



# TECHNICAL SERVICE BULLETIN

Classification: AT21-010A	Reference: NTB22-021A	Date: February 23, 2023
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## DTC P0746, P0776, P0841, P0965, P17F0 AND/OR P17F1 STORED IN THE TCM

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

**APPLIED VEHICLES:** 2018-2022 Kicks (P15)  
2020-2022 Versa (N18)

**APPLIED TRANSMISSIONS:** CVT (RE0F11B)

### IF YOU CONFIRM

One or more of the following DTCs are stored:

- P17F0 – CVT JUDDER (T/M INSPECTION)
- P17F1 – CVT JUDDER (C/V INSPECTION)
- P17F2 – CVT JUDDER (T/C INSPECTION)
- P0746 – PRESSURE CONTROL SOLENOID A
- P0776 – PRESSURE CONTROL SOLENOID B
- P0841 – TRANSMISSION FLUID PRESSURE SEN/SW A
- P0875 – T/M FLUID PRESS SENSOR/SWITCH
- P0965 – PRESSURE CONTROL SOLENOID B
- P2857 – CLUTCH A PRESSURE
- P2858 – CLUTCH B PRESSURE
- P2859 – CLUTCH A PRESSURE
- P285A – CLUTCH B PRESSURE

### IMPORTANT:

- If DTCs are stored other than those listed above, this bulletin **does not apply**.
- If DTCs P17F0 and/or P17F1 are the only DTCs stored and there is no customer complaint of judder, this bulletin **does not apply**.
- If ONLY P0875 T/M FLUID PRESS SENSOR/SWITCH is stored, refer to the ESM.
- NTB20-060, **2018-2019 Kicks; Enhanced Diagnostic Logic For CVT**, has reprogramming instructions that may apply.

### ACTION

Refer to the **REPAIR OVERVIEW** on page 2.

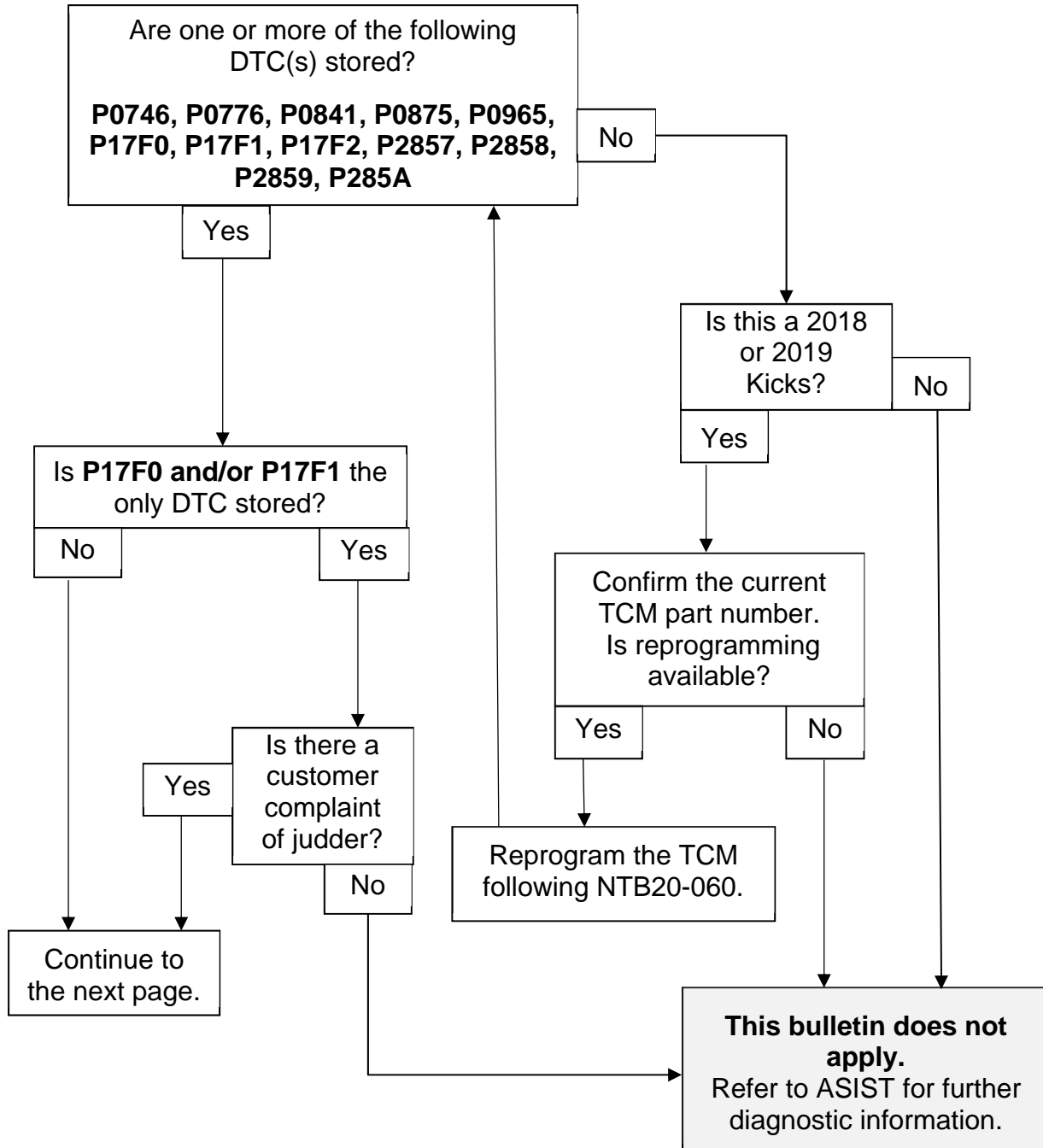
**IMPORTANT:** The purpose of **ACTION** (above) is to give you a quick idea of the work you will be performing. You **MUST** closely follow the entire **SERVICE PROCEDURE** as it contains information that is essential to successfully completing this repair.

Nissan 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.

## REPAIR OVERVIEW

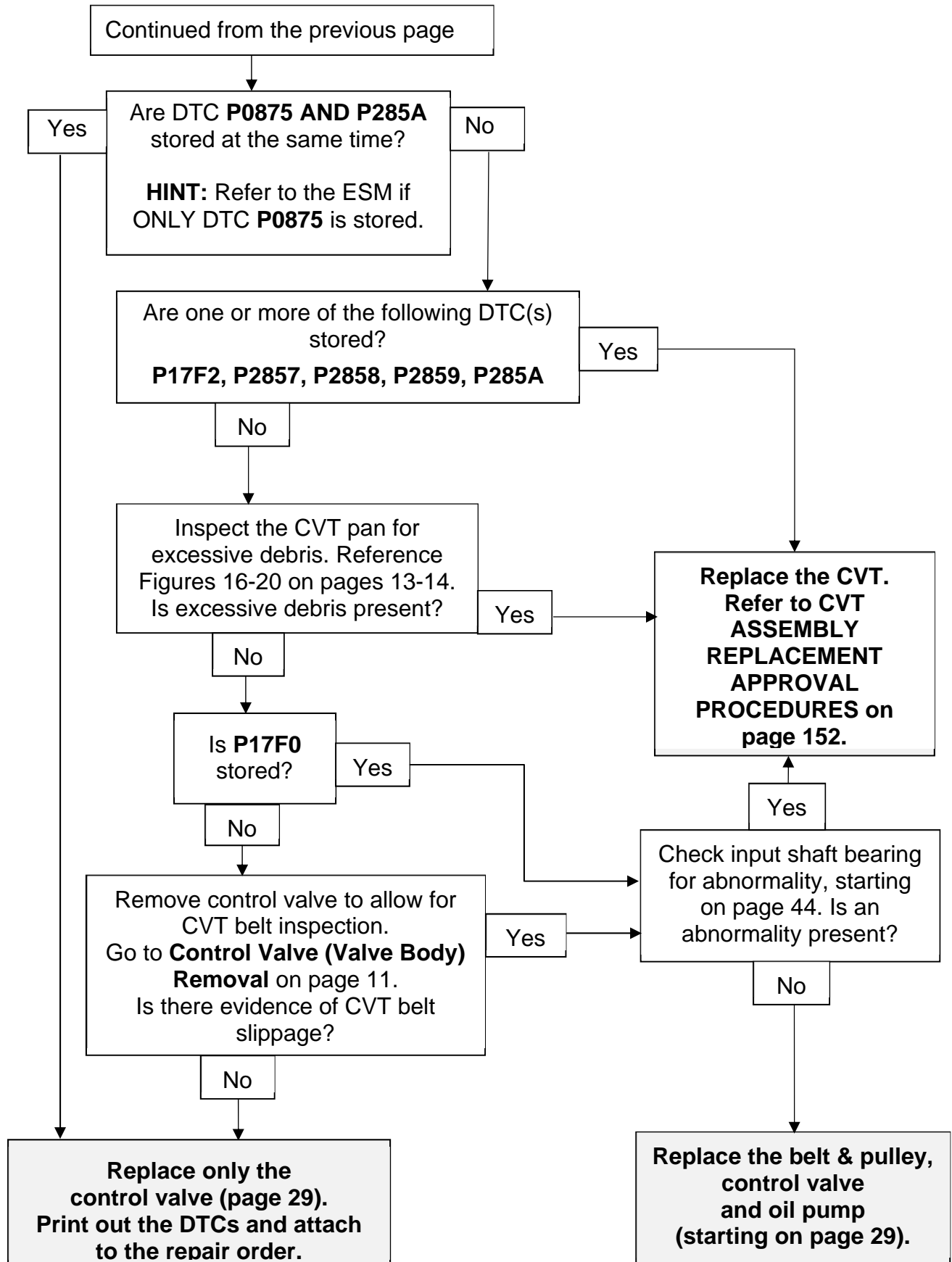
### **CAUTION**

To avoid the risk of minor personal injury or property damage, always handle the CVT and component assemblies carefully.



Continued on the next page

## REPAIR OVERVIEW (continued)



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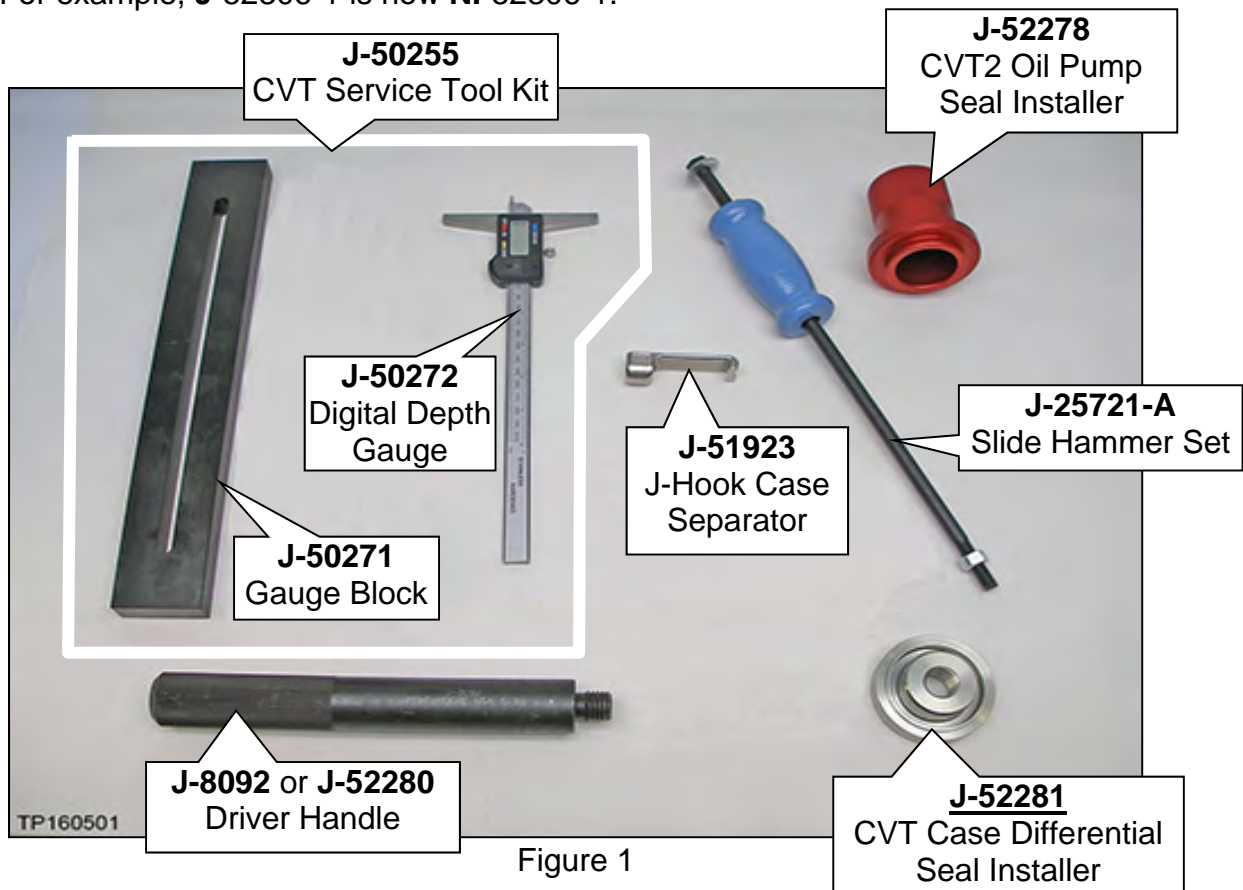
## REQUIRED TOOLS / MATERIALS

- Petroleum jelly or equivalent
- Extendable magnet
- Large clean surface / 1 to 2 work tables
- Brake cleaner
- Rubbing alcohol
- Plastic scraper
- Mallet
- Sandpaper

## Essential Special Service Tools

New or replacement Essential Tools are available from Tech•Mate online:  
[www.techmatetools.com](http://www.techmatetools.com), or by phone: 1-833-397-3493

**HINT:** When ordering, keep in mind that the tool part number prefix has changed from “J” to “NI”. For example, J-52306-1 is now NI-52306-1.





## Essential Special Service Tools (continued)

### Tech Cam J-51951

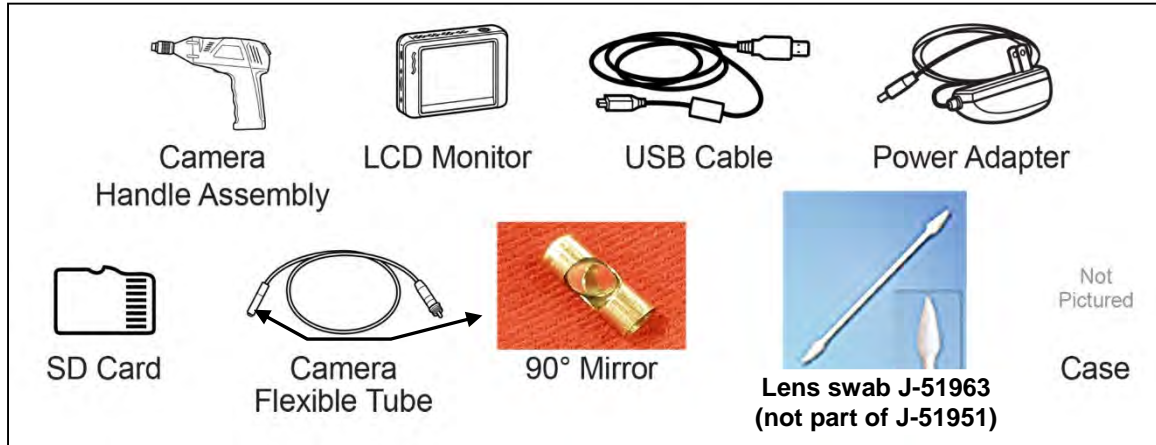


Figure 3

**J-52306-1 and J-52306-2**  
Transmission Range Switch  
Alignment Bracket and Pin



Figure 4

**J-52273** Clutch  
Engagement Tool

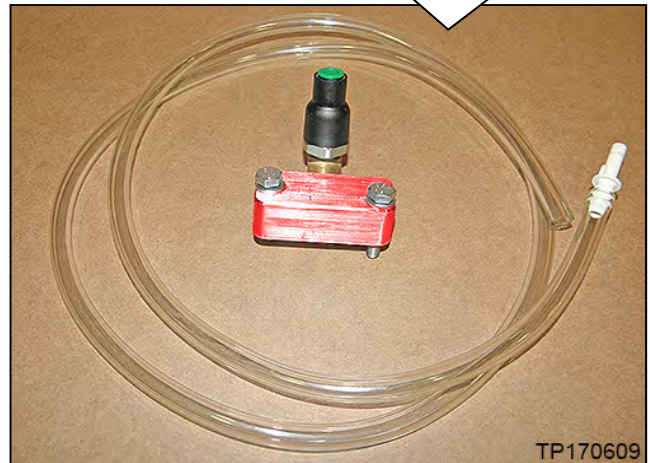


Figure 5

**J-42909** EVAP  
Pressure Test Kit

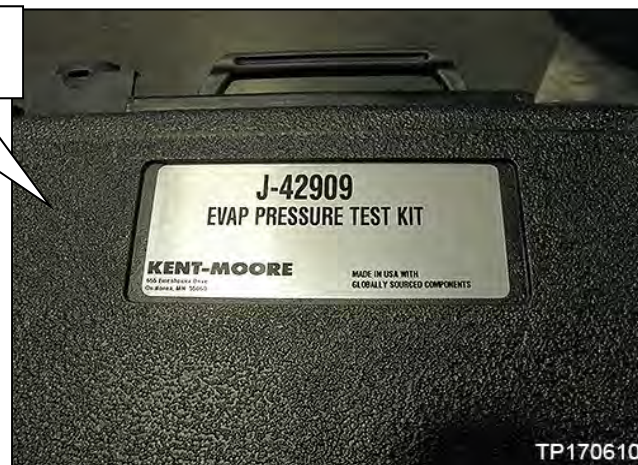


Figure 6



## Essential Special Service Tools (continued)

- Split Ring Seal Installer Kit **J-52595**



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12

### Weights

- CVT assembly: 150 lbs. approximately
- CVT sub-assembly: 40 lbs. approximately



## SERVICE PROCEDURE

**IMPORTANT:** Repairs performed for this bulletin require CONSULT-III plus (C-III plus) **Diagnostic result reporting function-Setting** be turned ON and **Diagnosis (All Systems)** be performed. If not done, it may result in a repair being non-warrantable.

### Precautions when Disassembling a CVT Assembly

#### IMPORTANT:

Transmissions are vulnerable to particle contamination (dust, metal, lint, etc.).

When disassembling a CVT, make sure your work environment (shop, workbench, etc.), transmission area (sub-frame, oil pan, harness connector, etc.), and your hands are free of any contamination.

It is essential that any foreign contamination be kept out of the CVT internals. Disassembly and re-assembly shall be carried out under the following conditions:

#### NOTICE

To prevent possible drivability concerns, cover all air breather and drive shaft holes to prevent water intrusion.

- Wash and clean the exterior of the CVT assembly prior to disassembling.
  - Work in a covered indoor room to prevent contamination of the CVT.
  - Work on clean stainless drain table.
  - Avoid debris from dropping into the converter housing, side cover or CVT case.
  - Remove any sealant remaining on bolts or mating surfaces of the converter housing, side cover and/or the CVT case using a scraper, and then clean with lint-free paper cloths.
  - Do not use cotton gloves or woven cloths. Latex or rubber gloves are recommended.
    - Only lint-free paper cloths.
  - Apply rust penetrant to locator / dowel pins on torque converter housing and side cover of CVT and allow to soak as needed.
  - Only disassemble those parts which are mentioned in this bulletin.
  - Make sure all parts are clean prior to assembling / installing.
    - Brake cleaner is acceptable to remove remaining CVT fluid and residual sealer.
    - Unpack service parts just before installation.
  - Use only specified sealant material.
- 
- Store the related parts that have been removed separately to prevent being mixed up; small cups can be used.

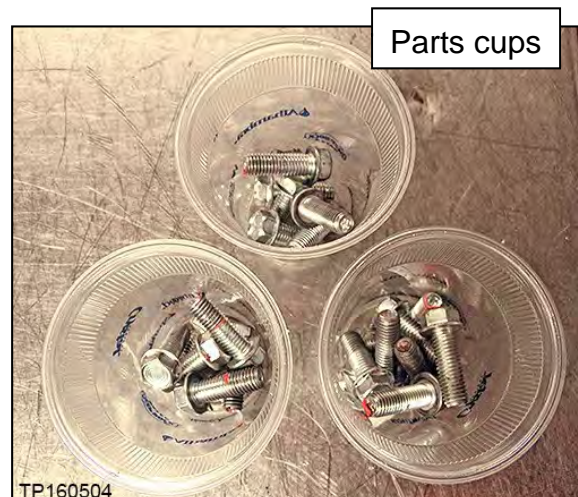


Figure 13

## **NOTICE**

**Non-warrantable damage to the CVT may occur if the steps in this procedure are not followed in order.**

### **Inspection for Abnormal Noise**

**HINT:** If DTCs are stored, abnormal noise may be present.

Listen for any abnormal CVT noises under the following conditions:

Set the parking brake, and start the engine.

- If an abnormal CVT noise stops once the CVT is shifted into Drive (D) or Reverse (R), this bulletin does not apply.
  - Refer to ASIST for further diagnostic information.
- If an abnormal CVT noise occurs while the CVT is in Drive (D) or Reverse (R), proceed to **Control Valve (Valve Body) Removal** on the next page.

## Control Valve (Valve Body) Removal

### NOTICE

- To avoid damage to the CVT, never allow any chemicals or fluids other than NS-3 CVT fluid or suitable cleaners to enter the CVT assembly.
- To avoid damage to the CVT, never allow any foreign debris, dust, dirt, etc. to enter the CVT assembly.

1. Write down all audio presets.

Presets	1	2	3	4	5	6
AM						
FM 1						
FM 2						
SAT 1						
SAT 2/3						
Bass	Treble		Balance	Fade	Speed Sen. Vol.	

2. Place the vehicle on a lift.
3. Before lifting the vehicle, place the transmission gear selector in Neutral.
4. Disconnect both battery cables, negative cable first.
5. Raise the vehicle, and then drain the CVT fluid by removing the drain plug.
  - Remove the engine under cover, if needed.

### CAUTION

To avoid the risk of minor personal injury, use caution when looking into the drain hole as there is the risk of fluid entering the eye.

6. Disconnect the engine room harness from the CVT.
7. Remove the fifteen (15) oil pan bolts, and then remove the oil pan and oil pan gasket.
  - Do not discard the bolts. These will be reused during assembly.

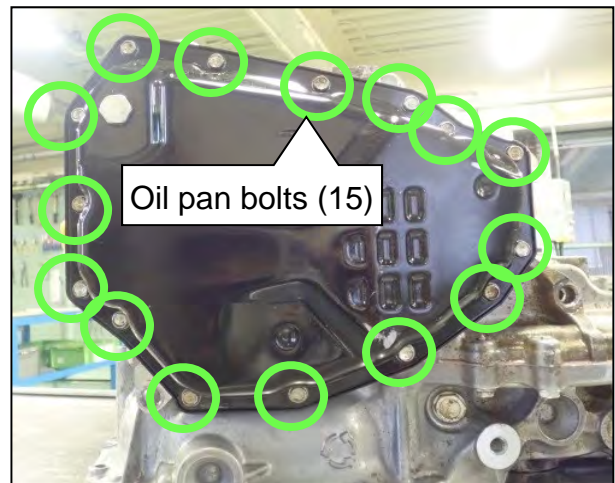


Figure 14

# Exploded View

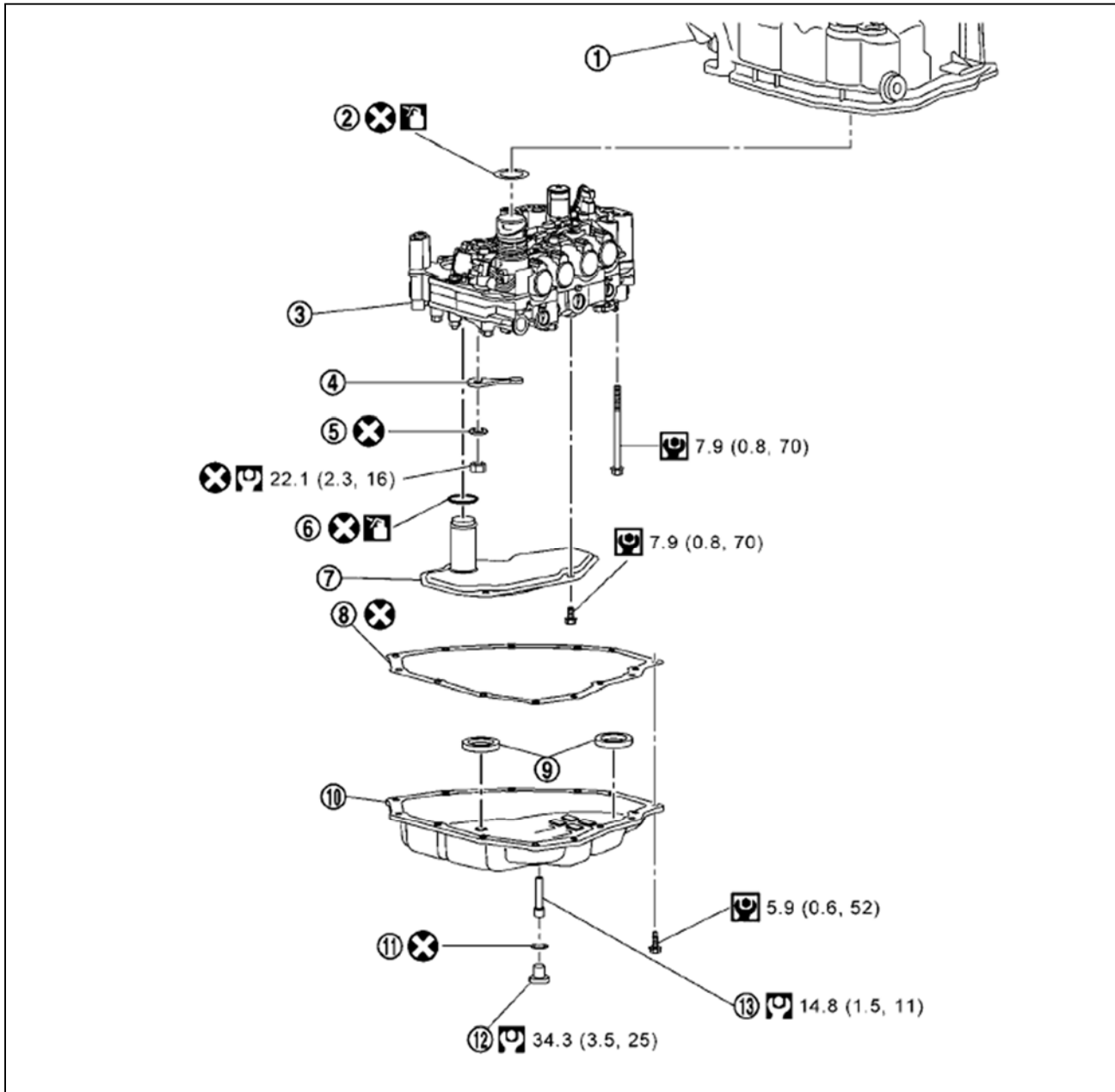


Figure 15

- 1. Transaxle assembly
- 4. Manual plate
- 7. Strainer
- 10. Oil pan
- 13. Overflow tube

- 2. O-ring
- 5. Washer
- 8. Oil pan gasket
- 11. Drain plug gasket

- 3. Control valve
- 6. O-ring
- 9. Magnet
- 12. Drain plug

- : Always replace after every disassembly.
- : N•m (kg-m, ft-lb)
- : N•m (kg-m, in-lb)

8. Inspect the inside of the CVT pan for any evidence of broken parts.

**EXAMPLE:**

- Figure 16 and Figure 17 **are acceptable for this repair** – Magnets with fine debris or sludge in any amount.

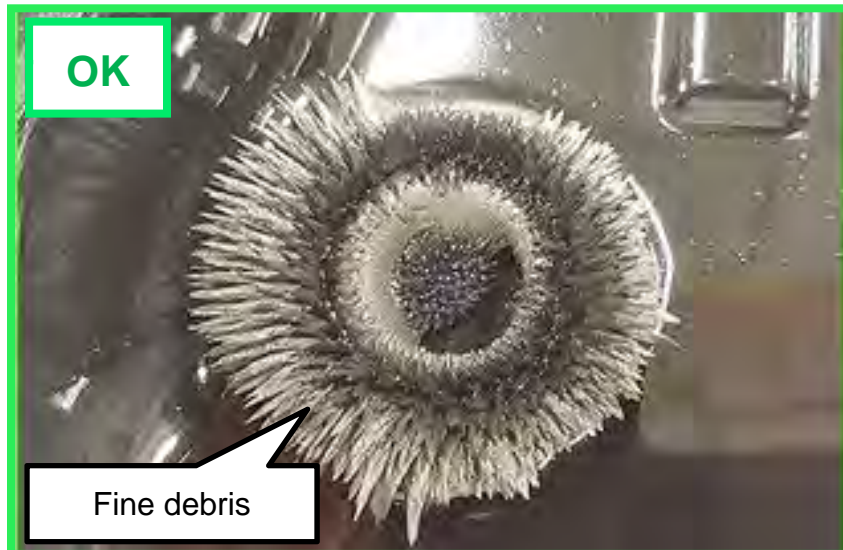


Figure 16

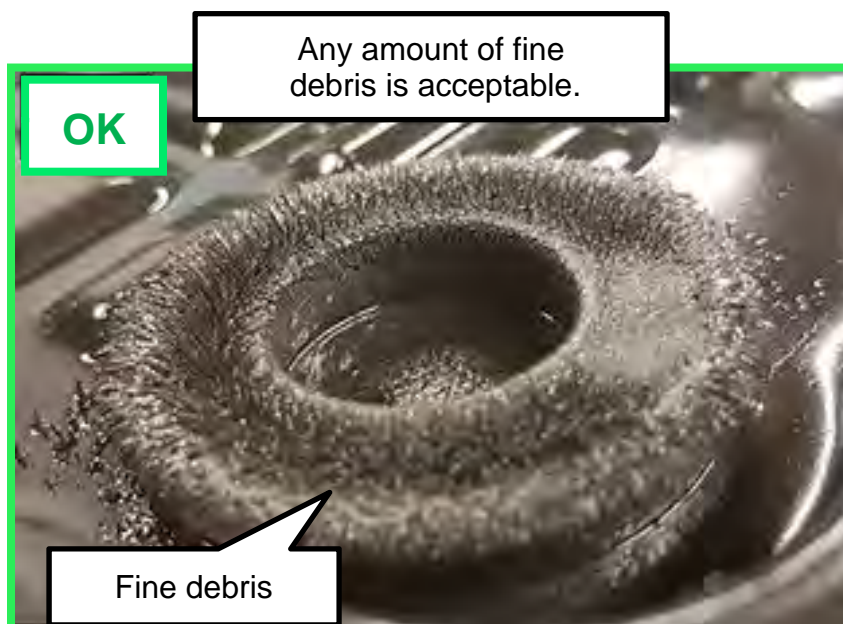


Figure 17

Continue to the next page.



- Figure 18, Figure 19 and Figure 20 are **No Good (NG)** for this repair - Broken parts would include pieces of bearings, clutch material, belt elements, etc.

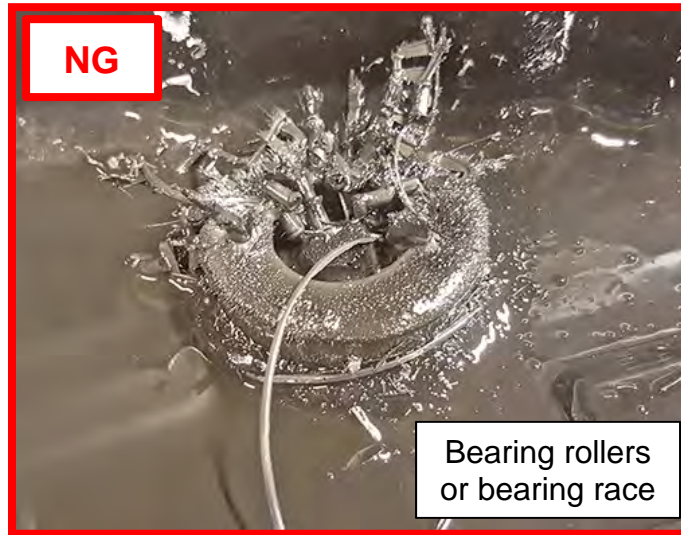


Figure 18

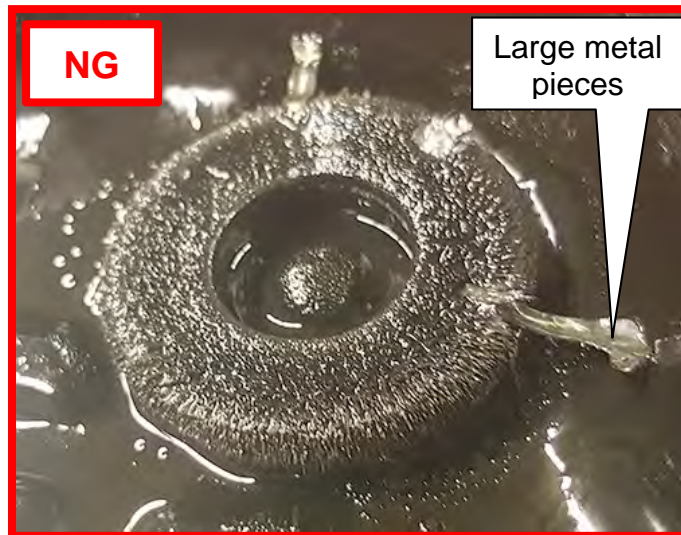


Figure 19



Figure 20

Continue to the next page.

Step 8 continued

Is there any evidence of broken parts or excessive debris?

**YES:** Replace the CVT assembly as follows:

- a. Document the debris found with a video (see page 152 for details).
- b. Re-install the CVT oil pan gasket and oil pan.
- c. Call the PCC for CVT replacement authorization (see page 152 for contact information).
- d. Refer to the ESM: **TRANSMISSION & DRIVELINE > TRANSAXLE & TRANSMISSION > CVT: RE0F11B > UNIT REMOVAL AND INSTALLATION > TRANSMISSION ASSEMBLY**

**NO:**

- If DTC P17F0 is not stored, proceed to next step to continue the repair.
- If DTC P17F0 is stored, proceed to **Remove CVT from the Vehicle and Disassemble External Parts** on page 31.

9. Remove the magnets from the oil pan.

**HINT:** The CVT pan may come with two (2) or three (3) magnets.

10. Clean the magnets.

11. Clean the CVT oil pan.

12. Reinstall the magnets to the oil pan in their original positions.

13. Remove the three (3) oil strainer bolts, and then remove the strainer from the control valve.

- These bolts will be reused.

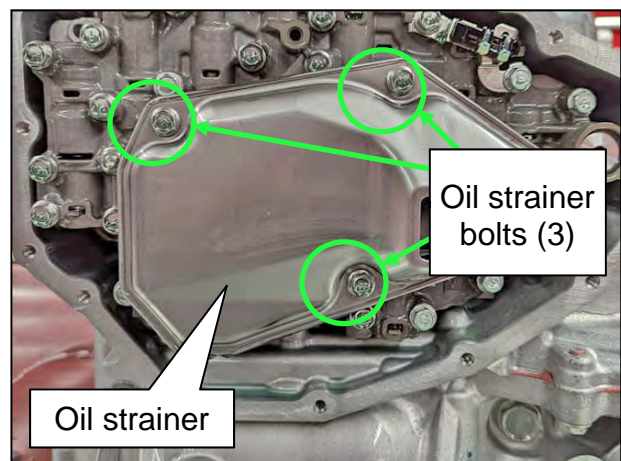


Figure 21

14. Remove the nut and washer, and then remove the manual plate (Figure 22 and Figure 23).

- Use a screwdriver to hold the manual plate to keep the shaft from rotating while removing the nut.
- Do not discard the nut and the washer. These will be reused during assembly.

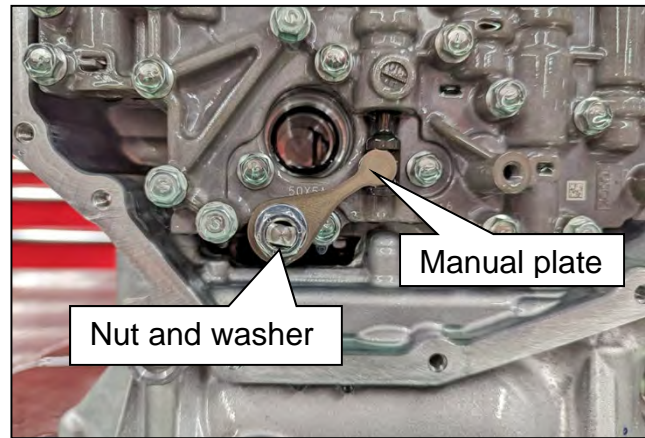


Figure 22

15. Clean around the CVT unit harness connector to prevent foreign materials from entering into the CVT case (picture not shown).

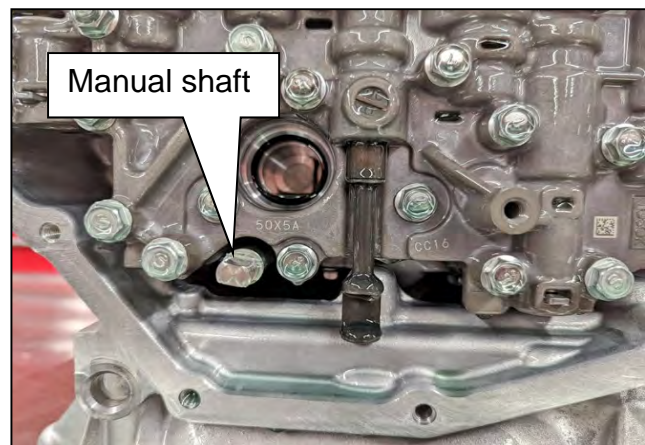


Figure 23

16. Remove ONLY the eleven (11) control valve bolts circled in green in Figure 24.

- The bolts removed will be reused.

17. Press the CVT unit harness connector down, into the transaxle case, and then remove the control valve from the transaxle case.

**NOTICE**

Transaxle damage may occur if care is not taken when handling the CVT unit harness connector.

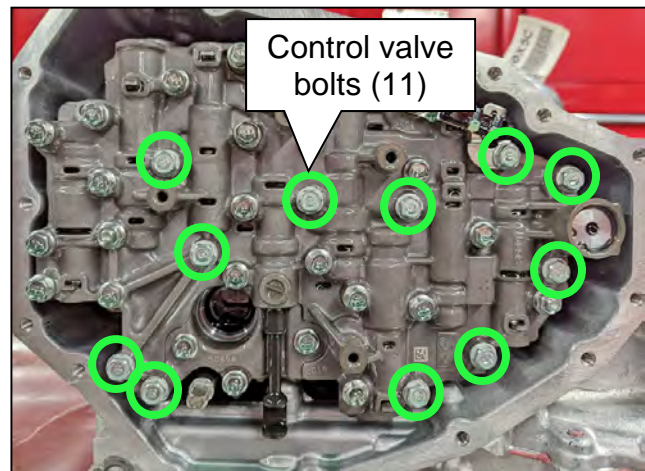


Figure 24



## CVT Belt Visual Inspection

18. Secure the passenger side (RH) front wheel with a suitable strap.
  - a. Connect the first hook of the strap to the coil spring as shown in Figure 25.
  - b. Route the strap around the center of the tire and attach the second hook through the eyelet of the first hook that is attached to the coil spring.
  - c. Tighten the strap sufficiently to keep the passenger side (RH) front tire from rotating but do not overtighten.
    - This will assist in making the belt turn during the borescope belt inspection step.

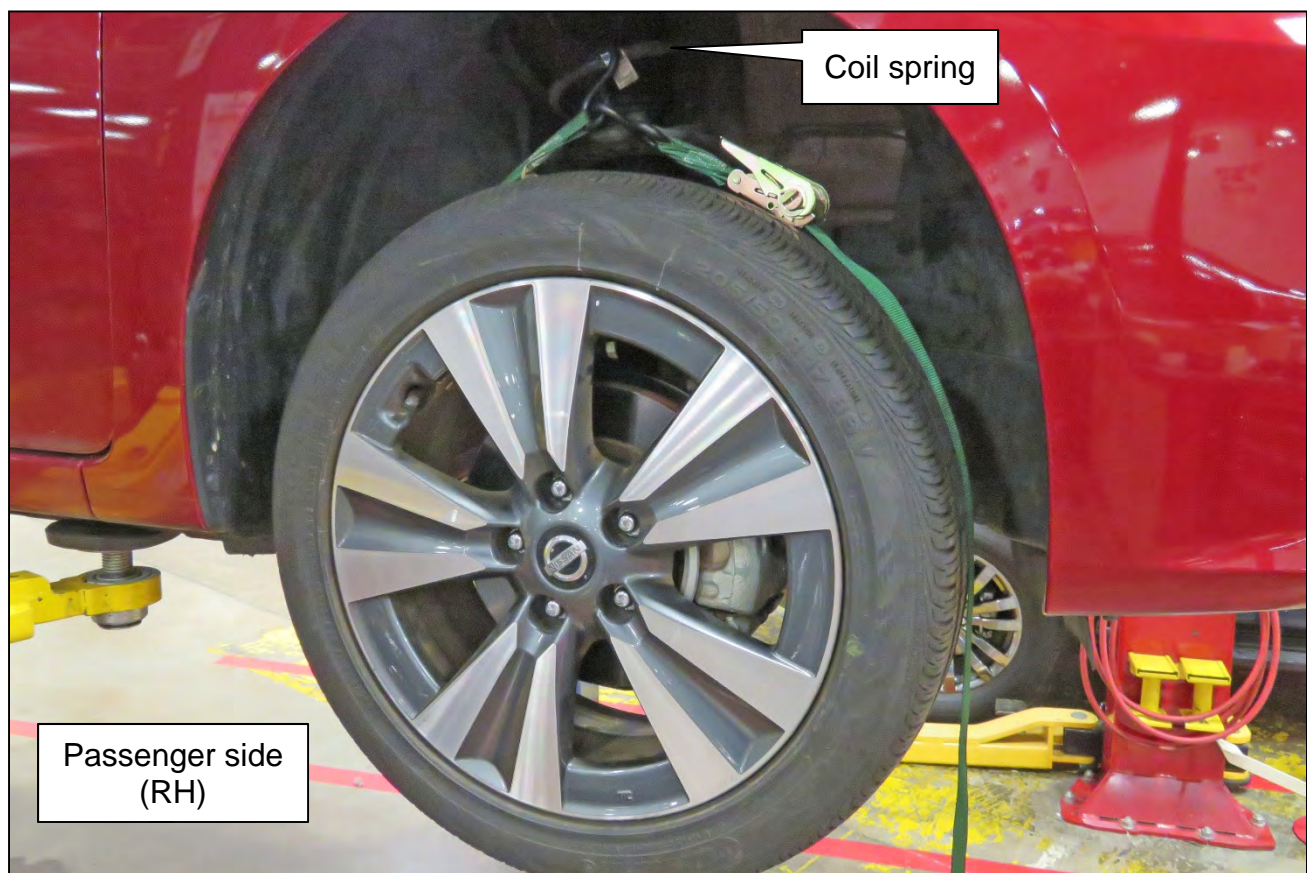


Figure 25

19. Mark the driver side (LH) front wheel with a suitable marking.
  - This will ensure all 360° of the belt are inspected.

20. Inspect the entirety of the two sides of the belt that come in contact with the pulleys (Figure 26).

**IMPORTANT:**

- Reference Figure 39 through Figure 47 on pages 25 - 28 for comparison.
- Use borescope J-51951 with mirror attachment.
- Be sure to remove the protective film from the mirror before the first use.
- Clean the camera lens and mirror before each inspection. Use 90% isopropyl alcohol, and a lens swab from Lens Swab packet J-51963 listed in **PARTS INFORMATION**, beginning on page 144.
- Before inspecting, make sure the batteries in the camera handle and LCD monitor are charged.

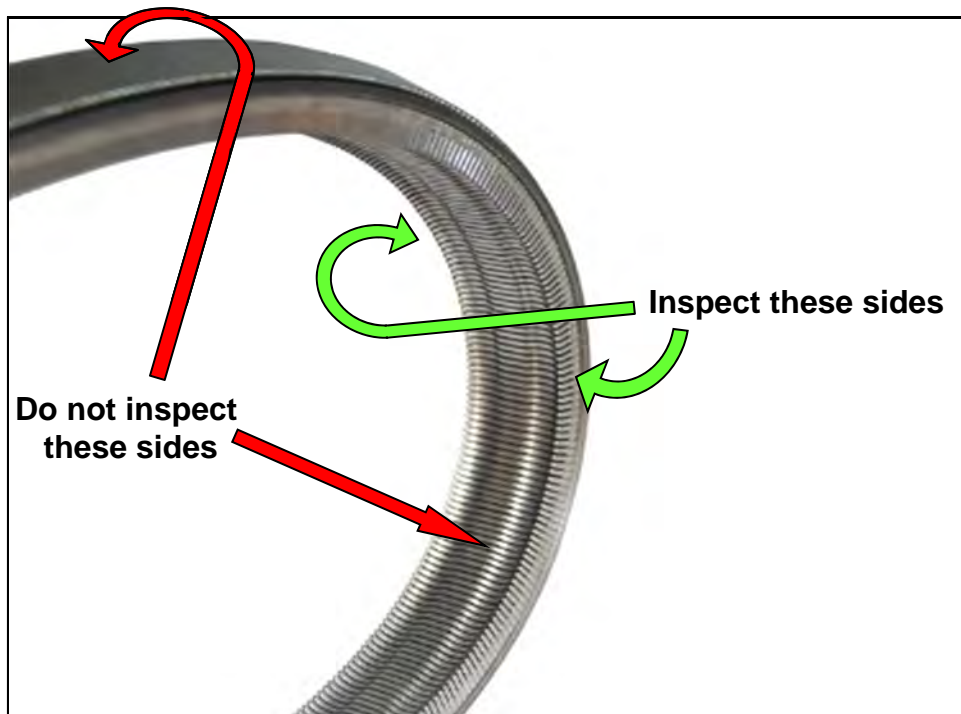


Figure 26

- a. Install the Clutch Engagement Tool (J-52273) to the CVT case with two bolts, finger tight, where shown in Figure 27 and Figure 28 on page 19.
- Bolt torque not to exceed: 2.26 N•m (0.23 kg-m, **20 in-lb.**)

**NOTICE**

- Use care when tightening the bolts as damage to the bolts/CVT could occur.
- Make sure an O-ring is installed to the Clutch Engagement Tool (J-52273) before installation as this could lead to improper/incomplete testing.



**HINT:** The O-ring for the Clutch Engagement Tool comes with the attachment. To order additional O-rings, refer to **PARTS INFORMATION** on page 144.

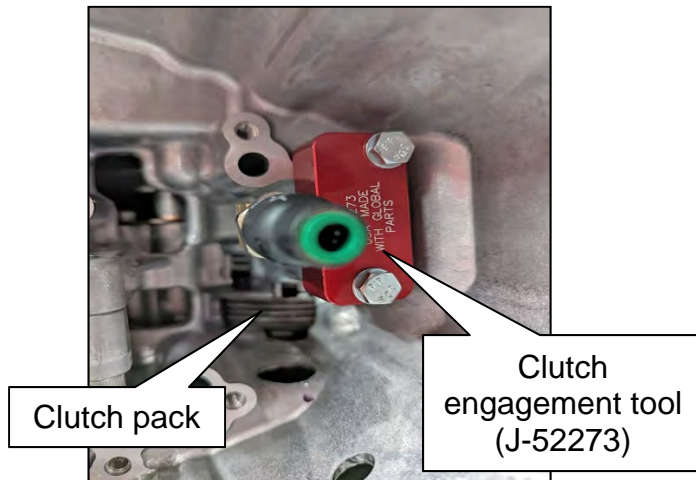


Figure 27

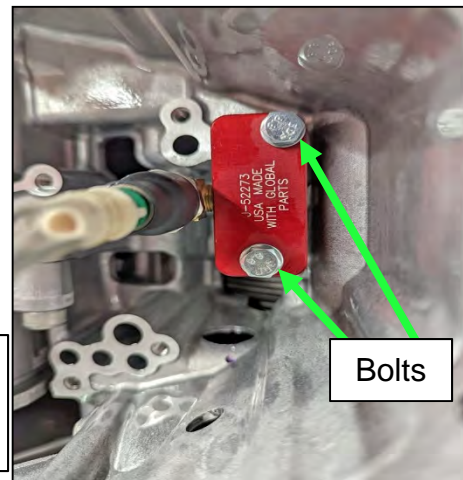


Figure 28

- b. Connect the hand pump from EVAP Pressure Test Kit (J-42909) to the Clutch Engagement Tool (J-52273) and pump to 30 PSI (Figure 29).

**IMPORTANT:** Proper pressure has been achieved when the CVT belt moves while the driver side (LH) front wheel is rotated and the CVT is in NEUTRAL with the passenger side (RH) front wheel secured.

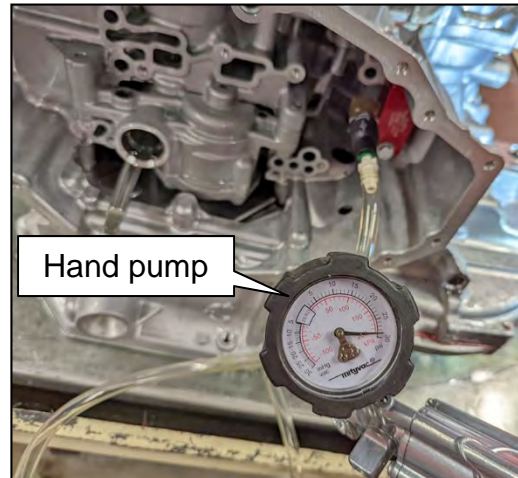


Figure 29

**NOTICE**

- Do NOT over-pressurize the system as internal damage to the CVT could result.
- The hand pump should be removed from the Clutch Engagement Tool (J-52273) quick connect once the clutch has been engaged and the belt is observed moving with tire rotation. Pressure will be retained.

c. Insert the borescope where shown in Figure 30 as follows:

- i. Face the mirror of the borescope toward the driver side of the vehicle (CVT side cover).
- ii. Insert the lens approximately 7 inches from the CVT oil pan gasket surface as shown in Figure 32 on page 21.
- iii. View the side of the belt that contacts the pulley.

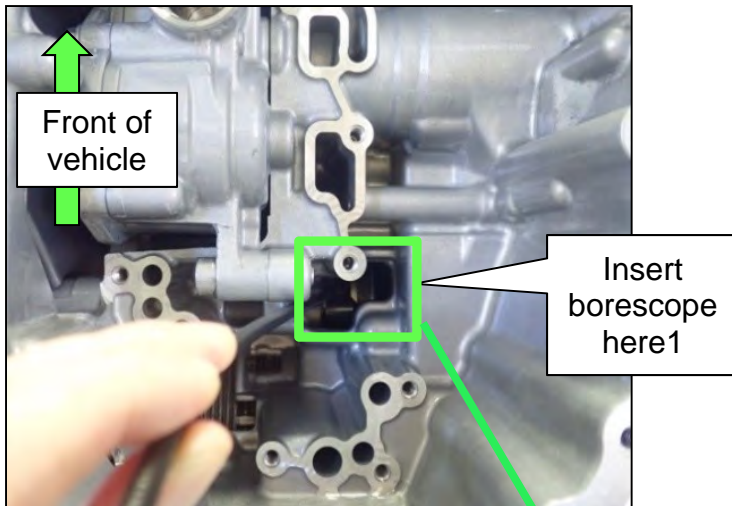


Figure 30

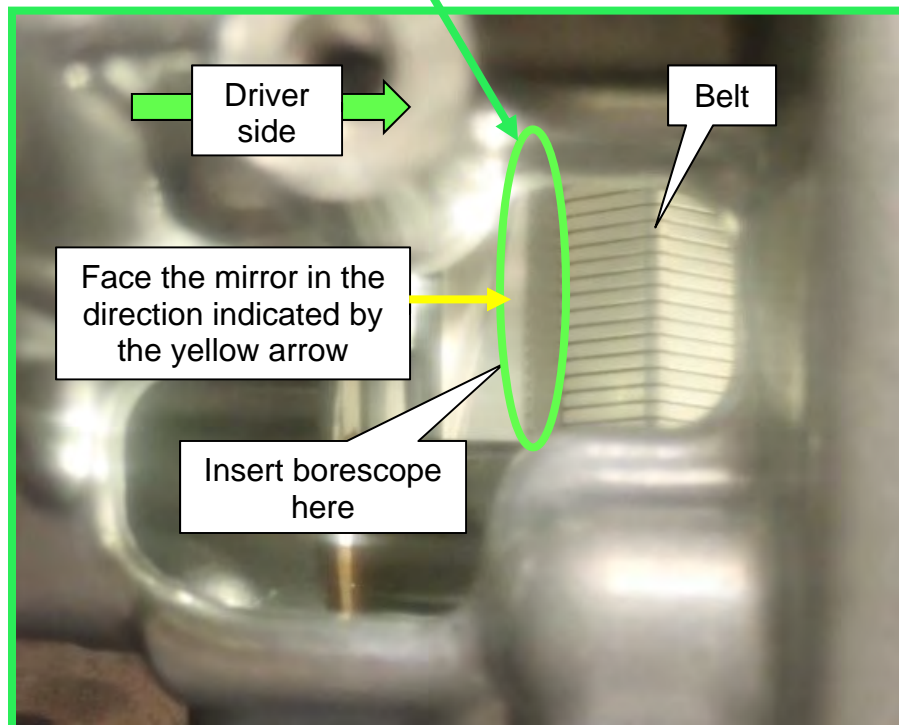


Figure 31

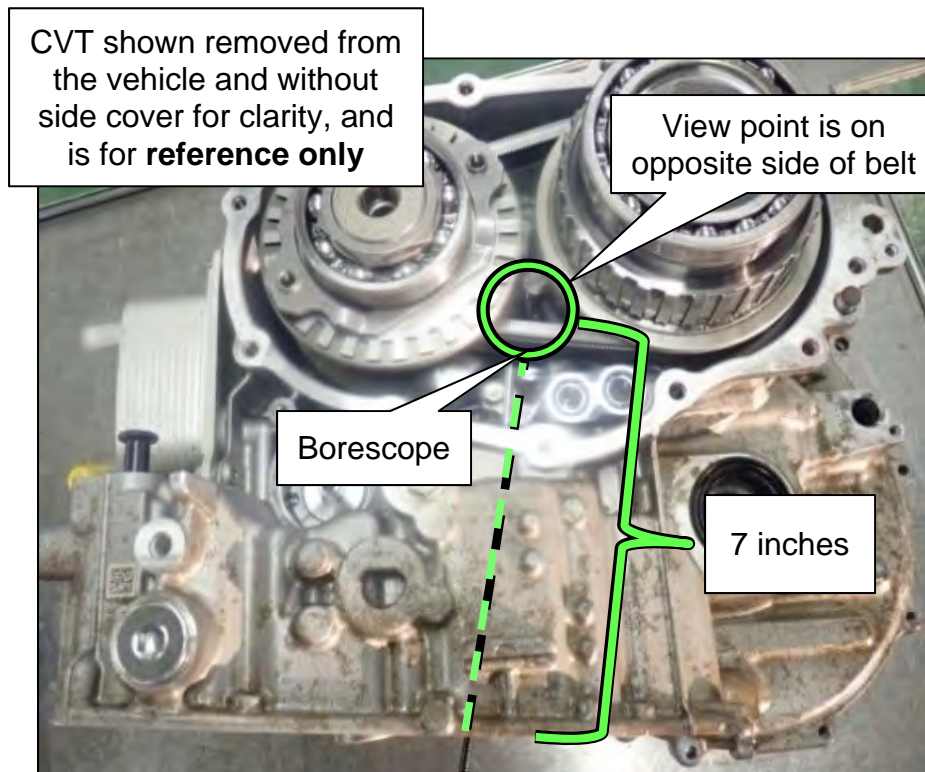


Figure 32

d. Using the mark applied to the driver side (LH) front wheel for reference, slowly and carefully rotate the driver side (LH) front wheel one full turn in either direction to view all of the belt.

