OPTIMA HYBRID

2017 Product Workbook

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- Keep up to date on competitive comparison* information
- Take a deeper dive into new technology features, functions and benefits
- Enhance your presentation with operational videos showcasing key vehicle features (requires an internet connection)

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INTRODUCTION

Meet the 2017 Kia Optima Hybrid

Not your ordinary hybrid midsize sedan.

Efficiency without Compromise

More integrated, refined, efficient and powerful, the 2017 Optima Hybrid and Plug-in Hybrid are amazing green-technology sedans.

Both feature a new 2.0-liter Atkinson Cycle GDI engine, a more powerful electric motor, and a larger-capacity battery to deliver a seamless transition from electric to conventional power. The new Plug-in Hybrid offers an estimated 27-mile All Electric Range (AER) for added driving convenience.

New technologies and features include standard Android Auto™* and Apple CarPlay®*, exterior design enhancements, and greater interior refinement. Available driver assistance systems include Autonomous Emergency Braking (AEB)*, Blind Spot Detection (BSD)*, and Lane Departure Warning System (LDWS)*. Optima Hybrid and Plug-in Hybrid transform expectations of what a high-efficiency sedan can be.

All New for 2017

Mechanical

- 2.0L Atkinson Cycle GDI 4-cylinder engine with 154 hp and 38kW (Hybrid) or 50 kW (Plug-in Hybrid) electric motor
- Hybrid Starter-Generator
- 6-speed automatic transmission with Sportmatic® shifting
- 270V lithium-ion-polymer battery (Hybrid Premium, EX)
- 360V lithium-ion-polymer battery (Plug-in Hybrid EX)
- Drive Mode Select (Eco, Normal, Sport)
- Plug-in adds HEV Mode Select (EV Electric, HEV Hybrid)
- 120V (Level 1) or 240V (Level 2) charging (Plug-in Hybrid EX)
- Estimated Plug-in 27-mile All-Electric Range (AER) (internal estimate)

Exterior

- Gloss black front grille
- Active Air Flap
- Unique front and rear bumpers, front air curtain, side sill moldings, Eco Hybrid badges
- Unique Plug-in Hybrid blue accent trims (front grille, side sills, rear bumper)
- Single projection headlight design with available LED Daytime Running Lights
- LED headlights with Dynamic Bending Light (DBL) (available Hybrid EX, Plug-in Hybrid EX)
- Unique 16-inch (Hybrid Premium) and 17-inch (Hybrid EX, Plug-in Hybrid EX) alloy wheel design

Previous Accolades

5-Star Safety Ratings
More Stars. Safer Cars.

2015 Optima Hybrid Earned the 5-Star Overall NHTSA* Vehicle Score

2015 IIHS TOP SAFETY PICK

Insurance Institute for Highway Safety (IIHS)* Named Optima Hybrid a Top Safety Pick for 2015

edmunds.com

Optima Hybrid an Edmunds.com* Choice for "Top 10 Least Expensive Hybrids and Electrics for 2015"

*See the last page in this document for important Safety information and Legal disclaimers.

INTRODUCTION

All New for 2017 (continued)

- Unique LED taillights
- Plug-in charge port in left front fender (Plug-in Hybrid EX)
- Charging indicator (Plug-in Hybrid EX)

Interior

- Leather-trimmed seats (Hybrid EX, Plug-in Hybrid EX)
- 12-way power adjustable front passenger's seat with power lumbar support (available Hybrid Premium; standard Hybrid EX, Plug-in Hybrid EX)
- Integrated Memory System (IMS) for driver's seat (available Hybrid Premium; standard Hybrid EX, Plug-in Hybrid EX)
- Heated front seats (Hybrid EX, Plug-in Hybrid EX)
- Ventilated front seats (available Hybrid EX, Plug-in Hybrid EX)
- Heated rear seats (available Hybrid EX, Plug-in Hybrid EX)
- Rear side window sunshades (available Hybrid EX, Plug-in Hybrid EX)
- Auto-dimming rearview mirror (available Hybrid EX, Plug-in Hybrid EX)
- Panoramic sunroof with gloss black B-pillar (available Hybrid EX, Plug-in Hybrid EX)

Comfort & Convenience

- Autonomous Emergency Braking (AEB)* (available Hybrid EX, Plug-in Hybrid EX)
- Advanced Smart Cruise Control (ASCC)* (available Hybrid EX, Plug-in Hybrid EX)
- Blind Spot Detection (BSD)* with Rear Cross Traffic Alert (RCTA)* (Available Hybrid Premium, Hybrid EX, Plug-in Hybrid EX)
- Forward Collision Warning System (FCWS)* (available Hybrid EX, Plug-in Hybrid EX)
- High Beam Assist (HBA) (available Hybrid EX, Plug-in Hybrid EX)
- Lane Departure Warning System (LDWS)* (available Hybrid EX, Plug-in Hybrid EX)
- Rear Park Assist System (available Hybrid EX, Plug-in Hybrid EX)
- UVO eServices* with Android Auto™* and Apple CarPlay®
- UVO eServices* with Premium Navigation (Hybrid EX, Plug-in Hybrid EX)
- Harman/Kardon audio system with 10 speakers and Clari-Fi™* (Hybrid EX, Plug-in Hybrid EX)
- Integrated Wi-Fi (Plug-in Hybrid EX)
- Push-button Start with Smart Key* and Smart Trunk™*
- Eco Guide Gauge

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INTRODUCTION

GRADEWALK

Optima Hybrid Premium

Key Standard Features

- 2.0L Atkinson Cycle GDI MPI 4-cylinder engine with 154 hp + 38kW electric motor
- 270V lithium-ion-polymer battery
- 16-inch alloy wheels with P205/65R16 tires
- Four-wheel disc brakes with ABS and Brake Assist System (BAS)*
- Pedestrian Warning System
- Gloss black front grille
- Single projection headlight design
- Headlight anti-fog function
- Unique front and rear bumpers, side sills
- Unique LED tail lights
- Single-hidden instead of dual-exposed exhaust
- Drive Mode Select (Eco, Normal, Sport)
- Aero wiper cover
- Active Air Flap
- UV-reducing solar control glass
- Power-adjustable exterior mirrors with LED turn signals
- Keyless entry and alarm
- Exterior door handles with chrome accents
- Seven standard airbags*
- AM/FM/CD/MP3/SiriusXM®* audio with 6 speakers and steering-wheel-mounted controls*
- *Bluetooth®** wireless technology
- Cruise control
- Air conditioning
- Tilt and telescoping steering column
- UVO eServices® with Android Auto and Apple CarPlay®*
- Eco Guide Gauge
- Supervision Meter Cluster with Thin-Film Transistor (TFT) color LCD screen
- Power front windows with one-touch auto-up/down
- Cloth-trimmed seats with YES Essentails
- 6-way adjustable driver's seat with power lumbar
- Leather-wrapped steering wheel and shift knob
- Cup holders with chrome accents
- Illuminated and cooling glove box
- USB/Auxiliary input jacks
- Dual-zone automatic temperature control with rear vents
- 6-way adjustable front passenger's seat with height adjustment
- Rear reading lights
- Floor mats
- Electronic Stability Control (ESC)*
- Hill-start Assist Control (HAC)*
- Traction Control System (TCS)*
- Vehicle Stability Management (VSM)*
- Tire Pressure Monitoring System (TPMS)*
- Push Button Start with Smart Key* and Smart Trunk
- Tire Mobility Kit (TMK)*
- Folding key
- 60/40 split-folding rear seats
- 7.0-inch touch screen and rear camera display

Options & Packages

Hybrid Premium Convenience Package, MSRP* $TBD

- 12-way power-adjustable driver's seat with power lumbar support and Integrated Memory System (IMS)
- Acoustic Laminated Front Door Windows
- Acoustic Laminated Windshield
- Blind Spot Detection (BSD)* with Rear Cross Traffic Alert (RCTA)*
- Heated power-folding exterior mirrors
- USB ports (2)
- Rear Park Assist System

*See the last page in this document for important Safety information and Legal disclaimers.

INTRODUCTION

GRADEWALK (continued)

Optima Hybrid EX (In Addition to or In Place of Hybrid Premium)

Key Standard Features

- 17-inch alloy wheels with P215/55R17 tires
- Heated, power-folding exterior mirrors
- Electronic Parking Brake with Auto-Hold
- UVO eServices* with Premium Navigation*
- Heated steering wheel
- Single projection headlights with LED Daytime Running Lights (DRL)
- Leather-trimmed seats
- 12-way power-adjustable driver's seat with power lumbar support and Integrated Memory System (IMS)
- Heated front seats
- 8.0-inch touch screen and rear camera display
- Acoustic Laminated Front Door Windows
- Harman/Kardon® audio system with 10 speakers and Clari-Fi™*

Options & Packages

Hybrid EX Technology Package, MSRP* $TBD

- 10-way power adjustable front passenger's seat with power lumbar support
- Auto-dimming rearview mirror
- Panoramic sunroof with gloss black B-pillar
- Autonomous Emergency Braking (AEB)*
- Advanced Smart Cruise Control (ASCC)*
- Blind Spot Detection (BSD)* with Rear Cross Traffic Alert (RCTA)*
- Rear Park Assist System*
- Forward Collision Warning System (FCWS)*
- High Beam Assist (HBA)
- Lane Departure Warning System (LDWS)*
- LED headlights with Dynamic Bending Light (DBL)
- LED front and rear reading lamps
- Heated rear seats
- Rear side window sunshades
- Ventilated front seats

Optima Plug-in Hybrid EX (adds to Hybrid EX)

Key Standard Features

- 2.0L Atkinson Cycle GDI 4-cylinder engine (SULEV)
- 360V Lithium Polymer Battery
- 120V (Level 1) or 240V (Level 2) charging
- 27-mile All-Electric Range (AER)
- HEV Mode Select (EV Electric, HEV Hybrid)
- Plug-in charge port in left front fender
- Charging indicator
- Unique Plug-in Hybrid blue accent trims (front grille, side sills, rear bumper)
- Integrated Wi-Fi
- Metal door scuff plates
- 60/40 split-folding rear seats

Options & Packages

Plug-in Hybrid EX Technology Package, MSRP* $TBD

- 10-way power adjustable front passenger's seat with power lumbar support
- Auto-dimming rearview mirror
- Panoramic sunroof with gloss black B-pillar
- Autonomous Emergency Braking (AEB)*
- Advanced Smart Cruise Control (ASCC)*
- Blind Spot Detection (BSD)* with Rear Cross Traffic Alert (RCTA)*
- Rear Park Assist System*
- Forward Collision Warning System (FCWS)*
- High Beam Assist (HBA)
- Lane Departure Warning System (LDWS)*
- LED headlights with Dynamic Bending Light (DBL)
- LED front and rear reading lamps
- Heated rear seats
- Rear side window sunshades
- Ventilated front seats

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SPECIFICATIONS

Engine & Drivetrain	HYBRID 2.0L GDI 4-cyl. Engine	PLUG-IN HYBRID 2.0L GDI 4-cyl. Engine
Type	2.0-liter Atkinson Cycle 4-cyl., aluminum block and aluminum heads with 38kW electric motor	2.0-liter Atkinson Cycle 4-cyl., aluminum block and aluminum heads w/50 kW electric motor
Valve gear	DOHC, four valves per cyl., Dual CVVT	DOHC, four valves per cyl., Dual CVVT
Displacement	1,999 cc	1,999 cc
Bore x Stroke (mm)	81.0 x 97.0	81.0 x 97.0
Compression ratio	13.5:1	13.5:1
Combined Hybrid System Horsepower (hp @ rpm)	193 @ 6,000	202 @ 6,000
Combined Hybrid System Torque (lb.-ft. @ rpm)	271 @ 1,770	276 @ 2,330
Engine Horsepower (hp @ rpm)	154 @ 6,000	154 @ 6,000
Engine Torque (lb.-ft. @ rpm)	140 @ 4,000	140 @ 4,000
Electric Motor Horsepower (hp @ rpm)	TBD @ 1,770	TBD @ 2,330
Engine Motor Torque (lb.-ft. @ rpm)	151 @ 0-1,773	151 @ 0-2,330
Fuel tank capacity (gal.)	TBD	TBD
Fuel requirement	Regular Unleaded (87 Octane)	Regular Unleaded (87 Octane)
Fuel delivery	Gasoline Direct Injection (GDI)	Gasoline Direct Injection (GDI)
Transmission	6-speed automatic w/Sportmatic® shifting	6-speed automatic w/Sportmatic® shifting
Hybrid type	Parallel	Parallel
Hybrid battery type/power output/ voltage/weight	Lithium-ion-polymer/47 kW/270V/TBD lbs.	Lithium-ion-polymer/56 kW/360V/TBD lbs.
Electric motor type	Interior-permanent magnet synchronous motor	Interior-permanent magnet synchronous motor
Electric-vehicle operation limit (mph)	TBD	74
EPA Estimated Fuel Economy	**2.0L GDI 4-cyl. Engine**	**2.0L GDI 4-cyl. Engine**
Hybrid A/T (city/hwy/combined; MPG*)	TBD	-
Hybrid EX A/T (city/hwy/combined; MPG*)	TBD	-
Plug-in Hybrid EX A/T (Electric + Gasoline; EV mode combined; MPGe)	-	99
All Electric Range (AER) (miles, est.)	-	27
Charging Times 110/120V (Level 1)	-	< 9 hours
Charging Times 220/240V (level 2)	-	< 3 hours
Body & Chassis	**Specifications**	**Specifications**
Layout	Front engine, front-wheel drive	Front engine, front-wheel drive
Body type	Steel unibody	Steel unibody
Front suspension	Independent, MacPherson struts, stabilizer bar	Independent, MacPherson struts, stabilizer bar
Rear suspension	Independent, multi-link, stabilizer bar	Independent, multi-link, stabilizer bar
Steering type	Electric Power Steering (EPS)	Electric Power Steering (EPS)
Turning circle, curb-to-curb (ft.)	35.7	35.7
Brakes	**Specifications**	**Specifications**
Type	Hydraulic, vacuum power-assisted 4-wheel disc brakes	Hydraulic, vacuum power-assisted 4-wheel disc brakes
Front	TBD-in. ventilated discs	TBD-in. ventilated discs
Rear	TBD-in. solid discs	TBD-in. solid discs
Wheels	**Tires** / **Recommended Inflation Pressure (Front/Rear; psi)**	**Recommended Inflation Pressure (Front/Rear; psi)**
6.5J x 16-in. alloy wheels	P205/65R16 / 32/32	P205/65R16 / 32/32
7.0J x 17-in. alloy wheels	P215/55R17 / 32/32	P215/55R17 / 32/32
Exterior Dimensions	**Specifications**	**Specifications**
Wheelbase (in.)	110.4	110.4
Length (in.)	191.1	191.1
Track (front/rear; in.)	63.5/63.8	63.0/63.3
Width (in.)	73.2	73.2
Height (in.)	57.4	57.4
Ground clearance (in.)	5.1	5.1
Coefficient of drag (Cd)	0.24	0.25
Interior Dimensions	**Specifications**	**Specifications**
Seating capacity	5	5
Headroom (front/rear; in.)	39.8/37.8	39.8/37.8
Shoulder room (front/rear; in.)	58.1/56.4	58.1/56.4
Legroom (front/rear; in.)	45.5/35.6	45.5/35.6
Hip room (front/rear; in.)	56.0/56.0	56.0/56.0
Passenger volume (cu.-ft.)	TBD	TBD
Cargo volume (cu.-ft.)	13.4	TBD
Capacities	**Specifications**	**Specifications**
Curb weight (Hybrid; lbs.)	TBD	-
Curb weight (Hybrid EX; lbs.)	TBD	-
Curb weight (Plug-in Hybrid EX; lbs.)	-	TBD

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INTRODUCTION

ACCESSORIES

Aesthetic

- Kia keychain
- License plate frame
- Touch-up paint pen
- Valve stem caps

Convenience

- Cargo net (CN) A
- First aid kit
- Smoker's kit
- Sport visor
- Universal electronics holder

Protection/Security

- Bumper appliqué (BA)
- Cargo tray (CT) B
- Floor mats, all-weather C
- Floor mats, carpet (CF)
- Hood deflector
- Splash guards (MUG) D
- Wheel locks (WL)*

All cargo should be evenly distributed, properly secured and never piled higher than the seatback.

Images for representation only. Actual feature/component may vary.

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HYBRID OPPORTUNITIES AND CHALLENGES

Opportunities

- Exposure to a wider segment of customers
- Impressive technology for Kia
  - Fun to sell
  - Delivers a lot to your customers
  - Key purchase motivator

Challenges

- New technology to learn
- Differences in ownership experience
- New customers & customer motivators
  - Eco-conscious
  - Tech buffs
  - Status seekers

What do these challenges mean for you as a dealer sales or service consultant?

If you don't overcome these challenges, here's what can happen:

- Customer leaves without understanding the vehicle
- Customer comes back with questions
- Customer can end up dissatisfied with the vehicle, with the purchase decision, with Kia, with your dealership and with you
- Customer marks us down negatively on surveys
- Customer spreads bad word of mouth
- We lose customer trust

Challenge Yourself to Become a Hybrid Consultant

Payoffs for you:

- Gain a competitive edge — doing a better job selling and supporting technology than our competitors increases the value of your dealership
- Build trust in you, your dealership, and Kia
- Increase the customer's comfort with their purchase
- Gain repeated exposure to your customer, which helps build long-term relationships, fostering repeat sales and referrals

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HYBRID TECHNOLOGY

HYBRID BASICS

HYBRID VEHICLES – DID YOU KNOW?

What was the first mass-produced hybrid vehicle sold globally?

What was the first mass-produced hybrid vehicle sold in the U.S.?

What does CAFE stand for?

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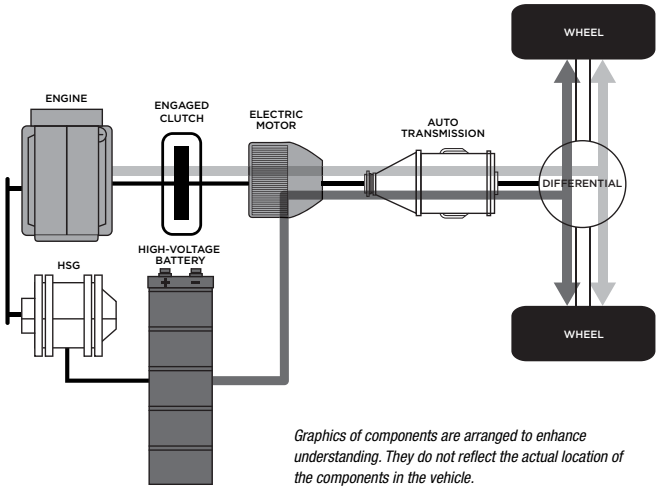
OPTIMA'S PARALLEL HYBRID SYSTEM

The Optima Hybrid is a parallel hybrid system. That means it can power the vehicle by:

- Gasoline engine only
- Electric motor only
- Combination of both



Graphics of components are arranged to enhance understanding. They do not reflect the actual location of the components in the vehicle.

