THE PROFESSIONAL PUBLICATION FOR KIA DEALERSHIP TECHNICIANS & SERVICE STAFF

Kia University

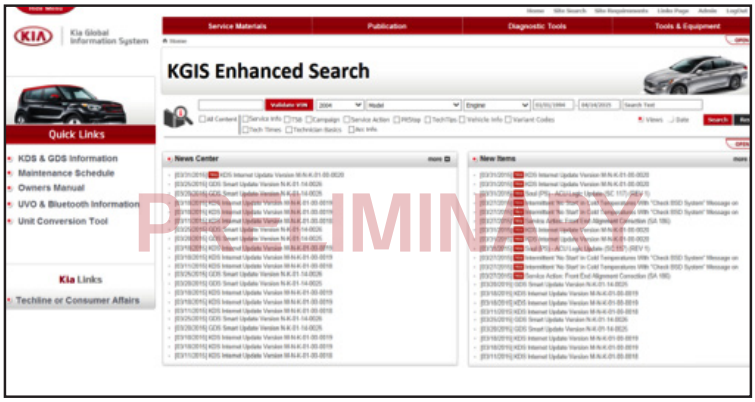
TECH TIMES

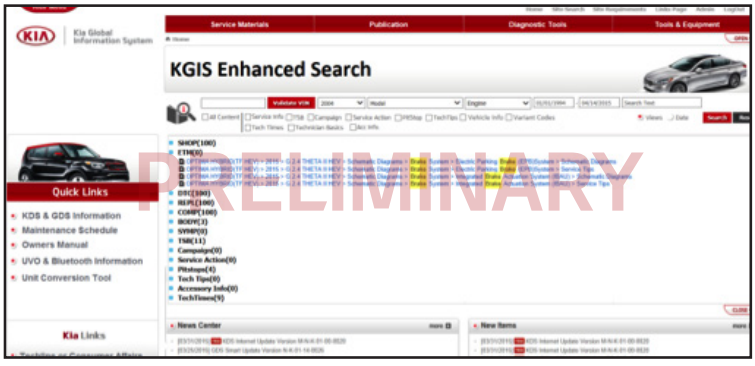
2015 • VOLUME 18, ISSUE 2

INSIDE THIS ISSUE:

KGIS ENHANCED SEARCH

The upcoming KGIS "Enhanced Search" feature to be released later this year, will enable Kia service technicians to find related service information quickly and easily. The enhancements provided for technicians to improve performance with more accurate search results. Below are a few examples of the new KGIS search feature.





NOTE: IMAGES SUBJECT TO CHANGE.

The New "Enhanced Search" and "Hit List" results will be based on actual Table of Contents (TOC) with auto expansion of service information.

- Incorporating the Service Information table of contents and selected page will be synced to the table of contents.
- Search results hit list will include model and engine type for easy identification.
- Improved search performance with the new auto populated keyword list, helps to eliminate spelling errors.
- New window page view will include the auto selected table of contents from the target pages.

ASE CERTIFIED

Did you take your ASE certification this year?

Good news! You don't have to wait till the end of the year to get your ASE certification credit uploaded to your transcript on the Kia University website. Starting this year, we will upload the ASE certification credits every quarter instead of once a year.

As a reminder, to get ASE credit in Kia University, please visit www.myase.com and under Employer Information, enter the four (4) character KUID in the Company-Assigned ID for "Kia" Company.

TECHLINE FAQS

QUESTION	ANSWER
How do I open a PWA case?	It is the same as opening a Techline case. When you create a case; on the top right, you will have options for "Quality", "Assistance" and "Parts Warranty Authorization". Refer to Parts Warranty Bulletin 2014-09 in Kdealer.com for further information.
How do I improve grounds?	Remove the ground cable and use emery cloth to remove paint to bare metal and secure the ground to bare metal or use star washers and protect with electronics grade clear coat.
I just checked for DTC's and there is freeze frame data available what should I do with it?	Freeze Frame Data is important and aids the Techline agents and Engineers in properly analyzing a failure and assisting you with diagnosis and repairs. When opening a Techline case that involves a DTC please make sure to attach your Freeze Frame Data to the "Case Attachment" section as this is required when starting a Techline case.
How do I access Kia Global Information System (KGIS)?	Login to Kdealer.com and on the left side of the home page you will see "MY FAVORITES" section with the KGIS link, it will redirect you to the KGIS site with all your latest KGIS Service Information and news.

LATEST TECHNICAL SERVICE BULLETINS, SERVICE ACTIONS AND CAMPAIGNS

ELE 085	UVO Software Upgrade – Media Button Inoperative (2015MY – SL, YD, QF/TF/TFH, XMa)
BOD 062r1	Airbag Control Unit (ACU) Servicing Warning (All Models)
ELE 081	Combination TSB/SA: UVO System Upgrade (SA 190) (2013MY – AM, XMa, QF/TF, UB, SL)
ELE 080	Combined TSB/SA: AVN System Upgrade (SA 189) (2013MY – QF/TF, AM)
ELE 082	Combined TSB/SA: Base Audio System Upgrade (SA 191) (2013MY – AM, XMa, TF/QF, TD)
SC 118	Sorento (UMa) – PCM Logic Reprogramming (UMa)
CHA 057	TPMS Sensor Replacement (SL)
CHA 058	TPMS Sensor Replacement (YD)

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.
- Always take proper and necessary safety precautions when performing any type of service on a vehicle.
- 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 help perform the job correctly.

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 Troubleshooting Manual or on KGIS should be performed first.

The information and specifications provided in this document were accurate at the time of development. Kia reserves the right to discontinue or change specifications or design at any time without notice and without incurring any obligation.

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SPRING 2015 SERVICE TECHNICAL UPDATE TEST

Kia University is pleased to announce the launch of the following web-based test on KiaUniversity.com.

Spring 2015 Service Technical Update Test	TEC-04-056-1

Kia Service Technicians need every edge to increase productivity and Fix Right First Time (FRFT) performance to drive superior customer satisfaction and owner loyalty to their dealership. This certification test challenges technicians to seek out the latest Service Information published over the last several months pertaining to new technology operation and diagnosis, emerging troubleshooting strategies, and tips for effective special service tool usage.

Prior to beginning this test, please reference the following materials:
- Tech Times Volume 17 Issue 4
- Tech Times Volume 17 Issue 5
- Tech Times Volume 17 Issue 6
- Technical Service Bulletins and Pitstops released June 2014 thru December 2014

This web-based test is required for Service Technician's certification.

KDS – CONFIGURING BROWSER FOR TECHLINE CASES

The Techline link requires Google Chrome as an internet browser.

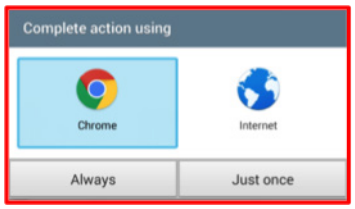
If a default browser other than Chrome has been set up, it must be cleared.

To check for and clear other default browsers:

1. Select Settings from the tablet's home screen.
2. Select the "General" tab at the top ❶.
3. Select "Default Applications" on the left ❷.
4. If a there is a browser other than Chrome, select the "Clear" button ❸.

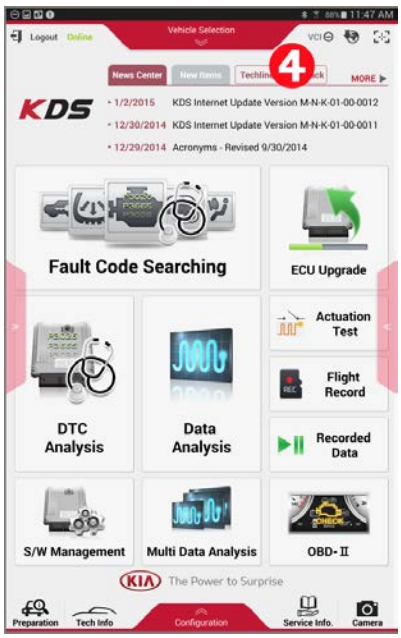
To Select browser:

1. Select the "Techline" button ❹.
2. A pop-up will appear with a choice of Browsers.
3. Select "Chrome" and then select "Always".



