

SAFETY RECALL

NORTH AMERICA

Loss of Crankshaft Position



Reference: 73A / NHTSA 23V-411

FCA US LLC



Remedy available for

2014-2017 & 2019 (WK) Jeep Grand Cherokee



RAM

Remedy available for

2014 and 2016 (DS) Ram 1500 Pickup

Template Version 1.0

Revision	Edition	Detail
0	October 2023	Initial Version.

SYMPTOM DESCRIPTION

The magnetic material attached to the tone wheel on about 440 of the above vehicles provides a signal to the crankshaft position sensor. If this signal material is lost, the engine loses its ability to synchronize injector pulses and cam timing. This loss of crankshaft position can result in an engine stall, as well as loss of the ability to restart the engine. A loss of motive power can cause a vehicle crash without prior warning.

SCOPE

This recall applies only to the above vehicles equipped with a 3.0L engine (sales code EXF).

NOTE: Some vehicles above may have been identified as not involved in this recall and therefore have been excluded from this recall.

IMPORTANT: Some of the involved vehicles may be in dealer used vehicle inventory. Dealers should complete this recall service on these vehicles before retail delivery. Dealers should also perform this recall on vehicles in for service. Involved vehicles can be determined by using the VIP inquiry process.

REPAIR TO BE PERFORMED

Replace the tone wheel.

ALTERNATE TRANSPORTATION

Dealers should attempt to minimize customer inconvenience by placing the owner in a loaner vehicle if tone wheel replacement is required and the vehicle must be held overnight.

COMPLETION REPORTING / REIMBURSEMENT

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

Use the following labor operation numbers and time allowances:

Labor Description	Number	Hrs
Replace Crankshaft Tone Wheel (2014-2018/2020 DS only)	09-73-A1-82	3.9
Replace Crankshaft Tone Wheel (2014-2020 WK only)	09-73-A1-83	5.1
Labor Description	Number	Hrs
4x4 Equipped (WK)	09-73-A1-60	1.3
4x4 Equipped (DS)	09-73-A1-60	1.1
Skid Plate Equipped (WK)	09-73-A1-61	0.2
Skid Plate Equipped (DS)	09-73-A1-61	1.1

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

In addition, enter "MATL" in the Part Number section of your claim with the applicable Material Allowance where appropriate.

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

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PARTS INFORMATION

Part No.	Qty.	Part Name
68493358AA	1	Crankshaft Tone Wheel (DS/WK)
68161231AA (MSQ 8)	8	Bolt, Flex Plate (DS/WK)
68163849AB (MSQ 4)	1	OAT Coolant - 50/50 Pre-diluted (DS/WK U.S.) (MS-12106)
06105052AA	1	Bolt, Hex Flange Head (WK)
06104709AA	1	Nut, Hex Flange, M8x1.25x8.0 (WK)
68350252AA	1	Gasket, SRC flange (WK)
68359475AA	1	Clamp, SCR to Turbo (WK)
68357407AA	1	Gasket, SCR to Turbo (WK)
68234976AA	1	Gasket, DEF Injector (WK)
CSRGW681 AA	1	Wire Harness Clips (DS/WK)

PARTS RETURN

No parts return required for this campaign.

Render the recalled part unusable and discard.

SPECIAL TOOLS

Number	Description	Picture
9546	Disconnect Tool (part of kit number 9590) (WK)	
8875A	Disconnect Tool (part of kit number 9575)	

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 / 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.

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 updated VIN list of their incomplete 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 must perform this repair on all unsold vehicles before 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.

SERVICE PROCEDURE

Jeep Grand Cherokee

This procedure is written for 4wd Grand Cherokees. For 2wd vehicles, use the same LOPs and steps without 4wd specific components.

CAUTION: The transmission and torque converter must be removed as an assembly to avoid component damage. The converter driveplate, oil pump, or oil seal can be damaged if the converter is left attached to the driveplate during removal. Be sure to remove the transmission and converter as an assembly.

A. Remove

1. Disconnect the negative battery cable.
2. Raise and support the vehicle.

WARNING: If torches are used when servicing the exhaust system, do not allow any flame near the fuel lines or the fuel tank. Failure to follow these instructions may result in possible serious or fatal injury.

3. If equipped, remove the skid plates.
4. Disconnect the front exhaust temperature sensors wire harness connector.
5. Disconnect the Diesel Exhaust Fluid (DEF) injector wire harness connector (3) (Figure 1).
6. Disconnect the DEF fluid supply line (1) (Figure 1).

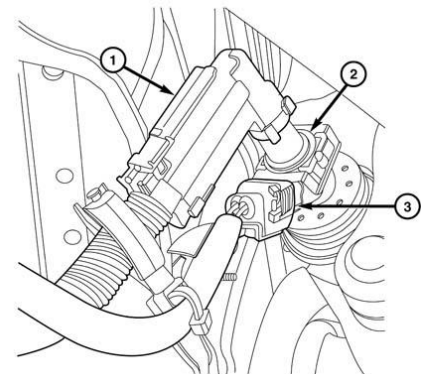


Figure 1 – DEF Injector Harness

7. Remove the fasteners (1) and the driveshaft heat shield (2) (Figure 2).

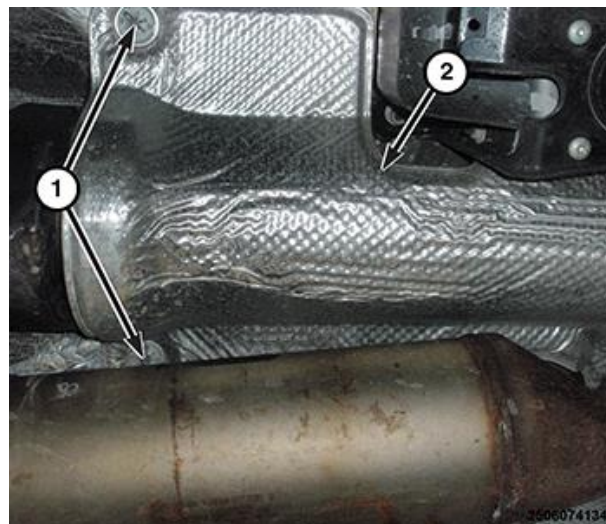


Figure 2 – Driveshaft Heat Shield

8. Remove the nuts (2) and NOx sensor 1/2 module cover (1) (Figure 3).

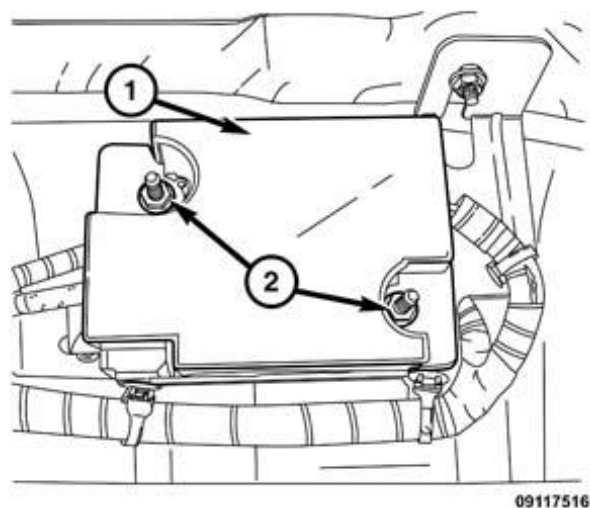


Figure 3 – NOx Sensor Module

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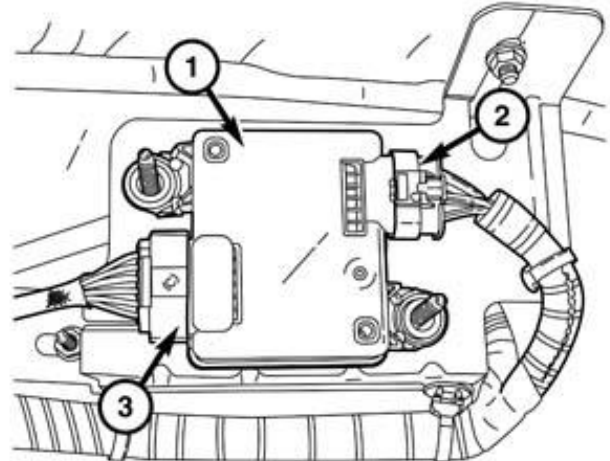


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NOTE: DO NOT try to disconnect wire harness connector (3) from NOx sensor module (1) (Figure 4).

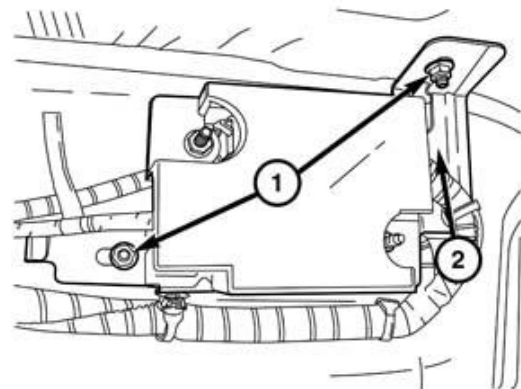
9. Disconnect the NOx sensor wire harness connector (2) (Figure 4).



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Figure 4 – NOx Sensor Harness

10. Remove the nuts (1) and the module mounting bracket (2) (Figure 5).



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Figure 5 – NOx Sensor Mounting Bracket

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NOTE: DO NOT try to disconnect wire harness connector (3) from Particulate Matter (PM) sensor module Figure 6).

11. Disconnect the PM sensor wire harness connector (1) (Figure 6).

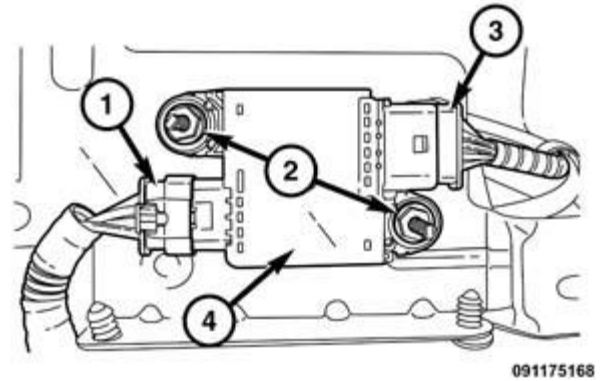


Figure 6 – PM Sensor Wiring

NOTE: Assistance during the tailpipe removal process is recommended. Never allow the muffler to hang from the isolators as this may cause damage to either the isolators or the tailpipe/muffler assembly.

NOTE: Some exhaust systems are equipped with adjustable tail pipes and can be removed without removing the resonator assembly.

12. Saturate the bolts and nuts with heat valve lubricant. Allow 5 minutes for penetration.
13. If equipped with adjustable tail pipes, separate the tailpipe from the resonator outlet pipe.

14. If equipped with non-adjustable tailpipes, separate the left side tailpipe/resonator at the flange (2) (Figure 7).

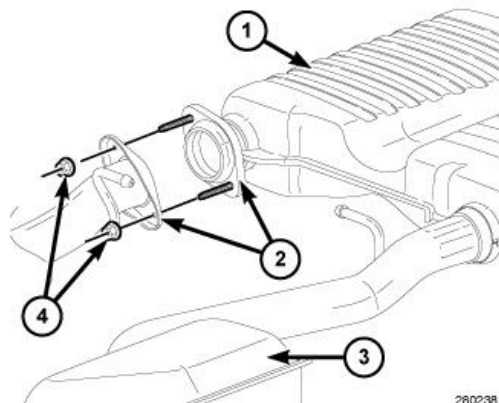


Figure 7 – Tailpipe Flange

15. Remove the rear isolators (2) (Figure 8).
16. Remove the tailpipe/resonator assembly.

NOTE: Some exhaust systems are equipped with adjustable tail pipes and can be removed without removing the resonator assembly.

