

# Quality **Connection**

Dedicated to Quality Kia Vehicle Repairs

FALL 2018 VOL. 13 | NO. 3

**2019 K900**

Shown with optional features

[www.kia.com](http://www.kia.com)



## HOW TO SERVICE GDI

Special procedures should be followed

## ASSURING BSD COMMUNICATION

Post collision, proper rear harness installation is key



Genuine Parts

# Once again, Kia receives high accolades

**K**ia has continued its streak of receiving important industry recognitions. For the fourth consecutive year, Kia was recognized as the number one non-premium brand in Initial Quality by J.D. Power in the 2018 Initial Quality Study (IQS), with the lowest rate of reported problems. Also, for the second year in a row, Kia has been acknowledged as one of the most trusted non-luxury automotive brands in the annual Trusted Automotive Brands Study (TABS) conducted by AMCI Global.

With regard to the J.D. Power IQS, Kia maintained its leadership position with segment-leading performances for the Sorento, Highest Ranked Midsize SUV in Initial Quality and for the Rio, Highest Ranked Small Car in Initial Quality.

“Ranking number one among all mass market brands in Initial Quality for four consecutive years leaves no doubt as to the world-class quality and craftsmanship instilled in every car and SUV that Kia builds,” said Michael Cole, Chief Operating Officer and EVP, Kia Motors America (KMA). “With two segment winners the evidence of Kia’s progression and focus on the ownership experience is overwhelming.”

The annual report analyzed responses from 75,712 respondents with regard to



The 2018 Kia Rio lead the small car segment.

240 vehicle models across 26 segments. Vehicles were evaluated on driving experience, engine and transmission performance and a broad range of quality issues reported by vehicle owners.

The TABS recognition underscores the importance of customer trust in a brand because it is one of the key factors leading to brand loyalty and a customer’s decision to repurchase that brand’s products. Now in its second year, TABS again shows that trust accounts for more than 50 percent of a consumer’s decision to recommend or repurchase a vehicle from an automotive brand.

“Building trust is never easy. It takes years of delivering great vehicles and standing behind those vehicles...” said William (Bill) Peffer, Vice President, Sales Operations, KMA. “It’s an honor for Kia to have

ranked as one of the most trusted non-luxury automotive brands two years running.”

Ian Beavis, chief strategy officer, AMCI Global, said the TABS recognition puts Kia “solidly in the top tier of the industry in terms of trust.”

That said, we hope that we have earned your trust as well and are committed to keep earning it everyday.

## Kia Motors America, Inc.

All trademarks and tradenames are the property of their respective owners. 2019 K900 shown with optional features. Some features may vary. Expected fall 2018 in limited quantities in select markets.

Disclaimer: The Kia Brand, Sorento, and Rio received the lowest rate of reported problems among mass market brands, midsize SUVs and small cars, respectively, in the J.D. Power 2018 U.S. Initial Quality Studies of new vehicle owners’ experience with their own vehicle after 90 days of ownership. Visit [jdpower.com/awards](http://jdpower.com/awards).

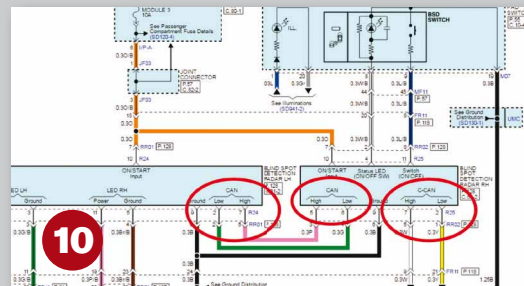
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# If it's not in the right box, it's not genuine.



Genuine Parts

From starters to alternators, oil filters to spark plugs, there is no substitute for genuine. The only way to assure that you are getting Genuine Kia parts, backed by the Kia Warranty, is to order them from your local Authorized Kia Dealer. Contact your local Kia dealer for assistance and delivery of the parts you need.


