



TECH TIMES

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Improving Kia's Service Information through YOUR Feedback

If you are one of the many Kia technicians that have reported a concern with Kia's Service Information by using the **Feedback** button on KGIS (www.kiatechinfo.com), we owe you our thanks! Nobody uses our Service Information quite as frequently—or *scrutinizes it quite as closely*—as our Kia technicians and TechLine representatives.

When feedback is submitted via KGIS, the process of investigating and validating the proposed correction begins. It might take time to test the concern on a vehicle, document it, test circuits and take additional steps that may

be deemed necessary to ensure the integrity and accuracy of our Service Information. But rest assured, every time a technician clicks that Feedback button (see TechTimes Vol. 15, Iss. 1 for an introduction to the **Feedback** button), it opens a case that, once completed, will result in an improved Service Information resource available to support your job as a technician.

In fact, between August 2008 and the end of 2012, we submitted a total of **436** requests to correct Service Information—many of them based on *your* feedback! The tables below illustrate the results of activity in our feedback program to date.

Type of Service Information	Opened Cases
Shop Manual	205
Electric Troubleshooting Manual	134
Diagnostic Trouble Codes	138

Total Cases Opened:	477
Total Corrections made:	436

So thanks for all your help in maintaining this valuable technical reference material. You're certainly making a difference in the quality of Kia's Service Information every day!

Keep the feedback coming!

Tech Line Tech Tips

Vehicle	Concern	Recommendation Before Calling Techline
2006.5 - 2010MY Optima (MG)	Rear parking lights stay on intermittently	Inspect the taillamp relay for intermittent sticking. Check for tail lamp ON ground signal to IPM from BCM. If ground is not present at the IPM, but tail lamps remain on, internal tail lamp relay is sticking and entire IPM requires replacement.
All	How do I perform a flight recording?	Please refer to TechTimes volume 11, issue 5 for article explainign the flight recording procedure.
2013 Sorento	fluttering noise at highway speeds originating behind glove box	Examine fender liner in area where a mud guard would be mounted. You'll see a piece of plastic overlapping a larger piece. Install a screw through the smaller piece to secure it onto the larger piece beneath. This should correct the noise concern.
2011+ Sorento, 2009-2010 Optima (MG), 2010+ Rio (JB)	DTCs B1764, B1447, B1448, B1767	Prior to commencing any repair, refer to TSB BOD 072 for a procedure specifically developed to assist in troubleshooting these DTCs.
2011/12 Optima 2.0T or 2.4L	low power and MIL on with P0087 (Fuel Rail/ System Pressure - Too Low)	Recommend replacement of high pressure fuel pump and metal fuel line. Then clear code and test drive. This should correct the concern.
2013 Optima	Climate control blower stuck on high	First check right kick panel EM61 connector Pin 41 (yellow wire) for loose connection. Repair as needed.
2011 Sportage	rattle noise from dash at speeds above 50 mph	Refer to Pitstop PS209r1 for procedure to correct this concern.

Latest Technical Service Bulletins, Service Actions and Campaigns

ENG 128	PCSV Inspection & Replacement (SA 142)
BOD 093	2nd Row Seat Inoperative/Difficult to Release
GEN 022r3	Load Carrying Capacity Label Requirements & Instructions
GEN 037r1	Electrical/Other Related Info Collection for Limited Time Period through 6/15/2013
GEN 063	Hazardous Materials (HazMat) Information
TRANS 047r1	Axle Shaft Serviceability by Model
ELE 044	High-Voltage Battery Ordering & Return Procedure

CAUTION

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

WARNING

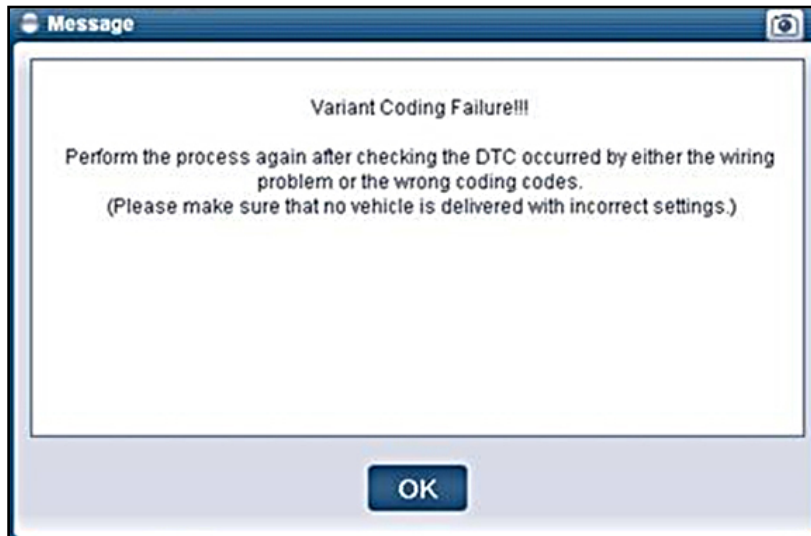
- Vehicle servicing performed by untrained persons could result in injury to those persons or to others.
- The Kia technician newsletter (Tech Times) is intended for use by professional Kia automotive technicians only. It is written to inform technicians of conditions that may occur on some vehicles. 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.

Setting ACU / SRSCM Variant Coding

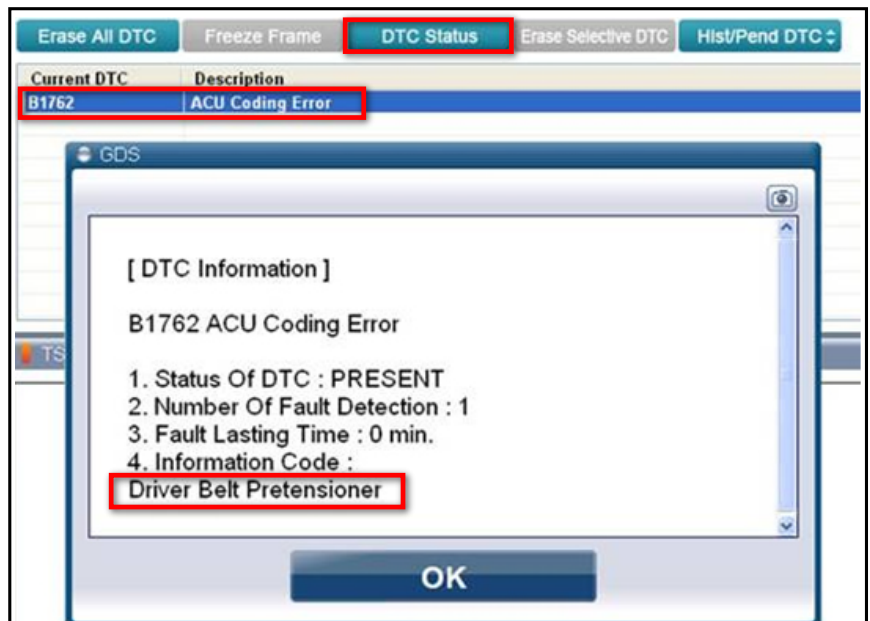
After the replacement of the ACU/SRSCM, the Variant Code may not be accepted by the SRSCM. This is usually because there is a fault in the system.