- Holding the borescope (camera flexible tube) with one hand allows rotation of the wheel with the other hand (Figure 33).
- If evidence of belt slip is identified, as shown in Figure 43 through Figure 47 on pages 27 - 28, skip to step 26 on page 30.



Figure 33

- If the belt does not move when rotating the driver side (LH) front wheel, return to step 17b on page 19.

e. If the inspection result confirms that no slippage has occurred on the observed side, inspect the other side of the belt as follows:



For the following steps print this page as a template and then shape the borescope camera flexible tube like the image in Figure 34.

- Do not shrink or enlarge the sheet size when printing.
- The template shown is actual size when printed on 8.5" x 11" paper.

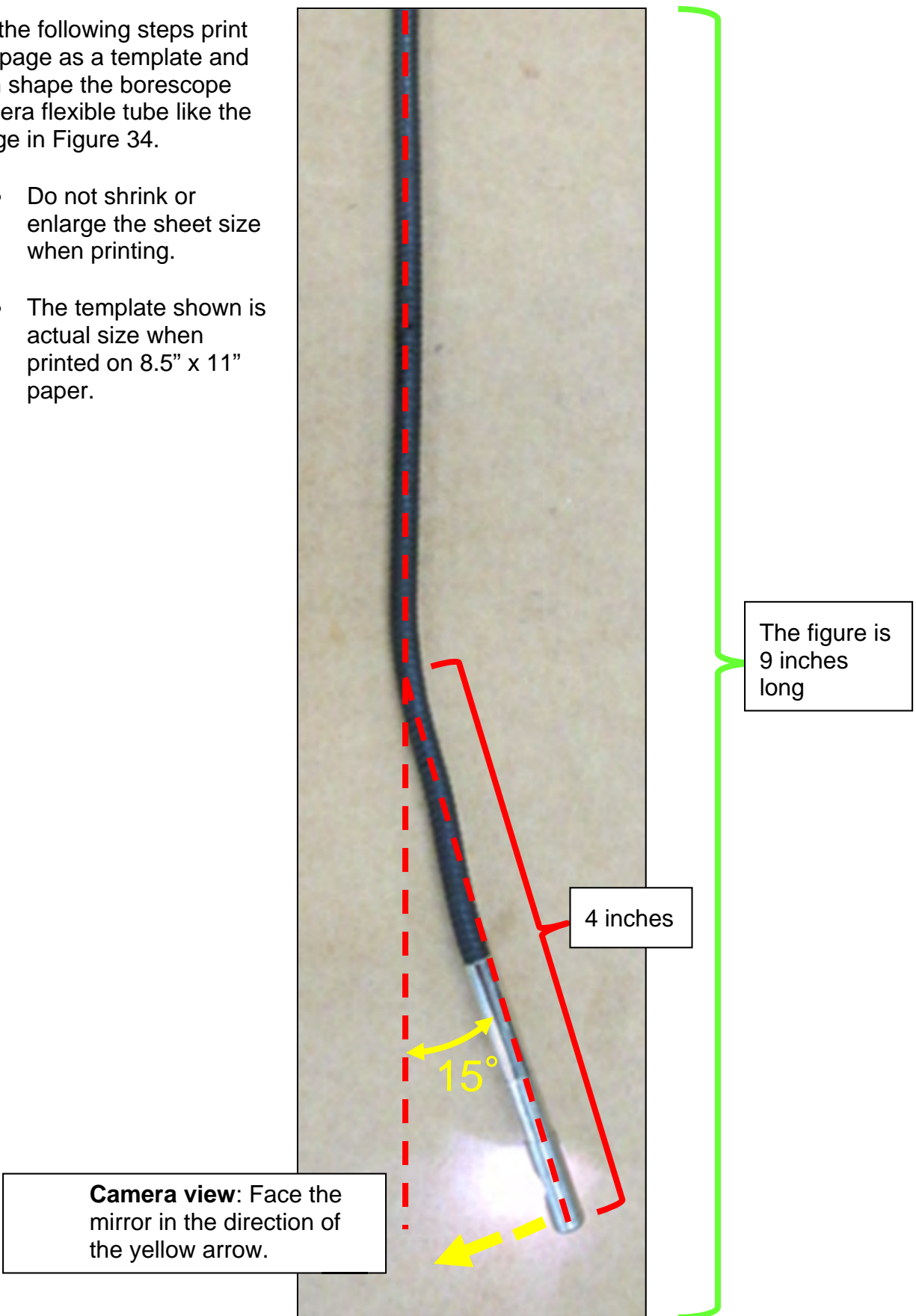


Figure 34

- i. Face the mirror of the borescope toward passenger side (engine side).
- ii. Insert the borescope in the second location, as shown in Figure 35.
- iii. Insert the lens approximately 7 inches from the CVT case rim as shown in Figure 38 on page 24.
- iv. View the side of the belt that contacts the pulley.

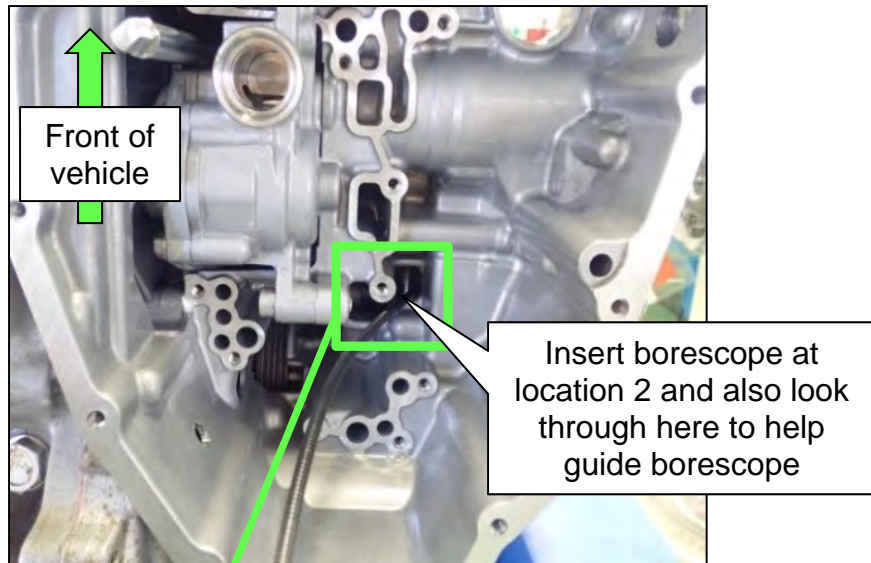


Figure 35

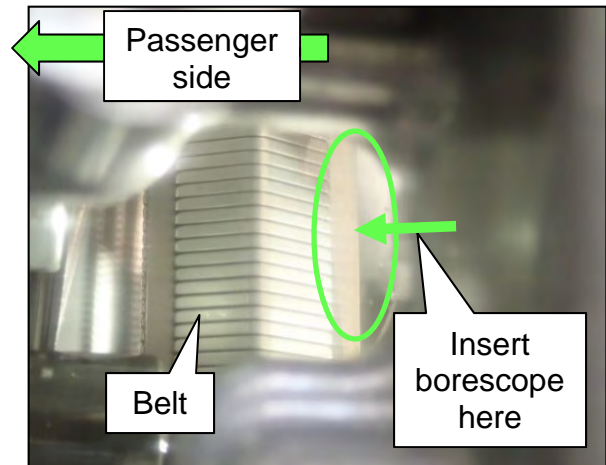
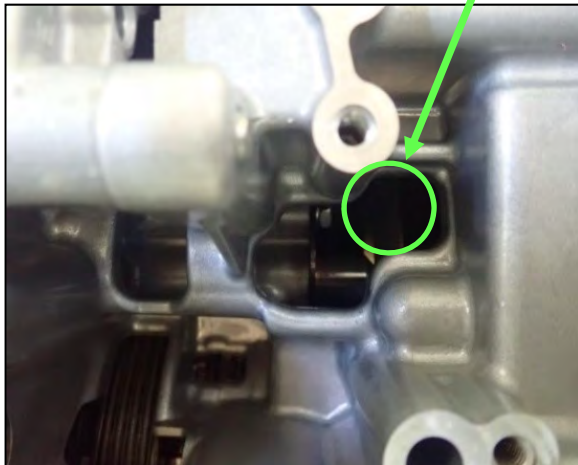


Figure 37



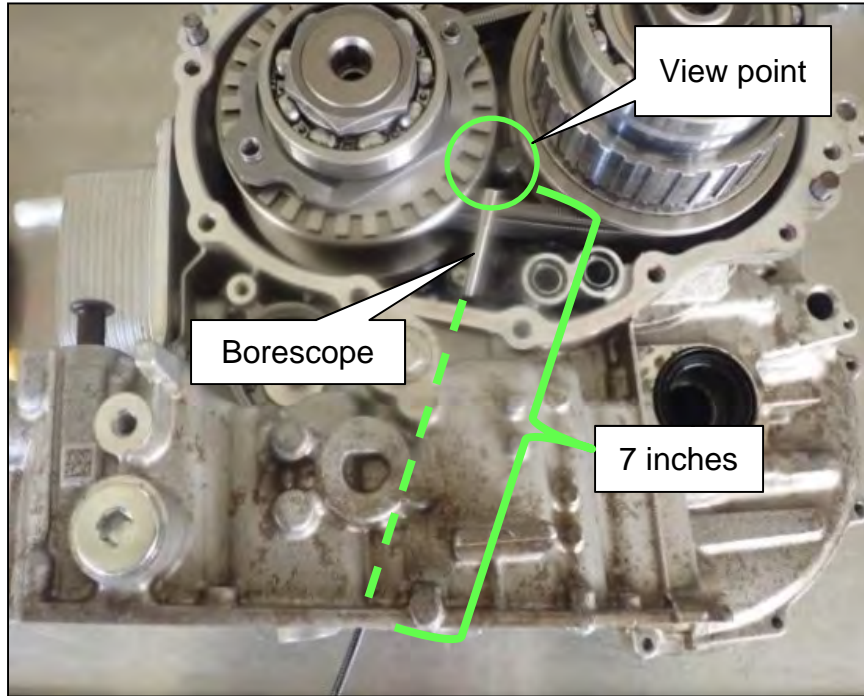


Figure 38

- f. Using the mark applied to the driver side (LH) front wheel for reference, slowly and carefully rotate the driver side (LH) front wheel one full turn in either direction to view all of the belt.
- Holding the borescope (camera flexible tube) with one hand allows rotation of the wheel with the other hand (Figure 33).  
**HINT:** If the belt does not move when rotating the driver side (LH) front wheel, supply additional air with hand pump (J-45664) to re-engage the clutch as necessary.
  - Look for evidence of belt slip as shown in Figure 43 through Figure 47 on pages 27 - 28.
- g. Is the inspection result OK (no evidence of slip) for 360° rotation of both sides of the belt?

**YES:** Go to step 21 on page 29.

**NO:** Skip to step 26 on page 30.



TP170630

Figure 39



TP170631

Figure 40

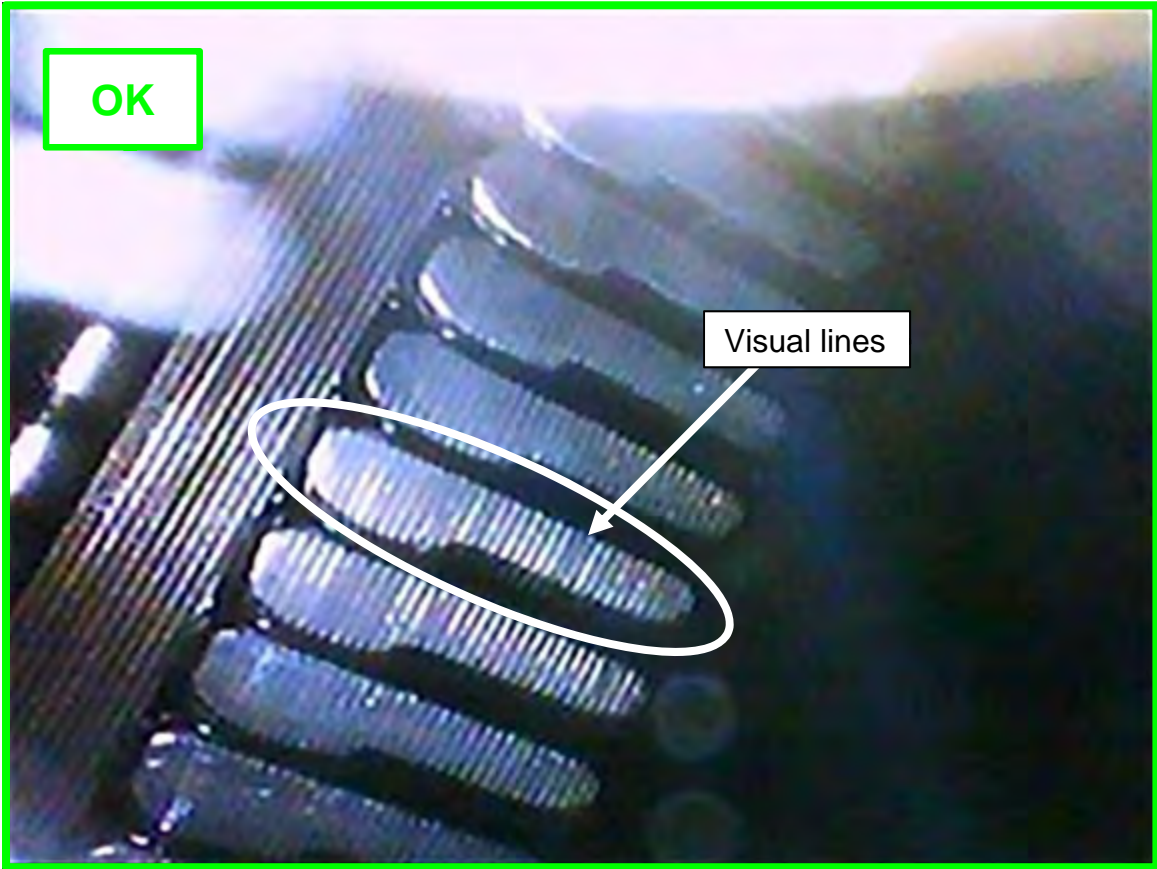


Figure 41

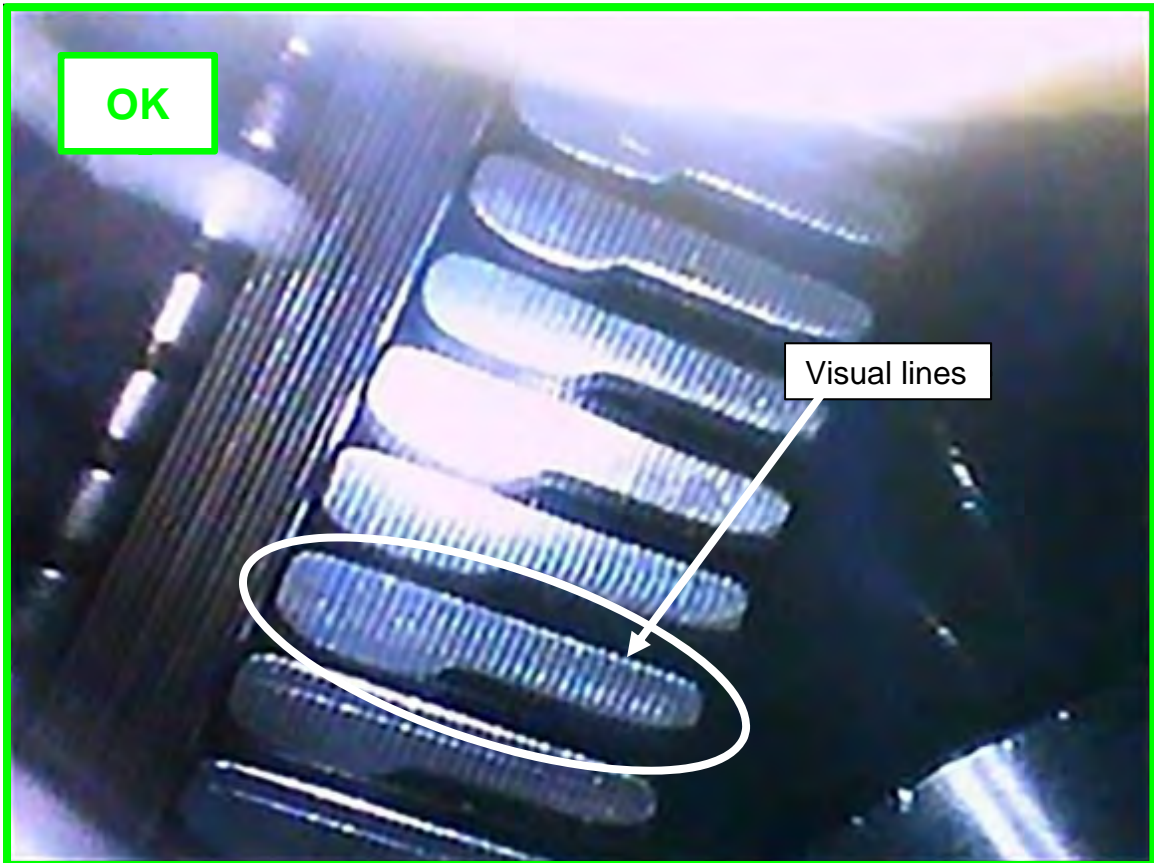


Figure 42



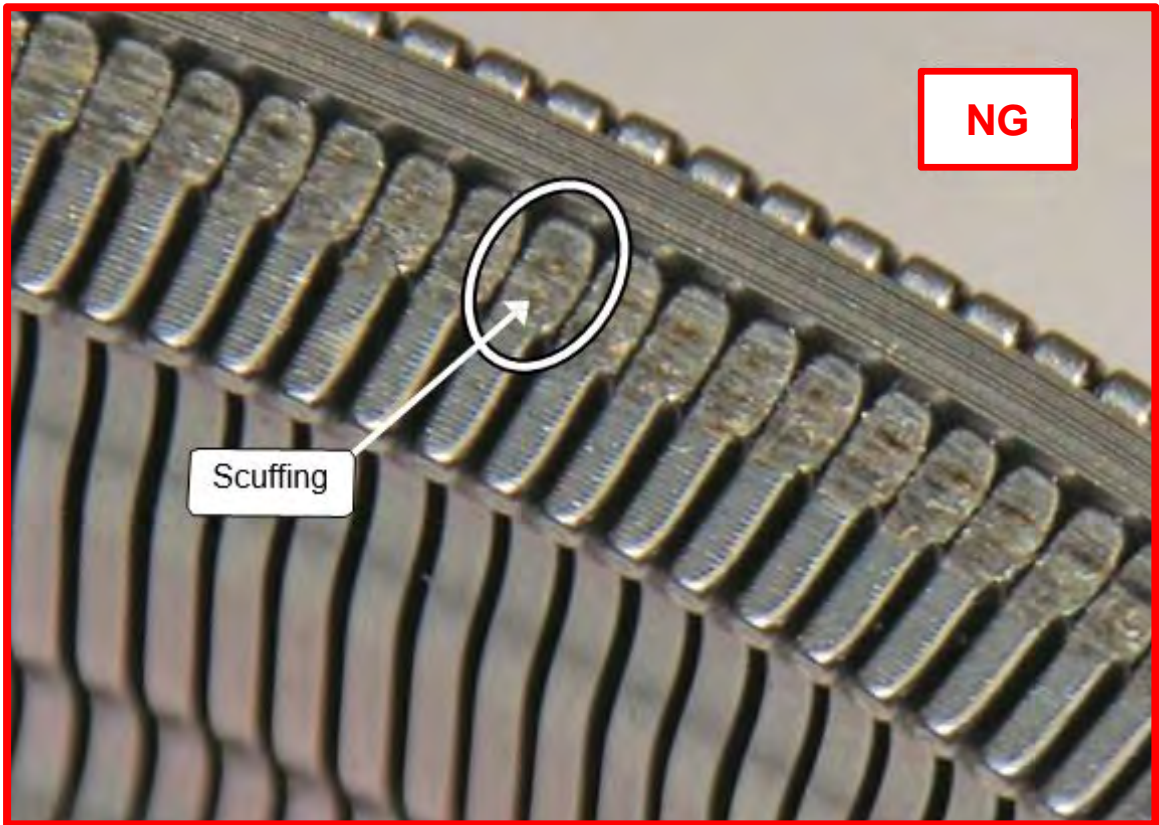


Figure 43

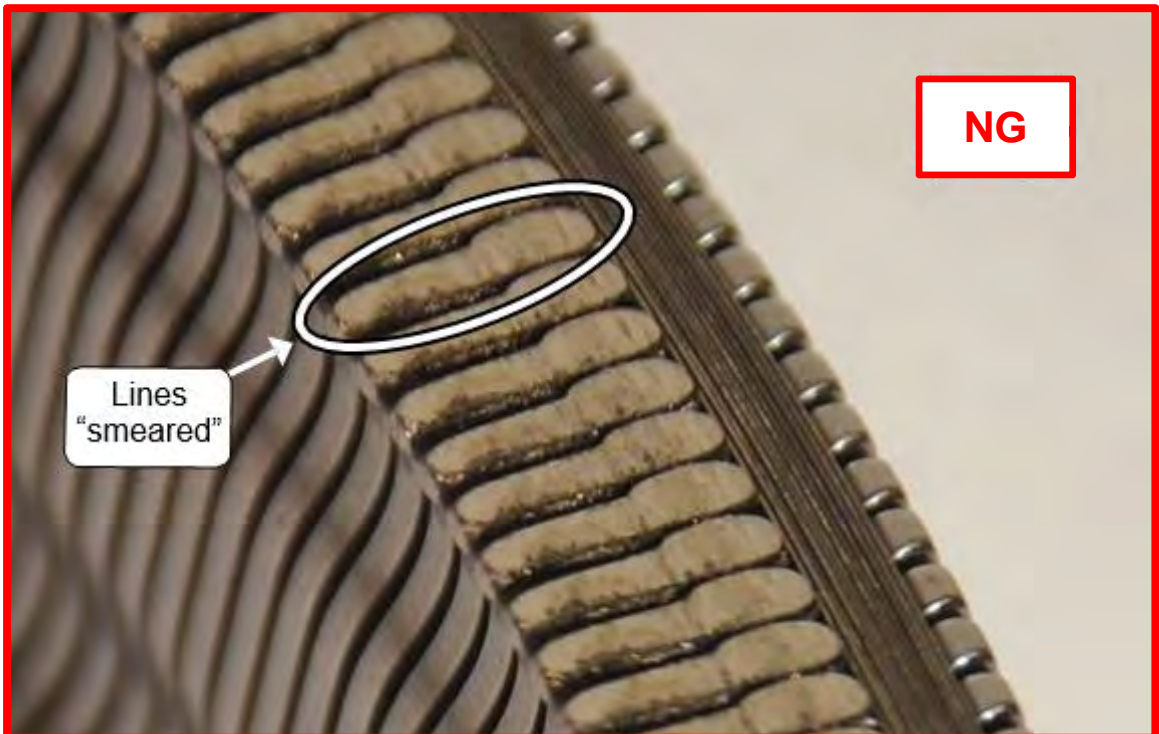


Figure 44



Figure 45



Figure 46



Figure 47



## No Belt Damage – Replace Control Valve

21. Remove the Clutch Engagement Tool J-52273 from the CVT.

### **⚠CAUTION**

To avoid the risk of minor personal injury, place a rag over the Clutch Engagement tool and SLOWLY loosen the two bolts until the audible depressurization is noted. The remaining CVT fluid may spray when the Clutch Engagement Tool is removed.

22. Install a new control valve in the reverse order of disassembly:
  - Refer to steps 162 - 173 on pages 94 - 96.
23. Connect both battery cables, negative cable last.
24. Reset/reinitialize systems as needed.
  - Refer to the ESM: **GENERAL INFORMATION > GENERAL INFORMATION > BASIC INSPECTION > ADDITIONAL SERVICE WHEN REMOVING 12V BATTERY NEGATIVE TERMINAL > After Work Procedure**, for a listing of systems that require reset/initialization after reconnecting the 12V battery.
  - This list often includes items such as radio, power windows, clock, sunroof, etc.
25. Perform **Additional Service When Replacing Control Valve or Transaxle Assembly** starting on page 110.

## Belt Damaged

26. Remove the Clutch Engagement Tool (J-52273) from the CVT.

**⚠ CAUTION**

To avoid the risk of minor personal injury, place a rag over the Clutch Engagement tool and SLOWLY loosen the two bolts until the audible depressurization is noted. The remaining CVT fluid may spray when the Clutch Engagement Tool is removed.

27. Install the original (removed) oil pan gasket and oil pan temporarily with at least two oil pan bolts, hand tight.

**IMPORTANT:** DO NOT discard the remaining oil pan bolts. These bolts will be reused.

28. Replace the belt and pulley sub-assembly and control valve.
  - Go to **Remove CVT from the Vehicle and Disassemble External Parts** on page 31.

## Remove CVT from the Vehicle and Disassemble External Parts

29. Remove the CVT from the vehicle.

- Refer to the ESM:  
**TRANSMISSION & DRIVELINE >  
TRANSAXLE & TRANSMISSION  
> CVT: RE0F11B > UNIT  
REMOVAL AND INSTALLATION  
> TRANSMISSION ASSEMBLY >  
Removal and Installation**

30. Remove the torque converter and set aside.

- The torque converter may be reused if CVT replacement is not required.

31. Put the CVT assembly on a work bench with the oil pan side down.

### **CAUTION**

To avoid minor personal injury, use assistance when placing the CVT on the work bench.

### **NOTICE**

Use care when placing the CVT on the work bench to avoid damage to the oil pan or internal CVT components.

32. Drain the CVT fluid out of the torque converter (Figure 49).

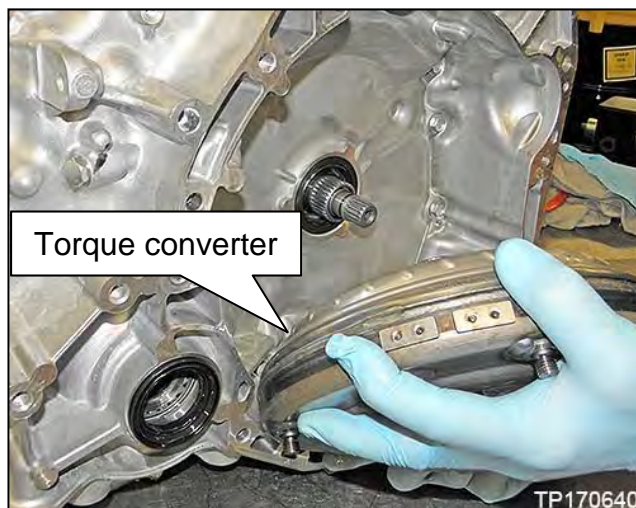
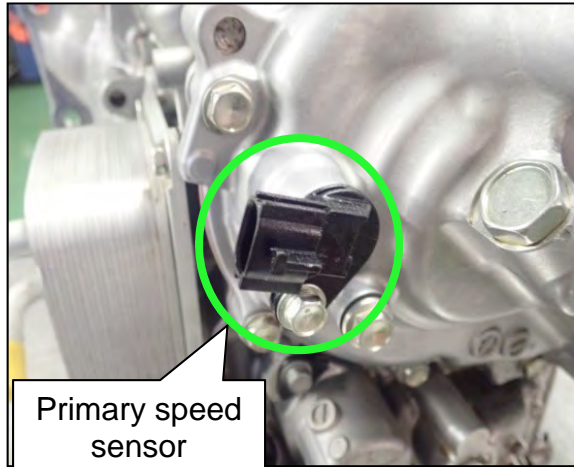


Figure 48



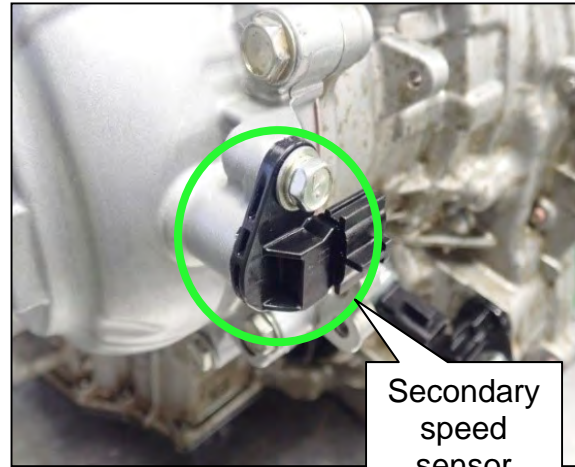
Figure 49

33. Remove the primary speed sensor, secondary speed sensor and the output speed sensor from the CVT (Figure 50, Figure 51, Figure 52 and Figure 53).



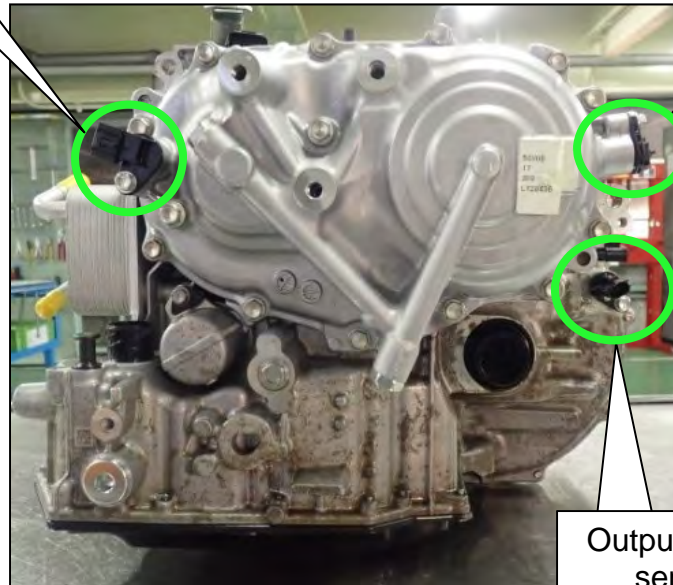
Primary speed sensor

Figure 50



Secondary speed sensor

Figure 51



Output speed sensor

Figure 52

- There are two types of output speed sensors (Figure 54 and Figure 55 on page 33).
  - Type A output speed sensor has a shim, and it will be reused.
- Remove the O-rings from all three speed sensors.
- The O-rings are one-time use parts. Do not reuse.
- Inspect all three sensors for debris on the magnet and clean as necessary.
- These sensors will be reused.



Figure 53



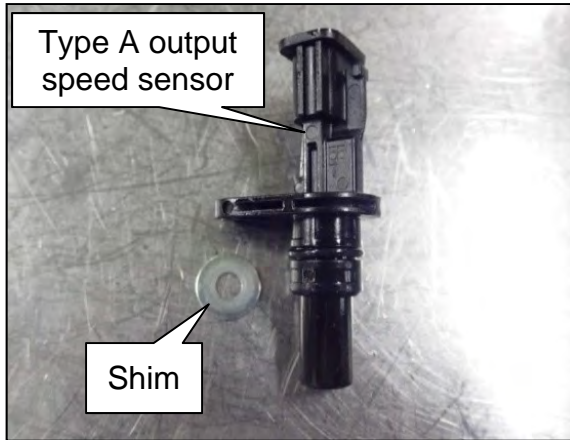


Figure 54

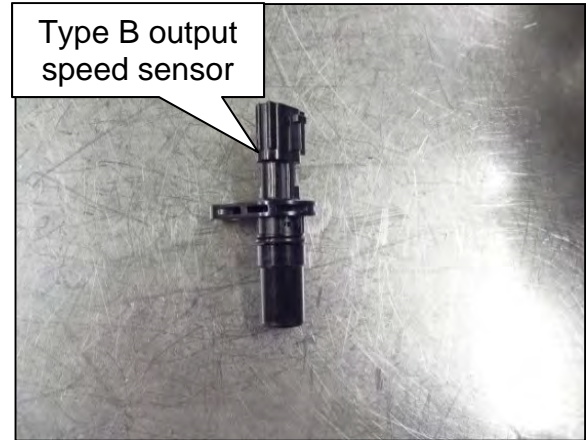


Figure 55

34. Remove the oil pressure sensor from the CVT (Figure 56 and Figure 57).
- Remove the O-ring from the oil pressure sensor.
  - The O-ring is a one-time use part. Do not reuse.
  - The sensor will be reused.

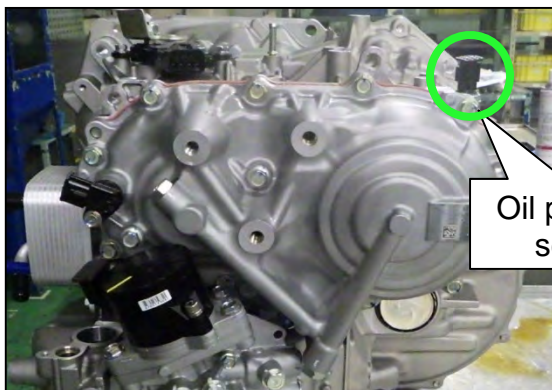


Figure 56

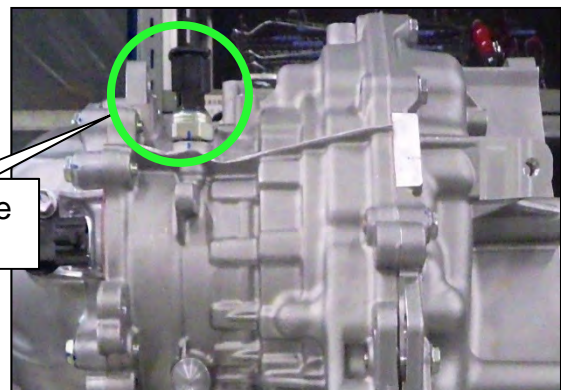


Figure 57

## Remove the Oil Filter

35. Remove the oil filter cover bolts and remove the oil filter cover.
- The bolts will be reused.

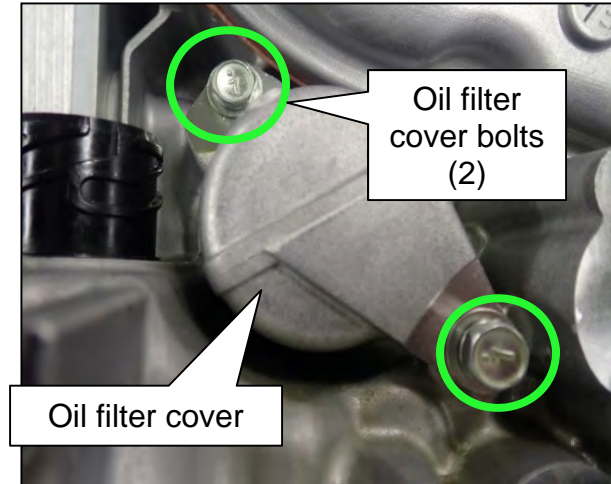


Figure 58

36. Pull the oil filter with grommet away from the CVT case to remove.
- The oil filter is a one-time use part. Do not reuse.
- HINT:** The grommet may separate from the oil filter and remain on the CVT case.

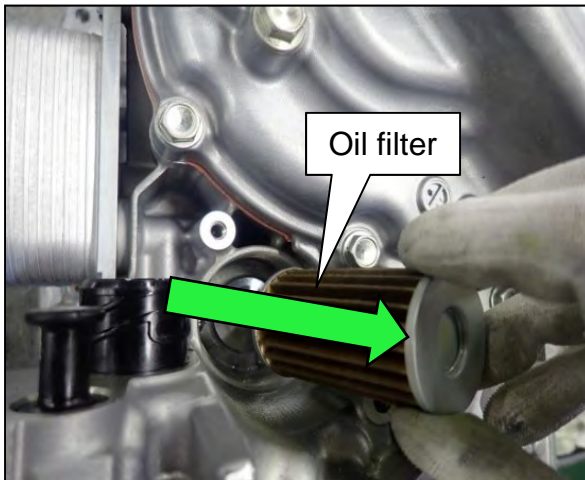


Figure 59



Figure 60

37. Remove the O-ring from the oil filter cover.
- The O-ring is a one-time use part. Do not reuse.

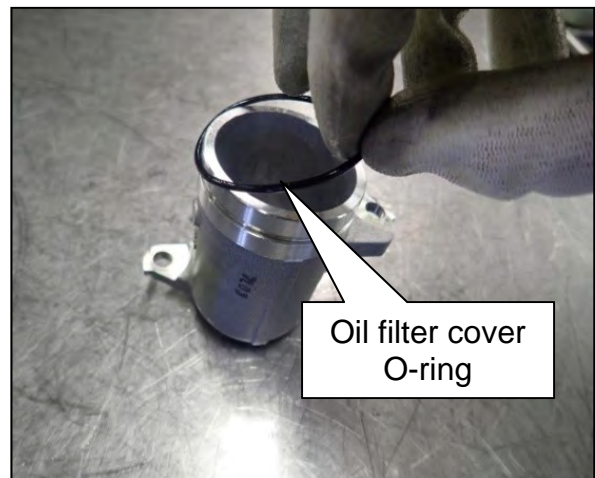


Figure 61

38. Thoroughly wipe and clean the inside of the oil filter cover.
- Brake cleaner may be used during this step to thoroughly remove any residual material.



Figure 62

39. Thoroughly wipe and clean the oil filter bore of the CVT case.

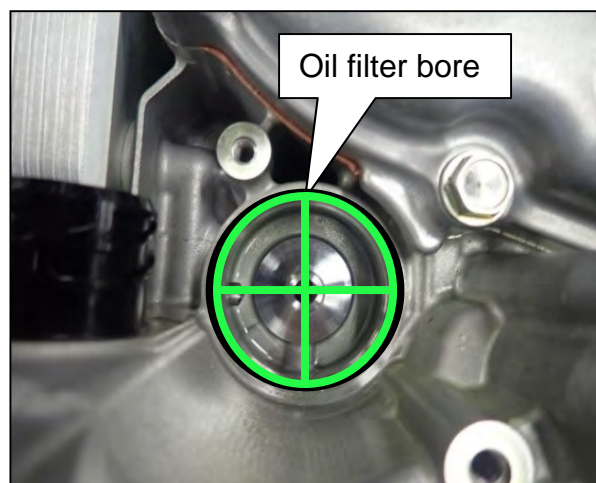


Figure 63

## Remove the Oil Pan and Torque Converter Housing

40. Reposition the CVT assembly on the work bench with the torque converter housing side facing up.
  - Use plastic or wood blocks to stabilize the CVT assembly on the work bench if needed.

**HINT:** CVT fluid will drain from the CVT case when the oil pan is removed.



Figure 64

41. Remove the oil pan and oil pan gasket which were installed to the CVT temporarily.
  - Keep the original oil pan for installation during reassembly.
  - The bolts will be reused.



42. Remove the nineteen (19) bolts circled in green from the torque converter housing (Figure 66).

- Do not discard these bolts. They will be temporarily re-used later in this procedure.
- The bolts that are not visible in Figure 66 are indicated with a dotted green circle.

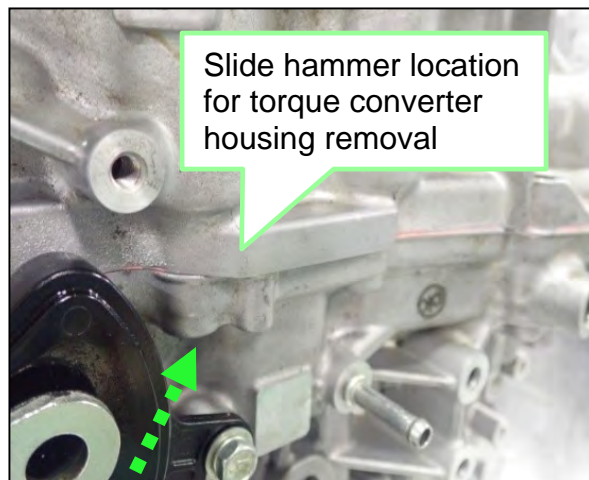


Figure 65

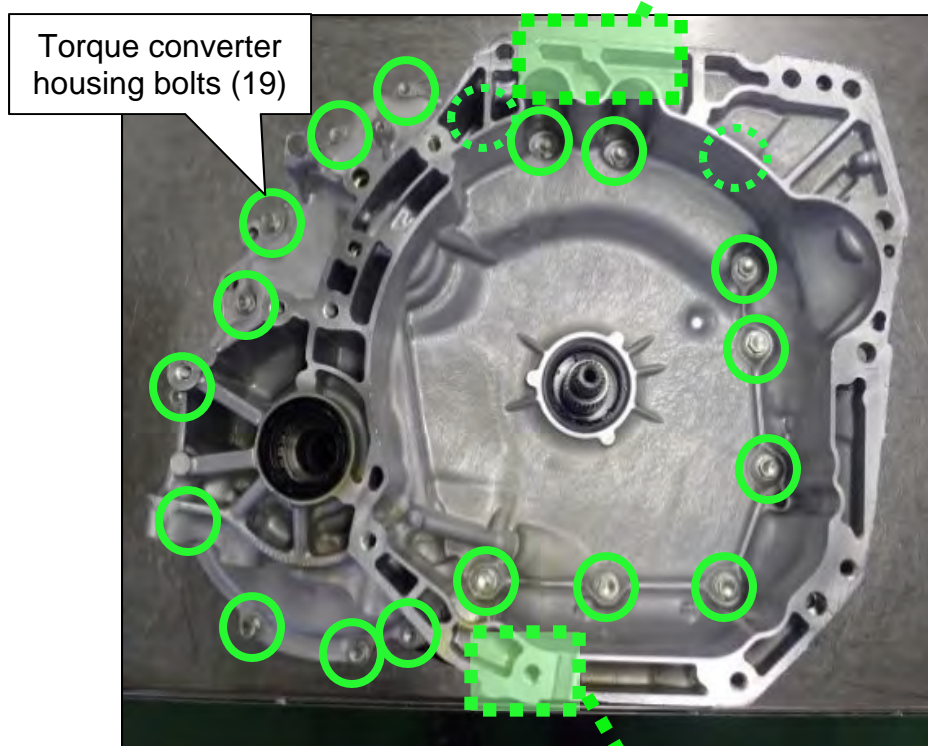


Figure 66

43. Remove the torque converter housing from the CVT case.

- If necessary, use Slide Hammer J-25721-A at the locations highlighted in green (Figure 65, Figure 66, and Figure 67).
- The input shaft thrust bearing washer may be attached to the torque converter housing, remove it and put it aside; it will be reused.

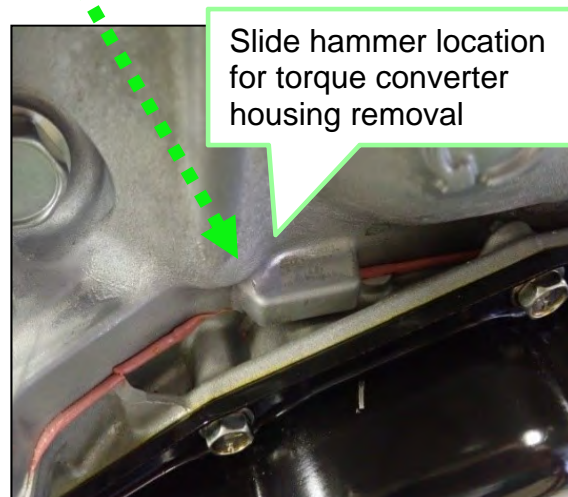


Figure 67

## Remove the Oil Seals from the Torque Converter Housing

44. Remove the torque converter oil seal from the torque converter housing with a suitable tool.
  - Take care not to damage the seal-to-case surface when removing seal.
  - The torque converter oil seal is a one-time use part. Do not reuse.
45. Remove the differential side oil seal from the torque converter housing with a suitable tool.
  - The differential side oil seal is a one-time use part. Do not reuse.

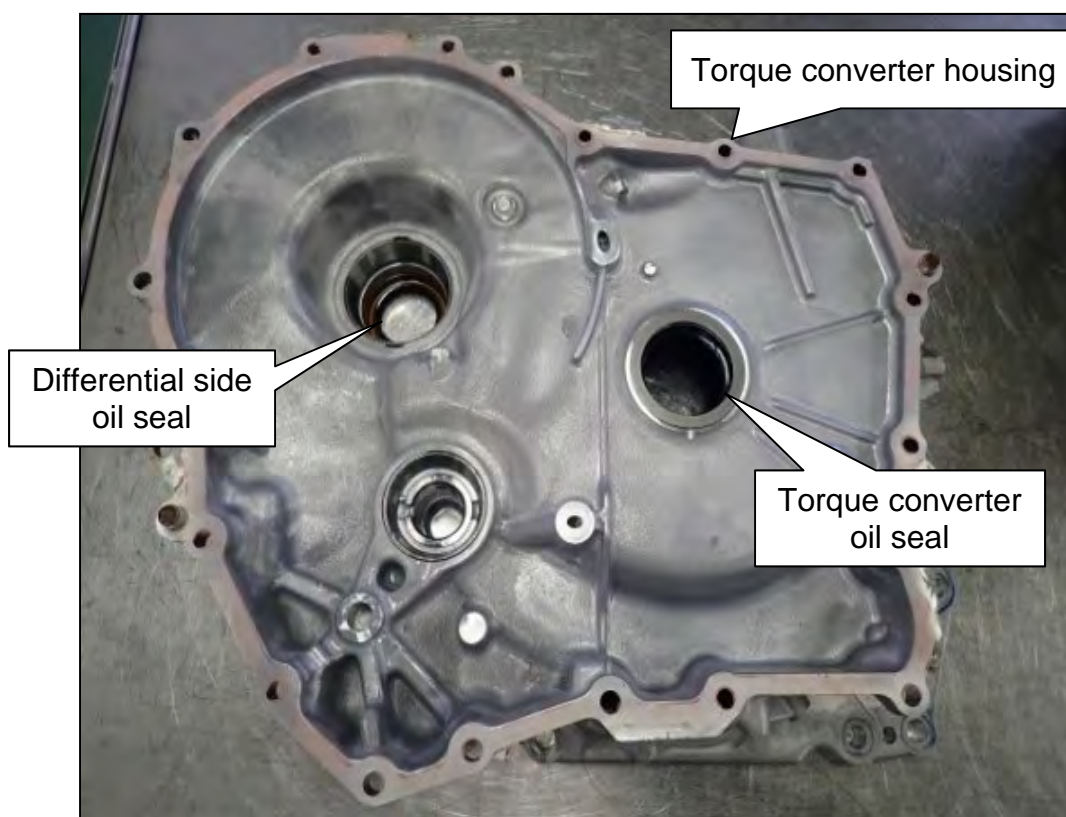


Figure 68

## Remove the CVT Internal Components

46. Remove the final drive assembly and the reduction gear assembly at the same time by lifting both straight up.

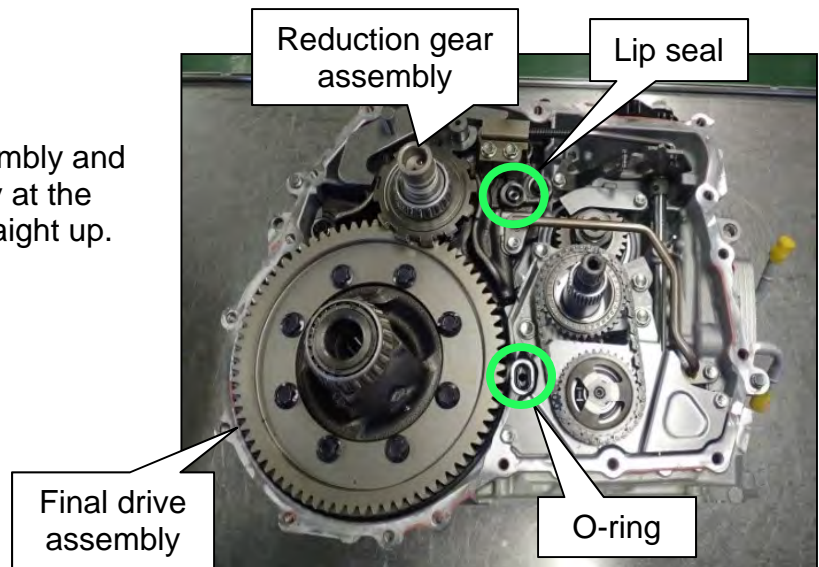


Figure 69

47. Remove the O-ring from the CVT case.
- The O-ring is a one-time use part. Do not reuse.

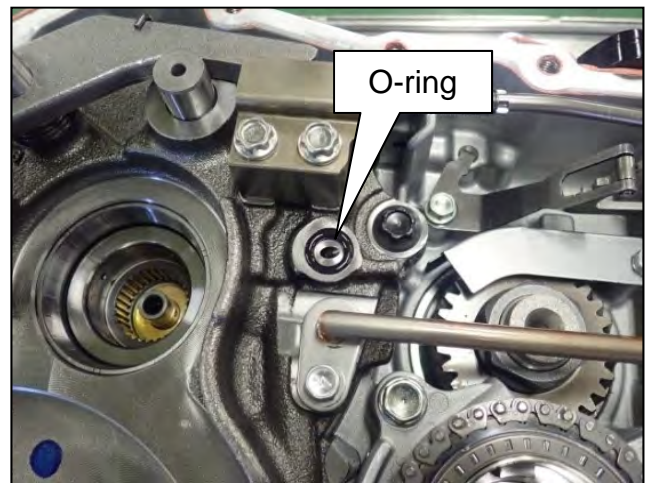


Figure 70

48. Remove the O-ring from the CVT case.
- The O-ring is a one-time use part. Do not reuse.

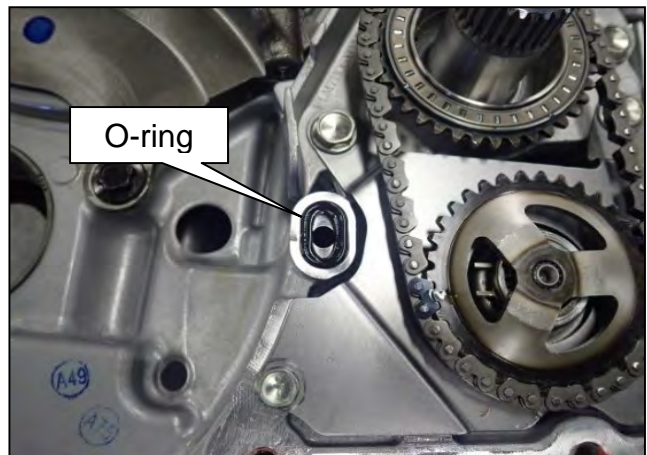


Figure 71



49. Remove the O-ring from the input shaft (Figure 72).
  - The O-ring is a one-time use part. Do not reuse.
50. Remove the thrust bearing from the drive sprocket and set aside to reuse during re-assembly.

**HINT:** The thrust washer for the thrust bearing may either be on the drive sprocket or may have remained with the torque converter housing when it was removed.

- The thrust washer will be reused later in this procedure.

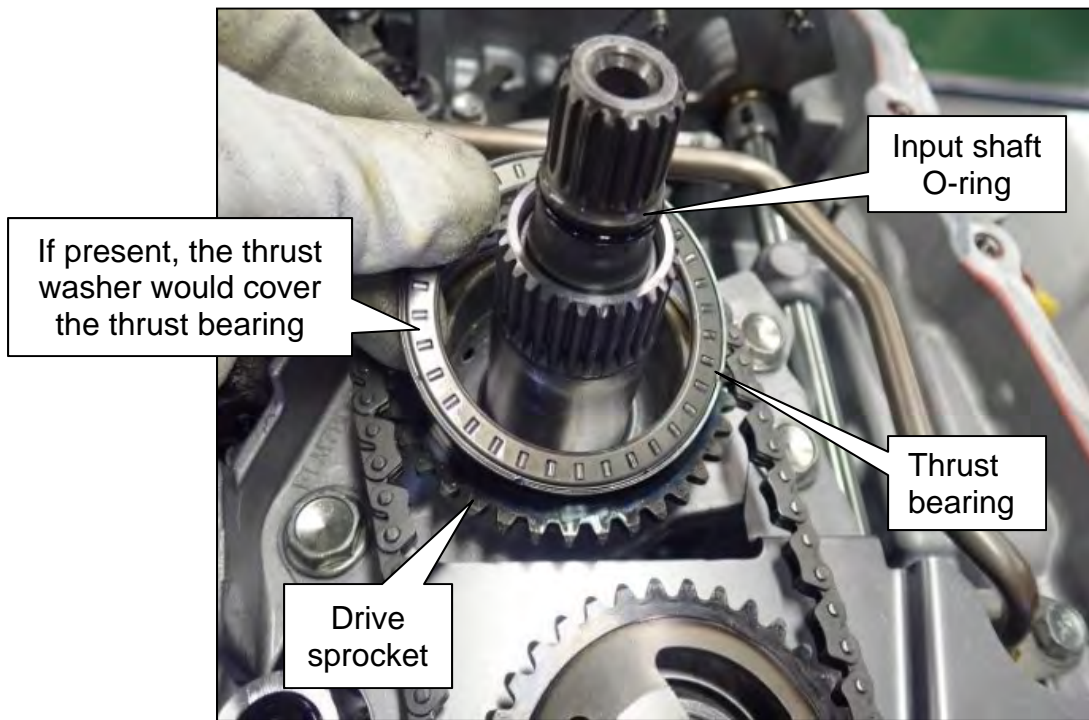


Figure 72

51. Spread the snap ring shown in Figure 73 and Figure 74, and then remove both sprockets and the chain.

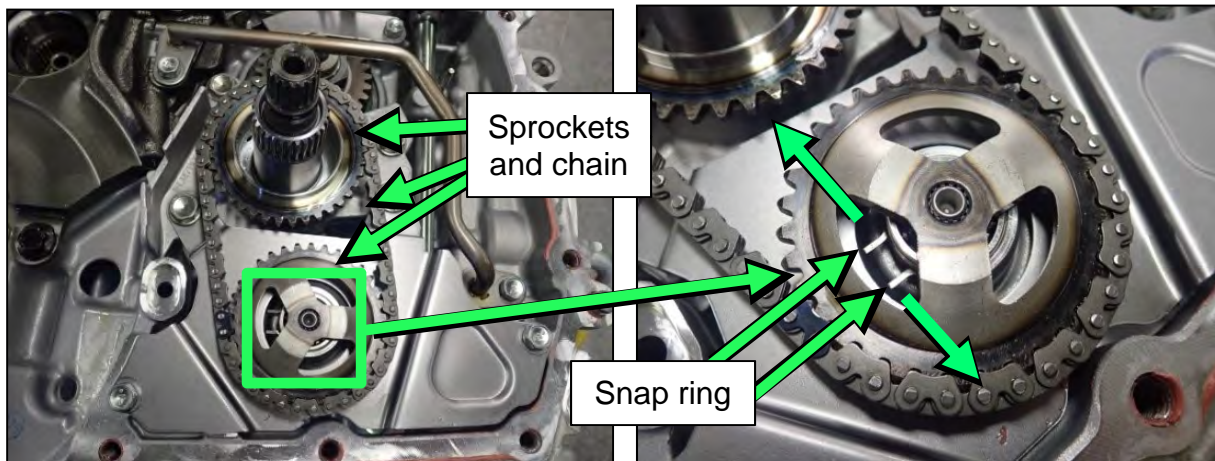


Figure 73

Figure 74



52. Remove the parking rod from the detent plate as follows:
- a. Rotate the detent plate to the "L" position.
    - o The detent spring should be aligned with the leftmost concave of the detent plate (Figure 75).

