



# TECHNICAL SERVICE BULLETIN

Classification: AT23-005A	Reference: NTB24-015A	Date: March 22, 2024
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## ENGINE SUPPORT TOOLS

This bulletin has been amended. See **AMENDMENT HISTORY** on the last page.  
Please discard previous versions of this bulletin.

**APPLIED VEHICLES:** 2017-2020 Pathfinder (R52)

### SERVICE INFORMATION

A new Engine Support Tool, Engine Support Bracket, and CVT Transmission Jack Adapter are now available to allow the CVT to be removed from the **APPLIED VEHICLES** without having to remove the engine.

The procedure in this bulletin is different from the procedure currently in the Electronic Service Manual (ESM), which will be updated with this information at a later date.

Please refer to the **SERVICE PROCEDURE** to use these new tools:

- **Front Wheel Drive (FWD)** – pages 4 - 26
- **All Wheel Drive (AWD)** – pages 27 - 55

Bulletins are intended for use by qualified technicians, not 'do-it-yourselfers'. Qualified technicians are properly trained individuals who have the equipment, tools, safety instruction, and know-how to do a job properly and safely. **NOTE:** If you believe that a described condition may apply to a particular vehicle, **DO NOT** assume that it does. See your Nissan dealer to determine if this applies to your vehicle.

## SPECIAL TOOLS

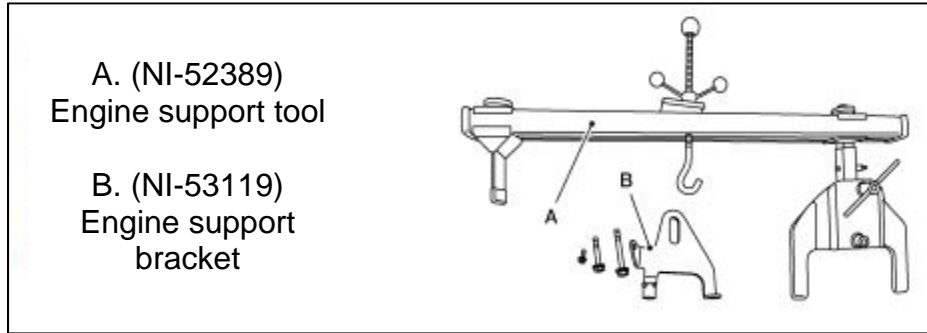


Figure 1

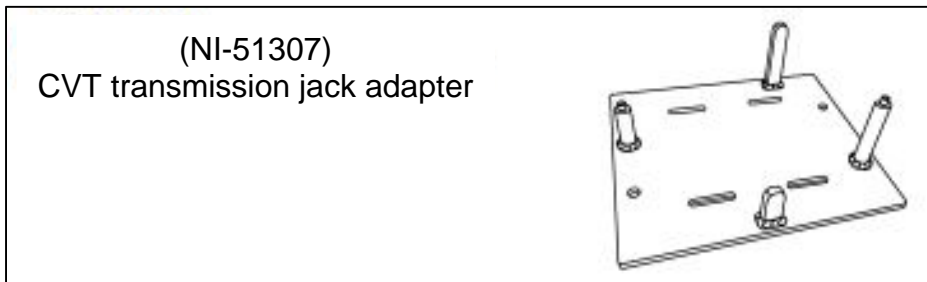


Figure 2



Figure 3

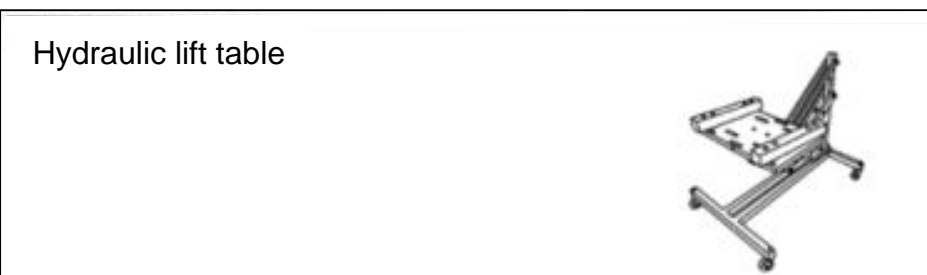


Figure 4

Transmission jack



Figure 5

Drive shaft joint puller



Figure 6

Ball joint remover

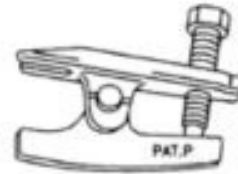


Figure 7

## SERVICE PROCEDURE

### Removal (FWD)

#### **⚠ WARNING**

To avoid the risk of death or severe personal injury, do not remove the radiator cap when the engine is hot. Serious burns could occur from high pressure engine coolant escaping from the radiator. Wrap a thick cloth around the cap. Slowly turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by turning it all the way.

#### **⚠ CAUTION**

To avoid the risk of minor personal injury or property damage:

- Perform when the engine is cold.
- When replacing the TCM and transaxle assembly as a set, replace the transaxle assembly first and then replace the TCM.
  - Refer to "Description" in the Transaxle and Transmission section of the ESM.
- When replacing the transaxle assembly, perform "ADDITIONAL SERVICE WHEN REPLACING TRANSAXLE ASSEMBLY."
  - Refer to "Description" in the Transaxle and Transmission section of the ESM.

**HINT:** When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Remove the battery tray.
  - Refer to "Removal and Installation" in the Power Supply, Ground & Circuit Elements section of the ESM.
2. Remove the cowl top cover and the cowl top extension.
  - Refer to "Removal and Installation" in the Exterior section of the ESM.
3. Remove engine room cover.
  - Refer to "Removal and Installation" in the Engine Mechanical section of the ESM.

4. Disconnect the harness connector (A) from the transmission range switch (1).

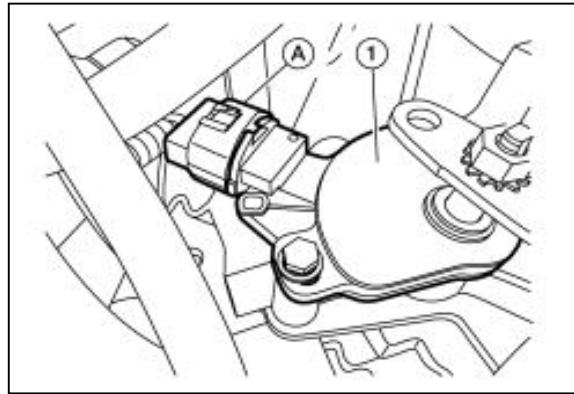


Figure 8

5. Remove the lock plate (1) as shown.

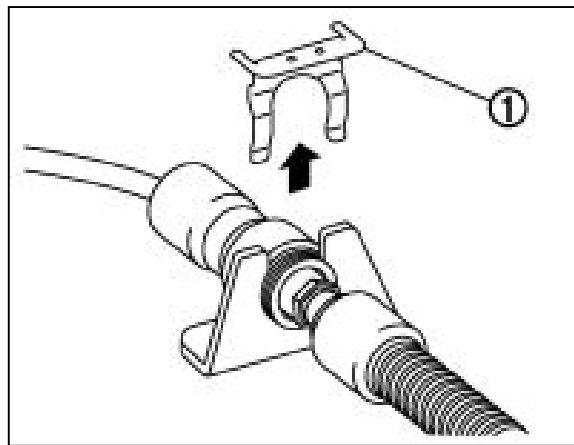


Figure 9

6. Remove nut (A) and separate the control cable (1) from the manual lever (B).

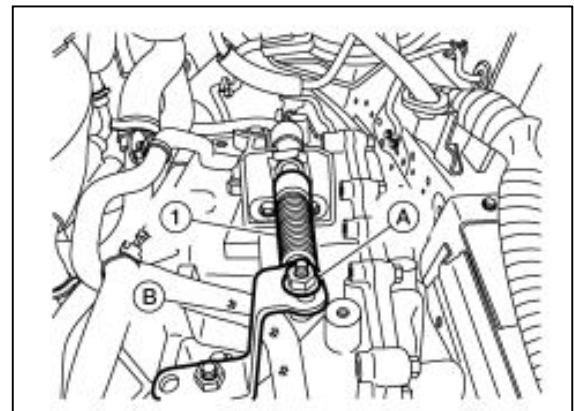


Figure 10

7. Disconnect brake booster vacuum hose from intake manifold collector.
  - Refer to Vacuum Lines "Exploded View" in the Brake System section of the ESM.
8. Disconnect the PCV hose from the intake manifold collector.
9. Remove bolts (A) and set VIAS Control Solenoid Valves (1) aside.

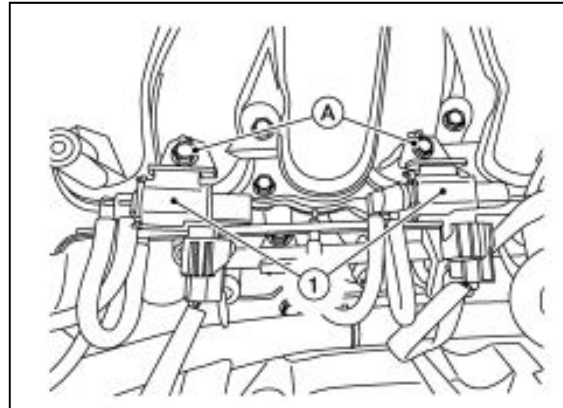


Figure 11

10. Disconnect vacuum hoses (1) from the Intake Manifold Collector (2).

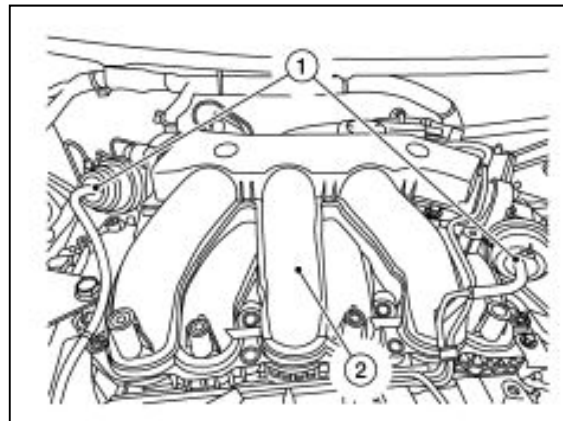


Figure 12

11. Disconnect the vacuum hose (1) from the vacuum pipe (2).

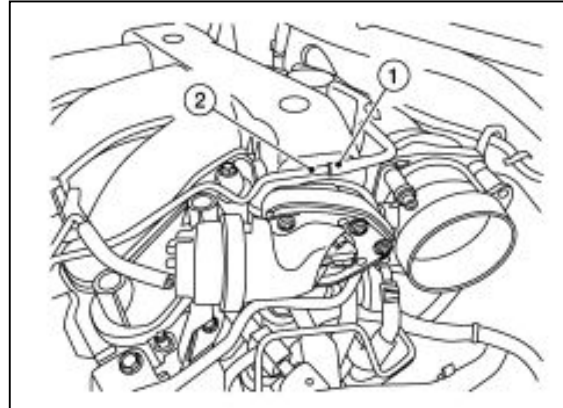


Figure 13

12. Remove clamp (1) and disconnect hose (2) from pipe (3).
13. Release the pawl, and remove hose (4) from retainer (A).
14. Remove bolt (B) and set EVAP canister purge volume control solenoid (5) aside.

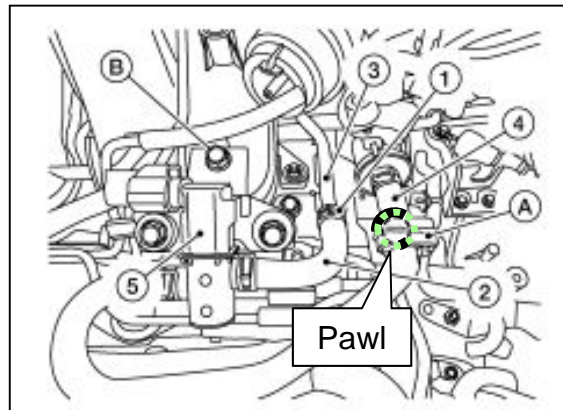


Figure 14

15. Set vacuum tube assembly (1) aside.

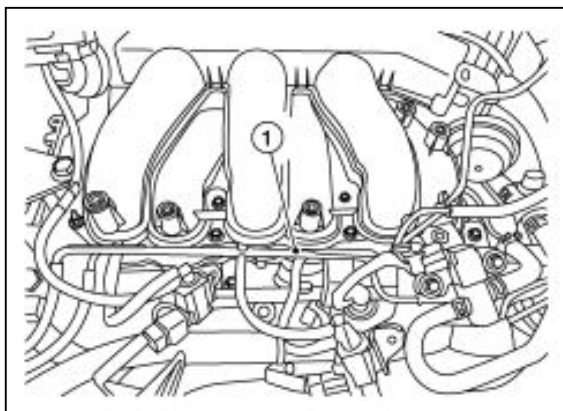


Figure 15

16. Loosen bolts in reverse of sequence shown and remove electric throttle control actuator bolts, then remove electric throttle control actuator and position aside.

**NOTICE**

To avoid damage to the electric throttle control actuator:

- Handle the electric throttle control actuator carefully to avoid any shock to the electric throttle control actuator.
- Do not disassemble the electric throttle control actuator.

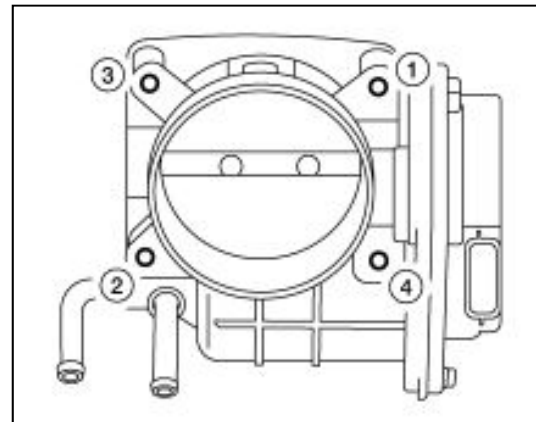


Figure 16

17. Remove bolt (A) and set the bracket (1) aside.

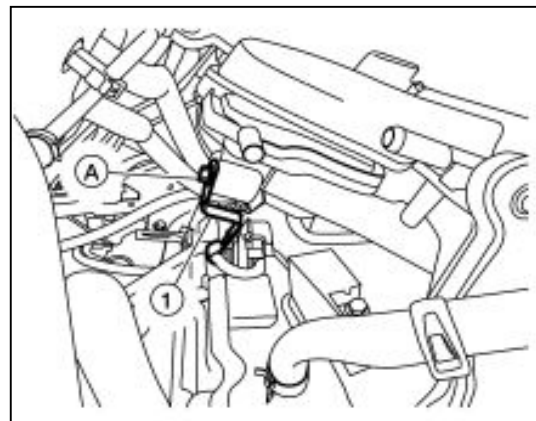


Figure 17

18. Loosen the intake manifold collector bolts and nuts in reverse of sequence shown, and then remove the intake manifold collector and gasket.