\*Genuine Kia replacement parts (except battery) sold by Authorized Kia Dealer under warranty are covered for the greater of (1) the duration of the New Vehicle Limited Warranty or (2) the first 12 months from the date of installation or 12,000 miles, whichever comes first. Labor charges not included when not installed by an Authorized Kia Dealer. Warranty is limited. See Kia's Replacement Parts and Accessories Limited Warranty for further details.



# How to service GDI

Special procedures should be followed

Special service information for all Kia vehicles equipped with Gasoline Direct Injection (GDI) engines is provided in this article.

 In GDI engines, highly pressurized gasoline is injected via a common fuel rail and injectors that deliver fuel directly into the combustion chamber of each cylinder. In comparison, in a conventional Multi-Point Fuel Injection (MPI) engine, the gasoline is injected into the intake port of each cylinder at a relatively low pressure. Due to high fuel pressure in a GDI system, servicing the GDI system requires special attention and handling procedures.

The following aspects of the Kia GDI fuel system are outlined in this article:

- Fuel Pressure Specification
- High Pressure Fuel System Tightening Torque
- SST For Tightening High Pressure Fuel Pipe Flare Nuts
- High Pressure Fuel System Residual Pressure Warning
- High Pressure Fuel Pump Installation
- High Pressure Fuel Pipe Installation
- Delivery Pipe and Injector Installation



**Warning:** Whenever the high pressure fuel pump, fuel pipe, delivery pipe, or injector is removed immediately after shutting off the engine, an injury may be caused by the release of highly pressurized fuel. Therefore, release the residual pressure in the high pressure fuel line by referring to the “Residual Fuel Pressure Release Procedure” outlined on page 6 before removing any high pressure fuel system components.

## SERVICE PROCEDURE

### Fuel Pressure Specification Comparison

MPI (Theta-2.0L/2.4L)	GDI (Theta-2.0/2.4L)
43-64 psi (3.0~4.5 kgf/cm <sup>2</sup> ) (Regulated by Fuel Pressure Regulator)	569-2133 psi (40~150 kgf/cm <sup>2</sup> ) (High Pressure Fuel Line)

**Notice:** The GDI high pressure fuel system operates at considerably higher fuel pressures than the conventional MPI fuel system.

### High Pressure Fuel System Tightening Torque



**Caution:** When installing the high pressure fuel pump, fuel pipe, or the delivery pipe, be sure to follow the tightening torque specifications listed in the table below using a torque wrench.

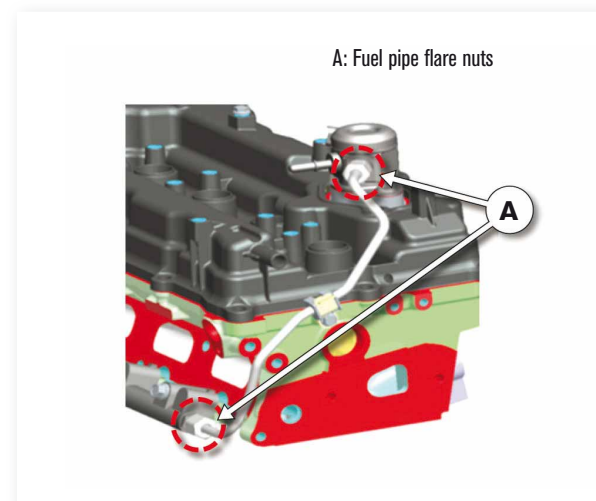
Failure to do so may cause damage to fuel line connections and may result in fuel leaks.

- Fully tighten the fasteners by hand without using a tool. During this time, check for proper positioning of the fittings and components.
- Afterwards, completely tighten to the specified torque using a torque wrench.
- If the fasteners are not tightened in a straight line with the mating bolt holes or fittings, a fuel leak may result due to misalignment, broken fasteners or damaged threads.