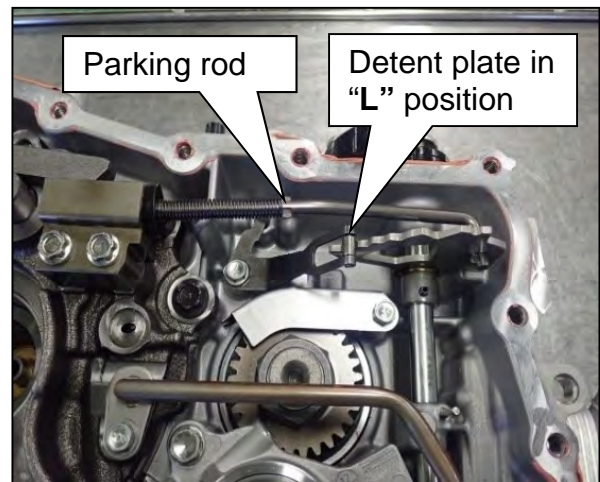


Figure 75

- b. Remove the two (2) parking rod bolts (Figure 76).

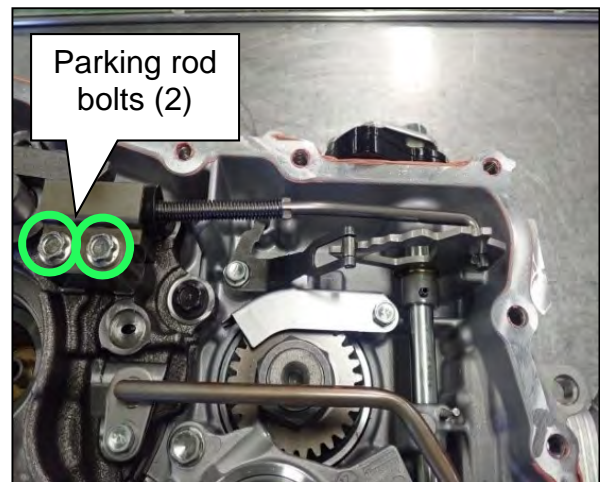


Figure 76

- c. Rotate the parking rod vertically to align the tab on the parking rod with the slot on the detent plate, and then separate it from the detent plate (Figure 77).

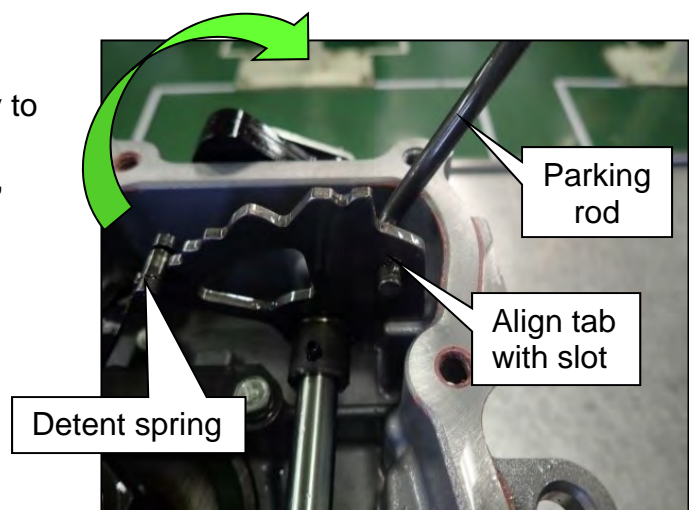


Figure 77

53. Remove the two (2) bolts circled in green, and then remove the reverse brake tube from the CVT (Figure 78).

- Do not discard the reverse brake tube and bolts. These will be reused during assembly.

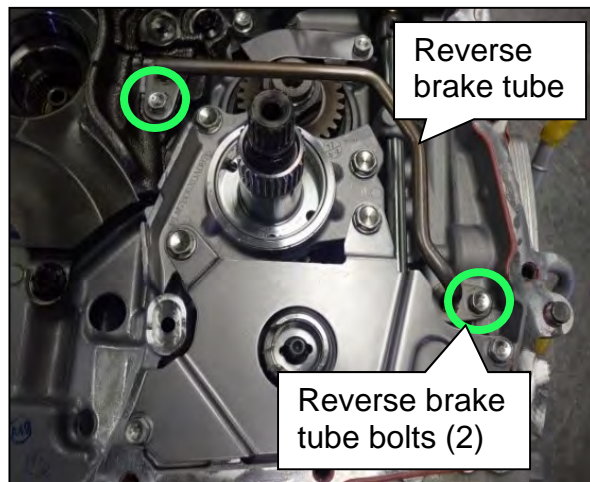


Figure 78

- Remove the sleeve from the reverse brake tube.
- Remove the O-ring from the reverse brake tube.
- The sleeve and the O-ring are one-time use parts. Do not reuse.

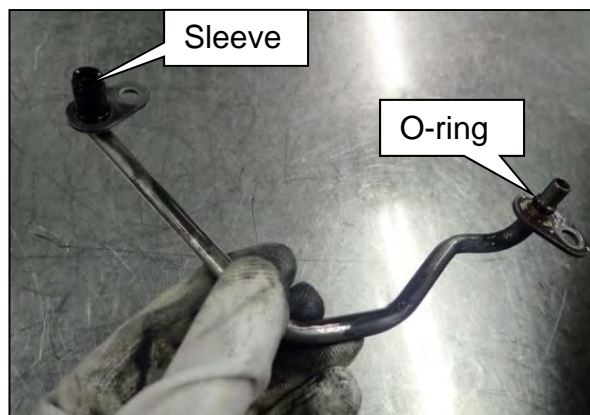


Figure 79

54. Remove the six (6) bolts circled in green, and then remove the chain cover (Figure 80).

- Do not discard. The bolts and chain cover will be reused during assembly.

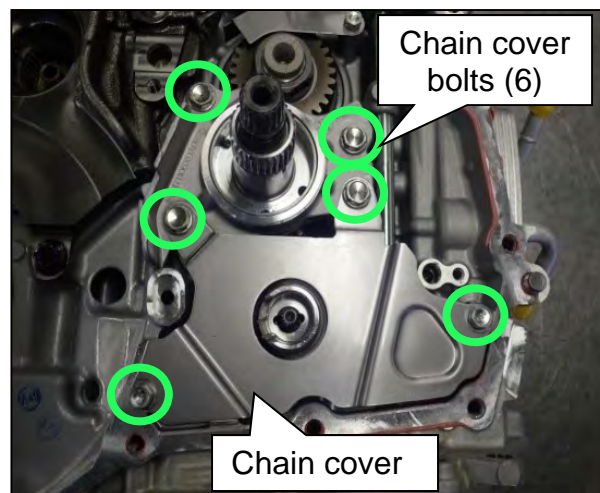
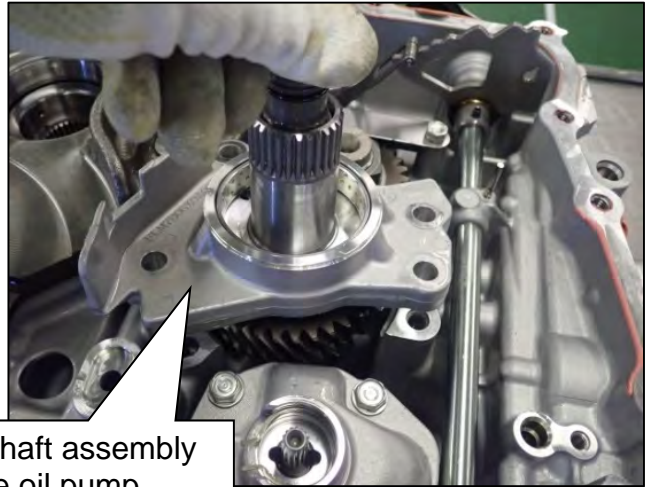


Figure 80

55. Remove the input shaft assembly and the oil pump cover (dummy cover) from the CVT as a unit.

- Hold the input shaft assembly by the end, as shown in Figure 81, and pull straight up to remove.

**HINT:** The dummy cover, shaft and bearing will separate if the input shaft is not held at the end.



Input shaft assembly and the oil pump cover (dummy cover)

Figure 81

56. Remove the outer race of the roller bearing from the counter bearing bore of the CVT case by hand.

**NOTICE**

Do not use excessive force to remove the bearing race as damage to the CVT may occur. A magnet can be used to lift this bearing if needed.

**HINT:** The outer race of the roller bearing might remain on the shaft when removing the input shaft and dummy cover.

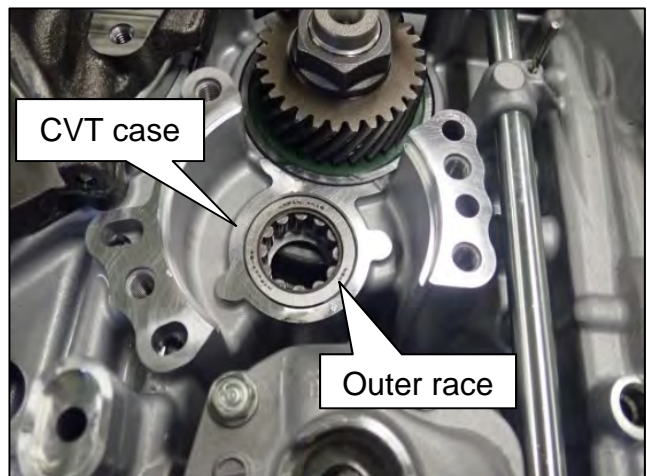


Figure 82

57. Inspect type “A” bearing (roller bearing) as follows:
- Inspect the bearing outer race and input shaft for flaking or pitting.
  - Install the bearing outer race onto the input shaft assembly with the “bearing number” facing the gear, and then rotate the bearing while applying an axial load by hand to check for any abnormality.

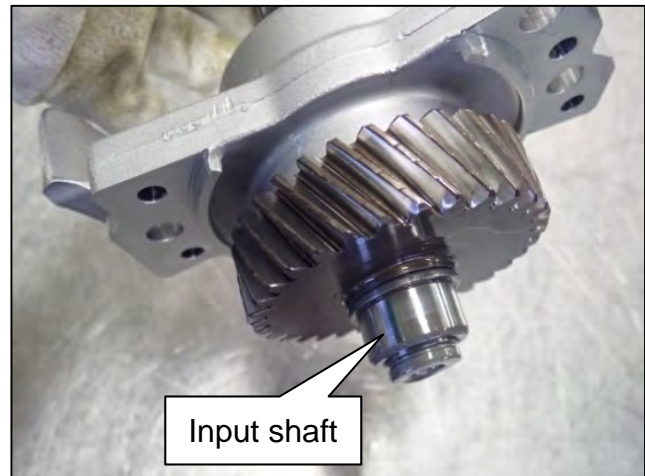


Figure 83

**NOTICE**

DO NOT drop the outer race of the bearing to avoid damage and/or contamination.

- Were any abnormalities found or felt in the bearing (sound, flat spots, flaking)?

**NO:** Put bearing and shaft aside, and then skip to step 58 on page 45.

**YES:**

- Document the abnormalities found with a video and then contact the PCC for authorization to replace the CVT. See page 152 for PCC contact information.
- Refer to steps 201-205 on page 109 when replacing the CVT.
- After CVT replacement, perform **ADDITIONAL SERVICE WHEN REPLACING CONTROL VALVE OR TRANSAXLE ASSEMBLY** on page 110.
- Loosely reassemble the original CVT in the reverse order of disassembly with the original parts.



58. If the bearing is judged to be OK, remove the shim (Figure 84) from the bottom of the counter bearing bore.

- A magnet can be used to remove the shim if needed.
- This shim will be reused later in this procedure.

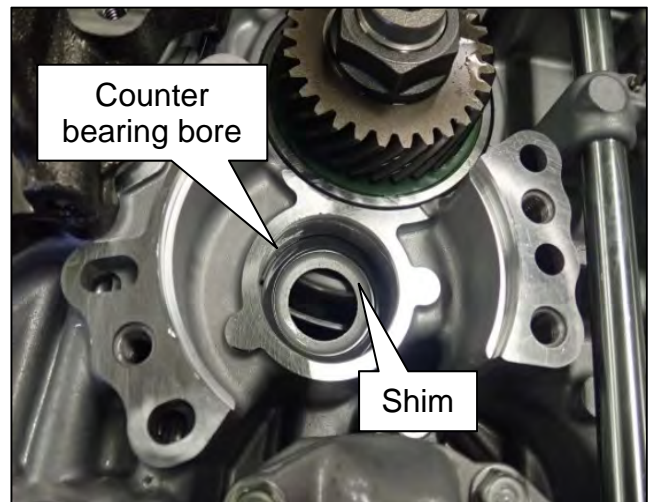


Figure 84

59. Remove the differential side oil seal from the CVT case by driving it away from the case with a suitable tool.

- The differential side oil seal is a one-time use part. Do not reuse.
- Take care not to damage the seal-to-case surface when removing the seal.

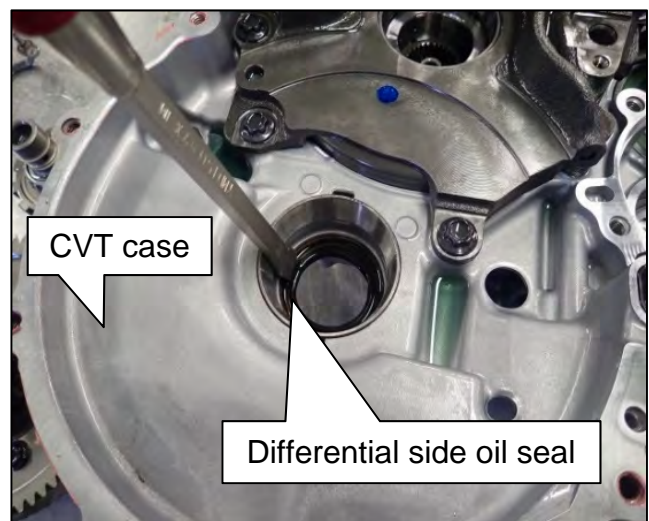


Figure 85

60. Rotate the manual shaft (Figure 86) until it stops in the Park position (Figure 87).

**NOTICE**

Confirm that the detent plate is in the Park position before proceeding. Do not remove the roll pin in any other position. This will allow pin removal and avoid damage to the case.

61. Remove the roll pin completely from the manual shaft with a 3 mm punch.
- The roll pin is a one-time use part. Do not reuse.

**NOTICE**

Use a 3 mm punch. If a larger sized punch is used, the hole may become enlarged and damage the manual shaft.

**HINT:** Do not leave the roll pin in the CVT case.

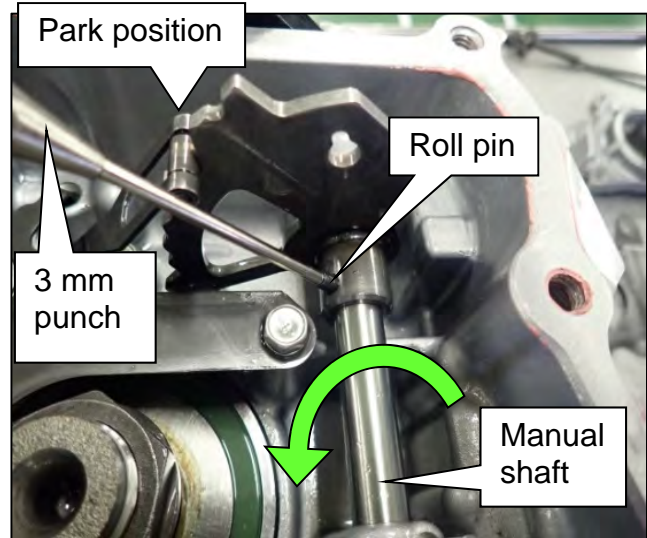


Figure 86

62. Remove the detent spring bolt circled in green in Figure 87, and then remove the detent spring from the CVT case.

- Do not discard the bolt. It will be reused during reassembly.

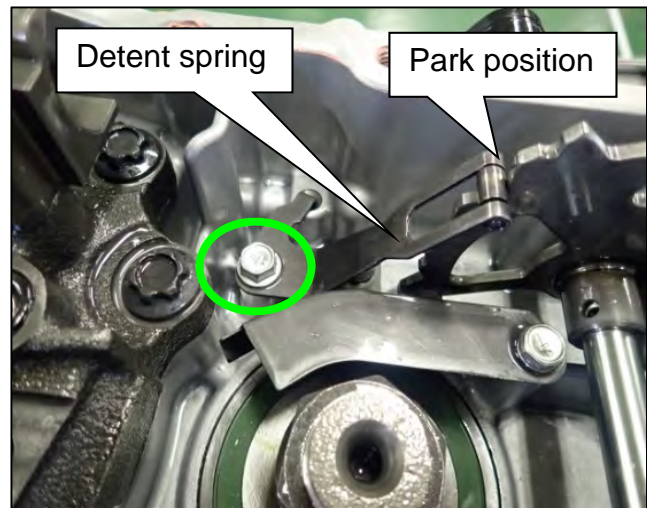


Figure 87

63. Remove the manual shaft retaining pin (straight pin) from the CVT case by grasping and pulling vertically by hand.
- Do not discard the pin. It will be reused during reassembly.

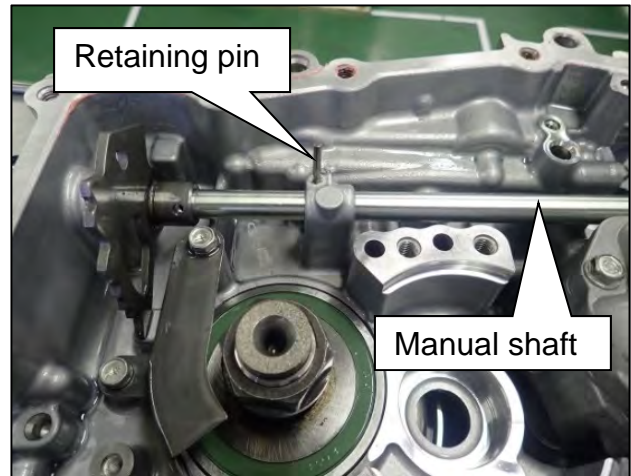


Figure 88

64. Remove the two (2) bolts shown in Figure 89 from the transmission range switch.
- Do not discard the bolts. They will be reused during reassembly.

**HINT:**

- DO NOT remove the manual shaft lock nut at this step.
- DO NOT try to remove the transmission range switch from the manual shaft.

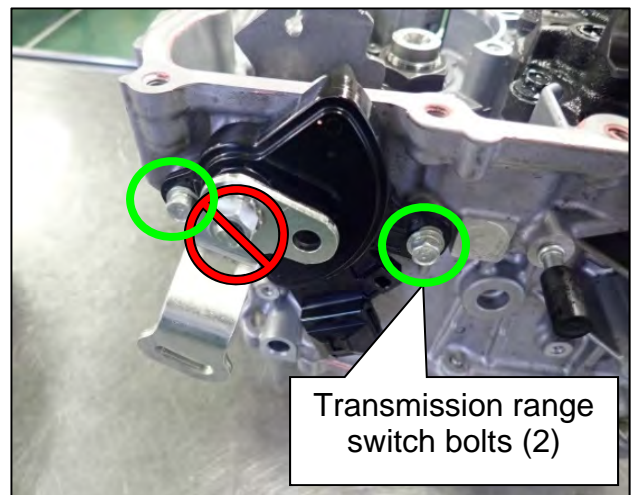


Figure 89

65. Slide the manual shaft approximately 5.3 inches (135 mm) out of the CVT case to allow removal of the oil pump (step 66).

**NOTICE**

To avoid damage to the seal, do not remove the manual shaft completely from the CVT case. If the retaining pin slot contacts the seal, damage may occur.

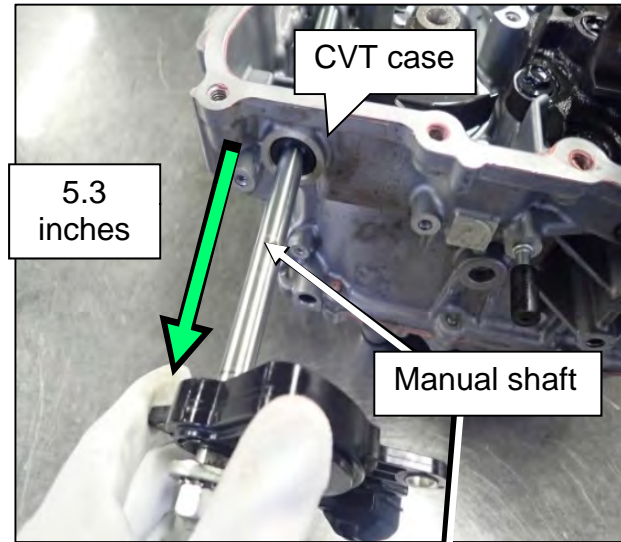


Figure 90

66. Remove the three (3) hex bit screw fasteners in the locations shown in Figure 91, and then remove the oil pump from the CVT case.
- This oil pump will not be reused, it will be replaced with a new one.
  - Do not discard hex bit screw fasteners. They will be reused during reassembly.

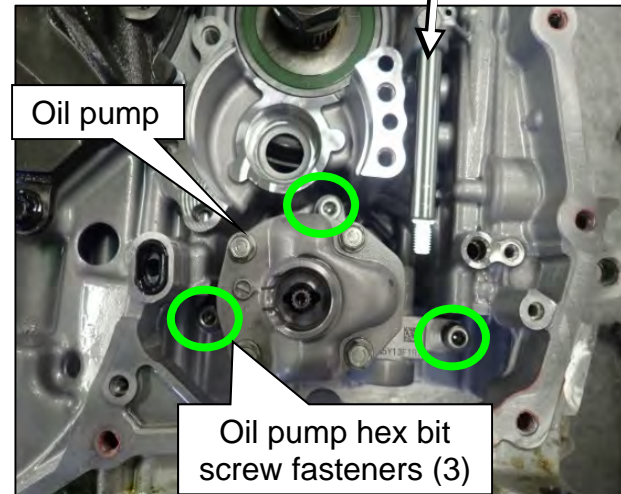


Figure 91



67. Remove the snap ring from the original oil pump.

**HINT:** DO NOT discard the removed snap ring. This snap ring will be reused.

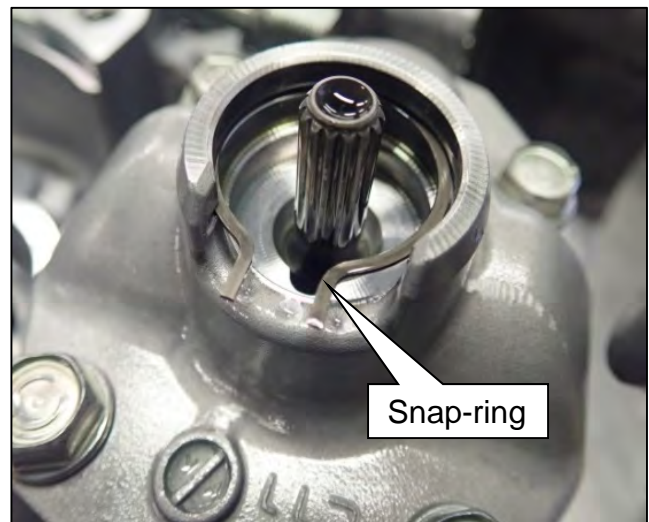


Figure 92

68. Remove the two (2) oil pump gaskets from the CVT case.

- The oil pump gasket is a one-time use part. Do not reuse.

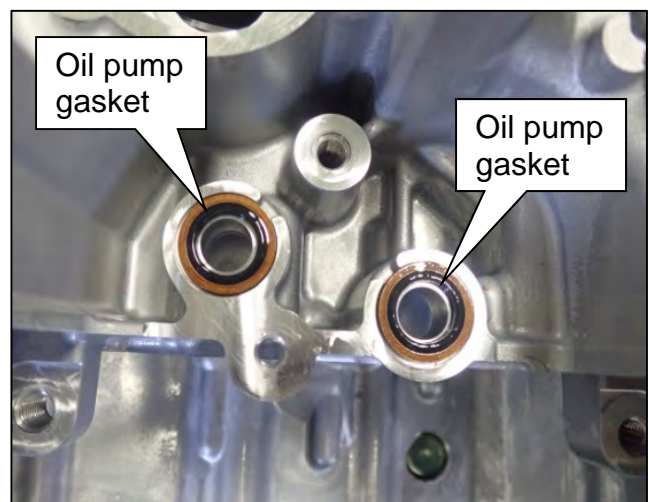


Figure 93

69. Temporarily install the transmission range switch with the two (2) original bolts removed in step 64 on page 47, finger tight.

- The transmission range switch will be permanently installed later in this procedure.

## Remove the Sub-assembly

**IMPORTANT:** Steps 72 through 80 are **ONLY** to separate the sealant of the side cover. The sub-assembly with belt and pulley **CANNOT** be removed from the CVT while in this orientation and will be removed from the case at a later step.

70. Reposition the torque converter housing onto the CVT.

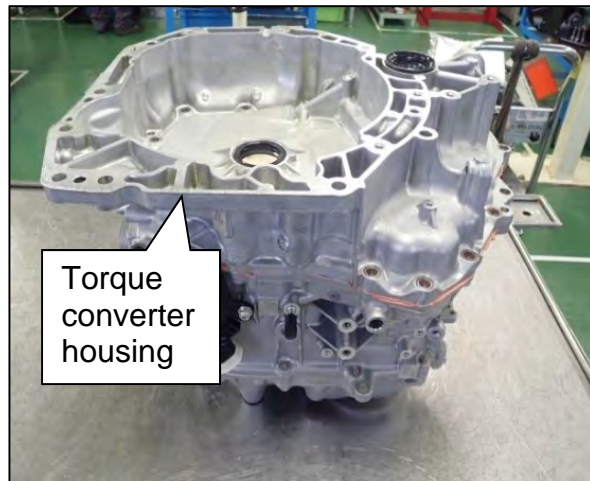


Figure 94

71. Install and hand tighten two (2) of the original torque converter housing bolts.

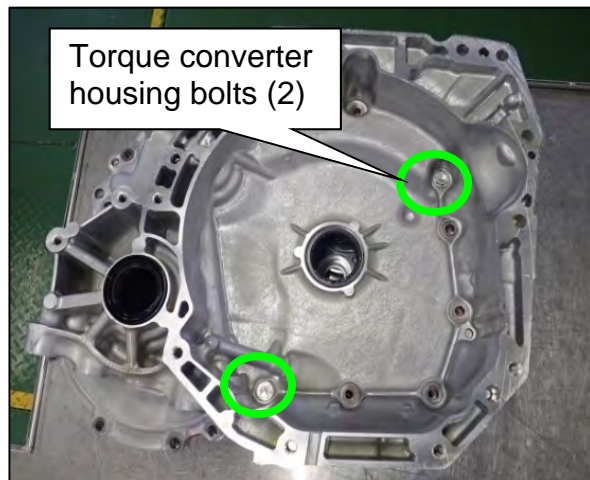


Figure 95

72. Reposition the CVT on the work bench with the torque converter housing side down.

**HINT:** A wood block may be used to stabilize the CVT during disassembly/reassembly.



Figure 96

73. Remove the two (2) pulley bearing retainer bolts shown in Figure 97.
- Do not discard bolts. They will be temporarily installed during a later step.

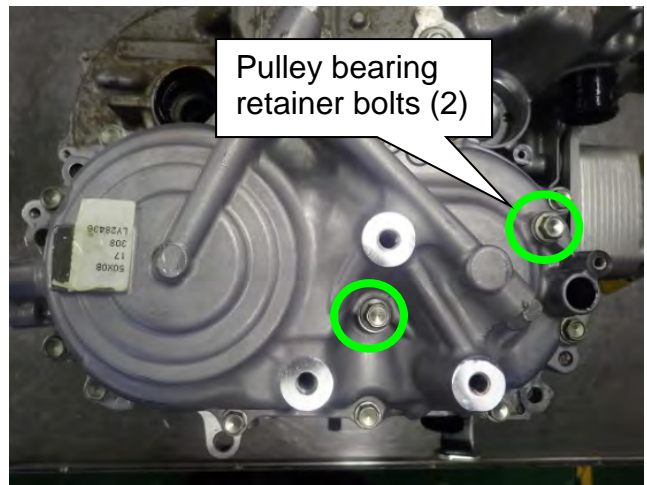


Figure 97

74. Remove the twelve (12) side cover bolts (Figure 98).
- Retain two (2) of these bolts. They will be temporarily installed during a later step.

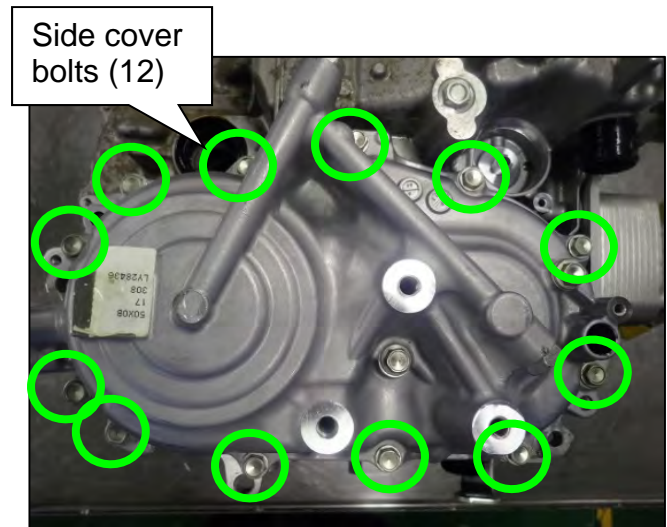


Figure 98



75. Remove the side cover with a slide hammer J-25721-A to separate the side cover and CVT case.
- There are three slide hammer tool points, as shown in Figure 99.
  - The mating surfaces will be cleaned at a later step.
  - This step will help with sub-assembly removal at a later step.

**NOTICE**

- To avoid damage to the CVT, do not use the speed sensor bore for slide hammer tool location.
- Do not pry the surfaces apart as internal CVT damage may result.

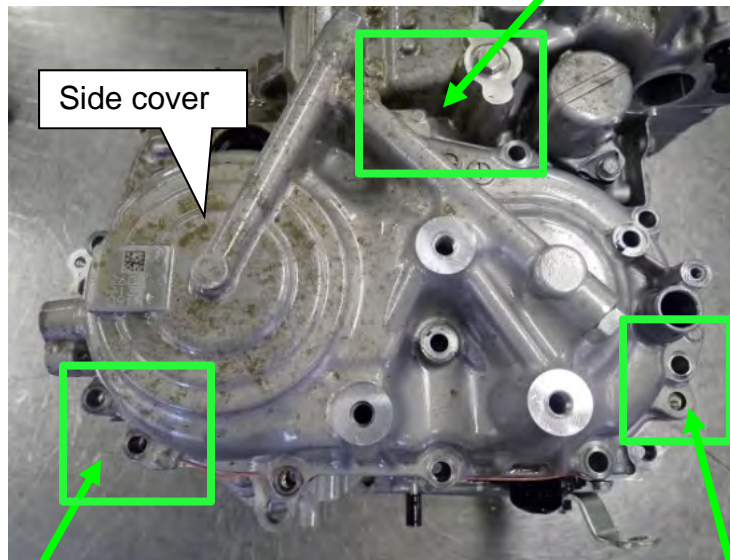
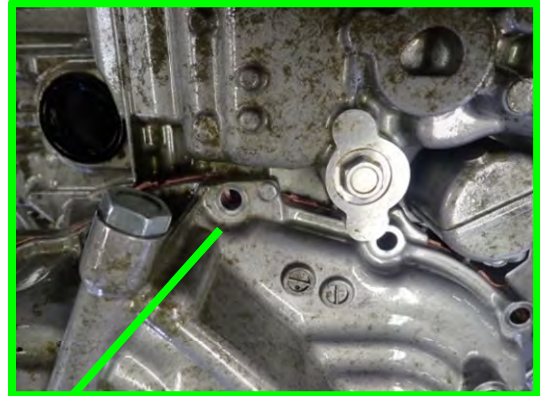
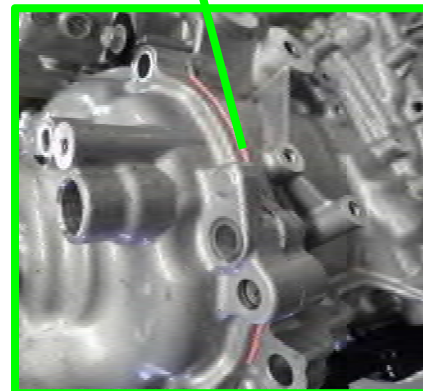
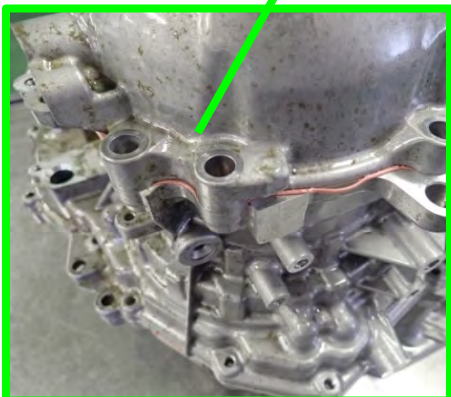


Figure 99





76. Remove the two (2) case O-rings (Figure 100).
- The case O-rings are one-time use parts. Do not reuse.

**HINT:** This helps alignment of the bearing retainer bolt threads after reinstalling the original side cover.

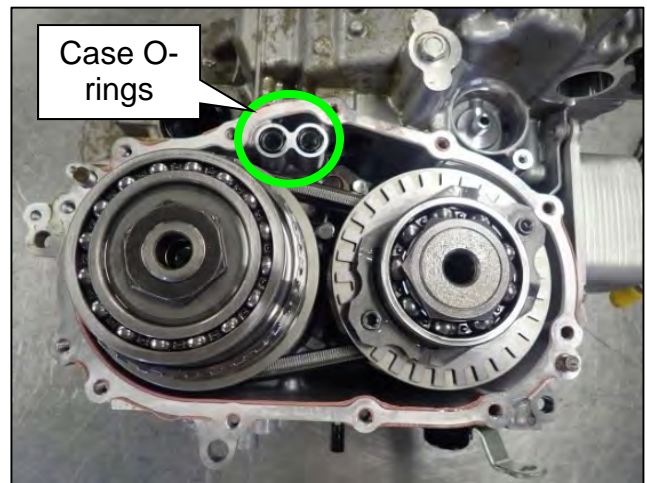


Figure 100

77. Align the primary pulley bearing retainer bolt holes with the bolt hole on the case (Figure 101).

**HINT:** This helps alignment of the bearing retainer bolt threads after reinstalling the original side cover.

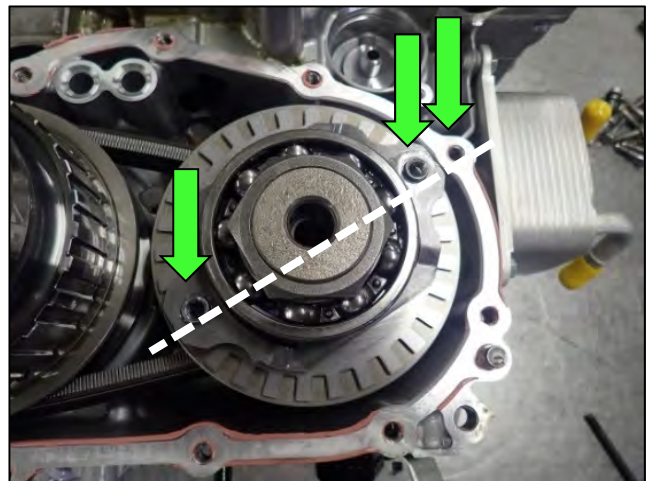


Figure 101

**NOTICE**

To avoid damage to the pulse gear, do not allow the Assembly Guide Pin to contact the pulse gear during installation, as shown in Figure 102.

78. Install one of the “Assembly Guide Pins, Pulley Bracket” (Guide Pin J-52272) to one of the two pulley bearing retainer bolt holes.

- This will assist in installation of the original side cover to the pulley assembly.

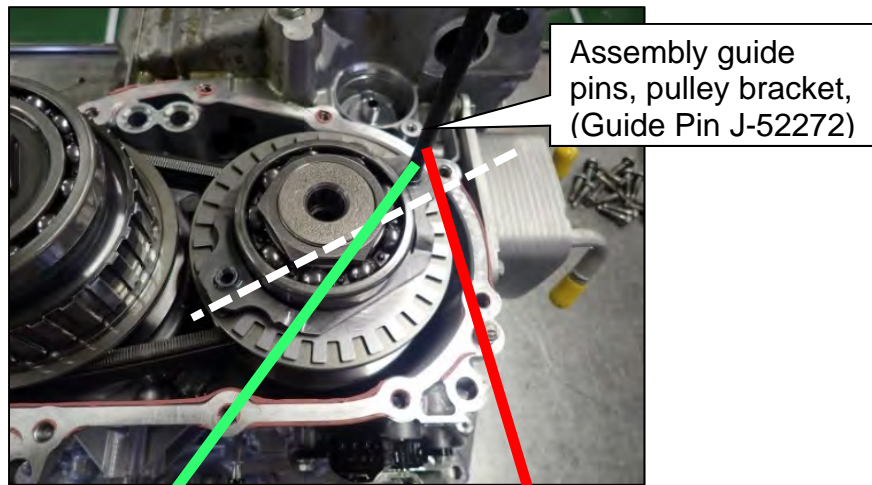
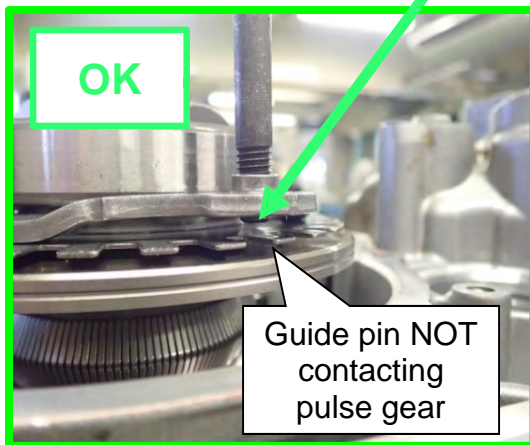


Figure 102



79. Place the original side cover onto the CVT case.
- Position the primary pulley bearing retainer to allow the guide pin to be inserted through the bolt hole of the side cover.

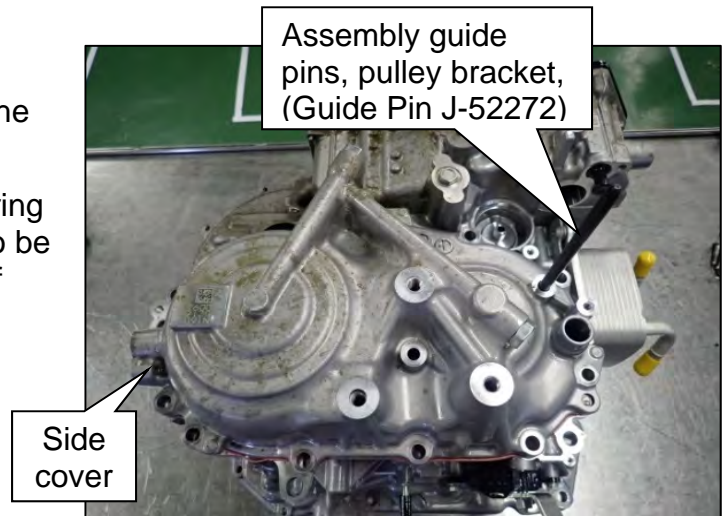


Figure 103

80. Install the two (2) original pulley bearing retainer bolts (Figure 104) as follows:

- Use the original bolts and O-rings at this step.
  - a. Install one pulley bearing retainer bolt finger tight into open bearing retainer bolt hole.
  - b. Remove the guide pin from the other bearing retainer bolt hole.
  - c. Install the other bearing retainer bolt by hand (finger tight).

81. Temporarily reattach the removed side cover onto the CVT case with two (2) original bolts on opposite corners, hand tight.

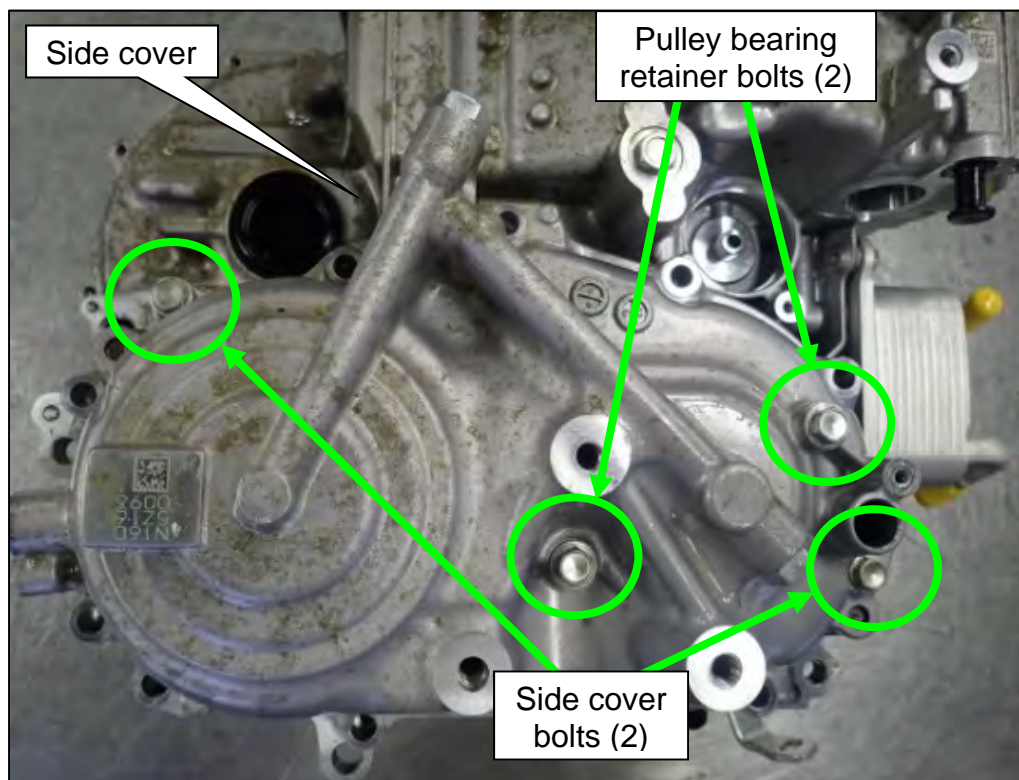


Figure 104



82. Reposition the CVT with the side cover facing down.

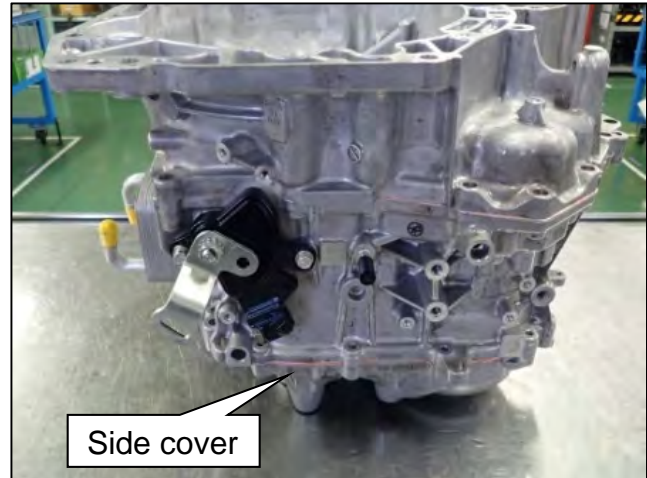


Figure 105

83. Remove the two (2) torque converter housing bolts and set the torque converter housing aside.

**HINT:** The CVT case will be placed onto the removed torque converter housing later in this procedure.

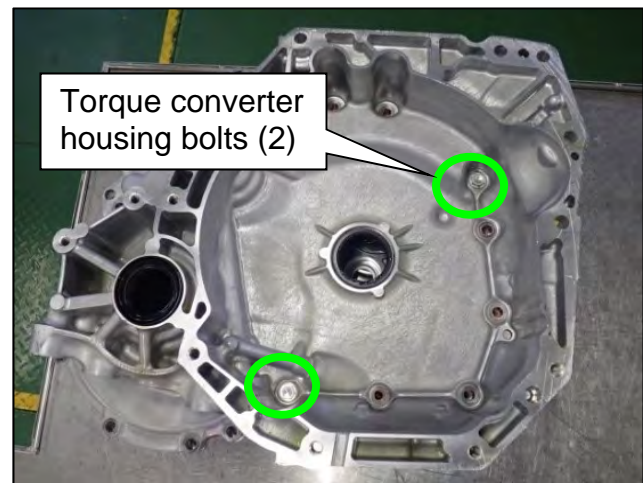


Figure 106



84. Remove the two (2) side cover bolts which were temporarily installed to hold the side cover to the CVT in step 81 on page 55 (Figure 107 and Figure 108).

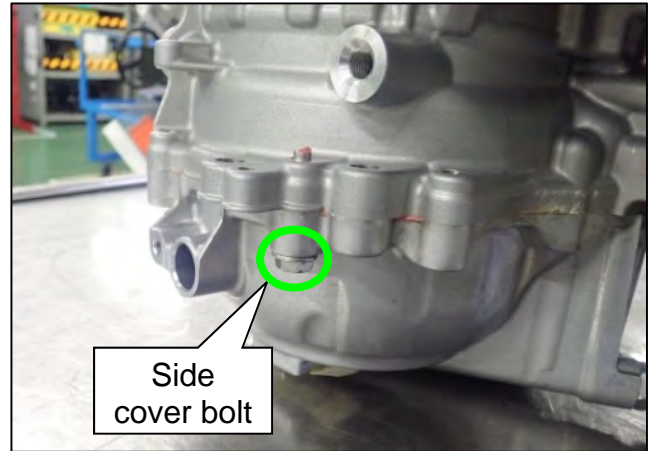


Figure 107

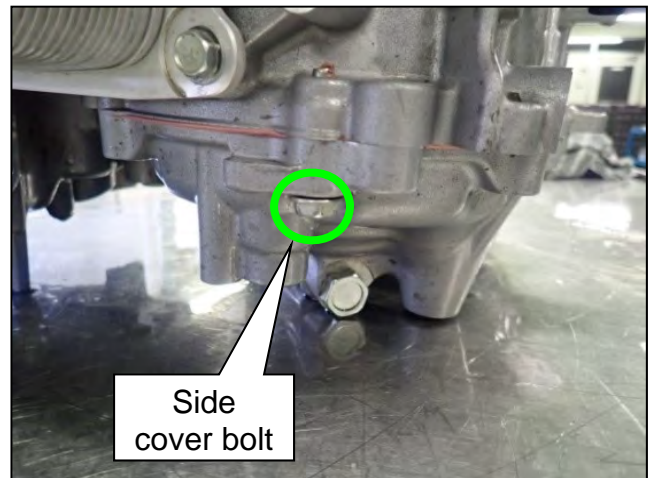


Figure 108

85. Lift the CVT case vertically off of the sub-assembly and side cover.

- Weight 17.4 kg (**38.4 lbs.**)
- This sub-assembly will not be reused.

**IMPORTANT:** The sub-assembly must be separated from the case as shown in Figure 109.



Figure 109

86. Place the removed CVT case onto the torque converter housing, for temporary storage in stable condition.



Figure 110

## Clean the CVT Surfaces

### NOTICE

To avoid damage to the CVT and potential drivability concerns:

- Prevent any debris from dropping into the torque converter housing, side cover or the CVT case.
- Use brake cleaner to remove the remaining CVT fluid and any residual sealant.
- Do not use sanding discs, abrasive tools, or metal blades on sealing surfaces.
- Clean dowel pins with a mild abrasive sandpaper to remove all rust and debris.
  - This will assist at a later step when mating the CVT case to the sub-assembly and again when mating the CVT case to the torque converter housing.

87. Remove any sealant that remains on the sealing surface of the CVT case where it seals with the sub-assembly side cover.

- A plastic scraper can be used.
- Use ONLY brake cleaner to clean surfaces.
- Clean with a lint-free paper towel.

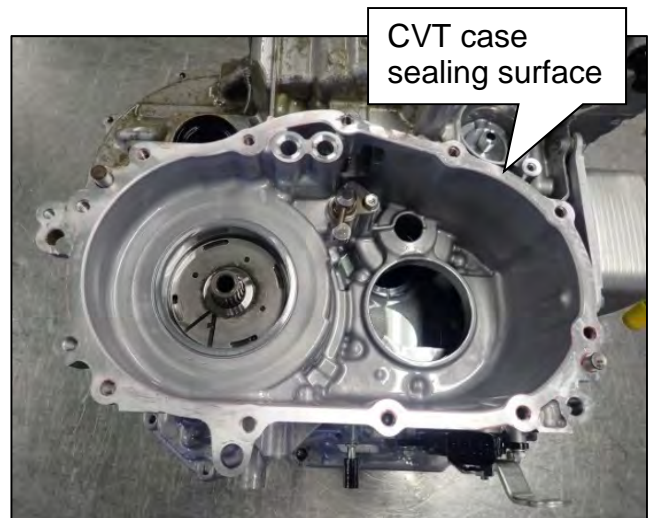


Figure 111

88. Remove any sealant that remains on the sealing surfaces of the torque converter housing and CVT case using a plastic scraper, and then clean with a lint-free paper towel.

- Use ONLY brake cleaner to clean surfaces.

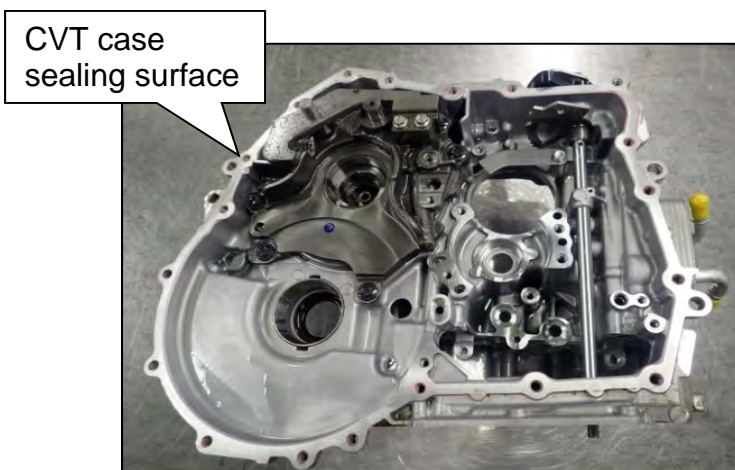


Figure 112

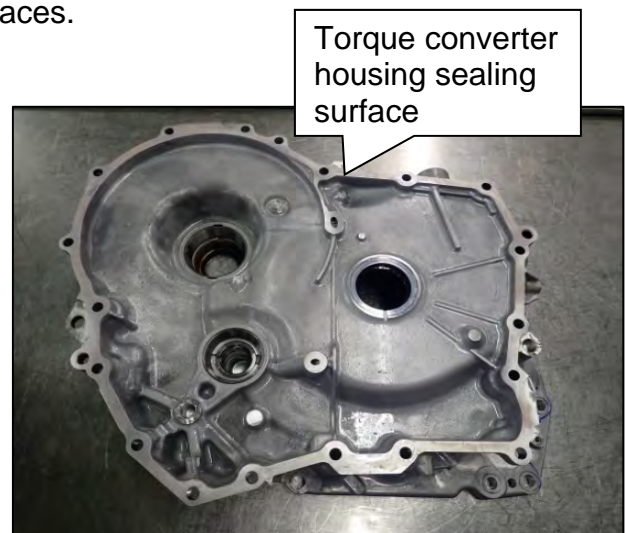


Figure 113

## Clean Oil Passages in CVT Case and Oil Pump Cover

In the following steps:

- Brake cleaner and compressed air will be used to clean out oil passages in the CVT assembly.

### **CAUTION**

- To avoid the risk of minor personal injury, wear eye/face protection when using compressed air and cleaning fluids.
- To avoid risk of minor personal injury, regulate air pressure up to a maximum of 75 PSI.

89. Confirm the CVT case is on the work bench with sub-assembly side down.

- Use wood blocks as necessary to stabilize the assembly during these steps.

### **NOTICE**

To avoid damage to the CVT, ensure the surface of the work bench has been cleaned to avoid contamination of the components.

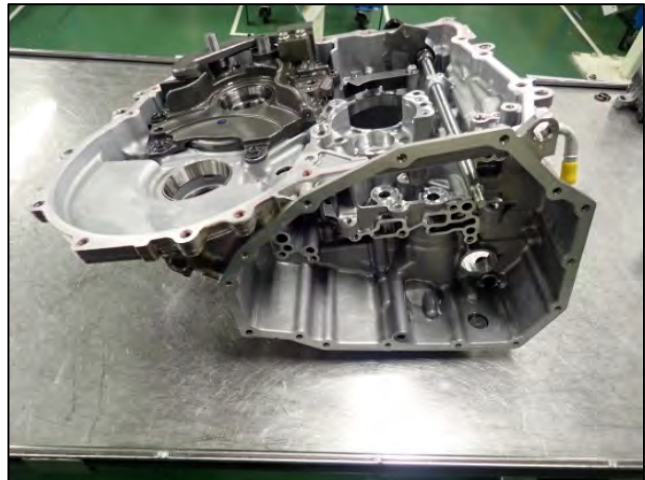


Figure 114



90. Spray brake cleaner into each oil passage of the CVT case, where shown in Figure 115 and Figure 116 with green circles, until the fluid runs clear for 5 seconds.