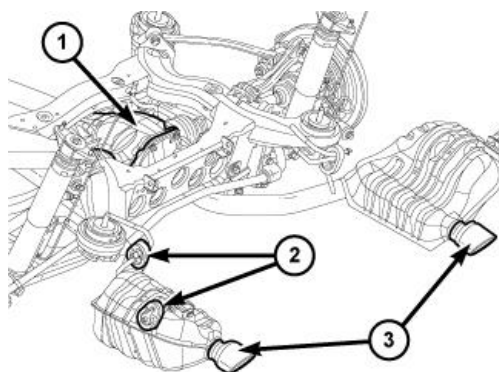


Figure 8 – Rear Exhaust Isolators

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17. If removing with muffler, remove the tailpipe/resonator to muffler assembly flange (2) nuts (Figure 9).
18. Remove tailpipe/resonator and muffler as an assembly from vehicle.
19. Remove the SCR from the isolators.

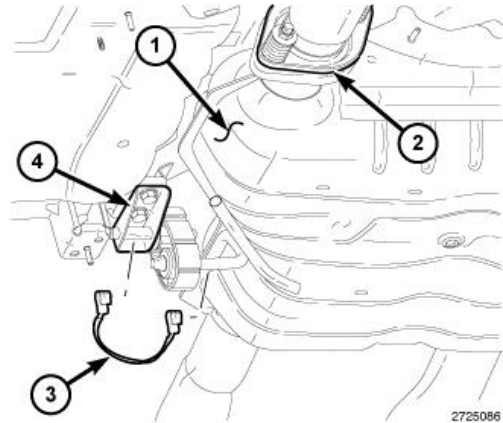


Figure 9 – Tailpipe/Resonator Flange

20. Remove the nuts (8) and the SCR (10) (Figure 10).
21. Remove and discard the flange gasket (7) (Figure 10).

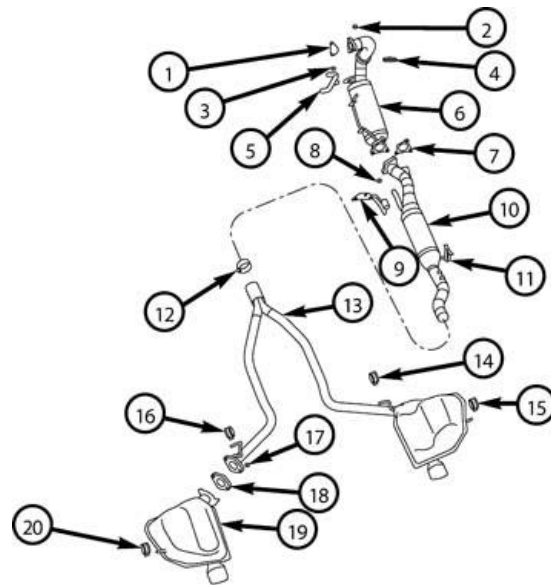


Figure 10 – Exhaust System

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22. If necessary, using a six-sided crow foot to remove the PM sensor (1) from the Selective Catalyst Reduction (SCR) (Figure 11).
23. If the PM sensor fails to loosen use a torque wrench set to 160 N·m (118 ft. lbs.) and loosen the PM sensor (1) (Figure 11).

NOTE: DO NOT use a torch as a heat source.

24. If the PM sensor (1) is still not loose after applying 160 N·m (118 ft. lbs.) then use a heat gun to heat the PM sensor boss for 1 minute at 450° C (842° F) (Figure 11).
25. If necessary, using a six-sided crow foot to remove the NOx sensor 1/2 (2) with module (Figure 11).

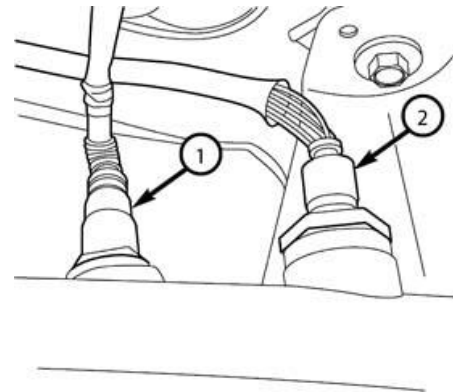


Figure 11 – PM Sensor on SCR

26. If the NOx sensor (2) fails to loosen use a torque wrench set to 160 N·m (118 ft. lbs.) and loosen the NOx sensor (2) (Figure 11).
27. If the NOx sensor (2) is still not loose after applying 160 N·m (118 ft. lbs.) then use a heat gun to heat the NOx sensor boss for 1 minute at 450° C (842° F) (Figure 11).

NOTE: DO NOT use a torch as a heat source.

28. Disconnect the Mechanical Park Release (MPR) cable (1) from the lever (2) (Figure 12).
29. Rotate the MPR lever (2) forward to engage neutral position and secure it with a suitable zip tie (3) (Figure 12).

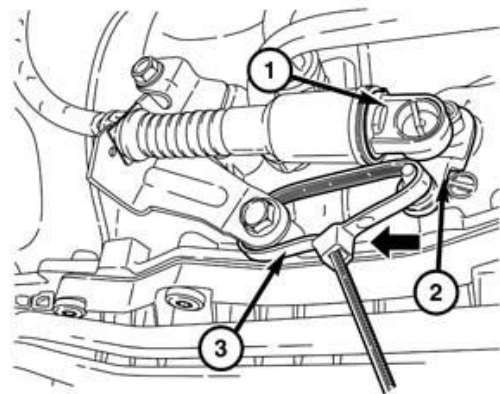


Figure 12 – Mechanical Park Release Cable

CAUTION: Driveshaft removal is a two-person operation. Never allow driveshaft to hang from the center bearing, or while only connected to the transmission or rear axle flanges. A helper is required. If a driveshaft section is hung unsupported, damage may occur to the shaft, coupler, and center bearing from over-angulation. This may result in driveline vibrations or component failure.

CAUTION: Failure to follow these instructions may result in a driveline vibration.

30. Mark the rear driveshaft to the pinion flange and transmission/transfer case flanges for installation reference.

31. Remove the heat shield (3) from the center bearing (Figure 13).

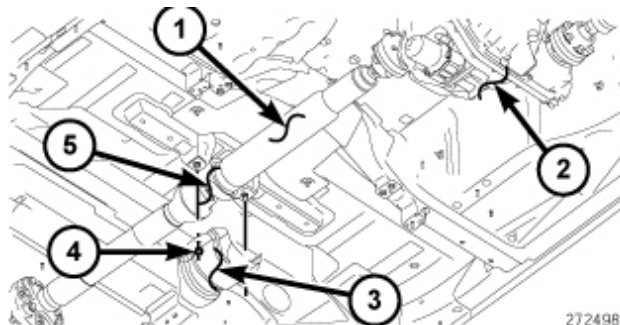


Figure 13 – Center Bearing Heat Shield

32. Using a long piece of wood or similar, fasten it to the driveshaft with several cable ties in order to keep the driveshaft from over-articulating during removal and installation (Figure 14).



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Figure 14 – Securing the Driveshaft

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33. Remove the center support bearing bracket (1) (Figure 15).
34. Remove the driveshaft from axle pinion flange.
35. Remove the driveshaft from transmission/transfer case flange.
36. With the aid of a helper, remove driveshaft assembly.

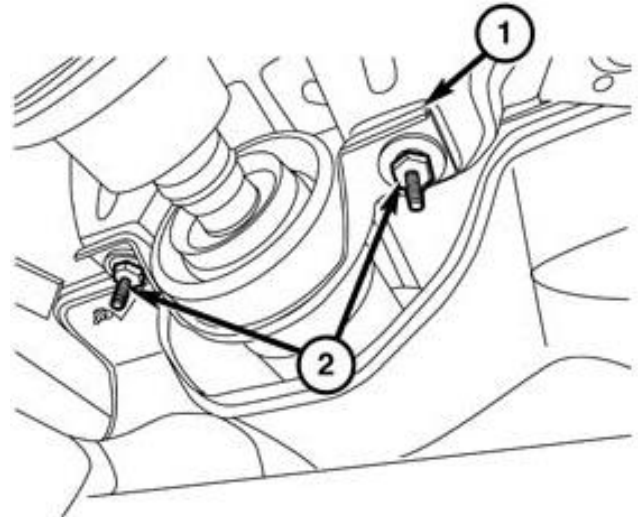
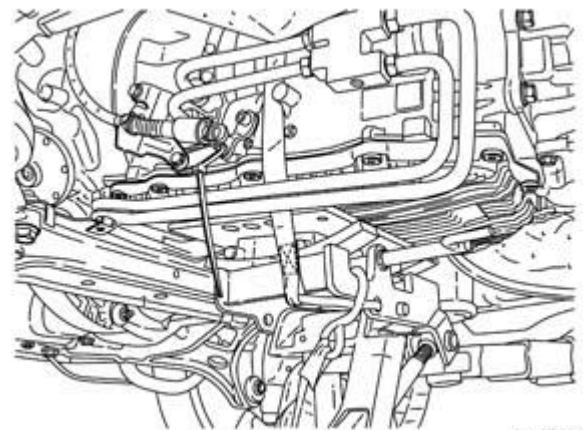


Figure 15 – Center Support Bearing Bracket

37. Support the transmission with a suitable jack (Figure 16).

NOTE: Be careful not to damage to transmission pan.



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Figure 16 – Transmission Support

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38. Remove the transmission mount nuts (2) (Figure 17).
39. Remove the cross-member bolts (1 and 3) (Figure 17).
40. Remove the cross-member.
41. Mark a line across the front driveshaft Constant Velocity (CV) joints to companion flanges for installation reference.

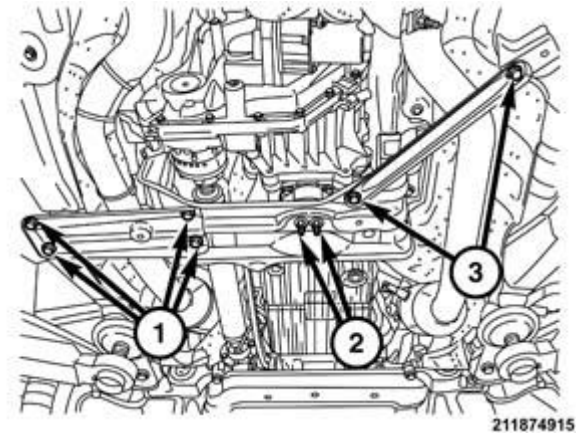


Figure 17 – Transmission Mount

42. Remove the fasteners (1) from CV joints (Figure 18).
43. Push the driveshaft forward to clear the transfer case companion flange and remove the shaft.
44. Remove the front propeller shaft heat shield.