HIGH PRESSURE FUEL SYSTEM TIGHTENING TORQUE		
	Theta-2.0L turbo GDI	Theta-2.4L GDI
1. Fuel Pump	9.4~10.8 lbs-ft. (12.7~14.7 Nm)	9.4~10.8 lbs-ft. (12.7~14.7 Nm)
2. Fuel Pipe Flair Nut	19.5~23.9 lbs-ft. (26.5~32.4 Nm)	19.5~23.9 lbs-ft. (26.5~32.4 Nm)
3. Clamp	72~8.7 lbs-ft. (9.8~11.8 Nm)	72~8.7 lbs-ft. (9.8~11.8 Nm)
4. Delivery Pipe	13.7~174 lbs-ft. (18.6~23.5 Nm)	13.7~174 lbs-ft. (18.6~23.5 Nm)

### SST for High Pressure Fuel Pipe Flare Nuts

Tool Name/No.
Torque Wrench Socket (09314-3Q100)
Figure

Using Tool

Tightening flare nuts on both ends of the fuel pipe



TSBs may be updated from time to time. Please refer to TSB ENG148 at [www.kiatechinfo.com](http://www.kiatechinfo.com) for the latest procedures.

All images are for illustration purposes only.

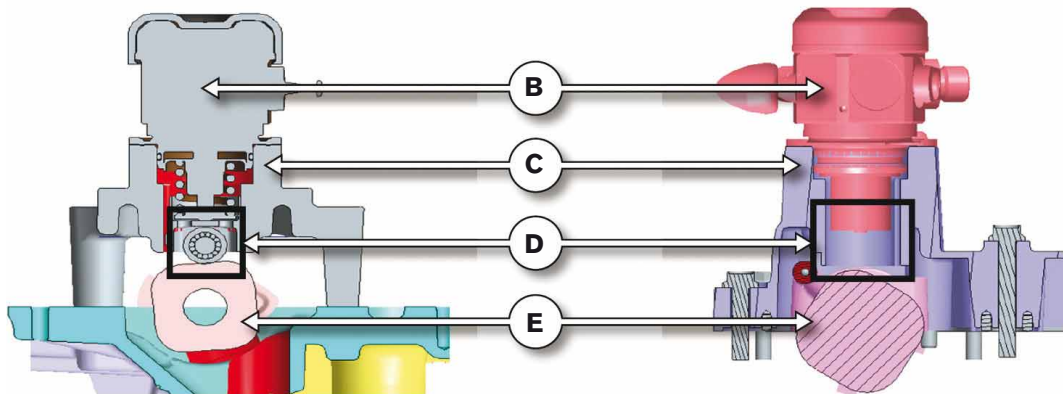
## Residual Fuel Pressure Release Procedure

Wear safety glasses and fuel resistant gloves.

- Turn the ignition off and disconnect the battery negative cable.
- Remove the fuel pump relay and the electrical connector to the high pressure fuel pump.
- Reconnect the battery negative cable.
- Run the engine for about 20 seconds to lower the pressure in both the high or low pressure lines. The engine may shut off within the 20-second period. If not, turn the engine off.
- Proceed with the service or repair. Use rags to cover opening and catch spills when opening up either fuel line.
- Reinstall/reconnect all components in reverse order of removal. Start engine and confirm proper operation, and make sure there are no fuel leaks.
- After completing, clear DTC(s) using GDS scan tool (the procedure described above will cause DTC to set).

## High Pressure Fuel Pump Installation

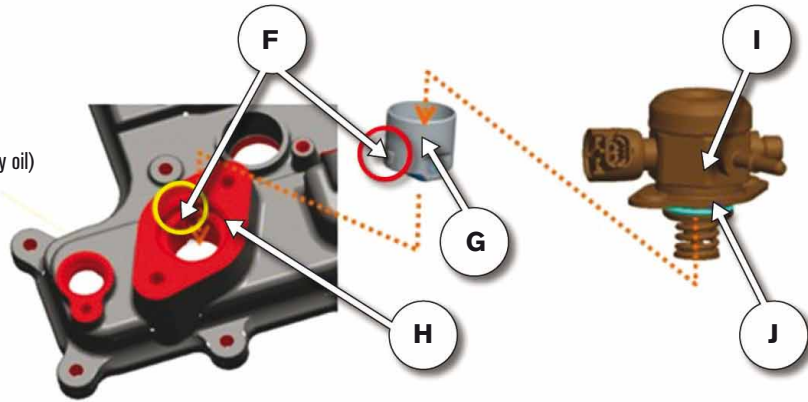
Before installing the high pressure fuel pump, be sure to place the fuel pump drive cam to the flat part of the lobe (as shown below) by rotating the crankshaft. If the drive cam for the fuel pump is not placed in the lowest position during installation, the fuel pump may be positioned improperly, which may result in fuel pump piston damage, broken bolt, damaged threads, damaged o-ring, etc.