**NOTICE**

To avoid damage to the CVT and potential drivability concerns, do not apply brake cleaner or compressed air to passages shown in red.

91. Apply compressed air in the same passages to remove remaining brake cleaner and debris.

**CAUTION**

To avoid the risk of minor personal injury, do not stand in front of the passages while using compressed air.



Figure 115

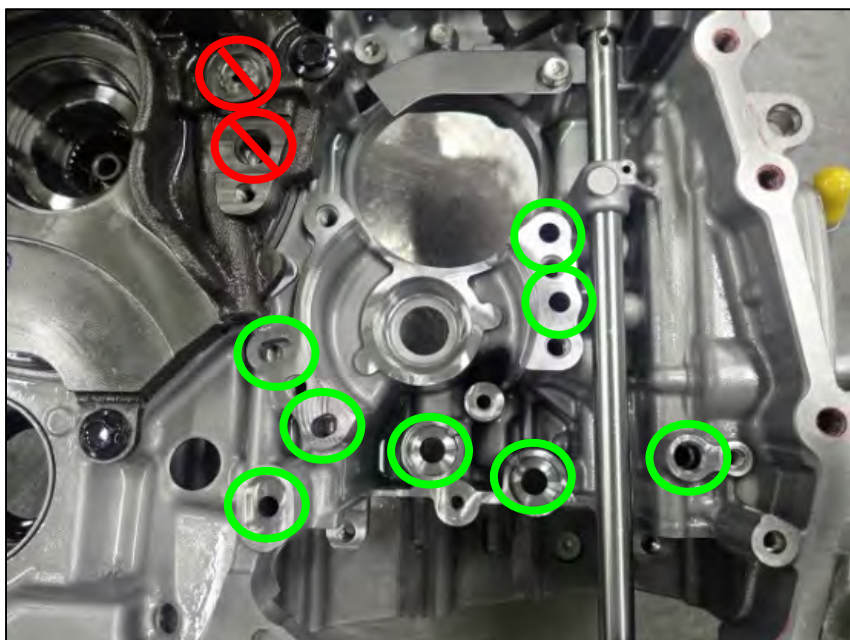


Figure 116

92. Spray brake cleaner into the reverse brake tube.

- Apply compressed air in the same passages to remove remaining cleaner and debris.

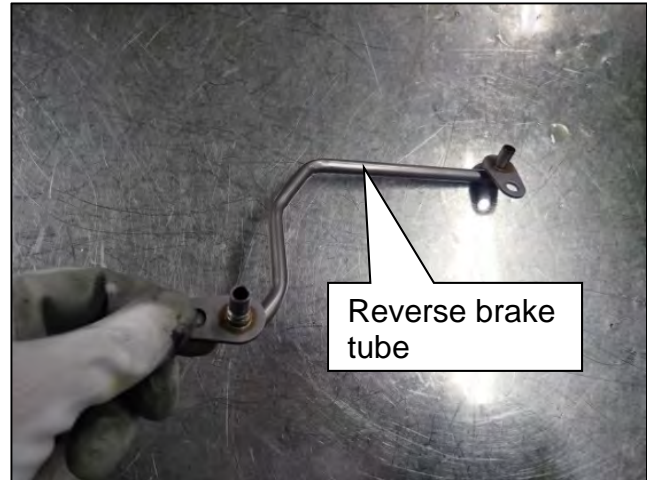


Figure 117

93. Clean the input shaft bearing bore area (Figure 118 and Figure 119).

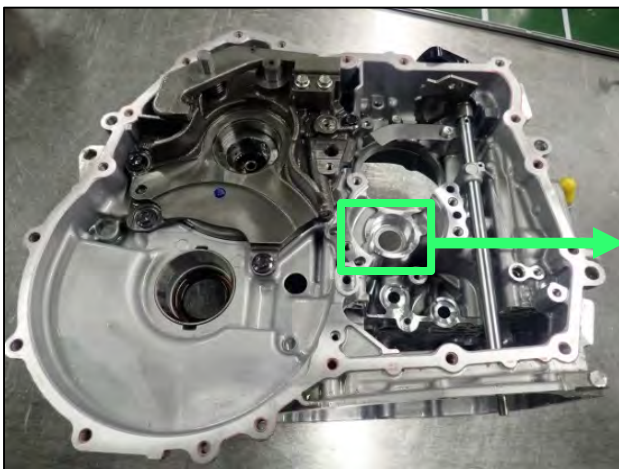


Figure 118

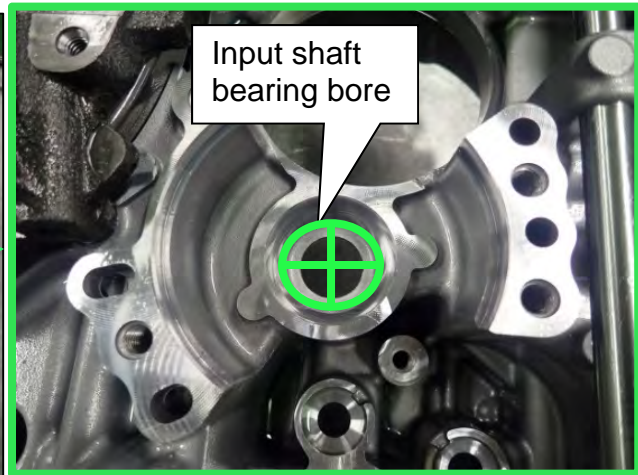


Figure 119

94. Spray brake cleaner into the high clutch fluid passage on the torque converter housing.

**CAUTION**

- To avoid the risk of minor personal injury, take care when cleaning passages as brake cleaner will exit the passage shown as “fluid discharge” in Figure 120.
- Apply compressed air in the same passages to remove the remaining cleaner and debris.

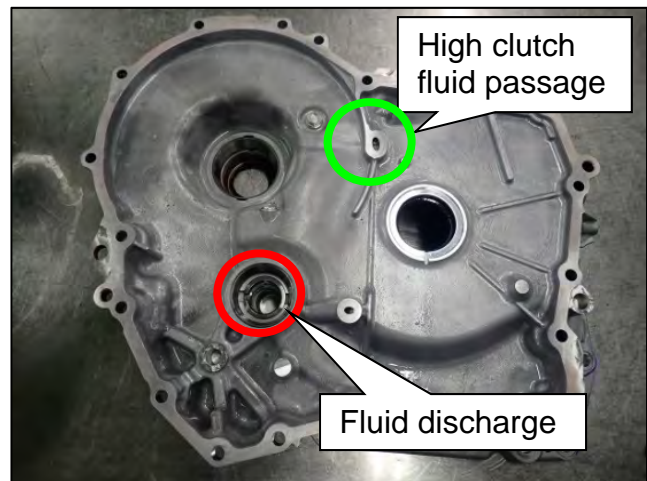


Figure 120



95. Spray brake cleaner into the reduction gear bearing fluid passage on the torque converter housing. Then apply compressed air in the same passages to remove remaining cleaner and debris.

**CAUTION**

To avoid the risk of minor personal injury, do not face the passage indicated in red of Figure 121 when cleaning passages as brake cleaner will exit the passage.

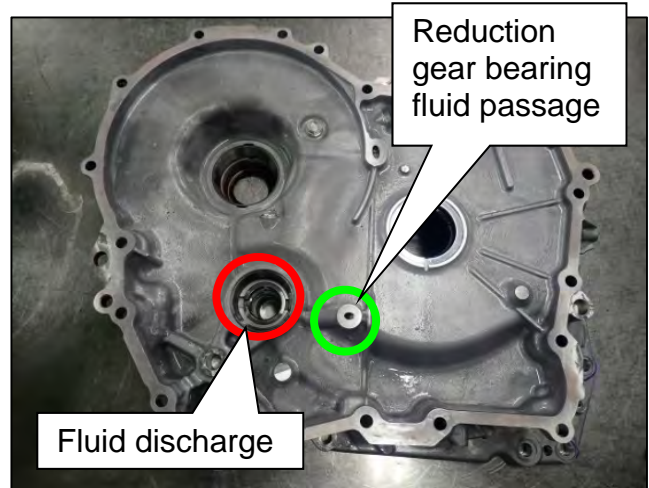


Figure 121

96. Clean the passages of the oil pump cover as follows:
- Remove the input shaft from the oil pump cover.

**NOTICE**

Do not drop the counter bearing outer race (roller bearing type only) as damage or contamination could occur.

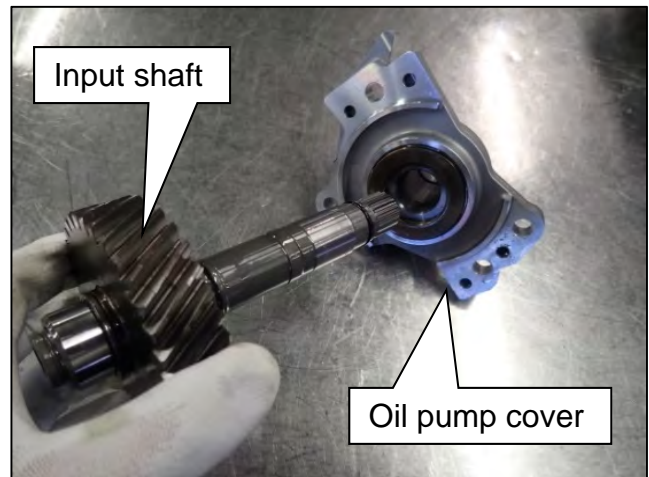


Figure 122

- Note the orientation and then remove the thrust bearing.
  - Do NOT discard. This will be reused at a later step.

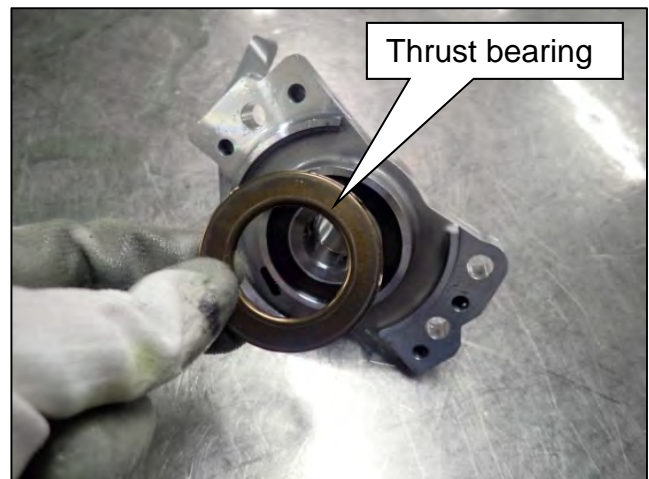


Figure 123

- c. Remove the washer.
  - o Do NOT discard. This will be reused at a later step.
- d. Spray brake cleaner into the oil pump cover oil passages indicated in green in Figure 125.
- e. Apply compressed air in the same passages to remove the remaining cleaner and debris.

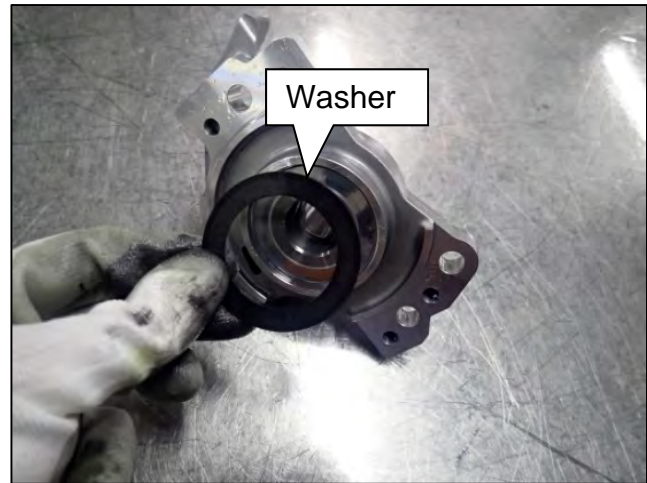


Figure 124

**CAUTION**

To avoid the risk of minor personal injury, do not face the passage indicated in red in Figure 125 and Figure 126 while cleaning.

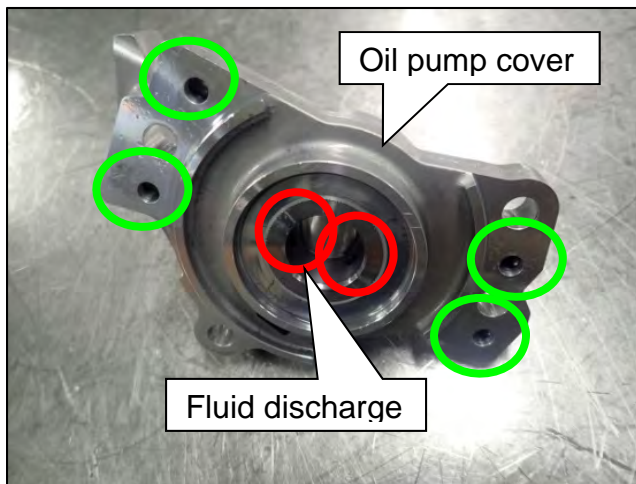


Figure 125

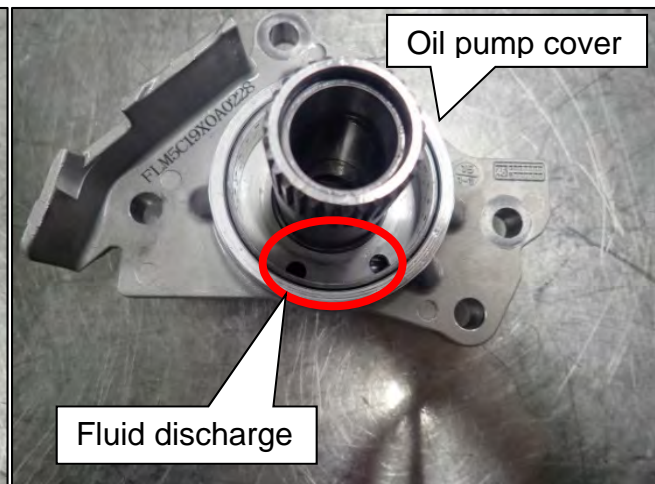


Figure 126

- f. Install the original washer.

**HINT:**

- o Orientation is NOT critical for the washer.
- o Apply petroleum jelly to the washer to hold it in place during assembly.

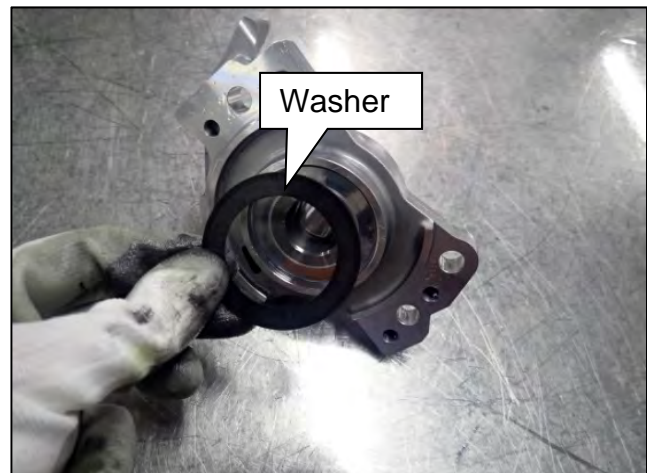


Figure 127



- g. Install the original thrust bearing in the correct orientation as shown in Figure 128 and Figure 129.
  - o Apply petroleum jelly or equivalent to hold in place.

**NOTICE**

The thrust washer is direction specific. Install in the correct orientation. If the thrust washer is incorrectly installed, damage to the CVT may occur.

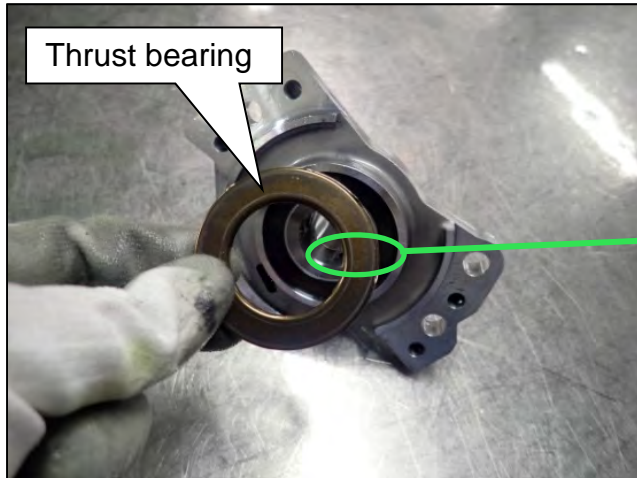


Figure 128

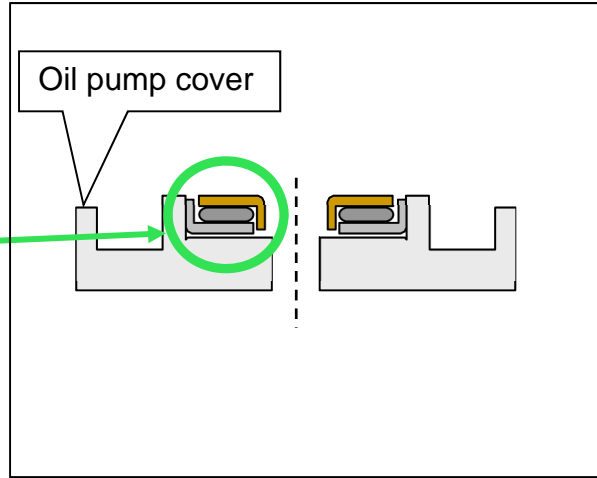


Figure 129

- h. Insert the input shaft into the oil pump cover (Figure 130).

**IMPORTANT:**

- o Apply petroleum jelly to the sealing ring on the input shaft before installation.
  - The sealing ring is hidden behind the input gear in Figure 130.
- o Make sure all exposed internal areas of the CVT (including the oil pan and magnets) have been thoroughly cleaned.

**NOTICE**

- o To avoid damage to the CVT, use care while assembling the input shaft to the oil pump cover as the input shaft sealing ring may become damaged.
- o To avoid damage to the CVT when not being worked on, cover all parts with a lint-free covering to prevent contamination.

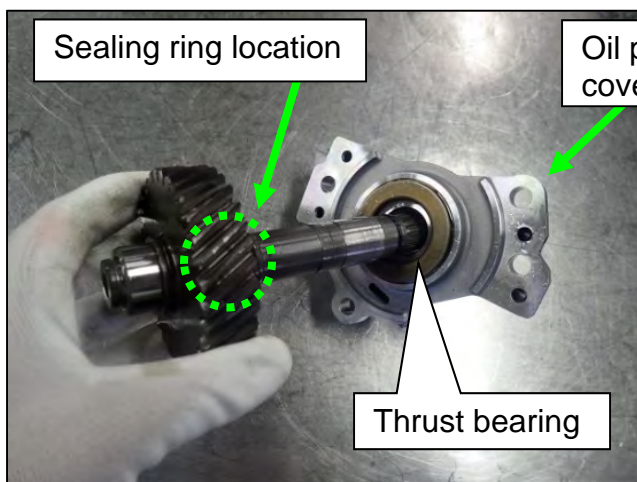


Figure 130

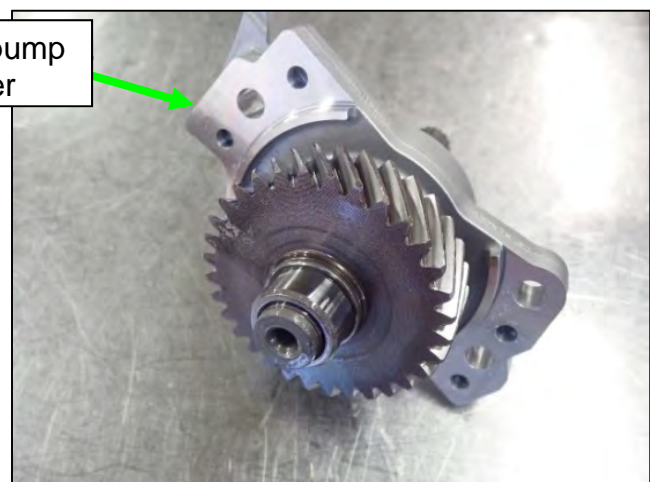


Figure 131

## Measuring the CVT Sub-assembly Case Depth

97. Temporarily install the torque converter housing to the CVT case with two (2) bolts at opposite corners, hand tight (Figure 132).
  - Use the original bolts to secure.

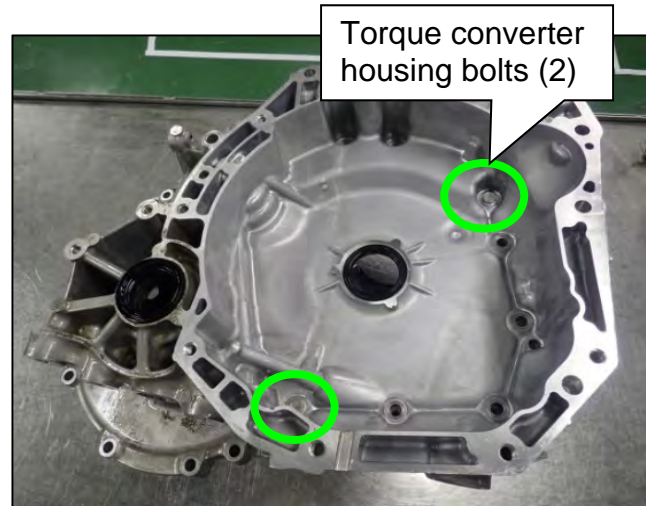


Figure 132

98. Reposition the CVT on the work bench with the torque converter housing side facing down (Figure 133).
99. Clean and then zero the digital depth gauge J-50272.
100. Set the digital gauge to millimeters.



Figure 133

101. Clean the Gauge Block J-50271.

### HINT:

- If Gauge Block J-50271 is not used, the thickness of the substitute gauge block will need to be measured.
- The thickness of the gauge block is shown as "X" (Figure 137 on page 67).

102. Confirm the sealing surfaces of the CVT case are clean.
103. Place the Gauge Block J-50271 across the sub-assembly sealing surface (Figure 134).

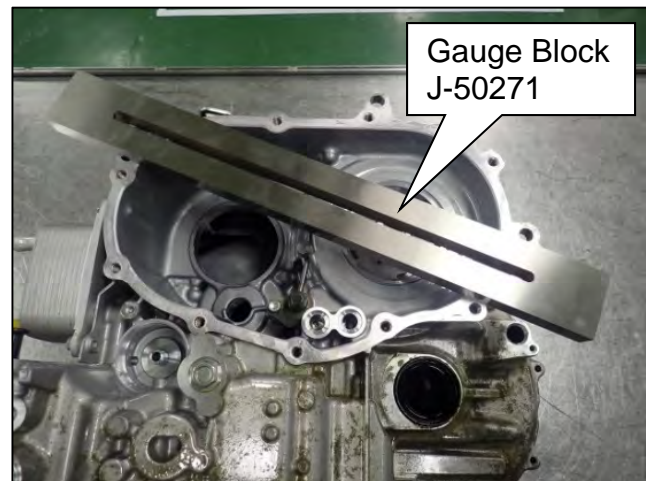
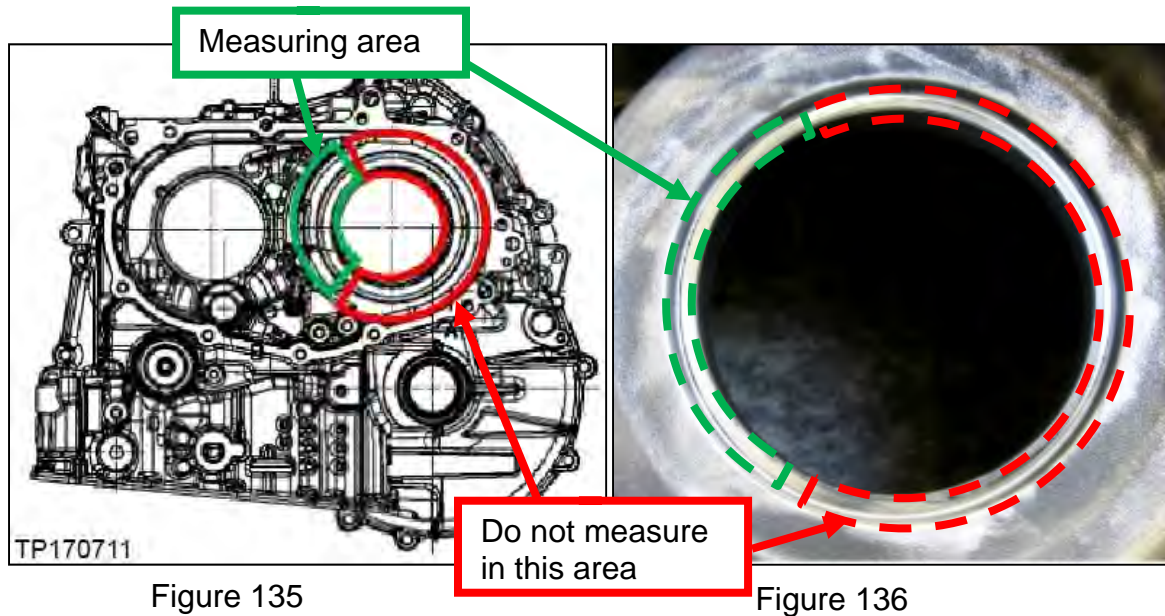


Figure 134

104. Measure the average distance (Y) shown in Figure 137 as follows:

- Refer to Figure 135, Figure 136 and Figure 137, then proceed to page 68.
- Measure only from areas that do not have any signs of contact.
- Refer to “Measuring area” referenced in green to measure “Y”.



Y = The distance between the upper surface of the Gauge Block J-50271 and the surface where the snap ring seats.

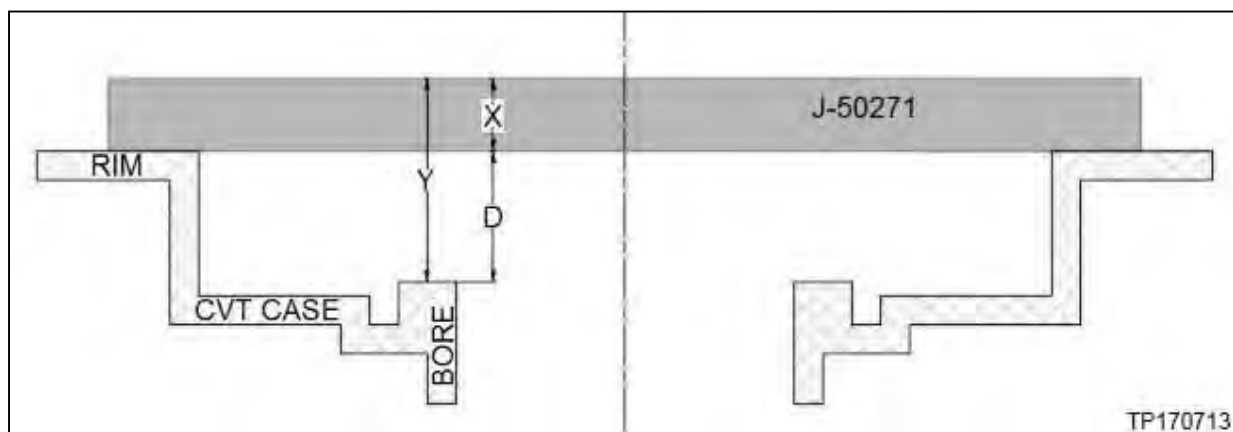


Figure 137

Proceed to the next page.



Secondary pulley bearing snap ring surface

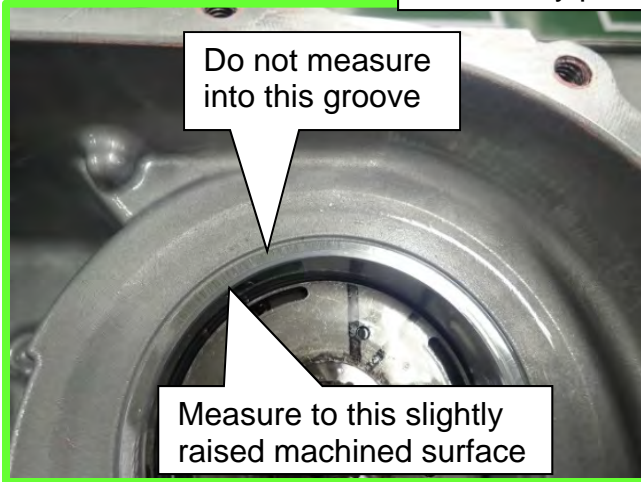


Figure 138

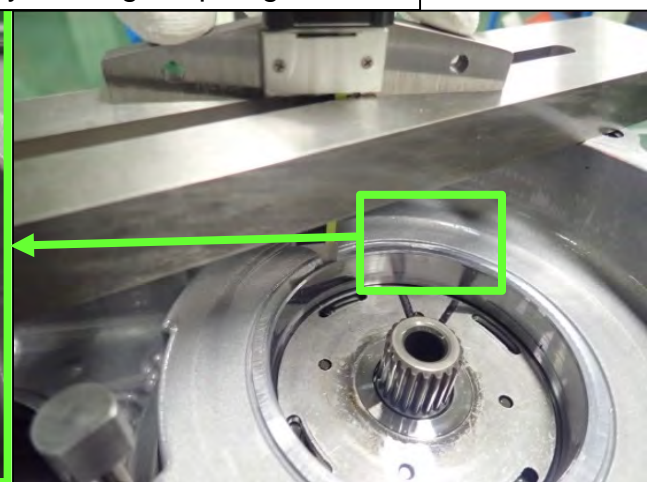


Figure 139

- a. Measure between the top of the Gauge Block (J-50271) to where the snap ring on the secondary pulley bearing seats in three (3) locations to calculate the average value, "Y". Refer to Figure 138 and Figure 139.

Y1 \_\_\_\_\_, Y2 \_\_\_\_\_, Y3 \_\_\_\_\_

- b. Calculate the average, "Y", using the formula below and then record it below.

$$Y = \frac{(Y1+Y2+Y3)}{3} \text{ (millimeter)}$$

Y = \_\_\_\_\_

- c. Calculate case depth "D" as follows:

**IMPORTANT:** Essential tool Gauge Block (J-50271) is **20 mm** thick.

- Average depth calculated in step 103b → Y \_\_\_\_\_
- Subtract the Gauge Block thickness →        - X \_\_\_\_\_
- Calculated depth → = D \_\_\_\_\_

**D** = Distance between the sub-assembly sealing surface and the secondary pulley front bearing surface with the snap ring attached.

**EXAMPLE:**

$$\begin{array}{r} Y = 61.39 \text{ mm} \\ - X = 20.00 \text{ mm} \\ \hline D = 41.39 \text{ mm} \end{array}$$



## New Snap Ring Selection and Installation to the New Sub-assembly

105. Remove the top of the shipping box of the new sub-assembly.

**HINT:** The outer cardboard of the shipping box can be disassembled for easy removal of the sub-assembly by removing the shipping tape.



Figure 140

106. Remove the upper board with foam spacer assembly.

- The packing material may be different than what is shown in Figure 141.

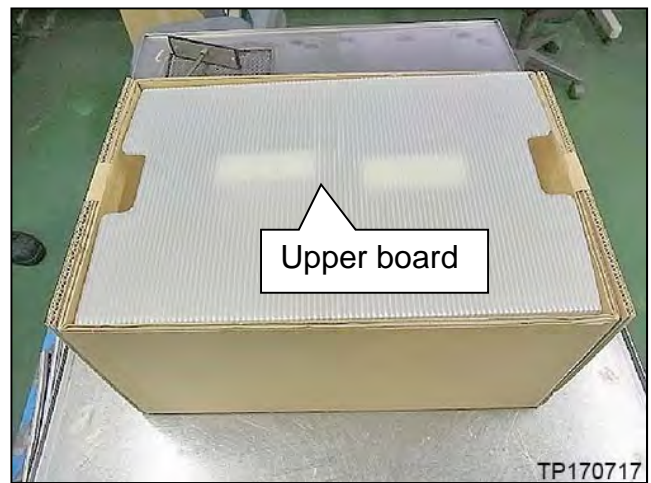


Figure 141

107. Locate the data sheet in the shipping box and place it in a safe place.

- This data sheet is required for snap ring selection in the following steps.

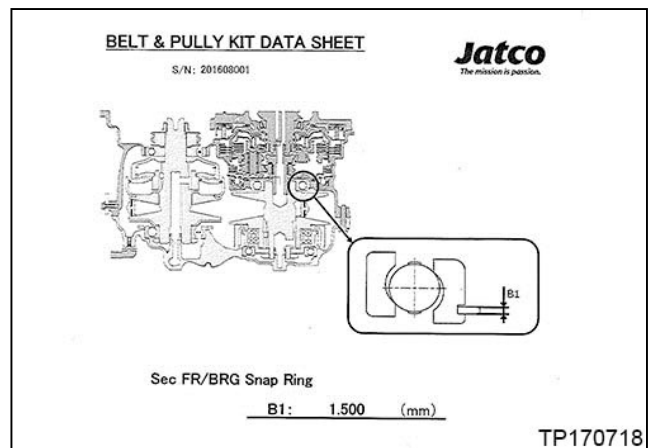


Figure 142

108. Locate the plastic bag that contains the snap rings (Figure 143).

- There are six (6) individual snap rings in the plastic bag.
- Take the plastic bag out of the shipping box, and put aside on the work bench.

**HINT:** See Reference # 5 in the **KIT PARTS REFERENCE TABLE** on page 149.



Figure 143

109. Take the new sub-assembly out of the shipping box and place it on the work bench.

**NOTICE**

To avoid possible damage to the CVT:

- Hold the sub-assembly by the side cover **ONLY** when removing it from the shipping box.
- **DO NOT** handle the belt or pulleys of the sub-assembly when removing from the shipping box.
- **DO NOT BREAK** the foam cushion in the shipping box. This will be used as a stabilizer for the sub-assembly during the repair.



Figure 144

**HINT:** See Reference # 4 in the **KIT PARTS REFERENCE TABLE** on page 149.

110. Take the lower board with foam cushion (lower board) out of the shipping box shown in Figure 146.

**HINT:** Step 111 is for kits that have a separate spacer (Figure 145). In later kits this spacer will be part of the lower board and step 111 will not be used.

111. Take the spacer (Figure 145) out of the shipping box and place it on the work bench where the sub-assembly will be installed, and then place the lower board on top of the spacer as shown in Figure 146.

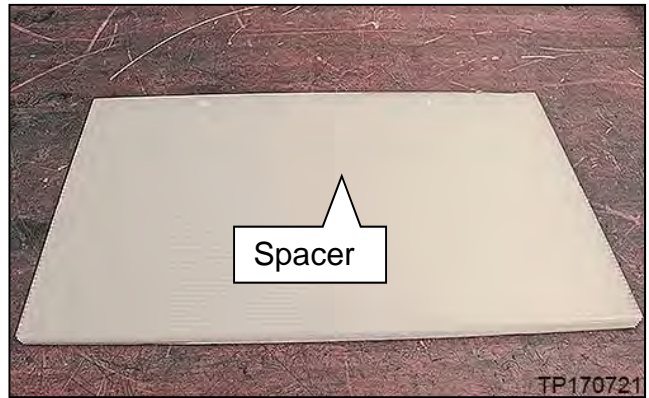


Figure 145

**HINT:** The spacer will be the last item that is removed from the shipping box and is approximately 1 inch thick.

- Position the lower board so that it hangs over the spacer.
- Align the lower board so that the left and the right cut-outs are even with the spacer.

**HINT:** The positioning of the lower board with foam cushion will allow the CVT case enough clearance from the work bench to allow it to seat flush with the sub-assembly.

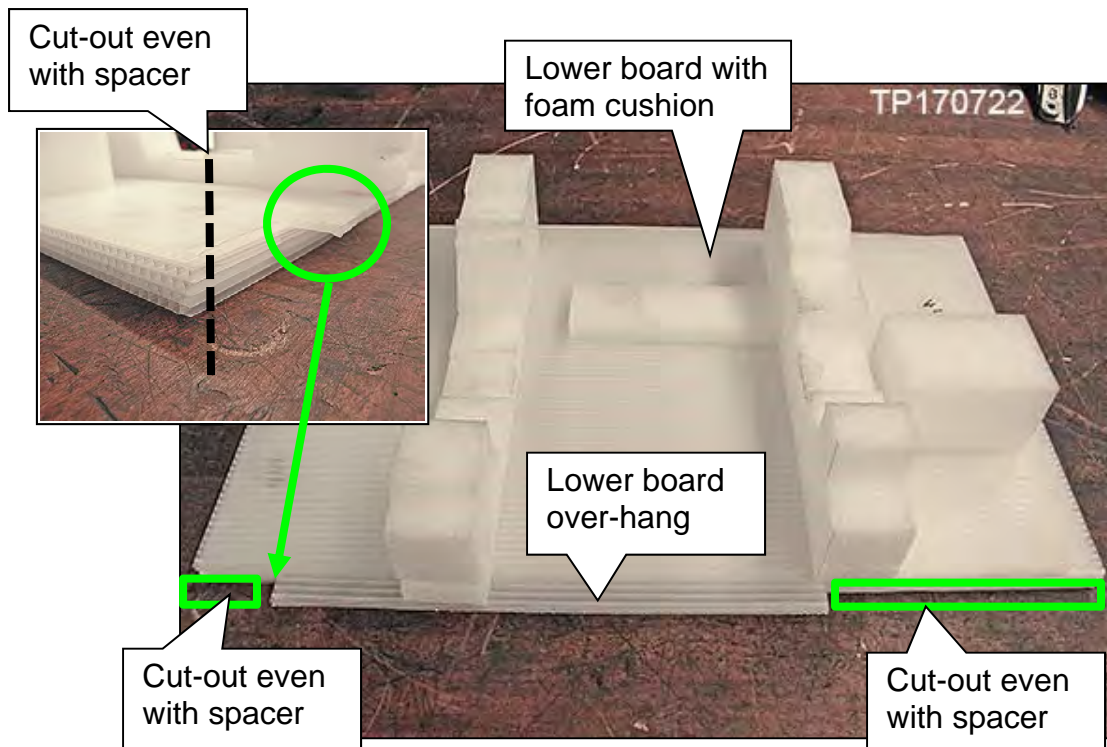
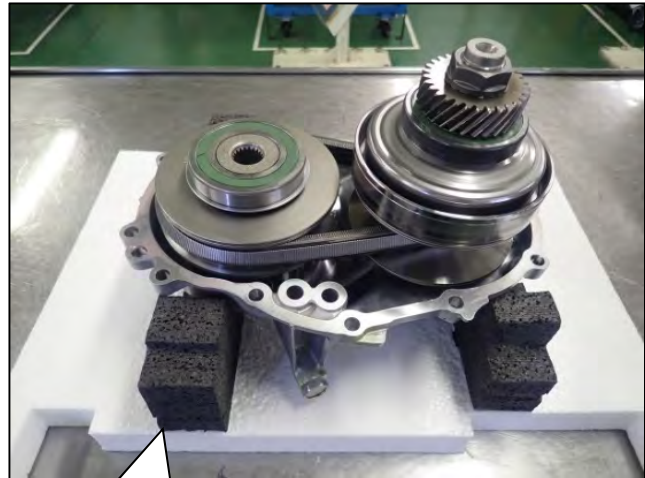


Figure 146



112. Remove the sub-assembly from the plastic bag.
113. Place the new sub-assembly onto the lower board.
- The sub-assembly must be level and oriented as shown in Figure 147 for proper seating of the CVT case later in this procedure.



Lower board and spacer

Figure 147

114. Remove the snap ring from the secondary pulley front bearing of the new sub-assembly.
- A new snap ring will be installed later in the procedure.

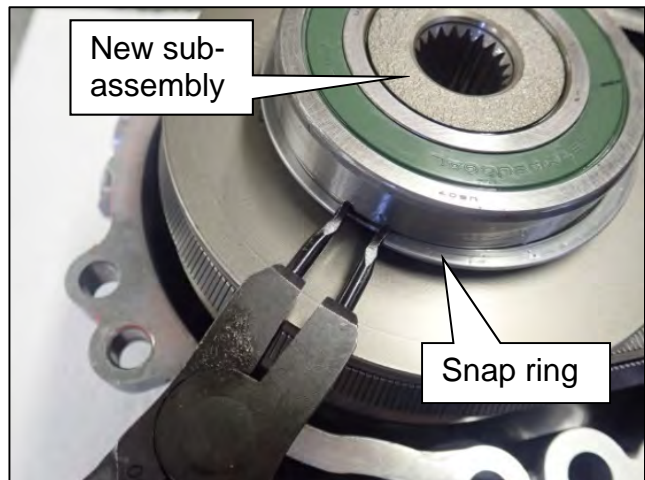


Figure 148

115. Calculate "E" for snap ring selection as follows:

**HINT:** For the value of "B1", refer to the data sheet that was put aside when the sub-assembly shipping box was opened.

- Calculated case depth from step c on page 68 → **D** \_\_\_\_\_
- Subtract constant value → **- 37.80**  
-----
- Subtotal → **=** \_\_\_\_\_
- Add value for "B1" from data sheet → **+ B1** \_\_\_\_\_  
-----
- Total calculated depth → **= E** \_\_\_\_\_

**E** = This will be used to select a snap ring from **Table A** on page 74.

**EXAMPLE:**

**If D** = 41.39 mm  
**Constant** = 37.80 mm (subtracted)  
**And B1** = 1.56 mm (added)  
-----  
**E** = 1.65 mm

116. Select the appropriate Part Number from **Table A** shown below, based on the calculated result of “E” in step 115 on page 73.

**EXAMPLE:** If E = 1.65, and is between or equal to 1.64 to 1.67, choose new snap ring Part Number “31506 3JX9C”.

E (MM)	PART NUMBER	SNAP RING REFERENCE (MM)
1.55 to 1.59	31506 3JX9A	1.61
1.60 to 1.63	31506 3JX9B	1.65
1.64 to 1.67	31506 3JX9C	1.69
1.68 to 1.71	31506 3JX9D	1.73
1.72 to 1.75	31506 3JX9E	1.77
1.76 to 1.76	31506 3JX8A	1.79

Example only. Do not use in your calculations.

**Table A**

E (MM)	PART NUMBER	SNAP RING REFERENCE (MM)
1.55 to 1.59	31506 3JX9A	1.61
1.60 to 1.63	31506 3JX9B	1.65
1.64 to 1.67	31506 3JX9C	1.69
1.68 to 1.71	31506 3JX9D	1.73
1.72 to 1.75	31506 3JX9E	1.77
1.76 to 1.76	31506 3JX8A	1.79

117. Open the plastic bag (with snap rings) that was removed from the shipping box in step 108 on page 70 and then choose the correct Part Number selected from **Table A**.

**HINT:** There are six (6) individually packed snap rings in the plastic bag. See Reference # 5 in the **KIT PARTS REFERENCE TABLE** on page 149.

118. Measure the new snap ring and confirm its thickness is equal to the Snap Ring Reference in **Table A**.

119. Install the selected snap ring onto the secondary pulley front bearing of the new sub-assembly.

**HINT:** Discard unused snap rings.

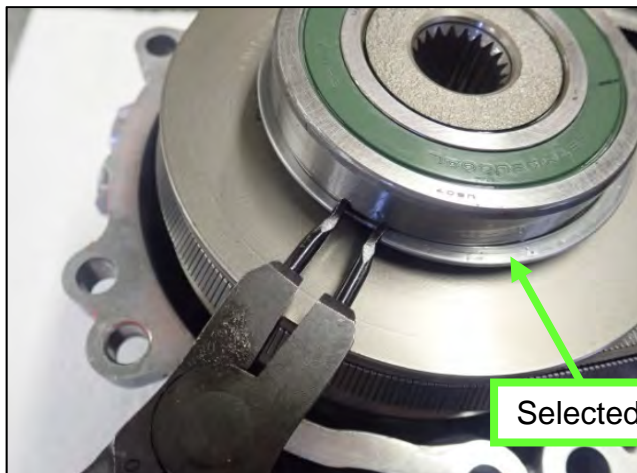


Figure 149

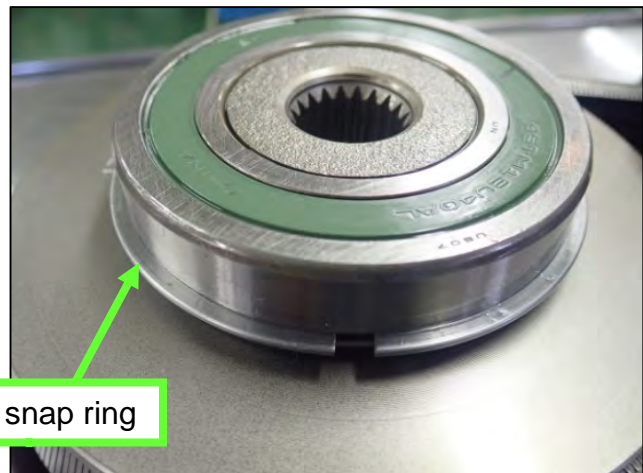


Figure 150



## Install Sub-assembly to CVT Case

120. Make sure the CVT case sealing surface of the side cover is thoroughly cleaned.
121. Make sure the dowel pins are cleaned and any rust has been removed.

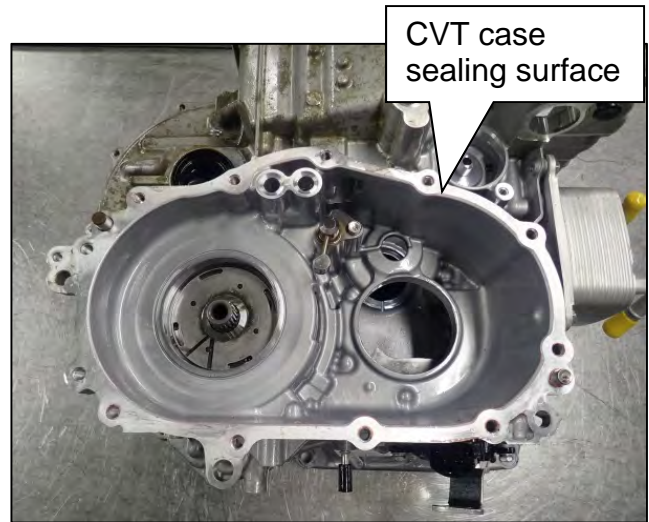


Figure 151

122. Flip the CVT case over on the work bench with the torque converter housing side facing up.

### **NOTICE**

To avoid possible contamination and damage to the CVT, ensure the work bench surface is thoroughly cleaned before flipping the CVT case.

123. Remove the two (2) temporary bolts and then remove the torque converter housing from the CVT case.

- Discard these bolts.

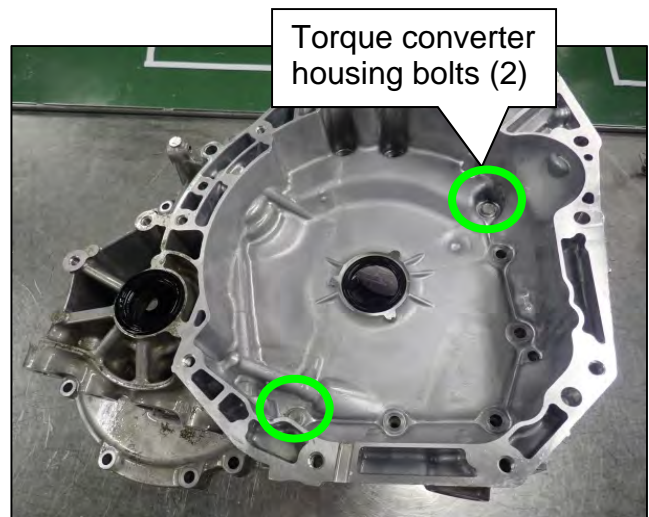


Figure 152

124. Install the CVT case onto the new sub assembly as follows:

**HINT:** Sealant will be applied between these components at a later step.

a. Slowly lower the CVT case onto the sub-assembly.

**NOTICE**

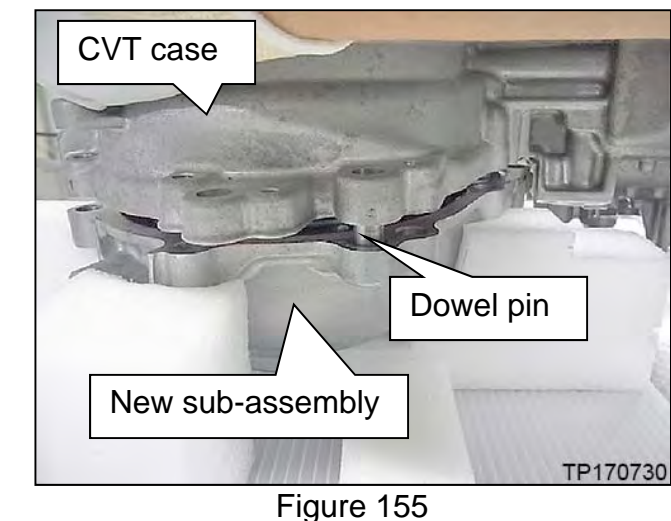
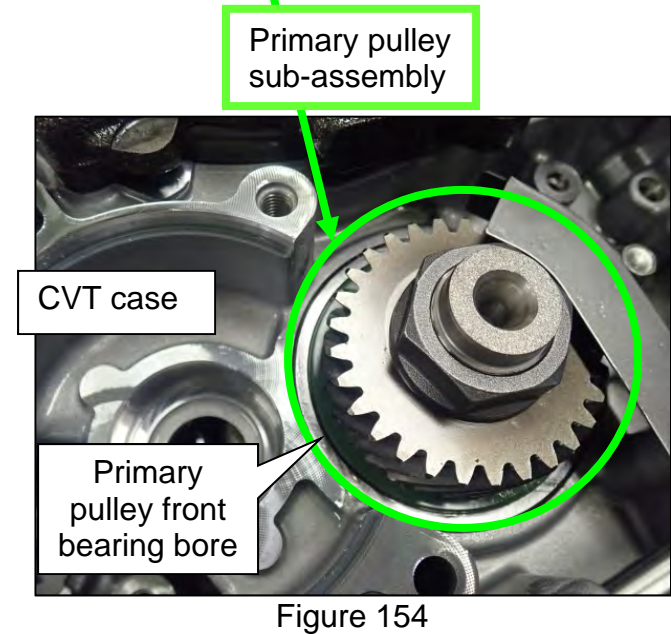
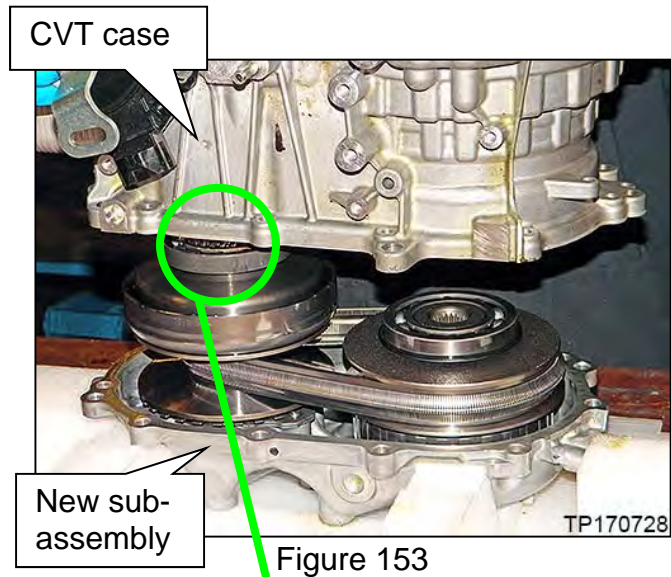
To avoid damage to the CVT:

- Only use the weight of the CVT case when installing it to the sub-assembly.
- Do NOT use any other external force to seat the CVT case to the sub-assembly.

b. Align the primary pulley front bearing bore of the CVT case to the primary pulley front bearing of the sub-assembly.

**HINT:** Figure 154 is shown looking down into the CVT case while it is being lowered.

c. Align one of two dowel pin holes found on the CVT case to the sub-assembly.



- d. Align the second dowel pin of the sub-assembly with the hole on the opposite side of the CVT case and seat the CVT case.

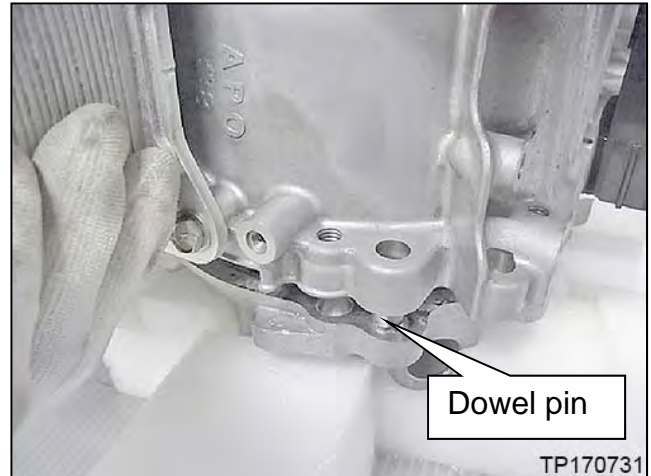


Figure 156

- e. If the CVT case will not seat on the sub-assembly:
- Access the counter driven gear through the top of the CVT case,
- and**
- Rotate the counter driven gear on the primary pulley back and forth.

