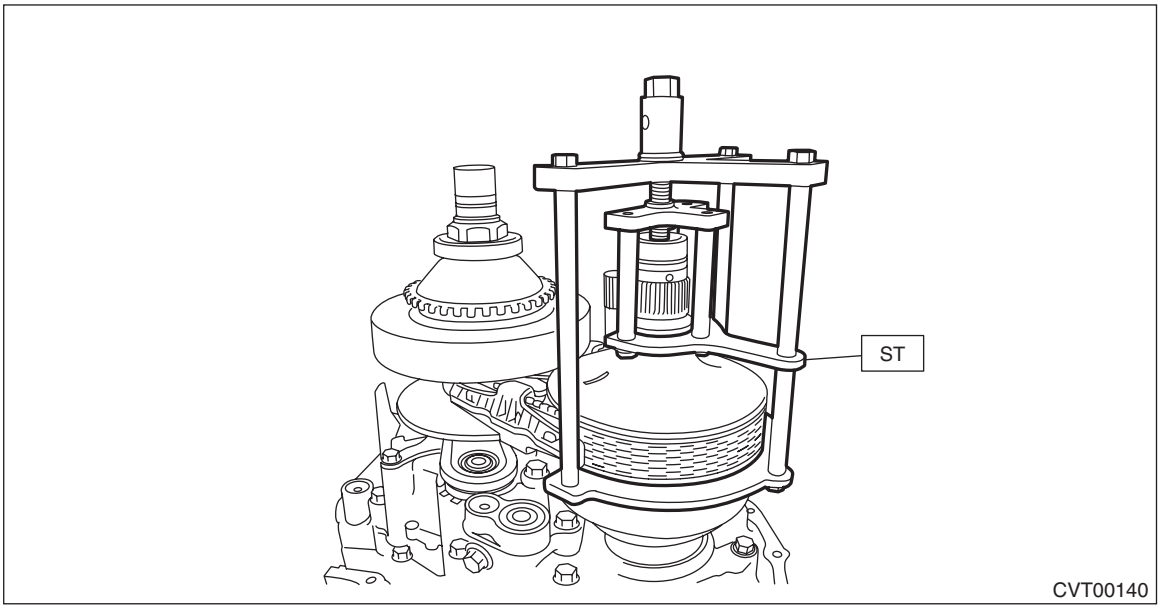
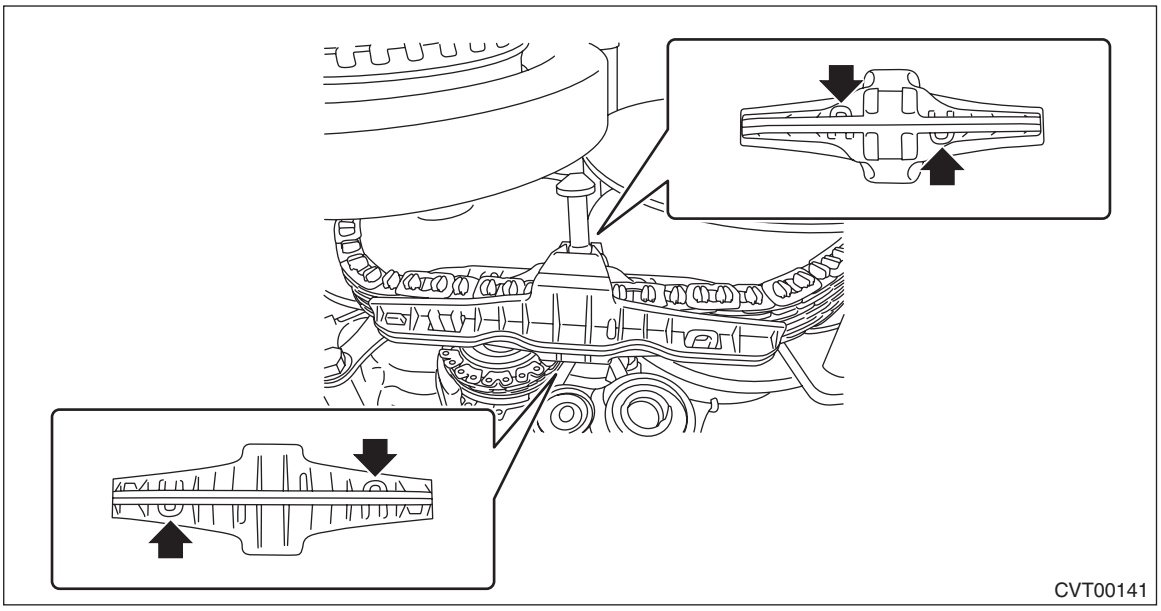
43.Primary Pulley and Secondary Pulley

A: REMOVAL

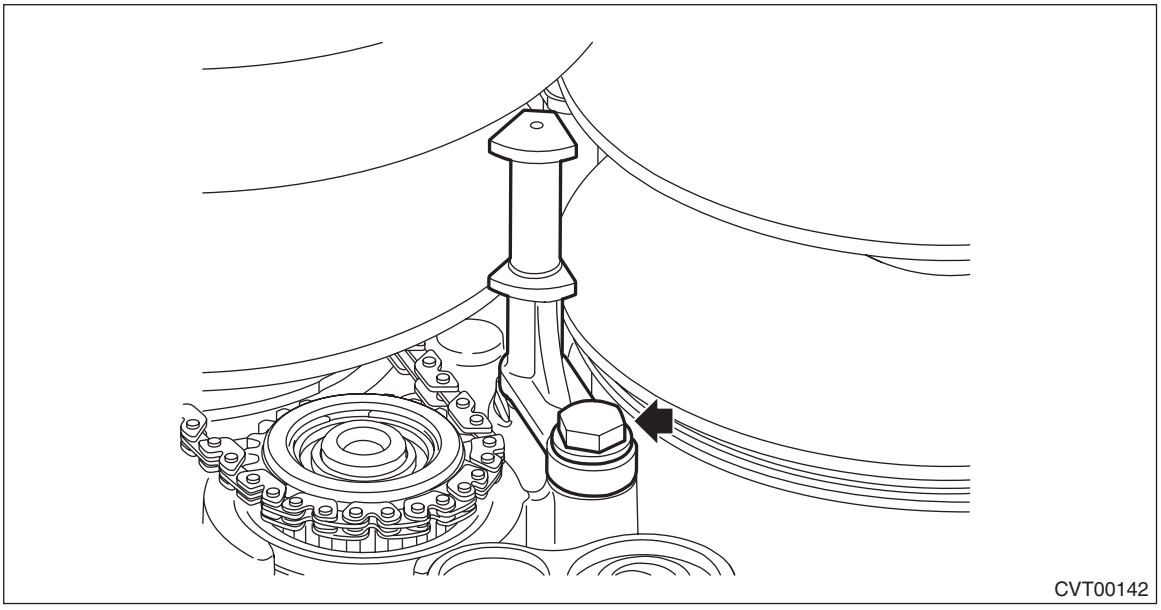
NOTE:
Always replace primary pulley and secondary pulley as an assembly because they are non-disassembled parts.
1) Remove the transmission assembly from the vehicle. <Ref. to CVT(TH58A)-63, REMOVAL, Automatic Transmission Assembly.>
2) Remove the air breather hose. <Ref. to CVT(TH58A)-171, REMOVAL, 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) Set the ST to secondary pulley, expand the V groove of pulley, and then completely loosen the variator chain.
ST 18769AA010 EXPANDER PULLEY



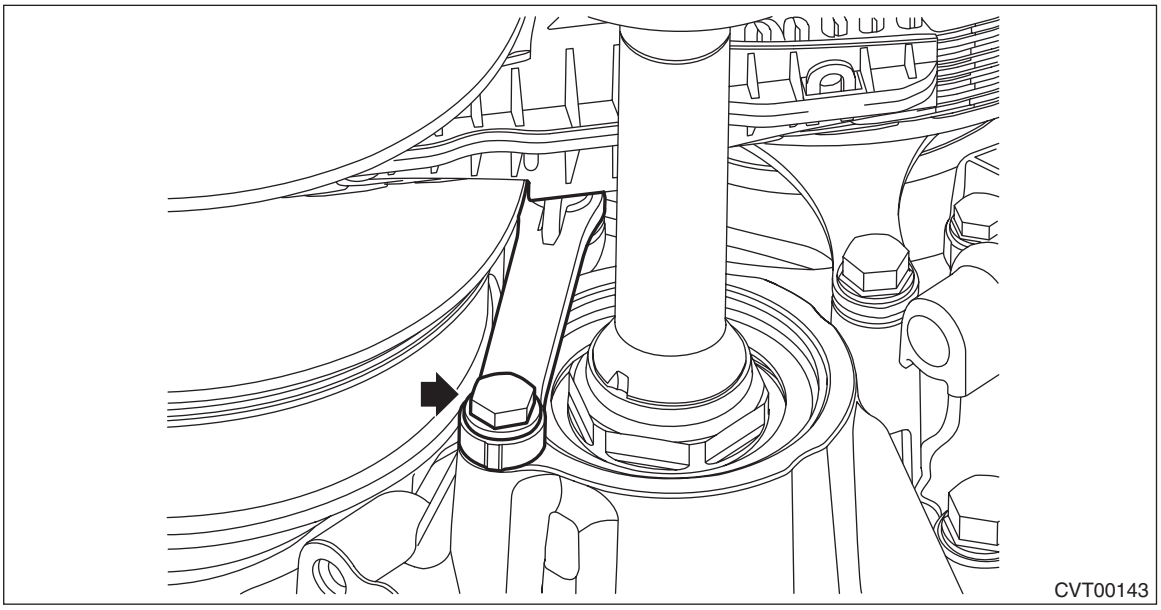
21) Remove the chain guide.
(1) Remove the chain guide from lubrication pipe.
(2) Detach the four claws to remove the chain guide.


CVT00141

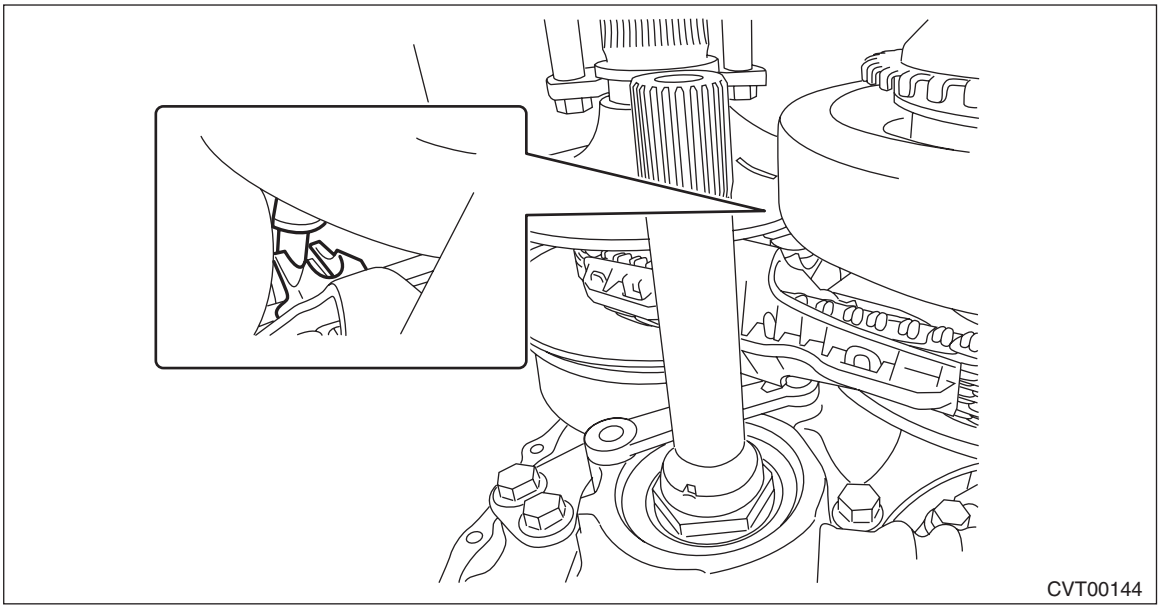
(3) Remove the lubrication pipe.


