



TECH TIMES

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MAHLE R1234yf REFRIGERANT RECLAIM A/C MACHINE OVERVIEW

In March 2016 Kia introduced the Mahle ACX1299 to service all new Kia vehicles equipped with R1234yf refrigerant systems (refer to TSB CLI 029).

The Mahle ACX1299 A/C machine is the next generation of A/C equipment featuring the Mahle ArticPro TechPro diagnostic software, which includes Wi-Fi, wireless Bluetooth VCI connectivity, and a 7" LCD touch screen making navigation through A/C services quick and easy. The machine also features onboard diagnostic information to help find answers to common A/C problems and diagrams/pictures such as A/C ports location.

The ACX1299 walks the user through each of the steps of the auto recovery/ recharge process including:

1. Connect the VCI: Reads the vehicle VIN and determines the amount of refrigerant required.
2. Refrigerant identification: a small sample of refrigerant is taken from the vehicle to verify R1234yf is in the vehicle to avoid contamination.
3. Refrigerant recovery: a vacuum is applied and all refrigerant is recovered from the vehicle.
4. Refrigerant Pre-charge and test: the vehicle is loaded with 15% refrigerant charge which is held for a leak test. It will then ask the technician to perform a leak detection inside the vehicle with the provided refrigerant leak detector "refrigerant sniffer."
5. Refrigerant recharge: the machine will then create a system vacuum and charge the system with the required amount of refrigerant.



6. Oil purge: Occasionally the machine will perform an oil purge from the system during the auto recovery/ recharge.
7. Hose drain: the system automatically performs a hose drain following and sometimes prior to an A/C service.

The ACX1299 is easily field serviceable and can be accessed remotely by Mahle technicians to perform software troubleshooting. In the coming months a companion application will be launched that will mirror the processes happening on the ACX1299 and provide alerts when input or intervention is needed from the technician. This feature will give technicians the freedom to work on other things while still keeping an eye on the machine performing A/C service. To work with this new refrigerant you need to be trained and certified by an EPA organization. You can receive your Certification Training for Refrigerant Recovery and Recycling review (Section 609 program) training from ASE (ASE.com) or MACS (macsw.org).

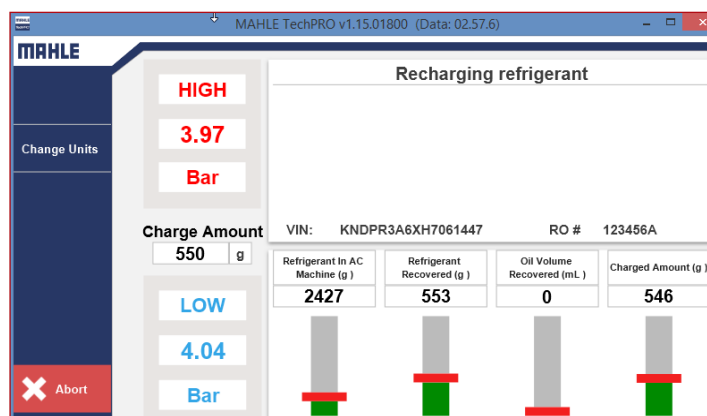


Image shows A/C System recharging refrigerant.

TECHLINE FAQs

Q

I am unable to duplicate the customer's concern. What should I do?

A

No repair attempts should be made prior to duplicating the customer's concern. Techline cases are opened where there is no duplication of the concern but the technician has for example already added Stabilant to the connectors or tightened the gas cap for EVAP codes then proceeded to try and duplicate the customer's concern. Often, these simple steps will have corrected the concern and the technicians are often looking for a problem that has already been repaired.

Q

My PWA case just disappeared from my case list. Do I need to open up another one?

A

No. Techline agents must close your PWA case to send the PWA approval. If you check your messages from your email that you have associated with your KU profile, you should see an email message from Techline stating the case was either approved or denied. We often hear from technicians telling us they did not get an email notification. Make sure the email address in your KU profile is up to date and update it if necessary. All emails/responses from Techline will go to the email address you have in your KU profile.

Q

The TPMS light is flashing after installing a new TPMS module and completing all the programming steps. Why?

A

The issue is one of the steps is missing and it is only for TRW TPMS sensors. The step that needs to be completed is changing the TPMS module from a Virgin state to a Normal state. Go into S/W management and then go into TPMS mode configuration. Change the module from Virgin state to Normal state. Please note that this process should be done after writing the sensor IDs and adding the vehicle name.

Q

Techline referenced a Tech Times article but when I look in KGIS the issue is not listed.

A

Hit the reset button to clear the vehicle data from the search window and all Tech Times articles will be listed.

LATEST TECHNICAL SERVICE BULLETINS, SERVICE ACTIONS AND CAMPAIGNS

ELE 103	Service Action: Start Stop Button (SSB) Inspection and Replacement (2015MY KH)
BOD 136	Service Action: Door Latch Replacement (2017MY QL)
SC 130	Multi-Function Switch Replacement (2015 - 2016MY KH)
TRA 059	HCU/TCU Upgrade - For 100 Mesh Solenoid Equipped Hybrid Transmissions (2011-2016MY TFH)
CHA 066	Front Stabilizer Link Replacement (Multiple Models)
ELE 104	Apple CarPlay Roll Out and Troubleshooting Guide (2016MY JFa, 2017MY QL, UMa)
SC 131	Driver's Frontal Airbag Module Replacement (2016MY JFa)
ELE 100r2	Combination TSB/SA: UVO System Upgrade (SA222r2) (2014-2016MY PS, XMa, TF/QF, YD, SL)



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.

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Director, Kia University
David Wobst

Tech Times Editor
Lewis Thompson

Production Coordinator
Carlos Sicairos

Tech Times Contributors

Barry Nelson

Tony Cartagena

Carlos Sicairos

Joe Alt

Dan Algarin

Sujith Somasekharan

Robert Scholer

Shari Brady

Mark Ramsey Adam

Pisz

Joe Perez



Technical Editors

Neem Van der Reest

Lewis Thompson

Engineering Support &
Technical Writer

Neem Van der Reest

Technical Writer

Mario Garcia

KIA UNIVERSITY

CURRENT NEWS

NEW COURSE LAUNCHES

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

SPRING 2016 SERVICE TECHNICAL UPDATE TEST

Code: TEC-04-058-1

Service Technicians need the latest and most current information to increase productivity and fix it right the first time performance. This will ultimately 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 18 Issue 4
- Tech Times Volume 18 Issue 5
- Tech Times Volume 18 Issue 6
- Technical Service Bulletins and Pitstops released June 2015 thru December 2015

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

2ND QUARTER TECHNICIAN SATISFACTION SURVEY RAFFLE

Greetings Kia Technicians!!

