KIA TECH TIMES

The Professional Publication for Kia Dealership Technicians & Service Staff

2013 Volume 16, Issue 2

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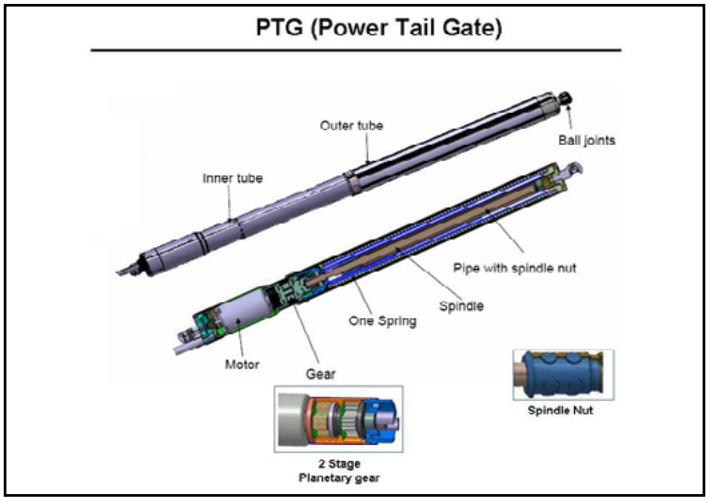
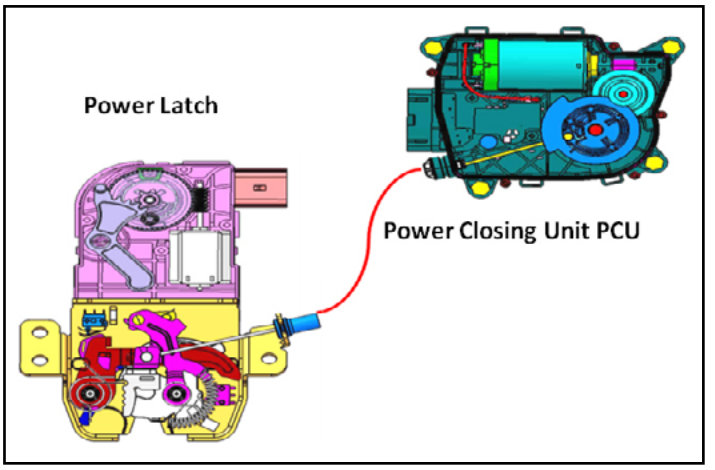
The New Sorento's Programmable Power Tailgate Feature

Kia has introduced its first programmable power tailgate (PTG) on the 2014 Sorento. Benefits include convenience for those who might have difficulty operating an ordinary lift tailgate, and easy operation with innovative cinching for a complete closing. This makes for a better PTG system. Features include self-diagnosis and an obstacle detection algorithm integrated into the system.



New to the power lift gate on the Sorento is the PTG **Spindle Drive Unit**. It is the main component that uses an internal motor and Hall sensor to open and close the tailgate. This mechanical system is simpler than the previous gas strut 'push load' type. It has greater durability (no gas leakage) and unlike the gas strut, it's temperature-independent.



The **Power Latch** consists of a un-latch motor and cinch motor. The un-latch motor unlocks the latch when opening and the cinch motor pulls the tailgate inward and locks the latch when closed.

PTG Safety and Anti Theft Logic:

The tailgate will only operate when the vehicle is stopped or speed is lower than 1.8MPH.

Obstacle detection is monitored by a Hall sensor and Pinch Strip. When the Tailgate detects an obstacle during opening (by Hall sensor frequency), the motor reverses and goes to the

Continued on page 5

Tech Line Tech Tips

Vehicle	Concern	Recommendation Before Calling Techline
All models	Audio System	When opening a case concerning a vehicle audio system, be sure to state ***which*** audio system the vehicle is equipped with in your initial notes (e.g., Base, NAV, UVO or UVO2). Including that important information up front helps your Tech Line agent handle your case quicker and more efficiently.
All models	Actuation Tests	When conducting an actuation test, technicians sometimes report a component as having passed, when in fact it was found faulty. Technicians should be aware that when a GDS states "success", this only means the PCM or controller has successfully sent a signal to the component, not that the component is actually working. Tech Line recommends that technicians VISUALLY inspect the component, or test for an AMP change to determine whether it is functioning during an actuation test.
All models with NAV	NAV unit hard reset	In the event that a technician is unable to properly diagnose/repair a NAV unit, and prior to deciding to replace the unit, the technician should reset the unit back to default status. This can be done by pushing the FM, MAP, and EJECT buttons simultaneously for 15 seconds ***with audio ON***, then testing to see if condition persists. Be certain to note the customer's station presets prior to conducting this procedure, and set those station presets again after completing the repair.
All models	Flight recordings and Tech Line Web Cases	Due to their format, flight recordings cannot be attached to a Tech Line Web Case. Flight recording data *can* be attached to an email, if needed. See TechTimes Volume 11, Issue 5 for more information

Latest Technical Service Bulletins, Service Actions and Campaigns

ENG 129	XM/VQ 3.5L MIL on with DTCs P0638 / P2110
FUE 023	ECM Upgrade -- Cylinder Contribution / Balance
SST 026r1	Global Diagnostic System (GDS) Unit Requirement (Rev 1)
TRANS 049	6-Speed A/T Transmission Adaptive Values Reset / Relearn
ENG 124r4	Data Collection: Extract California Emissions Data from ECU (DC004) (Rev 4)
GEN 054r3	iPod Adapter Cable Application Information (Rev 3)
ENG 131	ECM Upgrade -- Knock Improvement
GEN 064	DTC Scanning Techniques & Best Practices
ELE 051r1	Service Action: Driver's Side Power Window Motor Reflash Procedure (SA 143) (Rev 1)

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New Kia University Courses and Tests

Kia University is pleased to announce the launch of the following new web-based courses and tests on **KiaUniversity.com** which are required for Technician Certification.

