



February 2017

Dealer Service Instructions for:

# Safety Recall S89 / NHTSA 16V-907 Crankshaft Camshaft Sensor Wire Harness

Models

# 2016 (JC)Dodge Journey2016 (MK)Jeep<sub>®</sub> Compass and Jeep<sub>®</sub> Patriot

*NOTE:* This recall applies only to the above vehicles equipped with a 2.0L (sales code ECN or ECT) or 2.4L (sales code ED3 or ED7) engine built from May 08, 2016 through July 12, 2016 (*MDH 050800 through 071216*).

**IMPORTANT:** Some of the involved vehicles may be in dealer new vehicle inventory. Federal law requires you to complete this recall service on these vehicles before retail delivery. Dealers should also consider this requirement to apply to used vehicle inventory and should perform this recall on vehicles in for service. Involved vehicles can be determined by using the VIP inquiry process.

## Subject

The crankshaft sensor and/or camshaft sensor electrical connector terminal(s) on about 43,000 of the above vehicles may have been improperly manufactured. Improperly manufactured crankshaft or camshaft sensor electrical connector terminal(s) could result in an intermittent electrical connection. An intermittent electrical connection could cause a "no start" condition, the engine to stall while driving, and/or the illumination of the Malfunction Indicator Lamp (MIL). An engine stall event while driving could cause a crash without warning.

#### Repair

- The crankshaft sensor electrical connector and terminals must be replaced on all involved (JC) Dodge Journey vehicles.
- The crankshaft sensor and camshaft sensor electrical connector and terminals must be replaced on all involved (MK)  $Jeep_{\circledast}$  Compass and  $Jeep_{\circledast}$  Patriot vehicles.

NOTE: A small number of vehicles may have already had one or more connectors replaced during a repair process conducted at the assembly plant. If during the repair process it is determined that a particular connector has already been replaced it is not necessary to replace that connector a second time. On MK vehicles the crank and both cam sensors must ALL be inspected. One connector that was previously replaced does NOT indicate that other connectors on that vehicle have also been replaced.

#### Alternate Transportation

Dealers should attempt to minimize customer inconvenience by placing the owner in a loaner vehicle if the vehicle must be held overnight.

## **Parts Information**

## <u>Part Number</u> <u>Description</u>

## CSEGS892AA Wiring Kit

Each package contains the following components:

Quantity Description

1 Wiring Kit for (JC) Dodge Journey

#### Part Number Description

### CSEGS891AA Wiring Kit

Each package contains the following components:

Quantity Description

3 Wiring Kit for (MK) Jeep<sub>®</sub> Compass and Jeep<sub>®</sub> Patriot

Dealers should determine which wire harness kit is required for each vehicle at the time appointments are scheduled to assure that the correct part is available when the customer arrives.

#### Parts Return

No parts return required for this campaign.

## **Special Tools**

#### The following specials tools are required to perform this repair:

- NPN wiTECH micro pod II
  NPN Laptop Computer
  NPN wiTECH Software
- ➢ 10042 Crimper, Wire/Terminal

#### Service Procedure

NOTE: (JC) Dodge Journey vehicles: Only the crankshaft position sensor wire harness electrical connector requires replacement. The crankshaft position sensor is located in the lower right rear of the engine block near the transmission bell housing.

NOTE: (MK) Jeep Compass and Jeep Patriot vehicles: The crankshaft position sensor, intake camshaft position sensor and exhaust camshaft position sensor wire harness electrical connectors all require replacement. The crankshaft position sensor is located in the lower right rear of the engine block near the transmission bell housing. The intake camshaft position sensor is located near the left rear corner of the engine head. The exhaust camshaft position sensor is located near the right rear corner of the engine head.

1. (MK) Jeep Compass and Jeep Patriot vehicles: Remove and save the engine cover (Figure 1).



Figure 1 – (MK) Engine Cover

2. (MK) Jeep Compass and Jeep Patriot vehicles: Unlock the two air inlet duct retainers. Then remove and save the fresh air inlet duct (Figure 2).