**NOTICE**

To avoid the risk of minor property damage, do not reuse the intake manifold collector gasket.

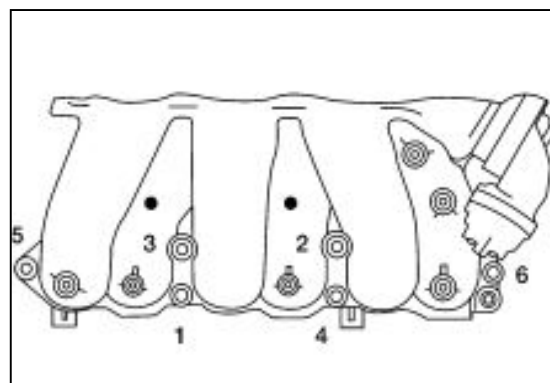


Figure 18



19. Disconnect transaxle breather hose (1) from transaxle assembly.

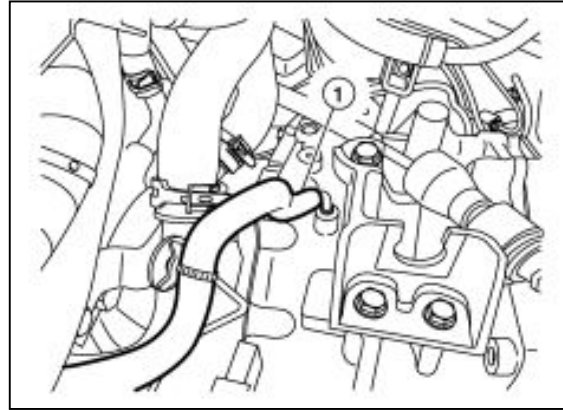


Figure 19

20. Remove bolt (A) from CVT charge pipe (1).

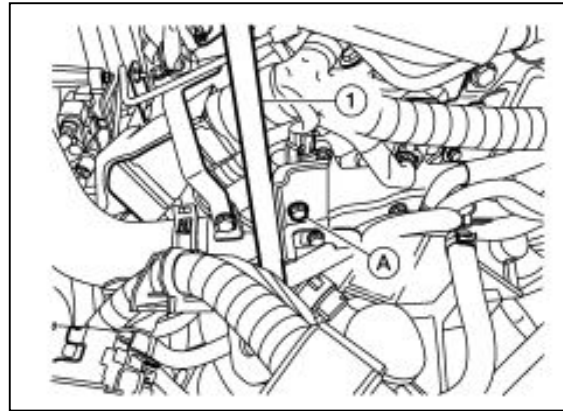


Figure 20

21. Remove bolt (A) from upper torque rod.

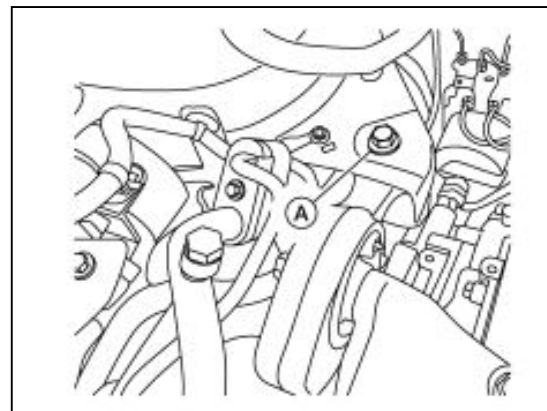


Figure 21

22. Remove CVT gusset bolt (A).

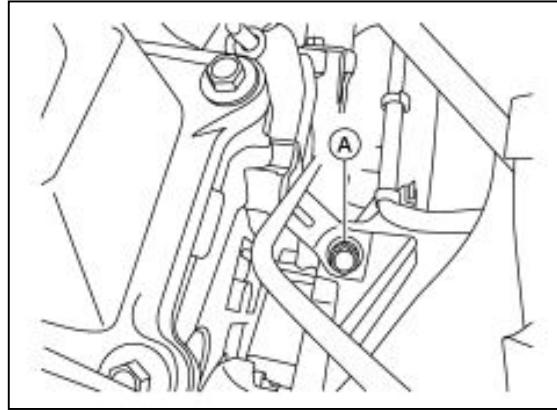


Figure 22

23. Remove bolts (A).

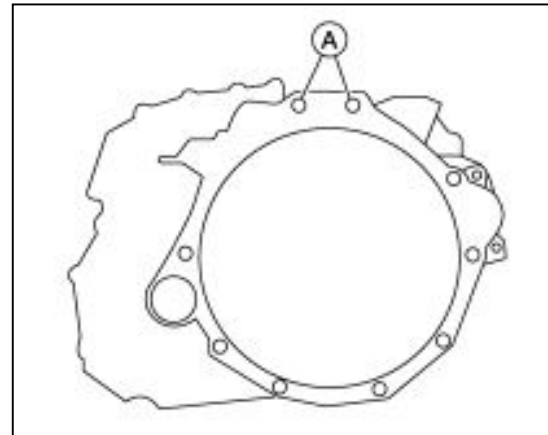


Figure 23

24. Using a suitable tool, release the clip.

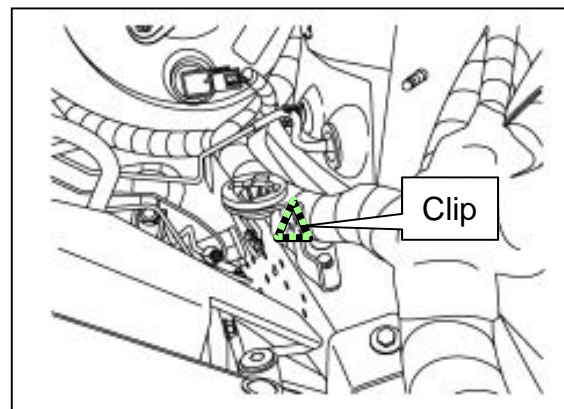


Figure 24

25. Remove intake stud and install Tool (A) using bolts (B), (C) and (D) supplied with tool. Tighten bolts to specification. Refer to Engine Support Tool Operating Instructions.

- Tool (A): NI-53119
- Bolts (B) torque: 24.0 N•m (2.4 kg-m, **18 ft-lb**)
- Bolts (C) torque: 7.0 N•m (0.7 kg-m, **62 in-lb**)
- Bolts (D) torque: 24.0 N•m (2.4 kg-m, **18 ft-lb**)

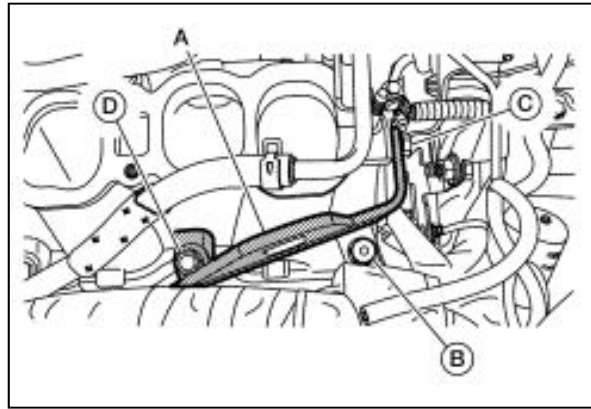


Figure 25

26. Install Tool (A) to driver's (LH) side frame rail (1) as shown. Refer to Engine Support Tool Operating Instructions.

- Tool (A): NI-52389

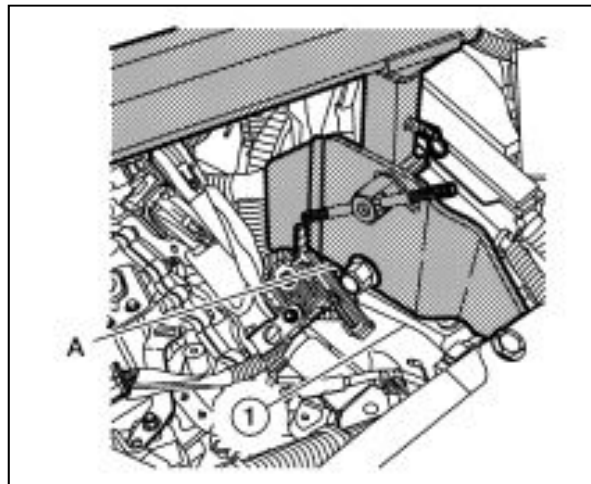


Figure 26

27. Install Tool (A) on top of engine mounting insulator [RH (1)] as shown. Refer to Engine Support Tool Operating Instructions.

- Tool (A): NI-52389

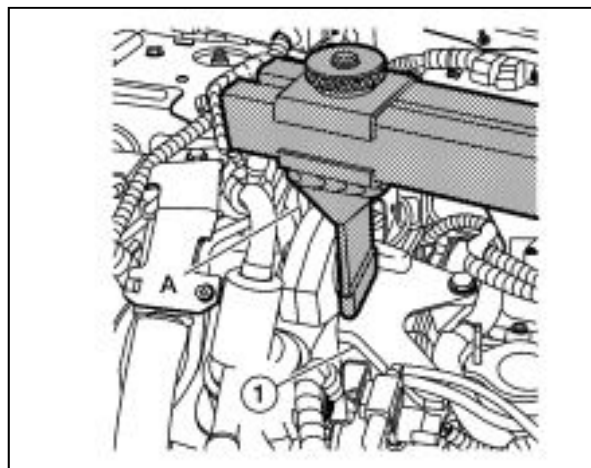


Figure 27

28. Install Tool (A) to Tool (B). Refer to Engine Support Tool Operating Instructions.

- Tool (A): NI-52389
- Tool (B): NI-53119

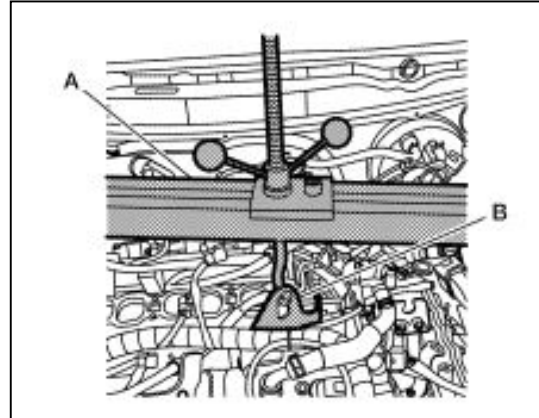


Figure 28

29. Using bubble level (B) on Tool (A), level Tool as shown. Refer to Engine Support Tool Operating Instructions.

- Tool (A): NI-52389

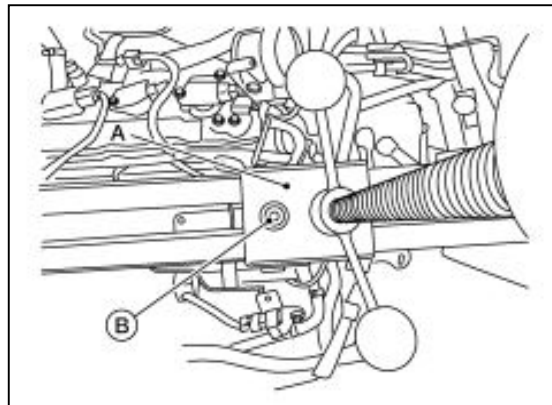


Figure 29

30. Remove nut from engine mounting insulator (front).

- Refer to Engine Assembly "Exploded View" in the Engine Mechanical section of the ESM.

31. Remove nut from engine mounting insulator (rear).

- Refer to Engine Assembly "Exploded View" in the Engine Mechanical section of the ESM.

32. Remove front under cover.

- Refer to "Removal and Installation" in the Exterior section of the ESM.

33. Remove the front wheels and tires using power tool (LH/RH).

34. Remove the lock plates [A (LH/RH)] and remove brake hoses from struts.

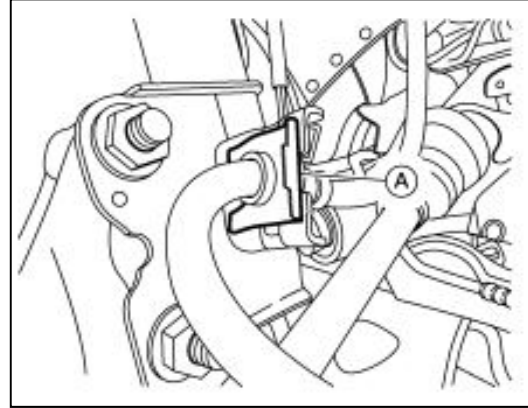


Figure 30

35. Remove nut and separate stabilizer connecting rods from struts (LH/RH).
- Refer to Front Stabilizer "Exploded View" in the Front Suspension section of the ESM.
36. Remove the brake caliper torque member bolts, leaving brake hoses attached. Position the brake calipers aside with wire (LH/RH).
- Refer to Brake Caliper Assembly "Exploded View" in the Brake System section of the ESM.

**NOTICE**

To avoid damage to the brake calipers, do not depress the brake pedal while the brake calipers are removed.

37. Put alignment marks (A) on disc brake rotors and on the wheel hubs and bearings. Remove the disc brake rotors (LH/RH).

**CAUTION**

To avoid the risk of minor personal injury or damage to the disc brake rotors, do not drop the disc brake rotors.

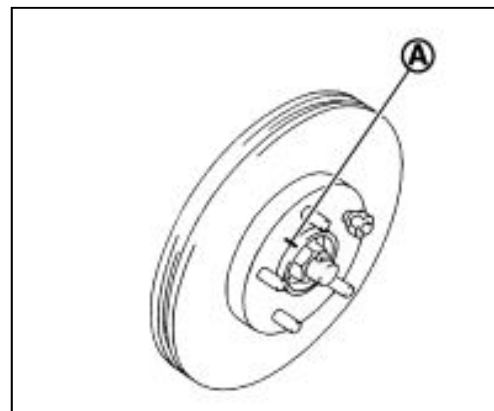


Figure 31

38. Remove wheel sensor bolts (A) and position wheel sensors aside (LH/RH).

**NOTICE**

To avoid damage to the wheel speed sensor, do not pull on the wheel speed sensor harness.