- **2014 Cadenza Web-based Course:** This course, which includes an informative 15-minute Cadenza walk-around video, prepares dealer personnel for the raised expectations of premium-make shoppers, stand-out features, and primary competitors of this segment.
- **2014 Forte 4DR Course:** This course incorporates coverage of significant advancements such as blind-spot detection, lane-change assist, HID headlamps, and additional refinements to the powertrain, steering and body network systems. It also provides service technicians with the foundation knowledge necessary to enhance their diagnostic and troubleshooting efficiency on this vehicle.
- **2013 Spring Update Test:** This certification test challenges skilled technicians to discover the latest Service Information pertaining to new technology operation and diagnosis, emerging troubleshooting strategies, and tips for effective special service tool usage.
- **UVO eServices Diagnostic Web-based Course:** This course provides Kia dealership service technicians with an overview of the diagnosis and on-board self test features.

Course Code	Course Name	Required Browser
TEC-01-042-1	WEB: 2014 Cadenza Highlights Course & Test Technician – NEW!	These courses were built with HTML5
TEC-01-041-1	WEB: 2014 Forte 4DR Course & Test Technical - NEW!	Use Internet Explorer 9 (or greater) or Google Chrome browser

Course Code	Course Name	Required Browser
TEC-04-052-1	WEB: 2013 Spring Update Test Technician - NEW!	These courses were built with Flash
TEC-01-038-1	WEB: UVO eServices Diagnostics Course & Test Technician - NEW!	Use Internet Explorer or Google Chrome browser

Free Google Chrome Download at **www.google.com/chrome**

These tests are available for your retail personnel to take at **KiaUniversity.com**.

⚠ CAUTION

VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN DAMAGE TO THE VEHICLE.

⚠ WARNING

- **Vehicle servicing performed by untrained persons could result in injury to those persons or to others.**
- **The Kia technician newsletter (Tech Times) is intended for use by professional Kia automotive technicians only. It is written to inform technicians of conditions that may occur on some vehicles. Trained Kia technicians have the equipment, tools, safety instructions, publications and expertise to perform the job correctly and safely.**

✱NOTICE

The topics covered in this newsletter are designed to assist you with the diagnosis and repair of specific vehicle conditions. Just because a condition is described in this newsletter, do not assume that it applies to your vehicle, or that your vehicle will have that condition. In all cases, the procedures in the applicable Service Manual and/or Electrical Trouble-shooting Manual or on KGIS should be performed first.

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Recognizing the Top Providers of Service Information Feedback

In our last issue of TechTimes, you read an article about the great response we've had from Kia service technicians in our efforts to improve the quality of Kia's Service Information by using the Feedback button on KGIS (www.kiatechinfo.com). In that article, we expressed our appreciation of the essential role you, the Kia Service Technician, play in this effort.

Well, the month of May was our chance to recognize two of your Kia technician colleagues who have been outstanding in providing Service Information feedback to date. First up for well-deserved recognition was Kia technician David Woolworth of Kia Depot in Santa Ana, California. To recognize his contributions toward improving Service Information, David was presented with a framed award of recognition by Lewis Thompson, Service Information and Equipment Manager of Kia Motors America and Western Region DPSM Joe Hegmann. Kia Depot's Dealer Principle K. C. Heidlor and Service Manager Steven Simmons were present to congratulate David on his achievement. Along with the certificate, David received a valuable gift card, and the entire Kia Depot Service Department was treated to a lunch time pizza party courtesy of KMA!

Next up for recognition for his Service Info feedback was Jim Simmons, Kia service technician at Courtesy Kia in Moline, Illinois. Techline Manager Tony Cartagena and Central Region DPSM Mark Houkal were received by Bob Weiss, Service Manager at Courtesy Kia, and Service Advisor Jeremie Mann, along with some of Jim's fellow Kia technicians. Jim was presented with his certificate of recognition and a gift card for his quality contributions. Afterwards, Courtesy Kia's service department was treated to a pizza lunch party as well, provided by the appreciative folks at KMA.

Our thanks to David and Jim, and to all the other Kia service personnel who've helped their fellow technicians across the country and the Techline agents that support them, by improving the service information we use to conduct diagnosis on Kia vehicles.

Your feedback has been key in achieving the improved service information we are seeing, and we appreciate your ongoing effort and participation as we continue to pursue this goal!

fully closed position. When an obstacle is detected during closing (Hall frequency or pinch strip) the tailgate reverses to its fully open position.

If the trim switch is pushed while the tailgate is opening, it stops operation. If it's pressed during closing, the tailgate will reverse direction to a fully open position. During tailgate operation, the tailgate will also immediately stop operation if the engine is started.

If "All Door Lock" is activated by the RKE, or if the vehicle enters alarm pre–arm mode, the tailgate cannot be opened by use of the outside switch.

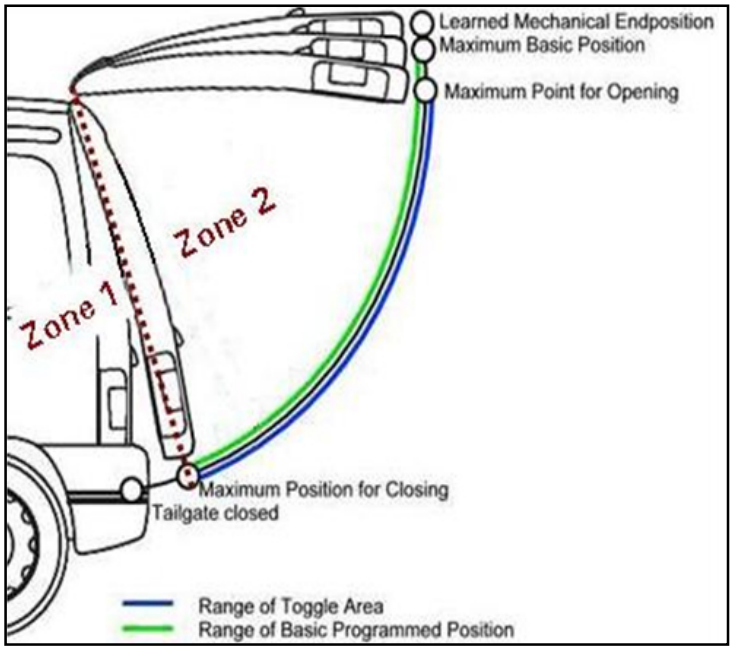
If the vehicle is in alarm pre-arm mode and the RKE tailgate button is pushed the Hazard lamps will blink two times when opening or closing the tailgate.