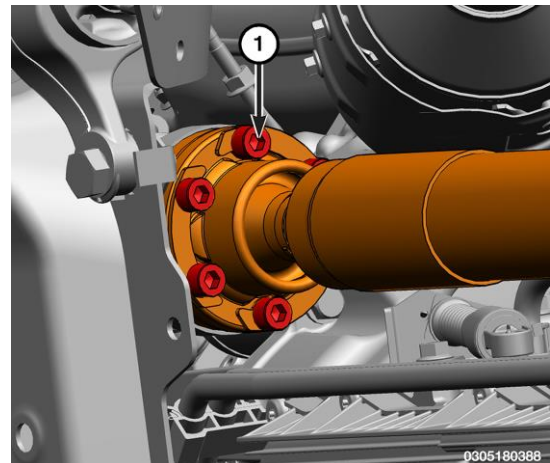


Figure 18 – CV Joint Fasteners

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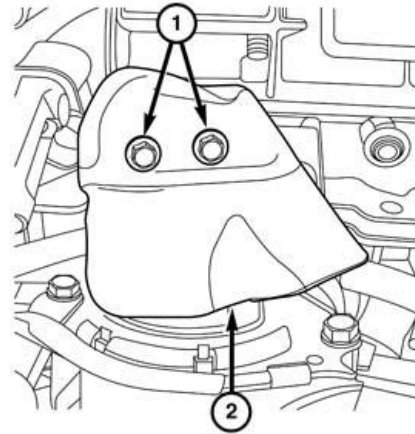
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45. Remove bolts (1) and the starter heat shield (2) (Figure 19).



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Figure 19 – Starter Heat Shield

46. Remove the left engine mount nut (1) (Figure 20).
47. Using a suitable lifting device, slightly raise up the engine.

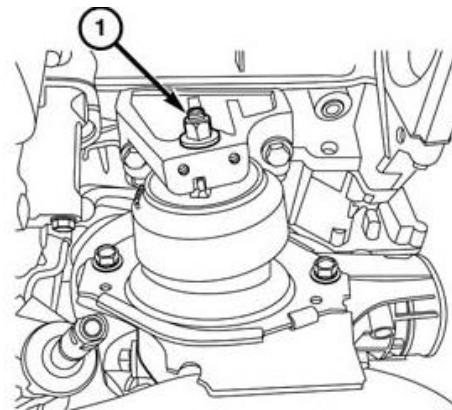


Figure 20 – Engine Mount Nut

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48. Remove nut and the B+ battery cable (2). (Figure 21).
49. Disconnect the solenoid wire harness connector (1) (Figure 21).
50. Remove bolts and the starter (3) (Figure 21).

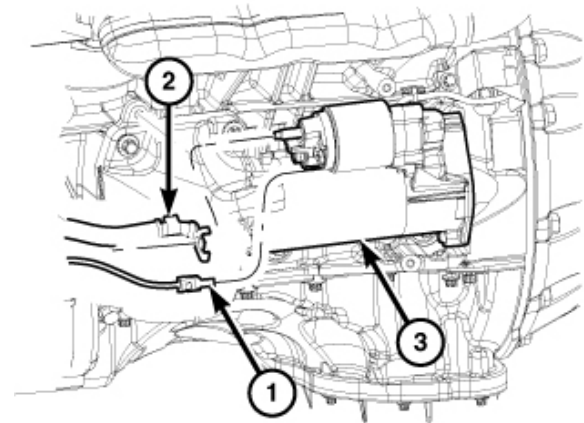


Figure 21 – Starter Removal

WARNING: Always secure your vehicle by fully applying the parking brake, before activating the Manual Park Release. Activating the Manual Park Release will allow your vehicle to roll away if it is not secured by the parking brake or by proper connection to a tow vehicle. Activating the Manual Park Release on an unsecured vehicle could lead to serious injury or death for those in or around the vehicle.

51. Engage the Manual Park Release (MPR) lever.

NOTE: If equipped, the air suspension system will auto-disable when lifted on a frame hoist, or when jacking one corner of the vehicle. The air suspension may attempt to change height slightly prior to switching to auto-disable. A manual disable is also available by pressing the "Up" and "Down" switches of the terrain select switch simultaneously for more than 5 seconds. The air suspension system will return to normal operation when the vehicle speed reaches 25 km/h (15 mph).

52. Remove the fasteners (1) and remove the heat shield (Figure 22).
53. Disconnect the transfer case shift motor and mode sensor electrical connector.
54. Disconnect the transfer case vent hose.



Figure 22 – Transfer Case Heat Shield

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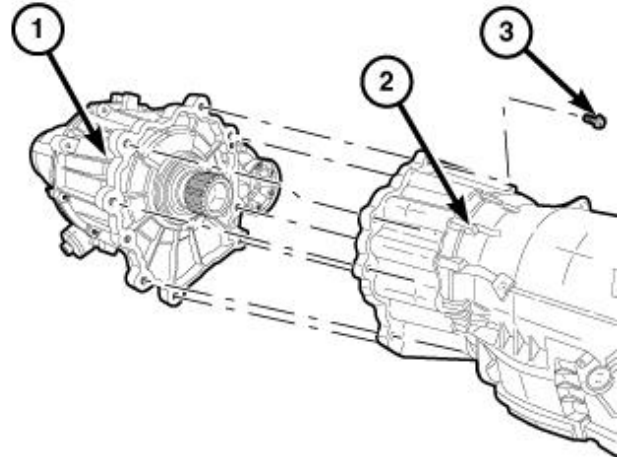
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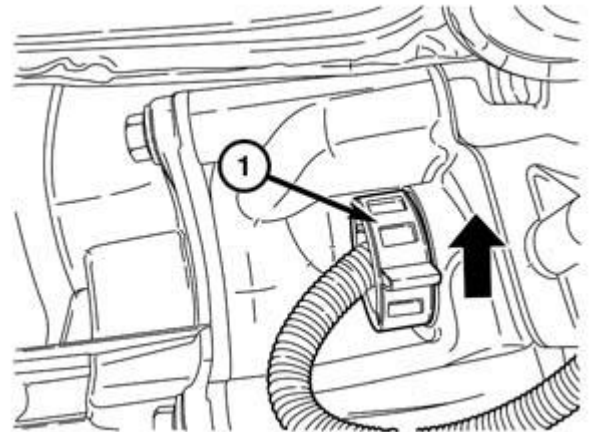
55. Support transfer case (1) with transmission jack (Figure 23).
56. Secure transfer case to jack with chains.
57. Remove bolts (3) attaching transfer case (1) to transmission (2) (Figure 23).
58. Pull transfer case and jack rearward to disengage transfer case.
59. Remove transfer case from under vehicle.



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Figure 23 – Transfer Case to Transmission

60. Disconnect the 13-pin plug connector (1). Turn the connector counter-clockwise to release. (Figure 24).



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Figure 24 – 13-pin Plug Connector

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61. Remove the 13-pin connector bracket (2) from the transmission case and exhaust (Figure 25).
62. Unclip all remaining wiring harness from the transmission.

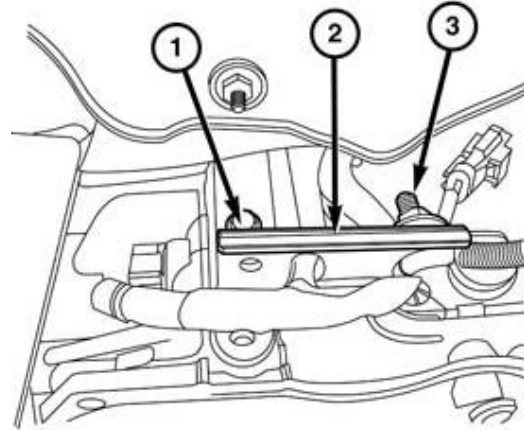


Figure 25 – 13-pin Connector Bracket

63. Remove the Differential pressure sensor bracket (1) from the right side of the torque converter housing (Figure 26).

NOTE: Removing this bracket will gain clearance to the under body.

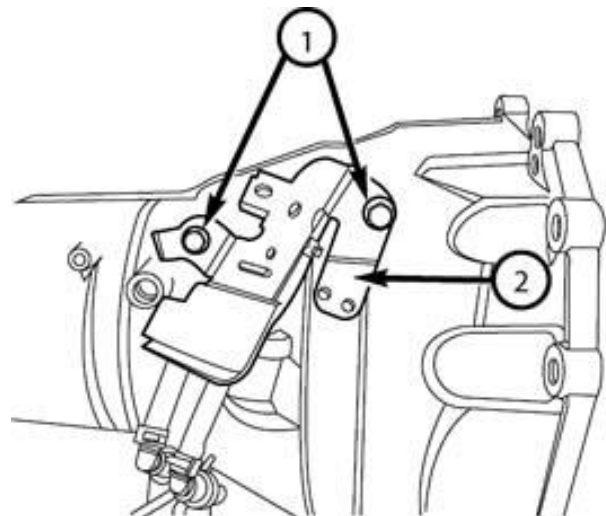


Figure 26 – Differential Pressure Sensor Bracket

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64. Remove the exhaust bracket (1) from the convertor housing to the exhaust pipe. (Figure 27).

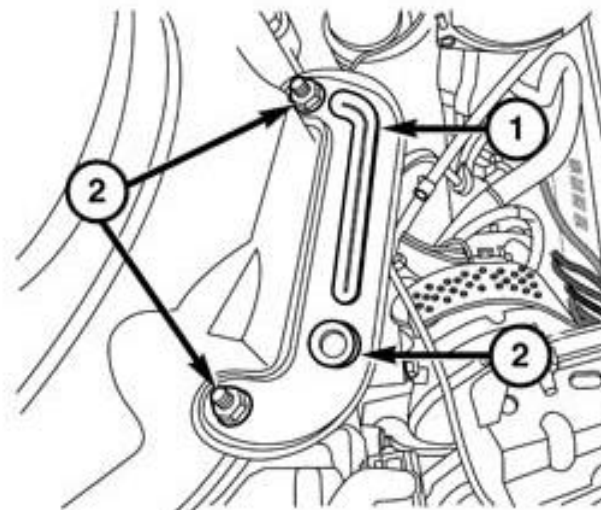


Figure 27 – Exhaust Bracket

65. Release the locking tab (1) from the MPR cable (2) and remove the cable from the bracket (3) (Figure 28).

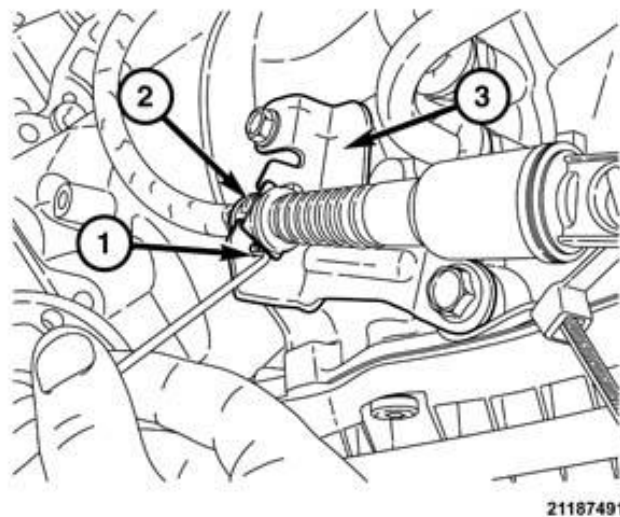


Figure 28 – MPR Cable Locking Tab

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66. Unclip the Jiffy Tite locking covers (1) and slide them back onto the transmission lines (Figure 29).
67. Using Disconnect Tool 9546 remove the trans cooler lines.
68. Disconnect trans vent hose.

