

CONTINUOUSLY VARIABLE TRANSMISSION

CVT(TR580)

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General Description

CONTINUOUSLY VARIABLE TRANSMISSION

1. General Description

A: SPECIFICATION

1. TORQUE CONVERTER

Model	DOHC non-turbo
Type	Symmetric, 3-element, single stage, 2-phase torque converter
Stall torque ratio	2.07
Nominal mm (in)	236 (9.29)
Stall speed (at sea level) r/min	1,900 — 2,700 (D range) 1,800 — 2,600 (R range)
One-way clutch	Sprag type one-way clutch

2. OIL PUMP

Type	Internal gear pump	
Driving method	Driven by chain	
Number of teeth	Inner rotor	8
	Outer rotor	9

3. TRANSMISSION CONTROL ELEMENT

Type	Forward continuously variable speed change, 1 reverse, planetary gear
Multi-plate clutch	1 set
Multi-plate brake	1 set

4. TRANSMISSION GEAR RATIO

Forward	3.600 — 0.512
Rev	3.687

5. PLATE

Number of forward clutch drive plates	3
Number of reverse brake drive plates	4

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

6. SELECTOR POSITION

P (Park)	Transmission neutral, output shaft locked, engine start enabled
R (Reverse)	Rev
N (Neutral)	Transmission neutral, engine start enabled
D (Drive)	Forward continuously variable speed change
M (Manual mode) (paddle shift +side)	Manual gear change 1st → 2nd → 3rd → 4th → 5th → 6th → 7th
M (Manual mode) (paddle shift -side)	Manual gear change 1st ← 2nd ← 3rd ← 4th ← 5th ← 6th ← 7th

7. HYDRAULIC CONTROL AND LUBRICATION

Type	Electronic hydraulic control (gear ratio is changed by signals of vehicle speed and accelerator opening angle.)	
Fluid	Specified fluid: SUBARU CVT FLUID LINEARTRONIC II CAUTION: Always use specified CVTF. Using other fluid will cause malfunction.	
Fluid capacity	Sedan	11.03 — 11.53 (11.7 — 12.2, 9.7 — 10.1)
L (US qt, Imp qt)	OUTBACK	11.43 — 11.93 (12.1 — 12.6, 10.1 — 10.5)
Lubrication system	Forced feed lubrication with oil pump	

8. COOLING AND HARNESS

Cooling system	Sedan	CVTF cooler (with warmer feature)
	OUTBACK	CVTF cooler (with warmer feature) + air cooler
Transmission harness	Power supply circuit, CAN communication circuit, paddle shift circuit, etc.	16 poles
	Back-up light circuit, starter circuit	5 poles

9. TRANSFER

Transfer type	Multi-plate transfer (MP-T)
Number of transfer clutch drives & driven plates	5
Control method	Electronic hydraulic type
Reduction gear ratio	1.000 (43/43)

10. REDUCTION GEAR RATIO

	Sedan	OUTBACK
Front final reduction gear ratio	3.900	4.111

11. FRONT DIFFERENTIAL GEAR OIL

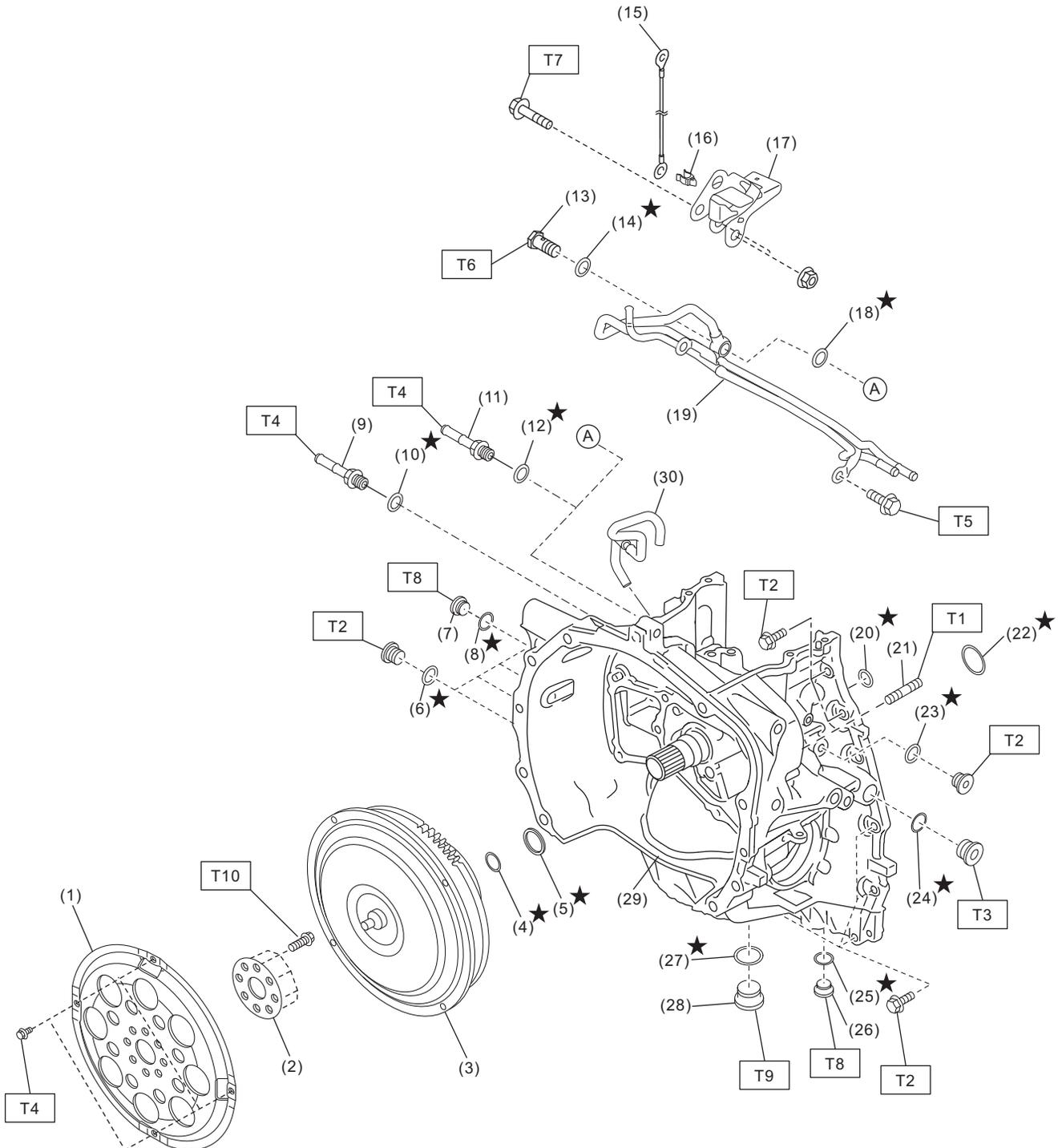
Fluid	SUBARU GEAR OIL EXTRA MT or equivalent
Fluid capacity L (US qt, Imp qt)	1.14 — 1.24 (1.2 — 1.3, 1.0 — 1.1)

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

B: COMPONENT

1. TORQUE CONVERTER ASSEMBLY AND CONVERTER CASE



CVT10066

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General Description

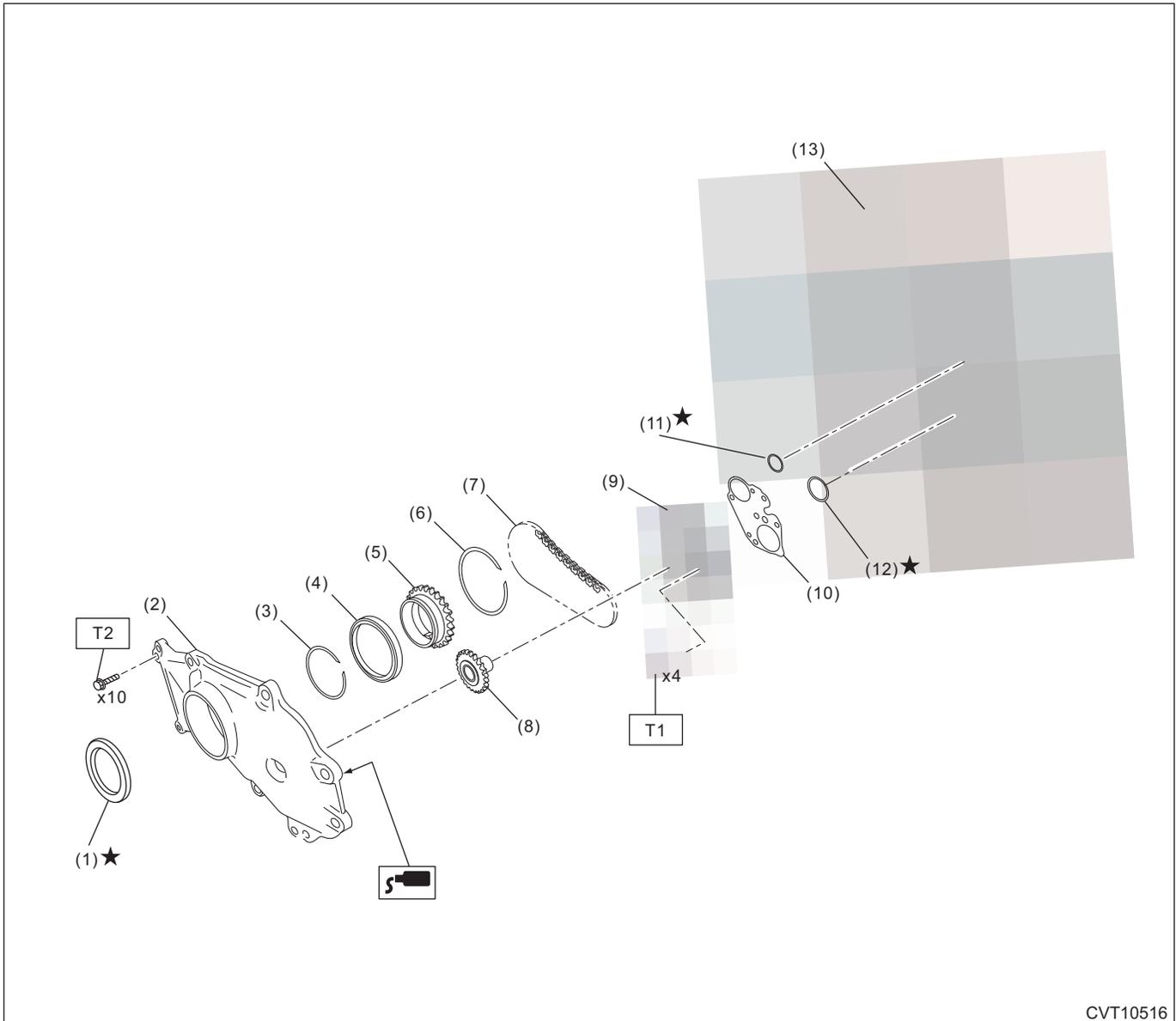
CONTINUOUSLY VARIABLE TRANSMISSION

(1) Drive plate	(15) Transmission radio ground cord	(29) Converter case
(2) Reinforcement drive plate	(16) Clip	(30) Air breather hose
(3) Torque converter ASSY	(17) Transmission hanger	
(4) O-ring	(18) Gasket (with CVTF cooler (air cool))	Tightening torque: N·m (kgf·m, ft·lb)
(5) Seal ring	(19) CVTF cooler pipe COMPL (with CVTF cooler (air cool))	T1: 18 (1.8, 13.3)
(6) O-ring	(20) O-ring	T2: 22 (2.2, 16.2)
(7) Front differential gear oil filler plug	(21) Stud bolt	T3: 22.5 (2.3, 16.6)
(8) O-ring	(22) O-ring	T4: 25 (2.5, 18.4)
(9) Oil cooler pipe	(23) O-ring	T5: 35 (3.6, 25.8)
(10) O-ring	(24) O-ring	T6: 40 (4.1, 29.5)
(11) Oil cooler pipe (without CVTF cooler (air cool))	(25) Gasket	T7: 41 (4.2, 30.2)
(12) O-ring (without CVTF cooler (air cool))	(26) Overflow drain plug	T8: 50 (5.1, 36.9)
(13) Union screw (with CVTF cooler (air cool))	(27) Gasket	T9: 70 (7.1, 51.6)
(14) Gasket (with CVTF cooler (air cool))	(28) Front differential gear oil drain plug	T10: <Ref. to CVT(TR580)-200, INSTALLATION, Drive Plate.>

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

2. OIL PUMP ASSEMBLY



CVT10516

- (1) Oil seal
- (2) Oil pump chain cover
- (3) Snap ring
- (4) Ball bearing
- (5) Drive sprocket
- (6) Snap ring

- (7) Oil pump chain
- (8) Driven sprocket
- (9) Oil pump ASSY
- (10) Plate
- (11) O-ring (small)
- (12) O-ring (large)

- (13) Converter case

Tightening torque: N-m (kgf-m, ft-lb)

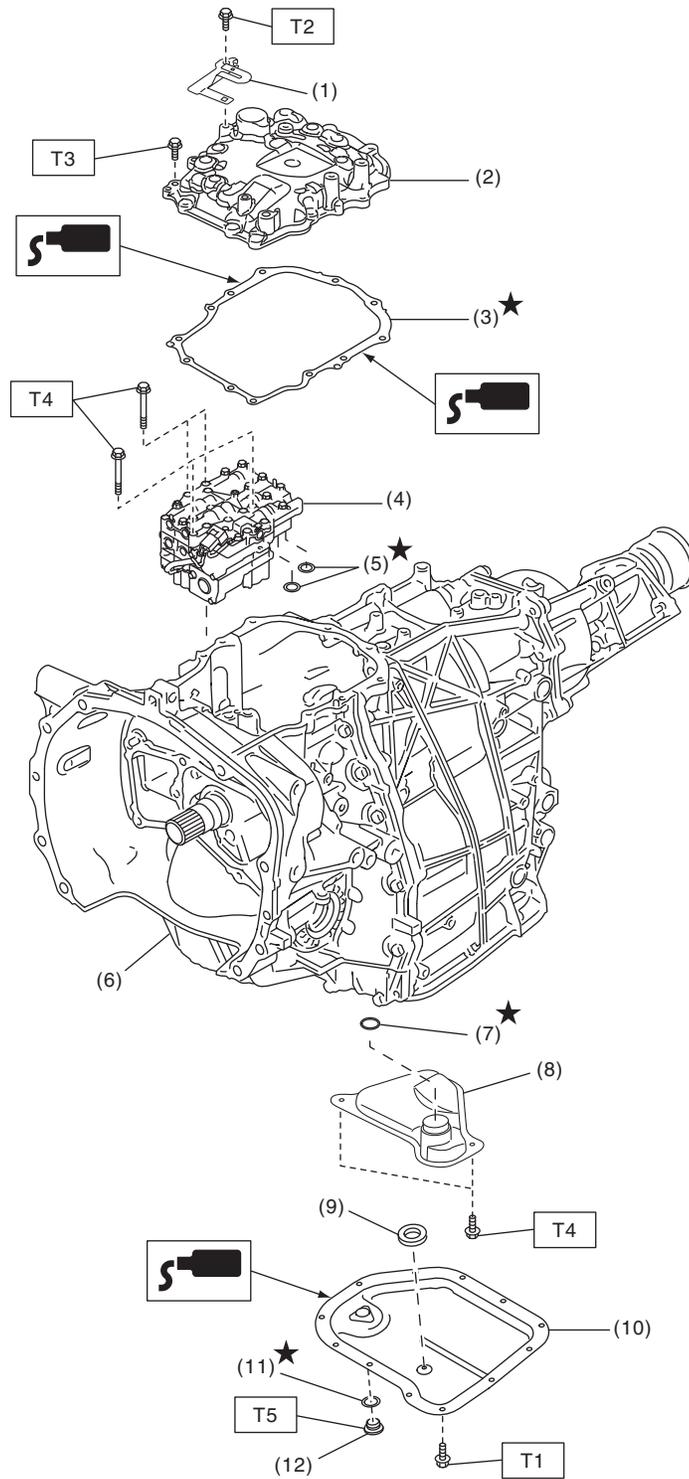
T1: 8.5 (0.9, 6.3)

T2: 21 (2.1, 15.5)

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

4. CONTROL VALVE BODY



- (1) Transmission harness stay
- (2) Valve cover
- (3) Gasket
- (4) Control valve body
- (5) O-ring
- (6) Transmission ASSY

- (7) O-ring
- (8) Oil strainer
- (9) Magnet
- (10) Oil pan
- (11) Gasket
- (12) CVTF drain plug

Tightening torque: N-m (kgf-m, ft-lb)

T1: 5 (0.5, 3.7)

T2: 7 (0.7, 5.2)

T3: 8 (0.8, 5.9)

T4: 9 (0.9, 6.6)

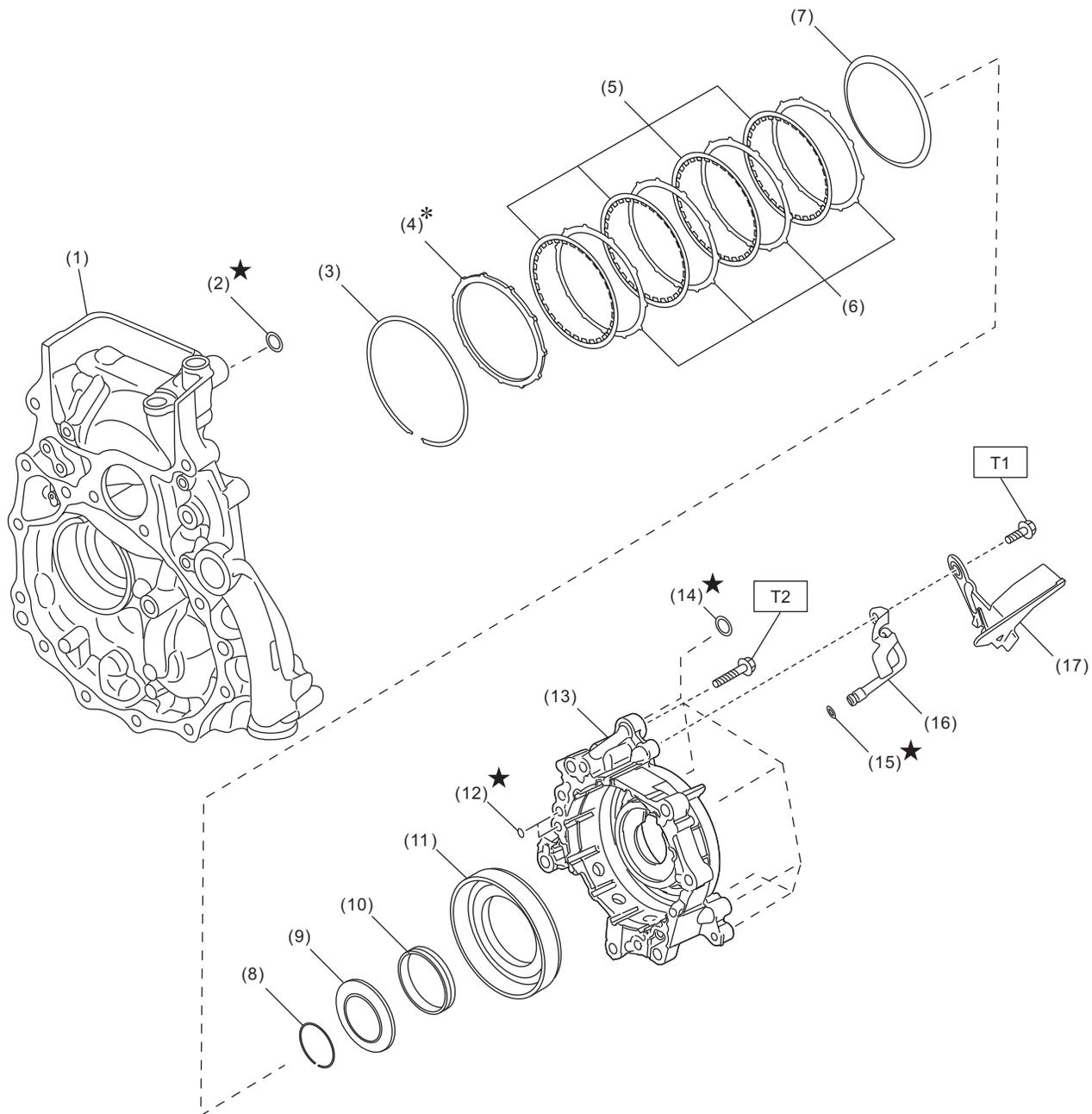
T5: 31 (3.2, 22.9)

CVT00900

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

5. REVERSE BRAKE ASSEMBLY



CVT00661

- (1) Drive pinion retainer
- (2) O-ring
- (3) Snap ring
- (4) Retaining plate
- (5) Drive plate
- (6) Driven plate
- (7) Dish plate

- (8) Snap ring
- (9) Spring retainer
- (10) Return spring
- (11) Reverse brake piston
- (12) O-ring
- (13) Reverse brake housing
- (14) O-ring

- (15) O-ring
- (16) Lubrication pipe
- (17) Oil guide

Tightening torque: N·m (kgf·m, ft·lb)

T1: 16 (1.6, 11.8)

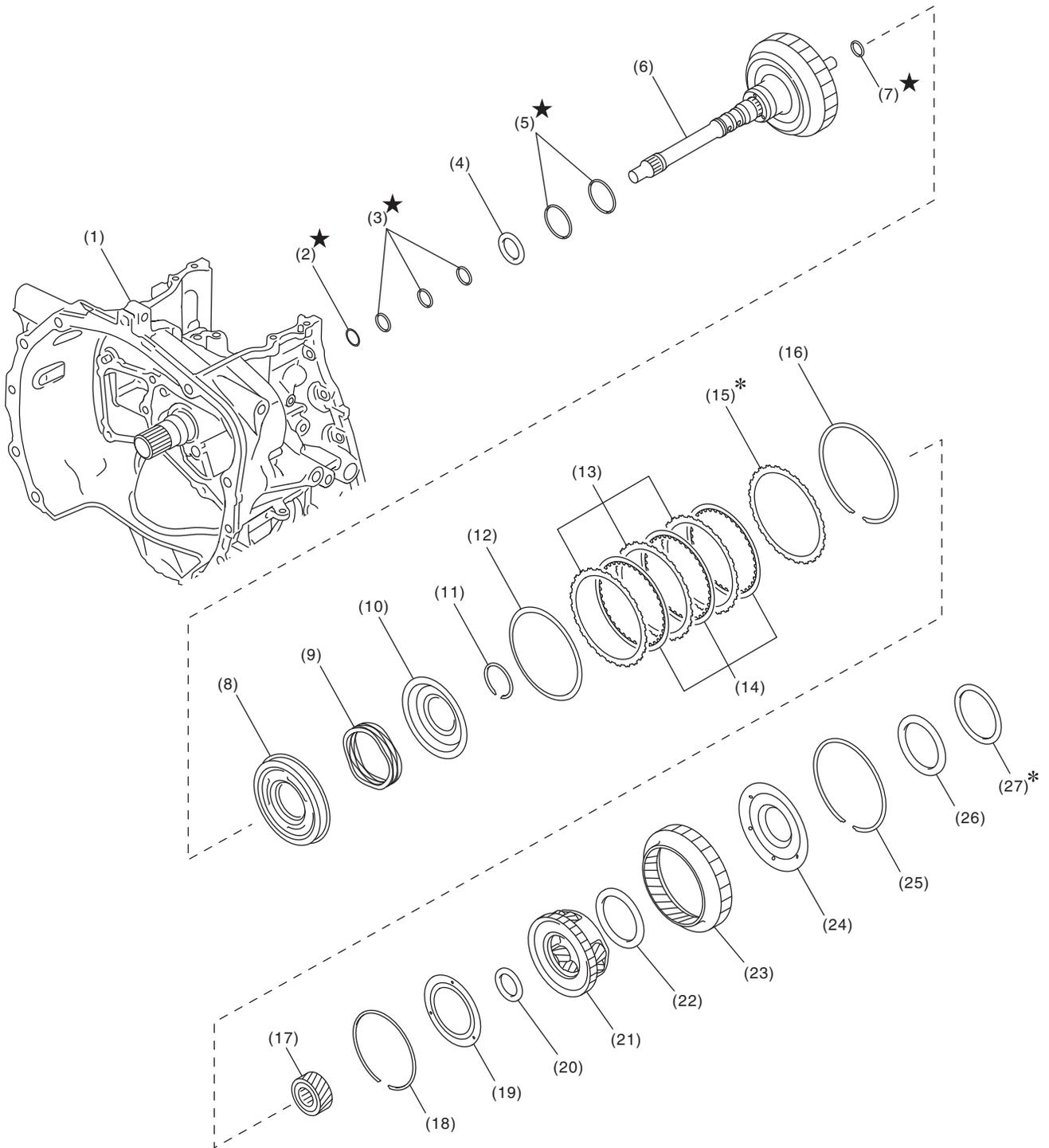
T2: 37 (3.8, 27.3)

CVT(TR580)-10

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

6. FORWARD CLUTCH ASSEMBLY



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CVT00902

General Description

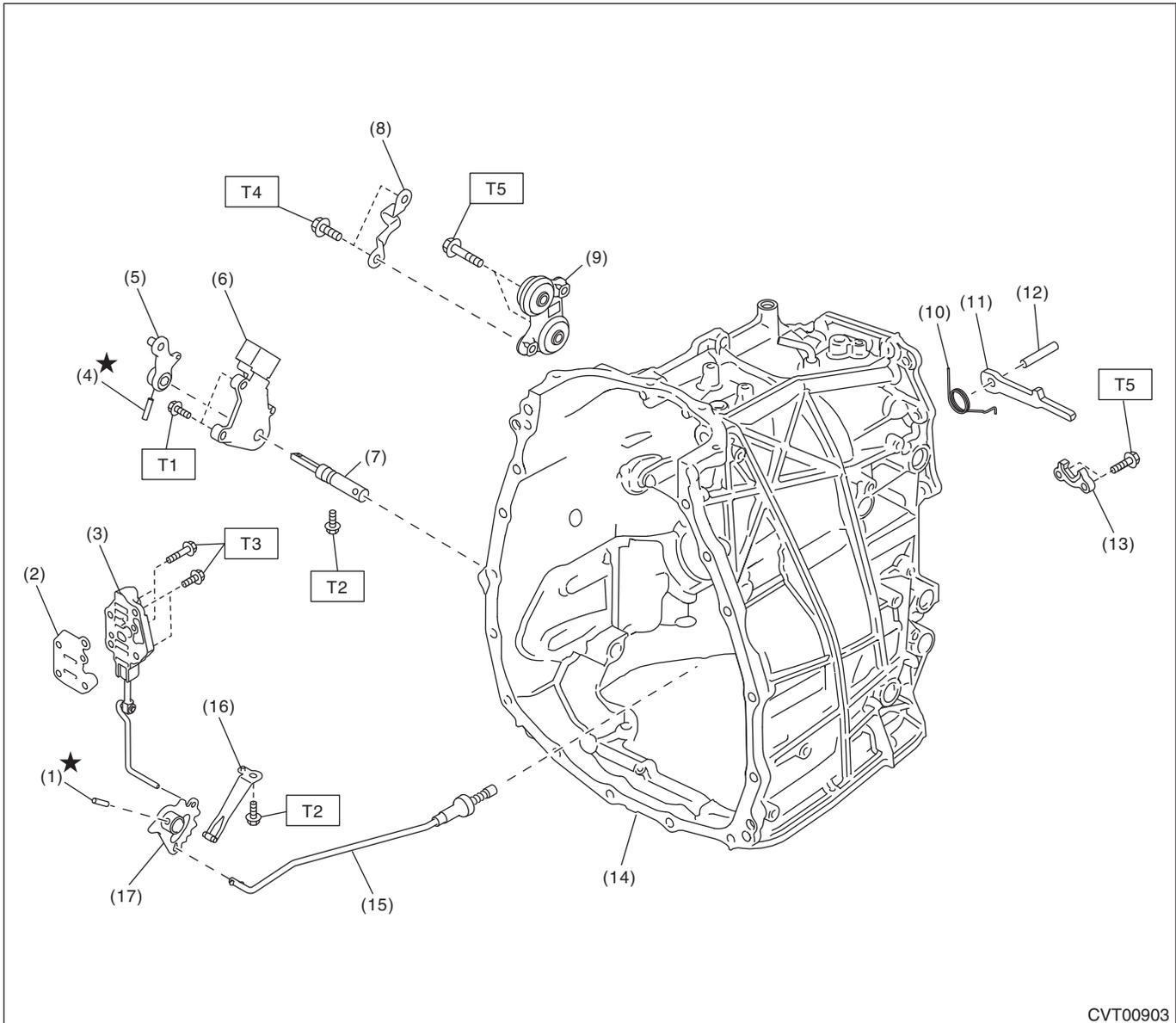
CONTINUOUSLY VARIABLE TRANSMISSION

- | | | |
|------------------------------|----------------------|-----------------------------|
| (1) Converter case | (10) Chamber COMPL | (19) Balance oil guide |
| (2) O-ring | (11) Snap ring | (20) Thrust bearing |
| (3) Seal ring | (12) Dish plate | (21) Planetary carrier ASSY |
| (4) Thrust bearing | (13) Driven plate | (22) Thrust bearing |
| (5) Seal ring | (14) Drive plate | (23) Internal gear |
| (6) Forward clutch drum ASSY | (15) Retaining plate | (24) Thrust gear plate |
| (7) Seal ring | (16) Snap ring | (25) Snap ring |
| (8) Forward clutch piston | (17) Sun gear | (26) Thrust bearing |
| (9) Return spring | (18) Snap ring | (27) Washer |

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

7. TRANSMISSION CONTROL DEVICE



CVT00903

- | | |
|-----------------------|------------------------|
| (1) Spring pin | (10) Return spring |
| (2) Separator plate | (11) Parking pawl |
| (3) Manual valve ASSY | (12) Shaft |
| (4) Spring pin | (13) Parking support |
| (5) Shifter arm | (14) Transmission case |
| (6) Inhibitor switch | (15) Parking rod |
| (7) Shifter arm shaft | (16) Detent spring |
| (8) Cable bracket | (17) Manual plate |
| (9) Plate ASSY | |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 5 (0.5, 3.7)

T2: 7 (0.7, 5.2)

T3: 9 (0.9, 6.6)

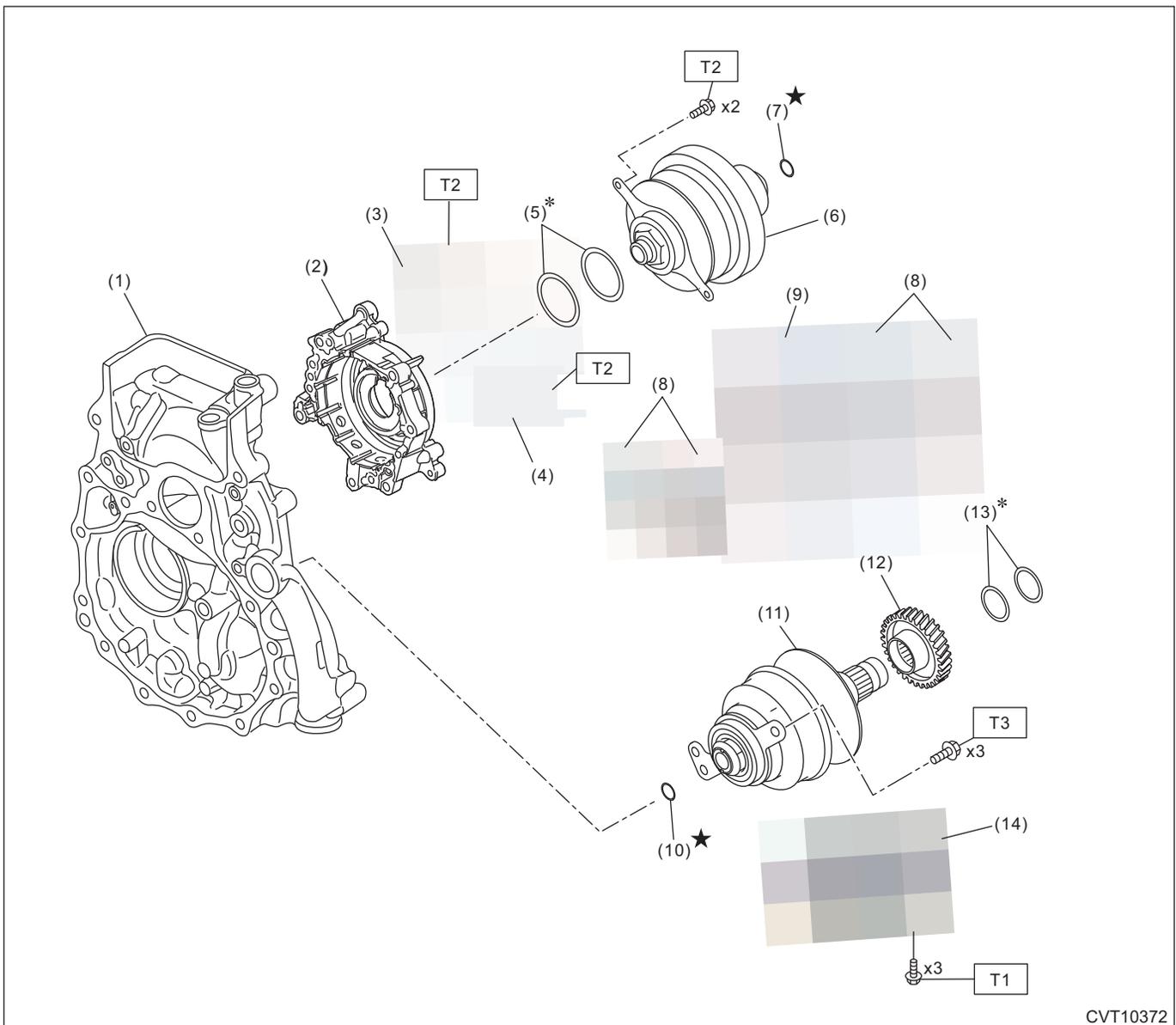
T4: 18 (1.8, 13.3)

T5: 25 (2.5, 18.4)

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

8. PRIMARY PULLEY, SECONDARY PULLEY & VARIATOR CHAIN AND REDUCTION DRIVE GEAR



- | | |
|---------------------------|----------------------------|
| (1) Drive pinion retainer | (8) Chain guide |
| (2) Reverse brake housing | (9) Variator chain |
| (3) Support rod | (10) Seal ring |
| (4) Lubrication pipe | (11) Secondary pulley ASSY |
| (5) Primary pulley shim | (12) Reduction drive gear |
| (6) Primary pulley ASSY | (13) Reduction gear shim |
| (7) Seal ring | (14) Oil baffle |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 16 (1.6, 11.8)

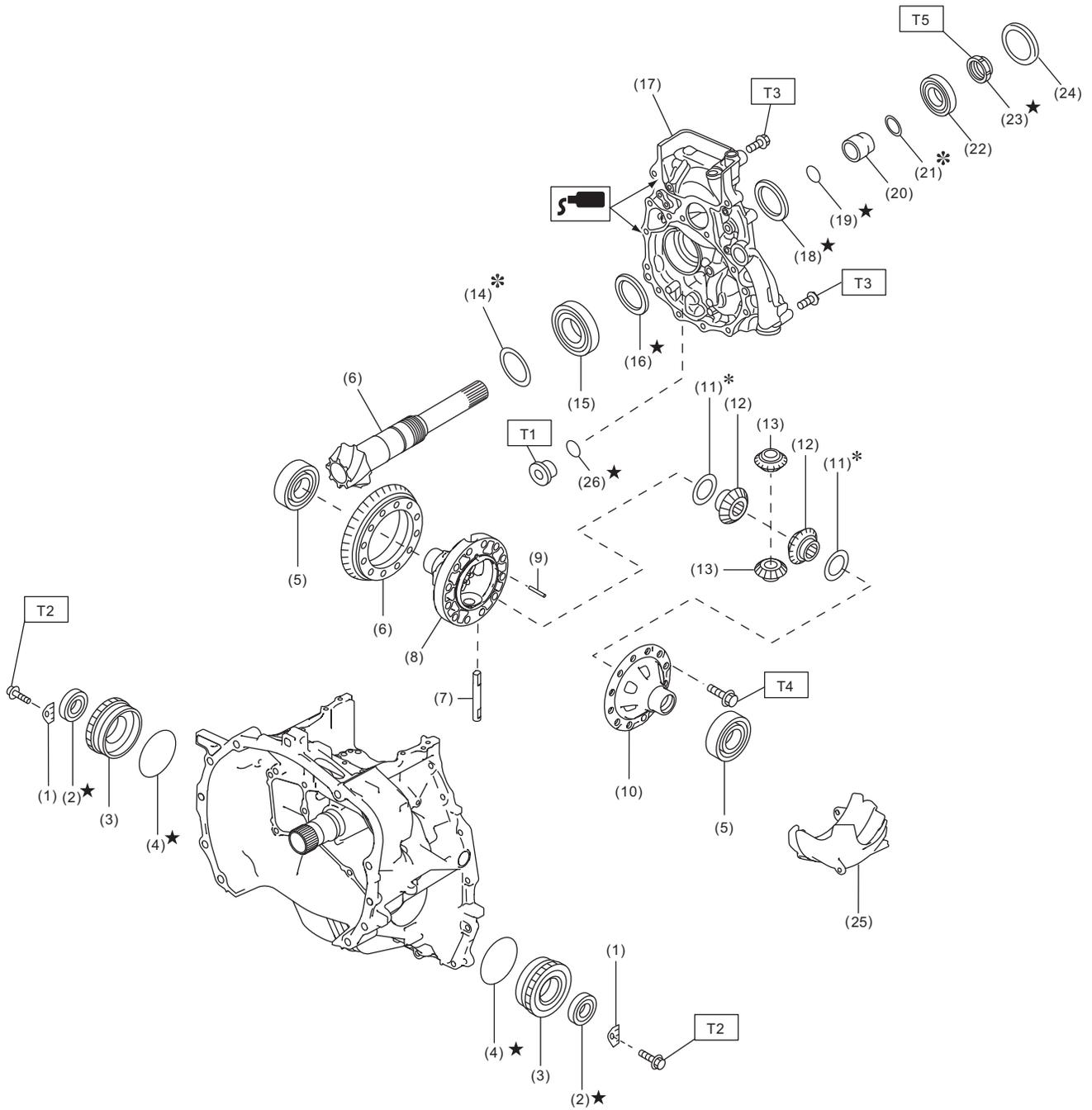
T2: 21 (2.1, 15.5)

T3: 67.5 (6.9, 49.8)

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

9. FRONT DIFFERENTIAL GEAR



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CVT10053

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

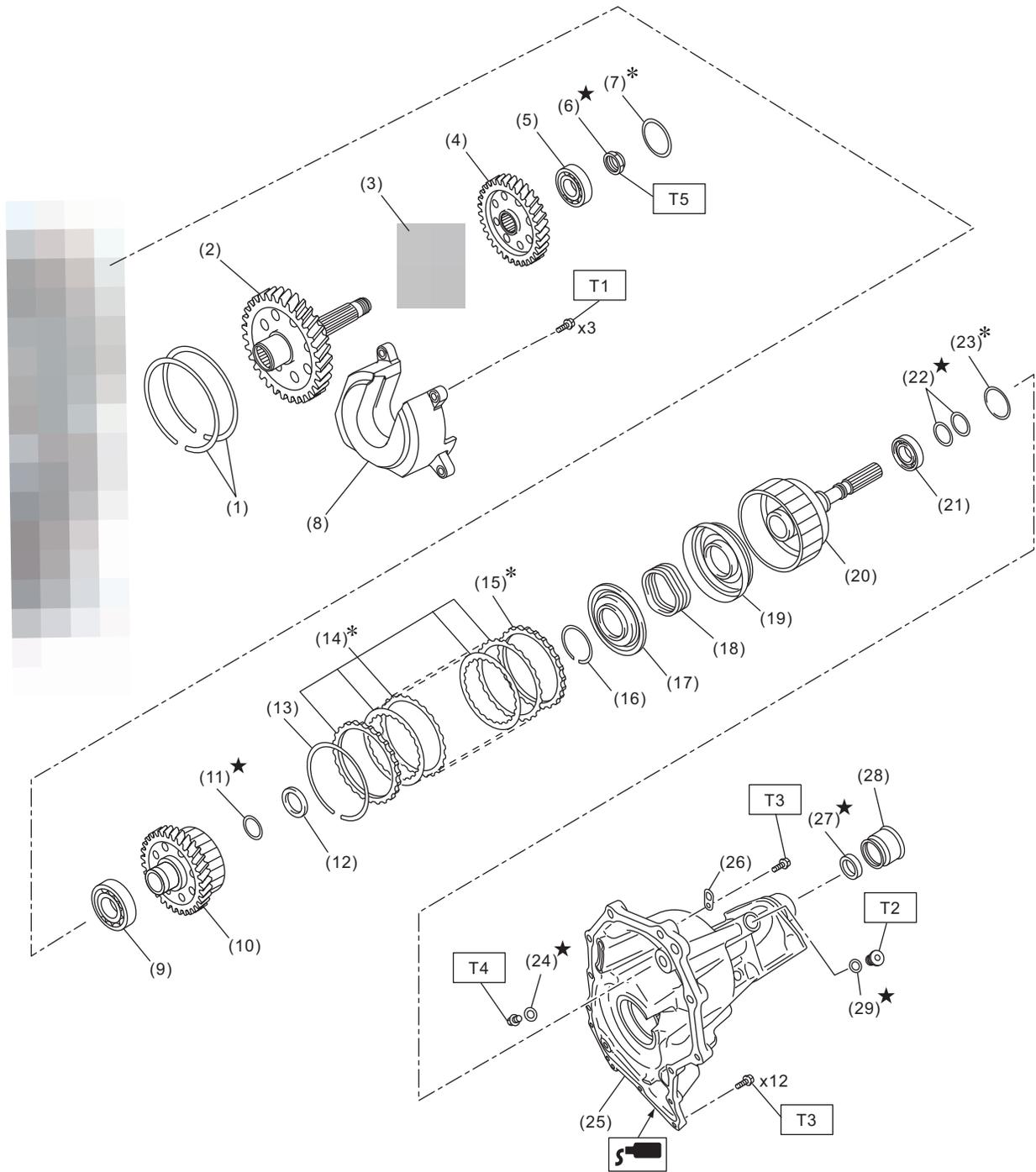
(1) Lock plate	(12) Differential bevel gear	(23) Lock nut
(2) Oil seal	(13) Differential bevel pinion	(24) Plug
(3) Differential side retainer	(14) Drive pinion shim	(25) Oil baffle
(4) O-ring	(15) Taper roller bearing	(26) O-ring
(5) Taper roller bearing	(16) Oil seal	
(6) Drive pinion gear set	(17) Drive pinion retainer	
(7) Pinion shaft	(18) Oil seal	
(8) Differential case RH	(19) O-ring	
(9) Straight pin	(20) Drive pinion spacer	
(10) Differential case LH	(21) Drive pinion washer	
(11) Washer	(22) Taper roller bearing	

Tightening torque: N·m (kgf-m, ft-lb)**T1: 22 (2.2, 16.2)****T2: 25 (2.5, 18.4)****T3: 43 (4.4, 31.7)****T4: 64 (6.5, 47.2)****T5: <Ref. to CVT(TR580)-327,
ASSEMBLY, Drive Pinion Shaft
Assembly.>**

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

10. TRANSFER AND EXTENSION CASE



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CVT10378

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

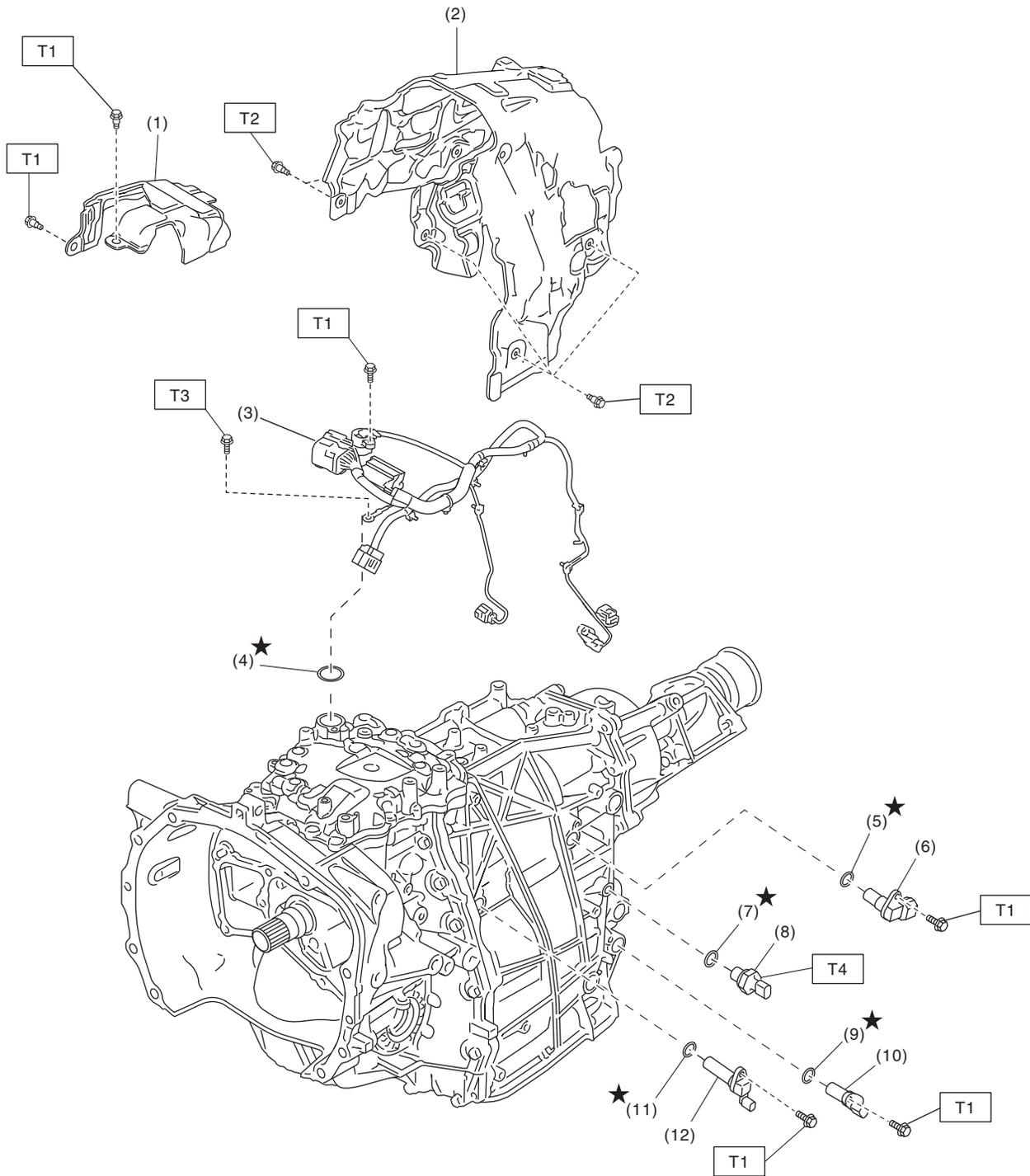
(1) Snap ring	(14) Transfer clutch plate set	(27) Oil seal
(2) Reduction driven gear COMPL	(15) Pressure plate	(28) Dust cover
(3) Parking gear	(16) Snap ring	(29) O-ring
(4) Transfer drive gear	(17) Transfer clutch piston seal	
(5) Ball bearing	(18) Transfer clutch piston return spring	
(6) Lock nut	(19) Transfer clutch piston	
(7) Transfer drive gear shim	(20) Rear drive shaft	
(8) Spacer oil	(21) Ball bearing	
(9) Ball bearing	(22) Seal ring	
(10) Transfer driven gear	(23) Transfer driven gear shim	
(11) Seal ring	(24) Gasket	
(12) Thrust bearing	(25) Extension case	
(13) Snap ring	(26) Transmission hanger	

Tightening torque: N·m (kgf·m, ft·lb)**T1: 17 (1.7, 12.5)****T2: 22 (2.2, 16.2)****T3: 25 (2.5, 18.4)****T4: 35 (3.6, 25.8)****T5: 95 (9.7, 70.1)**

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

11. TRANSMISSION HARNESS AND SENSOR



CVT00906

- | | |
|-----------------------------|-------------------------------|
| (1) Transmission case cover | (7) O-ring |
| (2) Transmission case cover | (8) Secondary pressure sensor |
| (3) Transmission harness | (9) O-ring |
| (4) O-ring | (10) Secondary speed sensor |
| (5) O-ring | (11) O-ring |
| (6) Primary speed sensor | (12) Turbine speed sensor |

Tightening torque: N·m (kgf·m, ft·lb)

T1: 7 (0.7, 5.2)

T2: 8 (0.8, 5.9)

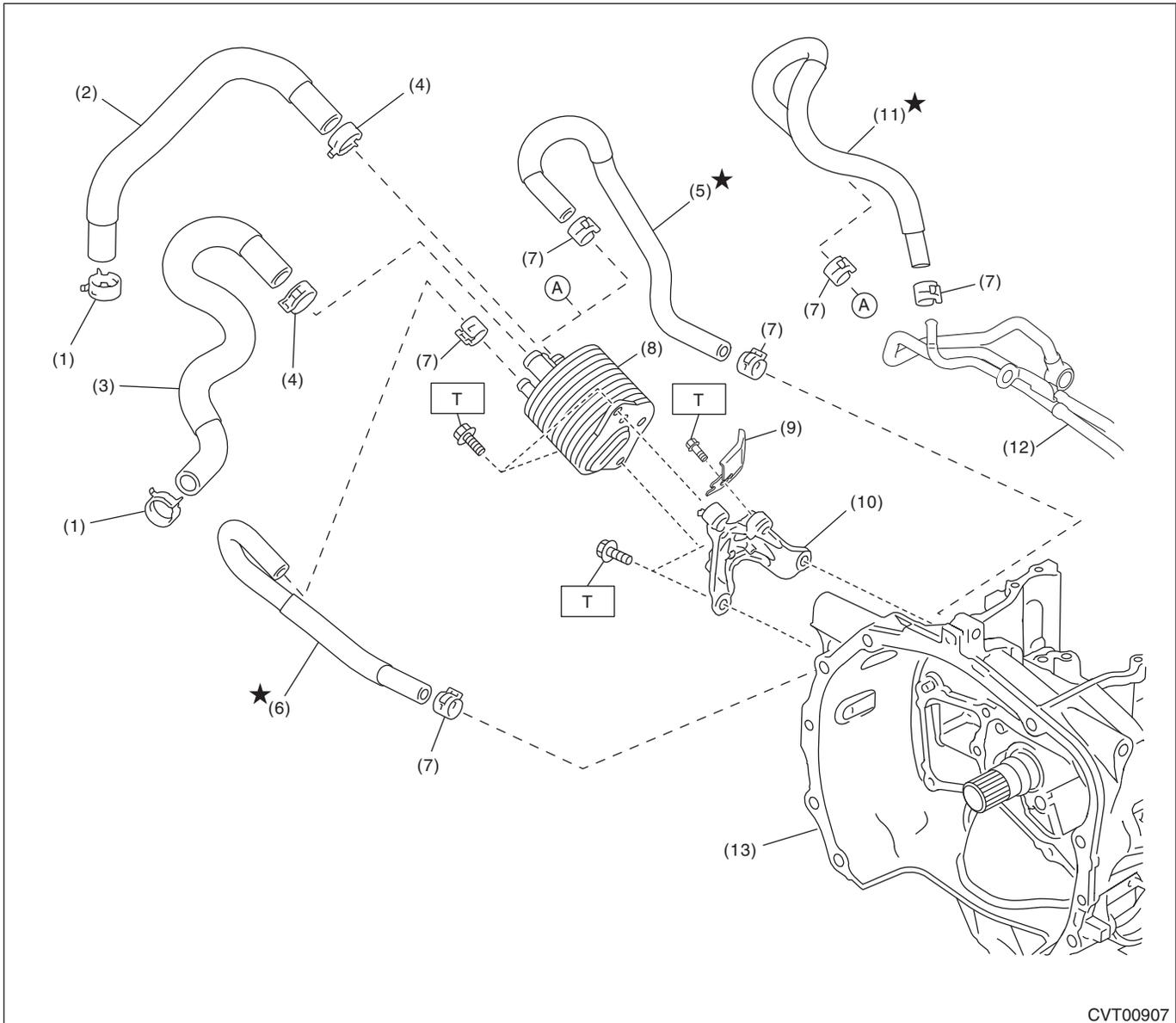
T3: 14 (1.4, 10.3)