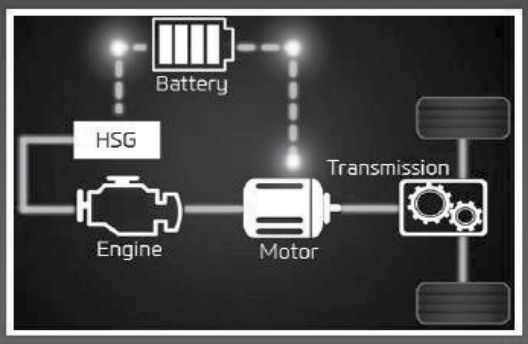
Hybrid Definition

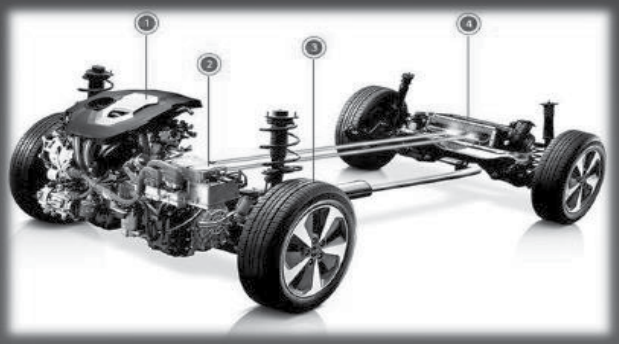
- A vehicle that uses two or more distinct power sources to move the vehicle
- Currently the most common hybrid vehicles use a traditional engine and a motor use an internal combustion engine and an electric motor

NOTES:

HYBRID TECHNOLOGY

KIA's Hybrid System Architecture





- KIA's TMED Hybrid System Benefits
  - Fast and seamless mode change
    - EV Mode ↔ Hybrid Mode
    - Precise control of engine clutch
  - Refined shift quality
    - Shift assist control of motor

※ TMED : Transmission Mounted Electric Device

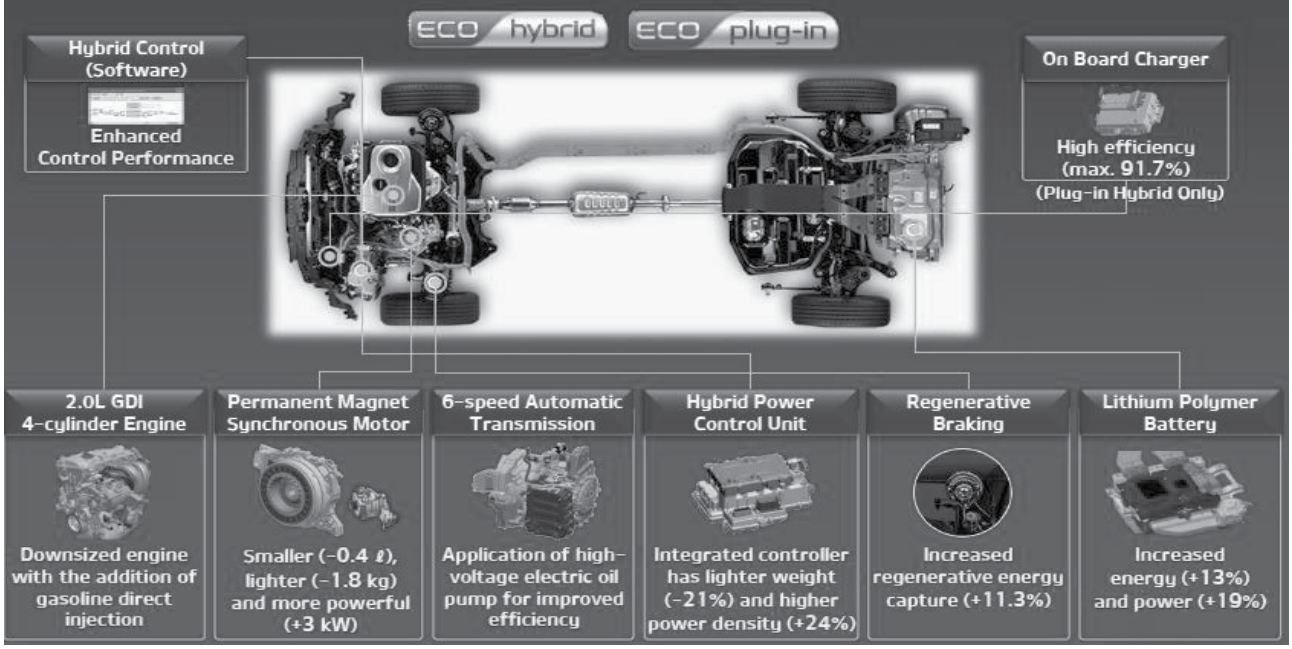
① Gasoline Engine – Efficient engine coupled with Hybrid Starter Generator

② Electric Motor – Provides traction power, assists the engine and recharges the battery

③ Regenerative Braking System – Recovers and stores kinetic energy during deceleration

④ Lithium-Ion Polymer Battery System- Compact, lightweight, high-density

KIA's Optima Hybrid System Enhancement



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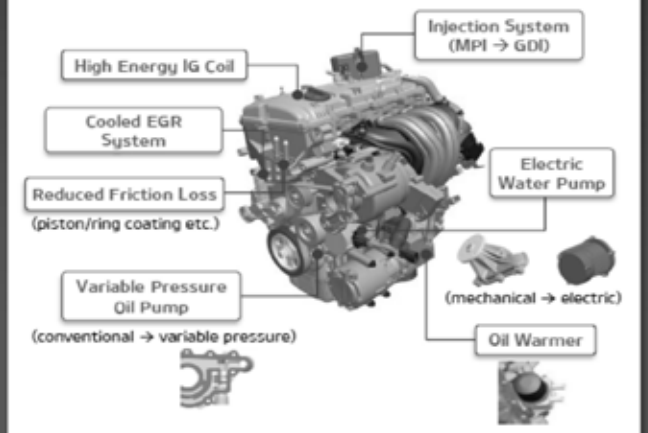
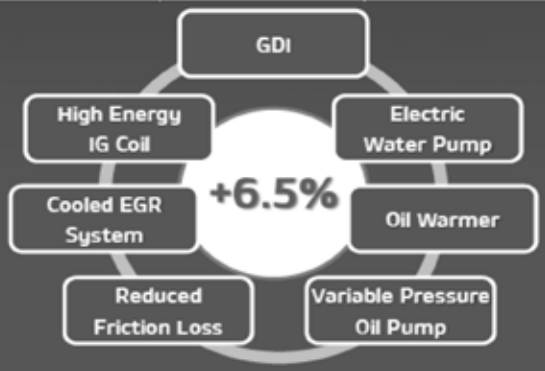
HYBRID TECHNOLOGY

Technical highlights - Gasoline Engine

Engine Improvement

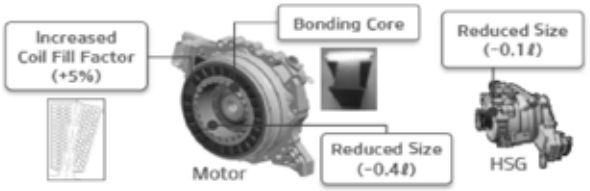


	2015 Optima Hybrid	2017 Optima Hybrid
Engine	Theta II 2.4 MPI	Nu 2.0 GDI
Max. Torque [kg-m]	21.3	19.3
BSFC [g/kWh] 8-poing average	235	225



Technical highlights - Motor/HSG & Transmission

Motor/HSG Improvement



		2015 Optima Hybrid		2017 Optima Hybrid
Traction Motor	Power (kW)	35	+8.6 %	38
	Torque (Nm)	205		←
	Efficiency (%)	90.1	+2.6 %	92.7
	Size (mm)	Φ280 X L56	-0.4 ℓ	Φ280 X L50
	Weight (kg)	30	-6 %	28.2
HSG	Power (kW)	8.5		←
	Torque (Nm)	43.2		←
	Size (Φ × L)	Φ128 x L80	-0.1 ℓ	Φ128 x L74
	Weight (kg)	12.6	-7.1 %	11.7

Transmission Improvement

	2015 Optima Hybrid		2017 Optima Hybrid
Oil Pump	(Main) Mechanical Oil Pump + (Auxiliary) Low Voltage Electric Oil Pump		High Voltage Electric Oil Pump
Operation Voltage	13.5V		270V (Hybrid) 360V (Plug-in Hybrid)
System Efficiency	45%	+9.5 %	54.5%
Cooling Type	Natural Air Cooling		Water Cooling

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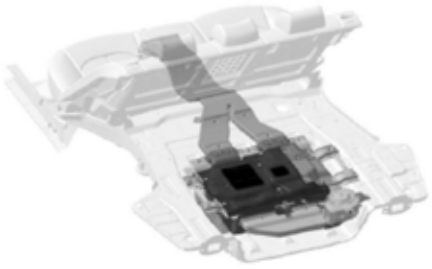
HYBRID TECHNOLOGY

Technical highlights – Battery System

Battery System Improvement

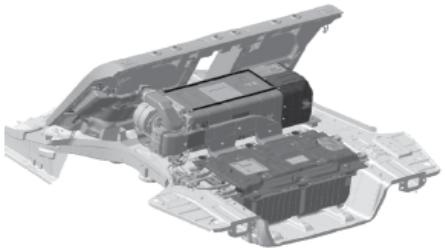


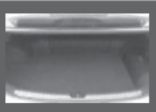
Hidden battery pack in tire well

	2015 Optima Hybrid	2017 Optima Hybrid	Camry Hybrid
Type	Lithium Ion Polymer	←	Ni-MH
Energy	1.43 kWh (270V / 5.3Ah)	+13 % 1.62 kWh (270V / 6.0Ah)	1.59 kWh (244.8V / 6.5Ah)
Power	47 kW	+19 % 56 kW	26 kW
Efficiency	94.3 %	+1.8 % 96.1 %	85.5 % *(est)*
Location	Behind the Rear Seat	Tire Well	Behind the Rear Seat
Cargo Volume (VDA)	381 ℓ	+11 % 425 ℓ	416 ℓ

Optima Plug-in Hybrid Battery System

Optima Plug-in Hybrid

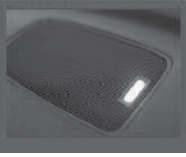


	Optima Plug-in Hybrid	Fusion Energi	Accord Plug-in Hybrid
Type	Lithium Ion Polymer	Lithium Ion	Lithium Ion
Energy	9.8 kWh (360V / 27.2Ah)	7.6 kWh (310V / 24.5Ah)	6.7 kWh (320V / 21Ah)
Energy Density	75 Wh/kg	(67 Wh/kg)	(47 Wh/kg)
Location	Behind the Rear Seat + Tire Well	Behind the Rear Seat	Behind the Rear Seat
Cargo Volume (VDA)	307 ℓ	233 ℓ	244 ℓ
Appearance			

HYBRID TECHNOLOGY

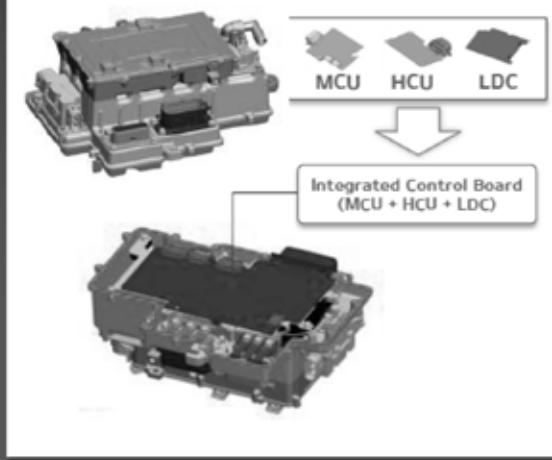
Optima Plug-in Hybrid Powertrain Attributes

		Optima Plug-in Hybrid	Fusion Energi	Accord Plug-in Hybrid
Battery System	Type	Lithium-Ion Polymer	Lithium-Ion	Lithium-Ion
	Capacity	9.8 kWh	7.6 kWh	6.7 kWh
Charging	On-board Charger	3.3 kW	3.3 kW	6.6 kW
	120V (L1)	<9 hrs	7 hrs	3 hrs
	240V (L2)	<3 hrs	2.5 hrs	1 hr
All Electric Range (AER, miles)		27 (internal estimate)	19	13
Total Driving Range (miles)		608 (internal estimate)	548	570



Technical highlights - Hybrid Power Control Unit

HPCU Improvement

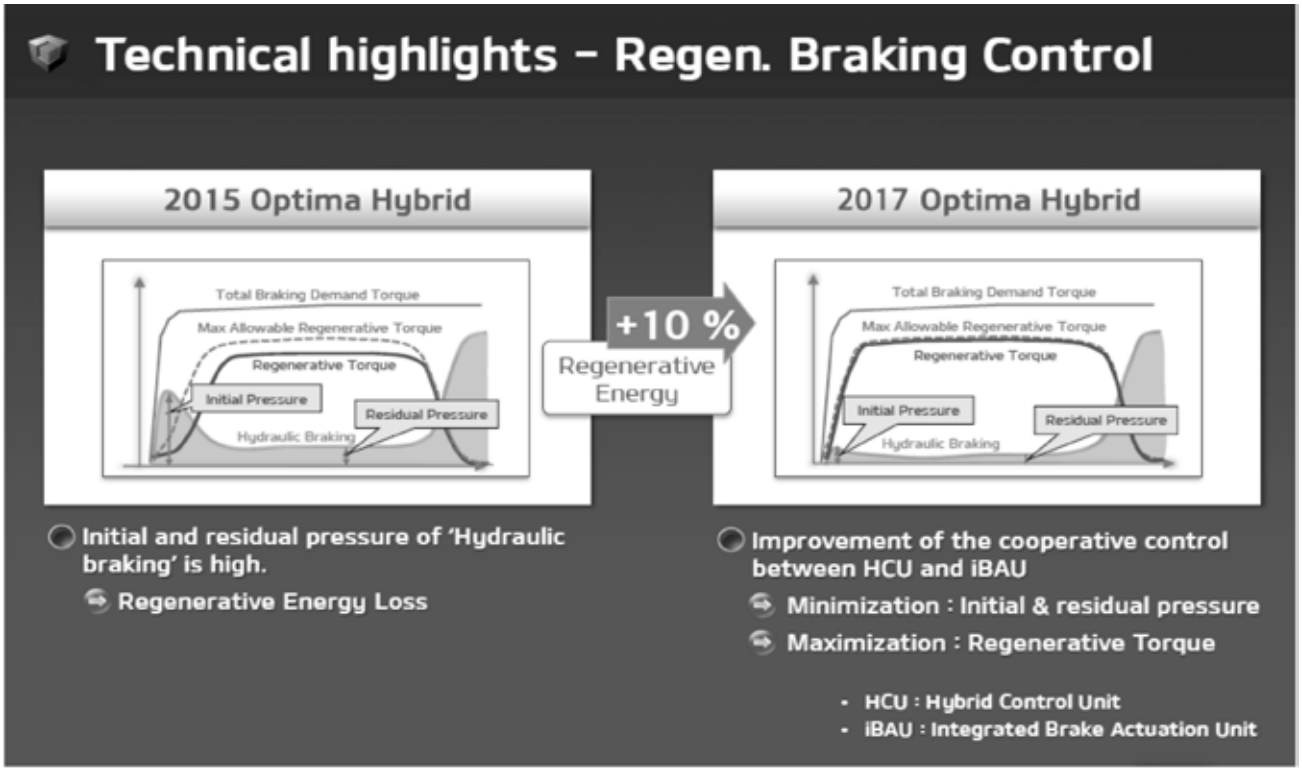


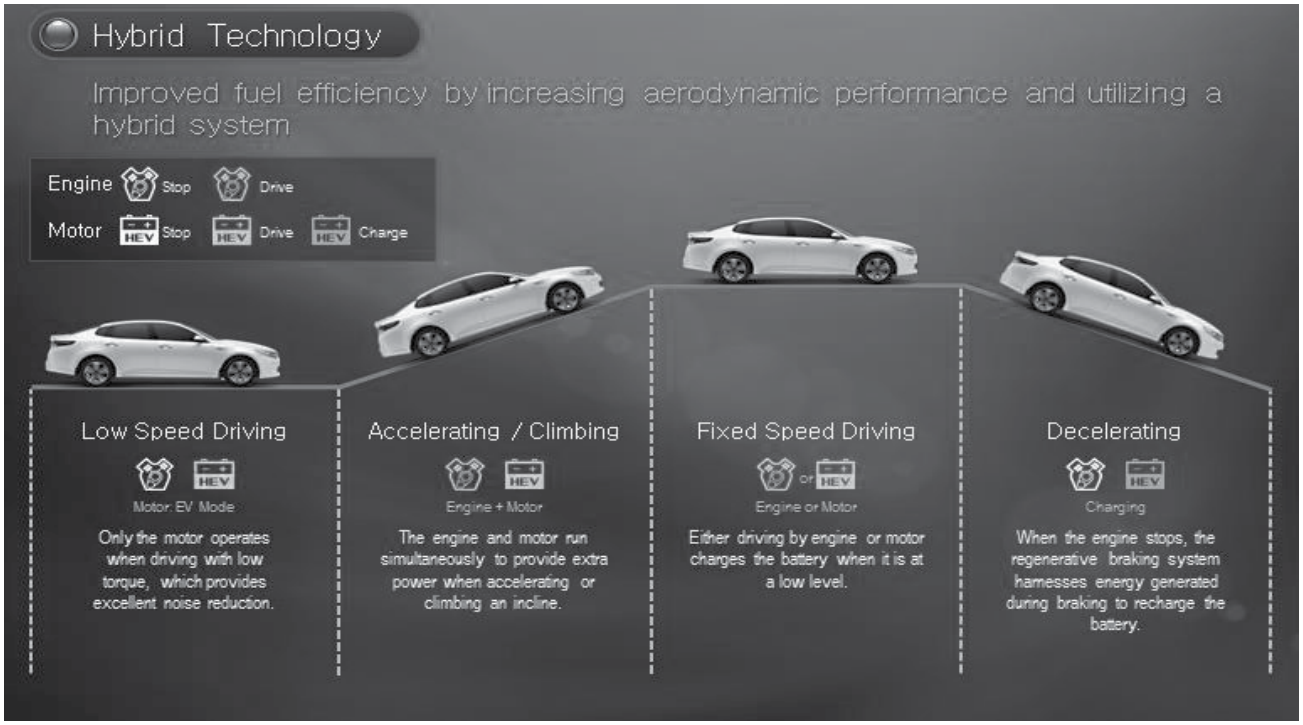
	2015 Optima Hybrid	2017 Optima Hybrid
HPCU	• HCU • MCU (Dual Inverter) : Motor/HSG Drive • LDC	
	Distributed 3 Controllers (1 Board 1 CPU) x 3	Integrated Controller 1 Board Dual CPU's
Power Density	13.5 kVA/L	+24 % 17.7 kVA/L
Weight	12.6 kg	-21 % 10 kg
Performance	-	Enhanced Dynamic Control Performance

- HCU : Hybrid Control Unit
- MCU : Motor Control Unit
- LDC : Low DC-DC Converter

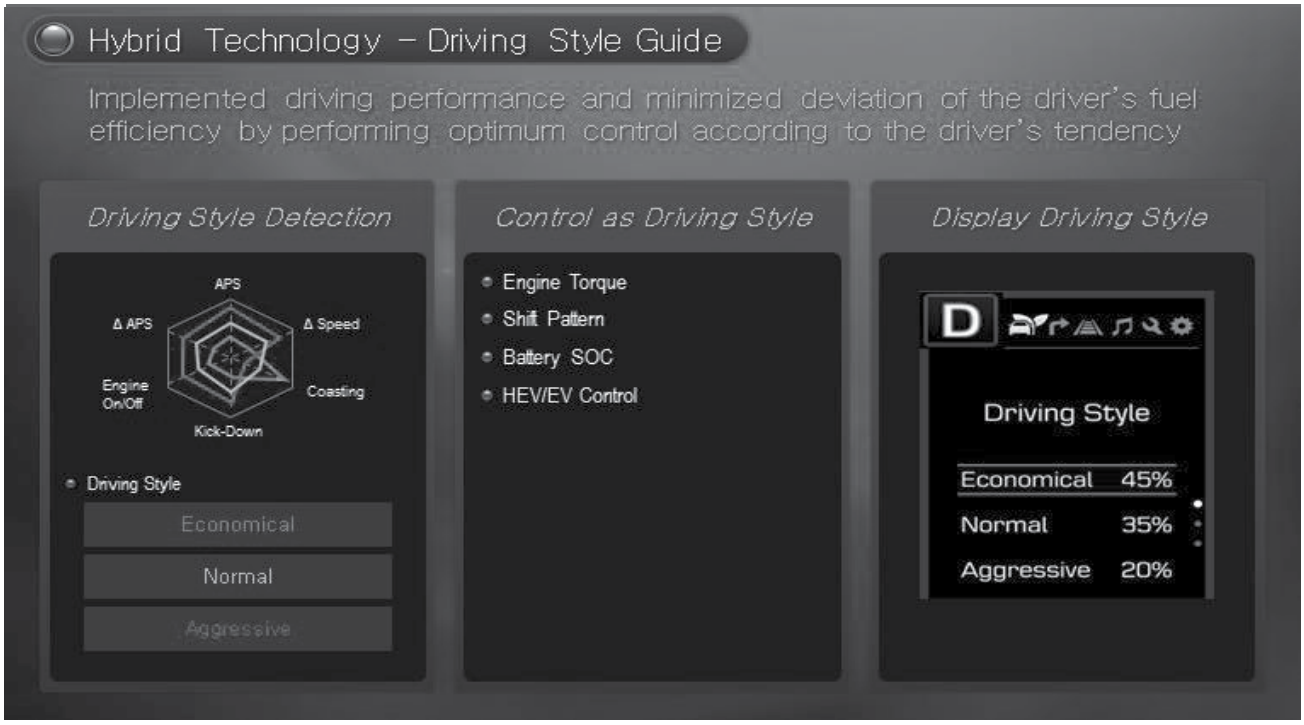
*See the last page in this document for important Safety information and Legal disclaimers.

