

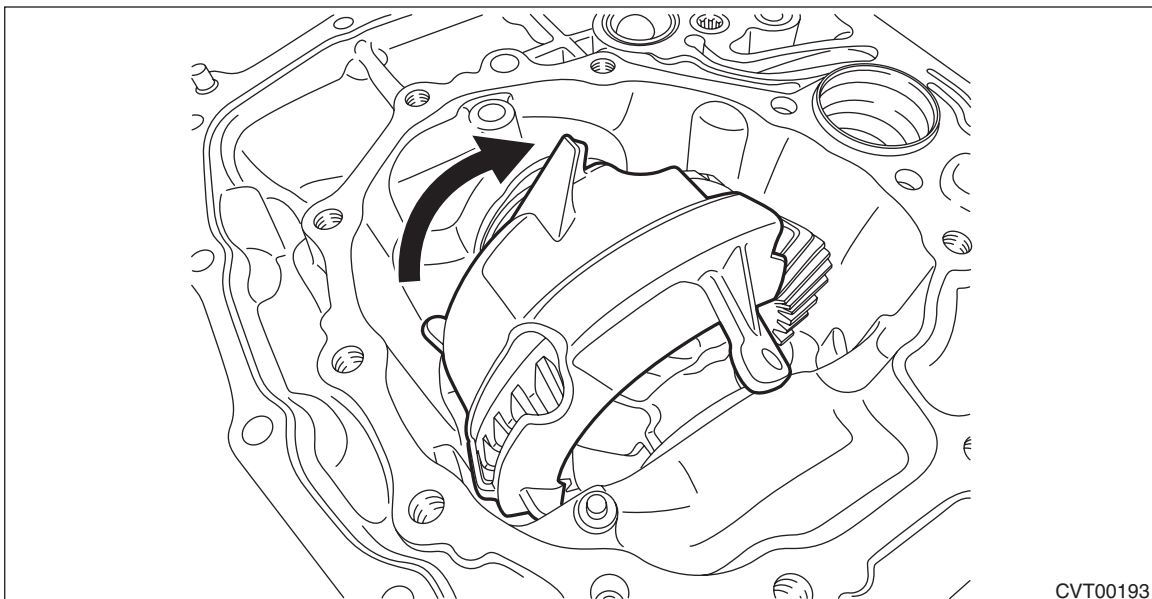
Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

48.Front Differential Assembly

A: REMOVAL

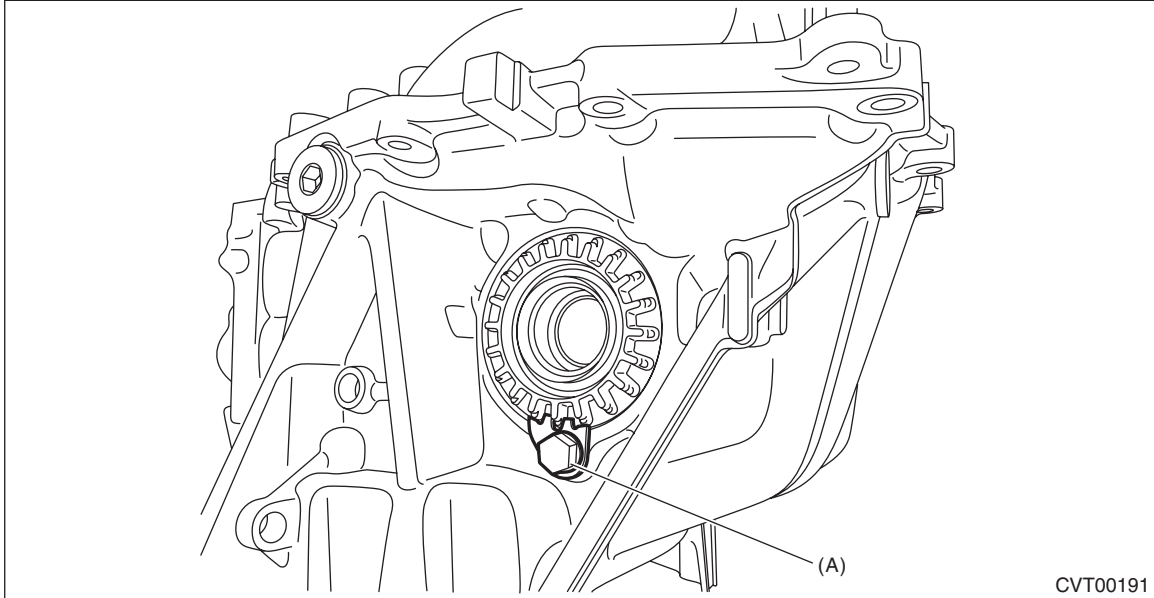
- 1) Remove the transmission assembly from the vehicle. <Ref. to CVT(TH58A)-63, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the air breather hose. <Ref. to CVT(TH58A)-171, REMOVAL, Air Breather Hose.>
- 3) Remove the transmission harness. <Ref. to CVT(TH58A)-143, REMOVAL, Transmission Harness.>
- 4) Remove the main control valve body. <Ref. to CVT(TH58A)-115, REMOVAL, Control Valve Body.>
- 5) Remove the turbine speed sensor. <Ref. to CVT(TH58A)-104, REMOVAL, Turbine Speed Sensor.>
- 6) Remove the secondary speed sensor. <Ref. to CVT(TH58A)-106, REMOVAL, Secondary Speed Sensor.>
- 7) Remove the front wheel speed sensor. <Ref. to CVT(TH58A)-108, REMOVAL, Front Wheel Speed Sensor.>
- 8) Remove the inhibitor switch. <Ref. to CVT(TH58A)-101, REMOVAL, Inhibitor Switch.>
- 9) Remove the extension case. <Ref. to CVT(TH58A)-182, REMOVAL, Extension Case.>
- 10) Remove the transfer clutch assembly. <Ref. to CVT(TH58A)-186, REMOVAL, Transfer Clutch.>
- 11) Remove the transfer driven gear assembly. <Ref. to CVT(TH58A)-200, REMOVAL, Transfer Driven Gear.>
- 12) Remove the transfer drive gear assembly. <Ref. to CVT(TH58A)-203, REMOVAL, Transfer Drive Gear.>
- 13) Remove the parking pawl. <Ref. to CVT(TH58A)-208, REMOVAL, Parking Pawl.>
- 14) Remove the oil pan and oil strainer. <Ref. to CVT(TH58A)-112, REMOVAL, Oil Pan and Strainer.>
- 15) Remove the transmission control device. <Ref. to CVT(TH58A)-210, REMOVAL, Transmission Control Device.>
- 16) Remove the drive motor assembly. <Ref. to CVT(TH58A)-217, REMOVAL, Drive Motor Assembly.>
- 17) Remove the output clutch assembly. <Ref. to CVT(TH58A)-228, REMOVAL, Output Clutch Assembly.>
- 18) Remove the transmission case. <Ref. to CVT(TH58A)-245, REMOVAL, Transmission Case.>
- 19) Remove the reduction drive gear. <Ref. to CVT(TH58A)-258, REMOVAL, Reduction Drive Gear.>
- 20) Remove the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TH58A)-263, REMOVAL, Primary Pulley and Secondary Pulley.>
- 21) Remove the reverse brake assembly. <Ref. to CVT(TH58A)-287, REMOVAL, Reverse Brake Assembly.>
- 22) Remove the forward clutch assembly. <Ref. to CVT(TH58A)-303, REMOVAL, Forward Clutch Assembly.>
- 23) Remove the drive pinion shaft assembly. <Ref. to CVT(TH58A)-323, REMOVAL, Drive Pinion Shaft Assembly.>
- 24) Remove the oil baffle.



Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

25) Remove the lock plates on both sides.



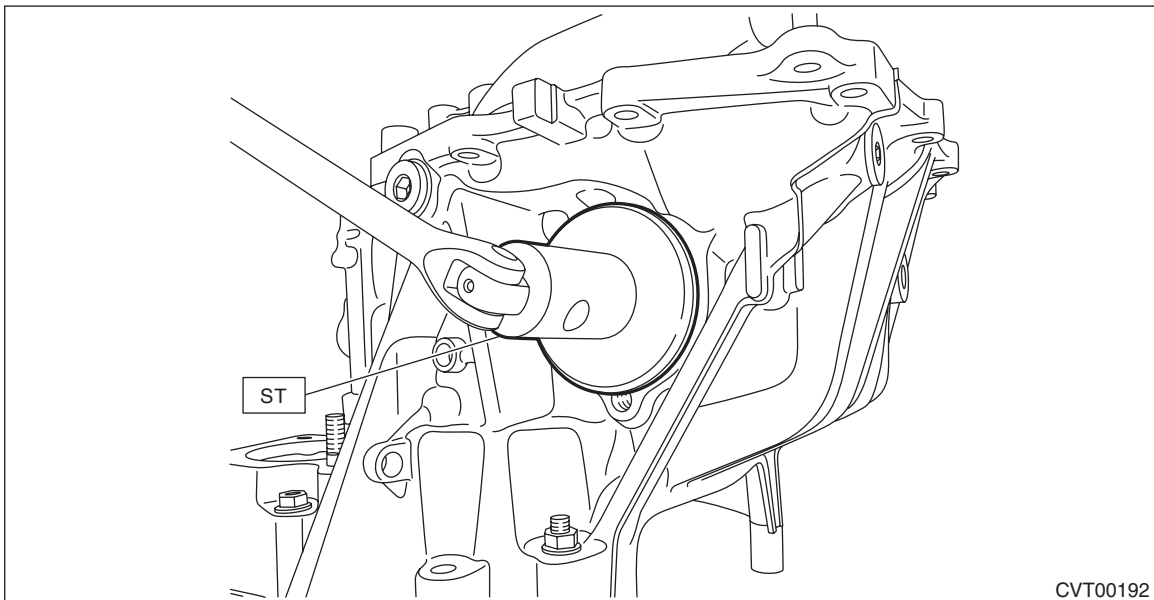
(A) Lock plate

26) Remove the differential side retainers using ST.

NOTE:

- When the wrench COMPL retainer interferes with the converter case, align the cutout portion with the interference part.
- Support the differential case assembly by hand to avoid damaging the retainer mounting hole of the converter case.
- Keep the left and right differential side retainers and left and right bearing outer races by attaching tags or in similar ways to make it possible to identify RH and LH sides.