This may occur after a vehicle has been in an accident and the SRSCM has been replaced by the body shop. The SRSCM will not accept the Variant Code if there is a fault in the system, but the DTC for the fault will not display without the Variant Code being set. Use the procedure below with a GDS to resolve this concern.

In most cases, a technician can determine the fault in the system by performing the following:

1. Click on **DTC Analysis**
2. Click on the **Current DTC**, described as the "ACU Coding Error"
3. Click on **DTC Status**

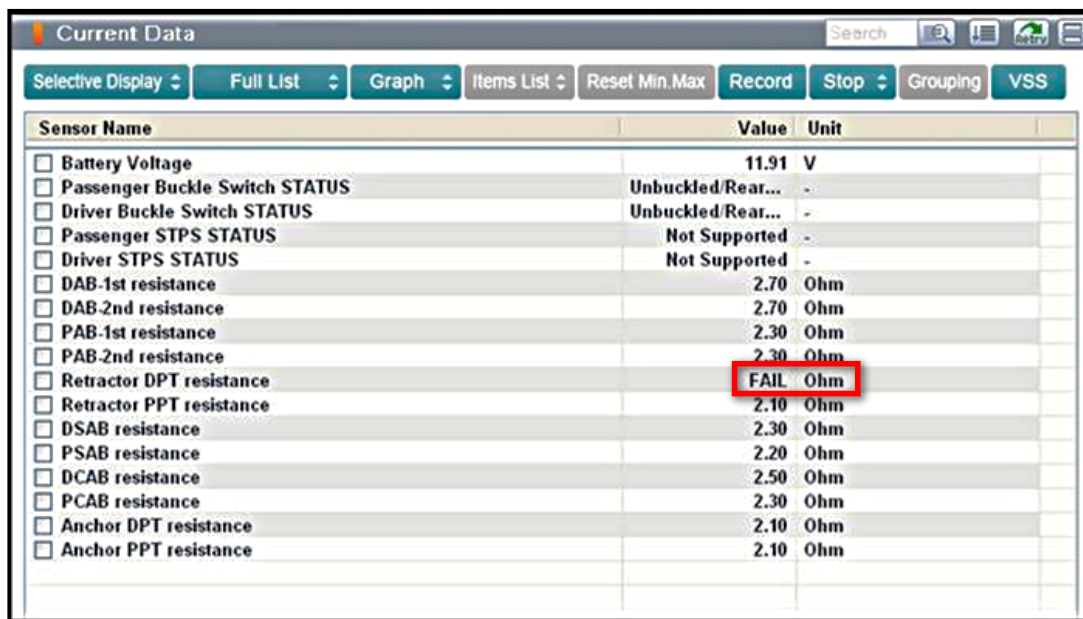


The system at fault is listed near the bottom of the pop-up "DTC Information" window. In the sample window above, DTC Information indicates that the fault is in the Driver Belt Pretensioner circuit. After acquiring this information, the technician can proceed to diagnose and repair the appropriate system.

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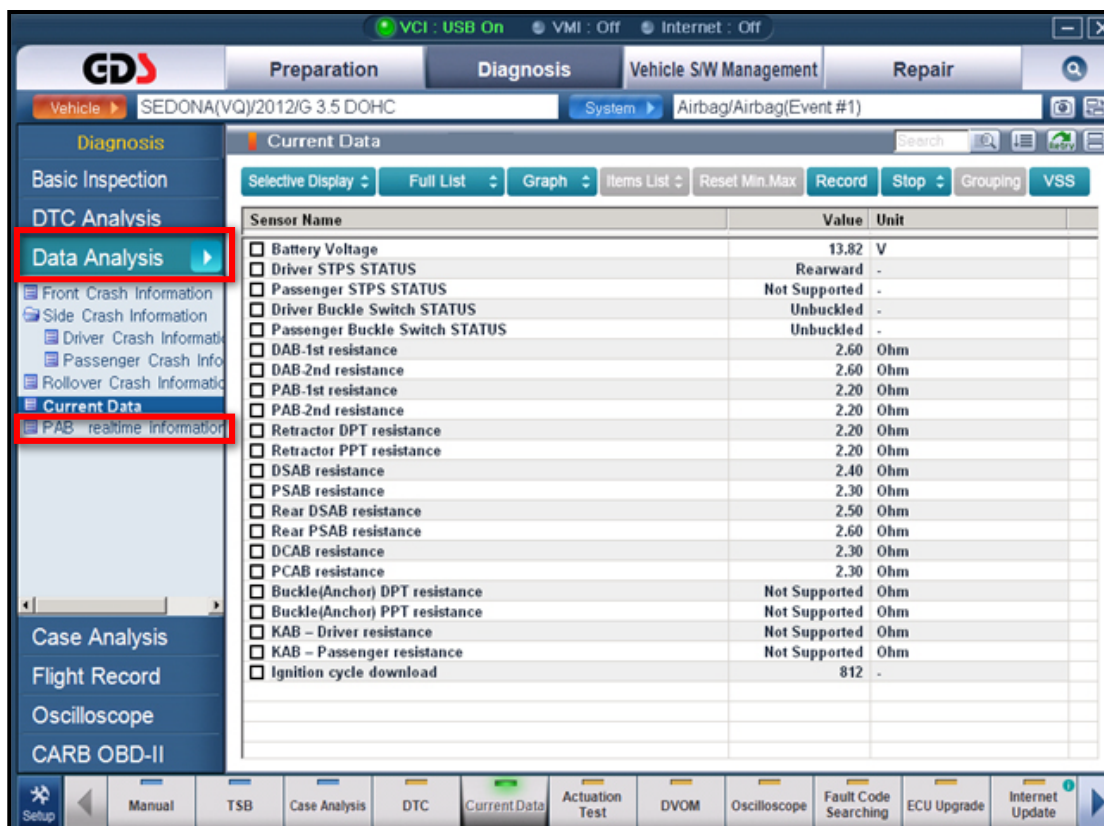
Setting ACU / SRSCM Variant Coding (Continued)

The technician can also check air bag-related **Current Data** to determine which system is at fault. **Current Data** can be displayed before the Variant Coding is set, as in the example below.