T4: 39 (4.0, 28.8)

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

12.CVTF COOLER (WITH WARMER FEATURE)



- (1) Hose clamp
- (2) Engine coolant outlet hose
- (3) Engine coolant inlet hose
- (4) Hose clamp
- (5) CVTF cooler inlet hose (except for OUTBACK model)
- (6) CVTF cooler outlet hose

- (7) Hose clamp
- (8) CVTF cooler (with warmer feature)
- (9) Harness stay
- (10) CVTF cooler bracket
- (11) CVTF cooler inlet hose (OUTBACK model)
- (12) Oil cooler pipe COMPL (OUTBACK model)

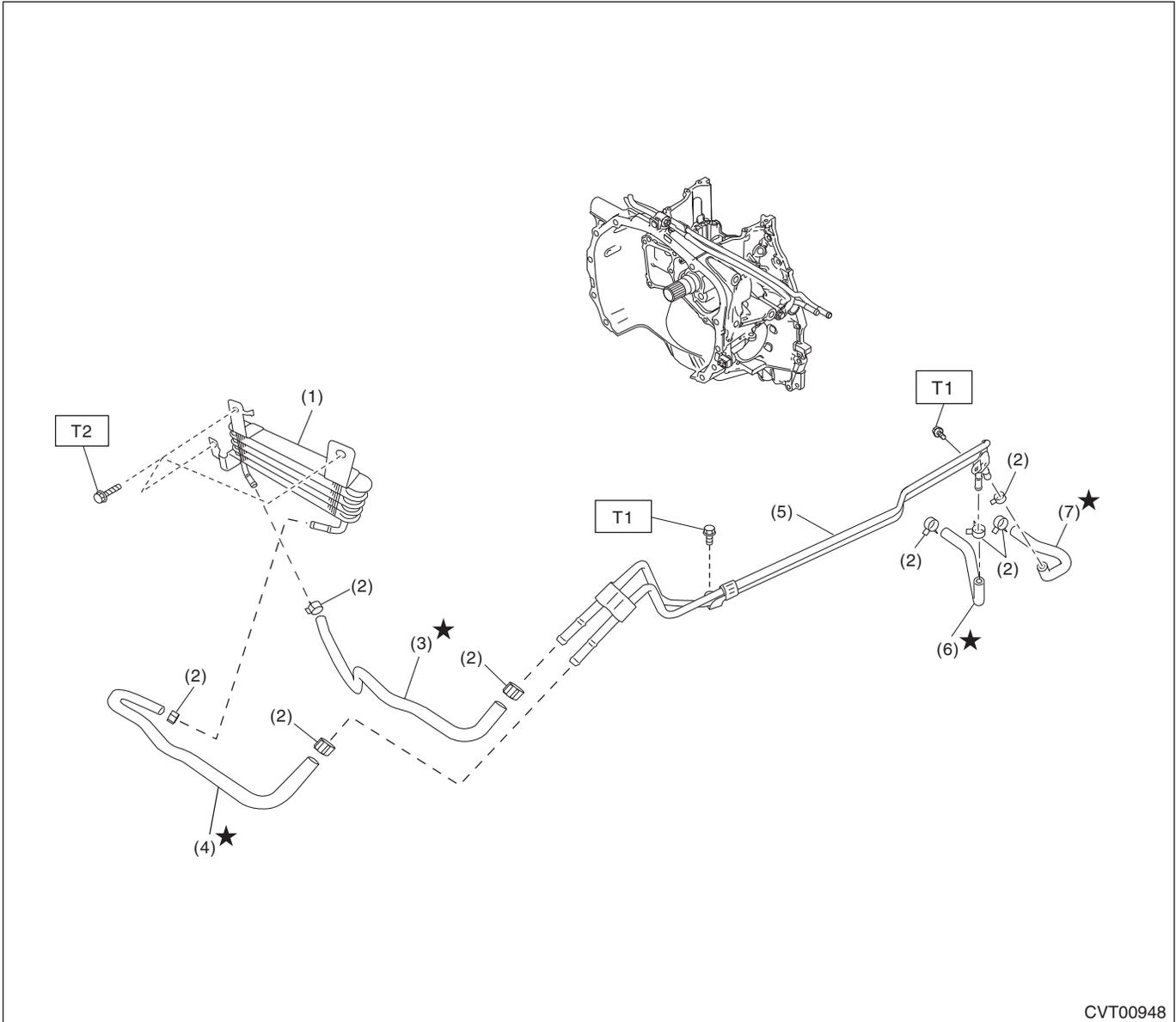
- (13) Converter case

Tightening torque: N-m (kgf-m, ft-lb)
T: 23 (2.3, 17.0)

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

13. CVTF COOLER PIPE AND HOSE



- | | |
|----------------------------------------|---------------------------|
| (1) CVTF cooler (air cool) | (5) CVTF cooler pipe ASSY |
| (2) CVTF hose clip | (6) CVTF CVT outlet hose |
| (3) CVTF cooler (air cool) inlet hose | (7) CVTF CVT inlet hose |
| (4) CVTF cooler (air cool) outlet hose | |

Tightening torque: N·m (kgf·m, ft·lb)

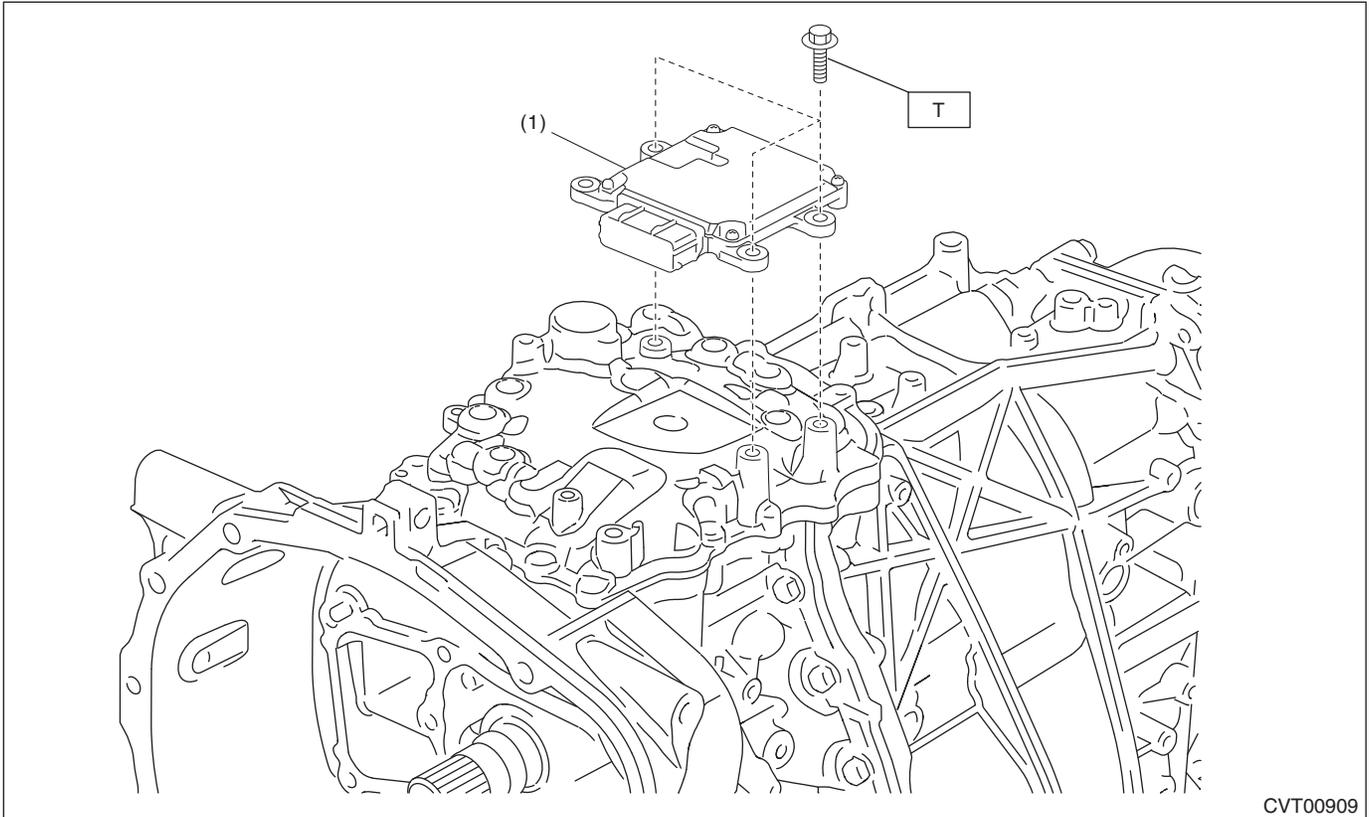
T1: 7.5 (0.8, 5.5)

T2: 12 (1.2, 8.9)

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

14. TRANSMISSION CONTROL MODULE



CVT00909

- (1) Transmission control module (TCM)

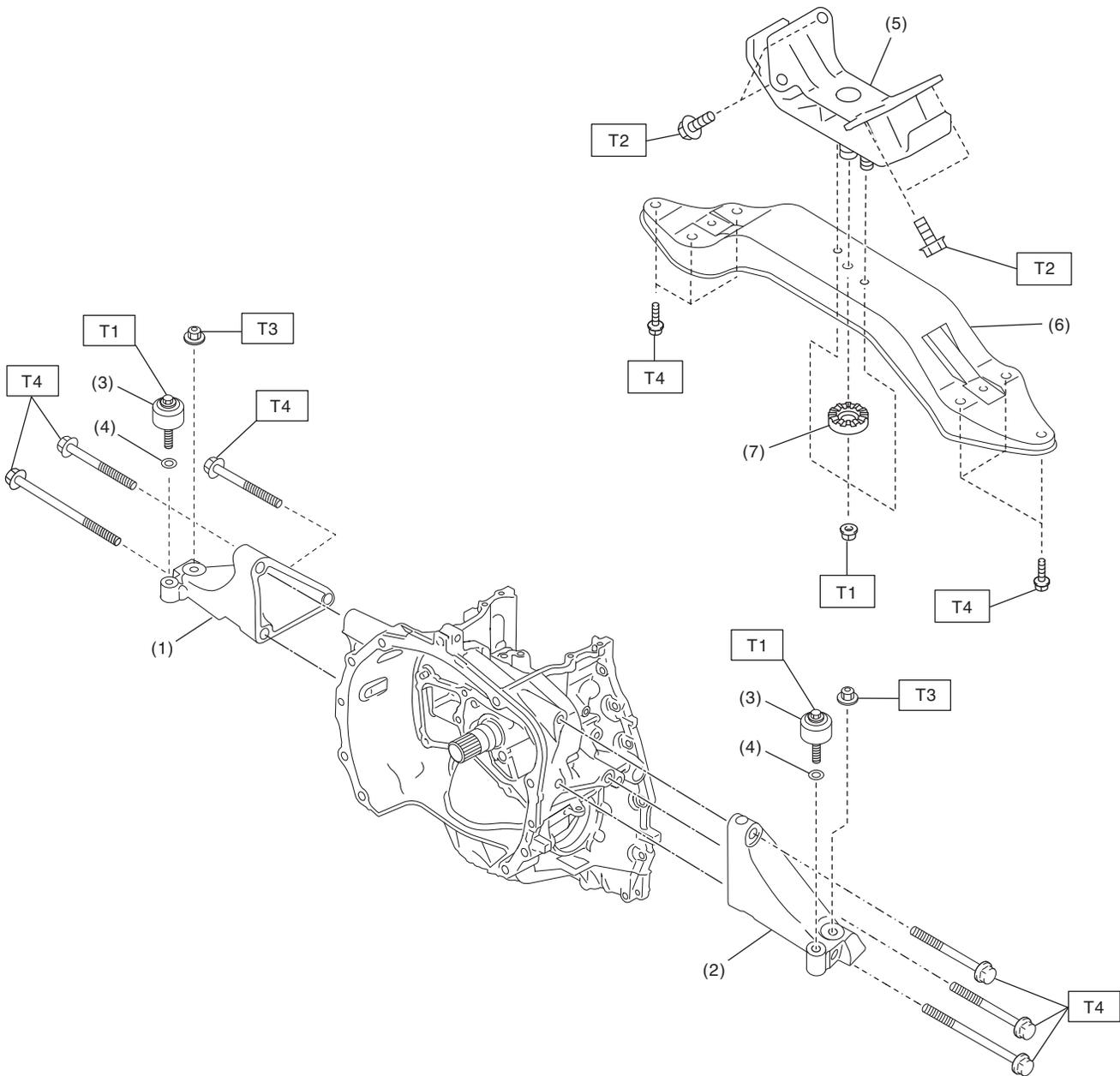
Tightening torque: N·m (kgf·m, ft·lb)

T: 7 (0.7, 5.3)

General Description

CONTINUOUSLY VARIABLE TRANSMISSION

15. TRANSMISSION MOUNTING



CVT00908

- | | |
|----------------------------------------|-----------------------------------|
| (1) Transmission mounting bracket (RH) | (5) Rear cushion rubber |
| (2) Transmission mounting bracket (LH) | (6) Transmission rear crossmember |
| (3) Dynamic damper | (7) Stopper |
| (4) Washer | |

Tightening torque: N-m (kgf-m, ft-lb)

T1: 35 (3.6, 25.8)

T2: 40 (4.1, 29.5)

T3: 45 (4.6, 33.2)

T4: 75 (7.6, 55.3)

General Description

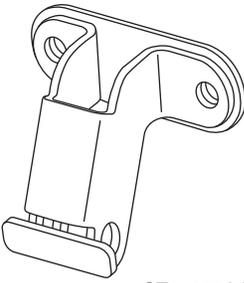
CONTINUOUSLY VARIABLE TRANSMISSION

C: CAUTION

- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Do not place the valve cover with its inner side facing up until it is installed, to prevent intrusion of foreign matter into the control valve body.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- When disassembling the case and other light alloy parts, use a plastic hammer to force it apart. Do not pry apart with screwdrivers or other tools.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine CVTF and recommended grease. Do not mix CVTF, grease etc. of different grades or manufacturers.
- Be sure to tighten bolts and nuts to the specified torque.
- Apply CVTF onto sliding or revolving surfaces before installation.
- Replace deformed or damaged snap rings with new parts.
- Before installing O-rings or oil seals, apply sufficient amount of CVTF or gear oil to appropriate locations in order to avoid damage and deformation.
- Be careful not to incorrectly install or fail to install O-rings, snap rings and other such parts.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or cloth between the part and the vise.
- Avoid damaging the mating surface of the case.
- Before applying liquid gasket, completely remove the old liquid gasket.
- After removing the sensors, breather hose and plugs, plug the holes to avoid foreign materials intruding as necessary.
- During disassembly or assembly, be sure to use nylon gloves or paper towels. Do not use cloth gloves or waste cloth.
- Be careful of handling the oil seal, O-ring and gasket. If the contact surface of them is damaged, oil leakage may occur.
- When pressing-in the oil seal, make sure that the oil seal lip portion and outer surface are not damaged or tilted.
- When replacing the taper roller bearing, replace the outer race and inner race as a set.
- When replacing the hypoid gear, replace the hypoid gear and drive pinion shaft as a set.
- Replace the bolts if the seating surface or the thread surface is excessively rusted.

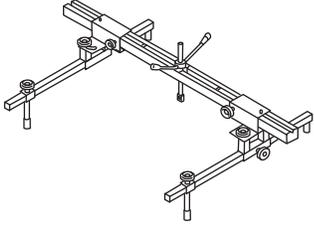
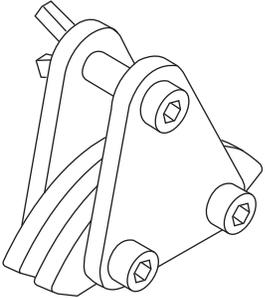
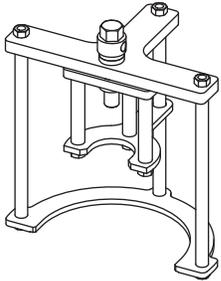
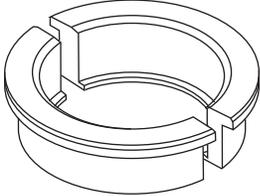
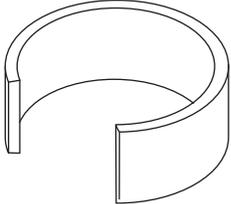
D: PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST41099AJ130	41099AJ130	ST H4 (FA, FB)	Used for holding and balancing the engine unit.

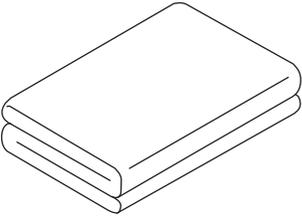
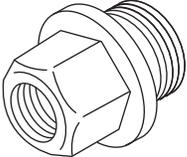
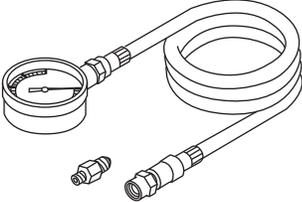
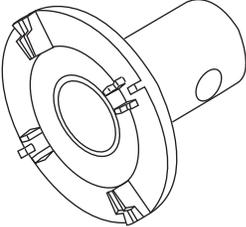
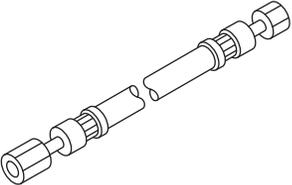
General Description

CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST99099AJ000</p>	99099AJ000	ENGINE HANGER	<ul style="list-style-type: none"> Used for removing and installing transmission assembly. Used together with CHAIN BALANCER (99099AJ010).
 <p>ST99099AJ010</p>	99099AJ010	CHAIN BALANCER	<ul style="list-style-type: none"> Used for removing and installing transmission assembly. Used together with ENGINE HANGER (99099AJ000).
 <p>ST18769AA010</p>	18769AA010	EXPANDER PULLEY	Used for removing and installing the secondary pulley assembly.
 <p>ST18767AA010</p>	18767AA010	BEARING REMOVER	Used for removing the ball bearing of transfer clutch assembly.
 <p>ST18762AA010</p>	18762AA010	COMPRESSOR SPECIAL TOOL	Used for removing and installing snap ring of forward clutch assembly.

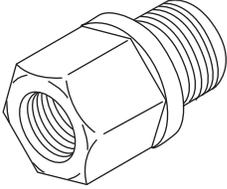
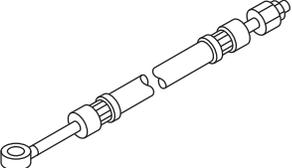
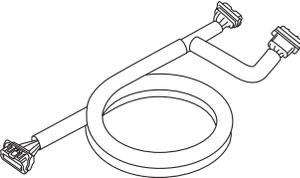
General Description

CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST18761AA010</p>	18761AA010	SHEET SPECIAL TOOL	<ul style="list-style-type: none"> • Used for removing and installing control valve body. • Used for removing and installing valve cover. • Used for removing and installing transmission harness.
 <p style="text-align: center;">ST18681AA010</p>	18681AA010	PRESSURE GAUGE ADAPTER	<p>Used for measuring the secondary pressure (line pressure).</p> <p>NOTE: Used together with the genuine O-ring (part No. 806916050).</p>
 <p style="text-align: center;">ST18801AA000</p>	18801AA000	OIL PRESSURE GAUGE ASSY	Used for measuring the secondary pressure (line pressure).
 <p style="text-align: center;">ST18658AA020</p>	18658AA020	WRENCH COMPL RETAINER	Used for removing and installing the differential side retainer.
 <p style="text-align: center;">ST34099AC010</p>	34099AC010	ADAPTER HOSE A	Used for measuring the transfer clutch hydraulic pressure.

General Description

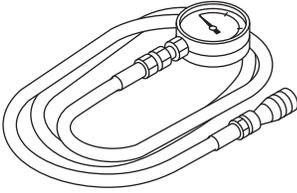
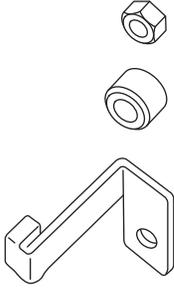
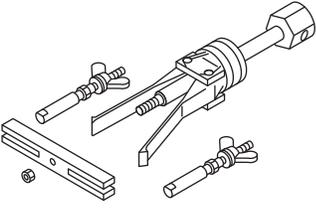
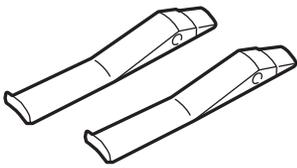
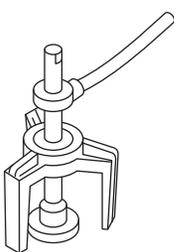
CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18681AA000</p>	18681AA000	PRESSURE GAUGE ADAPTER	Used for measuring the transfer clutch hydraulic pressure. NOTE: Used together with the genuine O-ring (Part No. 806911080).
 <p>ST34099AC020</p>	34099AC020	ADAPTER HOSE B	Used for measuring the transfer clutch hydraulic pressure. NOTE: Used together with genuine union screw (Part No. 801914010) and gasket (Part No. 803914060).
 <p>ST18460AA040</p>	18460AA040	CHECK BOARD	Used for measuring voltage and resistance of TCM terminals.
 <p>ST18360AA040</p>	18360AA040	HANGER	Used for removing and installing transmission assembly.
 <p>ST18363AA050</p>	18363AA050	BOLT	Used for removing and installing transmission assembly.

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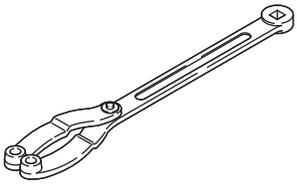
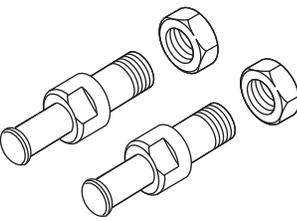
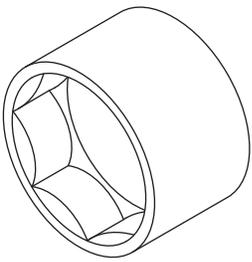
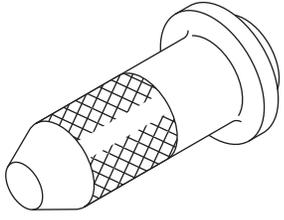
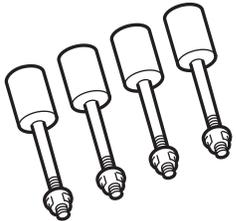
CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498575400</p>	498575400	OIL PRESSURE GAUGE ASSY	Used for measuring the transfer clutch hydraulic pressure.
 <p>ST-498277200</p>	498277200	STOPPER SET	<ul style="list-style-type: none"> • Used for removing and installing transmission assembly to engine. • Used for preventing the torque converter from dropping off.
 <p>ST-398527700</p>	398527700	PULLER ASSY	<ul style="list-style-type: none"> • Used for removing the extension case oil seal. • Used for removing the bearing outer race of the drive pinion shaft. • Used for removing the bearing of transmission case.
 <p>ST18760AA000</p>	18760AA000	CLAW	<ul style="list-style-type: none"> • Used for removing the bearing of transmission case. • Used together with PULLER ASSY (398527700).
 <p>ST-398673600</p>	398673600	COMPRESSOR	Used for removing and installing snap ring of forward clutch assembly.

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General Description

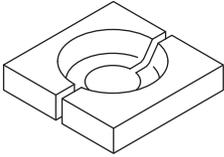
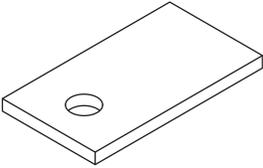
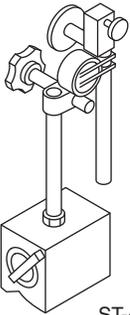
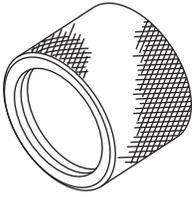
CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18355AA000</p>	18355AA000	PULLEY WRENCH	<ul style="list-style-type: none"> • Used for removing and installing the lock nut of reduction driven gear. • Used together with PIN SET (18334AA000).
 <p>ST18334AA000</p>	18334AA000	PIN SET	<ul style="list-style-type: none"> • Used for removing and installing the lock nut of reduction driven gear. • Used together with PULLEY WRENCH (18355AA000).
 <p>ST-499987003</p>	499987003	SOCKET WRENCH (35)	Used for removing and installing the lock nut of reduction driven gear.
 <p>ST-498057300</p>	498057300	INSTALLER	Used for installing the extension case oil seal.
 <p>ST18632AA000</p>	18632AA000	STAND ASSY	Used for disassembling and assembling the transmission.

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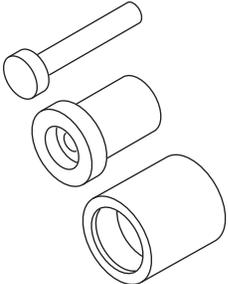
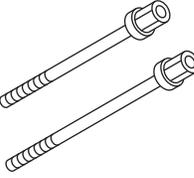
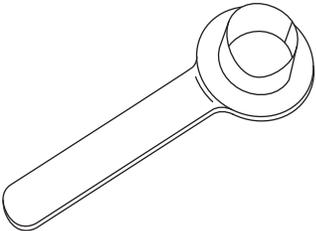
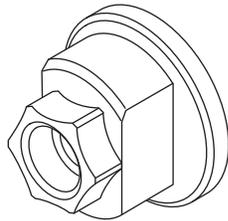
CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-498515500</p>	498515500	REMOVER	Used for removing the bearing inner race of the drive pinion shaft.
 <p style="text-align: center;">ST-498255400</p>	498255400	PLATE	Used for measuring the backlash of hypoid gear.
 <p style="text-align: center;">ST-498247001</p>	498247001	MAGNET BASE	<ul style="list-style-type: none"> • Used for measuring the backlash of differential bevel pinion gear. • Used for measuring the backlash of hypoid gear. • Used together with DIAL GAUGE (498247100).
 <p style="text-align: center;">ST-498247100</p>	498247100	DIAL GAUGE	<ul style="list-style-type: none"> • Used for measuring the backlash of differential bevel pinion gear. • Used for measuring the backlash of hypoid gear. • Used together with MAGNET BASE (498247001).
 <p style="text-align: center;">ST18675AA000</p>	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing the differential side retainer oil seal.

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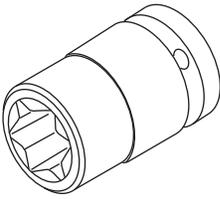
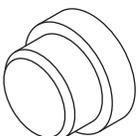
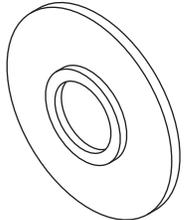
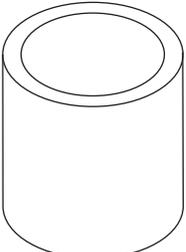
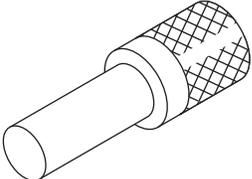
CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18762AA001</p>	18762AA001	COMPRESSOR SPECIAL TOOL	<ul style="list-style-type: none"> Used for disassembling and installing the multi-plate clutch piston. COMPRESSOR SPECIAL TOOL (18762AA000) can also be used.
 <p>ST-927720000</p>	927720000	HOUSING BUSHING INSTALLER AND REMOVER	<ul style="list-style-type: none"> Used for installing the oil seal. Use BUSHING SHAFT (927880000).
 <p>ST18763AA000</p>	18763AA000	COMPRESSOR SHAFT	Used for measuring the backlash of hypoid gear.
 <p>ST28399SA010</p>	28399SA010	OIL SEAL PROTECTOR	Used for protecting oil seal when installing front drive shaft.
 <p>ST-498937110</p>	498937110	HOLDER	<ul style="list-style-type: none"> Used for removing and installing the drive pinion lock nut. Used as a holder to rotate gear when checking tooth contact.

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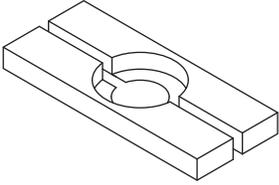
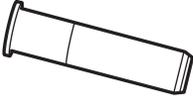
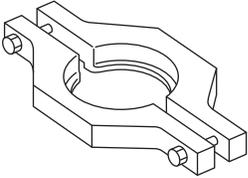
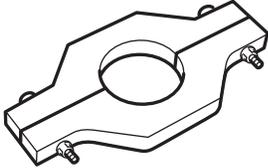
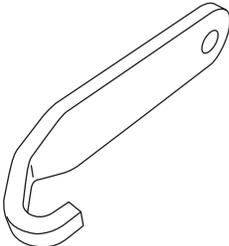
CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST18270KA020</p>	18270KA020	SOCKET (E20)	<ul style="list-style-type: none"> • Used for removing and installing the hypoid driven gear. • Used for removing and installing the drive pinion shaft retainer.
 <p>ST-398497701</p>	398497701	SEAT	Used for removing and installing the bearing.
 <p>ST-398177700</p>	398177700	INSTALLER	<ul style="list-style-type: none"> • Used for installing the ball bearing. • Used for installing the parking gear. • Used for installing the bearing outer race. • Used for installing the plug.
 <p>ST28499TC010</p>	28499TC010	PRESS SNAP RING	<ul style="list-style-type: none"> • Used for installing the bearing outer race of drive pinion shaft. • Used for installing the ball bearing of the transmission case.
 <p>ST-899864100</p>	899864100	REMOVER	<ul style="list-style-type: none"> • Used for removing and installing the ball bearing. • Used for removing the parking gear and transfer drive gear. • Used for removing the bearing inner race of the front differential.

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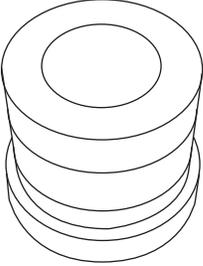
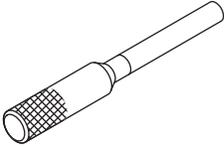
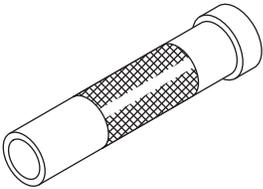
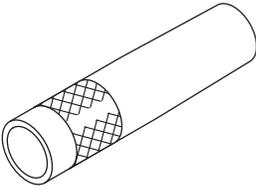
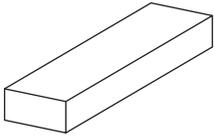
CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-498077000</p>	498077000	REMOVER	Used for removing the bearing inner race of the front differential.
 <p>ST18657AA010</p>	18657AA010	INSTALLER	Used for installing the oil seal at shifter arm shaft portion.
 <p>ST-498077600</p>	498077600	REMOVER	Used for removing the ball bearing of drive sprocket.
 <p>ST18723AA000</p>	18723AA000	REMOVER	Used for removing the ball bearing of transfer clutch assembly.
 <p>ST-498497300</p>	498497300	CRANKSHAFT STOPPER	Used for stopping the drive plate rotation when removing and installing the drive plate.

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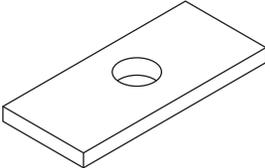
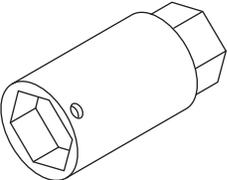
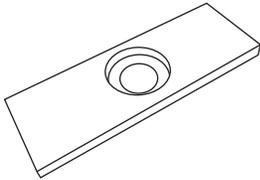
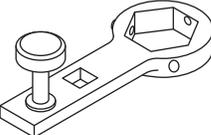
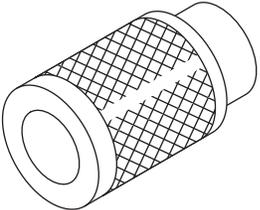
General Description

CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p style="text-align: center;">ST-399513600</p>	399513600	INSTALLER	Used for removing the ball bearing of drive sprocket.
 <p style="text-align: center;">ST-499267300</p>	499267300	STOPPER PIN	Used for adjusting the inhibitor switch.
 <p style="text-align: center;">ST-499277100</p>	499277100	BUSHING 1-2 INSTALLER	<ul style="list-style-type: none"> • Used for installing the ball bearing. • Used for installing the bearing inner race. • Used for installing the ball bearing of the transmission case.
 <p style="text-align: center;">ST-499277200</p>	499277200	INSTALLER	Used for installing the ball bearing of the transfer clutch assembly.
 <p style="text-align: center;">ST-499575400</p>	499575400	GAUGE	Used for measuring height of end play.

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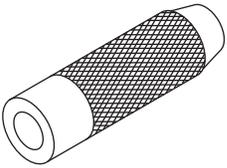
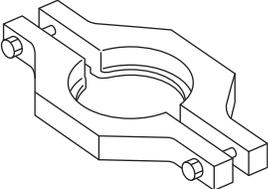
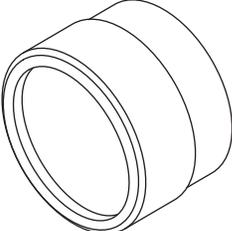
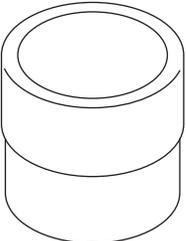
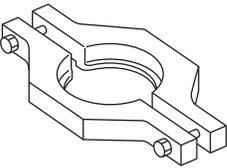
CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-499575500</p>	499575500	GAUGE	Used for measuring height of end play.
 <p>ST-499787500</p>	499787500	ADAPTER	<ul style="list-style-type: none"> • Used for removing and installing the drive pinion shaft lock nut. • Used for measuring the preload of the drive pinion shaft. • Used for measuring the backlash of hypoid gear.
 <p>ST-499575600</p>	499575600	GAUGE	Used for measuring height of end play.
 <p>ST-499787700</p>	499787700	WRENCH	<ul style="list-style-type: none"> • Used for removing and installing the drive pinion shaft lock nut. • Used for measuring the preload of the drive pinion shaft. • Used for measuring the backlash of hypoid gear.
 <p>ST-499757002</p>	499757002	INSTALLER	<ul style="list-style-type: none"> • Used for removing the bearing of reduction driven gear. • Used for installing the parking gear. • Used for installing the transfer drive gear.

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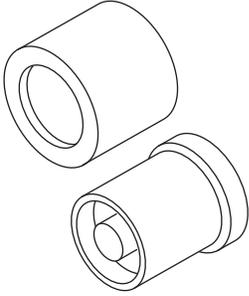
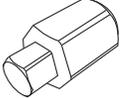
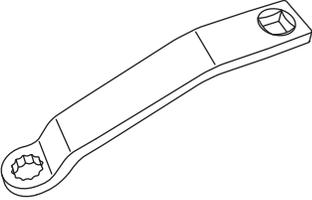
CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST-899580100</p>	899580100	INSTALLER	<ul style="list-style-type: none"> • Used for installing the collar of reduction driven gear. • Used for installing the ball bearing of the transfer driven gear. • Used for installing the bearing inner race of drive pinion shaft.
 <p>ST-498077300</p>	498077300	REMOVER	Used for installing the ball bearing of reduction driven gear.
 <p>ST-499755502</p>	499755502	PRESS SNAP RING	Used for installing the drive sprocket ball bearing.
 <p>ST-499755602</p>	499755602	PRESS SNAP RING	<ul style="list-style-type: none"> • Used for installing the oil seal. • Used for installing the plug.
 <p>ST-498077400</p>	498077400	REMOVER	Used for removing the ball bearing of transfer driven gear.

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CONTINUOUSLY VARIABLE TRANSMISSION

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 <p>ST20099AE020</p>	20099AE020	INSTALLER	Used for installing the bearing outer race of drive pinion shaft.
 <p>ST18270AA040</p>	18270AA040	SOCKET	Used for removing and installing the transfer clutch pressure test plug.
 <p>ST73099SG000</p>	73099SG000	SPECIAL TOOL CONDENSER	Used for installing the transfer clutch pressure test plug.
 <p>ST-927130000</p>	927130000	EXTENSION DRIVE SHAFT	Used for installing the bearing inner race of drive pinion shaft.
 <p>STSSM4</p>	—	SUBARU SELECT MONITOR 4	Used for setting of each function and trouble-shooting for electrical system. NOTE: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

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General Description

CONTINUOUSLY VARIABLE TRANSMISSION

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Thickness gauge	Used for measuring the clearance in reverse brake, forward clutch and transfer clutch.
Caliper	Used for measuring the dimension.
Spring scale	Used for measuring the starting torque of the drive pinion.
TORX® bit T70	Used for removing and installing differential gear oil drain plug.
Straight pin remover	Used for removing and installing the straight pin and spring pin.
Push/pull gauge	Used for measuring clutch clearance.
Chain sling	Used for removing and installing transmission. <ul style="list-style-type: none">• Length: 0.8 — 1 m (2.6 — 3.3 ft)• Load capacity: 1.2 t (2646 lb) or more• Diameter: 6 mm (0.24 in) or 6.3 mm (0.25 in)• Chain external width: 23.5 mm (0.93 in) or less• Chain internal width: 8.5 mm (0.33 in) or more
Screw shackle	Used for removing and installing transmission. <ul style="list-style-type: none">• Load capacity: 250 kg (551 lb) or more• Use two pieces.
Angle gauge	Used for installing the drive plate.
DST-i	Used together with Subaru Select Monitor 4.

2. CVTF

A: INSPECTION

Check for leakage of CVTF from transmission.

B: ADJUSTMENT

CAUTION:

- CVTF level changes along with CVTF temperature. When inspecting CVTF level, observe the specified CVTF temperature.

- Always use specified CVTF. Using other fluid will cause malfunction.

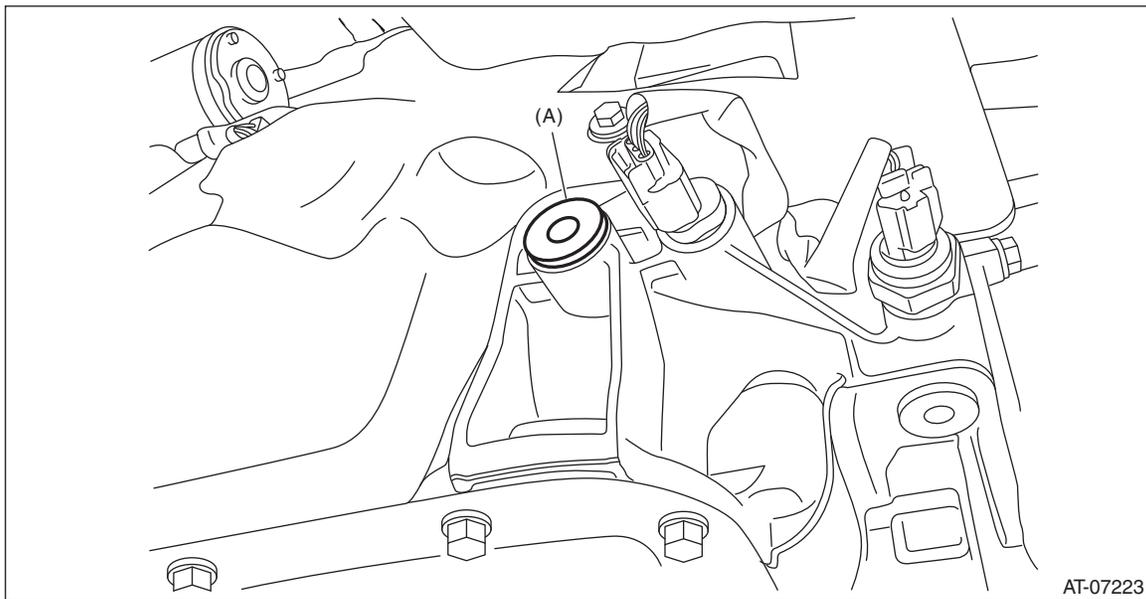
- 1) Start the engine to raise CVTF temperature to 35 — 45°C (95 — 113°F) on Subaru Select Monitor.
- 2) Operate the select lever in P → R → N → D and D → N → R → P to circulate CVTF with the engine idling.
- 3) With the engine idling, lift up the vehicle and remove the filler plug.

CAUTION:

Pay special attention to the following operations as the engine is at idle.

NOTE:

CVTF is at the specified level when it is up to the filler plug hole lower section.



(A) Filler plug

- 4) When there is no CVTF leakage from the transmission, add the specified fluid up to the filler plug hole lower section.

Specified fluid:

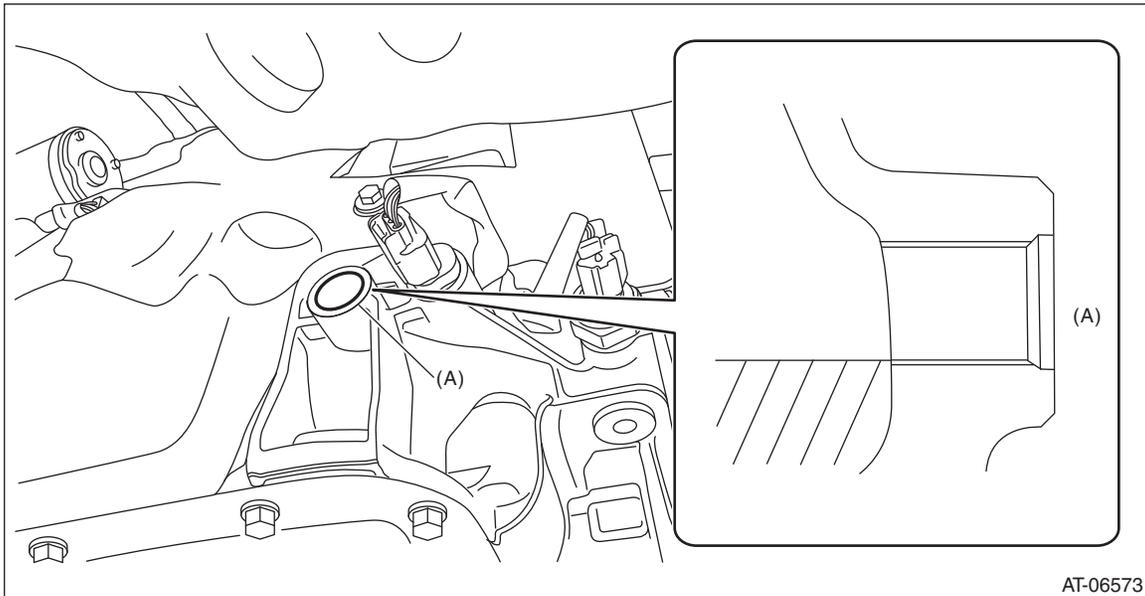
<Ref. to CVT(TR580)-4, HYDRAULIC CONTROL AND LUBRICATION, SPECIFICATION, General Description.>

CVTF

CONTINUOUSLY VARIABLE TRANSMISSION

CAUTION:

Note that when CVTF is added up to the lower section of filler plug while the transmission is in cold condition, overfilling of CVTF occurs, causing the oil to spill out.



(A) Filler plug hole

5) Install the filler plug.

NOTE:

Use a new gasket.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

C: REPLACEMENT

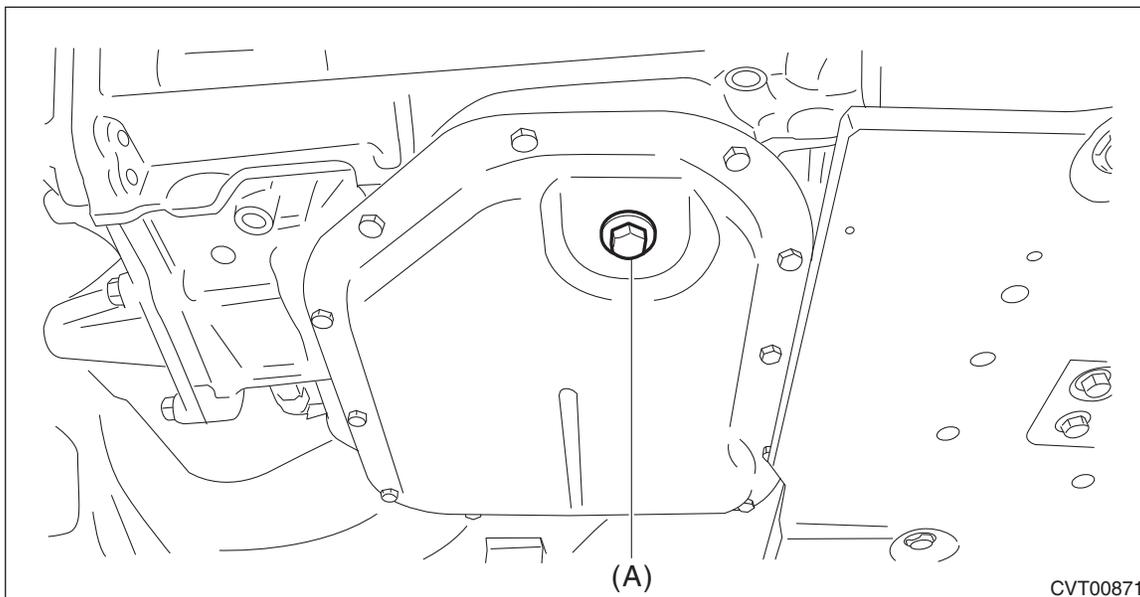
CAUTION:

- Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.
- Be careful not to spill the CVTF on exhaust pipe to prevent it from emitting smoke or causing fires. If CVTF adheres, wipe it off completely.
- Always use specified CVTF. Using other fluid will cause malfunction.

CVTF

CONTINUOUSLY VARIABLE TRANSMISSION

- 1) Lift up the vehicle, and remove the CVTF drain plug.



(A) CVTF drain plug

- 2) Check the CVTF condition. <Ref. to CVT(TR580)-42, CONDITION CHECK, CVTF.>
- 3) Install the CVTF drain plug and gasket.

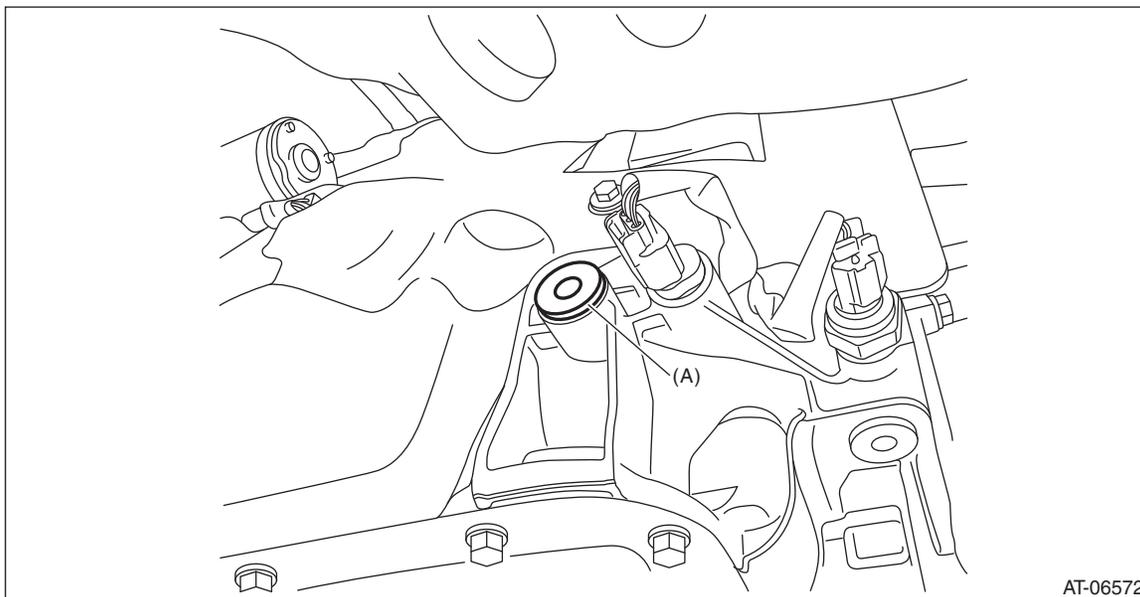
NOTE:

Use a new gasket.

Tightening torque:

31 N·m (3.2 kgf·m, 22.9 ft·lb)

- 4) Remove the filler plug.



(A) Filler plug

- 5) Add the specified fluid up to the filler plug hole lower section.

Specified fluid:

<Ref. to CVT(TR580)-4, HYDRAULIC CONTROL AND LUBRICATION, SPECIFICATION, General Description.>

CVTF

CONTINUOUSLY VARIABLE TRANSMISSION

- 6) Temporarily tighten the filler plug.
- 7) Idle the engine to raise CVTF temperature to 35 — 45°C (95 — 113°F) on Subaru Select Monitor.
- 8) Operate the select lever in P → R → N → D and D → N → R → P to circulate CVTF with the engine idling.

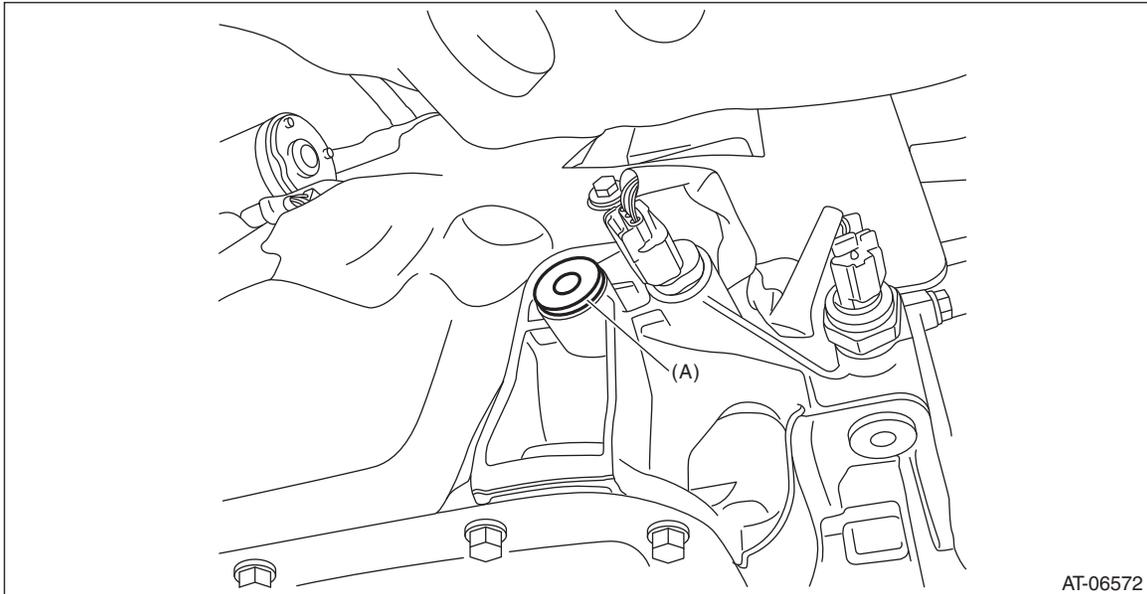
CAUTION:

Pay special attention to the following operations as the engine is at idle.