In an ongoing effort to continue increasing Technician Satisfaction Survey responses and continue to gain valuable feedback from our technicians on their Techline experiences, Kia Techline has brought back the Technician Satisfaction Survey Raffle! The 2016 Quarter 2 raffle opened on April 1, 2016 and will end on June 30, 2016. Winners will be notified via email and phone call in the first week of July 2016. As in previous raffles, all Kia dealer technicians will have a chance at winning 1 of 3 \$500 MasterCard gift cards each time he/she closes their Techline Repair Assistance (RA) case and completes the Technician Satisfaction Survey.

We had a very strong turnout the last two raffles in quarter 3 and quarter 4 of 2015 with over 10,000 responses received within 6 months! Thank you all for your valuable feedback! The overall results for Techline were very positive with the overall satisfaction rating for Techline at 88% (in 2015) using a 1 to 5 point scoring system where only a score of 5 counts. Anything less than 5 is considered a failure. We would like to keep the momentum going, so future raffles will continue each quarter throughout 2016!

Please submit your feedback by completing the Technician Satisfaction Survey when you close your cases and get your chance to win some cash!

Kia Techline continuously works hard to provide industry leading technical support to all Kia dealers in an efficient manner. Here are the latest performance metrics for Kia Techline:

Web case response time avg: 16 minutes

PWA case response time avg: 9 minutes

Phone response time avg: 12 seconds

Comeback Ratio: 0.6%

New Case Count (includes PWA cases):
33,967 as of 5/23/2016

Overall Satisfaction Survey Score
(Only a score of 5 counts): 92%

Thank you all for your continued support!!

Go Kia!!!

Regards,

Tony Cartagena
Techline Communications Manager
Kia Motors America

2016 KIA SKILLS WORLD CUP

GOING FOR THE GOLD!

The time has come for the Kia Skill World Cup competition in Seoul, South Korea the week of May 23rd 2016. All four Kia Skill National Cup winners are packed and ready to go. We are proud to support these talented technicians. Please join us in congratulating and wishing luck to these extraordinary technicians. Let's bring home the Gold. Go Team USA!

Stay tuned for a special Tech Times edition to see the results of the 2016 Kia Skill World Cup.



Kia Skill National Cup winners (left to right): Jason Powell Derek Eveler Gregory Dubs Ben Hendricks

KIA UNIVERSITY

2016 TECHNICIAN SATISFACTION SURVEY

This summer, Kia University will launch our annual Technician Satisfaction Survey. We recognize this is one of your busiest times of the year, but we have retooled the survey and it now has fewer questions. The new survey focuses on GDS/KDS and KGIS, and should only take about 5-10 minutes to complete.

It's important that we receive your honest opinions about GDS/KDS and KGIS. We encourage you to tell us how we're doing so we can improve our service to you. Remember, this survey is completely confidential. Thank you for participating in the survey, and we look forward to your feedback.



☒	_____
☐	_____
☐	_____

JOE'S CORNER DON'T LET THE LIGHTS GO OUT (PARASITIC DRAW)

How do you know if a vehicle has excessive parasitic draw?

The tried and true method is to place an ammeter between the negative battery post and the negative battery cable and measure the current flow.



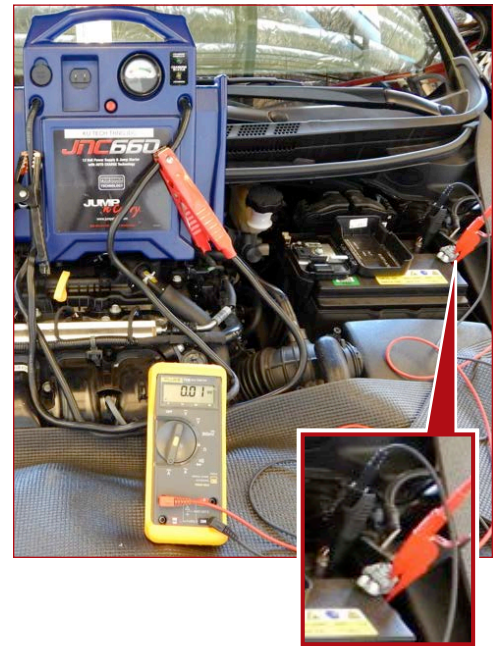
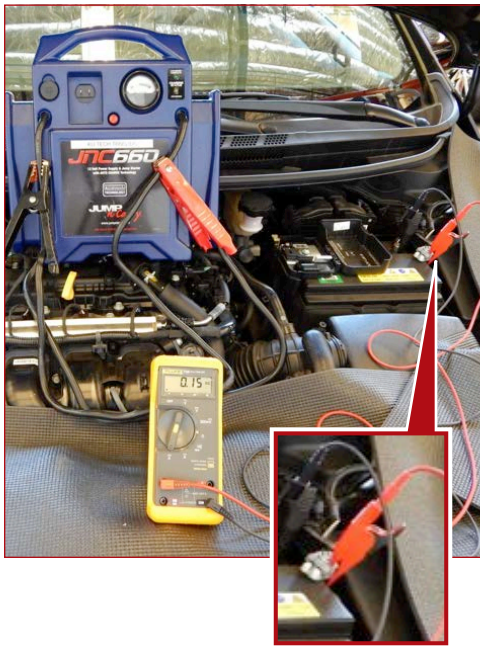
Check the fuse in your ammeter!

A quick way to check the fuse:

- Set the DVOM to measure 10 amps
- Connect a good 1.5V AA or AAA battery in series
- A good battery with a good fuse will measure typically between one (1) and four (4) amps

To test for excessive parasitic draw:

- Disconnect the hood switch for the alarm system (if equipped)
- Leave the hood open
- If the battery is in the trunk, also leave the trunk open
- Roll down the driver's window
- Turn the ignition OFF
- Remove the key/FOB and place it several feet away (to ensure that the key/FOB and the Smart Key Module do not communicate and wake up any of the systems.)



- Use the 10 amp setting, it will allow you to measure down to 10 mA. (50 mA on most displays will read as 0.05 A).

So how do you keep everything alive while disconnecting the negative battery cable?

