

# TECH TIMES

*Celebrating 20 Years  
1996 - 2016*

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## ATTENDING TECHNICAL TRAINING COURSES AT ALL KU TRAINING CENTERS

Kia Motors America, Inc. recently reorganized into five regions. The new 5th region is the Southwest region covering Arkansas, Colorado, Louisiana, Mississippi (partial), Oklahoma, New Mexico, Texas, and Wyoming.

We would like to remind you all that Technicians can attend training at any training center when space is available.

While Kia University training centers are within the geographic boundaries of the five regions, we encourage dealers and technicians to travel to the center that meets their immediate training needs and minimizes expenses to maximize your Service Department profitability.



For your reference, here is a list of Kia University training centers:

- ALNTC Allentown, Pennsylvania
- ATLTC Lawrenceville (Atlanta), Georgia
- BOSTC Marlborough (Boston), Massachusetts
- CHITC Lombard (Chicago), Illinois
- DALTC Lancaster (Dallas), Texas
- IRVTC Irvine, California (KMA Headquarters)
- ORLTC Orlando, Florida
- SEATC Kent (Seattle), Washington

## TECHLINE FAQs

<b>Q</b>	I just got done building this short block, and now I have a horrible vibration. The BSM that I installed has a 20 tooth driven sprocket, but the old one has a 19 tooth. Is this a problem?	<b>A</b>	Contact parts hotline for a BSM drive sprocket that is 40 tooth count, and the longer chain that goes with these 2 sprockets as this is a running parts update for the 2.0/2.4 Theta II GDI engine.
<b>Q</b>	The BSD warning works but I do not hear the audible alert when the turn signal is on?	<b>A</b>	Please check the right door speaker and ensure it is not disconnected or faulty, to resolve this concern.
<b>Q</b>	I have a 2017 Sorento that I'm unable to set the clock time on during PDI because the icon is greyed out.	<b>A</b>	On this particular model the time will set automatically through the Sirius antenna. Set the radio band to Sirius mode and test drive the vehicle with a clear view of the sky and the clock should set automatically.
<b>Q</b>	On a JFA 1.6 Turbo DCT transmission equipped Optima, the customer complained of a warning light 'trans hot park with engine on' but no codes and I cannot duplicate.	<b>A</b>	Most likely customer has been doing extended stop and go, aggressive driving or holding the vehicle in place on a hill by using the throttle, all which will elevate the transmission temp. Park vehicle with engine running and let the transmission cool until the light turns off. It is a warning light to avoid damaging the transmission due to excessive temps.
<b>Q</b>	The 12v battery on the 2017 Niro I'm working on is dead and the vehicle will not go into Ready mode.	<b>A</b>	Depress the 12V BATT RESET button located on the left side of the steering column and put the vehicle into Ready mode within 60 seconds of activating the 12V BATT RESET button.

## LATEST TECHNICAL SERVICE BULLETINS, SERVICE ACTIONS AND CAMPAIGNS

<b>SA 277r1</b>	Service Action: UVO Software Upgrade (ELE 129 r1) (15MY - Various Models)
<b>SA 276r1</b>	Service Action: Audio Software Upgrade (ELE 128r1) (15MY - Various Models)
<b>SA 210r1</b>	Service Action: Power Sliding Door (PSD) Inspection and/or Repair (BOD116r1) (15-16MY YP)
<b>ENG 159r1</b>	E-CVVT Cover & Motor Plug Replacement (16MY JF/JFa, 17MY QL, 16-17MY UMa)
<b>BOD 168</b>	Front License Plate Bracket Installation (17MY YD, YDm 5-Door)
<b>BOD 162</b>	Backup Warning System Malfunction (14MY XMa)
<b>SC 144</b>	Driveshaft Hub Nut (LH/RH) Replacement (14MY PS)
<b>SA 280r1</b>	Combination TSB/SA: ECU Upgrade - DTC P0441 Logic Improvement (ENG164r1) (12-16MY UB, 14-16MY PS 1.6 GDI, 12-13MY AM 1.6 GDI)



### CAUTION

Vehicle servicing performed by untrained persons could result in damage to the vehicle.



### WARNING

- Vehicle servicing performed by untrained persons could result in serious injury or death 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 and trained Kia automotive technicians only. It is written to provide a general overview 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

**Dan Algarin**

**Joe Alt**

**Brian Betz**

**Shari Brady**

**Tony Cartagena**

**Eric Henson**

**Benny Ishii**

**Barry Nelson**

**Karen Nguyen**

**Carlos Sicairos**

**Hoc Tran**



Technical Editors

**Lewis Thompson**

**Neem Van der Reest**

Engineering Support & Technical Writer

**Neem Van der Reest**

Technical Writers

**Scott Irwin**

**Henry Nguyen**

## 2017 KIA FORTE 2.0 LITER ATKINSON ENGINE

In the 2016 Volume 19 Issue #3 of Tech Times an article titled **2017 Forte Introduction and Technical Highlights** discussed the differences between the Korea built (YD) and Mexico built (YDm) Forte and the introduction of a new Atkinson Cycle engine. The Atkinson cycle 2.0 liter MPI engine replaced the 1.8 liter MPI engine.

The Atkinson cycle engine is not new to Kia. Both the 2.4 liter 4-cylinder engine used in the Optima Hybrid and the new Niro 1.6 liter engine also use the Atkinson cycle.

Let's take a look at how the Atkinson engine cycle differs from the well-known Otto engine cycle.

The Atkinson cycle engine uses the four strokes of the Otto cycle to complete the combustion process (intake, compression, expansion & exhaust), but unlike the Otto cycle, Atkinson's late closing of the intake valves produces an effective compression stroke that is shorter than the expansion stroke. This results in improved efficiency of the engine, at the expense of low-end torque (See Fig.1).

The Atkinson cycle engine delays the intake valve's closing until the piston has completed 20 to 30 percent of its upward travel on the compression stroke. As a result, some of the fresh air/fuel

charge is driven back into the intake manifold by the rising piston so the cylinder is never completely filled. The payoff comes after ignition when the piston begins descending on the expansion (also called power) stroke. The shortened intake stroke combined with a full-length expansion stroke squeezes more work out of every increment of fuel.

The table below shows a Valve Timing Comparison of both intake and exhaust valve opening/closing shown in degrees of crankshaft rotation, between a 2016 Forte 1.8 Liter MPI engine versus the new 2017 2.0 Liter MPI Atkinson engine.

The most important factor to consider when servicing an Atkinson cycle engine is that other than some specific cylinder head components (e.g. camshaft) and some engine block components (e.g. pistons), there are very few engine mechanical differences between an Otto and an Atkinson cycle engine. When it comes to the engine management control, there is only one difference which is mainly in the software that is needed to support the Atkinson Valve timing (e.g. CVVT operation).