- 9) With the select lever shifted to “P” range and the engine started, lift up the vehicle. Adjust the CVTF level and check for leakage. <Ref. to CVT(TR580)-39, ADJUSTMENT, CVTF.>
- 10) Replace with a new gasket, and attach the filler plug.

Tightening torque:

50 N·m (5.1 kgf·m, 36.9 ft·lb)



(A) Filler plug

D: CONDITION CHECK

NOTE:

When replacing CVTF, determine the condition inside the transmission body by inspecting the drained CVTF.

Fluid condition	Trouble and possible cause	Corrective action
Metal particles.	Excessive wear of the internal of the transmission body.	Replace CVTF and check if CVT operates correctly.
Thick and varnish-form fluid.	Burnt clutches	Replace CVTF and check the CVT body or vehicle for faulty.
Clouded CVTF or bubbles.	Water mixed in fluid.	Replace CVTF and check the water entering point.

3. Differential Gear Oil

A: INSPECTION

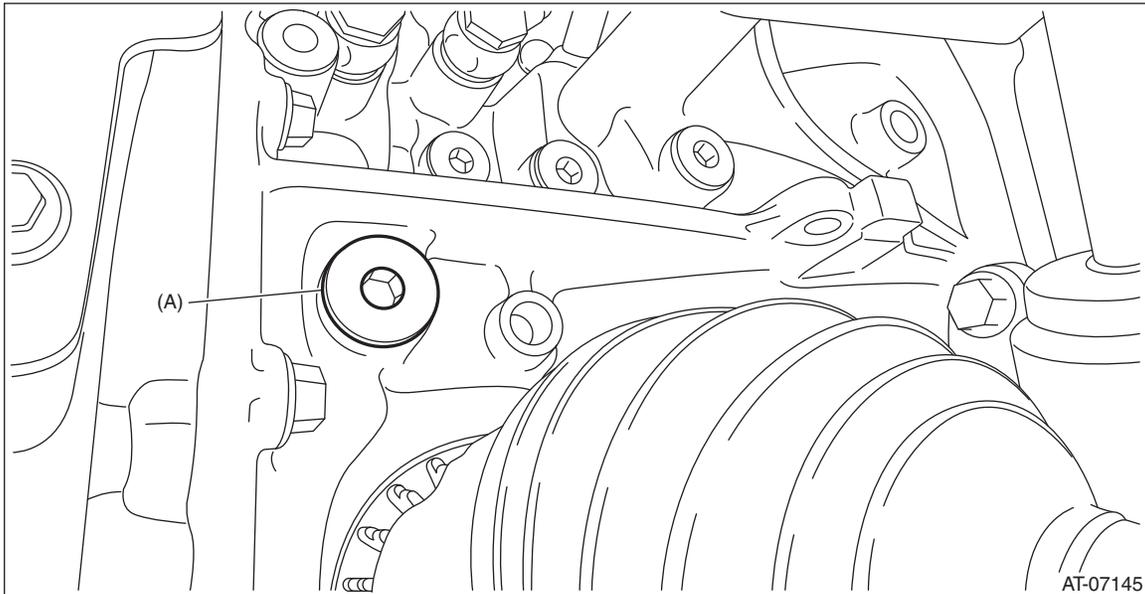
Check that there is no leakage of differential gear oil from the converter case.

B: ADJUSTMENT

NOTE:

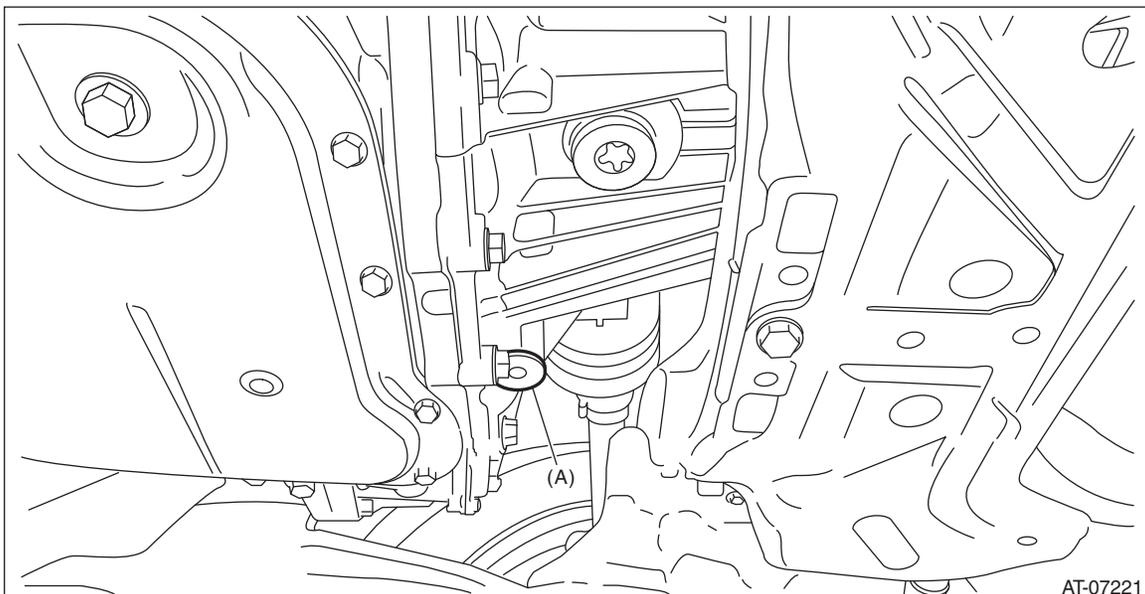
Immediately after removing the overflow drain plug, remaining gear oil (approx. 8 cc) may come out of the overflow pipe. This is not included in the specified amount. When removing the overflow drain plug, make sure the gear oil flows out of the overflow drain plug hole by filling with gear oil.

- 1) Lift up the vehicle.
- 2) Remove the under cover - front.
- 3) Remove the filler plug.



(A) Filler plug

- 4) Remove the overflow drain plug.



(A) Overflow drain plug

Differential Gear Oil

CONTINUOUSLY VARIABLE TRANSMISSION

5) Fill in the differential gear oil through the filler plug hole up to where the oil flows out of the overflow drain plug.

Recommended gear oil:

<Ref. to CVT(TR580)-4, FRONT DIFFERENTIAL GEAR OIL, SPECIFICATION, General Description.>

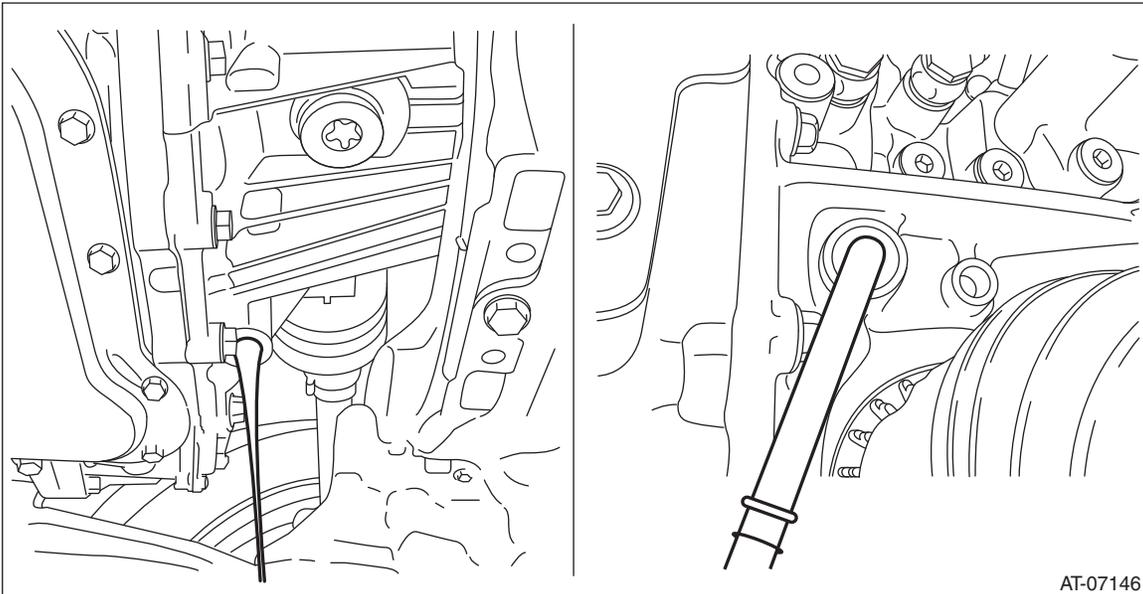
6) When the flow of the differential gear oil turns into a narrow stream, install the overflow drain plug.

NOTE:

Use a new gasket.

Tightening torque:

50 N·m (5.1 kgf·m, 36.9 ft·lb)



7) Install the filler plug.

NOTE:

Use a new gasket.

Tightening torque:

50 N·m (5.1 kgf·m, 36.9 ft·lb)

C: REPLACEMENT

CAUTION:

- Immediately after the vehicle has been running or after idling for a long time, the differential gear oil will be hot. Be careful not to burn yourself.
- Be careful not to spill differential gear oil on the exhaust pipe to prevent it from emitting smoke or causing a fire. If gear oil adheres, wipe it off completely.

- 1) Lift up the vehicle.
- 2) Remove the under cover - front.
- 3) Remove the differential gear oil drain plug using TORX[®] bit T70. Drain differential gear oil.
- 4) Install the differential gear oil drain plug using TORX[®] bit T70.

NOTE:

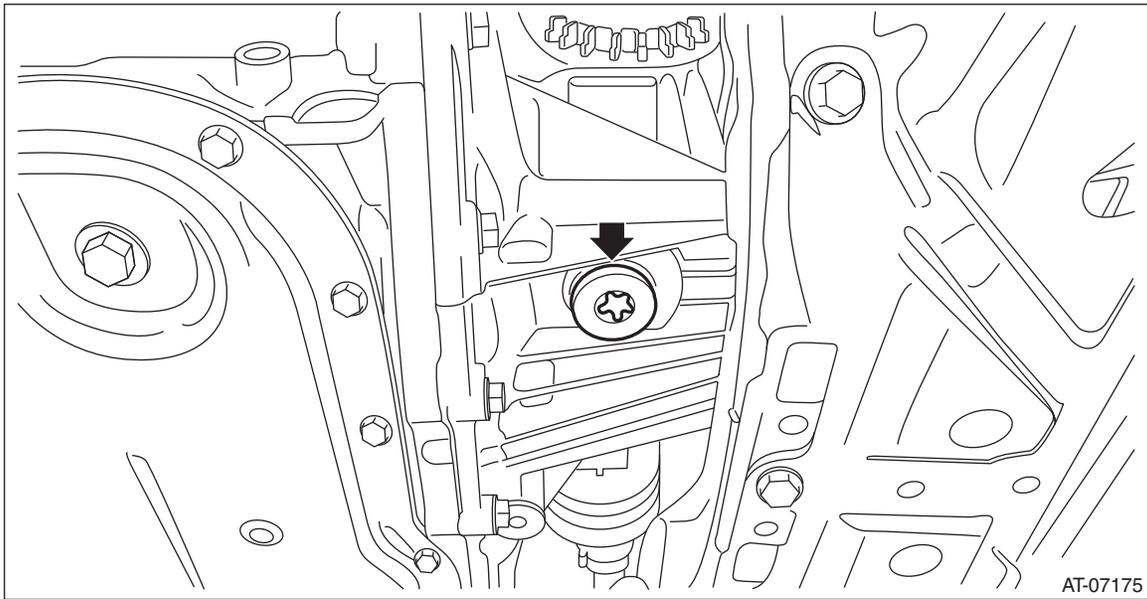
Use a new gasket.

Differential Gear Oil

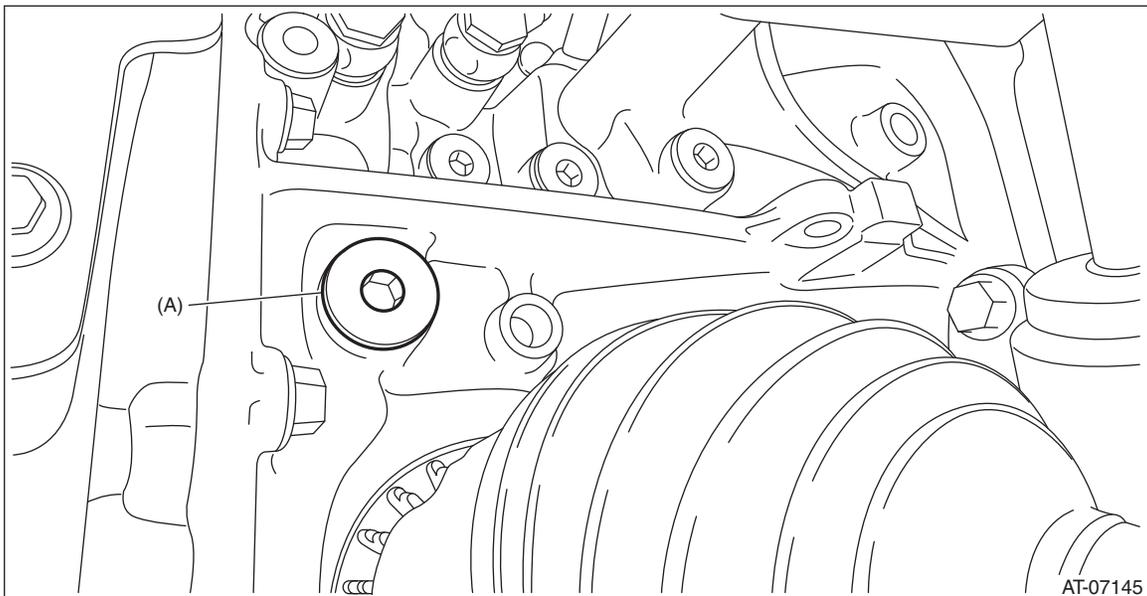
CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

70 N·m (7.1 kgf·m, 51.6 ft·lb)



5) Remove the filler plug.



(A) Filler plug

6) Pour gear oil into the filler plug hole.

Recommended gear oil:

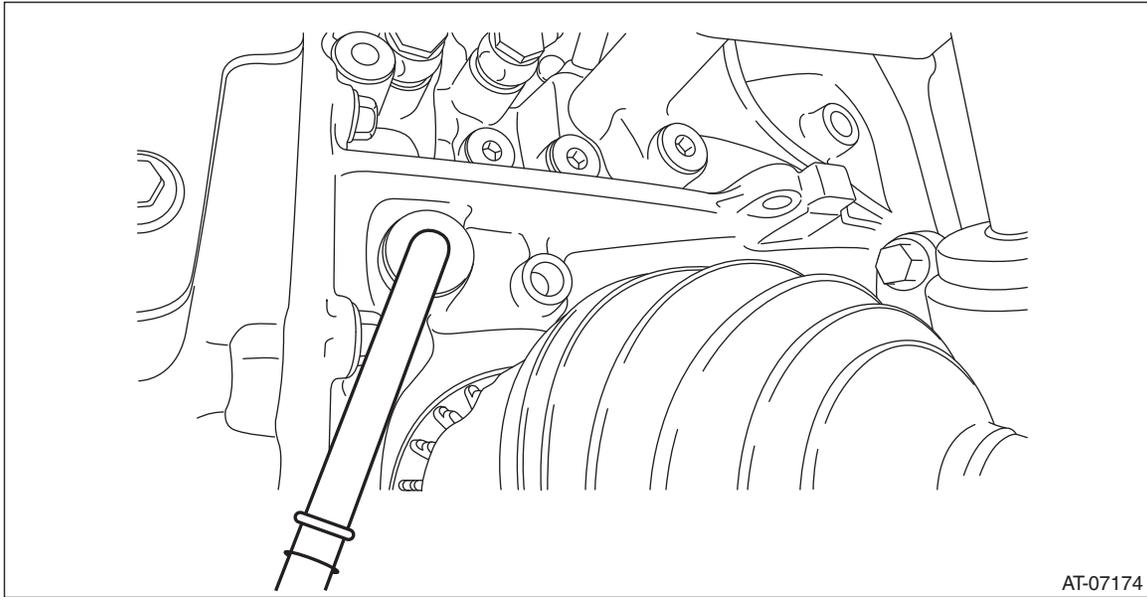
<Ref. to CVT(TR580)-4, FRONT DIFFERENTIAL GEAR OIL, SPECIFICATION, General Description.>

Differential Gear Oil

CONTINUOUSLY VARIABLE TRANSMISSION

Gear oil capacity:

<Ref. to CVT(TR580)-4, FRONT DIFFERENTIAL GEAR OIL, SPECIFICATION, General Description.>



7) Adjust the level of differential gear oil. <Ref. to CVT(TR580)-43, ADJUSTMENT, Differential Gear Oil.>

4. AWD ON/OFF Switching Mode

A: GENERAL DESCRIPTION

- Follow the messages displayed on the Subaru Select Monitor when working.
- Perform as necessary in FWD mode.
- When switched to FWD, AWD light illuminates.

B: PROCEDURE

CAUTION:

- **Do not turn the power of the Subaru Select Monitor OFF during work, and do not disconnect the data link connector.**

- **On completing the work in FWD, switch back in AWD.**

- 1) Shift the select lever to “P” range.
- 2) Connect the Subaru Select Monitor to data link connector.
- 3) Turn the ignition to ON. (For model with push button ignition switch, press the push button ignition switch twice without depressing brake pedal.)
- 4) Turn off all switches causing an electrical load, such as headlights, A/C, seat heater and rear defogger.
- 5) Select «Diagnosis» in the «Start» screen of Subaru Select Monitor.
- 6) On «Vehicle selection» display, input the vehicle information and select «Confirmed».
- 7) On «Main Menu» display, select «Each System».
- 8) On «Select System» display, select «Transmission Control System».
- 9) On «Select Function» display, select «Work Support».
- 10) Select «AWD ON/OFF switching mode» in the «Work Support» screen.
- 11) Follow the messages displayed on the Subaru Select Monitor screen when working.

Switching completes successfully if any of the following messages is displayed.

- When switching from AWD to FWD: «Switched to FF. To return to AWD, perform basic mode again.»
- When switching from FWD to AWD: «Switched to AWD. To return to FF, perform basic mode again.»

NOTE:

- If communication error occurs during switching mode, start in the “AWD ON/OFF switching mode” again.
- If operation is interrupted before the successful end message is displayed, perform the «AWD ON/OFF switching mode» from the beginning until confirming the operation is successfully ended. If this mode fails to complete successfully, the cause is as follows.
 - Select lever is not in “P” range.
 - Engine is running.
- For detailed operation procedures, refer to “Application help”.

5. Road Test

A: INSPECTION

1. GENERAL PRECAUTION

Road tests should be conducted to properly diagnose the condition of CVT.

CAUTION:

Always observe the local traffic laws when performing the test.

2. D RANGE SHIFT FUNCTION

Make sure that the engine speed is 1,100 — 1,400 r/min while driving on the level road at 50 km/h (31 MPH) after accelerating from halting up to 1/4 of accelerator opening angle. Then stop the vehicle. Check normal gear change has occurred while the vehicle speed changes from a constant speed to zero.

3. KICK-DOWN FUNCTION

Check if engine speed will rise by operating the accelerator opening angle to the full from a constant speed of 50 km/h (31 MPH) or more.

4. ENGINE BRAKE OPERATION

- Drive in “7th speed of manual mode” [90 — 100 km/h (56 — 62 MPH)], and shift down from 7th to 6th. Check if the indicator of combination meter switches “7” → “6”. At the same time, check engine braking in 6th gear.
- Drive in “6th speed of manual mode” [70 — 80 km/h (43 — 50 MPH)], and shift down from 6th to 5th. Check if the indicator of combination meter switches “6” → “5”. At the same time, check the engine brake in 5th gear.
- Drive in “5th speed of manual mode” [60 — 70 km/h (37 — 43 MPH)], and shift down from 5th to 4th. Check if the indicator of combination meter switches “5” → “4”. At the same time, check the engine brake in 4th gear.
- Drive in “4th speed of manual mode” [50 — 60 km/h (31 — 37 MPH)], and shift down from 4th to 3rd. Check if the indicator of combination meter switches “4” → “3”. At the same time, check the engine brake in 3rd gear.
- Drive in “3rd speed of manual mode” [40 — 50 km/h (25 — 31 MPH)], and shift down from 3rd to 2nd. Check if the indicator of combination meter switches “3” → “2”. At the same time, check the engine brake in 2nd gear.
- Drive in “2nd speed of manual mode” [20 — 30 km/h (12 — 19 MPH)], and shift down from 2nd to 1st. Check if the indicator of combination meter switches “2” → “1”. At the same time, check the engine brake in 1st gear.

5. LOCK-UP FUNCTION

When the accelerator is lightly depressed while driving on a flat road in “D” range, check that rpm does not change abruptly.

6. P RANGE OPERATION

Stop the vehicle on an uphill grade of 5% or more and shift to the “P” range and apply the parking brake. Check that the vehicle does not move when the parking brake is released.

7. NOISE AND VIBRATION

Check for noise and vibration during driving at a constant speed, accelerating, decelerating and manual shift operation.

8. OIL LEAKAGE

After the driving test, inspect for leakage of CVTF and differential gear oil from the transmission body.

6. Stall Test

A: INSPECTION

CAUTION:

Make sure no other person is around the vehicle during stall test measurement.

NOTE:

Stall test is extremely important in diagnosing the condition of CVT and engine. The test is necessary to measure the engine stall speeds in “R” and “D” range.

Purposes of the stall test:

- Operational check of forward clutch and reverse brake
 - Operational check of the torque converter assembly
 - Engine performance check
- 1) Place wheel chocks at the front and rear of all wheels and engage the parking brake.
 - 2) Turn the A/C OFF.
 - 3) Using the Subaru Select Monitor, check if the throttle valve operates when you depress the accelerator pedal. <Ref. to EN(H4DO)(diag)-59, DISPLAY OF ENGINE FREEZE FRAME DATA, OPERATION, Subaru Select Monitor.>
 - 4) Check the engine oil level. <Ref. to LU(H4DO)-9, Engine Oil.>
 - 5) Check the coolant level. <Ref. to CO(H4DO)-15, Engine Coolant.>
 - 6) Adjust the CVTF level. <Ref. to CVT(TR580)-39, ADJUSTMENT, CVTF.>
 - 7) Increase the CVTF temperature to 60 — 80°C (140 — 176°F) with the engine running and the select lever shifted to “N” or “P” range.
 - 8) Shift the select lever to “D” range.
 - 9) Depress the accelerator pedal to the full while fully depressing the foot brake pedal with your left foot.
 - 10) When the engine speed stabilizes, quickly record the engine speed and release accelerator pedal. Shift the select lever to “N” range. Let the engine idle for one minute or more to cool it down.
 - 11) Shift to “R” range and perform the same stall test.

NOTE:

- Do not perform a stall test for over 5 seconds at a time. (From closed throttle, fully open throttle to stall speed reading.) Failure to follow this instruction will cause the engine oil and CVTF to deteriorate and the clutch and brake to be adversely affected.
- Be sure to cool down the engine for at least one minute after each stall test with the select lever set in the “P” or “N” range and with the idle speed of 1,200 r/min or less.
- If the stall speed is higher than the specified range, attempt to finish the stall test in as short a time as possible, in order to prevent the CVT from sustaining damage.

Stall speed standard:

D range: 1,900 — 2,700 r/min

R range: 1,800 — 2,600 r/min

Stall Test

CONTINUOUSLY VARIABLE TRANSMISSION

Stall test judgment

Range	Range	Probable cause
Lower than standard value	D, R	<ul style="list-style-type: none">• Insufficient engine output• Torque converter malfunction
Higher than standard value	D	<ul style="list-style-type: none">• Forward clutch slippage• Secondary pressure (line pressure) is low.• Variator chain malfunction
	R	<ul style="list-style-type: none">• Reverse brake slippage• Secondary pressure (line pressure) is low.• Variator chain malfunction
	D, R	<ul style="list-style-type: none">• Torque converter malfunction• Control valve body malfunction• TCM malfunction• Damaged harness and harness connector

7. Time Lag Test

A: INSPECTION

NOTE:

When the select lever is shifted while the engine is idling, there will be a certain time elapse or lag before shock is felt. This symptom helps to check the condition of forward clutch and reverse brake.

- Perform the test at normal operation CVTF temperature of 60 — 80°C (140 — 176°F).
- Be sure to allow one minute or more interval between tests.
- Make three measurements and take the average value.

1) Apply the parking brake.

2) Start the engine. Check the idle speed. (A/C OFF)

3) Shift the select lever from “N” to “D” range. Using a stop watch, measure the time elapsed from shifting the lever until the shock is felt.

Time lag standard:

1.5 seconds or less

If “N” → “D” time lag is longer than specified:

- Secondary pressure (line pressure) is too low.
- Forward clutch worn
- Forward clutch piston malfunction
- Control valve body malfunction
- Learning incomplete

4) In the same manner, measure the time lag when shifting from “N” range to “R” range.

Time lag standard:

1.5 seconds or less

If “N” → “R” time lag is longer than specified:

- Secondary pressure (line pressure) is too low.
- Reverse brake worn
- Reverse brake piston malfunction
- Control valve body malfunction
- Learning incomplete

Secondary Pressure (Line Pressure) Test

CONTINUOUSLY VARIABLE TRANSMISSION

8. Secondary Pressure (Line Pressure) Test

A: INSPECTION

CAUTION:

- Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.
- Make sure no other person is around the vehicle during secondary pressure (line pressure) test measurement.
- After performing the secondary pressure (line pressure) test measurement, adjust the CVTF level.

NOTE:

- If the pulley and variator chain, clutch or brake show signs of slipping or shift feel is not correct, check the secondary pressure (line pressure).
- Connect Subaru Select Monitor to vehicle so as to measure the engine speed and actual secondary pressure (secondary pressure (line pressure)).
- In many cases, slippage or inability to operate the vehicle may be due to insufficient oil pressure for the operation of clutch, brake or control valve.

1) Lift up the vehicle.

2) Remove the secondary pressure (line pressure) test plug, and install ST1 and ST2.

CAUTION:

Removal of the test plug and installation of the ST shall be both performed quickly.

Secondary Pressure (Line Pressure) Test

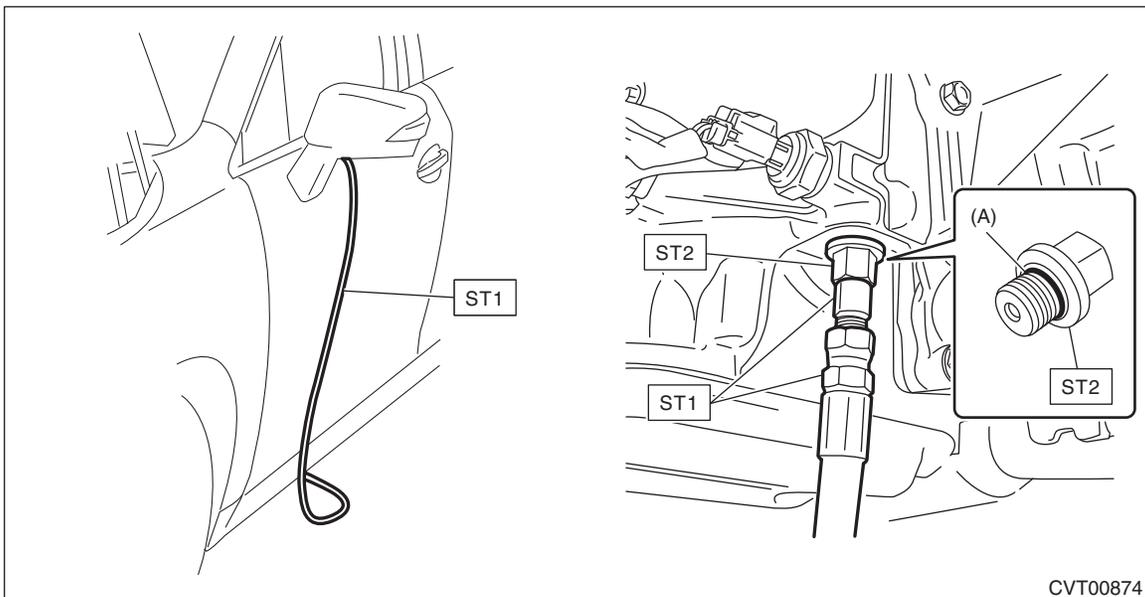
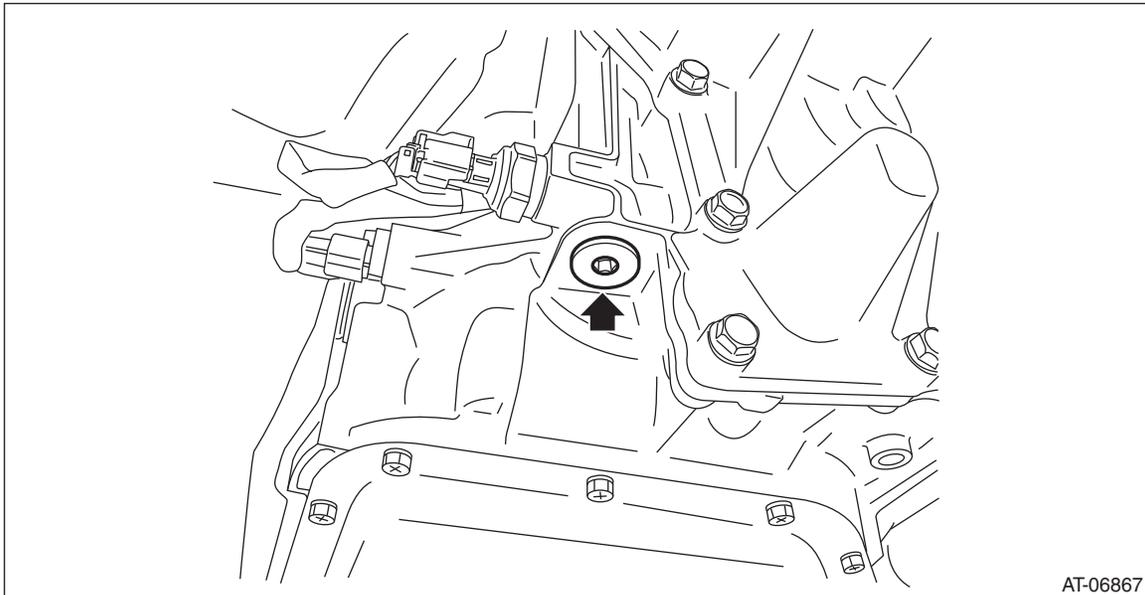
CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Use ST2 PRESSURE GAUGE ADAPTER with genuine O-ring (Part No. 806916050) attached.

ST1 18801AA000 OIL PRESSURE GAUGE ASSY

ST2 18681AA010 PRESSURE GAUGE ADAPTER



(A) O-ring (genuine part)

- 3) Lower the vehicle.
- 4) Set the gauge so that it can be seen from the driver's seat.
- 5) Using the Subaru Select Monitor, check if the throttle valve operates when you depress the accelerator pedal. <Ref. to EN(H4DO)(diag)-59, DISPLAY OF ENGINE FREEZE FRAME DATA, OPERATION, Subaru Select Monitor.>
- 6) Check the engine oil level. <Ref. to LU(H4DO)-9, Engine Oil.>
- 7) Check the coolant level. <Ref. to CO(H4DO)-15, Engine Coolant.>
- 8) Adjust the CVTF level. <Ref. to CVT(TR580)-39, ADJUSTMENT, CVTF.>
- 9) Increase the CVTF temperature to 60 — 80°C (140 — 176°F) with the engine running and the select lever shifted to "N" or "P" range.
- 10) Shift the select lever to "D" range.
- 11) Depress the accelerator pedal to the full while fully depressing the foot brake pedal with your left foot.

Secondary Pressure (Line Pressure) Test

CONTINUOUSLY VARIABLE TRANSMISSION

12) Immediately after the engine speed becomes steady, record the reading of the secondary pressure (line pressure), engine speed and actual secondary pressure on Subaru Select Monitor. And then release the accelerator pedal. Shift the select lever to “N” range. Let the engine idle for one minute or more to cool it down.

NOTE:

- Do not continue the stall test for 5 seconds or more at a time (from fully closed throttle, fully open throttle to secondary pressure (line pressure) reading). Failure to follow this instruction will cause the engine oil and CVTF to deteriorate and the clutch and brake to be adversely affected.
- After performing the secondary pressure (line pressure) test, be sure to cool down the engine for at least one minute with the select lever set in “P” or “N” range and with the idle speed at 1,200 r/min or less.
- Under each condition, check that the measured pressure matches almost totally with actual secondary pressure.
- When both measured pressure and actual secondary pressure are out of specification, judge as control valve malfunction.
- The value at stall is for reference because the pressure changes under different conditions or circumstances.
- The value at idling is steady because it is not affected by any condition or circumstance.
- When the engine is started with the select lever in the “P” range and the secondary pressure at idling is measured without shifting the select lever, the value may be higher than the standard. Shift the select lever to the “D” or “R” range, then measure the value.

Secondary pressure (line pressure) standard				
	Range	Throttle	Brake	Secondary pressure (line pressure) (MPa (kgf/cm ² , psi))
Stall	D, R	Full open	ON	4.5 — 6.0 (45.9 — 61.2, 652 — 870)
Idling	P, N	Full closed	OFF	0.5 — 1.5 (5.1 — 15.3, 72 — 218)

13) Remove the ST and install the plug after measurement.

CAUTION:

Removal of the ST and installation of the test plug shall be both performed quickly.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

14) Adjust the CVTF level. <Ref. to CVT(TR580)-39, ADJUSTMENT, CVTF.>

Transfer Clutch Pressure Test

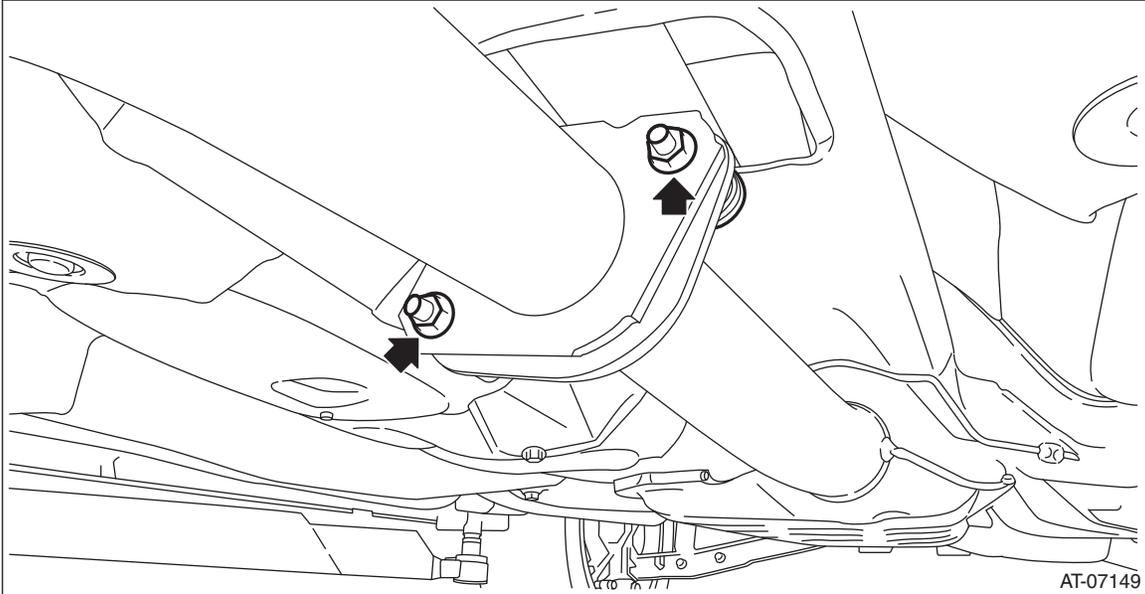
CONTINUOUSLY VARIABLE TRANSMISSION

9. Transfer Clutch Pressure Test

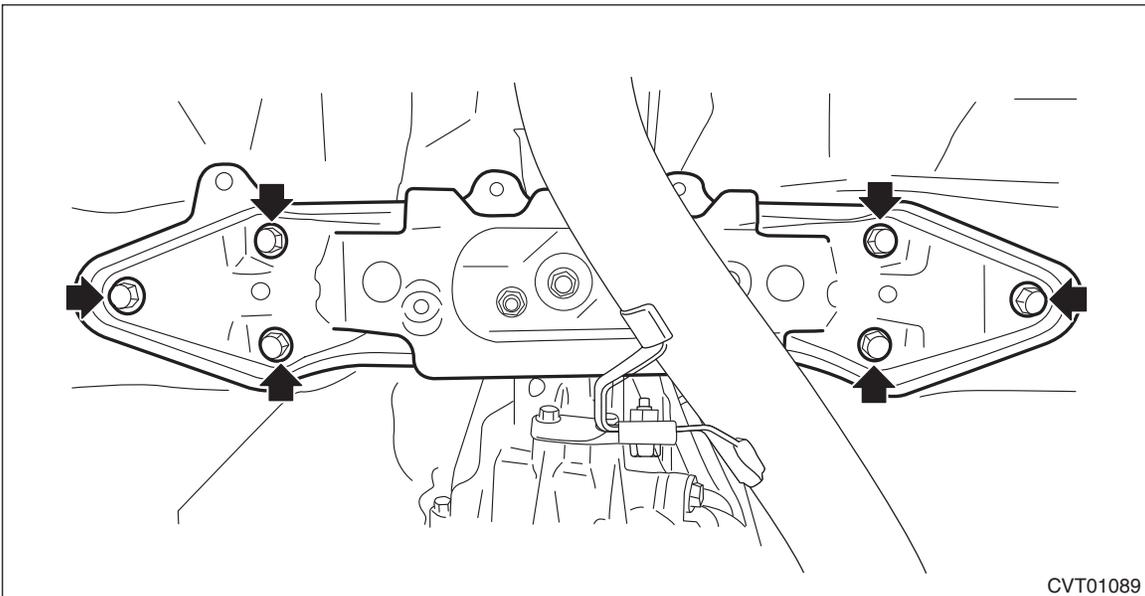
A: INSPECTION

1. EXCEPT FOR OUTBACK MODEL

- 1) Lift up the vehicle.
- 2) Remove the rear exhaust pipe from center exhaust pipe.



- 3) Remove the center exhaust cover.
- 4) Set the transmission jack under the transmission.
- 5) Remove the mounting bolt of rear crossmember.

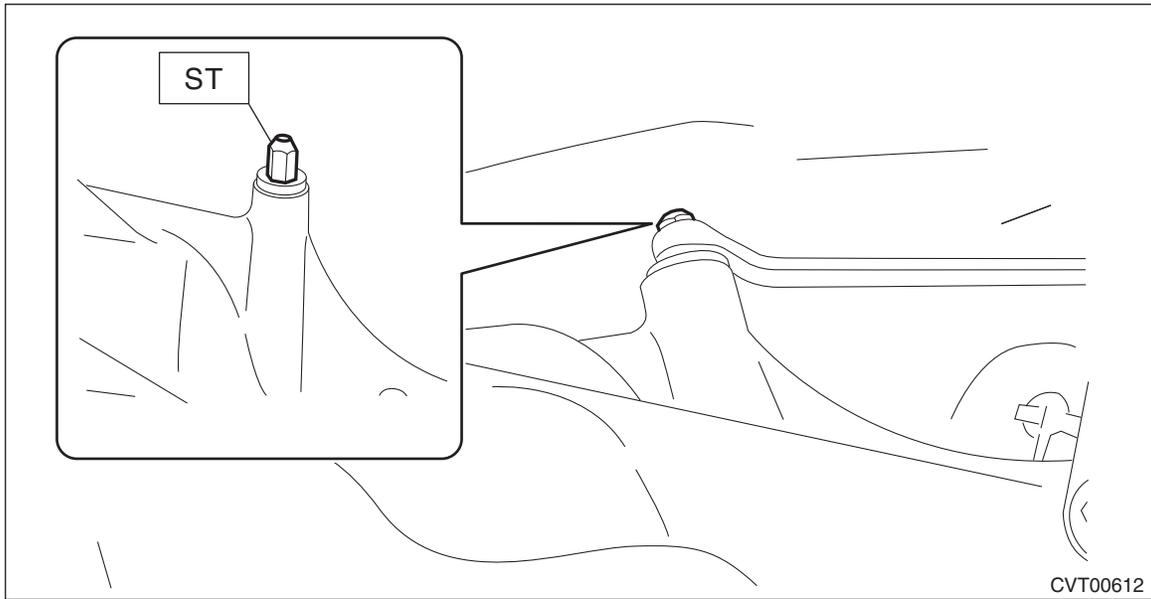


- 6) Lower the rear side of transmission until the transfer clutch pressure test plug can be removed.

Transfer Clutch Pressure Test

CONTINUOUSLY VARIABLE TRANSMISSION

- 7) Using the ST, remove the transfer clutch pressure test plug.
ST 18270AA040 SOCKET



- 8) Set the ST1, ST2, ST3 and ST4 to the transmission.

NOTE:

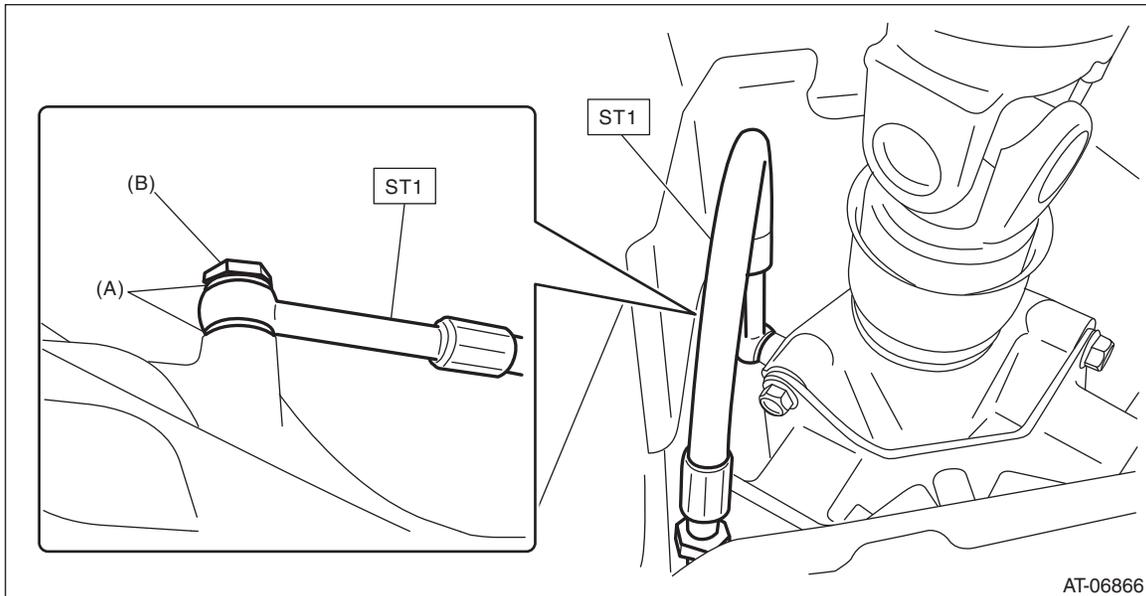
- Use ST1 ADAPTER HOSE B with genuine union screw (Part No. 801914010) and gasket (Part No. 803914060) attached.

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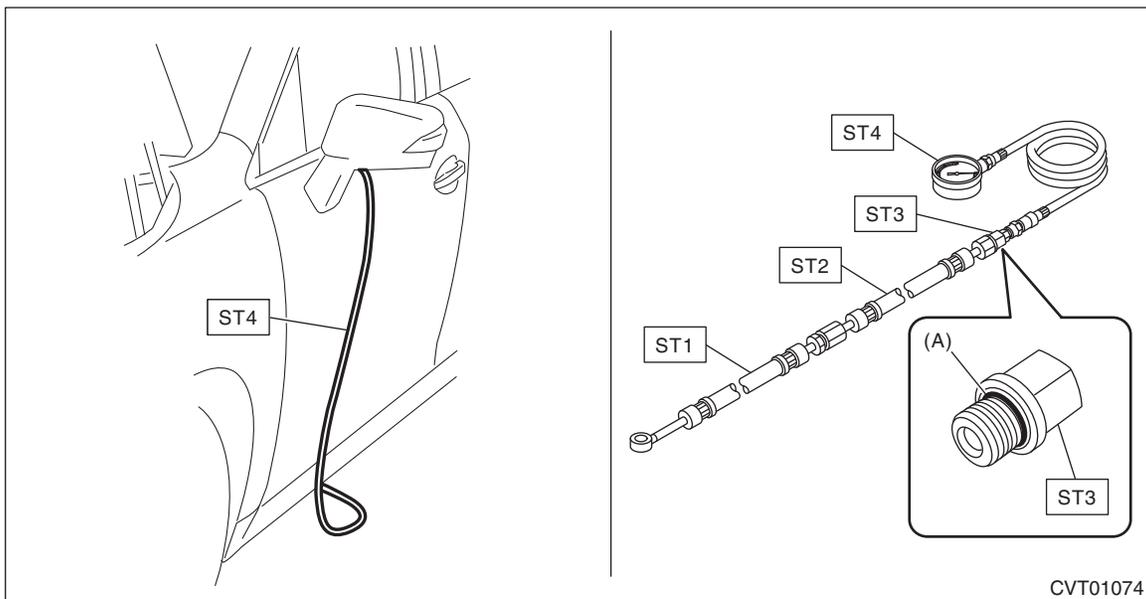
Transfer Clutch Pressure Test

CONTINUOUSLY VARIABLE TRANSMISSION

- Use ST3 PRESSURE GAUGE ADAPTER with genuine O-ring (Part No. 806911080) attached.
ST1 34099AC020 ADAPTER HOSE B
ST2 34099AC010 ADAPTER HOSE A
ST3 18681AA000 PRESSURE GAUGE ADAPTER
ST4 498575400 OIL PRESSURE GAUGE ASSY



- (A) Gasket (genuine part)
- (B) Union screw (genuine part)



- (A) O-ring (genuine part)

9) Raise the transmission, and install the rear crossmember.

Tightening torque:

75 N·m (7.6 kgf·m, 55.3 ft·lb)

10) Install the rear exhaust pipe to center exhaust pipe.

Tightening torque:

18 N·m (1.8 kgf·m, 13.3 ft·lb)

11) Lower the vehicle.

Transfer Clutch Pressure Test

CONTINUOUSLY VARIABLE TRANSMISSION

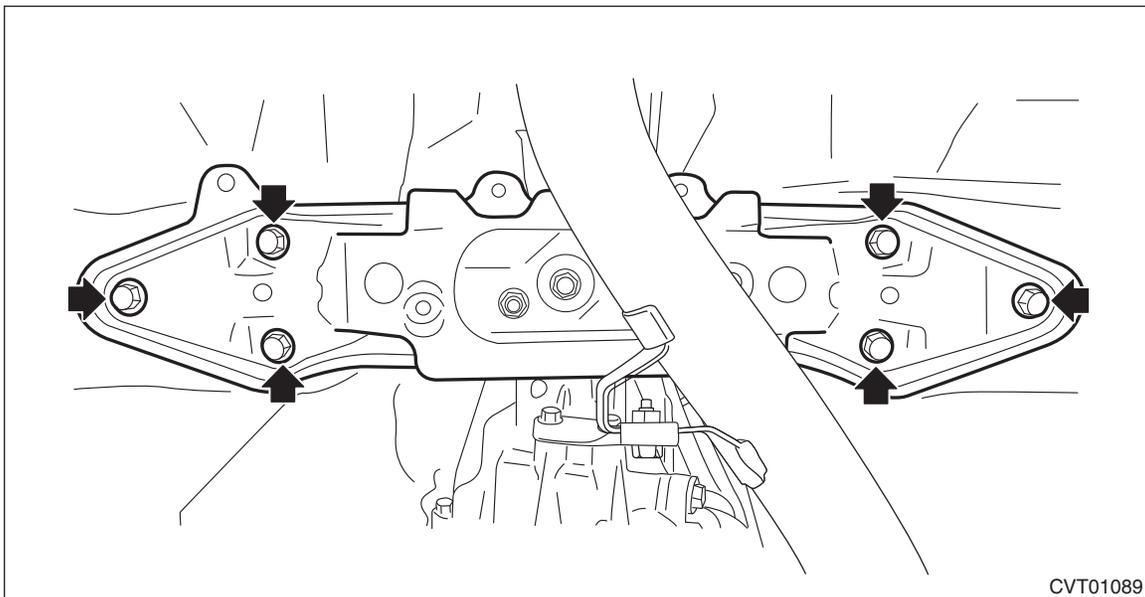
- 12) Connect the Subaru Select Monitor to the data link connector and read the current data.
- 13) Check the transfer clutch pressure as in secondary pressure (line pressure) test. <Ref. to CVT(TR580)-52, Secondary Pressure (Line Pressure) Test.>

NOTE:

- Use Subaru Select Monitor for switching to FWD mode. <Ref. to CVT(TR580)-47, AWD ON/OFF Switching Mode.>
- If no oil pressure is produced, if it does not change in AWD mode or if oil pressure is produced in FWD mode, there may be a problem in the control valve body.

Range position	ON Duty ratio (%)	Accelerator pedal opening angle (%)	Standard transfer clutch pressure kPa (kgf/cm ² , psi)	
			AWD mode	FWD mode
D	95 — 100	Fully opened (100)	1,000 — 1,200 (10.2 — 12.2, 145 — 174)	—
	60	Adjust ON Duty ratio to 60%.	400 — 700 (4.1 — 7.1, 58 — 102)	—
	0	Fully closed (0)	—	0 (0, 0)
N or P	0	Fully closed (0)	0	—

- 14) Lift up the vehicle.
- 15) Remove the rear exhaust pipe from center exhaust pipe.
- 16) Set the transmission jack under the transmission.
- 17) Remove the mounting bolt of rear crossmember.



- 18) Lower the rear side of transmission until the ST can be removed.
- 19) Install the test plug using ST1 and ST2.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.
- Tighten the test plug while directly aligning ST2 and torque wrench.