Sensor Name	Value	Unit
<input type="checkbox"/> Battery Voltage	11.91	V
<input type="checkbox"/> Passenger Buckle Switch STATUS	Unbuckled/Rear...	-
<input type="checkbox"/> Driver Buckle Switch STATUS	Unbuckled/Rear...	-
<input type="checkbox"/> Passenger STPS STATUS	Not Supported	-
<input type="checkbox"/> Driver STPS STATUS	Not Supported	-
<input type="checkbox"/> DAB-1st resistance	2.70	Ohm
<input type="checkbox"/> DAB-2nd resistance	2.70	Ohm
<input type="checkbox"/> PAB-1st resistance	2.30	Ohm
<input type="checkbox"/> PAB-2nd resistance	2.30	Ohm
<input type="checkbox"/> Retractor DPT resistance	FAIL	Ohm
<input type="checkbox"/> Retractor PPT resistance	2.10	Ohm
<input type="checkbox"/> DSAB resistance	2.30	Ohm
<input type="checkbox"/> PSAB resistance	2.20	Ohm
<input type="checkbox"/> DCAB resistance	2.50	Ohm
<input type="checkbox"/> PCAB resistance	2.30	Ohm
<input type="checkbox"/> Anchor DPT resistance	2.10	Ohm
<input type="checkbox"/> Anchor PPT resistance	2.10	Ohm

In most cases the technician will need to click on **Data Analysis**, then on **Service Data** or **Current Data** on the left side of the page to retrieve the air bag-related **Current Data**. For more information on **Current Data** for the air bag system, see TechTimes Vol. 13 Iss. 4.



The screenshot shows the GDS software interface with the 'Diagnosis' tab selected. The vehicle information is 'SEDONA(VQJ)2012/G 3.5 DOHC' and the system is 'Airbag/Airbag(Event #1)'. The 'Current Data' window is open, showing a table of sensor values. The 'Retractor DPT resistance' row is highlighted with a red box, indicating a 'FAIL' status. The left sidebar menu has 'Data Analysis' highlighted in red.

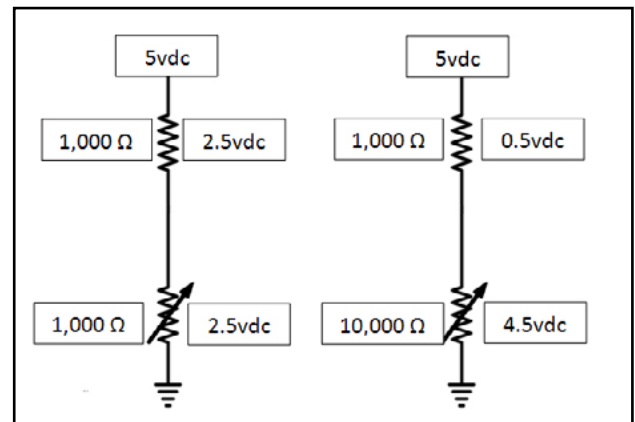
Sensor Name	Value	Unit
<input type="checkbox"/> Battery Voltage	13.82	V
<input type="checkbox"/> Driver STPS STATUS	Rearward	-
<input type="checkbox"/> Passenger STPS STATUS	Not Supported	-
<input type="checkbox"/> Driver Buckle Switch STATUS	Unbuckled	-
<input type="checkbox"/> Passenger Buckle Switch STATUS	Unbuckled	-
<input type="checkbox"/> DAB-1st resistance	2.60	Ohm
<input type="checkbox"/> DAB-2nd resistance	2.60	Ohm
<input type="checkbox"/> PAB-1st resistance	2.20	Ohm
<input type="checkbox"/> PAB-2nd resistance	2.20	Ohm
<input type="checkbox"/> Retractor DPT resistance	2.20	Ohm
<input type="checkbox"/> Retractor PPT resistance	2.20	Ohm
<input type="checkbox"/> DSAB resistance	2.40	Ohm
<input type="checkbox"/> PSAB resistance	2.30	Ohm
<input type="checkbox"/> Rear DSAB resistance	2.50	Ohm
<input type="checkbox"/> Rear PSAB resistance	2.60	Ohm
<input type="checkbox"/> DCAB resistance	2.30	Ohm
<input type="checkbox"/> PCAB resistance	2.30	Ohm
<input type="checkbox"/> Buckle(Anchor) DPT resistance	Not Supported	Ohm
<input type="checkbox"/> Buckle(Anchor) PPT resistance	Not Supported	Ohm
<input type="checkbox"/> KAB - Driver resistance	Not Supported	Ohm
<input type="checkbox"/> KAB - Passenger resistance	Not Supported	Ohm
<input type="checkbox"/> Ignition cycle download	812	-

Voltage Divider Circuit

As the term indicates, a Voltage Divider Circuit, divides a reference voltage (v_{ref}) into two or more parts. By placing two resistors of the same value in series, the applied voltage is divided into equal parts. When the resistors have different values, the voltage is divided according to resistance value.

The Temperature Voltage Divider circuit contains:

- Two resistors in series, which form the voltage divider
- Resistor R1, a constant value
- Resistor R2 changes resistance according to temperature
- Voltage drop of R1 and R2 equal the reference voltage (V_{ref})

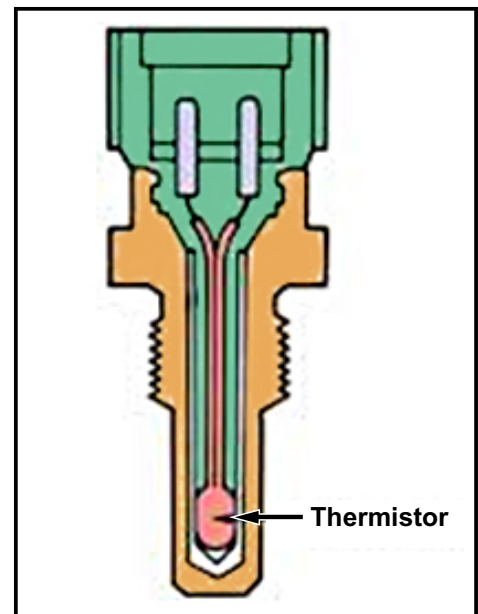


Temperature sensors are used to measure temperature of various components and systems.

To do this we use a thermistor that changes its resistance (coefficient) according its temperature.

