, LRDM, RRDM, LGM, PSDM, MSM, HVSM, RCDLR, SOD, TDM or SCLM. The module displayed has an incorrect VIN programmed into that module.
Incorrect VIN 5	No Error	The scan tool displays Unknown, No Error, ECM/PCM, TCM, EBCM, DSCC, TBCM, ESCM, ASCM, BCM, BCM Aux., SDM, PPS, ROS, PIDM, IPC, DIC, HUD, Chime, Radio, Amp., CDX, RSA, DRR, Onstar, HVAC, RCC, DDM, PDM, LRDM, RRDM, LGM, PSDM, MSM, HVSM, RCDLR, SOD, TDM or SCLM. The module displayed has an incorrect VIN programmed into that module.
Incorrect VIN 6	No Error	The scan tool displays Unknown, No Error, ECM/PCM, TCM, EBCM, DSCC, TBCM, ESCM, ASCM, BCM, BCM Aux., SDM, PPS, ROS, PIDM, IPC, DIC, HUD, Chime, Radio, Amp., CDX, RSA, DRR, Onstar, HVAC, RCC, DDM, PDM, LRDM, RRDM, LGM, PSDM, MSM, HVSM, RCDLR, SOD, TDM or SCLM. The module displayed has an incorrect VIN programmed into that module.
Incorrect VIN 7	No Error	The scan tool displays Unknown, No Error, ECM/PCM, TCM, EBCM, DSCC, TBCM, ESCM, ASCM, BCM, BCM Aux., SDM, PPS, ROS, PIDM, IPC, DIC, HUD, Chime, Radio, Amp., CDX, RSA, DRR, Onstar, HVAC, RCC, DDM, PDM, LRDM, RRDM, LGM, PSDM, MSM, HVSM, RCDLR, SOD, TDM or SCLM. The module displayed has an incorrect VIN programmed into that module.
Incorrect VIN 8	No Error	The scan tool displays Unknown, No Error, ECM/PCM, TCM, EBCM, DSCC, TBCM, ESCM, ASCM, BCM, BCM Aux., SDM, PPS, ROS, PIDM, IPC, DIC, HUD, Chime, Radio, Amp., CDX, RSA, DRR, Onstar, HVAC, RCC, DDM, PDM, LRDM, RRDM, LGM, PSDM, MSM, HVSM, RCDLR, SOD, TDM or SCLM. The module displayed has an

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

		incorrect VIN programmed into that module.
Incorrect VIN 9	No Error	The scan tool displays Unknown, No Error, ECM/PCM, TCM, EBCM, DSCC, TBCM, ESCM, ASCM, BCM, BCM Aux., SDM, PPS, ROS, PIDM, IPC, DIC, HUD, Chime, Radio, Amp., CDX, RSA, DRR, Onstar, HVAC, RCC, DDM, PDM, LRDM, RRDM, LGM, PSDM, MSM, HVSM, RCDLR, SOD, TDM or SCLM. The module displayed has an incorrect VIN programmed into that module.
Incorrect VIN 10	No Error	The scan tool displays Unknown, No Error, ECM/PCM, TCM, EBCM, DSCC, TBCM, ESCM, ASCM, BCM, BCM Aux., SDM, PPS, ROS, PIDM, IPC, DIC, HUD, Chime, Radio, Amp., CDX, RSA, DRR, Onstar, HVAC, RCC, DDM, PDM, LRDM, RRDM, LGM, PSDM, MSM, HVSM, RCDLR, SOD, TDM or SCLM. The module displayed has an incorrect VIN programmed into that module.
Learn Coded Key	No	The scan tool displays Yes or No.
Master Keys Learned	Varies	This displays Counts. This is the number of master keys learned by the TDM.
PCM Authentication Status	Valid	The scan tool displays Unknown, Incorrect, Negative or Valid. This is the state of the PCM authentication.
PCM Auto. Learn Timer	Inactive	The scan tool displays Active or Inactive. This is the current state of the ECM auto learn timer.
PCM Password Learning	Enabled	The scan tool displays Enabled or Disabled. This is the state of the password learning in the ECM.
PCM Release Status	Release	The scan tool displays Unknown, Post Release, Pre-Release or Release. This is the release status of the ECM.
Power Mode	Run	The scan tool displays Off, Accessory, Run or Crank Request. This is the state of the ignition switch.
Powertrain DTC	No	The scan tool displays Yes or No. Yes is displayed if there is a powertrain DTC stored in the ECM or TCM.
Previous TDM State	Varies	The scan tool displays Asleep, Wake-up, Normal, Learn Passkey, Tamper, Monitor Key, Fail Pending, Fail Enabled, Lrn Keys Stdbby, Learn More Keys, Learn Pending, Auto Learn, Auto. Lrn. Done, No Coded Key, Check Second Key, VIN Check, OnStar, Bypass, Override or VIN Timer. This was the last state of the TDM.
Security Code Programmed	No	The scan tool displays Yes or No. Yes is displayed if a security code is programmed.
Start Disabled	No	The scan tool displays Yes or No. Yes is displayed if the starter is disabled.
		The scan tool displays Pass or Fail. Pass is displayed