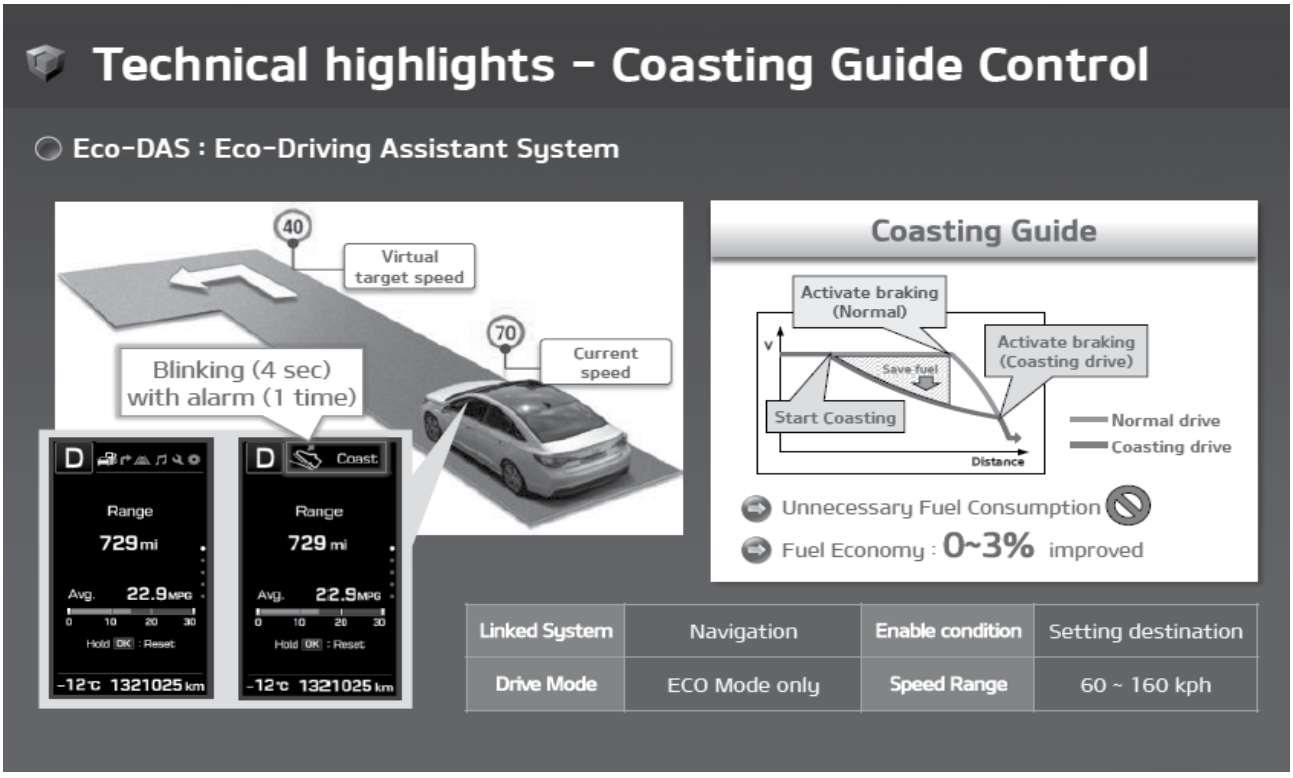
HYBRID TECHNOLOGY





HYBRID TECHNOLOGY





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HYBRID TECHNOLOGY

Hybrid Technology – Drive Mode Select

Drive Mode Select for personalized user experience and more engaging driving dynamics

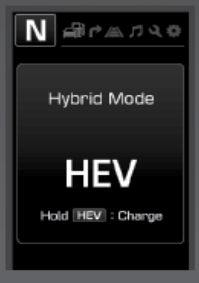
	Efficient	Balanced	Dynamic
Drive Mode	ECO	NORMAL	SPORT
Powertrain	ECO	NORMAL	SPORT
Steering	NORMAL	NORMAL	SPORT

	All-New OPTIMA hybrid	Camry HEV	Fusion HEV	Accord HEV
Drive Mode	ECO NORMAL SPORT	ECO NORMAL	N/A	N/A
A/T Mode	6 A/T Manual Shift Mode (+/- pattern)	ECVT B(Engine braking) Mode	ECVT B(Engine braking) Mode	ECVT L(Low speed) Mode

Technical highlights – Plug-in Hybrid Mode Select

HEV Mode Select

- HEV Mode Select on Plug-in Hybrid provides users the opportunity to reserve electric range.

	Electric Mode	Hybrid Mode
Display		
Battery Charge Level	Battery charge level is being depleted	Battery charge level is being kept
Recommend.	City Driving *(default mode)*	Highway Driving

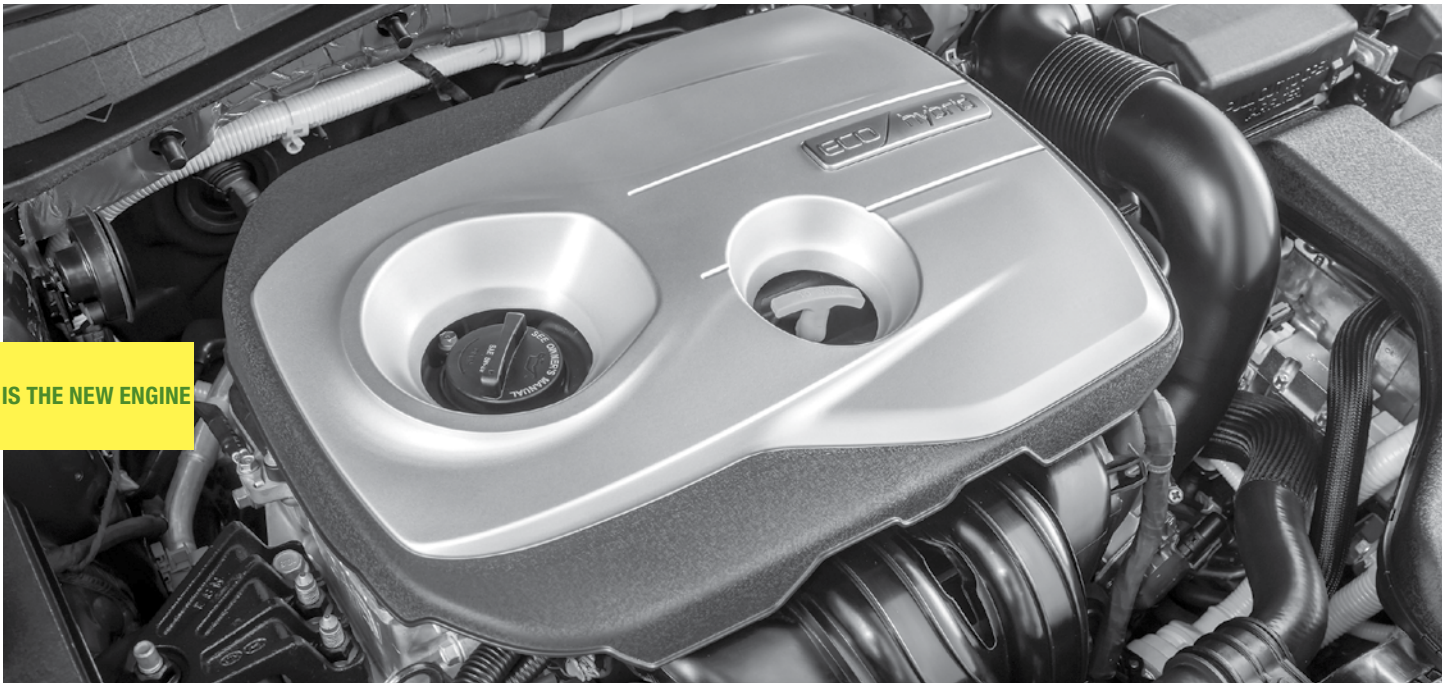
HYBRID TECHNOLOGY

*See the last page in this document for important Safety information and Legal disclaimers.

HYBRID TECHNOLOGY

INTERNAL COMBUSTION (IC) ENGINE

2.0L GDI 4-CYLINDER



- THIS IS THE NEW ENGINE

Specifications/Characteristics	Roles
• Up to 154 hp @ 6,000 rpm » Total hp (engine and motor) = Up to 193 hp • Up to 140 lb.-ft. of torque @ 5,000 rpm » Total torque (engine and motor) = Up to 271 lb.-ft. • PZEV • Dual CVVT • Atkinson combustion cycle • Gasoline Direct injection (GDI)	• Send power to the wheels when needed • Charge up the battery when needed through the Electric (EV) Motor or Hybrid Starter Generator (HSG) • Shut off when not needed. This can occur when the vehicle is stopped, decelerating/braking, or when the vehicle is being powered by the electric motor • A clutch disengages the (IC) engine from the drivetrain; it allows the engine to shut off/start up as needed » Clutch must be engaged to send power from the engine through the drivetrain

What are the benefits of stop/start technology?

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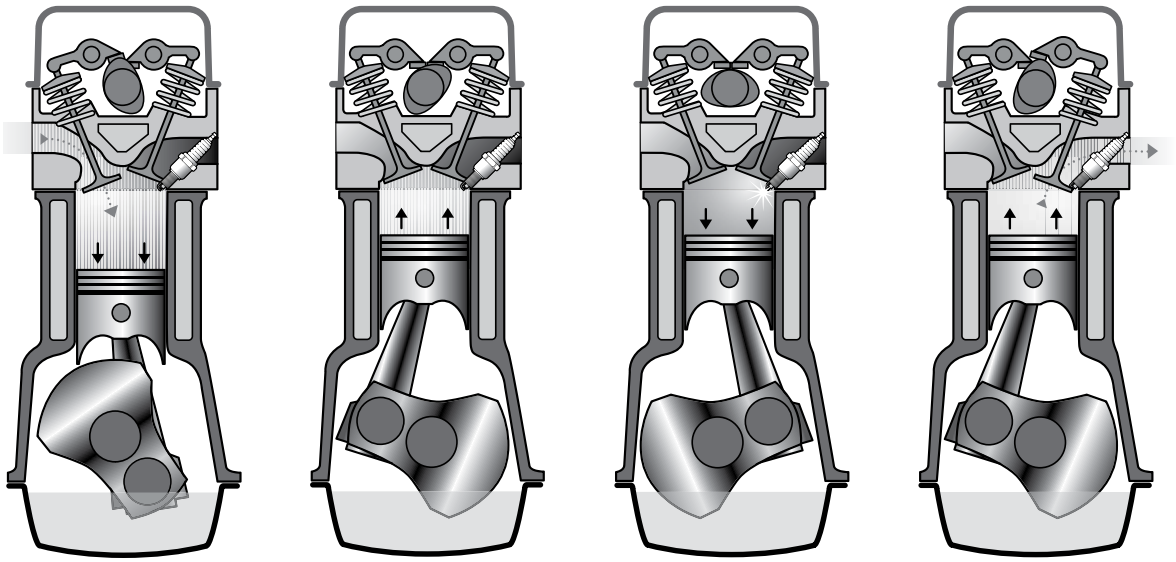
OTTO CYCLE

To understand the Atkinson cycle, we first need an understanding of the conventional 4-stroke combustion cycle (known as the Otto cycle).



Intake Compression Power Exhaust

Intake stroke:

Compression stroke:

Power (expansion) stroke:

Exhaust stroke:

Drawback of Conventional 4-Stroke Cycle: Can Never Be Maximally Efficient

- The intake stroke compresses the air-fuel mixture to a fixed degree (e.g., 10:1). Following ignition, during the power stroke, the combustion chamber expands by the same ratio
- However, gasoline provides maximum efficiency when the expansion or power stroke is greater than the compression stroke. So, if it compressed at a 10:1 rate, it reaches maximum efficiency when — during combustion — it's allowed to expand beyond a ratio of about 17:1
- In a conventional engine, before you can experience the full power of the combustion, the power stroke ends. As a result, the normal Otto cycle engine can never be maximally efficient because its expansion ratio can never rise above the compression ratio

HYBRID TECHNOLOGY

ENTER THE ATKINSON CYCLE

The Atkinson cycle makes the compression stroke shorter in relation to the power stroke by keeping the intake valve open for a portion of the compression stroke.

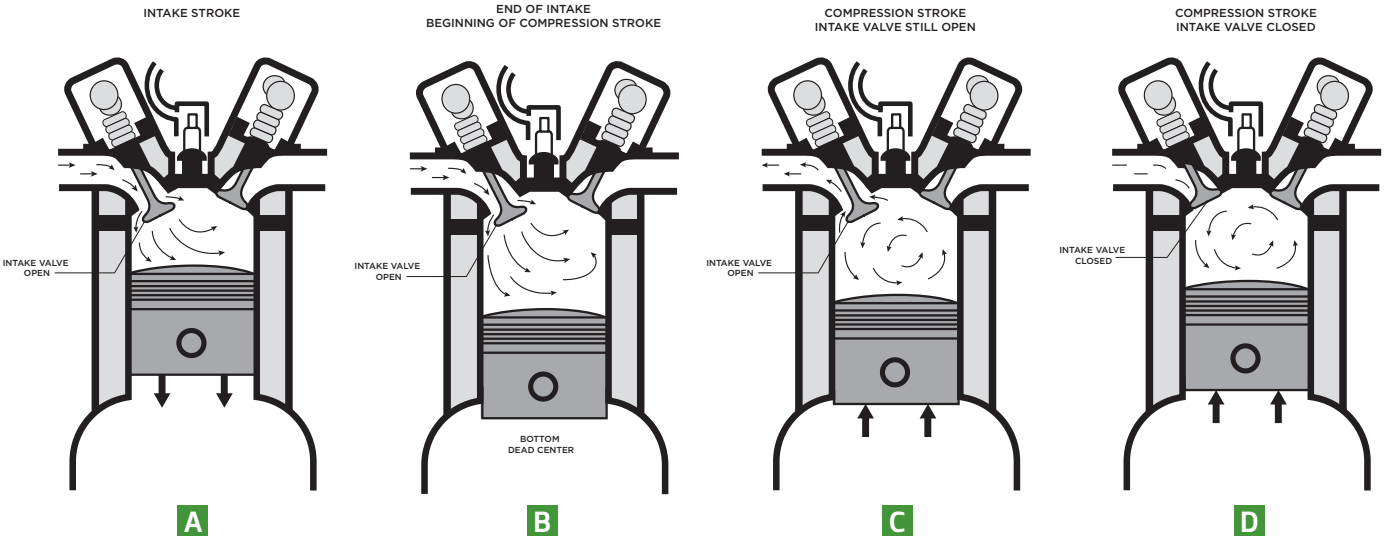
A The intake valve is open during the intake stroke, drawing the air-fuel mixture into the cylinder

B At the bottom of the intake stroke, the valve continues to stay open

C The compression stroke begins, compressing the air-fuel mixture. But since the intake valve is still open, the piston ends up pushing part of the air-fuel mixture through the intake valve, back into the manifold

D Partway up the compression stroke, the intake valve closes. At this point, the compression stroke begins

We now have a shorter compression stroke. But the power stroke will remain the same: It will still be the full length of the cylinder. With a longer power stroke in relation to the compression stroke, we're now able to get closer to getting the full expansion force of combustion.



Atkinson Cycle Drawbacks

- The engine sacrifices top-end power because the maximum amount of fuel it can burn per cycle is smaller than what is possible in an Otto cycle engine
- This limit on fuel also makes the engine far less powerful at the low end of its rpm range
- An Atkinson cycle needs to run in a narrow rpm band in order to make the best use of its capabilities
- That's where the electric (EV) motor comes in — it provides the low-end torque needed during acceleration and passing, allowing the engine to remain in the range where it functions best
- This combo — an Atkinson cycle engine teamed with an electric motor — is featured on most hybrid configurations

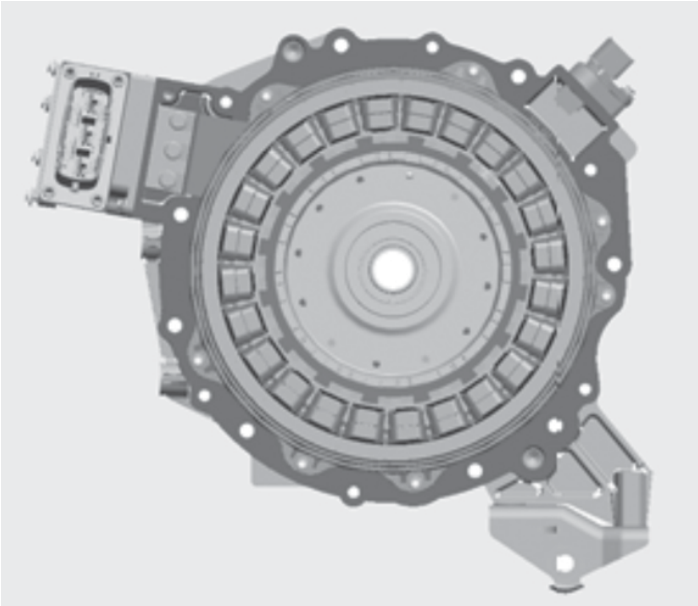
Atkinson Cycle Bottom Line

Here are the key messages to communicate to customers:

- The Atkinson cycle enables the engine to achieve greater degrees of efficiency and power than a conventional combustion cycle, but it needs to operate within a narrow rpm band
- The electric (EV) motor kicks in whenever high torque is required — during acceleration and passing
- Electric motor + Atkinson cycle = maximum power AND efficiency

HYBRID TECHNOLOGY

ELECTRIC (EV) MOTOR



Charging Modes:

1. Whenever the vehicle is decelerating, regenerative braking comes into play
   - » The engine shuts off
   - » The hybrid system switches the motor to 'charge' mode
   - » The wheels — through the driveline and transmission — turn the electric motor, creating electricity that charges up the high-voltage battery
2. The electric motor can also be switched to "charge" whenever the vehicle is under power by the engine
   - » Here the engine is powering the driveline
   - » The driveline in turn is forcing the electric motor to turn

Regenerative Braking Notes:

- Besides creating electricity, it actually enhances braking (to a limited extent)
- The turning motor creates resistance, which takes some load off the actual brakes
- A slight whirring noise may be audible during braking — it's the motor turning — and it's perfectly normal. Many times this noise can be hard to decipher

Hybrid System Performance Combined (Engine and Motor)

- Up to 193 hp @ 6,000 rpm
- Up to 271 lb.-ft. of torque

Specifications/Characteristics	Roles
• Up to 51 hp @ 6,000 rpm » Total hp (engine and motor) = Up to 193 hp • Up to 151 lb.-ft. of torque @ TBD rpm » Total torque (engine and motor) = Up to 271 lb.-ft. • Permanent Magnet Synchronous Motor » Allows EV only cruising up to 62 mph • Maximum 270V DC (nominal)	• Send power to the wheels — either by itself or along with the gas engine • Charge up the high-voltage battery

6-SPEED AUTOMATIC TRANSMISSION

- 6 forward gears for improved response and smooth power delivery
- Motor is permanently affixed to the transmission, replacing the torque converter
- Power inputs:
  - » When the clutch is engaged, receives power from the engine
  - » Receives power from the (EV) electric motor when it is in propulsion mode

*See the last page in this document for important Safety information and Legal disclaimers.