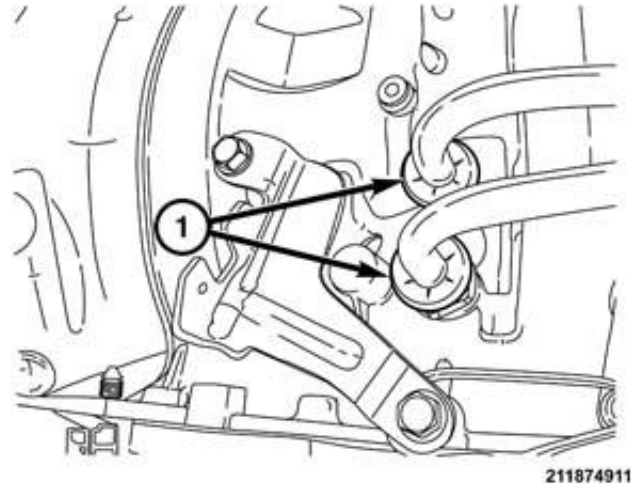


Figure 29 – Jiffy Tite Locking Covers

69. Disconnect left front cooler line clip (1) (Figure 30).

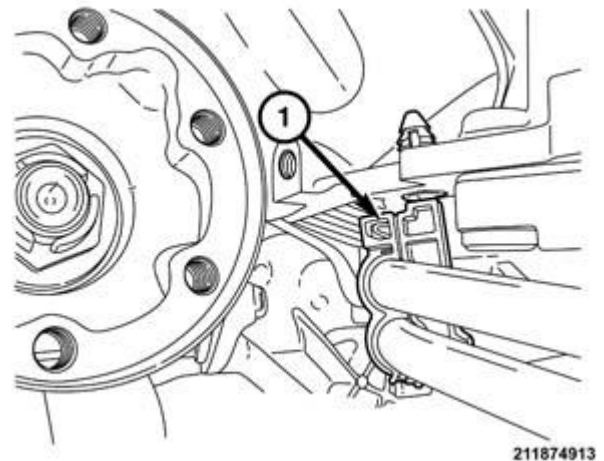


Figure 30 – Front Cooler Line Clip

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70. Remove the NVH cover (1) from the crankshaft damper (Figure 31).

NOTE: 3.6L engine shown, diesel starter pocket similar.

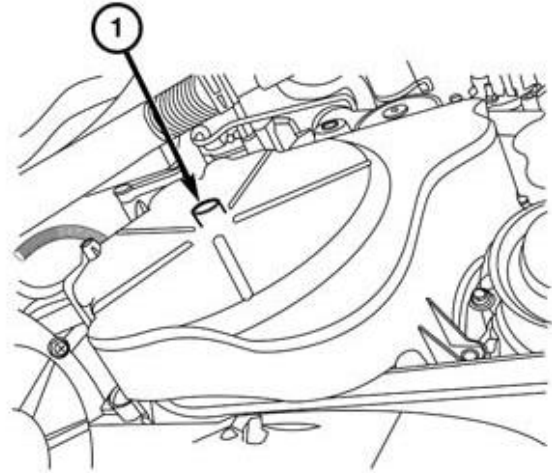


Figure 31 – NVH Cover

71. Rotate crankshaft clockwise and remove six torque converter bolts (1) through the starter pocket (Figure 32).

NOTE: There are three pairs of torque converter bolts located 120° apart from each other.

NOTE: If necessary, mark crankshaft pulley for torque converter bolt location every 120°.

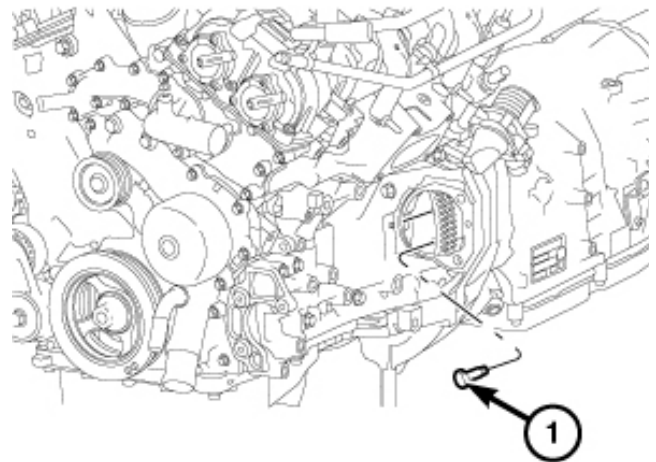


Figure 32 – Torque Converter Bolts

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72. Remove two engine to transmission bolts (3)
(Figure 33).

NOTE: It may be necessary to support the rear of the engine during transmission removal.

73. Remove remaining transmission to engine bolts (4)
(Figure 33).

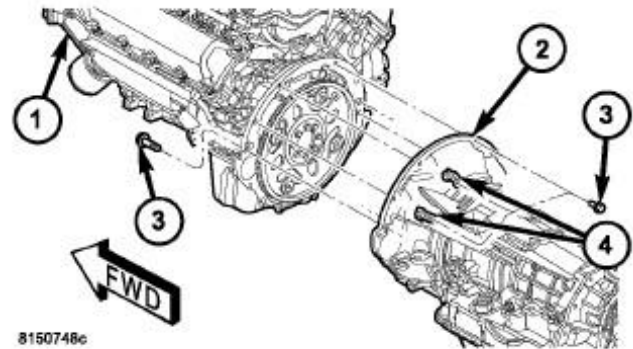


Figure 33 – Engine to Transmission Bolts

CAUTION: The transmission and torque converter must be removed as an assembly to avoid component damage. The converter driveplate, oil pump, or oil seal can be damaged if the converter is left attached to the driveplate during removal. Be sure to remove the transmission and converter as an assembly.

74. Carefully work transmission (2) and torque converter assembly rearward off the engine (1) block dowels
(Figure 33).

NOTE: Be careful not to damage or bend the transmission oil cooler lines.

75. Hold torque converter in place during transmission removal.
76. Lower transmission and remove assembly from under the vehicle.
77. Paint mark the flexplate hub to flexplate relationship.

CAUTION: Do not use an impact socket or a thick-walled socket when removing or installing the flexplate retaining bolts, damage to the crankshaft, internal engine or the transmission may occur.

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78. Remove the bolts (1), the backing plate (2) and the flexplate (3) (Figure 34).
79. Mark the counterweight location.
80. Remove the counterweight (4) and tone wheel (5) (Figure 34).
81. Inspect the crankshaft position sensor for damage and replace as needed.

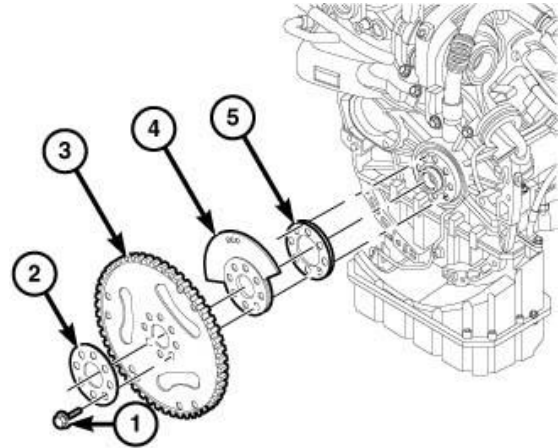


Figure 34 – Flexplate Removal

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B. Install

1. Install the **NEW** tone wheel 68493358AA (5) (Figure 34).

NOTE: Make sure the dowel pin (1) is installed in the dead hole of the counter weight. The other hole is a through hole and is not to be used (Figure 35).



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Figure 35 – Counter Weight Dowel Pin

NOTE: Do Not lubricate the NEW bolts as they are already coated with an anti-scuff treatment.

NOTE: Always use NEW flexplate bolts whenever the existing bolts have been removed.

2. Install the counter weight (4) and make sure the dowel pin side is inserted into the crankshaft hole for proper counter weight timing. A vibration can occur if the counter weight is installed incorrectly (Figure 34).
3. Install the flexplate, aligning the paint marks.

NOTE: With clean engine oil, lubricate the bolt side of backing plate (2).

4. Lubricate and install the backing plate (2) and tighten the **NEW** bolts 68161231AA (1) finger tight (Figure 34).

CAUTION: Do not use an impact socket or a thick walled socket when removing or installing the flexplate retaining bolts, damage to the crankshaft, internal engine or the transmission may occur.

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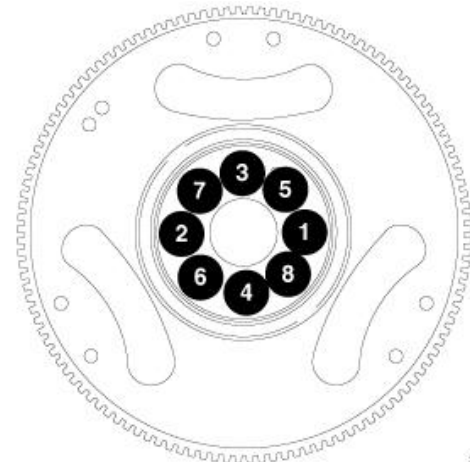
Loss of Crankshaft Position



Reference: 73A / NHTSA 23V-411

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5. Using the tightening sequence shown in Figure 36, tighten bolts to:
 - Tighten the bolts 50 N·m (37 ft. lbs.).
 - Loosen one bolt at a time and then retighten the bolt in a clockwise cross pattern to 125 N·m (92 ft. lbs.).
 - Using a torque angle gauge, tighten each bolt an additional 30 degrees in a clockwise cross pattern.



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Figure 36 – Flexplate Tightening Sequence

6. Raise the transmission and install the assembly under the vehicle.

NOTE: Be careful not to damage to transmission pan.

7. Hold torque converter in place during transmission installation.
8. Apply a light coating of Mopar® High Temp Grease to the torque converter hub pocket in the rear pocket of the engine's crankshaft.
9. Carefully work transmission (2) and torque converter assembly forward onto the engine (1) block dowels (Figure 33).
10. Verify that the torque converter spins and is not bound up.
11. Align torque converter to flywheel holes.
12. Install the upper transmission-to-engine bolts and tighten to 55 N·m (41 ft. lbs.).
13. Install the four transmission-to-oil pan bolts and tighten to 55 N·m (41 ft. lbs.).
14. Verify that the torque converter is pulled flush to the flexplate.

NOTE: Torque wrench access can be achieved by using a short torque wrench, or by using extensions on a conventional torque wrench reaching between components from the front of the engine.

15. Install the torque converter bolts and tighten to 42 N·m (31 ft. lbs.).
16. Install the vibration damper cover and tighten the bolts to 10 N·m (89 in. lbs.) (Figure 31).

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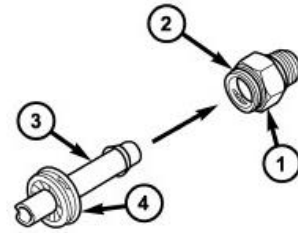
Loss of Crankshaft Position

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17. Connect the left front cooler line clip (1) (Figure 30).
18. Connect the transmission vent hose.
19. Align transmission cooler line with quick connect fitting while pushing straight into the fitting (Figure 37).
20. Push in on transmission cooler line until a “click” is heard or felt (Figure 37).
21. Push in on transmission cooler line until a “click” is heard or felt.



NOTE: If dust cap will not snap into place, repeat assembly step 2.

22. Install the MPR cable into the bracket and lock into place (Figure 28).
23. Remove the zip tie (3) from the MPR lever (Figure 12).
24. Connect the MPR cable (1) to the MPR lever (2) (Figure 28).
25. Install the exhaust to transmission case bracket. Tighten the nuts to 25 N·m (18 ft. lbs.) (Figure 27).
26. Install the Differential Pressure Sensor (DPS) and bracket (2) and tighten the bolts (1) to 10 N·m (89 in. lbs.) (Figure 26).
27. Clip all remaining wiring harnesses to the transmission.
28. Install the 13-pin connector bracket (2) from the transmission case and exhaust (Figure 25).
29. Check O-ring on plug connector (1) and replace if necessary (Figure 24).
30. Connect the 13-pin plug connector (1). Turn the connector clockwise to engage. (Figure 24).
31. Install the 13-way connector bracket to the transmission case and catalytic converter. Tighten bolts to 25 N·m (18 ft. lbs.) (Figure 25).
32. Move the transfer case under the vehicle.
33. Push transfer case and jack forward to engage the transmission.
34. Install bolts (3) attaching transfer case (1) to transmission (2) and tighten the bolts to 45 N·m (33 ft. lbs.) (Figure 23).
35. Remove the chains securing the transfer case to jack.
36. Remove the transmission jack.