This will allow the Techline link to work properly on the KDS.

Check articles on "Emailing Files and Images From KDS" and "Setting Up Screen Capture Folder for Emailing" to assist when submitting Techline cases.



SOUL EV RANGE AND BATTERY HEALTH

Last year in TechTimes Vol 17, Issue 5, page 4 , we covered charging, charging efficiency and energy used. (Please refer to it for details on charging and electricity costs.) This article will discuss the available range, the effect of driving patterns and how to correctly measure the HV battery health on the Soul EV.

The EPA-estimated range for the Soul EV is 93 miles and was calculated using a series of low and high speed driving patterns on a dynamometer, similar to determining the MPG for gas vehicles. As with gas vehicles, the real world results will depend on several factors, many of which have a different, or even opposite effect in an electric vehicle.

One of the first ingrained misconceptions comes from people having experienced gas vehicles getting better efficiency (MPG) at highway speeds vs. stop & go city driving. The gas Soul (2.0L) has EPA ratings of 23 MPG city and 31 MPG highway (highway is 35% better). In contrast, the Soul EV has EPA ratings of 120 MPGe city and 92 MPGe highway (city is 30% better!). The main reason that the EV gets such good city mileage is that each and every time the vehicle slows down (not only with brake application) it recaptures a portion of this energy through regenerative braking and charges the battery. In contrast, a gas vehicle wastes this energy by converting it to heat in the brakes. In addition, whenever the gas vehicle is idling it's wasting a significant amount of fuel running the engine and driving the accessories. The EV draws very little energy when stopped and only consumes the power needed to run the requested HVAC and accessories.

The scenario for the EV at highway speeds is not as advantageous. It's no longer experiencing a high percentage of deceleration events compared to the sustained higher speeds and is therefore not benefitting from regenerative braking. The HVAC and accessory load in the EV is still a constant power draw, but the similar load in the gas vehicle is now a much smaller percentage of the power being used and less impactful to MPG. Additionally, aerodynamics become more critical at higher speeds. As speed increases, aerodynamic drag compounds, which requires more energy to overcome and erodes range quickly. Ultimately, sustained high speed has a significant impact on EV range.

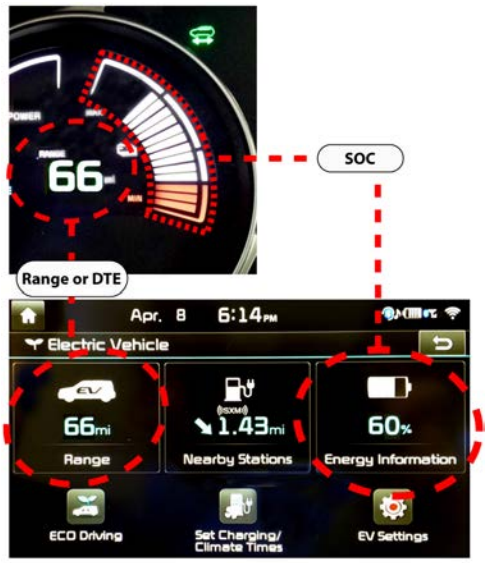
Another point of confusion may come from the displayed available range (also known as "Distance to Empty" or "DTE") in the instrument cluster and EV information screen. When the vehicle is new, the indicated range may show 100+ miles. After the customer begins daily driving, the DTE will adjust to their usage pattern and potentially show much less range. This is especially true if the customer drives at sustained highway speeds. The customer may believe that there's a problem with the battery and/or report that the battery is no longer "fully" charging.

The **range** displayed is based on the customer's usage pattern during the last 20 drive cycles and will reflect the most accurate estimated distance the vehicle can travel. If the customer's driving pattern is highly variable, the indicated range will dynamically adjust during the drive cycle and may show a "jump" or "dip" vs. the actual miles traveled. Example, the customer typically drives in the city and always gets around 100 mile range. They assume that they can take a road trip that is 90 miles. However, the highway speeds consume power faster than the city driving and the vehicle may run out of range before reaching the destination.

To help diagnose a range complaint, you can review the customer's driving history and energy used in the EV Eco Driving History tab. This will help to show their usage and variability.

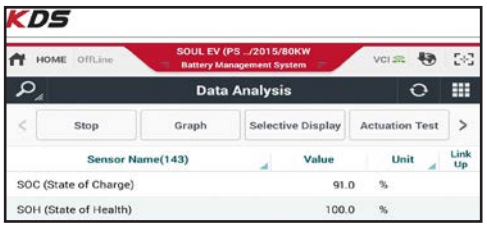
Battery SOC and SOH

How full the battery is charged is shown by the **State of Charge "SOC"**. It is displayed in a bar graph in the instrument cluster and numerically in the EV information screen. The battery will always charge to 100% SOC regardless of capacity loss.



How much energy the battery can hold is displayed as **State of Health "SOH"** in the GDS/KDS diagnostic tools under the Battery Management System (BMS). It is a percentage of the new, full rated capacity of the high voltage battery pack. All batteries lose capacity over time and the SOH is the best indicator to use when addressing concerns of range and battery degradation.

SOC vs. SOH – To better understand these terms, let's think of a fuel tank that holds 10 gallons. When the tank is new and full, it will hold 10 gallons and shows 100% SOC and 100% SOH. After some time, imagine the tank loses capacity and can now no longer hold the full amount, only storing 8.5 gallons. It is now at 85% SOH (because of the capacity loss), but when filled will still be at 100% SOC since it is full.



Electric vehicles are relatively new to both customers and dealers. Understanding these fundamental terms, how range is determined and why the EV gets significantly better city efficiency vs. highway will help you to address customer questions and concerns on battery health and range.

TEST YOUR TECH TIMES KNOWLEDGE

Test your knowledge of the articles in this issue of Tech Times, this edition of Word Scramble may be slightly more challenging. Unscramble all the words below to reveal the secret phrase. *(Tip: Page number provided to help unscramble word)*

1. DUTYIMIH (1) Pg. 13
2. DGINOGFGE (2) Pg. 13
3. RTABYTE (13) Pg. 4
4. HSKNSTICE (10) Pg. 11
5. ROFWRAD (7) Pg. 8
6. ANETSTRNI (14) Pg. 6
7. ETNCIJRO (9) Pg. 6

8. OONICTIUNMMAC (3) Pg. 7
9. EIGAVNTREERE (4) Pg. 4
10. ARDGIANTDEO (11) Pg. 4
11. IATCPYCA (5) Pg. 4
12. EKRLAED (8) Pg. 2
13. ISRECEESV (16) Pg. 14
14. THNATCTMAE (15) Pg. 2
15. ICSNETDA (12) Pg. 8
16. SRGENEIT (6) Pg. 10
17. OXIPTMRIY (17) Pg. 9