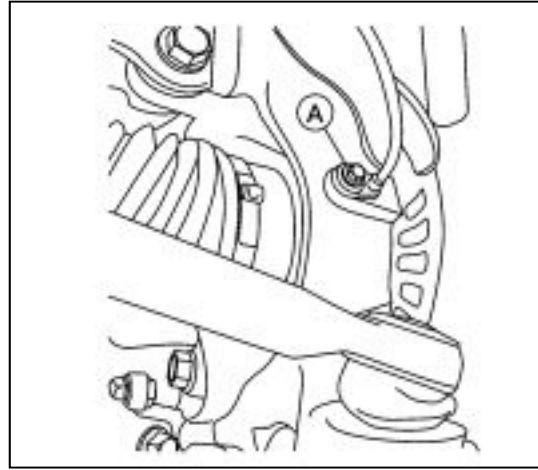


Figure 32

39. Remove cotter pins from front drive shafts (LH/RH).
40. Remove the nut retainers from front drive shafts (LH/RH).
41. Loosen the wheel hub lock nuts from the drive shafts using power tool (LH/RH).

42. Using a piece of wood and a suitable tool, tap on the wheel hub lock nuts to disengage the drive shafts from the wheel hub and bearings (LH/RH).

**NOTICE**

To avoid damage to the drive shaft:

- Do not place the drive shaft joints at an extreme angle.
- Do not over extend the slide joints.
- Do not allow the drive shafts to hang without support.

**HINT:** Use a suitable puller if the drive shafts cannot be separated from the wheel hub and bearings.

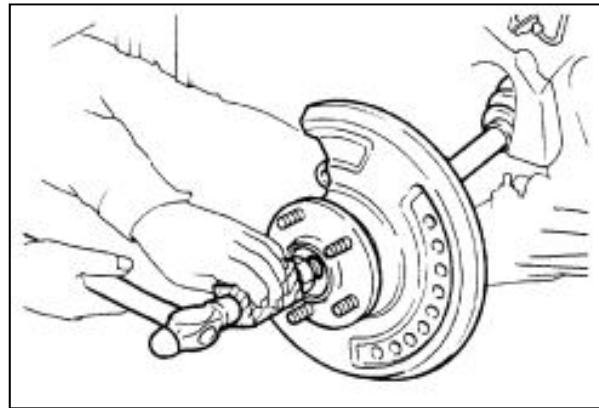


Figure 33

43. Remove the wheel hub lock nuts (LH/RH).

**⚠ WARNING**

To avoid the risk of death or severe personal injury, do not reuse the wheel hub lock nuts.

44. Remove the lower strut bolts and nuts. Separate the steering knuckles from the struts (LH/RH).
- Refer to Front Coil Spring and Strut "Exploded View" in the Front Suspension section of the ESM.

45. Remove bearing retainer to support bearing bracket bolts (RH only).

46. Insert suitable tool (A) between the drive shafts and transaxle. Remove the drive shafts from the transaxle (LH/RH).

- Tool (A) Drive Shaft Joint Puller (commercially available)

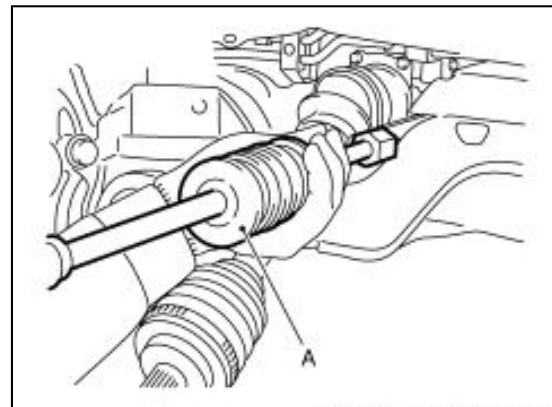


Figure 34

**NOTICE**

To avoid damage to the drive shafts:

- Confirm that the circular clips are attached to the drive shafts.
- Do not place drive shaft joints at extreme angles when removing drive shafts. Also be careful not to overextend the slide joints.
- Do not reuse the circular clips.

47. Remove the differential side oil seals (LH/RH).

**NOTICE**

To avoid damage to the differential, do not reuse the differential side oil seals.

48. Remove front fender protector side covers (LH/RH).
  - Refer to Fender Protector "Exploded View" in the Exterior section of the ESM.
49. Remove the front half of front fender protectors (LH/RH).
  - Refer to Fender Protector "Exploded View" in the Exterior section of the ESM.
50. Remove outer socket cotter pins (LH/RH).
  - Refer to Steering Gear and Linkage "Exploded View" in the Steering System section of the ESM.

**⚠CAUTION**

To avoid the risk of minor personal injury or property damage, do not reuse the outer socket cotter pins.

51. Loosen the outer socket nuts and separate outer sockets from the steering knuckles (LH/RH) using ball joint remover (commercially available).

**⚠CAUTION**

To avoid the risk of minor personal injury or property damage, leave the outer socket nuts half threaded on the outer sockets to prevent damage to the threads and to prevent the tool from coming off suddenly.

52. Remove the outer socket nuts and separate the outer sockets from the steering knuckles (LH/ RH).
53. Remove bolt (A) and position crankshaft position sensor (1) aside.

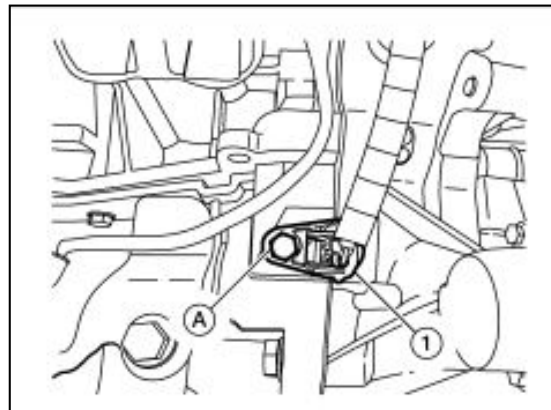


Figure 35

54. Remove the front exhaust tube.
  - Refer to Exhaust System "Exploded View" in the Exhaust System section of the ESM.



55. Disconnect the front engine mount insulator vacuum hose (1).

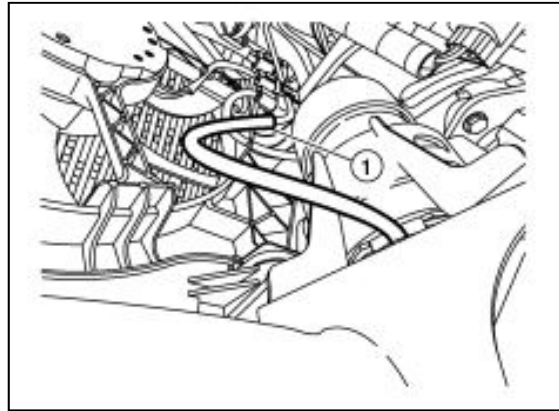


Figure 36

56. Disconnect the rear engine mount insulator vacuum hose (1).

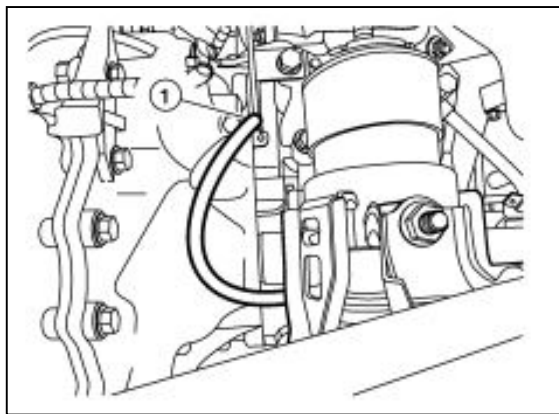


Figure 37

57. Remove bolt (A) and remove rear cover plate (1).

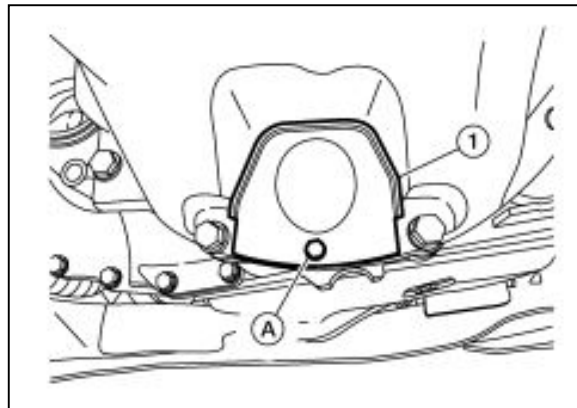


Figure 38

58. Hold drive plate with a suitable tool and remove torque converter nuts.
- Refer to Transmission Assembly "Exploded View" in the Transaxle and Transmission section of the ESM.

59. Remove the power steering tube bracket bolts.

- Refer to Hydraulic Line "Exploded View" in the Steering System section of the ESM.

**HINT:** There are four (4) bolts on the suspension member for the power steering tubes. The power steering tubes will stay with the vehicle during removal and installation.

60. Remove the bolts and nuts from the steering gear.

- Refer to Steering Gear and Linkage "Exploded View" in the Steering System section of the ESM.

61. Secure the steering gear using suitable wire.

**HINT:** The steering gear will remain in the vehicle during removal and installation.

62. Remove bolts (A) from the transaxle mount.

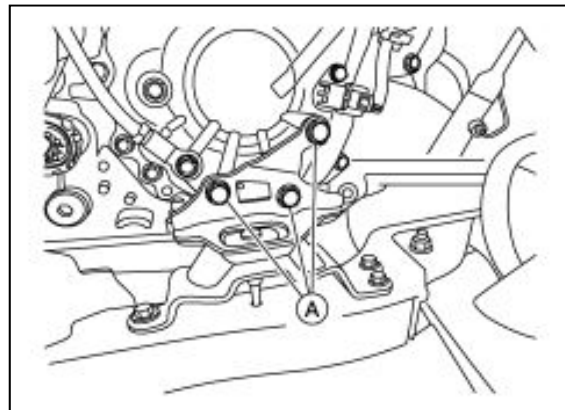


Figure 39

63. Remove bolt (A) and position ground (1) aside.

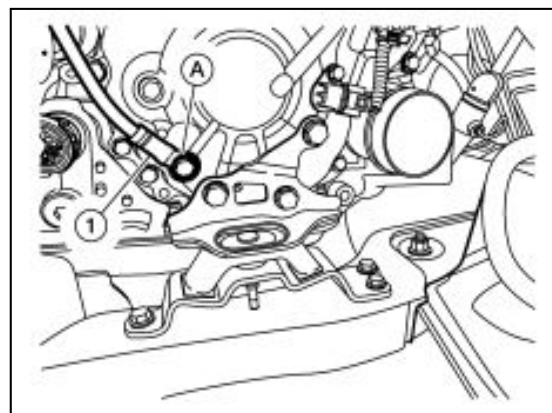


Figure 40

64. Remove rear torque rod bolt.

- Refer to Engine Assembly "Exploded View" in the Engine Mechanical section of the ESM.

65. Set hydraulic lift table (A) or equivalent tool under front suspension member.

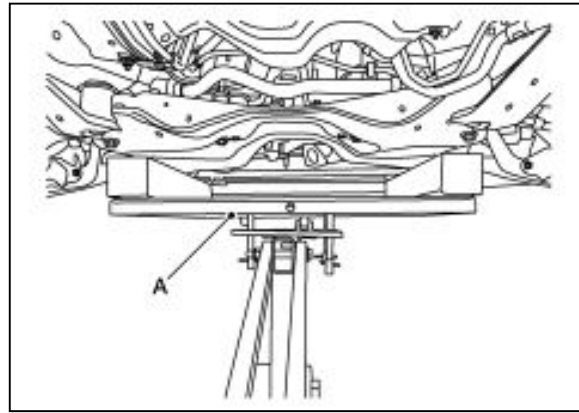


Figure 41

66. Remove front suspension member bolts and front suspension member stays.
- Refer to Front Suspension Member "Exploded View" in the Front Suspension section of the ESM.

**CAUTION**

To avoid the risk of minor personal injury or property damage, secure the front suspension member to the hydraulic lift table (or equivalent tool) while removing it.

67. Lower the front suspension member.
68. Remove bolt from heater thermostat bracket.
- Refer to Water Hose "Exploded View" in the Transmission and Transaxle section of the ESM.
69. Drain coolant.
- Refer to "Changing Engine Coolant" in the Engine Cooling System section of the ESM.
70. Remove CVT fluid cooler hose "A" and CVT fluid cooler hose "D" from the CVT oil warmer.
- Refer to CVT Fluid Cooler System "Exploded View" in the Transaxle and Transmission section of the ESM.
71. Remove CVT water hose "A" and CVT water hose "B" from CVT oil warmer.
- Refer to Water Hose "Exploded View" in the Transaxle and Transmission section of the ESM.
72. Using Tools, lower engine and transaxle assembly until the transaxle assembly is low enough to clear driver's side frame rail.
- Tool Numbers: NI-52389, NI-53119

73. Disconnect the harness connector from the starter motor "S" terminal.
  - Refer to Starter Motor "Exploded View" in the Starting System section of the ESM.
74. Remove nut and remove "B" terminal harness and position aside.
  - Refer to Starter Motor "Exploded View" in the Starting System section of the ESM.
75. Remove starter motor bolts and remove starter motor.
  - Refer to Starter Motor "Exploded View" in the Starting System section of the ESM.

76. Remove bolt (A) and remove CVT fluid charging pipe (1).

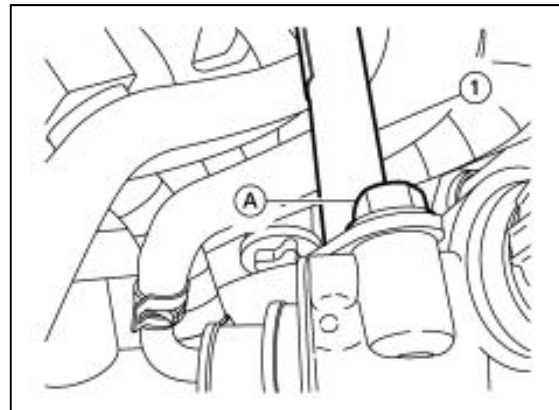


Figure 42

77. Separate the harness retainers from the transaxle assembly.

78. Disconnect the harness connector (A) from the transaxle assembly.

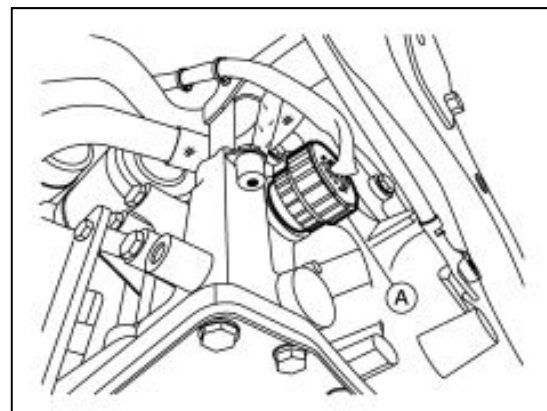


Figure 43

79. Disconnect the harness connector from the output speed sensor.
  - Refer to Output Speed Sensor "Exploded View" in the Transaxle and Transmission section of the ESM.
80. Disconnect the harness connector from the primary speed sensor.
  - Refer to Primary Speed Sensor "Exploded View" in the Transaxle and Transmission section of the ESM.