CVT00142

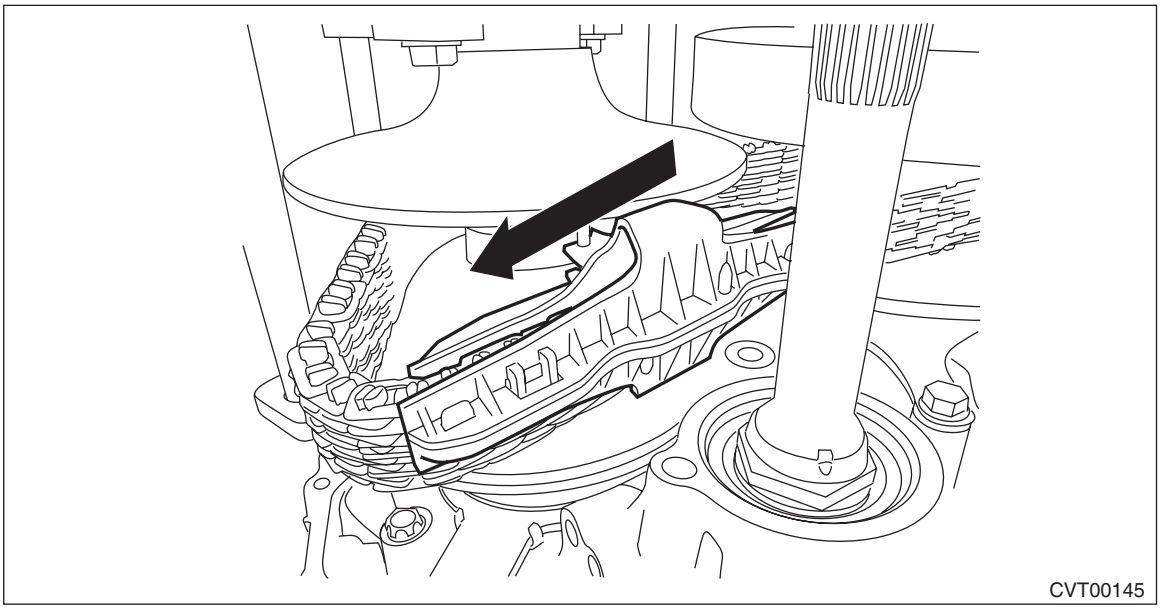
(4) Remove the support rod mounting bolts.



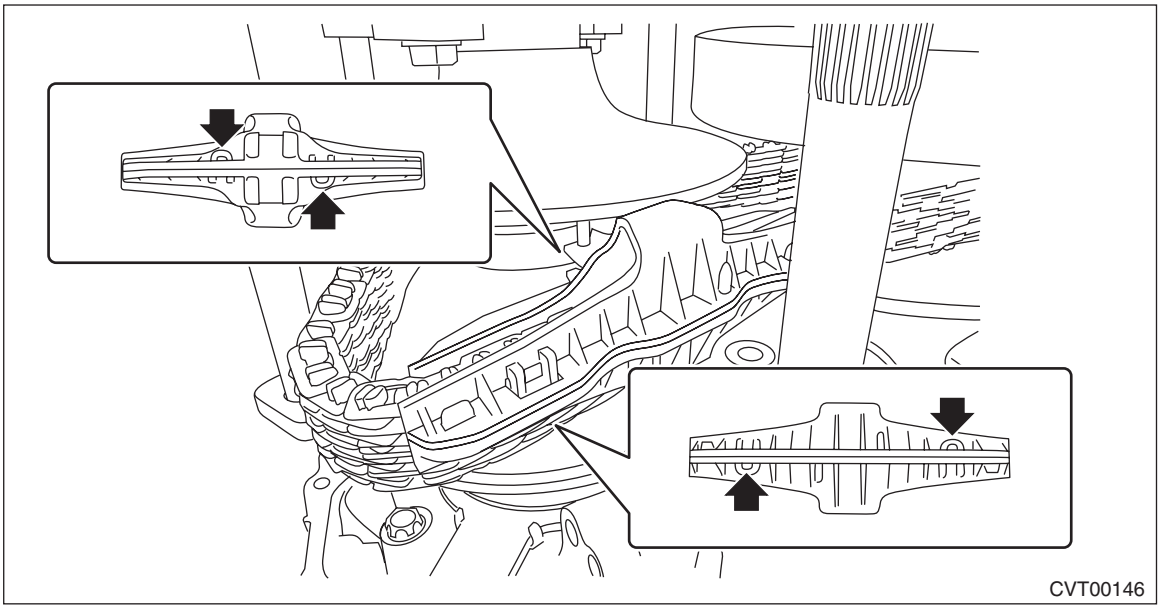
(5) Raise the support rod to remove the chain guide.



(6) Move the chain guide to the secondary pulley side.

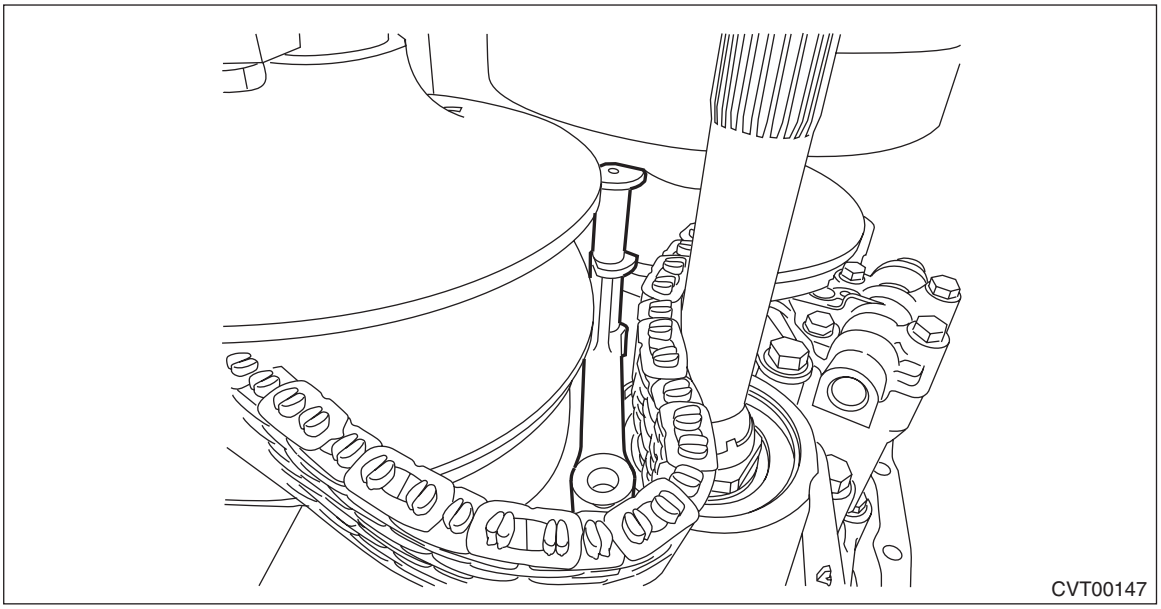


(7) Detach the four claws to remove the chain guide.

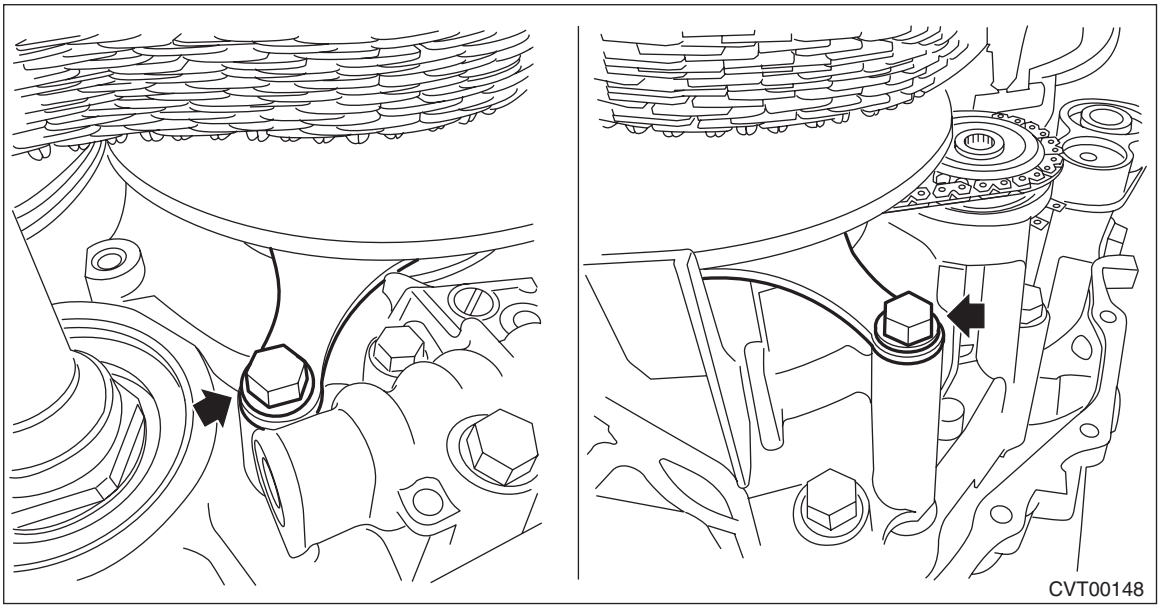


(8) Remove the support rod.

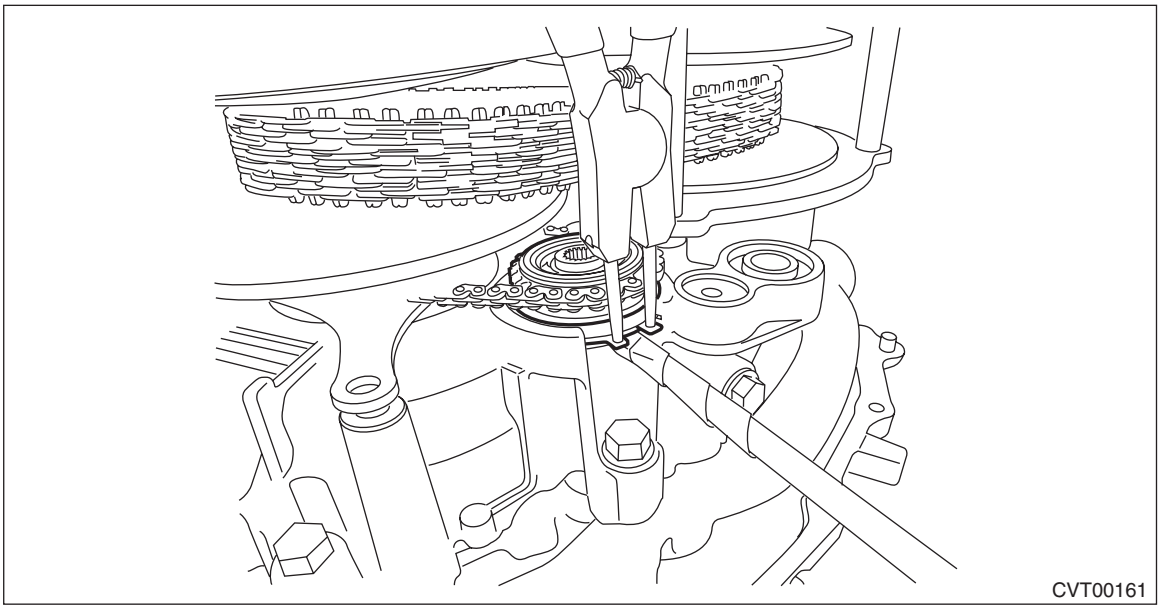
CAUTION:
Protect the both pulleys and variator chain from scratching.



22) Remove the primary pulley mounting bolt.



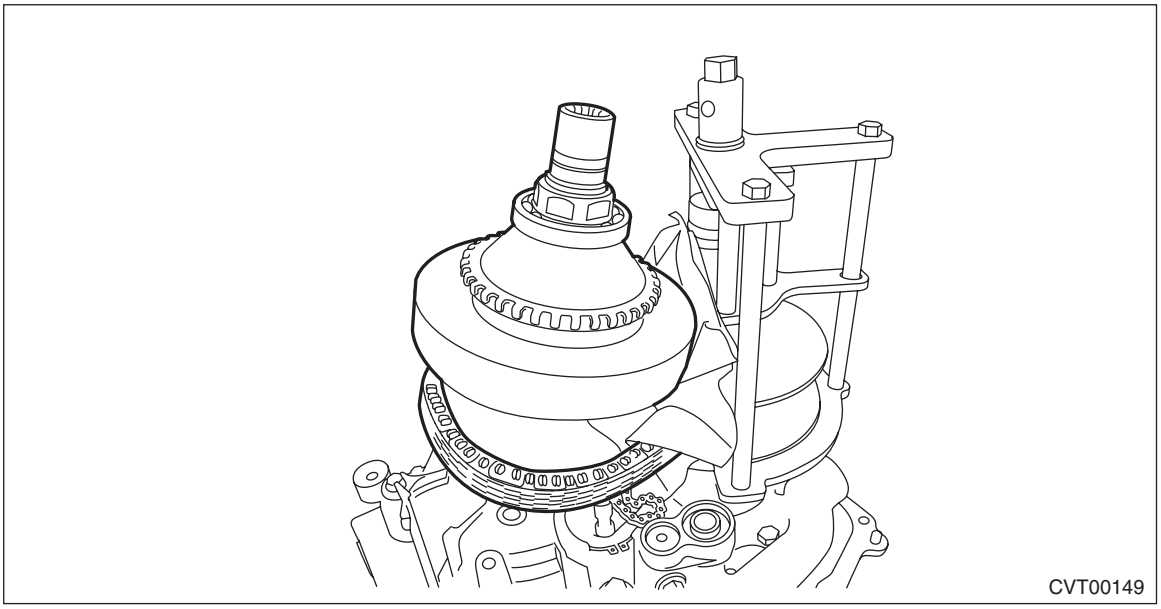
23) Spread the snap ring, and remove the snap ring from the oil pump sprocket (rear).