Secret Phrase – Clue: *"It's our goal"*

7	6	17	4	5	11	10	3	2	9	14	16	13	12	1	15	8

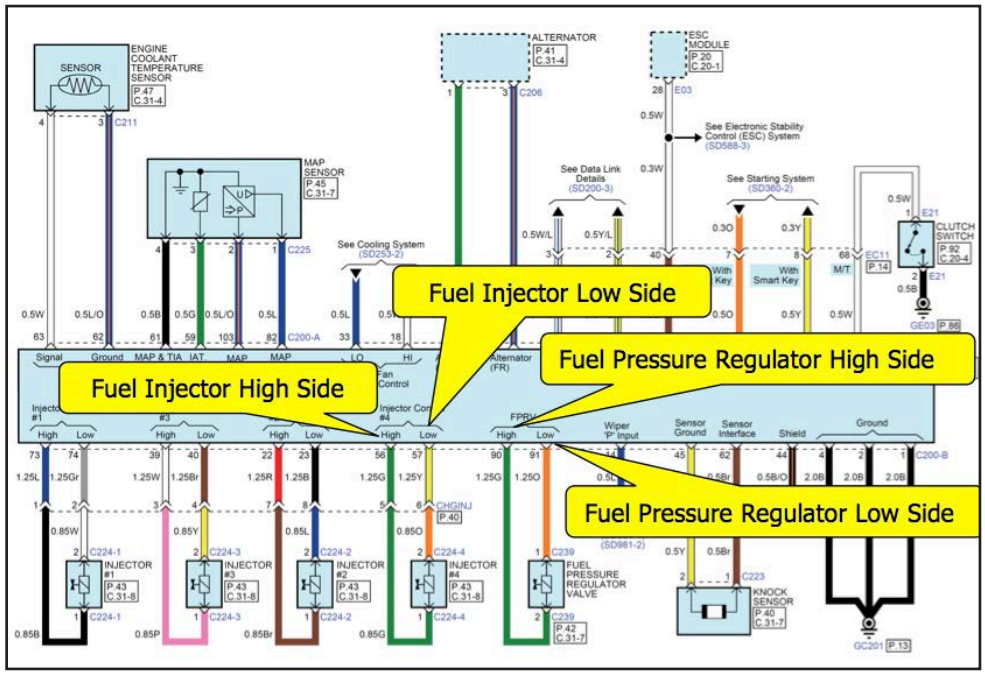
OUTPUT CONTROL CIRCUIT TESTING (PART 4)

In part 3 (Vol. 18, Iss. 1), we covered testing fuel injector and ignition coil primary circuits with an oscilloscope

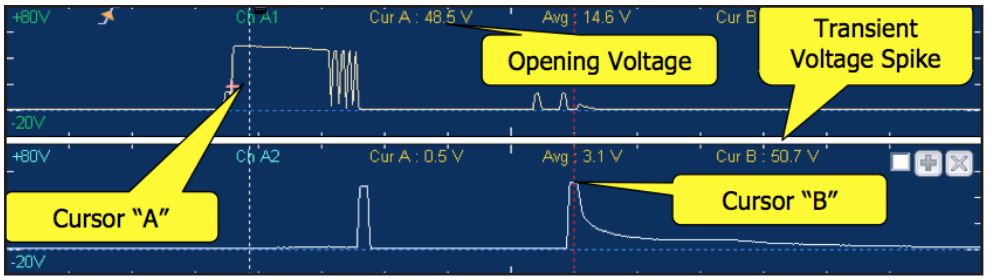
In part 4, we will continue to use the VMI oscilloscope with the GDS for testing Gasoline Direct Injection (GDI) fuel injectors and fuel pressure regulator circuits.

GDI Fuel Injector

GDI injectors and fuel pressure regulator use High and Low Side driver circuits.

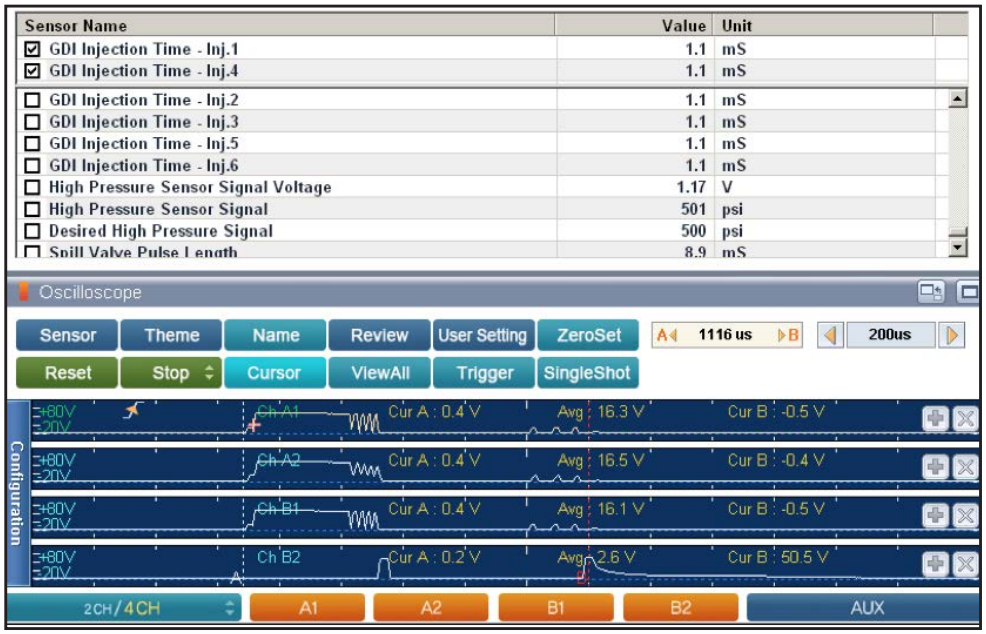


Cursor "A" shows the voltage required to open the injector. Cursor "B" shows the transient voltage spike when the injector closes.



In this example, the 4-channel mode displays the operation of injector 1 and 4. Channel "A1" & "A2" is when injector "1" is OFF. At the same time Channel "B1" & "B2" is when injector 4 is ON. You can also see that the time between when the High Side voltage rises, and the Low Side transient voltage spikes is the same as the GDI Injection Time in Current Data

All Kia GDI engines have two injectors using the same High Side driver. In this example, both injectors 1 & 4 are supplied high voltage at the same time. To turn on the injector requires the Low Side driver to ground the circuit. This explains why the ground side voltage is the same as the High Side when the injector is ON and pulled to ground when the injector is OFF.



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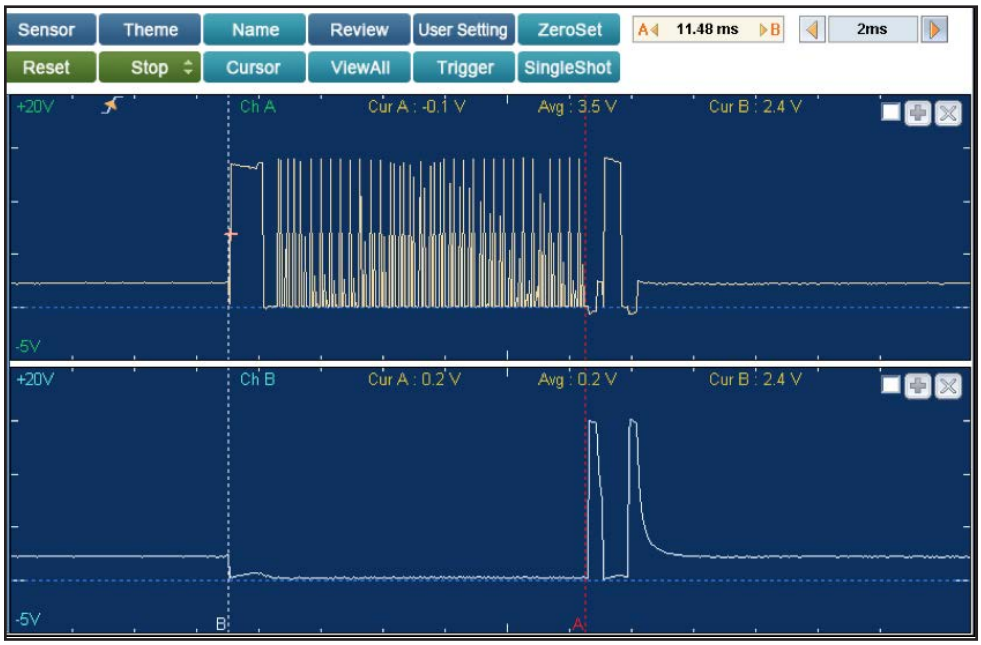
OUTPUT CONTROL CIRCUIT TESTING PART 4 (Continued)

Fuel Pressure Regulator (Spill valve)

The fuel pressure regulator (spill valve) operates similar to the GDI Injector. When the High Side driver voltage increases and the Low Side is pulled to ground the valve turns ON. When the High Side returns to zero and the Low Side transient spike starts, the valve is OFF. When the valve is ON (closed), it allows the fuel pressure to rise. When the valve is OFF (open), it allows fuel to bypass the pump, lowering the pressure.