CAUTION: Do not try to disassemble the spindle drive unit. When replacing the spindle drive unit, the clip must be removed completely or ball joint may be damaged. Do not hold the cable of the spindle drive unit while carrying the unit. Make sure to disconnect the spindle wiring connectors prior to removing the spindles. If spindle is dropped, it should not be used. Transverse force to the spindle drive must be avoided.

Outside Switch

Trim Switch

Module Initialization of the system is required if the vehicle battery is disconnected or discharged. It should also be performed after spindle drive replacement or adjustments have been made to the tailgate bracket, striker, body hinge, or collision repairs. To initialize the PTG module, open tailgate and press the outside handle switch and tailgate trim switch at the same time for 3 seconds until vehicle beeps once. Then close the tailgate manually. Once closed, open the tailgate by pressing the outside handle switch. No restraint or obstruction is permitted during this procedure. Once the tailgate is fully open the initialization will be completed.



Tailgate Positions:

Learned Mechanical End Position is set during PTG Module Initialization.

Maximum Basic Position is where the tailgate will stop during normal operation. This position may be changed for overhead obstructions like overhead garage door or lower overhead clearance.

Maximum Point for Opening: the tailgate must be below this position to start power tailgate opening. Power opening will not start above this point to prevent over extending the mechanical limitations and damaging vehicle.

Maximum Position for Closing: the tailgate must be above this position for power closing of the tailgate. This is to ensure there is sufficient downward momentum to fully engage the latch

Continued on next page

The New Sorento's Programmable Power Tailgate Feature *(Continued)*

Reprogramming the Tailgate: To reprogram the **Maximum Basic Position:** during normal operation, this is the point at which the tailgate will stop. First, open the tailgate by use of the panel switch or RKE. Then, either manually or electrically, move the tailgate to the desired fully opened height. If the new position is below the current programmed Max Basic Position, push and hold the trim switch for 3 seconds. If the new desired open position is above the current programmed Max Basic Position push and hold the trim button for 5 seconds or more to set the new desired open height.

Refer to Kia Service Information for complete service and repair procedures.

Potentiometers

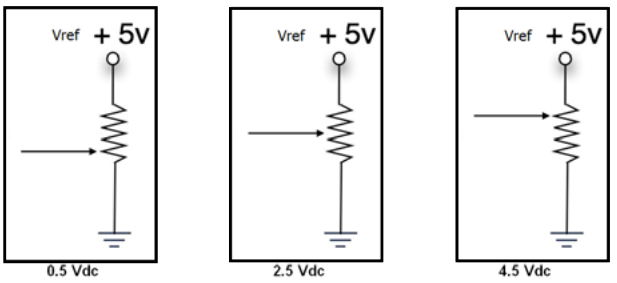
In our last issue, we discussed how Voltage Divider Circuits divide reference voltages for use in different NTC or (more rarely) PTC sensors. Another use for voltage divider circuits is in the Potentiometer or "Pot". The Potentiometer Voltage Divider Circuit contains:

- A two terminal resistor
- A third terminal sliding contact (wiper)

The total resistance is divided into two parts, resistance before and after the sliding contact, which varies with the position of the sliding contact.

When a reference voltage Vref is applied to one leg and ground to the other leg of the pot, the voltage at the slider referenced to ground is based upon the relationship between slider position and resistance.

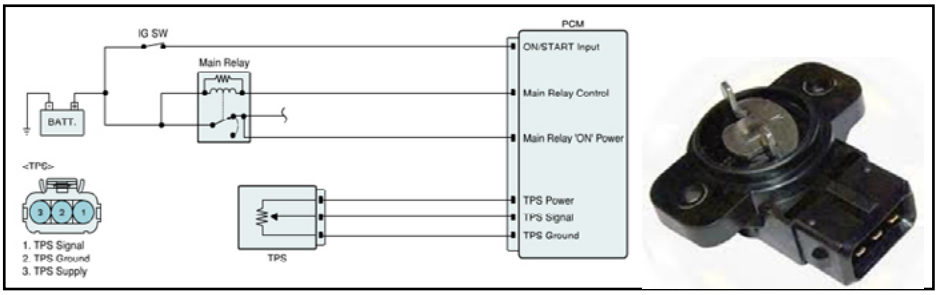
When the position of the slider is near the ground side of the resistor, it typically measures about 0.5 volts, when in the center position about 2.5 volts and at the Vref side of the resistor about 4.5 volts.