Figure 2 – (MK) Air Inlet Duct

3. (JC) Dodge Journey vehicles: Remove the battery negative cable remote terminal nut from the battery negative remote post. Remove and isolate the battery negative cable terminal from the battery negative remote post (Figure 3).



Figure 3 – (JC) Battery Negative Cable

4. (MK) Jeep Compass and Jeep Patriot vehicles: Disconnect and isolate the battery negative cable terminal (Figure 4).

5. (MK) Jeep Compass and Jeep Patriot vehicles: Remove and save the three PCM mounting bolts. Note the location of the PCM ground wire for later reassembly (Figure 5).



Figure 4 – (MK) Battery Negative Cable

6. (MK) Jeep Compass and Jeep Patriot vehicles: Position the PCM aside (Figure 5).



Figure 5 – (MK) PCM

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- 7. (MK) Jeep Compass and Jeep Patriot vehicles: Loosen the air inlet tube clamp at the air cleaner body and disconnect the air inlet tube from the air cleaner body (Figure 6).
- 8. (MK) Jeep Compass and Jeep Patriot vehicles: Disconnect the make-up air hose from the air cleaner body (Figure 6).



Figure 6 – (MK) Air Cleaner Body

- 9. (MK) Jeep Compass and Jeep Patriot vehicles: Remove and save the bolt attaching the air cleaner body support bracket to the strut tower (Figure 7).
- 10. (MK) Jeep Compass and Jeep Patriot vehicles: Pull the air cleaner body upward to disengage the air cleaner body locating pins from the rubber mounting grommets.
- 11. (MK) Jeep Compass and Jeep Patriot vehicles: Remove and save the air cleaner body.



Figure 7 – (MK) Air Cleaner Body



Figure 8 – Electrical Wire Harness To Heat Shield Edge Biting Retainer Clips

- 12. Release the two edge biting retainer clips securing the wire harness to the heat shield (Figure 8).
- 13. Front Wheel Drive vehicles: Disconnect the O2 sensor wire harness electrical connectors (Figure 9).



Figure 9 – Front Wheel Drive Vehicles: O2 Sensor Wire Harness Electrical Connectors

NOTE: On front wheel drive vehicles only, steps 14 through 16 may be performed from above or below the vehicle per technician preference.

- 14. Remove and save the one nut and two bolts retaining the heat shield (Figure 10).
- 15. Remove and save the heat shield (Figure 10).
- 16. Unlock the connector position assurance (CPA) retainer then disconnect the electrical connector from the crankshaft position sensor (Figure 10).
- 17. Route the crankshaft position sensor wire harness takeout branch up to the top of the engine compartment for accessibility while splicing the electrical connector wires.
- 18. **Front Wheel Drive vehicles:** For improved access to the crankshaft position sensor electrical connector for wire splicing, the O2 sensor wire retainer may be released to provide additional wire harness length (Figures 9 and 10).



Figure 10 – Heat Shield And Crankshaft Position Sensor Electrical Connector

ELECTRICAL CONNECTOR

19. (MK) Jeep Compass and Jeep Patriot vehicles: Unlock CPA the retainer then disconnect the electrical connector from the exhaust position camshaft sensor (Figure 11).

> NOTE: The exhaust camshaft position sensor is located near the right rear corner of the engine head.

- 20. (MK) Jeep Compass and vehicles: Jeep Patriot Release the retainer clip attaching the wire harness to the valve cover fastener stud (Figure 12).
- 21. (MK) Jeep Compass and Jeep **Patriot** vehicles: Unlock the CPA retainer then disconnect the electrical connector from the intake camshaft position sensor (Figure 13).

**NOTE:** The intake camshaft position sensor is located near the left rear corner of the engine head.

MIRROR SHOWING BACK SIDE OF EXHAUST CAMSHAFT **ENGINE HEAD** POSITION SENSOR



Figure 13 – (MK) Intake Camshaft Position Sensor Electrical Connector





POSITION SENSOR

WIRE HARNESS

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#### **Service Procedure [Continued]**

NOTE: (JC) Dodge Journey vehicles: Only the crankshaft position sensor wire harness electrical connector requires replacement.