B: Fuel pump, C: Adapter Bracket (Cylinder Head Cover), D: Roller Tappet, E: Fuel pump Drive Cam

- During a repair requiring fuel pump removal, cover the exposed fuel pump mounting hole in the adapter bracket to prevent any foreign substance or debris contamination.
- Do not reuse the fuel pump mounting bolts. Once a fuel pump is removed, the removed bolts must be replaced with new ones.
- When installing the fuel pump mounting bolts, hand-thread the fasteners first, then gradually tighten 1/2 turn at a time to the specified torque while alternating between the two bolts in several cycles using a torque wrench. Failure to follow this procedure will cause misalignment to the assembly due to internal spring tension of the fuel pump and can result in damage to the adapter bracket.
- Do not drop the fuel pump. External impacts may damage the internal components of the fuel pump. If this has occurred, confirm proper operation through performance tests prior to reuse.
- Before installing the fuel pump into the adapter bracket, be sure to apply clean engine oil evenly over the entire surface of the O-ring, roller tappet, and fuel pump mounting hole. When installing the fuel pump, align the protrusion on the roller tappet to the groove in the fuel pump mounting hole.

- F: Align protrusion to groove
- G: Roller tappet (Apply oil)
- H: Fuel pump mounting hole (Apply oil)
- I: Fuel pump
- J: O-ring (Apply oil)

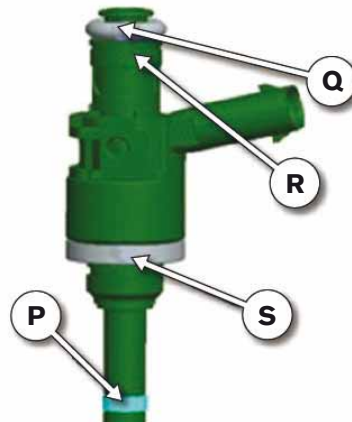
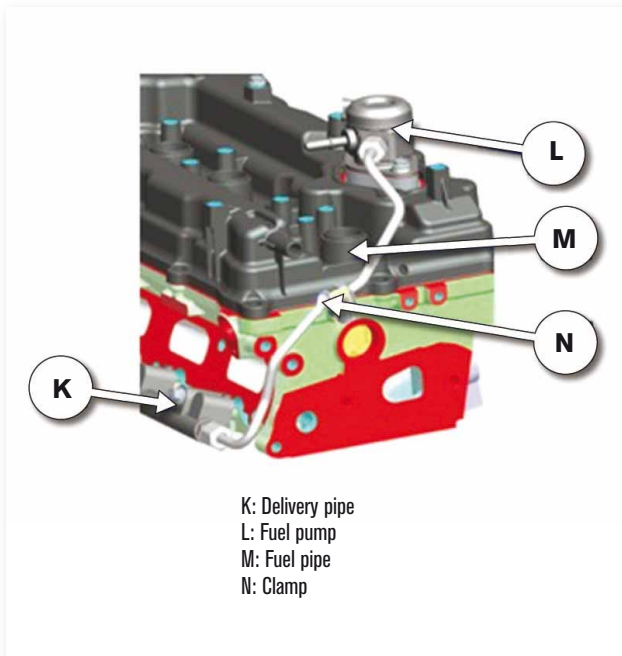


### High Pressure Fuel Pump Installation

- Do not reuse the fuel pipe. Once the fuel pipe is removed, it must be replaced with a new one.
- There are protective caps on both ends of the replacement fuel pipe to prevent foreign substances from entering into the fuel pipe. Remove the caps prior to installing the fuel pipe to the fuel pump and the delivery pipe.
- Refer to the “High Pressure Fuel System Tightening Torque” chart on page 5 to properly install the high pressure fuel pipe.