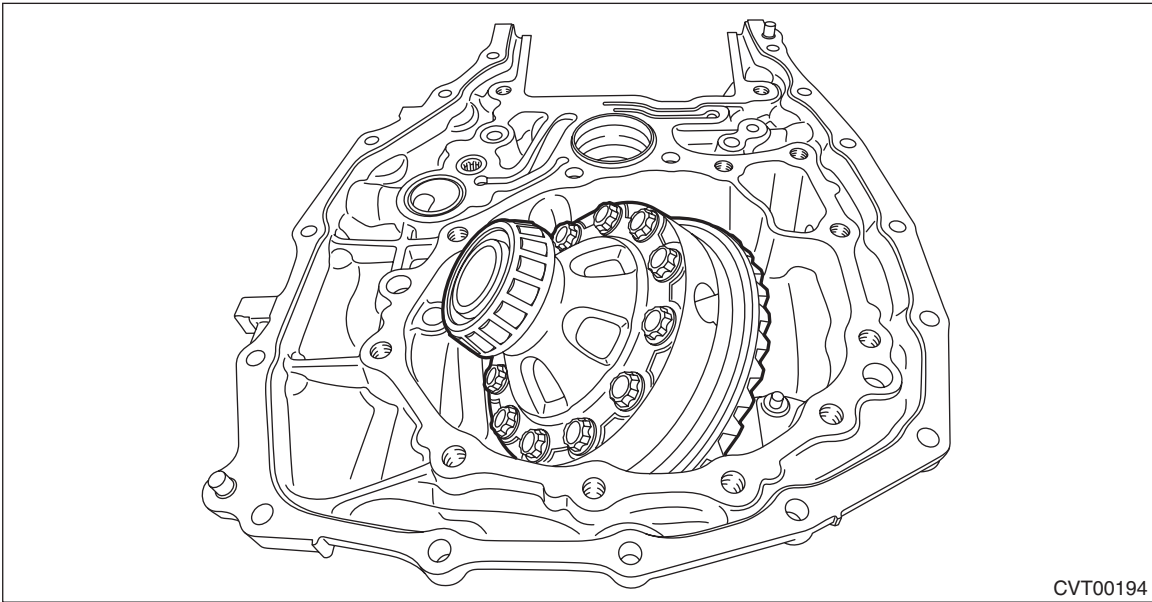
ST 18658AA020 WRENCH COMPL RETAINER



Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

27) Remove the front differential assembly while being careful not to damage the attachment part of the retainer.



CVT00194

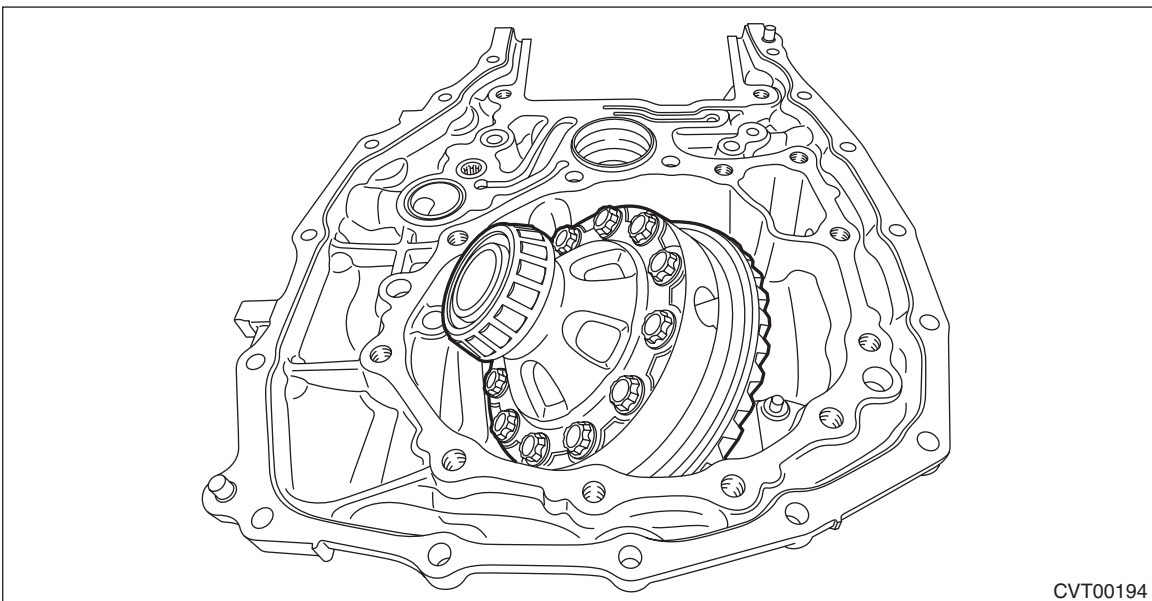
28) Remove the oil seals and O-rings from both differential side retainers. <Ref. to CVT(TH58A)-360, SIDE RETAINER, DISASSEMBLY, Front Differential Assembly.>

B: INSTALLATION

1) Install the front differential assembly to the converter case.

NOTE:

Be careful not to damage the inside of the case (especially the mounting surface of the differential side retainers).



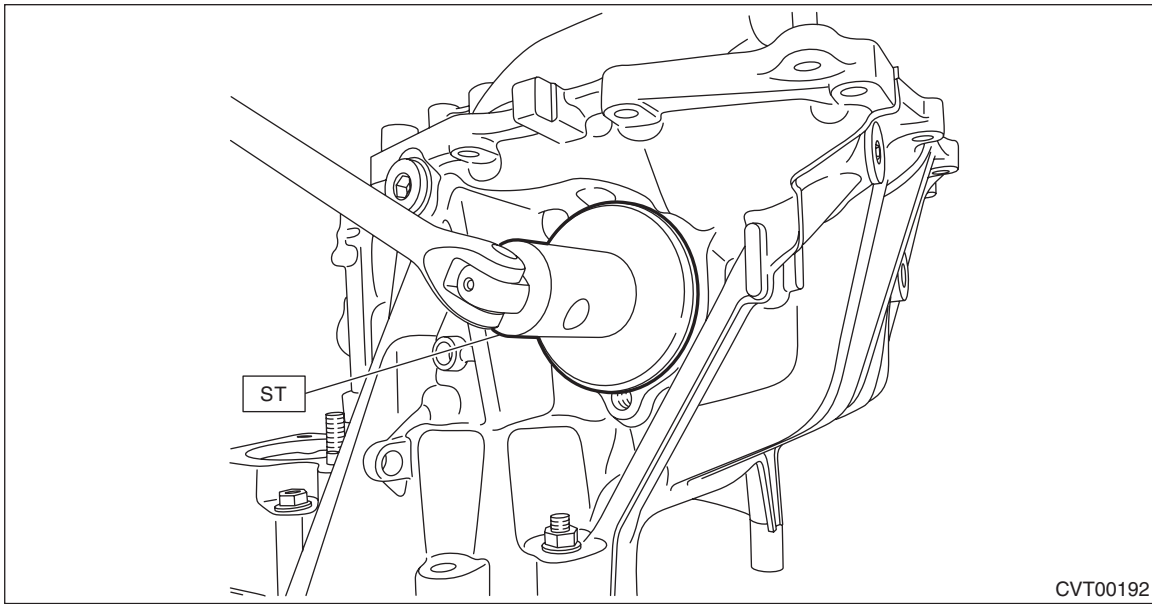
CVT00194

2) Install the bearing outer race.

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 3) Temporarily install the differential side retainers using ST.
ST 18658AA020 WRENCH COMPL RETAINER



- 4) Adjust the backlash of the front differential. <Ref. to CVT(TH58A)-368, ADJUSTMENT, Front Differential Assembly.>
5) Inspect and adjust the tooth contact. <Ref. to CVT(TH58A)-345, ADJUSTMENT, Drive Pinion Shaft Assembly.>
6) Using the ST, loosen the differential side retainer until the mounting groove of the O-ring appears, and then install the O-ring.

NOTE:

- When loosening the differential side retainer, record the number of the turns made.
- Perform this for both left and right differential side retainers.
- Use new O-rings.
- Apply the differential gear oil to O-ring.

ST 18658AA020 WRENCH COMPL RETAINER

- 7) Using the ST, tighten the retainer to the position before it is loosened.

ST 18658AA020 WRENCH COMPL RETAINER

- 8) Install the oil seal to the differential side retainer. <Ref. to CVT(TH58A)-92, Differential Side Retainer Oil Seal.>

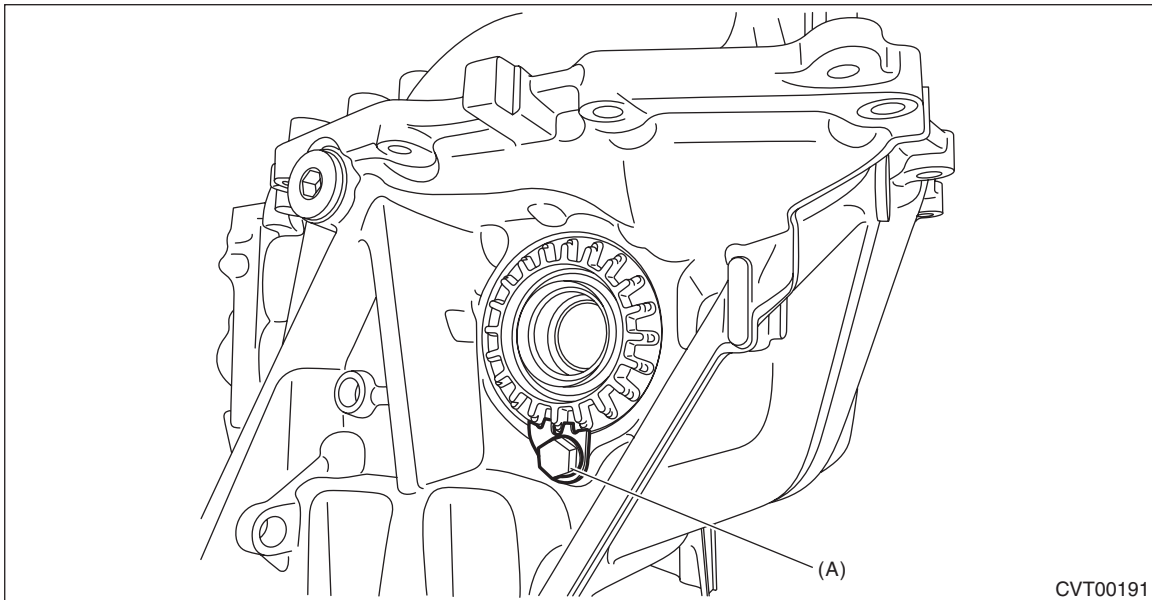
Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

9) Install the lock plate.