NOTE: (MK) Jeep Compass and Jeep Patriot vehicles: The crankshaft position sensor, intake camshaft position sensor and exhaust camshaft position sensor wire harness electrical connectors all require replacement.

NOTE: Follow the wire splicing Steps 22-34 for each of the affected crankshaft sensor and camshaft sensor electrical connectors that require replacement per vehicle model.

NOTE: Wire colors within the wire harness takeout may vary depending on sensor location and vehicle configuration. Figures 15-25 are for reference ONLY; specific wire colors on the vehicle may be different.

22. Remove the tape and abrasion resistant sleeve from the wire harness takeout branch in order to expose the wire splice area (Figures 14 and 15).



Figure 14 – Wire Harness Takeout Branch



Figure 15 – Splice Area Exposed

NOTE: A small number of vehicles may have already had or more connectors one during replaced a repair conducted process at the assembly plant. If the wire takeout branch looks like Figure 25 with spliced purple color wires and a NEW connector, it has already been repaired. If the connector was previously replaced, proceed to Step 35 to retape the wire takeout branch. On MK vehicles a replaced connector indicate does not other connectors on that vehicle have been replaced. All crank and cam sensors must be inspected and repaired if not previously repaired.

23. Stagger the wire splice areas to prevent increased harness diameter and to retain flexibility of the wire harness takeout branch (Figures 16 and 17).

> NOTE: Temporally save the removed connector with wires attached for reference of wire lengths and wire colors during the splicing process.

24. Cut the wires to prepare for splicing (Figures 16 and 17).



Figure 16 – Stagger Cut Wire Splice Areas



Figure 17 – Wires Cut In Stagger Pattern

NOTE: The new wire terminal kit should include the following: connector housing, three wires, three splice bands and three pieces of heat shrink tubing (Figure 18).

25. Insert the new wires with terminal ends into the new wire harness connector housing (Figure 19).

> NOTE: The new connector housing does not include a connector position assurance (CPA) retainer lock. This is by design and it is not necessary to transfer or replace the CPA.

- 26. Depress the wire terminal lock on the end of the connector housing (Figure 19).
- 27. Stagger cut the wire splice locations on the new connector to match the wire length of the old connector plus 13 mm (0.50 in.) to compensate for the splice overlap (Figure 20).
- 28. Remove 13 mm (0.50 in.) of insulation from each wire that needs to be spliced (Figure 20).



SPLICE BANDS

Figure 18 – Wire Splice Kit Content



Figure 19 – Assemble Electrical Connector



Figure 20 – Stagger Cut Wires To Match With Vehicle Wire Harness Splice Area

HEAT SHRINK

TUBING



Figure 21 – Stagger Cut Wire Splice Areas

- 29. Place a piece of adhesive sealant-lined heat shrink tubing supplied in the kit over the wire on one side of the splice. Be certain the length of tubing will be sufficient to cover and seal the entire repair area (Figure 21).
- 30. Place the strands of the wires being spliced so that they are overlapping each other within the splice band (Figure 21).
- 31. Using crimping tool 10042 or equivalent, crimp the splice band and wires together securely (Figure 22).



Figure 22 – Use Crimping Tool To Crimp The Splice Band And Wires Together.



Figure 23 – Solder The Wire And Splice Band Connection Together

#### **CAUTION:** Never use acid core solder for electrical wiring repairs.

- 32. Using rosin core type solder only and a suitable soldering iron, solder the wire and splice band connection together (Figure 23).
- 33. Center the heat shrink tubing over the splice joint and heat using a suitable heat gun. Heat the joint until the tubing is tightly sealed and sealant begins to ooze out of both ends of the tubing (Figure 24).



Figure 24 – Seal The Splice Joint With Heat Shrink Tubing



Figure 25 – All Three Wires Spliced And Sealed

- 34. Repeat Steps 29-33 for the remaining wires (Figure 25).
- 35. Tape the wire harness takeout branch 13 mm (0.5 in) behind the connector to secure the branch abrasion resistant sleeve. Then install the abrasion resistant sleeve and tape in place taking care that no wires remain exposed (Figure 26).