If the battery is up front:

- Connect a jumper box (not a battery charger) to the positive battery cable and the engine block or head

If the battery is in the trunk:

- Connect the jumper box to the positive and negative charging ports under the hood (if equipped)
- Remove the negative battery cable and connect your ammeter in series
- Allow the vehicle to sit undisturbed for 20 minutes
- Disconnect the jumper box and read the value on the meter

- An amperage draw greater than 50 mA after the 20 minutes indicates something is not shutting down or shutting off.

In my next issue, I will deal with coolant (what happens in coolant, stays in coolant!)

Kia first introduced the High Beam Assist (HBA) feature on the 2015MY Sedona. It is available on models fitted with Lane Departure Warning System (LDWS) such as the 2016MY Optima and 2017MY Sportage. The HBA system automatically adjusts the headlamps lighting range (switching between High & Low beam) according to the headlamp and/or tail lamp brightness of other vehicles, plus road conditions such as street lighting.

The system uses the Lane Departure Warning System (LDWS) camera to monitor ambient light brightness and traffic conditions, and can detect the headlights of approaching vehicles up to a distance of approximately 3000 feet and the rear lights of vehicles ahead up to a distance of approximately 1,600 feet (See Fig. 1).

The HBA system switches the headlights from high beam to low beam automatically. As soon as other vehicles are no longer in danger of being overwhelmed by the bright high beams, the system automatically switches from low beam to

high beam again. The system also automatically switches to low beam when the vehicle enters an area with a relatively high amount of street lighting.

HBA requires a few conditions in order for the system to operate.

First, the light switch needs to be in the AUTO position and the multi-function switch lever needs to be pushed away from the driver to the High Beam position. The system needs to travel at 25mph to become active. At this point the green-colored HBA assist indicator (See Fig. 2), will illuminate.



Fig. 2. HBA indicator

Once active, the HBA system automatically switches to Low beam in any conditions such as when the head lamps from an oncoming vehicle are detected or the tail lamps from a vehicle in front are detected. When lighting from other vehicles such as motorcycles or bicycles is detected, or when street or road lighting is detected and high beam is not necessary. Finally, the system stops operating and defaults to low beam when vehicle speed drops below 19 mph.

If the HBA system encounters an error or malfunction (e.g., a burned out bulb), the system will display a warning message in the instrument cluster message center (See Fig. 3).

Since the HBA operation is primarily controlled by the LDWS system (see Fig. 4), all diagnostics procedures and diagnostic trouble codes (DTCs) can be found under the LDWS shop manual section. HBA system Electrical wiring schematics can be found under LDWS and Auto Lights systems.

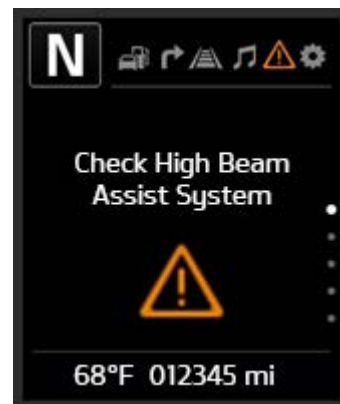


Fig. 3. HBA Malfunction Message



Fig. 1. HBA System operation

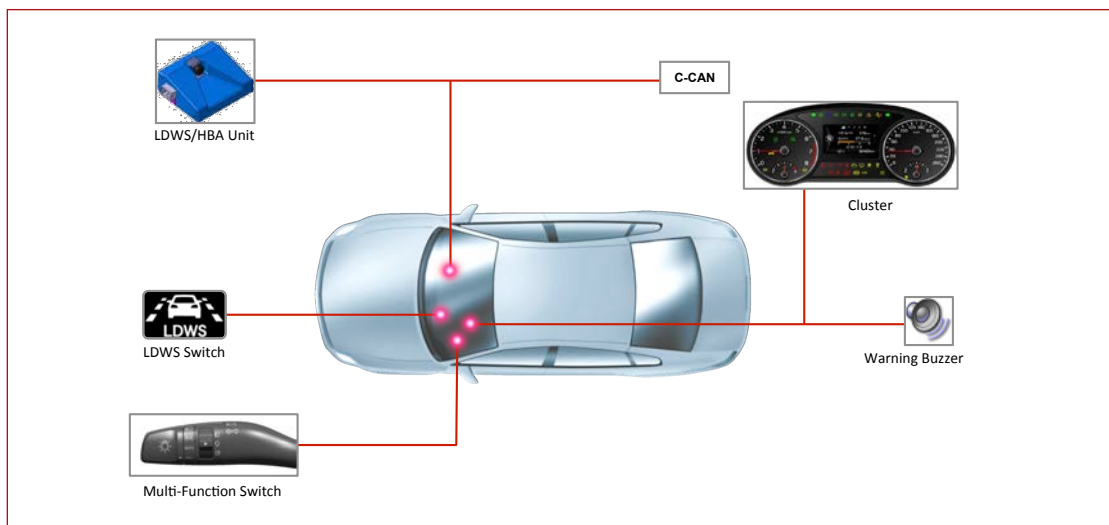
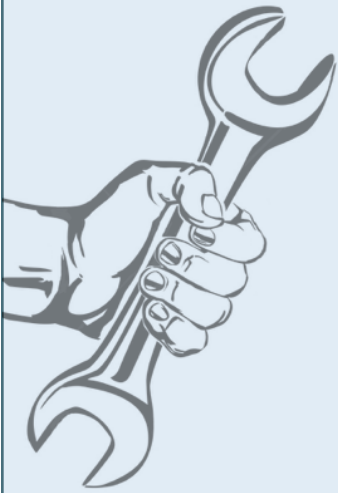


Fig. 4. Lane Departure System (LDWS) & High Beam Assist (HBA) System Diagram

TEST YOUR TECH TIMES KNOWLEDGE

Test your knowledge of the articles in this issue of Tech Times. This edition of Word Scramble maybe slightly more challenging. Unscramble all the words below to reveal the secret phrase.