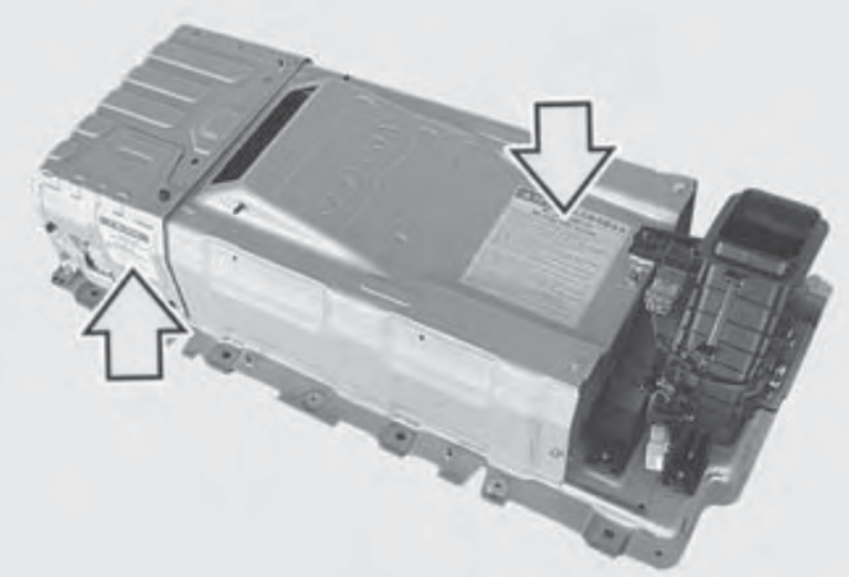
HYBRID TECHNOLOGY

HIGH-VOLTAGE BATTERY

- Power output: 56 kW
- Type: Lithium-ion-polymer
- Voltage: 270V
- Weight: 92.6 lbs
- Capacity: 6 Amp-hour

Notes:

- Advanced lithium-ion-polymer is lighter, more compact and more efficient than the nickel-metal hydride battery in Camry Hybrid and the lithium-ion battery in Fusion Hybrid
- The battery stores power to drive the motor and power the Hybrid Starter Generator (HSG). It can be charged by both the motor and the Hybrid Starter Generator (HSG)
- Kia is confident in the battery's longevity and covers it under a 10-year/100,000-mile* warranty



LITHIUM-POLYMER VS. NICKEL-METAL HYDRIDE

- Same power w/30% less weight
- 50% less volume
- 10% greater efficiency
- 2X more energy density
- Holds charge 20X longer
- Discharge rate is less than 1/3 of a nickel-metal-hydride

NOTES:

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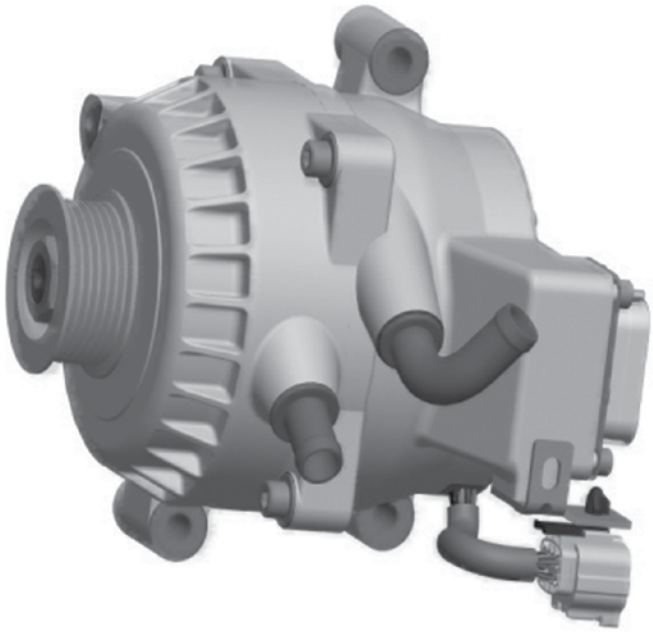
HYBRID STARTER GENERATOR (HSG)

To Start the Engine:

- A belt connects a pulley on the HSG to a pulley connected to the engine crankshaft. The crankshaft is connected to all the pistons
- To start the engine, the high-voltage battery powers the starter motor; the starter motor turns the crankshaft
- At the same time, the controller opens the throttle, and spark and fuel are provided to the point that the engine starts
- The HSG can start the engine during a standstill and when the vehicle is in motion
- When in motion, the heavy-duty, 5.6 kW starter motor seamlessly brings the engine up to speed, syncing it with the vehicle speed. The clutch then engages, enabling a seamless power transfer to the wheels



To Recharge the High-Voltage Battery:

- System switches HSG to charge mode
- Engine turns HSG
- HSG sends power to battery, charging it up (engine must be running/on for the HSG to charge)

HSG Charge Scenarios:

The HSG can charge up the battery in several situations (Note: The Hybrid system will have to determine that a HSG charge is needed for the following to occur):

- **Vehicle at a stop:** The system will start the engine; the engine will turn the HSG to charge the high-voltage battery
- **Vehicle under motor power:** If the motor is powering the vehicle, the system can use the engine to power the HSG
- **Vehicle under engine power:** Whenever the engine is powering the vehicle, the HSG can charge the battery
- **Braking/deceleration:** If an additional charge is needed (more than what can be delivered through regenerative braking alone), the engine will remain on and power the HSG

Benefits of utilizing existing components in Optima Hybrid's powertrain design:

- Utilizing the 6-speed automatic transmission and a 2.0L 4-cylinder engine design simplified the design of the vehicle
  - » Reduced the number of all-new components to be introduced to the new Optima chassis and helped maintain component consistency across the Optima lineup
- Less components to design from scratch and integrate into Optima's new chassis means more efficiencies gained in development of the vehicle

What is the common denominator in all these scenarios?

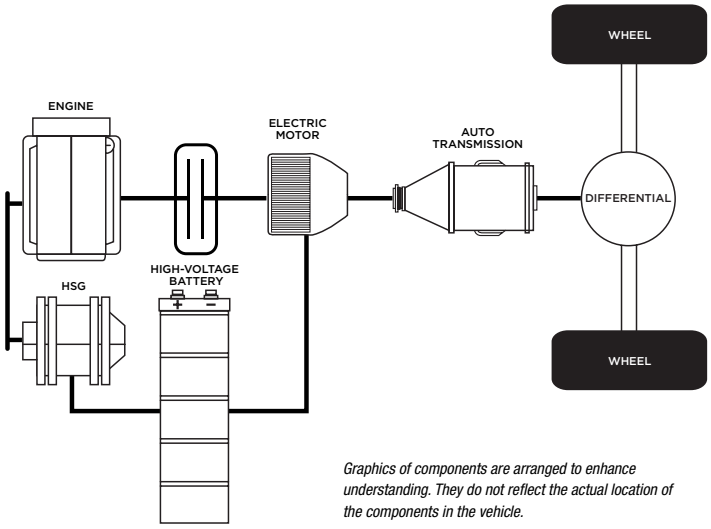
2017 OPTIMA HYBRID WALKAROUND

POWERTRAIN PUZZLE

In this exercise, we will explore the primary modes of operation. For your assigned mode of operation, fill in your graphic identifying the following:

- The states of the components:
  - » IC engine on or off
  - » Clutch engaged or disengaged
  - » EV motor: powering the wheels, charging the battery or disengaged
  - » HEV high-voltage battery: sending power, recharging or neither
  - » HSG: charging the high-voltage battery or inactive
- Identify the power flow:
  - » IC engine to wheels
  - » HEV battery to EV motor; EV motor to wheels
  - » EV motor to HEV battery (recharging)
  - » HSG to HEV motor to battery (recharging)

Note: Many variables affect hybrid operation, including state of charge (if the battery has a full charge or a low charge, etc.) and throttle input (hard or light acceleration). Since these variables can change with great frequency, predicting which mode the powertrain is operating under, given certain situations, is difficult to do.



Graphics of components are arranged to enhance understanding. They do not reflect the actual location of the components in the vehicle.

NOTES:

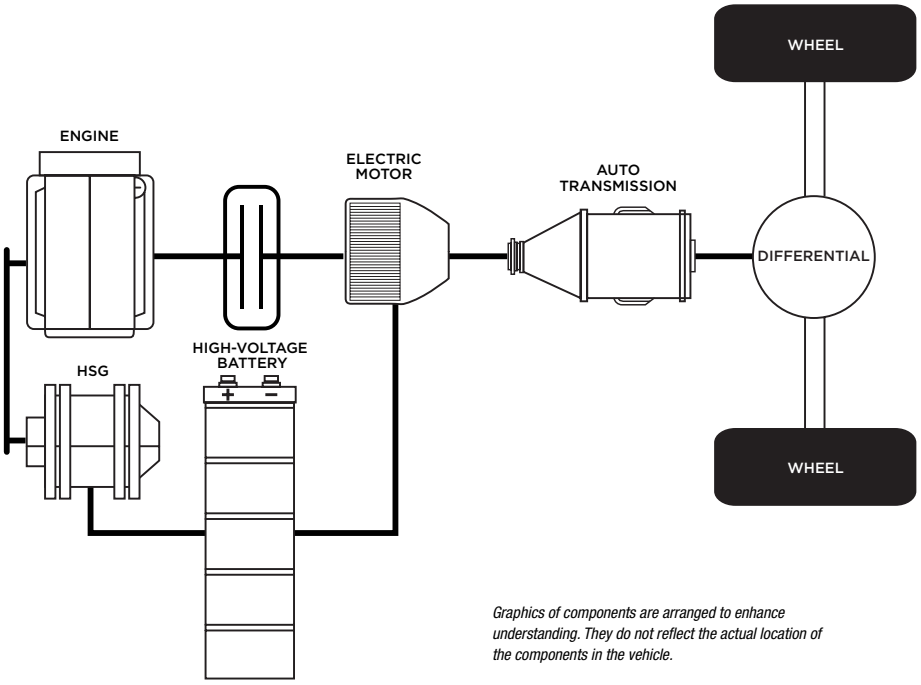
*See the last page in this document for important Safety information and Legal disclaimers.

2017 OPTIMA HYBRID WALKAROUND

FACILITATOR DEMO: MOTOR ONLY (FULL STATE OF CHARGE)

Components			
Engine		ON	OFF
Clutch		engaged	disengaged
EV motor	propulsion	charging	disengaged
High-voltage (HEV) battery	sending power	recharging	neither
HSG		charging	inactive

Power flow:



Graphics of components are arranged to enhance understanding. They do not reflect the actual location of the components in the vehicle.

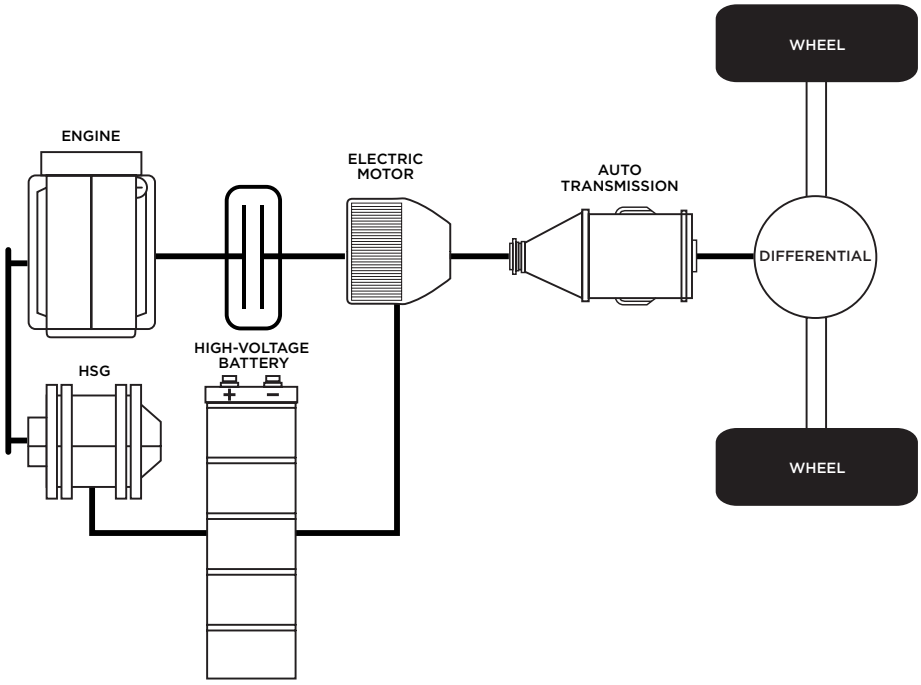
NOTES: _____

2017 OPTIMA HYBRID WALKAROUND

MODE OF OPERATION 1: ENGINE ONLY (FULL STATE OF CHARGE)

Components			
Engine		ON	OFF
Clutch		engaged	disengaged
EV motor	propulsion	charging	disengaged
High-voltage (HEV) battery	sending power	recharging	neither
HSG		charging	inactive

Power flow:



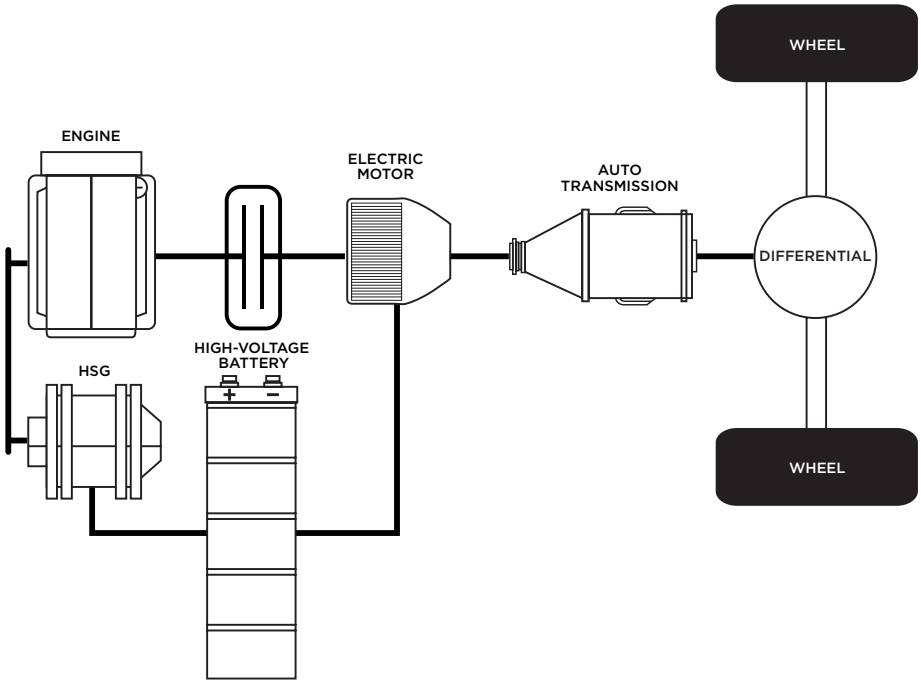
NOTES:

2017 OPTIMA HYBRID WALKAROUND

MODE OF OPERATION 2: ENGINE + ELECTRIC (EV) MOTOR (FULL STATE OF CHARGE)

Components			
Engine		ON	OFF
Clutch		engaged	disengaged
EV motor	propulsion	charging	disengaged
High-voltage (HEV) battery	sending power	recharging	neither
HSG		charging	inactive

Power flow:



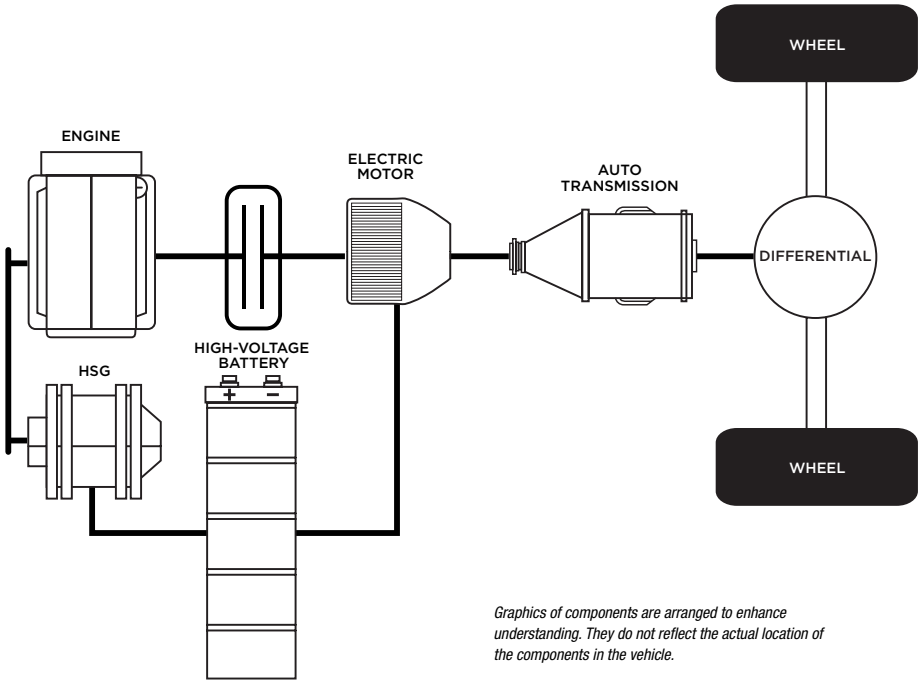
NOTES: _____

2017 OPTIMA HYBRID WALKAROUND

MODE OF OPERATION 3: REGENERATIVE

Components			
Engine		ON	OFF
Clutch		engaged	disengaged
EV motor	propulsion	charging	disengaged
High-voltage (HEV) battery	sending power	recharging	neither
HSG		charging	inactive

Power flow:



Graphics of components are arranged to enhance understanding. They do not reflect the actual location of the components in the vehicle.