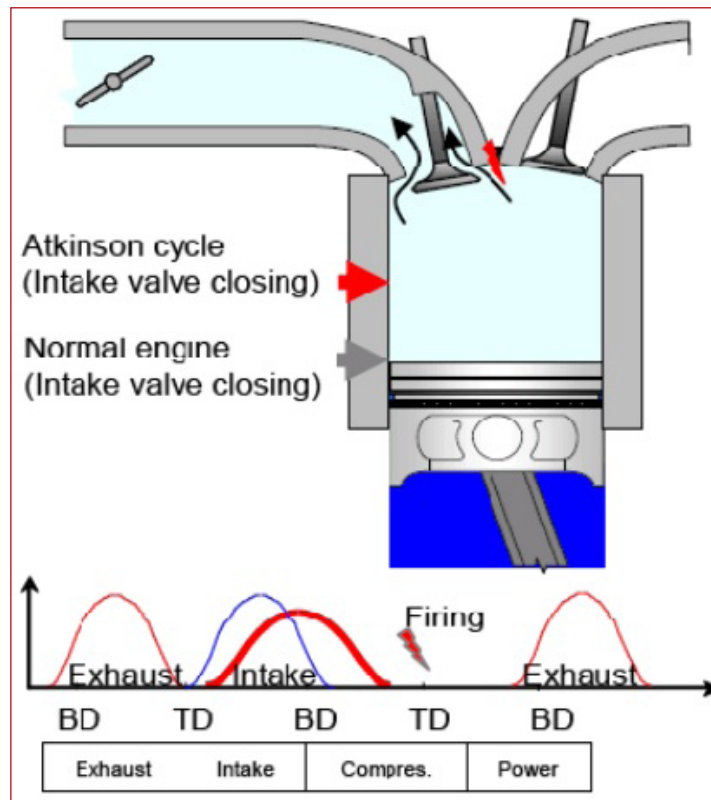


Fig. 1: Atkinson Cycle Engine

### 2016 Forte (YD) 1.8 Liter MPI Otto Cycle Valve Timing

Intake Valve	Open: BTDC 3° ~ BTDC 53°
	Close: ABDC 54° ~ ABDC 4°
Exhaust Valve	Open: BBDC 52° ~ BBDC 12°
	Close: ATDC 3° ~ ATDC 43°

### 2017 Forte (YDm) 2.0 Liter MPI Atkinson Cycle Valve Timing

Intake Valve	Open: BTDC 38° ~ ATDC 42°
	Close: ABDC 43° ~ ABDC 123°
Exhaust Valve	Open: BBDC 54° ~ ABDC 6°
	Close: ATDC 1° ~ ATDC 61°



# CONGRATULATIONS 2017 SERVICE TECHNICIANS!



## 13 YEARS CONSECUTIVE CERTIFICATION

DEALER	TECHNICIAN	CERTIFICATION LEVEL
Chris Leith Kia	Matthew Stevens	Master Elite Plus
Dorschel Kia	Todd Dugan	Master Elite
Dutch Miller Kia	Dana Woodrome	Master Elite
Edwards Kia	Michael Smith	Master Elite
Family Kia Of St. Augustine	Mike Hammer	Professional Elite
Galeana Kia	David Wilson	Master Elite
Gay Family Kia	Scott Dutzel	Master Elite Plus
Grand Kia	Murray Osthoff	Master Elite Plus
Hart Kia	Roy Tibbs Jr	Master Elite Plus
Jake Sweeney Kia	Richard Middendorf Jr	Master Elite Plus
Kia Country of Savannah	Calvin Riggins Jr	Master Elite Plus
Kia of Bradley	Brad Barker	Master Elite Plus
Lee Kia	Everett Nichols III	Master Elite
Lou Fusz Kia	Richard Secrease	Master Elite Plus
Medved Kia	Robert Laursen	Master Elite Plus
Olathe Kia	Curtis Darby	Master Elite Plus
Pete's Car Smart Kia	Jeremy Gibson	Master Elite
Rosen Kia	Steve Larsen	Master Elite
San Luis Bay Motors Kia	Ian Anderson	Master Elite Plus
Serra Kia	Timothy Bridges	Master Elite
Stevenson Kia of Jacksonville	Joseph Carter	Master Elite
The Kia Store	Guy Neuschwander	Master Elite
Wallace Kia of Bristol	Richard Guy	Master Elite
Warner Kia	Robert Richards	Senior Elite
West-Herr Kia	Jon Brawdy	Master Elite



# CONGRATULATIONS 2017 SERVICE TECHNICIANS!



## 12 YEARS CONSECUTIVE CERTIFICATION

DEALER	TECHNICIAN	CERTIFICATION LEVEL
Auto World Kia	Robert Baker	Master Elite
Boniface-Hiers Kia	Dean Dewitt	Master Elite Plus
Boucher Kia	Dave Batzko	Master Elite Plus
Car Pros Kia	Ralph Brunt	Master Elite
Car Town Kia, USA	Mark Rayburn	Master Elite
Century Kia	David Cummins	Master Elite
Commonwealth Kia	Richard Burnham	Master Elite
Crain Kia	Joseph Sansom	Master Elite
Darcars Kia	Robert Covolo	Master Elite Plus
Dick Witham Kia	Dean Vogl	Master Elite
Eagle Auto Kia	Charles Sladky	Master Elite Plus
Elk Grove Kia	Todd Goodwalt	Master Elite
Family Kia Of St. Augustine	Clive Delaphena	Master Elite
Galpin Kia	Edwin Torossian	Master Elite Plus
Generation Kia	David Nourse	Master Elite
Gerry Wood Kia	Jason Atwell	Master Elite
Grand Kia	Jim Schofield	Master Elite Plus
Hyman Bros Kia	Wiley Preston	Master Elite
Jerry Seiner Kia, Salt Lake	James Baker	Master Elite Plus
Jim Butler Kia	Billy Beaver	Master Elite Plus
Keffer Kia	Chris Wright	Master Elite
Kia AutoSport	John Hale	Professional Elite
Kia of Bedford	Britt Vanmeter	Master Elite
Kia Store	Kem Jackson	Master Elite
Kia Store - Anniston	Fred Hogan	Master Elite