1. FNETIARRERG _____ (Page 7)

2. ERMPEAGA _____ (Page 4)

3. NGIACDSTOI _____ (Page 1)

4. TTIACAISNF SO _____ (Page 3)

5. MOIRAYPLPTXEA _____ (Page 5)

6. BAME _____ (Page 5)

7. SNLIOOCLI _____ (Page 7)

8. RATEBCK _____ (Page 8)

9. TCAEMENNINA _____ (Page 9)

10. RLPCAYA _____ (Page 10)

11. EIUGD _____ (Page 11)

12. CUCIRIT _____ (Page 12)

13. ECCITRITIOANF _____ (Page 3)

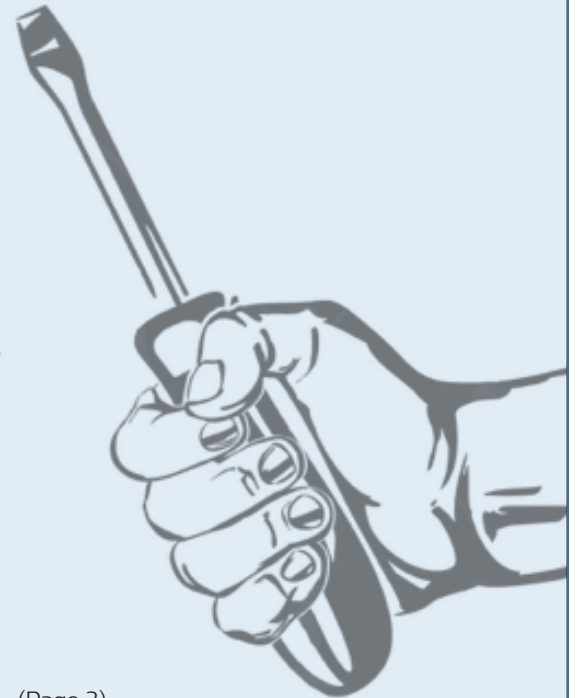
14. TIEEBNF _____ (Page 12)

15. RNPIRTWEOA _____ (Page 12)

16. GRNATIIN _____ (Page 1)

17. SFEU _____ (Page 4)

18. POETERAVA _____ (Page 7)



The All-New
2017 Sportage is...

Answers are on page 13

SOUL FORWARD COLLISION WARNING (FCW) INDICATOR

FORWARD COLLISION WARNING (FCW) INDICATOR ILLUMINATED ON CLUSTER WITHOUT DTC(S)

On some 2016MY Soul (PS) vehicles, you may see a Forward Collision Warning (FCW) indicator may appear on the instrument cluster with no DTC's present (Fig. 1). This condition may be caused by incorrect/lost variant coding of the Lane Departure Warning System (LDWS) camera, or when replacing with a new camera. Follow the procedure outlined below to resolve the concern.

Service Procedure:

1. Use KDS/GDS to access the LDWS Camera Variant Coding screen.
2. Enter the values shown below to correctly code the camera.

Please refer to Pit Stop PS 447.

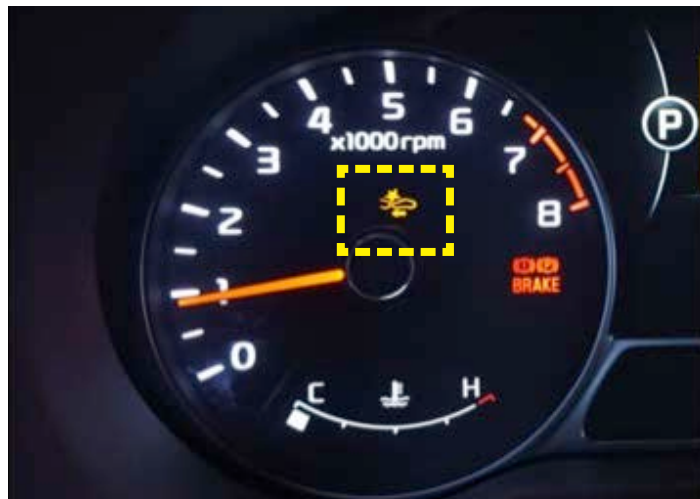


Fig. 1. The FCW warning indicator

ITEM	SETTING VALUE
Vehicle Code:	Default
Country Code:	North America
Left/Right Hand Drive:	LHD
Transmission Type:	Automatic
HBA Option:	NONE
LKAS/LDWS Option:	LDWS
Vehicle Body Type:	NONE
SLIF Option:	NONE
FCW/AEB Option:	FCWS (Camera Only)
Attention Assist:	NONE

WHAT IS THE EFFECT OF TIME AND TEMPERATURE DURING REFRIGERANT RECOVERY?

With the introduction of the R1234yf refrigerant and the cost involved, it is important to ensure as much as possible R1234yf refrigerant is removed during recovery. As refrigerant is being evacuated from a vehicle's A/C system, the pressure in the system drops. The vaporizing refrigerant pulls heat away from the A/C system, lowering the liquid refrigerant temperature. Liquid refrigerant can be encapsulated in the oil and can settle into pockets of the A/C system. It can be very difficult to fully remove all of the refrigerant.

To overcome this effect, heat and time are on your side. By running the engine and warming up the engine compartment, more refrigerant can be vaporized and removed. Lowering the hood will also help to hold the heat in the engine compartment. Use caution to keep the service hoses away from belts, fans and sharp edges. Without the help of heat, the A/C Recovery Equipment will leave some refrigerant in the system, which will escape into the atmosphere or be evacuated during the vacuum process.

If the A/C system has been opened to replace a part, moisture will have entered the system. If not removed, the moisture could form ice in the expansion valve causing a lack of cooling.



By pulling a vacuum on the A/C system, the boiling point can be lowered enough to evaporate or boil off the moisture. With the A/C system under 29" of vacuum, the temperature would need to be above 75°F before vaporization will occur. Heat will also help (engine running, hood closed) to fully remove the moisture, especially in cooler weather. Because the amount of moisture is not known, the vacuum should be held for at least 30 minutes. It takes a combination of time, vacuum, and heat to completely boil the moisture out of the system. And additionally, the time vacuum is on a system should be increased as humidity rises.

SERVICE INTERVAL MINDER: INCREASE CUSTOMER SATISFACTION & VEHICLE LONGEVITY

A large majority of Kia models feature a Supervision or LCD cluster that offers the driver several customizable modes. One important mode is the Service Interval Reminder using the Service Mode feature.

Service Mode allows the driver to activate the Service Interval minder to display either "Mileage" displayed in either miles or kilometers, and time displayed in "days", or "Months" when the vehicle is due in for maintenance.

Once activated, the **"Service in"** message is displayed for a few seconds every time the **START/STOP** button is pressed to the ignition **ON** position (refer to Owner's Manual for specific vehicle)) (Fig. 1).