The ECU sends out a regulated reference voltage of either 3.3 or 5.0 volts to the sensor, which drops the voltage in relation to the position of the slider on the resistor, which varies with position. This voltage is measured by the ECU on the signal wire

The potentiometer is typically used as a position sensor and is an input to the ECU Kia uses potentiometers for the following position sensors:

- Throttle
- Accelerator
- A/C Inlet Door
- A/C Mode Door
- A/C Temperature Door
- Power Seat
- Power Mirror



Normal Configuration Ignition ON

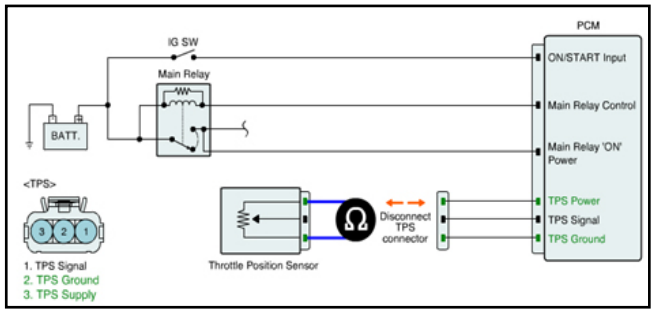
Throttle opening (°)	Output voltage(V) [Vref=5.0]
0°	0.0V
10°	0.5V
20°	0.9V
30°	1.4V
40°	1.8V
50°	2.3V
60°	2.7V
70°	3.2V
80°	3.6V
90°	4.1V
100°	4.5V
110°	5.0V

Throttle angle compared to Throttle Position Sensor Voltage.

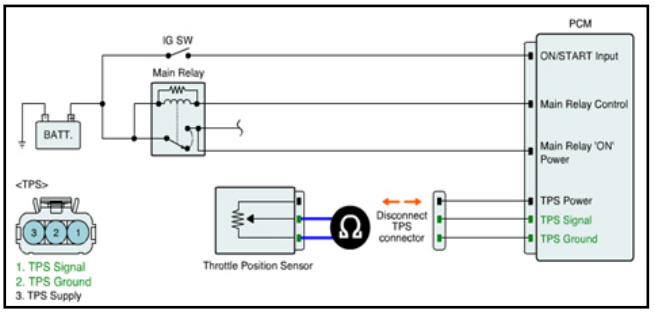
Continued on next page

Potentiometers *(Continued)*

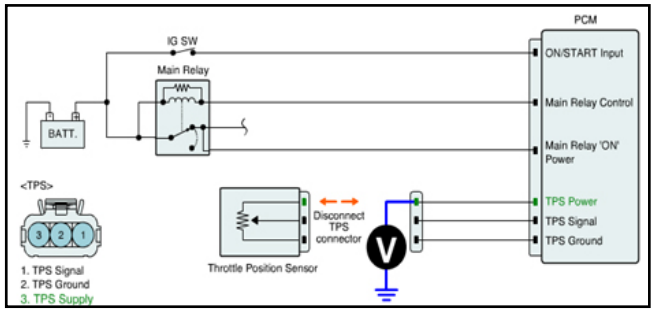
The ECU compares the measured voltage with a lookup table to determine the position being measured. You can measure the sensor total resistance and resistance at a given position and compare the value with specifications listed in service information.