ST1 18270AA040 SOCKET

ST2 73099SG000 SPECIAL TOOL CONDENSER

Transfer Clutch Pressure Test

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

Calculation formula

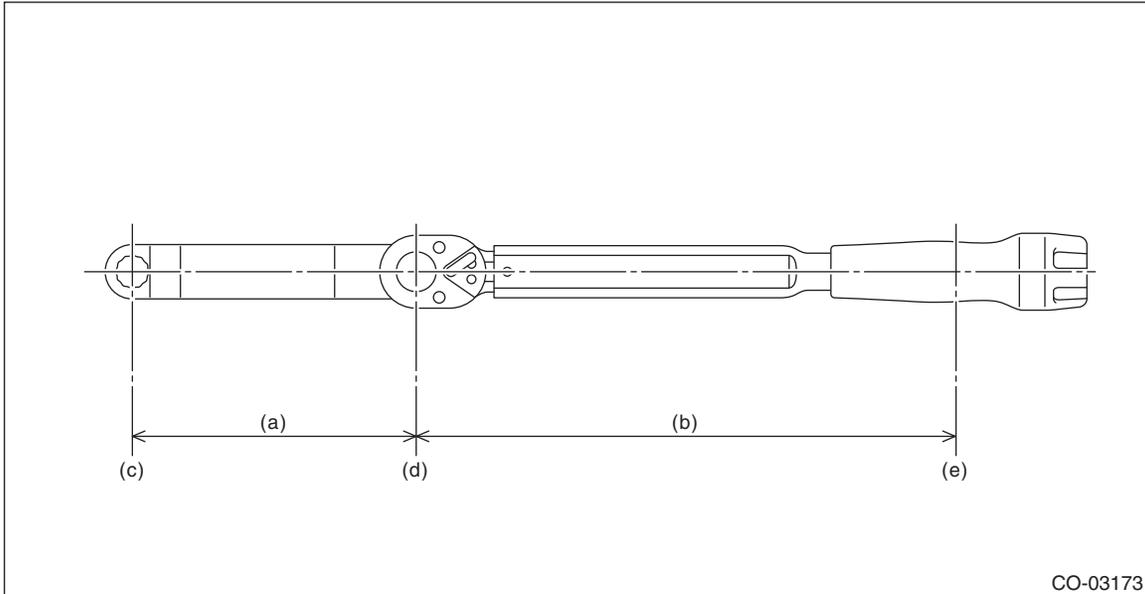
$$T = L / (100 \text{ mm (3.94 in)} + L) \times 22 \text{ N}\cdot\text{m (2.2 kgf}\cdot\text{m, 16.2 ft}\cdot\text{lb)}$$

T: Tightening torque

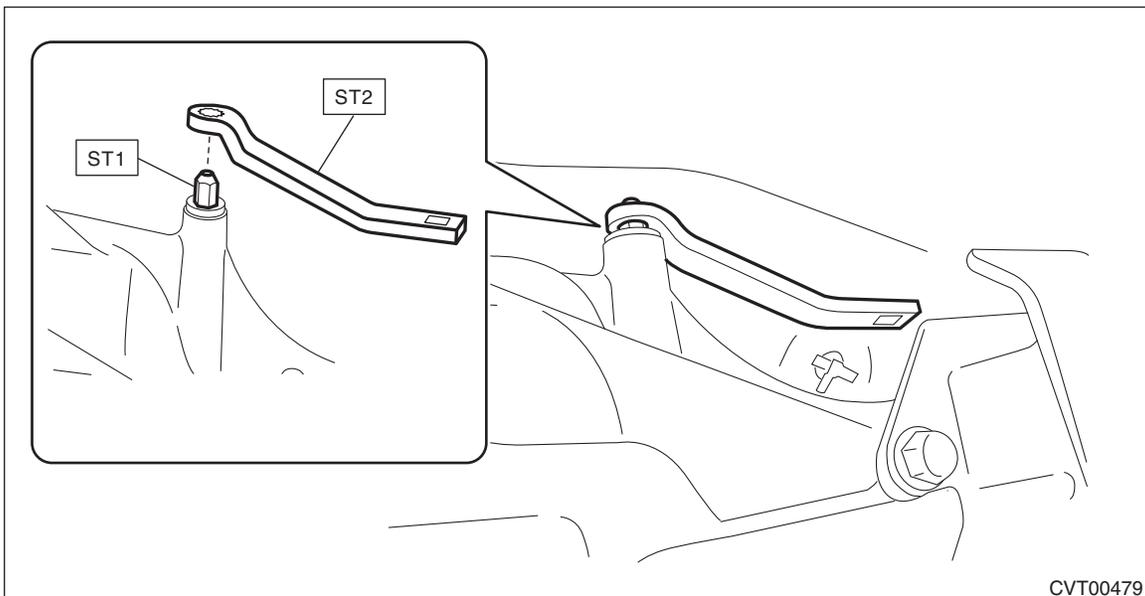
L: Effective length of torque wrench

NOTE:

If the effective length of the torque wrench used is unknown, consult the manufacturer of the torque wrench.



- (a) Effective length of the ST2
- (b) Effective length of the torque wrench
- (c) Center of drive angle of the ST2
- (d) Center of drive angle of the torque wrench
- (e) Center of the position where a force is applied by hand



20) Raise the transmission, and install the rear crossmember.

Tightening torque:

75 N·m (7.6 kgf·m, 55.3 ft·lb)

21) Install the center exhaust cover.

Transfer Clutch Pressure Test

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

18 N·m (1.8 kgf·m, 13.3 ft·lb)

22) Install the rear exhaust pipe to center exhaust pipe.

NOTE:

Use a new gasket.

Tightening torque:

18 N·m (1.8 kgf·m, 13.3 ft·lb)

23) Lower the vehicle.

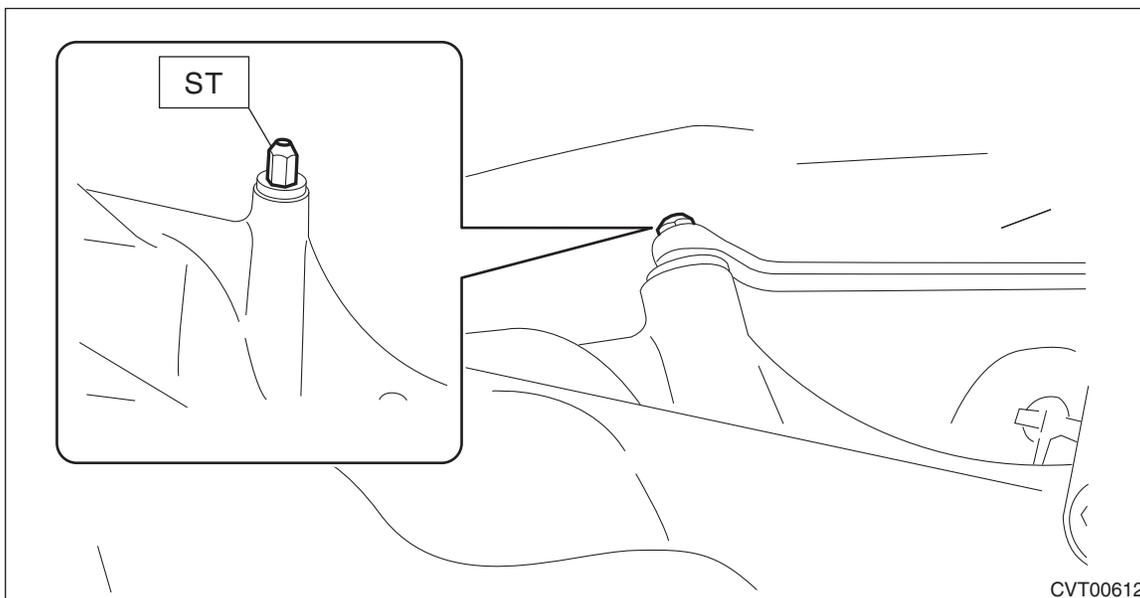
2. OUTBACK MODEL

1) Lift up the vehicle.

2) Remove the center exhaust cover.

3) Using the ST, remove the transfer clutch pressure test plug.

ST 18270AA040 SOCKET



4) Set the ST1, ST2, ST3 and ST4 to the transmission.

NOTE:

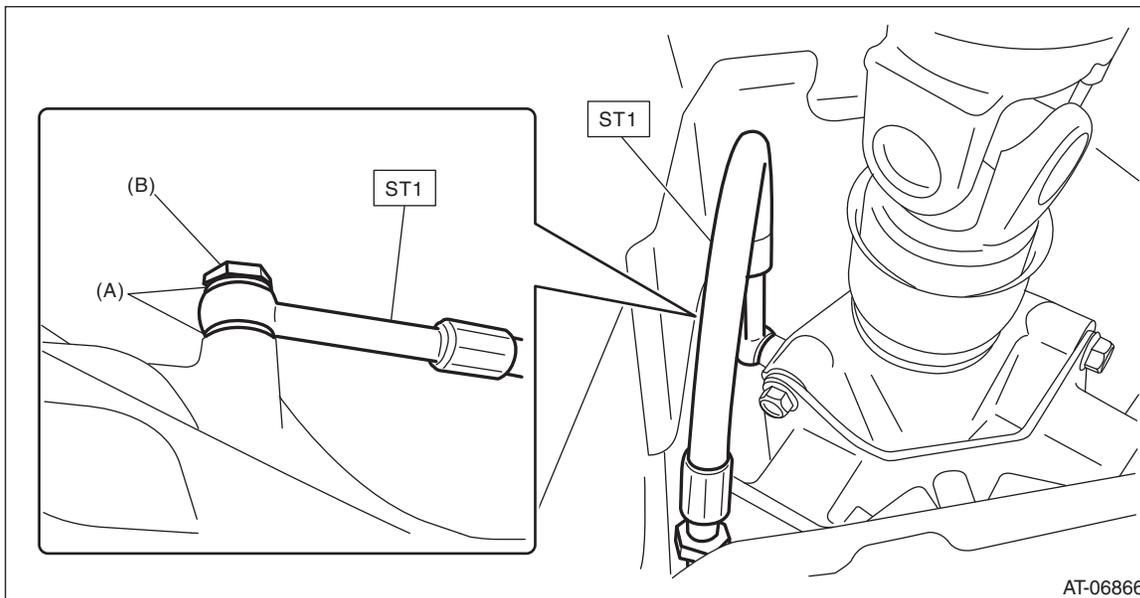
- Use ST1 ADAPTER HOSE B with genuine union screw (Part No. 801914010) and gasket (Part No. 803914060) attached.

Transfer Clutch Pressure Test

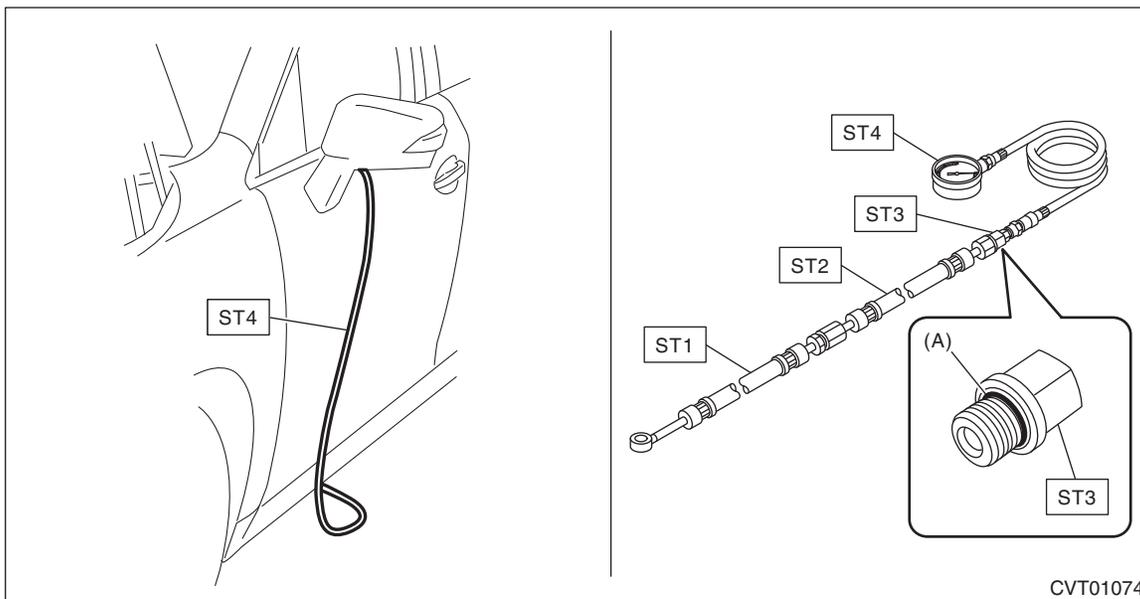
CONTINUOUSLY VARIABLE TRANSMISSION

- Use ST3 PRESSURE GAUGE ADAPTER with genuine O-ring (Part No. 806911080) attached.

ST1 34099AC020 ADAPTER HOSE B
ST2 34099AC010 ADAPTER HOSE A
ST3 18681AA000 PRESSURE GAUGE ADAPTER
ST4 498575400 OIL PRESSURE GAUGE ASSY



- (A) Gasket (genuine part)
(B) Union screw (genuine part)



- (A) O-ring (genuine part)

- 5) Connect the Subaru Select Monitor to the data link connector and read the current data.
6) Check the transfer clutch pressure as in secondary pressure (line pressure) test. <Ref. to CVT(TR580)-52, Secondary Pressure (Line Pressure) Test.>

NOTE:

- Use Subaru Select Monitor for switching to FWD mode. <Ref. to CVT(TR580)-47, AWD ON/OFF Switching Mode.>

Transfer Clutch Pressure Test

CONTINUOUSLY VARIABLE TRANSMISSION

- If no oil pressure is produced, if it does not change in AWD mode or if oil pressure is produced in FWD mode, there may be a problem in the control valve body.

Range position	ON Duty ratio (%)	Accelerator pedal opening angle (%)	Standard transfer clutch pressure kPa (kgf/cm ² , psi)	
			AWD mode	FWD mode
D	95 — 100	Fully opened (100)	1,000 — 1,200 (10.2 — 12.2, 145 — 174)	—
	60	Adjust ON Duty ratio to 60%.	400 — 700 (4.1 — 7.1, 58 — 102)	—
	0	Fully closed (0)	—	0 (0, 0)
N or P	0	Fully closed (0)	0	—

- 7) Lift up the vehicle.
- 8) Remove the ST.
- 9) Install the test plug using ST1 and ST2.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.
- Tighten the test plug while directly aligning ST2 and torque wrench.

ST1 18270AA040 SOCKET

ST2 73099SG000 SPECIAL TOOL CONDENSER

Transfer Clutch Pressure Test

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

Calculation formula

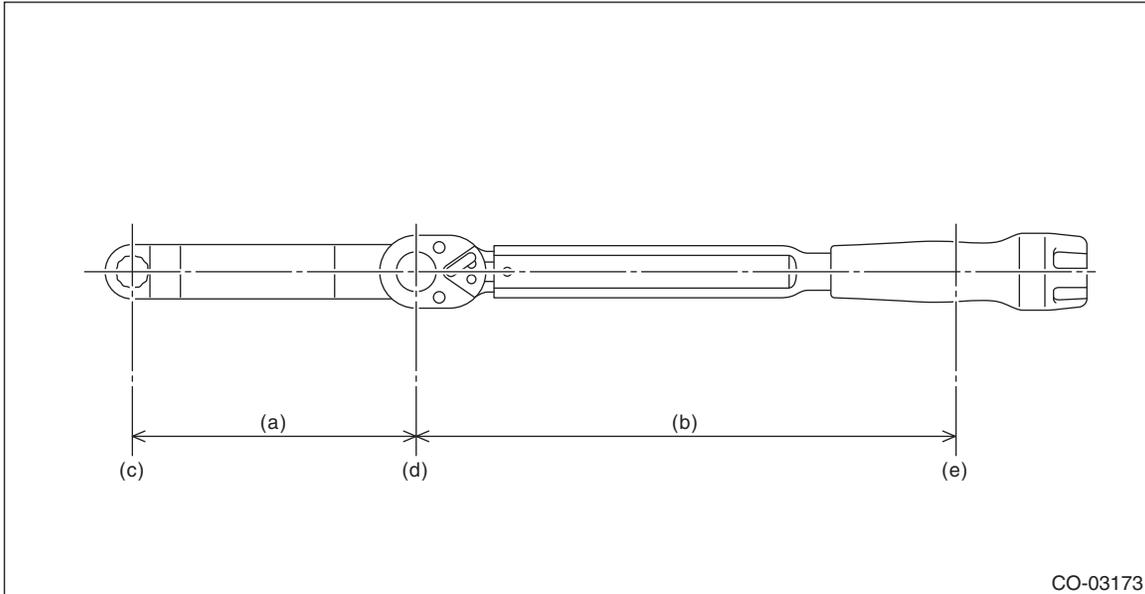
$$T = L / (100 \text{ mm (3.94 in)} + L) \times 22 \text{ N}\cdot\text{m (2.2 kgf}\cdot\text{m, 16.2 ft}\cdot\text{lb)}$$

T: Tightening torque

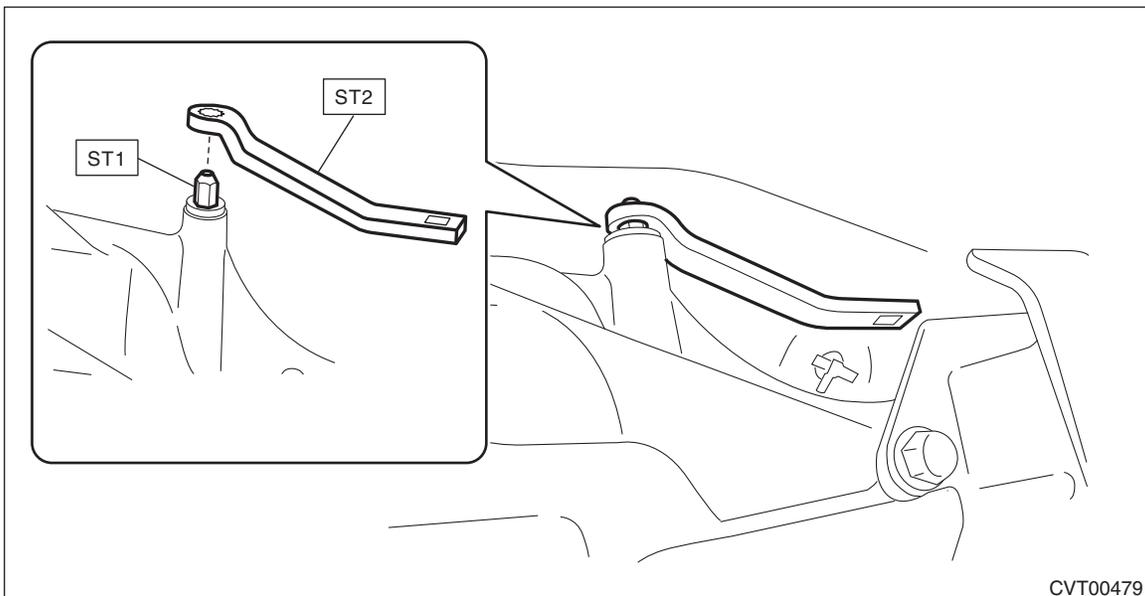
L: Effective length of torque wrench

NOTE:

If the effective length of the torque wrench used is unknown, consult the manufacturer of the torque wrench.



- (a) Effective length of the ST2
- (b) Effective length of the torque wrench
- (c) Center of drive angle of the ST2
- (d) Center of drive angle of the torque wrench
- (e) Center of the position where a force is applied by hand



10) Install the center exhaust cover.

Tightening torque:

18 N·m (1.8 kgf·m, 13.3 ft·lb)

11) Lower the vehicle.

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

10. Automatic Transmission Assembly

A: REMOVAL

1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

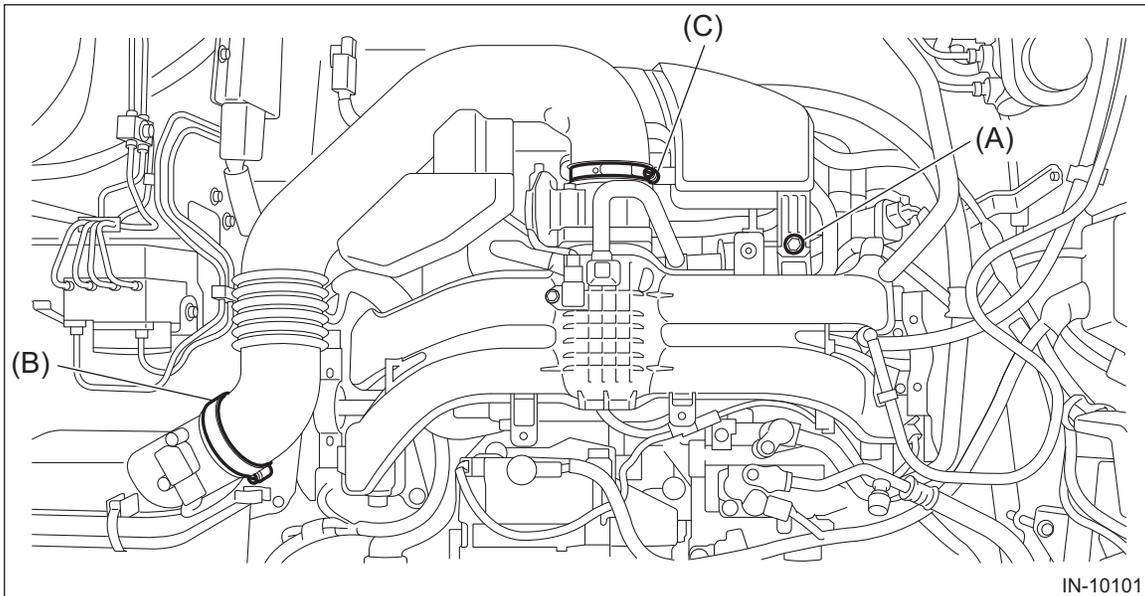
NOTE:

For model with battery sensor, disconnect the ground terminal from battery sensor.

2) Lock the steering wheel.

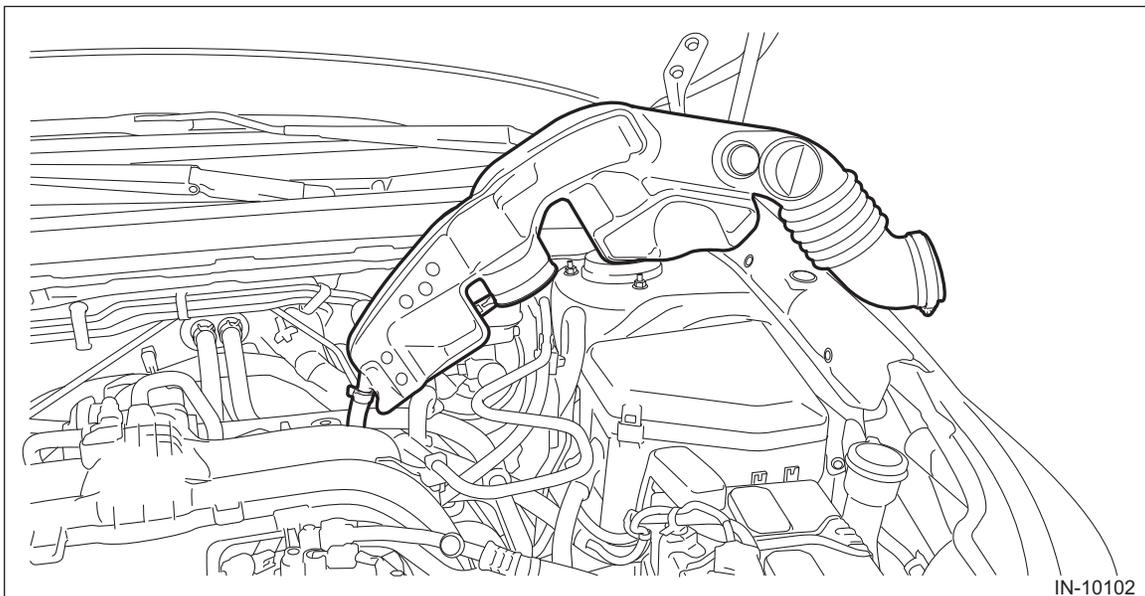
3) Remove the air intake duct. <Ref. to IN(H4DO)-12, REMOVAL, Air Intake Duct.>

4) Remove the clip (A), and loosen the clamps (B) and (C).



IN-10101

5) Remove the air intake boot from the throttle body, and move it to the left side wheel apron, etc.

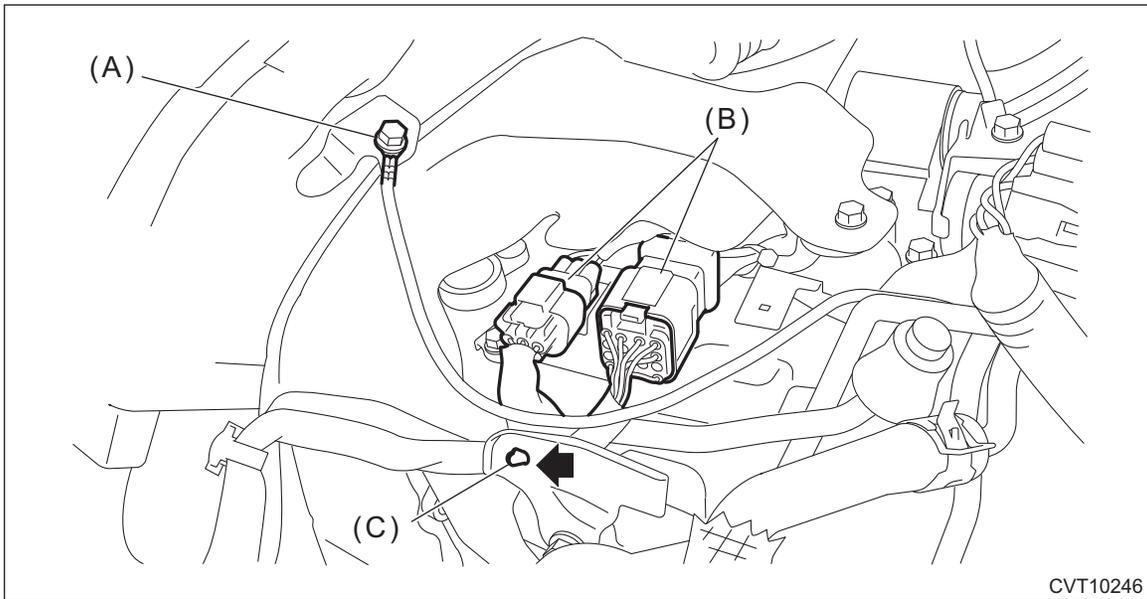


IN-10102

Automatic Transmission Assembly

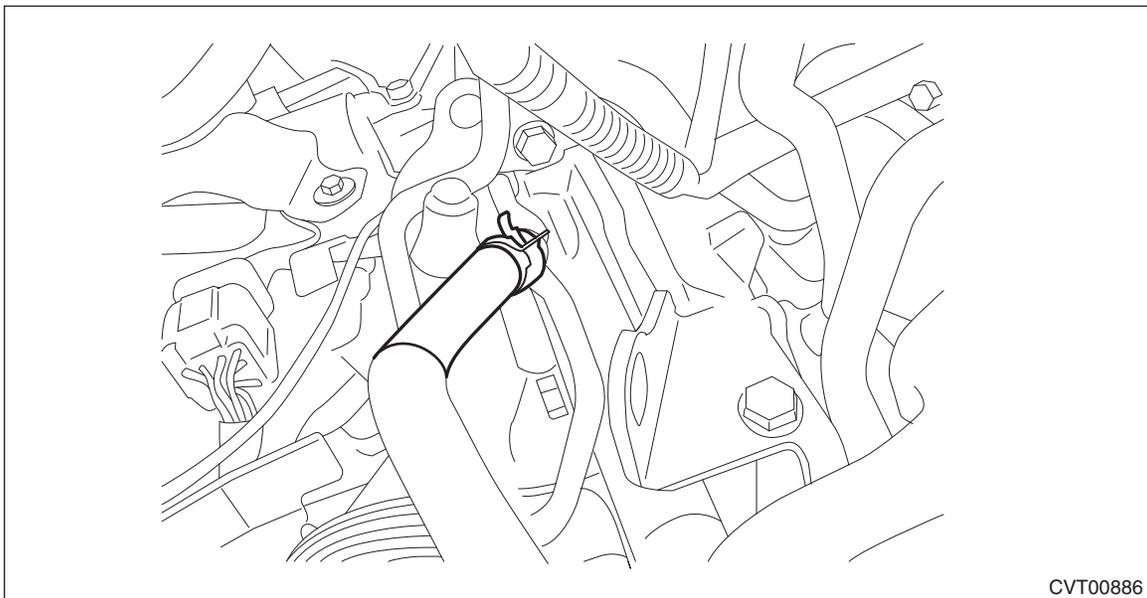
CONTINUOUSLY VARIABLE TRANSMISSION

6) Disconnect the transmission radio ground terminal and transmission harness connector, and remove the harness clip.



- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

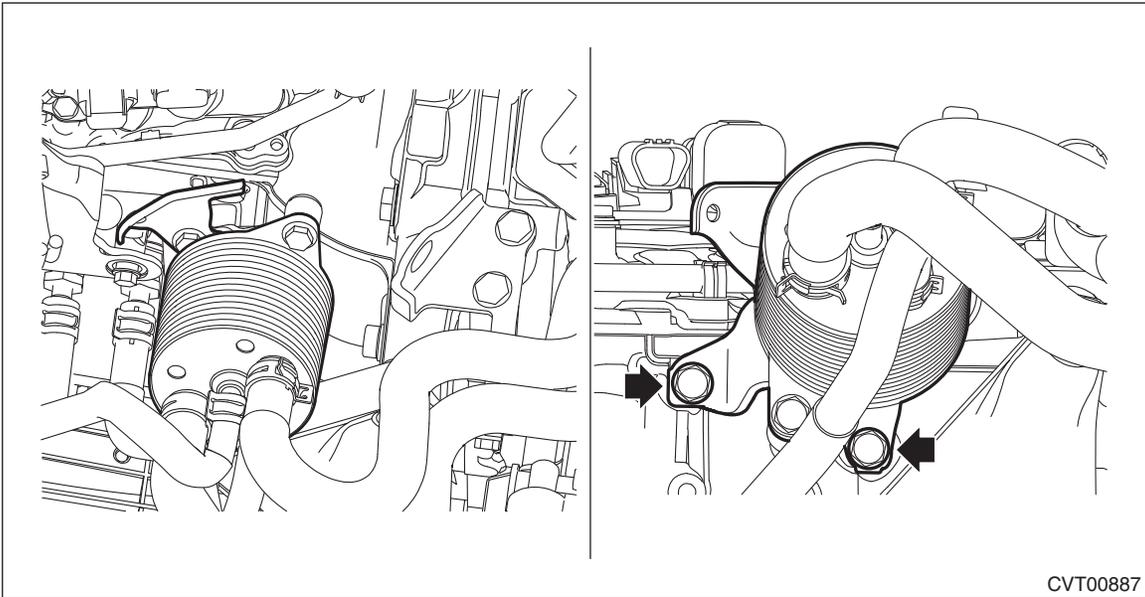
7) Remove the CVTF cooler hose. (With CVTF cooler (air cool))



Automatic Transmission Assembly

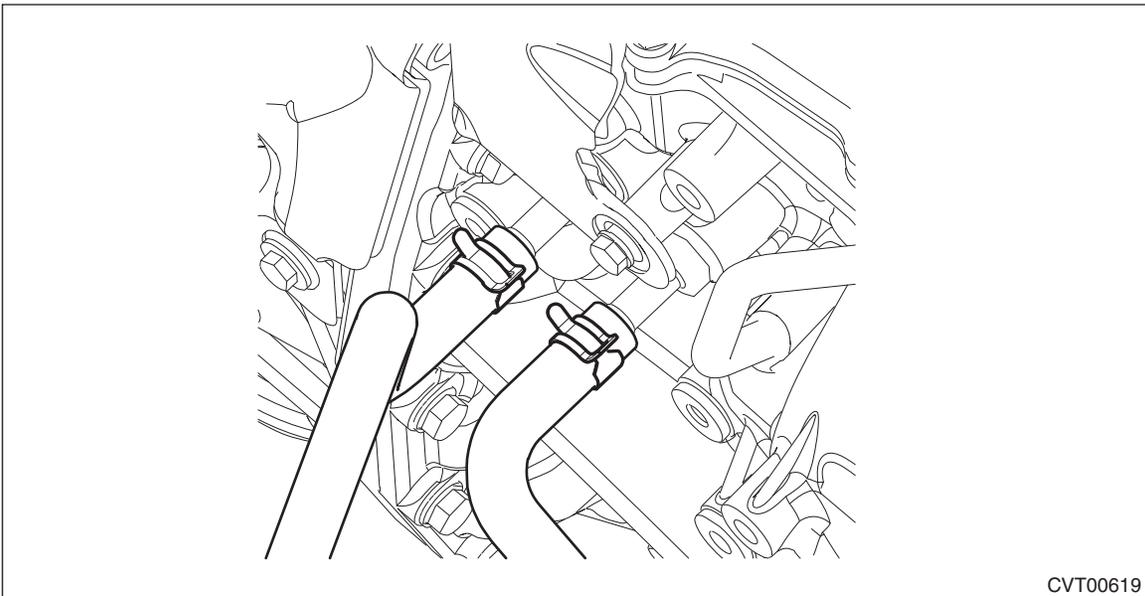
CONTINUOUSLY VARIABLE TRANSMISSION

8) Remove the CVTF cooler (with warmer feature), and using a piece of wire, affix to a location of the body where it will not interfere with the removal/installation of the transmission.



CVT00887

9) Remove the CVTF inlet hose and outlet hose. (Without CVTF cooler (air cool))

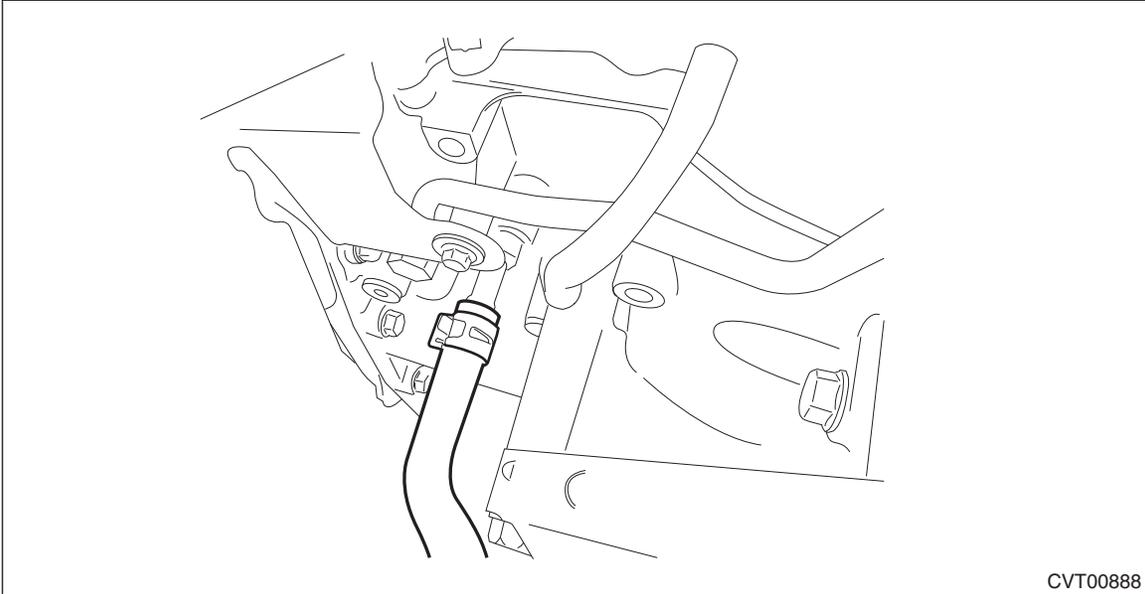


CVT00619

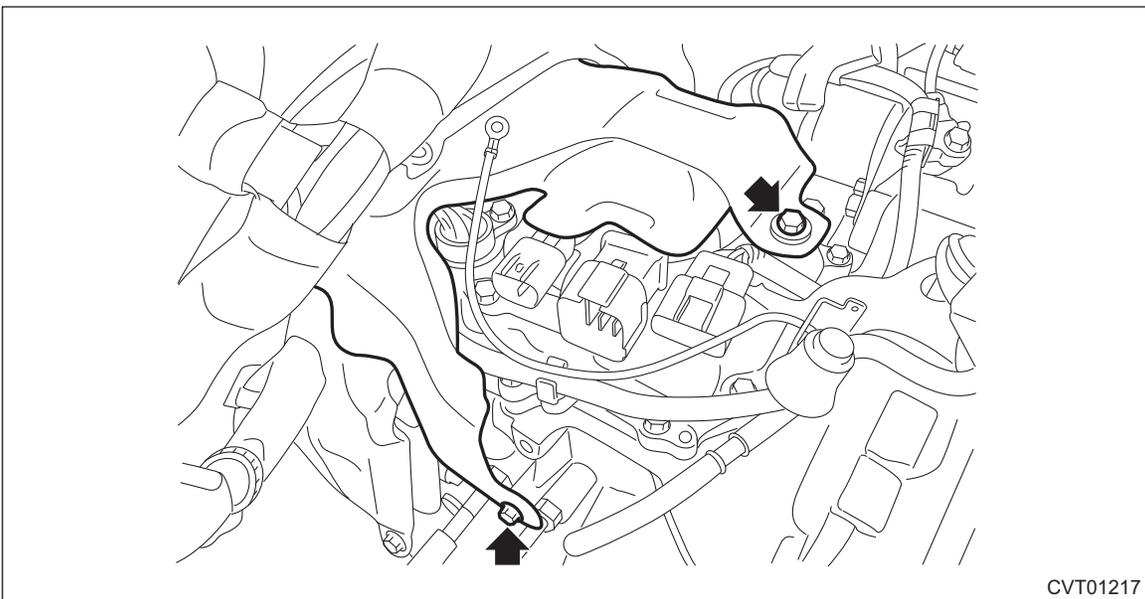
Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

10) Remove the CVTF outlet hose. (With CVTF cooler (air cool))



11) Remove the transmission case cover.

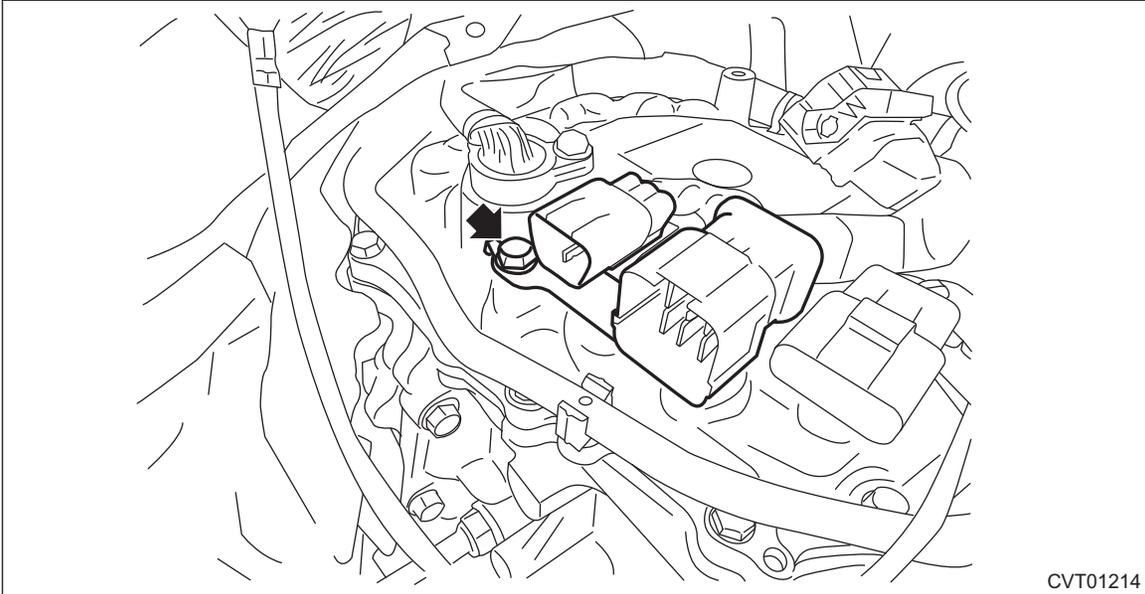


12) Remove the TCM. <Ref. to CVT(TR580)-164, REMOVAL, Transmission Control Module (TCM).>

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

13) Remove the transmission harness stay.



14) Remove the front tire LH and RH.

15) Lift up the vehicle.

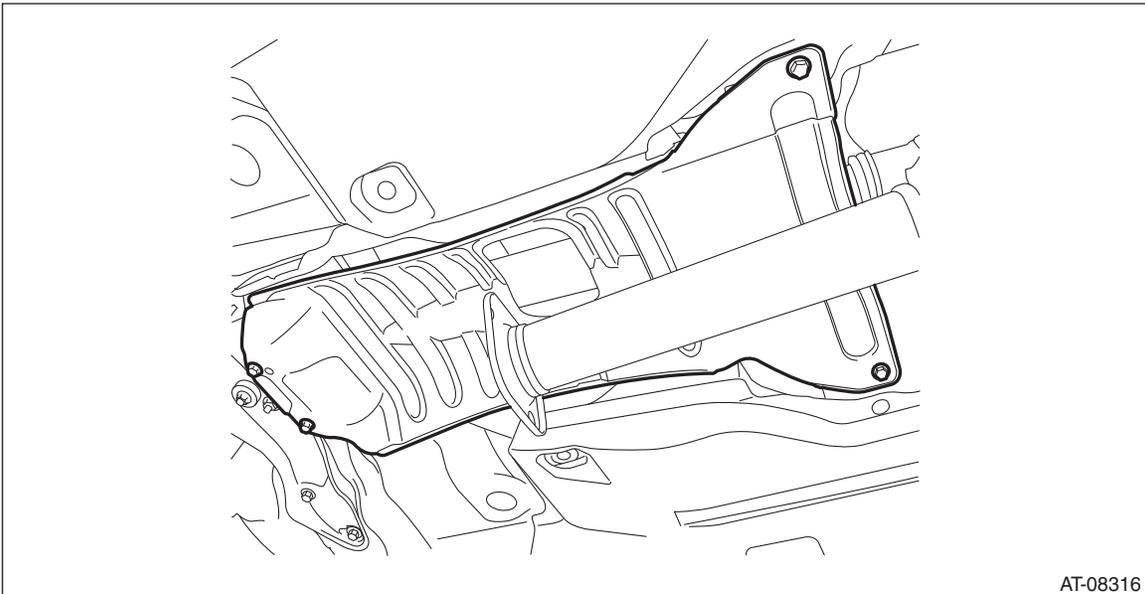
16) Remove the under cover - front.

17) Remove the CVTF drain plug to drain CVTF. <Ref. to CVT(TR580)-40, REPLACEMENT, CVTF.>

18) Drain differential gear oil. <Ref. to CVT(TR580)-44, REPLACEMENT, Differential Gear Oil.>

19) Remove the center exhaust pipe (rear). <Ref. to EX(H4DO)-13, REMOVAL, Center Exhaust Pipe.>

20) Remove the center exhaust cover.



21) Remove the propeller shaft. <Ref. to DS-10, REMOVAL, Propeller Shaft.>

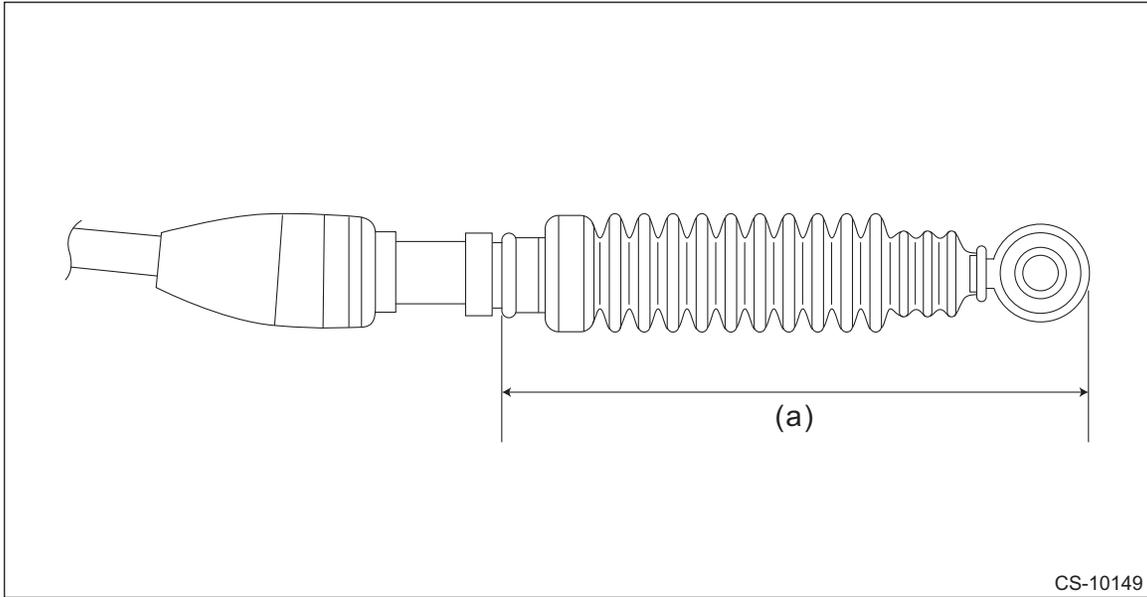
22) Remove the snap pin and washer from shifter arm and remove the select cable.

Automatic Transmission Assembly

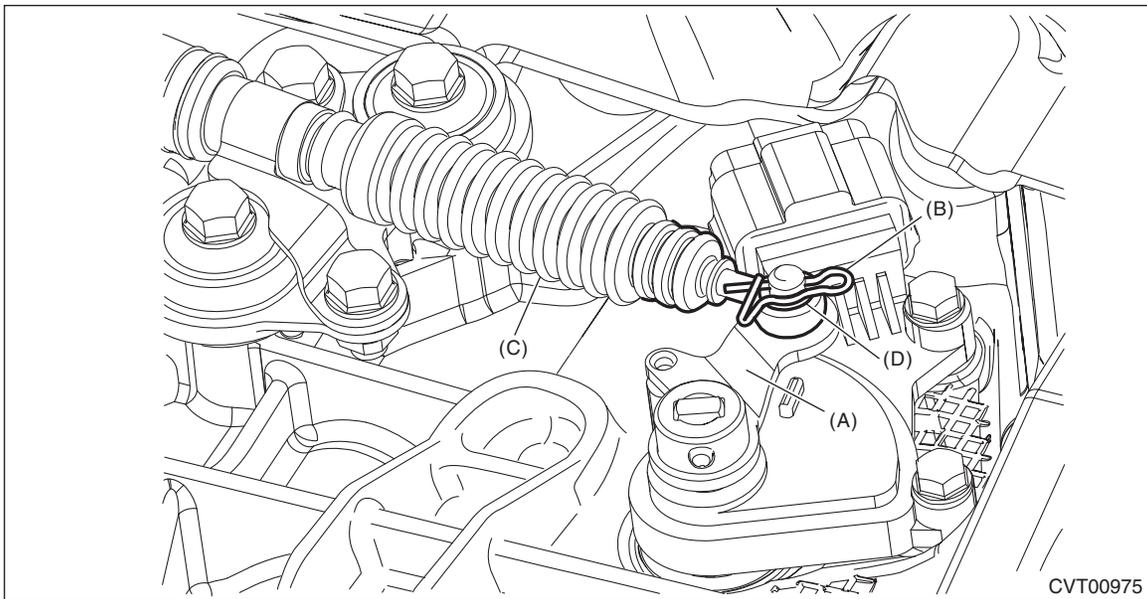
CONTINUOUSLY VARIABLE TRANSMISSION

CAUTION:

Do not apply extra overload while holding the part (a).



CS-10149



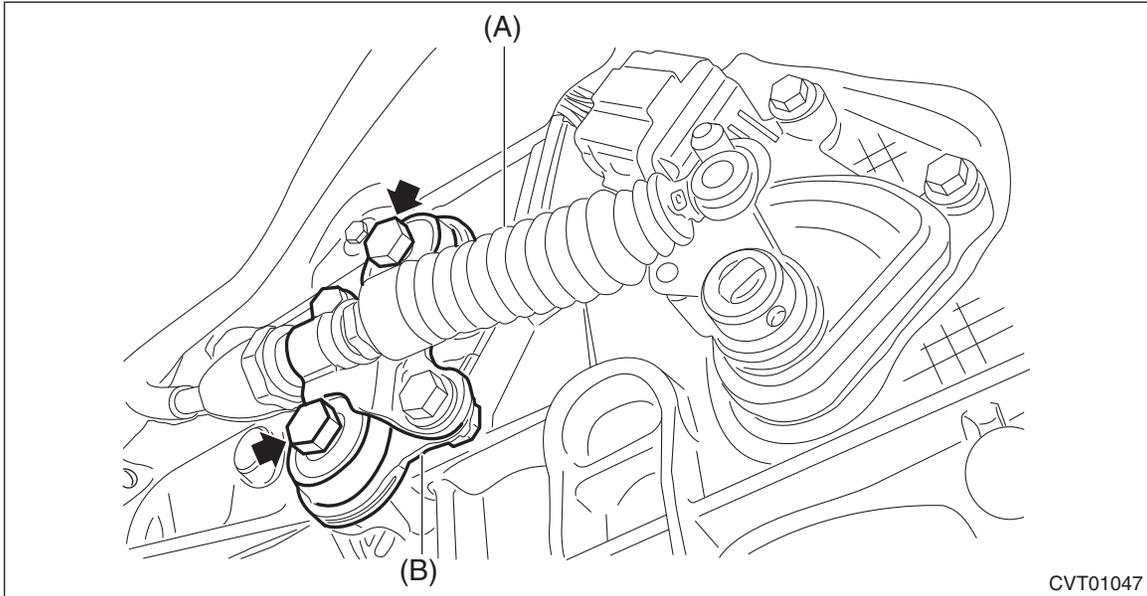
CVT00975

- (A) Shifter arm
- (B) Snap pin
- (C) Select cable
- (D) Washer

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

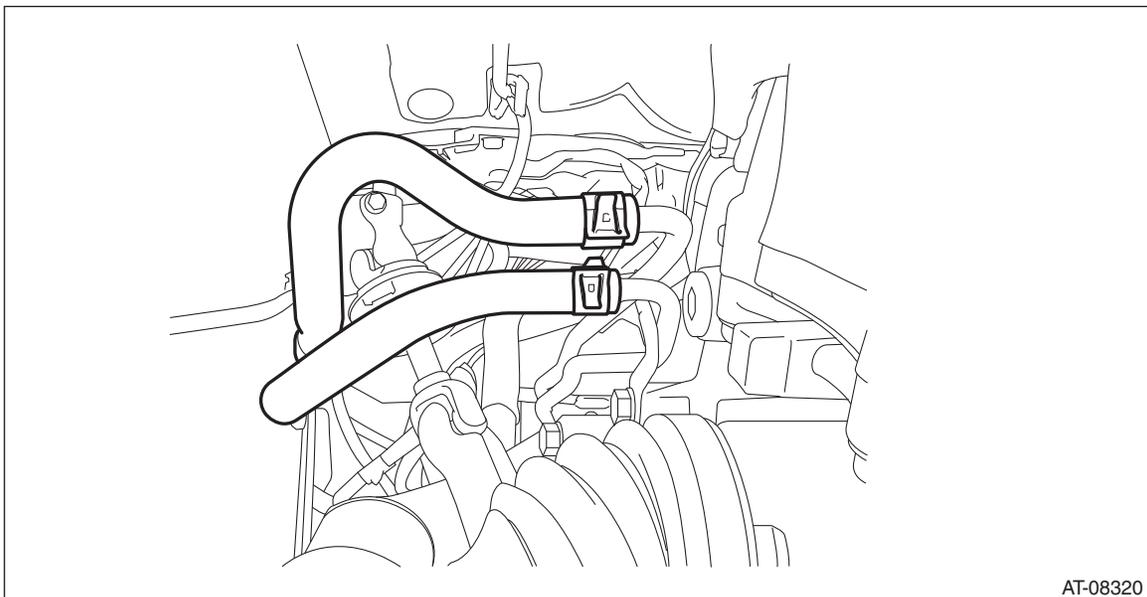
23) Remove the plate assembly.