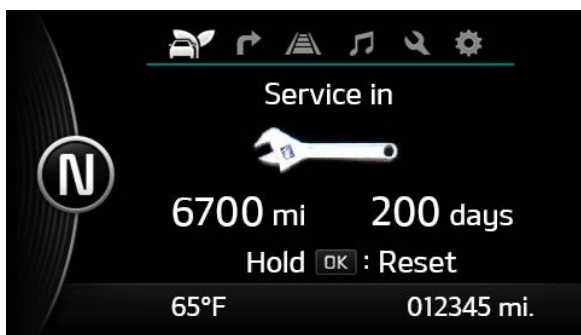


Fig. 1.
Service
Interval
Message

If the vehicle is not serviced according to the entered service interval, a **"Service Required"** message then appears for a few seconds every time the **START/STOP** button is pressed to the ignition **ON** position (See Fig. 2).

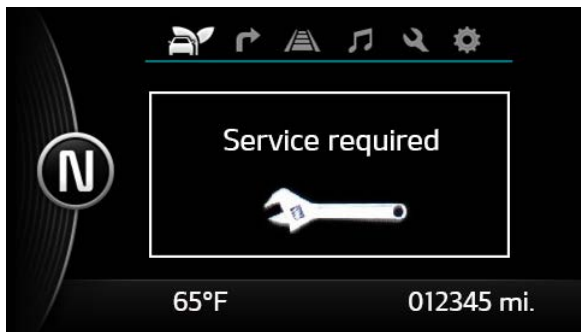


Fig. 2.
Service
Interval
Past Due
display

To reset the Service required message, press the **RESET** button for more than a second.

To enter Service Mode, press the **MODE** button located on the steering wheel until the **Vehicle Service Mode Symbol** is displayed (this varies by model; e.g. on 2015–2016MY Sedona, it is under "User Settings"). The system will display one of two messages: **"Service In OFF"** (Fig. 3) or the number of miles or months/days remaining until the next service is due.

During maintenance service, make it a habit to check and reset the Service Interval minder to keep Kia owners aware of their vehicles' needs (Fig. 4).

Finally, always take advantage of any opportunity during maintenance appointments to advise your customers about proper Kia vehicle maintenance service.

Consider explaining to your customers that the Service Interval minder works more like the **"Low-Fuel"** warning indicator, where it's the longest you possibly can go without service before risking problems that could stem from vehicle maintenance neglect. If you're in the habit of resetting the minder properly at your dealer's 7,500, 15,000, 22,500, 30,000, (turbo equipped requires other intervals) etc. mile maintenance intervals, your regular customers should always see the display showing **"Service in XXXXX"**.

LCD Control Steering Wheel Buttons (2015 Optima shown)

1. Mode Button
2. Move Up/Down
3. OK : Select/Reset Button

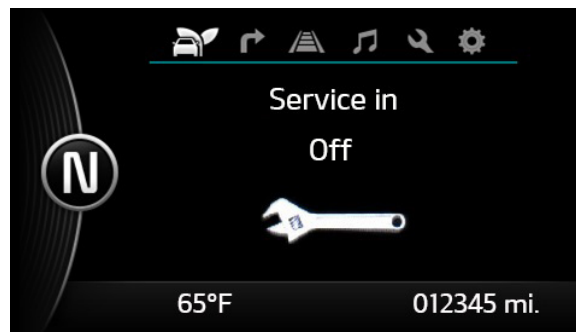


Fig. 3. Service Minder OFF Display

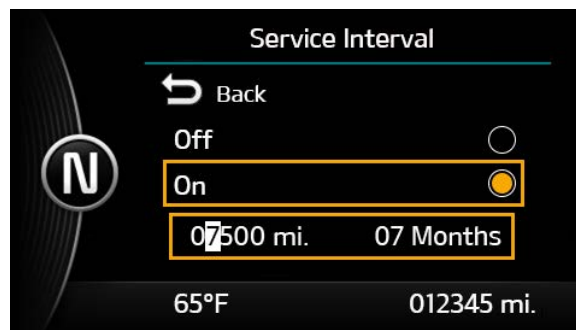


Fig. 4. Activating the Service Interval Minder and entering mileage or time to next service

PITSTOP

APPLE CAR PLAY OVERVIEW



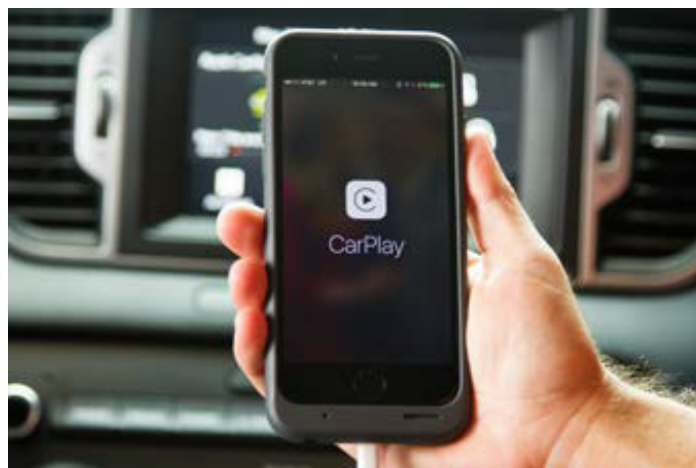
Apple CarPlay has launched as a running change on 2017MY Sorento, Optima and Sportage for the Premium navigation and UVO eServices head units. Apple CarPlay allows the head unit screen to display and access certain apps that are installed on the customer's iPhone device. Apple

CarPlay is part of the iPhone OS for all iPhone 5 or higher running iOS 8.2 or higher (it is not a separate app that must be downloaded). Apple CarPlay connects to the head unit only via the USB connection (Bluetooth is disconnected) and once recognized, displays the CarPlay menu (home screen).

FEATURES

Apple CarPlay displays and allows control of CarPlay compatible apps installed on the user's iPhone on to the Head Unit touch screen (Fig. 1.). Shown here is a typical layout with Phone, Music, Maps and Messages on the top line. On the second line the Kia Icon returns the user to the Head Unit Home screen and the other app icons depend on what apps are installed on the user's iPhone. This includes compatible Apple apps, such as: Phone, Music, Maps, iMessage, iBooks and Podcasts. Also available are a number of popular third-party apps: iHeartRadio, At Bat, Spotify, Pandora and more. If more than six compatible CarPlay apps are installed they can be accessed by swiping left on the screen.