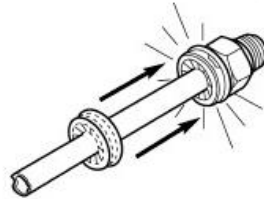
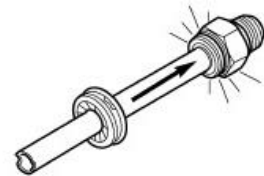


Figure 37 – Quick Connect Fittings

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37. Connect transfer case vent hose.
38. Connect the transfer case shift motor and mode sensor electrical connectors.
39. Install the heat shield and fasteners (1). Tighten bolts to 9 N·m (80 in. lbs.) (Figure 22).
40. Disengage the Manual Park Release (MPR) lever.
41. Using a suitable lifting device, slightly raise up the engine.
42. Install the starter (3) and bolts. Tighten bolts to 54 N·m (40 ft. lbs.) (Figure 21).
43. Connect the solenoid wire harness connector (1) (Figure 21).
44. Install the B+ battery cable and nut (2). Tighten nut to 10 N·m (89 in. lbs.) (Figure 21).
45. Lower the engine and install the left engine mount nut (1). Tighten the nut to 61 N·m (45 ft. lbs.) (Figure 20).
46. Install the starter heat shield (2) and bolts (1). Tighten the bolts to 10 N·m (89 in. lbs.) (Figure 19).

NOTE: Clean all driveshaft bolts and apply Mopar® Lock AND Seal Adhesive or equivalent to the threads before installation.

47. Install the front propeller shaft to the transfer case and front axle flanges, aligning the paint marks.
48. Tighten the front propeller shaft bolts in a star pattern to 55 N·m (41 ft. lbs.).
49. Install the transmission crossmember and install the crossmember bolts (1 and 3) (Figure 17).
50. Tighten the crossmember bolts (1 and 3) to 48 N·m (35 ft. lbs.) (Figure 17).
51. Install the transmission mount nuts and tighten to 61 N·m (45 ft. lbs.) for 2wd, and 23 N·m (17 ft. lbs.) for 4wd.
52. Install the crossmember reinforcement brackets and tighten to 55 N·m (41 ft. lbs.).
53. Install the rear engine cradle crossmember stiffener brackets and tighten the bolts:
 - Rear engine cradle bolts to 175 N·m (129 ft. lbs.).
 - Six cradle stiffener bracket bolts to 20 N·m (15 ft. lbs.).

NOTE: Clean all propeller shaft bolts and apply Mopar® Lock AND Seal Adhesive or equivalent to the threads before installation.

CAUTION: Failure to follow these instructions may result in a driveline vibration.

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54. Install the rear driveshaft, noting paint marks made during removal.
 - For Coupler type, install the propeller shaft on transfer case or transmission with reference marks, made during removal, are aligned. Install flange bolts and nuts and tighten to 85 N·m (63 ft. lbs.).
 - For Constant Velocity (CV) Joint type, install the propeller shaft on transfer case or transmission with the reference marks, made during removal, are aligned. Install the flange bolts and tighten in a star pattern to 55 N·m (41 ft. lbs.).

CAUTION: Make sure the center bearing is installed in the correct orientation. Failure to do so can create a vibration while driving the vehicle and subsequent damage to the drivetrain components.

55. Install the center bearing (1). Tighten the nuts (2) to 45 N·m (33 ft. lbs.) (Figure 15).
56. Install the center bearing heat shield (3) (Figure 13).
57. If removed, install the NOx sensor 1/2 (2) and tighten to 55 N·m (41 ft. lbs.) (Figure 11).
58. If removed, install the Particulate Matter (PM) sensor 1/2 (2) and tighten to 60 N·m (44 ft. lbs.) (Figure 11).
59. Clean all the gasket sealing surfaces.
60. Install a **NEW** Selective Catalytic Reduction Catalyst (SCR) flange gasket (6) (Figure 10).
61. Position the SCR (10) onto flange and install the flange nuts (8) finger tighten (Figure 10).
62. Install the isolators on the SCR hanger rods.
63. Tighten the flange nuts (8) to 32 N·m (24 ft. lbs.) (Figure 10).

NOTE: Muffler installation is a two-man operation. Never allow the muffler to hang from the isolators. A helper is required to prevent damage to the isolators or the tailpipe/muffler assembly.

64. If equipped with adjustable tail pipes, install the tailpipe to the resonator outlet pipe and tighten the clamp.
65. If equipped with non-adjustable tailpipes, position the tailpipe/resonator assembly in vehicle.
66. If equipped, install the left side tailpipe/resonator at the flange. Tighten the nuts to the proper to 32 N·m (24 ft. lbs.).
67. Install the tailpipe/resonator insulators.
68. Install the tailpipe into the exhaust pipe.
69. Check the exhaust system for contact with the body panels. A minimum of 25 mm (1.0 in.) is required between the exhaust system components and body/frame parts. Make the necessary adjustments, if needed.
70. Connect the PM sensor wire harness connector (1) (Figure 6).
71. Install the module mounting bracket (2). Tighten the nuts (1) to 11 N·m (8 ft. lbs.) (Figure 5).

72. Connect the NOx sensor 1/2 wire harness connector (2) (Figure 4).
73. Install the NOx sensor 1/2 module cover (1). Tighten the nuts to 8 N·m (71 in. lbs.) (Figure 3).
74. Connect the DEF fluid supply line (1) (Figure 1).
75. Connect the DEF injector wire harness connector (3) (Figure 1).
76. Connect the front exhaust temperature sensors wire harness connector.
77. Fill the transmission with appropriate fluid.
78. Lower the vehicle.
79. Connect the battery negative cable.
80. Perform the following Transmission Verification Test to verify proper transmission operation after repairs have been performed.
81. With the scan tool, erase TCM, ESM, ABS and PCM DTCs.

CAUTION: Apply the parking brake.

82. With the scan tool, display the Transmission Temperature.
83. Start the engine and allow the transmission fluid temperature to reach 43° C (110° F).
84. Check for Transmission fluid leaks.
85. Operate the vehicle in a manner that will allow 15-20 upshifts through all of the gears.
86. Allow these shifts to occur from 0 kPh (0 mph) to 72 kPh (45 mph) with a constant throttle opening of 20 to 25 degrees.
87. Operate the vehicle below 40 kPh (25 mph) and then perform a throttle kick-down maneuver to 1st gear. Do this several times from below 40 kPh (25 mph).
88. With the scan tool, check for TCM DTCs.
89. If TCM DTCs are present, Refer to 28 - DTC-Based Diagnostics/MODULE, Transmission Control (TCM) /Diagnosis and Testing.
90. With the scan tool, erase any DTCs in the Drivetrain Control Module (DTCM).
91. Turn off all accessories.

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92. Test drive the vehicle. If equipped with a selector switch, drive the vehicle in each Transfer Case range and verify proper operation in each range.
- To select or deselect 2WD, All Wheel Drive (AWD) or 4HI mode, vehicle speed must be below 88 Km/h (55 mph) with all wheels at vehicle speed.
 - Shifts will not take place with a wheel speed difference of greater than 21 Km/h (13 mph) between the front and rear wheels.
 - To select or deselect 4LO (if equipped), vehicle speed must be below 5 Km/h (3 mph) with the ignition on, engine not running and the transmission in neutral (automatic transmission) or the clutch pedal pressed (manual transmission).
 - To select or deselect Transfer Case Neutral (if equipped), vehicle speed must be 0 Km/h (0 mph) with the ignition on, engine not running, the brake pedal applied, and the transmission in neutral (automatic transmission) or the clutch pedal pressed (manual transmission). Press the Neutral button (if equipped) on the Transfer Case Selector Switch until the Neutral Indicator is illuminated.
 - If equipped with Axle Lockers, operate the axle lockers in accordance with the Owners Manual.
 - To verify that the Transfer Case is in Neutral, shift the automatic transmission into reverse and release the brake pedal for three seconds or shift the manual transmission into gear and slowly release the clutch pedal.

WARNING: Apply the parking brake. The vehicle may roll with the Transfer Case in neutral.

93. With the scan tool, check for DTCs in the Drivetrain Control Module (DTCM). If DTCs are present, perform the related diagnostic procedure for the DTC(s) or symptom. If there are no DTCs, the test is complete.

SERVICE PROCEDURE

Ram 1500 Pickup

This procedure is written for 4wd Ram 1500 Pickups. For 2wd vehicles, use the same steps without 4wd specific components.

A. Remove

1. Disconnect the negative battery cable.
2. Remove the bolts (1) and the vibration damper cover (2) (Figure 1).
3. For 4wd vehicles, make sure the transfer case is in 2wd.
4. Raise and support the vehicle.

NOTE: When servicing the cooling system, it is essential that coolant does not drip onto the accessory drive belts and/or pulleys. Shield the belts with shop towels before working on the cooling system. If coolant contacts the belts or pulleys, flush both with clean water.

WARNING: Make sure engine cooling system is cool before servicing. Do not remove any clamps or hoses, pressure cap, or open the radiator draincock. When the system is hot and under pressure serious burns from coolant can occur.

NOTE: DO NOT WASTE reusable coolant. If the solution is clean, drain the coolant into a clean retainer for reuse.

5. Position a drain pan under the draincock location.

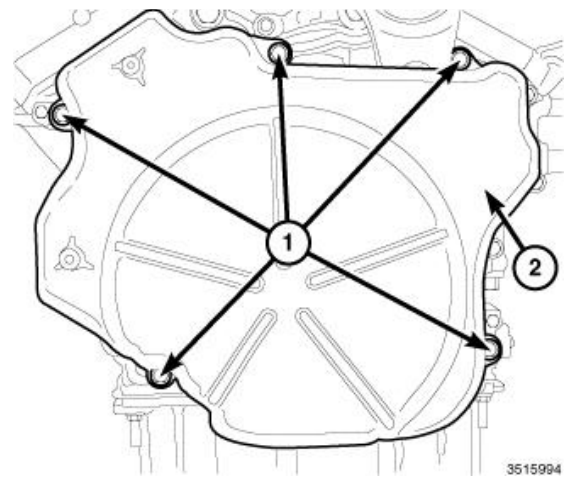


Figure 1 – Vibration Damper Cover

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6. Open radiator draincock (1) located at the lower left side of radiator. Turn draincock counterclockwise until it stops and allow to drain (Figure 2).
7. Remove coolant pressure cap.
8. Remove the transfer case skid plate, if equipped.
9. Support transmission and transfer case with jack stands.