**HINT:** This will allow the splines of the secondary pulley and the planetary carrier plate to align. (Figure 158).

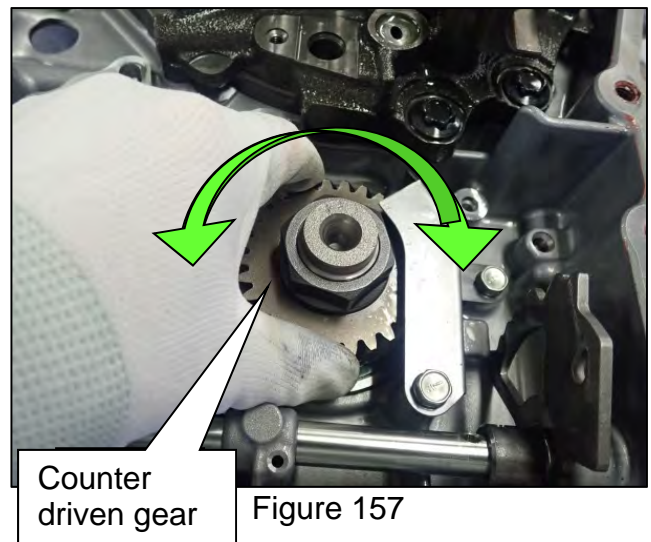


Figure 157

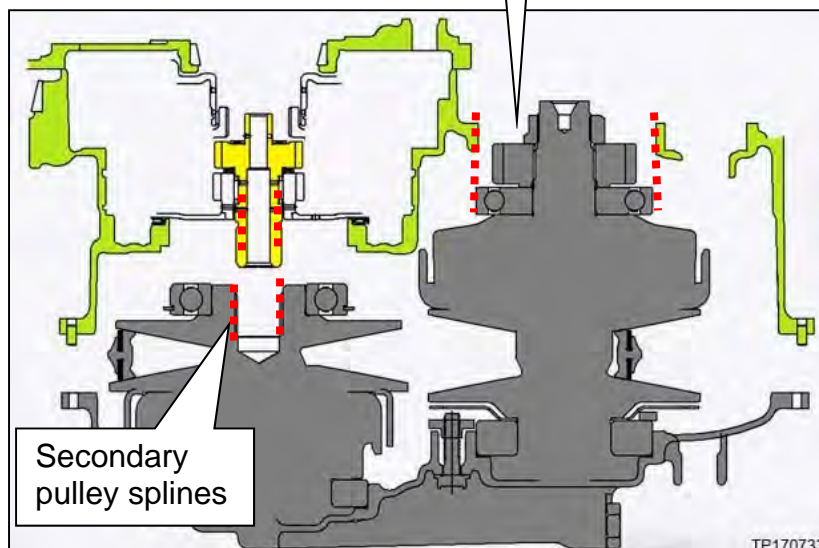


Figure 158



- f. Confirm that the mating surface of the CVT case is seated to the sub-assembly completely.
- If the CVT case does not sit completely flush with the sub-assembly, DO NOT apply any vertical force to seat it.
    - i. If this occurs, first lift the CVT case up slightly and then lower.
    - ii. Repeat until the CVT case and sub-assembly sit flush with each other.

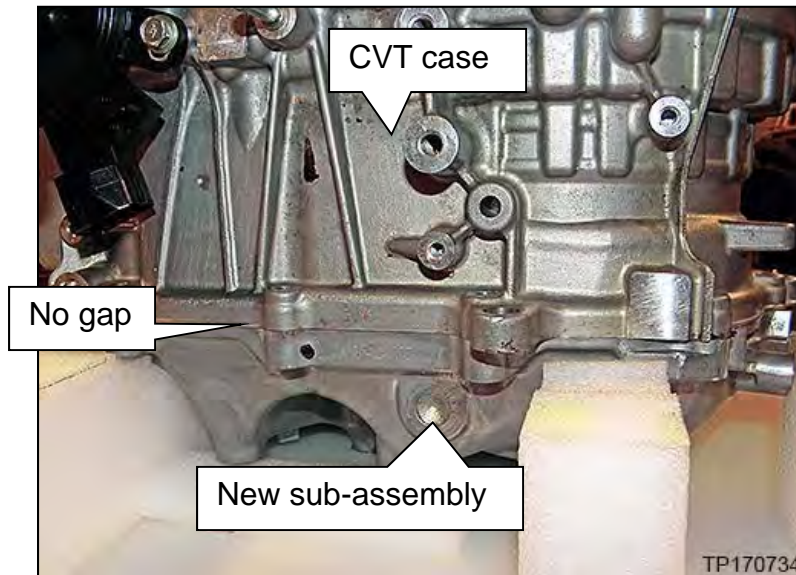


Figure 159

- g. Rotate the counter driven gear back and forth by hand to confirm its rotation is smooth.



125. Temporarily install two (2) original bolts hand tight to hold the sub-assembly cover to the CVT case.

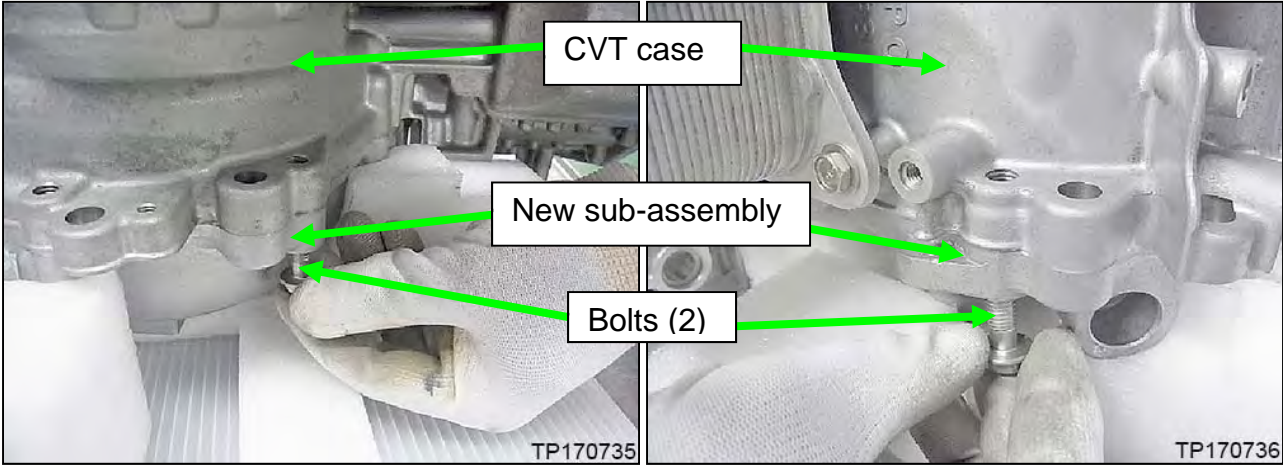


Figure 160

Figure 161

126. Lift the sub-assembly / CVT case away from the cradle and set aside. Discard the cradle.

- Leave the sub-assembly side cover facing down as shown in Figure 162.
- Weight: 29 kg (64 lbs.)

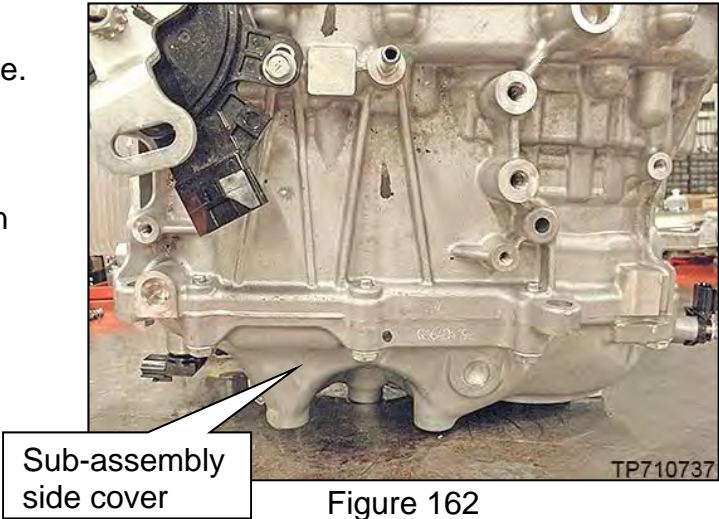


Figure 162

## Install the Oil Pump and the Manual Shaft

127. Install the two (2) oil pump gaskets to the CVT case.

- Use new gaskets (non-reusable).
- Apply CVT fluid before installation.

**HINT:** See Reference # 14 in the **KIT PARTS REFERENCE TABLE** on page 149.

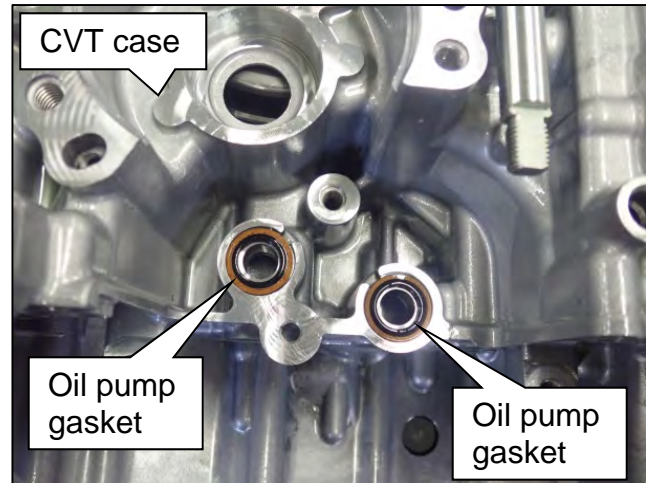


Figure 163

128. Remove the hand tight transmission range switch bolts and then slide the manual shaft out only far enough to install the oil pump. See Figure 90 on page 48.

### **NOTICE**

Do not remove the manual shaft completely from the CVT case. If the retaining pin slot contacts the seal, damage may occur.

129. Install a new oil pump to the CVT case.

- Reuse the three (3) original hex bit screw fasteners for the oil pump.
- 35 mm (1.4 inch) long bolt.
  - Bolt torque:  
20.3 N•m (2.1 kg-m,  
15 ft-lbs.)

**HINT:** See Reference # 13 in the **KIT PARTS REFERENCE TABLE** on page 149.

130. Install the snap ring that came out of the original oil pump to the new oil pump.

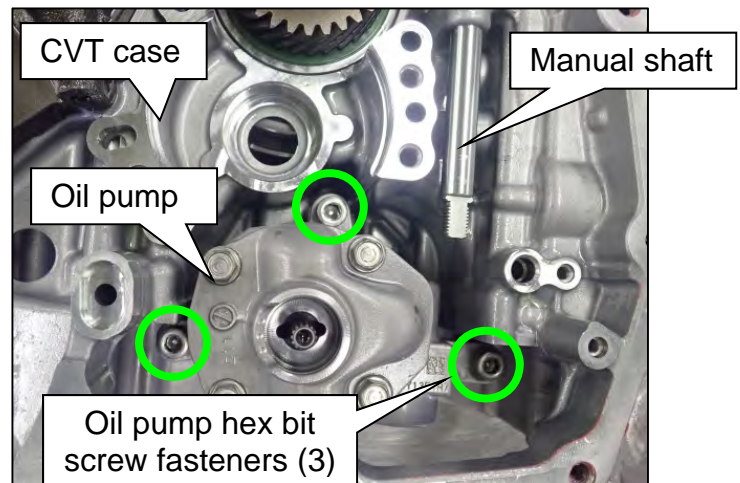


Figure 164

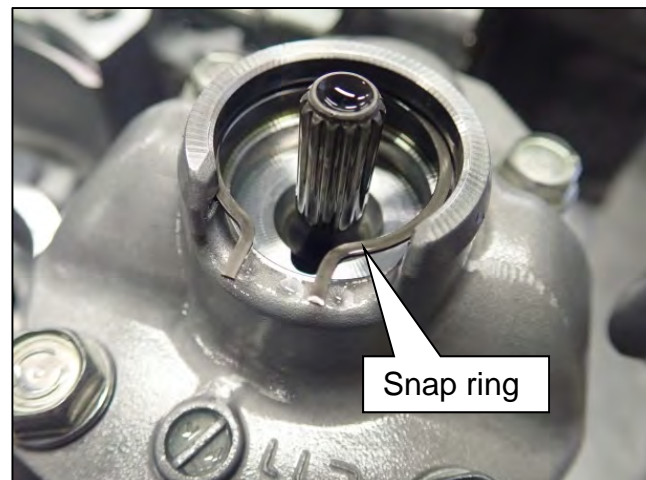


Figure 165

131. Slide the manual shaft back to the original position.

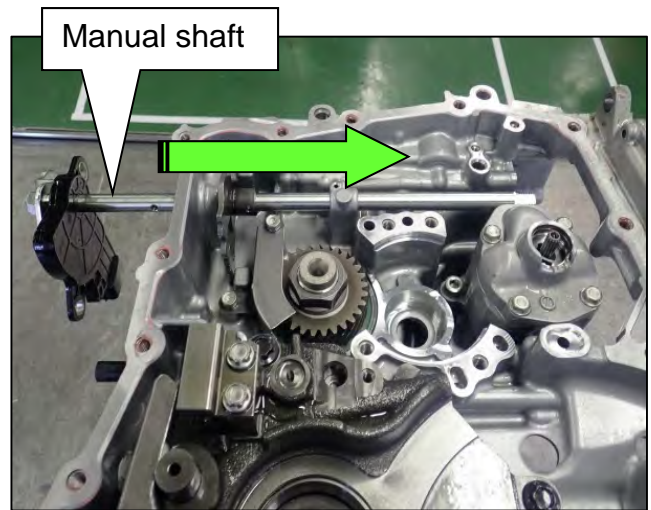


Figure 166

132. Install the original retaining pin, as shown in Figure 167.

- Align the manual shaft groove (Figure 168) to allow the retaining pin (Figure 167) to go through completely.

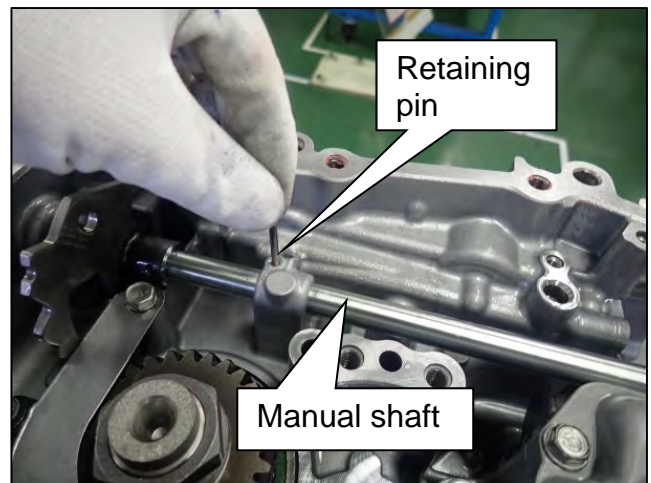


Figure 167

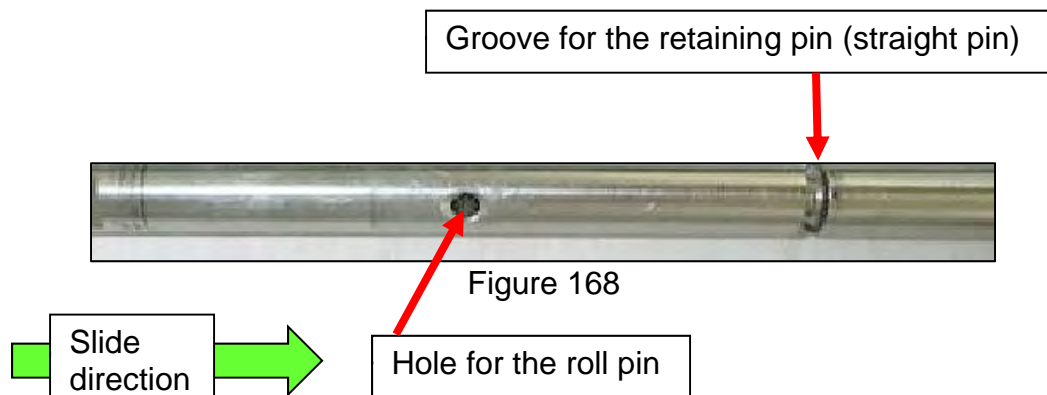


Figure 168



## NOTICE

To prevent CVT operational issues, use care when assembling the manual shaft and detent plate.

- Do not drive the roll pin flush with the detent plate.
- If the roll pin is driven flush, it will be overextended on the opposite side and the manual shaft/detent plate assembly will not rotate.
- The roll pin MUST be the same length on both sides of the detent plate after it is installed through the detent plate and manual shaft.

133. Install the new roll pin through the detent plate and manual shaft.

- The roll pin must be inserted through the detent plate so that both ends are the same length.
- Use a new roll pin (non-reusable).

## NOTICE

Use the appropriate size punch to prevent damage to the roll pin or detent plate.

**HINT:** See Reference # 12 in the **KIT PARTS REFERENCE TABLE** on page 149.

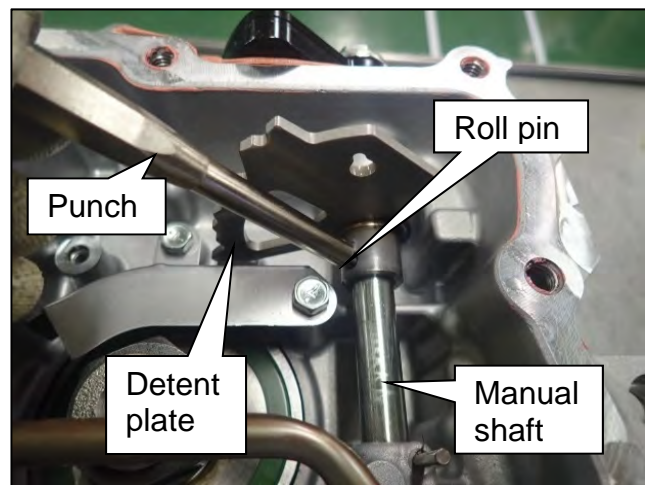


Figure 169

## Install Powertrain Parts

134. Install the original manual shaft detent spring to the CVT case.

**IMPORTANT:** Locate the tab of the detent spring to the hole of the CVT case.

- 16 mm (**0.6 inch**) long bolt.
  - Bolt torque:  
6.8 N•m (0.70 kg-m, **60 in-lbs.**)

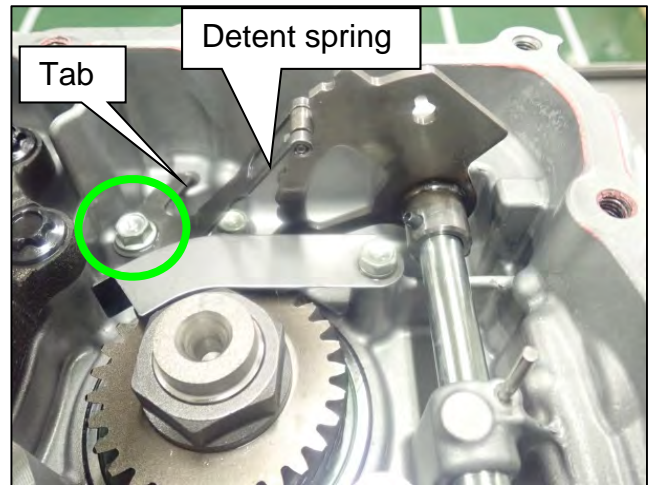


Figure 170

135. Install the original shim for the input shaft in the counter bearing bore (Figure 171).

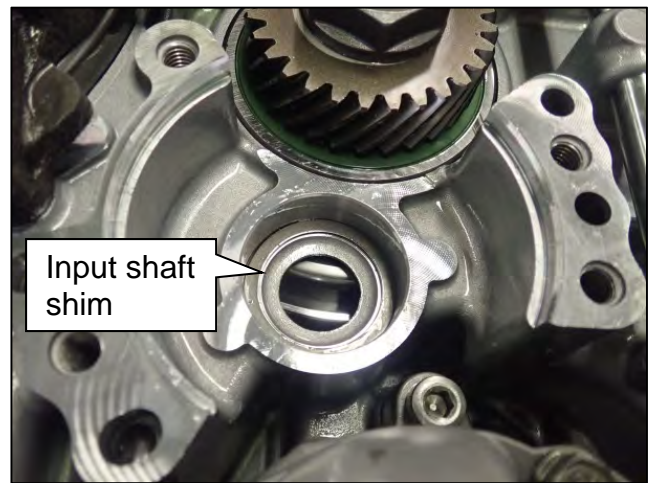


Figure 171

136. Install the outer race of the roller bearing to the counter bearing bore of the CVT case, if it has not been done already.

**IMPORTANT:** Apply CVT Fluid to the outer race of the roller bearing before installation.

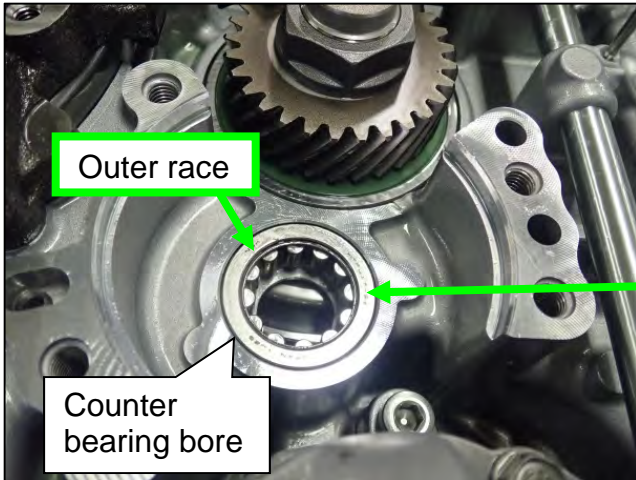


Figure 172

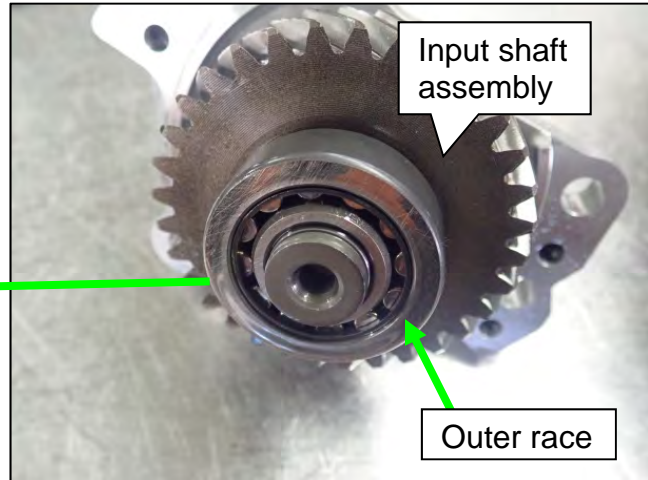


Figure 173

137. If the input shaft assembly is, for any reason, separated into individual components, see steps 96f - 96h on pages 64 - 65 to reassemble those parts, otherwise continue to step 138.

138. Install the input shaft assembly to the CVT case as follows:

- Hold the tip of the input shaft so that the input shaft and the pump cover remain together.
- Confirm that the oil pump cover seats onto the CVT case completely.

**NOTICE**

Do not draw the input shaft assembly down to the case with the mounting bolts or damage to the CVT may occur.

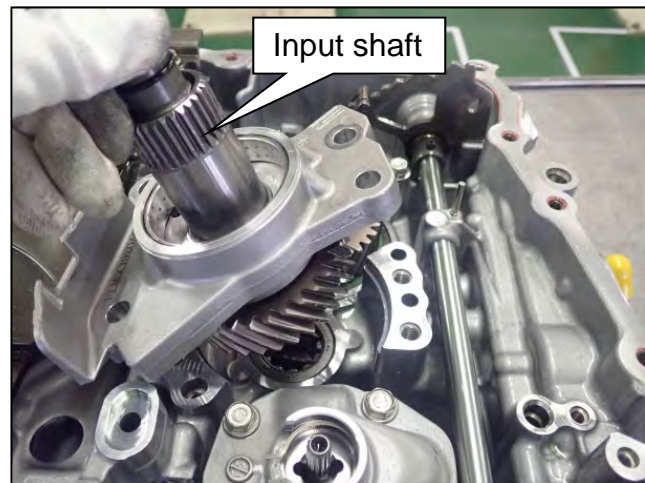


Figure 174



139. Install the original chain cover and the six (6) original bolts, and then tighten (Figure 175).

- 16 mm (**0.6 inch**) long bolt  
2 pieces, circled in green.
  - Bolt torque: 5.6 N•m  
(0.60 kg-m, **50 in-lbs.**)
- 30 mm (**1.2 inch**) long bolt  
4 pieces, circled in yellow.
  - Bolt torque: 27.1 N•m  
(2.8 kg-m, **20 ft-lbs.**)

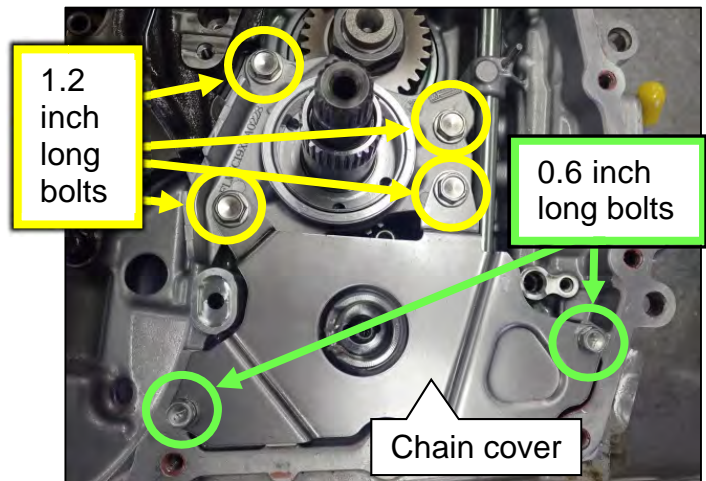


Figure 175

140. Rotate the input shaft by hand to confirm that the shaft rotates freely.

141. Install the sleeve and the O-ring to the reverse brake tube.

- Use a new sleeve and a new O-ring (non-reusable).
- Apply CVT Fluid to the sleeve and the O-ring before installation.

**HINT:** See Reference # 20 in the **KIT PARTS REFERENCE TABLE** on page 149.

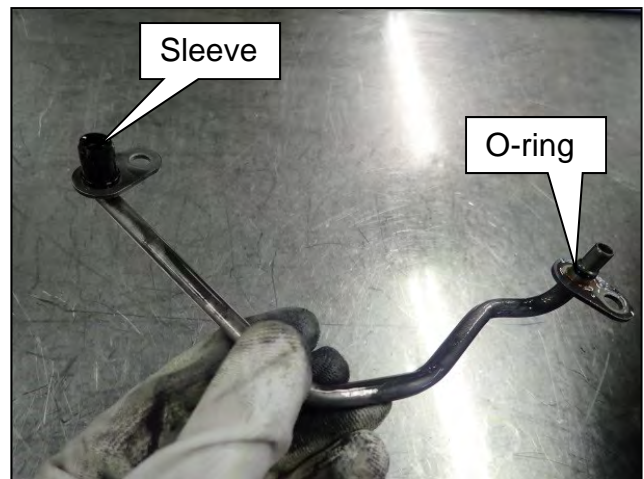


Figure 176

142. Install the reverse brake tube to the CVT case.

- 16 mm (**0.6 inch**) long bolts.
  - Bolt torque: 5.6 N•m  
(0.60 kg-m, **50 in-lbs.**)

**NOTICE**

Insert the tube to the CVT case vertically and evenly to avoid damage to the sleeve.

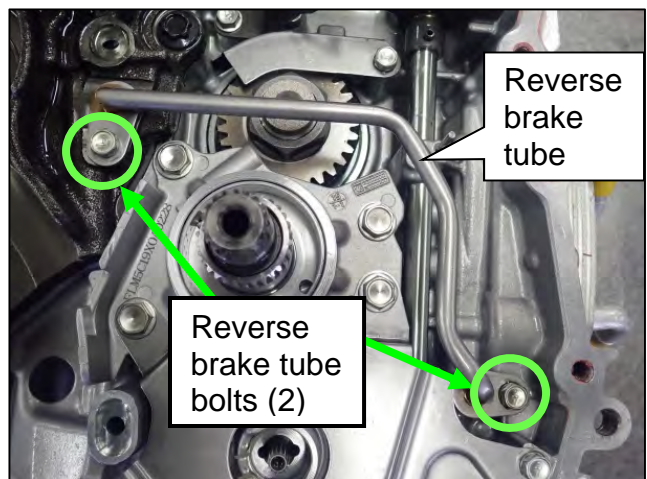


Figure 177

143. Install the parking rod as follows:

- a. Rotate the detent plate until the detent is in the “L” position, as shown in Figure 178.
  - o The detent roller position should be on the leftmost concave position of the detent plate.
- b. Rotate the parking rod vertically to align the tab on the parking rod with the slot on the detent plate, and then install it into the detent plate.

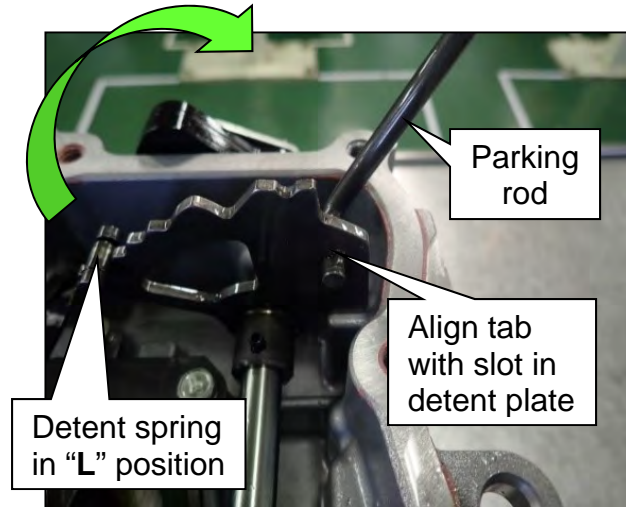


Figure 178

- c. Install the two (2) parking rod bolts (Figure 179).
  - o Bolt torque: 28.8 N•m (2.9 kg-m, **21 ft-lbs.**)

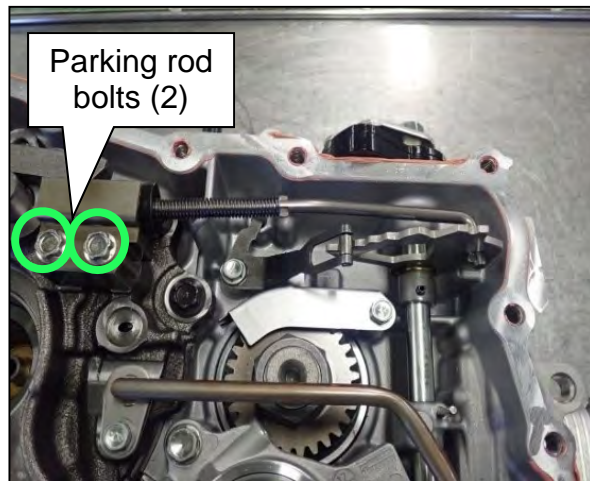


Figure 179

144. Rotate the detent plate until the detent is in the “D” position, as shown in Figure 180.

- The detent roller position should be on the second left concave of the detent plate.

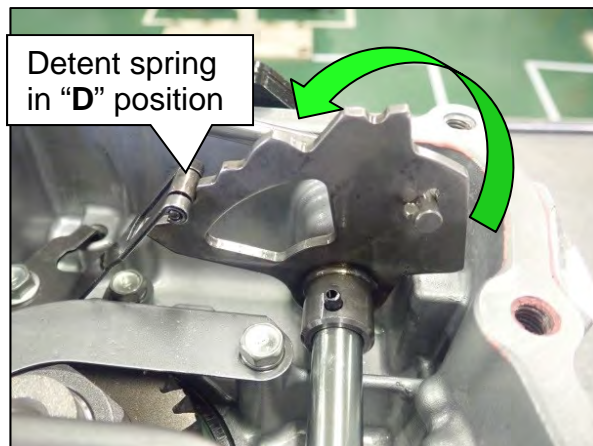


Figure 180



145. Install the oil pump chain onto the oil pump sprocket and the drive sprocket and then lower onto the oil pump shaft (driven sprocket) (Figure 181 and Figure 182).
146. Expand the snap ring with a suitable tool, and then push down on the driven sprocket until it bottoms out.
147. Release the snap ring and then pull up on the driven sprocket until the snap ring locks into its groove.

**HINT:** A click sound can be heard when the snap ring locks in place.

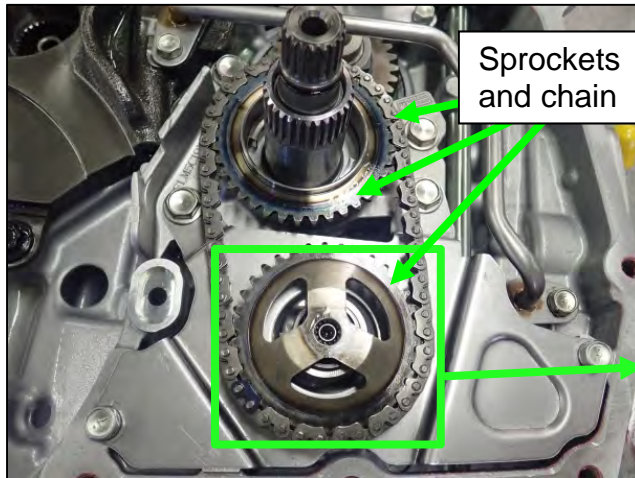


Figure 181

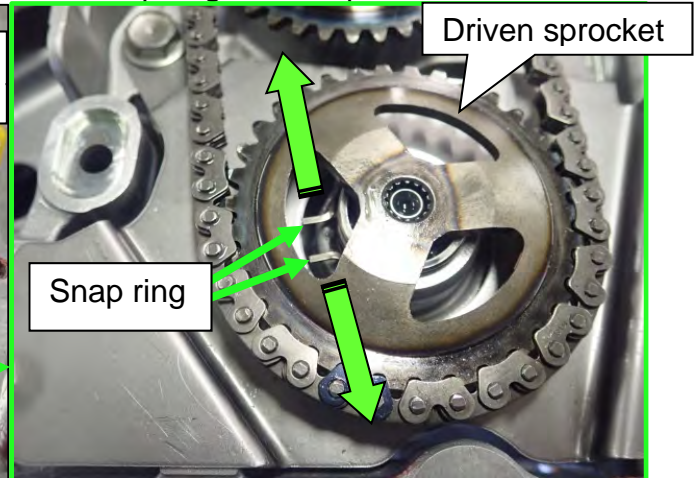


Figure 182

148. Install the original thrust bearing onto the drive sprocket.

**HINT:** Install the thrust bearing with the exposed bearings facing up.

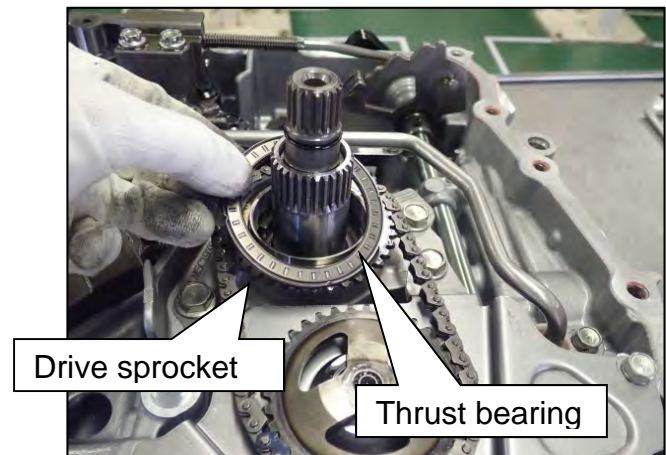


Figure 183

149. Rotate the input shaft by hand to confirm that the chain, pump and shaft rotate freely.
150. Install the new O-ring onto the input shaft.
  - Use a new O-ring (non-reusable).
  - Apply CVT Fluid to the O-ring before installation.

**HINT:** See Reference # 7 in the **KIT PARTS REFERENCE TABLE** on page 149.

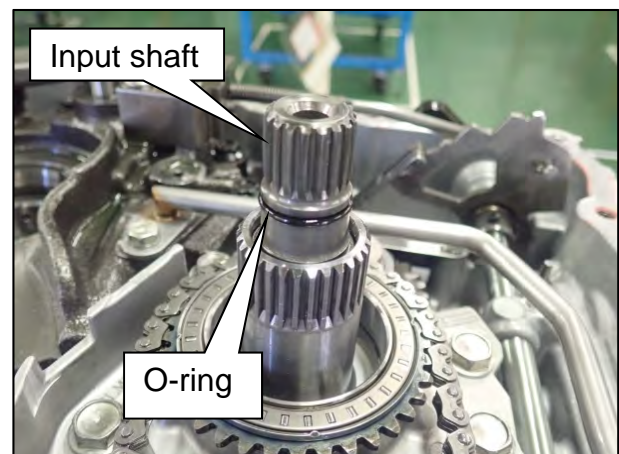


Figure 184



151. Install the CVT case O-ring (oval O-ring) to the CVT case.

- Use a new oval O-ring (non-reusable).
- Apply CVT Fluid to the O-ring before installation.

**HINT:** See Reference # 11 in the **KIT PARTS REFERENCE TABLE** on page 149.

152. Install the O-ring to the CVT case.

- Use a new O-ring.
- Apply CVT Fluid to the O-ring before installation.

**HINT:** See Reference # 10 in the **KIT PARTS REFERENCE TABLE** on page 149.

153. Confirm that both seals are seated in their grooves.

- Use petroleum jelly to help hold the seals in place.

154. Replace the two machine cut seals (Ring Seals) of the reduction gear assembly, shown in Figure 187 and Figure 188 as follows:

- a. Clean any debris out of the machined grooves that the two Ring Seals will be installed into.

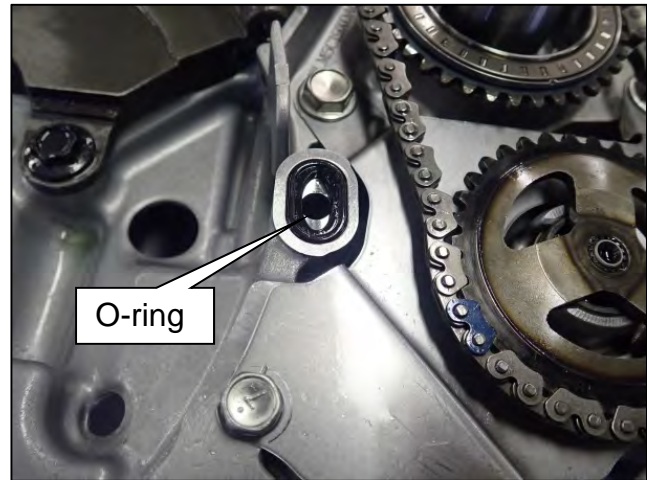


Figure 185

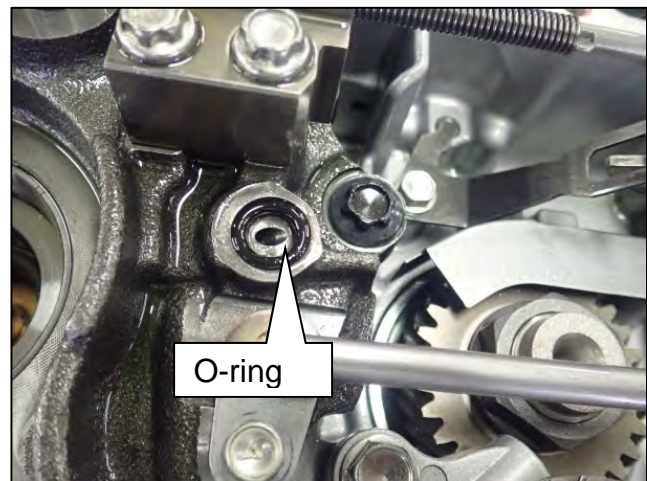


Figure 186

**NOTICE**

These seals are VERY delicate. Handle with care to avoid damage.

**HINT:** See Reference # 21 in the **KIT PARTS REFERENCE TABLE** on page 149.

- Machine cut seals can be ordered in packs of 50. See the part number in **KIT PARTS REFERENCE TABLE** on page 149.

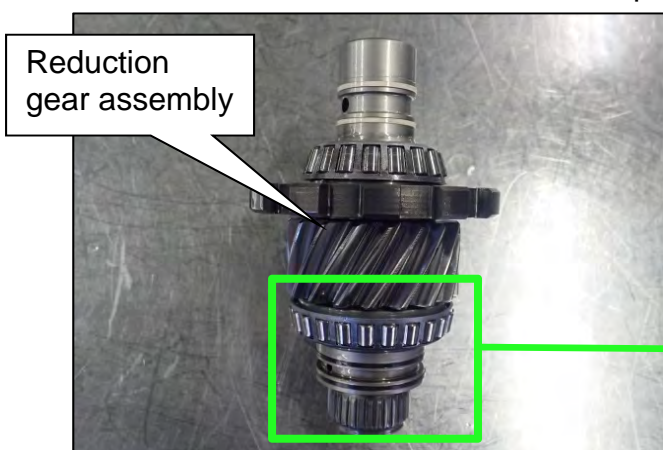


Figure 187

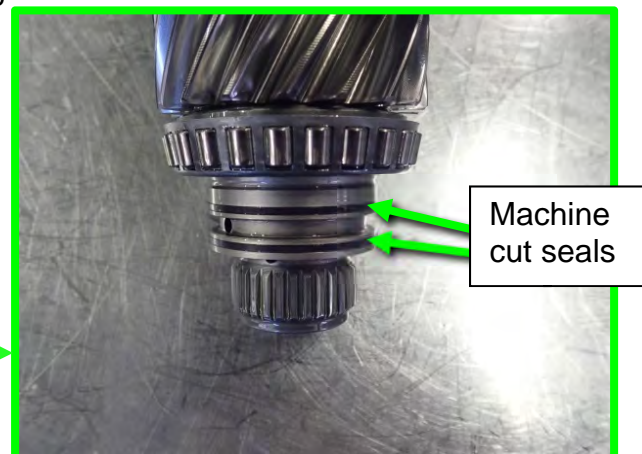


Figure 188

- b. Pre-lube both machined grooves with CVT fluid.
- c. Slide the First Groove Seal Tool (#J-52595-1) over the reduction gear shaft.
- d. Confirm that it is completely seated.

First Groove Seal Tool (#J-52595-1)



TP180740

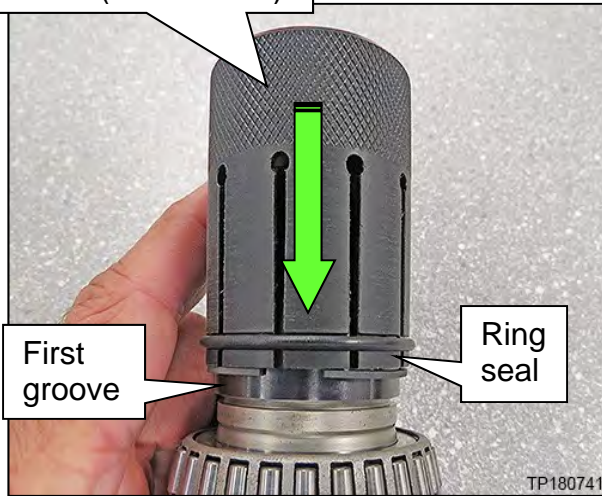
Figure 189

- e. Pre-lube both Ring Seals with CVT fluid.

Reduction gear assembly

- f. Place one (1) Ring Seal onto the First Groove Seal Tool.

Seal Driver (#J-52595-3)



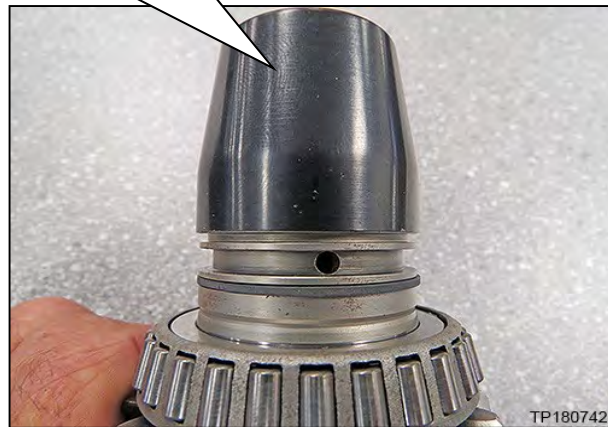
TP180741

Figure 190

- g. Slide the Seal Driver (#J-52595-3) over the First Groove Seal Tool.
- h. Gently push the Ring Seal onto the first groove.
- i. Remove the First Groove Seal Tool.

Second Groove Seal Tool (#J-52595-2)

- j. Slide the Second Groove Seal Tool (#J-52595-2) over the reduction gear shaft.
  - o Confirm that it is completely seated



TP180742

Figure 191

Reduction gear assembly



k. Place one (1) Ring Seal onto the Second Groove Seal Tool.

l. Slide the Seal Driver (#J-52595-3) over the Second Groove Seal Tool.

m. Gently push the ring seal onto the second groove.

n. Remove the Second Groove Seal Tool.

- o Confirm that both of the Ring Seals are not protruding in any direction.

**HINT:** If the reduction gear shaft is not going to be immediately installed, the Split Ring Seal Cover (#J-52595-4) can be slid over both ring seals to prevent damage.

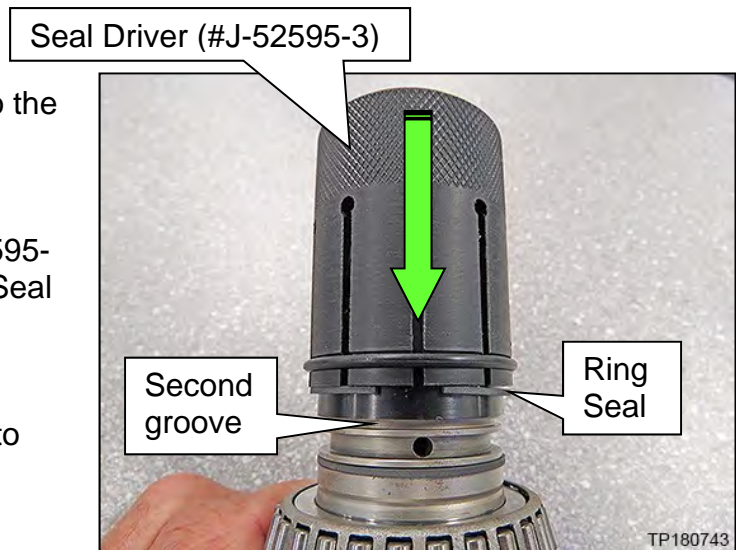


Figure 192

**NOTICE**

In the following step, use extreme care when installing the final drive and reduction gear assembly to avoid damage to components/seals.

- The machine cut seals are VERY delicate and will damage easily if forced.
- The reduction gear assembly should seat without any additional force.
- If the reduction gear assembly does not seat, remove it and confirm that machine cut seals are in place and centered in their grooves.

155. Confirm that the thrust bearing is in place in the bottom of the reduction gear assembly bore.

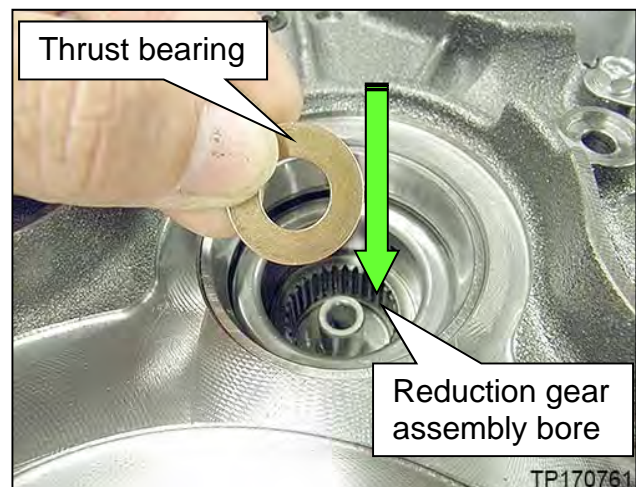


Figure 193



156. Install the final drive and reduction gear assembly together into the CVT case.
- If the reduction gear assembly does not seat, remove it and confirm that machine cut seals are in place and centered in their grooves.
157. Rotate the final drive by hand to confirm that it rotates freely.

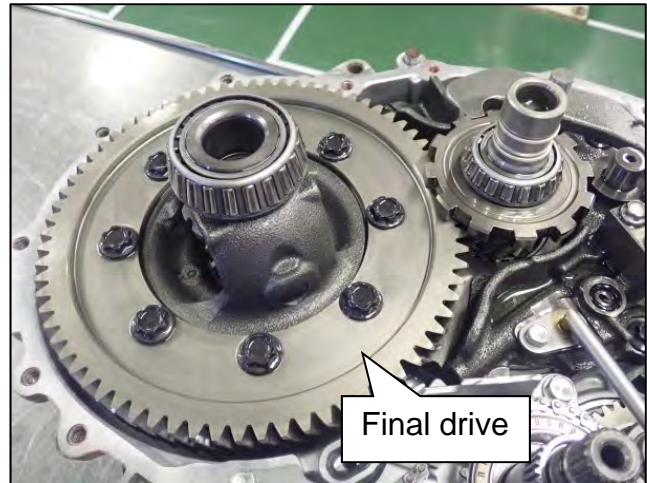


Figure 194

### Install the Torque Converter Housing

158. Place the original thrust washer on the torque converter housing.
- Apply petroleum jelly to the mating surface side of the washer to hold the washer on the converter housing.

**HINT:** Both sides of the thrust washer are the same, orientation is not critical.

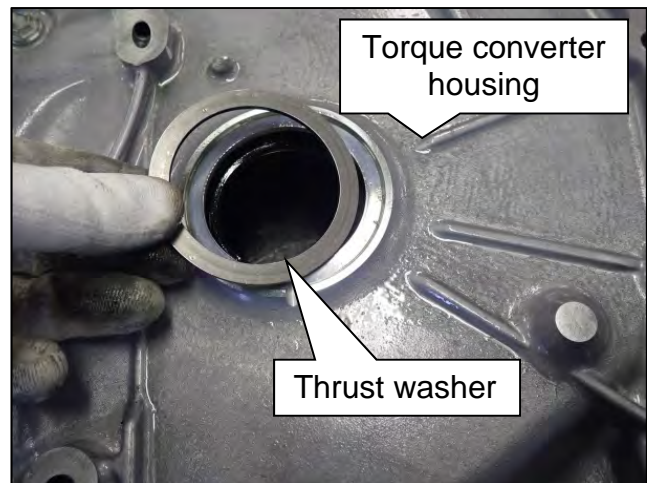


Figure 195

159. Remove any remaining CVT fluid on the sealing surfaces of the torque converter housing and the CVT case.

**HINT:** Brake cleaner is acceptable to remove remaining CVT fluid.

### **NOTICE**

To prevent possible CVT damage, prevent debris from entering into the torque converter housing or the CVT case.

160. Apply sealant to the CVT case side of the torque converter housing to CVT case mating surface.

- Sealant bead diameter: 2.0 mm

**Sealant:**

- Loctite 5460 (See the **PARTS INFORMATION** on page 144 of this bulletin)
- Color: Pink

**IMPORTANT:**

- Confirm that the mating surfaces are clean before applying sealant.
- Make sure that the starting point and the ending point of the sealant is between two bolt holes. Overlap both ends of the bead by 3 – 5 mm.
- If the Guide Pins were removed to clean the case surfaces, reinstall them now.

**NOTICE**

Be careful not to contact or contaminate the sealant. If the sealant has been disturbed or contaminated in any way before case assembly, remove the sealant completely and re-apply to prevent possible leaks.

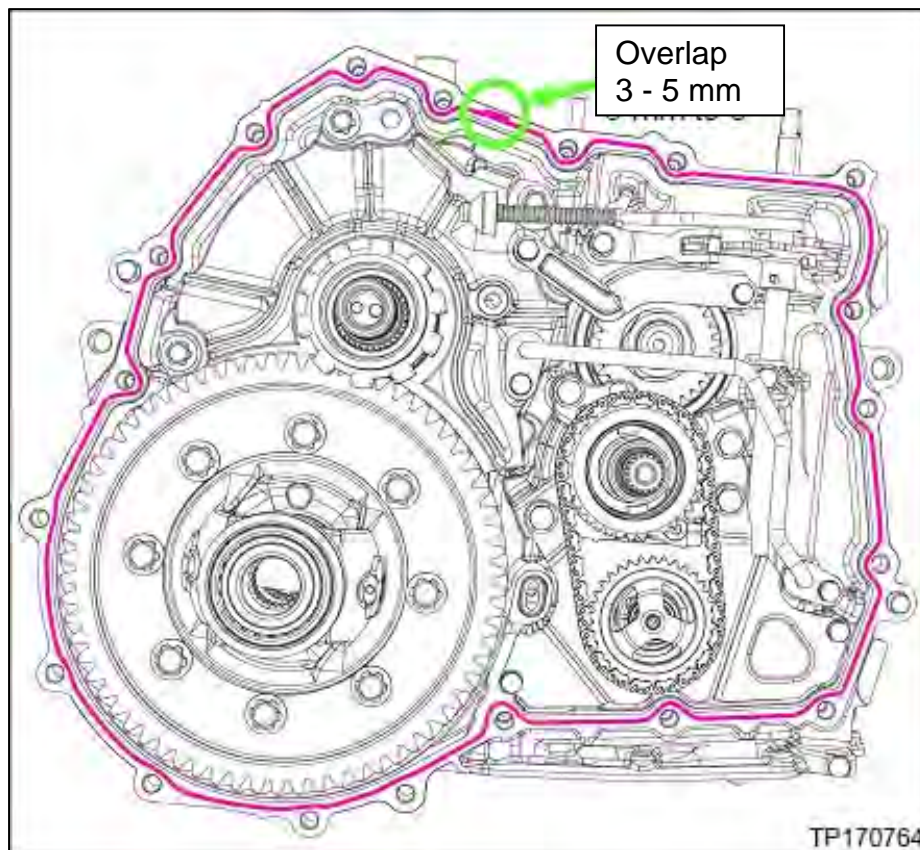


Figure 196

161. Install the torque converter housing onto the CVT case with nineteen (19) new bolts and torque to the pattern shown in Figure 197.

**HINT:** If the torque converter housing does not fully seat, the CVT may not be in Drive.

- Use new bolts.

**HINT:** See Reference # 9 in the **KIT PARTS REFERENCE TABLE** on page 150.

- Bolt torque: 27.1 N•m (2.8 kg-m, **20 ft-lbs.**)

**IMPORTANT:** Tighten the bolts in specific order shown below.

- The bolts not visible in Figure 197 are indicated with a dotted green circle.