Substitution Detection Status	Pass	if the TDM does not sense a module with incorrect VIN programming.
Tamper Status	Inactive	The scan tool displays Active or Inactive. This is the state of the tamper system.
TDM State	Varies	The scan tool displays Asleep, Wake-up, Normal, Learn Passkey, Tamper, Monitor Key, Fail Pending, Fail Enabled, Lrn Keys Stdby, Learn More Keys, Learn Pending, Auto Learn, Auto. Lrn. Done, No Coded Key, Check Second Key, VIN Check, OnStar, Bypass, Override or VIN Timer. This was the last state of the TDM.
Telltale Status	Off	The scan tool displays On, Off, Flash or Invalid. This is the state of the security indicator.
Theft Problem	No	The scan tool displays Yes or No. Yes is displayed if there is a theft problem.
Total Keys Learned	Varies	This displays Counts. This is the number of total keys learned by the TDM.
Transponder Key	Present	The scan tool displays Present or Not Present. Present is displayed when a transponder is present. This does not mean that this is a valid or learned transponder, but only that a transponder is present.
Valid Key	Yes	The scan tool displays Yes or No. Yes is displayed if a valid key was used as monitored by the TDM.
Valid VIN	Yes	The scan tool displays Yes or No. Yes is displayed if the VIN is valid.
VIN Learned	Yes	The scan tool displays Yes or No. Yes is displayed if the VIN was learned.
VIN Message Received	Yes	The scan tool displays Yes or No. Yes is displayed if the VIN message is received

TRANSMISSION CONTROL MODULE SCAN TOOL INFORMATION

The Transmission Control Module Scan Tool Data List contains all transmission related parameters that are available on the scan tool. The list is arranged in alphabetical order. A given parameter may appear in any one of the data lists, and in some cases may appear more than once or in more than one data list in order to group certain related parameters together.

The values below represent a typical display recorded from a properly functioning system.

Only the parameters listed below are used/referenced in this manual for diagnosis. If a scan tool displays other parameters, those values are not recommended by General Motors for use in diagnosis.

If all values are within the expected range described below, refer to **Symptoms - Automatic Transmission** for diagnosis.

The scan tool values from a properly functioning transmission may be used for comparison with the transmission you are diagnosing. The values below represent a typical display recorded from a properly functioning system.

Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
Operating Conditions: Engine at idle, upper radiator hose hot, closed throttle, transmission in Park, closed loop operation, accessories OFF, brake pedal not applied.			
1-2 Shift Time	-	Seconds, Varies	This parameter displays the actual time of the last adaptable 1-2 shift. The shift time is based on the gear ratio change after the commanded 1-2 shift.
2-3 Shift Time	-	Seconds, Varies	This parameter displays the actual time of the last adaptable 2-3 shift. The shift time is based on the gear ratio change after the commanded 2-3 shift.
3-4 Shift Time	-	Seconds, Varies	This parameter displays the actual time of the last adaptable 3-4 shift. The shift time is based on the gear ratio change after the commanded 3-4 shift.
4-5 Shift Time	-	Seconds, Varies	This parameter displays the actual time of the last adaptable 4-5 shift. The actual shift time is obtained by measuring the time required for the input shaft to decelerate from the previous ratio to the current ratio.
5-6 Shift Time	-	Seconds, Varies	This parameter displays the actual time of the last 5-6 shift. The shift time is based on the gear ratio change after the commanded 5-6 shift.
Brake Switch	-	Released	This parameter displays the status of the brake switch circuit input. Applied indicates a zero voltage input, brake pedal applied. Released indicates a voltage input, brake pedal released. The scan tool displays Applied or Released.
Calc. Throttle Position	-	%, Varies	This parameter displays a calculated value, which is determined by the accelerator pedal position and the actual throttle position, used to optimize transmission controls. It represents the driver's intended request for torque or acceleration. The range is 0-100%, where 0% represents an idle or coast request and 100% represents a request for wide open throttle (WOT).