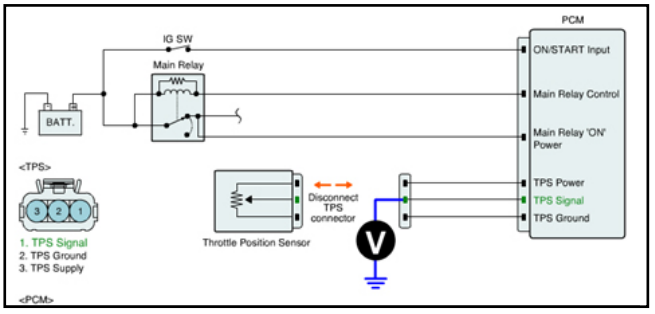
Resistance Check Ignition OFF



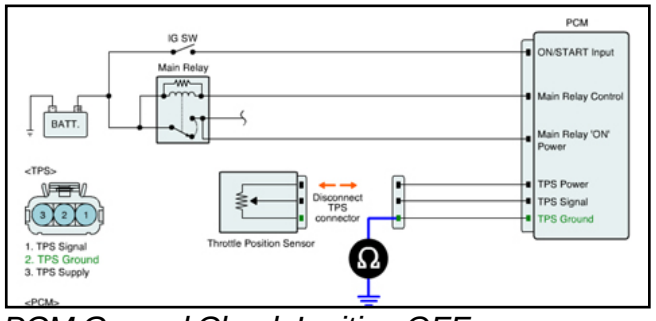
Resistance Check Ignition OFF



Vref Voltage Check Ignition ON



PCM Bias Voltage Check Ignition ON

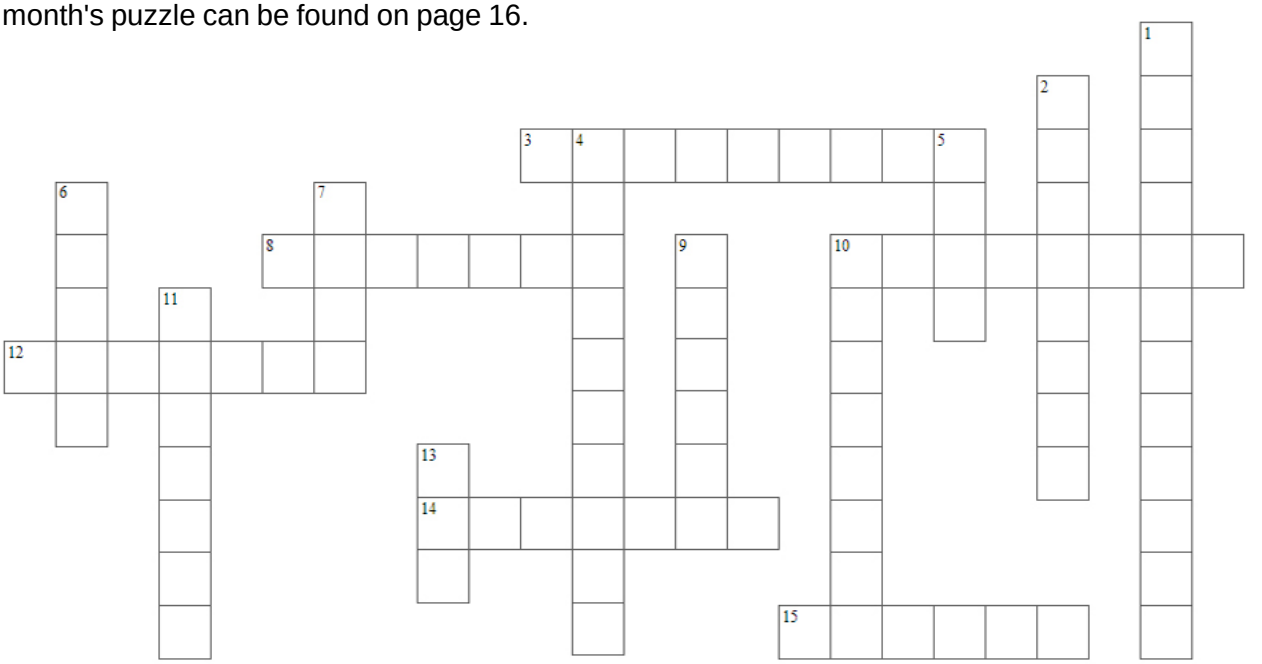


PCM Ground Check Ignition OFF

In our next issue, we will continue to discuss another Voltage Divider (transducer) Circuit, using pressure type sensors.

TechTimes Article Crossword Puzzle

Test your knowledge of the articles in this issue of TechTimes by completing this crossword puzzle. The solution to this month's puzzle can be found on page 16.



Across

3. Besides balancing a tire, a Road Force Balancer can also evaluate the _____ of a tire.
8. The Lane Departure Warning System may not be available under certain _____ or road conditions.
10. To ensure proper conductivity of a battery post & shim, use a battery terminal brush to clean _____ surfaces.
12. The Sorento power tailgate must be above the "_____ Position for Closing" position for power closing of the tailgate.
14. The power tailgate on the 2014 Sorento employs a _____ Drive Unit to open and close the tailgate.
15. With Advanced Smart Cruise Control, if a driver changes lanes to move around a slowing vehicle, the system will then automatically _____ the previously set ASCC speed.

Down

1. Web search, email activity, games, or active web chat may itnerfere with a phone's _____ and audio streaming.
2. A Potentiometer is typically used as a _____ sensor.
4. The Kia Lane Departure Warning System will not issue an alert when a driver intentionaly changes lanes or uses the _____ _____. (Two words)
5. If a battery terminal clamp is loose on the battery post, a battery _____ may be required.
6. Kia's Advanced Smart Cruise Control System uses _____ to locate and track the position of a vehicle ahead in traffic.
7. STFT is an acronym for "Short _____ Fuel Trim".
9. Vehicle tires are subject to both radial and _____ forces.
10. The new Sorento power liftgate employs an _____ Detection feature for safety.
11. The Potentiometer is an example of a Voltage _____ Circuit.
13. Conflicts may occur when streaming audio from an iPhone connected via a _____ port.

Introduction to the Kia Lane Departure Warning System

The Lane Departure Warning System (LDWS) uses a camera located near the inside rear view mirror to identify lane markings on the road surface. The system will identify lane markings on the road and track the vehicle's place and position relative to them.

While the system is activated, an indicator will appear on the LCD screen, an image of a vehicle situated within lane marking lines.

If the vehicle drifts toward a lane marking while driving, the corresponding lane marking on the LDWS symbol will flash (see image below), and the driver will hear an audible alert.

The system will not issue an alert when a driver intentionally changes lanes by turning the steering wheel or turning on the turn signal.

Under certain weather or road conditions (e.g., rain or snow, dirt), the LDWS may not be available. In such cases, the indicator will appear as in the image below, displaying a similar message.

The LDWS system is designed to alert the driver if the vehicle drifts toward a lane marker. It is not a substitute for proper and safe driving. Driver's should always drive safely and use caution.

New Causal P/N for AC "Evacuate / Recharge Only" Operation

To improve accuracy and tracking of warranty claim information related to HVAC system "evacuate/recharge only" repairs, KMA has recently added a unique Causal P/N:
"ACGAS 00000".

The new Causal P/N must be used for all "evacuate/recharge only " repairs where only refrigerant is being claimed. The new P/N cannot be used when actual parts have been replaced during the repair. In such cases, the proper P/N should be listed instead.

Additional details about claim submission can be found in Warranty Bulletin WB 2012-22 and in section 2.1.2. of the Kia Warranty Claims Processing Manual (WCPM)

Introduction to Advanced Smart Cruise Control

The Advanced Smart Cruise Control System (ASCC, or sometimes SCC) uses radar to locate and track the position of a vehicle ahead in traffic. ASCC is activated in the same manner as conventional cruise control, by turning on the cruise switch, then pressing the SET button at speeds above approximately 25MPH.

The vehicle will maintain the set speed, but the system will also track the distance between the vehicle and the vehicle ahead in traffic. When traffic is encountered and a vehicle ahead slows down, ASCC will slow the vehicle appropriately to maintain a set distance from traffic, without depressing the accelerator or brake pedal.

If the driver changes lanes to move around a slow vehicle, the system will resume the previously set ASCC speed. If the leading vehicle slows to a stop, ASCC will bring the vehicle to a complete stop. If the stop last less than 3 seconds, your car will resume the set speed, as traffic allows. If the stop is longer however, ASCC will return the vehicle to the previously set speed only after the accelerator is depressed briefly and lightly.

While driving with ASCC on, an indicator on the LCD display will show an image of the leading vehicle with lines parallel behind it. The different lines represent the distance between the driver's vehicle and the vehicle ahead. By pressing the ASCC button on the steering wheel, the driver can cycle through four different distance settings. A safe distance should always be maintained.