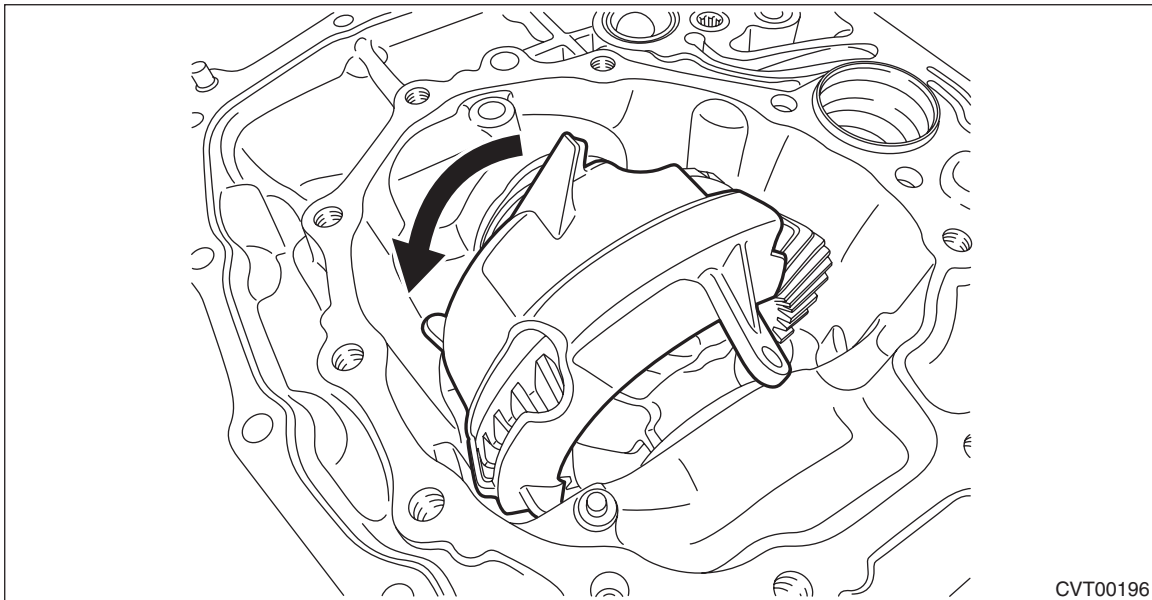
Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)



(A) Lock plate

10) Install the oil baffle.



11) Install the drive pinion shaft assembly. <Ref. to CVT(TH58A)-324, INSTALLATION, Drive Pinion Shaft Assembly.>

12) Install the forward clutch assembly. <Ref. to CVT(TH58A)-306, INSTALLATION, Forward Clutch Assembly.>

13) Install the reverse brake assembly. <Ref. to CVT(TH58A)-290, INSTALLATION, Reverse Brake Assembly.>

14) Install the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TH58A)-271, INSTALLATION, Primary Pulley and Secondary Pulley.>

15) Install the reduction drive gear. <Ref. to CVT(TH58A)-259, INSTALLATION, Reduction Drive Gear.>

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

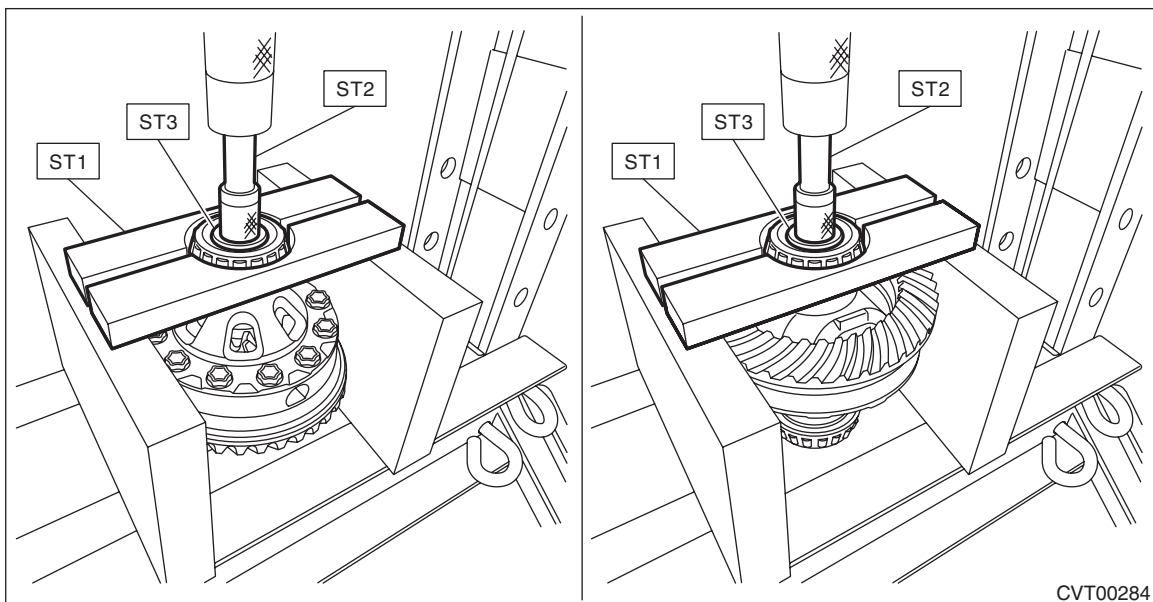
- 16) Install the transmission case. <Ref. to CVT(TH58A)-248, INSTALLATION, Transmission Case.>
- 17) Install the output clutch assembly. <Ref. to CVT(TH58A)-229, INSTALLATION, Output Clutch Assembly.>
- 18) Install the drive motor assembly. <Ref. to CVT(TH58A)-221, INSTALLATION, Drive Motor Assembly.>
- 19) Install the transmission control device. <Ref. to CVT(TH58A)-213, INSTALLATION, Transmission Control Device.>
- 20) Install the oil strainer and oil pan. <Ref. to CVT(TH58A)-114, INSTALLATION, Oil Pan and Strainer.>
- 21) Install the parking pawl. <Ref. to CVT(TH58A)-208, INSTALLATION, Parking Pawl.>
- 22) Install the transfer drive gear assembly. <Ref. to CVT(TH58A)-204, INSTALLATION, Transfer Drive Gear.>
- 23) Install the transfer driven gear assembly. <Ref. to CVT(TH58A)-201, INSTALLATION, Transfer Driven Gear.>
- 24) Install the transfer clutch assembly. <Ref. to CVT(TH58A)-188, INSTALLATION, Transfer Clutch.>
- 25) Install the extension case. <Ref. to CVT(TH58A)-183, INSTALLATION, Extension Case.>
- 26) Install the inhibitor switch. <Ref. to CVT(TH58A)-102, INSTALLATION, Inhibitor Switch.>
- 27) Install the secondary speed sensor. <Ref. to CVT(TH58A)-106, INSTALLATION, Secondary Speed Sensor.>
- 28) Install the front wheel speed sensor. <Ref. to CVT(TH58A)-108, INSTALLATION, Front Wheel Speed Sensor.>
- 29) Install the turbine speed sensor. <Ref. to CVT(TH58A)-104, INSTALLATION, Turbine Speed Sensor.>
- 30) Install the main control valve body. <Ref. to CVT(TH58A)-123, INSTALLATION, Control Valve Body.>
- 31) Install the transmission harness. <Ref. to CVT(TH58A)-151, INSTALLATION, Transmission Harness.>
- 32) Install the air breather hose. <Ref. to CVT(TH58A)-173, INSTALLATION, Air Breather Hose.>
- 33) Install the transmission assembly to the vehicle. <Ref. to CVT(TH58A)-77, INSTALLATION, Automatic Transmission Assembly.>

C: DISASSEMBLY

1. DIFFERENTIAL CASE ASSEMBLY

- 1) Remove the taper roller bearing using the ST.

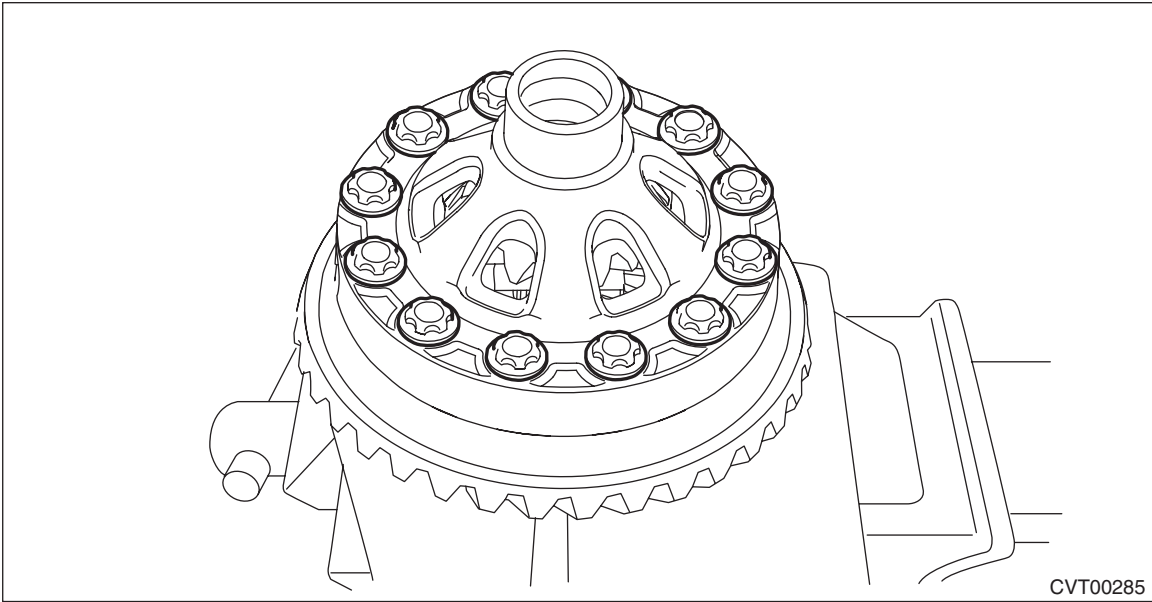
ST1	498077000	REMOVER
ST2	899864100	REMOVER
ST3	398497701	SEAT