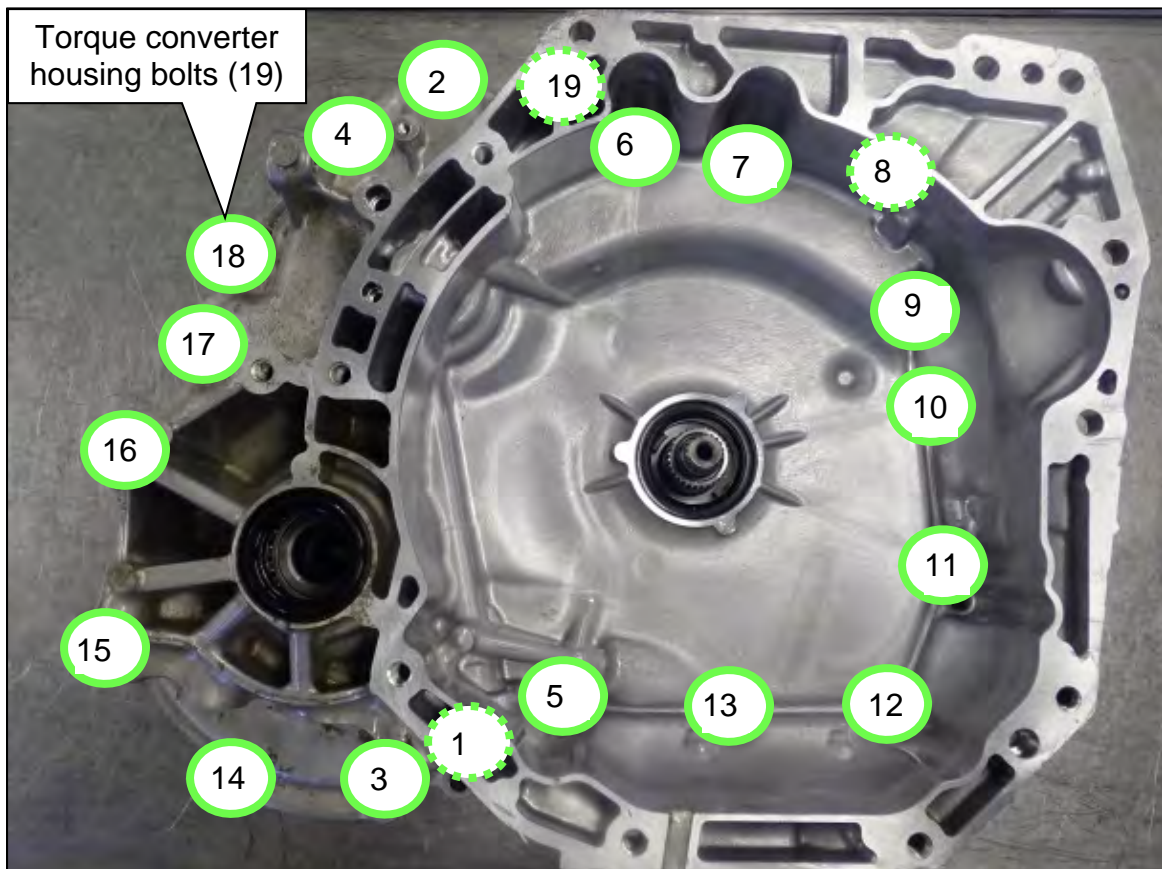


Figure 197



## Install the Control Valve and Oil Pan

162. Rotate the CVT assembly so that the torque converter housing side is facing down.
163. Make sure that the terminal assembly is attached to the bracket of the new control valve (Figure 198).

### HINT:

- Apply CVT Fluid to the O-ring of the terminal connector.
- See Reference # 1 in the **KIT PARTS REFERENCE** on page 149.

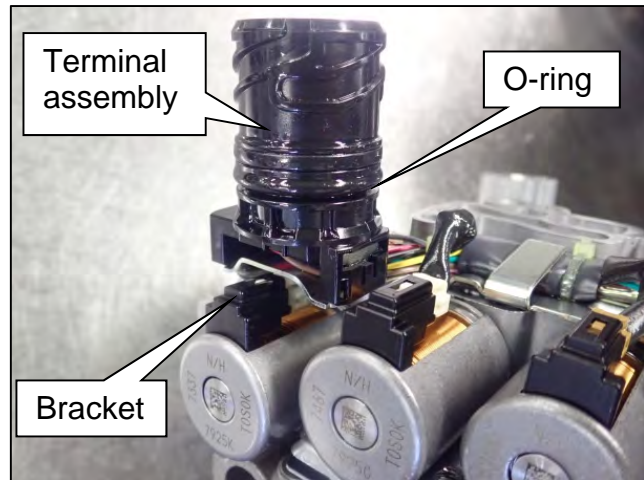


Figure 198

164. Install the new control valve assembly into the CVT case.
- Insert the terminal assembly through the hole of the CVT case, and then push the new control valve horizontally with even pressure to seat the control valve completely.

**HINT:** A clicking sound may be heard as the new control valve is seated to the CVT case.

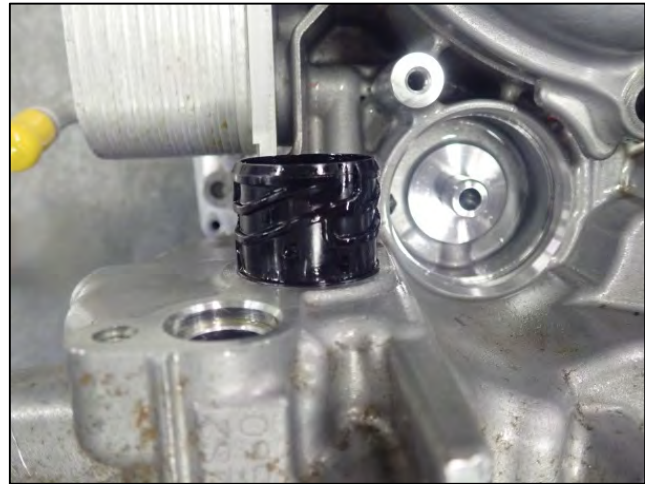


Figure 199

165. First tighten all eleven (11) original control valve bolts circled in green finger tight by hand, and then tighten to the specified bolt torque below.

### NOTICE

These bolts are easily stripped. Use care to not over-torque as this can damage the CVT.

- 87 mm (3.4 inch) long bolt.  
11 pieces
  - Bolt torque: 7.9 N•m, (0.80 kg-m, **70 in-lbs.**)

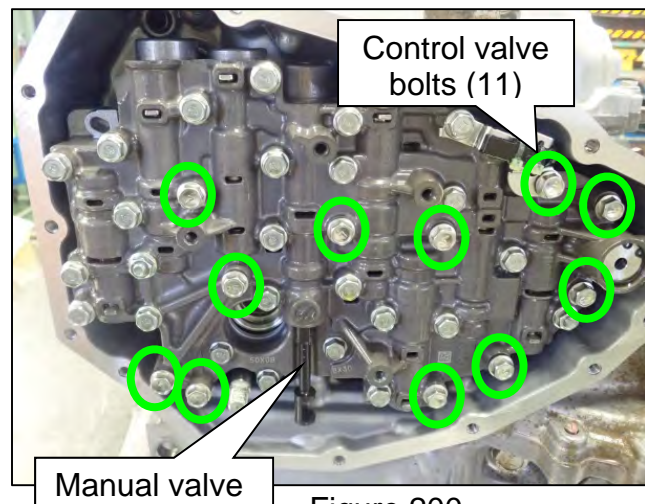


Figure 200

**HINT:** The manual valve may slide down and interfere with the CVT case.

166. Install the original manual plate to the manual shaft with the original spring washer and lock nut.
- Use an adjustable wrench on the transmission range switch side of the manual rod to keep the shaft from rotating while tightening.
    - Nut torque: 21.7 N•m (2.2 kg-m, **16 ft-lbs.**)

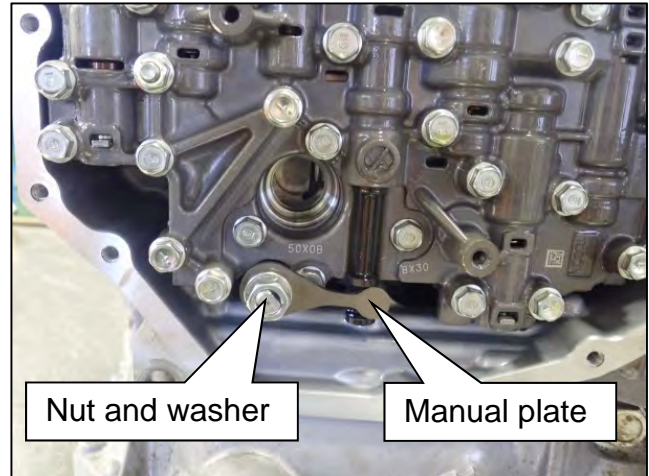


Figure 201

167. Confirm that the new O-ring is on the new oil strainer.
- Apply CVT Fluid to the O-ring before installation.

**HINT:**

- The new oil strainer comes with a new O-ring.
- See Reference # 3 in the **KIT PARTS REFERENCE TABLE** on page 149.

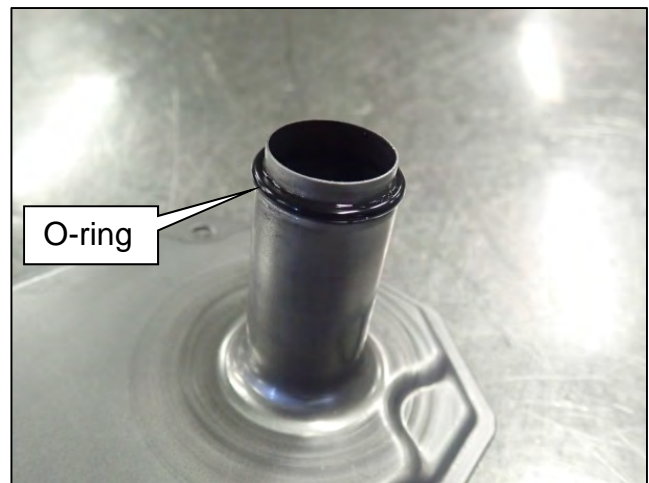


Figure 202

168. Install the new oil strainer to the control valve with the three (3) original bolts.
- 12 mm (**0.5 inch**) long bolt, 3 pieces
    - Bolt torque: 7.9 N•m (0.80 kg-m, **70 in-lbs.**)

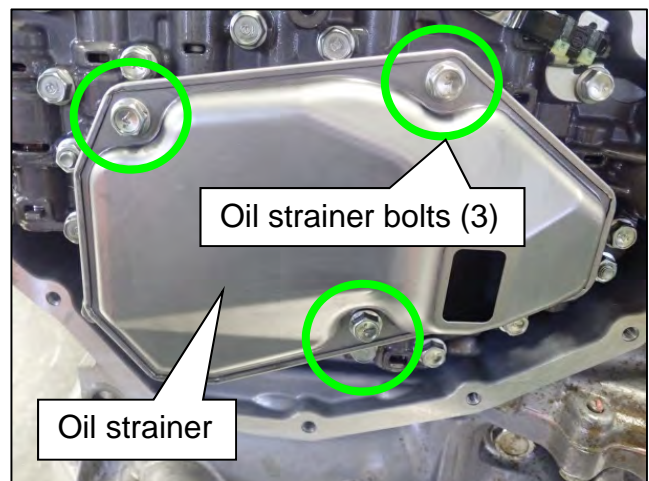


Figure 203

169. Remove the magnets from the CVT oil pan.  
**HINT:** The CVT oil pan may come with two (2) or three (3) magnets.
170. Clean the magnets.
171. Clean the CVT oil pan.
172. Reinstall the magnets to the CVT oil pan in their original positions.

173. Install the CVT oil pan with a new oil pan gasket using the original bolts.
- Tighten the CVT oil pan bolts in the sequence shown (Figure 204).
  - Bolt torque: 5.6 N•m (0.60 kg-m, **50 in-lbs.**)

**HINT:** See Reference # 2 in the **KIT PARTS REFERENCE TABLE** on page 149.

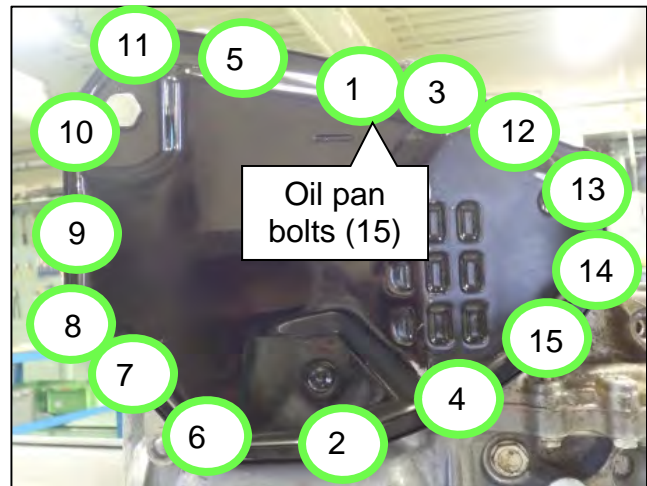


Figure 204



## Seal the Sub-assembly Cover

174. Confirm the torque converter housing side is facing down.
175. Remove the two temporary side cover bolts.

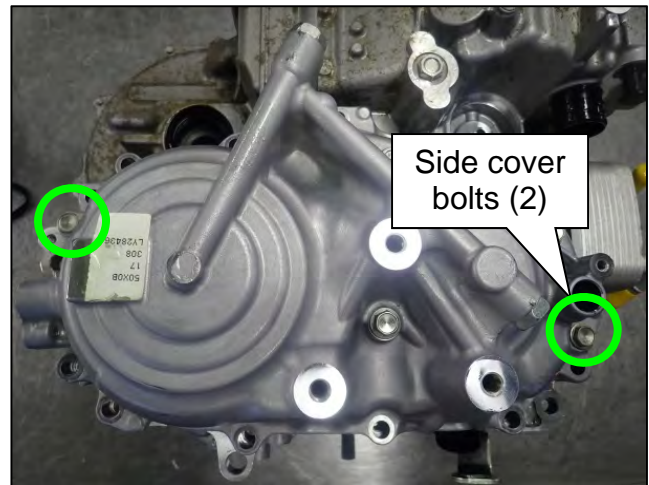


Figure 205

176. Remove the two pulley bearing retainer bolts.
  - These bolts will be reused later in this procedure.

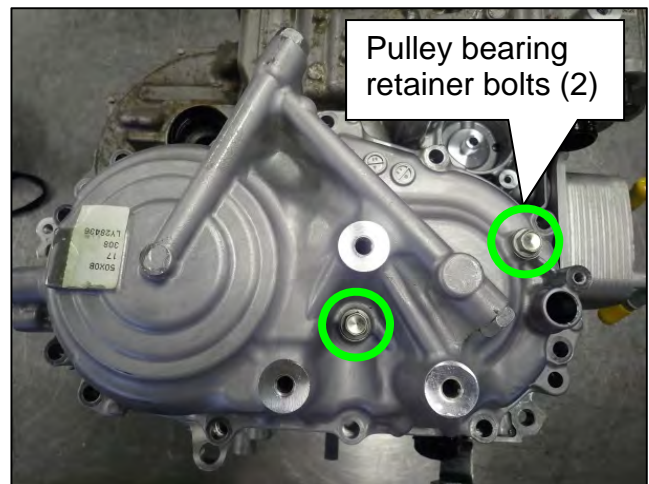


Figure 206

177. Remove the side cover.
- Use a slide hammer (J-25721-A) if needed.
  - There are three slide hammer tool locations on the side cover.

**HINT:** Figure 207 shown with side cover removed.

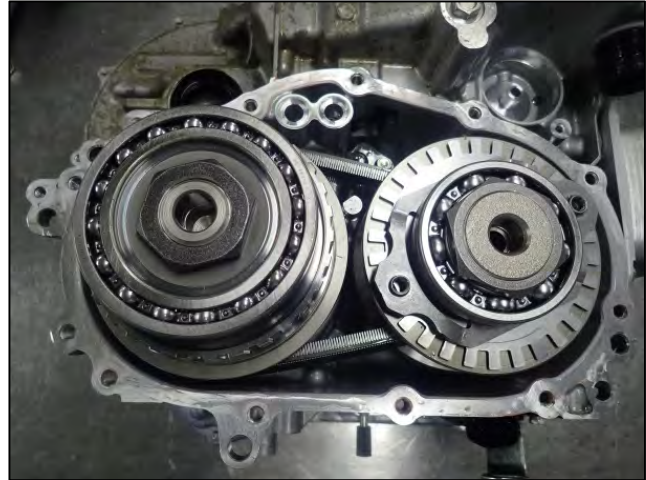


Figure 207

**NOTICE**

To prevent damage to the CVT, use care when working near the lubrication tube and ensure it does not contact the belt and pulley.

178. Install two (2) new case O-rings lubricated with CVT fluid (Figure 208).
- The case O-rings are one-time use parts. Do not reuse.

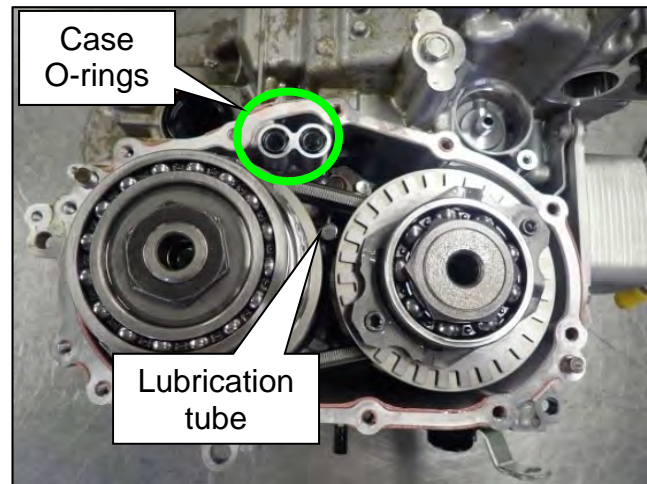


Figure 208

179. Apply sealant to the side cover sealing surface of the CVT case.

- Sealant bead diameter: 2.0 mm

**Sealant:**

- Loctite 5460 (See the **PARTS INFORMATION** on page 144 of this bulletin)
- Color: Pink

**IMPORTANT:**

- Confirm that the mating surfaces are clean before applying sealant.
- Make sure that the starting point and the ending point of the sealant is between two bolt holes. Overlap both ends of the bead by 3 – 5 mm.

**NOTICE**

Be careful not to contact or contaminate the sealant. If the sealant has been disturbed or contaminated in any way before side cover assembly is installed, remove the sealant completely and reapply to prevent possible leaks.

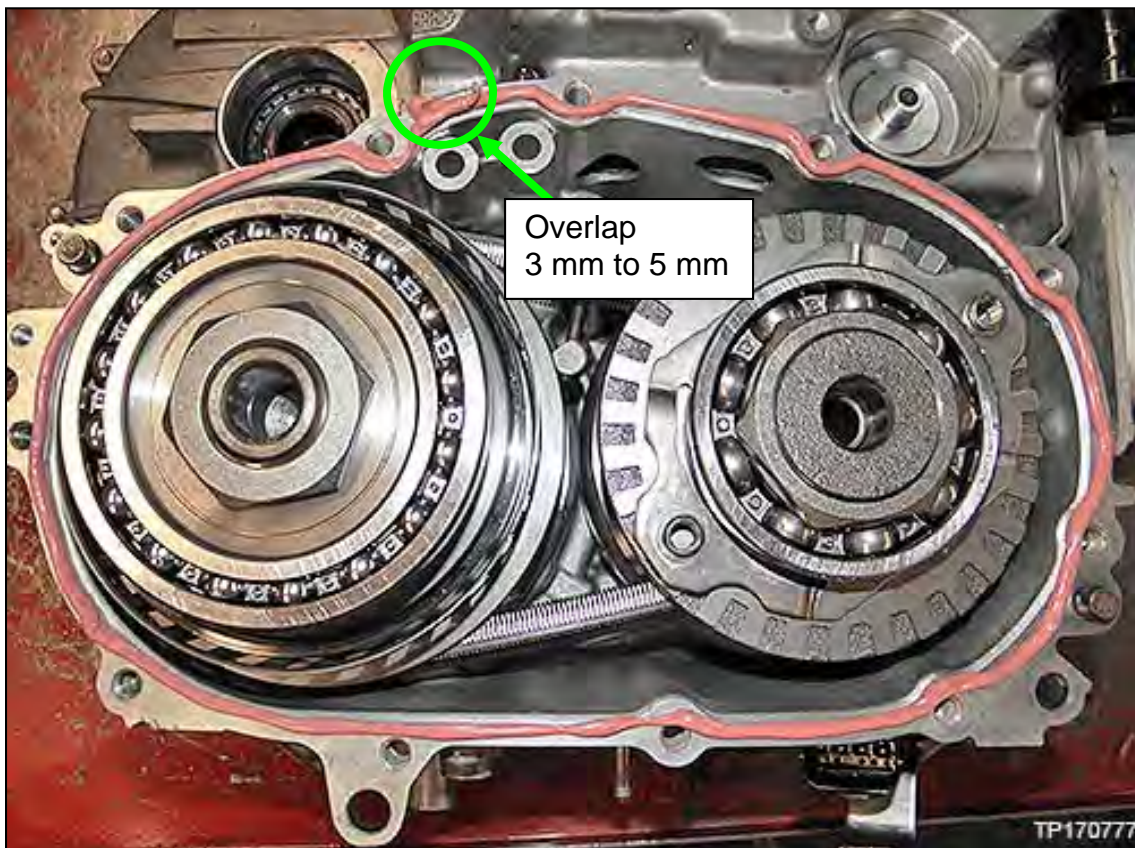


Figure 209



180. Screw in Guide Pin (J-52272) to either one of the two female bolt threads of the pulley bearing retainer.
- Place the guide pin next to the case bolt hole, as shown in Figure 210.

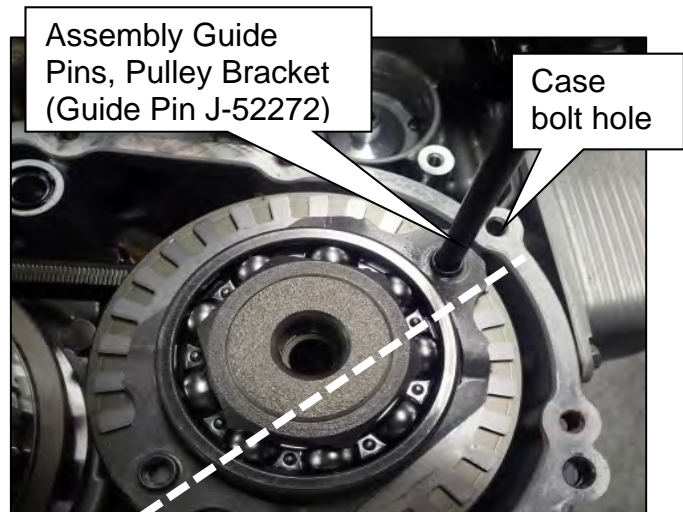


Figure 210

181. Install the side cover.
182. Install twelve (12) new side cover bolts, and then torque all of the side cover bolts to the specified torque in the sequence shown in Figure 211.
- 32.8 mm (1.3 inch) long bolt, 12 pieces
    - Bolt torque: 27.1 N•m (2.8 kg-m, 20 ft-lbs.)

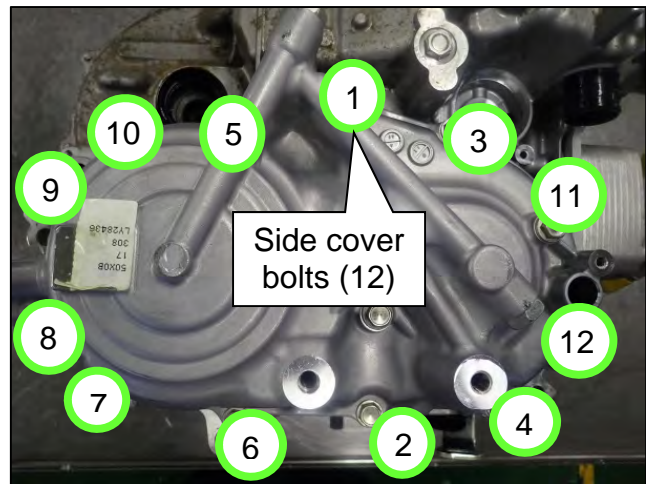


Figure 211

**HINT:** See Reference # 6 in the **KIT PARTS REFERENCE TABLE** on page 149.

183. Remove the O-rings that came on the new bearing retainer bolts and replace them with new O-rings from **PARTS INFORMATION** on page 144.

**HINT:** See Reference # 8 in the **KIT PARTS REFERENCE TABLE** on page 149.

184. Screw in one (1) original pulley bearing retainer bolt, hand tight.
- The second pulley bearing retainer bolt will be installed during the next step.

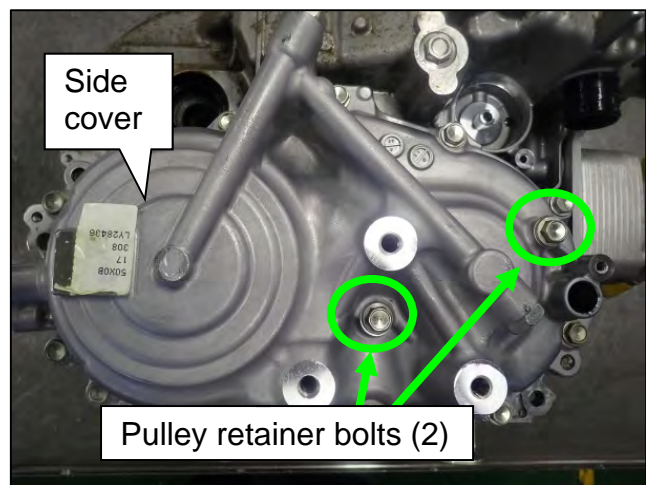


Figure 212

185. Remove the Guide Pin (J-52272) and then install the other pulley bearing retainer bolt, hand tight.

186. Torque the two pulley bearing retainer bolts to the specified torque.

- Bolt torque: 28.8 N•m, (2.90 kg-m, **21 ft-lbs.**)

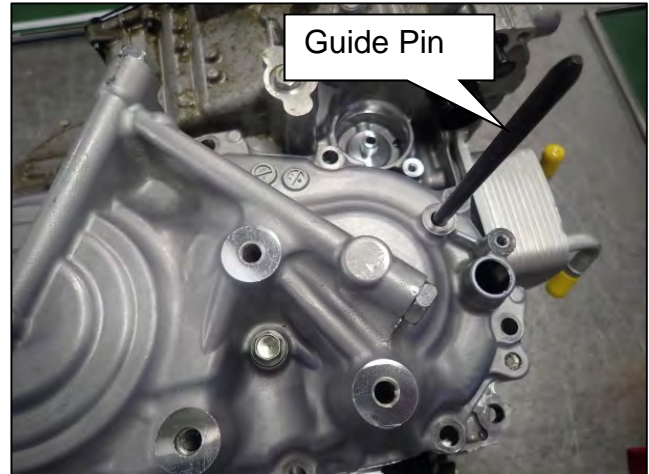


Figure 213

## Install and Adjust the Transmission Range Switch

187. Rotate the manual lever to the “N” position (two clicks counterclockwise from the left hard stop).
188. Remove the lock nut, washer and manual lever from the manual shaft.
  - They will be reused.
189. Adjust the transmission range switch position as follows:

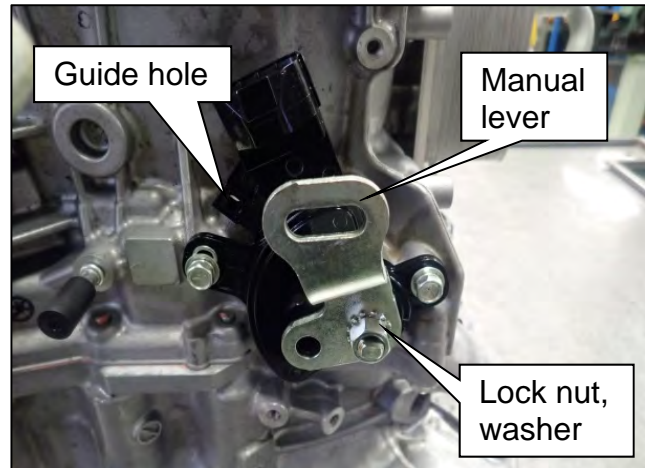


Figure 214

- a. Install the alignment pin (#J-52306-2) into the Transmission Range Switch Alignment Bracket (#J-52306-1), as shown in Figure 215.
- b. Attach the combined alignment tool onto the manual shaft as shown in Figure 216 with the part number facing out.

**HINT:** The combined alignment tool will only insert into the transmission range switch while in Neutral.

- Transmission range switch may need to be rotated to allow the pin to align.
- The alignment pin will insert into guide hole in the transmission range switch (Figure 214).

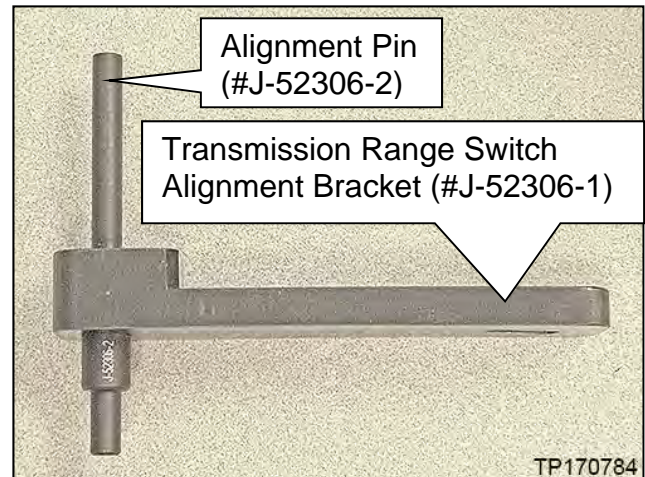


Figure 215

- c. Install the two (2) original bolts for the transmission range switch (Figure 216).
  - Bolt torque: 5.6 N•m (0.60 kg-m, **50 in-lbs.**)
  - Remove the adjustment tool when complete.

190. Install the manual lever to the manual shaft.
  - a. Set the original manual lever onto the manual shaft.

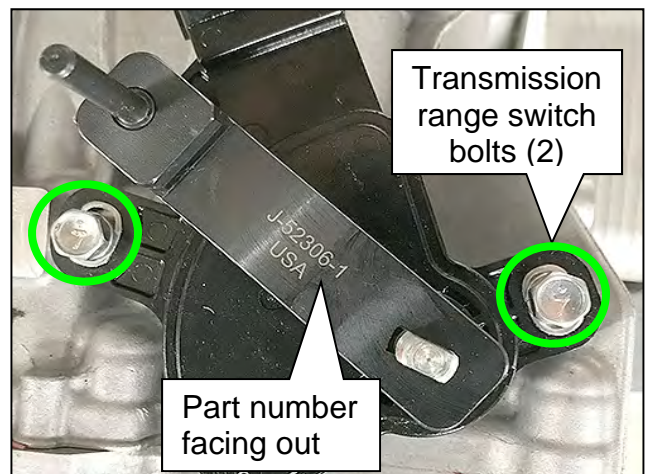


Figure 216

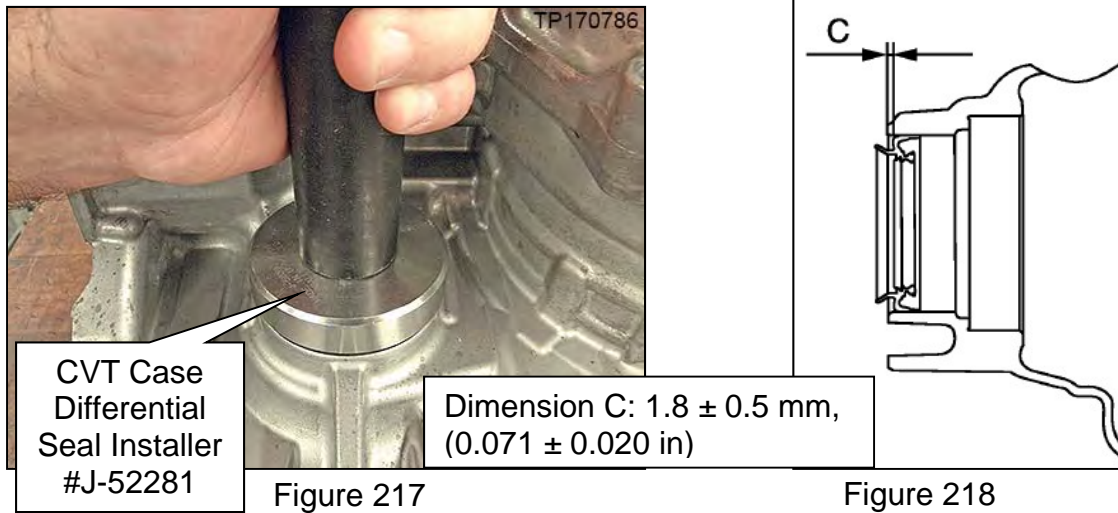
- b. Install the washer and the lock nut.
- c. Torque the lock nut.
  - Nut torque: 16.3 N•m (1.7 kg-m, **12 ft-lbs.**)



## Install Exterior CVT Parts

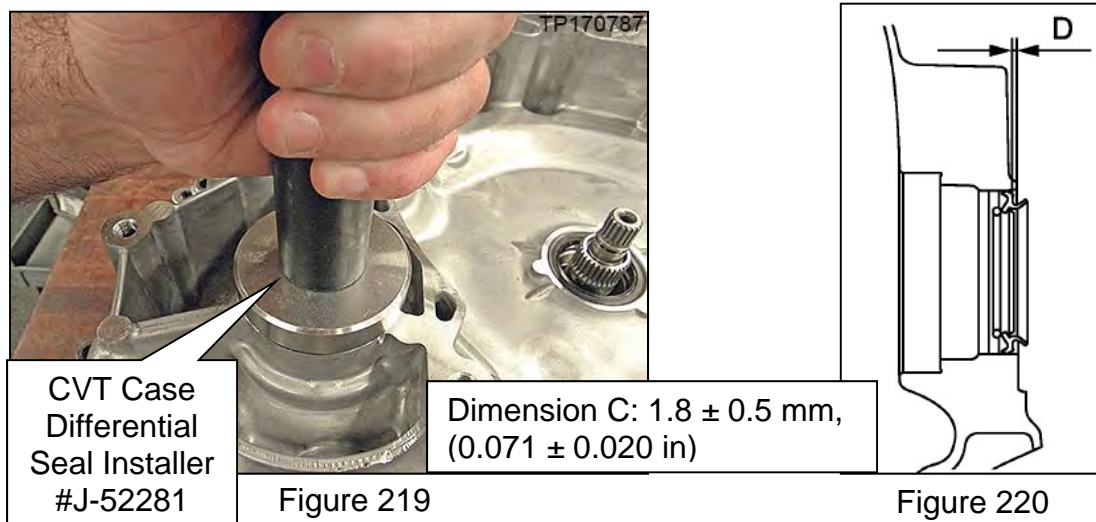
191. Install the differential side oil seal to the CVT case (Figure 217).

- Use a new oil seal (non-reusable). See Reference # 18 in the **KIT PARTS REFERENCE TABLE** on page 149.
- Apply CVT Fluid to the oil seal before installation.
- Drive the differential side oil seal in until the amount of oil seal protrusion from the CVT case edge matches dimension **C** shown in Figure 218.



192. Install the differential side oil seal to the converter housing (Figure 219).

- Use a new oil seal (non-reusable). See Reference # 18 in the **KIT PARTS REFERENCE TABLE** on page 149.
- Apply CVT Fluid to the oil seal before installation.
- Drive the differential side oil seal in until the amount of oil seal protrusion from the torque converter housing edge matches Dimension **D** shown in Figure 220.



193. Install the torque converter housing oil seal to the torque converter housing (Figure 221).
- Use a new oil seal (non-reusable). See Reference # 17 in the **KIT PARTS REFERENCE TABLE** on page 149.
  - Apply CVT Fluid to the oil seal before installation.
  - Drive the converter housing oil seal evenly so that converter housing oil seal sits below the case by Dimension **E**, as shown in Figure 222.

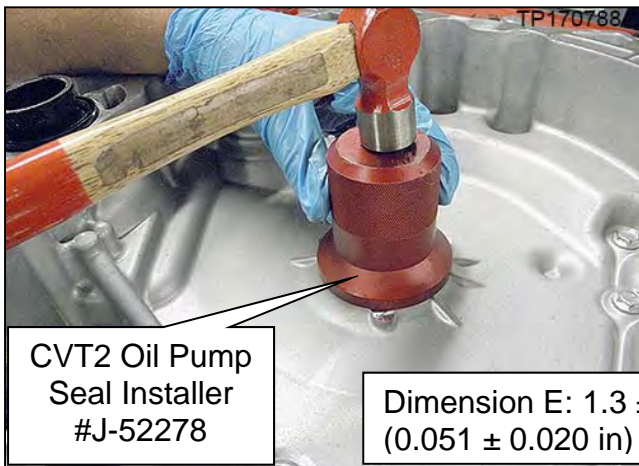


Figure 221

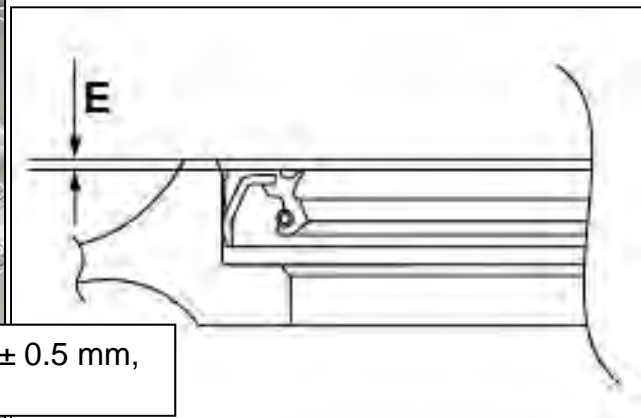


Figure 222

194. Install a new oil filter to the CVT case.
- Make sure the grommet is attached to the oil filter.
  - Apply CVT Fluid to the grommet of the oil filter.

**HINT:** See Reference # 16 in the **KIT PARTS REFERENCE TABLE** on page 149.

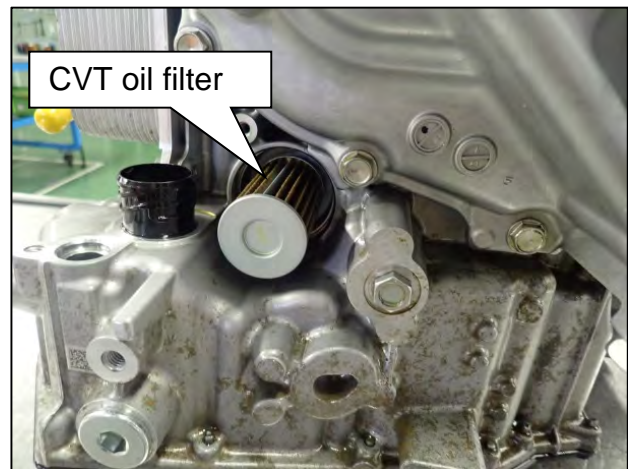


Figure 223

195. Install the new O-ring to the oil filter cover.
- Apply CVT fluid to the O-ring.

**HINT:** See Reference # 15 in the **KIT PARTS REFERENCE TABLE** on page 149.



Figure 224

196. Install the oil filter cover to the CVT case as follows:
- a. Push the oil filter cover onto the CVT case.
  - b. Install the original bolts.
    - 16 mm (**0.6 inch**) long bolts.
      - Bolt torque: 6.8 N•m (0.70 kg-m, **60 in-lbs.**)

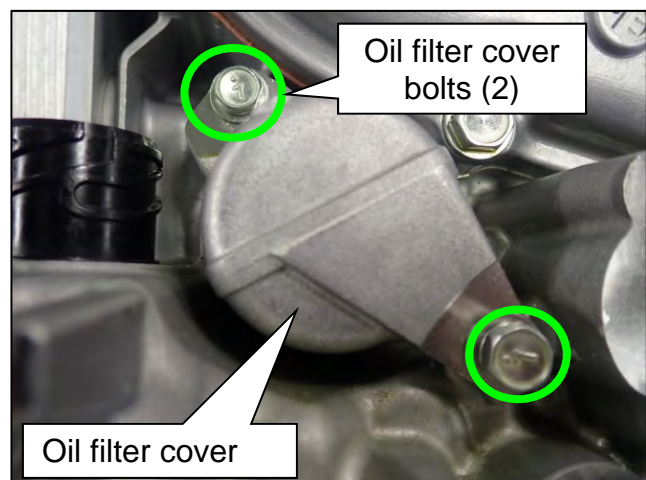


Figure 225

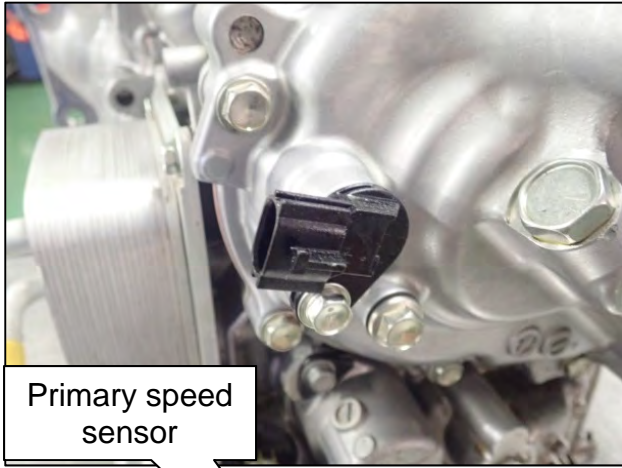


197. Install new O-rings to the original output speed sensor, primary pulley speed sensor and secondary pulley speed sensor and then install them to the CVT (Figure 226, Figure 227, Figure 228, and Figure 229 on page 107.

- The sensor O-rings are one-time use parts. Do not-reuse.

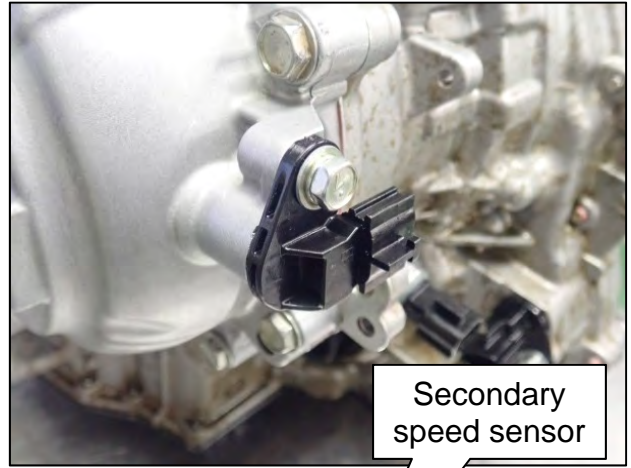
**HINT:** See Reference # 19 in the **KIT PARTS REFERENCE TABLE** on page 149.

- Apply CVT Fluid to the O-rings before installation.
- 16 mm (**0.6 inches**) long bolts.
  - Bolt torque: 5.6 N•m (0.60 kg-m, **52 in-lbs.**)



Primary speed sensor

Figure 226



Secondary speed sensor

Figure 227

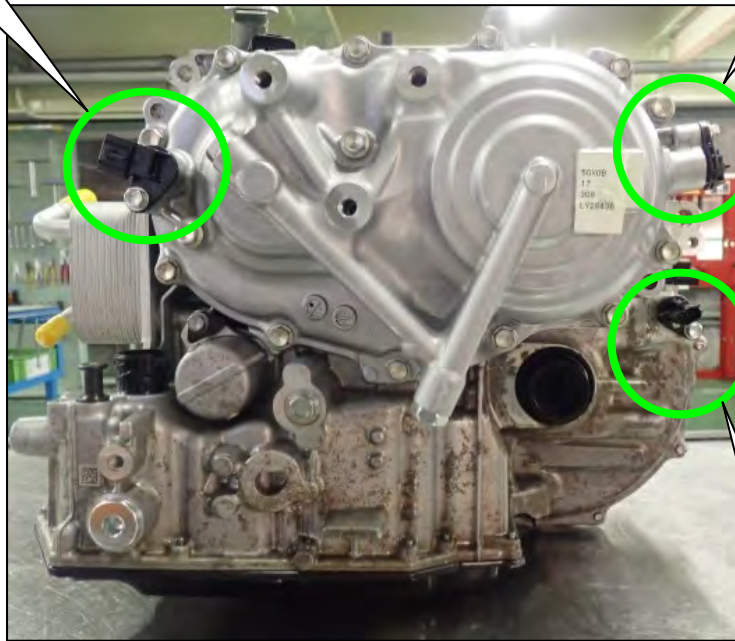
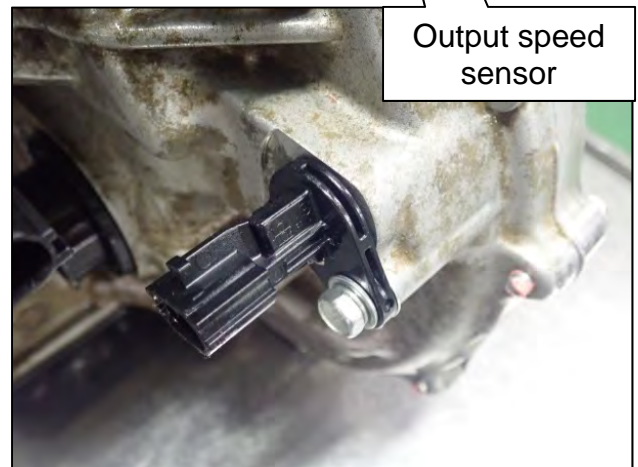


Figure 228



Output speed sensor

Figure 229

198. Place the CVT on a work surface with the oil pan side facing down.
199. Install the original torque converter.

**NOTICE**

Locate the two oil pump engagement tabs on the end of the torque converter snout horizontally while inserting to avoid damaging the torque converter oil seal.

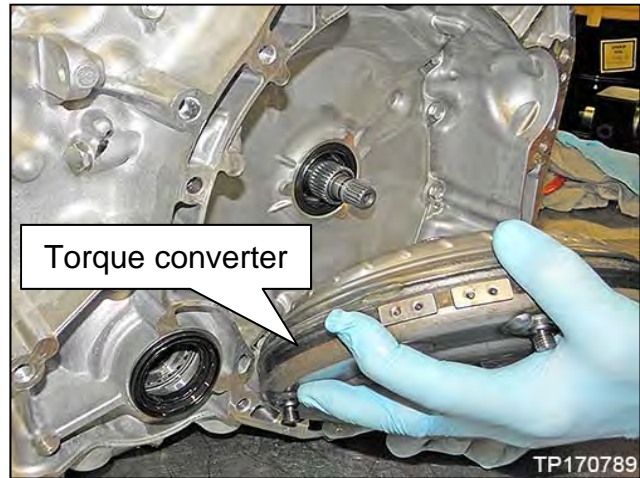


Figure 230

200. Measure dimension A to confirm that the torque converter is installed to the correct position (Figure 231).
  - Dimension A: 16.2 mm (0.638 in)

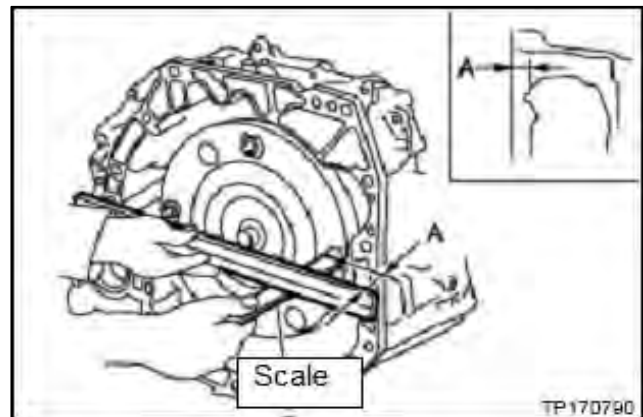


Figure 231



## Install the CVT Assembly

201. Install the CVT assembly into the vehicle.

- Refer to the ESM: **TRANSMISSION & DRIVELINE > TRANSAXLE & TRANSMISSION > CVT: RE0F11B > UNIT REMOVAL AND INSTALLATION > TRANSMISSION ASSEMBLY**

202. Flush the CVT cooler.

### **NOTICE**

To avoid possible contamination and damage to the CVT, the CVT cooler flush procedure must be performed.

- Refer to the ESM: **TRANSMISSION & DRIVELINE > TRANSAXLE & TRANSMISSION > CVT: RE0F11A > BASIC INSPECTION > CVT FLUID COOLER SYSTEM > CVT FLUID COOLER FLUSH > CVT FLUID COOLER CLEANING PROCEDURE**

203. Connect both battery cables, negative cable last.

204. Fill and adjust the CVT fluid level.

- Refer to the ESM: **TRANSMISSION & DRIVELINE > TRANSAXLE & TRANSMISSION > CVT: RE0F11A > PERIODIC MAINTENANCE > CVT FLUID**

205. Reset/reinitialize systems as needed.

- Refer to the ESM: **GENERAL INFORMATION > GENERAL INFORMATION > BASIC INSPECTION > INSPECTION AND ADJUSTMENT > ADDITIONAL SERVICE WHEN REMOVING BATTERY NEGATIVE TERMINAL**, for a listing of systems that require reset/initialization after reconnecting the 12V battery.
- This list often includes items such as radio, power windows, clock, sunroof, etc.

Proceed to the next page.

## **Additional Service When Replacing Control Valve Or Transaxle Assembly**

The following procedures, starting on the next page, must be performed in this order:

- a. **TCM Reprogramming (if applicable)**.....Page 111
- b. **CONTROL VALVE REPLACEMENT**.....Page 131
- c. **ERASE LEARNING VALUE**.....Page 136
- d. **CONFORM CVTF DETERIORATION**.....Page 138
- e. **AUXILIARY GEARBOX CLUTCH POINT LEARNING**.....Page 141
- f. **ERASE DTCS**.....Page 143

**Proceed to the next page.**

## TCM Reprogramming

**IMPORTANT:** Repairs performed for this bulletin require CONSULT Diagnostic result reporting function-Setting be turned ON and Diagnosis (All Systems) be performed. If not done, it may result in a repair being non-warrantable.

**IMPORTANT:** Before starting, make sure:

- ASIST on the CONSULT PC has been synchronized (updated) to the current date.
- All C-III plus software updates (if any) have been installed.
- The CONSULT PC is connected to the Internet (Wi-Fi or cable).

**HINT:**

- Most instructions for reprogramming with C-III plus are displayed on the CONSULT PC screen.
- If you are not familiar with the reprogramming procedure, [click here](#). This will link you to the "CONSULT Reprogramming for Engine or Transmission Control Module (ECM or TCM)" general procedure.

206. Connect the Vehicle Interface (VI) to the vehicle.

**NOTICE**

Make sure the VI is securely connected. If the VI connection is loose during reprogramming, the process will be interrupted and the TCM may be damaged.

207. Connect the AC Adapter to the CONSULT PC.

**NOTICE**

Be sure to connect the AC Adapter. If the CONSULT PC battery voltage drops during reprogramming, the process will be interrupted and the TCM may be damaged.

208. Connect a battery maintainer or smart charger, set to reflash mode or a similar setting, to the vehicle battery.

**NOTICE**

Be sure the battery maintainer or smart charger is connected securely to the battery. Make sure the battery voltage stays between 12.0V and 15.5V during reprogramming. If the battery voltage goes out of this range during reprogramming, the TCM may be damaged.

209. Turn OFF all external Bluetooth® devices (e.g., cell phones, printers, etc.) within range of the CONSULT PC and the VI.

**NOTICE**

Make sure to turn OFF all external Bluetooth® devices. If Bluetooth® signal waves are within range of the CONSULT PC and the VI during reprogramming, reprogramming may be interrupted and the TCM may be damaged.



210. Turn the ignition ON with the engine OFF.
  - **The engine must not start or run during the reprogramming procedure.**
211. Turn OFF all vehicle electrical loads such as exterior lights, interior lights, HVAC, blower, rear defogger, audio, NAVI, seat heater, steering wheel heater, etc.

**NOTICE**  
 Make sure to turn OFF all vehicle electrical loads. Make sure the battery voltage stays between 12.0V and 15.5V during reprogramming. If the battery voltage goes out of this range during reprogramming, the TCM may be damaged.

212. Connect the CONSULT PC to the vehicle to begin the reprogramming procedure.
213. Start C-III plus.
214. If prompted, select **USA/CANADA Dealers** from the drop down menu, and then select **OK**.
215. Login using your NNAnet credentials.

**IMPORTANT:** If not prompted to enter your username and password, the CONSULT PC may not be connected to Wi-Fi. Close C-III plus, confirm the CONSULT PC is connected to Wi-Fi, and then reopen C-III plus.

216. Wait for the VI to be recognized.
  - The serial number will display when the VI is recognized.
217. Select **Re/programming, Configuration**.

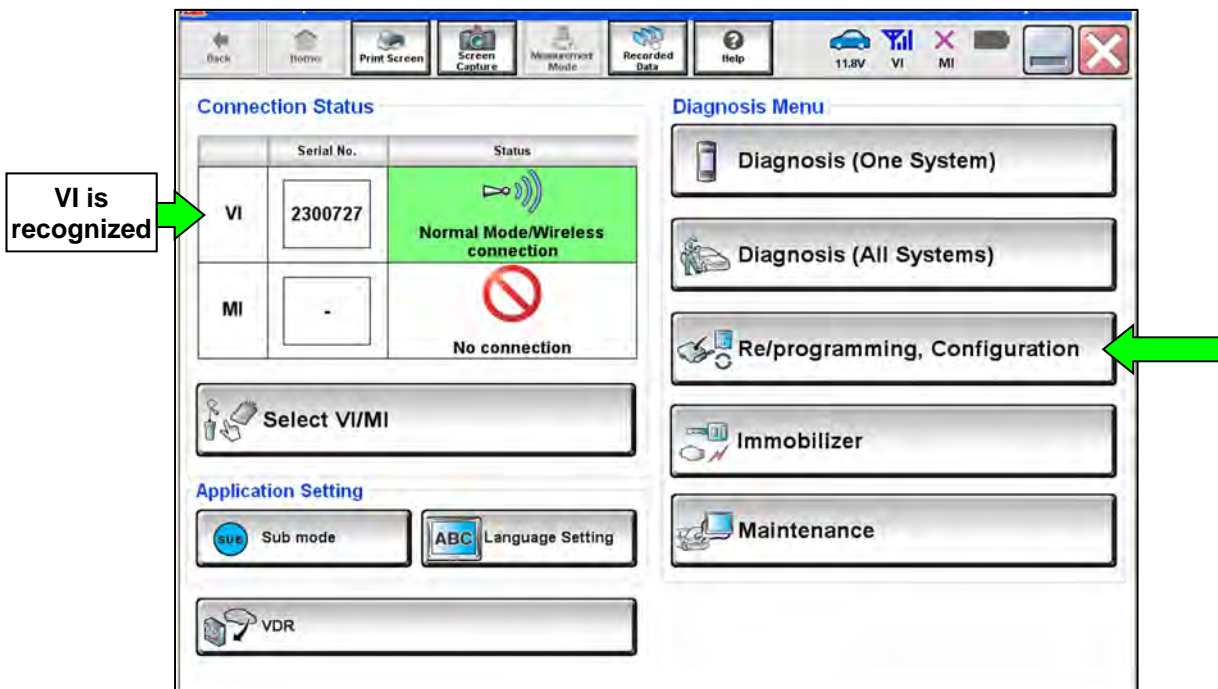


Figure 232

218. Use arrows (if needed) to view and read all precautions.
219. Check the box confirming the precautions have been read.
220. Select **Next**.