# CONGRATULATIONS 2017 SERVICE TECHNICIANS!



## 12 YEARS CONSECUTIVE CERTIFICATION

DEALER	TECHNICIAN	CERTIFICATION LEVEL
Lancaster Kia	Lawrence Cole	Master Elite Plus
Lehighton Kia	Scott Rutan	Master Elite
Matt Castrucci Kia	Bernard Crawford	Master Elite
Medved Kia	Chad Davis	Master Elite
Mentor Kia	John Vinkler	Master Elite
Miami Lakes Kia	Herbie Lopez	Master Elite
Midtown Kia	James Grannemann	Master Elite
Moritz Kia	James Goree	Professional Elite
Palmen Kia of Kenosha	Buddy Duvall	Master Elite
Performance Kia	Brett Raymer	Master Elite
Prestige Kia	David Bailey	Master Elite
Raymond Kia	Jason Fitzgerald	Master Elite Plus
Rosen Kia	Fidencio Perez	Master Elite
Safford Kia of Fredericksburg	Chris Childers	Master Elite
Steven Kia	Blair Vile	Master Elite Plus
Steven Kia	Shawn Beigler	Master Elite
World Kia Joliet	Pete Sustaita	Master Elite



# CONGRATULATIONS 2017 SERVICE TECHNICIANS!



# 11

## YEARS CONSECUTIVE CERTIFICATION

DEALER	TECHNICIAN	CERTIFICATION LEVEL
Auffenberg Kia Cape Girardeau	Mike Sample	Master Elite
Bill Bryan Kia	Frank Ballard	Master Elite
Billion Kia	Robert Danielsen	Master Elite
Bob Rohrman Schaumburg Kia	Bobby Kroman	Master Elite
Brown-Daub Kia	David Hill	Master Elite
Car Pros Kia	Seth Luke	Master Elite
Car Pros Kia	Leonard Teffteller	Master Elite
Car Pros Kia Huntington Beach	Richard Herrera	Master Elite
Central Kia of Plano	Adnan Aliefendic	Master Elite
Charlie's Kia	Dennis Corson	Master Elite Plus
Cobb County Kia	Andrew Maxted	Master Elite
DeMontrond Kia	Maurice Grant	Master Elite Plus
Dennis Eakin Kia	Paul Labombard	Senior Elite
Dutch Miller Kia	Homer Lanham III	Master Elite
Gateway Kia	George Kammerle	Master Elite
Gunther Kia	John Adams	Master Elite
Haddad Kia	Ruben Hernandez	Master Elite
Key West Kia	Craig Wellings	Maintenance Elite
Kia Country	Enrique Nuñez Jr.	Master Elite
Kia of Cerritos	Kenny Do	Master Elite Plus
Kia of Greenwood	Rodney Perry	Master Elite
Kia of Lansdale	Chau Lu	Master Elite Plus
Leighton Kia	Robert Workman Jr.	Master Elite
Luther Kia	Tim Clark	Professional Elite Plus
Martin Kia	Carl Strothmann	Master Elite



# CONGRATULATIONS 2017 SERVICE TECHNICIANS!



# 11

## YEARS CONSECUTIVE CERTIFICATION

DEALER	TECHNICIAN	CERTIFICATION LEVEL
Moritz Kia	Humberto Garcia	Master Elite
Paramount Kia	Jeff Lowman	Master Elite
Parkside Kia	Joseph Hamilton	Master Elite
Parkway Family Kia	Jose Rubio	Master Elite
Price Kia	Larry Houchens	Master Elite
Riverside Kia	Mario Salmon	Master Elite
Rodeo Kia	Greg Oler	Master Elite
Smail Kia	Sean Pease	Master Elite
Sunbury Motors Kia	Pjay Hunsberger	Master Elite
Sussman Kia	Joseph Herling	Master Elite
Tom Dolan's Reno Kia	Ken Evans	Master Elite
Universal Kia	Brian Strickler	Master Elite
Visalia Kia	Juan Lemus	Master Elite
Westside Kia	Herbey Rodriguez	Master Elite
Willowbrook Kia	Marcelino Francisco	Master Elite
Young Kia	Scott Bair	Master Elite





# CONGRATULATIONS 2017 SERVICE TECHNICIANS!



## 10 YEARS CONSECUTIVE CERTIFICATION

DEALER	TECHNICIAN	CERTIFICATION LEVEL
Alan Jay Kia	Douglas Campbell	Master Elite
Alexander Kia	Jeffrey	Master Elite
Aloha Kia Leeward	Pedro Pacleb	Professional Elite
Ancira Kia	Robert	Master Elite
Ancira Kia	David Estrada	Master Elite
Archer Kia	Hung Nguyen	Master Elite
Baierl Kia	Brad Leech	Master Elite
Ball Kia	Donald Way	Master Elite Plus
Berlin City Kia, Burlington	Peter Austin	Master Elite Plus
Berlin City Kia, Burlington	Kevin Butler	Master Elite
Berlin City Kia, Burlington	Dale Fullerton	Master Elite
Buchanan Kia	Wayne Vaughn	Master Elite
Burlington Kia	Michael Morey	Master Elite
Car Pros Kia Glendale	Patrick Farrell	Master Elite
Central Kia of Plano	Christopher Bettis	Master Elite
Central Kia of Plano	Marco Palacios	Master Elite
Citrus Kia	Rod Adams	Master Elite Plus
Clay Cooley Kia	Lawrence Alderete	Master Elite
Cooper Kia	Charles Christie	Master Elite
Cooper Kia	Scott Forbes	Master Elite
Courtesy Kia of Brandon	Byron Crowe	Master Elite
Covina Valley Kia	Juan Alvarez	Master Elite
Crowley Kia	Jared Brunet	Master Elite
Crown Kia	Keith Mullikin	Master Elite Plus
Destination Kia	Joseph Gaglioti	Master Elite
Dothan Kia	Nicholas Shelley	Master Elite
Ed Voyles Kia of Chamblee	Field Williams	Master Elite
Evans Kia	Jerry Poston	Master Elite