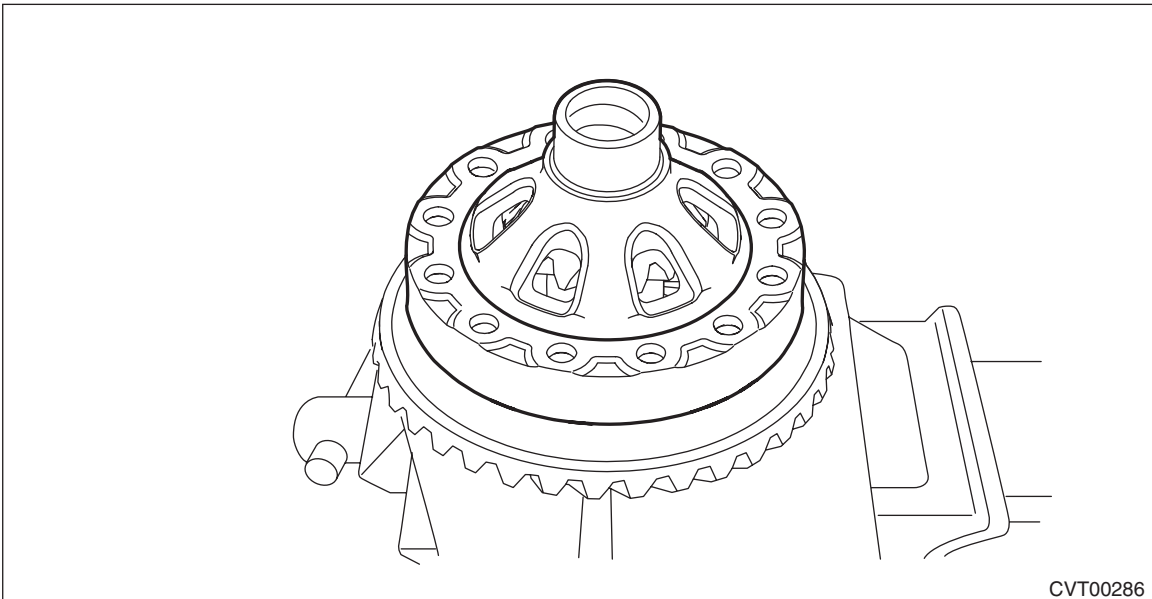
Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 2) Remove the hypoid driven gear mounting bolt using the ST.
ST 18270KA020 SOCKET (E20)



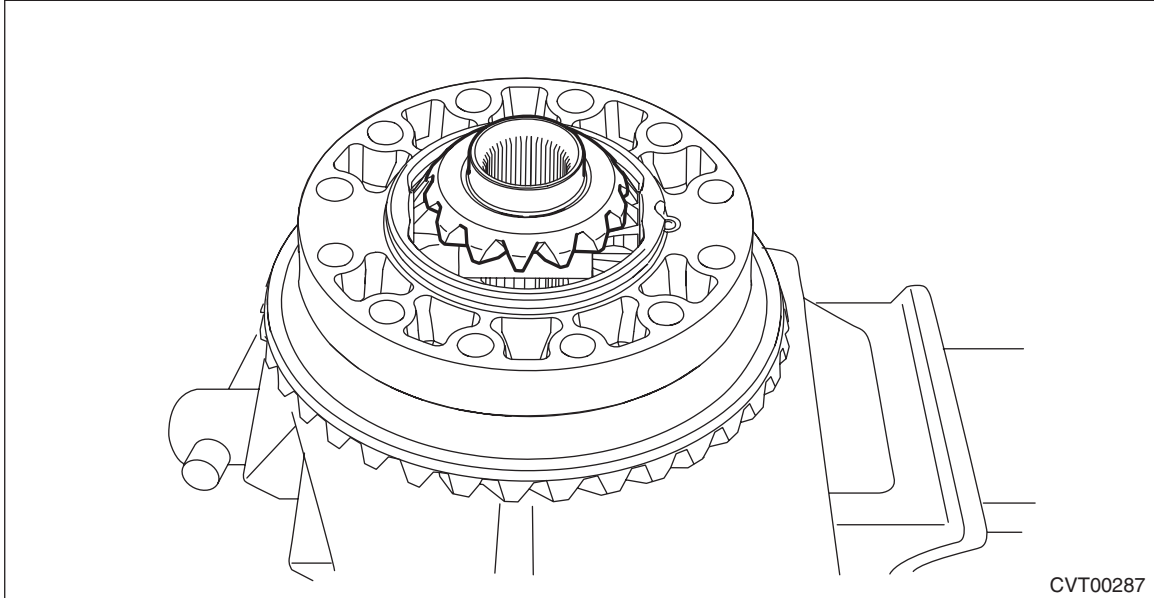
- 3) Remove the differential case (LH).



Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 4) Remove the differential bevel gear and washer from differential case.



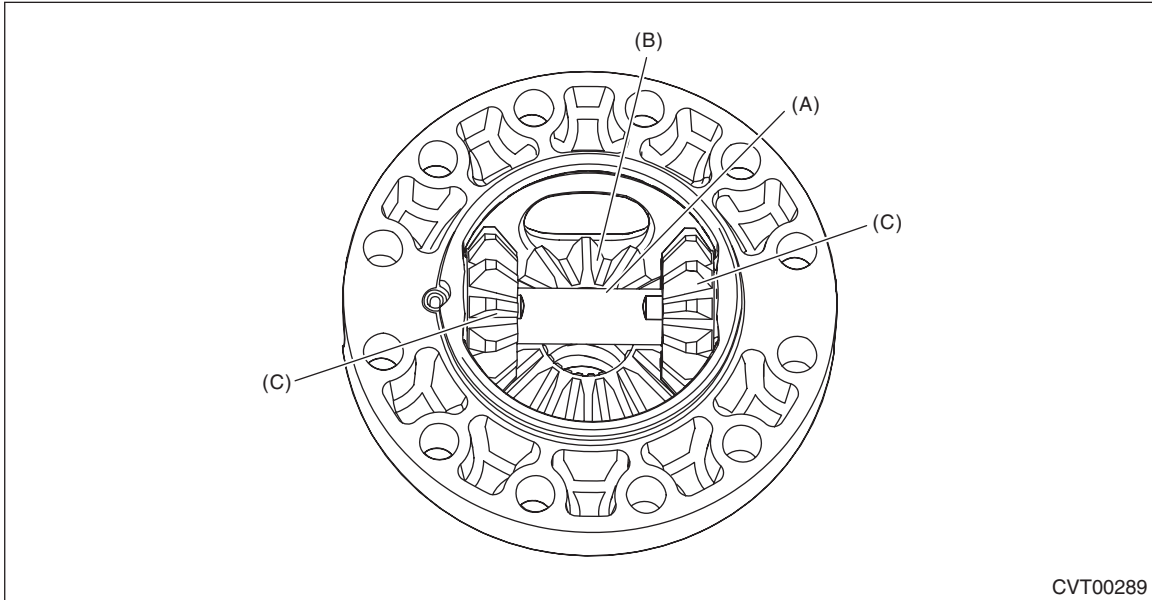
- 5) Remove the straight pin.



Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

6) Remove the pinion shaft, then remove the differential bevel gear, washer and differential bevel pinion.



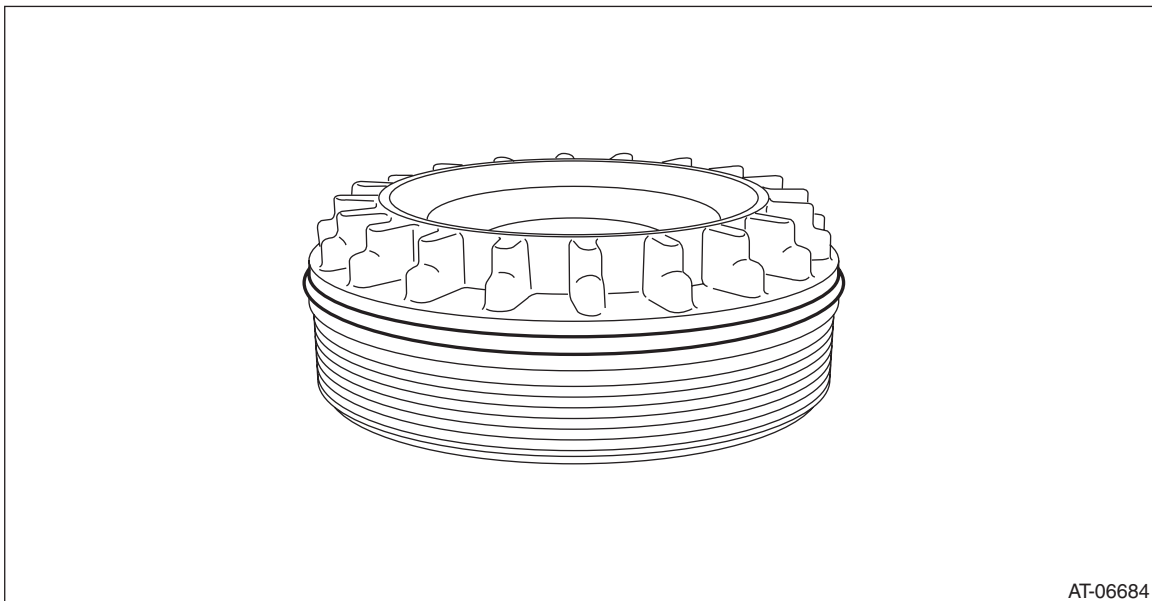
- (A) Pinion shaft
- (B) Differential bevel gear
- (C) Differential bevel pinion

2. SIDE RETAINER

NOTE:

After adjusting the drive pinion backlash and tooth contact, replace the oil seal and O-ring with new parts.

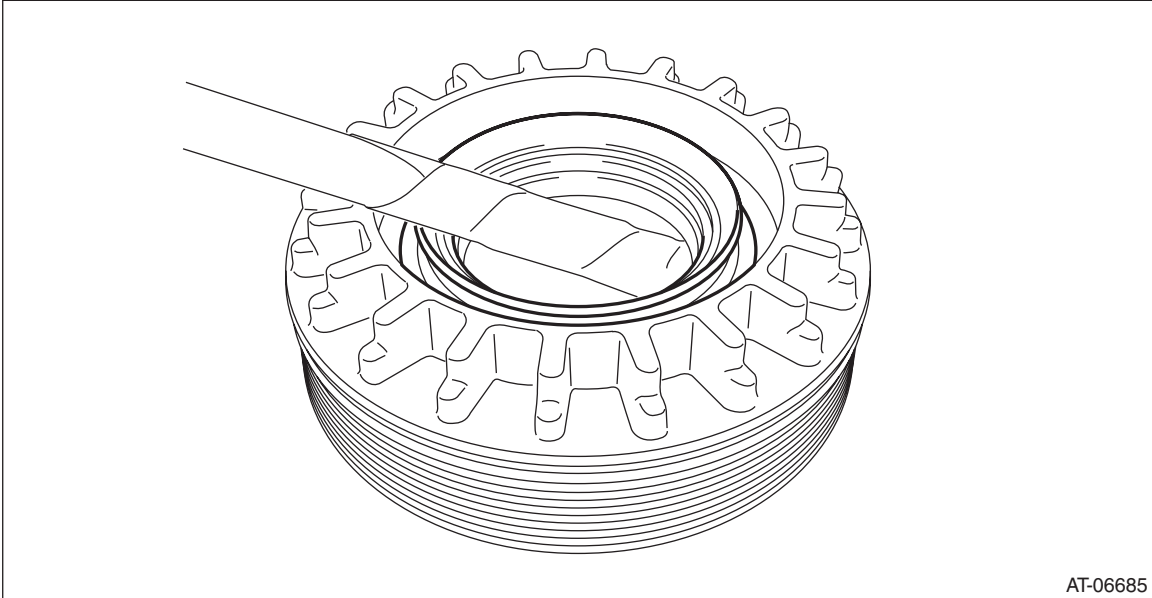
1) Remove the O-ring.



Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

2) Remove the oil seal.



AT-06685

D: ASSEMBLY

1. DIFFERENTIAL CASE ASSEMBLY

1) Install the washer and differential bevel gear into the differential case (RH).

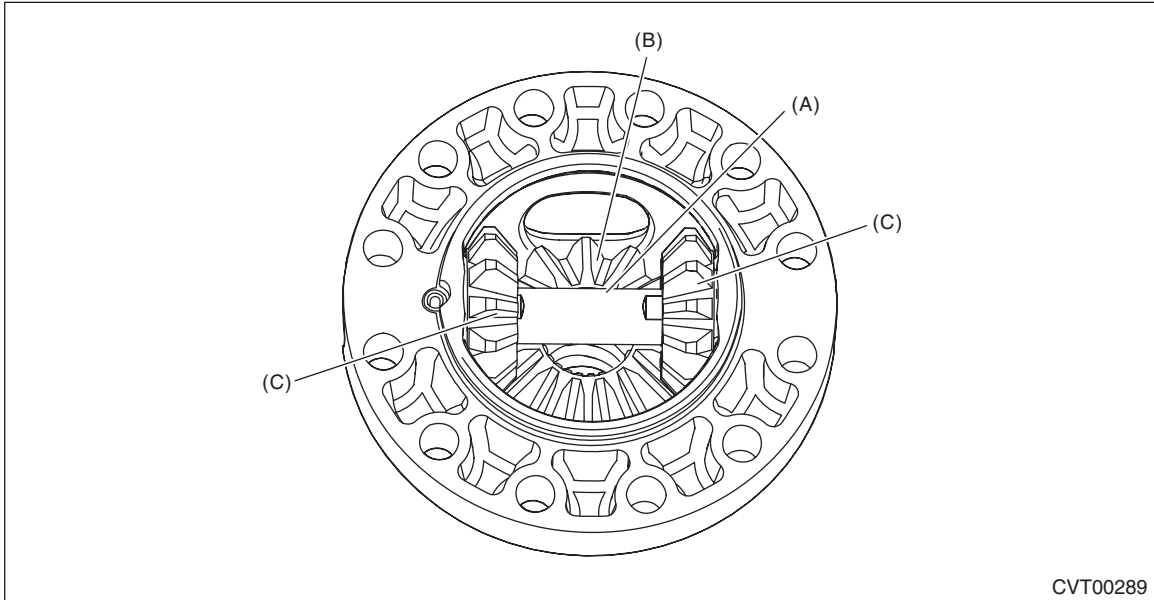


CVT00290

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

2) Install the differential bevel pinions into differential case (RH) and install the pinion shaft.



- (A) Pinion shaft
- (B) Differential bevel gear
- (C) Differential bevel pinion

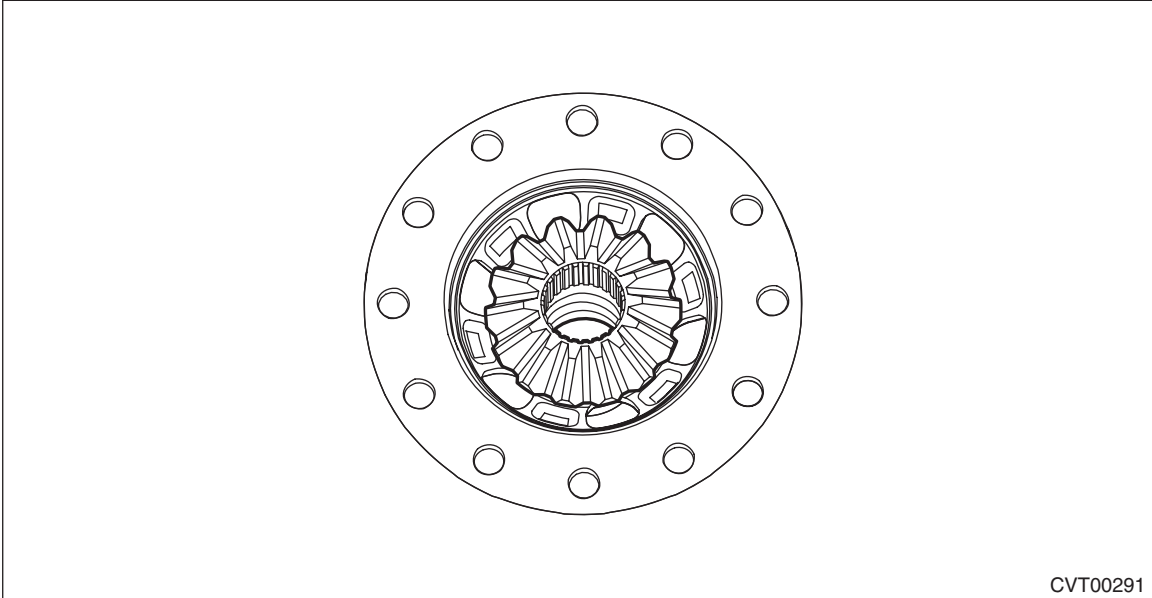
3) Install the straight pin.



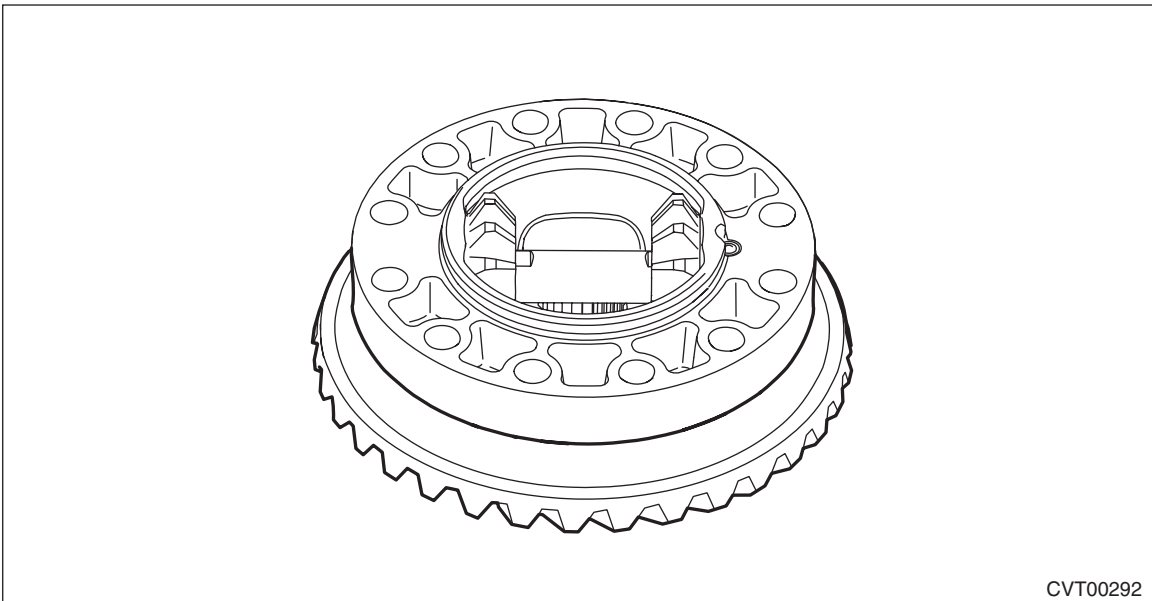
Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 4) Install the washer and differential bevel gear to the differential case (LH).



- 5) Install the differential case (RH) to the hypoid driven gear.



- 6) Install the differential case (LH) to the differential case (RH).

Front Differential Assembly

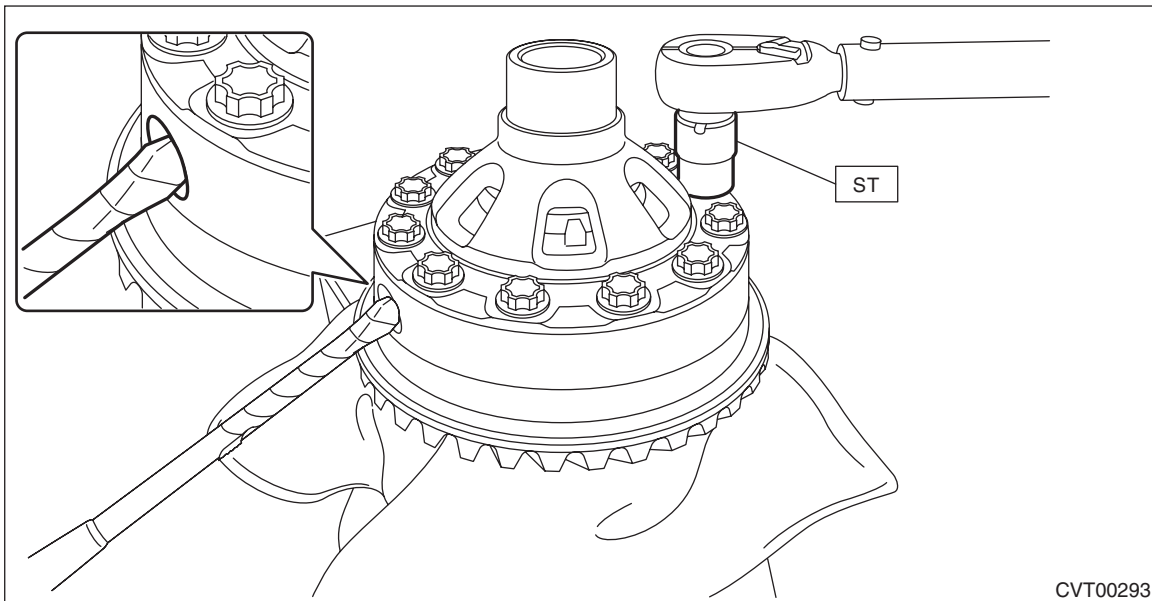
CONTINUOUSLY VARIABLE TRANSMISSION

7) Using the ST, install the hypoid driven gear by tightening the installation bolt.