24) Remove the primary pulley.

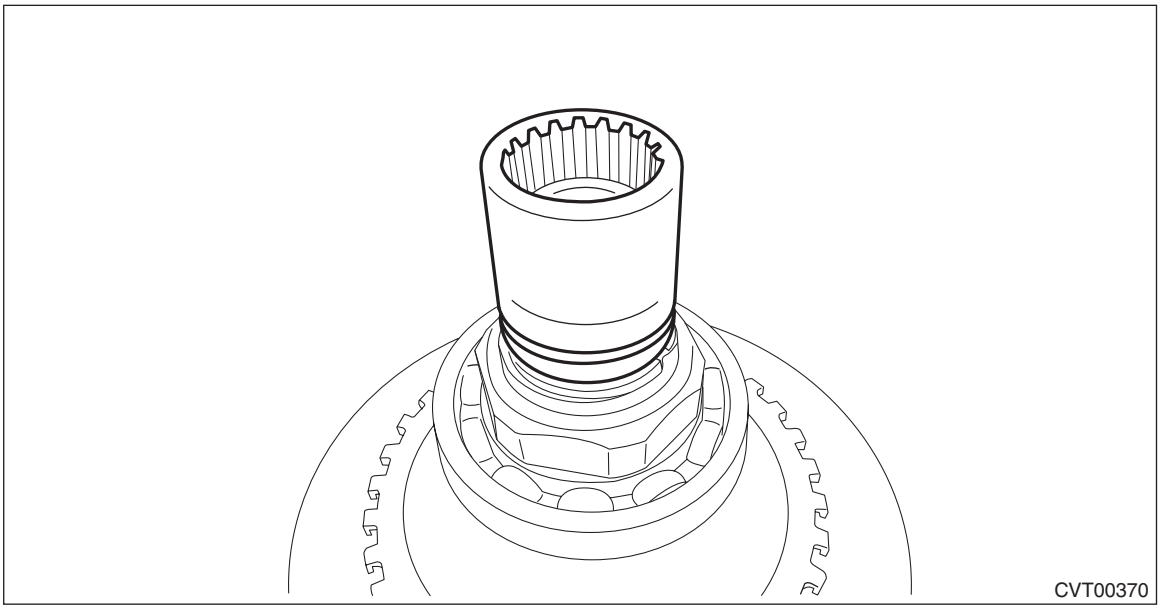
CAUTION:
Cover the V grooves of secondary pulley and primary pulley with cloth to protect the both pulleys and variator chain from scratching.

(1) Raise the primary pulley and the oil pump sprocket (rear) together, and remove the oil pump sprocket (rear).
(2) Remove the primary pulley from the reverse brake housing and intersect the V groove of secondary pulley and the V groove of primary pulley.
(3) Remove the variator chain from primary pulley, and remove the primary pulley.

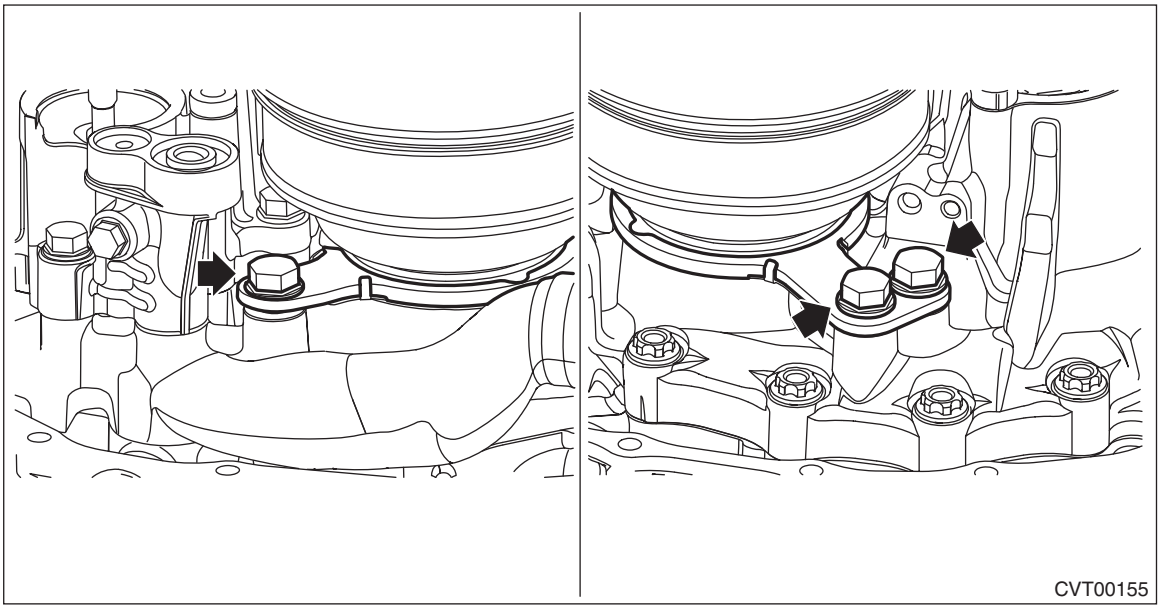


25) Remove the rear oil pump chain.

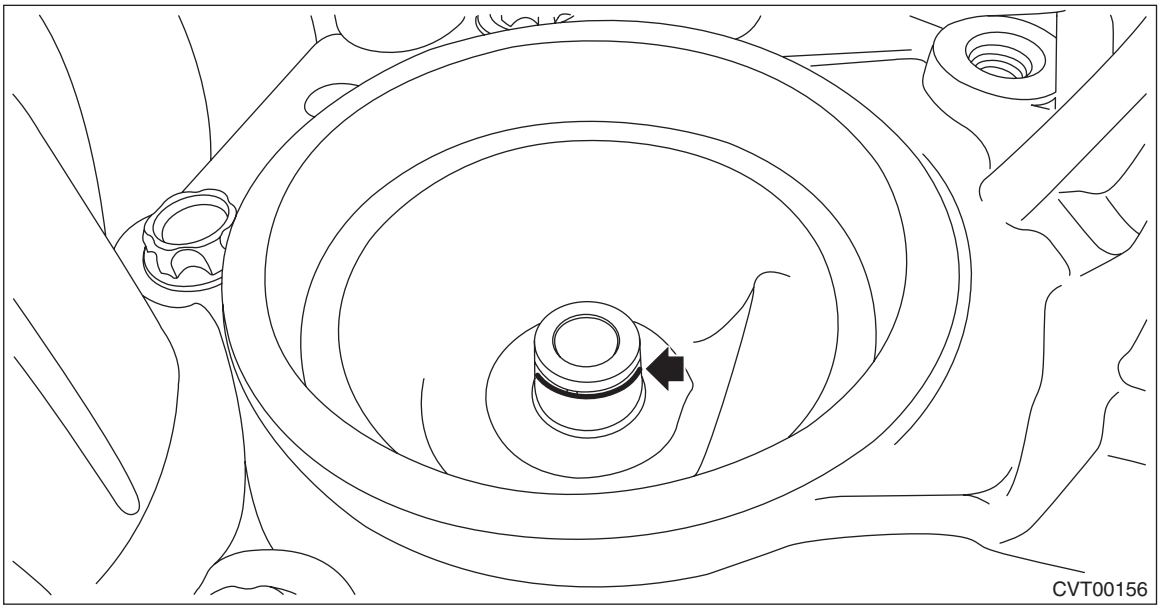
26) Remove the sleeve.



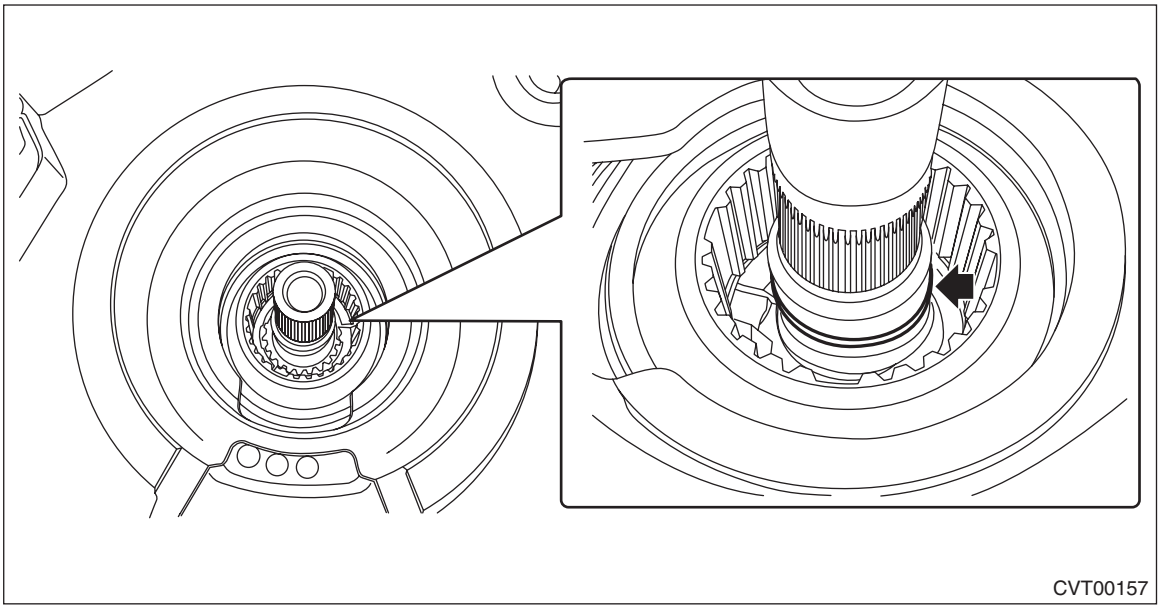
27) Remove the O-ring from the primary pulley assembly.
28) Remove the ST (EXPANDER PULLEY) from the secondary pulley.
29) Remove the variator chain from secondary pulley.
30) Remove the secondary pulley mounting bolts, and remove the secondary pulley.



31) Remove the seal ring from drive pinion retainer.



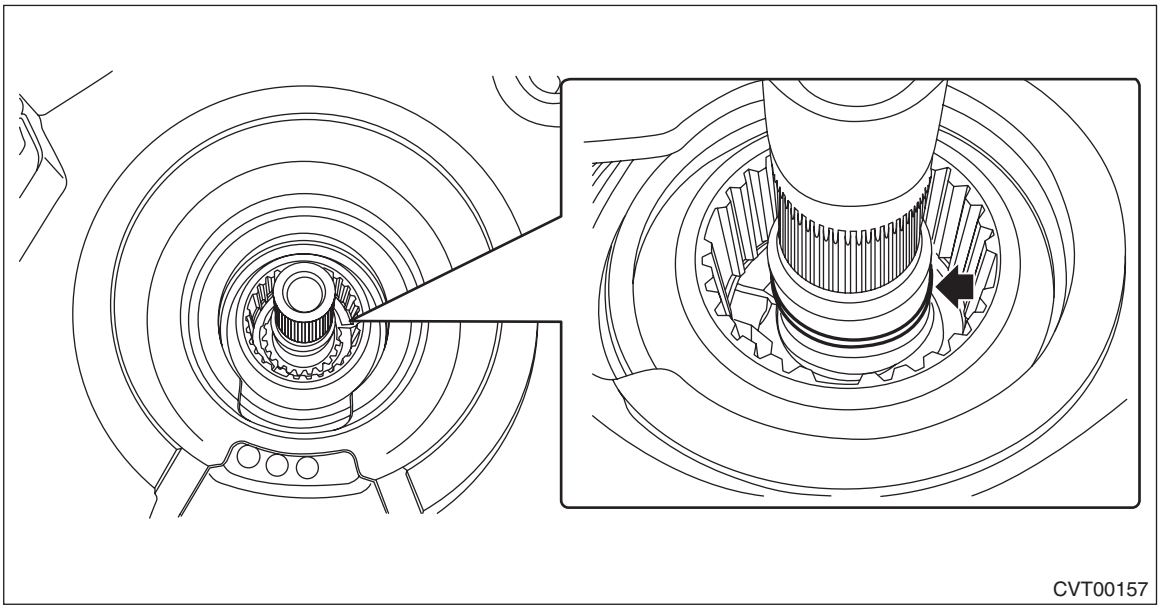
32) Remove the seal ring from the input shaft.