Two types of thermistors are:

- Negative Temperature Coefficient (NTC) decreases resistance as its temperature increases. (Most often used)
- Positive Temperature Coefficient (PTC) increase resistance as its temperature increases. (Seldom used)



Kia uses NTC type sensors for the following:

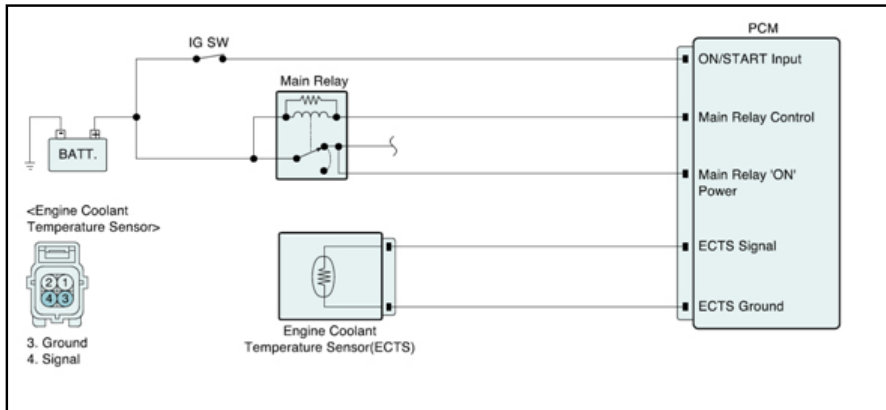
- Engine Coolant Temperature ECT
- Transmission Fluid Temperature TFT
- Cabin Temperature
- Ambient Air Temperature AMB
- Battery Temperature (Hybrid)
- Intake Air Temperature IAT
- Oil Temperature OTS
- Evaporator Temperature
- Water Temperature WTS

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Voltage Divider Circuit (Continued)

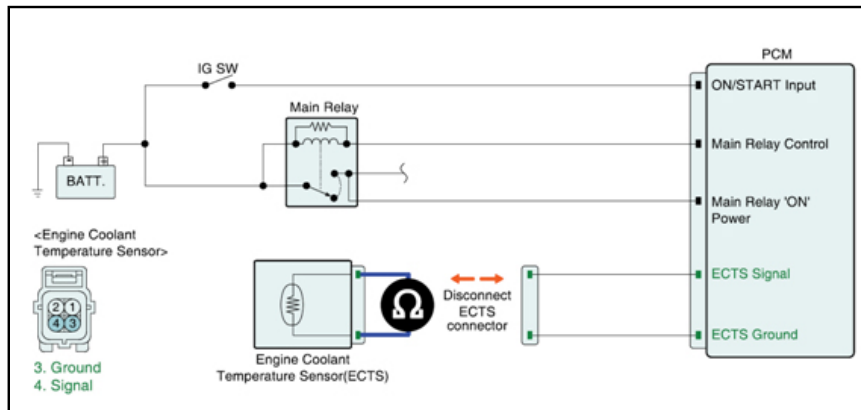
The ECU sends out a regulated reference voltage of either 3.3 or 5.0 volts to the Coolant Temperature Sensor, which drops the voltage in relation to the internal resistance of the sensor, which varies with temperature. This voltage is measured by the PCM on the signal wire.

The ECU compares the measured voltage with a lookup table to determine the temperature.



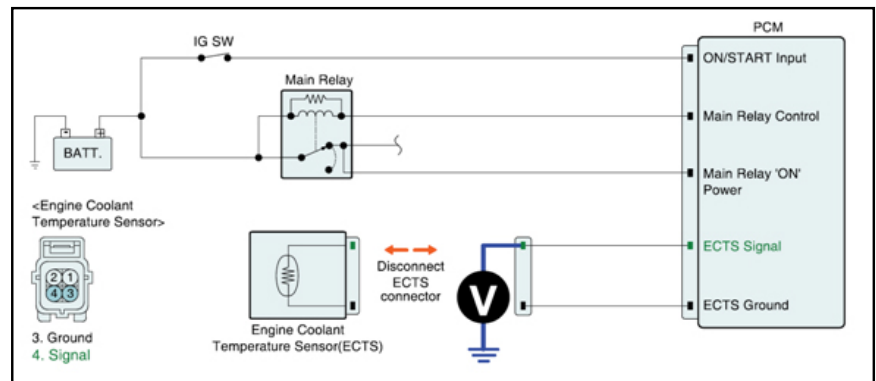
Voltage dc	Temperature °F
4.5	0
4.1	40
3.5	75
2.5	110
1.6	145
1.0	180
0.45	220

You can measure the sensor resistance at a given temperature and compare the value with specifications listed in service information.



Temperature (°C)	Temperature (°F)	Resistance (kΩ)
-20	-4	14.13 ~ 16.83
0	32	5.79
20	68	2.31 ~ 2.59
40	104	1.15
60	140	0.59
80	176	0.32

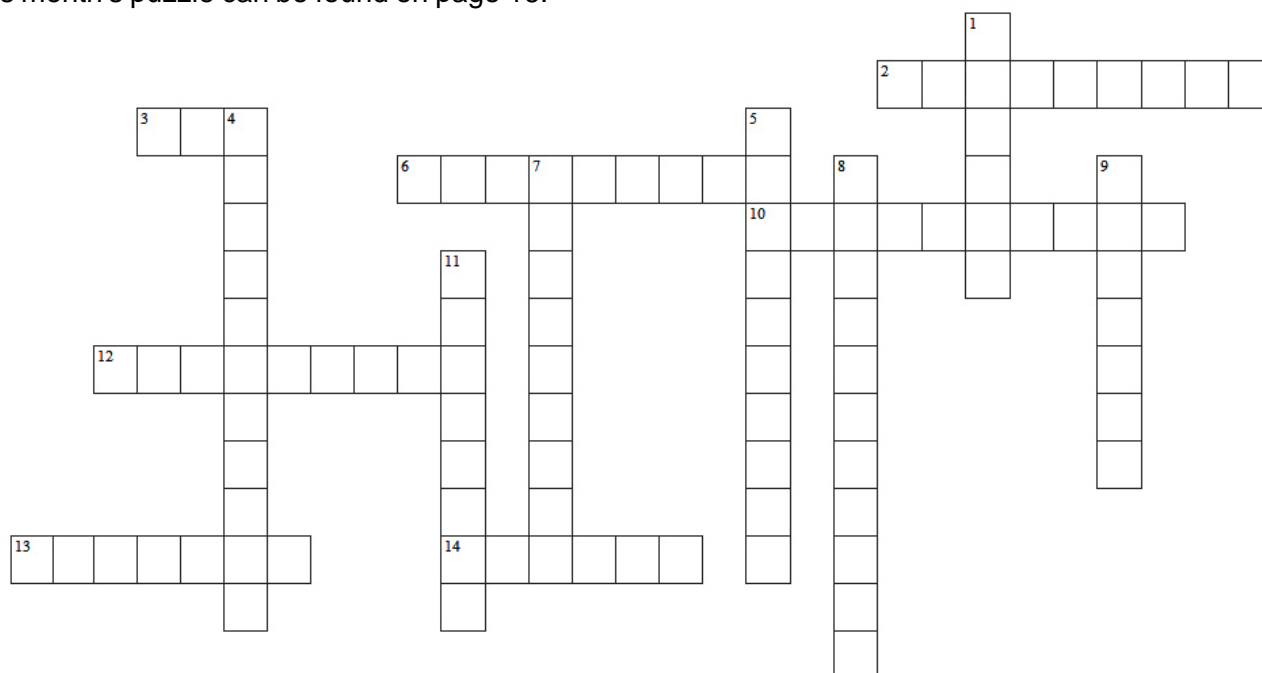
Another test is to measure vref. It should measure either 3.3vdc or 5.0vdc depending on the model.