# CONGRATULATIONS 2017 SERVICE TECHNICIANS!



## 10 YEARS CONSECUTIVE CERTIFICATION

DEALER	TECHNICIAN	CERTIFICATION LEVEL
Ewald Kia of Oconomowoc	Joseph Pasternak	Master Elite Plus
F.X. Caprara Kia	John Perretta	Senior Elite
Fayetteville Kia	Frank Dorado	Master Elite
Freedom Kia	Eric Nicholson	Master Elite
Freedom Kia	Eddie Price	Master Elite
Fuccillo Kia of Port Charlotte	Garfield Scarlett	Master Elite
Galeana Kia	Terry Garner	Master Elite
Gerald Kia of Naperville	Gregory Dubs	Master Elite Plus
Gervais Kia	Johnson Paisarn	Master Elite
Halleen Kia	David Zimmerman	Master Elite
Harper Kia	Tracy Hanger	Master Elite
J.P. Thibodeaux Kia	Gerald Provost	Master Elite
Jack Miller Kia	Todd Keown	Master Elite
Jack Miller Kia	Rick Nielsen	Professional Elite
Jeff Wyler Kia	James Mcgurk	Master Elite
JTs Kia of Rock Hill	Patron Miller	Master Elite
Kia Atlanta South	Walter Henson	Master Elite
Kia AutoSport	James Burkett	Master Elite
Kia AutoSport	Kelly Howley	Professional Elite
Kia Country	Aaron Kimmel	Master Elite
Kia Country	Dang Yang	Master Elite
Kia of Gastonia	Guy Gentry	Master Elite
Kia of Greer	Jay Hammond	Master Elite
Kia of Lansdale	James Mitchell	Master Elite
Kia Of Lincoln	John Frohner	Master Elite
Kia of McComb	Wesley Hubner	Master Elite
Kia of Puyallup	Christopher Ford	Master Elite
Lawton Kia	Walter Goodiell	Master Elite



# CONGRATULATIONS 2017 SERVICE TECHNICIANS!



## 10 YEARS CONSECUTIVE CERTIFICATION

DEALER	TECHNICIAN	CERTIFICATION LEVEL
Lee Kia	Groekrit Suttisawas	Professional Elite
Lifetime Kia	Lewis Clark	Master Elite
Lifetime Kia	Mark Roberts	Master Elite
Lokey Kia	Adam Donoho	Master Elite
Luther Kia Of Bloomington	Alex Soderberg	Professional Elite
Mark Kia	Russell Hahn	Master Elite
Mike Murphy Kia of Brunswick	Larry Thompson	Master Elite
Montrose Kia	William Barcklay	Master Elite
Napleton's Kia of Elmhurst	Jesus Payabyab	Master Elite
Napleton's River Oaks Kia	Lee Snyder	Master Elite
Napoli Kia	John Haydusky	Master Elite
Northtown Kia	Martin Ceciliano	Master Elite
Paramount Kia	Michael Barlowe	Master Elite
Paramount Kia of Asheville	Seth Heffner	Master Elite Plus
Parkside Kia	Tommy Latulipe	Master Elite
Patterson Kia of Arlington	Emanuel Hernandez	Master Elite
Peak Kia	Hector Delgado	Master Elite
Perris Valley Kia	Leo Rosales	Master Elite
Pitre Kia	Dave Klimowicz	Master Elite
Pocatello Kia	Logan Johns	Master Elite
Price Kia	Corey Byars	Master Elite
Riverside Kia	Roberto Lopez	Master Elite
Rock River Kia	Douglas Hawkinson	Master Elite
Rowe Kia	Eric Smith	Master Elite
Royal Kia	Chad Nowell	Master Elite
Russ Darrow Madison Kia	Erik Filipowicz	Master Elite Plus
Shawnee Mission Kia	Michael Bland	Master Elite
Southern Kia Greenbrier	Mark Chew	Master Elite



# CONGRATULATIONS 2017 SERVICE TECHNICIANS!



## 10 YEARS CONSECUTIVE CERTIFICATION

DEALER	TECHNICIAN	CERTIFICATION LEVEL
Southlake Kia	Paul Hamstra	Master Elite
Southwest Kia RR	Zachary	Master Elite
Sunset Kia of Venice	Dale North	Master Elite
Team Kia	Edward Papinchak	Master Elite Plus
Team Kia	Patrick Saylor	Master Elite Plus
Team Kia	Derek Cincevich	Master Elite
The Kia Depot	Thomas Cruz	Master Elite Plus
Transitowne Kia of West Seneca	Terry Bridenbaker	Master Elite
Tynan's Kia	Dominick Giglione	Master Elite
Universal Kia	Thomas Crowell	Master Elite
Van Griffith Kia	James Coffey	Master Elite
Van Griffith Kia	Justin Kenny	Master Elite
Warner Kia	John Mayhew	Senior Elite
West-Herr Kia	Dwayne Hogencamp	Master Elite
Westside Kia	Sean Martin	Master Elite
Williams Kia	Samuel Tann	Master Elite
Wyatt Johnson Kia	Michael Faught	Maintenance Elite

## WORD SEARCH PUZZLE

Test your search ability on this puzzle, which contains 30 different words found throughout this issue.

Words may be across, backwards, and diagonal. Some letters may appear in multiple words. Look to page 19 for a solution.

ACHIEVEMENT  
ATKINSON  
CALIBRATED  
CAMSHAFT  
CERTIFICATE  
CERTIFICATION

COMBUSTION  
COMPRESSION  
CONDITIONING  
COUPLERS  
CRANKSHAFT  
CVVT

EXHAUST  
INTAKE  
MALFUNCTION  
NAVIGATION  
PARAMETERS  
PHASE

PITSTOP  
REGIONS  
SATISFACTION  
SCHEMATICS  
SIMULATION  
SOFTWARE

SOLENOID  
TELEMATICS  
TERMINAL  
TORQUE  
TRAINING  
VIBRATION

W	T	G	S	A	N	S	R	S	U	E	M	A	S	R	T	F	G	N	C
T	N	X	A	T	A	S	C	G	R	E	R	O	E	F	J	T	U	O	X
V	E	B	T	K	V	E	R	H	M	E	L	A	A	S	E	K	N	I	T
V	M	X	I	I	I	G	X	Q	E	E	T	H	W	L	A	D	J	T	F
C	E	T	S	N	G	P	F	H	N	M	S	E	E	T	I	H	C	A	A
C	V	R	F	S	A	B	J	O	A	K	A	M	M	T	F	S	P	L	H
P	E	Z	A	O	T	Z	I	E	N	U	A	T	I	A	R	O	Z	U	S
I	I	R	C	N	I	D	E	A	Q	T	S	O	I	E	R	X	S	M	M
T	H	Z	T	D	O	T	R	T	I	E	N	T	L	C	V	A	D	I	A
S	C	L	I	I	N	C	B	C	A	I	G	P	N	Q	S	Z	P	S	C
T	A	V	O	G	F	X	S	J	N	C	U	O	A	R	S	H	D	V	I
O	O	M	N	R	J	I	B	G	N	O	I	S	S	E	R	P	M	O	C
P	N	H	R	Z	F	C	C	Y	C	T	G	F	R	E	G	I	O	N	S
D	E	T	A	R	B	I	L	A	C	J	R	X	I	X	N	S	Y	I	X
V	I	B	R	A	T	I	O	N	T	I	Y	A	H	T	W	V	N	K	K
I	I	N	C	O	M	B	U	S	T	I	O	N	I	F	R	T	Q	N	Y
E	U	Q	R	O	T	F	C	Q	P	S	O	J	O	N	A	E	T	P	W
Z	C	Y	U	F	L	N	Q	A	V	B	E	N	I	K	I	O	C	I	F
B	I	J	L	A	N	I	M	R	E	T	E	B	E	Q	P	N	J	X	A
D	C	B	M	Y	H	A	S	A	F	Z	P	C	E	A	D	X	G	O	I