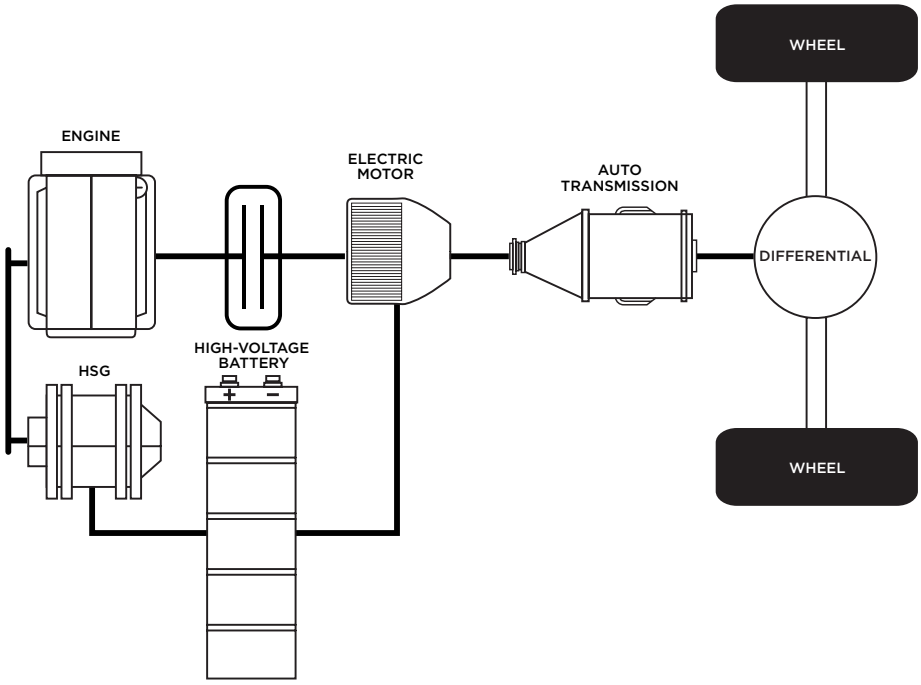
NOTES: _____

2017 OPTIMA HYBRID WALKAROUND

MODE OF OPERATION 4: CHARGING THE HIGH-VOLTAGE BATTERY AT A STOP

Components			
Engine		ON	OFF
Clutch		engaged	disengaged
EV motor	propulsion	charging	disengaged
High-voltage (HEV) battery	sending power	recharging	neither
HSG		charging	inactive

Power flow:



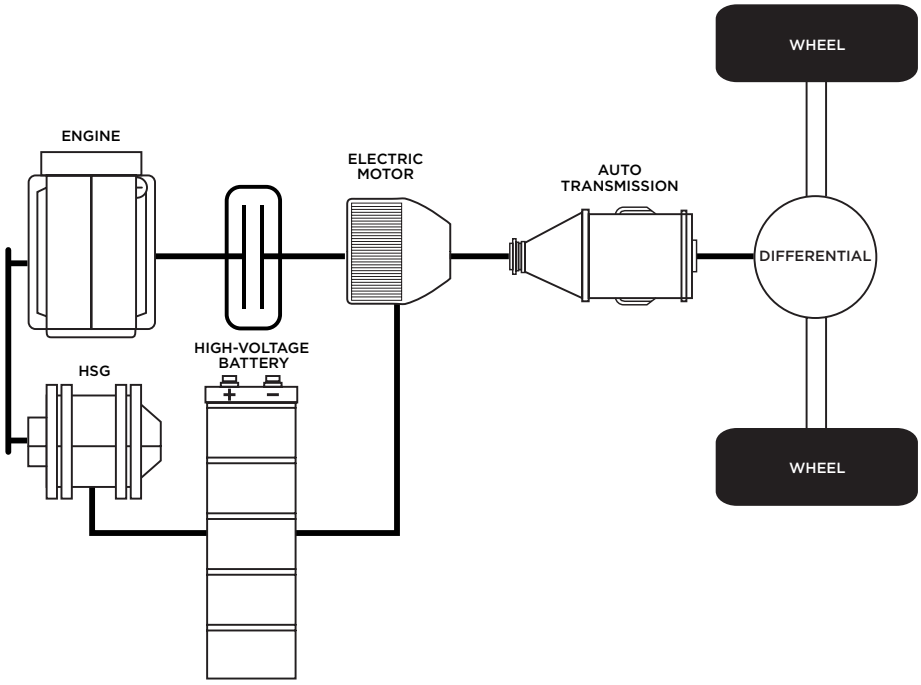
NOTES: _____

2017 OPTIMA HYBRID WALKAROUND

MODE OF OPERATION 5: CHARGING THE HIGH-VOLTAGE BATTERY WHILE HIGH-SPEED CRUISING (62+ MPH; UNDER IC POWER ONLY)

Components			
Engine		ON	OFF
Clutch		engaged	disengaged
EV motor	propulsion	charging	disengaged
High-voltage (HEV) battery	sending power	recharging	neither
HSG		charging	inactive

Power flow:



NOTES: _____

HYBRID TECHNOLOGY

STATES OF OPERATION

Since modes of operation are dependent on several variables, such as state of charge, throttle and rpm, it is difficult to predict for certain which modes will engage.

State of Operation	Powering the Vehicle	Charging the HEV Battery
Vehicle Stopped	-	-
	-	HSG (under Engine power)
Light Acceleration	EV Motor	-
	EV Motor + IC Engine	-
	EV Motor + IC Engine	HSG
Heavy Acceleration	EV Motor + IC Engine	-
	EV Motor + IC Engine	HSG
Low- to High-Speed Cruising	EV Motor	-
	EV Motor + IC Engine	-
	EV Motor + IC Engine	HSG
	IC Engine	-
	IC Engine	EV Motor
	IC Engine	HSG
	IC Engine	EV Motor + HSG
Deceleration/Braking	-	EV Motor
	-	EV Motor + HSG (under Engine power)

In a Nutshell

When presenting Kia's hybrid technology to a customer, you'll at least want to cover the following:

- The vehicle relies on a gasoline engine and an EV motor powered by a high-voltage battery
- The electric motor can power the vehicle by itself and also assists the IC engine (most often) during acceleration and passing
- The IC engine carries most of the load, but it will shut off whenever it's not needed to conserve fuel and reduce emissions
- Whenever the IC engine is on, it can charge up the high-voltage battery. The hybrid system will also use the kinetic energy of the driveline during deceleration and braking to charge up the HEV battery

NOTES: _____

2017 OPTIMA HYBRID

WALKAROUND

While many of the features found on Optima Hybrid will be similar to those on the Optima lineup, this is a closer look at the features, operations and precautions that separate the Hybrids.

EXTERIOR

Front	Profile	Rear
• Gloss black front grille design • Active Air Flap • Single projection headlights with available LED Daytime Running Lights (DRL) • Available LED headlights with Dynamic Bending Light (DBL) • Unique front and rear bumpers, front air curtain, side sill moldings • Eco Hybrid badges • Unique Hybrid accent trim on front grille, side sills, rear bumper (Plug-in Hybrid)	• Unique 16-inch alloy wheels and available 17-inch alloy wheels, both with low rolling resistance tires • Plug-in charge port in left front fender (Plug-in Hybrid) • Sporty side sills • Aerodynamic enhancements: » Lower ride height » Lower drag wheels » Low-rolling-resistance tires » Underbody aero tuning to reduce drag » These aerodynamic characteristics help Optima Hybrid achieve a drag coefficient of just 0.24. Compare that to 0.30 for the Porsche Boxster! (the regular Optima is 0.27)	• LED tail light design • Unique lower valence • Hybrid badge • Single hidden exhaust

*See the last page in this document for important Safety information and Legal disclaimers.

2017 OPTIMA HYBRID WALKAROUND

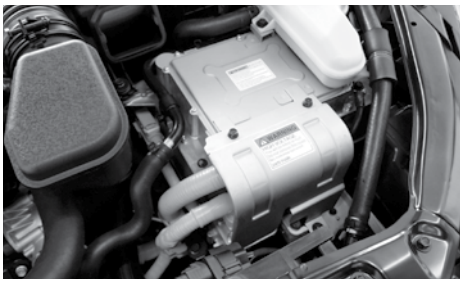
UNDER THE HOOD

KEY POWERTRAIN AND CHASSIS FEATURES

- 193 combined hp from 2.0L Atkinson Cycle DOHC GDI 4-cylinder engine and 38 kW electric motor with 6-speed automatic transmission with Sportmatic® shifting
- Plug-in Hybrid with 202 combined hp from 2.0L Atkinson Cycle GDI 4-cylinder engine and 50 kW electric motor with 6-speed automatic transmission with Sportmatic® shifting
- Dual Continuously Variable Valve Timing (Dual CVVT)
- Four-wheel disc brakes with ABS, Electronic Stability Control (ESC)*, Hill-start Assist Control (HAC)*, Traction Control System (TCS)*, and Vehicle Stability Management (VSM)*
- Independent MacPherson strut front suspension
- Electric Power Steering (EPS)

ELECTRICALLY DRIVEN AIR CONDITIONING COMPRESSOR

- Directly powered by the high-voltage battery
- Maintains climate control even with the engine off
- Traditional air conditioning compressors are driven by the serpentine belt, requiring the engine to be running — and requiring gasoline to operate



HIGH-VOLTAGE WIRES, CABLES AND CONNECTORS

- Hybrid vehicles rely on high voltages to power their complex systems
- Orange high-voltage warning labels/cables are attached to components that carry these electrical currents
- **Notes:**
  - » Remind customers that electric shock, serious injury, or even death, could result from touching or disassembling hybrid cables and components
  - » Improper disassembly may impair the performance and reliability of the hybrid vehicle

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2017 OPTIMA HYBRID WALKAROUND

VIRTUAL ENGINE SOUND SYSTEM (VESS)

- Plays a pre-recorded engine sound during electric-only operation to notify pedestrians that the vehicle is approaching
- Operational under 12 mph; cannot be disabled

PZEV EMISSION

- Optima Hybrid is a certified Partial Zero Emissions Vehicle: It has zero evaporative emissions from its fuel system, a 15-year/150,000-mile* warranty on its emission-control components and meets Super Ultra Low Emission Vehicle (SULEV*) tailpipe-emission standards

CLEANING THE ENGINE COMPARTMENT

- Do not use liquids to clean the engine compartment. Liquids may cause an electric shock to occur, and damage electronic parts and components
- If a fire should occur, an extinguisher for electrical fires should be used. Using water could result in electrical shock

NOTES:

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2017 OPTIMA HYBRID WALKAROUND

DRIVER'S SIDE WALKAROUND

- Available Harman/Kardon® audio system with 10 speakers and Clari-Fi™*
- Available UVO eServices* with Premium Navigation*, Android Auto™* and Apple CarPlay®*
- Push Button Start with Smart Key*
- Available Blind Spot Detection (BSD)* with Rear Cross Traffic Alert (RCTA)*, Forward Collision Warning System (FCWS)*, Lane Departure Warning System (LDWS)*
- *Bluetooth*®* wireless technology
- Available 12-way power-adjustable driver's seat with power lumbar support and Integrated Memory System (IMS)
- Cruise control with steering-wheel-mounted controls*
- Available Advanced Smart Cruise Control (ASCC)*
- Available heated steering wheel
- Leather-wrapped steering wheel and shift knob
- Available heated and ventilated front seats
- Eco Guide Gauge

REAR PASSENGER

- Available Rear Park Assist System*
- Rear-Camera Display*
- Smart Trunk*
- Multi-link rear suspension
- LED tail lights
- Tire Pressure Monitoring System (TPMS)*
- Single exhaust with hidden exhaust tip
- 270V lithium-ion-polymer battery (Hybrid)
- 360V lithium-ion-polymer battery (Plug-in Hybrid)

REAR

- Available Rear Park Assist System*
- Rear-Camera Display*
- Smart Trunk*
- Multi-link rear suspension
- LED tail lights
- Tire Pressure Monitoring System (TPMS)*
- Single exhaust with hidden exhaust tip
- 270V lithium-ion-polymer battery (Hybrid)
- 360V lithium-ion-polymer battery (Plug-in Hybrid)

FRONT PASSENGER

- Seven standard airbags*
- Available panoramic sunroof
- Available leather-trimmed seats
- Available 6-way power-adjustable front passenger's seat
- Illuminated and cooling glove box
- Dual front cup holders
- Front door map pockets with bottle holders

*See the last page in this document for important Safety information and Legal disclaimers.

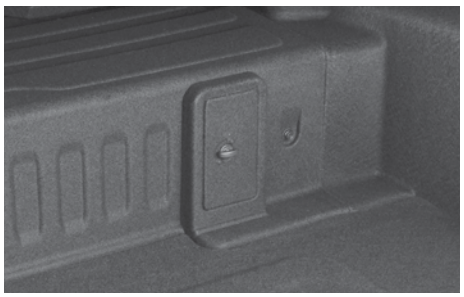
2017 OPTIMA HYBRID WALKAROUND

TRUNK

270-VOLT HIGH-VOLTAGE HEV BATTERY

- The high-voltage hybrid battery is located in a compartment in the trunk
- 270V lithium-ion-polymer battery (Hybrid Premium, EX)
- 360V lithium-ion-polymer battery (Plug-in Hybrid EX)
- This durable lithium-polymer battery was developed to weigh just 92 pounds (Hybrid Premium, EX)

What are the benefits of this lighter battery?

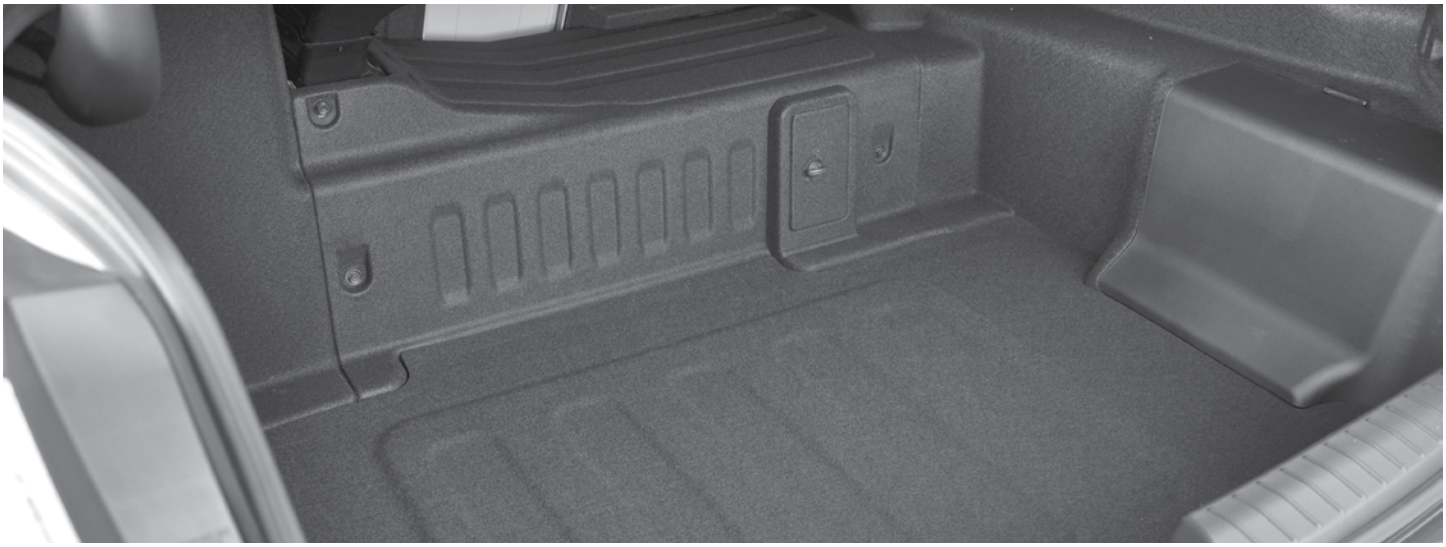


SAFETY PLUG

- Before performing any service on the vehicle, the safety plug in the trunk should be pulled out to disconnect and turn off the hybrid system
- ONLY HYBRID-CERTIFIED KIA TECHNICIANS SHOULD SERVICE THE HYBRID SYSTEM
- **Precautions:**
  - » It is important to wait 5 minutes after the plug is disconnected to work on the car, to ensure that all remaining charge in the system has dissipated
  - » Since the safety plug is attached to the hybrid battery system and has dangerously high voltages, special care should be taken when touching the service lever to avoid electric shock — it is recommended that owners take their vehicles to an authorized Kia dealer for service

NOTES:

2017 OPTIMA HYBRID WALKAROUND



12-VOLT BATTERY

- In addition to the hybrid battery, Optima Hybrid's trunk also houses the 12-volt battery
- Controls the vehicle's non-hybrid electrical components (lights, radio/audio system, etc.)
- Placement of the battery in the trunk helps to:
  - Improve Optima Hybrid's overall weight distribution
  - Extend the battery life by moving it away from the a heat source (the Engine)

TRUNK LOADS

- Special care should be taken to secure loads in the trunk of a hybrid vehicle
- Heavy, moving loads banging around in the trunk could damage battery compartments and lead to hybrid system malfunction

CLEANING THE TRUNK

- Since the trunk houses the high-voltage hybrid battery and 12-volt battery, owners should never wash their trunks with water (liquids). Damage to the hybrid system, electric shock or serious injuries could result

NO SPARE TIRE!

- Optima Hybrid Premium, Hybrid EX, and Plug-in Hybrid EX are all equipped with a Tire Mobility Kit (TMK)* that includes sealant and a compressor — check the owner's manual for operational instructions

NOTES: _____

*See the last page in this document for important Safety information and Legal disclaimers.

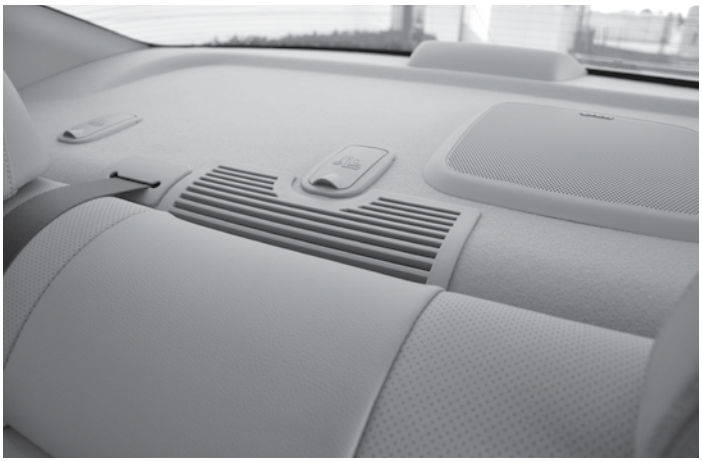
2017 OPTIMA HYBRID WALKAROUND

REAR SEAT

For a vehicle whose batteries are located in the trunk, it's no surprise that there are special considerations for the rear seat.

HYBRID BATTERY AIR INTAKE

- Located behind the rear seats
- Used to cool the hybrid battery
- **Precautions:**
  - » Do not cover the air intake with objects — if the intake is blocked, the hybrid battery could overheat
  - » Never wash the air intake with a wet cloth — if any water enters the intake, the hybrid battery could cause an electric shock, injury and/or damage
  - » Do not place liquids near the air intake. Spilling liquids over the intake is dangerous and could cause electric shock, injury and/or damage
  - » Do not place any objects into the air intake — doing so can damage the hybrid battery. An owner should contact their Kia dealer as soon as possible if this occurs
  - » To help ensure proper airflow, owners should clean the air intake regularly with a DRY cloth



FIXED REAR SEAT

- To accommodate the space needed for the hybrid battery, the split-folding seat found in the conventional Optima has been replaced in Optima Hybrids with a fixed rear seat on Hybrid Premium and Hybrid Plug-In EX
- Still features a convenient pass-through for longer cargo items (such as skis) for Hybrid Premium
- Note: Hybrid EX only has a 60/40-split rear seat

TRUNK RELEASE LOOP

- Located behind the driver's side rear seat
- Use the loop to open the trunk if the 12-volt battery is dead — there is no key access to the trunk

2017 OPTIMA HYBRID WALKAROUND

PUSH BUTTON START WITH SMART KEY*

One of the first things a driver will likely reach for is Optima Hybrid's ignition. Thanks to standard Push Button Start with Smart Key* operation, Optima Hybrid doesn't require a traditional key to start the hybrid system or mechanically unlock doors.