This ends our series on Input and Output circuits and testing. We hope that you can use this information to increase your diagnostic accuracy and decrease your diagnostic time.

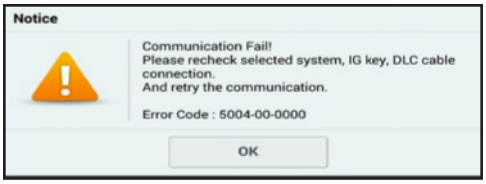
Stay tuned, next issue we will start a new section and new series. Revisiting voltage drop testing, parasitic draw, advanced circuit testing. This will include measuring circuit resistance, amperage, voltage and using the VMI oscilloscope to test them.

KDS – UNDERSTANDING WIRELESS RE-FLASHING OF ECUs

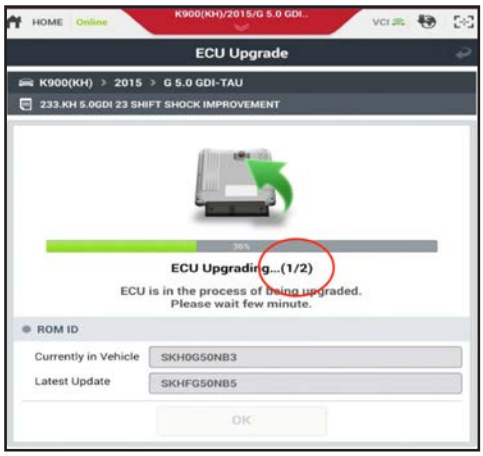
KDS separates the ECU Re-Flash (ECU Update) procedure into 2 parts. This helps eliminates the risk of re-flashing without a wired VCI II.

While performing an ECU update on the KDS, you will see part one and two.

If communication fails, a notice as shown on the right will pop up asking to recheck connection and retry communication.



Part 1 downloads the update onto the VCI II. The files are verified to make sure the data transferred properly.

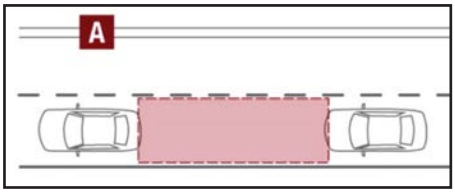


Part 2 downloads the update into the vehicle's ECU from the VCI II.

SORENTO (UMa) – TECHNOLOGY HIGHLIGHTS

In an effort to better educate and familiarize customers in regards to some of the features in their 2016MY Sorento (UMa) vehicle, Kia Motors America would like all dealership service personnel to become familiar with certain vehicle features, to help maximize owner satisfaction. Below are some of the features listed (for complete list of feature please refer to TSB: GEN 073).

FORWARD COLLISION WARNING SYSTEM (FCWS)



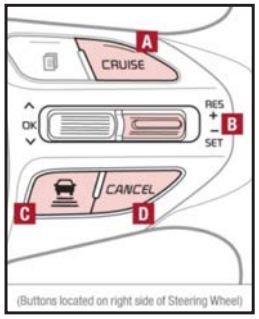
The FCWS helps to alert the driver when rapidly approaching a vehicle that is slowing down, braking or stopped **[A]**. A warning message will appear on the LCD screen and a chime will sound. The FCWS will become active when the vehicle is traveling more than 25 mph. To turn the FCWS off, go to User Settings in the LCD Instrument Cluster modes.

REMINDERS:

- The FCWS will be activated by default when vehicle power is cycled on, even when previously set to off
- The FCWS will not operate when the vehicle is traveling more than approximately 50 mph

ADVANCED SMART CRUISE CONTROL (ASCC)

The Advanced Smart Cruise Control (ASCC) system allows you to set the vehicle to maintain a speed so long as it is not limited by traffic. When traffic is encountered, the vehicle will be slowed to maintain a set distance behind traffic without depressing the accelerator or brake pedal.



To set/adjust the ASCC speed:

- Push the CRUISE button **[A]** to turn system ON. The CRUISE indicator will illuminate on the instrument cluster
- Accelerate/decelerate to the desired speed
- Press the ASCC lever **[B]** up or down to adjust or set speed

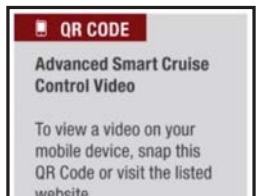
To set the vehicle-to-vehicle distance, press the ASCC button **[C]** on the steering wheel. The image on the LCD screen **[E]** will change when scrolling through the settings.

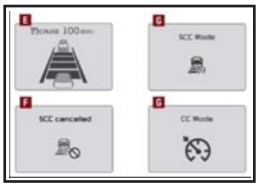
To turn system OFF, press the CANCEL button **[D]**. The CRUISE indicator on the instrument cluster will turn OFF and the LCD screen ASCC image will show "SCC canceled" **[F]**.

REMINDERS:

- Cruise Control button must be ON in order to turn ASCC ON/OFF
- ASCC is automatically activated by default when ignition is cycled

To change the Cruise Control mode from ASCC to standard Cruise Control [G], press and hold button [C]. Repeat to switch modes again (The ASCC system must not be activated to change modes).

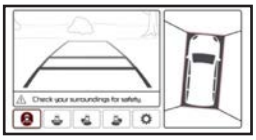




For the ASCC System to operate:

- When no vehicle is in front, you must be travelling at a minimum speed of 19 mph
- When following a vehicle, there is no minimum speed requirement

When following a vehicle, the system will automatically adjust your cruise speed based on the vehicle in front. It will even bring the vehicle to a complete stop if necessary. If the vehicle remains at a standstill for more than 3 seconds, the system will disable.



SURROUND VIEW MONITOR

The Surround View Monitor (SVM) is a parking support system that shows the areas around the front, rear, left, and right sides of the vehicle via four cameras displayed in the navigation screen.

Front SVM operation:

- The camera view will display on the Navigation screen in both Drive and Neutral
- In Drive, the camera view will continue to display until the vehicle is above approximately 13 mph

The Front SVM camera is ON when:

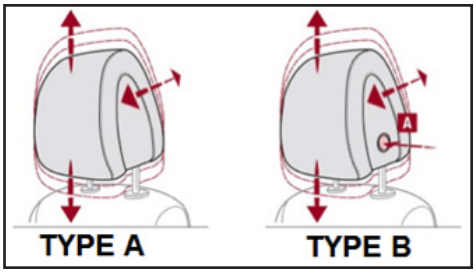
1. The ENGINE START/STOP button is ON
2. The gear shift is in Drive or Neutral
3. The SVM button **[A]** is pressed ON

Rear SVM Operation

- The camera view will automatically display on the navigation screen when the vehicle is shifted into Reverse
- The camera view will turn off when the vehicle is shifted out of Reverse

FRONT HEADREST ADJUSTMENT

Type A* (Slide and Adjust Type)



- To raise headrest, pull headrest up to the desired position
- To lower headrest, press the headrest down
- To adjust headrest forward, pull the headrest forward to the desired position
- To adjust headrest backward, pull headrest forward to the farthest position, and release

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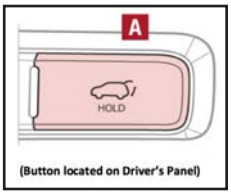
SORENTO (UMa) – TECHNOLOGY HIGHLIGHTS (Continued)

Type B* (Depress button on side of headrest for 3 detent positions)

- To raise headrest, pull headrest up to the desired position
- To lower headrest, press and hold the release button* **[A]** and lower headrest to the desired position
- To adjust headrest forward, pull the headrest forward to the desired position
- To adjust headrest backward, press and hold the release button* **[A]** and push the headrest backward to the desired position

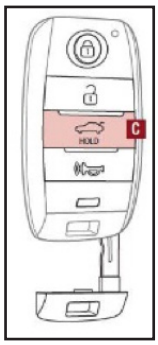
SMART POWER LIFTGATE™ (TAILGATE)

Inside the Vehicle:
Press and hold the Power Liftgate Open/ Close Button **[A]** to automatically open/ close Liftgate.