# JOE'S CORNER WHAT YOU SEE IS WHAT YOU GET

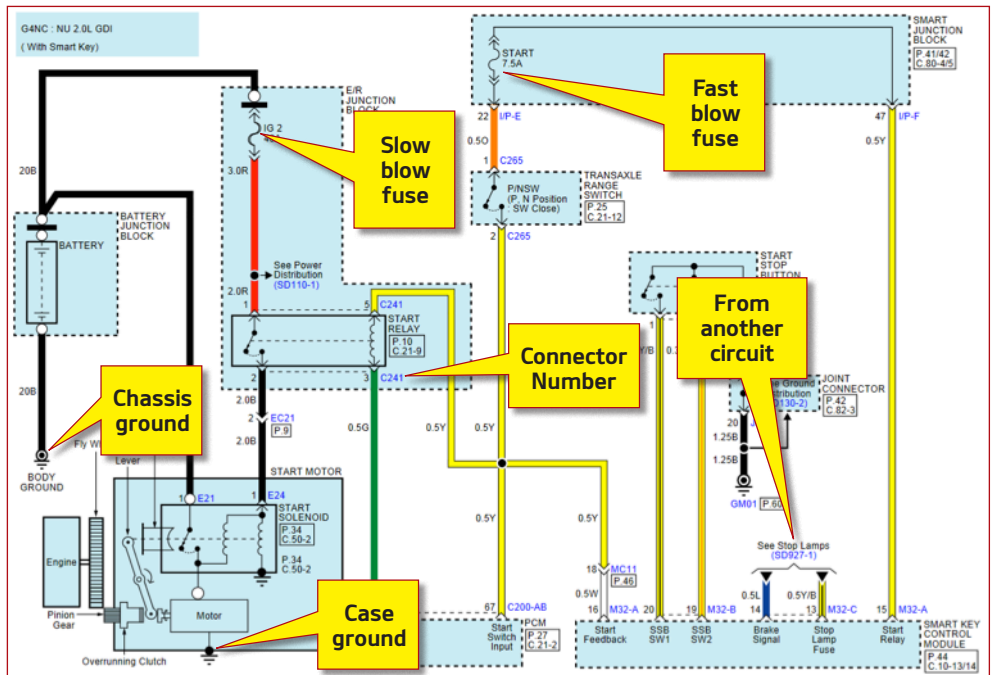
## How to read Kia ETM Schematics.

In this edition, I will show you how to easily read ETM schematics.

Let's start with one that should be easy to follow: the Starting System on a 2017 Soul NU 2.0L GDI with Smart Key. If you look closely, the **Slow Blow Fuses** have a double line. The **Fast Blow Fuses** only have a single line.

Also, notice the difference in the grounds. The Case Ground is the metal part of the component. The starter solenoid and motor bolts to the engine, which grounds through the Body Ground. The Body Ground, sometimes called a Chassis Ground, has a wire connected to it.

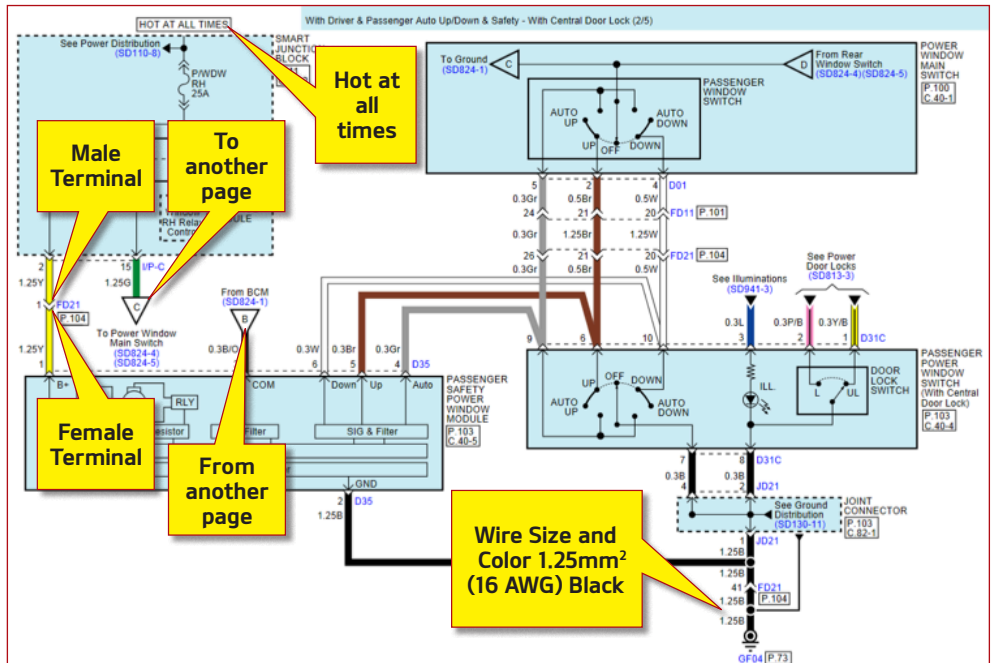
**Wire size** is helpful when trying to identify wires within a harness or a connector. **Wire color** is important when finding a specific circuit in a connector with many wires.



Symbol	Color	Symbol	Color
B	Black	O	Orange
Br	Brown	P	Pink
G	Green	R	Red
Gr	Gray	W	White
L	Blue	Y	Yellow
Lg	Light Green	LI	Light Blue

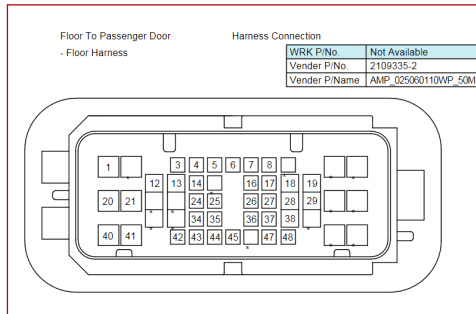
Background color (Y)(B) Black Stripe with yellow ground (2 colors)  
Color of stripe

AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>
30	0.05	18	0.75	6	16
28	0.08	17	1.0	4	25
26	0.14	15	1.5	2	35
24	0.25	14	2.5	1	50
22	0.34	12	4.0	1/0	55
21	0.38	10	6.0	2/0	70
20	0.50	8	10	3/0	95

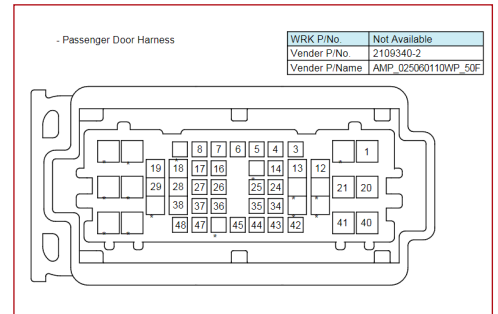


**Terminal numbering** can be confusing. Numbering is the terminal side. When looking at the backside of a Female Connector, use the Male Numbering to find the correct wire.