ST 18270KA020 SOCKET (E20)

Tightening torque:

64 N·m (6.5 kgf-m, 47.2 ft-lb)



CVT00293

8) Measure the backlash, and select the washer.

(1) Install the SUBARU genuine axle shaft to differential case.

Part No. 38415AA070 Axle shaft

(2) Using ST1 and ST2, insert the ST2 through the window of differential case. Measure the backlash of the gear.

NOTE:

- Measure the backlash by applying a differential bevel pinion tooth between two differential bevel gear teeth.
- When measuring, fix the differential bevel pinion gear in place with a screwdriver covered with cloth, or a similar tool.

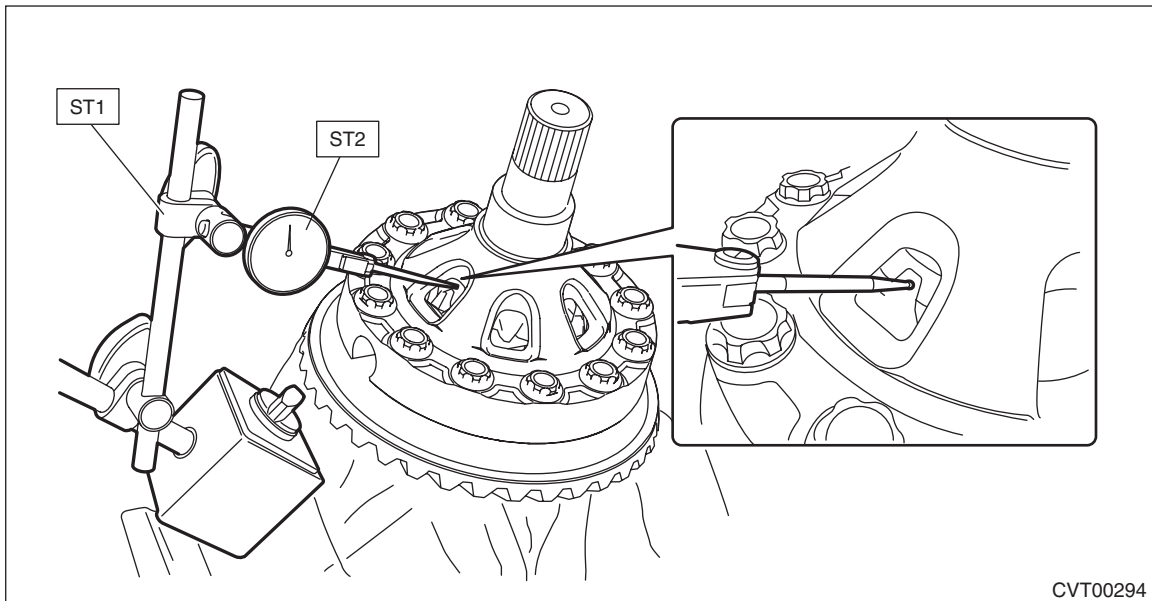
Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

ST1 498247001 MAGNET BASE
ST2 498247100 DIAL GAUGE

Specification:

0.13 — 0.18 mm (0.0051 — 0.0071 in)

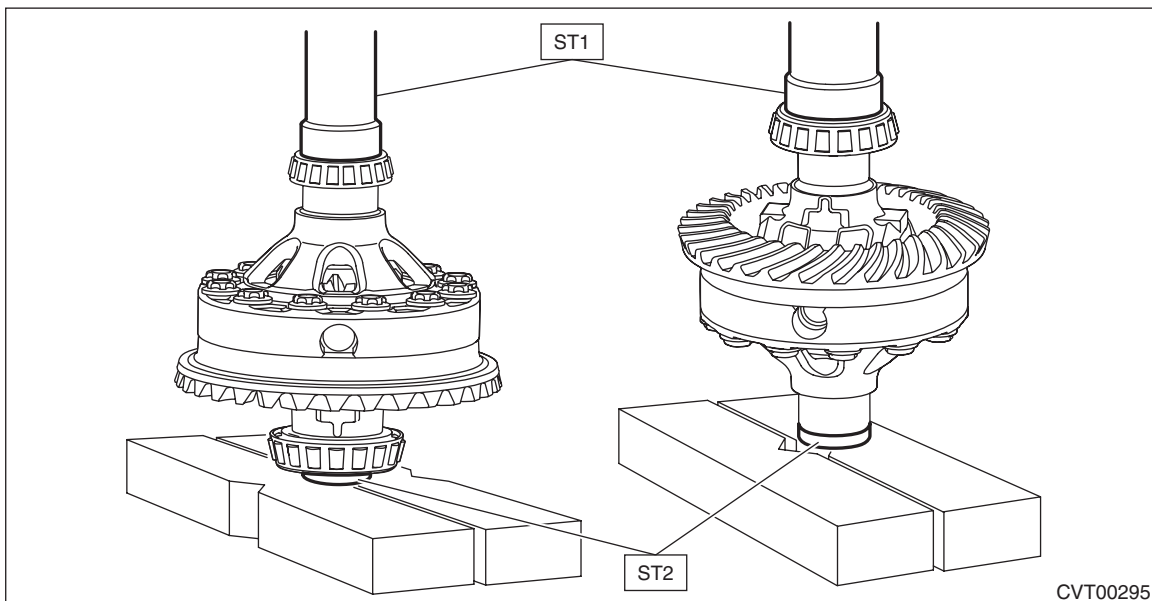


(3) If the backlash is not within specification, select a washer from the table below and replace.

Washer	
Part No.	Thickness mm (in)
803038021	0.95 (0.037)
803038022	1.00 (0.039)
803038023	1.05 (0.041)

9) Using the ST, install the left and right taper roller bearings.

ST1 499277100 BUSHING 1-2 INSTALLER
ST2 398497701 SEAT



Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

2. SIDE RETAINER

NOTE:

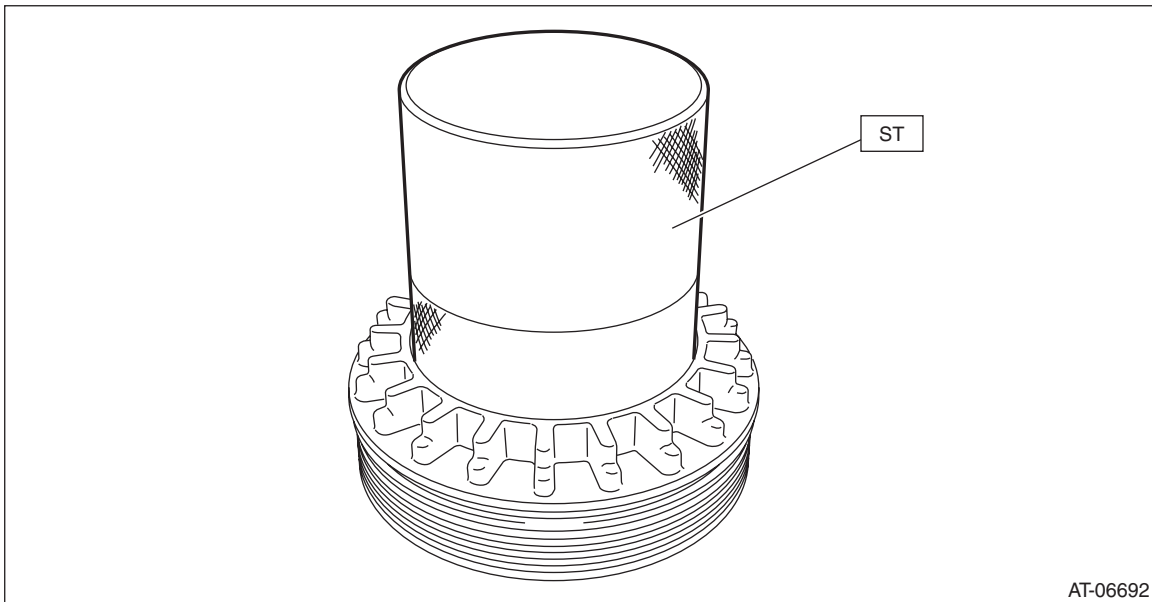
After adjusting the backlash and tooth contact, replace the oil seal and O-ring of side retainer with new parts.

1) Using the ST, install the oil seal.

NOTE:

- Use a new oil seal.
- Apply differential gear oil to the oil seal lip and press-fitting surface.
- Oil seal has an identification mark (R, L). When installing oil seals, do not confuse the left and right.

ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER

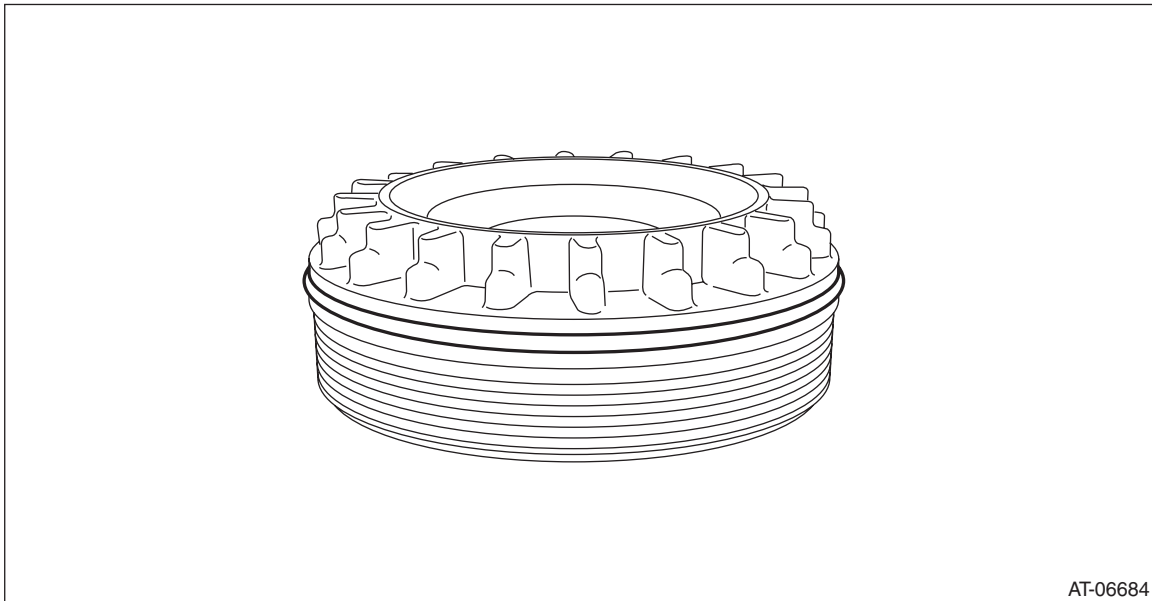


AT-06692

2) Install the O-ring.