In our next issue, we will continue to discuss Voltage Divider Circuits, using potentiometer type position 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

2. The Lane Change Assist function alerts a driver when a vehicle is approaching the driver's _____. (Two words)
3. Performing an _____ test on a switch may be the easiest way to check that it is functioning.
6. A voltage divider circuit divides a _____ voltage into two or more parts.
10. Kia technicians have used the Feedback button on KGIS over 400 times to improve the quality of Kia's _____, Electric Troubleshooting Manual, and Diagnostic Trouble Codes. (Two words)
12. Kia's Idle Stop & Go System may restart the engine WITHOUT release of the brake pedal when shifting to _____. (Two words)
13. The Blind Spot Detection System makes its debut in the 2014 Model Year _____.
14. As of January 1, 2013, Kia University has implemented a "_____-_____" policy on reservations made for instructor-led training classes. (Two words)

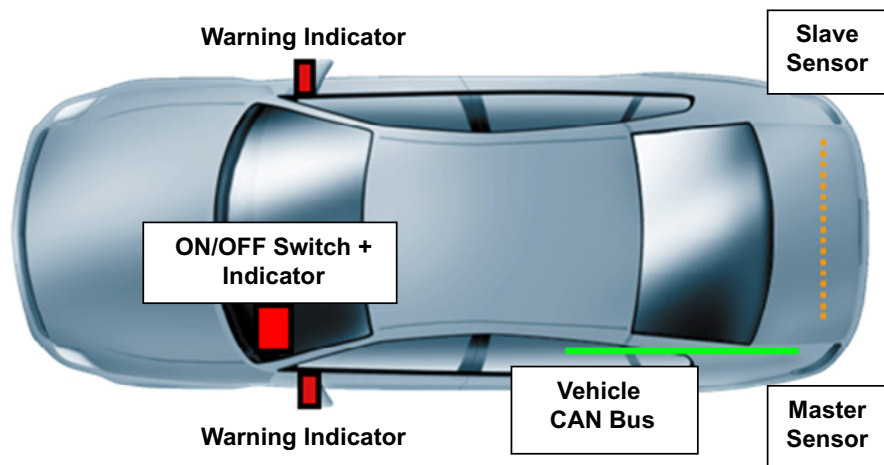
Down

1. Lane Change Assist utilizes both a _____ and audible warning to alert drivers.
4. 17% of the 4,212 technician certifications achieved last year were for _____ level. (Two words)
5. A thermistor of a temperature sensor changes its _____ according to its temperature to measure the temperature of a component or system.
7. Kia's Idle Stop & Go System contributes to lower _____ and fuel consumption by stopping the engine when the vehicle comes to a stop.
8. The Blind Spot Detection System may not detect _____, due to their smaller profile.
9. After an accident and ACU/SRSCM replacement, the _____ Code may not be accepted by the SRSCM, requiring the use of a GDS station to resolve the concern.
11. Rather than replacing wiper blades/elements, a simple normal maintenance and _____ are usually all that are required to address concerns of poor cleaning or streaking.

An Introduction to Blind Spot Detection

You may soon begin seeing Kia vehicles equipped with Blind Spot Detection System (BSD) as an option. The 2014MY Sorento will be the first Kia model to be equipped with the BSD option. The BSD is designed to help the driver know when another vehicle is in his/her blind spot. The system uses two sensors, one in each rear corner of the vehicle.

The Sensor antenna transmits signals at 24 GHz frequency. The signal bounces off the vehicle in the rear/side and returns to the antenna. The maximum detection range is around 70 meters. Smaller vehicles such as motorcycles may not be detected due to the motorcycle's smaller profile because very little of the signal bounces back to the sensor. The BSD is intended to aid the driver and is not intended to replace careful driving practices. Drivers should always use their mirrors and look over their shoulders to detect other vehicles.



When a vehicle is detected by the BSD, you will see a warning light in the outside rear view mirror.

If a vehicle is detected by the BSD and the turn signal is turned on, along with the warning light in the mirror, there is also an audible warning. This warning only sounds if the turn signal is used.



The Blind Spot Detection system can be turned on or off as the driver chooses. The Switch indicator will illuminate when the BSD is activated.



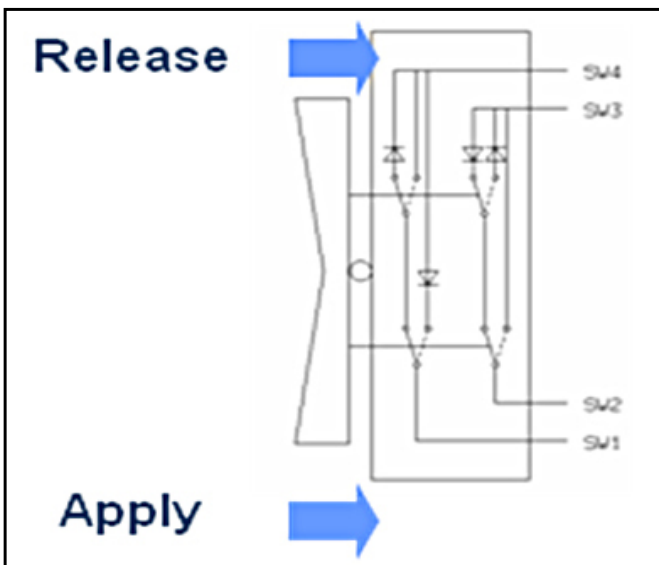
Another function of the Blind Spot Detection System is Lane Change Assist (LCA). LCA alerts the driver when a vehicle is approaching the driver's blind spot. As an example of LCA functionality, consider the case of a driver who intends to change lanes to his left. First, the driver physically looks over his shoulder and observes no vehicle in his blind spot, then activates the left turn signal. If another vehicle *then* approaches the driver's blind spot *before* he makes the lane change, LCA will utilize both a visual and an audible warning to alert the driver to the other vehicle's presence in or near the blind spot.