### Delivery Pipe and Injector Installation

- Do not reuse the delivery pipe mounting bolts. Once the delivery pipe is removed, the bolts must be replaced with new ones.
- Do not reuse the injector retaining clip, O-ring, backup ring, washer seal or combustion seal ring. Once an injector is removed, the five components must be replaced with new ones.



- O: Injector Retaining Clip
  - P: Injector Combustion Seal Ring
  - Q: Injector O-Ring
  - R: Injector Backup Ring
  - S: Injector Washer Seal
- Note: Items P, Q, and R are supplied in a single kit.

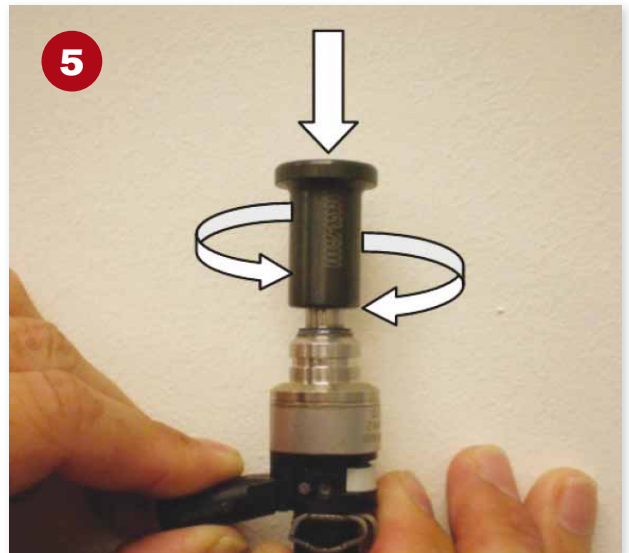
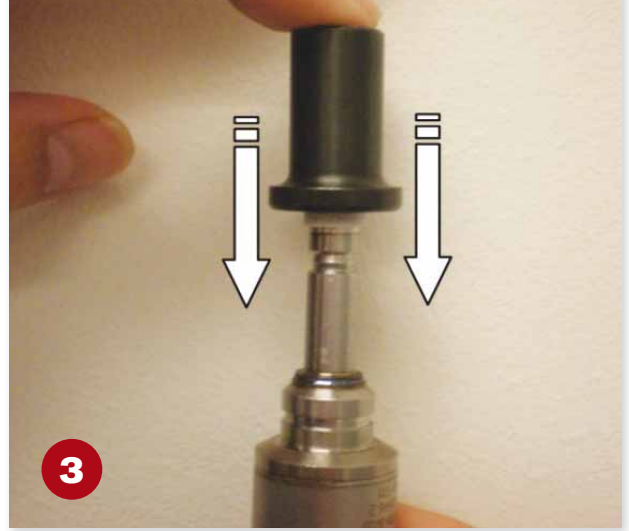
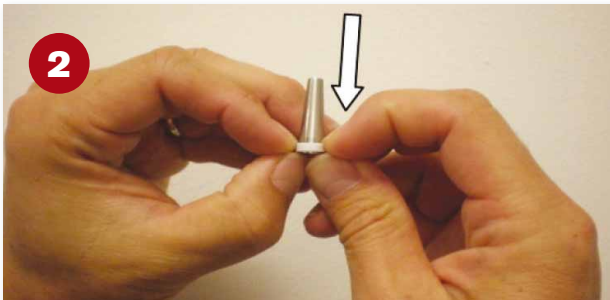
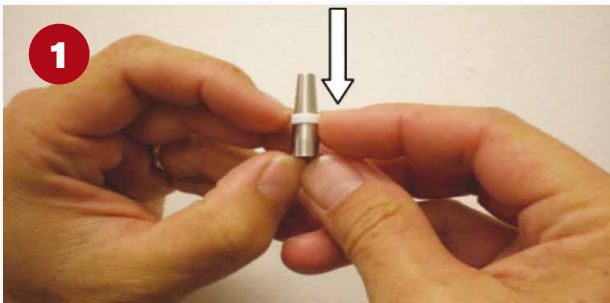
When installing the combustion seal ring onto the injector, use the SST 09353-2B000 (as shown below) and refer to the instructions below.