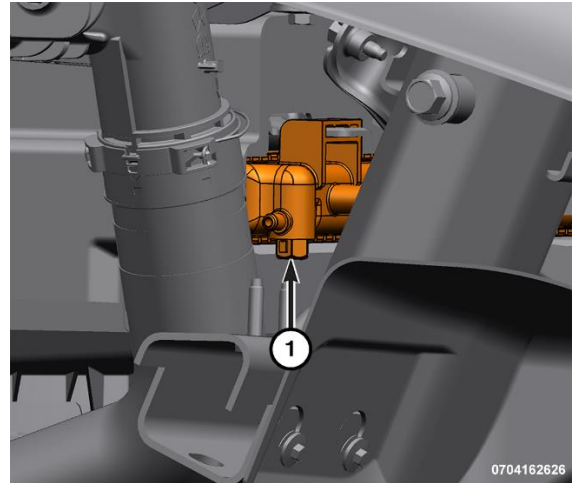


Figure 2 – Radiator Draincock

10. Release the push pin clips retaining the DEF tube and wiring harness to the transmission crossmember (Figure 3).
11. Mark front and rear propeller shafts for alignment reference.
12. Remove front and rear propeller shafts.

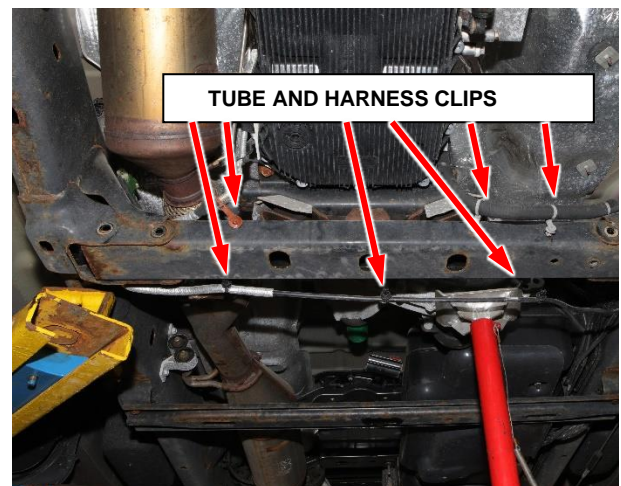


Figure 3 – Transmission Crossmember

13. Remove rear mount isolator nuts, the crossmember bolts, and crossmember (Figure 4).

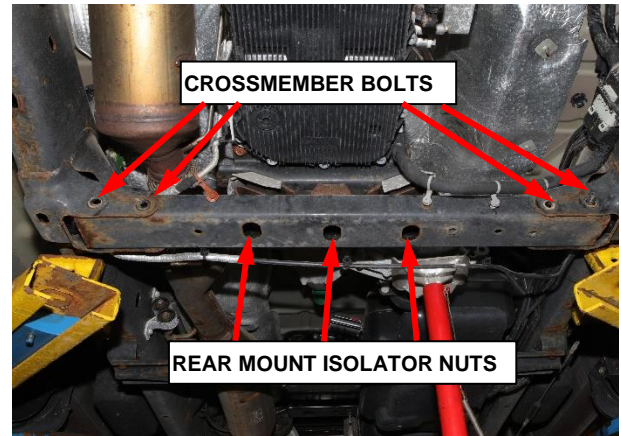


Figure 4 – Transmission Crossmember

14. Remove the four nuts (2) retaining the DEF tank shield (1) (Figure 5).
15. Remove the transmission skid plate crossmember from below the DEF tank.

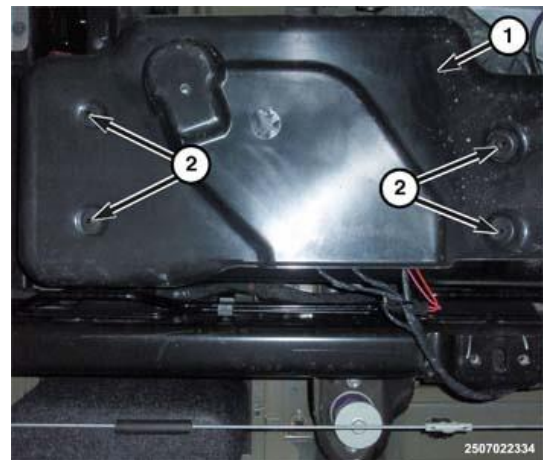


Figure 5 – DEF Tank Shield

- 16. Remove the four bolts and the rear engine mount bracket (Figure 6).

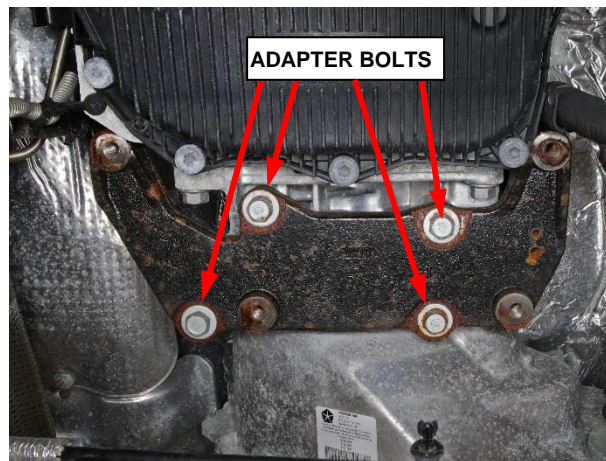


Figure 6 – Rear Engine Mount Bracket

- 17. Disconnect transfer case shift motor and mode sensor wire connectors (3) and the transfer case wiring harness retainers (Figure 7).
- 18. Disconnect transfer case vent hose.

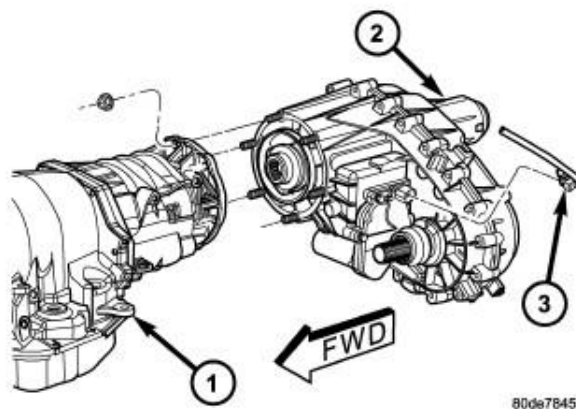


Figure 7 – Transfer Case

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19. Remove damper weight from transfer case (Figure 8).
20. Support transfer case with transmission jack.
21. Secure transfer case to jack with chains.
22. Remove nuts attaching transfer case (2) to transmission (1) (Figure 7).
23. Pull transfer case and jack rearward to disengage transfer case.
24. Remove transfer case from under vehicle.



Figure 8 – Transfer Case Damper

CAUTION: Failure to follow these instructions may result in a driveline vibration.

25. For 2wd, mark propeller shaft (1) pinion flange (2) and propeller shaft flange (4) with installation reference marks (3) (Figure 9).

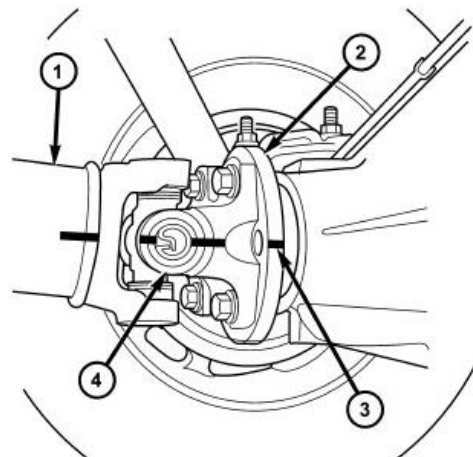


Figure 9 – Propeller Shaft Flange

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26. If equipped with a center bearing (1) mark an outline of the center bearing (1) on the center bearing bracket for installation reference. Then support propeller shaft and remove mounting bolts (2) (Figure 10).

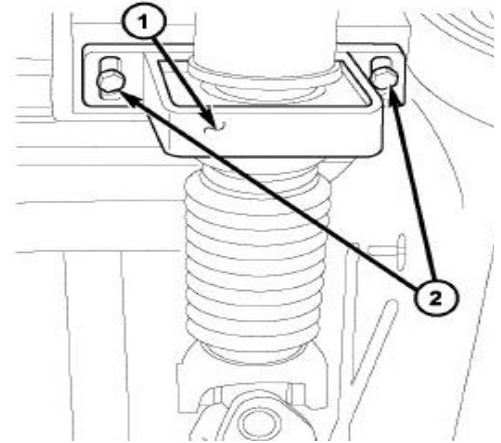


Figure 10 – Center Bearing

27. Using a long piece of wood or similar, fasten it to the propeller shaft with several cable ties in order to keep the propeller shaft from over-articulating during removal and installation (Figure 11).



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Figure 11 – Supporting Propeller Shaft

28. Remove pinion flange (1) bolts from propeller shaft (2) (Figure 12).

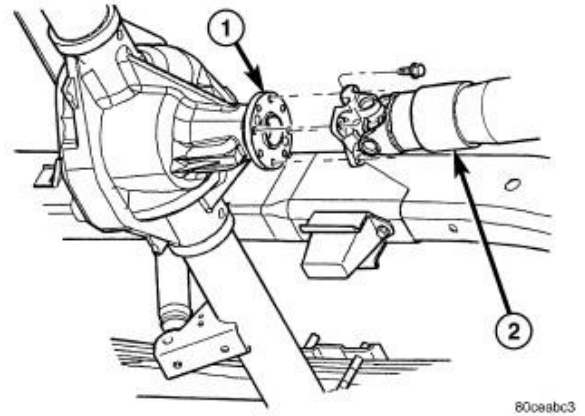


Figure 12 – Pinion Flange

29. Slide the propeller shaft back off of the automatic transmission output shaft, then mark propeller shaft (1) and transmission output shaft (2) for installation reference (Figure 13).
30. Remove the propeller shaft from the vehicle.
31. Remove the transmission and DEF injector wiring from the transmission case.
32. Remove the transmission vent hose from the transmission.

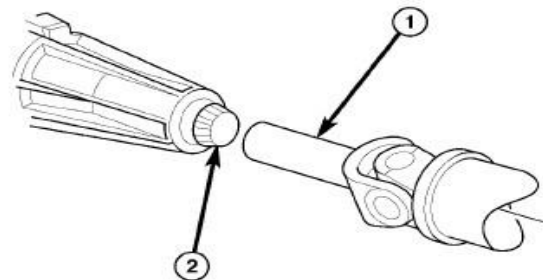


Figure 13 – Transmission Output Shaft

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33. Remove two bolts (3) holding the DPF differential pressure sensor and bracket (5) to the transmission (Figure 14).

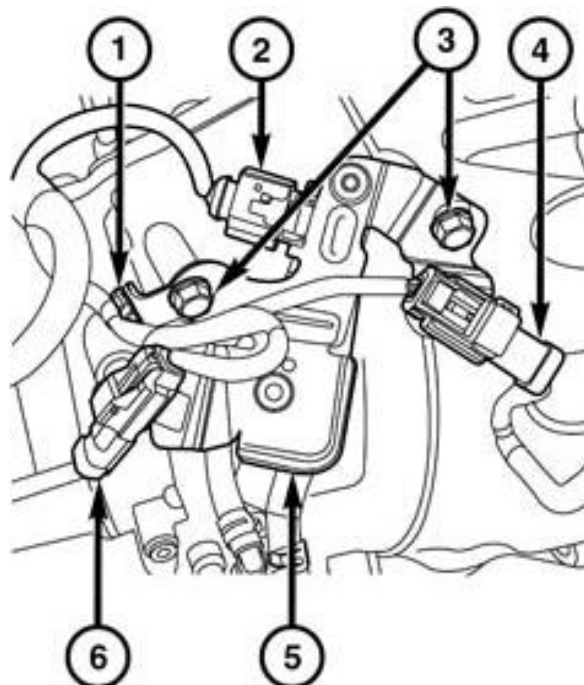


Figure 14 – EGT/CEGT Sensor Connectors

34. Remove the nut retaining the front DPF steady rest bracket to the transmission (Figure 15).

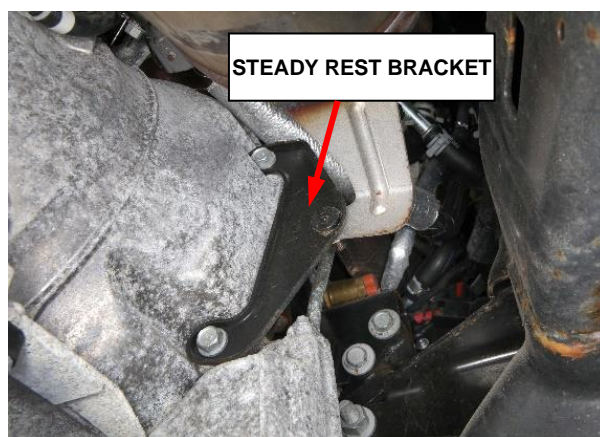


Figure 15 – Front Steady Rest Bracket

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35. Remove the nut retaining the rear DPF steady rest bracket to the transmission (Figure 16).