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Commanded Gear	-	1	This parameter displays the current commanded state of the shift solenoid valves. The scan tool displays 1, 2, 3, 4 or 5
Driver Shift Control	-	Inactive	This parameter displays Active or Inactive. The scan tool displays Active when the gear selector is in the sport (S) position, which enables TAP shift. The scan tool displays Inactive when the gear selector is not in the S position, TAP shift disabled.
Driver Shift Request	-	None	This parameter displays the current request from the TAP Shift System. This parameter will display up shift, downshift or invalid depending on the amount of voltage measured at the remote shift selector input and also will display none when there is no request.
ECT	-	°C (°F), Varies	This parameter displays the input signal from the engine coolant temperature (ECT) sensor. ECT is high at 151°C (304°F) when the signal voltage is low (0 V). ECT is low at -40°C (-40°F) when the signal voltage is high (5 V).
Engine Speed	-	RPM, Varies	This parameter displays the rotational speed of the engine expressed as revolutions per minute.
Engine Torque	-	Y, Varies	This parameter displays a calculated value based on engine load, throttle position, mass air flow, and other engine inputs. This parameter is accurate to within 15 lb ft of actual measured engine torque.
Gear Ratio	-	Ratio, Varies	This parameter displays the actual transmission gear ratio. The scan tool displays the gear ratio calculated from the automatic transmission input shaft speed sensor (AT ISS) and the automatic transmission output shaft speed sensor (AT OSS) inputs.
High Side Driver 1	-	Enabled	This parameter displays the High Side Driver 1 status on the scan tool. When the High Side Driver 1 is commanded OFF this displays Disabled, when the High Side Driver 1 is commanded ON this displays Enabled.

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

High Side Driver 1 CKT Status	-	OK	This parameter displays the High Side Driver 1 circuit status on the scan tool. If the voltage is low when the solenoid is commanded OFF, the scan tool will display Open/Short to GND. If the voltage is high when the solenoid is commanded ON, the scan tool will display Short to Volts. If no circuit fault is present the scan tool will display OK.
Ignition Voltage	-	Volts, 12-14	This parameter displays the system voltage measured at the ignition feed.
IMS	-	Park	This parameter displays PARK, PARK/REVERSE, REVERSE, REVERSE/NEUTRAL, NEUTRAL, NEUTRAL/DRIVE 4, DRIVE 4, DRIVE 4/DRIVE 3, DRIVE 3, DRIVE 3/DRIVE 2, DRIVE 2, DRIVE 2/DRIVE 1, DRIVE 1 or INVALID. The IMS Range display represents a decoded status of the four inputs from the IMS. The combination of IMS inputs are used to determine what position the manual valve is in at any time.
IMS A/B/C/P	-	Varies	This parameter displays the status of the four A/B/C/P inputs from the automatic transmission internal mode switch. I indicates an ignition voltage signal and LOW indicates a 0 voltage signal. The scan tool will display HI/LOW, HI/LOW, HI/LOW, HI/LOW.
ISS/OSS Supply Voltage	-	OK	This parameter displays OK, Out of Range.
Last Shift Time	-	Seconds, Varies	This parameter displays the actual time of the last up shift. This value is only accurate if the shift was adaptable.
Line PC Sol. Pressure Command	-	kPa (psi), Varies	This parameter displays kPa (psi).
PC Sol. 2 Pressure Command	-	kPa (psi), Varies	This parameter displays kPa (psi).
PC Sol. 3 Pressure Command	-	kPa (psi), Varies	This parameter displays kPa (psi).
PC Sol. 4 Pressure Command	-	kPa (psi), Varies	This parameter displays kPa (psi).
PC Sol. 5 Pressure Command	-	kPa (psi), Varies	This parameter displays kPa (psi).