To assist drivers in isolating and remedying start-up issues, Optima Hybrid's LCD screen offers several helpful diagnostic messages, including:

- Key not in vehicle
- Key not detected
- Low key battery
- Press brake pedal to start engine
- Shift to "P" position
- Remove key
- Insert key
- Press start button again
- Shift to "P" or "N" to start engine
- Align steering wheel

How to Start the Vehicle:

- Have the Smart Key* on your person or in the vehicle
- Ensure the shift lever is in Park
- Depress the brake pedal
- Press the START/STOP button
- If start-up is successful, the "READY" symbol will illuminate (the engine may not turn on)

NOTES:

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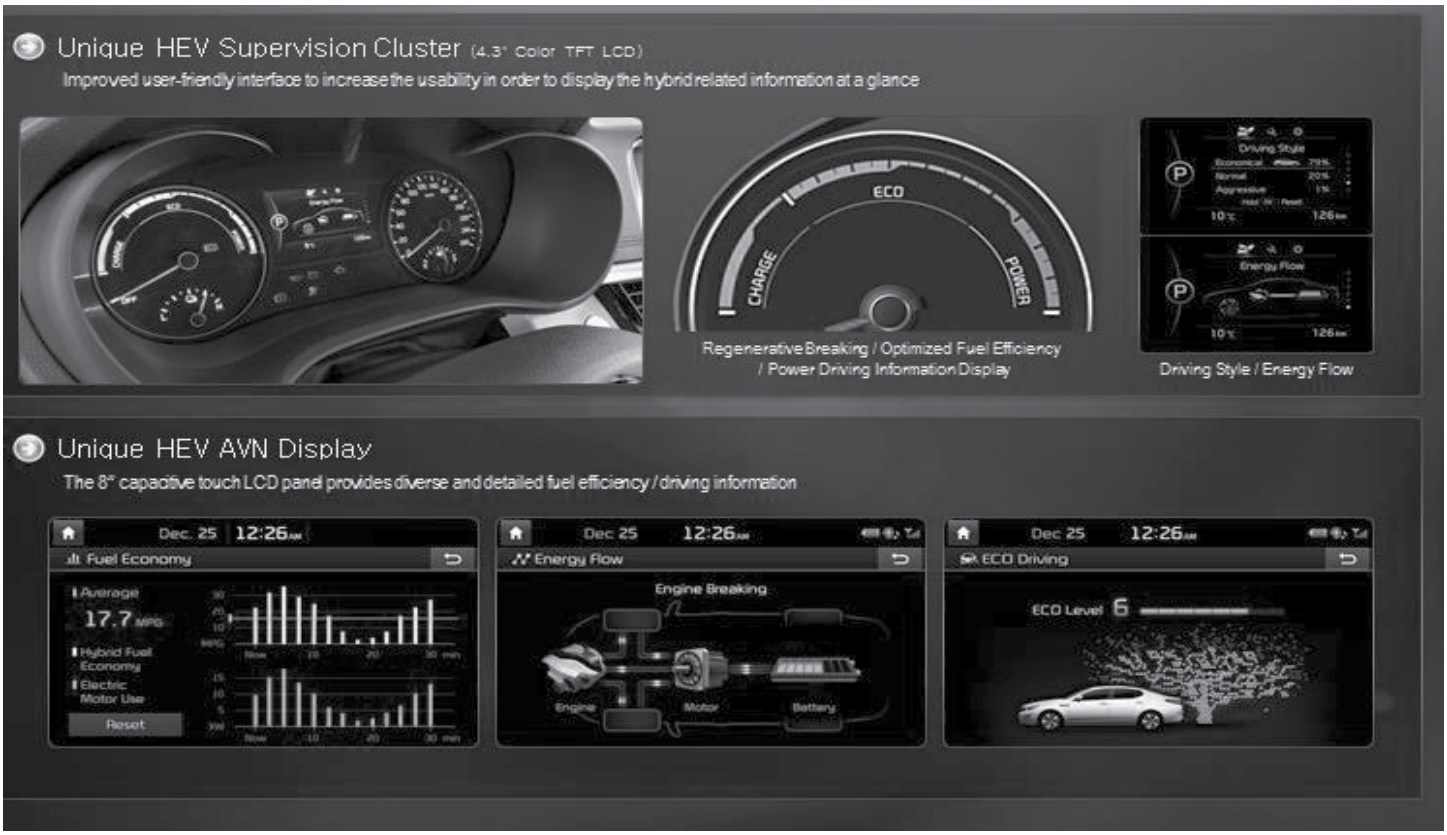
2017 OPTIMA HYBRID WALKAROUND

GAUGES



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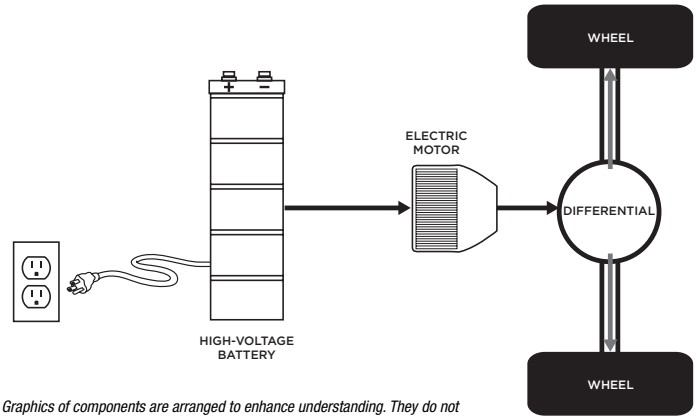
THE HYBRID/ALTERNATIVE-POWER LANDSCAPE

FULL ELECTRIC

FULL ELECTRIC VEHICLE



Graphics of components are arranged to enhance understanding. They do not reflect the actual location of the components in the vehicle.

Operation	Main Components	Vehicles of This Type
• Requires no fuel to power the vehicle or generate power for the motor • The plug-in battery supplies power • Powered by battery and electric motor only	• Large motor/generator • Large high-voltage battery • Transmission	• Nissan Leaf, Mitsubishi i (MiEV)
Benefits:	• Household current recharges high-voltage battery • Requires no fuel • Zero emissions	• _____ • _____ • _____ • _____
Drawbacks:	• Range is very limited — typically only useful for short commutes and in-town driving • Normal household currents can require long charging times (up to 24 hours) before vehicle is ready to operate again • Can be expensive to install a 240-volt home-charging system	• _____ • _____ • _____ • _____

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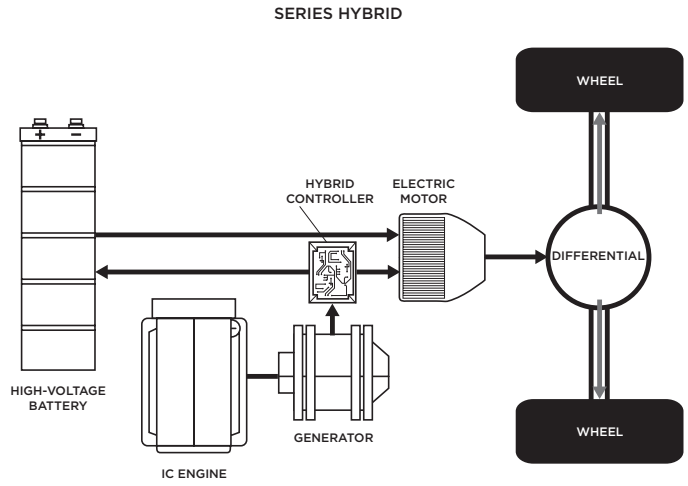
THE HYBRID/ALTERNATIVE-POWER LANDSCAPE

SERIES HYBRID

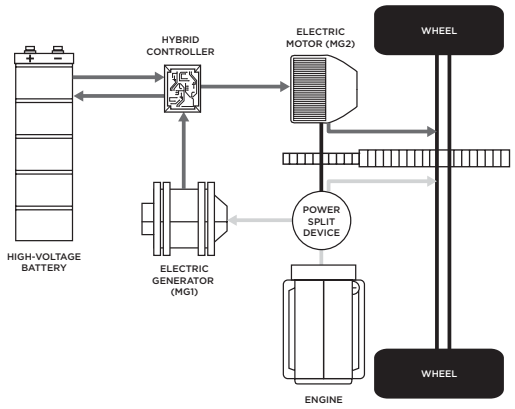


Graphics of components are arranged to enhance understanding. They do not reflect the actual location of the components in the vehicle.

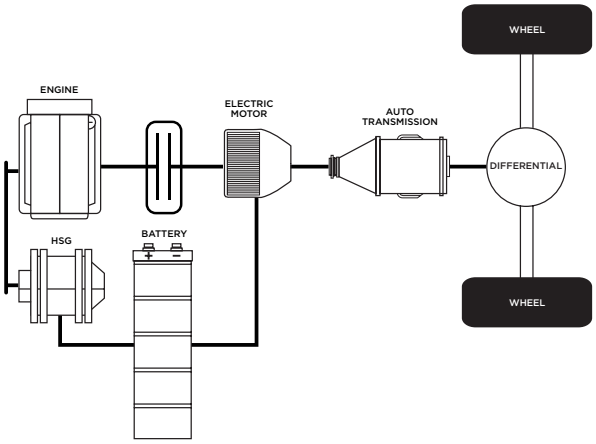
Operation	Main Components	Vehicles of This Type
• Electric motor powers vehicle • Battery sends power to electric motor • Engine powers a generator, which is used to power the electric motor and charge up the battery. The engine cannot power the vehicle by itself • All the components form a line that eventually connects to the wheels (thus the term "series") • Also referred to as range-extended electric vehicles to emphasize they are electric vehicles with combustion engine assist	• Small engine • Generator • Large high-voltage battery • Motor(s) • Transmission	• Chevrolet Volt (also plugs in, further extending its range)
Benefits:	• Extended range • Good power • Low emissions • _____	• _____ • _____ • _____ • _____
Drawbacks:	• Expense (Chevy Volt) • _____ • _____	• _____ • _____ • _____

THE HYBRID/ALTERNATIVE-POWER LANDSCAPE

SPLIT-SERIES HYBRID FULL PARALLEL



Graphics of components are arranged to enhance understanding. They do not reflect the actual location of the components in the vehicle.



Graphics of components are arranged to enhance understanding. They do not reflect the actual location of the components in the vehicle.

Operation	Main Components	Vehicles of This Type
• Very similar to a parallel hybrid except it includes two motors and is connected to a Continuously Variable Transmission (CVT) • MG1 is a generator: charges up the battery, powers MG2 and starts the vehicle • MG2 drives the vehicle • Gets its name from the power split device, which is a special gearbox that connects the gasoline engine, electric motor and generator together into one unit	• Engine • Generator • Motor • Large high-voltage battery • Continuously Variable Transmission (CVT) • Power split device	• Toyota Camry Hybrid • Ford Fusion Hybrid
Benefits:	• Good power • Good efficiency • Low emissions • _____	• _____ • _____ • _____ • _____
Drawbacks:	• "Motorboat" feel due to the CVT transmission. The CVT creates a driving experience that has a lot less natural feel than Optima's system	• _____ • _____ • _____

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THE HYBRID/ALTERNATIVE-POWER LANDSCAPE

HOW THEY COMPARE — WORKBOOK ACTIVITY

Identify each Kia advantage by placing a ✔ in the advantage columns.

	2017 Kia Optima Hybrid	2016 Toyota Camry Hybrid	✓	2017 Ford Fusion Hybrid	✓
Trim Levels					
Trim Levels	Hybrid Premium, Hybrid EX	LE, SE, XLE		S, SE, Titanium, Platinum	
MSRP*	$TBD (Hybrid Premium), $TBD (Hybrid EX)	$26,790 (LE); $27,995 (SE); $30,140 (XLE)		$25,185 (S); $25,990 (SE); $30,520 (Titanium); $37,020 (Platinum)	
Performance					
Engine	2.0L Atkinson Cycle DOHC 4-cyl.	2.5L Atkinson Cycle DOHC 4-cyl.		2.0L Atkinson Cycle DOHC 4-cyl.	
Horsepower (hp @ rpm)	154 @ 6,000	156 @ 5,700		141 @ 6,000	
Torque (lb.-ft. @ rpm)	140 @ 5,000	156 @ 4,500		129 @ 4,000	
Electric Motor Horsepower (hp @ rpm)	51 @ 1,770	105 @ 4,500		47 @ 1600	
Combined Horsepower (hp @ rpm)	193 @ 6,000	200		188	
Transmission	6-speed automatic with Sportmatic® sequential shift control	CVT with sequential shift control		CVT with rotary gearshift dial	
Fuel type	Regular unleaded	Regular unleaded		Regular unleaded	
EPA-Estimated Fuel Economy (city/highway/combined; MPG*)	TBD (Hybrid, Premium); TBD (Hybrid EX)	43/39/41 (LE); 40/38/40 (SE, XLE)		44/41/42	
Fuel tank capacity (gal.)	TBD	17.0		13.5	
Suspension, front/rear	MacPherson strut/Multi-link	MacPherson strut/Strut		MacPherson strut/Multi-link	
Stabilizer Bars	Front/rear	Front/rear		Front	
Steering	Electric Power Steering (EPS)	Electric Power Steering (EPS)		Electric Power Steering (EPS)	
Drive configuration	Front-wheel drive	Front-wheel drive		Front-wheel drive	
Exterior					
Wheels	16-in. alloy (Hybrid Premium); 17-in. alloy (Hybrid EX)	16-in. steel (LE); 17-in. alloy (SE, XLE)		17-in. alloy (S, SE) 18-in. alloy (Titanium, Platinum)	
Tires	P205/65HR16 (Hybrid Premium); P215/55VR17 (Hybrid EX)	P205/65VR16 (LE); P215/55VR17 (SE, XLE)		P225/50HR17 (S, SE); 235/45R18 (Titanium, Platinum)	
Power Sunroof	Available: Hybrid EX	Available: SE, XLE		Available: SE, Titanium; Standard: Platinum	
Power-adjustable exterior mirrors	Standard	Standard		Standard	
Heated exterior mirrors	Available: Hybrid Premium Standard: Hybrid EX	Standard		Available: SE; Standard: Titanium, Platinum	
Exterior mirrors w/LED turn signals	Standard	N/A		Available: SE; Standard: Titanium, Platinum	
Lighting & Instrumentation					
Auto-On/Off Headlights	Standard	Standard		Standard	
LED Daytime Running Lights	Standard: Hybrid EX	XLE		w/o LED	
Projector Beam Headlights	Single projection (Standard); LED w/ Dynamic Bending Light (DBL) (Available: Hybrid EX)	Halogen		Halogen (S, SE); LED (Standard: Titanium, Platinum; Available: SE)	
LED tail lights	Standard	N/A		Standard	
Supervision Meter Cluster LCD screen	Standard	Standard		Standard	

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THE HYBRID/ALTERNATIVE-POWER LANDSCAPE

	2017 Kia Optima Hybrid	2016 Toyota Camry Hybrid	✓	2017 Ford Fusion Hybrid	✓
Audio & Infotainment					
AM/FM	Standard	Standard		Standard	
CD	Single-disc	Single-disc		Single-disc	
MP3	Standard	Standard		Standard	
Speakers	6 speakers (Hybrid Premium); 10 speakers (Hybrid EX)	6 speakers		9 speakers (S, SE); 12 speakers (Titanium, Platinum)	
SiriusXM®* Satellite Radio	Standard	Available: LE, SE; Standard: XLE		SE, Titanium, Platinum	
USB/Auxiliary input jacks	Standard	Standard		Standard	
Bluetooth®* wireless technology	Standard	Standard		Standard	
Navigation*	Hybrid EX	Standard: XLE Available: LE, SE		Available: SE, Titanium	
Infotainment/telematics system	UVO eServices* (Hybrid Premium); UVO eServices* with Premium Navigation* (Hybrid EX)	Entune (Standard: LE, SE); Entune Plus (Available: LE, SE; Standard: XLE); Entune Premium (Available: SE, XLE)		SYNC (S, SE); SYNC 3 (Titanium)	
Android Auto & Apple CarPlay®*	Standard	N/A		N/A	
Comfort & Convenience					
Air conditioning	Dual-zone automatic temperature control	Dual-zone automatic temperature control		Dual-zone automatic temperature control	
Variable intermittent windshield wipers	Standard	Standard		Standard	
Power Windows	Standard	Standard		Standard	
Auto-up	Driver and Passenger	Driver and Passenger		Driver and Passenger	
Auto-down	Driver and Passenger	Driver and Passenger		Driver and Passenger	
Fuel efficiency indicator	Standard	Standard		Standard	
Tilting steering wheel-tilt/Telescoping steering wheel	Tilt and Telescoping	Tilt and telescoping		Tilt and Telescoping	
Steering-wheel-mounted controls*	Audio, Cruise, Phone	Audio, Cruise, Phone		Audio, Cruise, Phone	
Visor vanity mirrors	Illuminated	No Illumination		Illuminated	
Cruise control	w/steering-wheel-mounted controls*	w/steering-wheel-mounted controls		w/steering-wheel-mounted controls	
Advanced Smart Cruise Control (ASCC)*	Available: Hybrid EX	Available: XLE		Available: SE, Titanium; Standard: Platinum	
Remote keyless entry w/alarm	Keyfob (all doors)	Keyfob (all doors)		Keyfob (all doors)	
Push Button Start w/Smart Key*	Standard	Standard		Standard	
Smart Trunk*	Standard	N/A		N/A	
Rear Park Assist System*	Available: Hybrid EX	N/A		Available: SE; Standard: Titanium, Platinum	
Rear-Camera Display*	Standard: Hybrid EX	Standard		Standard	
Blind Spot Detection (BSD)*	Available: Hybrid Premium, EX	Available: XLE		Available: SE, Titanium; Standard: Platinum	
Rear Cross-Traffic Alert (RCTA)*	Available: Hybrid Premium, EX	Available: XLE		Available: SE, Titanium; Standard: Platinum	
Lane Departure Warning System (LDWS)*	Available: Hybrid EX	Available: XLE		Available: SE, Titanium; Standard: Platinum	
Forward Collision Warning System (FCWS)*	Available: Hybrid EX	Available: XLE		Available: SE, Titanium; Standard: Platinum	
Auto-dimming rearview mirror	Available: Hybrid EX	XLE		Available: SE; Standard: Titanium, Platinum	

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THE HYBRID/ALTERNATIVE-POWER LANDSCAPE