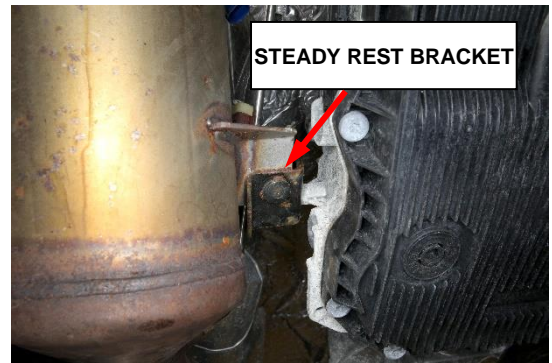


Figure 16 – Rear Steady Rest Bracket

36. Detach the starter cable harness retainer.
37. Disconnect the manual park release cable (1) from the lever (2) (Figure 17).
38. Remove the bolts from the manual park release cable bracket (3) and set the bracket/cable (2, 3) aside (Figure 17).

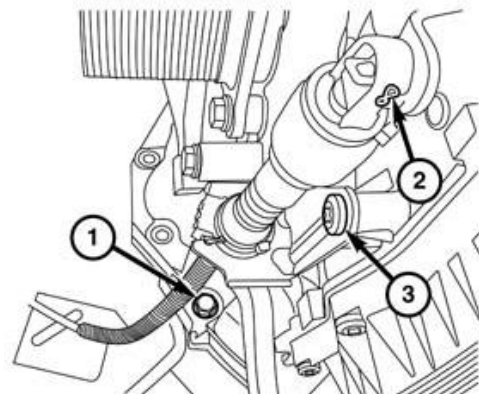


Figure 17 – MPR Cable and Bracket

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39. Remove the five bolts retaining front axle pinion housing to transmission bracket. Note that the top bolt is longer as it passes through two brackets (Figures 18 and 19).

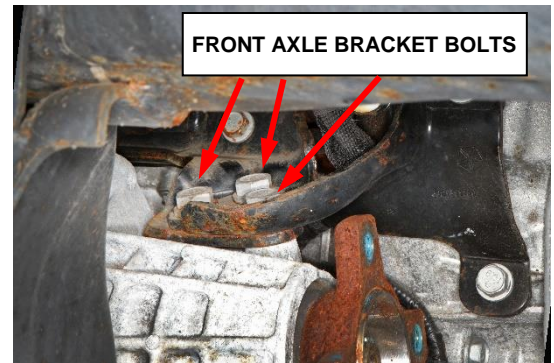


Figure 18 – Bracket at Front Axle

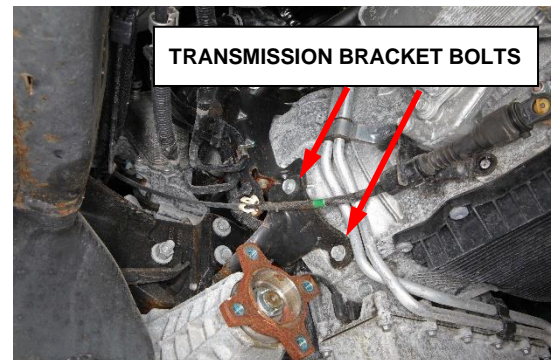


Figure 19 – Bracket at Transmission

40. Release the fuel lines from the clip on the upper bracket (Figure 20).

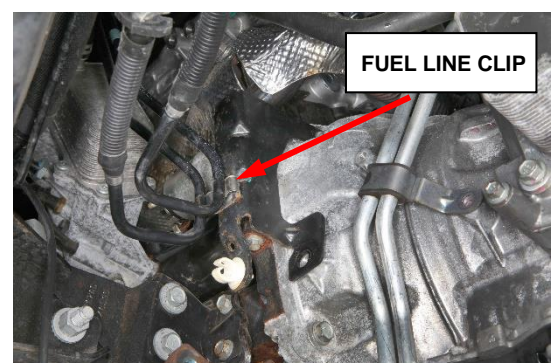


Figure 20 – Upper Bracket at Transmission

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41. Release the MRP cable and wiring harnesses from the upper bracket (Figure 21).

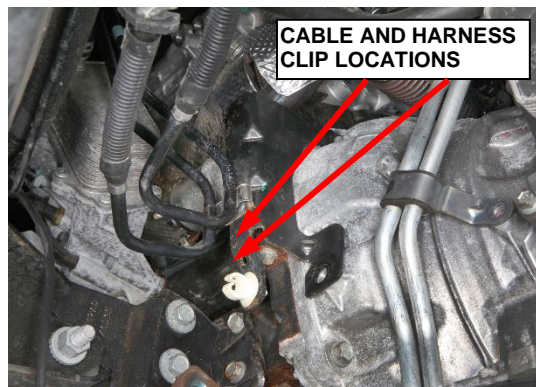


Figure 21 – Cable and Harness Clip Locations

42. Remove the bellhousing bolt retaining the upper bracket (Figure 22).

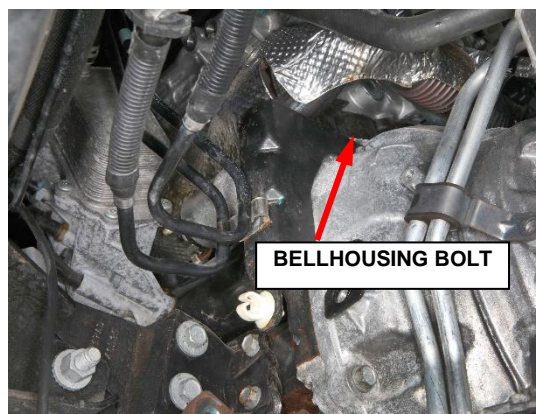


Figure 22 – Upper Bracket

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43. Disconnect the solenoid connector (1) (Figure 23).
44. Remove the B+ battery cable retainer and remove the B+ battery cable (2) (Figure 23).
45. Remove the retainers and remove the starter (3) (Figure 23).

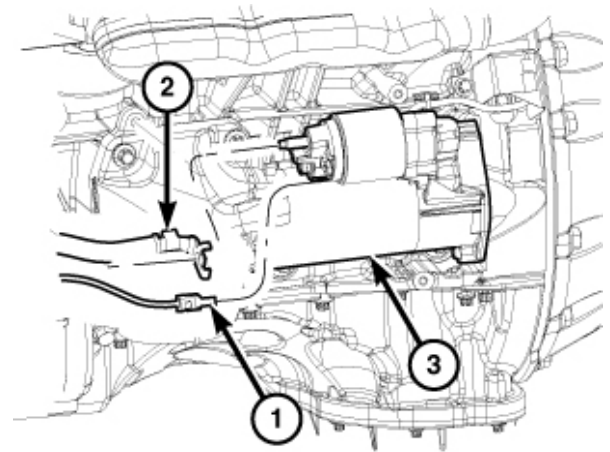


Figure 23 – Starter Motor Connections

46. The torque converter is attached with three sets of two bolts (1) 120° apart as shown (Figure 24).

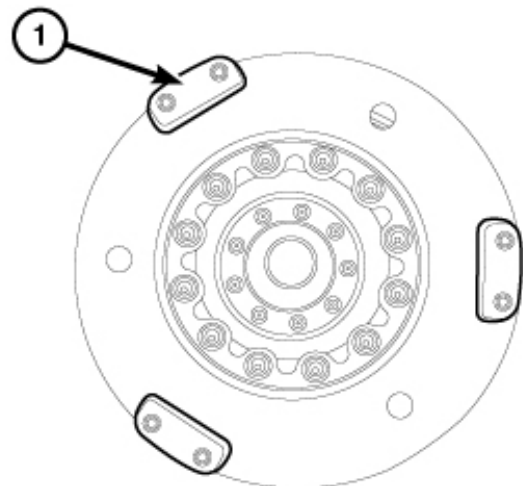


Figure 24 – Torque Converter Bolt Pattern

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- 47. Rotate the crankshaft in a clockwise direction for access, and through the starter opening, remove the six torque converter bolts (1) (Figure 25).
- 48. Remove the transmission oil cooler tube support bracket and nut.

CAUTION: When supporting or lifting the transmission at the oil pan the weight of the transmission must be distributed evenly on the lifting fixture. Failure to do so could damage the oil pan and transmission.

- 49. Position a transmission jack under the transmission and secure the transmission with chains or straps.
- 50. Remove the transmission bellhousing fasteners.
- 51. Remove the coolant hoses at heat exchanger.

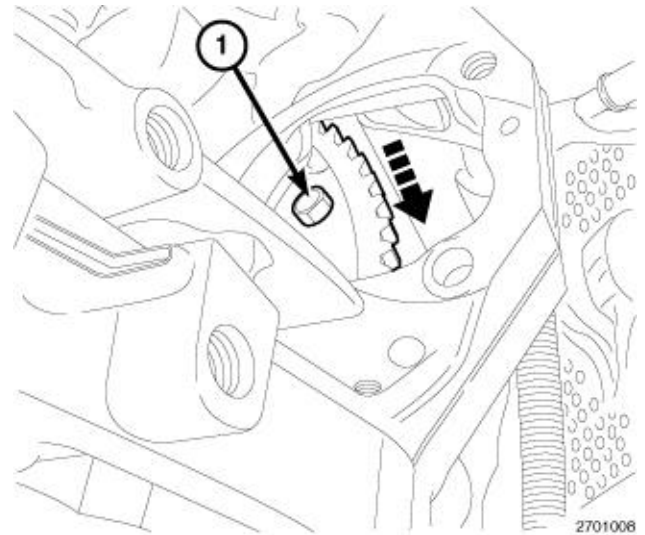


Figure 25 – Torque Converter Bolt

- 52. Remove dust cap by pulling it straight back off of quick connect fitting.
- 53. Place disconnect Special Tool 8875A onto a $\frac{3}{8}$ inch transmission cooler lines or Special Tool 9546 onto a $\frac{1}{2}$ inch transmission cooler lines with the fingers of the tool facing the quick connect fitting (Figure 26).
- 54. Slide disconnect tool down the transmission line and engage the fingers of the tool into the retaining clip. When properly engaged in the clip, the tool will fit flush against the quick connect fitting (Figure 26).
- 55. Rotate the disconnect tool 60° to expand the retaining clip (Figure 26).
- 56. While holding the disconnect tool against the quick connect fitting, pull back on the transmission cooler line to remove (Figure 26).
- 57. Hold the torque converter in place during transmission removal.
- 58. Remove the transmission assembly from the vehicle.
- 59. Paint mark the flexplate hub to flexplate relationship.