Stay tuned for my next article. "To Bleed or not to Bleed. That is the question." It will cover what to bleed in the brake systems on Hybrid and Electric Vehicles that do not have a vacuum brake booster.



(Male numbered left to right)



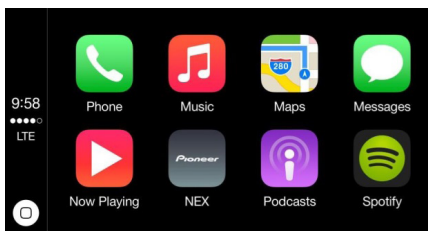
(Female numbered right to left)

## APPLE CARPLAY® CONCERNS WITH iOS 10.X VERSIONS

This article provides information regarding concerns with Apple CarPlay® with various iOS 10 versions on vehicles with the Apple CarPlay® feature (software dependent) on the head units below:

- Premium Navigation (AVN 4.0)
- UVO eServices (UVO 3.0)

Kia has no control over the changes and/or content in the Apple CarPlay® software that is rolled out by Apple in iPhone iOS updates.



The following concerns have been found after release

of iOS 10.X versions such as 10.1, 10.1.1, 10.2, 10.2.1 (not all complaints were found on each specific iOS 10 version):

- No notification of new text messages
- Text messages are not read
- Siri® mutes when playing voice mail
- Siri® fails to respond
- Fails to play music in previous mode after text message or phone call (such as Pandora®, iTunes®, SiriusXM®)
- Music freezes
- Black screen/Blank screen (sometimes occurs with no sound)
- Voice guidance from Apple maps when sound is muted
- Apple CarPlay® locks up after incoming phone call or is no longer available after phone call
- Concerns with the accuracy of the Apple Maps app

The following suggestions may improve the Apple CarPlay® experience:

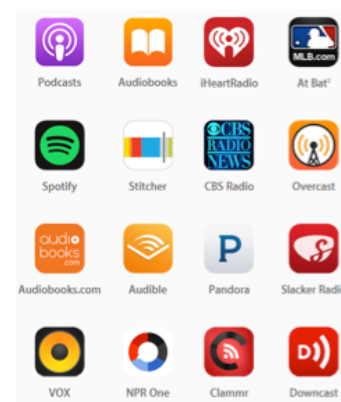
- Customers should continue to update to the latest released version of iOS 10 and beyond operating system as versions may be released that contain Apple CarPlay® improvements.
- Advise the customer to reboot their phone (turn the phone off and back on) and reconnect to Apple CarPlay®. This may reduce the occurrence of some concerns for a period of time.
- For temporary black/blank screen, try to change modes/disconnect/reconnect
- For interruption in functionality (Siri®, Maps, etc.) due to data signal strength, move to an area with stronger carrier signal.
- Try another Apple certified cable
- Refer to TSB ELE 104 for additional troubleshooting

**NOTE:** Use of Apple CarPlay® is dependent upon the iPhone, iOS version (Apple CarPlay® version).

Kia continues to work with Apple to resolve these iPhone/iOS compatibility concerns. More information will be provided as it is available.

**Note:** Other vehicle manufacturers are experiencing similar issues at this time.

For your information the following Apps are listed on the Apple web-site as compatible with Apple CarPlay®:  
[apple.com/ios/carplay/](http://apple.com/ios/carplay/)



iPhone® is a registered trademark of Apple, Inc. Apple CarPlay™ is a trademark of Apple, Inc.

## 2016 TECHNICIAN SATISFACTION SURVEY RAFFLE 4TH QTR WINNERS

### Greetings Kia Technicians!

The results of the Q4-2016 Technician Satisfaction Survey Raffle were once again very positive. Kia Techline performed very well in 2016! We received **16,802 survey responses** in 2016 and the overall results for Techline were very positive with the overall satisfaction rating for Techline at 90% using a 1 to 5 point scoring system where only a score of 5 counts. As you know, anything less than 5 will be considered a failure. We reviewed all of your responses and gained valuable feedback on your Techline experiences. We will continue to use your feedback to see how we were doing and how we can correct any issues that may be occurring in our ongoing efforts to improve the level of service we provide to all our dealers. Thank you to all who participated in the surveys in 2016 and we hope you will participate even more in 2017. We greatly appreciate all of your valuable feedback!

### The 3 winners of the Q4-2016 raffle were...

1. John Harris - GA093
2. Sean Abernathy - TX128
3. Michael Ludwig - IL054

**Congratulations to all the winners!**

The Techline Technician Satisfaction Survey will continue every quarter throughout 2017 so please continue to submit your feedback by completing the survey when you close your cases and get a chance at winning 1 of 3 \$500 MasterCard gift cards!

In closing, 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:** 14 minutes

**Phone response time avg:** 9 seconds

**Comeback Ratio:** 0.6%

**New Case Count (includes PWA cases):** 105,200 in 2016

**Overall Satisfaction Survey Score**

(Only a score of 5 counts): 90%

Thank you all for your continued support! **Go Kia!**

Regards, Tony Cartagena

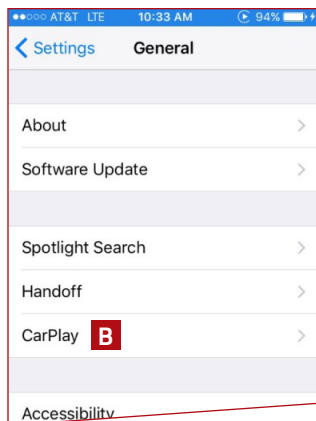
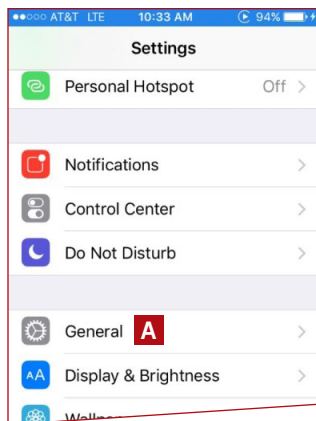
Techline Communications Manager, Kia Motors America

## APPLE CARPLAY® APP ICON PLACEMENT

This article provides information on the procedure to change the placement of the app icons that appear on a customer's vehicle display while using Apple CarPlay®. This allows customers to move their favorite apps to the home screen while moving less commonly used apps to subsequent pages.