	2017 Kia Optima Hybrid	2016 Toyota Camry Hybrid	✓	2017 Ford Fusion Hybrid	✓
Seating & Interior Trim					
Seating capacity	5	5		5	
Seating material	Cloth (Hybrid); Leather (Hybrid EX)	Cloth (LE); SofTex cloth/leatherette (SE); Leather (XLE)		Cloth (S, SE); Leather (Titanium, Platinum)	
Driver's seat 1	6-way adjustable (Hybrid Premium)	8-way power-adjustable		6-way adjustable (S)	
Driver's seat 2	12-way (w/ power lumbar) (EX)	N/A		10-way power-adjustable (SE, Titanium, Platinum)	
Heated front seats	Hybrid EX	XLE		Available: SE; Standard: Titanium, Platinum	
Ventilated front seats	Available: Hybrid EX	N/A		Available: Titanium; Standard: Platinum	
Heated outboard rear seat cushions	Available: Hybrid EX	N/A		N/A	
Leather-wrapped steering wheel & shift knob	Standard	SE, XLE		Available: S, SE; Standard: Titanium, Platinum	
Heated Steering Wheel	Hybrid EX	N/A		Available: SE, Titanium; Standard: Platinum	
Safety & Security					
Front/rear brakes	4-wheel disc	4-wheel disc		4-wheel disc	
4-Wheel ABS	Standard	Standard		Standard	
Traction Control System (TCS)*	Standard	Standard		Standard	
Electronic Stability Control (ESC)*	Standard	Standard		Standard	
Hill-start Assist Control (HAC)*	Standard	N/A		N/A	
Electronic Brake-force Distribution (EBD)*	Standard	Standard		Standard	
Dual front advanced airbags*	Standard	Standard		Standard	
Driver's knee airbag*	Standard	Standard		Standard	
Dual front seat-mounted side airbags*	Standard	Standard		Standard	
Full-length side curtain airbags*	Standard	Standard		Standard	
Tire Pressure Monitoring System (TPMS)*	Standard	Standard		Standard	
Exterior Dimensions					
Wheelbase (in.)	110.4	109.3		112.2	
Overall length (in.)	191.1	190.9		191.8	
Overall width (in.)	73.2	71.7		72.9	
Overall height (in.)	57.7	57.9		58	
Ground clearance (in.)	5.1	6.1		Information N/A	
Curb weight (lb.)	TBD	3485 to 3585		3668	
Interior Dimensions					
Headroom (front/rear; in.)	39.8/37.8	38.8/38.1		39.2/37.8	
Shoulder room (front/rear; in.)	58.1/56.4	58.0/56.6		57.8/56.9	
Hip room (front/rear; in.)	56.0/56.0	54.5/54.5		55.0/54.4	
Legroom (front/rear; in.)	45.5/35.6	41.6/38.9		44.3/38.3	
Passenger volume (cu.-ft.)	TBD	102.7		102.8	
Luggage compartment volume (cu.-ft.)	13.4	13.1		12.0	
Warranty					
New Vehicle Limited Basic Warranty	5-year/60,000-mile*	3-year/36,000-mile		3-year/36,000-mile	
Limited Powertrain Warranty	10-year/100,000-mile*	5-year/60,000-mile		5-year/60,000-mile	
Limited Anti-Corrosion Warranty	5-year/100,000-mile*	5-year/unlimited-mile		5-year/unlimited-mile	
Roadside Assistance	5-year/60,000-mile*	2-year/25,000-mile		5-year/60,000-mile	

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THE HYBRID/ALTERNATIVE-POWER LANDSCAPE

	2017 Kia Optima Plug-in Hybrid	2017 Ford Fusion Energi	✓
Trim Levels			
Trim Levels	Hybrid Premium, Hybrid EX	S, SE, Titanium, Platinum	
MSRP*	$TBD (Plug-in Hybrid EX)	$25,185 (S); $25,990 (SE); $30,520 (Titanium); $37,020 (Platinum)	
Performance			
Engine	2.0L Atkinson Cycle DOHC 4-cyl.	2.0L Atkinson Cycle DOHC 4-cyl.	
Horsepower (hp @ rpm)	154 @ 6,000	141 @ 6,000	
Torque (lb.-ft. @ rpm)	140 @ 5,000	129 @ 4,000	
Electric Motor Horsepower (hp @ rpm)	67 @ 2,300	TBD	
Combined Horsepower (hp @ rpm)	202 @ 6,000	188	
Transmission	6-speed automatic with Sportmatic® sequential shift control	CVT with rotary gearshift dial	
Fuel type	Regular unleaded	Regular unleaded	
Electric + Gasoline (EV mode) combined (MPGe*)	99 linternal estimate)	97	
All Electric Range (AER) (miles est.)	27	22	
Fuel tank capacity (gal.)	TBD	14.0	
Suspension, front/rear	MacPherson strut/Multi-link	MacPherson strut/Multi-link	
Stabilizer Bars	Front/rear	Front	
Steering	Electric Power Steering (EPS)	Electric Power Steering (EPS)	
Drive configuration	Front-wheel drive	Front-wheel drive	
Exterior			
Wheels	17-in. alloy	17-in. alloy (Standard) 18-in. alloy (Available)	
Tires	P215/55VR17	P225/50HR17 (Standard); P235/45R18 (Titanium, Platinum)	
Power Sunroof	Available	Available: SE, Titanium; Standard: Platinum	
Power-adjustable exterior mirrors	Standard	Standard	
Heated exterior mirrors	Standard	Standard	
Exterior mirrors w/LED turn signals	Standard	Standard	
Lighting & Instrumentation			
Auto-On/Off Headlights	Standard	Standard	
LED Daytime Running Lights	Standard	w/o LED	
Headlights	Single projection (Standard); LED w/ Dynamic Bending Light (DBL) (Available)	LED (Standard)	
LED tail lights	Standard	Standard	
Supervision Meter Cluster LCD screen	Standard	Standard	

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THE HYBRID/ALTERNATIVE-POWER LANDSCAPE

	2017 Kia Optima Plug-in Hybrid	2017 Ford Fusion Energi	✓
Audio & Infotainment			
AM/FM	Standard	Standard	
CD	Single-disc	Single-disc	
MP3	Standard	Standard	
Speakers	10 speakers	11 speakers (SE); 12 speakers (Titanium, Platinum)	
SiriusXM®* Satellite Radio	Standard	SE, Titanium, Platinum	
USB/Auxiliary input jacks	Standard	Standard	
Bluetooth®* wireless technology	Standard	Standard	
Navigation*	Hybrid EX	Available: SE, Titanium Standard: Platinum	
Infotainment/telematics system	UVO eServices* with Premium Navigation*	SYNC 3 (Titanium)	
Android Auto™* & Apple CarPlay®*	Standard	N/A	
Comfort & Convenience			
Air conditioning	Dual-zone automatic temperature control	Dual-zone automatic temperature control	
Variable intermittent windshield wipers	Standard	Standard	
Power Windows	Standard	Standard	
Auto-up	Driver and Passenger	Driver and Passenger	
Auto-down	Driver and Passenger	Driver and Passenger	
Fuel efficiency indicator	Standard	Standard	
Tilting steering wheel-tilt/Telescoping steering wheel	Tilt and Telescoping	Tilt and Telescoping	
Steering-wheel-mounted controls*	Audio, Cruise, Phone	Audio, Cruise, Phone	
Visor vanity mirrors	Illuminated	Illuminated	
Cruise control	w/steering-wheel-mounted controls*	w/steering-wheel-mounted controls	
Advanced Smart Cruise Control (ASCC)*	Available	Available: SE, Titanium; Standard: Platinum	
Remote keyless entry w/alarm	Keyfob (all doors)	Keyfob (all doors)	
Push Button Start w/Smart Key*	Standard	Standard	
Smart Trunk*	Standard	N/A	
Rear Park Assist System*	Available	Standard	
Rear-Camera Display*	Standard	Standard	
Blind Spot Detection (BSD)*	Available	Available: SE, Titanium; Standard: Platinum	
Rear Cross-Traffic Alert (RCTA)*	Available	Available: SE, Titanium; Standard: Platinum	
Lane Departure Warning System (LDWS)*	Available	Available: SE, Titanium; Standard: Platinum	
Forward Collision Warning System (FCWS)*	Available	Available: SE, Titanium; Standard: Platinum	
Auto-dimming rearview mirror	Available	Standard	

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THE HYBRID/ALTERNATIVE-POWER LANDSCAPE

	2017 Kia Optima Plug-in Hybrid	2017 Ford Fusion Energi	✓
Seating & Interior Trim			
Seating capacity	5	5	
Seating material	Leather	Cloth (SE); Leather (Titanium, Platinum)	
Driver's seat 1	12-way w/ power lumbar	10-way w/ power lumbar	
Driver's seat 2	N/A	N/A	
Heated front seats	Standard	Available: SE; Standard: Titanium, Platinum	
Ventilated front seats	Available	Available: Titanium; Standard: Platinum	
Heated outboard rear seat cushions	Available	N/A	
Leather-wrapped steering wheel & shift knob	Standard	Standard	
Heated Steering Wheel	Standard	Available: SE, Titanium; Standard: Platinum	
Safety & Security			
Front/rear brakes	4-wheel disc	4-wheel disc	
4-Wheel ABS	Standard	Standard	
Traction Control System (TCS)*	Standard	Standard	
Electronic Stability Control (ESC)*	Standard	Standard	
Hill-start Assist Control (HAC)*	Standard	N/A	
Electronic Brake-force Distribution (EBD)*	Standard	Standard	
Dual front advanced airbags*	Standard	Standard	
Driver's knee airbag*	Standard	Standard	
Dual front seat-mounted side airbags*	Standard	Standard	
Full-length side curtain airbags*	Standard	Standard	
Tire Pressure Monitoring System (TPMS)*	Standard	Standard	
Exterior Dimensions			
Wheelbase (in.)	110.4	112.2	
Overall length (in.)	191.1	191.8	
Overall width (in.)	73.2	72.9	
Overall height (in.)	57.7	58	
Ground clearance (in.)	5.1	Information N/A	
Curb weight (lb.)	TBD	3986	
Interior Dimensions			
Headroom (front/rear; in.)	39.8/37.8	39.2/37.8	
Shoulder room (front/rear; in.)	58.1/56.4	57.8/56.9	
Hip room (front/rear; in.)	56.0/56.0	55.0/54.4	
Legroom (front/rear; in.)	45.5/35.6	44.3/38.3	
Passenger volume (cu.-ft.)	TBD	102.8	
Luggage compartment volume (cu.-ft.)	TBD	8.2	
Warranty			
New Vehicle Limited Basic Warranty	5-year/60,000-mile*	3-year/36,000-mile	
Limited Powertrain Warranty	10-year/100,000-mile*	5-year/60,000-mile	
Limited Anti-Corrosion Warranty	5-year/100,000-mile*	5-year/unlimited-mile	
Roadside Assistance	5-year/60,000-mile*	5-year/60,000-mile	

*See the last page in this document for important Safety information and Legal disclaimers.

VOICE OF THE CUSTOMER

2017 Kia Optima Hybrid vs. 2016 Toyota Camry Hybrid

- Camry Hybrid trim levels: LE, SE, XLE
- Camry Hybrid powertrain: 2.5L Atkinson Cycle 4-cyl. with electric motor, nickel-metal-hydride battery and CVT

Key Optima Hybrid Wins

- **Advanced Powertrain**
  - » Lithium-ion-polymer battery pack vs. nickel-metal-hydride for Camry Hybrid
  - » 6-speed automatic transmission with Sportmatic® shifting though Camry Hybrid's standard electronically controlled CVT lacks this sporty, manual-style shifting feature
- **Greater Comfort and Convenience**
  - » Standard Android Auto™* and Apple CarPlay®* vs. not available on Camry Hybrid
  - » Available LED headlightsw/Dynamic Bending Light (DBL) vs. not available for Camry Hybrid
  - » Exterior mirrors with LED turn signals vs. LEDs not available on Camry Hybrid
  - » Hill-start Assist Control (HAC)* vs. not available for Camry Hybrid
  - » Available Rear Park Assist System* vs. not available for Camry Hybrid
- **Upgraded Interior**
  - » Optima Hybrid offers more front headroom and legroom than the Camry Hybrid: 39.8/45.5 vs. 38.8/41.6
  - » Available ventilated front seats vs. not available for Camry Hybrid
  - » Available heated steering wheel vs. not available for Camry Hybrid
  - » Standard Smart Trunk vs. not available for Camry Hybrid
- **Superior Warranty**
  - » 5-year/60,000-mile* New Vehicle Limited Basic Warranty vs. 3-year/36,000-mile for Camry Hybrid
  - » 10-year/100,000-mile* Limited Powertrain Warranty vs. 5-year/60,000 mile for Camry Hybrid
  - » 10-Year/100,000-mile* Hybrid System Warranty vs. 8-Year/100,000-mile for Camry Hybrid
  - » 5-year/60,000-mile* Roadside Assistance* vs. 2-year/25,000-mile for Camry Hybrid

2017 Kia Optima Hybrid vs. 2017 Ford Fusion Hybrid

- Fusion Hybrid Trim Levels: S, SE, Titanium, Platinum
- Fusion Hybrid Powertrain Options: 2.0L Atkinson Cycle 4-cyl. with electric motor, lithium-ion battery and E-CVT

Key Optima Hybrid Wins

- **Advanced Powertrain**
  - » Optima Hybrid's total system output is 193 hp vs. 188 hp for Fusion Hybrid
  - » 6-speed automatic transmission with Sportmatic® shifting, while Fusion Hybrid's standard electronically controlled CVT with rotary gearshift dial lacks this sporty, manual-style shifting feature
- **Greater Comfort and Convenience**
  - » Standard Android Auto™* and Apple CarPlay®* vs. not available on Fusion Hybrid
  - » Standard Smart Trunk vs. not available for Fusion Hybrid
  - » Hill-start Assist Control (HAC)* vs. not available for Fusion Hybrid
  - » Available heated outboard rear seat cushions vs. not available for Fusion Hybrid
- **Upgraded Interior**
  - » Optima Hybrid offers more front headroom and legroom than Fusion Hybrid: 39.8 in./45.5 in. vs. 39.2 in./44.3 in.
- **Superior Warranty**
  - » 5-year/60,000-mile* New Vehicle Limited Basic Warranty vs. 3-year/36,000-mile for Fusion Hybrid
  - » 10-year/100,000-mile* Limited Powertrain Warranty vs. 5-year/60,000-mile for Fusion Hybrid
  - » 10-year/100,000-mile* Hybrid System Warranty vs. 8-year/100,000-mile for Fusion Hybrid

2017 Kia Optima Plug-in Hybrid vs. 2017 Ford Fusion Energi

- Ford Fusion Energi trim levels: SE, Titanium, Platinum
- Ford Fusion Energi powertrain: 2.0L 4-cyl. with electric motor, lithium-ion battery and E-CVT

Key Optima Plug-in Hybrid Wins

- **Advanced Powertrain**
  - » Optima Plug-in Hybrid's total system output is 202 hp vs. 188 hp for Fusion Energi
  - » 6-speed automatic transmission with Sportmatic® shifting, while Fusion Energi's standard electronically controlled CVT with rotary gearshift dial lacks this sporty, manual-style shifting feature
- **Greater Comfort and Convenience**
  - » Standard Android Auto™* and Apple CarPlay®* vs. not available on Fusion Energi
  - » Standard Smart Trunk vs. not available for Fusion Energi
  - » Available heated outboard rear seat cushions vs. not available for Fusion Energi
  - » Hill-start Assist Control (HAC)* vs. not available for Fusion Energi
  - » Available heated outboard rear seat cushions vs. not available for Fusion Energi
- **Roomier Interior**
  - » Optima Plug-in Hybrid offers more front headroom and legroom than Fusion Energi: 39.8 in./45.5 in. vs. 39.2 in./44.3 in.
- **Superior Warranty**
  - » 5-year/60,000-mile* New Vehicle Limited Basic Warranty vs. 3-year/36,000-mile for Fusion Energi
  - » 10-year/100,000-mile* Limited Powertrain Warranty vs. 5-year/60,000 mile for Fusion Energi
  - » 10-Year/100,000-mile* Hybrid System Warranty vs. 8-Year/80,000-mile for Fusion Energi

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VOICE OF THE CUSTOMER

CUSTOMER EXPECTATIONS

Hybrid technology is new to many of the customers considering the Optima Hybrid. These customers may have preconceived notions about hybrid technology that, quite frankly, miss the mark. For customers buying the Optima Hybrid, it is imperative that they:

- Know exactly what to expect from this vehicle
- Understand the benefits and the limits of the Optima Hybrid
- Remain satisfied with their purchase long after they leave the dealership

Why should we concern ourselves about aligning customer perceptions with reality?

Expectation management should take place during the inquiry and sales stages, but it definitely needs to be reinforced at delivery and when your customers come back in for service.

NOTES:

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VOICE OF THE CUSTOMER

HYBRID HURDLES

The top hurdles customers have about buying a hybrid-electric vehicle include:

1. Price
2. Mileage expectations (they expect over 50 mpg*)
3. Concern about the reliability of hybrid technology

Techniques to address customer concerns:

Price:

- Point out that with the Optima Hybrid, you are investing in alternative fuel technology and shrinking your carbon footprint
- Invite customer to compare Optima Hybrid's price against key competitors
- Conduct a price analysis — use the Excel calculator to show how much the customer will save in fuel costs each year (see page 52)

Mileage Expectations:

- Many customers believe that hybrid vehicles get over 50 miles per gallon
- Although Optima Hybrid does not reach those levels, its efficiency is still expected to be excellent

Concern about the Reliability of Hybrid Technology:

- Kia is confident in their hybrid technology and backs unique hybrid components — with a 10-year/100,000-mile* warranty
- Kia's quality has been on the rise. If recent performance is any indication, customers should be very confident in the quality of Optima Hybrid

NOTES: _____

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VOICE OF THE CUSTOMER

FACTORS THAT AFFECT FUEL ECONOMY*

In both conventional and hybrid vehicles, the following factors all negatively affect fuel economy:

1. **Numerous short trips** — Every time a vehicle is started up cold, it uses more fuel while warming up
2. **Weight** — The more passengers and more cargo you put in the vehicle, the less fuel economy you will achieve
3. **Driving style** — Rapid acceleration and heavy braking will lower fuel economy. Fuel economy suffers at speeds higher than about 65 mph and drops precipitously above 70 mph
4. **Air conditioning** — In a conventional vehicle, the air conditioner and defogger engage the AC compressor, which is a direct draw on the engine, thus decreasing fuel economy. In Optima Hybrid, the air conditioner still affects fuel economy, but to a different degree:
   - The compressor does not run off the engine; it is electrically powered by the lithium-ion-polymer battery
   - While it is not a direct draw on engine performance, it does draw down battery power faster, causing the need for the engine to kick in and charge up the battery
5. **Cold weather (extreme)** — Can reduce any vehicle's fuel economy by 20-35 percent
   - Cold weather increases friction between internal components
   - Vehicle fluids are thicker and harder to pump
   - Cold weather increases rolling resistance:
     - » Cold temperatures lower the pressure in your vehicle's tires by 1 to 2 psi for every 10 degrees that the temperature plummets
     - » When the weather turns foul, vehicles must work harder to push through snow and slush
   - Gasoline doesn't atomize and burn as well in cold temperatures; trace amounts of unburned fuel are left in the cylinder and evacuated with the exhaust. Not only does the unburned fuel equal lost power, it also substantially increases the vehicle's emissions
6. **Hot weather (extreme)** — In warmer weather, the vehicle needs to exert more energy to cool its machinery, which lowers mileage. And it necessitates more AC usage, which also lowers mileage
7. **Low tire pressure** — Increases rolling resistance, which reduces fuel economy
8. **Hilly terrain** — Causes the vehicle to work harder and use more fuel

OPTIMA HYBRID: STEPS TO IMPROVE FUEL EFFICIENCY

Hitting Optima Hybrid's mpg estimates requires disciplined driving habits:

1. **Go easy on the pedal** — The faster you go and the harder you accelerate, the more fuel you'll use
2. **Use cruise control** — Maintaining a constant speed on the highway allows you to avoid constant braking and accelerating and, in most cases, will save gas
3. **Maintain a safe distance** — Constant braking makes it impossible to maintain a constant speed, hampering fuel economy
4. **Don't carry unnecessary loads** — Excessive weight reduces fuel economy — an extra 100 pounds of weight can decrease fuel economy by 1-2%
5. **Regularly check tire pressure (weekly)** — Keep pressure near the maximum recommended psi
6. **Plan ahead**
   - Combine several short trips in order to minimize cold engine starts
   - Monitor the flow of traffic to plan moves well ahead. If traffic is slowing, use moderate early braking or coasting to enhance fuel economy