The icon in the lower left of the screen (Fig. 1.) is the Apple CarPlay Home button ¹ used to return to this screen from open apps and if held down it launches Siri for voice communication. The Push to Talk button on the steering



wheel allows accessing Siri for voice recognition while CarPlay is running. Siri has the same limitations as it does on the iPhone. It can control native iPhone apps like Phone, Maps, Messages and Music, but can not control non-iPhone native applications.

Apps that are likely to be used while the vehicle is in motion are limited to Siri control for most functions. These include Phone, Music, Maps and Messages. Other apps have CarPlay modes that may only allow limited control or input. Volume control and other audio knobs will interface with Apple CarPlay apps however, not all steering wheel controls can be used in CarPlay mode.

The Kia icon ² on Fig. 1 returns the user to your Kia's native head unit environment outside of CarPlay. Kia specific apps will be accommodated here in the future as well.

(continued next page)

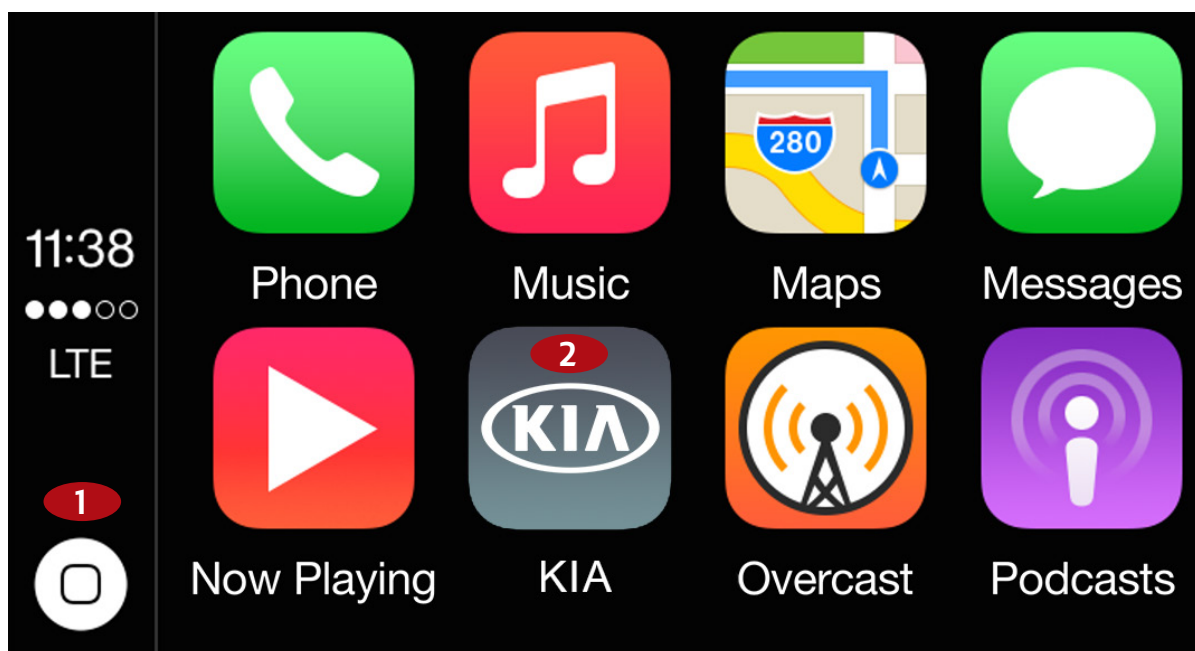


Fig. 1. Apple CarPlay Head Unit touch screen

PITSTOP

APPLE CAR PLAY OVERVIEW (CONTINUED)

SETTING UP CARPLAY

Before Connecting: Ensure iOS on phone and all Apps for CarPlay are up to date with the latest software versions.

1. From the Home screen on your vehicle, choose "Set up," then "Connectivity."
2. Select "Enable Apple CarPlay" (Fig. 5.) and accept all agreements on the phone or head unit for CarPlay.
3. Plug your compatible iPhone into the USB port in the console area (Fig. 4.) using an Apple lightning cable.
4. On the Home screen, select the "Apple CarPlay" icon. Your phone should display the CarPlay lock screen and all supported Apple CarPlay apps will appear on your vehicle's touchscreen.

To learn more about Apple CarPlay go to: apple.com/ios/carplay/

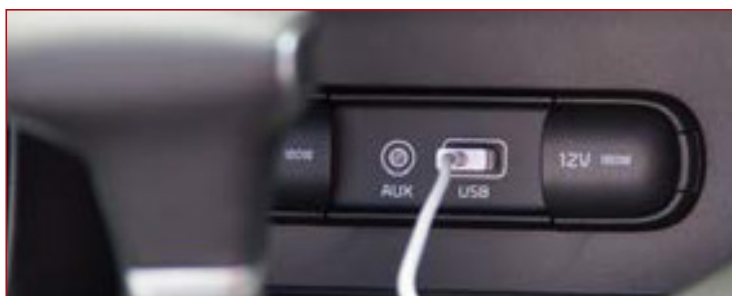


Fig. 4.



Fig. 5.

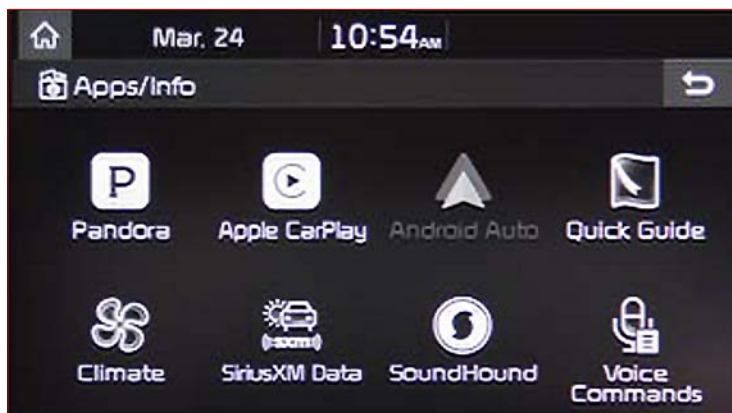


Fig. 6.

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in these materials. All information contained herein was accurate and correct at the time of publishing. From time to time, KMA may need to update or make changes to the Vehicle features and other vehicle information reported in this bulletin.