81. Disconnect the harness connector from the input speed sensor.
  - Refer to Input Speed Sensor "Exploded View" in the Transaxle and Transmission section of the ESM.
82. Support the transaxle assembly using a suitable transmission jack and tool.
  - Tool Number: NI-51307

**⚠CAUTION**

To avoid the risk of minor personal injury or property damage:

- Always secure the transaxle assembly to the transmission jack.
  - Do not lift or support the transaxle assembly using the bottom of the oil pan or damage can occur.
83. Remove bolts (A), (B), (C), and (D).

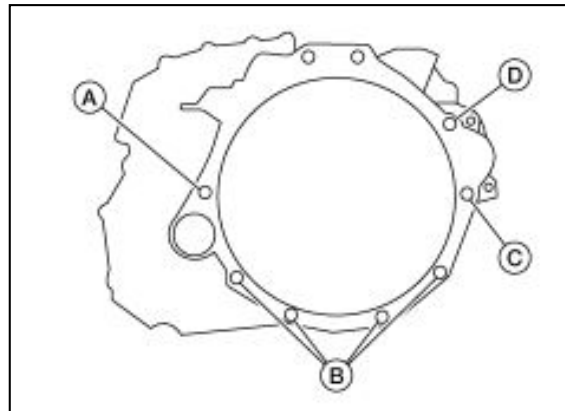


Figure 44

84. Separate the transaxle assembly from the engine assembly and lower the transaxle assembly.

**⚠CAUTION**

To avoid the risk of minor personal injury or property damage, secure the torque converter to the transaxle while removing the transaxle to prevent the torque converter from falling.

## Installation (FWD)

85. Installation is in the reverse order of removal.  
Perform Inspection Before Installation (FWD). Refer to "**Inspection Before Installation (FWD)**" below.
- If the same transaxle assembly will be reinstalled, replace differential side oil seals (LH/RH).
    - Refer to Differential Side Oil Seal "Exploded View" in the Transaxle and Transmission section of the ESM.
  - If a new transaxle assembly is being installed, write down the serial number of the new transaxle assembly.

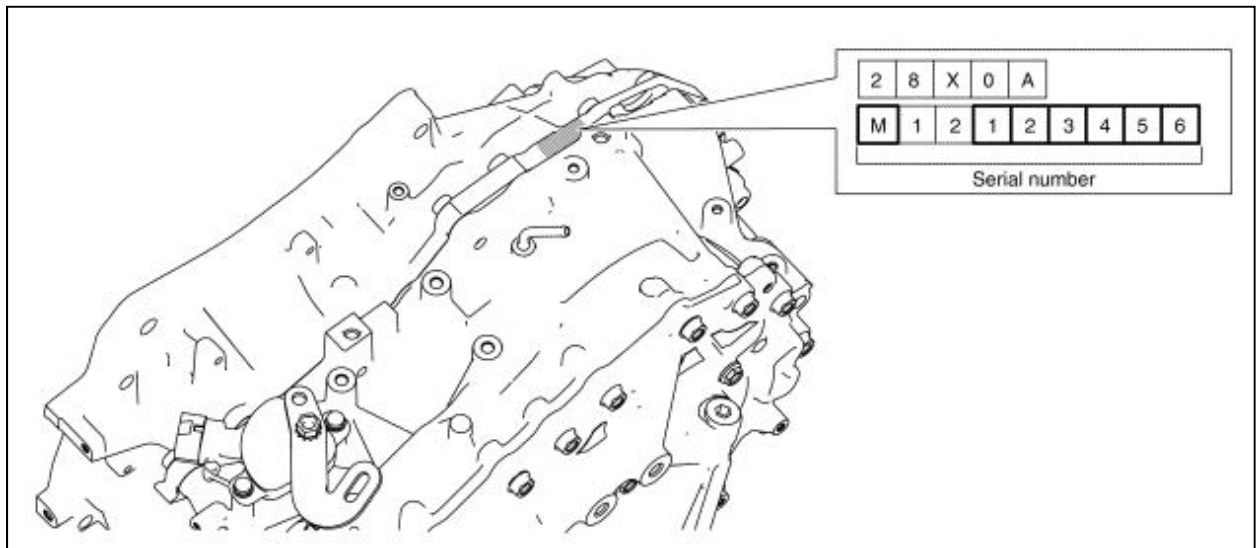


Figure 45

**⚠CAUTION**

To avoid the risk of minor personal injury or property damage:

- When replacing an engine or transaxle you must make sure any dowels are installed correctly during re-assembly.
- Improper alignment caused by missing dowels may cause vibration, oil leaks or breakage of drivetrain components.
- Do not reuse O-rings or copper sealing washers.
- When turning crankshaft, turn it clockwise as viewed from the front of the engine.
- When tightening the nuts for the torque converter while securing the crankshaft pulley bolt, be sure to confirm the tightening torque of the crankshaft pulley bolt.
  - Refer to Front Timing Chain Case "Removal and Installation" in the Engine Mechanical section of the ESM.
- After torque converter is installed to drive plate, rotate crankshaft several turns to check that CVT rotates freely without binding.
- When installing the CVT to the engine, align the matching mark on the drive plate with the matching mark on the torque converter.
- Do not reuse differential side oil seals.
- When installing the CVT to the engine, align the matching mark on the drive plate with the matching mark on the torque converter.

**HINT:**

- When installing the drive plate to torque converter nuts, tighten them temporarily, and then tighten the nuts to the specified torque.
  - Refer to "Exploded View" in the Transaxle and Transmission section of the ESM.
- Install the transaxle assembly and engine assembly mounting bolts according to the following standards:

<b>Bolt No.</b>	1		2		3		4		5
<b>Number of bolts</b>	1		2		1		1		4
<b>Bolt length "ℓ" mm (in)</b>	52 (2.05)	47 (1.85)	36 (1.42)	47 (1.85)	29 (1.14)	47 (1.85)	44 (1.73)	47 (1.85)	39.8 (1.57)
<b>Tightening torque N·m (kg·m, ft·lb)</b>	74.5 (7.6, 55)	62 (6.3, 46)	74.5 (7.6, 55)	62 (6.3, 46)	74.5 (7.6, 55)	62 (6.3, 46)	74.5 (7.6, 55)	62 (6.3, 46)	50.0 (5.1, 37)

Figure 46

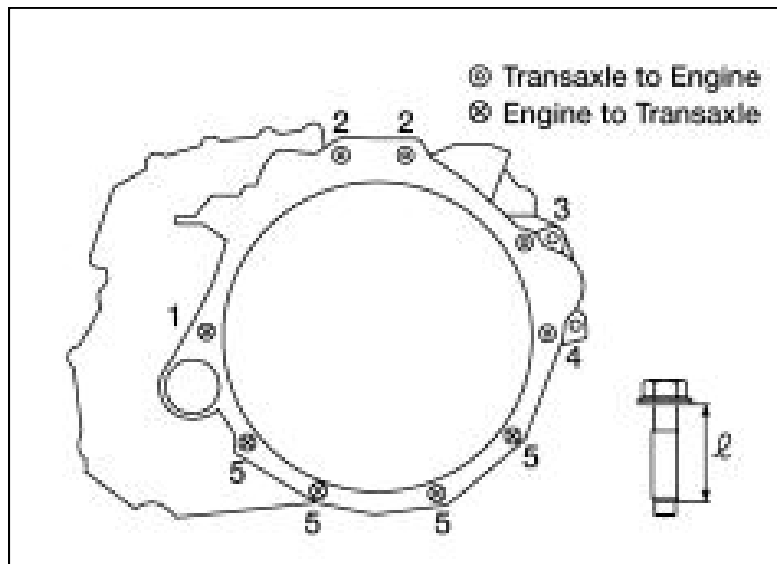


Figure 47



## Inspection Before Installation (FWD)

86. After inserting a torque converter to the CVT, check that dimension (A) is within the reference value limit.

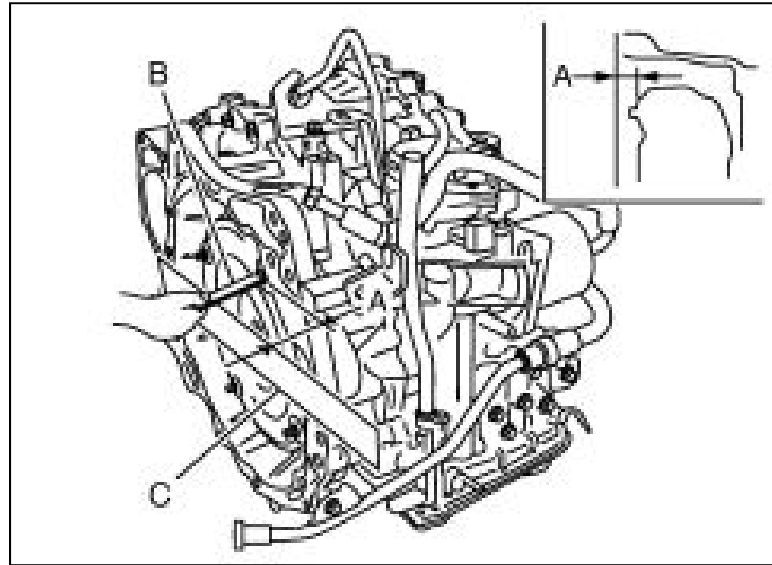


Figure 48

- **Dimension A:** Refer to "Service Data and Specifications (SDS)" in the Transaxle and Transmission section of the ESM.
- **B:** Scale
- **C:** Straightedge

## **Adjustment After Installation (FWD)**

87. Perform the following:

- Adjust CVT position.
  - Refer to "Adjustment" in the Transaxle and Transmission section of the ESM.
- Check and adjust the engine coolant level.
  - Refer to "Changing Engine Coolant" in the Engine Cooling System section of the ESM.
- Adjust the CVT fluid level.
  - Refer to "Adjustment" in the Transaxle and Transmission section of the ESM.
- Perform accelerator pedal released position learning.
  - Refer to "Description" in the Engine Control section of the ESM.
- Perform throttle valve closed position learning.
  - Refer to "Description" in the Engine Control section of the ESM.
- Perform front wheel alignment.
  - Refer to "Wheel Alignment" in the Front Suspension section of the ESM.
- Perform adjustment of steering angle sensor neutral position.
  - Refer to "Description" in the Brake Control System section of the ESM.

## **Inspection After Installation (FWD)**

88. Inspect the following items:

- Inspect CVT fluid leakage.
  - Refer to "Inspection" in the Transaxle and Transmission section of the ESM.
- Inspect CVT shifter position.
  - Refer to "Inspection" in the Transaxle and Transmission section of the ESM.
- Start the engine and inspect for coolant leaks.

## Removal (AWD)

### **⚠ WARNING**

To avoid the risk of death or severe personal injury, do not remove the radiator cap when the engine is hot. Serious burns could occur from high pressure engine coolant escaping from the radiator. Wrap a thick cloth around the cap. Slowly turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by turning it all the way.

### **⚠ CAUTION**

To avoid the risk of minor personal injury or property damage:

- Perform when the engine is cold.
- When replacing the TCM and transaxle assembly as a set, replace the transaxle assembly first and then replace the TCM.
  - Refer to "Description" in the Transaxle and Transmission section of the ESM.
- When replacing the transaxle assembly, perform "ADDITIONAL SERVICE WHEN REPLACING TRANSAXLE ASSEMBLY."
  - Refer to "Description" in the Transaxle and Transmission section of the ESM.

**HINT:** When removing components such as hoses, tubes/lines, etc., cap or plug openings to prevent fluid from spilling.

1. Remove the battery tray.
  - Refer to "Removal and Installation" in the Power Supply, Ground & Circuit Elements section of the ESM.
2. Remove the cowl top cover and the cowl top extension.
  - Refer to "Removal and Installation" in the Exterior section of the ESM.
3. Remove engine room cover.
  - Refer to "Removal and Installation" in the Engine Mechanical section of the ESM.

4. Disconnect the harness connector (A) from the transmission range switch (1).

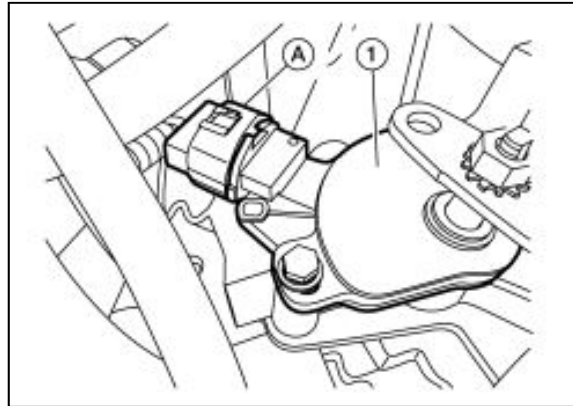


Figure 49

5. Remove the lock plate (1) as shown.

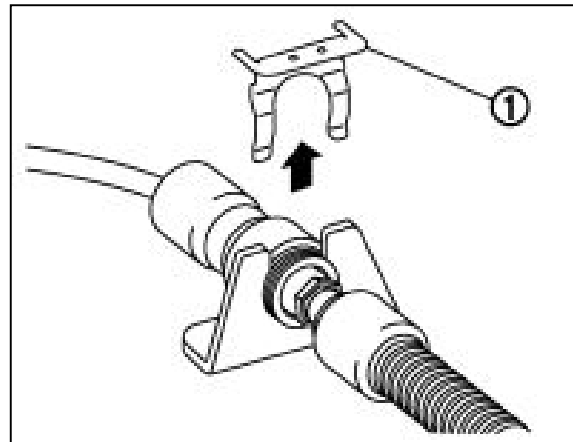


Figure 50

6. Remove nut (A) and separate the control cable (1) from the manual lever (B).

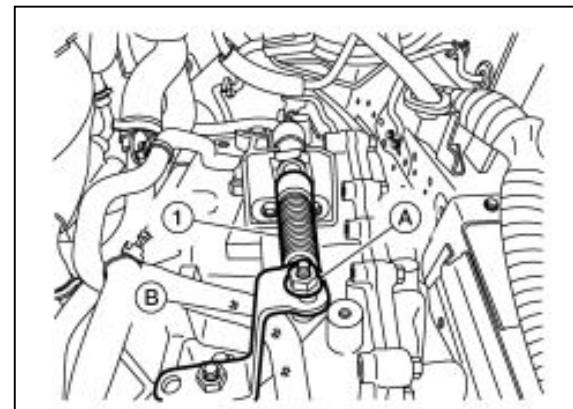


Figure 51

7. Disconnect brake booster vacuum hose from intake manifold collector.
  - Refer to Vacuum Lines "Exploded View" in the Brake System section of the ESM.
8. Disconnect the PCV hose from the intake manifold collector.