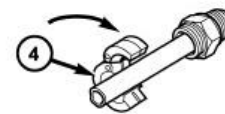
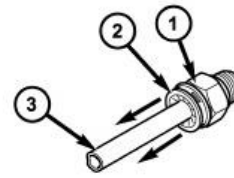


Figure 26 – Quick Connect Fittings

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CAUTION: Do not use an impact socket or a thick walled socket when removing or installing the flexplate retaining bolts, damage to the crankshaft, internal engine or the transmission may occur.

60. Remove the bolts (1) and flex plate (3) (Figure 27).
61. Remove the counter weight (4) and tone wheel (5) (Figure 27).
62. Inspect the crankshaft position sensor for damage and replace as needed.

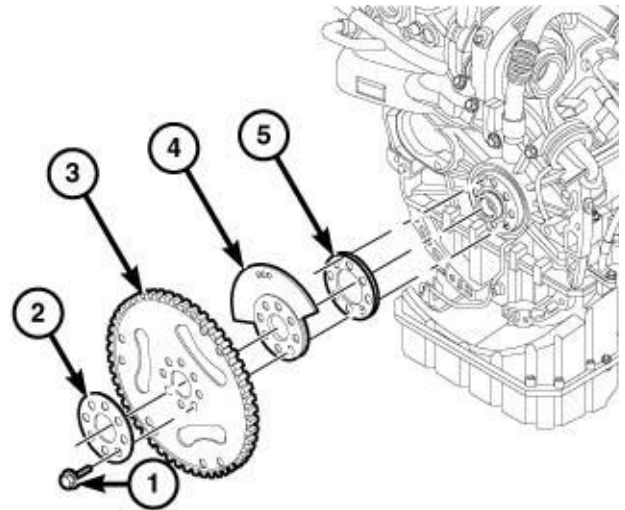


Figure 27 – Tone Wheel Removal

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B. Install

1. Install the **NEW** tone wheel 68493358AA (5) (Figure 27).

NOTE: Make sure the dowel pin (1) is installed in the dead hole of the counter weight. The other hole is a through hole and is not to be used (Figure 28).

NOTE: Do Not lubricate the NEW bolts as they are already coated with an anti-scuff treatment.

NOTE: Always use NEW flexplate bolts whenever the existing bolts have been removed.

2. Install the counter weight (4) and make sure the dowel pin side is inserted into the crankshaft hole for proper counter weight timing. A vibration can occur if the counter weight is installed incorrectly (Figure 27).
3. Install the flexplate, aligning the paint marks.



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Figure 28 – Counter Weight Dowel Pin

NOTE: With clean engine oil, lubricate the bolt side of backing plate (2).

4. Lubricate and install the backing plate (2) and tighten the **NEW** bolts 68161231AA (1) finger tight (Figure 27).

CAUTION: Do not use an impact socket or a thick walled socket when removing or installing the flexplate retaining bolts, damage to the crankshaft, internal engine or the transmission may occur.

5. Using the tightening sequence shown in Figure 29, tighten bolts to:
 - Tighten the bolts 50 N·m (37 ft. lbs.).
 - Loosen one bolt at a time and then retighten the bolt in a clockwise cross pattern to 125 N·m (92 ft. lbs.).
 - Using a torque angle gauge, tighten each bolt an additional 30 degrees in a clockwise cross pattern.
6. Lubricate the nose of the torque converter and install the transmission to the engine. Install bellhousing bolts finger tight.



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Figure 29 – Flexplate Tightening Sequence

NOTE: Make sure that the transmission dowel pins are seated in engine block and protrude far enough to hold transmission in alignment.

SAFETY RECALL

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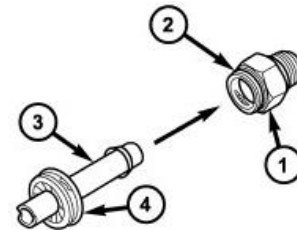
Loss of Crankshaft Position



Reference: 73A / NHTSA 23V-411

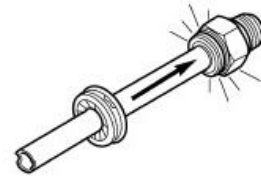
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7. Hold the torque converter in place during transmission installation.
8. Align transmission cooler line with quick connect fitting while pushing straight into the fitting (Figure 30).
9. Push in on transmission cooler line until a “click” is heard or felt (Figure 30).
10. Push in on transmission cooler line until a “click” is heard or felt.



NOTE: If dust cap will not snap into place, repeat assembly step 2.

11. Verify that the torque converter spins and is not bound up.
12. Align torque converter to flywheel holes.
13. Verify that the torque converter is pulled flush to the flexplate.
14. Install the torque converter bolts and tighten to 42 N·m (31 ft. lbs.).



15. Tighten the bellhousing bolts to 50 N·m (37 ft. lbs.). Install the upper bracket on the driver side and the upper DPF bracket by their shared bellhousing bolt at this time.
16. Install the coolant hoses at heat exchanger.
17. Install the transmission oil cooler tube support bracket and nut.
18. Install the bolts (1) and the vibration damper cover (2) (Figure 1).
19. Install the starter (3) the battery cable retainers. Tighten the starter bolts to 54 N·m (40 ft. lbs.) (Figure 23).
20. Install the B+ battery cable retainer and install the B+ battery cable nut to 12 N·m (9 ft. lbs.) (2) (Figure 23).
21. Connect the solenoid connector (1) (Figure 23).
22. Install the MRP cable and wiring harnesses to the upper bracket (Figure 21).
23. Install the fuel lines to the clip on the upper bracket (Figure 20).
24. Install the five bolts retaining front axle pinion housing to transmission bracket. Tighten bolts to 110 N·m (81 ft. lbs.) (Figures 18 and 19).
25. Install the bolts to the manual park release cable bracket (3) and tighten to 20 N·m (15 ft. lbs.) (Figure 17).
26. Install the manual park release cable (1) to the lever (2) (Figure 17).

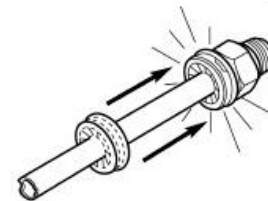


Figure 30 – Quick Connect Fittings

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27. Install the starter cable harness retainer.
28. Install the nut retaining the rear DPF steady rest bracket to the transmission and tighten to 32 N·m (24 ft. lbs.) (Figure 16).
29. Install the nut retaining the front DPF steady rest bracket to the transmission and tighten to 32 N·m (24 ft. lbs.) (Figure 15).
30. Install two bolts (3) holding the DPF differential pressure sensor and bracket (5) to the transmission and tighten to 21 N·m (15 ft. lbs.) (Figure 14).
31. Install wiring connections at the differential pressure sensor.
32. Install the transmission vent hose to the transmission.
33. Install the transmission and DEF injector wiring to the transmission case.
34. Install the transfer case to a jack and move it into place behind the transmission.
35. Push the transfer case and jack forward to engage transfer case.
36. Install nuts attaching transfer case (2) to transmission (1) and tighten to 27 N·m (20 ft. lbs.) (Figure 7).
37. Install the damper weight from transfer case and tighten to 55 N·m (41 ft. lbs.) (Figure 8).
38. Install the transfer case vent hose.
39. Install the transfer case shift motor and mode sensor wire connectors (3) and the transfer case wiring harness retainers (Figure 7).
40. Install the four bolts and the rear engine mount bracket and tighten to 33 N·m (24 ft. lbs.) (Figure 6).
41. For 2wd vehicle, install the propeller shaft.
42. Slide the propeller shaft onto the automatic transmission output shaft, noting the alignment marks made during removal (Figure 13).

NOTE: Drive shaft bolts must be replaced or cleaned and Mopar® Lock and Seal Adhesive or equivalent applied.

43. Install the pinion flange (1) bolts to propeller shaft (2) and tighten to 115 N·m (85 ft. lbs.) (Figure 12).
44. Remove the piece of wood used to keep the propeller shaft from over-articulating during removal and installation (Figure 11).
45. If equipped with a center bearing, align it with the outline of the center bearing (1) on the center bearing bracket made during removal (Figure 10).
46. Install the mounting bolts (2) and tighten to 54 N·m (40 ft. lbs.).
47. For 4wd, install the rear propeller shaft to the splined output shaft of the transfer case.

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48. Install the rear of the propeller shaft to the pinion flange, aligning the marks made during removal. Tighten the flange bolts to 115 N·m (85 ft. lbs.).
49. Install the front propeller shaft to the splined output shaft of the transfer case.
50. Install the front of the propeller shaft to the front axle pinion flange, aligning the marks made during removal. Tighten the flange bolts to 115 N·m (85 ft. lbs.).
51. Install the four nuts (2) retaining the DEF tank shield (1) and tighten to 15 N·m (11 ft. lbs.) (Figure 5).
52. Install rear engine mount isolator nuts, and crossmember bolts. Tighten bolts to 107 N·m (80 ft. lbs.) and the nuts to 61 N·m (45 ft. lbs.) (Figure 4).
53. Install skid plate crossmember below DEF tank. Tighten the crossmember bolts to 18 N·m (13 ft. lbs.).
54. Secure the DEF tube, transmission and transfer case harnesses to the transmission crossmember.
55. Remove the support jacks.
56. Install the transfer case skid plate, if equipped. Tighten the bolts to 18 N·m (13 ft. lbs.).
57. Connect the negative battery cable.
58. Refill the cooling system. Perform the Standard Procedure - Coolant Fill.
59. Perform the Standard Procedure – Transmission Fill After Service.
60. If transfer case fluid was lost during removal and installation, check the fluid level and top off as needed.

This notice applies to your vehicle,

[Model Year and Model]

VIN XXXXXXXXXXXXXXXXXXXX

73A/NHTSA 23V-411

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 recalls.mopar.com, scan the QR code below, or download the Mopar Owner's Companion App.**

QR Code

Get access to recall notifications, locate your nearest dealer, and more through this website or Mopar Owner's Companion App. 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 73A.

IMPORTANT SAFETY RECALL

Loss of Crankshaft Position

Dear [Name],

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

FCA US has decided that a defect, which relates to motor vehicle safety, exists in certain [2014 & 2016 Model Year (DS) Ram 1500 Pickup and 2014 through 2017 & 2019 Model Year (WK) Jeep® Grand Cherokee] vehicles.

It is extremely important to take steps now to repair your vehicle to ensure the safety of you and your passengers.

WHY DOES MY VEHICLE NEED REPAIRS?

The magnetic material attached to the tone wheel on your vehicle ^[1] provides a signal to the crankshaft position sensor. If this signal material is lost, the engine loses its ability to synchronize injector pulses and cam timing. This loss of crankshaft position can result in an engine stall, as well as loss of the ability to restart the engine. **A loss of motive power can cause a vehicle crash without prior warning.**

HOW DO I RESOLVE THIS IMPORTANT SAFETY ISSUE?

FCA US will repair your vehicle ^[2] free of charge (parts and labor). To do this, your dealer will replace the tone wheel. The estimated repair time is 8 hours depending on vehicle configuration. In addition, your dealer will require your vehicle for proper check-in, preparation, and check-out during your visit, which may require more time. Your time is important to us, so 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 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 Emission 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 Emission Recall has been performed.

In order to ensure your full protection under the emissions warranty provisions, it is recommended that you have your (vehicle or engine) serviced as soon as possible. Failure to do so could be determined as lack of proper maintenance of your (vehicle or engine).

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. ^[3] 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
FCA 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.