2014 GMC Acadia Denali

2014 GENERAL INFORMATION Vehicle Diagnostic Information - Specifications - Acadia, Enclave And Traverse

Replicated OSS CKT Status	-	OK	This parameter displays OK, Open/Short to GND, Short to Volts or Indeterminate.
Shift Sol. 1 CKT Status	-	OK	This parameter displays OK, Open/Short to GND, Short to Volts or Indeterminate.
Shift Solenoid 1	-	On	This parameter displays the commanded state of the reverse, 1st shift solenoid valve (S1). The scan tool displays On/Off.
Shift Sol. 2 CKT Status	-	OK	This parameter displays OK, Open/Short to GND, Short to Volts or Indeterminate.
Shift Solenoid 2	-	On	This parameter displays the commanded state of the 2-3, 3-4 shift solenoid valve (S2). The scan tool displays On/Off.
TCC Slip Speed	-	RPM, Varies	This parameter displays the difference between transmission input speed and engine speed. A negative value indicates that the engine speed is less than the input speed, deceleration. A positive value indicates that the engine speed is greater than the input speed, acceleration. A value of zero indicates that the engine speed is equal to the input speed, TCC applied.
TCM Temperature	-	°C (°F) Varies	This parameter displays results in °C (°F)
TFP Switch 1	-	HI/LOW	This parameter displays the state of the first clutch oil pressure switch. The scan tool displays HI/LOW.
TFP Switch 3	-	HI/LOW	This parameter displays state of the 3rd clutch oil pressure switch. The scan tool displays HI/LOW.
TFP Switch 4	-	HI/LOW	This parameter displays state of the 4th clutch oil pressure switch. The scan tool displays HI/LOW.
TFP Switch 5	-	HI/LOW	This parameter displays state of the fifth clutch oil pressure switch. The scan tool displays HI/LOW.
Trans. Fluid Temp.	-	°C (°F) Varies	This parameter displays the input signal of the transmission fluid temperature sensor. Transmission fluid temperature is high 151°C (304°F) when signal voltage is low, 0 V, and transmission fluid temperature is low -40°C (-40°F) when signal voltage is high, 5 V.
Transmission ISS	-	RPM, Varies	This parameter displays the rotational speed of the transmission input shaft.

			The scan tool displays input shaft speed is revolutions per minute (RPM).
Transmission OSS	-	RPM, Varies	This parameter displays the rotational speed of the transmission output shaft expressed as revolutions per minute.

Scan Tool Output Controls

Output Control	Description
TCC Control Solenoid	- The transmission control module (TCM) commands the torque converter clutch pressure control (TCC PC) solenoid pressure in order to apply and release the TCC. - When the ignition is ON, and the engine is OFF, there are no limits to this control. The solenoid remains ON until commanded OFF and vice versa. - When the engine is running, the following control limits apply: - If the transmission range is Park, and the transmission is in hot mode, the TCC PC solenoid may not be commanded OFF. If the solenoid is requested OFF, the message "TCC OFF command disabled in Hot Mode" appears on the scan tool display. - The TCC PC solenoid may not be commanded OFF for more than a calibrated amount of time. If the solenoid is commanded OFF, for a certain amount of time, the message "TCC OFF time has been exceeded" appears on the scan tool display.
Shift Solenoid	- The TCM commands Shift Solenoid 1 and Shift Solenoid 2 ON and OFF. - When the ignition is ON, and the engine is OFF, there are no limits to this control. The solenoid remains ON until commanded OFF, and vice versa. When the output control is exited, the solenoid state is determined by the TCM. - When the engine is running, the following control limits apply: - The transmission range must be in Park or Neutral. If the transmission range is not Park or Neutral, the message "Engine running and transmission range is not Park/Neutral" appears on the scan tool display. - The solenoid remains ON until commanded OFF, and vice versa. When the output control is exited, the solenoid state is determined by the TCM. - Transmission range DTCs must not be active. If a transmission range DTC is active, the message "Engine running with transmission DTC present" appears on the scan tool display.