NOTE:

- Use new O-rings.
- Apply the differential gear oil to O-ring.



AT-06684

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

E: INSPECTION

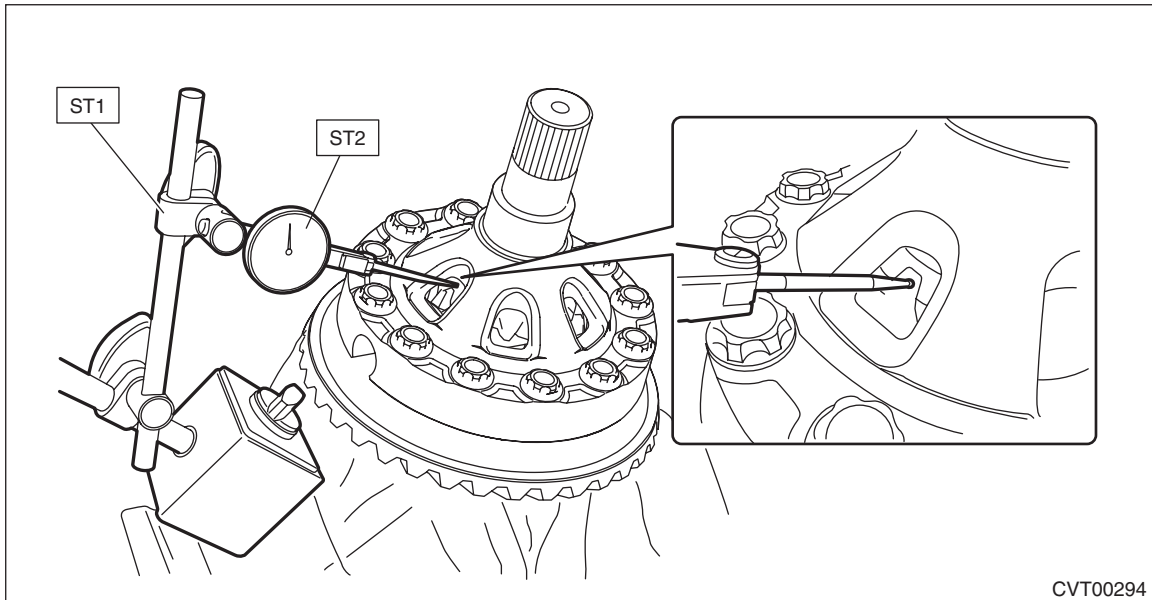
- Check each component for scratches, damage or other faults.
- Using the ST, check the backlash of pinion gear.

ST1 498247001 MAGNET BASE

ST2 498247100 DIAL GAUGE

Specification:

0.13 — 0.18 mm (0.0051 — 0.0071 in)



CVT00294

- Measure the hypoid gear backlash, and then adjust it to be within specification. <Ref. to CVT(TH58A)-368, ADJUSTMENT, Front Differential Assembly.>

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

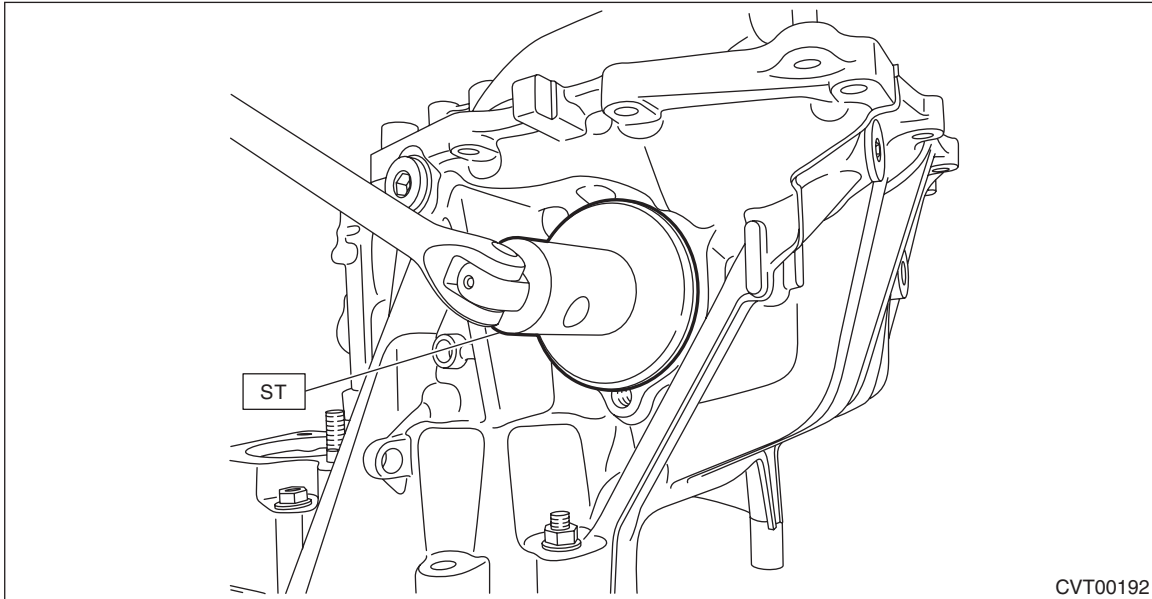
F: ADJUSTMENT

1) Using the ST, screw-in the retainer until resistance is felt.

NOTE:

RH side should be screwed-in more than LH side.

ST 18658AA020 WRENCH COMPL RETAINER



2) Remove the remaining liquid gasket from the mating surface completely.

3) Using the ST, install the drive pinion assembly to converter case.

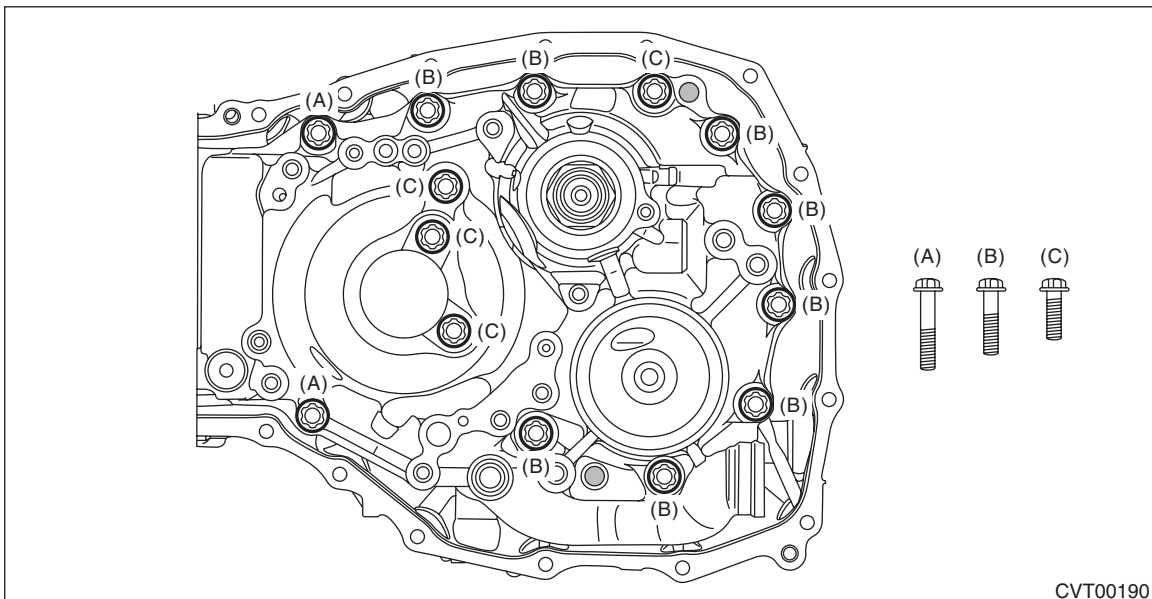
ST 18270KA020 SOCKET (E20)

NOTE:

Do not confuse the three different-length bolts when installing.

Tightening torque:

43 N·m (4.4 kgf·m, 31.7 ft·lb)



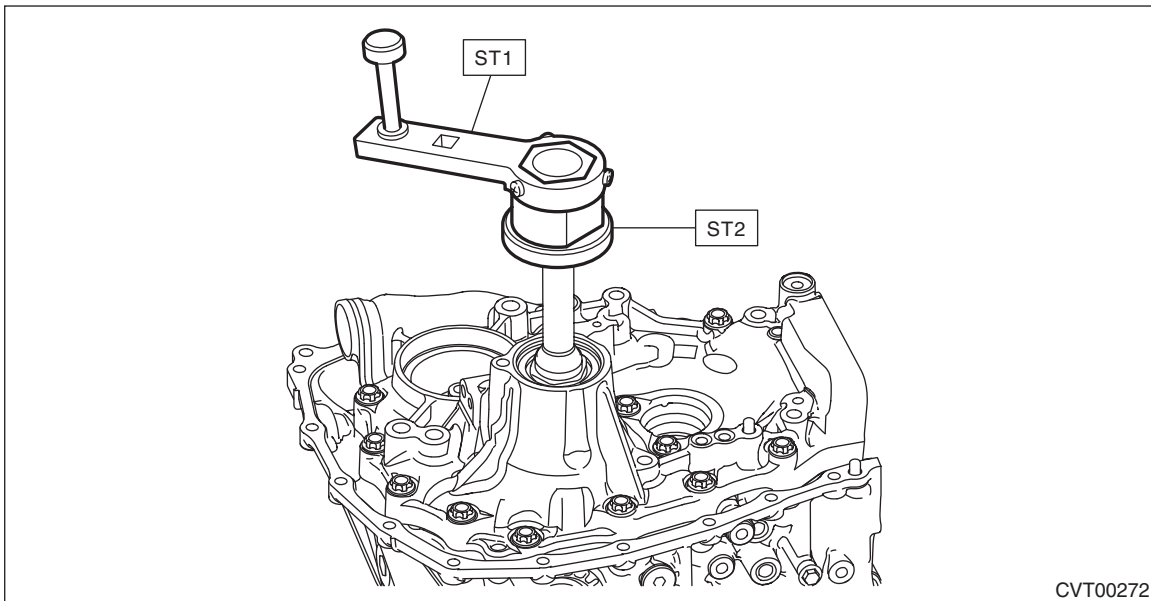
Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

4) Rotate the drive pinion shaft ten times or more using ST1 and ST2.