9. Remove bolts (A) and set VIAS Control Solenoid Valves (1) aside.

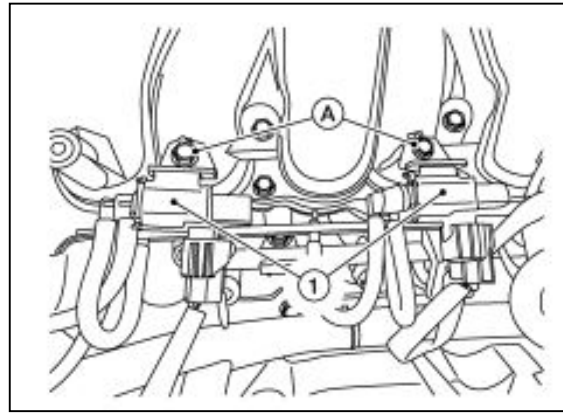


Figure 52

10. Disconnect vacuum hoses (1) from the Intake Manifold Collector (2).

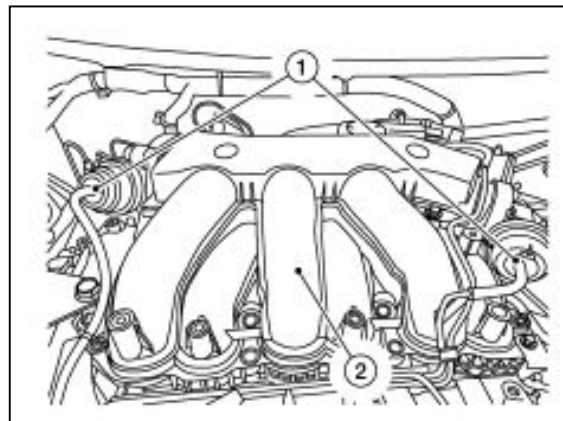


Figure 53

11. Disconnect the vacuum hose (1) from the vacuum pipe (2).

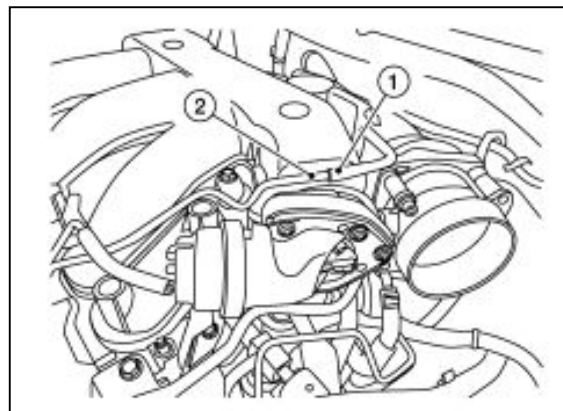


Figure 54

12. Remove clamp (1) and disconnect hose (2) from pipe (3).
13. Release the pawl, and remove hose (4) from retainer (A).
14. Remove bolt (B) and set EVAP canister purge volume control solenoid (5) aside.

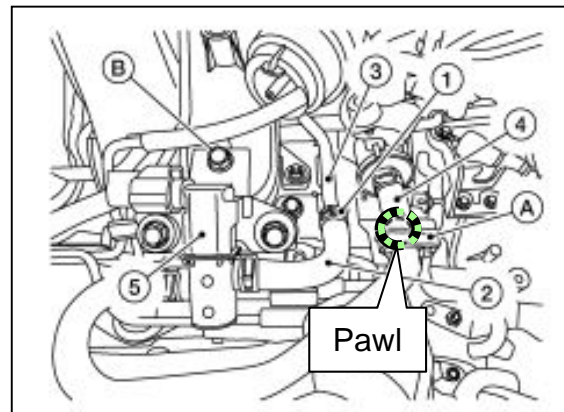


Figure 55

15. Set vacuum tube assembly (1) aside.

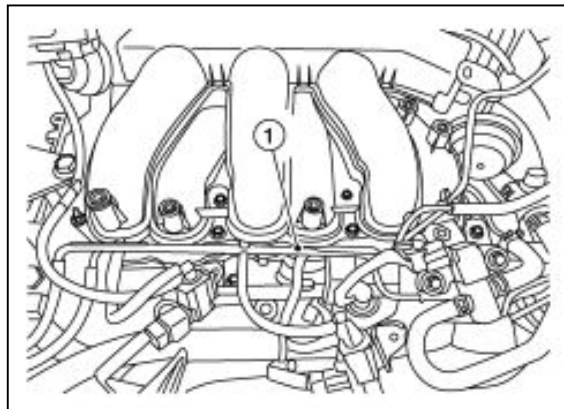


Figure 56

16. Loosen bolts in reverse of sequence shown and remove electric throttle control actuator bolts, then remove electric throttle control actuator and position aside.

**NOTICE**

To avoid damage to the electric throttle control actuator:

- Handle the electric throttle control actuator carefully to avoid any shock to the electric throttle control actuator.
- Do not disassemble the electric throttle control actuator.

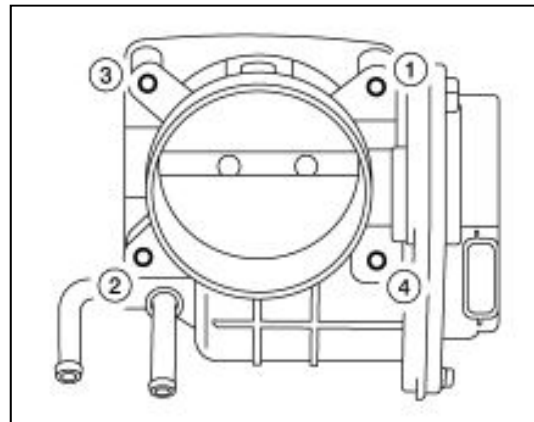


Figure 57

17. Remove bolt (A) and set the bracket (1) aside.

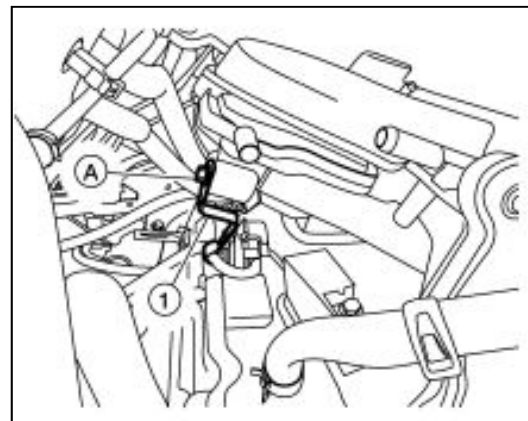


Figure 58

18. Loosen the intake manifold collector bolts and nuts in reverse of sequence shown, and then remove the intake manifold collector and gasket.

**NOTICE**

To avoid risk of minor property damage, do not reuse the intake manifold collector gasket.

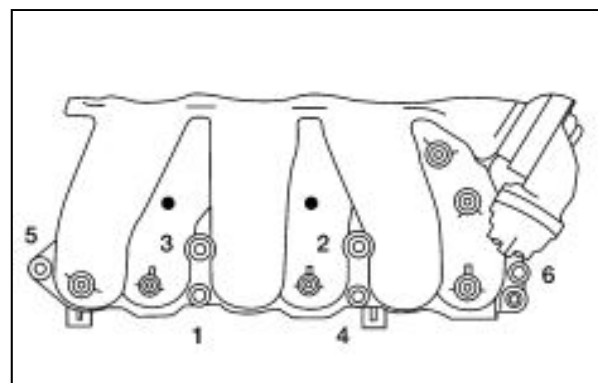


Figure 59

19. Disconnect transaxle breather hose (1) from transaxle assembly.

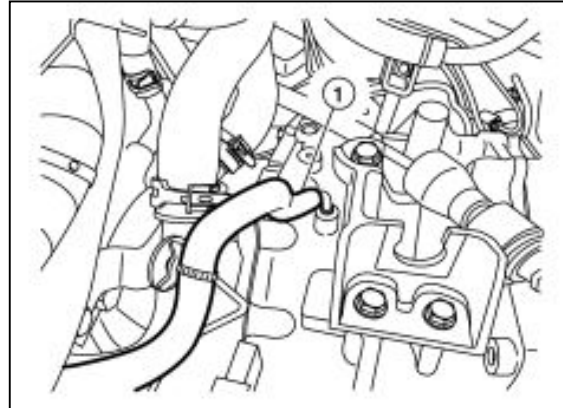


Figure 60

20. Remove bolt (A) from CVT charge pipe (1).

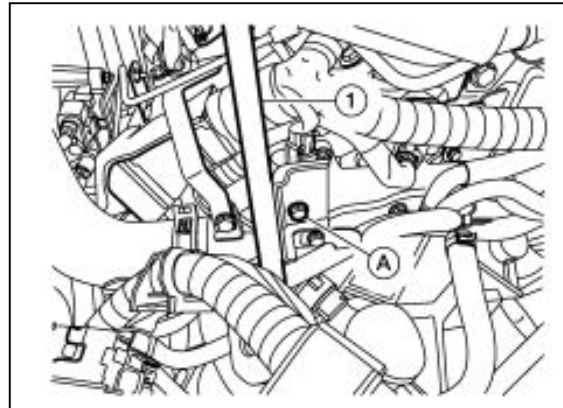


Figure 61

21. Remove bolt (A) from upper torque rod.

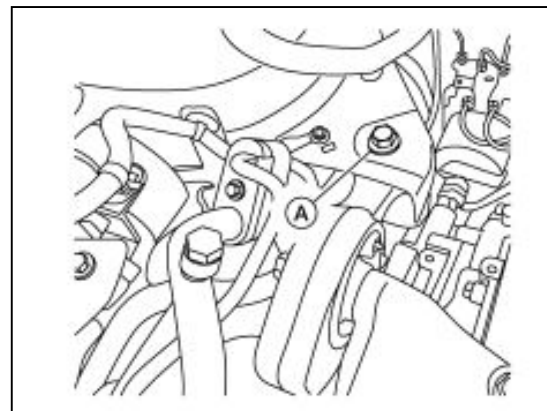


Figure 62



22. Remove CVT gusset bolt (A).

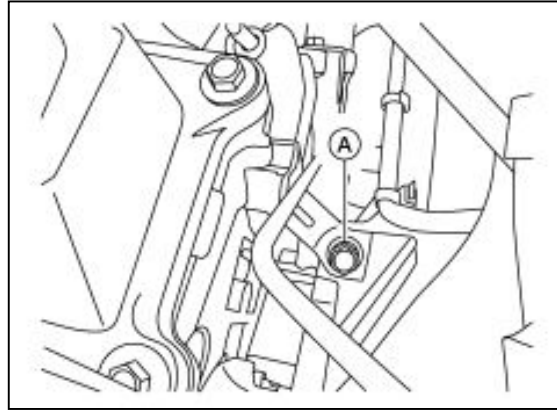


Figure 63

23. Remove bolts (A).

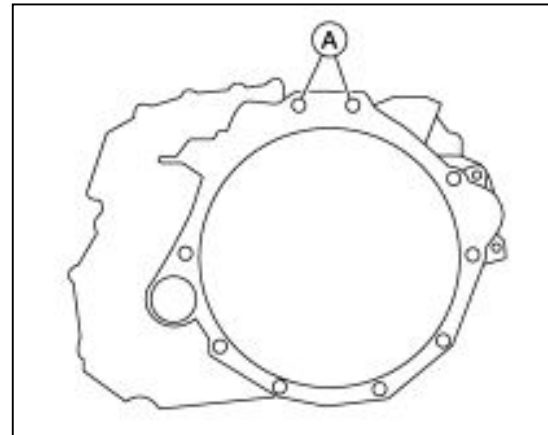


Figure 64

24. Using a suitable tool, release the clip.

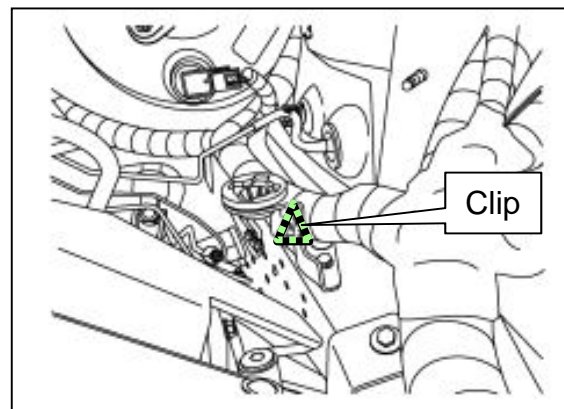


Figure 65

25. Remove intake stud and install Tool (A) using bolts (B), (C) and (D) supplied with tool. Tighten bolts to specification. Refer to Engine Support Tool Operating Instructions.

- Tool (A): NI-53119
- Bolts (B) torque: 24.0 N•m (2.4 kg-m, **18 ft-lb**)
- Bolts (C) torque: 7.0 N•m (0.7 kg-m, **62 in-lb**)
- Bolts (D) torque: 24.0 N•m (2.4 kg-m, **18 ft-lb**)

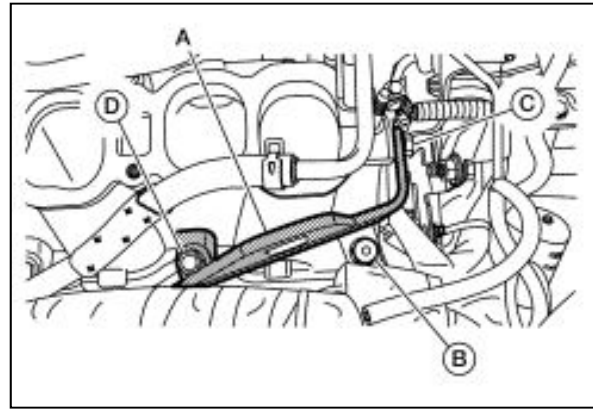


Figure 66

26. Install Tool (A) to driver's (LH) side frame rail (1) as shown. Refer to Engine Support Tool Operating Instructions.

- Tool (A): NI-52389

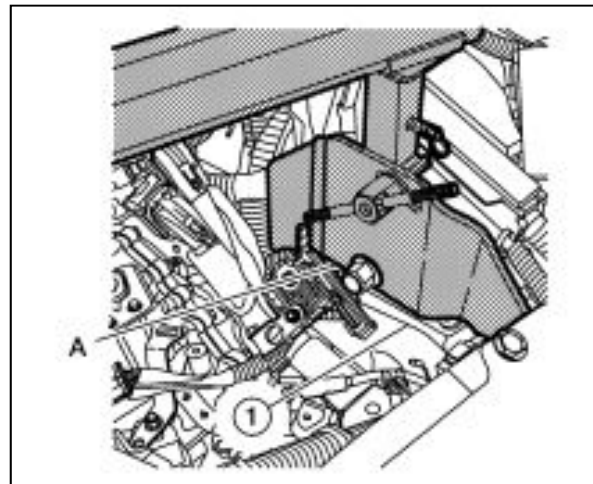


Figure 67

27. Install Tool (A) on top of engine mounting insulator [RH (1)] as shown. Refer to Engine Support Tool Operating Instructions.