B: INSTALLATION

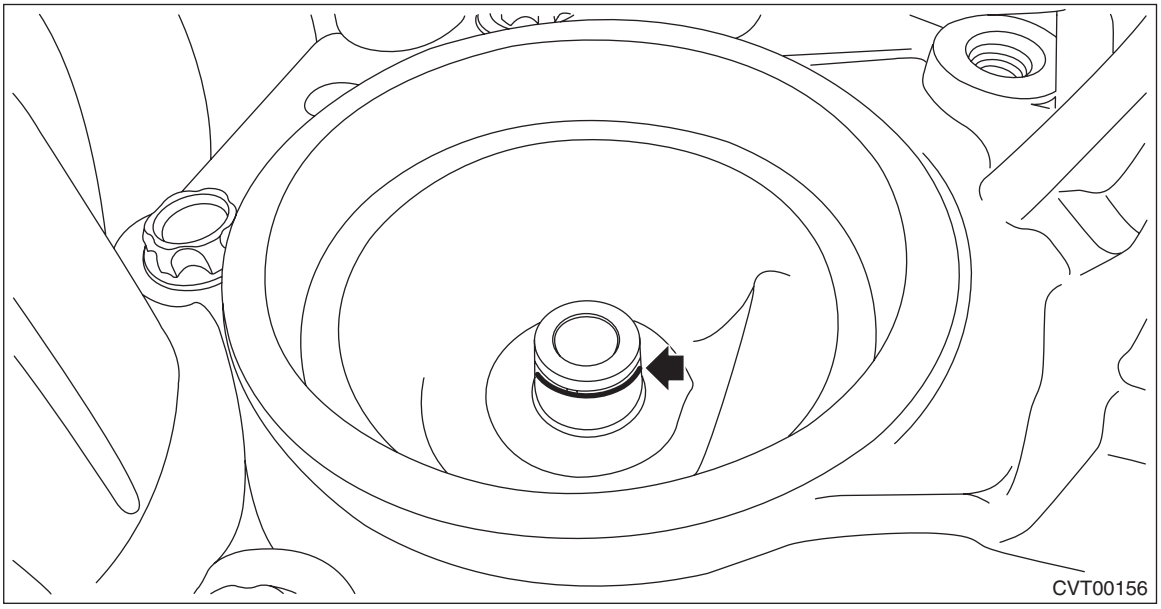
1) Select shims for pulley alignment. <Ref. to CVT(TH58A)-281, ADJUSTMENT, Primary Pulley and Secondary Pulley.>
2) When replacing the oil pump sprocket rear and the snap ring which secures the oil pump sprocket rear, select the oil pump shaft. <Ref. to CVT(TH58A)-387, ADJUSTMENT, Oil Pump.>
3) Install the seal ring to the input shaft.

NOTE:
- Use a new seal ring.
- When installing the seal ring, do not expand the seal ring too much.
- Apply CVTF to the seal rings.



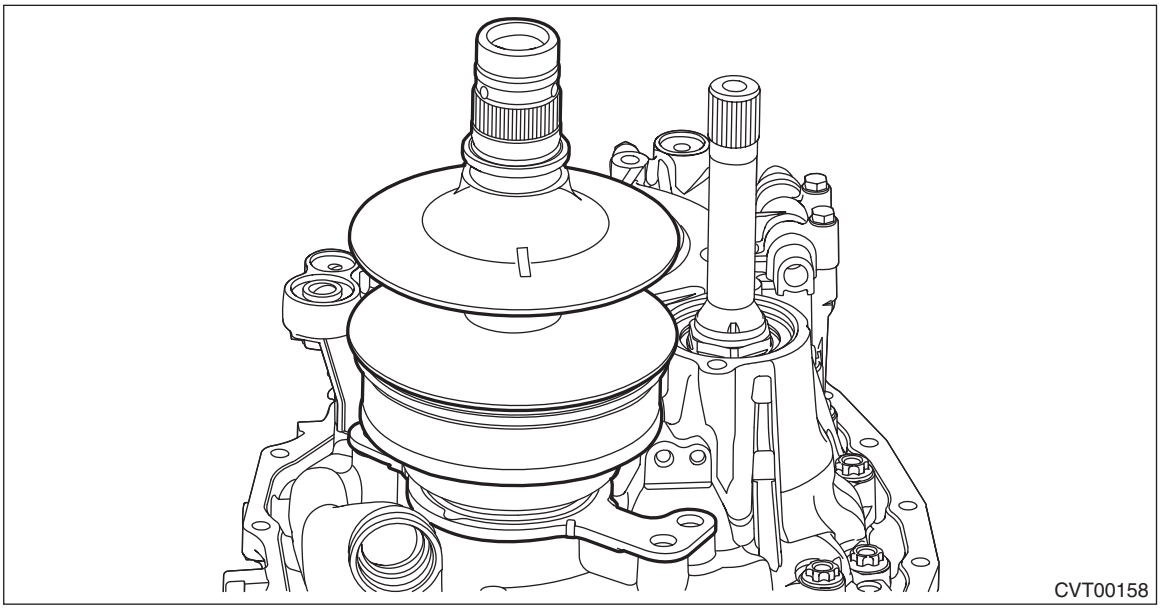
4) Install the seal ring to drive pinion retainer.

NOTE:
- Use a new seal ring.
- When installing the seal ring, do not expand the seal ring too much.
- Apply CVTF to the seal rings.



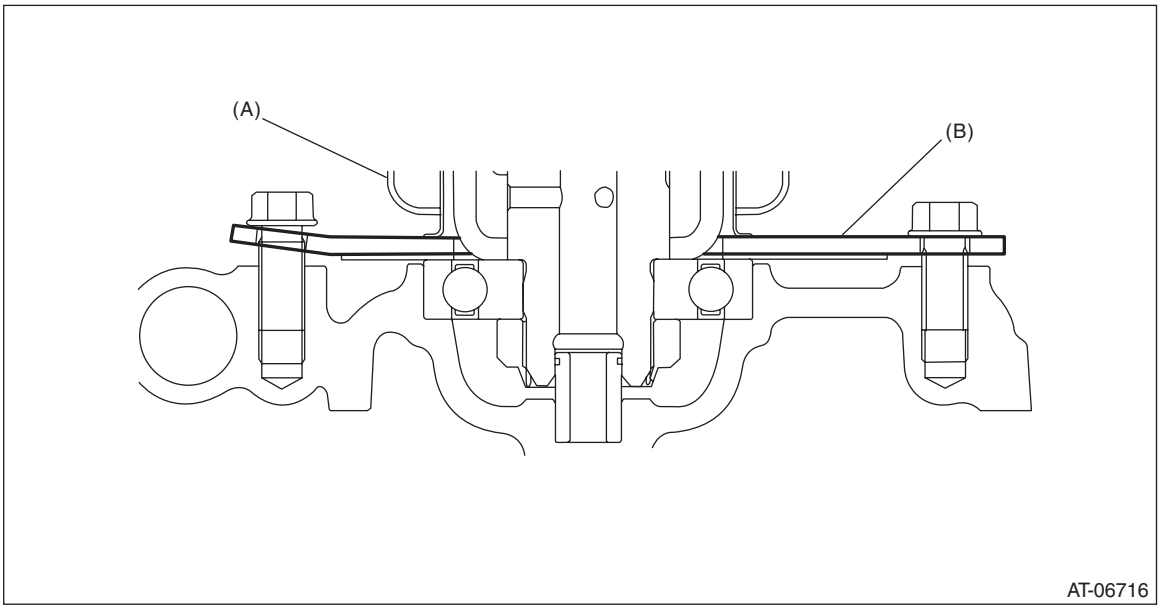
5) Install the selected shims to the primary pulley bearing catch surface.

6) Install the secondary pulley to the drive pinion retainer.



7) Install and tighten the secondary pulley securing bolts.
   (1) Tighten the three bolts until the seating surfaces contact the bearing retainer.

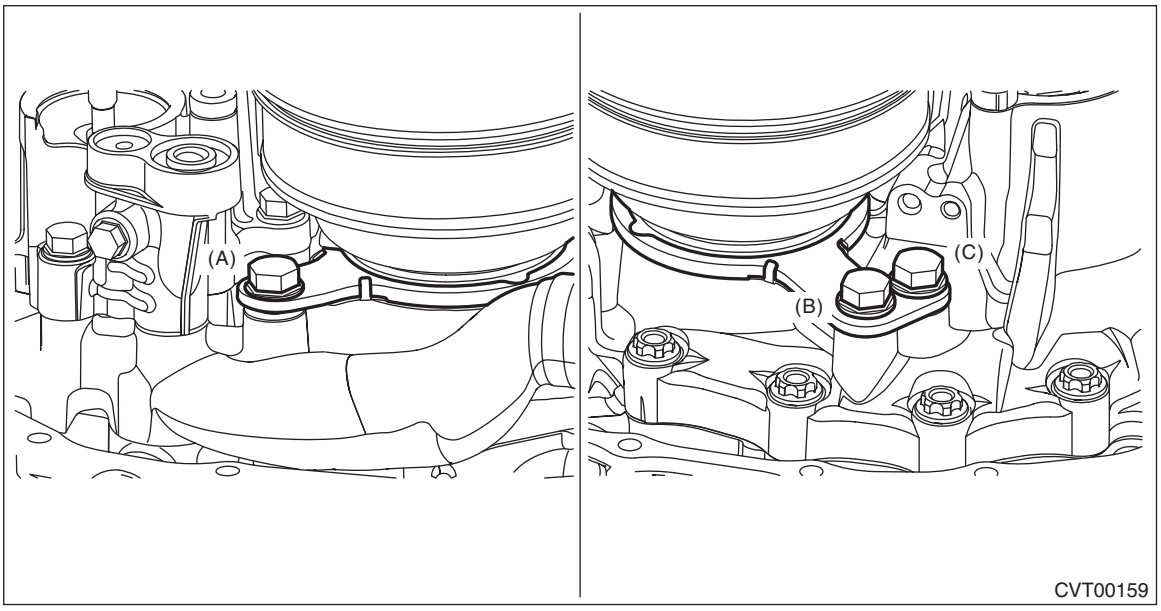
NOTE:
- Be careful not to tilt the bearing retainer of the secondary pulley.
- Apply CVTF to the bolt.



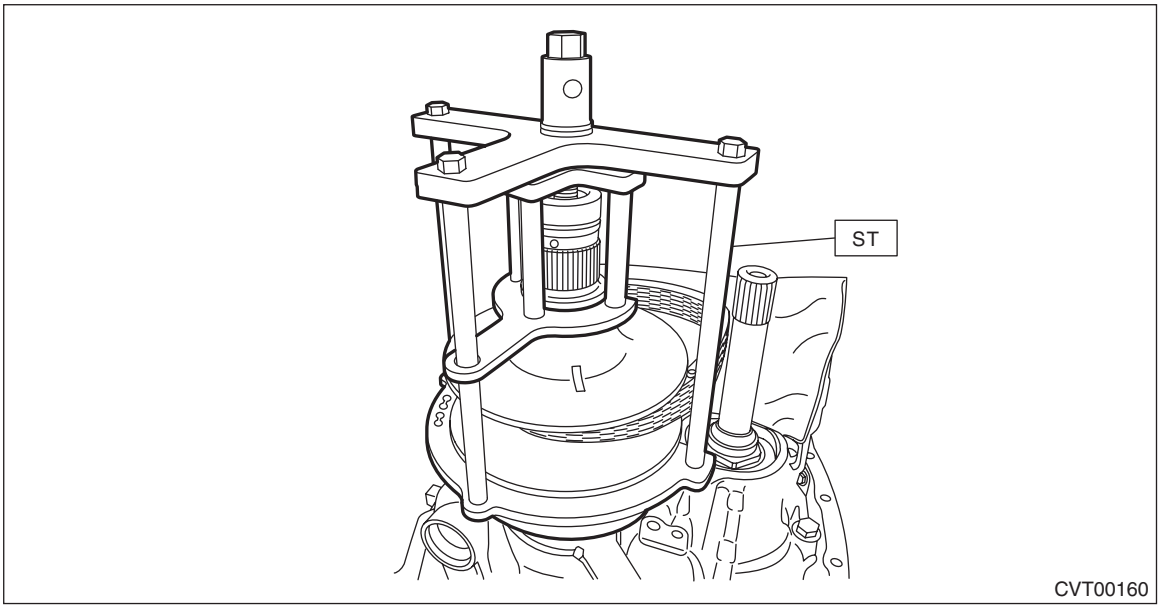
(A) Secondary pulley
(B) Bearing retainer

(2) Tighten the bolts in the order of (A) → (B) → (C) → (B).