Tool Name/No.
Injector Combustion Seal Ring Installer
Tool Number
09353-2B000
Components

1. Sizing Tool, 2. Guide 3. Pushing Tool

## Injector Combustion Seal Installation Procedure

**1.** Place the combustion seal on the cone and pull downward on the seal as indicated in the photo.

*Notice: Your finger will work better for installing the combustion seal over the cone.*

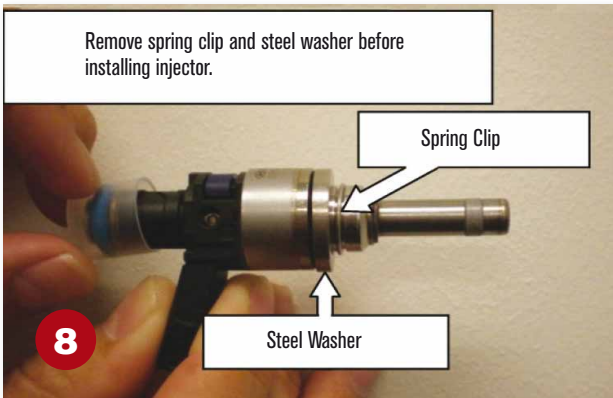
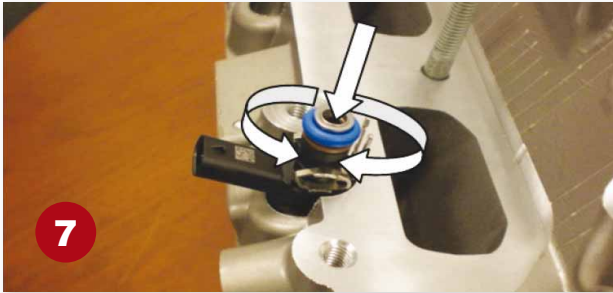
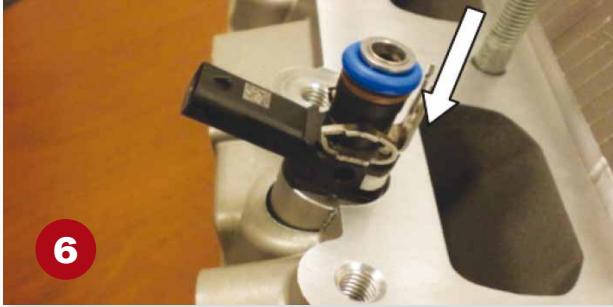


**2.** Pull the seal downward until it is near the bottom of the cone as shown in the photo.

**3.** Place the cone (with seal) on the end of the injector. Then place the sizing tool (09353-2B000) over the cone. Make sure the tool flange is toward the seal as shown. Press down on the tool to work the seal over the injector and into the groove.

**4.** Because the seal will stretch as it goes over the end of the injector, it will be a bit oversized after installation. By letting the injector and seal set for a few minutes, the seal may reduce in size. Inspect the seal for damage before continuing.





**5.** Place the resizing tool (flange up) over the seal. Twist the tool slightly while pushing down over the seal. This should reduce the size of the seal. *Be careful not to apply engine oil on the combustion seal ring.*

**6.** Place injector into the head as shown.

**7.** Twist slightly while pressing the injector into position in the head. This should complete the resizing of the seal. Remove the injector and inspect the seal before completing the injector installation process.

**8.** If the injector comes with a protective steel washer held in place by a spring clip, both will have to be removed before installation.