- Tool (A): NI-52389

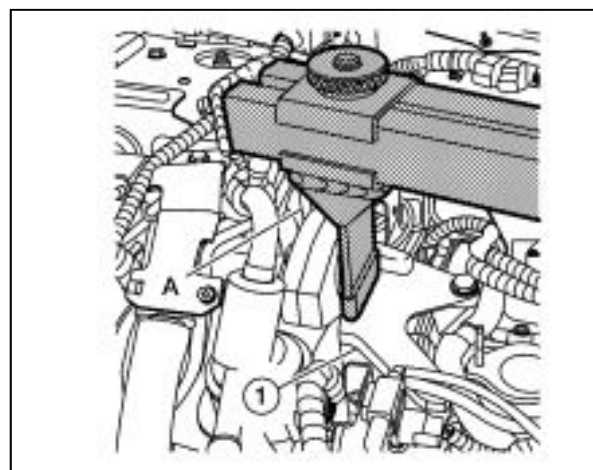


Figure 68

28. Install Tool (A) to Tool (B). Refer to Engine Support Tool Operating Instructions.

- Tool (A): NI-52389
- Tool (B): NI-53119

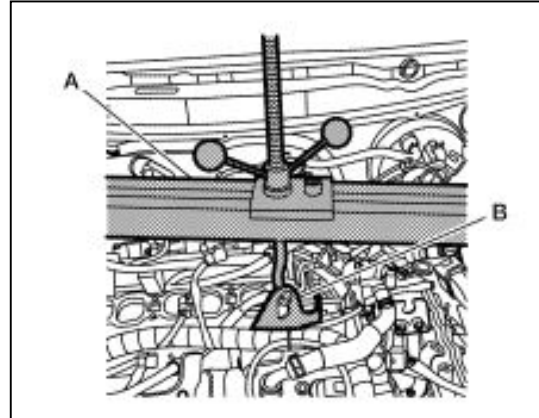


Figure 69

29. Using bubble level (B) on Tool (A), level Tool as shown. Refer to Engine Support Tool Operating Instructions.

- Tool (A): NI-52389

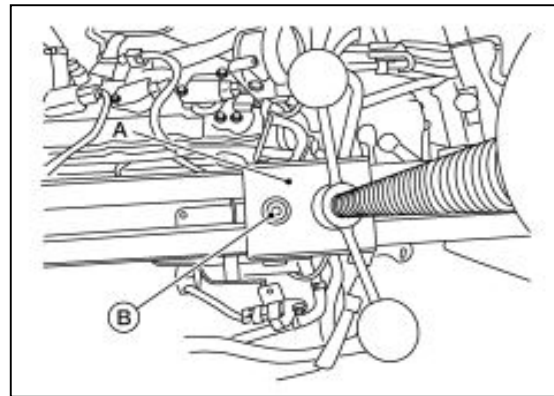


Figure 70

30. Remove nut from engine mounting insulator (front).

- Refer to Engine Assembly "Exploded View" in the Engine Mechanical section of the ESM.

31. Remove nut from engine mounting insulator (rear).

- Refer to Engine Assembly "Exploded View" in the Engine Mechanical section of the ESM.

32. Remove front under cover.

- Refer to "Removal and Installation" in the Exterior section of the ESM.

33. Remove the front wheels and tires using power tool (LH/RH).

34. Remove the lock plates [A (LH/RH)] and remove brake hoses from struts.

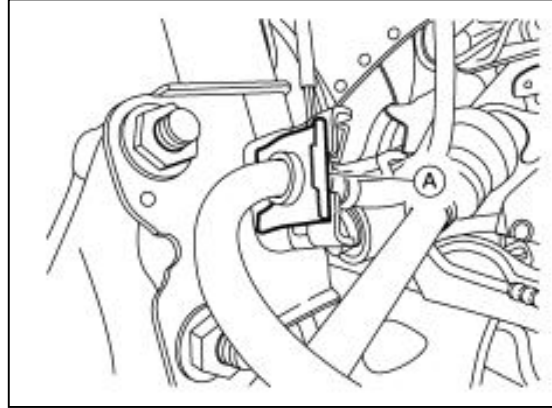


Figure 71

35. Remove nut and separate stabilizer connecting rods from struts (LH/RH).
- Refer to Front Stabilizer "Exploded View" in the Front Suspension section of the ESM.
36. Remove the brake caliper torque member bolts, leaving brake hoses attached. Position the brake calipers aside with wire (LH/RH).
- Refer to Brake Caliper Assembly "Exploded View" in the Brake System section of the ESM.

**NOTICE**

To avoid damage to the brake caliper, do not depress the brake pedal while the brake calipers are removed.

37. Put alignment marks (A) on disc brake rotors and on the wheel hub and bearings. Remove the disc brake rotors (LH/RH).

**CAUTION**

To avoid the risk of minor personal injury or property damage, do not drop the disc brake rotors.

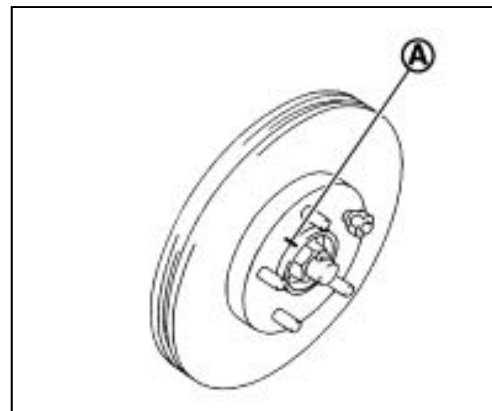


Figure 72

38. Remove wheel sensor bolts (A) and position wheel sensors aside (LH/RH).

**NOTICE**

To avoid damage to the wheel speed sensor, do not pull on the wheel speed sensor harness.

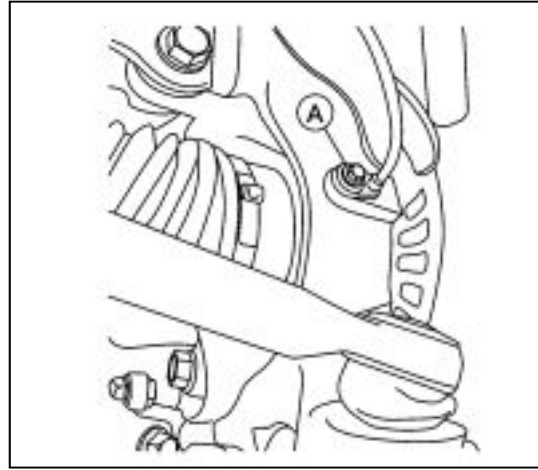


Figure 73

39. Remove cotter pins from front drive shafts (LH/RH).
40. Remove the nut retainers from front drive shafts (LH/RH).
41. Loosen the wheel hub lock nuts from the drive shafts using power tool (LH/RH).
42. Using a piece of wood and a suitable tool, tap on the wheel hub lock nuts to disengage the drive shafts from the wheel hub and bearings (LH/RH).

**NOTICE**

To avoid damage to the drive shafts:

- Do not place the drive shaft joints at an extreme angle.
- Do not over extend the slide joints.
- Do not allow the drive shafts to hang without support.

**HINT:** Use a suitable puller if the drive shafts cannot be separated from the wheel hub and bearings.

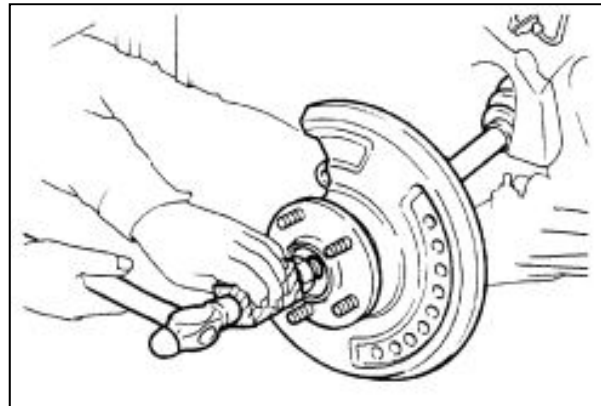


Figure 74

43. Remove the wheel hub lock nuts (LH/RH).

**⚠ WARNING**

To avoid the risk of minor personal injury or property damage, do not reuse the wheel hub lock nuts.

44. Remove the lower strut bolts and nuts. Separate the steering knuckles from the struts (LH/RH).

- Refer to Front Coil Spring and Strut "Exploded View" in the Front Suspension section of the ESM.

45. Remove bearing retainer to support bearing bracket bolts (RH only).

46. Insert suitable tool (A) between the drive shafts and transaxle. Remove the drive shafts from the transaxle (LH/RH).

- Tool (A) Drive Shaft Joint Puller (commercially available)

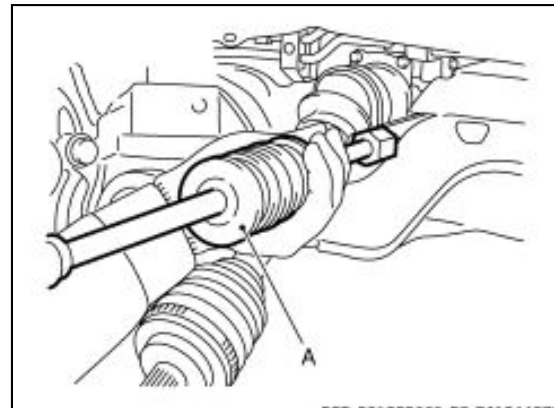


Figure 75

**NOTICE**

To avoid damage to the drive shafts:

- Confirm that the circular clips are attached to the drive shafts.
- Do not place drive shaft joints at extreme angles when removing drive shafts. Also be careful not to overextend slide joints.
- Do not reuse circular clips.

47. Remove the differential side oil seal.

**NOTICE**

To avoid damage to the differential, do not reuse the differential side oil seal.

48. Remove the transfer case oil seal.

**NOTICE**

To avoid damage to the transfer case, do not reuse the transfer case oil seal.

49. Remove front fender protector side covers (LH/RH).
  - Refer to Fender Protector "Exploded View" in the Exterior section of the ESM.
50. Remove the front half of front fender protectors (LH/RH).
  - Refer to Fender Protector "Exploded View" in the Exterior section of the ESM.
51. Remove bolt (A) and position crankshaft position sensor (1) aside.

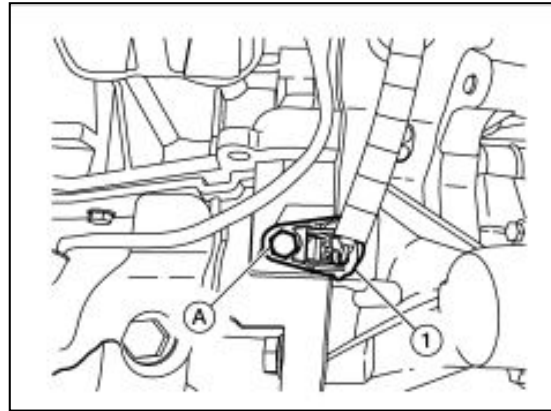


Figure 76

52. Remove the front exhaust tube.
  - Refer to Exhaust System "Exploded View" in the Exhaust System section of the ESM.

53. Disconnect the front engine mount insulator vacuum hose (1).

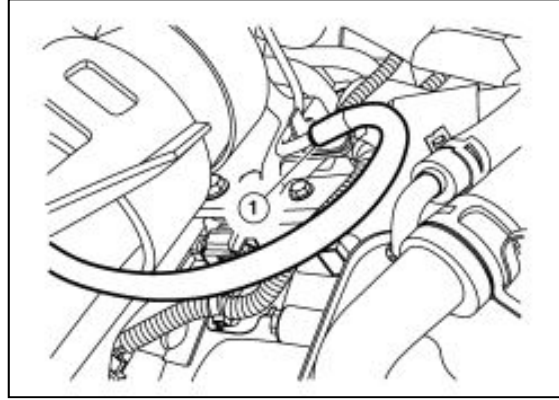


Figure 77

54. Remove bolt (A) from engine mounting insulator (front) pipe bracket.

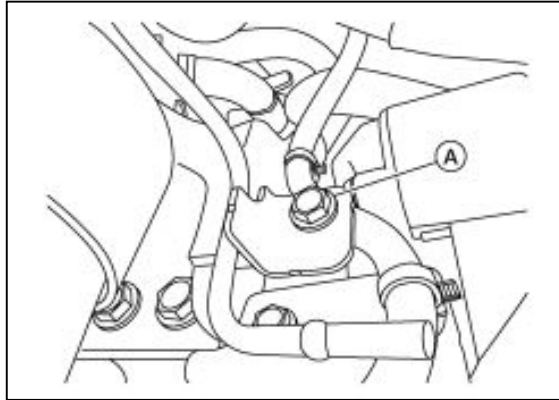


Figure 78

55. Remove bolt (A) and set bracket (1) aside.

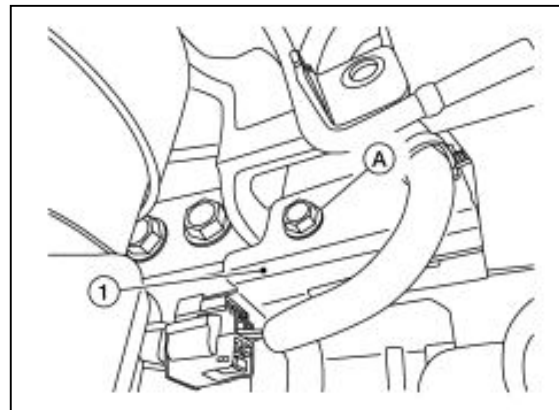


Figure 79



56. Remove bolt (A) and remove rear cover plate (1).

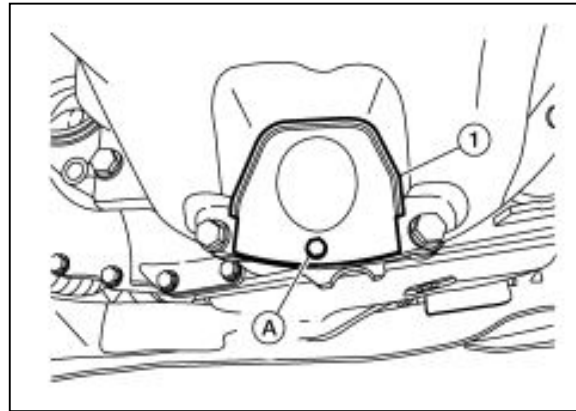


Figure 80

57. Hold drive plate with a suitable tool and remove torque converter nuts.
- Refer to Transmission Assembly "Exploded View" in the Transaxle and Transmission section of the ESM.