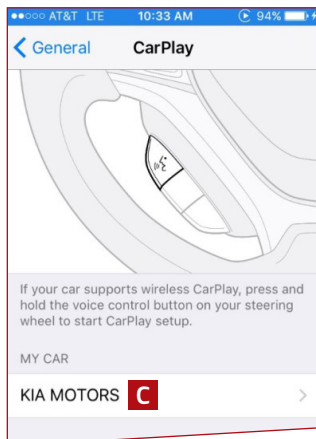
### Change Icon Location Procedure:

1. Obtain the customer's iPhone® and connect it to the customer's vehicle. Start CarPlay®. (Refer to TSB ELE104 for details.)
2. On the customer's iPhone®, open the Settings app. Scroll down and select General **A**.

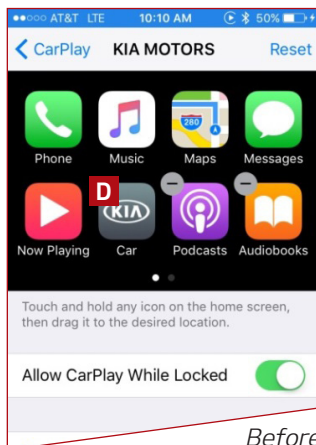


3. Select CarPlay® **B**.

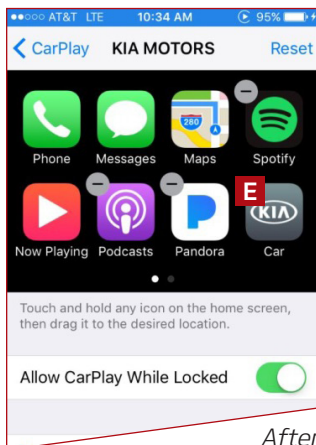
4. Select the customer's vehicle name: "KIA MOTORS" **C**.



5. The iPhone® displays the CarPlay® home screen **D**. Touch and hold any icon on the home screen and then drag it to the desired location **E**.

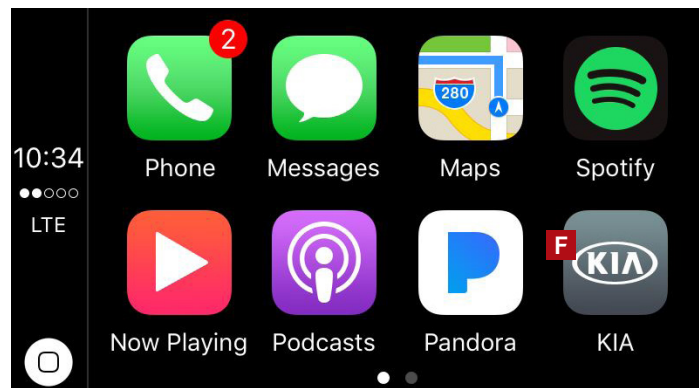


Before



After

6. The vehicle's home screen reflects what is shown on the iPhone® the next time CarPlay® is connected **F**.



## DIGITAL TORQUE CHECKER

Are your torque wrenches applying the correct amount of torque? The CDI Digital Torque Checker is a perfect tool for checking mechanical and digital torque wrench accuracy before each use. A little investment can go a long way in preventing unnecessary repairs due to improper torque application to critical automotive components. Not only will your torque wrenches be precisely calibrated, your technicians will be experts at applying torque properly and accurately.

Some of the features and benefits of the Digital Torque Checker include:

- Simple Operation
- Push Button Mode Select: First peak, Peak Hold, Tracking
- Accuracy +/- 1%
- Audio beep on over-torque (125% of full scale)
- Large backlit LCD screen
- Battery Life Indicator
- 3/8" Adapter included
- Units: Ft-Lb, In-Lb, Nm
- Includes Certificate of Calibration
- Compact Design: 4-3/4" x 13-1/2" x 2-3/16"
- Horizontal or Vertical Mounting Position
- CE Approved

For purchasing information, please visit [KiaSpecialTools.com](http://KiaSpecialTools.com).





# TESTING CVVT PERFORMANCE & OPERATION

## Using the KDS/GDS Data Analysis Tool

Proper operation of the Continuously Variable Valve Timing (CVVT) is critical for fuel economy, vehicle emissions and engine performance. However, technicians may misdiagnose a CVVT-related concern if they are not familiar with how the system works or are just reading a Diagnostic Trouble Code (DTC) from GDS/KDS. Proper diagnosis requires testing and inspecting both the mechanical and electrical sides of the system.

The following information provides a brief look at CVVT operation and how technicians can quickly test CVVT performance and monitor proper mechanical & electrical operation by evaluating a few specific Current Data parameters.

The Kia Continuous Variable Valve Timing (CVVT) system advances or retards valve timing of the intake and exhaust camshafts in accordance with the ECM control signal which is calculated using engine speed (RPM) and load (See Fig 1).

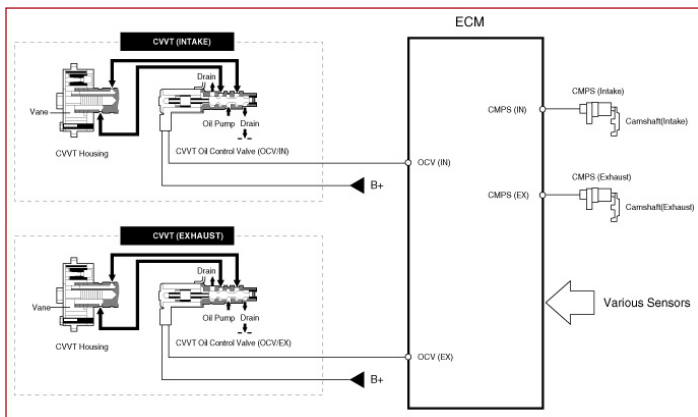


Fig. 1. CVVT System Overview

This system consists of:

- CVVT Oil Control Valve (OCV), which supplies the engine oil to the camshaft phaser or drains oil from the camshaft phaser in accordance with the ECM control signal to the OCV
- CVVT Oil Temperature Sensor (OTS) (if fitted), which measures the engine oil temperature
- Camshaft phaser unit, which varies the camshaft(s) position by using the hydraulic pressure/force of the engine oil, or the electrical input to the motor on ECVVT equipped engines

One of the biggest challenges any Kia dealer technician can encounter is the abundance of available parameters that can be monitored using GDS/KDS.