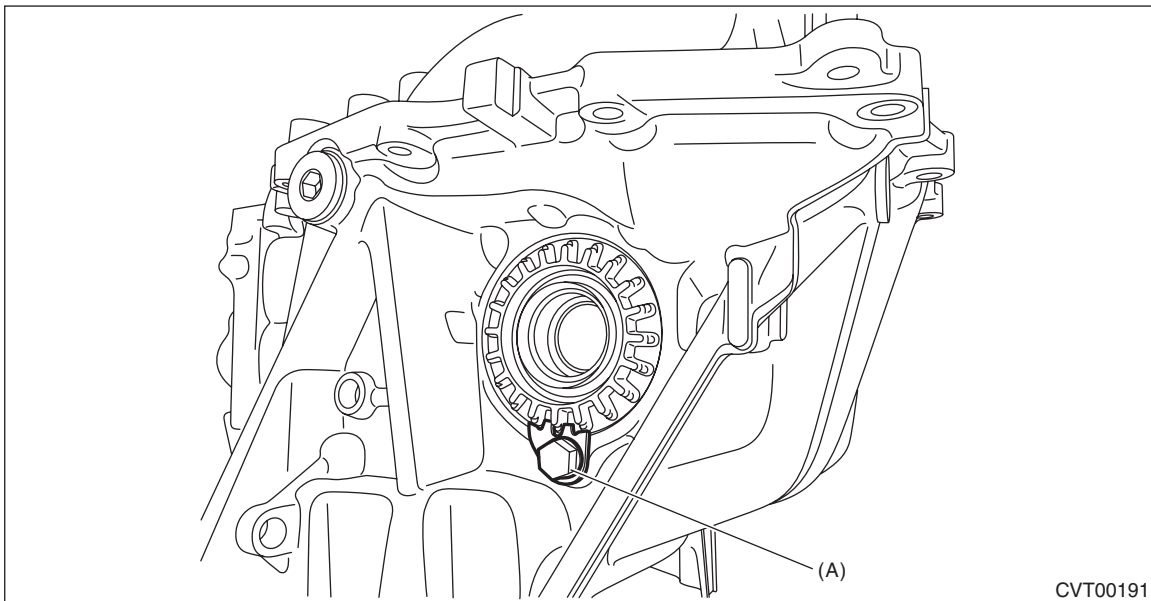
ST1 499787700 WRENCH

ST2 498937110 HOLDER



5) While rotating the pinion shaft, tighten the retainer LH and loosen the retainer RH until the shaft can't be turned anymore. The backlash is "zero" when the pinion shaft comes to the point where it doesn't rotate.

6) After the "zero" state is established, loosen the retainer LH by 3 notches and secure it with the lock plate. Retighten the retainer RH until it stops. Rotate the drive pinion 2 or 3 times. Tighten the retainer RH further 1-3/4 notches. This sets the preload. Finally, secure the retainer with its lock plate.



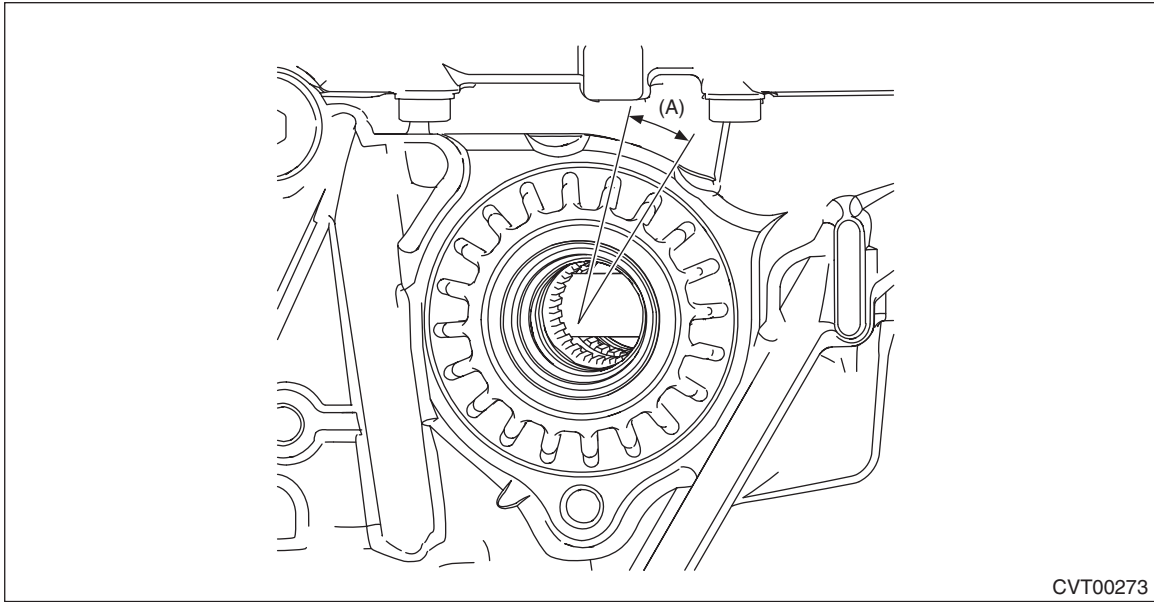
(A) Lock plate

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Turning the retainer by every one tooth changes the backlash approx. 0.05 mm (0.0020 in).



CVT00273

(A) 1 tooth

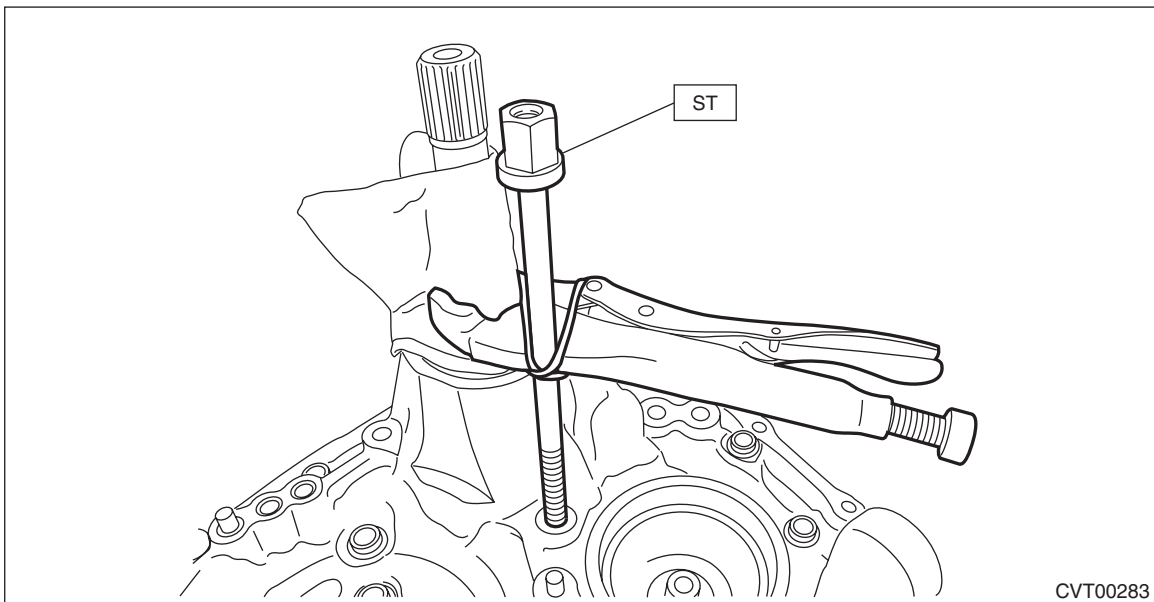
7) Insert the two SUBARU genuine axle shafts into differential case.

Part No. 38415AA070 Axle shaft

8) Install the ST to the drive pinion retainer, and wrap the drive pinion shaft with cloth and pinch with vise pliers. Using a tie-wrap or a wire, fix the vise pliers to the ST.

Make sure the drive pinion shaft does not move.

ST 18763AA000 COMPRESSOR SHAFT



CVT00283

Front Differential Assembly

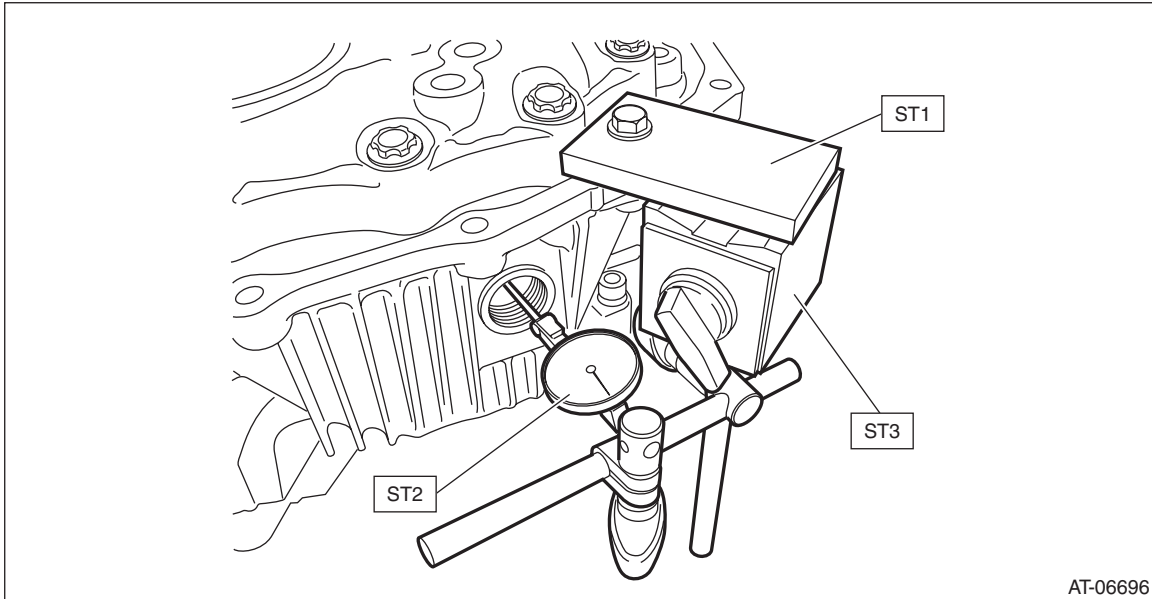
CONTINUOUSLY VARIABLE TRANSMISSION

9) Check the backlash is within specification using ST1, ST2 and ST3.

ST1 498255400 PLATE
ST2 498247100 DIAL GAUGE
ST3 498247001 MAGNET BASE

Backlash:

0.13 — 0.18 mm (0.005 — 0.007 in)



10) Adjust the teeth contact of the front differential and drive shaft. <Ref. to CVT(TH58A)-345, ADJUSTMENT, Drive Pinion Shaft Assembly.>