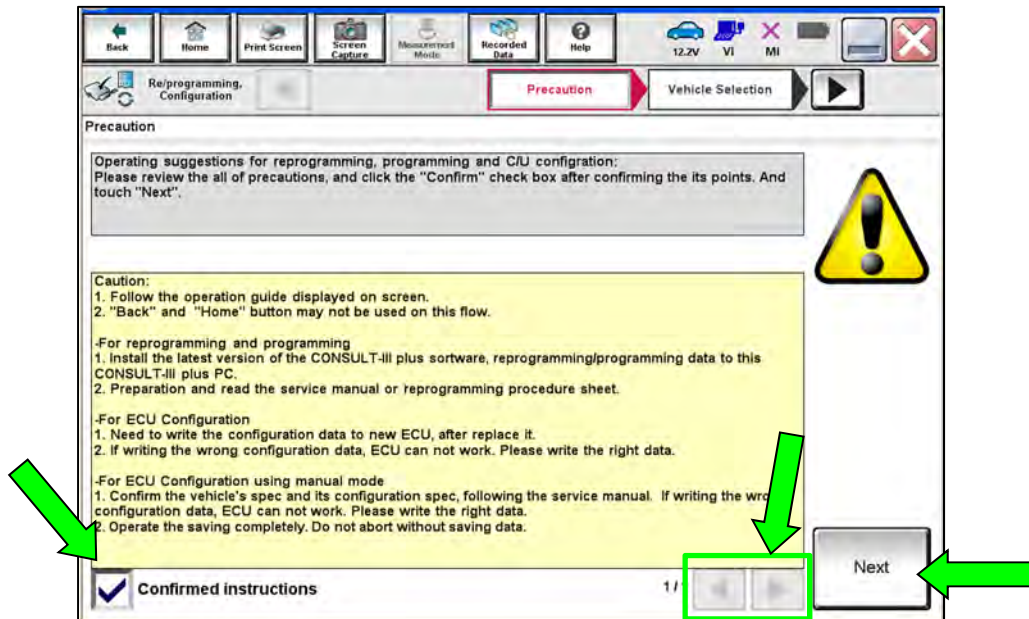


Figure 233

221. If the screen in Figure 234 displays, select **Automatic Selection(VIN)**.
- If the screen in Figure 234 does not display, continue to step 222.

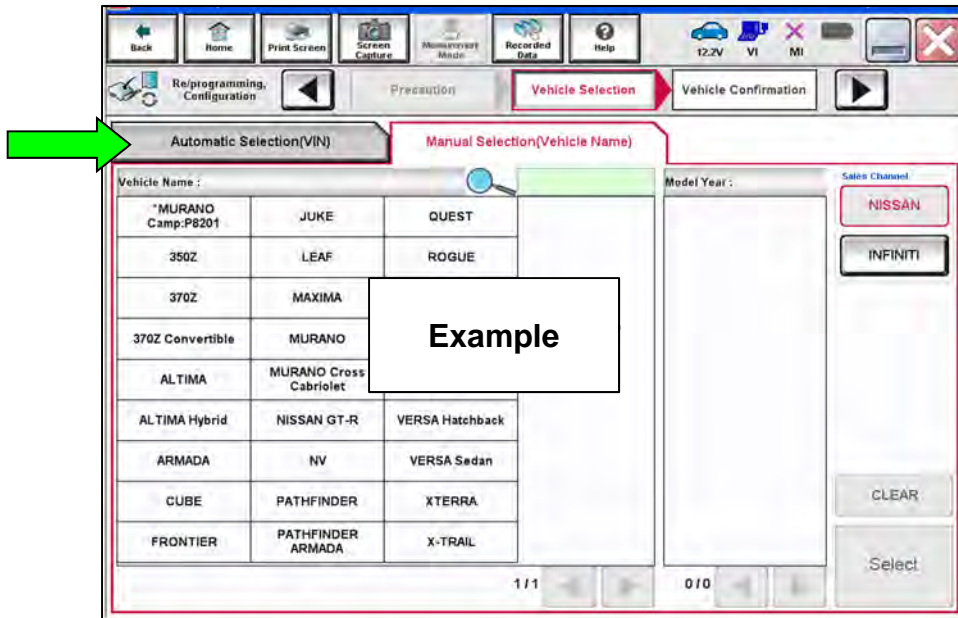


Figure 234

222. Make sure **VIN or Chassis #** matches the vehicle's VIN.

223. If the correct VIN is displayed, select **Confirm**.

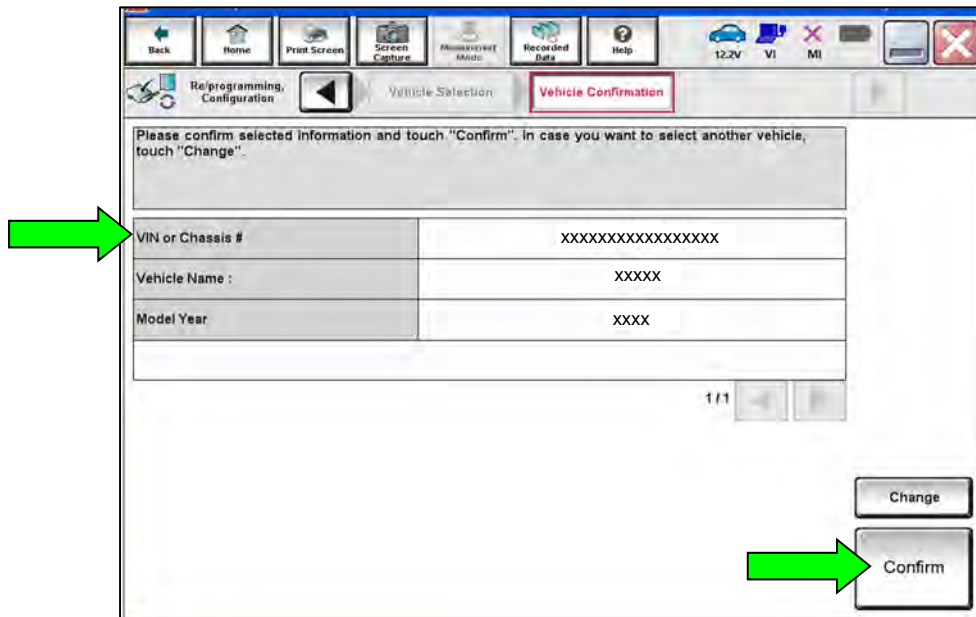


Figure 235



224. Select **Confirm**.

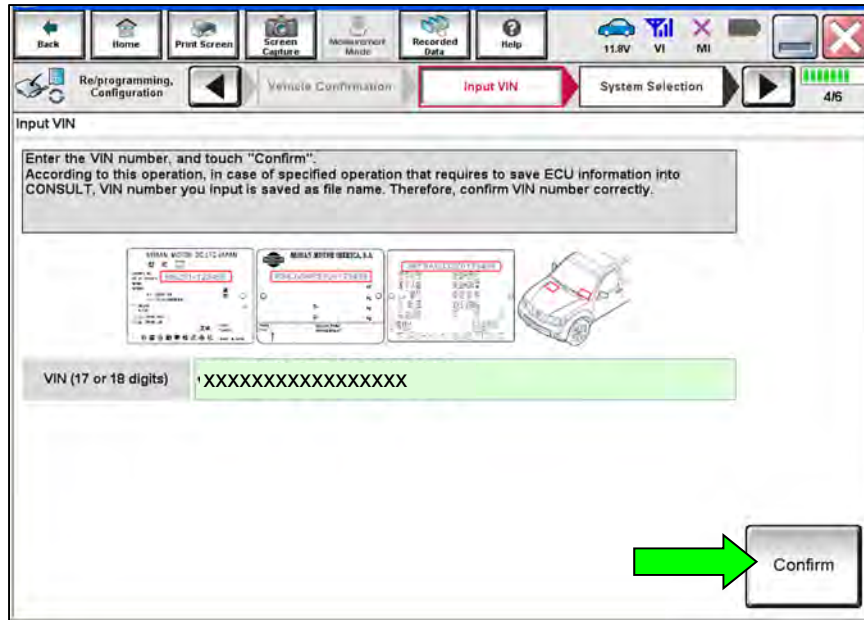


Figure 236

225. Select **TRANSMISSION**.

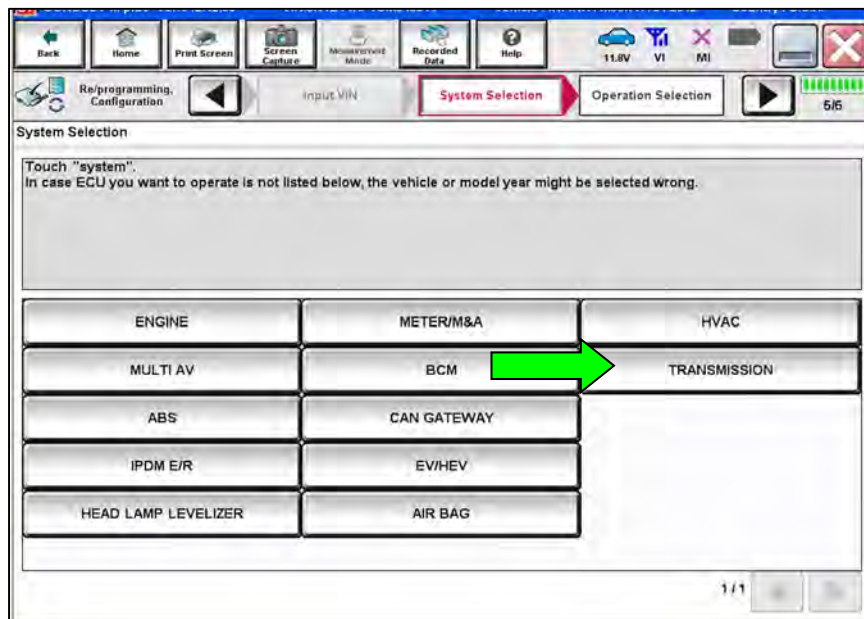


Figure 237

226. Select **Reprogramming**.

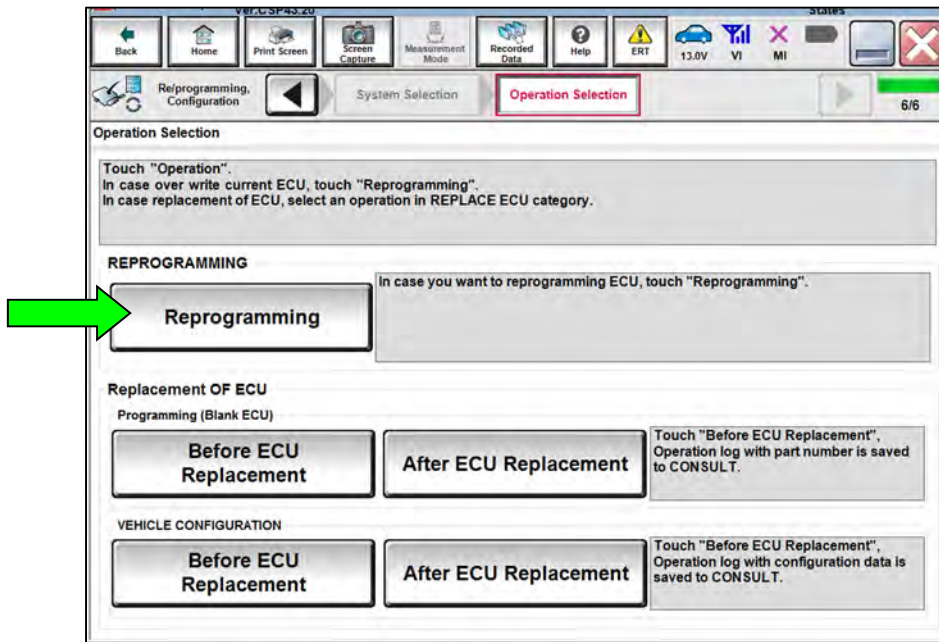


Figure 238

227. Follow the on-screen instructions; maintain the following conditions:

- a. Turn the ignition ON with the engine OFF.
- b. Press the brake pedal.
- c. Press the accelerator pedal between  $\frac{1}{4}$  and  $\frac{1}{2}$ .
- d. Put the shift selector in **R**.

228. Select **Start**.

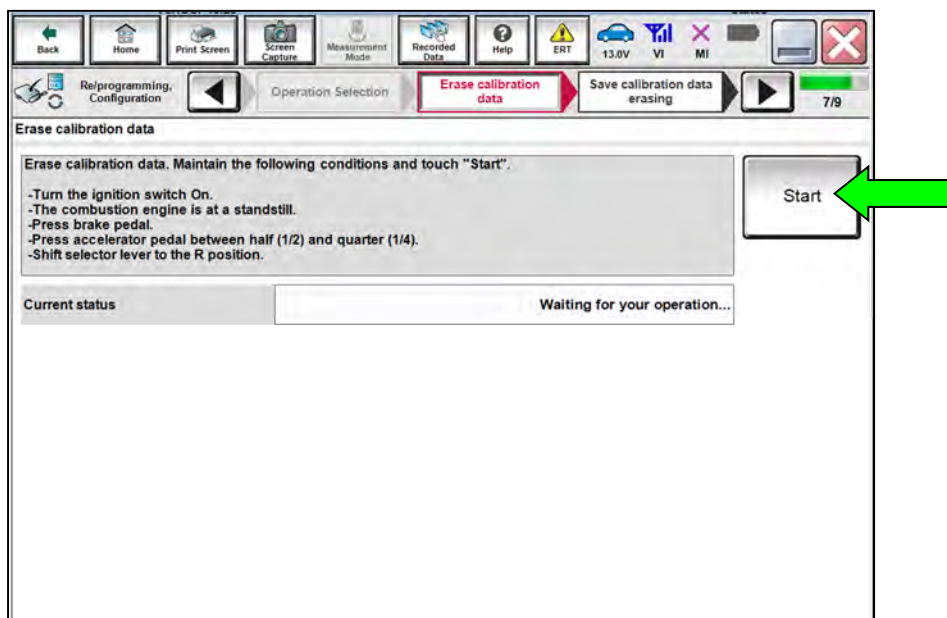


Figure 239

229. When "COMPLETED" is displayed, select **Next**.

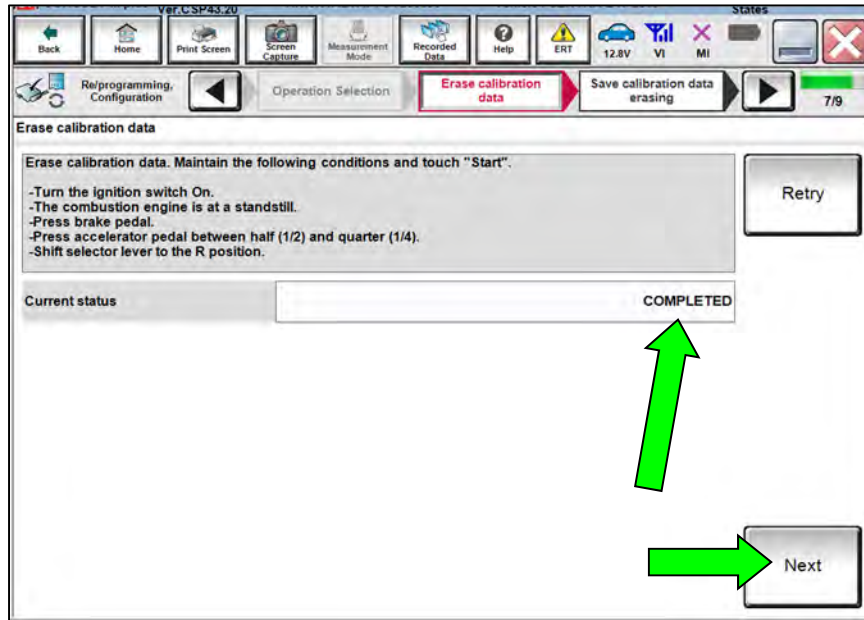


Figure 240

230. Operate the ignition per the on screen instructions.

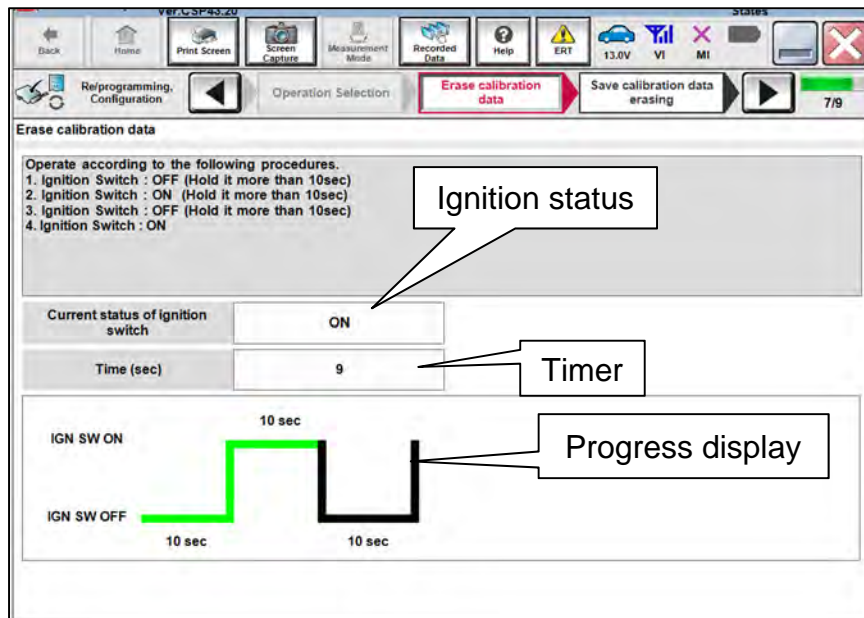


Figure 241



231. When "OK" is displayed, select **Next**.

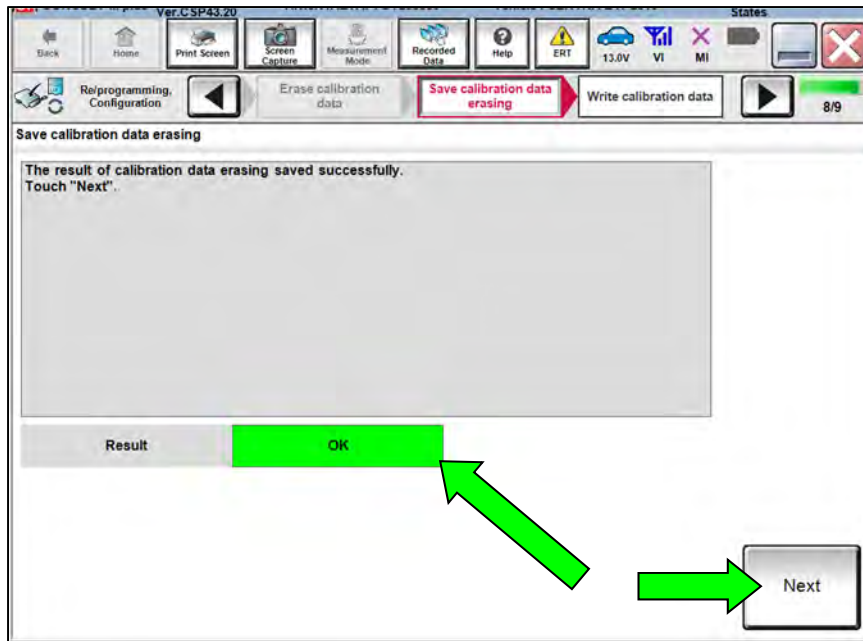


Figure 242

232. Move the shift selector to **P**, then select **Next**.

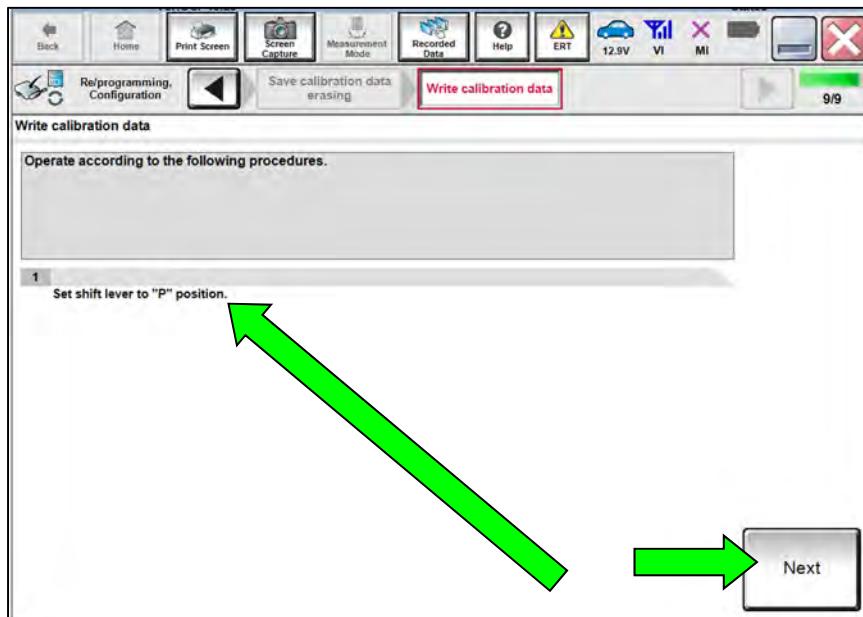


Figure 243

233. Operate the shift selector per the on screen instructions.
- Move the shift selector; **P>R>N>D>P**
  - Confirm the center display meter indicates the correct selector position.
234. Select **Next**.

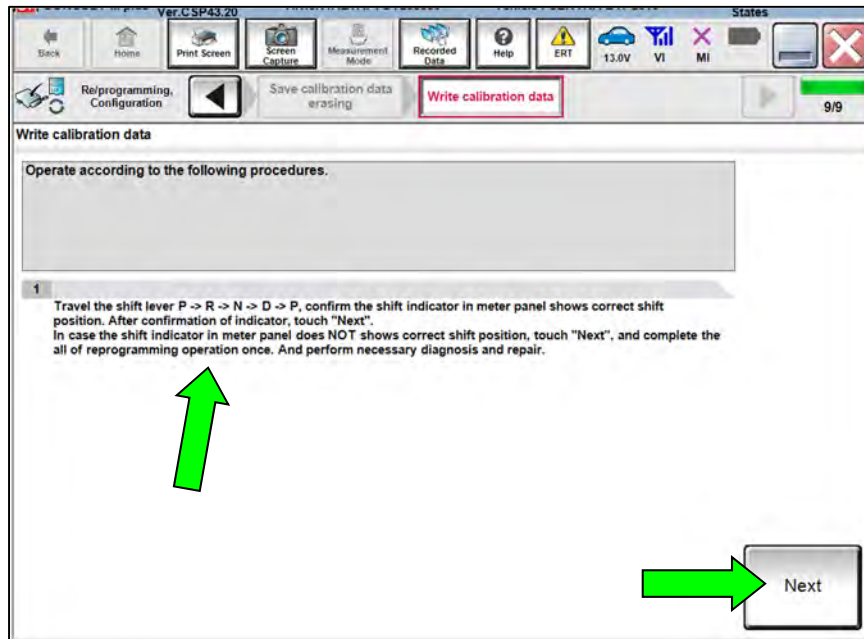


Figure 244

235. Find the TCM **Part Number** (Figure 245) and write it on the repair order.

**HINT:** This is the current Part Number (P/N).

236. Compare the P/N you wrote down to the numbers in the **Current TCM Part Number** column in **Table B** on page 120.

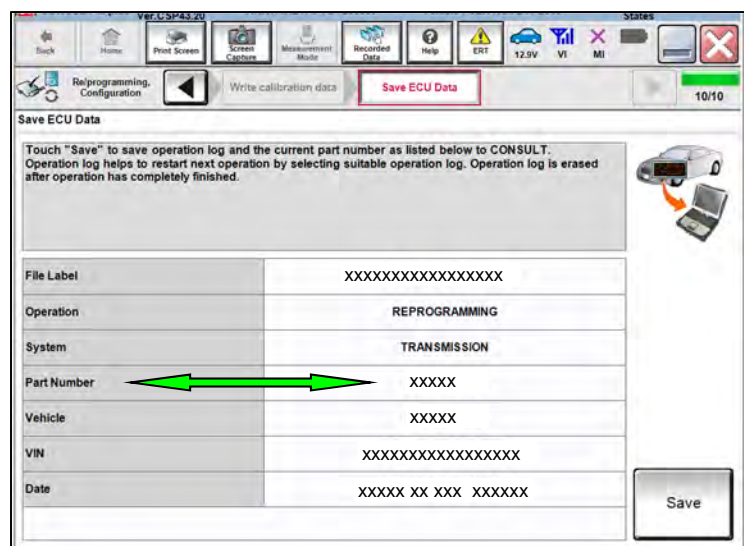


Figure 245

237. Comparison results:

- If there is a match, continue with the reprogramming procedure.
- If there is not a match, reprogramming is not needed. Skip to step 266 on page 131.

**Table B**

MODEL	YEAR	CURRENT TCM PART NUMBER: 31036 -
Kicks	2018	5RD0A, 5RD0C
	2019	5RR2A, 5RR2B, 5RR2C, 5RR2D
	2020	(1)
	2021	(1)
	2022	(1)
Versa	2020	(1)
	2021	(1)
	2022	(1)

(1) TCM reprogramming not currently applicable.

238. Select **Save**.

239. Use arrows (if needed) to view and read all precautions.

240. Check the box confirming the precautions have been read, and then select **Next**.

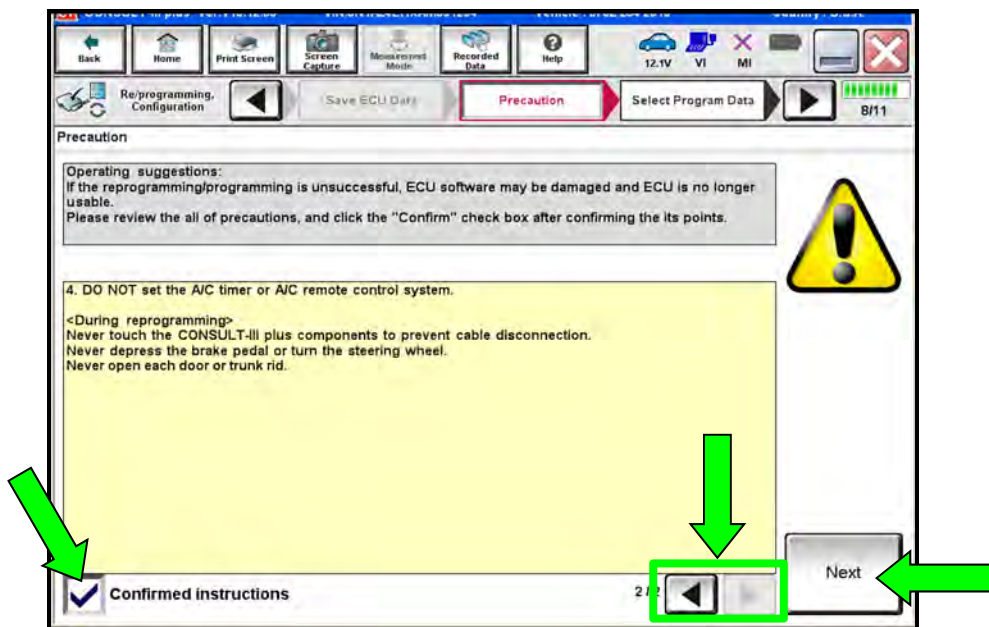


Figure 246



- 241. Read the **Current Part Number** and **Part Number After Reprogramming**. They should be different.
- 242. Select **Next**.

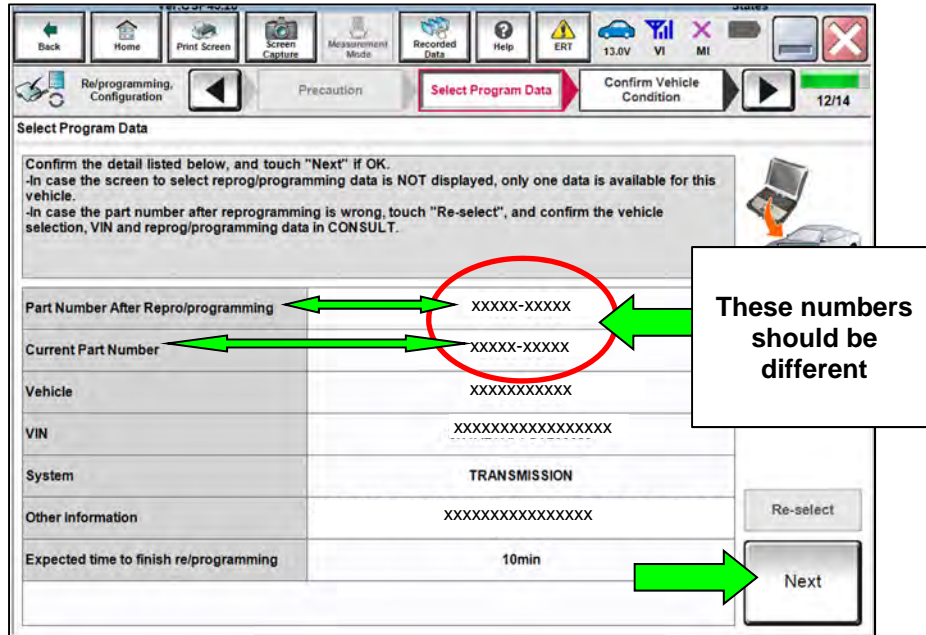


Figure 247

- 243. Make sure **OK** is highlighted **green** (battery voltage must be between **12.0 and 15.5 Volts**).
- 244. Select **Next**.

**IMPORTANT:** Battery voltage must stay between **12.0 and 15.5 Volts** during reprogramming or TCM reprogramming may be interrupted and TCM may be damaged.

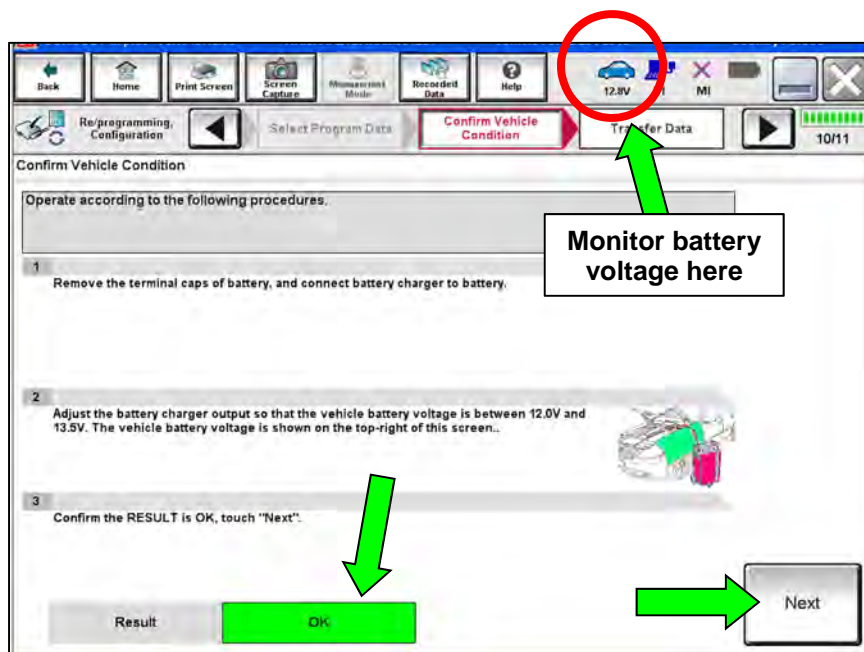


Figure 248

**HINT:** In the next step, the reprogramming process will begin when **Start** is selected.

245. Select **Start**.

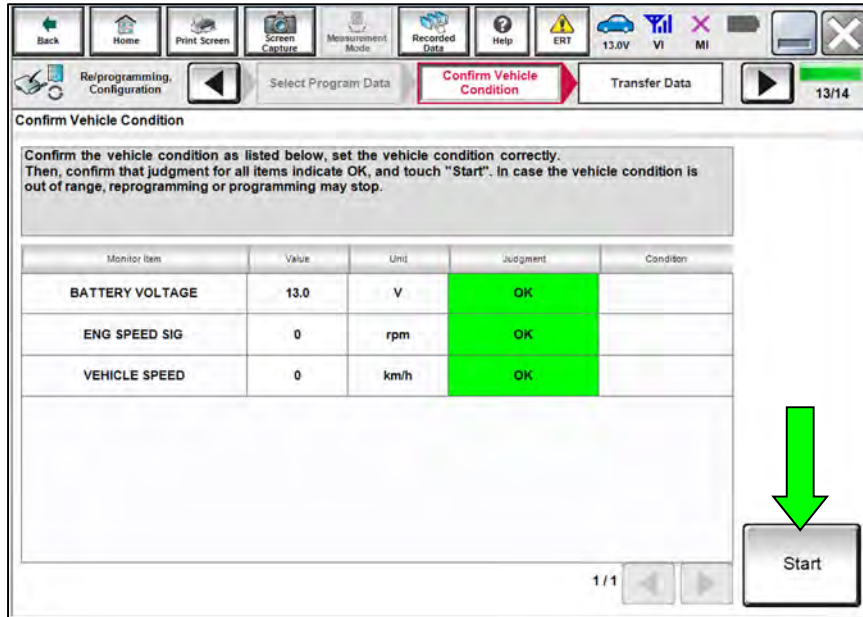


Figure 249

246. Wait for both progress bars to complete.

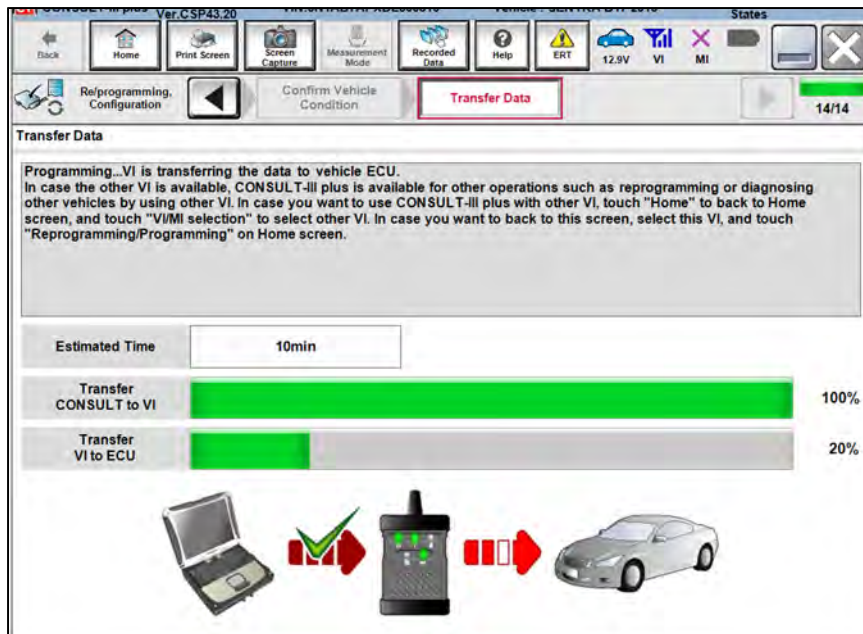


Figure 250

247. When the screen in Figure 251 displays, the reprogramming is complete.

**HINT:** If the screen in Figure 251 does not display (which indicates reprogramming did not complete), skip to **TCM RECOVERY** on page 130.

248. Disconnect the battery maintainer/smart charger from the vehicle.

249. Select **Next**.

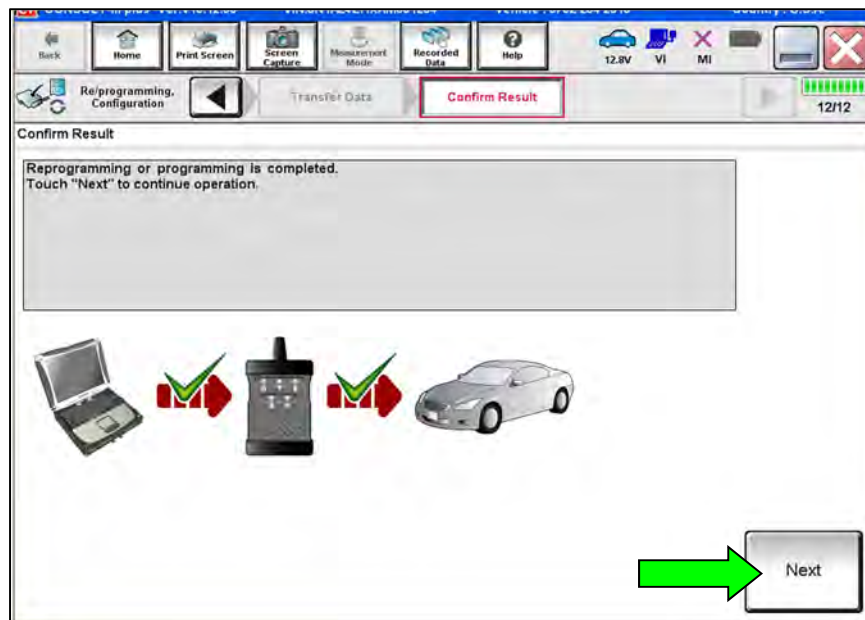


Figure 251

**HINT:** Additional steps/operations are required before C-III plus will provide the final reprogramming confirmation report. Continue to step 250 on page 124 to complete the reprogramming procedure.

250. Confirm the Transmission Fluid temperature judgment is “OK”, then select **Next**.
- If the judgement is “NG”, drive the vehicle to warm the transmission until the judgement changes to “OK”.

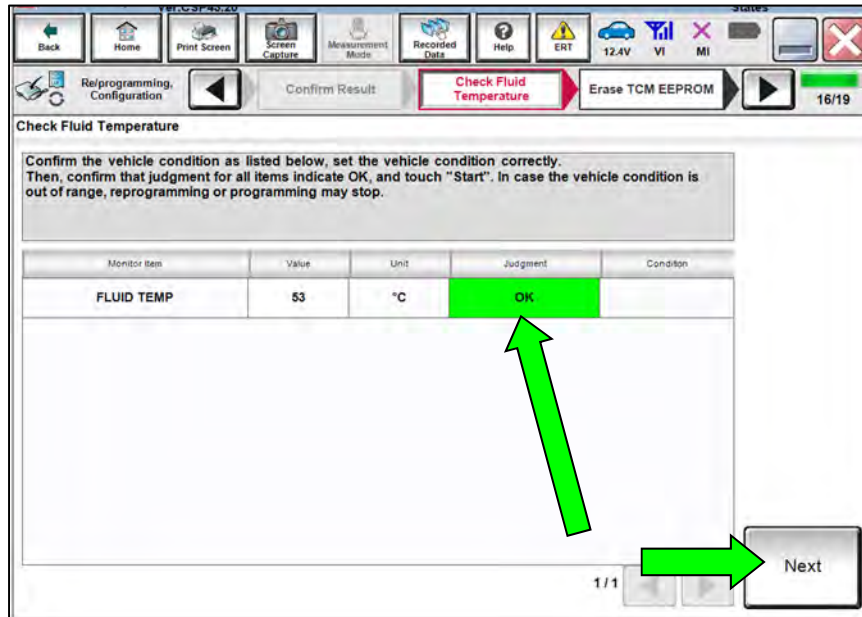


Figure 252



251. Follow the on-screen instructions while maintaining the following conditions:

- a. Parking brake set.
- b. Turn the ignition ON, with the engine OFF.
- c. Press the brake pedal.
- d. Press the accelerator pedal between  $\frac{1}{4}$  and  $\frac{1}{2}$ .
- e. Put the shift selector in R.

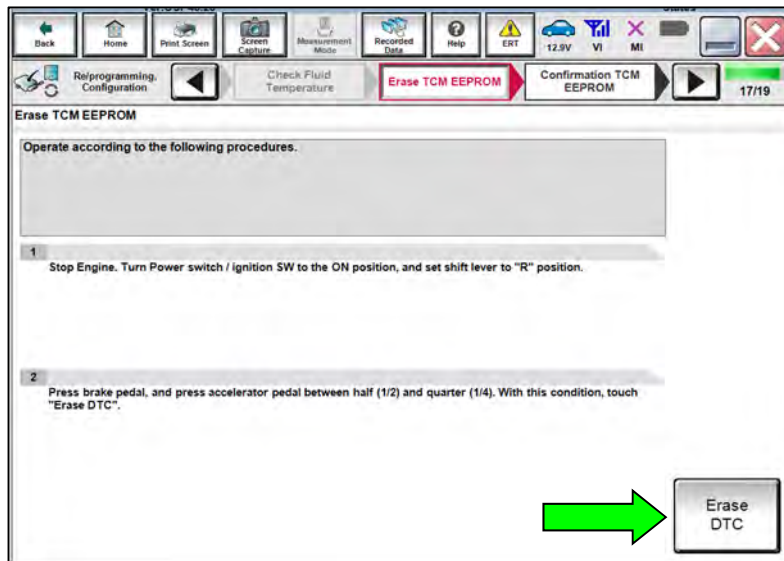


Figure 253

252. Select **Erase DTC**.

253. Follow the on-screen instructions while maintaining the following conditions:

- a. Parking brake set.
- b. Ignition ON, with the engine OFF.
- c. Fully depress the accelerator pedal.
- d. Put the shift selector in R.

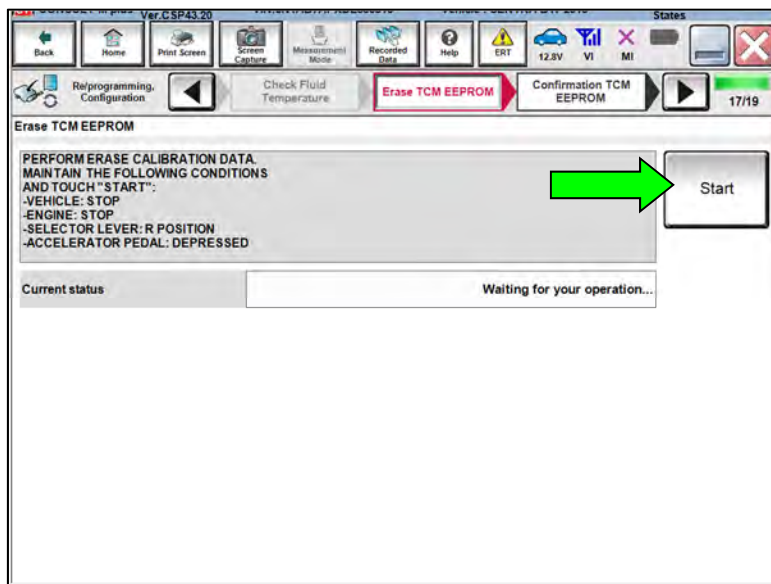


Figure 254

254. Select **Start**.

255. When "COMPLETED" is displayed, select **Next**.

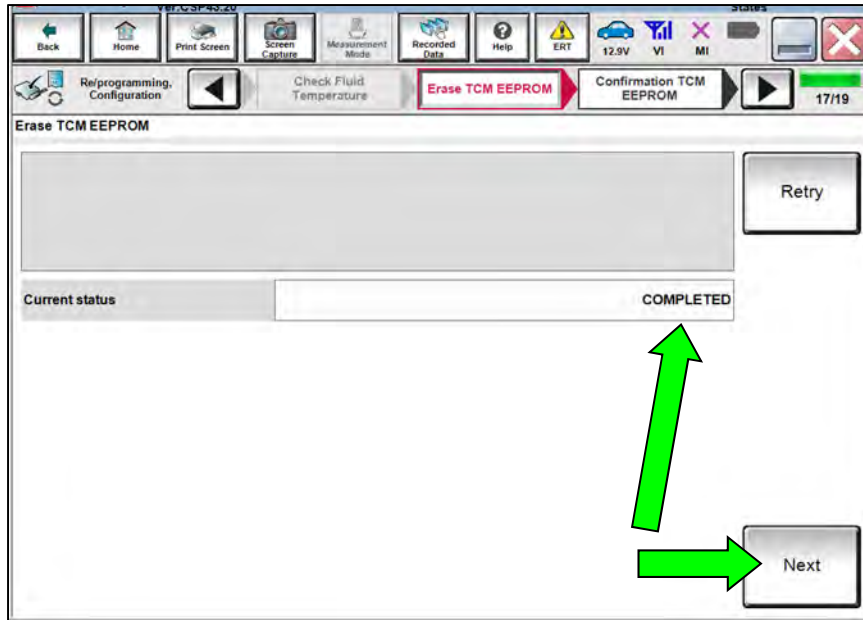


Figure 255

256. Operate the ignition per the on-screen instructions.

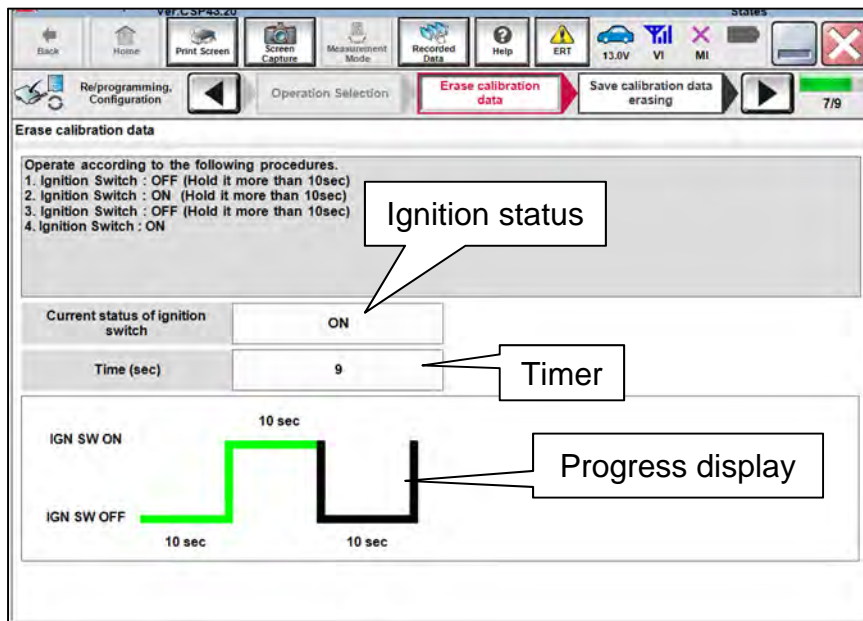


Figure 256

257. When "OK" is displayed, select **Next**.

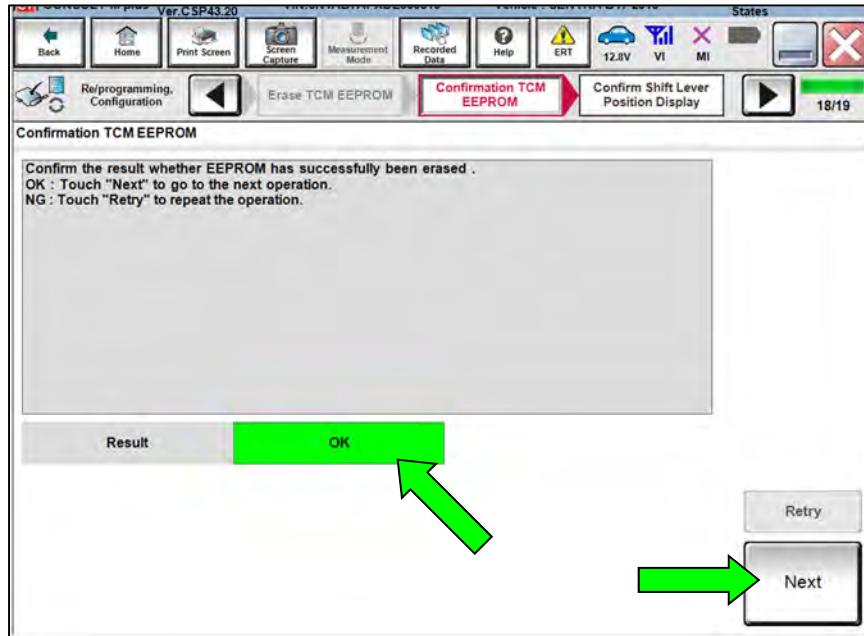


Figure 257

258. Operate the shift selector per the on-screen instructions.

- a. Move the shift selector to **P**, then move **P>R>N>D>P**.
- b. Confirm the center display meter indicates the correct selector position.

259. Select **Next**.

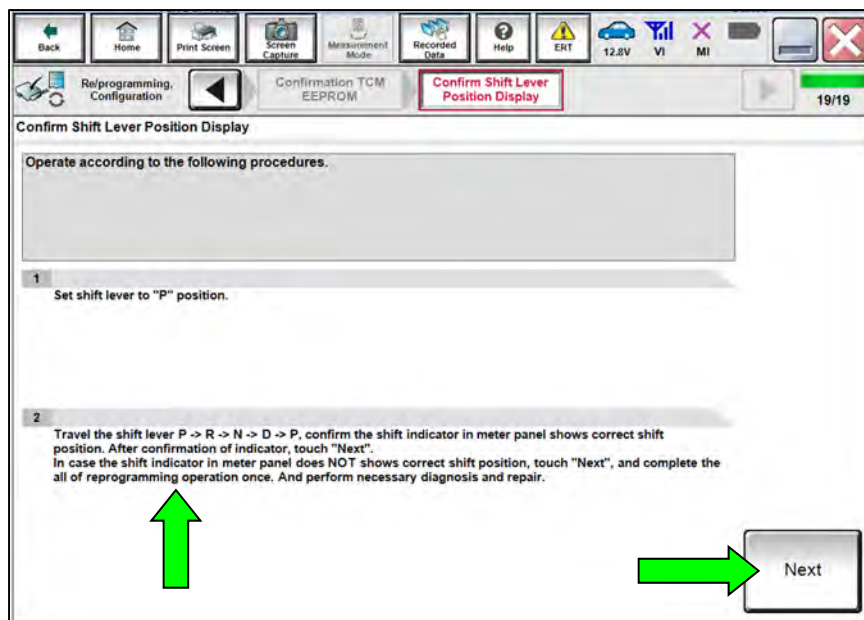


Figure 258

- 260. Follow the on-screen instructions to perform **Erase All DTCs**:
  - a. Turn the ignition OFF.
  - b. Turn the ignition ON.
  - c. Wait for **Erase All DTCs** to complete.
  
- 261. Select **Next**.

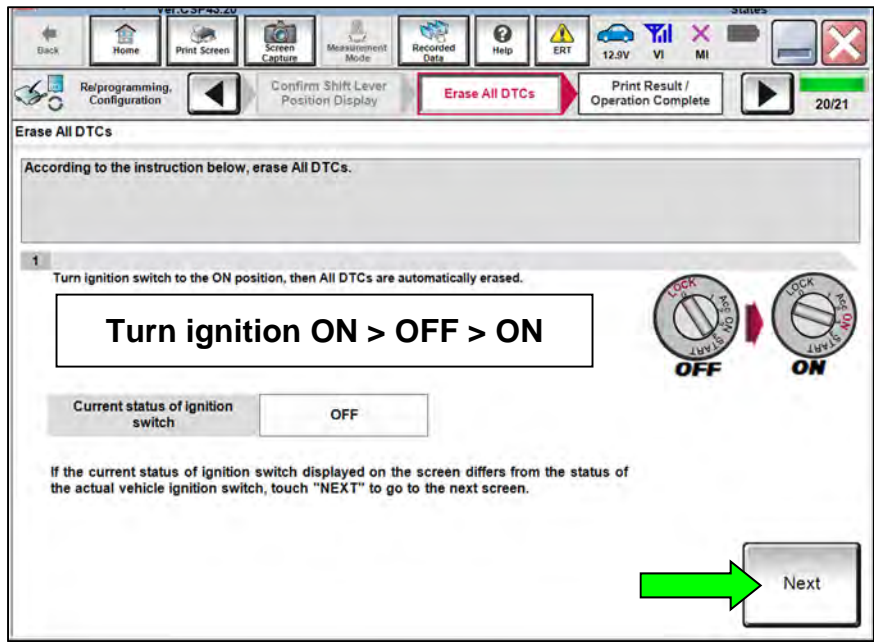


Figure 259

- 262. When the entire reprogramming process is complete, the screen in Figure 260 on page 129 will display.



263. Verify the before and after part numbers are different.
264. Print a copy of this screen (Figure 260) and attach it to the repair order.
265. Select **Confirm**.

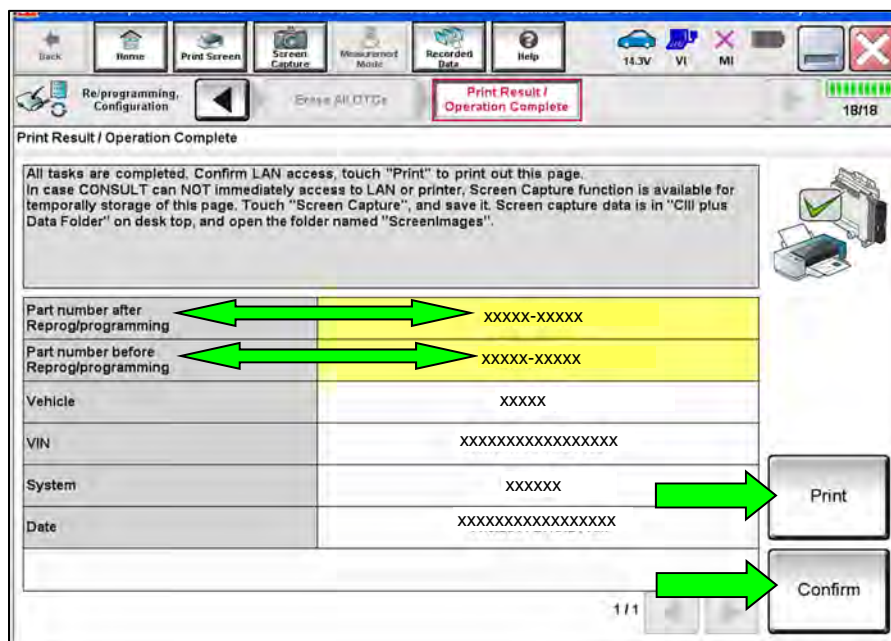


Figure 260

**HINT:** If you cannot print the above screen:

- a. Select **Screen Capture**.
- b. Name the file.
- c. Save the file in **My Documents**.
  - o A copy of the screen is now saved in the CONSULT PC. It can be retrieved and printed at a later time.

## TCM Recovery:

**Do not disconnect the VI or shut down C-III plus if reprogramming does not complete.**

If reprogramming does not complete and the “!?” icon displays as shown in Figure 261:

- Check battery voltage (12.0–15.5 V).
- Ignition is ON, engine OFF.
- External Bluetooth® devices are OFF.
- All electrical loads are OFF.
- **Select retry and follow the on screen instructions.**
- “Retry” may not go through on first attempt and can be selected more than once.