Tightening torque:
67.5 N·m (6.9 kgf-m, 49.8 ft-lb)



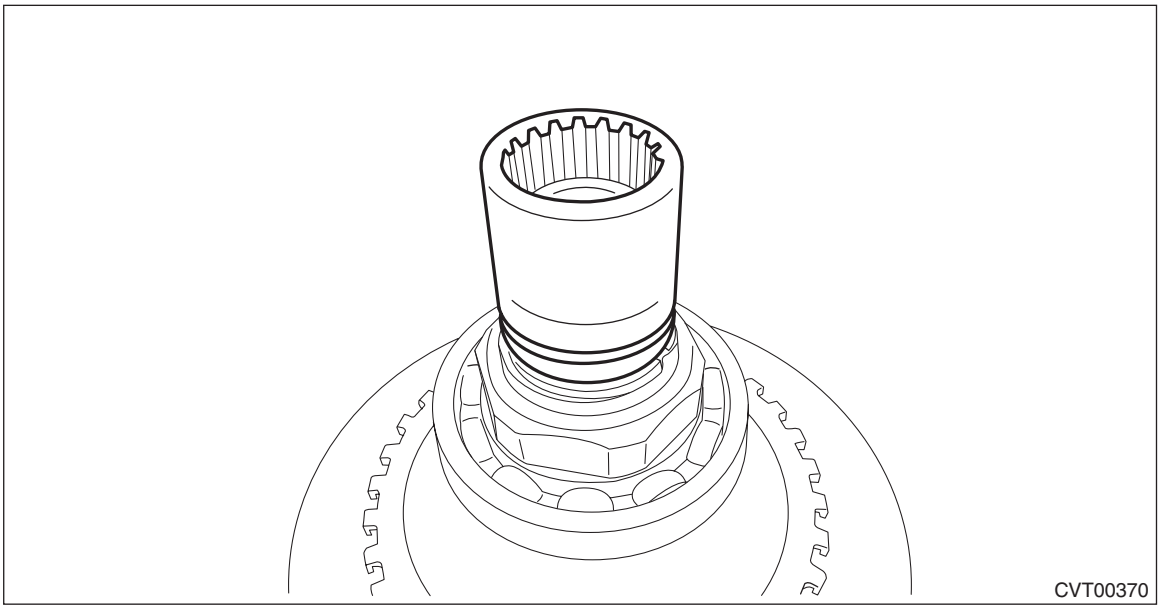
8) Place the variator chain on the V groove of the secondary pulley, and set the ST.
ST 18769AA010 EXPANDER PULLEY



9) Expand the V groove of the secondary pulley.
10) Install the O-ring to the primary pulley.

NOTE:
- Use new O-rings.
- Apply CVTF to the O-ring.

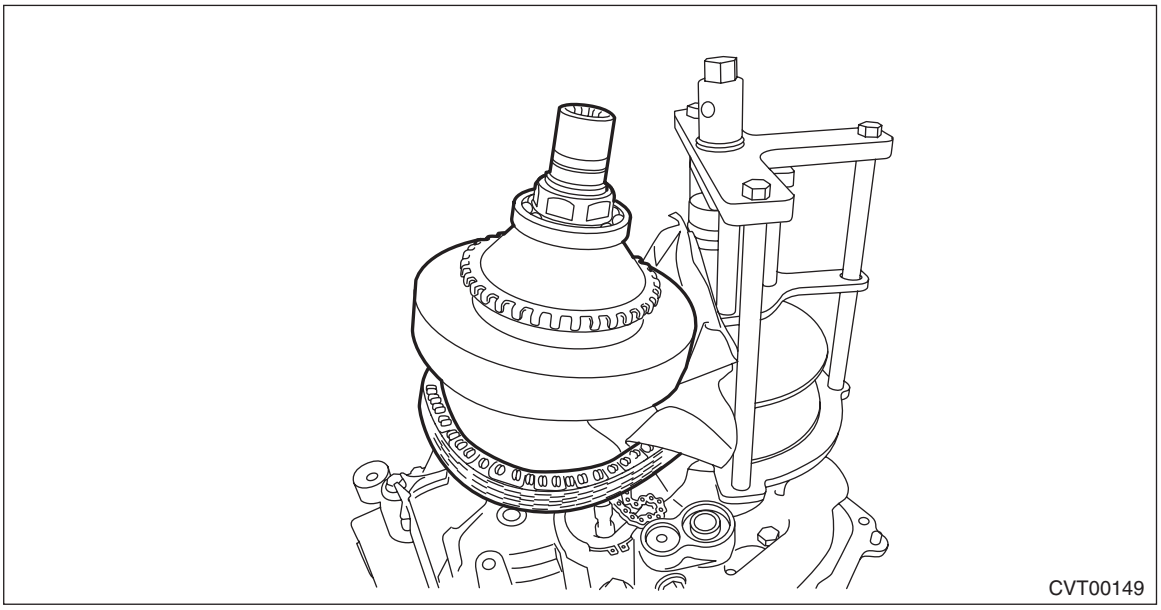
11) Install the sleeve.



12) Install the primary pulley.

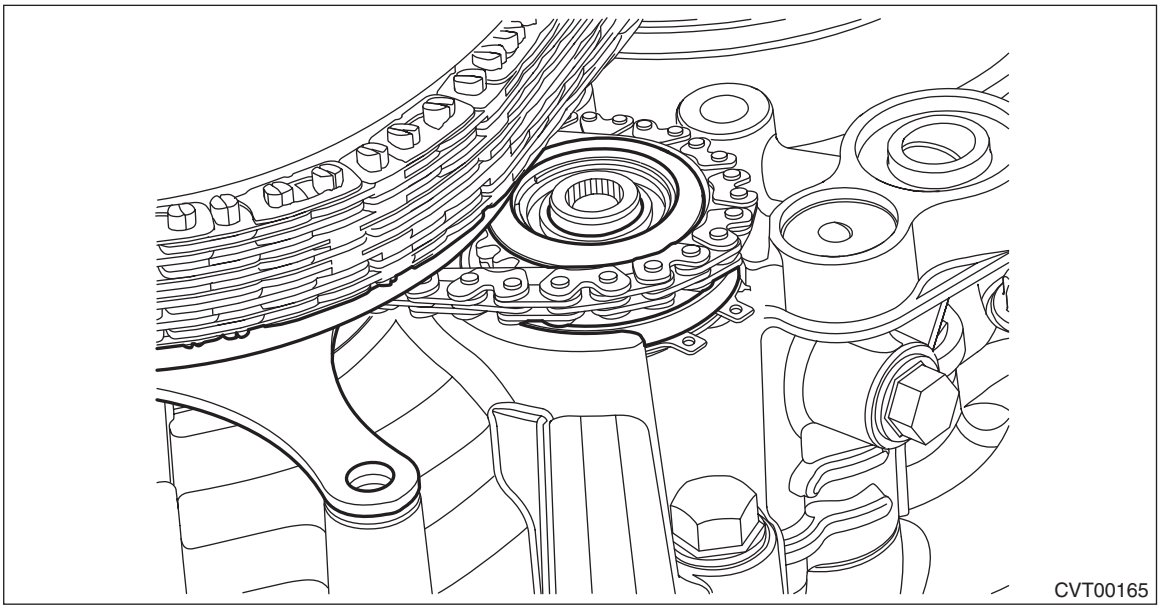
CAUTION:
Cover the V grooves of primary pulley and secondary pulley with cloth to protect the both pulleys and variator chain from scratching.

(1) Install the oil pump chain rear to the primary pulley.
(2) Intersect the V groove of primary pulley and the V groove of secondary pulley, and attach the variator chain to the primary pulley.

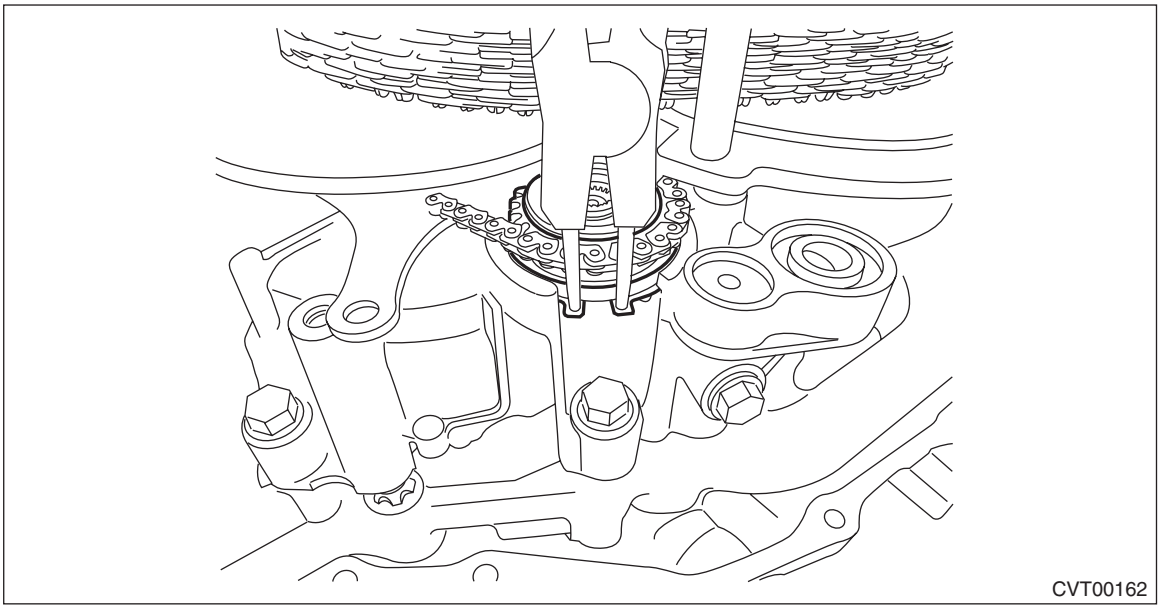


(3) Attach the oil pump chain rear to the primary pulley sprocket, and install the oil pump sprocket rear.

(4) Align the bolt hole of primary bearing retainer and the bolt hole of reverse brake housing, and install the primary pulley and the oil pump sprocket rear to the reverse brake housing.



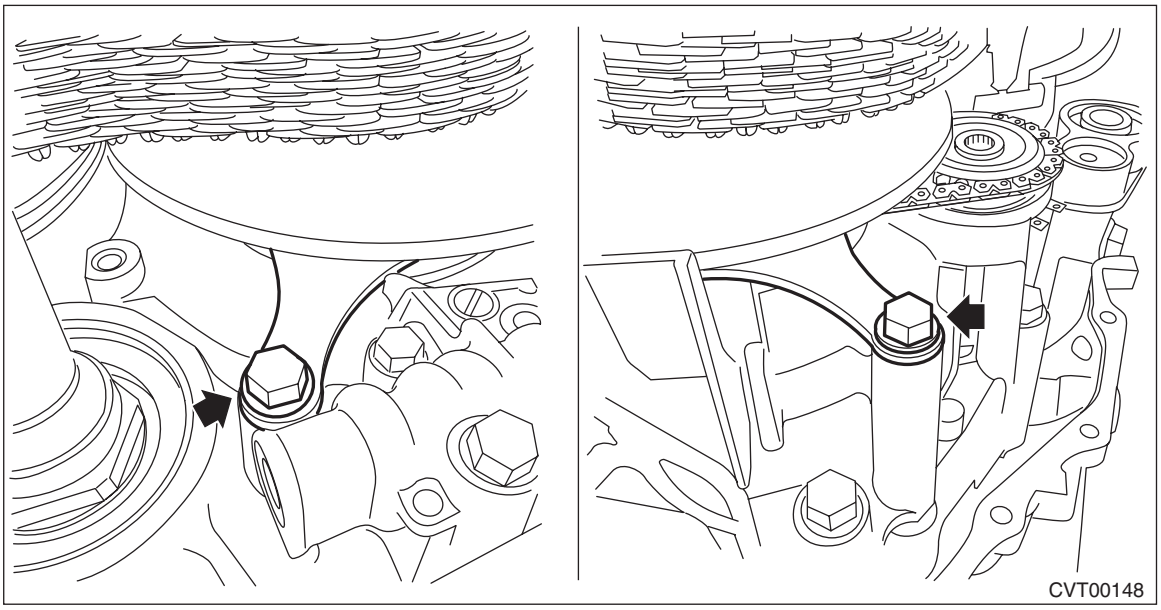
13) Spread the snap ring, align the snap ring with the bearing groove, and install the oil pump sprocket rear.



14) Install the primary pulley bolt.