A Closer Look at the EPB Switch

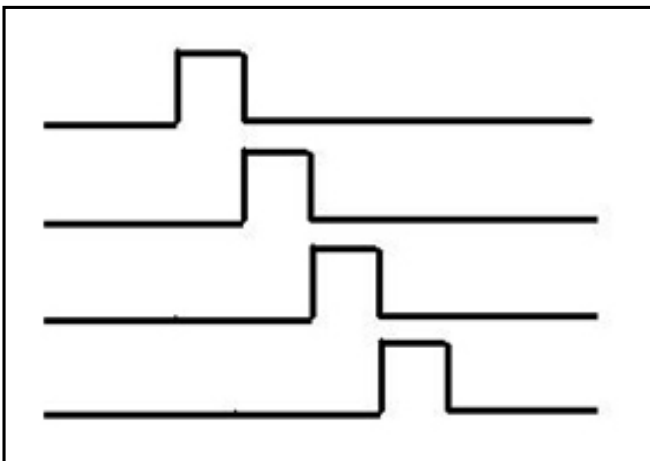
The switch circuit for the Electric Parking Brake is different from most ON/OFF switches. This switch circuit has 4 wires, while the switch itself has 3 positions: Neutral, Apply, and Release.

The reason for this type of switch is to assure a positive signal and to avoid unintended application or release of the parking brake.

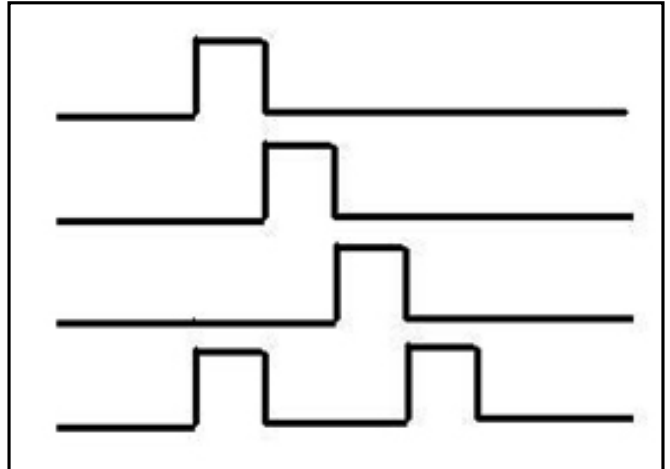
The controller sends out 10 mS pulses on the 4 switch wires. Notice in the image below that the switch has multiple contacts and some diodes. These contacts and diodes can either block the pulses or route the pulses to another line.



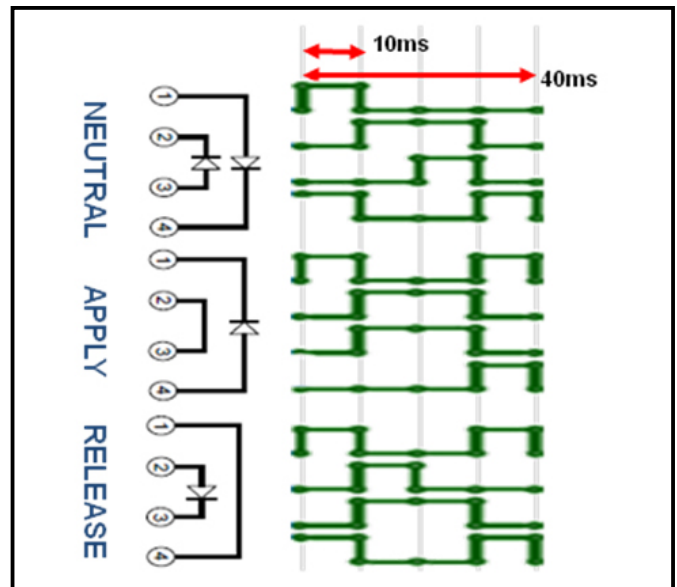
The controller puts out a pulse on a wire, then checks if the pulse is present on another wire. Each pulse is 10 milliseconds long, transmitted first along line one, then line two, and so on.



As shown in the next image, the pulse on line one also shows up on line four. This would indicate to the controller that there is a connection in the switch between lines one and four.



By checking all four lines during all four pulses, the control unit can determine the position of the switch. Notice below that in the Neutral position, the first pulse shows up on line four and the third pulse shows up on line two.



Performing an Ohm test on the switch may be the easiest way to check that the switch is functioning. Make sure to use the diode setting on the DVOM when testing the switch. To check the four wires in the switch circuit, check for a pulse on all four wires. If a wire is missing a pulse, check for an open or grounded wire.

Windshield Wiper Blade / Element Maintenance

Windshield wiper blades/elements are frequently replaced unnecessarily. Because of environmental conditions, a film can build up on both the windshield and the windshield wiper blades that will cause poor cleaning / streaking on the windshield, and in some instances, a chattering condition may occur as the wiper blades travel across the windshield.

Replacement of the wiper blades/elements is normally *not* required to correct issues like streaking or chattering. A simple, *normal maintenance* and cleaning of the wiper blades / elements and the windshield is all that is required.

If the wipe pattern appears to be streaky or if there is chatter and no damage to the wiper blades/elements is obvious, the following steps should be performed:

1. Use a soft cloth or sponge & squeegee and Kia Windshield Washer Concentrate (P/N UM040 CH014, 32 Oz.) Kia Glass Cleaner (P/N UM040 CH006) or a solution of 50/50 alcohol and water, to clean the windshield.
2. Raise the wiper blades off the glass and clean the wiper blade elements (rubber insert) with Kia Windshield Washer Solvent or a solution of 50/50 alcohol and water & a soft cloth, paper towel.
3. Return the wiper blades to their normal operating position and operate the wiper/washer system. If the wiper blades/elements are not streaking or a chattering noise is not heard, replacing the blade assembly (ies) is not necessary. If the wipe pattern is still objectionable, replace the wiper blades/elements.