Figure 26 – Install Protective Tape And Sleeve To Wire Harness Takeout Branch

NOTE: (MK) Jeep Compass and Jeep Patriot vehicles will require the crankshaft position sensor, intake camshaft position sensor and exhaust camshaft position sensor wire harness electrical connectors replaced. Complete steps 22-35 for all involved sensor electrical connectors.

- 36. (MK) Jeep Compass and Jeep Patriot vehicles: Connect the electrical connector to the intake camshaft position sensor (Figure 13). Be sure to tug firmly on the electrical connector to ensure that the electrical connector is securely fastened to the sensor.
- 37. (MK) Jeep Compass and Jeep Patriot vehicles: Install the retainer clip attaching the wire harness to the valve cover fastener stud (Figure 12).
- 38. (MK) Jeep Compass and Jeep Patriot vehicles: Connect the electrical connector to the exhaust camshaft position sensor (Figure 11). Be sure to tug firmly on the electrical connector to ensure that the electrical connector is securely fastened to the sensor.
- 39. Route the crankshaft position sensor wire harness takeout branch from the top of the engine compartment down to the crankshaft position sensor.
- 40. Connect the electrical connector to the crankshaft position sensor (Figure 10). Be sure to tug firmly on the electrical connector to ensure that the electrical connector is securely fastened to the sensor.
- 41. Install the heat shield (Figure 10).
- 42. Install the heat shield fasteners; one nut and two bolts, then tighten the fasteners securely (Figure 10).
- 43. **Front Wheel Drive vehicles:** Connect the O2 sensor wire harness electrical connectors (Figure 9).
- 44. **Front Wheel Drive vehicles:** If previously released, secure the O2 sensor wire retainer (Figures 9 and 10).
- 45. Install the two edge biting retainer clips securing the wire harness to the heat shield (Figure 8).

- 46. (MK) Jeep Compass and Jeep Patriot vehicles: Install the air cleaner body by pushing the air cleaner body downward to engage the air cleaner body locating pins to the rubber mounting grommets.
- 47. (MK) Jeep Compass and Jeep Patriot vehicles: Install the bolt attaching the air cleaner body support bracket to the strut tower (Figure 7). Tighten the bolt to 10 N⋅m (89 in. lbs.).
- 48. (MK) Jeep Compass and Jeep Patriot vehicles: Connect the make-up air hose to the air cleaner body (Figure 6).
- 49. (MK) Jeep Compass and Jeep Patriot vehicles: Connect the air inlet tube to the air cleaner body then tighten the air inlet tube clamp at the air cleaner body (Figure 6).
- 50. (MK) Jeep Compass and Jeep Patriot vehicles: Position the PCM on top of the air cleaner body (Figure 5).
- 51. (MK) Jeep Compass and Jeep Patriot vehicles: Position the PCM ground wire then install the three PCM mounting bolts. Tighten the bolts to 10 N·m (89 in. lbs.) (Figure 5).
- 52. (MK) Jeep Compass and Jeep Patriot vehicles: Connect the battery negative cable terminal to the battery. Tighten the cable clamp nut to 5 N·m (45 in. lbs.) (Figure 4).
- 53. (JC) Dodge Journey vehicles: Position the battery negative cable terminal onto the battery negative remote post. Install the nut to the battery negative remote post and tighten the nut to 28 N·m (18 ft. lbs.) (Figure 3).
- 54. (MK) Jeep Compass and Jeep Patriot vehicles: Install the fresh air inlet duct then secure the air inlet duct retainers (Figure 2).
- 55. (MK) Jeep Compass and Jeep Patriot vehicles: Install the engine cover (Figure 1).

56. Install a battery charger and verify that the charging rate provides 13.0 to 13.5 volts. Do not allow the charger to time out during the flash process. Set the battery charger timer (if so equipped) to continuous charge.