CARPLAY TROUBLESHOOTING GUIDE

Use of CarPlay is dependent on the iPhone and CarPlay. Issues can occur when using CarPlay that are caused by the iPhone or the Apple CarPlay feature. The head unit should NEVER be replaced for any of these concerns as the head unit is simply displaying what the iPhone sends to the head unit. The following concerns, and others not listed, may occur when a customer uses CarPlay:

- CarPlay fails to launch or reconnect
- Full black screen, partial black screen or blank screen
- Frozen screen
- Incorrect or incomplete information displayed
- Interruption in using Siri® (no response, no sound, black screen after using Siri)
- Intermittent connection

Sample basic troubleshooting concerns for CarPlay:

- Always confirm the iPhone is updated to latest iOS software.
- Confirm there is a strong coverage/data signal
- Disconnect cable, reconnect and ensure connection cable is seated properly in the iPhone and in the USB port. All phone/cable concerns should be handled by the customer/phone manufacturer.
- Try another original Apple cable and ensure customer is using an Apple branded cable (Aftermarket cables are NOT recommended as they may cause operation issues).
- Prior to use, ensure all 3rd party Apps are up to date. If any 3rd party apps are causing concerns, close the apps and then restart them.
- Unlock the iPhone
- Restart the iPhone
- Check iPhone's setting is enabled (Settings > General > Restrictions > CarPlay > On)
- In some cases, a hard reset of the phone is required.

NOTE: KMA cannot guarantee full functionality of CarPlay and compatibility of CarPlay with 3rd party Apps, or that all features are available with all cell phone carriers.

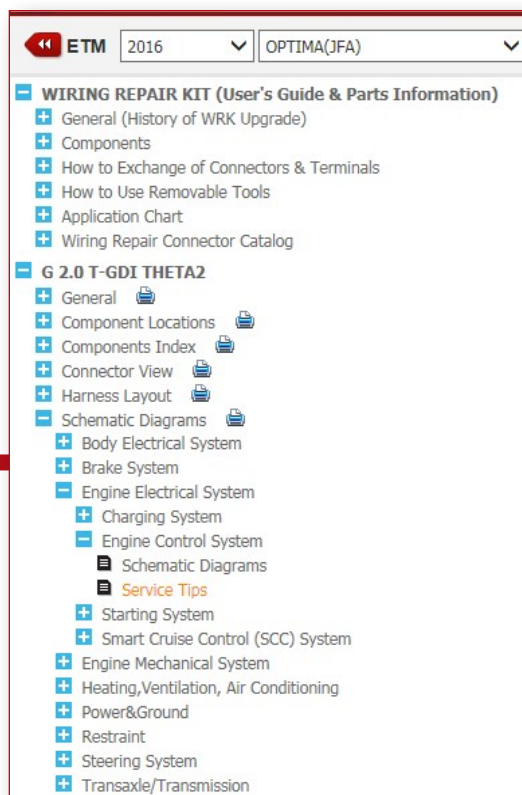
Apple® is a registered trademark of Apple, Inc. iPhone® is registered trademark of Apple, Inc. Siri® is registered trademark of Apple. App runs on your smartphone cellular data service. Normal data rates will apply. Android Auto™ is a registered trademark of Google™. App runs on your smartphone cellular data service. Normal data rates will apply.

PITSTOP ELECTRONIC TROUBLESHOOTING MANUAL (ETM) SERVICE TIPS

In an effort to increase the amount of Service Information available to our Kia Service technicians, KGIS offers a section called "Service Tips" located in the Electronic Troubleshooting Manual (ETM). These Service Tips provide valuable Service Information for individual systems, circuit description and operation.

Additionally, technicians can benefit from all the available Powertrain Control Module (PCM) information which includes detailed circuit description, condition, input and output signal type and level (range) and oscilloscope patterns (for good signal reference).

Please refer to PitStop PS 448.



Kia Global Information System (KGIS) - Google Chrome
Kia Motors America, Inc. [US] https://www.kiatechinfo.com/viewer/default_popup.aspx?content_no=ETM[ENG]3685[2016][14321]en[128][1_3_2_2]1001&siteinfotext=101^101g9^none^none^1001^3^ENG^KM^#1.3^2016^en^128^none^nor

ETM 2016 OPTIMA(JFA) G 2.0 T-GDI THETA2

WIRING REPAIR KIT (User's Guide & Parts Information)

- General (History of WRK Upgrade)
- Components
- How to Exchange of Connectors & Terminals
- How to Use Removable Tools
- Application Chart
- Wiring Repair Connector Catalog

G 2.0 T-GDI THETA2

- General
- Component Locations
- Components Index
- Connector View
- Harness Layout
- Schematic Diagrams
 - Body Electrical System
 - Brake System
 - Engine Electrical System
 - Charging System
 - Engine Control System
 - Schematic Diagrams
 - Service Tips
 - Starting System
 - Smart Cruise Control (SCC) System
 - Engine Mechanical System
 - Heating, Ventilation, Air Conditioning
 - Power&Ground
 - Restraint
 - Steering System
 - Transaxle/Transmission

Engine Control System (G4KH : THETA II 2.0L T-GDI)

Service Tips (4)