Smart Key:
To open the Power Liftgate, press and hold the Liftgate button **[C]** until the Liftgate begins opening. Press again to close.

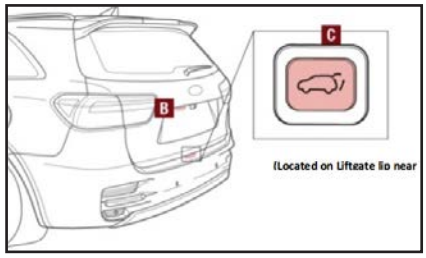
REMINDER:
Pulling the Rear Hatch upward by the handle or pressing the button a second time will interrupt the automatic opening of the Power Liftgate.



Outside the Vehicle:
To open Power Liftgate automatically, press the Rear Hatch Release Button **[B]**.

Close by pushing Power Liftgate Close button **[C]**.

Power Liftgate (Tailgate) Opening Height User Setting
The height setting of a fully opened Liftgate (tailgate) can be adjusted following the steps below:



1. Position the Liftgate (tailgate)manually to the preferred height
2. Press and hold the Power Liftgate Close button **[C]** for more than 3 seconds
3. A system beep will sound twice indicating the height setting has been saved

The Liftgate (tailgate) will open to the set height. To change setting again, repeat steps 1-3.

Smart Power Liftgate
When the Smart Key fob is on your person and you are near the back of the vehicle, within close proximity, the hazard lights will blink and a chime will sound for about 3 seconds as an alert that the Power Liftgate is about to open. Then the alert system will blink and chime 2 additional times before opening the Power Liftgate. The Smart Liftgate feature is off by default. To enable the Smart Liftgate, go to User Settings in the LCD instrument cluster modes.

QR CODE

Smart Tailgate Video

To view a video on your mobile device, snap this QR Code or visit the listed website.

Refer to page 2 for more information.

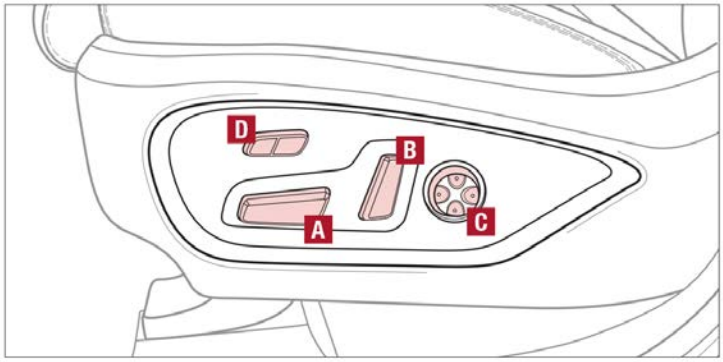
KuTechVideos.com/um13/2016

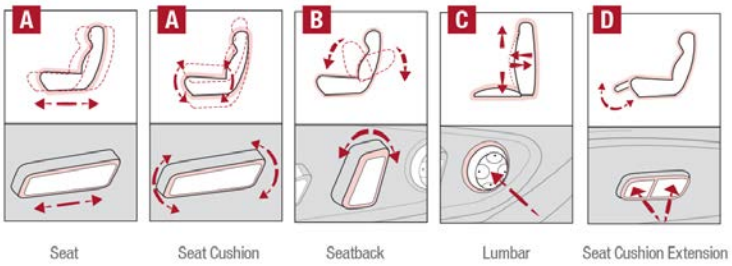
QUICK TIPS

During the Smart Liftgate alert, the Smart Liftgate can be deactivated with the Smart Key by pressing any button on the key fob.

POWER ADJUSTABLE DRIVER'S SEAT

Move/Press controls to adjust Seat, Seat Cushion, Seatback or Lumbar support.

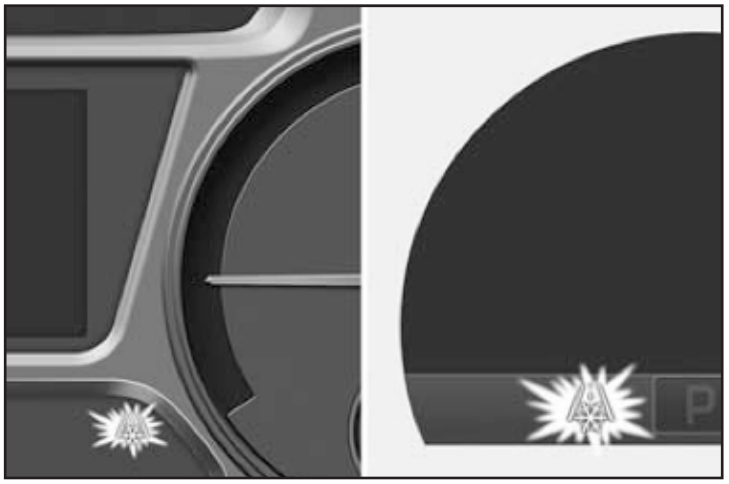




[A] Seat Bottom Adjustment
[B] Seat Back Recline Adjustment
[C] Lumbar Adjustment
[D] Seat Cushion Extension

ICY ROAD WARNING INDICATOR

This warning light will illuminate when the ambient temperature drops below 40° F. The warning light will blink 10 times and then illuminates. Additionally, a chime will sound 3 times.



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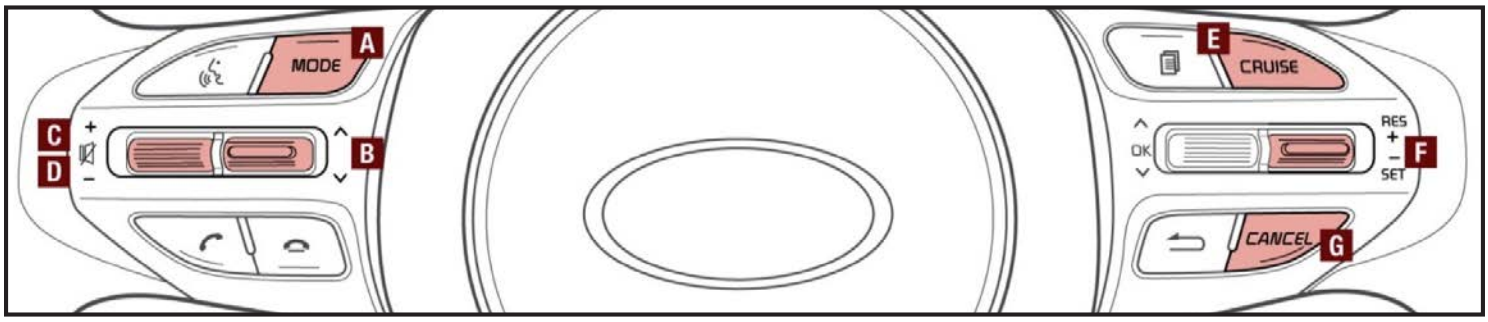
SORENTO (UMa) – TECHNOLOGY HIGHLIGHTS (Continued)

STEERING WHEEL CONTROLS

AUDIO CONTROLS | STANDARD CRUISE CONTROLS



[A] Audio Mode button: Press to cycle through FM/AM/Sirius® Media (CD, USB, iPod®, Aux, Bluetooth® Audio, My Music) modes

QUICK TIP

Pressing the Audio Mode button for more than 1 second will turn Audio Mode ON/OFF.