The GDS/KDS Data Analysis tool (also known as Current Data), offers a “Group” feature (Fig. 2).

Instead of sorting through a list of 100+ items to find the concern-related parameters needed to diagnose a concern, the “Group” feature is designed to save technicians time by offering a specific group of pre-selected parameters to assist with diagnosis of a distinct component and/or system.

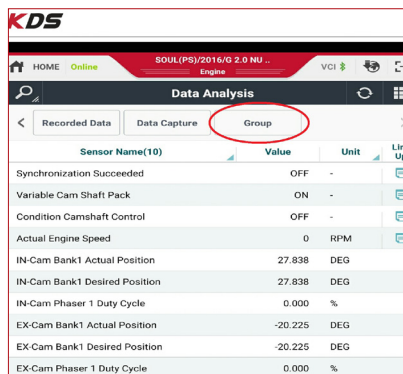


Fig. 2: KDS Data Analysis showing Grouping of CVVT system-related parameters (Ign. ON, Engine OFF)

Let’s take a closer look at a couple of CVVT system “Grouped” parameters and how they can help you diagnose CVVT concerns. Specifically, the Intake & Exhaust “Actual and Desired Camshaft” position parameters.

**IN-Cam or EX-Cam Bank 1 Actual Position:** The Camshaft Actual Position parameter displays the actual position of the Intake or exhaust camshafts relative to the crankshaft position. This is expressed as the number of degrees that full valve lift occurs after Top Dead Center (TDC) in the case of the inlet, and before TDC for the exhaust.

**IN-Cam or EX-Cam Bank 1 Desired Position:** This parameter displays the “Desired” position of the Intake or exhaust camshafts by the ECM/PCM, i.e., the position where PCM/ECM wants (desires) either camshaft to be. As in the case of “Actual” position, the “Desired” Camshaft position is also shown in degrees relative to the crankshaft position.

When monitoring these specific parameters for proper operation, it is important to remember that “Desired” should always be very close in degrees when compared to “Actual” position reading. If this is not the case, further diagnosis is required.

Let’s take a look at some examples:

In the illustration below (Fig. 3), the engine is under load and both Intake/Exhaust Camshafts “Actual” position can be seen reacting immediately to the load placed on the engine.

Concurrently, the “Desired” position of the intake/exhaust camshafts can be seen immediately reacting to match the “Actual” position. This is what a properly operating engine with no issues would display.

In this next scenario, when the engine is placed under a load, the Exhaust camshaft “Actual & Desired” positions do not seem to closely mirror each other as shown on Fig. 4 (next page). This could indicate a concern with the Exhaust side of the CVVT system.

Continued next page

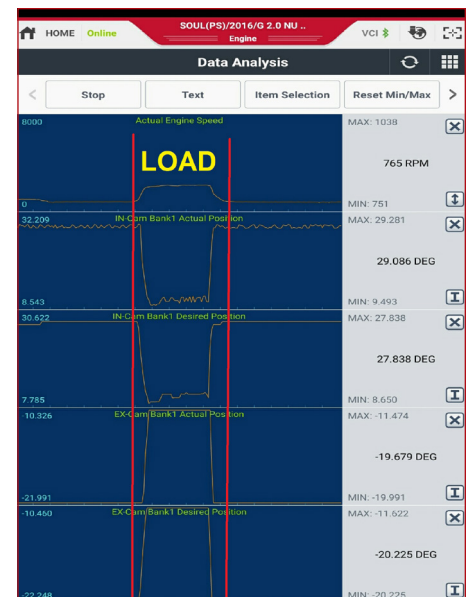


Fig. 3: Engine under load

## TESTING CVVT PERFORMANCE & OPERATION continued

At this point further diagnosis of the system is required since the ECM/PCM will most likely output a CVVT-related DTC (e.g. camshaft correlation code)

While the CVVT system is controlled by the Engine Management System (EMS) and a CVVT-related issue will most likely result in the GDS/KDS displaying a DTC, a mechanical issue such as insufficient oil pressure, or a piece of debris stuck inside the OCV could cause the system to malfunction and also output a DTC.

To determine the root cause of a CVVT concern, the following checks should be considered as part of your diagnosis:

- Check that the CVVT unit is being supplied with enough oil pressure to actuate the camshaft phaser -install a mechanical oil pressure gauge to verify oil pressure (check maintenance records, i.e., frequency of oil changes, engine oil quality, etc.)
- Has the Cylinder head been recently repaired or rebuilt? If yes, inspect/verify that the camshaft front bearing cap has the correctly-sized shell bearing installed (or missing)
- Check that the CVVT locking pin is releasing once the engine is started (engine oil pressure releases the locking pin). Refer to KGIS under CVVT & Camshaft Repair Procedures for more information on how to test locking pin operation.
- Is the mechanical portion of the Oil Control Valve (OCV) Operating? Remove the OCV from the engine and perform a visual inspection.
- Test the electrical portion of the OCV by measuring the coil resistance

- Test the electrical portion of the OCV by performing a GDS/ KDS actuation test
- Perform a GDS/KDS Simulation Test on the OCV while operating the engine and monitor the Actual vs. Desired positions.



Fig. 4: Engine under load —  
Ex. CVVT Concern

## CHECKING FOR LEAKS IN THE R1234YF AIR CONDITIONING SYSTEM

There may be some challenges when charging the A/C system when the system has a leak. The SAE requirement does not allow refrigerant to be put in a leaking system.

The R1234yf Recycling equipment is required by SAE J2843 to check for leaks in the vehicles A/C system before charging. A vacuum hold test is performed by the R1234yf equipment to confirm the system is free of leaks. After it passes the vacuum hold test, a small Pre-Charge is put in the A/C system so a leak check can be performed. This works until the system will not hold vacuum. The equipment will not charge the system because of the leak, but the leak cannot be found without a charge in the system.

### To continue with the A/C service:

Close off (counter clockwise) the couplers right before the vacuum Hold test. With vacuum locked in the recycling equipment, the Hold test will pass.

When the Pre-Charge cycle begins, open (clockwise) the couplers to allow the system to accept the Pre-Charge.

With the Pre-Charge in the system, use the ArcticPRO LD-2 Leak Detector to locate the leak. Check for leaks at the floor vents, connectors, hoses and compressor seal.

Once the leak is located, use the R1234yf equipment to reclaim the refrigerant before opening the system.