58. Using a suitable tool, release the clip.

59. Release hose clamp (1) and separate the high pressure piping [lower (2)] from the low pressure piping [upper (3)]

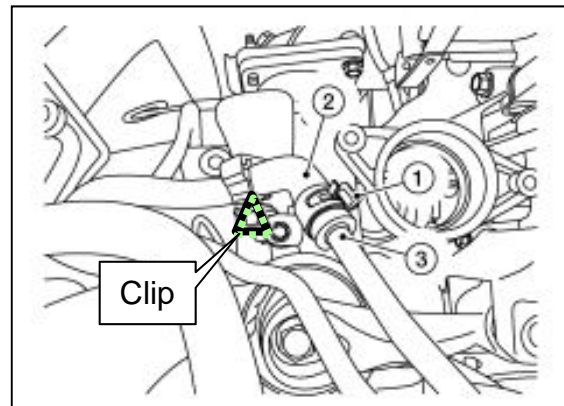


Figure 81

60. Remove the power steering tube bracket bolts.
- Refer to Hydraulic Line "Exploded View" in the Steering System section of the ESM.

**HINT:** There are three (3) bolts on the suspension member for the power steering tubes.

61. Using a suitable tool, release the retainer (A).

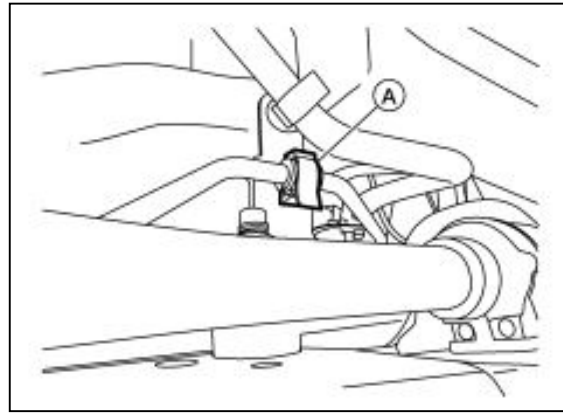


Figure 82

62. Separate the high pressure piping (A) from the steering gear (1).

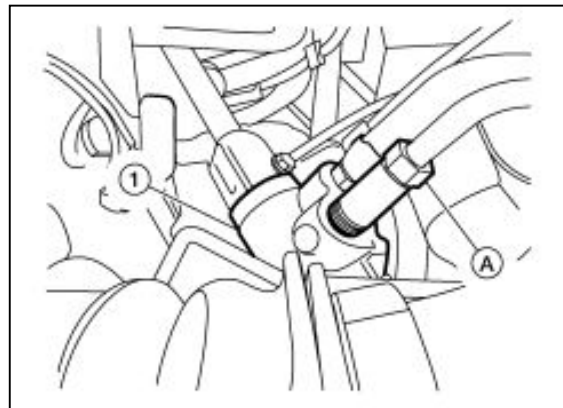


Figure 83

63. Remove lower bolt and separate the steering intermediate shaft from the steering gear.

**NOTICE**

To avoid damage to the spiral cable, secure the steering wheel after separating the steering intermediate shaft from the steering gear. This can prevent damaging the spiral cable in the event the steering wheel is turned beyond the limited number of turns.

64. Remove rear propeller shaft heat shield.

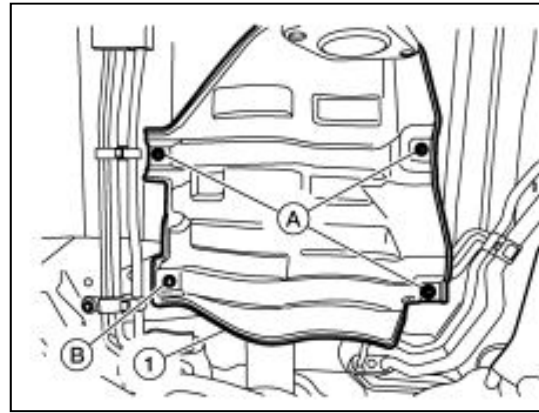


Figure 84

65. Remove bolts and disconnect rear propeller shaft from transfer assembly.
- Refer to Rear Propeller Shaft "Exploded View" in the Driveline section of the ESM.
66. Using suitable wire, secure the rear propeller shaft.

67. Remove bolts (A) from transaxle mount.

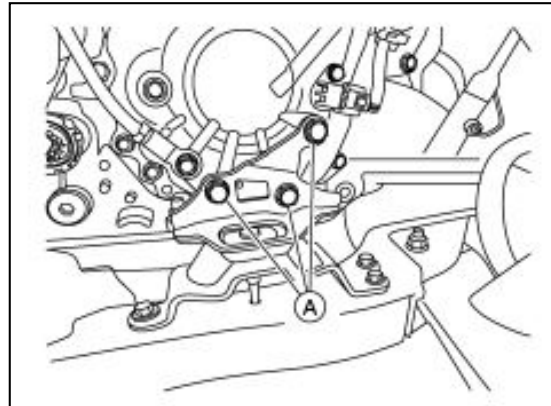


Figure 85

68. Remove bolt (A) and position ground (1) aside.

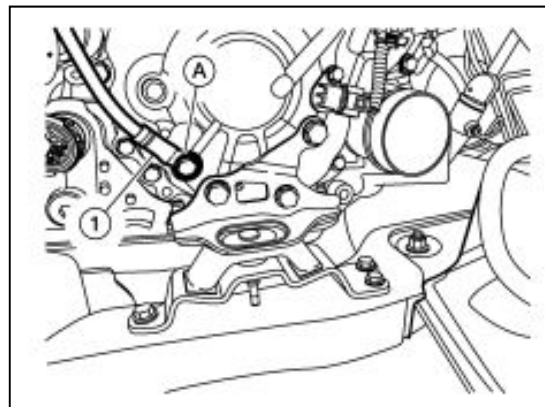


Figure 86

69. Remove rear torque rod bolt.
- Refer to Engine Assembly "Exploded View" in the Engine Mechanical section of the ESM.

70. Set hydraulic lift table (A) or equivalent tool under front suspension member.

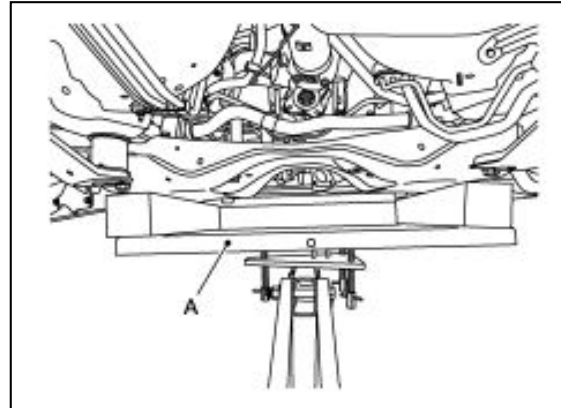


Figure 87

71. Remove front suspension member bolts and front suspension member stays.
- Refer to Front Suspension Member "Exploded View" in the Front Suspension section of the ESM.

**CAUTION**

To avoid the risk of minor personal injury or property damage, secure the front suspension member to the hydraulic lift table (or equivalent tool) while removing it.

72. Lower the front suspension member.
73. Remove bolt from heater thermostat bracket.
- Refer to Water Hose "Exploded View" in the Transmission and Transaxle section of the ESM.
74. Drain coolant.
- Refer to "Changing Engine Coolant" in the Engine Cooling System section of the ESM.
75. Remove CVT fluid cooler hose "A" and CVT fluid cooler hose "D" from the CVT oil warmer.
- Refer to CVT Fluid Cooler System "Exploded View" in the Transaxle and Transmission section of the ESM.
76. Remove CVT water hose "A" and CVT water hose "B" from CVT oil warmer.
- Refer to Water Hose "Exploded View" in the Transaxle and Transmission section of the ESM.

77. Disconnect the harness connector (A) from heated oxygen sensor 2 (bank 2).

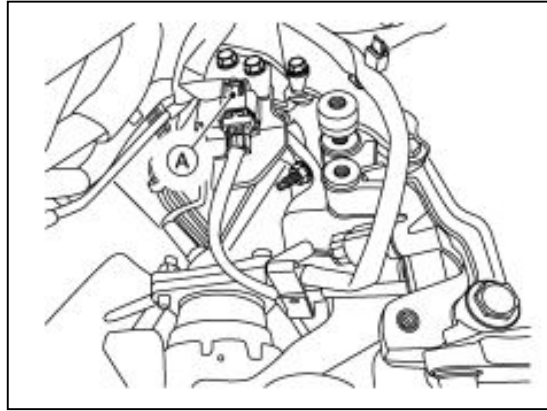


Figure 88

78. Separate the harness (1) from the bracket (2).

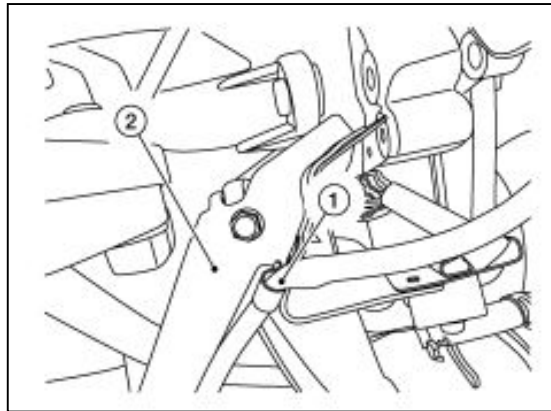


Figure 89

79. Remove the Three way catalyst (bank 1).
- Refer to Exhaust Manifold and Three Way Catalyst "Exploded View" in the Engine Mechanical section of the FSM.

**HINT:** Removal of the exhaust manifold is not necessary.

80. Remove bolts (A) and remove engine mount bracket [rear (1)].

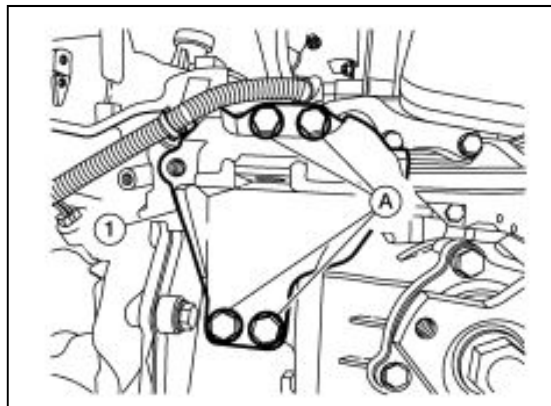


Figure 90

81. Remove rear gusset and transfer gusset.
- Refer to Transfer Assembly "Exploded View" in the Driveline section of the ESM.

82. Remove bolts (A), (B) and (C).

**NOTICE**

To avoid damage to the CVT, do not damage the oil seal inside the CVT.

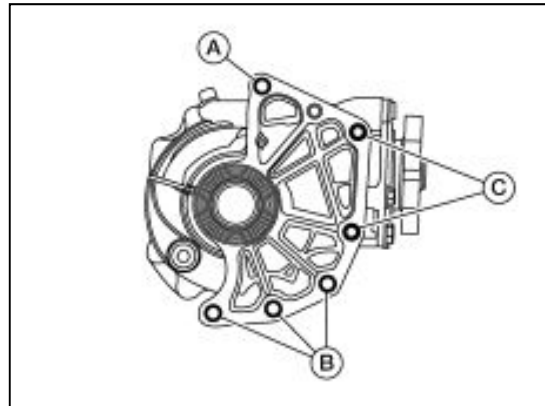


Figure 91

83. Remove transfer assembly from the vehicle.
84. Using Tools, lower engine and transaxle assembly until the transaxle assembly is low enough to clear driver's side frame rail.
- Tool (A): NI-52389
  - Tool (B): NI-53119
85. Disconnect the harness connector from the starter motor "S" terminal.
- Refer to Starter Motor "Exploded View" in the Starting System section of the ESM.
86. Remove nut and remove "B" terminal harness and position aside.
- Refer to Starter Motor "Exploded View" in the Starting System section of the ESM.
87. Remove starter motor bolts and remove starter motor.
- Refer to Starter Motor "Exploded View" in the Starting System section of the ESM.

88. Using a suitable tool, release the clip.

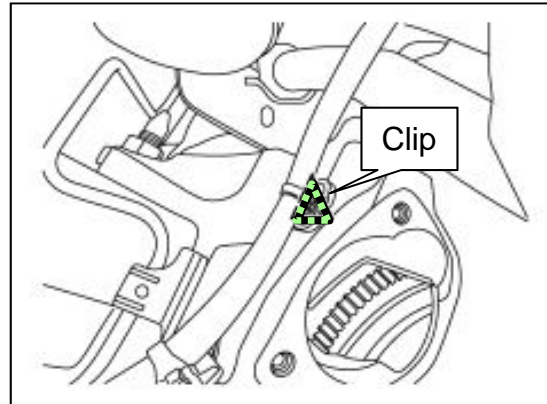


Figure 92

89. Remove bolt (A) and remove CVT fluid charging pipe (1).

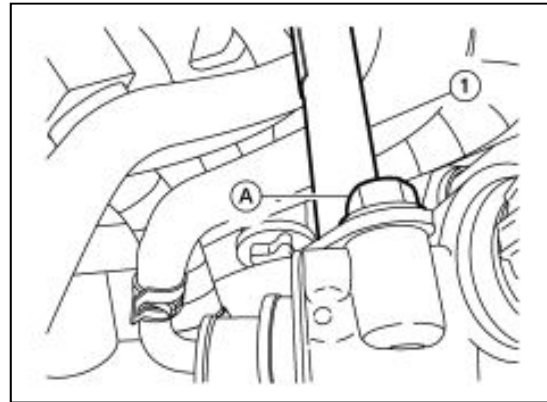


Figure 93

90. Separate the harness retainers from the transaxle assembly.

91. Remove bolt (A) and remove CVT fluid charging pipe (1).

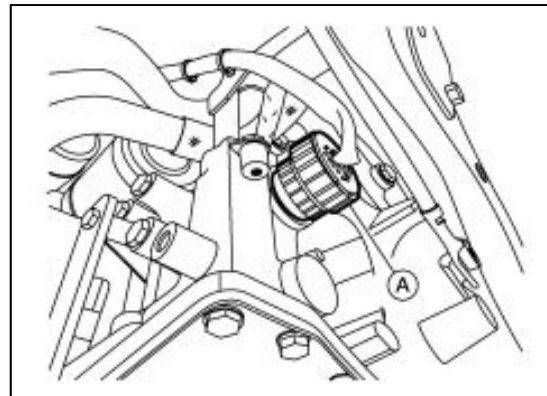


Figure 94

92. Disconnect the harness connector from the output speed sensor.
  - Refer to Output Speed Sensor "Exploded View" in the Transaxle and Transmission section of the ESM.
93. Disconnect the harness connector from the primary speed sensor.
  - Refer to Primary Speed Sensor "Exploded View" in the Transaxle and Transmission section of the ESM.
94. Disconnect the harness connector from the input speed sensor.
  - Refer to Input Speed Sensor "Exploded View" in the Transaxle and Transmission section of the ESM.
95. Support transaxle assembly using a suitable transmission jack and Tool.
  - Tool Number: NI-51307

**CAUTION**

To avoid the risk of minor personal injury or property damage:

- Always secure transaxle assembly to transmission jack.
  - Do not lift or support transaxle assembly using the bottom of oil pan or damage can occur.
96. Remove bolts (A), (B), (C), and (D).