[B] Seek/Preset buttons:

FM/AM/Sirius® Modes: Press to advance through Preset Stations. Press and hold to auto seek

Media Modes: Press up/down to move track up/down. Press and hold to fast forward/rewind

[C] Volume buttons: Roll up/down to raise/ lower volume

[D] Mute button: Press to mute all audio

[E] CRUISE Control ON/OFF button: Press to turn the Cruise Control ON/OFF

[F] Resume Cruising Speed button: Press up to resume or increase cruising speed

Set Cruising Speed button: Press down to set or decrease Cruising Speed

[G] Cruise Control CANCEL button: To cancel Cruise Control, do one of the following:

- Press the brake pedal
- Press the CANCEL button [G]

QUICK TIPS

- Cruise Control is designed to function above 25 mph
- The Cruise Control system will not activate until the brake pedal has been depressed at least once after ignition ON or engine start

NAVIGATION HEAD UNIT AND SD CARD COMPATIBILITY

This article provides information in regards to possible compatibility issues between navigation head units and SD cards when replacing head units for multimedia issues. If after replacing a navigation head unit the original SD card does not operate correctly, follow the steps below to diagnose the issue:

1. Confirm the replacement head unit part number matches the original head unit part number.

2. Check the software version on the replacement head unit. This information can be found by selecting SETUP > System Info or Software Update.

3. Check the SD card part number to ensure the software version and SD card are compatible. Access the link below and refer to the "SD Card Version Information" table to confirm compatibility.
http://www.kia-gpsmap.us/sdmatrix

NOTE: SD Cards should NOT be ordered and are NOT warrantable in these cases.

4. If you have received a head unit with software that is not listed on the SD Card Version Information table or is NOT compatible with the customer's SD Card, open a Techline case.

Please refer to Pitstop PS 387

MLA ADJUSTMENT OVERVIEW

In this article we will discuss how to properly adjust Mechanical Lash Adjusters (MLA). Kia usually specifies valve check/adjustment intervals at 60,000 miles on vehicles equipped with MLA's; in this example a 2009 Kia Spectra with the 2.0 Liter engine will be used. Before beginning the valve check procedure you should have the specification for the valves you are checking handy. Here are the specifications for our example vehicle. Note the temperatures for inspection. We'll use the cold Specification.

VALVE CLEARANCE SPECIFICATIONS:

Engine coolant temperature: 20°C ± 5°C [68°F ± 9°F]
Intake: 0.20mm (0.0079in.)
Exhaust: 0.28mm (0.0110in.)
Engine coolant temperature: 80°C [176°F]
Intake: 0.29mm (0.0114in.)
Exhaust: 0.34mm (0.0134in.)
Limit
Intake: 0.17 ~ 0.23mm (0.0067 ~ 0.091in.)
Exhaust: 0.25 ~ 0.31mm (0.0098 ~ 0.0122)

Begin by putting the cylinder in question so that the Cam lobes are facing up. Then measure the clearance between the camshaft and the MLA with a feeler gage and note the measurement. It is important that you have the exact clearance, if out of specification, as you will refer to this later to make adjustments.

Valve clearance

Feeler gauge in inches and millimeters

For this example we are checking an intake valve with the specification of 0.20mm with a tolerance range of 0.17mm – 0.23mm. The valve clearance as measured is 0.32mm and is out of specification. We'll come back to this number later. In order to make an adjustment and bring the intake valve clearance back into tolerance, we must remove the shim using SST (09220 – 2D000).

SST (09220 – 2D000)

For the removal procedure let's refer to Step 1 through 5.

STEP 1
Place SST next to camshaft lobe and squeeze together.

STEP 2
Rotate tool until MLA is fully depressed then insert holding tool.

STEP 3
Position MLA holding tool flush with camshaft bearing assembly.

– Make sure holding tool is positioned on MLA and not the shim.

STEP 4
Using a pick or similar tool, remove the shim.

Once the shim is removed, measure its thickness with a micrometer. The chart on the next page is needed to make our calculation for the new shim to be installed. Looking at the valve adjustment chart provided in the Service Information for this vehicle (Figure 1), we must locate our measured valve clearance on the right side of the chart; our measurement in this example is 0.32mm as stated earlier.

CONTINUED NEXT PAGE

MLA ADJUSTMENT OVERVIEW (Continued)

Next, measure the shim removed from the intake valve that was out of spec, this example is 2.20mm. Looking at the top of the valve adjustment chart, you'll find the measured shim we removed, 2.20mm, outlined in red (Figure 1). Then follow left column and the top column for the measurements made and note where they intersect (arrows).

Valve Adjustment Shim Selection Chart (Intake)

Measured Clearance mm (in.) / Install Shim Thickness mm (in.)	2.00 (0.0787)	2.02 (0.0795)	2.04 (0.0803)	2.06 (0.0811)	2.08 (0.0819)	2.10 (0.0827)	2.11 (0.0831)	2.12 (0.0835)	2.13 (0.0839)	2.14 (0.0843)	2.15 (0.0846)	2.16 (0.0850)	2.17 (0.0854)	2.18 (0.0858)	2.19 (0.0862)	2.20 (0.0866)	2.21 (0.0870)	2.22 (0.0874)	2.23 (0.0878)	2.24 (0.0882)	2.25 (0.0886)	2.26 (0.0890)	2.27 (0.0894)	2.28 (0.0898)	2.29 (0.0902)	2.30 (0.0906)	2.31 (0.0909)	2.32 (0.0913)	2.33 (0.0917)	2.34 (0.0921)
0.000 - 0.020 (0.0000 - 0.0008)													1	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5
0.021 - 0.040 (0.0008 - 0.0016)											1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5
0.041 - 0.060 (0.0016 - 0.0024)									1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6
0.061 - 0.080 (0.0024 - 0.0031)							1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
0.081 - 0.100 (0.0032 - 0.0039)						1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7
0.101 - 0.119 (0.0040 - 0.0047)					1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6	7	7	7
0.120 - 0.280 (0.0047 - 0.0110)																														
0.281 - 0.300 (0.0111 - 0.0118)	3	4	4	5	5	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12
0.301 - 0.320 (0.0119 - 0.0126)	4	4	5	5	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12
0.321 - 0.340 (0.0126 - 0.0134)	4	5	5	6	6	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13
0.341 - 0.360 (0.0134 - 0.0142)	5	5	6	6	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13
0.361 - 0.380 (0.0142 - 0.0150)	5	6	6	7	7	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14
0.381 - 0.400 (0.0150 - 0.0157)	6	6	7	7	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14
0.401 - 0.420 (0.0158 - 0.0165)	6	7	7	8	8	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15
0.421 - 0.440 (0.0166 - 0.0173)	7	7	8	8	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15
0.441 - 0.460 (0.0174 - 0.0181)	7	8	8	9	9	10	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16
0.461 - 0.480 (0.0181 - 0.0189)	8	8	9	9	10	10	11	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16
0.481 - 0.500 (0.0189 - 0.0197)	8	9	9	10	10	11	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17
0.501 - 0.520 (0.0197 - 0.0205)	9	9	10	10	11	11	12	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17
0.521 - 0.540 (0.0205 - 0.0213)	9	10	10	11	11	12	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18
0.541 - 0.560 (0.0213 - 0.0220)	10	10	11	11	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18
0.561 - 0.580 (0.0221 - 0.0228)	10	11	11	12	12	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19
0.581 - 0.600 (0.0229 - 0.0236)	11	11	12	12	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19
0.601 - 0.620 (0.0237 - 0.0244)	11	12	12	13	13	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20
0.621 - 0.640 (0.0244 - 0.0252)	12	12	13	13	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20
0.641 - 0.660 (0.0252 - 0.0260)	12	13	13	14	14	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20		
0.661 - 0.680 (0.0260 - 0.0268)	13	13	14	14	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20				
0.681 - 0.700 (0.0268 - 0.0276)	13	14	14	15	15	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20						
0.701 - 0.720 (0.0276 - 0.0283)	14	14	15	15	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20								
0.721 - 0.740 (0.0284 - 0.0291)	14	15	15	16	16	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20										
0.741 - 0.760 (0.0292 - 0.0299)	15	15	16	16	17	17	18	18	18	18	19	19	19	19	20	20	20	20												
0.761 - 0.780 (0.0300 - 0.0307)	15	16	16	17	17	18	18	18	19	19	19	19	20	20	20	20														
0.781 - 0.800 (0.0307 - 0.0315)	16	16	17	17	18	18	19	19	19	19	20	20	20	20																
0.801 - 0.820 (0.0315 - 0.0323)	16	17	17	18	18	19	19	19	20	20	20	20																		
0.821 - 0.840 (0.0323 - 0.0331)	17	17	18	18	19	19	20	20	20	20																				
0.841 - 0.860 (0.0331 - 0.0339)	17	18	18	19	19	20	20	20																						
0.861 - 0.880 (0.0339 - 0.0346)	18	18	19	19	20	20																								
0.881 - 0.900 (0.0347 - 0.0354)	18	19	19	20	20																									
0.901 - 0.920 (0.0355 - 0.0362)	19	19	20	20																										
0.921 - 0.940 (0.0363 - 0.0370)	19	20	20																											
0.941 - 0.960 (0.0370 - 0.0378)	20	20																												
0.961 - 0.980 (0.0378 - 0.0386)	20																													