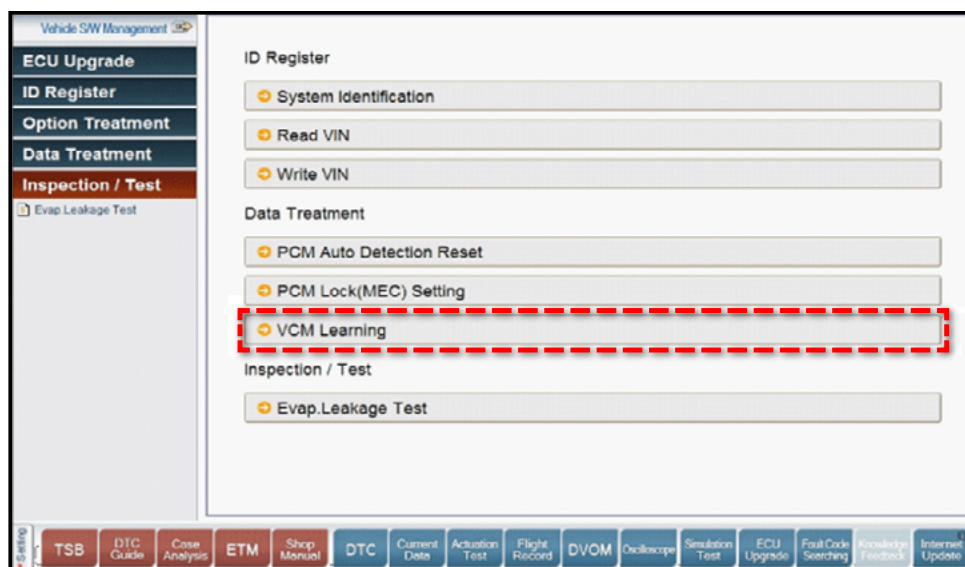
VCMA Relearn After Replacement – LAMBDA V6 Engines

When servicing the Variable Charge Motor Actuator (VCMA) on Lambda V-6 engines there are some simple steps that should be followed or the vehicle may return with the same DTC code present. Unlike the 2.4L engine, the 3.5L Lambda engine has a VCMA calibration relearn function that must be performed when replacing the VCM actuator.

Tip: Use a door panel trim tool to apply pressure and remove the VCMA link from the actuator arm.

Perform a relearn procedure as outlined below, otherwise there may be a performance related concern or a recurrence of DTC P200A.

1. Turn OFF the ignition switch
2. Connect GDS to the Data Link Connector (DLC)
3. Turn the ignition switch ON
4. Select the “Vehicle”, “Model year”, “Engine” and “System”
5. Select the “Vehicle S/W Management”
6. Select “Inspection/Test”
7. Select the “VCM Learning”



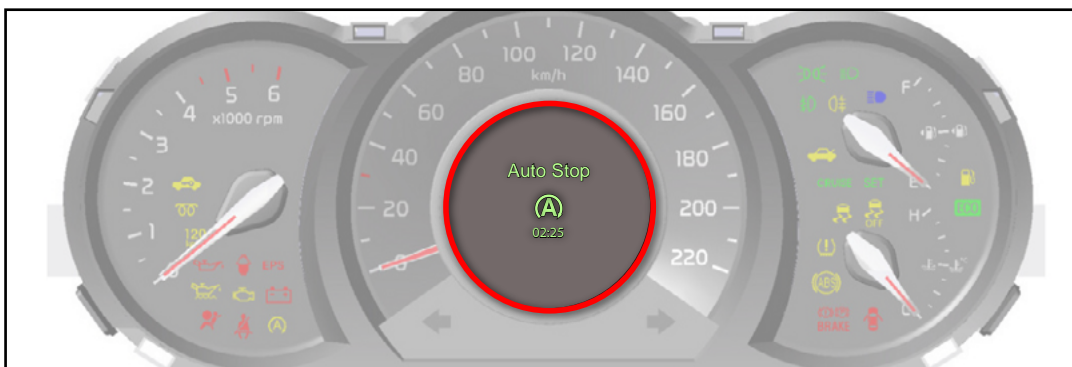
Idle Stop and Go (ISG) Update

Introduced in the 2013MY Kia Rio, and also made available in the Soul of the same model year, Kia's Idle Stop & Go System (ISG), contributes to lower emissions and fuel consumption by stopping the engine when the vehicle comes to a stop. In this article we will explore certain factors and conditions that will enhance your understanding of the ISG system, in order to better explain its operation to the customer.

The type of ISG notification displayed in a vehicle depends on the type of instrument cluster equipped. A **Standard** instrument cluster displays ISG status with a green indicator light, as in the illustration below.



For vehicles equipped with a **Supervision** instrument cluster, ISG status indicators and notifications appear in the circular information display located in the center of the speedometer, highlighted in the illustration below.



ISG may be prevented from activating under these conditions:

- Temperature is less than 172°F (78°C)
- Driver's seat belt is not buckled
- Driver's door or hood is open
- Ambient temperature is greater than 90°F (32°C) or less than 28°F (-2.2°C)
- Vehicle is on an uphill grade greater than 12% or a downhill grade steeper than 5%
- Steering wheel is turned to 180° or more at a stop
- Battery charge level, or health state, is lower than minimal threshold
- Brake switch malfunctions and/or faults in engine and/or ESC system occur
- Blower motor speed is equal or higher than the 3rd fan speed position with A/C system on
- A/C system is experiencing a malfunction
- Front and/or rear defogger/defroster is turned on
- Minimum vehicle speed of 5 MPH is not reached before coming to a complete stop
- OBD EVAP Monitor is on/running
- Battery sensor requires calibration

Idle Stop and Go (ISG) Update (Continued)

ISG may restart the engine ***without*** release of the brake pedal under these conditions:

NOTE: Green ISG icon  on the instrument cluster will blink 5 times as a reminder that the engine is running.

- When the charge level or health state of the vehicle battery is lower than the minimal threshold
- When shifting to Sport Mode
- When shifting gear to Reverse, Neutral or Drive (**Note: ISG icon will not blink in this instance**).
- When front windshield defroster is turned on
- When brake booster vacuum pressure is low
- When blower motor speed is equal or higher to the 3rd position with A/C on
- When driver's seat belt is not buckled or driver's door is opened
- When the engine remains off for more than 5 minutes

Under the following condition, the engine may be prevented from restarting even after release of the brake pedal:

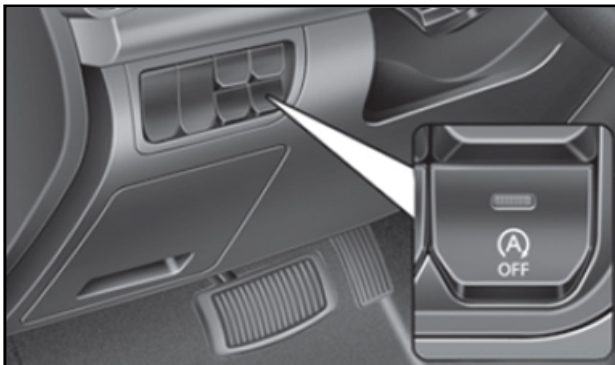
- If the hood is unlatched or opened *after* coming to a complete stop.

NOTE: An audible warning may sound to remind you to close the hood. Close the hood in order for the engine to restart. Engine will need to be started manually.