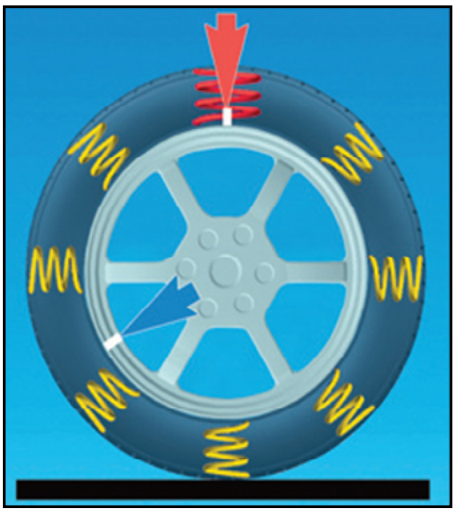
The vehicle's cruise control function defaults to ASCC but can be switched to conventional cruise control functionality as follows: with cruise control enabled but not set, the driver should press and hold the ASCC button on the steering wheel.

The display in the cluster will show the message “Conventional Cruise Mode” indicating that it is in standard Cruise Control. To return to ASCC, press and hold the button again.

Tire Balancing

In the past, technicians performed static wheel balancing. The balancer would identify the heavy part of the tire, then the technician would place weights on the lighter part of the wheel to balance the tire. This static-balancing of tires addresses concerns such as shaking and bouncing.

Later, with the first computerized, "off-the-car" wheel balancers, a technician could balance both planes of the tire separately. This allowed balancing of tires for both bouncing and shimmying. At the time, this was state of the art in tire balancing.



Road Force Balancers

Today, in addition to those tests, the Road Force Balancer can also evaluate the stiffness of a tire. This is necessary because a tire can be round and balanced, yet still have a stiff spot or weak spot in the side wall which will affect the way the tire rolls. Imagine that a tire is supported by springs rather than air. If one of the springs is stiffer than the others, the tire will not roll correctly. After all, a square tire can be balanced, yet still not roll very well.

Smart Weight Balancing Technology

It has been found that vehicle ride can better deal with a higher *lateral* imbalance than a *radial* imbalance. Therefore, the main concern when balancing is *radial* imbalance, while the lateral is balanced low enough that wobbling is not experienced. When calculating the amount of weight needed for a tire, the Hunter Smart Weight system can balance that tire using less weight. This saves the service center money.

Another advancement with wheel balancing is the ability to determine which direction a tire will pull or drift. A Road Force Balancer helps the technician place the tire on the vehicle to minimize drift.

Dealer Service Center Requirements

For more information on Road Force Balancer requirements for dealership service centers, or to order one, refer to Technical Service Bulletin **SST 030**.

Battery Application Guide & Update

The Kia Battery Application Guide has been updated to include 2014MY Sorento and Forte 4-Door:

Model Year	Reference	Kia Part Number	IBSA Type	CCA	RC
Amanti					
2004 - 2009	101	37110 24001U	V124R	700	120
Borrego					
2009 - V6 & V8	101	37110 24001U	V124R	700	120
Forte					
2010 -2014	102	37110 35001U	V121R	600	110
Koup					
2010 -2013	102	37110 35001U	V121R	600	110
Optima					
2001 - 2003	105	37110 47000U	60-47	590	85
2004 - 2013	101	37110 24001U	V124R	700	120
2011-12 Hybrid	107	37110 H6R00U	65-H6R	600	110
Rio / Rio 5					
2001 - 2013	102	37110 35001U	V121R	600	110
2012-13 - ISG Model	108	37110 H6A00U	65-H6A	800	116
Rondo					
2007 - 2009	101	37110 24001U	V124R	700	120
Sedona					
2002 - 2012	101	37110 24001U	V124R	700	120
Sephia					
1998 - 2001	102	37110 35001U	V121R	600	110
Spectra					
2000 - 2009	102	37110 35001U	V121R	600	110
Sportage					
1995 - 1999 prod to 9/3/98	103	37110 58000U	60-58HD	540	80
1999 - 2002 9/4/98-2002	104	37110 86000U	60-86	525	90
2005 - 2013*	101	37110 24001U	V124R	700	120
Soul					
2010 - 2013	102	37110 35001U	V121R	600	110
2012-13 - ISG Model	108	37110 H6A00U	65-H6A	800	116
Sorento					
2003 - 2009	106	37110 34000U	60-34	700	120
2011 - 2013	101	37110 24001U	V124R	700	120
2014*	101	37110 24001U	V124R	700	120
Battery Supplies					
Rescue Power Station		**37110 PWST950**	**Applies to all 12 Volt Vehicles**		
*** Battery Terminal Shim**		**00220 G8000U**	**Applies to Sportage (SL & 14MY XM) Positive Terminal**		
Note: Shim part number must be ordered through EPC, not available through Kia Battery Program					
Battery Warranty Policy and Procedures:					
Please refer to the following: "Kia Service Policies and Procedures Manual, topic: "Warranty Repair Policies and Procedure - Battery Policy and Procedures".					Revised Mar 2013

Note: A battery shim is now available for the 2011MY or later Sportage. If a battery terminal clamp is loose on the battery post of a replacement battery and will not tighten any further, a battery shim may be required. The battery shim will fill the gap between the clamp and post to ensure a secure fit. To ensure conductivity, use battery terminal brush to clean oxidized surfaces.

Shims can be ordered through EPC.

Continued on next page

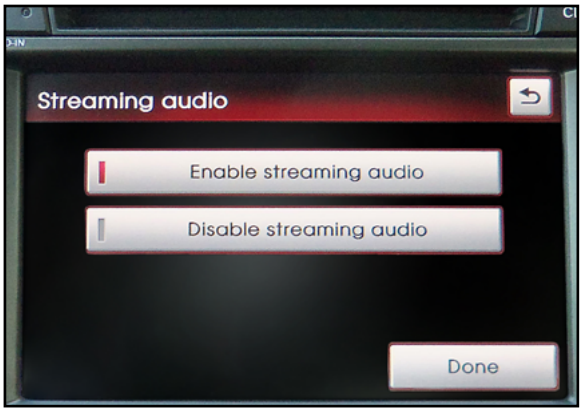
Troubleshooting Bluetooth® Streaming Audio for Customers

This article provides troubleshooting guidance for Technicians assisting customers who experience interruptions in their vehicle's Bluetooth® streaming audio when that feature is supported by their audio system and a Bluetooth® Wireless Technology-enabled phone.