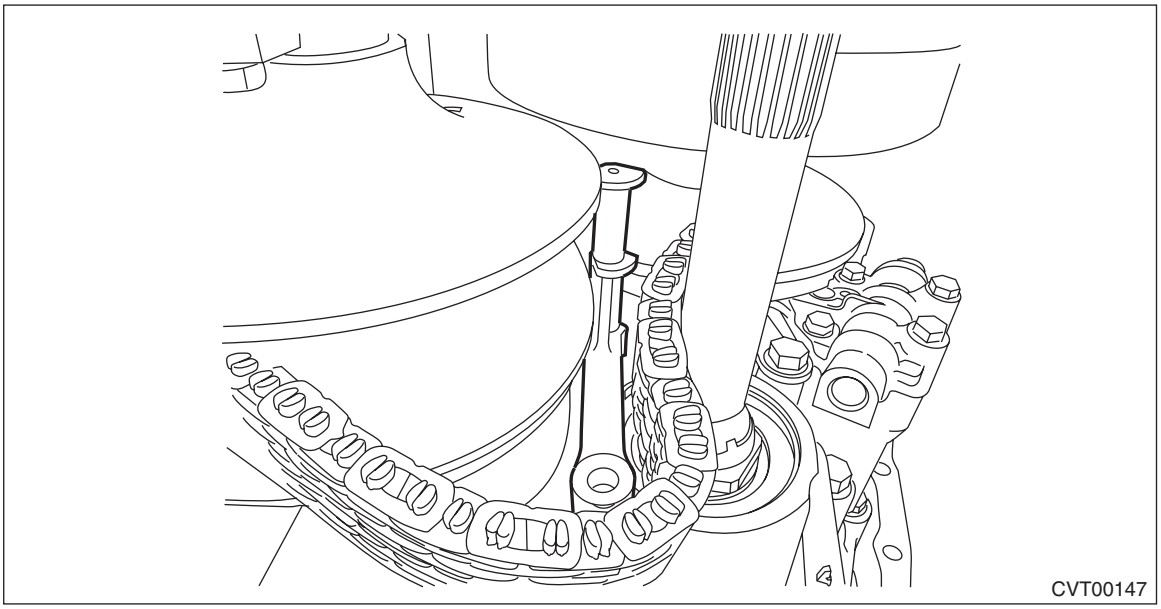
NOTE:
Apply CVTF to the bolt.

Tightening torque:
21 N·m (2.1 kgf-m, 15.5 ft-lb)

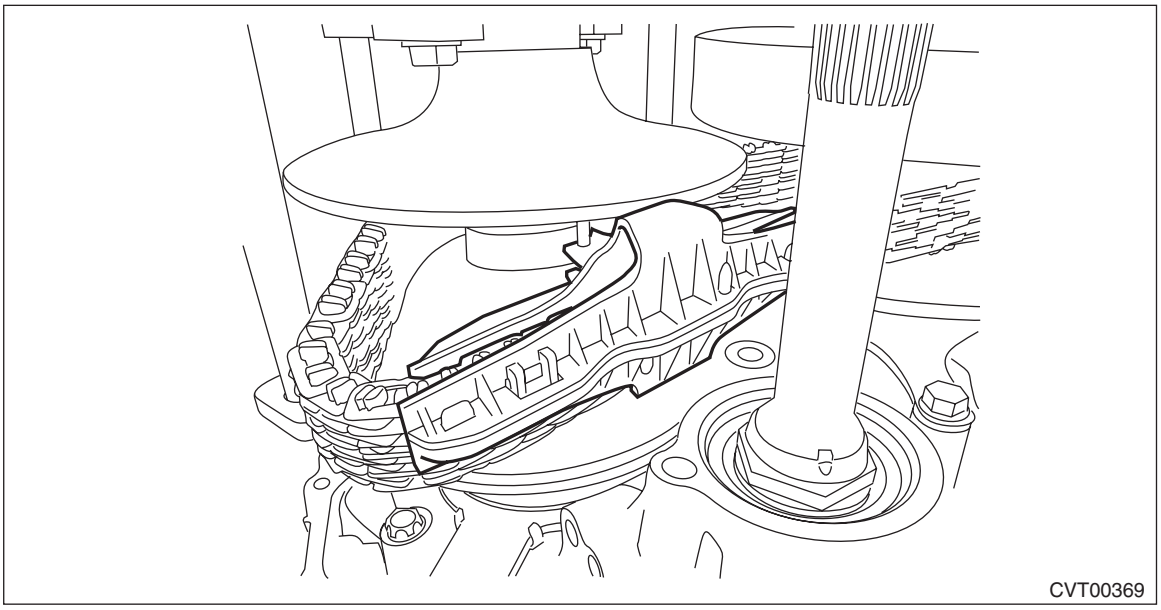


15) Install the chain guide.
(1) Place the support rod inside of the variator chain.

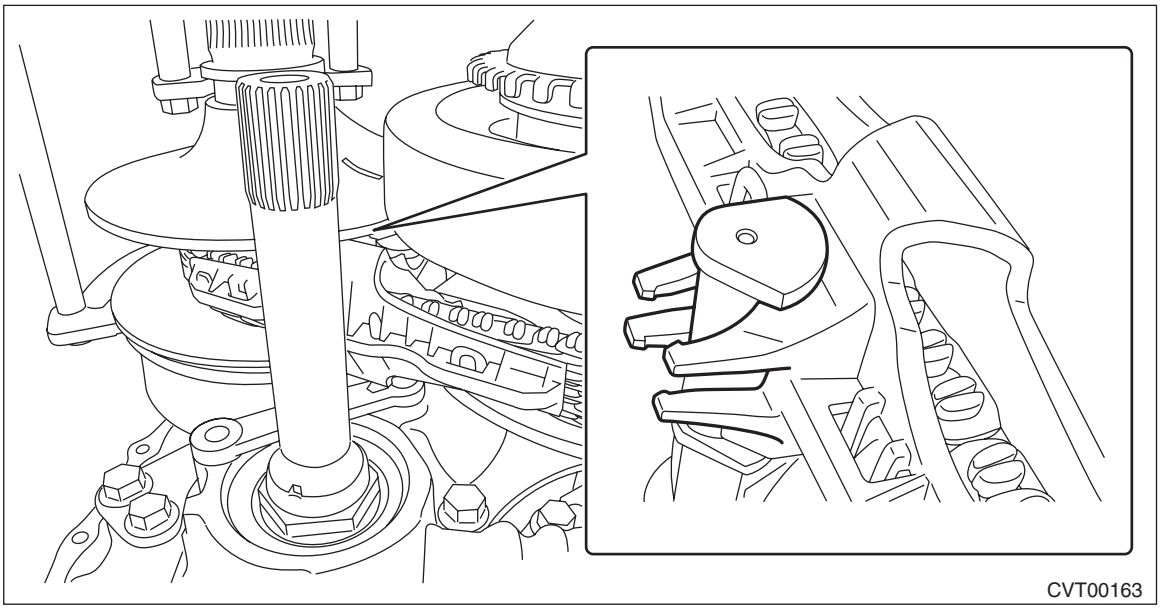
CAUTION:
Protect the both pulleys and variator chain from scratching.



(2) Install the chain guide to the variator chain.

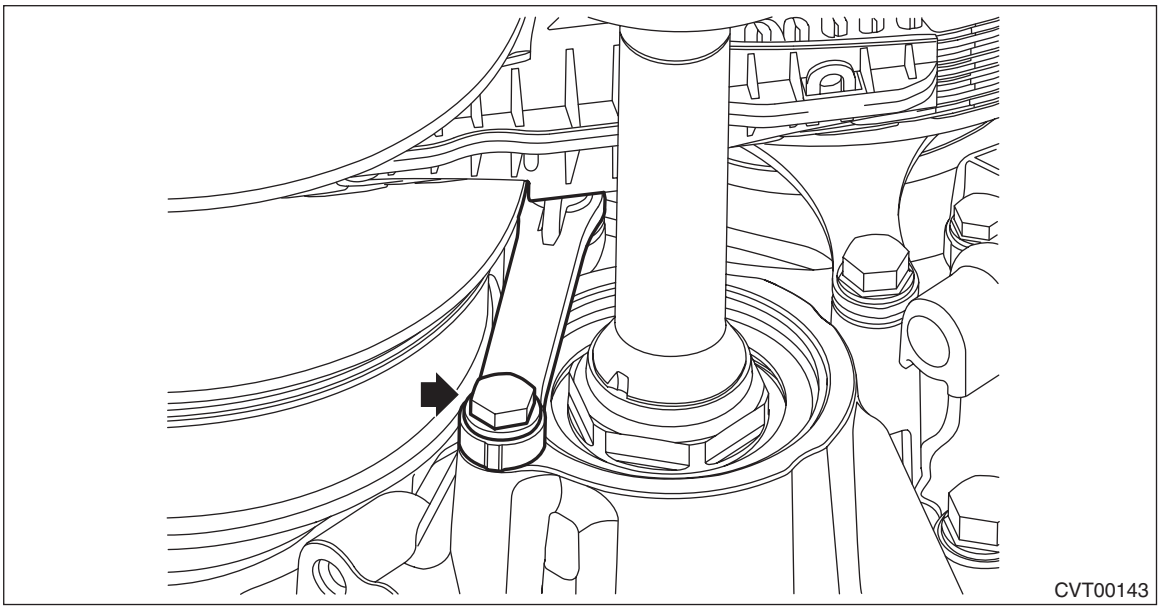


(3) Move the chain guide to the support rod side.
(4) While holding the support rod, press the chain guide so that the support rod runs through between the protrusions of chain guide and install the chain guide to the support rod.



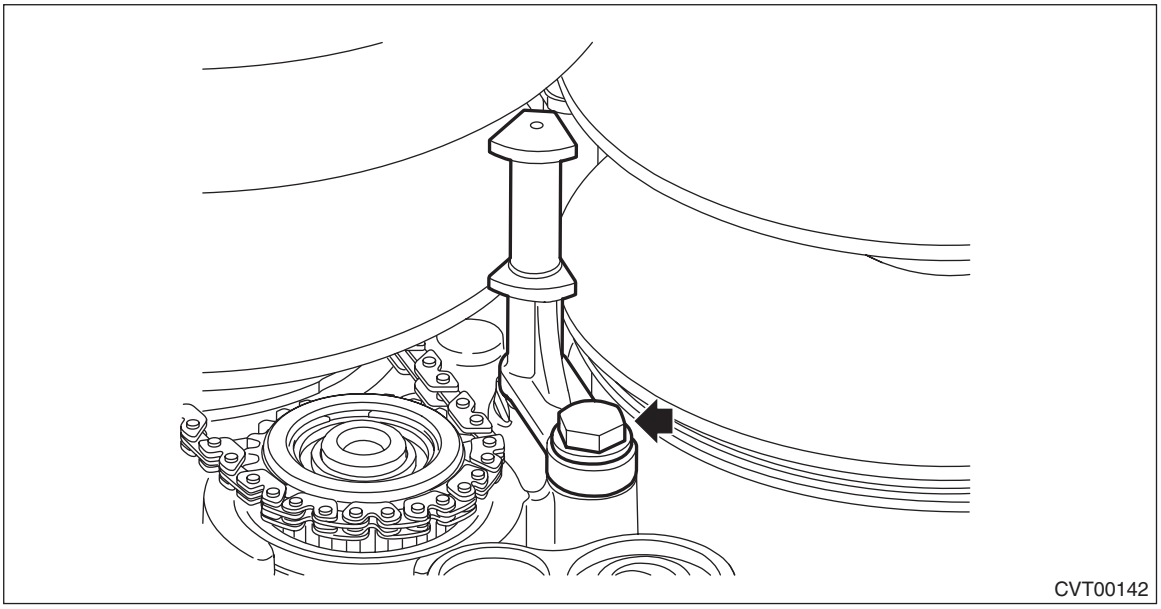
(5) Install the support rod.

Tightening torque:
21 N·m (2.1 kgf-m, 15.5 ft-lb)



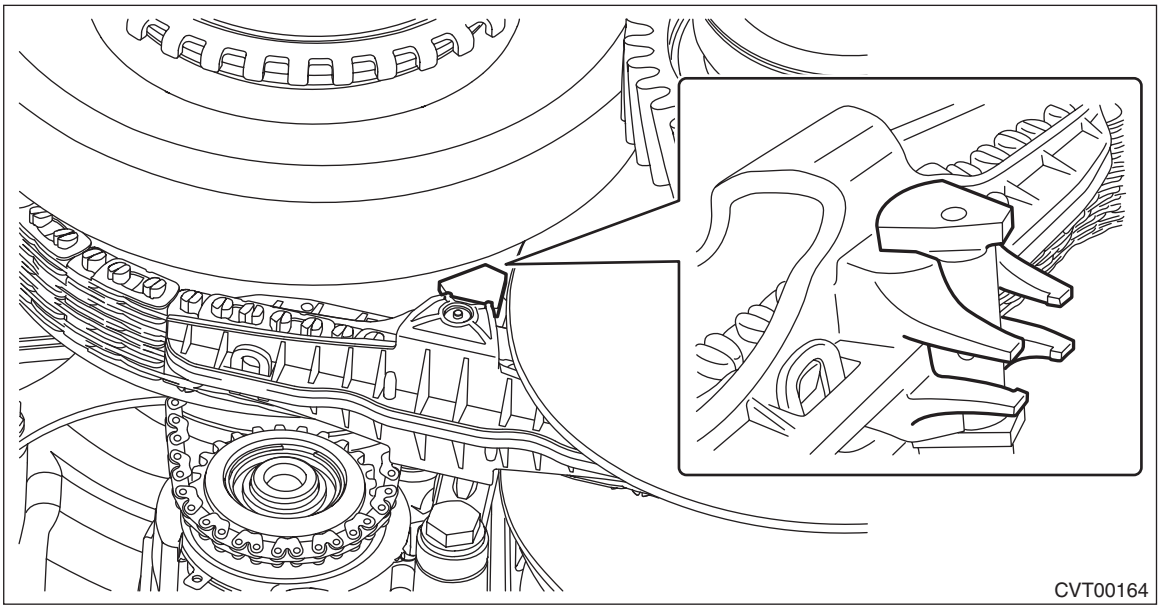
(6) Install the lubrication pipe.