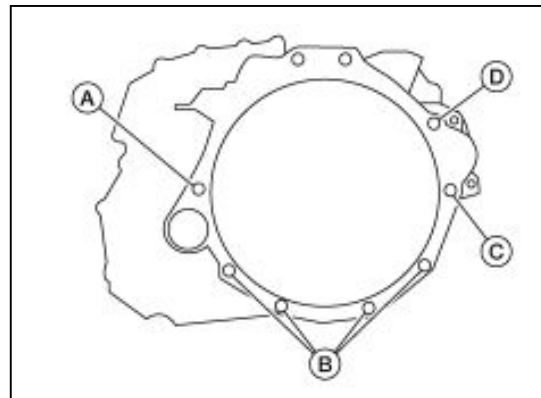


Figure 95

97. Separate the transaxle assembly from the engine assembly and lower transaxle assembly.

**CAUTION**

To avoid the risk of minor personal injury or property damage, secure the torque converter to the transaxle while removing the transaxle to prevent the torque converter from falling.



## Installation (AWD)

98. Installation is in the reverse order of removal.  
Perform Inspection Before Installation (AWD). Refer to "**Inspection Before Installation (AWD)**" below.
- If the same transaxle assembly will be reinstalled, replace differential side oil seal and transfer case seal.
    - Refer to Differential Side Oil Seal "Exploded View" in the Transaxle and Transmission section of the ESM.
  - If a new transaxle assembly is being installed, write down the serial number of the new transaxle assembly.

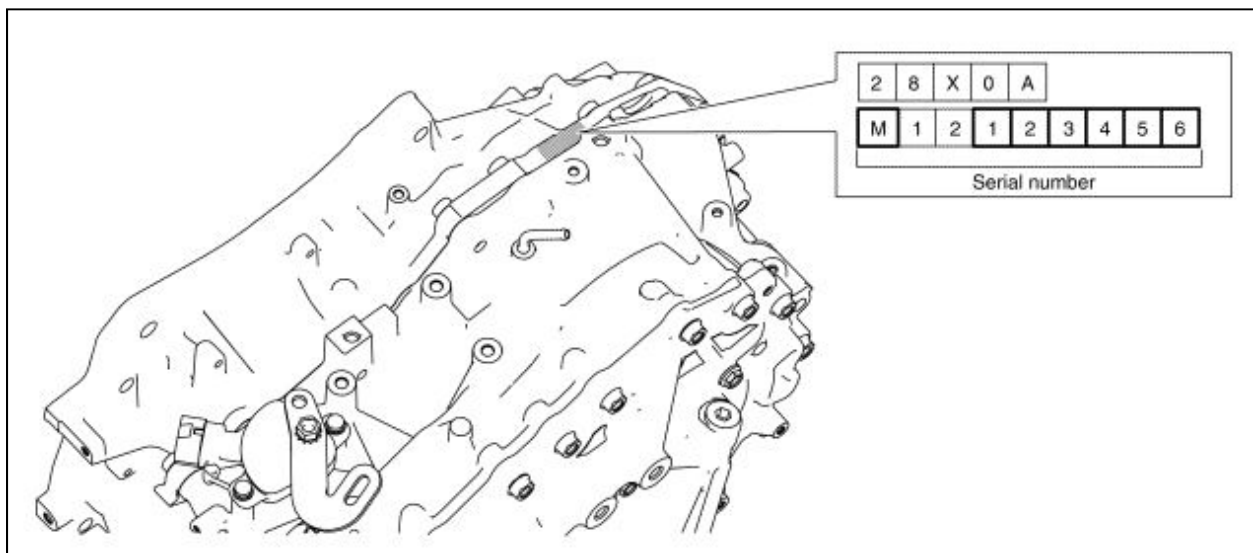


Figure 96

**⚠CAUTION**

To avoid the risk of minor personal injury or property damage:

- When replacing an engine or transaxle you must make sure any dowels are installed correctly during re-assembly.
- Improper alignment caused by missing dowels may cause vibration, oil leaks or breakage of drivetrain components.
- Do not reuse O-rings or copper sealing washers.
- When turning crankshaft, turn it clockwise as viewed from the front of the engine.
- When tightening the nuts for the torque converter while securing the crankshaft pulley bolt, be sure to confirm the tightening torque of the crankshaft pulley bolt.
  - Refer to Front Timing Chain Case "Removal and Installation" in the Engine Mechanical section of the ESM.
- After torque converter is installed to drive plate, rotate crankshaft several turns to check that CVT rotates freely without binding.
- When installing the CVT to the engine, align the matching mark on the drive plate with the matching mark on the torque converter.
- Do not reuse differential side oil seal or transfer case seal.
- When installing the CVT to the engine, align the matching mark on the drive plate with the matching mark on the torque converter.

**HINT:**

- When installing the drive plate to torque converter nuts, tighten them temporarily, and then tighten the nuts to the specified torque.
  - Refer to "Exploded View" in the Transaxle and Transmission section of the ESM.
- Install the transaxle assembly and engine assembly mounting bolts according to the following standards.

Bolt No.	1		2		3		4		5
Number of bolts	1		2		1		1		4
Bolt length "ℓ" mm (in)	52 (2.05)	47 (1.85)	36 (1.42)	47 (1.85)	29 (1.14)	47 (1.85)	44 (1.73)	47 (1.85)	39.8 (1.57)
Tightening torque N·m (kg-m, ft-lb)	74.5 (7.6, 55)	62 (6.3, 46)	74.5 (7.6, 55)	62 (6.3, 46)	74.5 (7.6, 55)	62 (6.3, 46)	74.5 (7.6, 55)	62 (6.3, 46)	50.0 (5.1, 37)

Figure 97

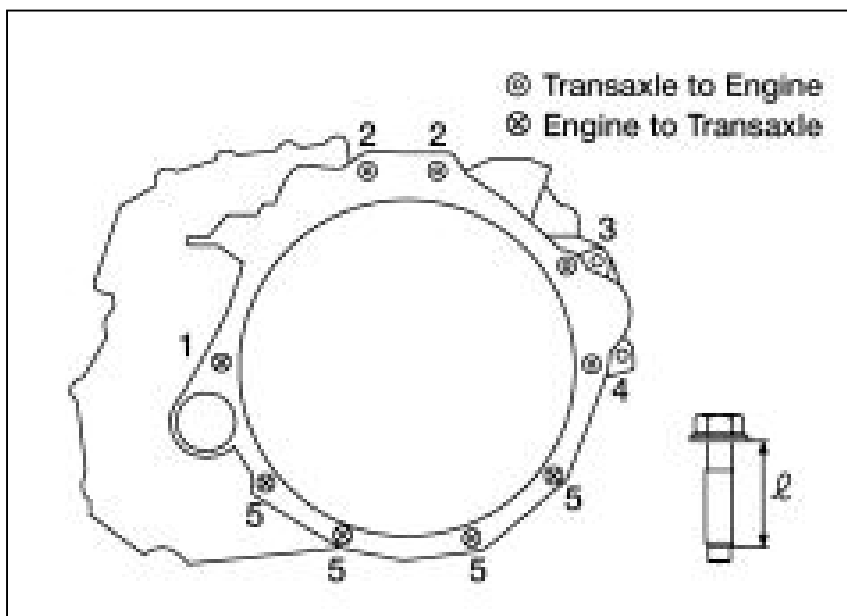


Figure 98

- When installing the transfer to the transaxle, install the bolts following the standard below.

Bolt No.	(A)	(B)
Quantity	4	2
Bolt length "l" mm (in)	40 (1.57)	40 (1.57)

Figure 99

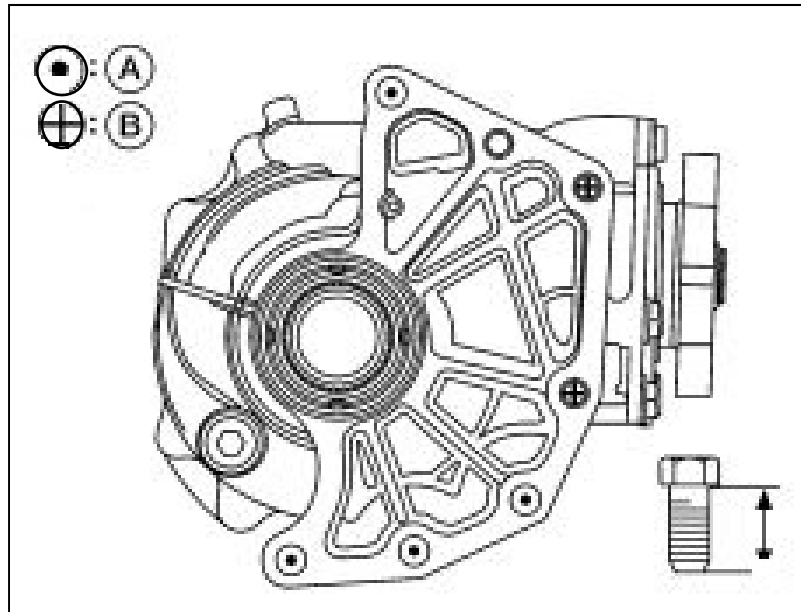


Figure 100

## Inspection Before Installation (AWD)

99. After inserting a torque converter to the CVT, check that dimension (A) is within the reference value limit.

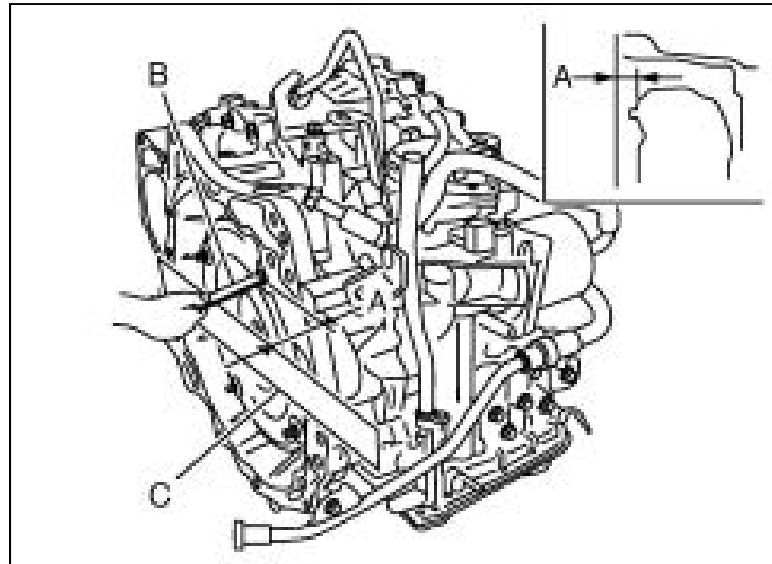


Figure 101

- **Dimension A:** Refer to "Service Data and Specifications (SDS)" in the Transaxle and Transmission section of the ESM.
- **B:** Scale
- **C:** Straightedge

## Adjustment After Installation (AWD)

100. Perform the following:

- Adjust CVT position.
  - Refer to "Adjustment" in the Transaxle and Transmission section of the ESM.
- Check and adjust power steering fluid.
  - Refer to "Periodic Maintenance" in the Steering System section of the ESM.
- Check and adjust transfer case fluid.
  - Refer to "Periodic Maintenance" in the Driveline section of the ESM.
- Check and adjust the engine coolant level.
  - Refer to "Changing Engine Coolant" in the Engine Cooling System section of the ESM.
- Adjust the CVT fluid level.
  - Refer to "Adjustment" in the Transaxle and Transmission section of the ESM.
- Perform accelerator pedal released position learning.
  - Refer to "Description" in the Engine Control section of the ESM.
- Perform throttle valve closed position learning.
  - Refer to "Description" in the Engine Control section of the ESM.
- Perform front wheel alignment.
  - Refer to "Wheel Alignment" in the Front Suspension section of the ESM.
- Perform adjustment of steering angle sensor neutral position.
  - Refer to "Description" in the Brake Control System section of the ESM.

## Inspection After Installation (AWD)

101. Inspect the following items:

- Inspect CVT fluid leakage.
  - Refer to "Inspection" in the Transaxle and Transmission section of the ESM.
- Inspect transfer assembly for leaks.
  - Refer to "Inspection" in the Driveline section of the ESM.
- Inspect power steering system for leaks.
  - Refer to "Inspection" in the Steering System section of the ESM.
- Inspect CVT shifter position.
  - Refer to "Inspection" in the Transaxle and Transmission section of the ESM.
- Start the engine and inspect for coolant leaks.

## CLAIMS INFORMATION

Submit a Primary Part (PP) type line claim using the following claims coding:

DESCRIPTION	OP CODE	FRT
CVT R & I	JD01AA	(1)

- (1) The new procedure in the bulletin will alter the Flat Rate Time (FRT) for operations involving removal of the CVT from the vehicle. Refer to the current Nissan Warranty Flat Rate Manual for the current FRTs.

## AMENDMENT HISTORY

PUBLISHED DATE	REFERENCE	DESCRIPTION
February 27, 2024	NTB24-015	Original bulletin published
March 22, 2024	NTB24-015A	2020 model year added to <b>APPLIED VEHICLES</b>