NOTE: Use an accurate stand-alone voltmeter. The battery charger volt meter may not be sufficiently accurate. Voltages outside of the specified range will cause an unsuccessful flash. If voltage reading is too high, apply an electrical load by activating the park or headlamps and/or HVAC blower motor to lower the voltage.

- 57. Connect the wiTECH micro pod II to the vehicle data link connector.
- 58. Place the ignition in the "RUN" position.
- 59. Open the wiTECH 2.0 website.
- 60. Enter your "User id", "Password" and "Dealer Code" then select "Finish" at the bottom of the screen.
- 61. Starting at the "Vehicle Selection" screen, select the vehicle.
- 62. Verify that all Diagnostic Trouble Codes (DTCs) have been cleared.
- 63. Turn the ignition to the "OFF" position.
- 64. Remove the wiTECH micro pod II from the vehicle.
- 65. Remove the battery charger from the vehicle.
- 66. Return the vehicle to the customer.
- 67. Complete Proof of Correction Form for California Residents.

#### **Complete Proof of Correction Form for California Residents**

This recall is subject to the <u>State of California Registration Renewal/Emissions</u> <u>Recall Enforcement Program</u>. Complete a Vehicle Emission Recall Proof of Correction Form (<u>Form No. 81-016-1053</u>) and supply it to vehicle owners residing in the state of California for proof that this recall has been performed when they renew the vehicle registration.

#### **Completion Reporting and Reimbursement**

Claims for vehicles that have been serviced must be submitted on the DealerCONNECT Claim Entry Screen located on the Service tab. Claims submitted will be used by FCA to record recall service completions and provide dealer payments.

Use one of the following labor operation numbers and time allowances:

	Labor Operation <u>Number</u>	Time <u>Allowance</u>
Replace Wire Harness Electrical Connector and Terminals for Crankshaft Position Sensor (JC Model)	08-S8-91-82	0.9 hours
Replace Wire Harness Electrical Connectors and Terminals for Crankshaft and Camshaft Position Sensors (MK Model)	08-\$8-91-83	1.7 hours

Add the cost of the recall parts package plus applicable dealer allowance to your claim.

NOTE: See the Warranty Administration Manual, Recall Claim Processing Section, for complete recall claim processing instructions.

#### **Dealer Notification**

To view this notification on DealerCONNECT, select "Global Recall System" on the Service tab, then click on the description of this notification.

#### **Owner Notification and Service Scheduling**

All involved vehicle owners known to FCA are being notified of the service requirement by first class mail. They are requested to schedule appointments for this service with their dealers. A generic copy of the owner letter is attached.

Enclosed with each owner letter is an Owner Notification postcard to allow owners to update our records if applicable.

#### Vehicle Lists, Global Recall System, VIP and Dealer Follow Up

All involved vehicles have been entered into the DealerCONNECT Global Recall System (GRS) and Vehicle Information Plus (VIP) for dealer inquiry as needed.

GRS provides involved dealers with an <u>updated</u> VIN list of <u>their incomplete</u> vehicles. The owner's name, address and phone number are listed if known. Completed vehicles are removed from GRS within several days of repair claim submission.

To use this system, click on the "Service" tab and then click on "Global Recall System." Your dealer's VIN list for each recall displayed can be sorted by: those vehicles that were unsold at recall launch, those with a phone number, city, zip code, or VIN sequence.

**Dealers** <u>must</u> perform this repair on all unsold vehicles <u>before</u> retail delivery. Dealers should also use the VIN list to follow up with all owners to schedule appointments for this repair.

Recall VIN lists may contain confidential, restricted owner name and address information that was obtained from the Department of Motor Vehicles of various states. Use of this information is permitted for this recall only and is strictly prohibited from all other use.

#### **Additional Information**

If you have any questions or need assistance in completing this action, please contact your Service and Parts District Manager.

Customer Services / Field Operations FCA US LLC This notice applies to your vehicle,

#### S89/NHTSA 16V-907

## LOGO

#### **VEHICLE PICTURE**

#### YOUR SCHEDULING OPTIONS

- 1. RECOMMENDED OPTION Call your authorized Chrysler / Dodge / Jeep / RAM Dealership
- 2. Call the FCA Recall Assistance Center at 1-800-853-1403. An agent can confirm part availability and help schedule an appointment
- 3. Visit our Recall Website, recalls.mopar.com or scan below.