Measured Clearance mm (in.) / Install Shim Thickness mm (in.)	2.35 (0.0925)	2.36 (0.0929)	2.37 (0.0933)	2.38 (0.0937)	2.39 (0.0941)	2.40 (0.0945)	2.41 (0.0949)	2.42 (0.0953)	2.43 (0.0957)	2.44 (0.0961)	2.45 (0.0965)	2.46 (0.0969)	2.47 (0.0972)	2.48 (0.0976)	2.49 (0.0980)	2.50 (0.0984)	2.51 (0.0988)	2.52 (0.0992)	2.53 (0.0996)	2.54 (0.1000)	2.56 (0.1008)	2.58 (0.1016)	2.60 (0.1024)	2.62 (0.1031)	2.64 (0.1039)	2.66 (0.1047)	2.68 (0.1055)	2.70 (0.1063)	2.72 (0.1071)	2.74 (0.1079)	2.76 (0.1087)
0.000 - 0.020 (0.0000 - 0.0008)	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	11	11	12	12	13	13	14	14	15	15
0.021 - 0.040 (0.0008 - 0.0016)	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	12	12	13	13	14	14	15	15	16
0.041 - 0.060 (0.0016 - 0.0024)	6	6	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	12	12	13	13	14	14	15	15	16	16
0.061 - 0.080 (0.0024 - 0.0031)	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	13	13	14	14	15	15	16	16	17
0.081 - 0.100 (0.0032 - 0.0039)	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	13	13	14	14	15	15	16	16	17	17
0.101 - 0.119 (0.0040 - 0.0047)	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	13	13	14	14	15	15	16	16	17	17	18
0.120 - 0.280 (0.0047 - 0.0110)																															
0.281 - 0.300 (0.0111 - 0.0118)	12	12	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	18	18	19	19	20	20				
0.301 - 0.320 (0.0119 - 0.0126)	13	13	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	19	19	20	20					
0.321 - 0.340 (0.0126 - 0.0134)	13	13	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	19	19	20	20						
0.341 - 0.360 (0.0134 - 0.0142)	14	14	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	20	20							
0.361 - 0.380 (0.0142 - 0.0150)	14	14	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	20	20								
0.381 - 0.400 (0.0150 - 0.0157)	15	15	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20									
0.401 - 0.420 (0.0158 - 0.0165)	15	15	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20										
0.421 - 0.440 (0.0166 - 0.0173)	16	16	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20											
0.441 - 0.460 (0.0174 - 0.0181)	16	16	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20													
0.461 - 0.480 (0.0181 - 0.0189)	17	17	17	17	18	18	18	18	19	19	19	19	20	20	20	20															
0.481 - 0.500 (0.0189 - 0.0197)	17	17	18	18	18	18	19	19	19	19	20	20	20	20																	
0.501 - 0.520 (0.0197 - 0.0205)	18	18	18	18	19	19	19	19	20	20	20	20																			
0.521 - 0.540 (0.0205 - 0.0213)	18	18	19	19	19	19	20	20	20	20																					
0.541 - 0.560 (0.0213 - 0.0220)	19	19	19	19	20	20	20	20																							
0.561 - 0.580 (0.0221 - 0.0228)	19	19	20	20	20	20																									
0.581 - 0.600 (0.0229 - 0.0236)	20	20	20	20																											
0.601 - 0.620 (0.0237 - 0.0244)	20	20																													
0.621 - 0.640 (0.0244 - 0.0252)																															
0.641 - 0.660 (0.0252 - 0.0260)																															
0.661 - 0.680 (0.0260 - 0.0268)																															
0.681 - 0.700 (0.0268 - 0.0276)																															
0.701 - 0.720 (0.0276 - 0.0283)																															
0.721 - 0.740 (0.0284 - 0.0291)																															
0.741 - 0.760 (0.0292 - 0.0299)																															
0.761 - 0.780 (0.0300 - 0.0307)																															
0.781 - 0.800 (0.0307 - 0.0315)																															
0.801 - 0.820 (0.0315 - 0.0323)																															
0.821 - 0.840 (0.0323 - 0.0331)																															
0.841 - 0.860 (0.0331 - 0.0339)																															
0.861 - 0.880 (0.0339 - 0.0346)																															
0.881 - 0.900 (0.0347 - 0.0354)																															
0.901 - 0.920 (0.0355 - 0.0362)																															
0.921 - 0.940 (0.0363 - 0.0370)																															
0.941 - 0.960 (0.0370 - 0.0378)																															
0.961 - 0.980 (0.0378 - 0.0386)																															

New Shim Thickness mm (in.)

Shim No.	Thickness	Shim No.	Thickness
1	2.00 (0.0787)	11	2.40 (0.0945)
2	2.04 (0.0803)	12	2.44 (0.0961)
3	2.08 (0.0819)	13	2.48 (0.0976)
4	2.12 (0.0835)	14	2.52 (0.0992)
5	2.16 (0.0850)	15	2.56 (0.1008)
6	2.20 (0.0866)	16	2.60 (0.1024)
7	2.24 (0.0882)	17	2.64 (0.1039)
8	2.28 (0.0898)	18	2.68 (0.1055)
9	2.32 (0.0913)	19	2.72 (0.1071)
10	2.36 (0.0929)	20	2.76 (0.1087)

HINT: New shims have the thickness in millimeters imprinted on the face.

Intake valve clearance (Cold): 0.20 mm (0.0079")
Limit = 0.17 ~ 0.23mm (0.0067" ~ 0.091")

Example: The 2.24 mm shim is installed, and the measured clearance is 0.450 mm.
Replace the 2.24 mm shim with a new No. 13 shim.