**9.** Install the washer seal onto injector with the rubber side (stepped) toward the injector.

**10.** The stepped rubber side of the seal goes towards the injector.

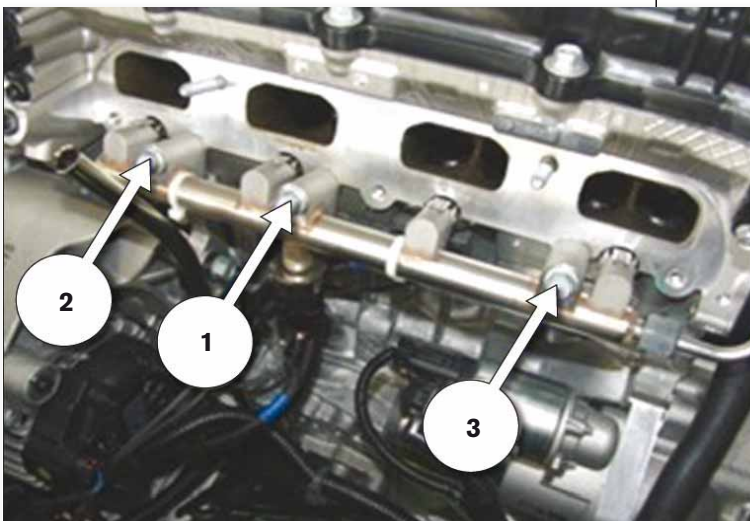
**11.** The flat washer side of the seal goes towards the head. Before installing the injectors into the delivery pipe, be sure to apply clean engine oil evenly over the entire surface of the injector o-ring. *Be careful not to apply engine oil on the combustion seal ring.*



Avoid dropping the fuel pipe (including injectors) or bumping it into any hard objects since damage to the internal components may occur. If necessary, visually inspect and confirm proper operation with performance tests prior to reuse.

Before installing the injector into the cylinder head, clean the injector hole and avoid contaminants from entering inside the injector hole. When installing the injector, avoid bumping the injector tip into any of the surrounding components since the tip may become damaged from the impact.


When fastening the three fuel delivery pipe mounting bolts, fully hand-tighten first, and then tighten in the proper sequence (see photo above) in several cycles up to the specified torque. The delivery pipe should move less than 1/8 inch (approx. 3mm), whenever each bolt is tightened. **KIA**

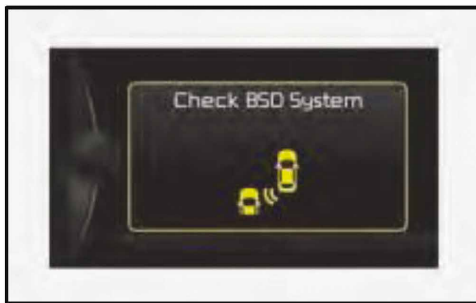


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# Assuring BSD communication