Pin No.	Description	Condition	In/Output Signal	
			Type	Level
9	-	-	-	-
10	Brake Switch 2 signal input	Brake OFF	DC Voltage	Battery Voltage
		Brake ON		Max. 0.5V
12	-	-	-	-
14	Electrical load [wiper] signal input	-	-	-
15	Electrical load signal input (FR)	Lamp OFF	DC Voltage	Battery Voltage
		Lamp ON		-0.3 ~ 0.5V
16	Alternator PWM signal output (COM)	Idle	Pulse	High: Battery Voltage Low: Max. 1.5V Frequency: 125Hz
17	-	-	-	-
18	Cooling Fan Relay [High] control output	Relay OFF	DC Voltage	Battery Voltage
		Relay ON		Max. 1.0V
19	Immobilizer Lamp control output	Lamp OFF	DC Voltage	Battery Voltage
		Lamp ON		-0.3 ~ 1.2V
20	-	-	-	-
22	Injector (Cylinder #2) [High] control output	Engine Running	PWM	Vpeak=55V
23	Injector (Cylinder #2) [Low] control output	Engine Running	Pulse	Vpeak=55V Vmax=5.0V
24	-	-	-	-
25	Sensor ground	Idle	DC Voltage	-0.3 ~ 0.5V
27	Brake Switch 1 signal input	Brake OFF	DC Voltage	Max. 0.5V
		Brake ON		Battery Voltage
28	-	-	-	-
29	Camshaft Position Sensor (CMPS) [Bank 1/Intake] signal input	Engine Running	Pulse	High: 4.5 ~ 5.5V Low: -0.3 ~ 0.5V Frequency: 7Hz (Idle), 25Hz (3,000rpm)
30	Camshaft Position Sensor (CMPS) [Bank 1/Exhaust] signal input	Engine Running	Pulse	High: 4.5 ~ 5.5V Low: -0.3 ~ 0.5V Frequency: 7Hz (Idle), 25Hz (3,000rpm)
31	-	-	-	-
32	LIN communication signal input	-	-	-
33	Cooling Fan Relay [Low] control output	Relay OFF	DC Voltage	Battery Voltage
		Relay ON		-0.3 ~ 1.2V
36	-	-	-	-
39	Injector (Cylinder #3) [High] control output	Engine Running	PWM	Vpeak=55V
40	Injector (Cylinder #3) [Low] control output	Engine Running	Pulse	Vpeak=55V Vmax=5.0V
41	Battery power (B+)	IG OFF	DC Voltage	Max. 1.0V
		IG ON		Battery Voltage
42	-	-	-	-
44	Sensor shield	Idle	DC Voltage	-0.3 ~ 0.5V
45	Sensor ground	Idle	DC Voltage	-0.3 ~ 0.5V
46	Sensor ground	Idle	DC Voltage	-0.3 ~ 0.5V
47	Sensor ground	Idle	DC Voltage	-0.3 ~ 0.5V
50	-	-	-	-
53	Main Relay control output	Relay OFF	DC Voltage	Battery Voltage
		Relay ON		-0.3 ~ 1.2V
55	-	-	-	-
56	Injector (Cylinder #4) [High] control output	Engine Running	PWM	Vpeak=55V
57	Injector (Cylinder #4) [Low] control output	Engine Running	Pulse	Vpeak=55V Vmax=5.0V

FRONT LICENSE PLATE BRACKET POSITION ON VEHICLES WITH AEB (17MY QL)

On 2017MY Sportage (QL) vehicles equipped with Autonomous Emergency Brake (AEB), the front license plate bracket is installed in one of two different positions, depending on whether the vehicle is equipped with 2WD or All-Wheel-Drive (AWD).

Follow the instructions below to ensure that the AEB system is not being impaired by an incorrect licence plate installation!

On 2WD vehicles equipped with AEB, the radar sensor is mounted below the front bumper cover. The license plate needs to be positioned to provide an unobstructed "forward view" for the AEB radar module. If the bracket and license plate are mounted incorrectly, the plate may interfere with the AEB sensor and cause the system to not operate correctly. The system may display the "Auto Emergency Braking Disabled Temporarily" message in the instrument cluster center and/or may illuminate the AEB warning light until the condition is corrected.



Radar module partially blocked:
plate mounted incorrectly

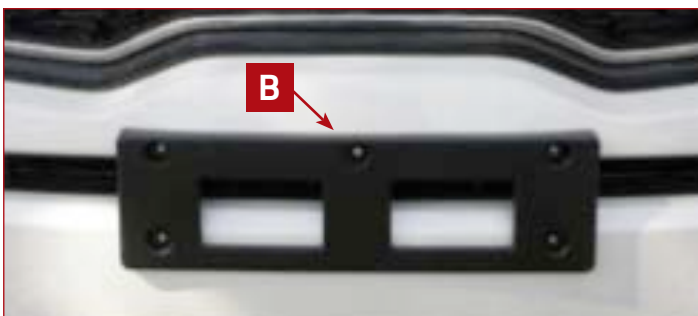


Radar module unobstructed:
plate mounted correctly



Warning message may alert
driver that AEB is unavailable!

To position the bracket and plate correctly, align the two guide/locator pins on the back of the bracket with the dimples in the front bumper cover (A) and position the license plate mounting holes in the bracket at the top, as shown (B) below.

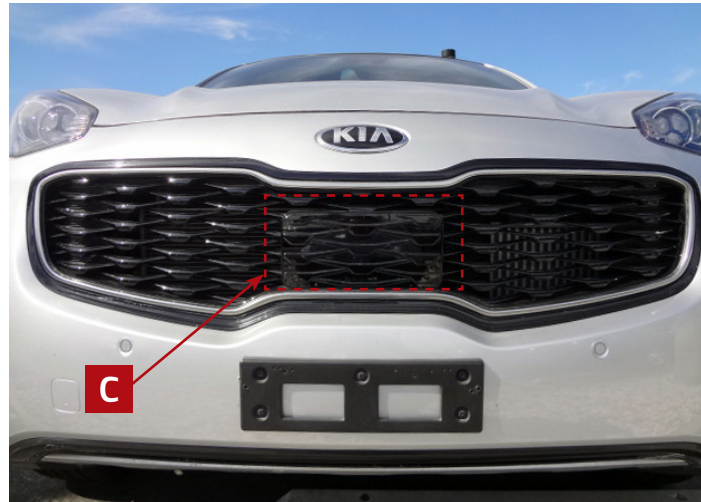


2WD vehicle with AEB

For more information on AEB operation and how obstructions of the sensor can interfere with proper system performance, refer to the applicable owner's manual pages (6-56 and 6-57) or view the manual on KGIS.

On vehicles equipped **with** AWD and AEB, the radar sensor is mounted above the license plate, in front of the grill. The front license plate mounting bracket (C) is installed on the lower portion of the front bumper cover, as shown below.

Please refer to PitStop PS 451.



AWD vehicle with AEB

TEST YOUR KNOWLEDGE ANSWERS

We hope you gave this issue's word scramble on page 7 a try. In case you need a little help, here are the answers to the word scramble.

- | | |
|-------------------|------------------|
| 18. EVAPORATE | 9. MAINTENANCE |
| 17. FUSE | 8. BRACKET |
| 16. TRAINING | 7. COLLISION |
| 15. POWERTRAIN | 6. BEAM |
| 14. BENEFIT | 5. APPROXIMATELY |
| 13. CERTIFICATION | 4. SATISFACTION |
| 12. CIRCUIT | 3. DIAGNOSTIC |
| 11. GUIDE | 2. AMPERAGE |
| 10. CARPLAY | 1. REFRIGERANT |

Secret Phrase
(Clue: "2017 Sportage is...")
ENGINEERED
TO EXCITE