Kia University

Figure 1

The number **9** refers to the shim needed to bring our intake valve back into specification, in this example a 2.32mm shim as shown on the lower right of figure 2. With this shim installed, our Intake valve clearance should be approximately .20mm, right in the middle of the tolerance range.

Another method to determine the correct shim to install after making a clearance inspection is to follow this formula provided in service information (shown on the right).

T: Thickness of removed shim

A: Measured valve clearance

N: Thickness of new shim

Intake: N = T + [A – 0.20mm (0.0079in.)]

Exhaust: N = T + [A–0.28mm (0.0110in.)]

Here's what our example looks like with the numbers plugged in:

T: 2.20 (removed shim)

A: 0.32mm (measured clearance)

2.20 + (0.32 – 0.20) **Note: 0.20 is the intake valve clearance specification in mm.**

2.32 = 2.20 + 0.12

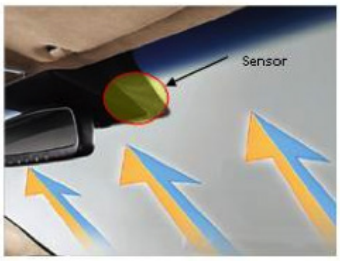
N: 2.32mm (thickness of new shim)

As you can see, we arrived at the same conclusion regardless of what calculation method used.

Whichever method you choose, always recheck the valve clearance once the new shim is installed to avoid a potential dissatisfied customer. Refer to Service Information for the subject vehicle.

KIA AUTOMATIC DEFOG SYSTEM

During the 2014 Model Year, KIA introduced an Automatic Defog feature on models fitted with Dual Automatic Temperature Control (DATC) systems such as Cadenza, Optima, Sorento and 2015-onwards models such as K900, Soul, Forte and Sedona. The system automatically removes moisture from the windshield plus it controls humidity levels inside the cabin for maximum visibility and comfort.

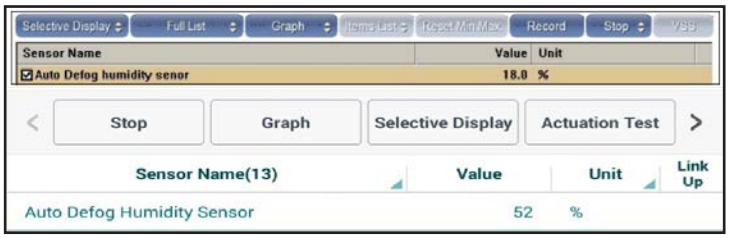


(Vehicle without Auto Defogging System)

(Vehicle with Auto Defogging System)

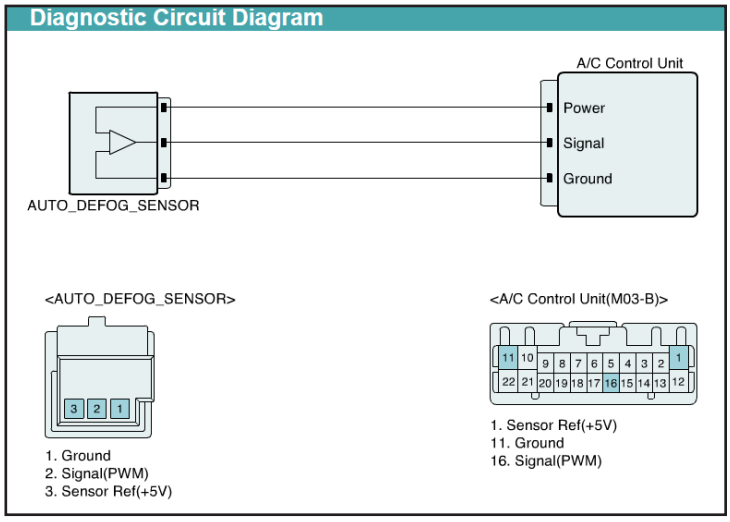
(Fig. 1)

The vehicle's climate control system is fitted with a defogging control logic that directs airflow to the windshield at the right temperature to remove moisture (Fig. 1). The system uses a humidity sensor (attached to the windshield) to detect moisture levels around the windshield area and automatically activates the A/C system to defog the windshield without the driver having to press a button.



(Fig. 2)

The humidity sensor detects the dew point by measuring humidity changes in the air around the windshield and cabin areas. The sensor is calibrated to measure humidity levels of < ± 2% of Relative Humidity (RH), and it outputs a Pulse Width Modulated (PWM) signal to the climate control module which can be monitored using GDS or KDS current data (Fig.2)



(Fig. 3)

The humidity sensor operation can be tested by checking the sensor reference 5 volt supply and the sensor ground as shown above (Fig. 3) using a 2014 Cadenza. In addition, the sensor signal (PWM) can be checked by increasing or decreasing the humidity levels around sensor and monitoring the results in GDS/KDS current data and comparing the readings to specifications outlined in the vehicle's shop/repair manual.

(Fig. 4)

The Auto Defogging system operates when heater or air conditioning system are turned on.

An indicator in the climate control display (Fig 4) illuminates when the Auto Defogging system senses high levels of moisture around the windshield area and begins to operate.

If high levels of moisture are detected in the cabin, the Climate Control System begins removing the moisture performing a series of automated steps, i.e., steps 1 through 4. If Auto Defogging does not defog the windows with step 1 – outside air position, step 2 – operating the air conditioning occurs, followed by steps 3 & 4, or until moisture levels are reduced.

Step 1 : Outside air position
Step 2 : Operating the air conditioning
Step 3 : Directing air toward the windshield
Step 4 : Increasing air flow toward the windshield

The Auto Defogging system is automatically activated when specific conditions are met. However, should the driver choose to cancel the Auto Defogging operation the vehicle's owner's manual provides detailed instructions on how to cancel Auto Defog operation.

One final note, if the battery has been disconnected or discharged, the climate control system resets to the Automatic Defogging operation.

UVO ESERVICES W/PREMIUM NAVIGATION (AVN 4.0) FUNCTIONALITY AND USE OF USB CABLE

For customer complaints on UVO eServices w/Premium Navigation (AVN 4.0) equipped vehicles regarding the following concerns:

- Unable to Activate eServices or unable to send data from head unit
- Message "The connected device does not support UVO eServices features" displaying on the head unit screen.
- Or, in some cases, after recently applying TSB ELE 066 to the 2014MY Soul (PS) to add eServices functionality.

To address the above concerns, make sure the customer is aware that AVN 4.0 platforms require a USB cable connection to the phone in order to activate eServices and utilize its features.

The models listed below are equipped with the latest version of AVN 4.0:

2014MY Soul (PS) – After TSB Electrical 066 has been applied
2015MY Soul (PS)
2015MY Optima (QF/TF)
2015MY Optima Hybrid (TF HEV)
2015MY Sedona (YP)
2016MY Sorento (UMa)

NOTE: UVO eServices w/Navigation (AVN 3.0) and UVO eServices (UVO2) platforms require that the phone be connected to Bluetooth ONLY to enable UVO eServices functionality. Consult the appropriate navigation guide and UVO eServices guides for additional information regarding the UVO eServices features.

Please refer to PitStop PS 402

TEST YOUR TECH TIMES KNOWLEDGE SOLUTIONS

F	I	X		R	I	G	H	T		F	I	R	S	T		T	I	M	E
7	6	17		4	5	11	10	3		2	9	14	16	13		12	1	15	8

Secret Phrase – Clue: *"It's our goal"*

1. HUMIDITY
2. DEFOGGING
3. BATTERY
4. THICKNESS
5. FORWARD
6. TRANSIENT
7. INJECTOR
8. COMMUNICATION
9. REGENERATIVE
10. DEGRADATION
11. CAPACITY
12. KDEALER
13. ESERVICES
14. ATTACHMENT
15. DISTANCE
16. STEERING
17. PROXIMITY

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