(A) Select cable

(B) Plate ASSY

24) Remove the CVTF CVT inlet hose and CVTF CVT outlet hose. (With CVTF cooler (air cool))



25) Remove the universal joint. <Ref. to PS-21, REMOVAL, Universal Joint.>

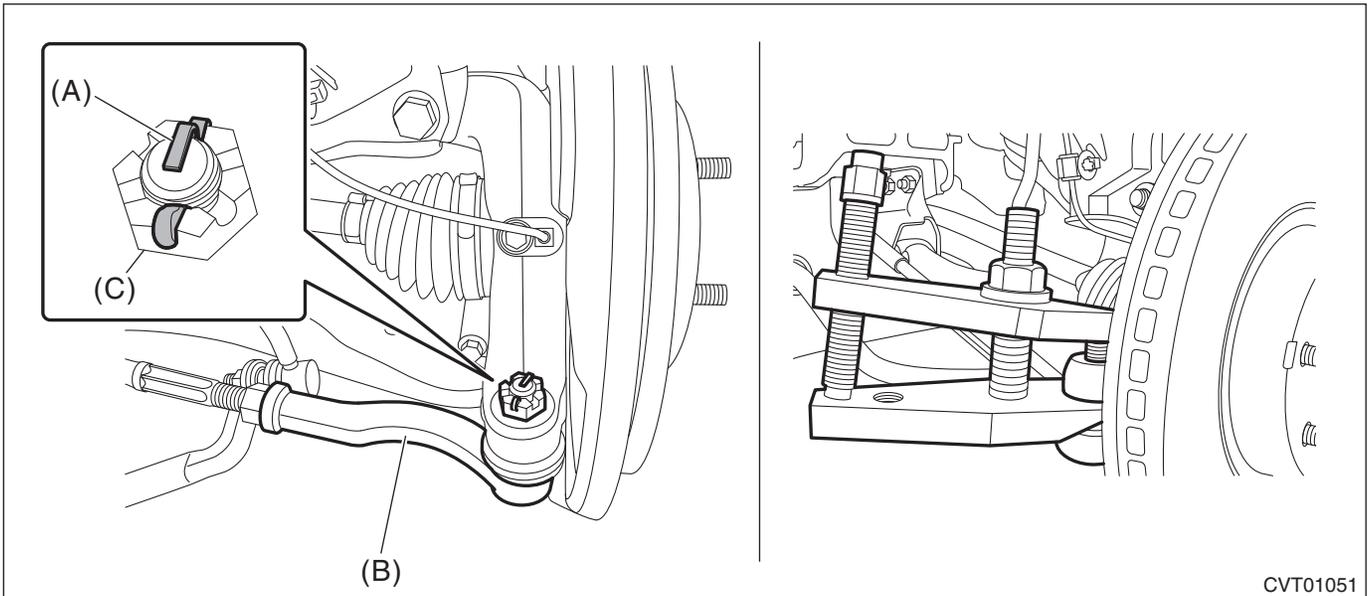
26) After pulling off the cotter pin and removing the castle nut, use a puller to remove the tie-rod end.

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

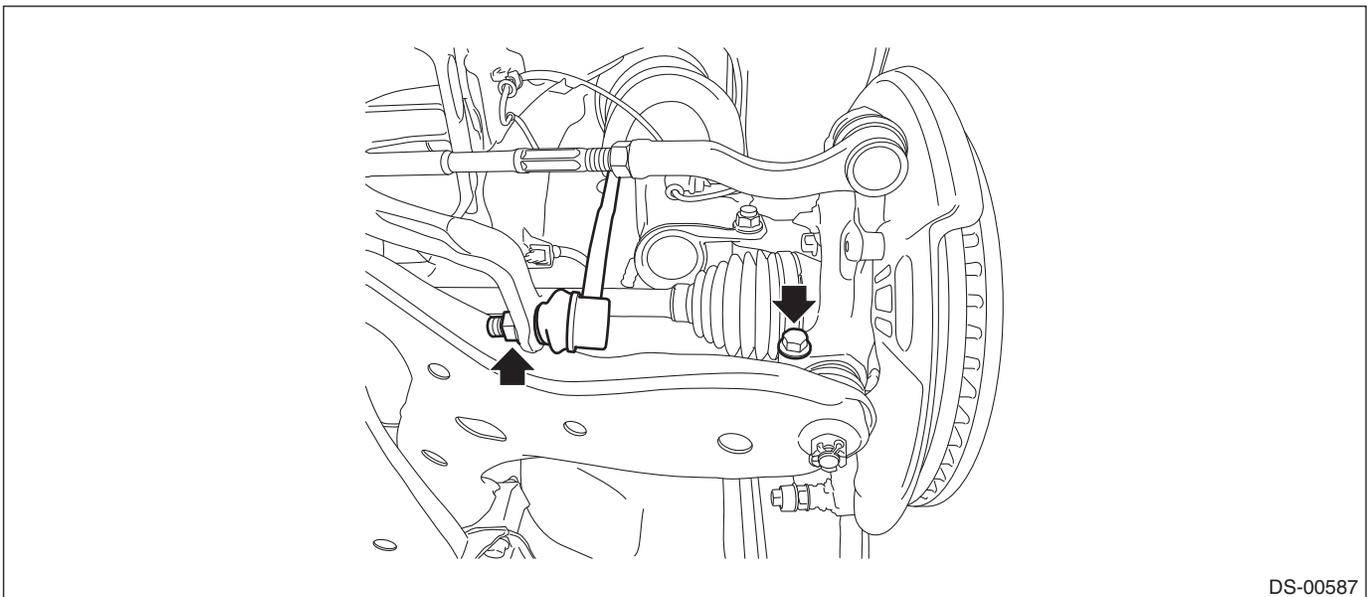
NOTE:

Use a tool appropriate to the structure, and be careful not to damage the boot of the joint while removing. The boot may be damaged depending on the tool used.



- (A) Cotter pin
- (B) Tie-rod end
- (C) Castle nut

27) Remove the stabilizer link, and disconnect the lower arm ball joint and housing.



28) Pull out the front drive shaft from transmission using a crowbar.

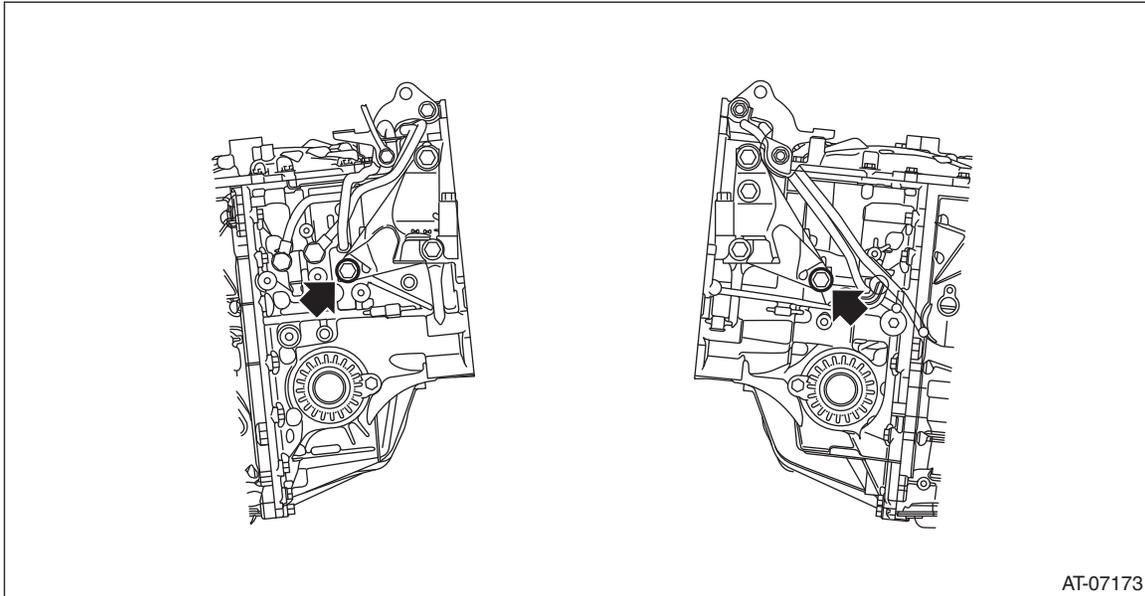
NOTE:

Holding the joint of front drive shaft from transmission side, pull out the drive shaft from transmission with care not to stretch the boot.

Automatic Transmission Assembly

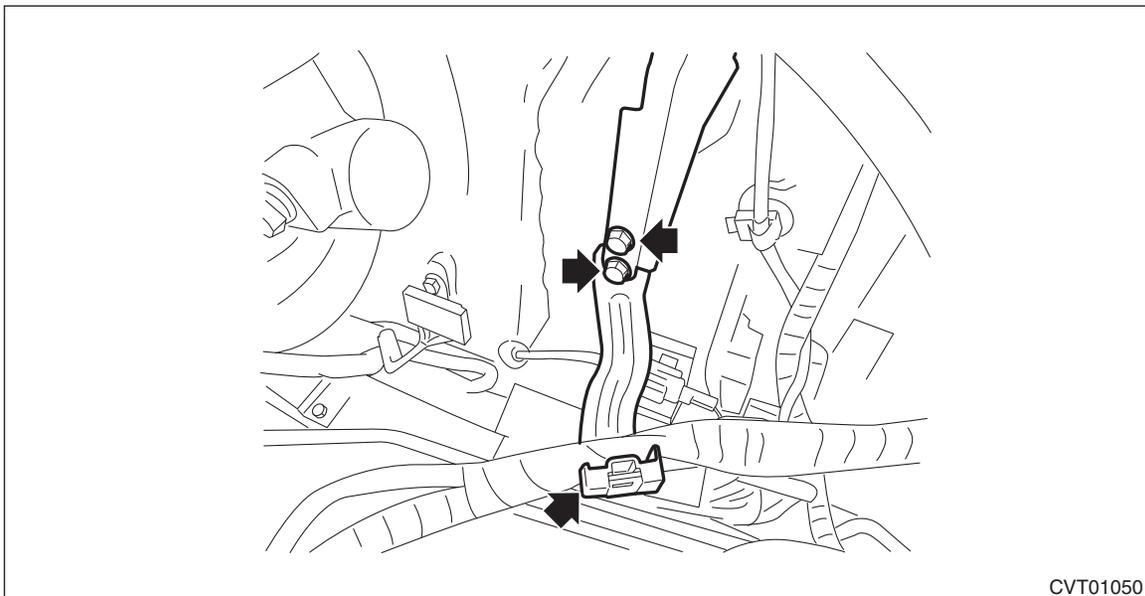
CONTINUOUSLY VARIABLE TRANSMISSION

29) Loosen the bolt at the bottom of the transmission mounting bracket.



30) Lower the vehicle.

31) Detach the battery cable clip, and remove the battery cable bracket.

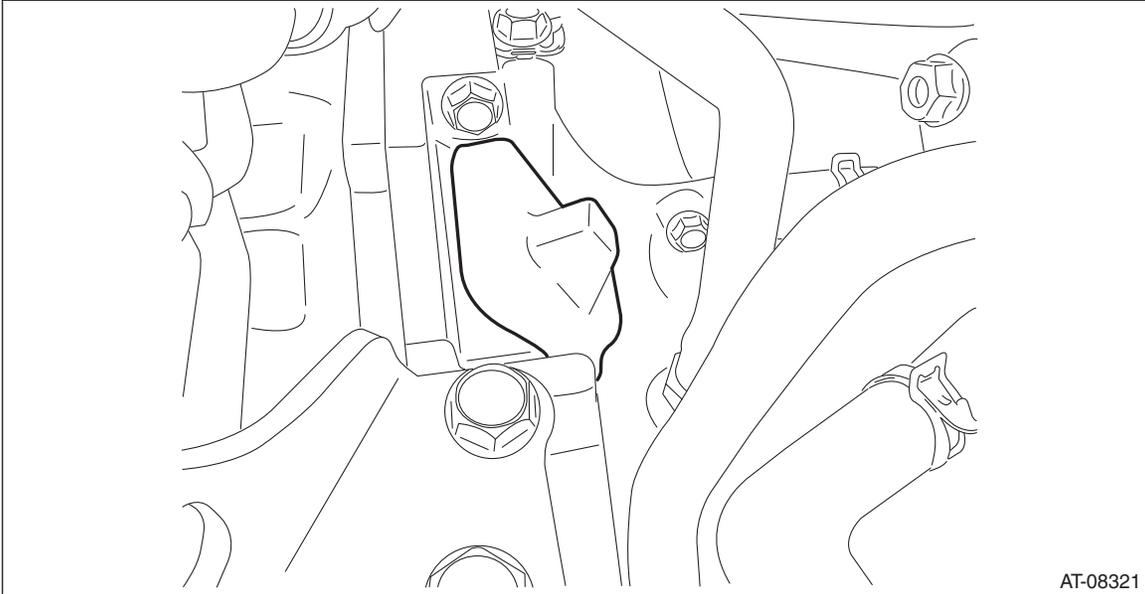


32) Remove the starter. <Ref. to SC(H4DO)-7, REMOVAL, Starter.>

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

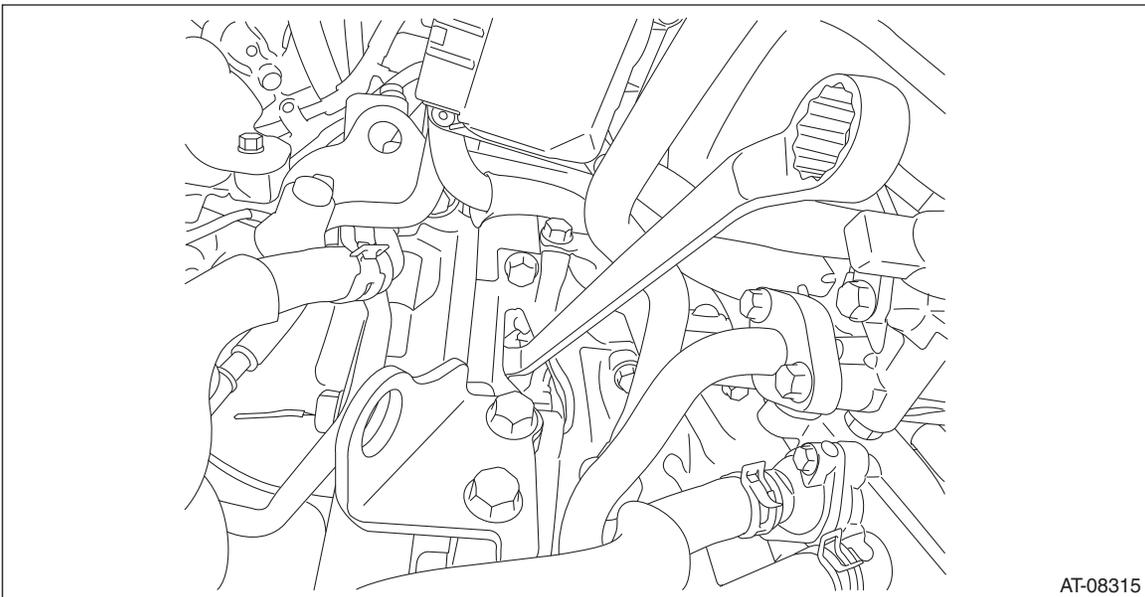
33) Remove the service hole plug.



34) Remove the four bolts combining the torque converter and drive plate while rotating the crank pulley a little at a time in the same direction as engine revolution.

CAUTION:

- Be careful not to drop bolts into converter housing.
- Be careful not to damage the mounting bolts.



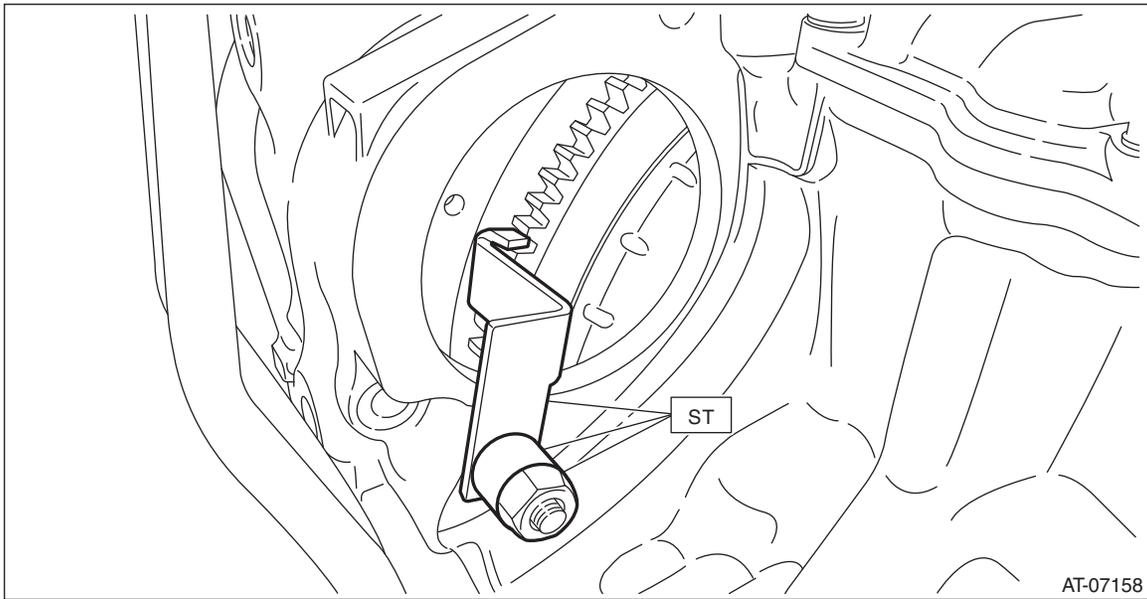
35) Make sure the torque converter moves freely by rotating with finger through the starter installation hole.

Automatic Transmission Assembly

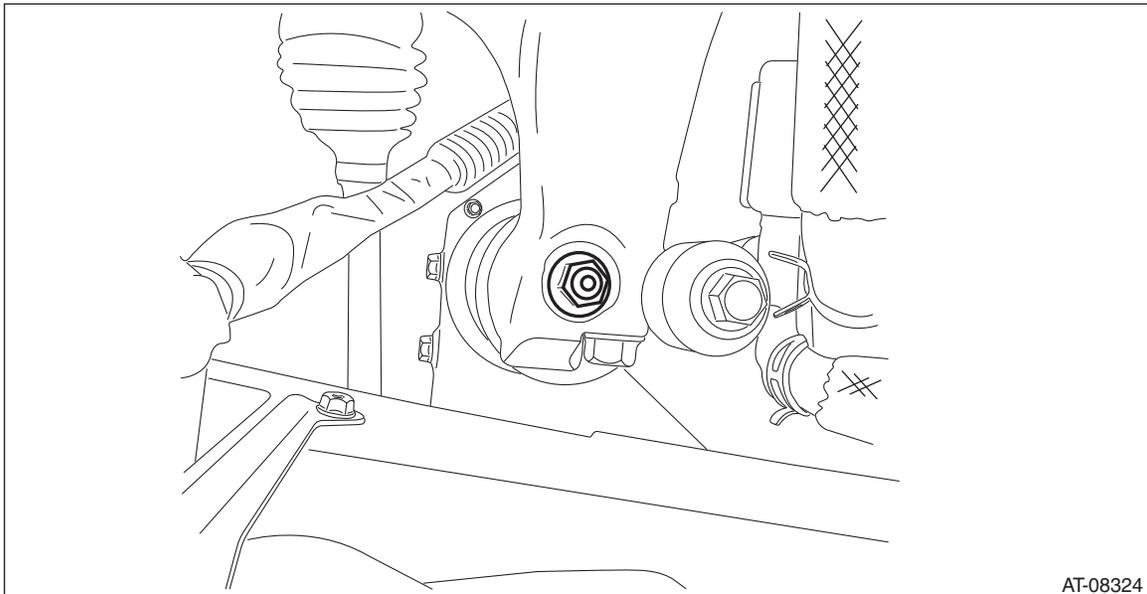
CONTINUOUSLY VARIABLE TRANSMISSION

36) Attach the ST to the converter case.

ST 498277200 STOPPER SET



37) Remove the nuts from the transmission mounting brackets LH and RH.



38) Remove the V-belt covers.

39) Set the ST to the engine.

ST1 18363AA050 BOLT

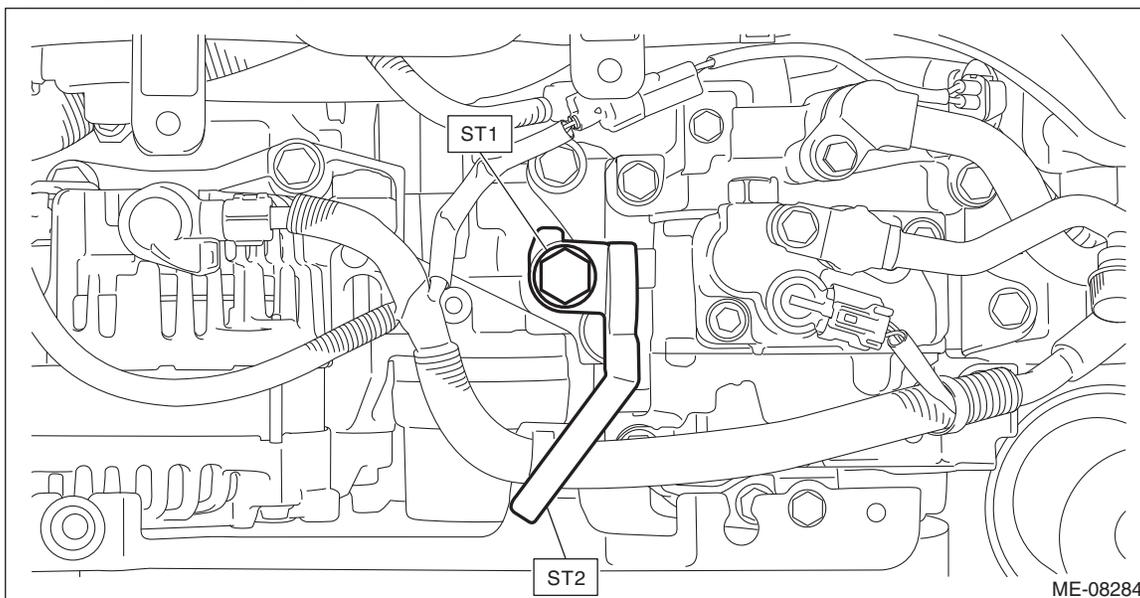
ST2 18360AA040 HANGER

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

43 N·m (4.4 kgf·m, 31.7 ft·lb)



40) Set the ST1 and ST2 to vehicle.

ST1 99099AJ000 ENGINE HANGER

ST2 99099AJ010 CHAIN BALANCER

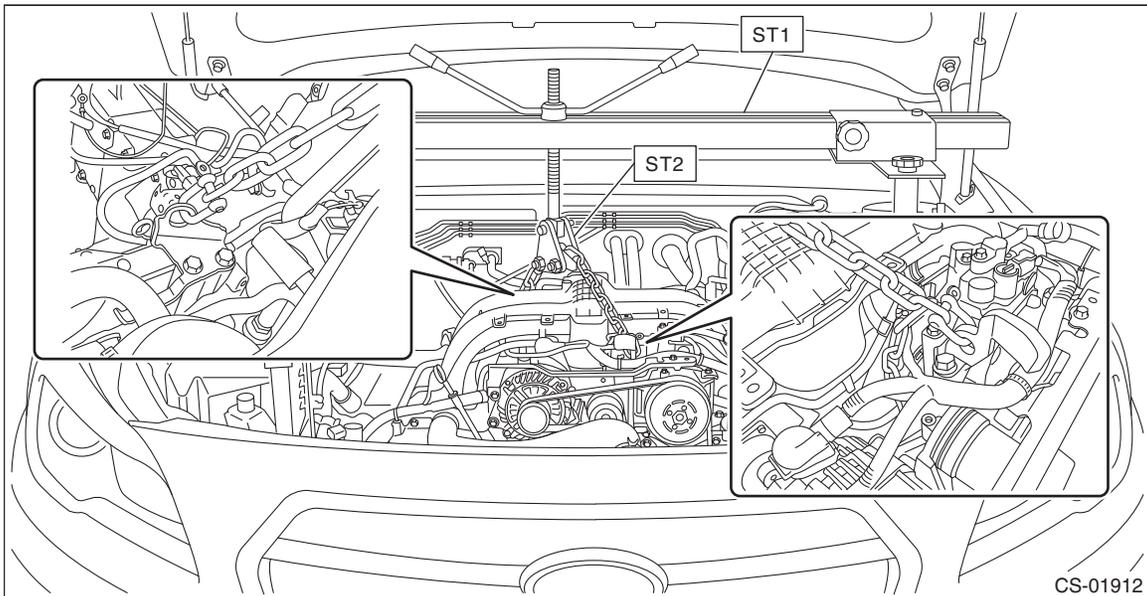
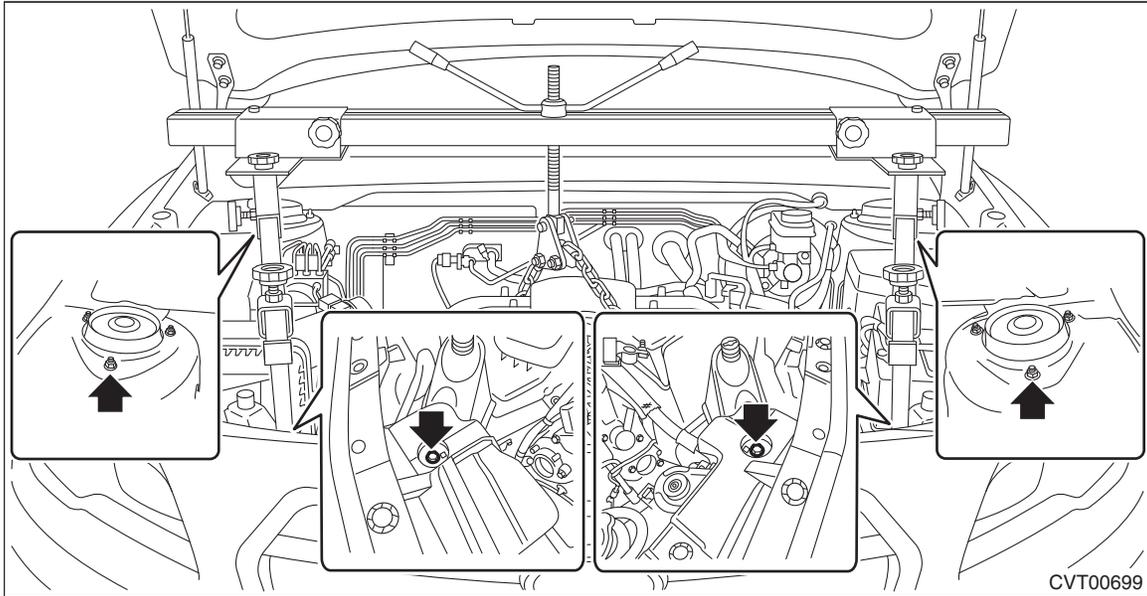
CAUTION:

- Set so that the chain sling does not contact the engine parts.
- Install a bolt of $\phi 8$ mm (0.3 in) at the locations shown in the figure, and place the front side arms of ST (ENGINE HANGER).

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- Set the arms of ST (ENGINE HANGER) at the locations shown in the figure.

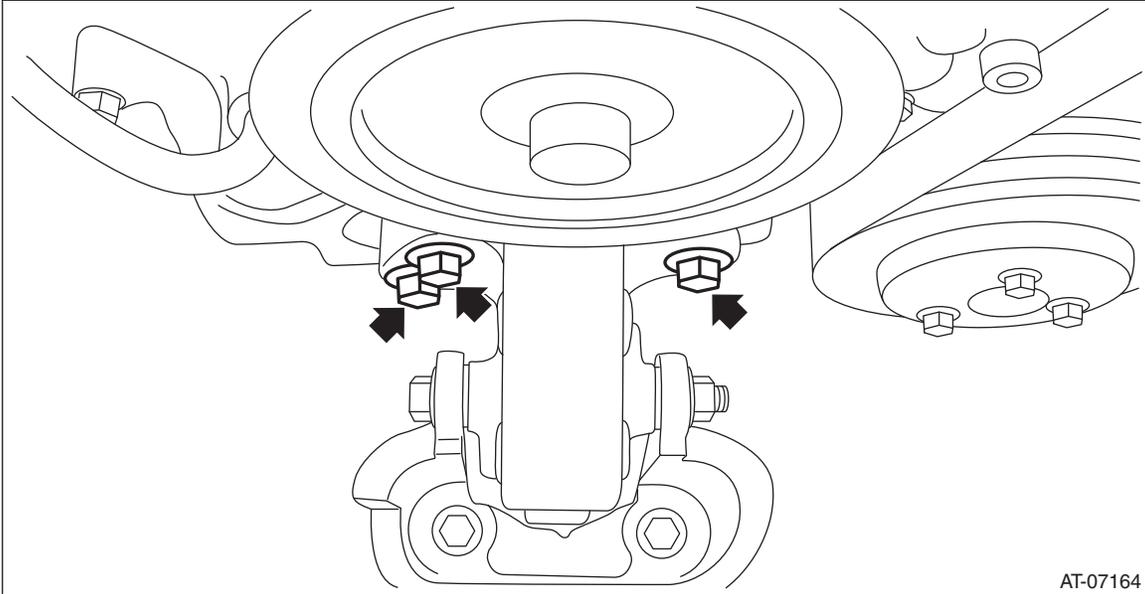


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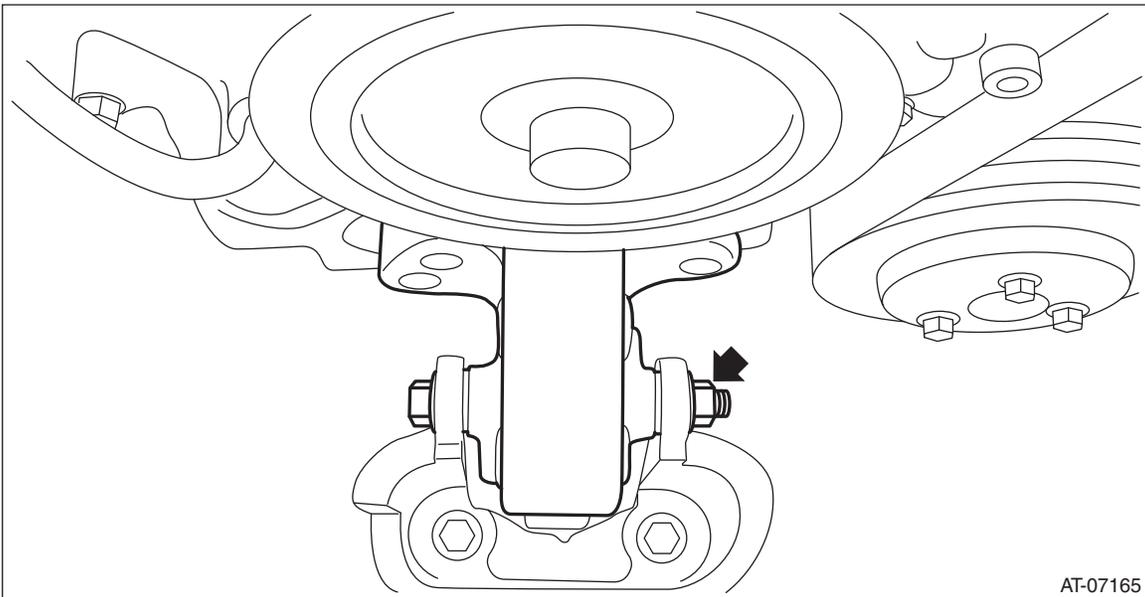
Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

41) Lift the engine slightly and remove the engine mounting bolts.



42) Remove the engine mounting nut and bolt to remove the front cushion rubber.

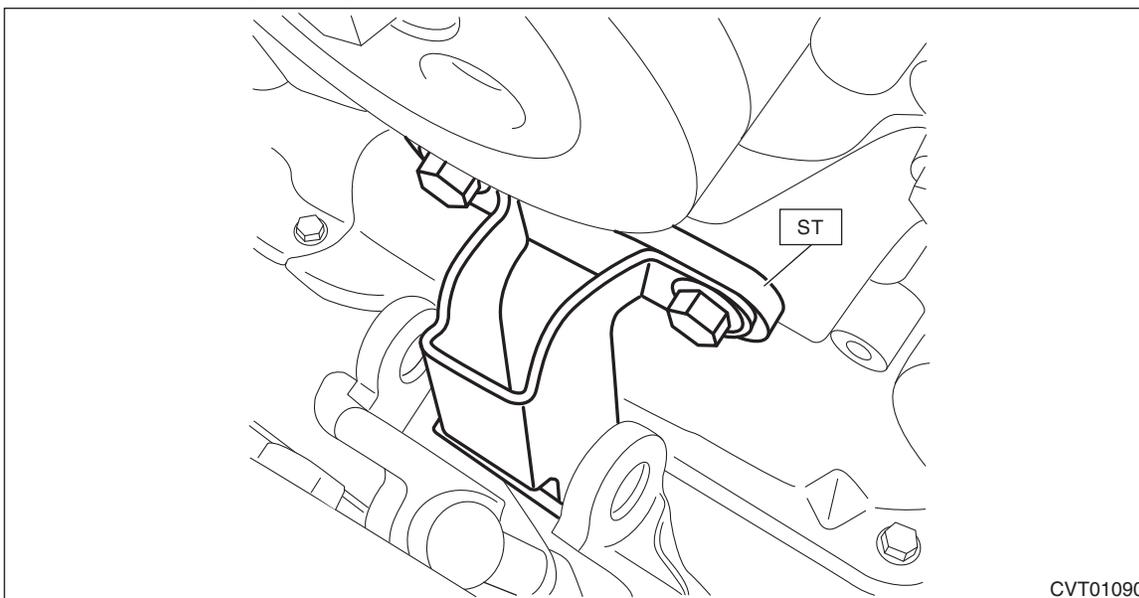


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Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 43) Temporarily attach ST by using two bolts.
ST 41099AJ130 ST H4 (FA, FB)



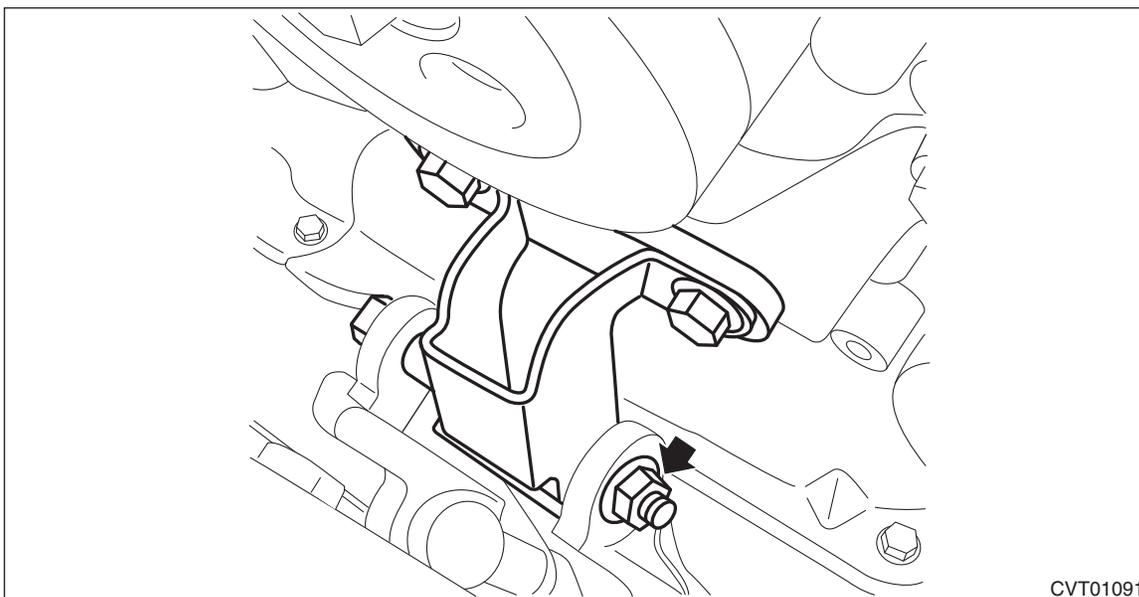
- 44) Lift up the engine unit high enough to install the bolt and nut.

CAUTION:

Do not lift up higher than enough level to install the ST to avoid damage to the hoses and pipes inside the engine room.

NOTE:

If it is difficult to pull out the stud bolt from transmission mounting bracket, slightly shake the engine unit while lifting up.

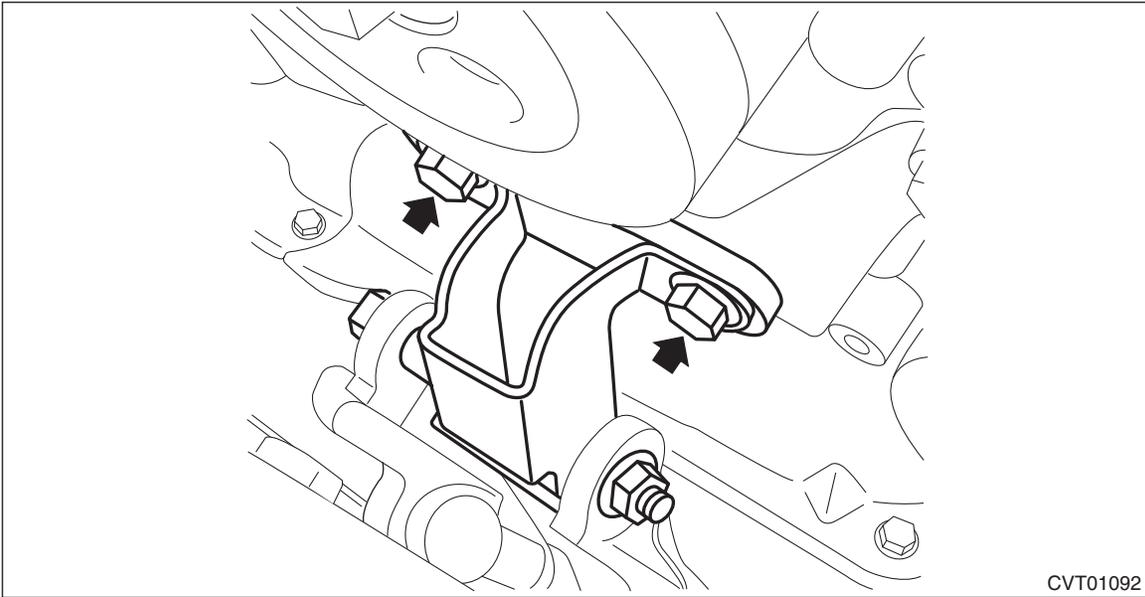


- 45) Tighten the mounting bolts on the engine side.

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:
25 N·m (2.5 kgf·m, 18.4 ft·lb)

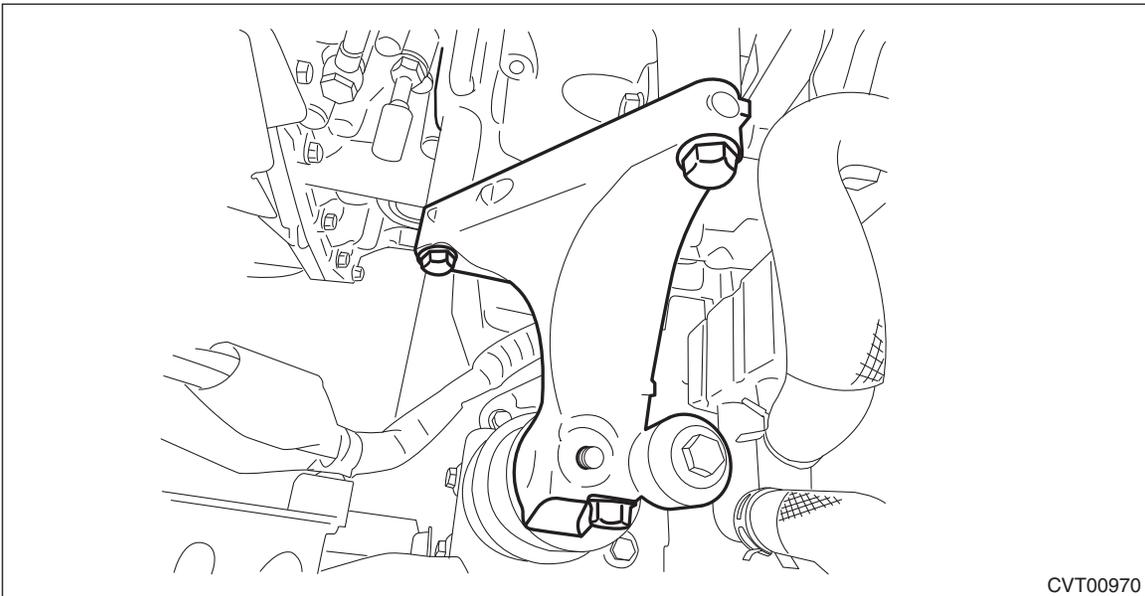


CVT01092

- 46) Remove the ST (ENGINE HANGER).
- 47) Remove the transmission mounting bracket LH and RH.

NOTE:

First, remove the transmission mounting bracket RH, and then tilt the engine unit to remove the transmission mounting bracket LH.

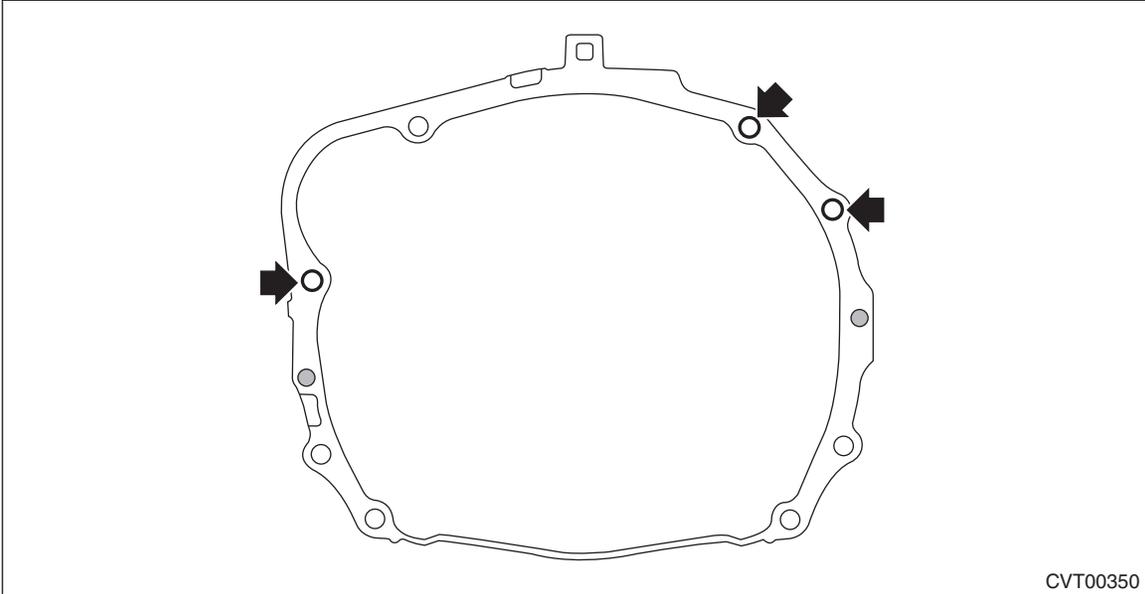


CVT00970

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

48) Remove the three transmission connecting bolts.

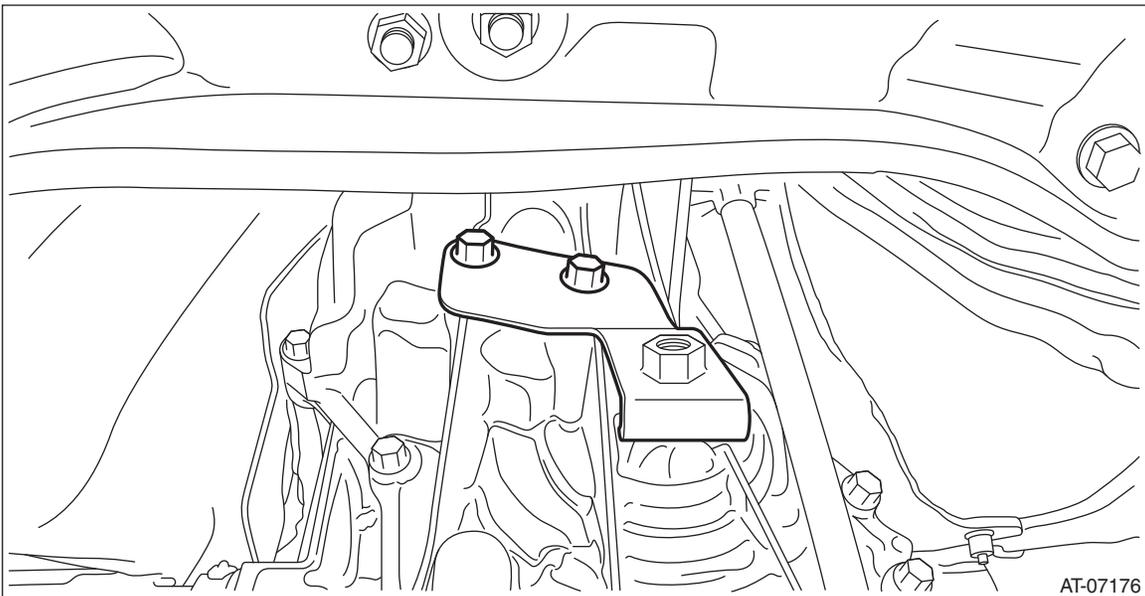


49) Set the ST (ENGINE HANGER) again to loosen the chain sling.

50) Lift up the vehicle.

51) Set the transmission jack under the transmission.

52) Remove the hanger bracket.



53) Remove the rear crossmember. <Ref. to CVT(TR580)-99, TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER, REMOVAL, Transmission Mounting System.>

54) Lower the transmission rear end (dust cover rear end).

CAUTION:

When lowering the transmission rear end, be careful not to let the converter case and steering mechanical parts contact each other.

NOTE:

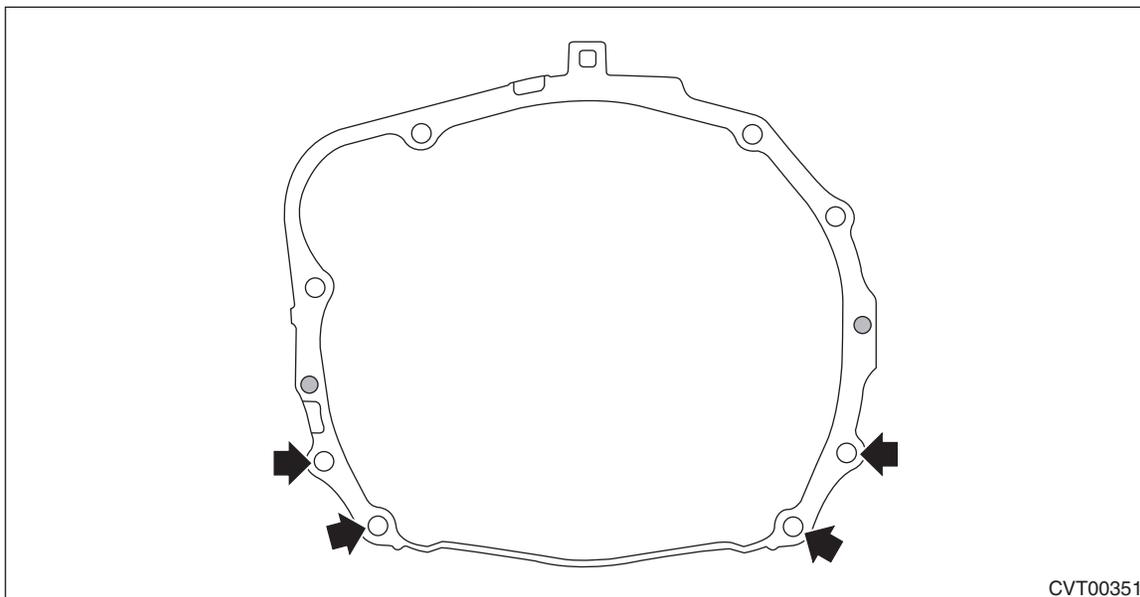
Lower the transmission rear end by approx. 80 mm (3.1 in) (reference).

55) Rotate the handle of ST (ENGINE HANGER) to apply tension to the chain sling.

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

56) Remove the two transmission connecting bolts and two nuts (lower side).



57) Remove the transmission assembly.

NOTE:

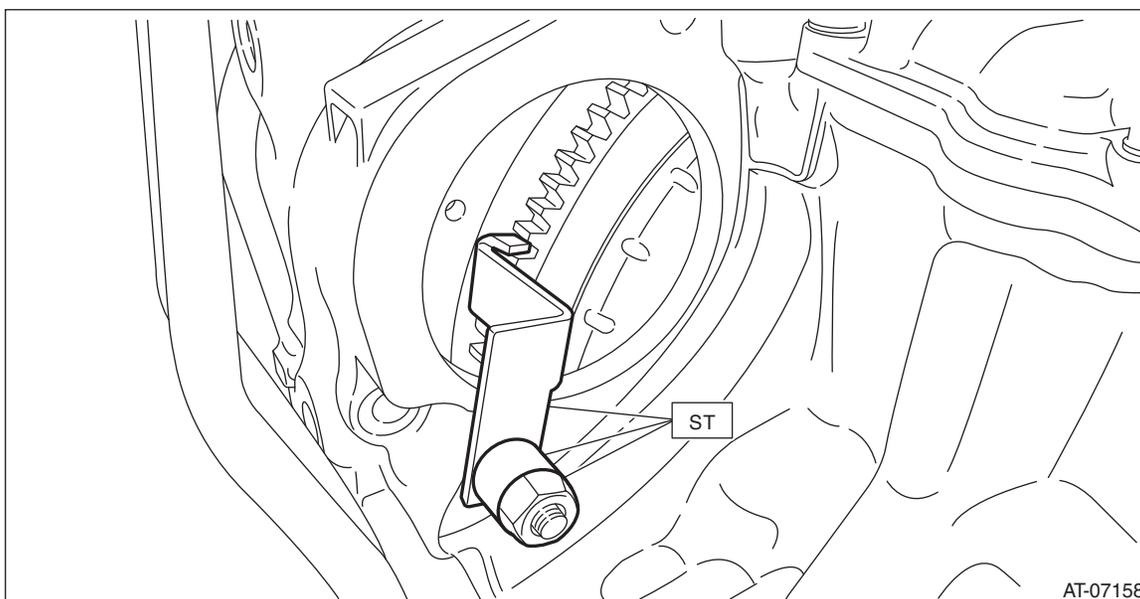
Remove it while moving the transmission jack up and down so that the engine and transmission axes are aligned straight.