You can access http://www.kia.com/#/bluetooth/setup to confirm if streaming audio is supported by the customer's phone.

For detailed instructions and/or to confirm the availability of streaming audio, refer to the appropriate UVO System Users Manual or Digital Navigation System Owner's Manual.

Sample Streaming Audio Menus



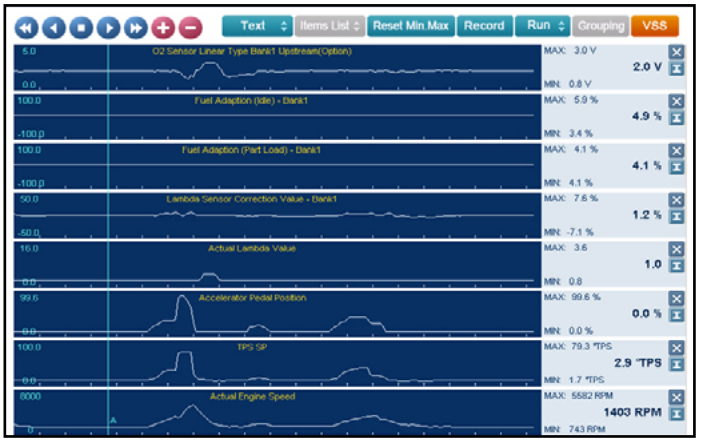
If interruptions in streaming audio are experienced, check the following:

1. Confirm the phone is connected through Bluetooth.
2. Confirm streaming audio is enabled on the radio and on the phone.
3. If the phone is connected and streaming is enabled on all devices, confirm the phone is not being used for other functions. Web search, incoming/outgoing email, games, and active web chat may interfere with phone connectivity and audio streaming.
4. Press the play button on the radio one time and try starting the music directly from the phone.
5. If music is not playing, disable (turn off) the audio streaming feature on the radio and phone, then re-enable (turn on) the audio streaming on both devices.
6. Only one function can be used at a time between the Bluetooth handsfree and Bluetooth Audio Streaming. While playing Bluetooth audio, streaming will end upon entering the Bluetooth phone screen to make a call.
7. In some models, conflicts may occur when streaming audio from an iPhone® when the iPhone is connected via the USB port. If the intention is to stream audio, disconnect the iPhone from the USB port. It is recommended to use the 12-Volt power outlet to charge an iPhone and other devices (12-Volt electric accessories which are less than 10A).
8. If Steps 1-7 do not resolve the concern, perform these additional steps:
    - Reboot the phone and delete the Bluetooth pairing from the phone and the radio.
    - Pair the phone and the radio.
    - Enable bluetooth streaming audio on both devices
    - Try streaming audio.

Fuel Adaptations or Corrections Values

Fuel Trims in Current Data on many of our systems has been changed. The terms “Long and Short Term Fuel Trims” have been replaced by Lambda Sensor Correction Value and Fuel Adaptation.

By looking at Lambda Sensor Correction Value (Short Term Fuel Trim (STFT) we can see if the system is adding or subtracting fuel to keep the fuel mixture near stoichiometric.



When the engine is started, the controller looks at fuel related sensors such as MAF, TPS, Coolant and Air Temperatures. The controller then calculates the amount of fuel that is needed. Once the O2 sensor warms up and the controller can rely on the O2 values, the controller checks for correct fuel delivery based on the O2 sensor values. If corrections are needed, the controller makes them and lets us see the corrections through the Short Term Fuel Trim. In a perfect world no corrections would be needed but values change and parts wear over time. If the O2 sensor shows that the system is running a little lean, the controller will add fuel. We can see this in Lambda Sensor Correction Value (Short Term Fuel Trim). The No Correction value is usually “1” but you may sometimes see a value of “0” or “100”. When adding fuel, the value will move up to, say, 1.2 and the value will lower to maybe.8 when moving lean.

As a side note, check out the graph for “Actual Lambda Value”. It is flat-lined at 1.0 except during a short time of deceleration where it moves lean. Setting at 1.0 tells us that the Air Fuel Mixture is right where we want it. Lambda is a Greek letter that is used to describe the amount of air that is added to fuel to achieve an air/fuel ratio of 14.7~1 otherwise known as stoichiometric. Lambda 1 equals stoichiometric while Lambda less than one (less air) is a rich mixture and Lambda more than 1 (more air) is a lean mixture. Lambda 1 does not directly relate to the No Correction value of 1. Lambda 1 indicates that the A/F Mixture is correct and the Lambda Sensor Correction Value 1 indicates the correction needed to achieve Lambda 1.

The STFT can move quickly but it cannot add or remove large amounts of fuel. The controller tries to keep the STFT near the middle of the scale. By keeping the Fuel trim near the middle of the scale, the system can make corrections quickly in both directions. To do this, the controller will add or remove fuel through another calculation called “Long Term Fuel Trim” (LTFT) also known as “Fuel Adaption”. By adding fuel through Long Term Fuel Trim, the Short Term Fuel Trim will move back toward the no correction value, i.e. 1. The current data from TF/QF shows Fuel Adaption for Idle and for Part Load. The controllers track Long Term Fuel Trims in a series of cells, or load ranges, in relation to RPM and Load. In my “made up” Cell Block, cell 1 represents low RPM and low Load while cell 16 represents high Load and RPM. By tracking the Fuel Trim by RPM and Load, the controller can improve the performance and correction time. Driving up a steep grade, for example puts you in cell 11 and a fuel trim of 1.3. This tells us that the last time it was in this cell, the controller was adding fuel. As you accelerate up the driveway this time, the controller adds the same amount of fuel as last time. This gives the system a quicker response and improves performance. In the screen shot below, the Fuel Adaption is displayed for both Idle and Part Load. Because the engine was idling, there are changes to the Idle value but not to the Part Load value. The vehicle would have to be driven in the correct RPM/Load for the monitored cell to show any changes in the Part Load value. Without driving the vehicle, there is no way of knowing what exact conditions (or cell) they are looking at for Part Load.