Deactivating ISG:

To manually deactivate the ISG system, press the ISG **OFF** button located on the driver's side panel.

NOTE: The system will remain deactivated until the Start button is switched to the **OFF** position. Once the start button is switched to the **ON** position, the system will resume normal operation.



Rio (UB)



Soul (AM)

Battery calibration (Only to be performed after battery replacement and/or disconnection):


The vehicle must remain undisturbed for a period of 4 hours, with the key off, to successfully complete calibration.

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Idle Stop and Go (ISG) Update (Continued)

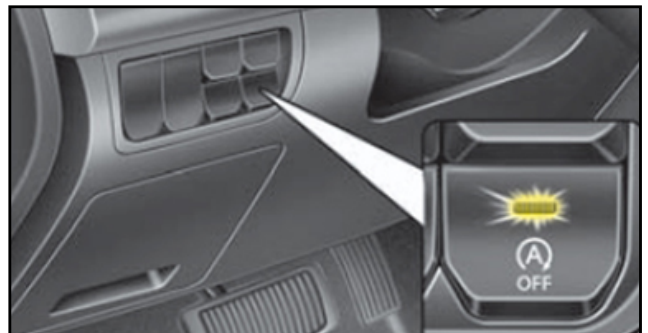
Interpreting the ISG icons and the ISG OFF indicators in both Standard and Supervision clusters:

Standard Instrument Cluster (Rio UB):


The green ISG icon  will illuminate after the engine turns off during a stop. This is considered normal system operation.

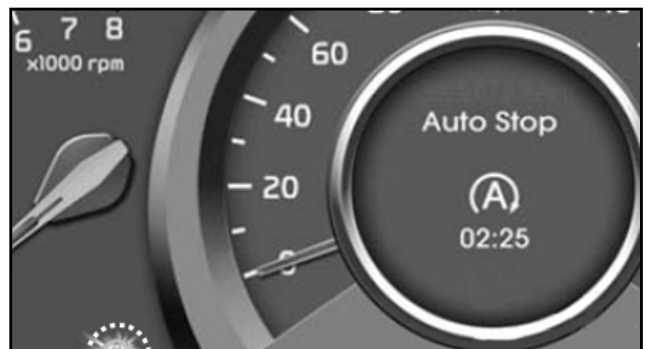


If the ISG system **OFF** button is illuminated, it indicates that the ISG system either has been turned off, or is deactivated for one or more reasons, as described at the start of this article.



Supervision Instrument Cluster (Rio UB):

The green ISG icon  will illuminate after the engine turns off during a stop. This is considered normal system operation.




If the ISG system **OFF** button is illuminated, it indicates that either the ISG system has been turned off, or it is deactivated for one or more reasons, as described at the start of this article. The cluster LCD readout will display a message alerting the driver of the system status (see image).



Idle Stop and Go (ISG) Update (Continued)

Standard Instrument Cluster (Soul AM):

The Green ISG icon  will illuminate after the engine turns off during a stop. This is considered normal system operation.



If the ISG system “OFF” button is illuminated, it indicates that either the ISG system has been turned off or is deactivated for one or more reasons, as described at the start of this article.



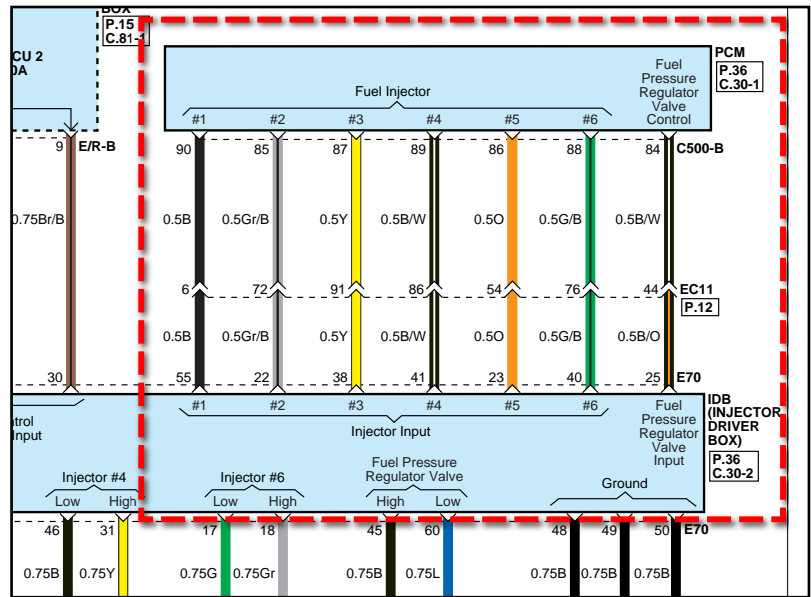
Have any feedback for
the TechTimes staff?
If you do, we want to hear it!
Please email your
comments & suggestions
to ssalama@kiausa.com
or fax to (949) 468-4905
to have your voice heard!

Injector Drivers in a Separate Box

In the past, Injector Driver circuits were typically located in the PCM. Recently however, they are more commonly located in a separate module.

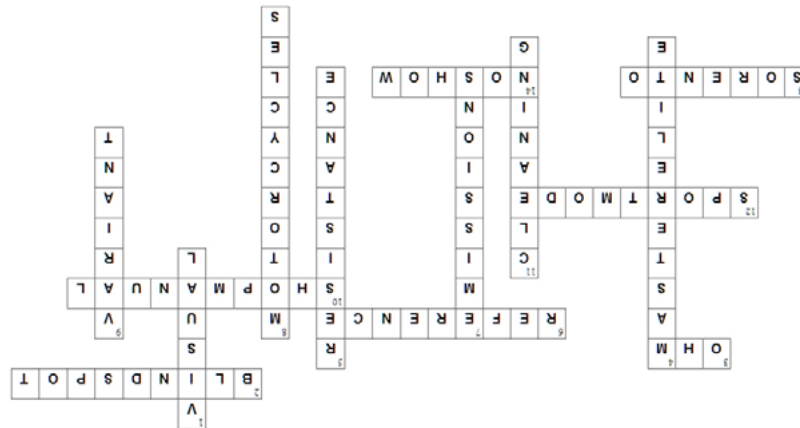
As you know, the GDI injector driver circuits increase the voltage to energize the GDI injectors (for more information on GDI injector functionality, see the article "A Longer Look at GDI", published in TechTimes - Volume 13, Issue 5). The Delphi PCM/ECM has been in use on Kia V6 engines for some time, but the control unit was not set up for the GDI injection system. A separate module was added to house the injector driver circuits.

The injector circuits from the PCM are used to trigger the injector circuits in the Injector Driver Module.



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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