Line PC Solenoid	• The scan tool is used to request pressure in increments of 200 kPa (30 psi) from 200-2200 kPa (30-320 psi). The TCM will then command the solenoid to achieve a pressure within a range based on the requested pressure. Refer to Solenoid Valve Pressure. • When the ignition is ON, and the engine is ON, the pressure request may be controlled within calibrated limits. There are no limits to the output control when the engine is OFF. • When the engine is running, the following control limits apply: ○ When the transmission range is Park or Neutral, the pressure request may be controlled within calibrated limits. The engine speed must be less than 1,500 RPM. If the engine speed is greater than 1,500 RPM, the message "TR in park/neutral and engine speed over 1,500 RPM" appears on the scan tool display. ○ When the transmission range is not Park or Neutral, the requested pressure can only be controlled equal to or greater than the pressure determined by the TCM. The TCM does not allow a pressure to be selected that may cause damage to the transmission. If the requested pressure is less than allowed by the TCM, the message "Requested pressure for the Line PC Solenoid is too low" appears on the scan tool display. ○ Transmission range DTCs must not be active. If a transmission range DTC is active, the message "Engine running with transmission DTC present" appears on the scan tool display.
Clutch PC Solenoids	• The TCM commands the pressure control solenoids in order to apply and release the clutches. • When the ignition is ON, and the engine is OFF, there are no limits to this control. The solenoid remains ON until commanded OFF, and vice versa. When the output control is exited, the solenoid state is determined by the TCM. • When the engine is running, the following control limits apply: ○ The transmission range must be in Park or Neutral. If the transmission range is not Park or Neutral, the message "Engine running and transmission range is not Park/Neutral" appears on the scan tool display. ○ The solenoid remains ON until commanded OFF, and vice versa. When the output control is exited, the solenoid state is determined by the TCM. ○ Transmission range DTCs must not be active. If a transmission range DTC is active, the message "Engine running with transmission DTC present" appears on the scan tool display.

Shift Transmission	• The TCM commands upshifts and downshifts. The scan tool Commanded Gear parameter should correspond with the shift solenoid combination. Refer to the <u>Shift Solenoid Valve State and Gear Ratio</u> table. • When the ignition is ON, and the engine is OFF, there are no limits to this control. The scan tool shift solenoid states change to match the Commanded Gear selected. • When the engine is running, the following control limits apply: ◦ The TCM does not allow a shift if it causes the engine RPM to exceed a calibrated limit. If a gear is requested and the engine speed is too high, the message "Engine speed too high" appears on the scan tool display. ◦ The TCM does not allow a 3-2 or 2-1 downshift if the vehicle speed exceeds a calibrated limit. If either downshift is requested and the vehicle speed is too high, the message "Eng. is on and veh. speed too hi for 3-2 or 2-1 downshift" appears on the scan tool display. ◦ The TCM does not allow a 4-3 downshift if the vehicle speed exceeds a calibrated limit. If a 4-3 downshift is requested and the vehicle speed is too high, the message "Vehicle speed too high" appears on the scan tool display. ◦ The TCM does not allow an upshift if the vehicle speed exceeds a calibrated limit. If an upshift is requested and the vehicle speed is too high, the message "Vehicle speed too high" appears on the scan tool display. ◦ The TCM does not allow an upshift that is greater than the current selected transmission range (PRNDL). For example, 3rd gear is not allowed if the transmission range is D2. If an upshift is requested that is greater than the current selected transmission range, the message "Eng. running and gear request is greater than the current TR" appears on the scan tool display.
High Side Driver 1	• The TCM commands the driver for the solenoid voltage supply ON and OFF. • When the ignition is ON, and the engine is OFF, there are no limits to this control. • High side drivers may not be commanded ON and OFF with the scan tool if the engine is running.
	• The scan tool is used to start and stop the transmission cleaning procedure algorithm. • The following control limits apply: ◦ The engine must be running. The message "Engine not Running" will appear on the scan tool if this control is

Service Cleaning Procedure	attempted without the engine running. ○ There cannot be active transmission DTCs. The message "Transmission Fault present" will appear on the scan tool if this control is attempted with transmission DTCs active. ○ The transmission range must be Park or Neutral. The message "Transmission not in PARK or NEUTRAL" will appear on the scan tool if this control is attempted with the transmission in any range other than Park or Neutral. ○ The vehicle speed cannot exceed 5 mph. The message "Vehicle Speed too high" will appear on the scan tool if this control is attempted with a vehicle speed greater than 8 km/h (5 mph). ○ The engine speed cannot exceed 2500 RPM. The message "Engine Speed too high" will appear on the scan tool if this control is attempted with an engine speed greater than 2500 RPM. ○ The transmission oil temperature must be at a normal operating temperature. The message "Transmission oil temperature out of range" will appear on the scan tool if this control is attempted without a transmission oil temperature between 70-110°C (158-230°F).
Reset Transmission Adapts	● The scan tool is used to start and stop the transmission Fast Learn Adapt algorithm. ● The following control limits apply: ○ The engine must be running. The message "Engine not Running" will appear on the scan tool if this control is attempted without the engine running. ○ There cannot be active transmission DTCs. The message "Transmission Fault present" will appear on the scan tool if this control is attempted with transmission DTCs active.