Tightening torque:
21 N·m (2.1 kgf-m, 15.5 ft-lb)



(7) Install the chain guide to the variator chain.

(8) Install the chain guide so that the lubrication pipe runs through between the protrusions of each chain guide. Then remove the ST (PULLEY EXPANDER).

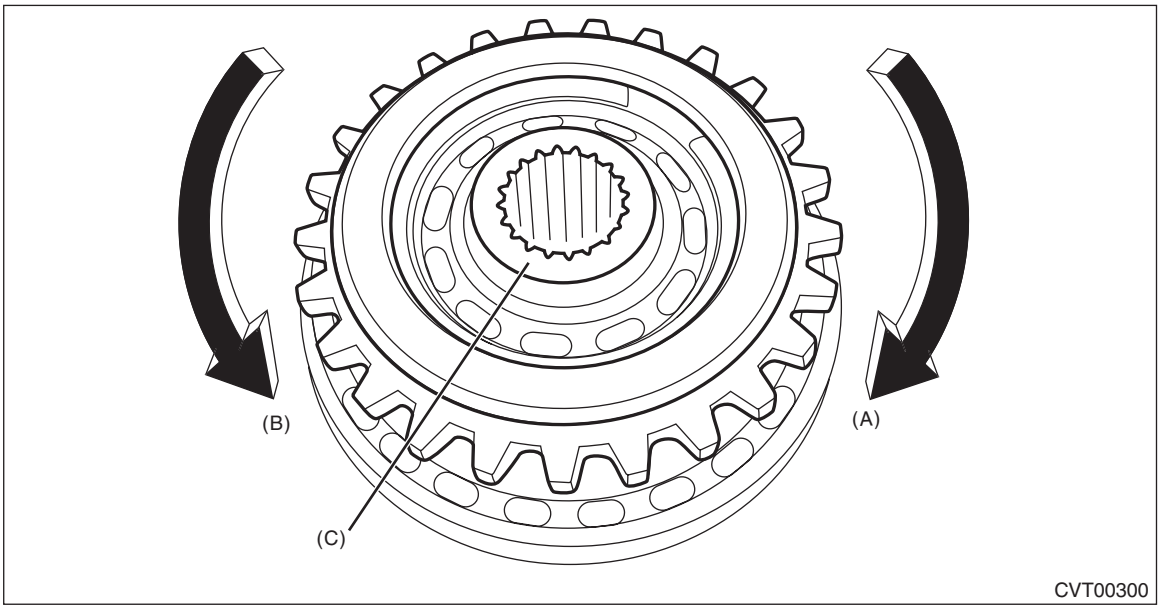


16) Install the reduction drive gear. <Ref. to CVT(TH58A)-259, INSTALLATION, Reduction Drive Gear.>
17) Install the transmission case. <Ref. to CVT(TH58A)-248, INSTALLATION, Transmission Case.>
18) Install the output clutch assembly. <Ref. to CVT(TH58A)-229, INSTALLATION, Output Clutch Assembly.>
19) Install the drive motor assembly. <Ref. to CVT(TH58A)-221, INSTALLATION, Drive Motor Assembly.>
20) Install the transmission control device. <Ref. to CVT(TH58A)-213, INSTALLATION, Transmission Control Device.>
21) Install the oil strainer and oil pan. <Ref. to CVT(TH58A)-114, INSTALLATION, Oil Pan and Strainer.>
22) Install the parking pawl. <Ref. to CVT(TH58A)-208, INSTALLATION, Parking Pawl.>
23) Install the transfer drive gear assembly. <Ref. to CVT(TH58A)-204, INSTALLATION, Transfer Drive Gear.>
24) Install the transfer driven gear assembly. <Ref. to CVT(TH58A)-201, INSTALLATION, Transfer Driven Gear.>
25) Install the transfer clutch assembly. <Ref. to CVT(TH58A)-188, INSTALLATION, Transfer Clutch.>
26) Install the extension case. <Ref. to CVT(TH58A)-183, INSTALLATION, Extension Case.>
27) Install the inhibitor switch. <Ref. to CVT(TH58A)-102, INSTALLATION, Inhibitor Switch.>
28) Install the secondary speed sensor. <Ref. to CVT(TH58A)-106, INSTALLATION, Secondary Speed Sensor.>
29) Install the front wheel speed sensor. <Ref. to CVT(TH58A)-108, INSTALLATION, Front Wheel Speed Sensor.>
30) Install the turbine speed sensor. <Ref. to CVT(TH58A)-104, INSTALLATION, Turbine Speed Sensor.>
31) Install the main control valve body. <Ref. to CVT(TH58A)-123, INSTALLATION, Control Valve Body.>
32) Install the transmission harness. <Ref. to CVT(TH58A)-151, INSTALLATION, Transmission Harness.>
33) Install the air breather hose. <Ref. to CVT(TH58A)-173, INSTALLATION, Air Breather Hose.>
34) Install the transmission assembly to the vehicle. <Ref. to CVT(TH58A)-77, INSTALLATION, Automatic Transmission Assembly.>

C: INSPECTION

- Check the surface of primary and secondary pulley cones for damage or wear.
- Check the primary and secondary pulley for damage.
- Check the bearing for seizure or wear.
- Apply CVTF to bearing and rotate the bearing to check for noise or dragging etc.
- Check the rear oil pump chain for damage.
- Check the one-way clutch of the oil pump sprocket (rear).

Secure the inner race, and check that the sprocket rotates clockwise and locks counterclockwise.

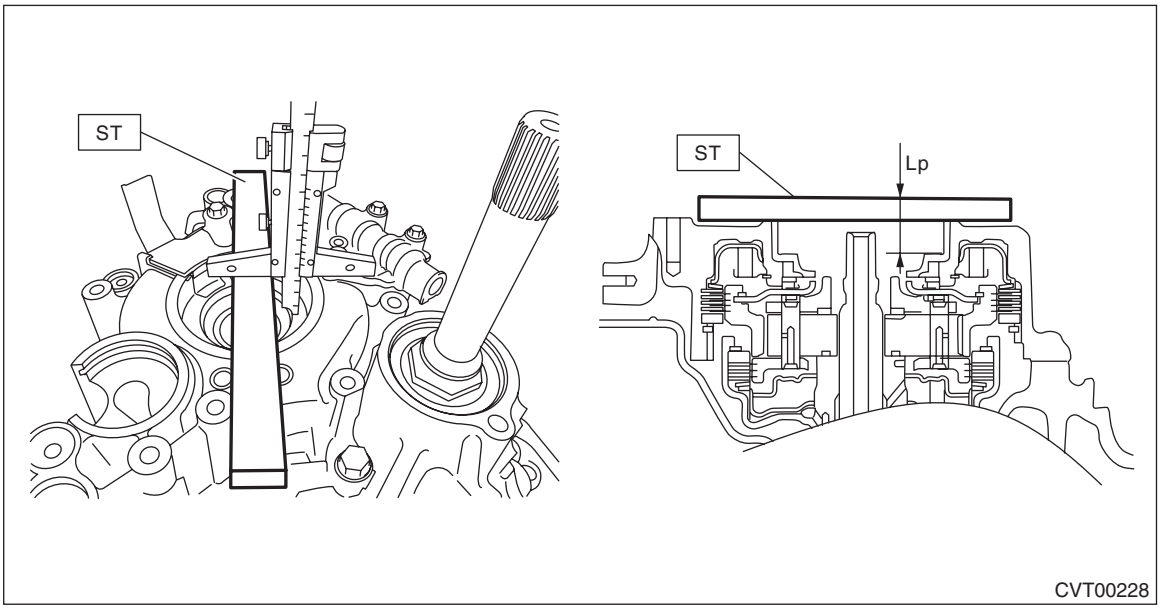


(A) Rotates freely
(B) Locked
(C) Inner race

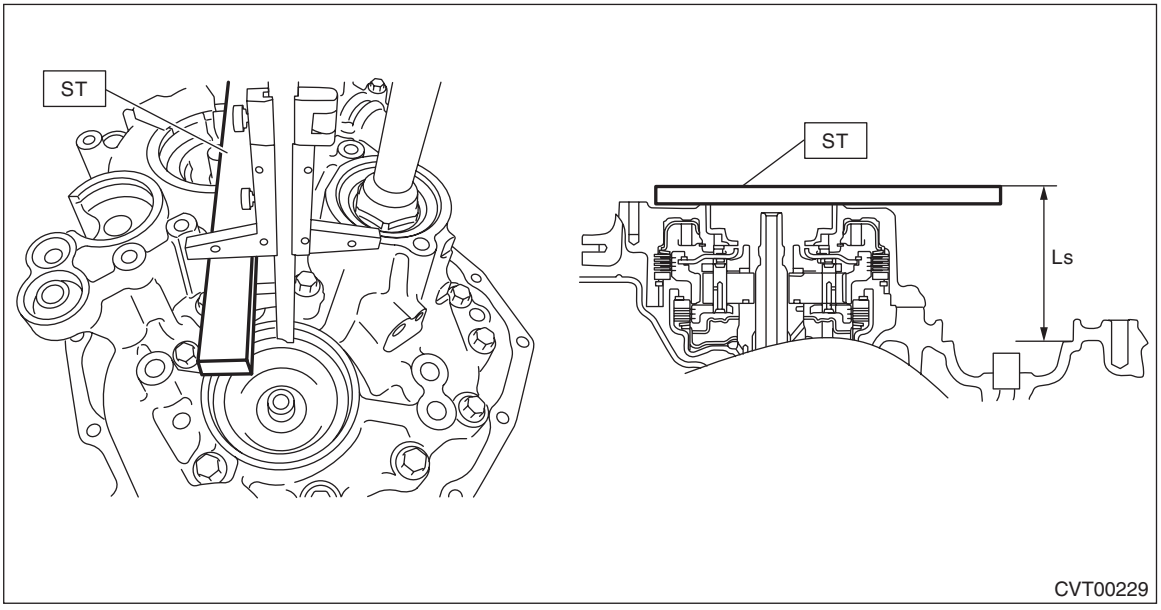
D: ADJUSTMENT

1. PROCEDURE IN REPLACEMENT OF PRIMARY AND SECONDARY PULLEY, OR IN REPLACEMENT OF PRIMARY PULLEY, SECONDARY PULLEY AND VARIATOR CHAIN

1) Measure depth “Lp” from the ST upper face to the primary pulley bearing catch surface at several points and calculate the average.
ST 499575400 GAUGE



2) Measure the depth “Ls” from the ST upper face to the secondary pulley bearing catch surface at several points and calculate the average.
ST 499575400 GAUGE



3) Calculate the following formula.
Calculation formula:
T (mm) = B – A + Lp – Ls – 28.602
[T (in) = B – A + Lp – Ls – 1.126]
T: Pulley alignment
A: Specified primary pulley dimension
B: Specified secondary pulley dimension
Lp: Depth from the ST upper face to the primary pulley bearing catch surface
Ls: Depth from the ST upper face to the secondary pulley bearing catch surface
28.602 mm (1.126 in): Constant

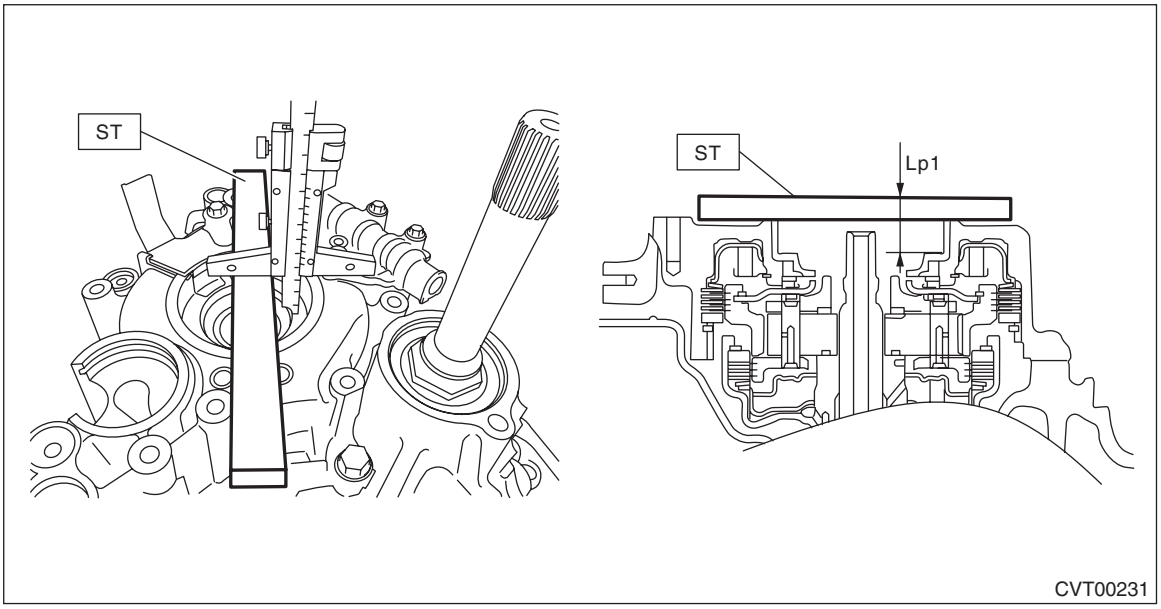
Pulley alignment T mm (in)	Thickness of shim mm (in)
-0.05 — 0.049(-0.002 — 0.002)	No shims
0.050 — 0.149(0.002 — 0.006)	0.1 (0.004)
0.150 — 0.249(0.006 — 0.010)	0.2 (0.008)
0.250 — 0.349(0.010 — 0.014)	0.3 (0.012)
0.350 — 0.449(0.014 — 0.018)	0.4 (0.016)
0.450 — 0.549(0.018 — 0.022)	0.5 (0.020)
0.550 — 0.649(0.022 — 0.026)	0.6 (0.024)
0.650 — 0.749(0.026 — 0.029)	0.7 (0.028)
0.750 — 0.849(0.029 — 0.033)	0.8 (0.031)
0.850 — 0.949(0.033 — 0.037)	0.9 (0.035)
0.950 — 1.049(0.037 — 0.041)	1.0 (0.039)
1.050 — 1.149(0.041 — 0.045)	1.1 (0.043)

4) Select one to two shims so that the total thickness meets the value obtained from step 3).