58) Remove the cushion rubber. <Ref. to CVT(TR580)-99, TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER, REMOVAL, Transmission Mounting System.>

B: INSTALLATION

1) Attach the ST to converter case.

ST 498277200 STOPPER SET



2) Replace the front differential side retainer oil seal. <Ref. to CVT(TR580)-103, REPLACEMENT, Differential Side Retainer Oil Seal.>

NOTE:

- Be sure to replace the differential side retainer oil seal with a new part whenever the front drive shaft is removed from the transmission.
- When a new differential side retainer oil seal has been installed, replacement is not required.

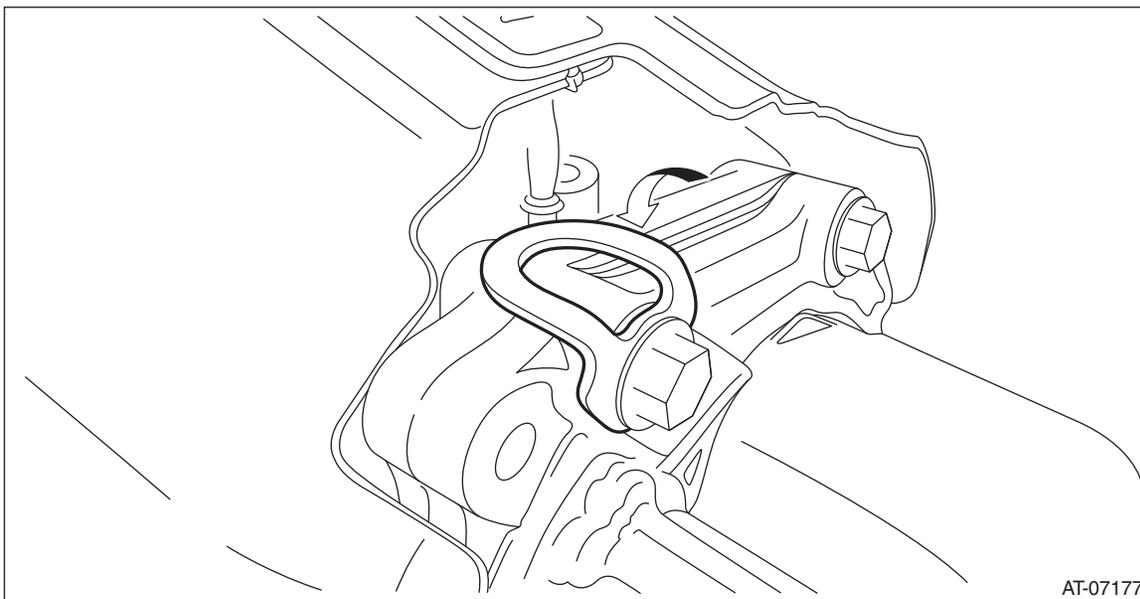
Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 3) Install the cushion rubber on the transmission. <Ref. to CVT(TR580)-100, INSTALLATION, Transmission Mounting System.>
- 4) Mount the transmission onto the transmission jack.
- 5) Strike and bend the transmission hanger of transmission rear with a soft rubber hammer etc. so that it gets in contact with the transmission case.

CAUTION:

Do not apply excessive load or impact to the transmission case.



- 6) While lifting up the transmission gradually, install the transmission to the engine.

CAUTION:

This operation requires at least two persons.

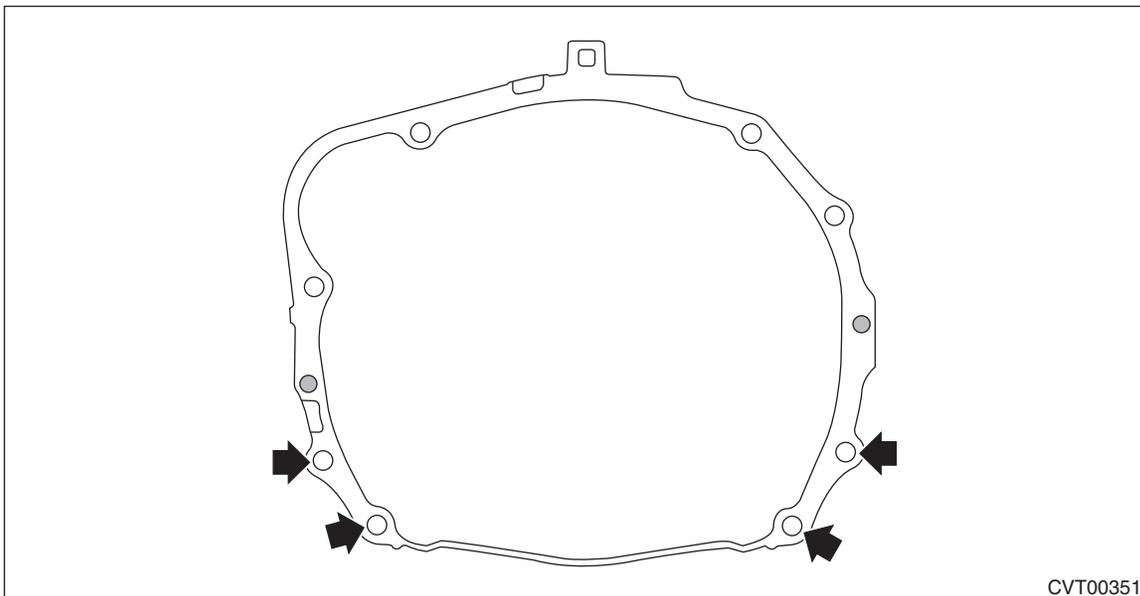
NOTE:

Keep the engine level.

- 7) Install the two engine connecting bolts and two nuts (lower side).

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)



- 8) Install the transmission rear crossmember. <Ref. to CVT(TR580)-100, TRANSMISSION REAR CROSS-MEMBER AND REAR CUSHION RUBBER, INSTALLATION, Transmission Mounting System.>

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

9) Install the hanger bracket.

Tightening torque:

23 N·m (2.3 kgf·m, 17.0 ft·lb)

10) Remove the transmission jack.

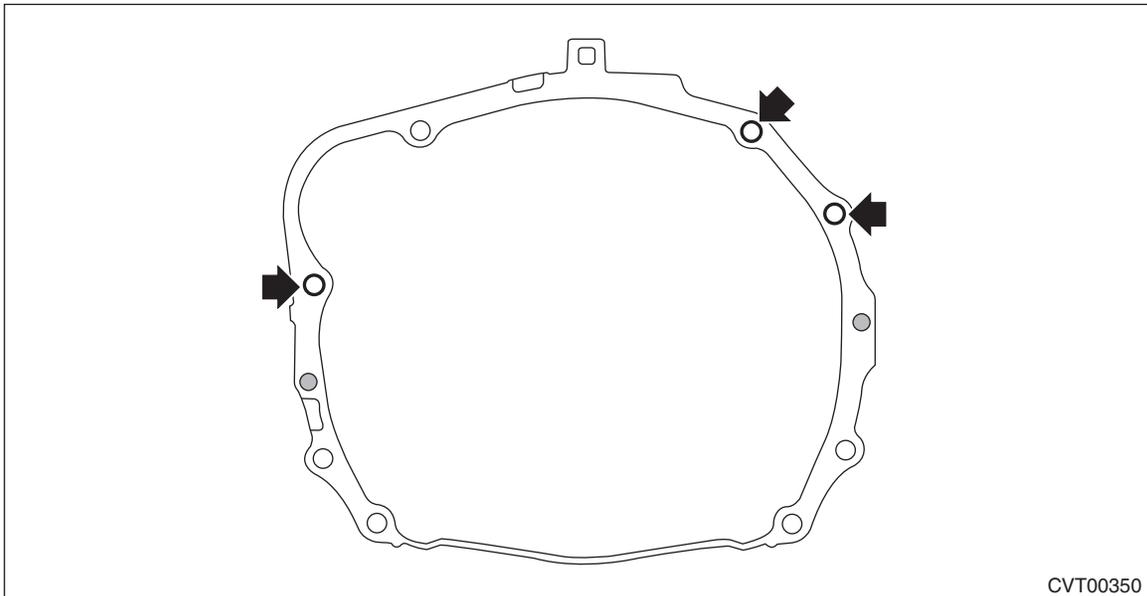
11) Lower the vehicle.

12) Remove the ST (ENGINE HANGER).

13) Install the three engine mounting bolts (upper side).

Tightening torque:

50 N·m (5.1 kgf·m, 36.9 ft·lb)



CVT00350

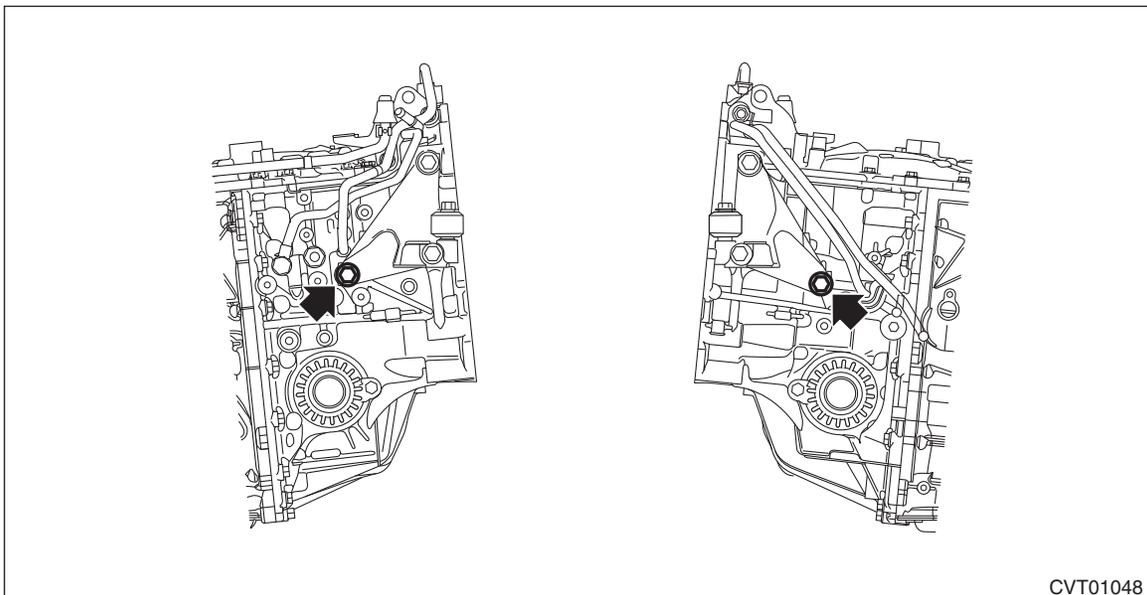
14) Install the transmission mounting bracket LH and RH.

NOTE:

- Install to the left side of vehicle first because the engine inclines to the left.
- Temporarily tighten the bolt arrowed in the figure.

Tightening torque:

75 N·m (7.6 kgf·m, 55.3 ft·lb)



CVT01048

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

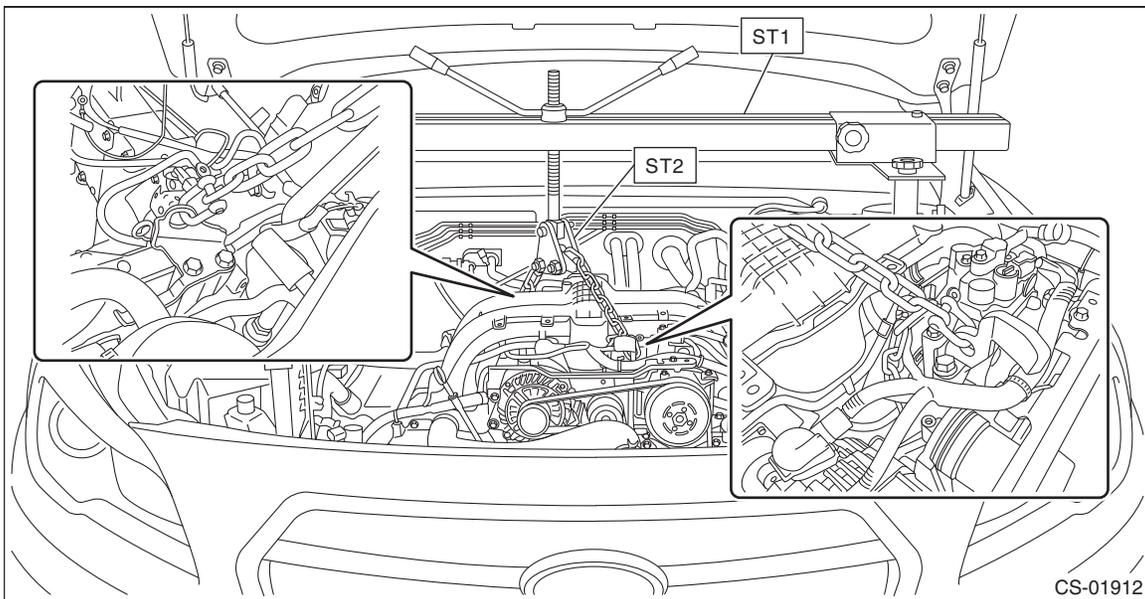
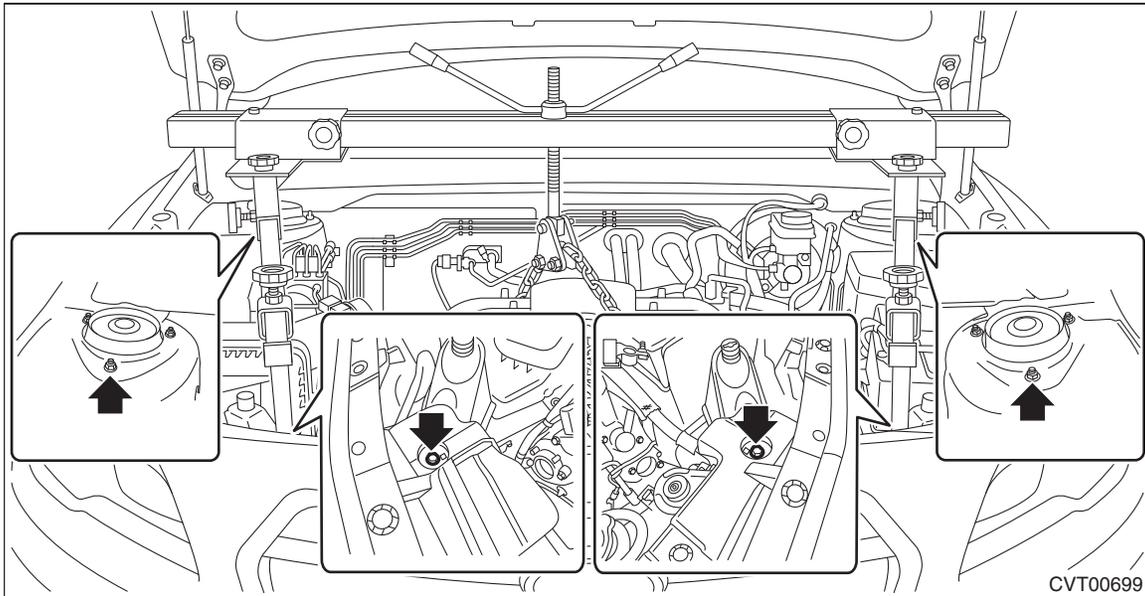
15) Set the ST to vehicle body and lift up the engine unit slightly.

ST1 99099AJ000 ENGINE HANGER

ST2 99099AJ010 CHAIN BALANCER

CAUTION:

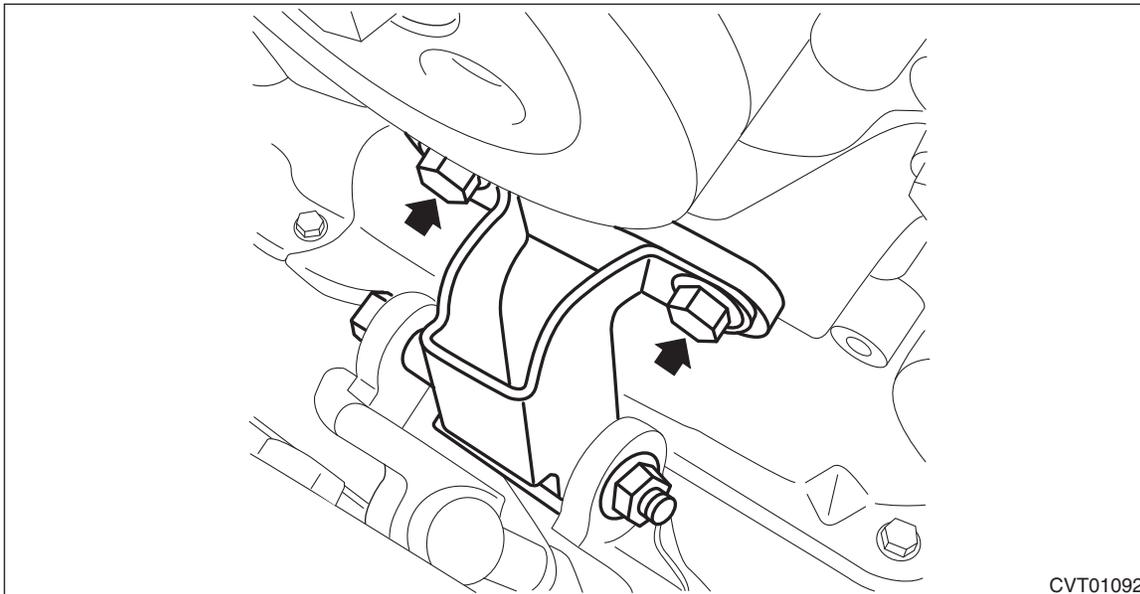
- Set so that the chain sling does not contact the engine parts.
- Set the arms of ST (ENGINE HANGER) at the locations shown in the figure.



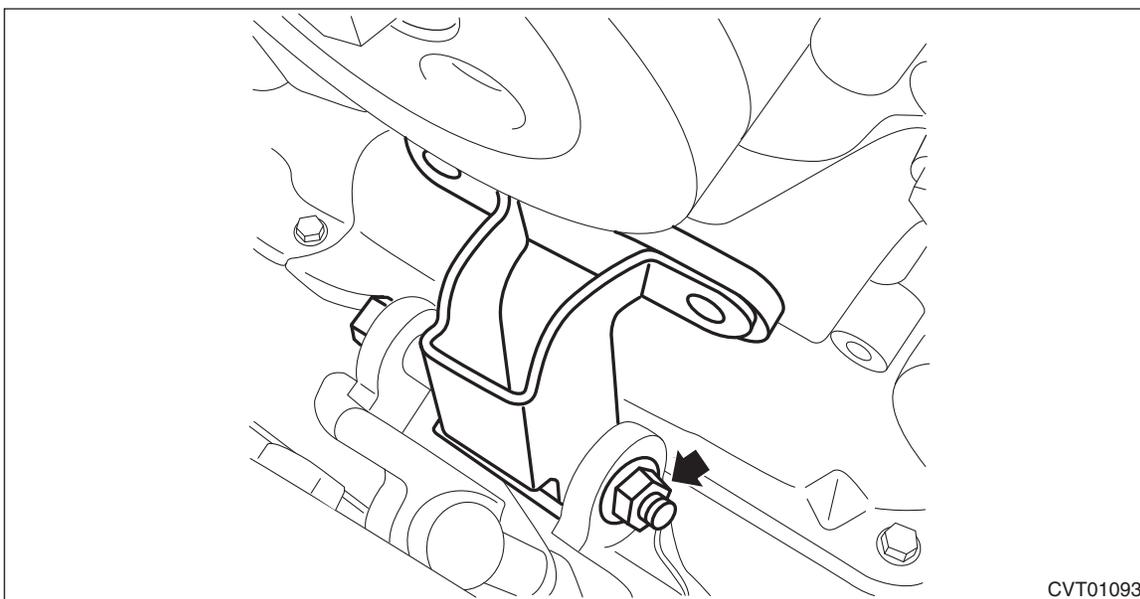
Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

16) Remove the bolts from ST (ST H4 (FA, FB)).



17) Remove the bolt and nut to remove ST (ST H4 (FA, FB)).

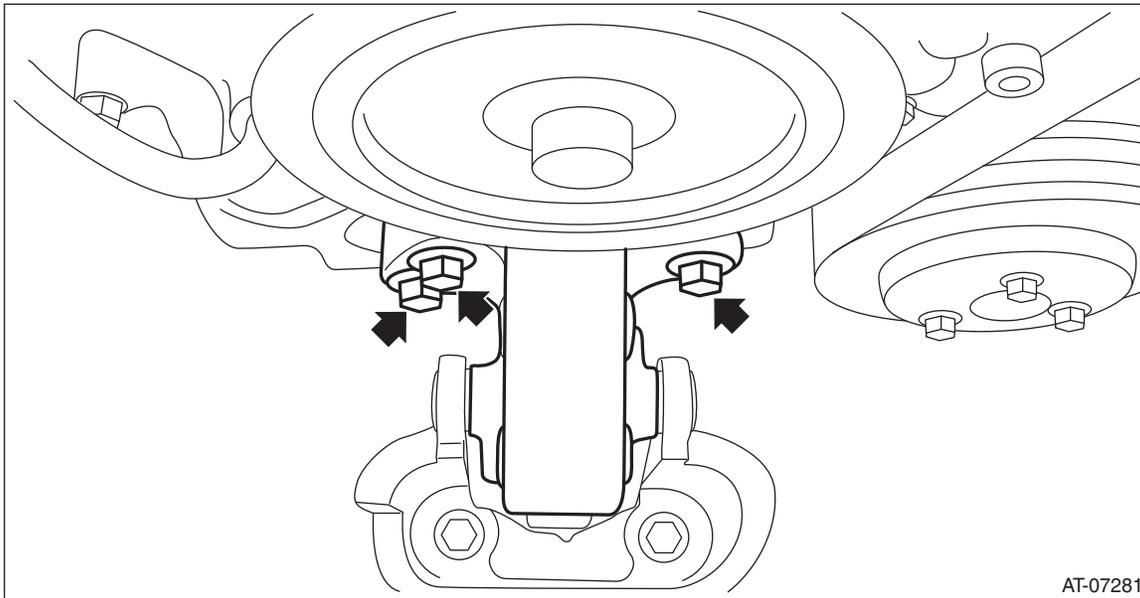


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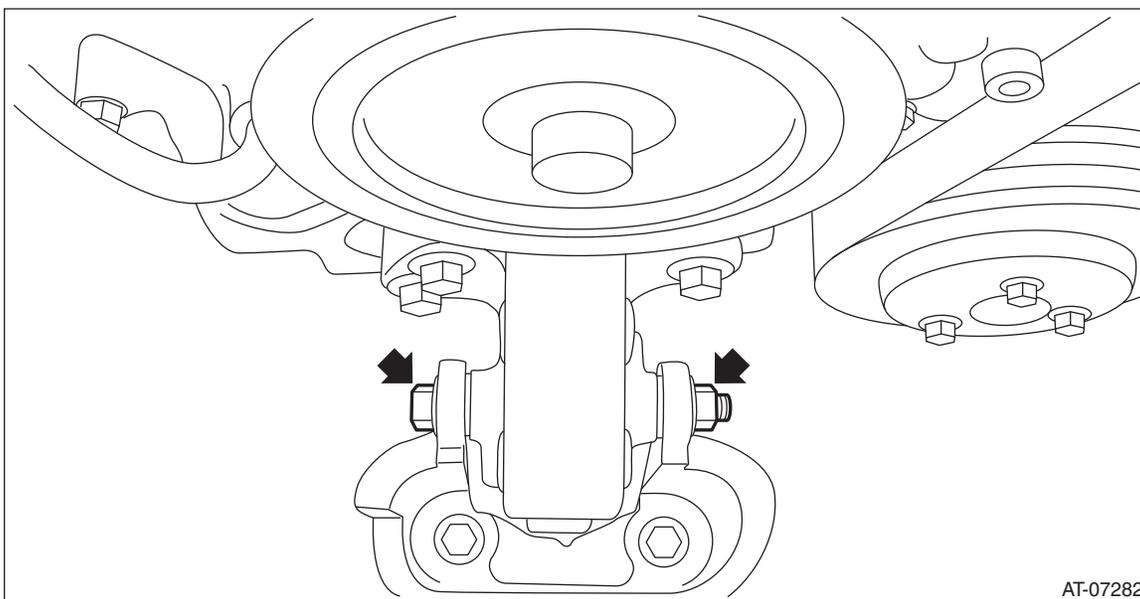
Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

18) Temporarily attach the front cushion rubber with bolts.



19) Install the bolt and nut to the front cushion rubber.



20) Tighten the bolts and nuts of front cushion rubber.

NOTE:

Always start tightening from the bolts on the engine side.

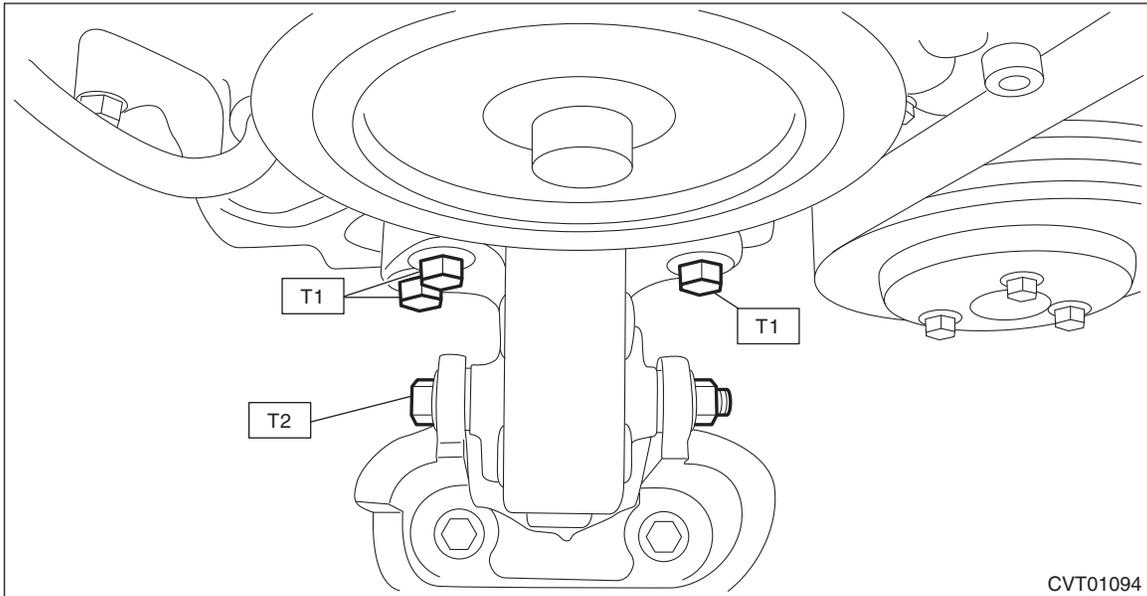
Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

T1: 25 N·m (2.5 kgf-m, 18.4 ft-lb)

T2: 45 N·m (4.6 kgf-m, 33.2 ft-lb)



21) Remove the ST (ENGINE HANGER and CHAIN SLING) and the bolt of $\phi 8$ mm (0.3 in).

22) Install the V-belt cover.

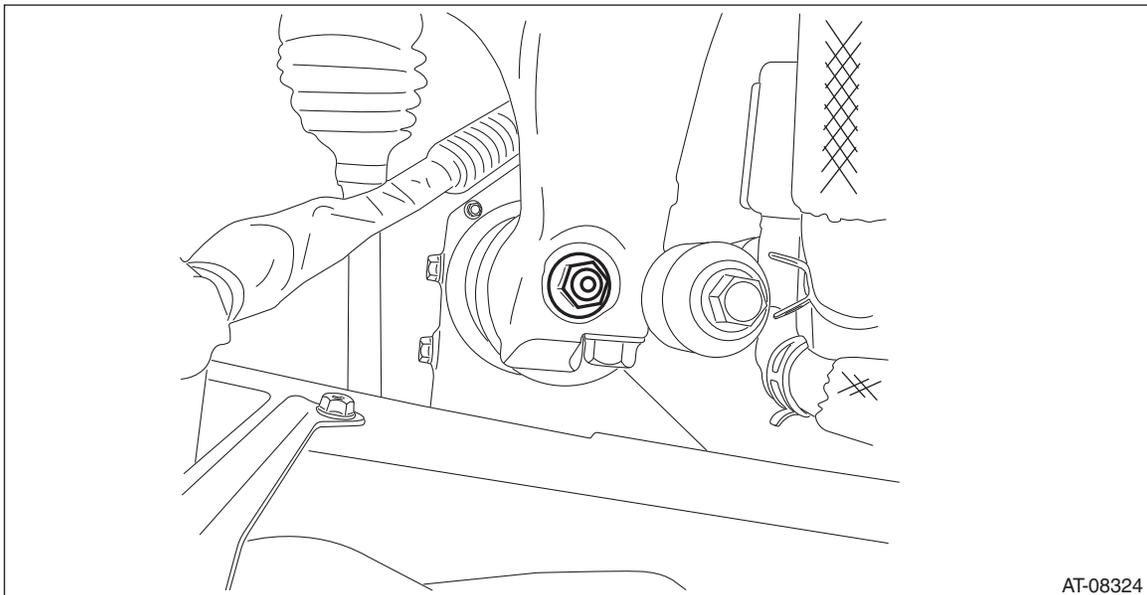
Tightening torque:

6.5 N·m (0.7 kgf-m, 4.7 ft-lb)

23) Install the nut to the transmission mounting bracket.

Tightening torque:

45 N·m (4.6 kgf-m, 33.2 ft-lb)



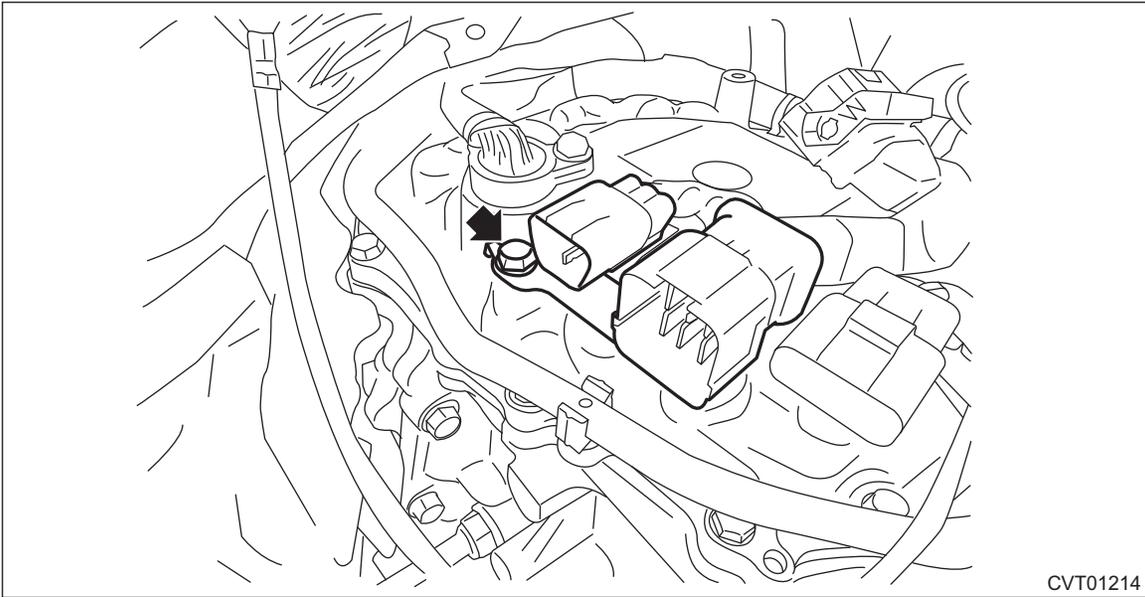
24) Install the transmission harness stay.

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

7 N·m (0.7 kgf·m, 5.2 ft·lb)



25) Install the TCM. <Ref. to CVT(TR580)-166, INSTALLATION, Transmission Control Module (TCM).>

26) Insert the transmission case cover (small) between transmission case cover (large) and transmission to install.

NOTE:

When inserting, be careful that the insulator inside transmission case cover is not turned over.

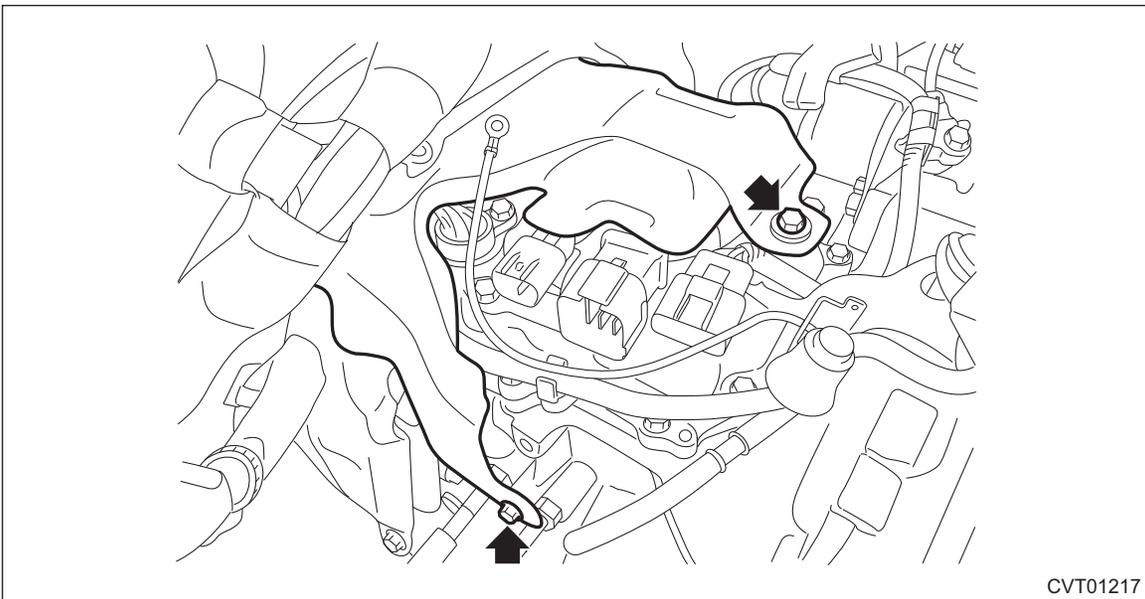
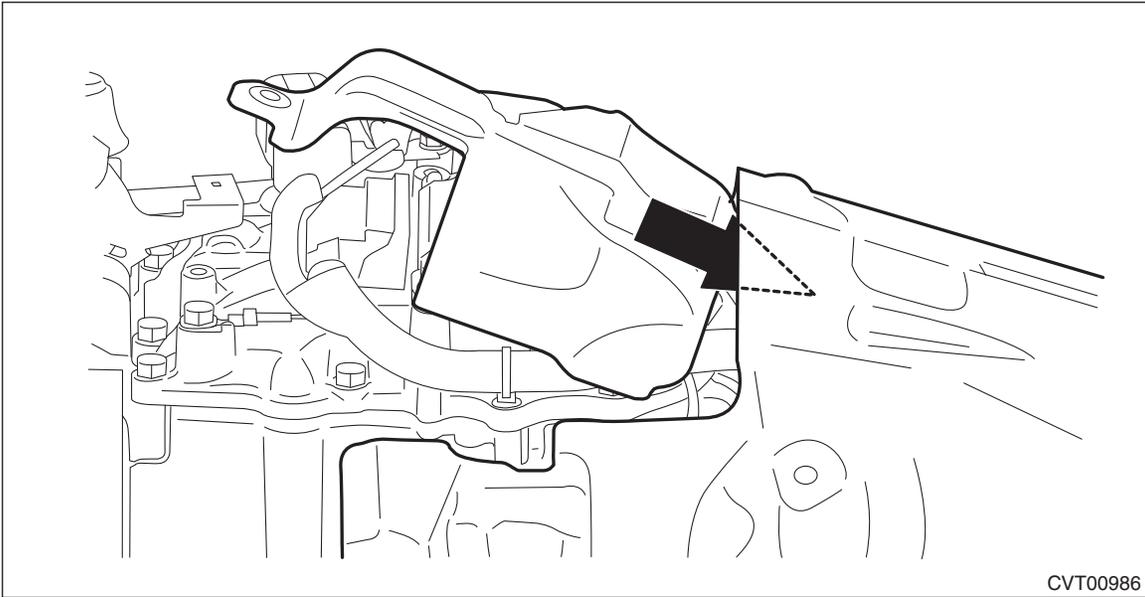
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Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

7 N·m (0.7 kgf·m, 5.2 ft·lb)



27) Remove the ST (STOPPER SET) from converter case.

28) Match the torque converter screw hole with drive plate hole to install the bolt.

CAUTION:

- Do not drop the mounting bolt in the converter housing.
- Do not damage the mounting bolt.

Tightening torque:

25 N·m (2.5 kgf·m, 18.4 ft·lb)

29) Install the remaining three bolts by rotating the crank pulley a little at a time in the same direction as engine revolution.

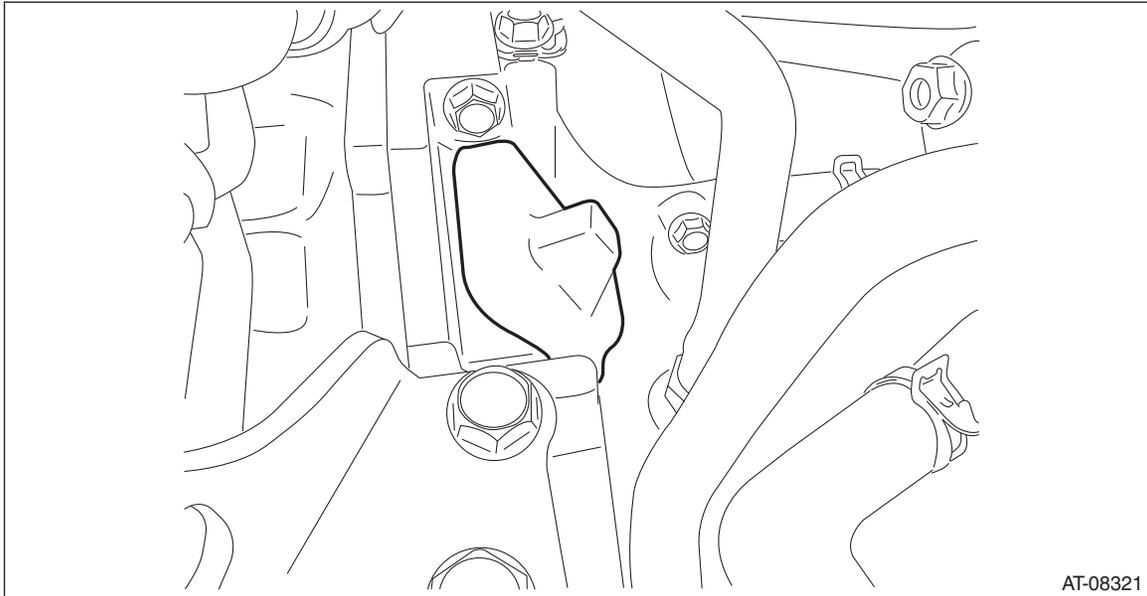
Tightening torque:

25 N·m (2.5 kgf·m, 18.4 ft·lb)

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

30) Install the service hole plug.



AT-08321

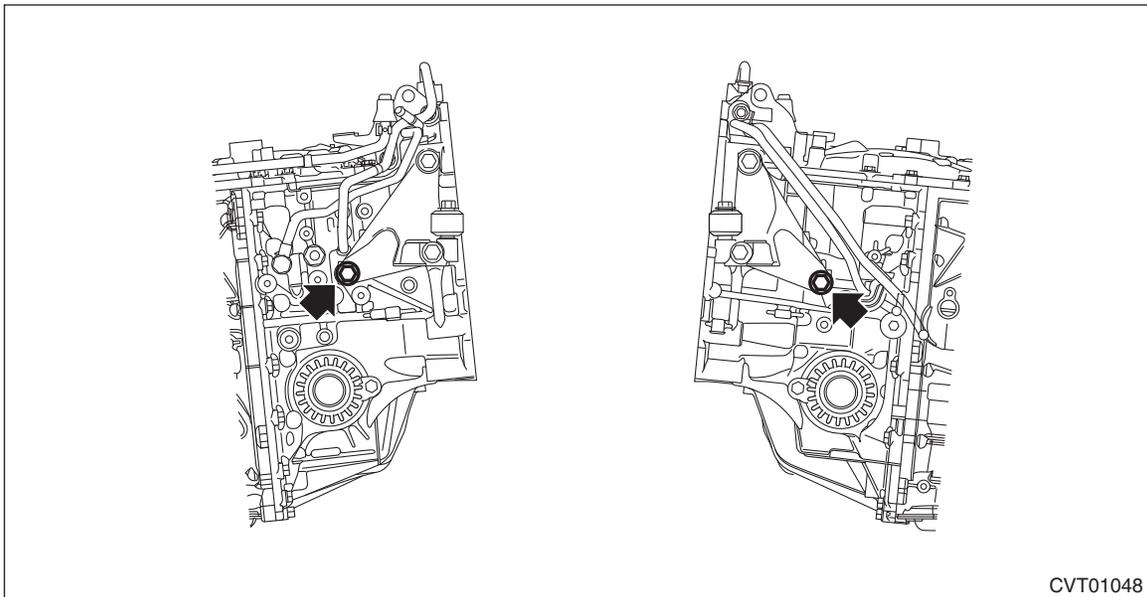
31) Install the starter. <Ref. to SC(H4DO)-8, INSTALLATION, Starter.>

32) Lift up the vehicle.

33) Tighten the single mounting bolt of transmission mounting bracket.

Tightening torque:

75 N·m (7.6 kgf·m, 55.3 ft·lb)



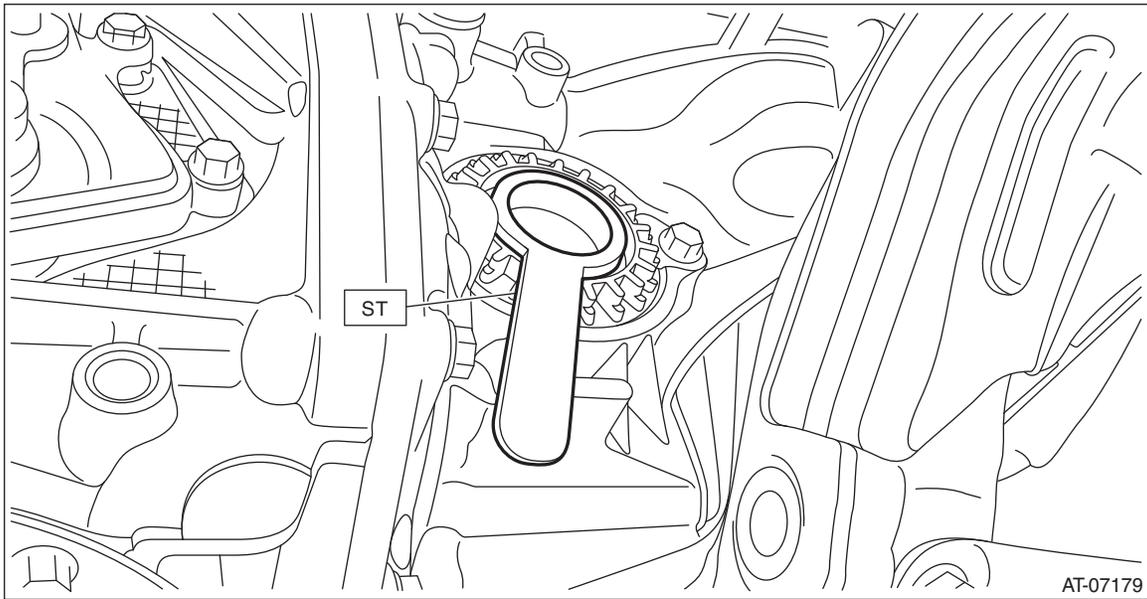
CVT01048

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Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

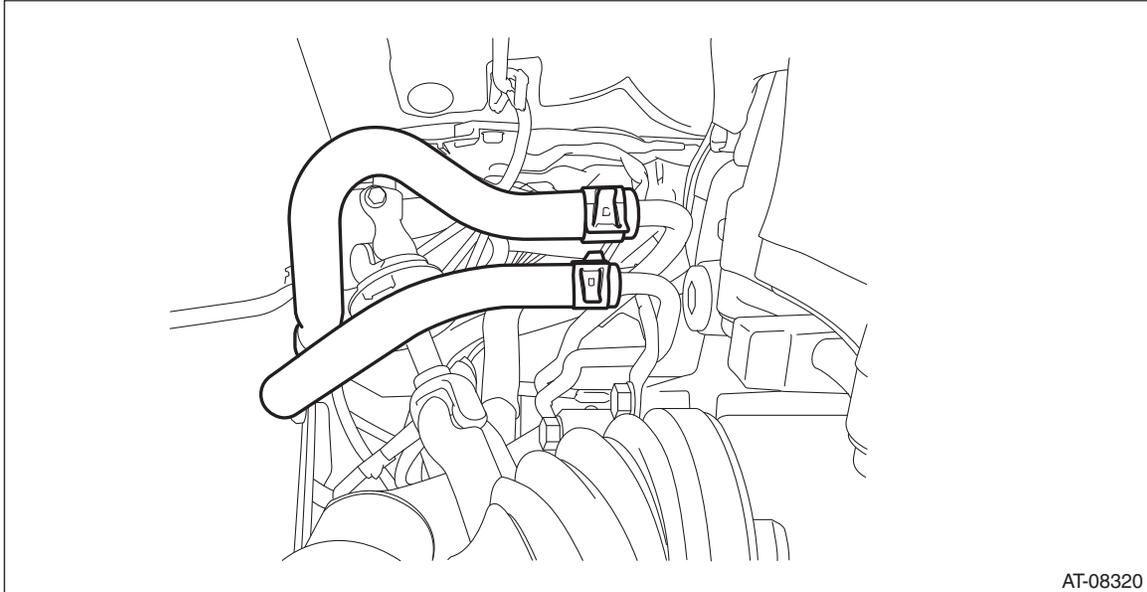
- 34) Set the ST to differential side retainer.
ST 28399SA010 OIL SEAL PROTECTOR



- 35) Replace the circlip of the drive shaft with a new part.
36) Insert the front drive shaft spline section into transmission and remove the ST (OIL SEAL PROTECTOR).
37) Insert the drive shaft into the transmission securely by pressing the housing from outside of the vehicle.
38) Install the CVTF CVT inlet hose and CVTF CVT outlet hose. (With CVTF cooler (air cool))

NOTE:

Use new CVTF CVT inlet hose and CVTF CVT outlet hose.



- 39) Insert the ball joint into housing and secure with bolt.

CAUTION:

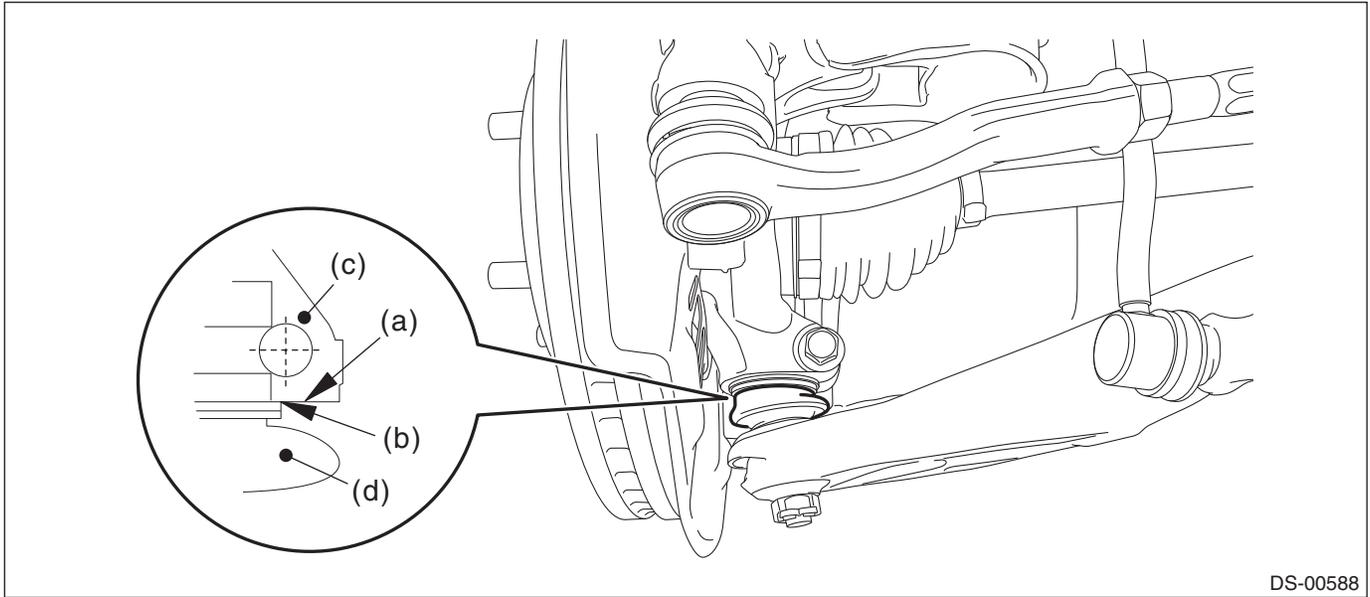
- Before tightening, make sure the bottom surface of the housing assembly - front axle and the stepped section of ball joint are in contact.
- Be careful not to damage the boot of the joint.

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

50 N·m (5.1 kgf·m, 36.9 ft·lb)



DS-00588

- (a) Bottom surface of housing ASSY - front axle (b) Raised section of ball joint (c) Housing ASSY - front axle
(d) Ball joint ASSY

40) Install the stabilizer link.

NOTE:

Use a new flange nut.

Tightening torque:

60 N·m (6.1 kgf·m, 44.3 ft·lb)

41) Connect the tie-rod end and knuckle arm, and attach the castle nut.

CAUTION:

When connecting the tie-rod end, do not hit the cap at the bottom of tie-rod end with a hammer.