You can find your nearest dealer and review all your scheduling options from this website. You will be asked to provide your Vehicle Identification Number (VIN) to protect and verify your identity. The last eight characters of your VIN are provided above.

#### **DEALERSHIP INSTRUCTIONS**

Please reference Safety Recall S89.

## **IMPORTANT SAFETY RECALL**

#### **Crankshaft Camshaft Sensor Wire Harness**

#### Dear [Name],

This notification is being sent to you in accordance with the National Traffic and Motor Vehicle Safety Act.

FCA has decided that a defect, which relates to motor vehicle safety, exists in certain [2016 Model Year Dodge Journey, Jeep Compass and Jeep Patriot] vehicles equipped with a 2.0L or 2.4L engine.

#### WHY DOES MY VEHICLE NEED REPAIRS?

The crankshaft sensor and/or camshaft sensor electrical connector terminal(s) on your vehicle <sup>[1]</sup> may have been improperly manufactured.

Improperly manufactured crankshaft or camshaft sensor electrical connector terminal(s) could result in an intermittent electrical connection. An intermittent electrical connection could cause a "no start" condition, the engine to stall while driving, and/or the illumination of the Malfunction Indicator Lamp (MIL). An engine stall event while driving could cause a crash without warning.

#### HOW DO I RESOLVE THIS IMPORTANT SAFETY ISSUE

FCA will repair your vehicle <sup>[2]</sup> free of charge (parts and labor). To do this, your dealer will replace the crankshaft and/or camshaft electrical connector and terminals. In addition, your dealer will require your vehicle for proper check-in, preparation, and check-out during your visit. Your time is important to us; please be aware that these steps may require more time. The estimated repair time is 2 hours. We recommend that you schedule a service appointment to minimize your inconvenience. Please bring this letter with you to your dealership.

#### TO SCHEDULE YOUR FREE REPAIR CALL 1-800-853-1403 OR YOUR CHRYSLER, DODGE, JEEP OR RAM DEALER TODAY

#### **CALIFORNIA RESIDENTS**

The State of California requires the completion of emission recall repairs prior to vehicle registration renewal. Your dealer will provide you with a Vehicle Emission Recall Proof of Correction Form after the recall service is performed. Be sure to save this form since the California Department of Motor Vehicles may require that you supply it as proof that the recall has been performed.

#### WHAT IF I ALREADY PAID TO HAVE THIS REPAIR COMPLETED?

If you have already experienced this specific condition and have paid to have it repaired, you may visit **www.fcarecallreimbursement.com** to submit your reimbursement request online.<sup>[3]</sup> Once we receive and verify the required documents, reimbursement will be sent to you within 60 days. If you have had previous repairs performed and/or already received reimbursement, you may still need to have the recall repair performed.

We apologize for any inconvenience, but are sincerely concerned about your safety. Thank you for your attention to this important matter.

Customer Assistance/Field Operations Fiat Chrysler Automobiles US LLC



Mr. Mrs. Customer 1234 Main Street Hometown, MI 48371

[1] If you no longer own this vehicle, please help us update our records. Call the FCA Recall Assistance Center at 1-800-853-1403 to update your information.

[2] If your dealer fails or is unable to remedy this defect without charge and within a reasonable time, you may submit a written complaint to the Administrator, National Highway Traffic Safety Administration, 1200 New Jersey Ave., S.E., Washington, DC 20590, or you can call the toll-free Vehicle Safety Hotline at 1-888-327-4236 (TTY 1-800-424-9153), or go to safercar.gov.

[3] You can also mail in your original receipts and proof of payment to the following address for reimbursement consideration: FCA Customer Assistance, P.O. Box 21-8004, Auburn Hills, MI 48321-8007, Attention: Recall Reimbursement.

Note to lessors receiving this recall notice: Federal regulation requires that you forward this recall notice to the lessee within 10 days.