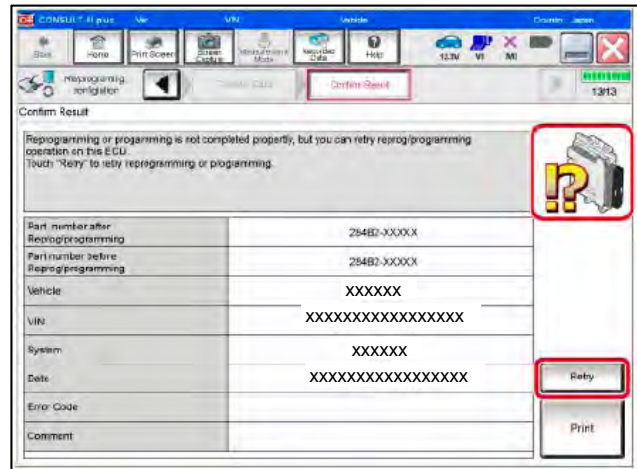


Figure 261

If reprogramming does not complete and the “X” icon displays as shown in Figure 262:

- Check battery voltage (12.0–15.5 V).
- CONSULT A/C adapter is plugged in.
- Ignition is ON, engine OFF.
- Transmission is in Park.
- All C-III plus / VI cables are securely connected.
- All C-III plus updates are installed.
- **Select Home, and restart the reprogram procedure from the beginning.**

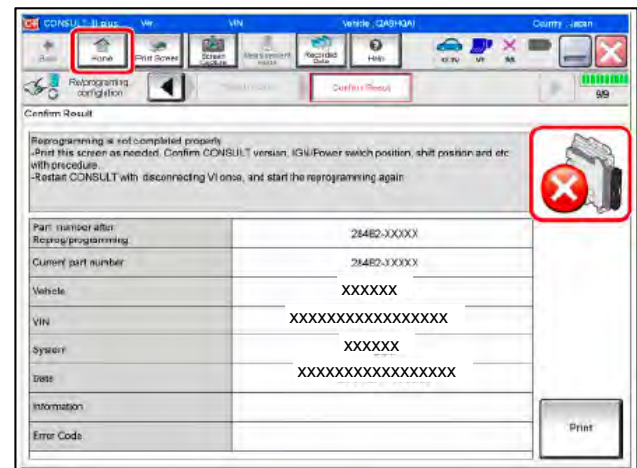


Figure 262

## CONTROL VALVE REPLACEMENT

266. Navigate C-III plus to the screen shown in Figure 263.

- **Diagnosis (All Systems) > TRANSMISSION > Work support**

267. Select **CONTROL VALVE REPLACEMENT**.

268. Select **Start**.

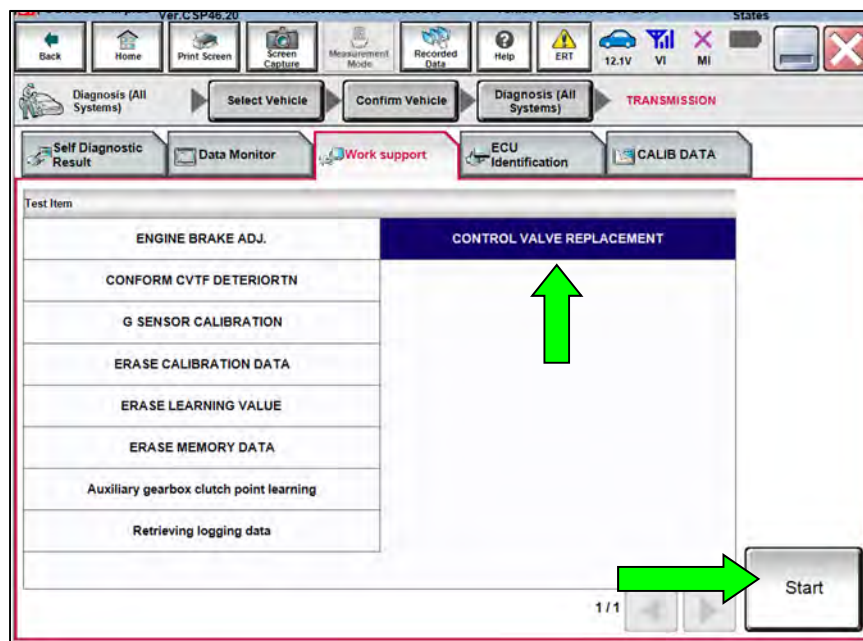


Figure 263

269. Follow the on-screen instructions; maintain the following conditions:
- Turn the ignition ON, with the engine OFF.
  - Press the brake pedal.
  - Press the accelerator pedal between  $\frac{1}{4}$  and  $\frac{1}{2}$ .
  - Put the shift selector in **R**.
270. Select **Start**.

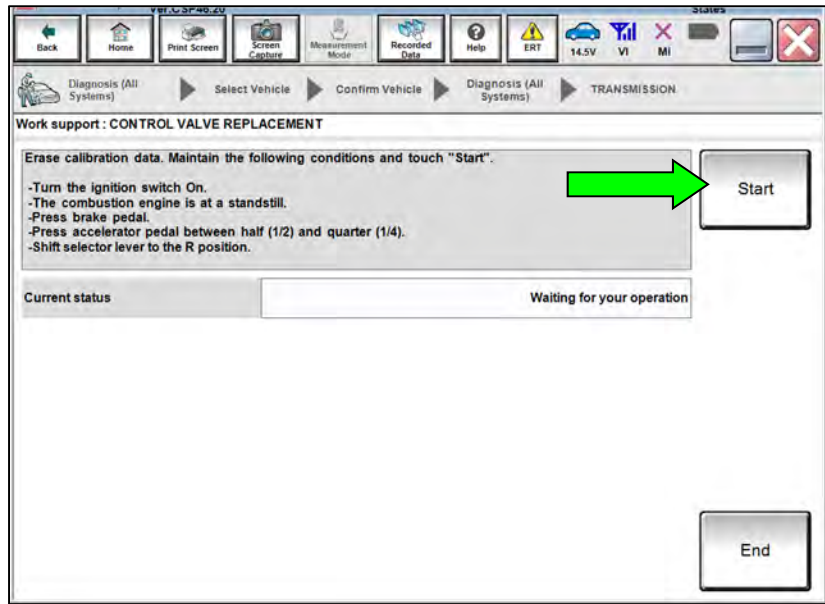


Figure 264

271. Release the accelerator and brake (shift selector remains in **R**).
272. Turn the ignition OFF, and then wait 10 seconds.

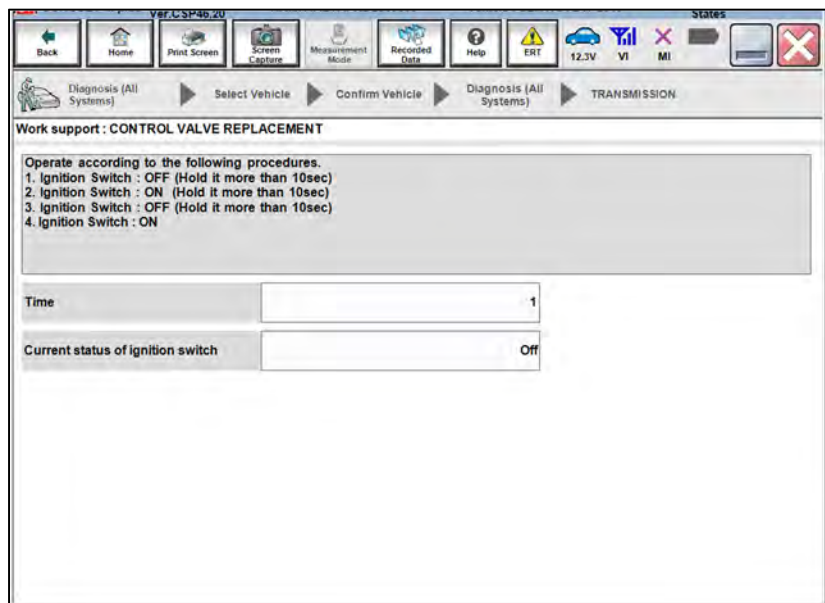


Figure 265



273. Turn the ignition ON, and then wait 10 seconds.

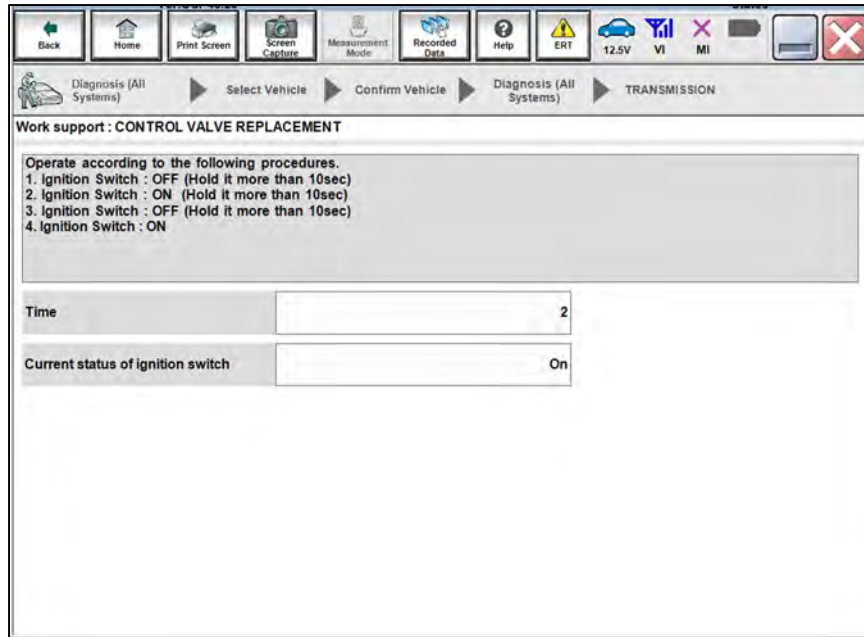


Figure 266

274. Turn the ignition OFF, and then wait 10 seconds.

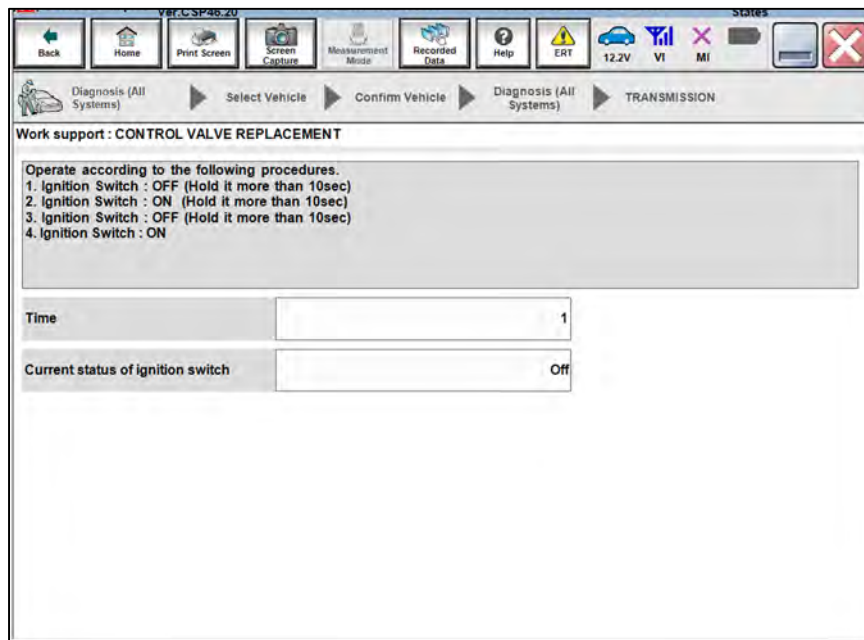


Figure 267

275. Turn the ignition ON.

276. Move shift selector to **P**.

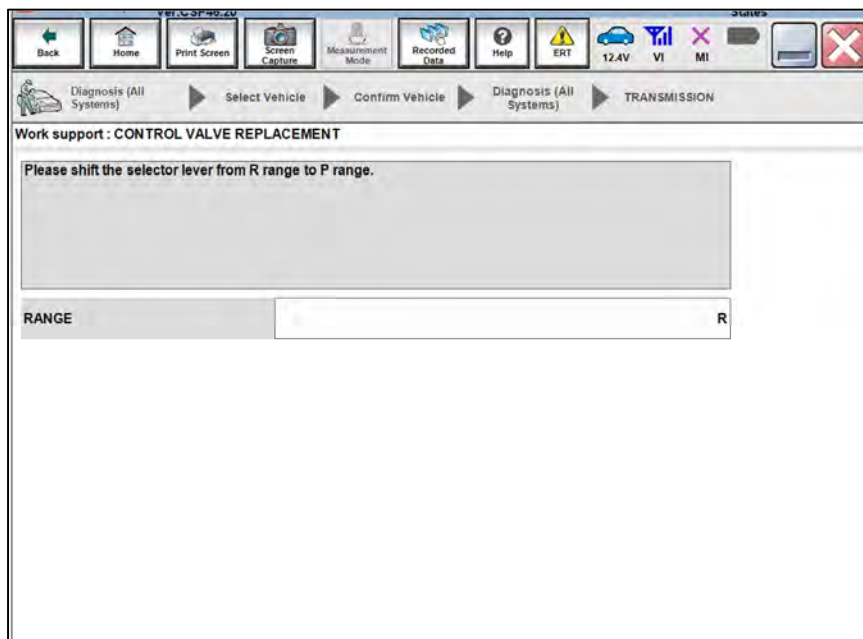


Figure 268

277. When "Completed" is displayed, select **End**.

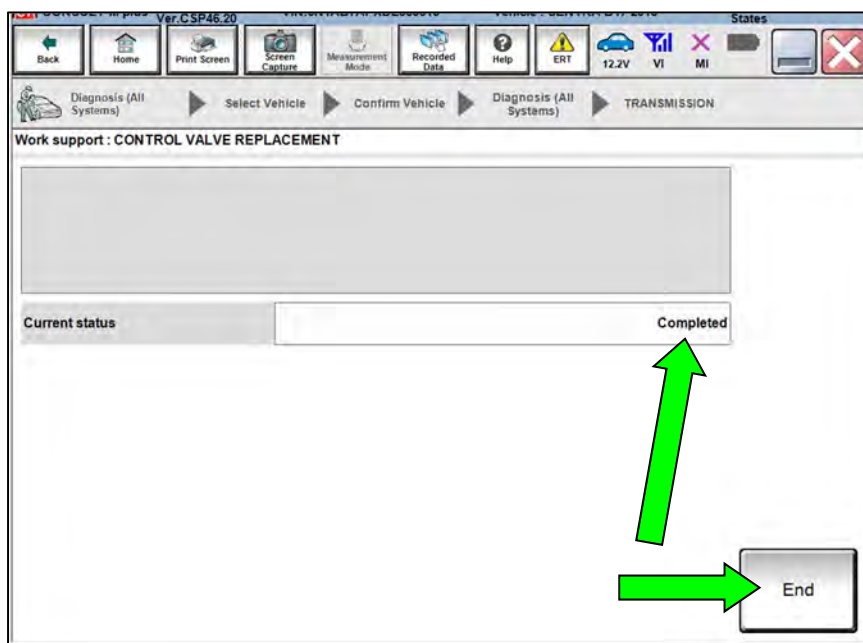


Figure 269

278. Does the pop-up notification in Figure 270 display?

**YES:** TCM Programming is not correct for the installed control valve. Select **OK**, and then return to step 206 on page 111.

**NO:** Proceed to step 279 on page 136.

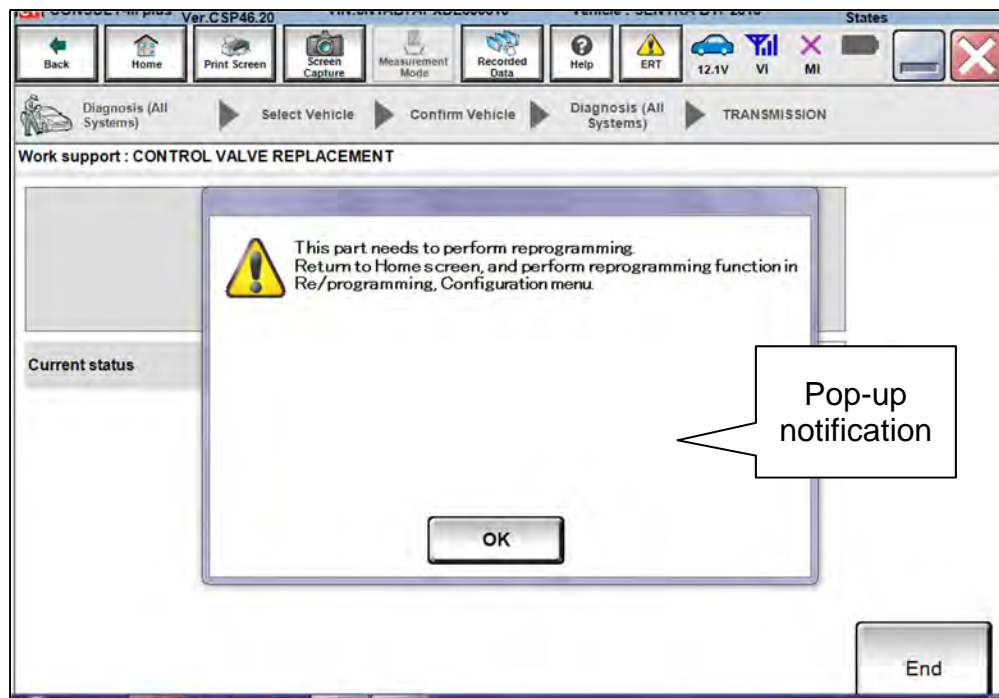


Figure 270

## ERASE LEARNING VALUE

279. Navigate C-III plus to the screen shown in Figure 271.

- **Diagnosis (All Systems) > TRANSMISSION > Work support**

280. Select **ERASE LEARNING VALUE**.

281. Select **Start**.

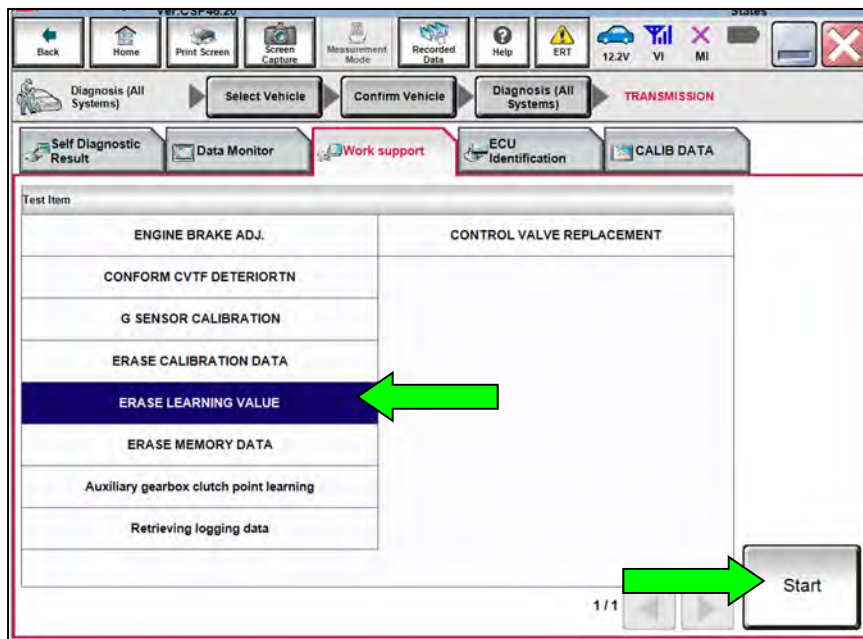


Figure 271



282. Follow the on-screen instructions while maintaining the following conditions:
- a. Parking brake set.
  - b. Ignition ON, with the engine OFF.
  - c. Put the shift selector in **R**.
  - d. Fully depress the accelerator pedal.
283. Select **Start**.

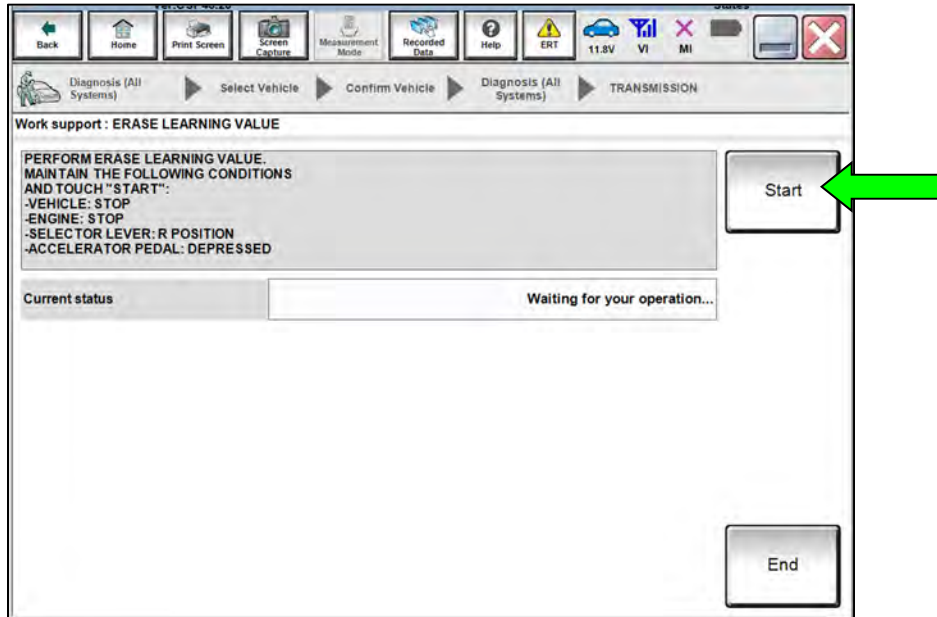


Figure 272

284. When "COMPLETED" is displayed, select **End**.

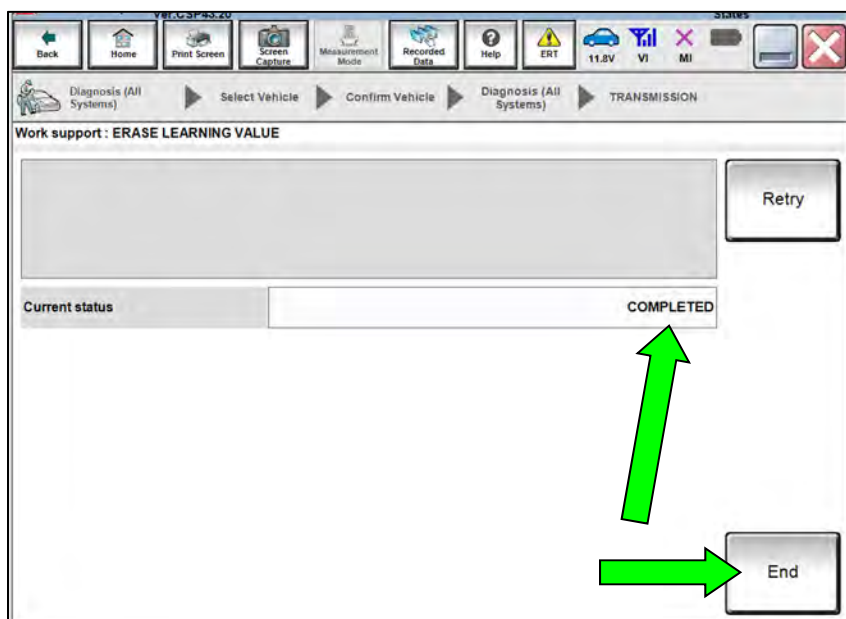


Figure 273

## CONFORM CVTF DETERIORTN

285. Navigate C-III plus to the screen shown in Figure 274.

- **Diagnosis (All Systems) > TRANSMISSION > Work support**

286. Select **CONFORM CVTF DETERIORTN**.

287. Select **Start**.

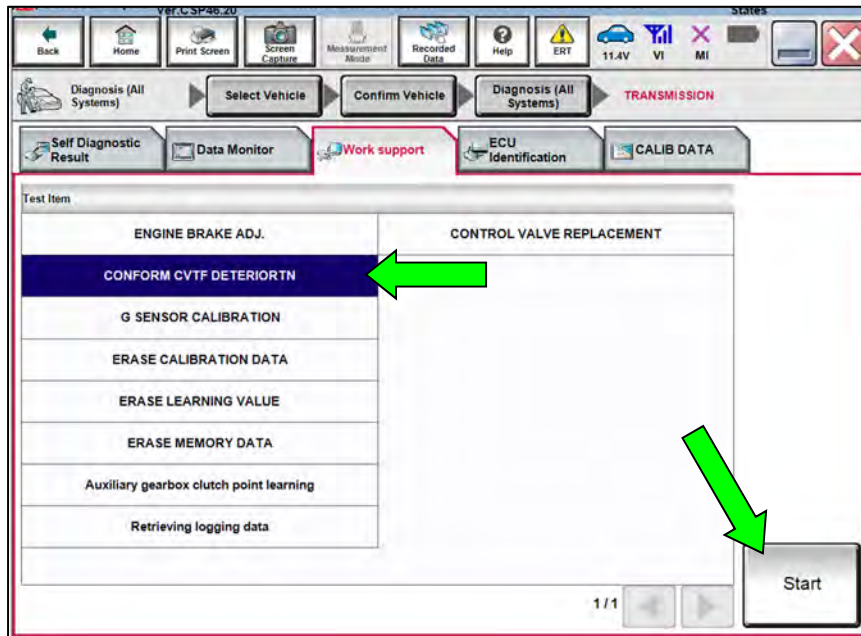


Figure 274

288. Select **Start**.

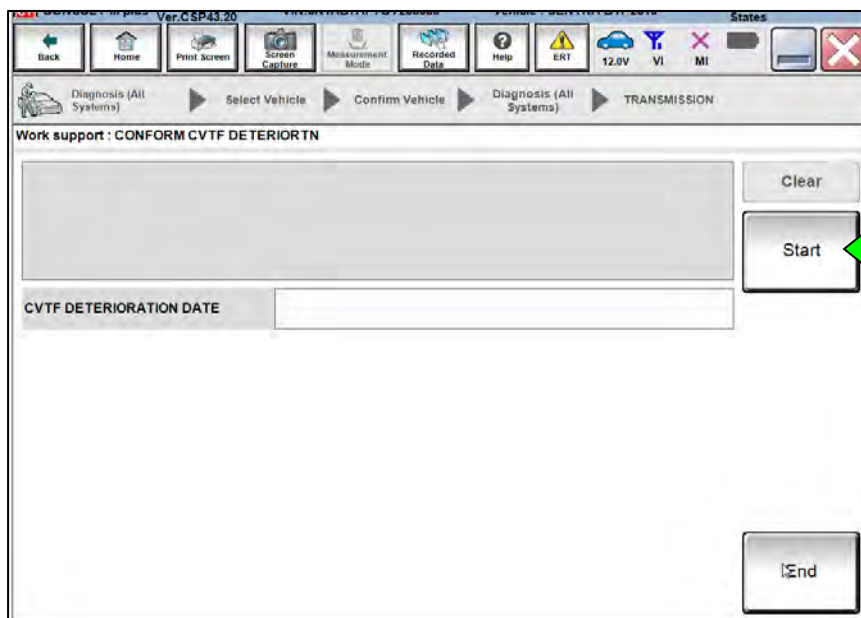


Figure 275

289. Select **Clear**.

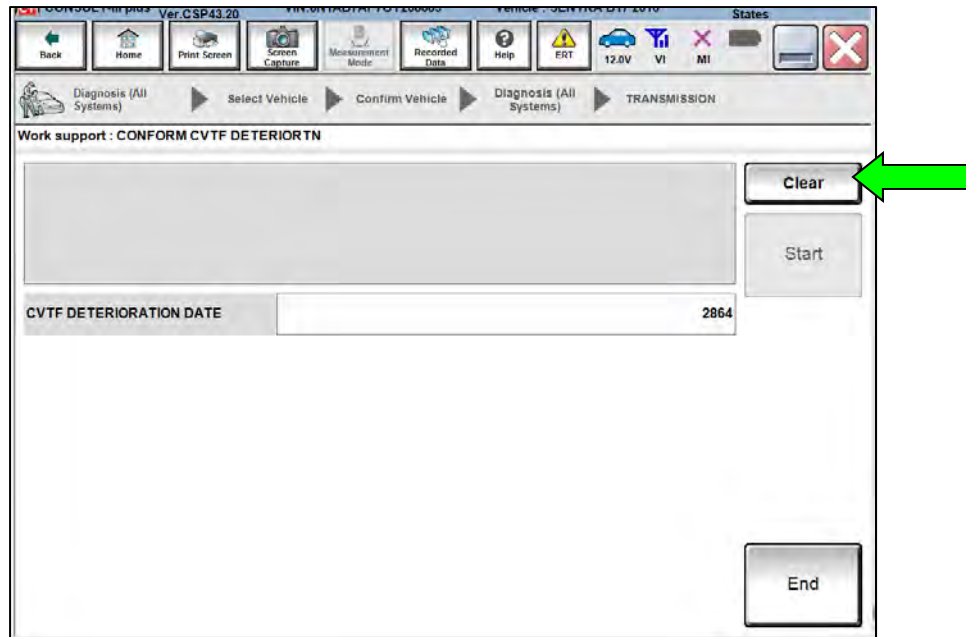


Figure 276

290. Select **Yes**.

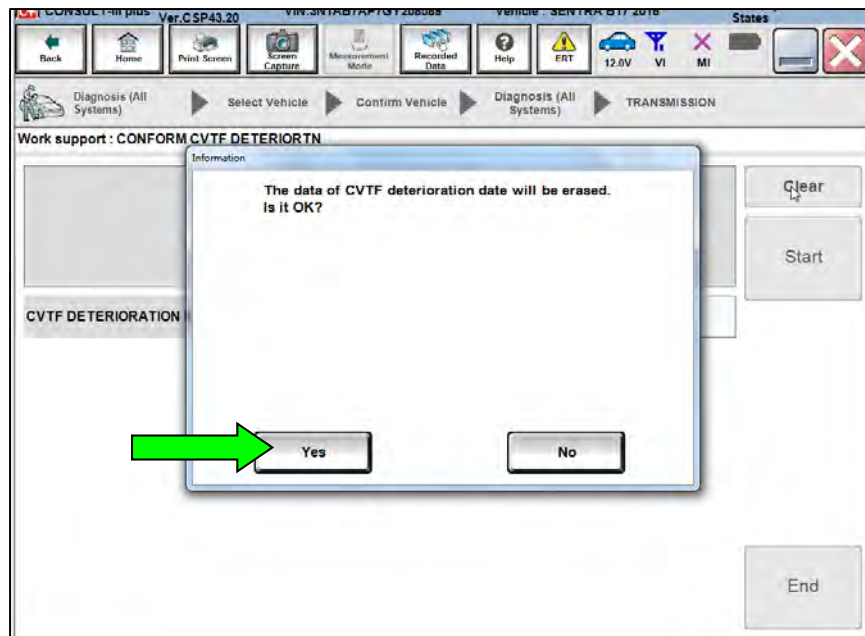


Figure 277

291. When **CVTF DETERIORATION DATE** changes to “0”, select **End**.

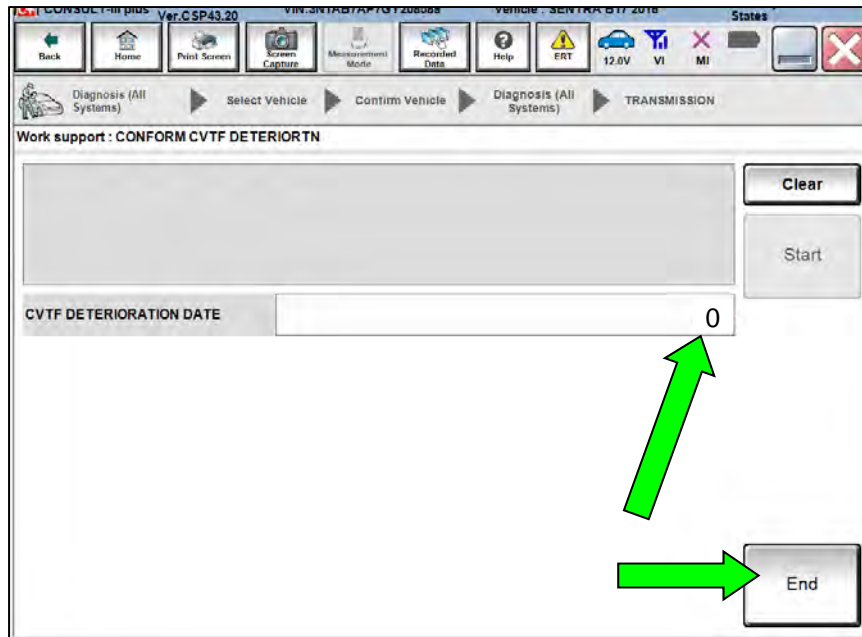


Figure 278

292. Start the engine.

293. Set the parking brake.

294. Turn OFF the A/C.

295. Bring the engine to normal operating temperature range.

296. Confirm the CVT fluid temperature is over 122°F (50°C).



## AUXILIARY GEARBOX CLUTCH POINT LEARNING

297. Navigate C-III plus to the screen shown in Figure 279.

- **Diagnosis (All Systems) > TRANSMISSION > Work support**

298. Select **Auxiliary gearbox clutch point learning**.

299. Select **Start**.

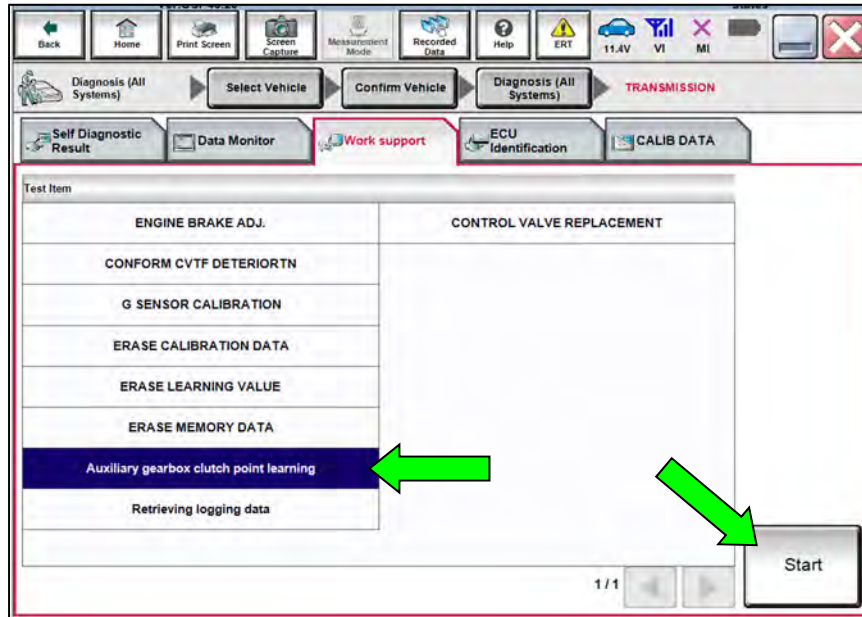


Figure 279

300. Follow the on-screen instructions in Figure 280, and then select **Start**.

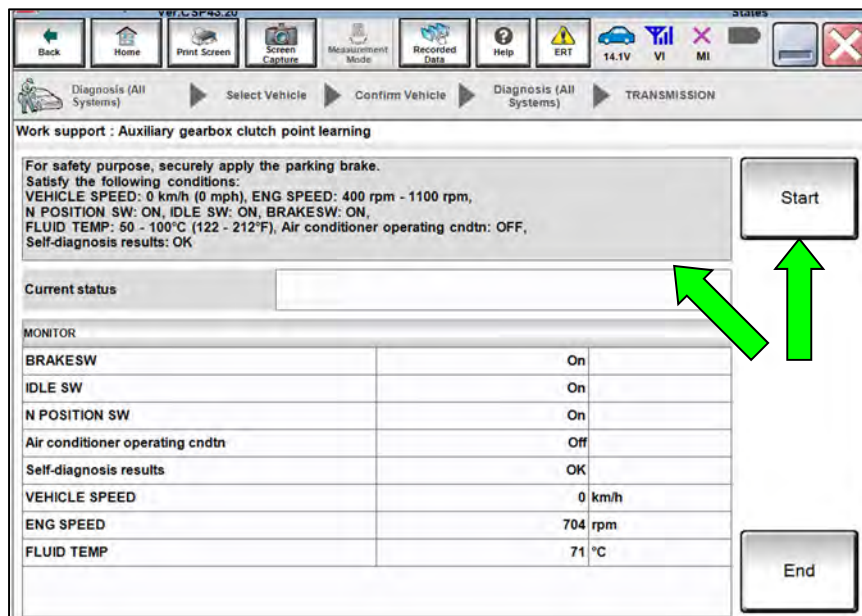


Figure 280

301. With the brake pedal still applied, move the CVT selector lever into the **D** position.

- Figure 281 will be displayed after shifting into **D** position.

**HINT:** The Current status will show “EXECUTING”, but Auxiliary gearbox clutch point learning will not begin until the vehicle is shifted into the Drive (**D**) position.

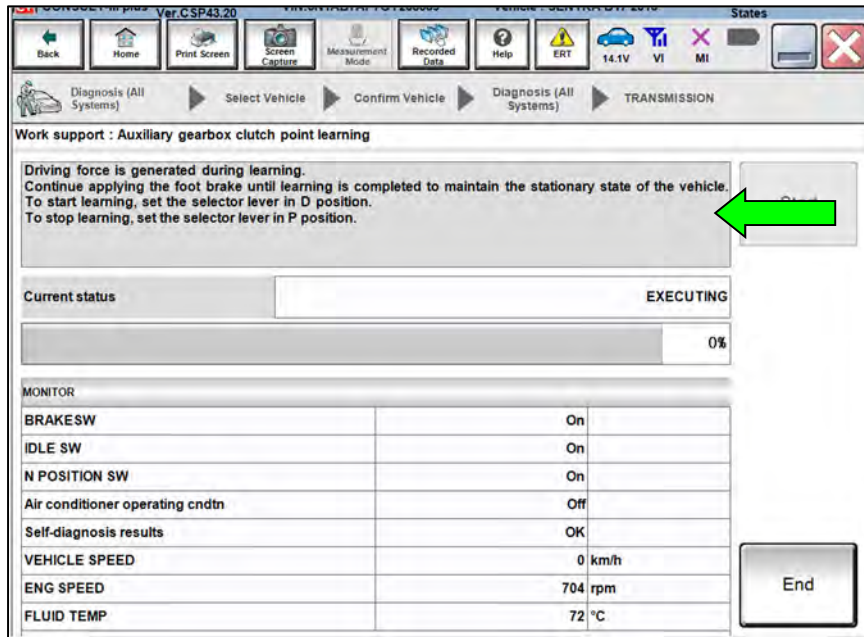


Figure 281

302. Continue to press the brake pedal until the **Current status** shows “Completed” as shown in Figure 283 on page 143.

**HINT:** This may take several minutes to complete.

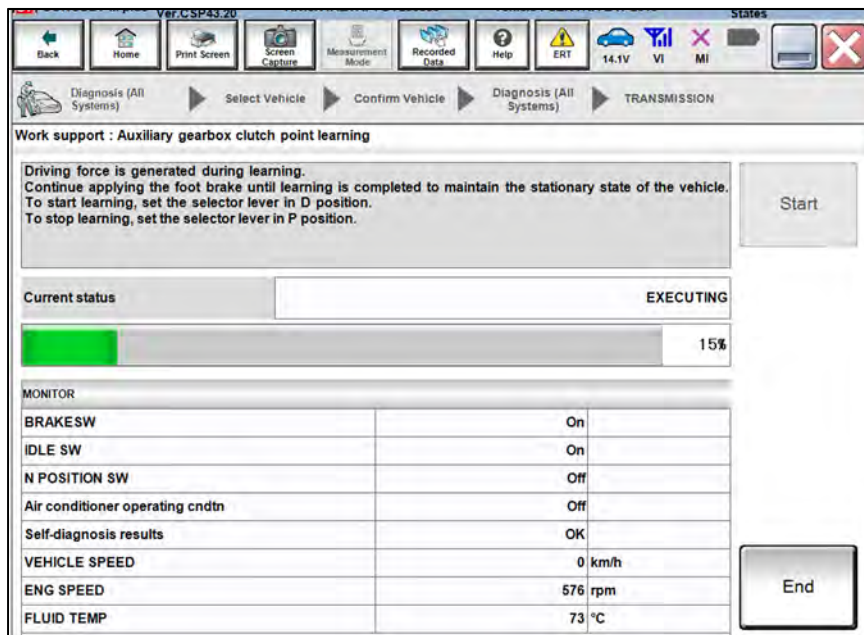


Figure 282

303. When “Completed” is displayed, select **End**.

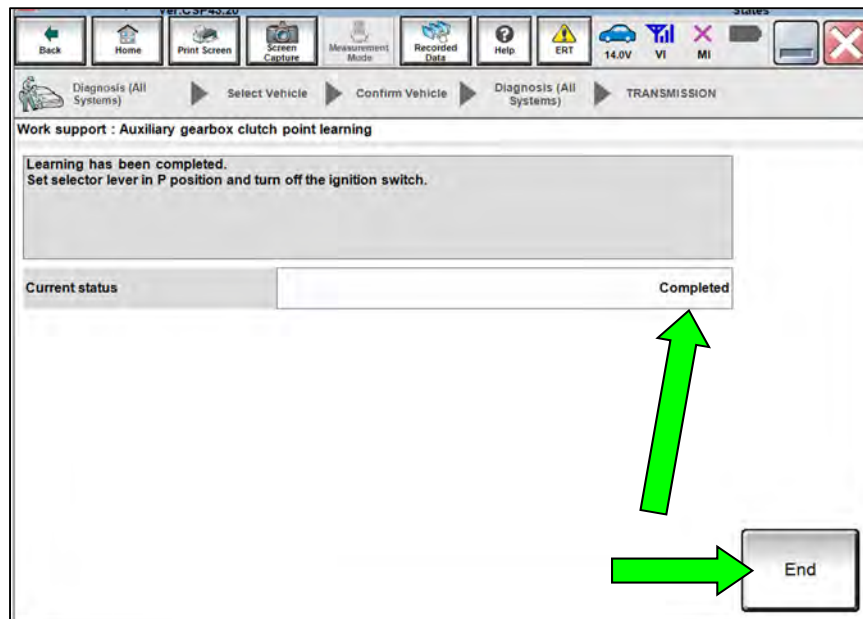


Figure 283

304. Shift the vehicle into Park, turn the ignition OFF and release the brake pedal.

305. Perform **Auxiliary Gearbox Clutch Point Learning** (steps 297 - 304 on pages 141 - 143) one additional time (a total of two times).

### Erase DTCs

306. Use C-III plus to erase any transmission DTCs that may have stored.

307. Turn OFF C-III plus.

308. Disconnect the VI from the vehicle.

309. Verify the CVT operates normally and no abnormal noises are heard during a test drive.

**Procedure complete.**

## PARTS INFORMATION

### Belt and Pulley with Control Valve Repair (Sub-Assembly Repair)

DESCRIPTION	PART #	QUANTITY
KIT-CONTROL VALVE	3170E-50X5A	1
KIT-PULLEY	31214-50X9D	1
KIT-OIL PUMP	31340-50X9E	1
Loctite 5460 Sealant (1) (2)	999MP-LT5460P	(3) (4)
Nissan NS-3 CVT Fluid (1) (2)	999MP-CV0NS3	As needed
Additional Engagement Tool O-Rings (5)	NI-52273-1	As needed
Lens Swab packet (6)	J-51963	(7)

Refer to the footnotes on page 146.

\*\*\*\*Single use parts that are not included in the above kit\*\*\*\*

\*\*\*\*Refer to the library in the EPC for the single use parts lists\*\*\*\*

DESCRIPTION	PART # PREFIX	QUANTITY
WASHER – SPRING (manual plate)	08915	1
NUT - HEX (manual plate)	08911	1



## PARTS INFORMATION (continued)

### Control Valve only Repair

DESCRIPTION	PART #	QUANTITY
KIT-CONTROL VALVE	3170E-50X5A	1
Nissan NS-3 CVT Fluid (1) (2)	999MP-CV0NS3	As needed
Additional Engagement Tool O-Rings (5)	NI-52273-1	As needed
Lens Swab packet (6)	J-51963	(7)

Refer to the footnotes on page 146.

### \*\*\*\*Single use parts that are not included in the above kit\*\*\*\*

DESCRIPTION	PART # PREFIX	QUANTITY
WASHER – SPRING (manual plate)	08915	1
NUT - HEX (manual plate)	08911	1
WASHER-DRAIN (CVT Oil Pan Drain Plug Gasket)	11026	1

## PARTS INFORMATION (continued)

### CVT Assembly Replacement

DESCRIPTION	PART #	QUANTITY
CVT Assembly	(8)	1
Nissan NS-3 CVT Fluid (1) (2)	999MP-CV0NS3	As needed

- (1) For warranty repairs, Nissan NS-3 CVT Fluid and Loctite 5460 Sealant **must** be used. For customer pay repairs, Nissan NS-3 CVT Fluid and Loctite 5460 Sealant or their equivalents are recommended.
- (2) Nissan NS-3 CVT Fluid and Loctite 5460 Sealant can be ordered through the Nissan Maintenance Advantage program: Phone: 877-NIS-NMA1 (877-647-6621) or Website: Order via link on dealer portal [www.NNAnet.com](http://www.NNAnet.com) and click on the "Maintenance Advantage" link.
- (3) One container of Loctite 5460 Sealant is good for approximately 5 repairs. This sealant is not included in any kit.
- (4) Bill out Loctite 5460 Sealant (or equivalent) under **expense code 008**. Do not include the Loctite 5460 Sealant part number on the claim.
- (5) Engagement tool will initially come with 10 O-rings. Additional O-rings are available from Tech•Mate: 1-833-397-3493.
- (6) Lens swabs are available from Tech•Mate online: [www.techmatetools.com](http://www.techmatetools.com), or by phone: 1-833-397-3493. When ordering, keep in mind that the tool part number prefix has changed from "J" to "NI" (NI-51963).
- (7) Shop supply.
- (8) Refer to the Electronic Parts Catalog for the correct part number.

## CLAIMS INFORMATION

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

If pan inspection shows excessive large debris and CVT is replaced

OPERATION	PFP	OP CODE	SYM	DIA	FRT
Inspect CVT Pan for Excessive Debris = <b>NG</b>	(1)	JX49AA	ZE	32	0.3
Replace CVT		JD01AA JD023A			(2)

- (1) Reference the Electronic Parts Catalog and use the applicable CVT assembly part number as the Primary Failed Part (PFP).
- (2) Reference the current Nissan Warranty Flat Rate Manual and use the indicated Flat Rate Time (FRT).

**OR**

If P17F0 IS stored and Sub-assembly is replaced

OPERATION	PFP	OP CODE	SYM	DIA	FRT
CVT R&R	(1)	JD01AA JD023A	ZE	32	(2)
Replace Control Valve with P17F0 stored		JX56AA			0.9
Replace CVT Sub-assembly		JX45AA			3.6
Reprogram TCM (when applicable)		JE99AA			(2)

- (1) Reference the **PARTS INFORMATION** Table and use the Kit-Pulley Part Number as the Primary Failed Part (PFP).
- (2) Reference the current Nissan Warranty Flat Rate Manual and use the indicated Flat Rate Time (FRT).

**OR**

If P17F0 is **NOT** stored, belt inspection is performed, and Sub-assembly is replaced (belt inspection shows signs of belt slip, NG)

OPERATION	PFP	OP CODE	SYM	DIA	FRT
CVT R&R	(1)	JD01AA JD023A	ZE	32	(2)
Inspect CVT Belt, Belt = <b>NG</b> (Includes control valve R&I)		JX36AA			1.2
Replace CVT Sub-assembly		JX45AA			3.6
Reprogram TCM		JE99AA			(2)

- (1) Reference the **PARTS INFORMATION** Table and use the Kit-Pulley Part Number as the Primary Failed Part (PFP).
- (2) Reference the current Nissan Warranty Flat Rate Manual and use the indicated Flat Rate Time (FRT).

**CLAIMS INFORMATION continued on next page.**

## CLAIMS INFORMATION (continued)

OR

If P17F0 is **NOT** stored, belt inspection and only control valve is replaced (belt inspection shows NO signs of belt slip)

OPERATION	PFP	OP CODE	SYM	DIA	FRT
Inspect CVT Belt, Belt = <b>OK</b>	(1)	JX37AA	ZE	32	0.4
Replace Control Valve (Valve Body)		JD48AA			(2)
Reprogram TCM		JE99AA			(2)

- (1) Reference the **PARTS INFORMATION** Table and use the Kit-Control Valve Part Number as the Primary Failed Part (PFP).
- (2) Reference the current Nissan Warranty Flat Rate Manual and use the indicated Flat Rate Time (FRT).

**HINT:** FRT allows adequate time to access DTCs. No other diagnostic procedures subsequently required. Do NOT claim any diagnostic OP Codes with this claim.



## KIT PARTS REFERENCE TABLE

### HINT:

- This table is for reference only. Part numbers listed cannot be ordered individually.
- These part numbers are for identification of the correct part within the kit (part number is listed on the bag for each individual part).
- Some parts have more than one part number listed. In this case, one of the part numbers listed will be in the kit.

### KIT-CONTROL VALVE (3170E-50X5A) PARTS REFERENCE (Kit Content)

REFERENCE #	DESCRIPTION	PART NUMBER	QTY:
1	VALVE ASSY - CONTROL (Control valve)	31705-50X5B	1
2	GASKET - OIL PAN (Oil pan gasket)	31397-X425A	1
3	STRAINER ASSY - OIL, AUTO TRANS (Oil pan strainer)	31728-50X0A	1

### KIT-PULLEY (31214-50X9D) PARTS REFERENCE (Kit Content)

REFERENCE #	DESCRIPTION	PART NUMBER	QTY:
4	PULLEY ASSY (Sub assembly: Belt & Pulley)	31209-50X9D	1
5	SNAP RING KIT (Snap ring kit)	31506-3JX8B	1
6	BOLT (Side cover bolts)	31377-X424C	12
7	SEAL - O RING (Input shaft O ring)	31526-X420C	1
8	SEAL - O RING	31526-8E000 or 31526-28X0C	2

**KIT PARTS REFERENCE TABLE (Continued)**

**KIT-OIL PUMP (31340-50X9E) PARTS REFERENCE (Kit Content)**

<b>REFERENCE #</b>	<b>DESCRIPTION</b>	<b>PART NUMBER</b>	<b>QTY:</b>
9	BOLT (Torque converter case bolts)	31377-X424C	19
10	SEAL-O RING (Torque converter case to CVT case)	31526-3JX3C	1
11	SEAL-O RING (Case O ring)	31526-X420B	1
12	PIN - RET (Manual shaft roll pin)	31906-1XF0A	1
13	PUMP ASSY - OIL (Oil pump)	31340-50X5A	1
14	GSKT - OIL PUMP (Oil pump gasket)	31366-3JX0B	2
15	SEAL - O RING (Oil filter cover O ring)	31526-3JX3A	1
16	FLTR ASSY - OIL, AUTO TRANS (Oil filter)	31726-28X0A	1
17	SEAL ASSY - OIL (Torque converter Seal)	31375-3JX1A	1
18	SEAL - OIL,DIFF (Axle seals)	38342-3VX0A	2
19	SEAL - O RING (Primary/Secondary/Output Sensor O-ring)	31526-1XG0C	3
20	SLEEVE - OIL DIST	31374 80X01	1
21	RING - SEAL	31525 X420A	2
22	SEAL - O RING (Reverse brake tube)	31526-3TX0A	1
23	SEAL - O RING (Side cover to CVT case)	31526-3JX9B	2
24	SEAL - O RING (Oil pressure sensor	31526-1XF0B	1

## PART KITS VISUAL REFERENCE

- Figure 284 and Figure 285 show the smaller components of individual kits.
- KIT - CONTROL VALVE is not shown.

KIT - PULLEY. Sub-assembly not shown

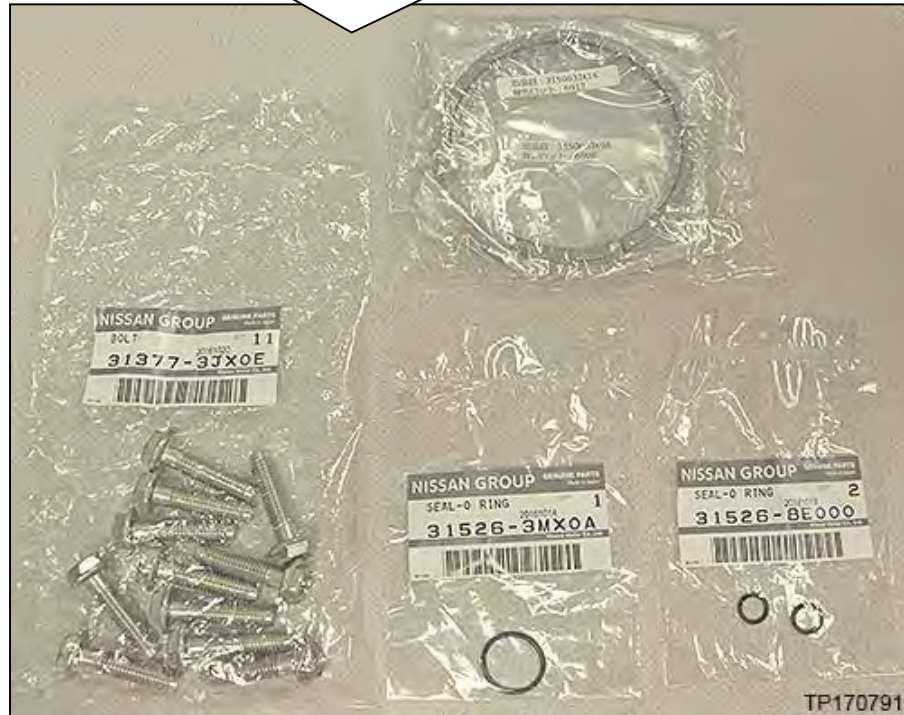


Figure 284



Figure 285

## CVT ASSEMBLY REPLACEMENT APPROVAL PROCEDURES

If CVT inspection indicates **CVT assembly replacement** is required:

- a. Complete the PCC CVT Preauthorization Form in ASIST.
- b. Attach the required video (15 seconds or less) to the CVT Preauthorization Form.
  - o Failure to submit a continuous video showing evidence of abnormalities and the VIN will cause immediate denial of request for CVT unit replacement.
- c. Call the PCC for authorization at **800-973-9992 (opt 2)**.

**IMPORTANT:** Make sure the video has a clear image of the VIN on the F.M.V.S.S. certification label (VIN label).

### AMENDMENT HISTORY

PUBLISHED DATE	REFERENCE	DESCRIPTION
March 21, 2022	NTB22-021	Original bulletin published
February 23, 2023	NTB22-021A	<b>APPLIED VEHICLES, Table B</b> on page 120, and the part number for Additional Engagement Tool O-Rings revised; Tech•Mate information updated on pages 6 and 146; login information moved to page 112