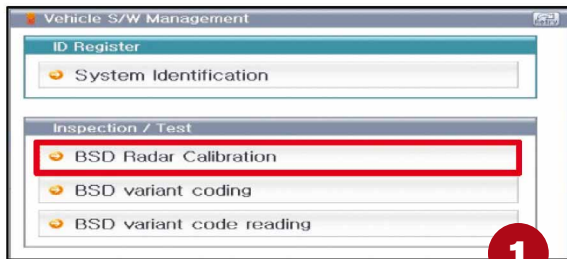
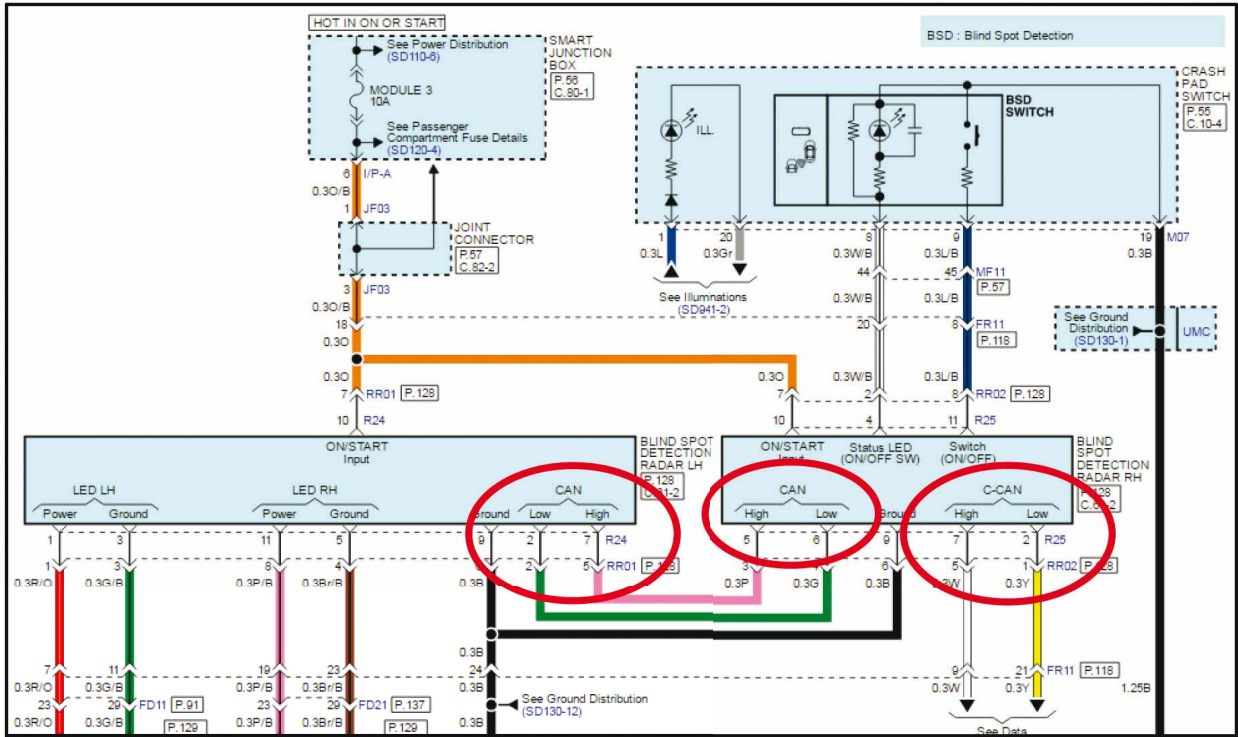
Post collision, proper rear harness installation is key

 This article provides information relating to the vehicles listed in the chart below when equipped with Blind Spot Detection\* (BSD), which may exhibit a “Check BSD System” message and no communication with the BSD system after collision repairs. This concern is commonly caused if the rear bumper harness is installed backwards.



Model	Year	BSD Master Location
Optima (QF)	2014-2015MY	Right
Sorento (XM)	2014-2015MY	Left
Cadenza (VG)	2014-2016MY	Right
Cadenza (YG)	2017-2018MY	Left
Niro (PHEV)	2017-2018MY	N/A (No Master/Slave)

*\*Blind Spot Detection is not a substitute for safe driving, and may not detect all objects behind or around vehicle. Always drive safely and use caution.*



[ BSD Radar Calibration ]

This function sets BSD Radar after replacement.

This calibration procedure will clear any 'Missing Calibration' DTCs which allows the Radar Sensors to go through the Self Alignment Procedure. The Sensors continually self-align while the vehicle is driven.

It may take up to 30 seconds.

It will not allow cancellation of the process.

Press OK below to continue.

2

The master BSD module, located at either side of the rear bumper (refer to table at left), is the only BSD module that communicates on the C-CAN. The slave module (opposing side of bumper) communicates to the master module via local network CAN. The master and slave module connectors are physically identical and may be mistakenly swapped.

**Note: Niro (PHEV) does not have a master/slave. Both modules communicate on the C-CAN.**

To confirm correct installation of the harness, verify the pin location is correct for the left or right side module, which can be found on the Kia Global Information System (KGIS). See the diagram above.

It is important to note that the BSD system may be adjusted and calibration must be performed after any rear collision repairs. Failure to do so can result in improper BSD system operation. Refer to SST060 for more details.

1. Using a KDS/GDS, select "BSD Radar Calibration" in the BSD System.
2. Perform the "BSD Radar Calibration" procedure according to the KDS screen.
3. Once the procedure is complete, test drive the vehicle at speeds above 20mph to verify proper operation of the BSD system. **KIA**

**⚠ Pitstop Technical Operations may be updated from time to time. Please refer to PS464 at [www.kiatechinfo.com](http://www.kiatechinfo.com) for the latest procedures.**

**⚠ All images are for illustration purposes only.**

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