Tightening torque:

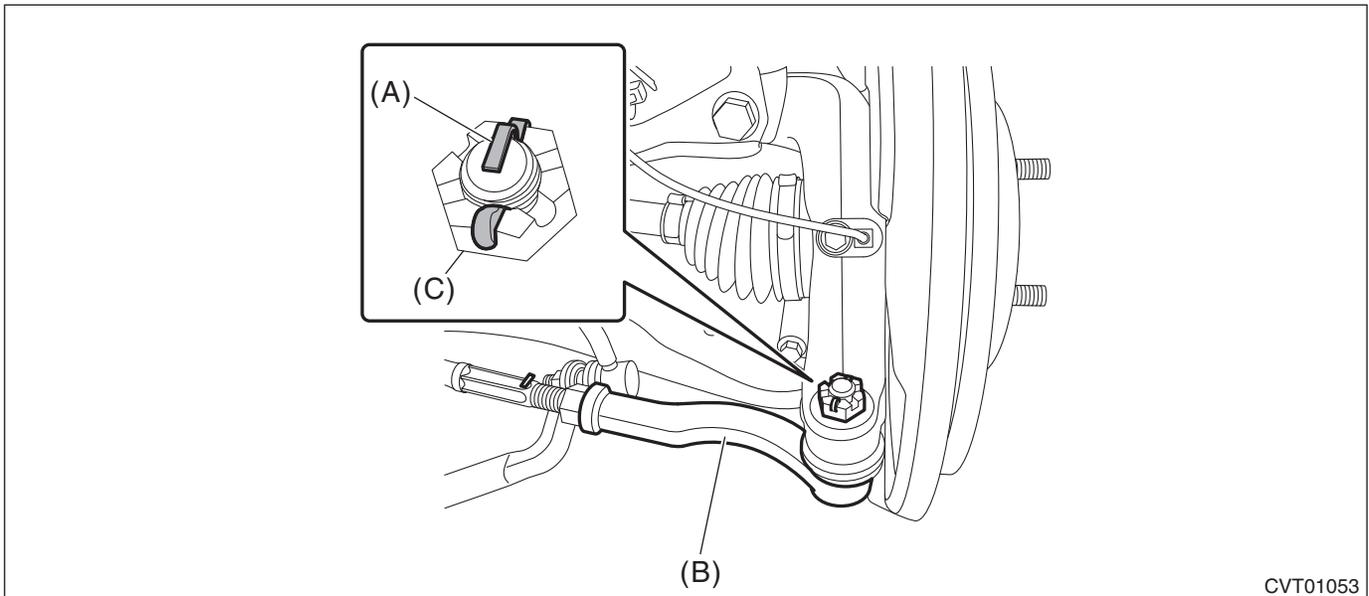
27 N·m (2.8 kgf·m, 19.9 ft·lb)

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Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

42) After tightening the castle nut to the specified tightening torque, tighten it further within 60° until the cotter pin hole is aligned with slot in the nut. Fit the cotter pin into the nut, and then bend the pin to lock.



- (A) Cotter pin
- (B) Tie-rod end
- (C) Castle nut

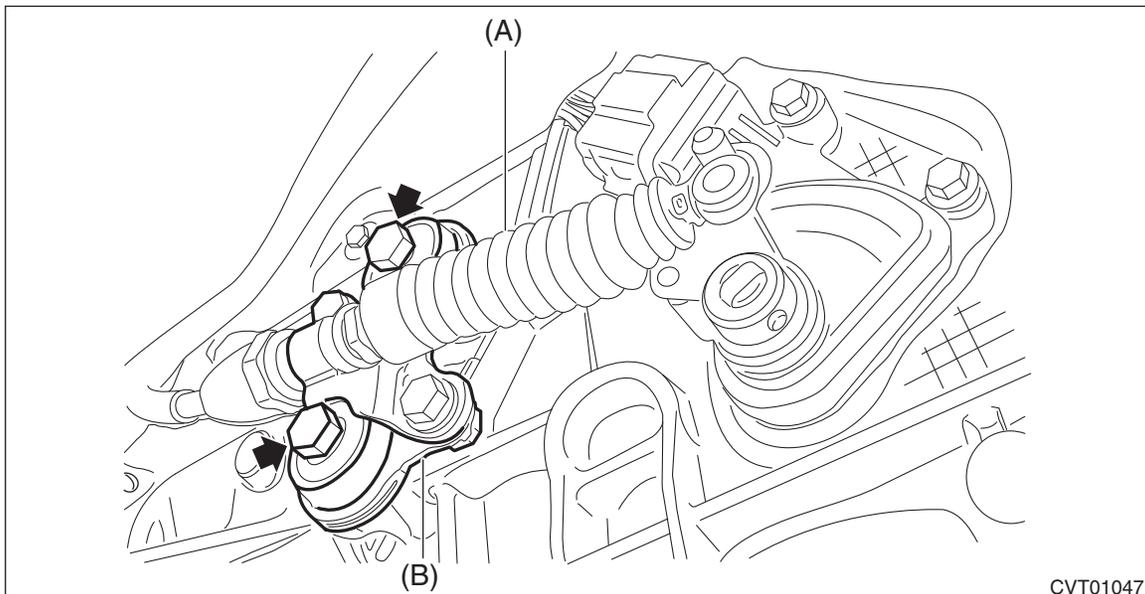
43) Install the propeller shaft. <Ref. to DS-12, INSTALLATION, Propeller Shaft.>

44) Install the universal joint. <Ref. to PS-21, INSTALLATION, Universal Joint.>

45) Install the plate assembly to transmission.

Tightening torque:

25 N·m (2.5 kgf·m, 18.4 ft·lb)



- (A) Select cable
- (B) Plate ASSY

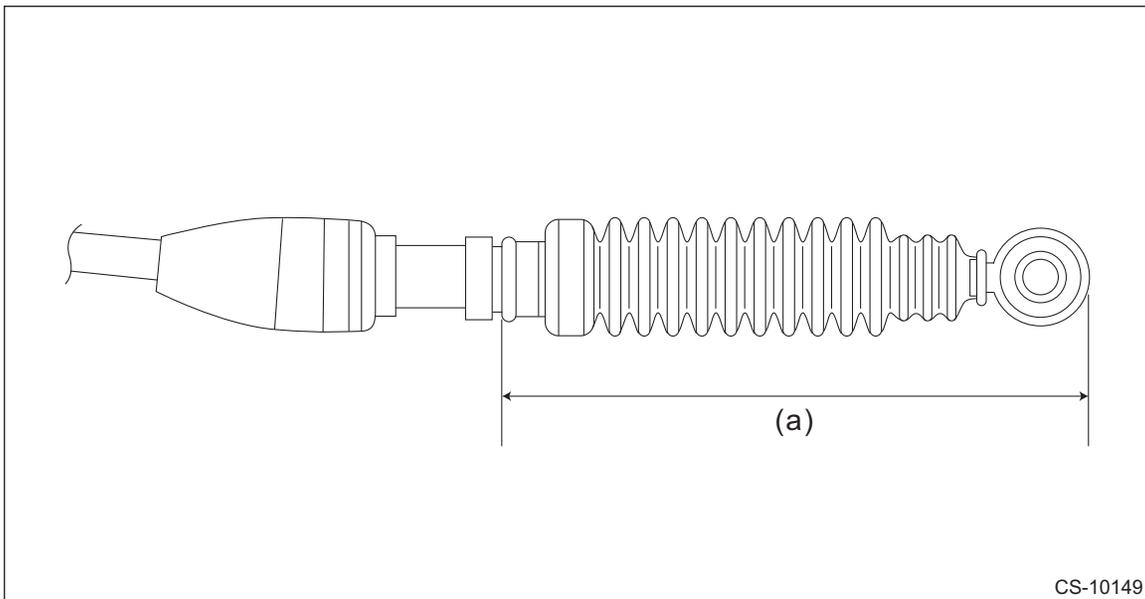
46) Install the washer and snap pin to the shifter arm.

Automatic Transmission Assembly

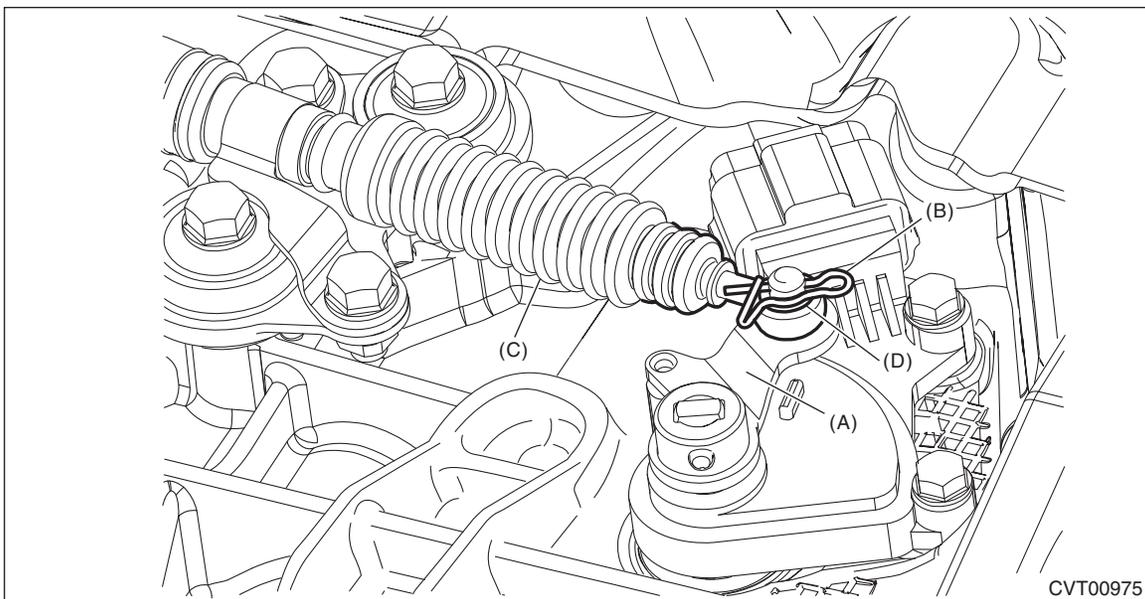
CONTINUOUSLY VARIABLE TRANSMISSION

CAUTION:

Do not apply extra overload while holding the part (a).



CS-10149



CVT00975

- (A) Shifter arm
- (B) Snap pin
- (C) Select cable
- (D) Washer

47) Install the center exhaust cover.

Tightening torque:

18 N·m (1.8 kgf·m, 13.3 ft·lb)

48) Install the center exhaust pipe. <Ref. to EX(H4DO)-14, INSTALLATION, Center Exhaust Pipe.>

49) Install the under cover - front.

50) Lower the vehicle.

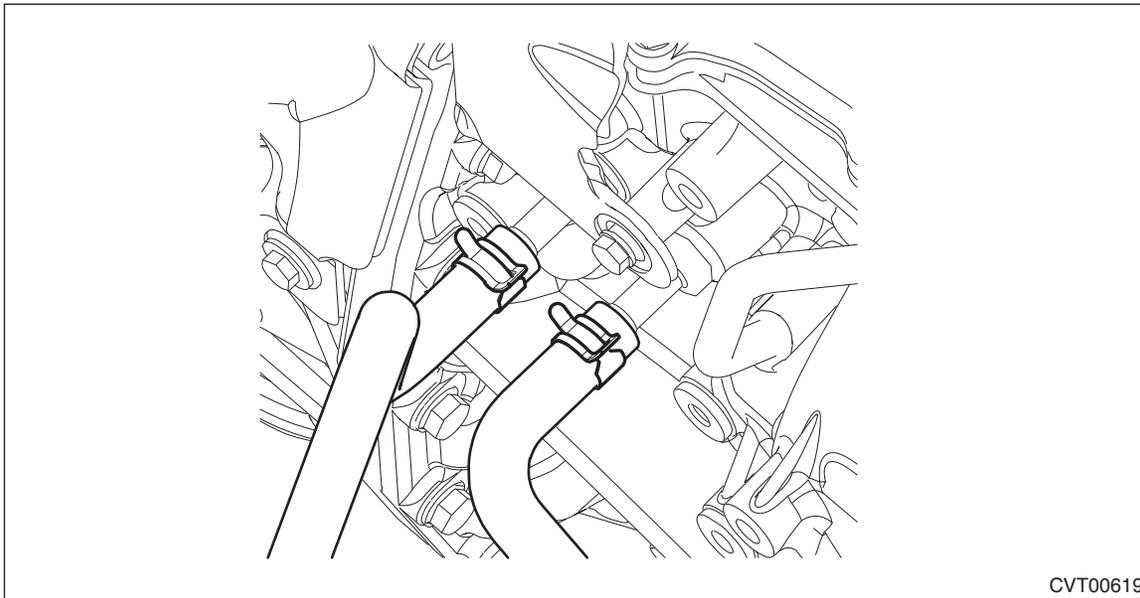
51) Install the front tire LH and RH. <Ref. to WT-6, INSTALLATION, Tire and Wheel.>

52) Replace the CVTF inlet hose and CVTF outlet hose with new parts. <Ref. to CVT(TR580)-171, CVTF Cooler (With Warmer Function).>

Automatic Transmission Assembly

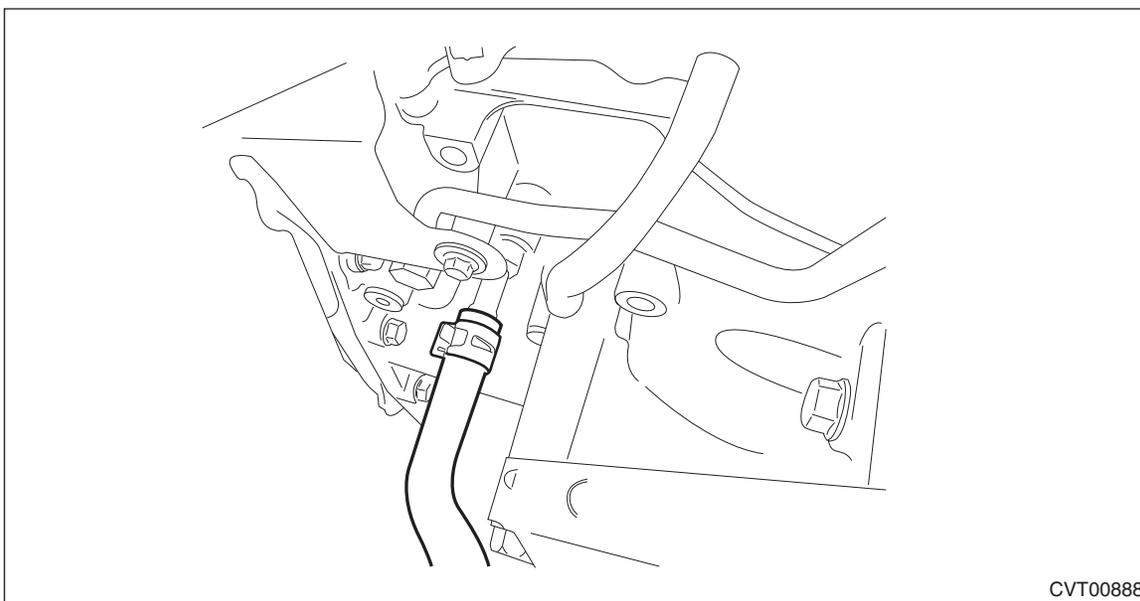
CONTINUOUSLY VARIABLE TRANSMISSION

53) Install the CVTF inlet hose and CVTF outlet hose. (Without CVTF cooler (air cool))



CVT00619

54) Install the CVTF outlet hose. (With CVTF cooler (air cool))



CVT00888

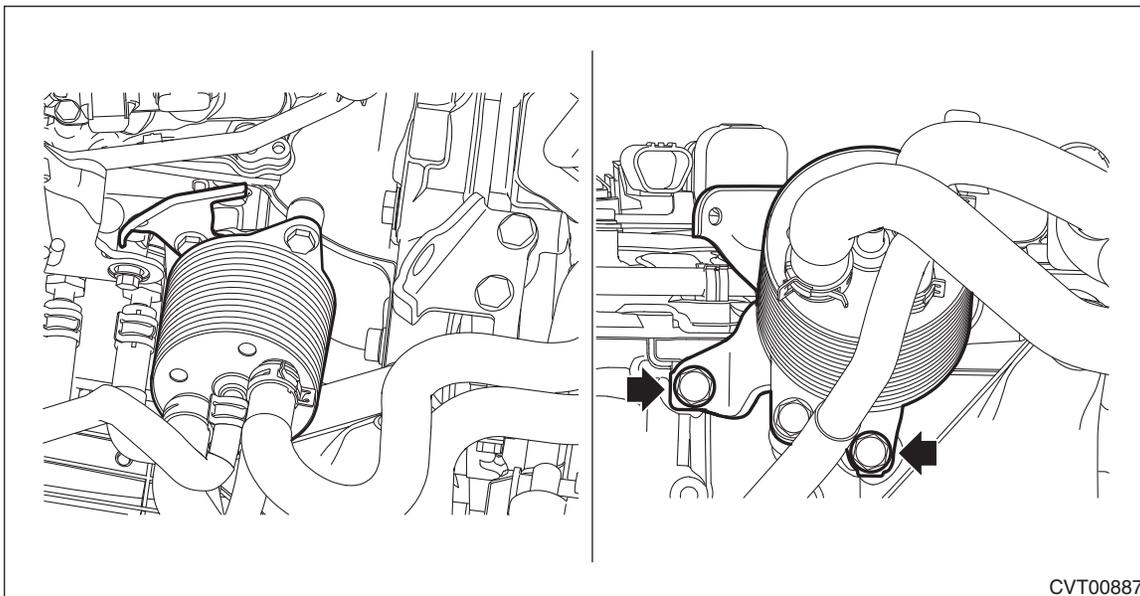
55) Install the CVTF cooler (with warmer feature).

Automatic Transmission Assembly

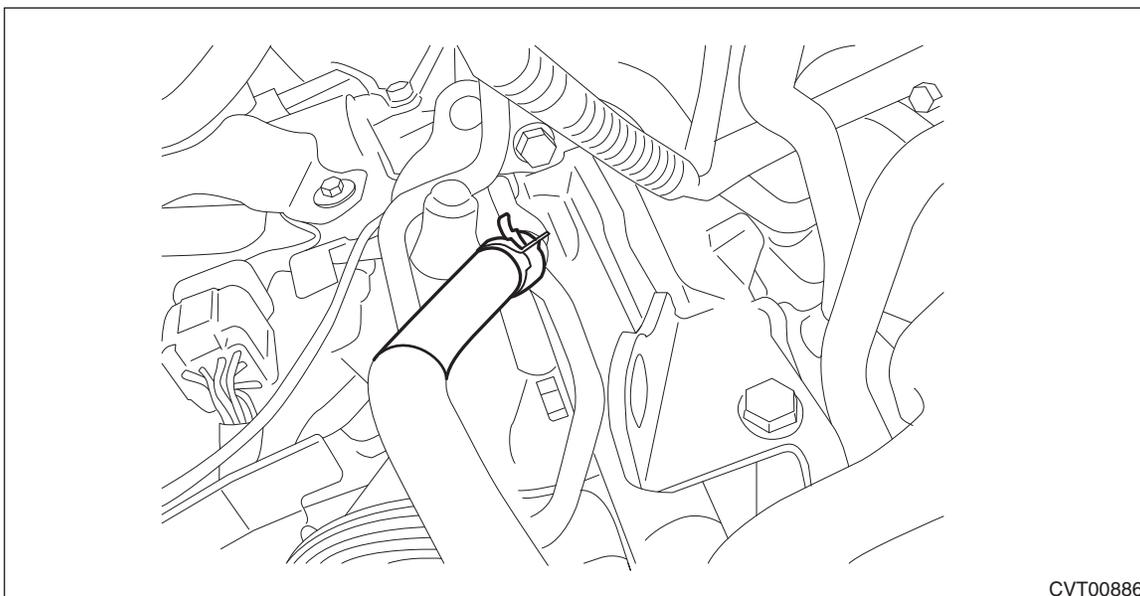
CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

23 N·m (2.3 kgf·m, 17.0 ft·lb)



56) Install the CVTF cooler hose. (With CVTF cooler (air cool))



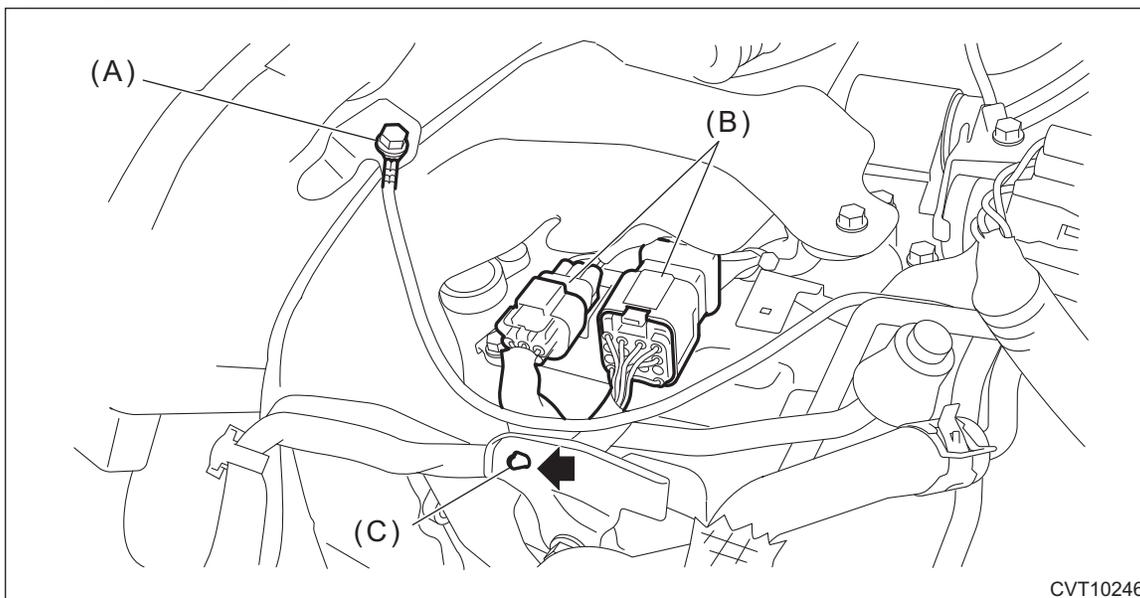
57) Connect the harness connector, and install the clip and transmission radio ground cord terminal.

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

13 N·m (1.3 kgf·m, 9.6 ft·lb)

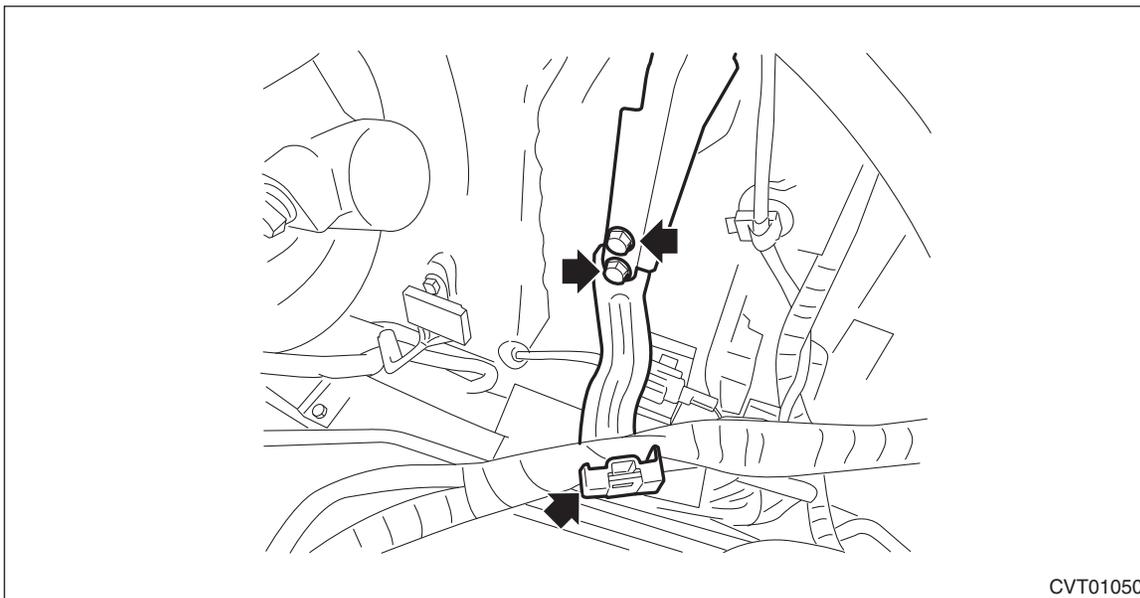


- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

58) Install the battery cable bracket, and install the battery cable clip to the bracket.

Tightening torque:

7.5 N·m (0.76 kgf·m, 5.5 ft·lb)



59) Install the air intake boot assembly. <Ref. to IN(H4DO)-10, INSTALLATION, Air Intake Boot.>

60) Install the air intake duct. <Ref. to IN(H4DO)-12, INSTALLATION, Air Intake Duct.>

61) Connect the battery ground terminal.

62) Refill differential gear oil to adjust the differential gear oil amount. <Ref. to CVT(TR580)-43, ADJUSTMENT, Differential Gear Oil.>

63) Refill CVTF to adjust the CVTF amount. <Ref. to CVT(TR580)-39, ADJUSTMENT, CVTF.>

64) Perform the operation for clearing AT learning value. <Ref. to CVT(diag)-26, Clear Memory Mode.>

65) Perform the operation of AT learning mode. <Ref. to CVT(diag)-33, Learning Control.>

Automatic Transmission Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

66) Execute the rear differential inspection mode. <Ref. to DI-63, Rear Differential Inspection Mode.>

CAUTION:

Always execute the rear differential inspection mode at the replacement of the following.

- **Replacement of transmission assembly**
- **Replacement of front differential hypoid gear set**

67) Perform the road test to make sure there is no fault. <Ref. to CVT(TR580)-48, INSPECTION, Road Test.>

11. Transmission Mounting System

A: REMOVAL

1. TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER

1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

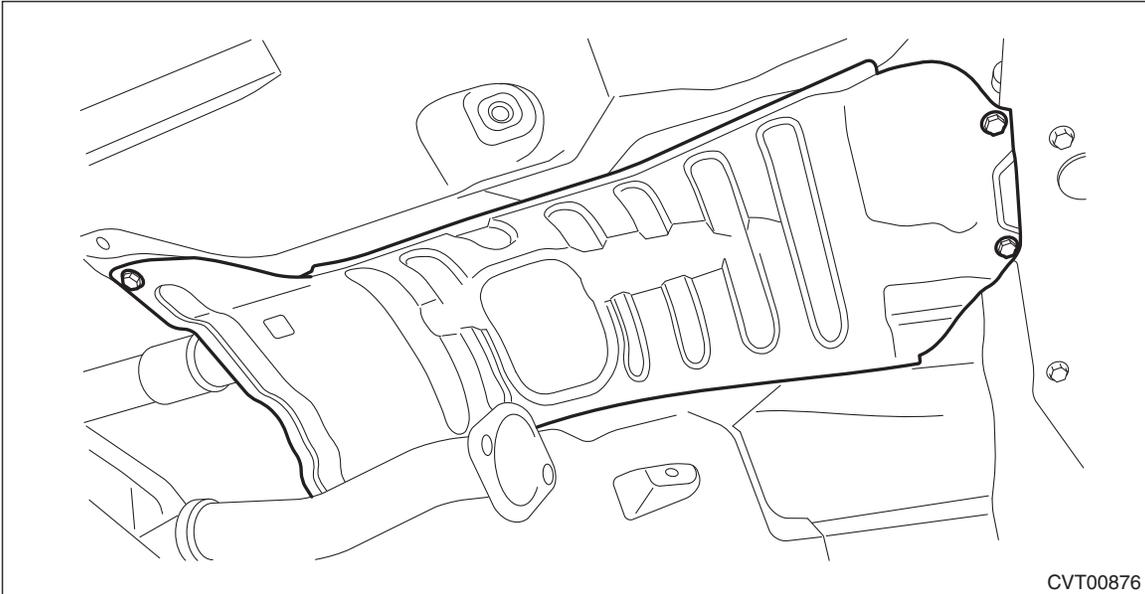
NOTE:

For model with battery sensor, disconnect the ground terminal from battery sensor.

2) Lift up the vehicle.

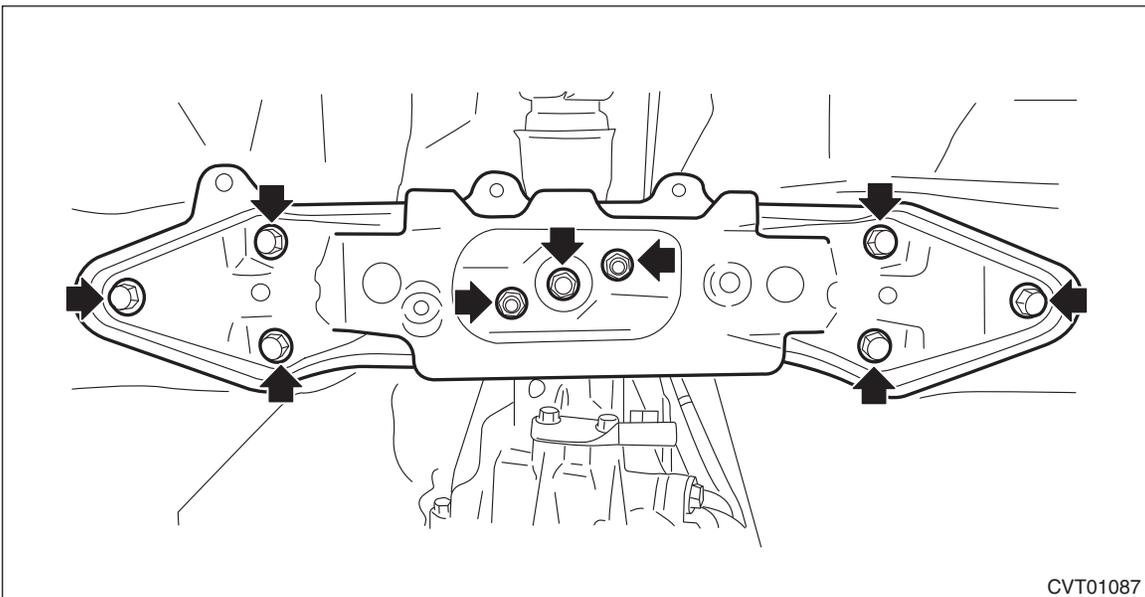
3) Remove the center exhaust pipe. <Ref. to EX(H4DO)-13, REMOVAL, Center Exhaust Pipe.>

4) Remove the center exhaust cover.



5) Set the transmission jack under the transmission. Make sure that the support plate of transmission jack does not touch the oil pan.

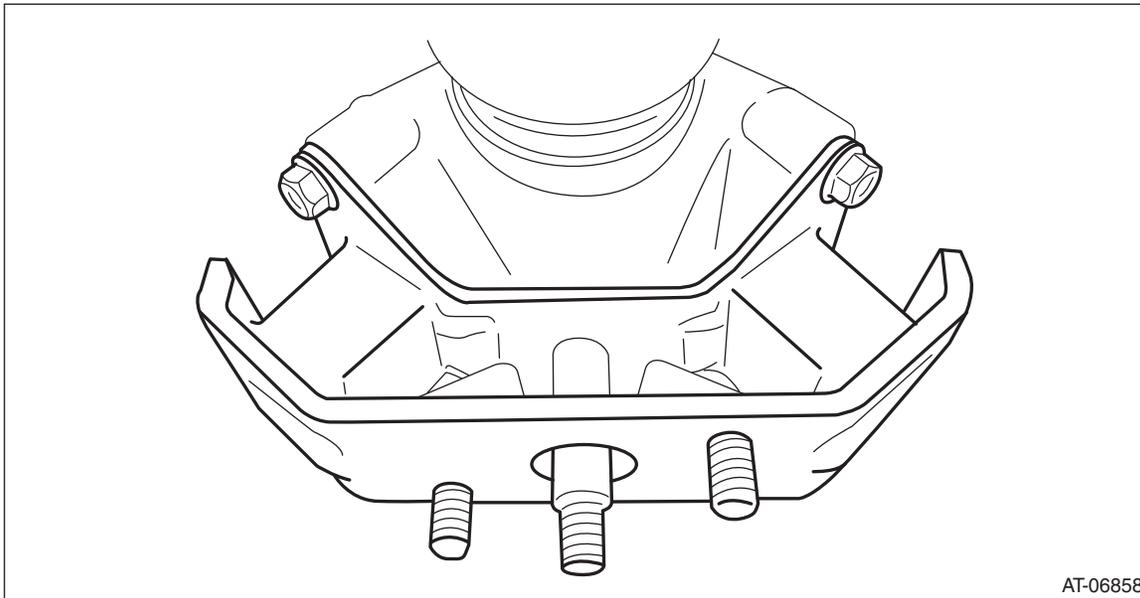
6) Remove the transmission rear crossmember.



Transmission Mounting System

CONTINUOUSLY VARIABLE TRANSMISSION

7) Remove the rear cushion rubber.



2. MAIN MOUNTING BRACKET & MAIN CUSHION RUBBER

Refer to “MECHANICAL (H4DO)” for removal procedures. <Ref. to ME(H4DO)-65, MAIN MOUNTING BRACKET & MAIN CUSHION RUBBER, REMOVAL, Engine Mounting.>

B: INSTALLATION

1. TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER

1) Attach the rear cushion rubber to the transmission.

Tightening torque:

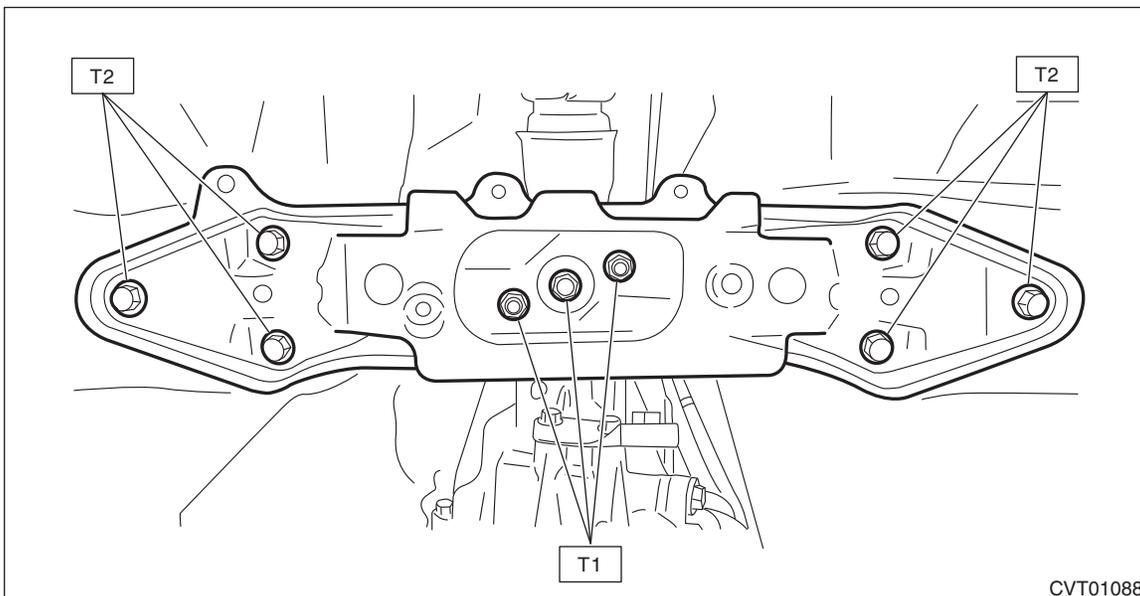
40 N·m (4.1 kgf-m, 29.5 ft-lb)

2) Install the crossmember.

Tightening torque:

T1: 35 N·m (3.6 kgf-m, 25.8 ft-lb)

T2: 75 N·m (7.6 kgf-m, 55.3 ft-lb)



3) Remove the transmission jack.

4) Install the center exhaust cover.

Transmission Mounting System

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

5) Install the center exhaust pipe. <Ref. to EX(H4DO)-14, INSTALLATION, Center Exhaust Pipe.>

6) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

2. MAIN MOUNTING BRACKET & MAIN CUSHION RUBBER

Refer to “MECHANICAL (H4DO)” for installation procedures. <Ref. to ME(H4DO)-68, MAIN MOUNTING BRACKET & MAIN CUSHION RUBBER, INSTALLATION, Engine Mounting.>

C: INSPECTION

- Check the crossmember for bends or damage.
- Check that the cushion rubber is not stiff, cracked or otherwise damaged.

Extension Case Oil Seal

CONTINUOUSLY VARIABLE TRANSMISSION

12.Extension Case Oil Seal

A: INSPECTION

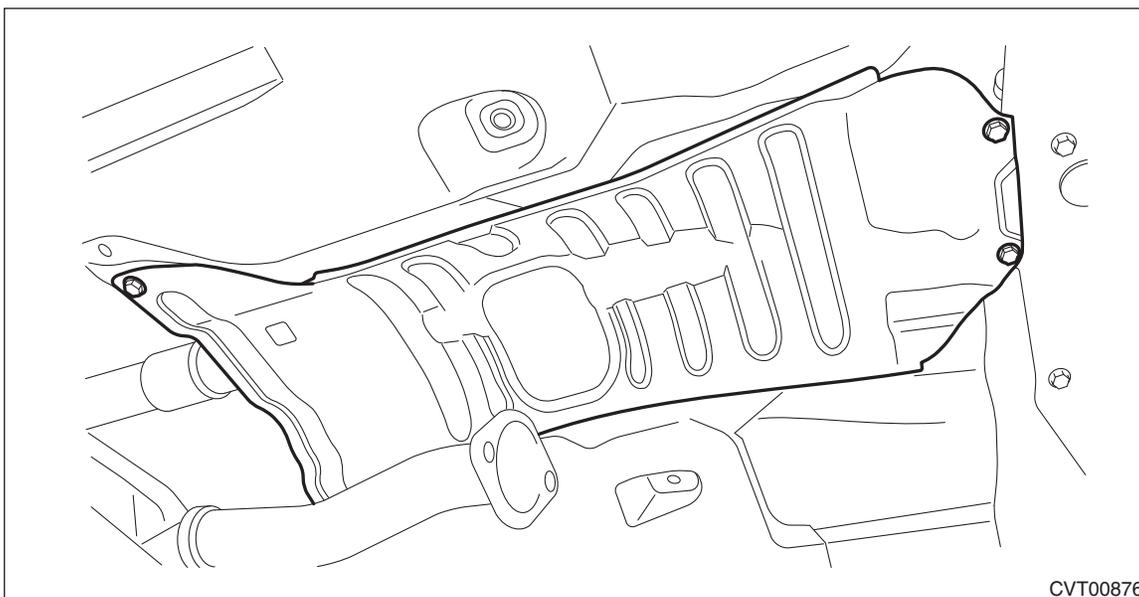
Check for leakage of CVTF from the joint section of transmission and propeller shaft. If a leak is found, inspect the propeller shaft and replace the oil seal.

B: REPLACEMENT

CAUTION:

Immediately after the vehicle has been running or after idling for a long time, the CVTF will be hot. Be careful not to burn yourself.

- 1) Lift up the vehicle.
- 2) Remove the center exhaust pipe. <Ref. to EX(H4DO)-13, REMOVAL, Center Exhaust Pipe.>
- 3) Remove the center exhaust cover.



- 4) Clean the transmission exterior.
- 5) Remove the propeller shaft. <Ref. to DS-10, REMOVAL, Propeller Shaft.>
- 6) Using a screwdriver or ST, remove the oil seal trying not to damage the extension case.
ST 398527700 PULLER ASSY
- 7) Using the ST, install the oil seal.

NOTE:

- Use a new oil seal.
- Apply CVTF to the oil seal lip and press-fitting surface.

ST 498057300 INSTALLER

- 8) Install the propeller shaft. <Ref. to DS-12, INSTALLATION, Propeller Shaft.>
- 9) Install the center exhaust cover.

Tightening torque:

18 N·m (1.8 kgf·m, 13.3 ft·lb)

- 10) Install the center exhaust pipe. <Ref. to EX(H4DO)-14, INSTALLATION, Center Exhaust Pipe.>
- 11) Adjust the CVTF level and check there is no leakage. <Ref. to CVT(TR580)-39, ADJUSTMENT, CVTF.>

13. Differential Side Retainer Oil Seal

A: INSPECTION

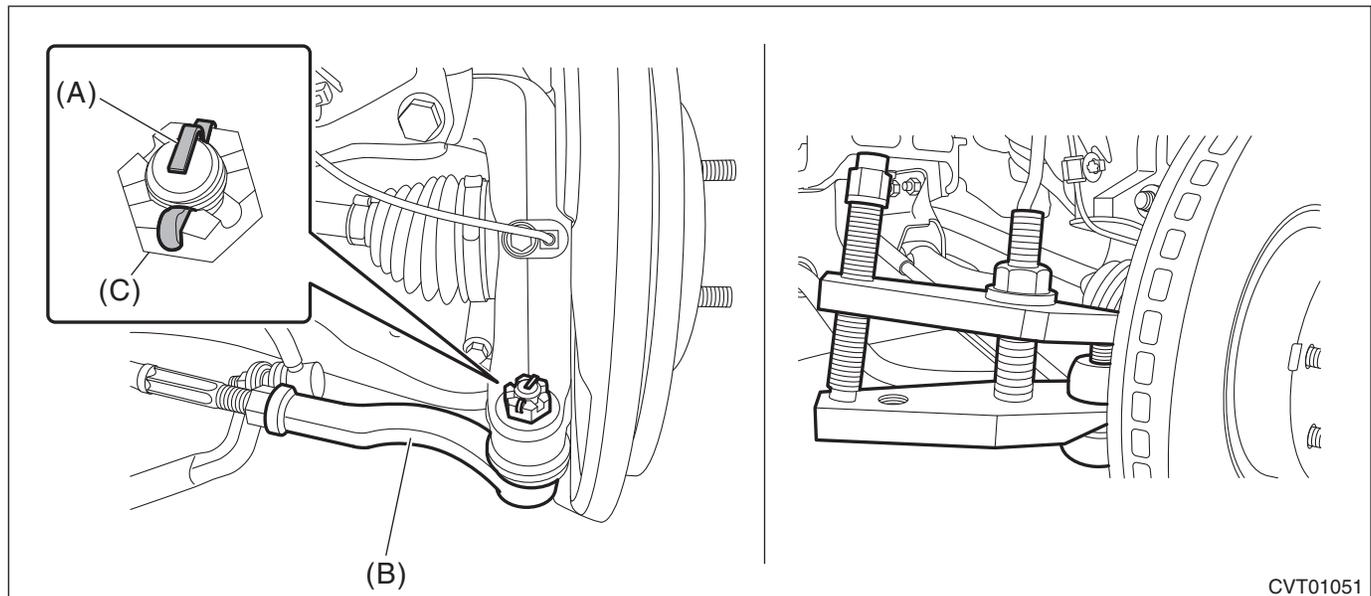
Check for leakage of gear oil from differential side retainer oil seal part. If there is an oil leak, inspect the front drive shaft and replace the oil seal.

B: REPLACEMENT

CAUTION:

- Immediately after the vehicle has been running or after idling for a long time, the differential gear oil will be hot. Be careful not to burn yourself.
- Be careful not to spill the differential gear oil on exhaust pipe to prevent it from emitting smoke or fire. If differential gear oil is spilled on the exhaust pipe, wipe it off completely.

- 1) Lift up the vehicle, and remove the front wheels.
- 2) After pulling off the cotter pin and removing the castle nut, use a puller to remove the tie-rod end.



- (A) Cotter pin
 (B) Tie-rod end
 (C) Castle nut

- 3) Lift up the vehicle.
- 4) Remove the under cover - front.
- 5) Remove the center exhaust pipe. <Ref. to EX(H4DO)-13, REMOVAL, Center Exhaust Pipe.>
- 6) Drain differential gear oil. <Ref. to CVT(TR580)-44, REPLACEMENT, Differential Gear Oil.>
- 7) Tighten the differential gear oil drain plug.

NOTE:

Use a new gasket.

Tightening torque:

70 N·m (7.1 kgf·m, 51.6 ft·lb)

- 8) Remove the stabilizer link. <Ref. to FS-33, REMOVAL, Front Stabilizer.>
- 9) Disconnect the ball joint and housing.
- 10) Pull out the front drive shaft from transmission using a crowbar.

NOTE:

Holding the joint of front drive shaft from transmission side, pull out the drive shaft from transmission with care not to stretch the boot.

- 11) Remove the differential side retainer oil seal using driver wrapped with vinyl tape etc.
- 12) Using the ST, install the differential side retainer oil seal by lightly tapping with a hammer.

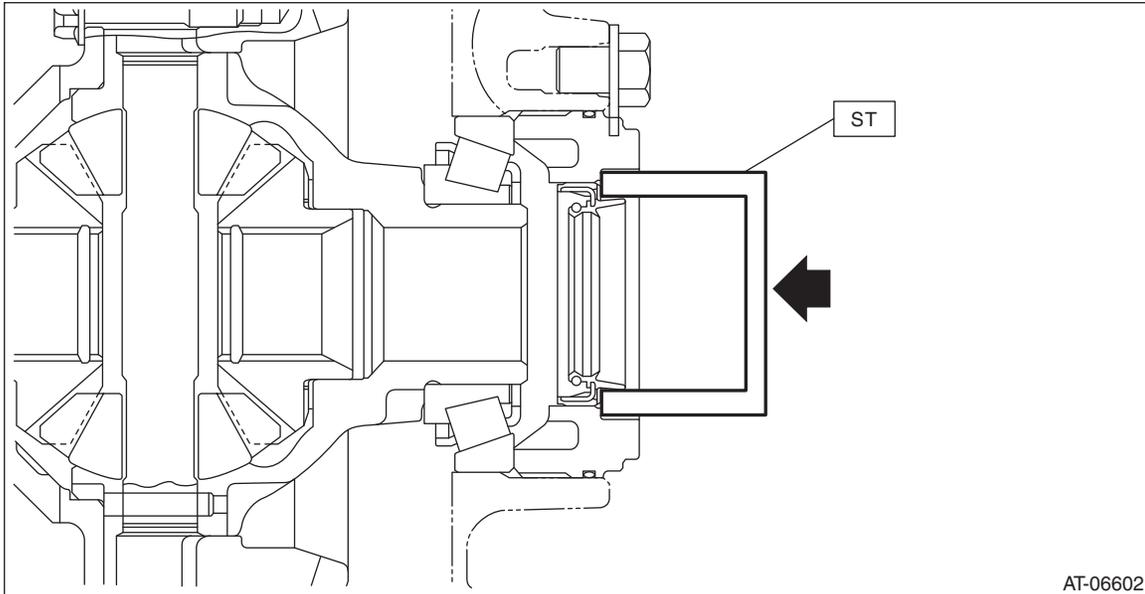
Differential Side Retainer Oil Seal

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

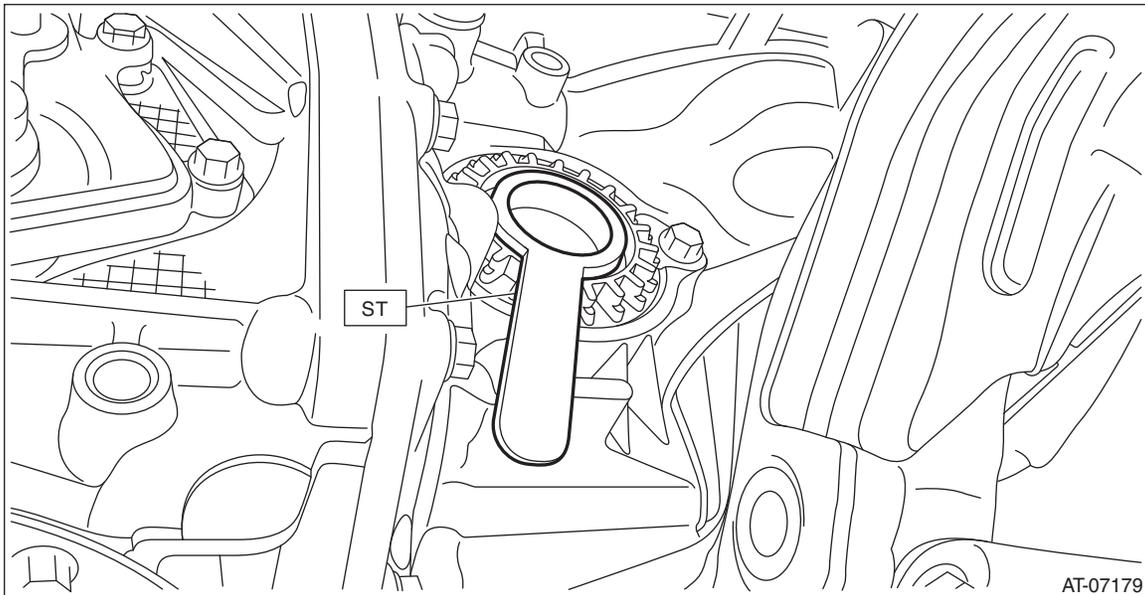
- Apply differential gear oil to the lip surface, so that the oil seal lip is not deformed.
- Apply differential gear oil to the press-fitting surface of oil seal and the differential side retainer.
- Oil seal has an identification mark (R, L). When installing oil seals, do not confuse the left and right.

ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER



13) Set the ST to side retainer.

ST 28399SA010 OIL SEAL PROTECTOR



14) Replace the circlip of the drive shaft with a new part.

15) Insert the front drive shaft spline section into transmission and remove the ST (DIFFERENTIAL SIDE OIL SEAL INSTALLER).

16) Insert the drive shaft into the transmission securely by pressing the housing from outside of the vehicle.

17) Insert the ball joint into housing and secure with bolt.

CAUTION:

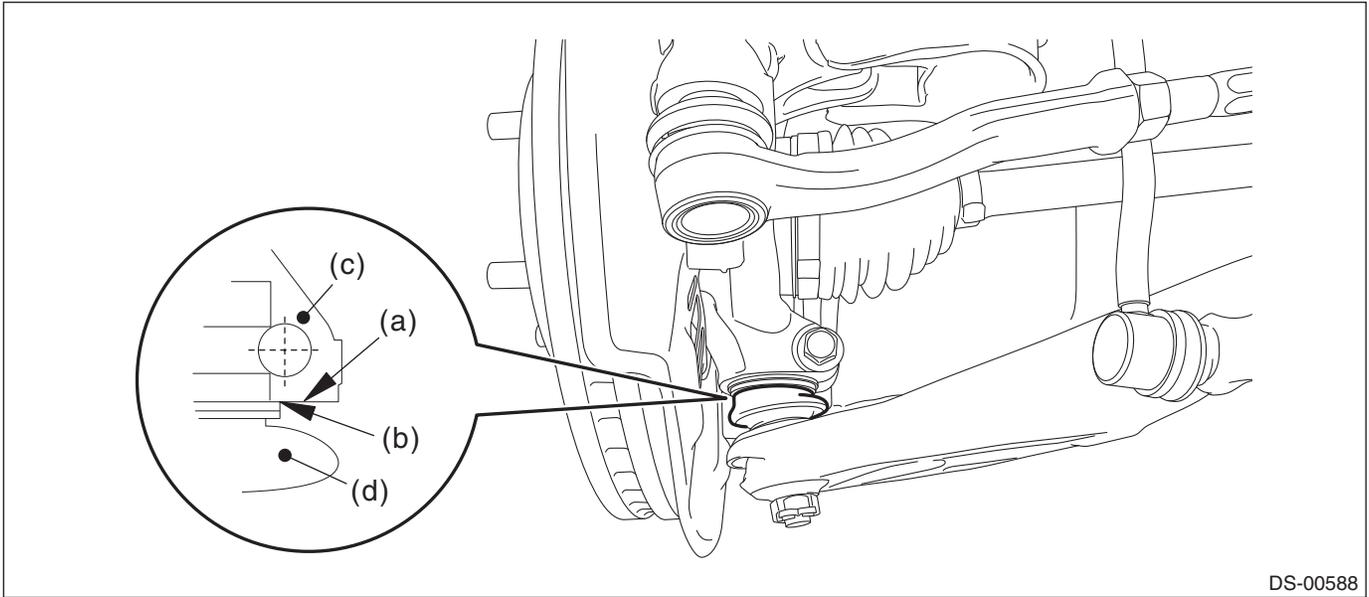
- Before tightening, make sure the bottom surface of the housing assembly - front axle and the stepped section of ball joint are in contact.
- Do not apply grease to the tapered portion of ball stud.