NOTES: _____

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VOICE OF THE CUSTOMER

NOISE/FEEL ITEMS TO COVER WITH NEW OWNERS

1. **Gas engine will start up and shut down repeatedly**
2. **Vehicle may not emit ANY sound at a stop (gas engine off)**
3. **VESS is active under electric-only power at speeds of 18 mph or less** — to notify pedestrians that the vehicle is approaching
4. **A slight whirring noise may be audible during regenerative braking** — it's the motor in generator mode, charging up the high-voltage battery
5. **A slight noise may be audible from behind the rear seats** — it's the blower motor cooling off the high-voltage battery

ADDITIONAL "VOICE OF THE CUSTOMER" ISSUES

- **State of Charge Gauge** — indicates the charge level of the high-voltage battery
  - » May not show up to 100% full
  - » Typically moves between above and below the halfway mark
- **Lack of Use Can be Detrimental** — If Optima Hybrid is parked for a long time and not started, the hybrid system may discharge. The vehicle should be driven once per month (for at least 1 hour or 10 miles)
- **Hot Weather Affects Battery Life** — Battery life may be shorter in extremely warm climates. However, the battery is covered by Kia's Limited Powertrain Warranty*, so if something goes wrong within the warranty period, Kia has it covered
- **Cold Weather Makes the Engine Run More** — The longer it takes for the battery pack to reach its most efficient temperature, the longer the vehicle will depend on the engine
- **Hybrid Service Expense** — Maintaining a hybrid vehicle may cost less than a conventional vehicle due to decreased wear and tear on the engine and braking system
  - » The engine works less in a hybrid vehicle than in a conventional vehicle
  - » During deceleration, the resistance of the motor "acts like a brake," taking some load off of the conventional brakes
- **Hybrid Perks**
  - » Some states offer tax credits, carpool lane exceptions, exemptions from emissions testing and free parking
  - » Federal tax credits may apply to the Optima Plug-in Hybrid
  - » Unfortunately, federal tax credits have expired for vehicles like the Optima Hybrid
  - » Check www.fueleconomy.gov the latest information
- **Recommended Maintenance Intervals** — Refer to the Owner's Manual for Optima Hybrid and Plug-in Hybrid maintenance intervals
- **Safety Tips** — The high-voltage electrical system necessitates some safety precautions:
  - » Avoid touching orange high-voltage cables, wires and connectors
  - » Avoid cleaning engine compartment and trunk with liquids
  - » Avoid placing liquids or objects around the Hybrid Battery Air Intake
  - » Secure large and heavy loads in the trunk
  - » Owners should NOT service the hybrid system; only hybrid-certified Kia technicians should (they will need to pull the safety plug and wait 5 minutes prior to any service)

NOTES: _____

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VOICE OF THE CUSTOMER

DELIVERY CHECKLIST

1. Apply good fuel economy practices to get maximum fuel economy:

- Go easy on the pedal
- Use cruise control
- Maintain a safe distance
- Keep your cargo weight down
- Check tire pressure regularly — keep it close to the maximum recommended psi
- Plan ahead

2. Explain the following:

- Gauges and indicators
- Starting the vehicle
- The engine will turn off and on as needed
- No noise when stopped
- VESS
- HEV Cooling System Fan
- In extreme cold temps, the Optima Hybrid will rely on the engine more than usual
- Potential system discharge if vehicle is not used regularly
- New and different driving feel
- Tax credits, HOV lane exceptions, and other Hybrid perks
- Tire Mobility Kit (TMK)*

3. Cover hybrid safety:

- Avoid touching orange high-voltage cables, wires and connectors
- Avoid cleaning engine compartment and trunk with liquids
- Avoid placing liquids or objects around the Hybrid Battery Air Intake
- Secure large and heavy loads in the trunk
- Only hybrid-certified Kia techs should service the hybrid system

NOTES:

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SELLING OPTIMA HYBRID

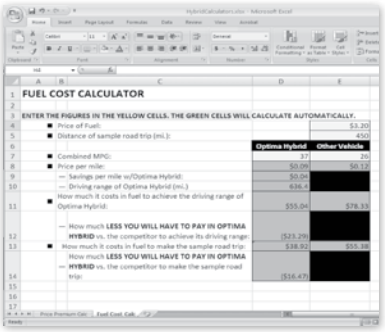
HYBRID CUSTOMERS

As the Optima Hybrid differs from its non-hybrid counterpart, hybrid customers differ from non-hybrid buyers. Knowing who your customers are and what their motivators and needs are can set you up for success.

How do hybrid customers differ from non-hybrid customers?

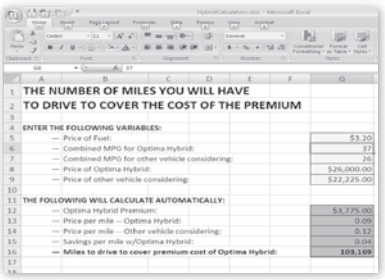
APPEAL TO MOTIVATORS

- **Green image** — It's a choice between buying a product from a company that is working to reduce dependency on fossil fuels by developing advanced technologies that work towards achieving that goal, rather than giving that money to the gas station. The effects of this decision stretch beyond the customer's account, affecting the environment and everyone who enjoys it
  - » According to the Maritz New Vehicle Customer Study, "fuel economy" is the main reason people choose a hybrid vehicle (28.3%) and "eco-friendly" is the 4th largest reason (6.2%)
- **Saving money** — The main appeal of hybrid vehicles is their increased fuel economy. Fuel economy directly affects how often your customers fill up at the pump and, consequently, how much they spend on fuel. This decreased operating cost can compensate for the increased cost of hybrids compared to their gas-only counterparts
  - » Increased fuel economy to save money at the pump
  - » Hybrid vehicle prices are down with the advances in new hybrid component development
  - » Use Fuel Cost and Price Premium Calculators to demonstrate savings to customers
- **Advanced technology** — Consumers like knowing they have got the latest and greatest. Hybrids and alternative fuels represent the next step in automotive technology and hybrids appeal to those that like to keep up with the latest products. Optima Hybrid packs a lot of impressive technology:
  - » Advanced battery — The lithium-ion-polymer battery is more advanced than both nickel-metal hydride (Ni-MH) and lithium-ion batteries
  - » Advanced gauge cluster — Supervision gauges with 4.2-inch LCD screen for crisp, clear vehicle information
  - » Advanced electric motor — Permanent magnet synchronous unit, 151 lb.-ft. of torque and TBD hp
  - » Virtual Engine Sound System (VESS) — To help alert those outside the vehicle, VESS emulates the sound of a running engine when Optima is in EV-mode and driving at speeds of 18 mph or less


FUEL COST CALCULATOR

ENTER THE FIGURES IN THE YELLOW CELLS. THE GREEN CELLS WILL CALCULATE AUTOMATICALLY.

	Optima Hybrid	Other Vehicle
Price of Fuel:		$3.20
Distance of sample road trip (mi.):		450
Combined MPG:	37	26
Price per mile:	$0.09	$0.12
— Savings per mile w/Optima Hybrid:	$0.04	
— Driving range of Optima Hybrid (mi.)	636.3	
How much it costs in fuel to achieve the driving range of Optima Hybrid:	$55.04	$78.33
— How much LESS YOU WILL HAVE TO PAY IN OPTIMA HYBRID vs. the competitor to achieve its driving range:	($23.29)	
How much it costs in fuel to make the sample road trip:	$38.02	$55.38
— How much LESS YOU WILL HAVE TO PAY IN OPTIMA HYBRID vs. the competitor to make the sample road trip:	($16.47)	


THE NUMBER OF MILES YOU WILL HAVE TO DRIVE TO COVER THE COST OF THE PREMIUM

ENTER THE FOLLOWING VARIABLES:

— Price of Fuel:	$3.20
— Combined MPG for Optima Hybrid:	37
— Combined MPG for other vehicle considering:	26
— Price of Optima Hybrid:	$26,000.00
— Price of other vehicle considering:	$22,225.00

THE FOLLOWING WILL CALCULATE AUTOMATICALLY:

— Optima Hybrid Premium:	$3,775.00
— Price per mile -- Optima Hybrid:	0.09
— Price per mile -- Other vehicle considering:	0.12
— Savings per mile w/Optima Hybrid:	0.04
— Miles to drive to cover premium cost of Optima Hybrid:	103,169

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SELLING OPTIMA HYBRID

HYBRIDS AREN'T FOR EVERYONE

While hybrid vehicles are a great step forward in reducing fuel consumption and vehicle emissions, that doesn't mean they're the right answer for every customer. Many other factors aside from fuel economy affect a car purchase decision.

- A hybrid isn't the only vehicle that features advanced technology
  - » Many Kia vehicles feature advanced technologies like Idle, Stop & Go (ISG), Variable Intake System (VIS), Gasoline Direct Injection (GDI) technology, Turbocharging, Electric Power Steering (EPS), UVO eServices, and many others
- A hybrid vehicle isn't the only type of vehicle to emit reduced emissions
  - » Other Kia vehicles feature SULEV-rated engines: Forte, Optima, Sportage
- Assess your customer's driving habits and needs and whether a hybrid is right for them
  - » It's your job as a sales consultant to help ensure your customer makes the most informed purchase decision possible

Mr. "Hybrid All the Way"

Key characteristics:

How should you proceed once you've determined your customer is a "Mr. Hybrid All the Way"?

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SELLING OPTIMA HYBRID

Mr. "Green Conscious"

Key characteristics:

How should you proceed once you've determined your customer is a "Mr. Green Conscious"?

Mr. "Bottom Line"

Key characteristics:

How should you proceed once you've determined your customer is a "Mr. Bottom Line"?

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CUSTOMER QUALIFYING INTERVIEW

The qualifying interview is the best way to figure out which of the three types your customer falls into, if they fall into any of the three categories at all.

Key questions:

- Why are you considering hybrid vehicles?
- What drew you to the Optima Hybrid?
- What other vehicles are you shopping?
- For how many years do you normally hold onto vehicles?

Note: The Optima Hybrid may NOT be the best fit for your customer. You help guide the customer to the choice that makes the most sense.

MEET & GREET/QUALIFYING ROLE-PLAY

Profile 1:

Caleb Tanner
Age: 41
Profession: Personal Trainer

"I'm a personal trainer for a few different health clubs across the city. Depending on the day, I can drive from 10 miles to 40 miles. As a personal trainer, I'm huge on taking care of myself, and that's not just personal health. I take the same approach to the other aspects of my life. I am committed at a very deep level to taking care of the environment. From organic and ethically raised foods to environmentally friendly cleaning products and clothing, I try to leave as little carbon footprint as possible. Naturally, Hybrid vehicles are high on my list of vehicles, for their ecology of course. But their practicality and economy are also a perfect fit for me."

Profile 2:

Donna Fields
Age: 34
Profession: Retail Store Manager

"I recycle, try to eat organic, and occasionally hang out with my 'green' friends. Some of them have hybrids, and I've thought about getting one for a while, but I don't know how affordable they are. My Civic was a hand-me-down from my parents and it's time for me to move on. It saves me gas but it's starting to become an eyesore. I live pretty close to work and my daily drive is only about 10-12 miles, but I go to the gym frequently, get my nails done downtown and regularly visit friends on the west side. With a new hybrid car, I can save even more on gas than I do now, and I love the interiors because they look so futuristic."

Profile 3:

Frank Pasquale
Age: 38
Profession: College Professor

"Times are tight right now — I teach classes at State in the morning, and then I hold lectures at City College in the afternoon. It's 20 miles between the two, and by the end of my day, I've driven 50-60 miles. The State budget is hurting, and it's directly affecting my bank account and my family. With two kids and a mortgage, we've definitely seen better days. Unfortunately, so has my four-door. I need to replace it with a car that's reliable, fuel-efficient, comfortable and, ultimately, one that makes financial sense."

SELLING OPTIMA HYBRID

BEST PRACTICES

Identify Best Practices for each of the following stages on the Road to the Sale.

Customer Qualify/Interview: _____

Product Presentation: _____

Demo Drive: _____

Delivery: _____

Follow-up: _____

VIDEOS & LOG-IN INSTRUCTIONS

OPERATIONAL VIDEOS

Snap a Code

To ensure customer satisfaction, make sure to familiarize yourself with the operation and functions of these five popular Optima Hybrid features and perform a thorough customer demonstration during Delivery. By taking the time to fully explain potentially difficult-to-understand or hard-to-operate vehicle features for your customers, you will help to pre-emptively mitigate potential questions and confusion and set yourself up for more repeat business. For detailed operational information, please view the Optima Hybrid Features & Functions Guide or Optima Hybrid Owner's Manual.

If you have a smartphone with a QR codeReader app* just snap a code with your phone, and a video on the topic will start playing (compatible phone required). Similar codes are featured throughout the 2016 Optima Features & Functions Guide. We highly recommend every appropriate dealership team member review these videos to help build their product knowledge. The entire video library can be accessed from the following locations:

Kia Mobile PRG / Desktop PRG
Under VIDEOS on the home page.

KiaUniversity.com
Under RESOURCES tab and Sales or Service link.

Kdealer.net
In the left navigation under the FFG Video link.

KiaTechInfo.com
In the center PUBLICATION navigation under the FFG Video link.

Voice Recognition Tips	Bluetooth®* Wireless Technology	USB/Auxiliary Input Jacks	Kia USB
Premium Navigation*	Headrest Adjustment	Heated Steering Wheel	

To access Kia University information:

Type www.KDealer.com into your web browser
If you are a returning user and have a username and password:

- Enter your username and password
- Click the Login button
- Click on the Kia University symbol at the top of the page

If you are a returning user but have forgotten your username and/or password, refer to the FAQ section at the bottom of the website. Otherwise, contact the KDealer.com support team at KDealerSupport@kiausa.com or 1-800-327-2707.

If you are a new user, or if you need further assistance, contact your dealership administrator or KDealer.com support team at KDealerSupport@kiausa.com or 1-800-327-2707.

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SAFETY & LEGAL INFORMATION

Advanced Smart Cruise Control (ASCC): The Advanced Smart Cruise Control system is not a substitute for safe driving and cruise-control procedures. This is not an auto-pilot feature. Always drive safely and use caution. The Advanced Smart Cruise Control system may not detect every object in front of the vehicle.

App: App runs on your smartphone cellular data service. Normal data rates will apply.

Airbags: For maximum protection, always wear your seat belt.

Blind Spot Detection (BSD) with Rear Cross Traffic Alert (RCTA): Blind Spot Detection and Rear Cross Traffic Alert are not substitutes for safe driving, and may not detect all objects around or behind vehicle. Always drive safely and use caution.

***Bluetooth*® Wireless Technology:** The *Bluetooth*® word mark and logos are registered trademarks owned by Bluetooth SIG Inc., and any use of such marks by Kia is pursuant to license. A *Bluetooth*® enabled cell phone is required to use *Bluetooth*® wireless technology.

Brake Assist System (BAS): No system, no matter how advanced, can compensate for all driver error and/or driving conditions. Always drive responsibly.

Competitive Comparison: Comparison data gathered from manufacturers' websites May 2016.

Edmunds.com: Edmunds and Consumers' Top Rated® are registered trademarks of Edmunds.com, Inc.

Electronic Brake-force Distribution (EBD): No system, no matter how advanced, can compensate for all driver error and/or driving conditions. Always drive responsibly.

Electronic Stability Control (ESC): No system, no matter how advanced, can compensate for all driver error and/or driving conditions. Always drive responsibly.

Forward Collision Warning System (FCWS): The Forward Collision Warning System is not a substitute for proper and safe driving. The Forward Collision Warning System may not detect every object in the path of the vehicle. Always drive safely and use caution.

Hill-start Assist Control (HAC): No system, no matter how advanced, can compensate for all driver error and/or driving conditions. Always drive responsibly.

Insurance Institute for Highway Safety (IIHS) Top Safety Pick: The Kia Optima Hybrid was named an IIHS "Top Safety Pick" for 2015 for good performance in front, side, and rear tests and standard electronic stability control.

Lane Departure Warning System (LDWS): The Lane Departure Warning System is not a substitute for proper and safe lane-changing procedures. Always drive safely and use caution when changing lanes. The lane departure warning may not detect every object alongside the vehicle.

MPG (Miles Per Gallon): Based on EPA estimates. Actual mileage will vary with options, driving conditions, driving habits and your vehicle's condition.

MPGe is the EPA-equivalent measure of gasoline fuel efficiency for electric mode operation.

MSRP: MSRP excludes destination and handling, taxes, title, license fees, options and retailer charges. Actual prices set by retailer and may vary.

National Highway Traffic Safety Administration (NHTSA): Government star ratings are part of the National Highway Traffic Safety Administration's (NHTSA's) New Car Assessment Program (www.safercar.gov).

Navigation: GPS maps and directions are for information purposes only and Kia does not make any warranties about the accuracy of that information. Kia is not responsible for loss or delay resulting from the use of the navigation system. Caution: Do not enter information into the navigation system while the vehicle is moving. Failure to pay attention to travel conditions and vehicle operation while the vehicle is in motion could result in loss of vehicle control. Operate the system only when it is safe and legal to do so.

Push Button Start with Smart Key: Always come to a complete stop before turning the engine on or off. However, if you have an emergency while the vehicle is in motion and must turn the engine off, you can turn the engine off to the ACC position by pressing the Start/Stop button for more than 3 seconds or 3 times in succession. If the vehicle is still moving, you can restart the engine by pressing the Start/Stop button with the shift lever in Neutral (N). With the engine off, power assist for steering and braking will be disabled, and the vehicle will be more difficult to control.

Rear-Camera Display: Rear-Camera Display is not a substitute for safe driving, and may not detect all objects behind vehicle. Always drive safely and use caution.

Rear Park Assist System: The Park Assist System is not a substitute for proper and safe parking procedures. The system may not display every object behind the vehicle. Always drive safely and use caution when parking.

Roadside Assistance: 24-hour Roadside Assistance is a service plan provided by Kia Motors America, Inc. Limitations apply. See Kia Warranty and Consumer Information Manual for details.

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Smart Trunk: Driving with the trunk open may be unlawful and can draw dangerous exhaust fumes into your vehicle; if you choose to do so, keep air vents and all windows open for proper ventilation.

Steering-wheel-mounted controls: Driving while distracted is dangerous and should be avoided. Remain attentive to driving and be cautious when using steering-wheel-mounted controls while driving.

Traction Control System (TCS): No system, no matter how advanced, can compensate for all driver error and/or driving conditions. Always drive responsibly.

Tire Mobility Kit (TMK): Tire Mobility Kit is a temporary fix, and used for one tire only. Have damaged tire inspected as soon as possible. Some damaged tires cannot be sealed; do not use the kit if a tire is damaged beyond repair.

Tire Pressure Monitoring System (TPMS): Even with the Tire Pressure Monitoring System, always check your tire pressure on a regular basis.

UVO eServices: Warning: Driving while distracted can result in a loss of vehicle control that may lead to an accident, severe personal injury, and death. The driver's primary responsibility is in the safe and legal operation of a vehicle, and use of any handheld devices, other equipment, or vehicle systems which take the driver's eyes, attention and focus away from the safe operation of a vehicle or which are not permissible by law should never be used during operation of the vehicle.

UVO eServices with Premium Navigation: Distracted driving can result in a loss of vehicle control. Never use a handheld device or vehicle system that takes your focus away from safe vehicle operation. Navigation is for information purposes only, and Kia does not make any warranties about the accuracy of the information.

Vehicle Stability Management (VSM): No system, no matter how advanced, can compensate for all driver error and/or driving conditions. Always drive responsibly.

Warranty: The Kia 10-year/100,000-mile warranty program includes various warranties. Warranties include powertrain and the New Vehicle Limited Warranty (Basic). All warranties are limited. See retailer for details or go to kia.com.

Wheel Locks: Available as accessory on Kia vehicles with aluminum wheels.

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