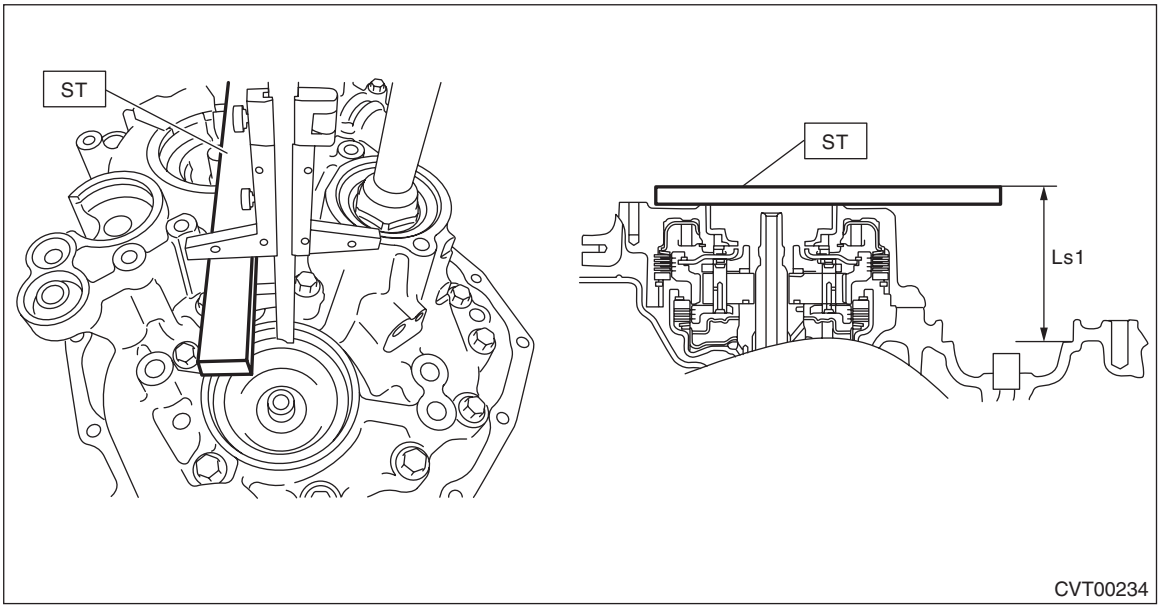
Part No.	Shim thickness mm (in)
32451AA050	0.1 (0.004)
32451AA060	0.2 (0.008)
32451AA070	0.3 (0.012)
32451AA080	0.4 (0.016)
32451AA090	0.5 (0.020)
32451AA100	0.6 (0.024)

2. PROCEDURE WHEN REPLACING ONLY DRIVE PINION RETAINER OR REVERSE BRAKE HOUSING

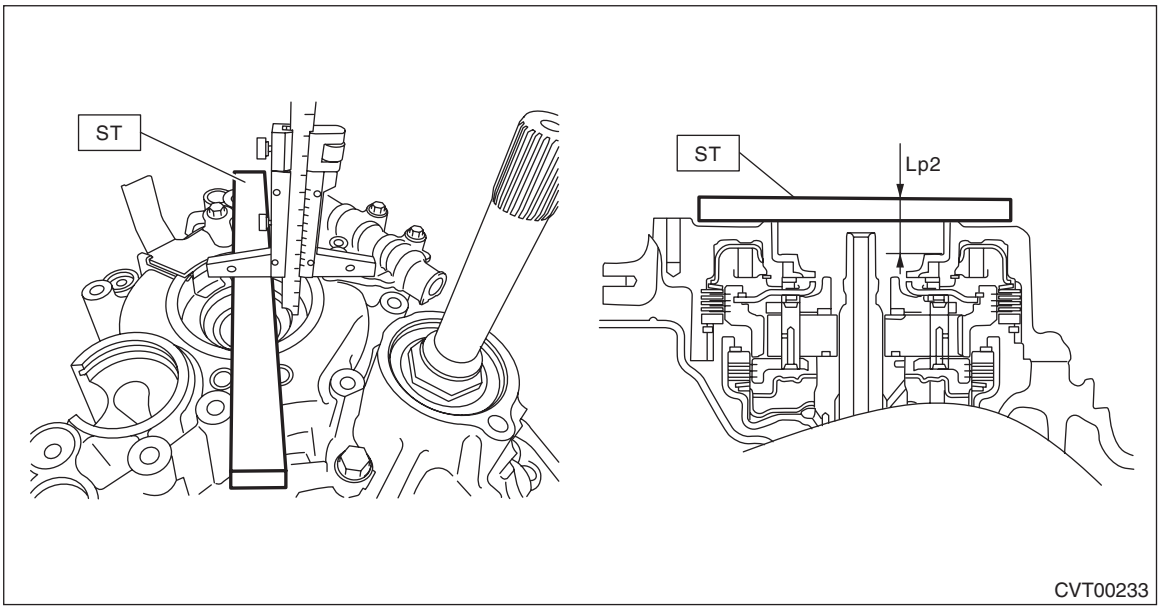
1) Clean the mating surface of current drive pinion retainer and converter case.
2) Measure and record the shim thickness that is attached on the current reverse brake housing.
3) Using the current drive pinion retainer, measure depth “Lp1” from the ST upper face to the primary pulley bearing catch surface at several points and calculate the average.
ST 499575400 GAUGE



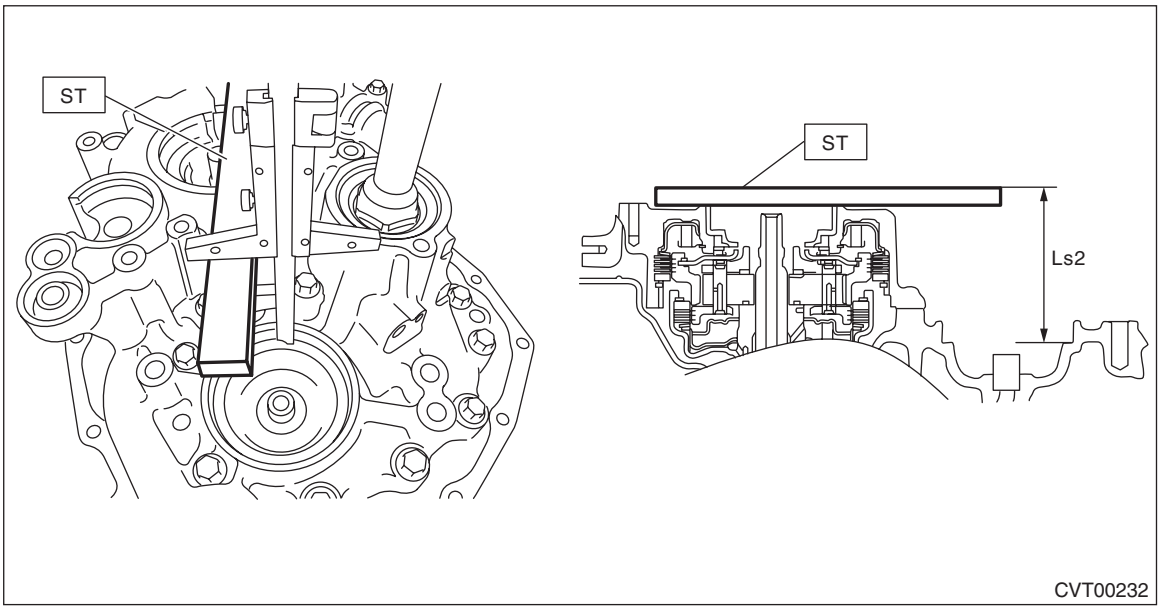
4) Using the current drive pinion retainer or current reverse brake housing, measure the depth “Ls1” from the ST upper face to the secondary pulley bearing catch surface at several points and calculate the average.
ST 499575400 GAUGE



5) Calculate the “LD1” using the following formula and record it.
Calculation formula:
LD1 mm (in) = Ls1 – Lp1
LD1: Height from the primary pulley bearing catch surface to the secondary pulley bearing catch surface
Lp1: Depth from the ST upper face to the primary pulley bearing catch surface
Ls1: Depth from the ST upper face to the secondary pulley bearing catch surface
6) Using the new drive pinion retainer or new reverse brake housing, measure the depth “Lp2” from the ST upper face to the primary pulley bearing catch surface at several points and calculate the average.
ST 499575400 GAUGE



7) Using the new drive pinion retainer or new reverse brake housing, measure depth “Ls2” from the ST upper face to the secondary pulley bearing catch surface at several points and calculate the average.
ST 499575400 GAUGE



8) Calculate the “LD2” using the following formula and record it.
Calculation formula:
LD2 mm (in) = Ls2 – Lp2
LD2: Height from the primary pulley bearing catch surface to the secondary pulley bearing catch surface
Lp2: Depth from the ST upper face to the primary pulley bearing catch surface
Ls2: Depth from the ST upper face to the secondary pulley bearing catch surface

9) Calculate the recorded values of “LD1” and “LD2” to obtain the positive number to select the shims.
Calculation formula: T1 mm (in) = LD1 – LD2 or T2 mm (in) = LD2 – LD1
T1, T2: Difference between new drive pinion retainer or new reverse brake housing and current drive pinion retainer or current reverse brake housing
LD1: Calculated value of current drive pinion retainer or current reverse brake housing
LD2: Calculated value of new drive pinion retainer or new reverse brake housing

Difference of the case (T1) mm (in)	Shim selection procedure
0 — 0.050 (0 — 0.00197)	Select a new shim of the same thickness with the shim that is used on the primary pulley side of the current reverse brake housing.
0.051 — 0.150 (0.00201 — 0.00591)	Select a shim which is 0.1 mm (0.004 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.
0.151 — 0.250 (0.00594 — 0.00984)	Select a shim which is 0.2 mm (0.008 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.
0.251 — 0.350 (0.00988 — 0.01378)	Select a shim which is 0.3 mm (0.012 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.
0.351 — 0.450 (0.01382 — 0.01772)	Select a shim which is 0.4 mm (0.016 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.
0.451 — 0.550 (0.01776 — 0.02165)	Select a shim which is 0.5 mm (0.020 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.
0.551 — 0.600 (0.02169 — 0.02362)	Select a shim which is 0.6 mm (0.024 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.

Difference of the case (T2) mm (in)	Shim selection procedure
0 — 0.050 (0 — 0.00197)	Select a new shim of the same thickness with the shim that is used on the primary pulley side of the current reverse brake housing.
0.051 — 0.150 (0.00201 — 0.00591)	Select a shim which is 0.1 mm (0.004 in) thinner than the shim that is used on the primary pulley side of the current reverse brake housing.
0.151 — 0.250 (0.00594 — 0.00984)	Select a shim which is 0.2 mm (0.008 in) thinner than the shim that is used on the primary pulley side of the current reverse brake housing.
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0.551 — 0.600 (0.02169 — 0.02362)	Select a shim which is 0.6 mm (0.024 in) thinner than the shim that is used on the primary pulley side of the current reverse brake housing.

Part No.	Shim thickness mm (in)
32451AA050	0.1 (0.004)
32451AA060	0.2 (0.008)
32451AA070	0.3 (0.012)
32451AA080	0.4 (0.016)
32451AA090	0.5 (0.020)
32451AA100	0.6 (0.024)