LOAD				
	13	14	15	16
	9	10	11 1.3	12
	5	6	7	8
	1	2	3	4
			RPM	

What happens when propane is added?

As propane is added to the air intake the STFT starts to decrease the amount of fuel injected. In an attempt to keep the STFT near the center, the controller will

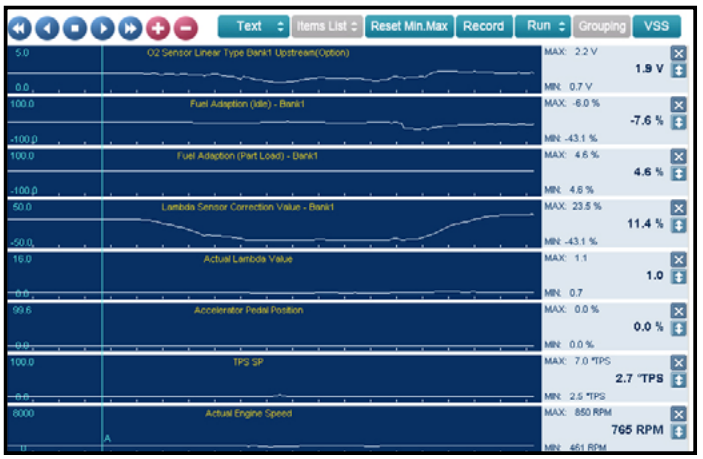
Continued on next page

Fuel Adaptations or Corrections Values *(Continued)*

start pulling fuel back using Long Term Fuel Trim. You can see that in the graphs to the right.

As long as the system can compensate and deliver the correct amount of fuel, the STFT will start moving back toward the No Correction value. The LTFT moves slower than STFT but can add more fuel.

If the Fuel Trims cannot add or subtract enough fuel to maintain Lambda 1, DTCs will set. In some cases after the fuel trims have been pushed to the limits, it may be necessary to reset the Adaptive Values in the controller to speed up the correction process.

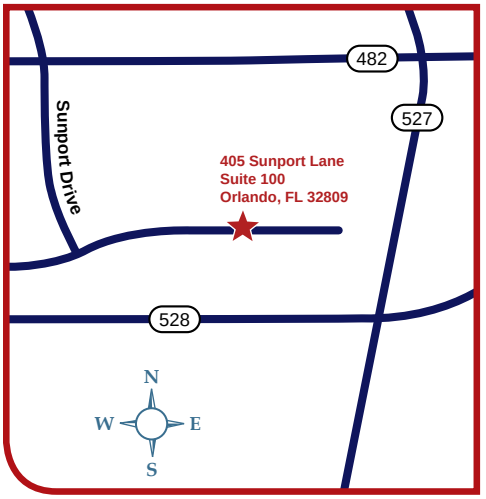


Kia's New Orlando Technical Training Center

Kia University is pleased to announce the opening of our 6th technical training facility, the Orlando Technical Training Center. This new 7,535 square foot facility includes one large classroom and a service shop containing 4 lifts and 14 training vehicles. The classroom is equipped with a large front-projection screen for trouble-free viewing from any angle in the room and 12 folding table in-desk computers to support interactive learning simulations. This classroom is also designed to accommodate Kia University Sales, Service, and Parts training programs with seating for up to 32 participants.

Address and Map:

405 Sunport Lane,
Suite 100
Orlando, FL 32809



Nearby Hotels:

Quality Inn Orlando Airport

2601 McCoy Road, Orlando, FL
(407) 856-4663

Free shuttle to training center & airport.

Sleep Inn & Suites Airport

1700 McCoy Road, Orlando, Fl
(407) 855-4447

Free shuttle to airport from hotel only. Shuttle to training center available for a fee.

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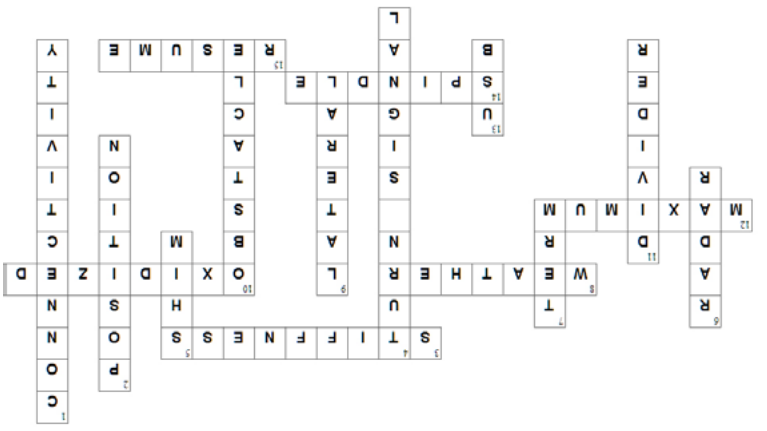
for the TechTimes staff?
If you do,
we want to hear it!
Please email your
comments & suggestions
to ssalama@kiausa.com
or fax to (949) 468-4905
to have your voice heard!

Crossword Puzzle Solution

We hope you gave this issue's crossword puzzle on page 8 a try. In case you need a little help, here are the answers to the puzzle clues.



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