Differential Side Retainer Oil Seal

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

50 N·m (5.1 kgf·m, 36.9 ft·lb)



DS-00588

- (a) Bottom surface of housing ASSY - front axle
(b) Raised section of ball joint
(c) Housing ASSY - front axle
(d) Ball joint ASSY

18) Install the stabilizer link.

NOTE:

Use a new flange nut.

Tightening torque:

60 N·m (6.1 kgf·m, 44.3 ft·lb)

19) Install the center exhaust pipe. <Ref. to EX(H4DO)-14, INSTALLATION, Center Exhaust Pipe.>

20) Install the under cover - front.

21) Lower the vehicle.

22) Connect the tie-rod end and knuckle arm, and attach the castle nut.

Tightening torque:

27 N·m (2.8 kgf·m, 19.9 ft·lb)

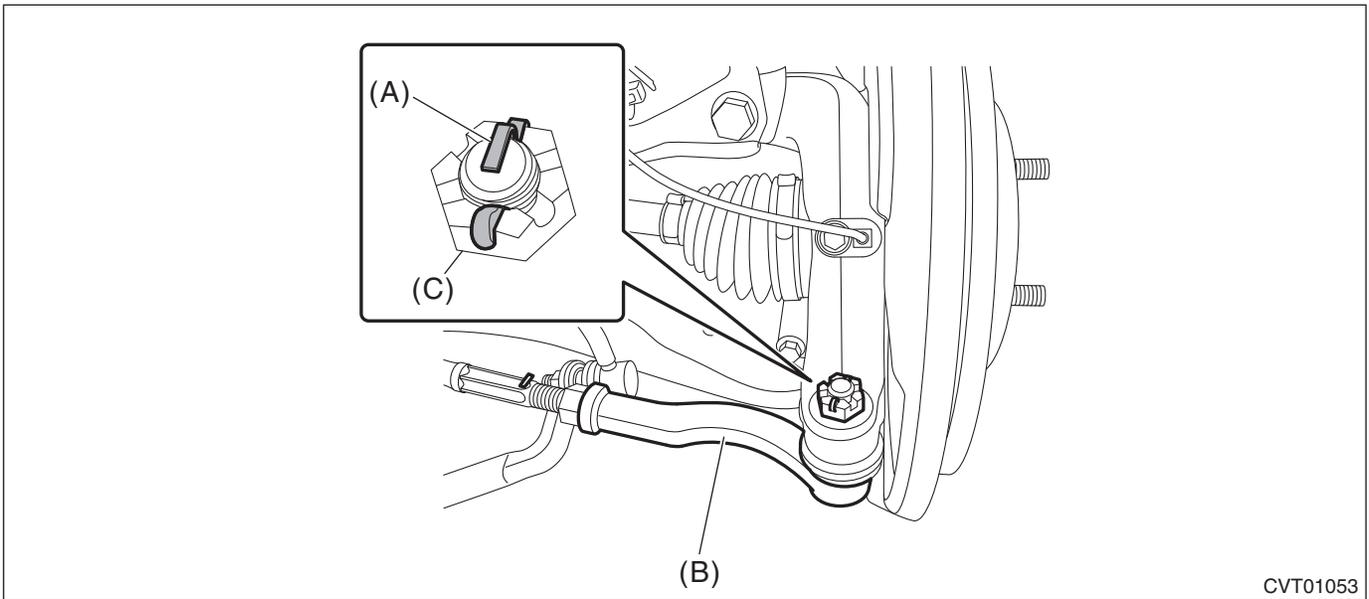
CAUTION:

When connecting, do not hit the cap at the bottom of tie-rod end with hammer.

Differential Side Retainer Oil Seal

CONTINUOUSLY VARIABLE TRANSMISSION

23) After tightening the castle nut to the specified tightening torque, tighten it further within 60° until the cotter pin hole is aligned with slot in the nut. Fit the cotter pin into the nut, and then bend the pin to lock.



- (A) Cotter pin
- (B) Tie-rod end
- (C) Castle nut

24) Fill differential gear oil. <Ref. to CVT(TR580)-43, Differential Gear Oil.>

25) Adjust the differential gear oil level, and check for leakage. <Ref. to CVT(TR580)-43, ADJUSTMENT, Differential Gear Oil.>

26) Install the front tires. <Ref. to WT-6, INSTALLATION, Tire and Wheel.>

14. Inhibitor Switch

A: INSPECTION

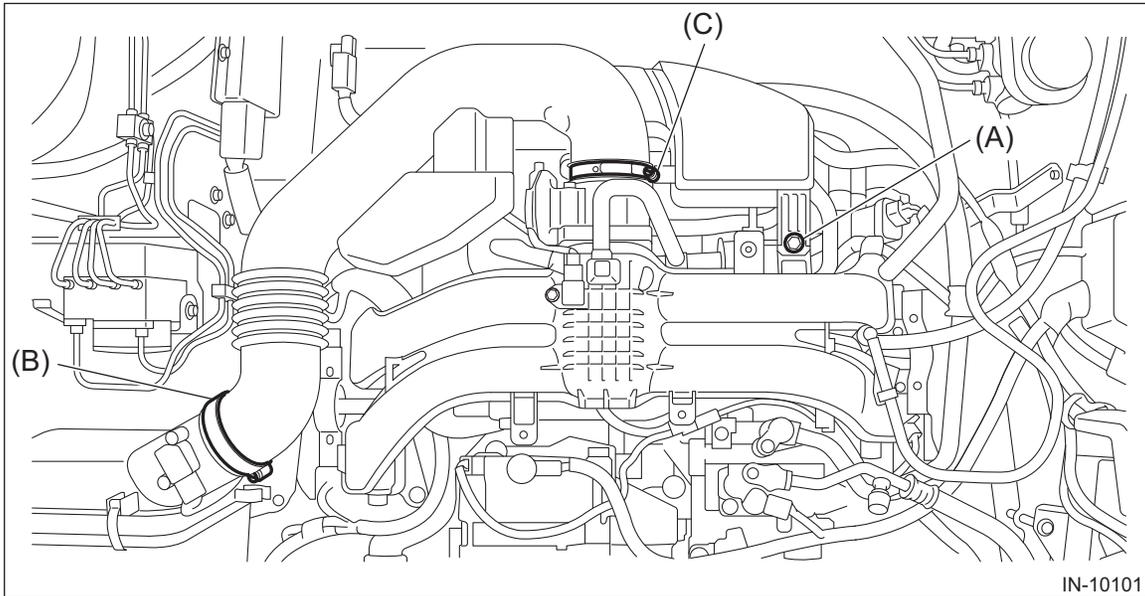
When the driving condition or starter motor operation is improper, first check the shift linkage for improper operation. If the shift linkage is functioning properly, check the inhibitor switch.

1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

NOTE:

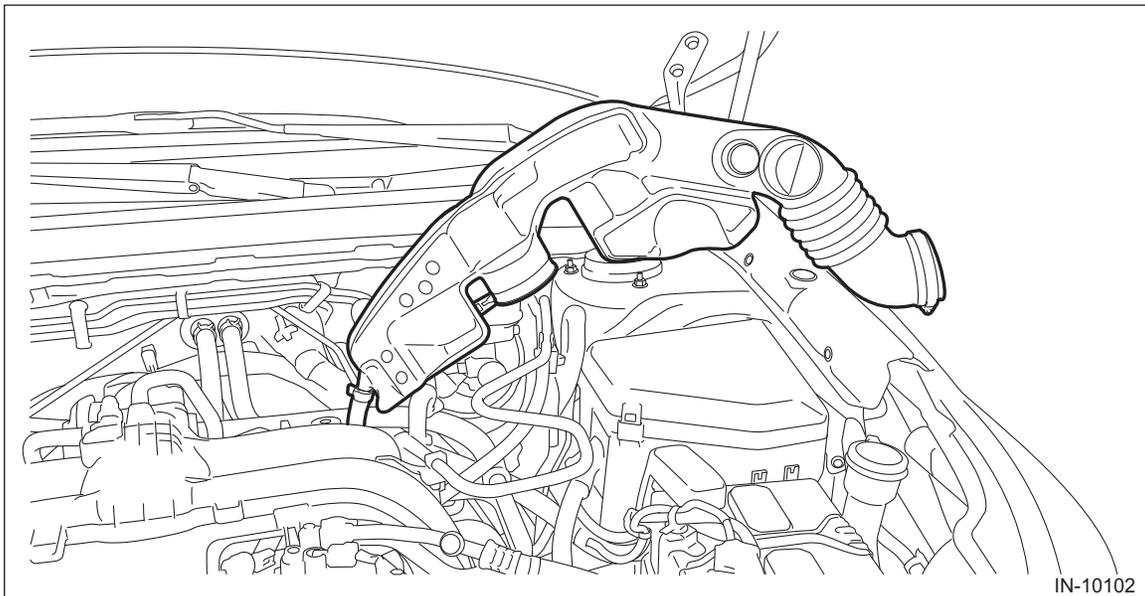
For model with battery sensor, disconnect the ground terminal from battery sensor.

2) Remove the clip (A), and loosen the clamps (B) and (C).



IN-10101

3) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.

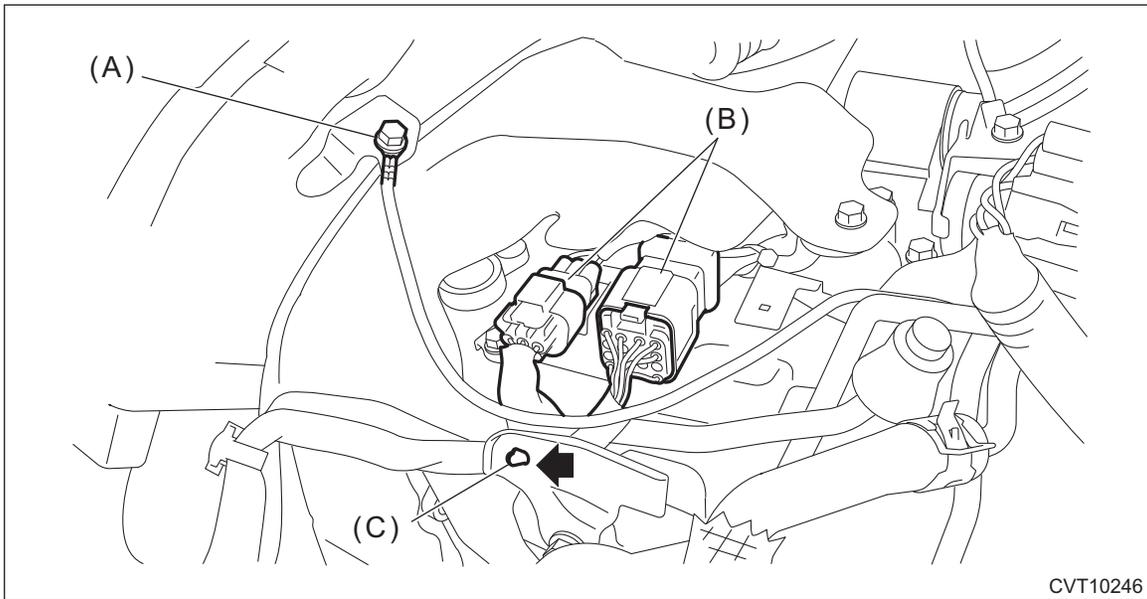


IN-10102

Inhibitor Switch

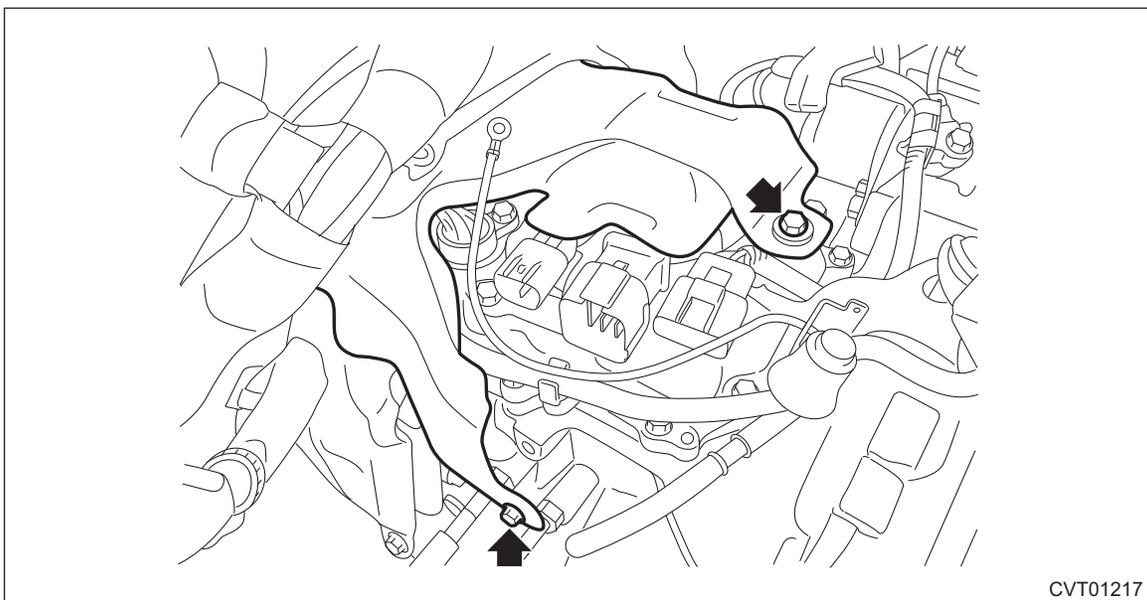
CONTINUOUSLY VARIABLE TRANSMISSION

4) Disconnect the transmission radio ground terminal and transmission harness connector, and remove the harness clip.



- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

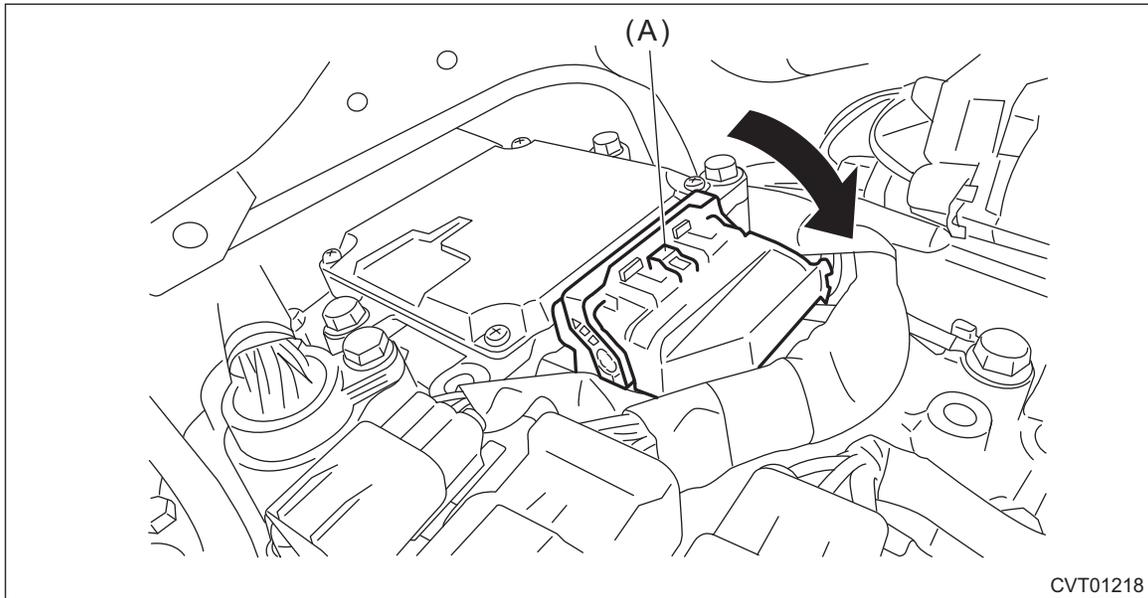
5) Remove the transmission case cover.



Inhibitor Switch

CONTINUOUSLY VARIABLE TRANSMISSION

- 6) Move the lock lever in the arrow direction while pressing the lock button, and disconnect the connector.



(A) Lock button

- 7) Attach the ST to the bulkhead harness. <Ref. to CVT(diag)-5, CAUTION, General Description.>

ST 18460AA040 CHECK BOARD

- 8) Check for continuity in inhibitor switch circuit by shifting the select lever in "P", "R", "N" and "D" respectively.

NOTE:

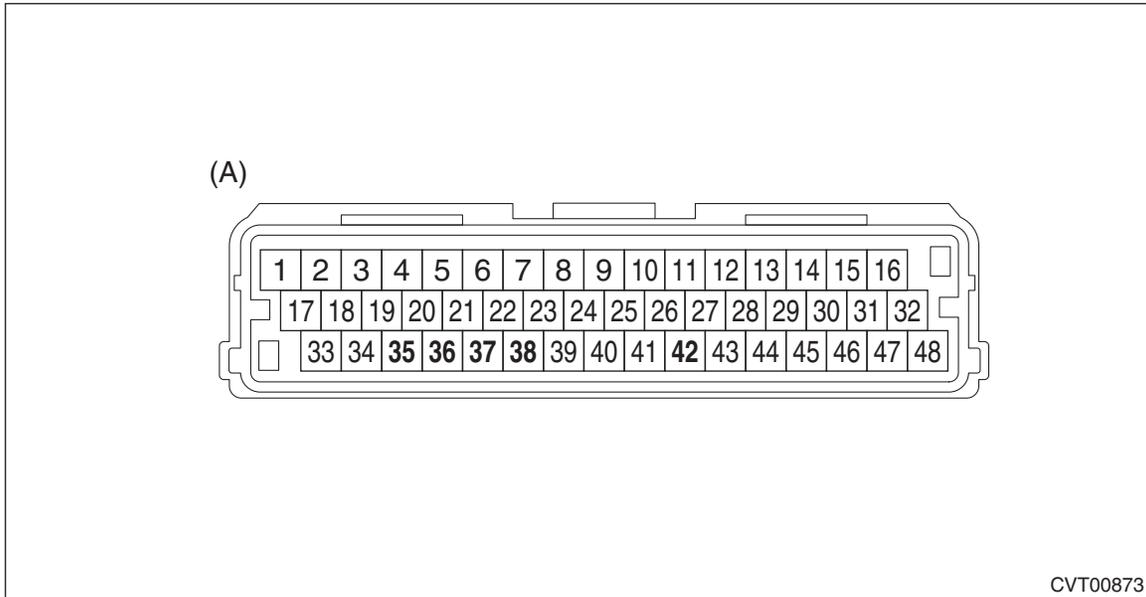
- Check that there is no continuity in the starter circuit when the select lever is in the "R" and "D" ranges.

Inhibitor Switch

CONTINUOUSLY VARIABLE TRANSMISSION

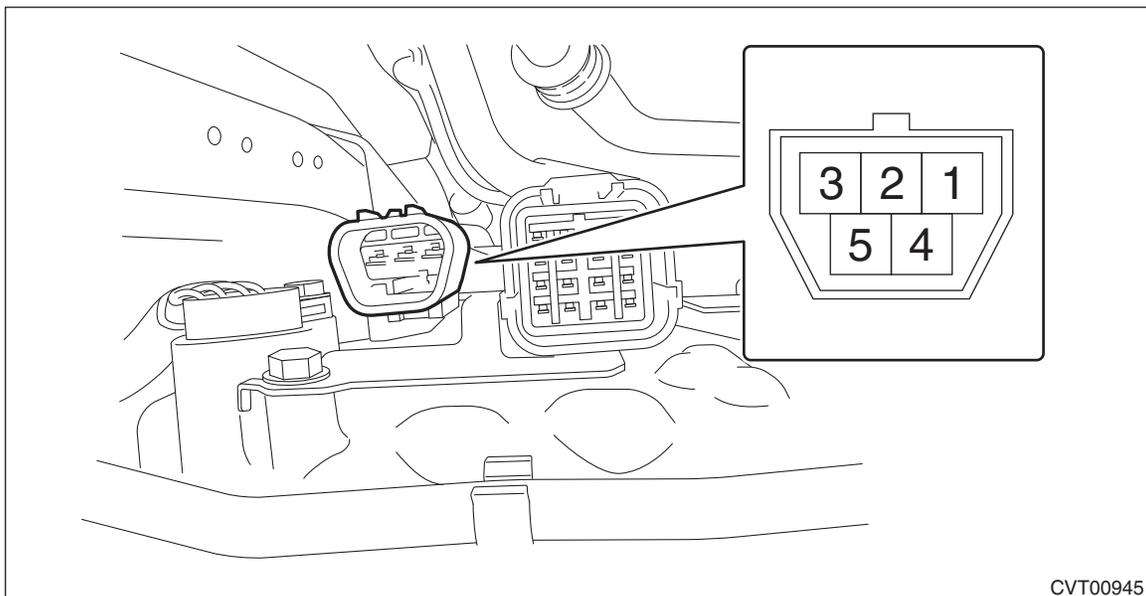
- When inhibitor switch is normal, check there is no poor contact in vehicle side connector and no open circuit in harness.

	Range	Terminal No.	Standard
Signal sent to TCM	P	38 — 42	Less than 1 Ω
	R	37 — 42	
	N	36 — 42	
	D	35 — 42	



(A) Check board connector

	Range	Terminal No.	Standard
Starter circuit	P/N	1 — 5	Less than 1 Ω
Back-up light circuit	R	2 — 3	

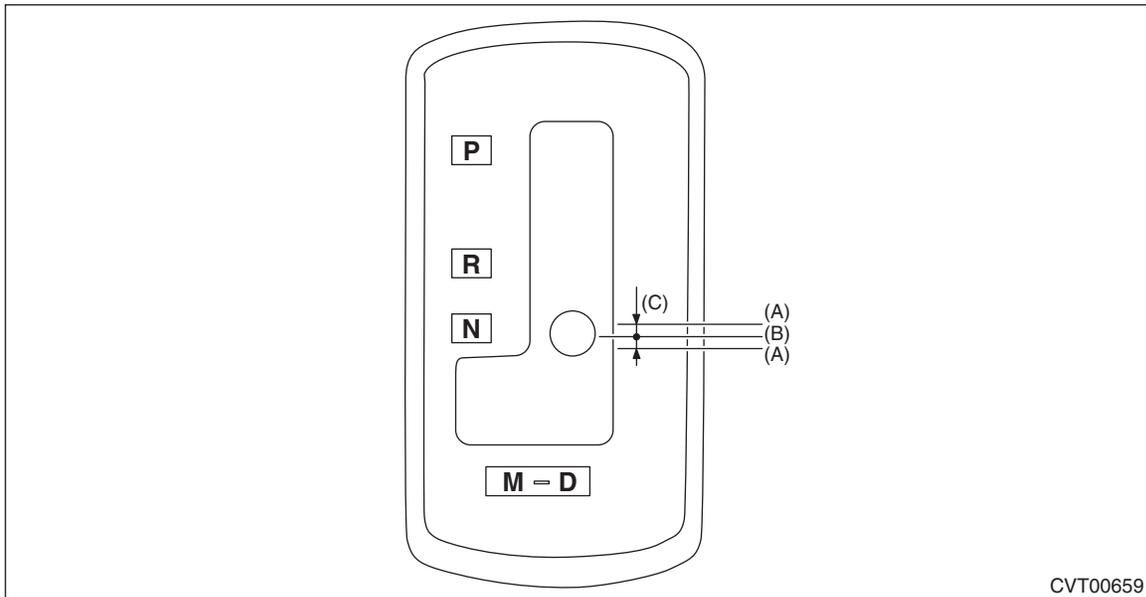


Inhibitor Switch

CONTINUOUSLY VARIABLE TRANSMISSION

9) Check that there is continuity at equal points when the select lever is moved 1.5° in both directions from the "N" range.

If there is continuity in only one direction or in other points, adjust the inhibitor switch. <Ref. to CVT(TR580)-111, ADJUSTMENT, Inhibitor Switch.>



- (A) Continuity does not exist.
- (B) Continuity exists.
- (C) 1.5°

10) Repeat the above inspection in other gear ranges. If there is fault, adjust the inhibitor switch and select cable. <Ref. to CVT(TR580)-111, ADJUSTMENT, Inhibitor Switch.> <Ref. to CS-48, ADJUSTMENT, Select Cable.>

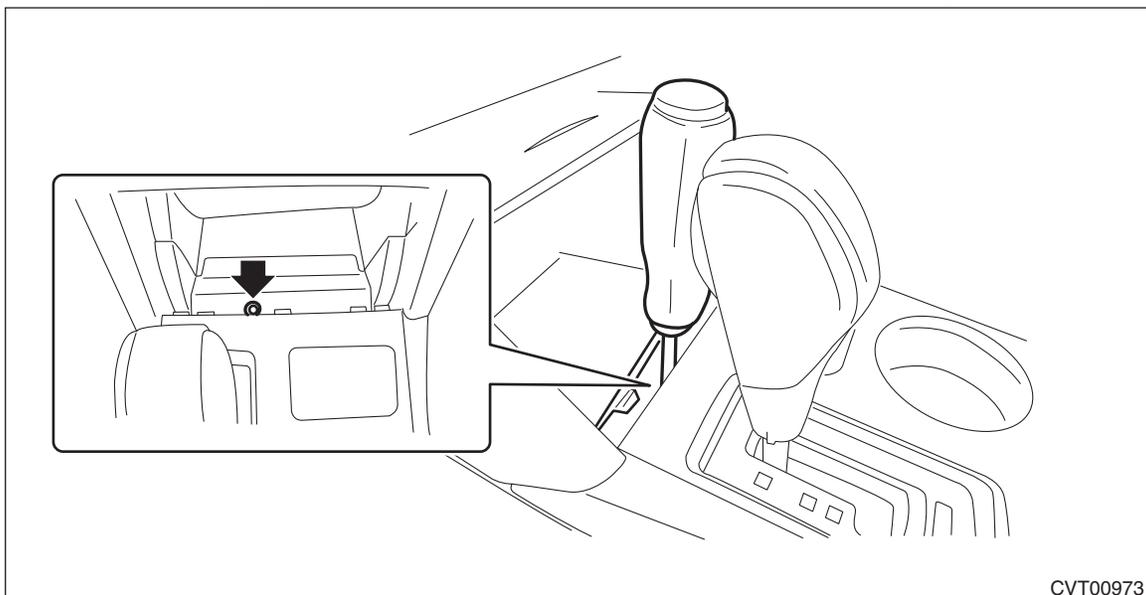
B: ADJUSTMENT

1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

NOTE:

For model with battery sensor, disconnect the ground terminal from battery sensor.

2) Release the shift lock using a screwdriver to shift the select lever to the "N" range.

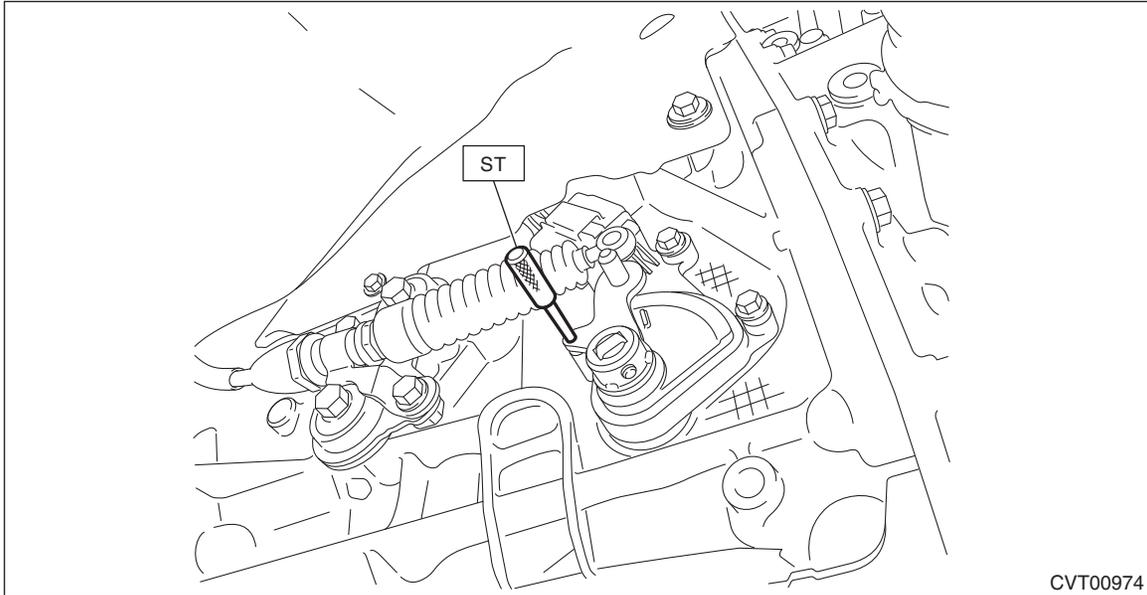


3) Lift up the vehicle.

Inhibitor Switch

CONTINUOUSLY VARIABLE TRANSMISSION

- 4) Remove the center exhaust pipe. <Ref. to EX(H4DO)-13, REMOVAL, Center Exhaust Pipe.>
 - 5) Loosen the two bolts holding the inhibitor switch.
 - 6) Insert the ST vertically into the holes of the shifter arm and switch body.
- ST 499267300 STOPPER PIN



- 7) Tighten the two bolts holding the inhibitor switch.

Tightening torque:

5 N·m (0.5 kgf·m, 3.7 ft·lb)

- 8) Repeat the inspection of the inhibitor switch. If the inhibitor switch is determined to be “faulty”, replace it.

C: REMOVAL

- 1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

NOTE:

For model with battery sensor, disconnect the ground terminal from battery sensor.

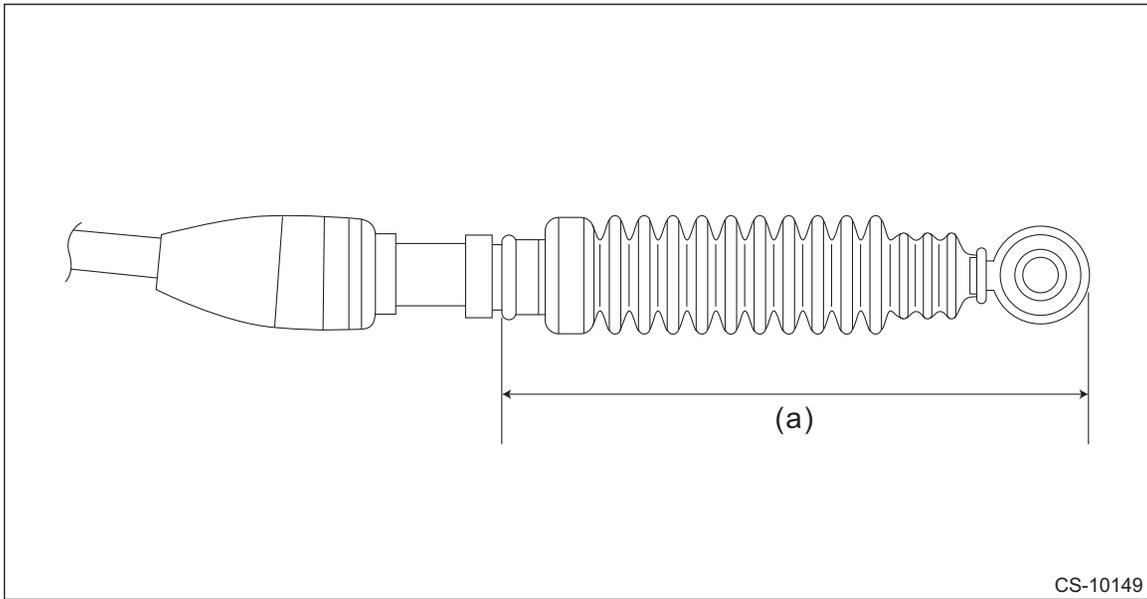
- 2) While pressing the shift lock release button, shift the select lever to the “N” range.
- 3) Lift up the vehicle.
- 4) Remove the center exhaust pipe. <Ref. to EX(H4DO)-13, REMOVAL, Center Exhaust Pipe.>
- 5) Remove the snap pin and washer.

Inhibitor Switch

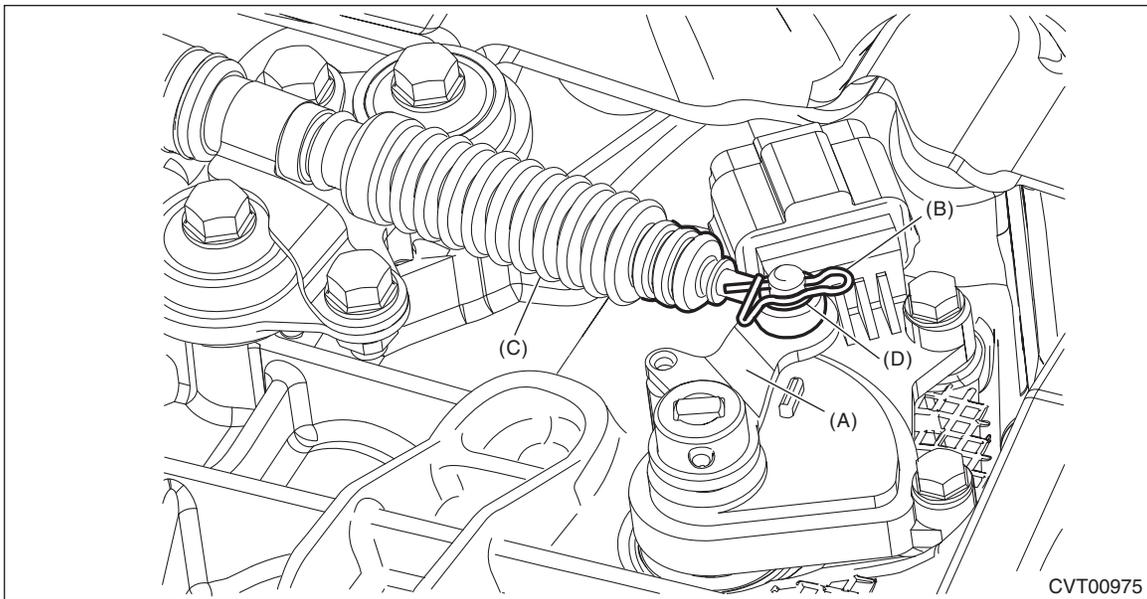
CONTINUOUSLY VARIABLE TRANSMISSION

CAUTION:

Do not apply extra overload while holding the part (a).



CS-10149



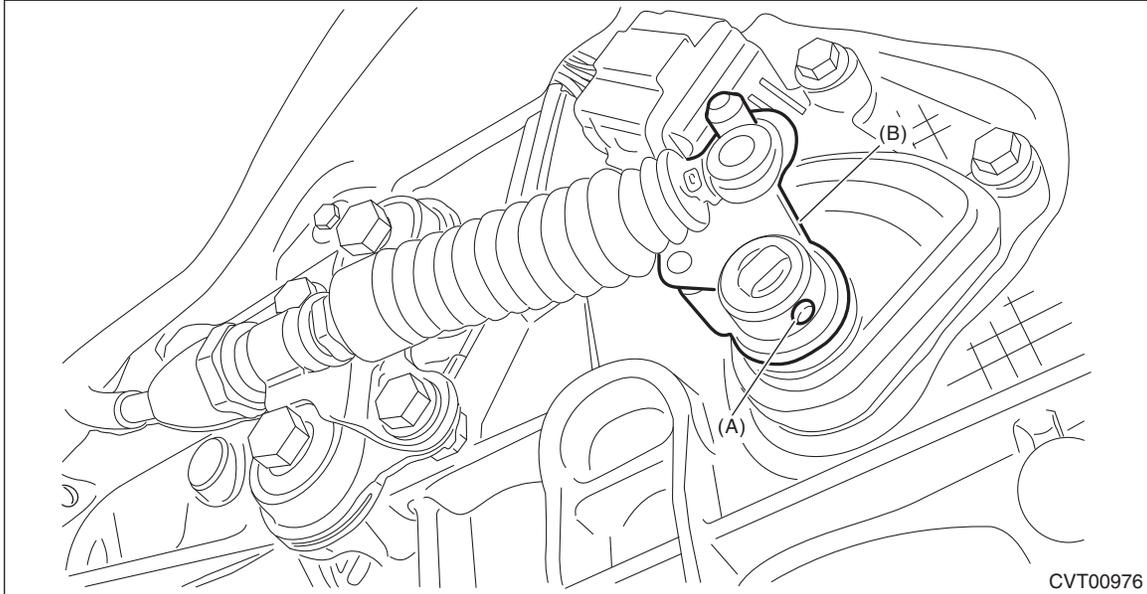
CVT00975

- (A) Shifter arm
- (B) Snap pin
- (C) Select cable
- (D) Washer

Inhibitor Switch

CONTINUOUSLY VARIABLE TRANSMISSION

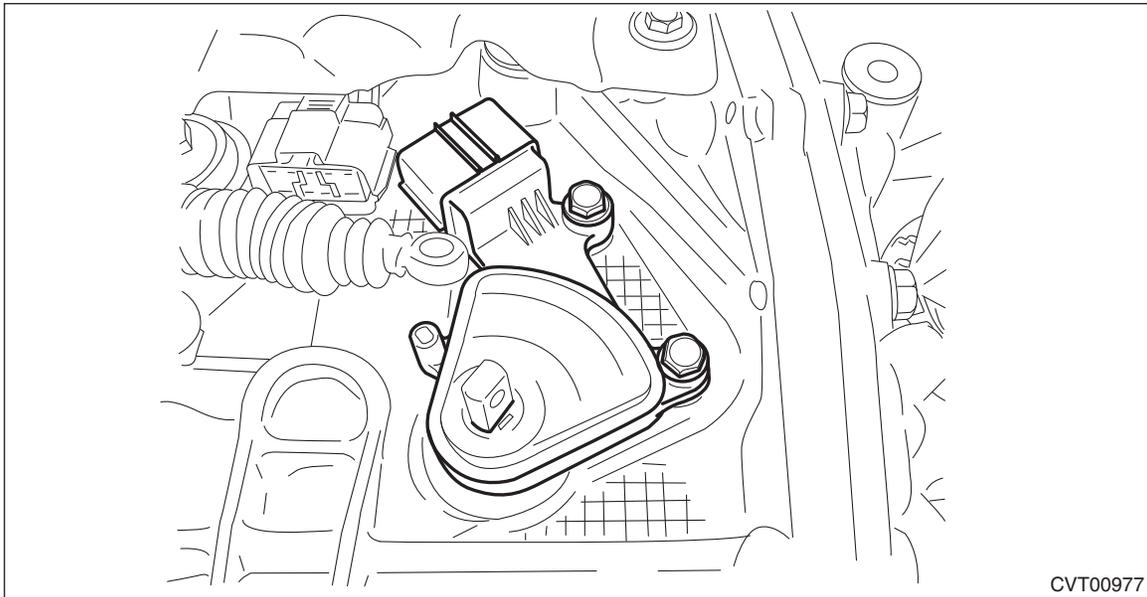
6) Remove the spring pin and shifter arm.



- (A) Spring pin
- (B) Shifter arm

7) Disconnect the inhibitor harness connector.

8) Remove the inhibitor switch.



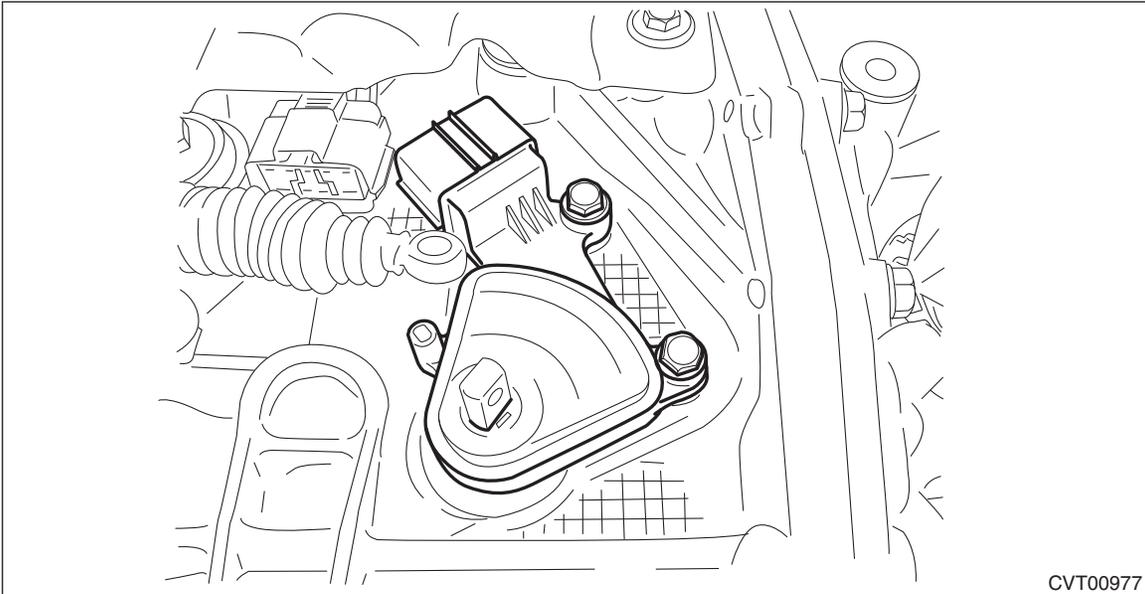
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Inhibitor Switch

CONTINUOUSLY VARIABLE TRANSMISSION

D: INSTALLATION

1) Install the inhibitor switch to the transmission case temporarily.

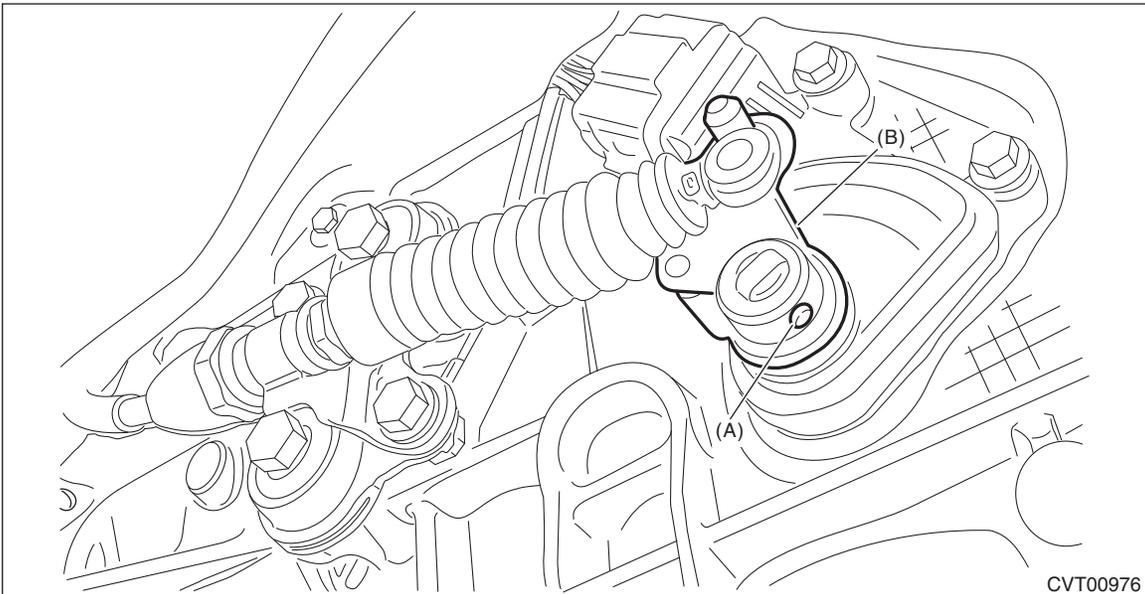


2) Connect the inhibitor harness connector.

3) Install the shifter arm and fix with the spring pin.

NOTE:

Use new spring pin.



(A) Spring pin

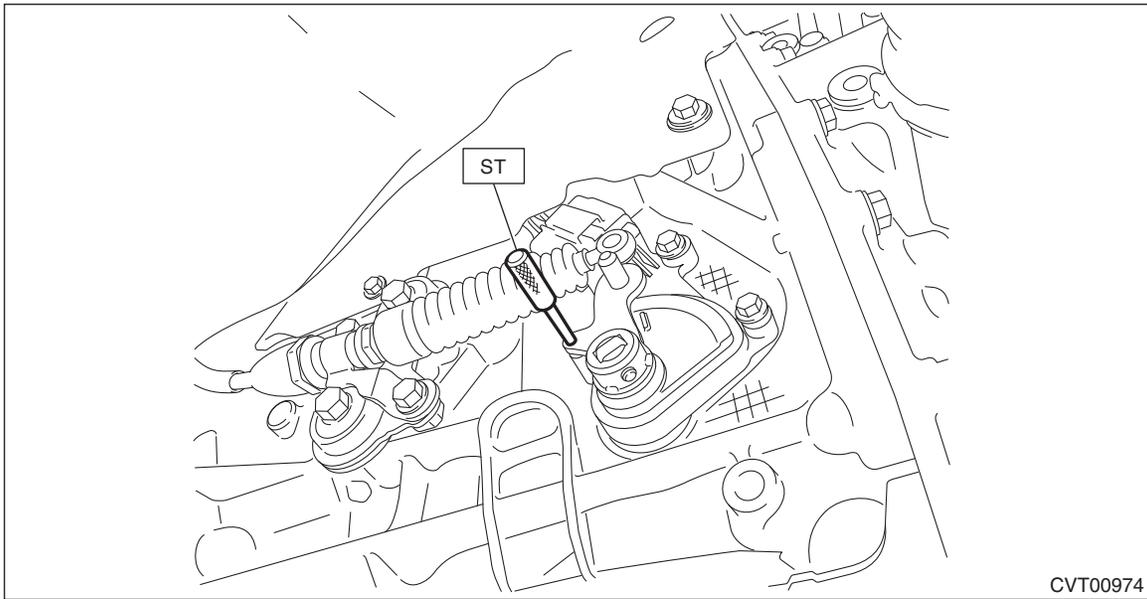
(B) Shifter arm

4) Shift the shifter arm to "N" range.

Inhibitor Switch

CONTINUOUSLY VARIABLE TRANSMISSION

- 5) Install the ST vertically in the cutout of shifter arm and the hole of switch body.
ST 499267300 STOPPER PIN



- 6) Tighten the two bolts holding the inhibitor switch.

Tightening torque:

5 N·m (0.5 kgf·m, 3.7 ft·lb)

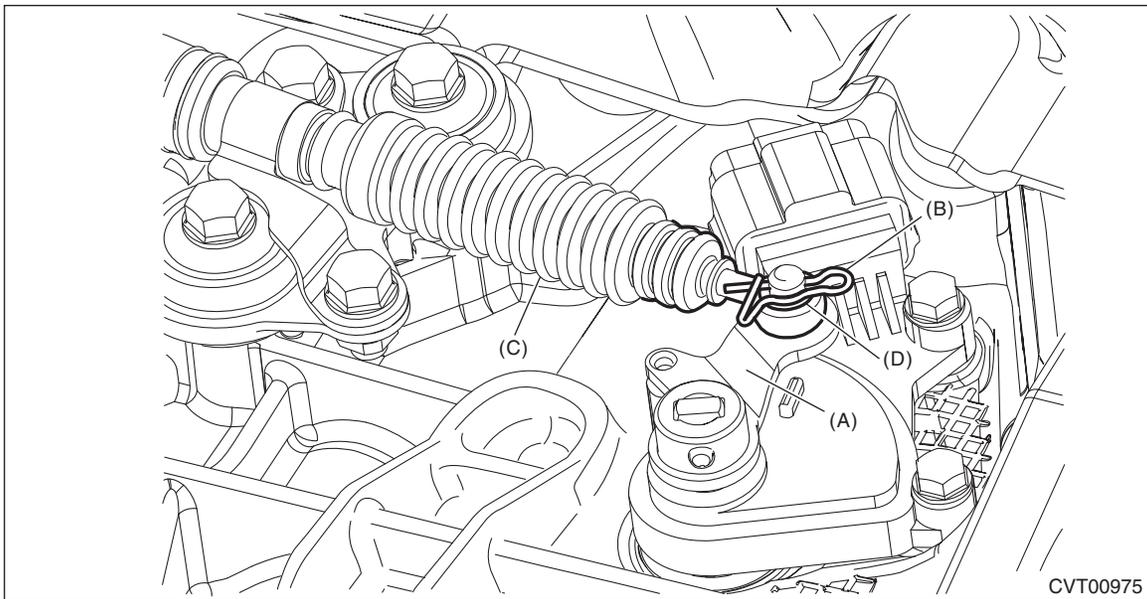
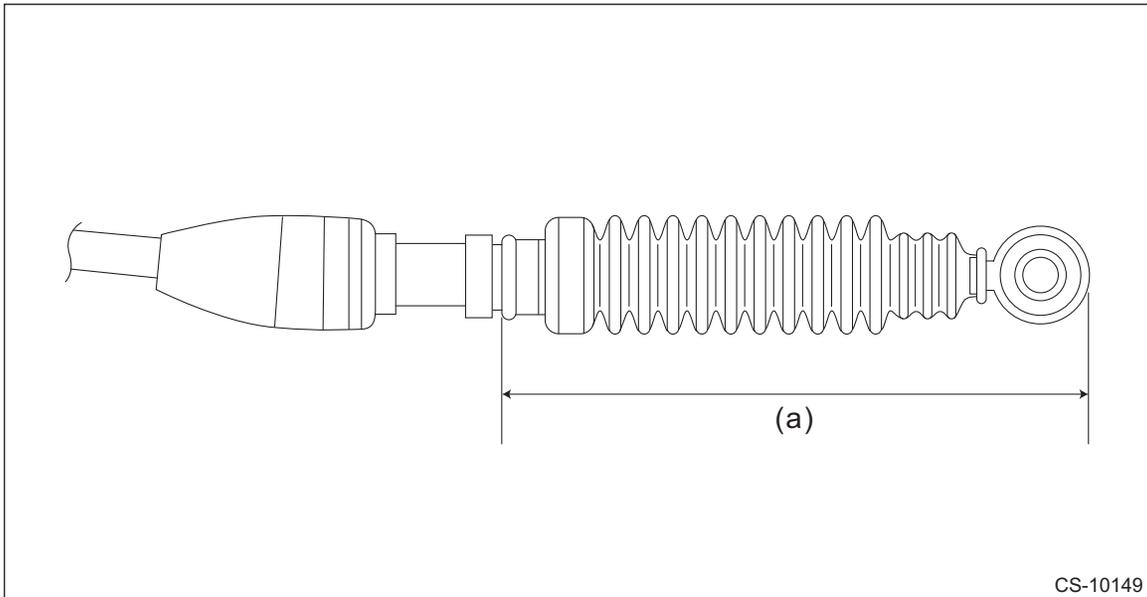
- 7) Install the select cable to the shifter arm.
8) Install the washer and snap pin.

Inhibitor Switch

CONTINUOUSLY VARIABLE TRANSMISSION

CAUTION:

Do not apply extra overload while holding the part (a).



- (A) Shifter arm
- (B) Snap pin
- (C) Select cable
- (D) Washer

9) Install the center exhaust pipe. <Ref. to EX(H4DO)-14, INSTALLATION, Center Exhaust Pipe.>

10) Lower the vehicle.

11) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

12) Check the inhibitor switch. <Ref. to CVT(TR580)-107, INSPECTION, Inhibitor Switch.>

Turbine Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

15. Turbine Speed Sensor

A: REMOVAL

CAUTION:

Be sure to prevent water or oil from contacting the connector terminal of turbine speed sensor. If adhesion occurs, replace with a new part.

1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

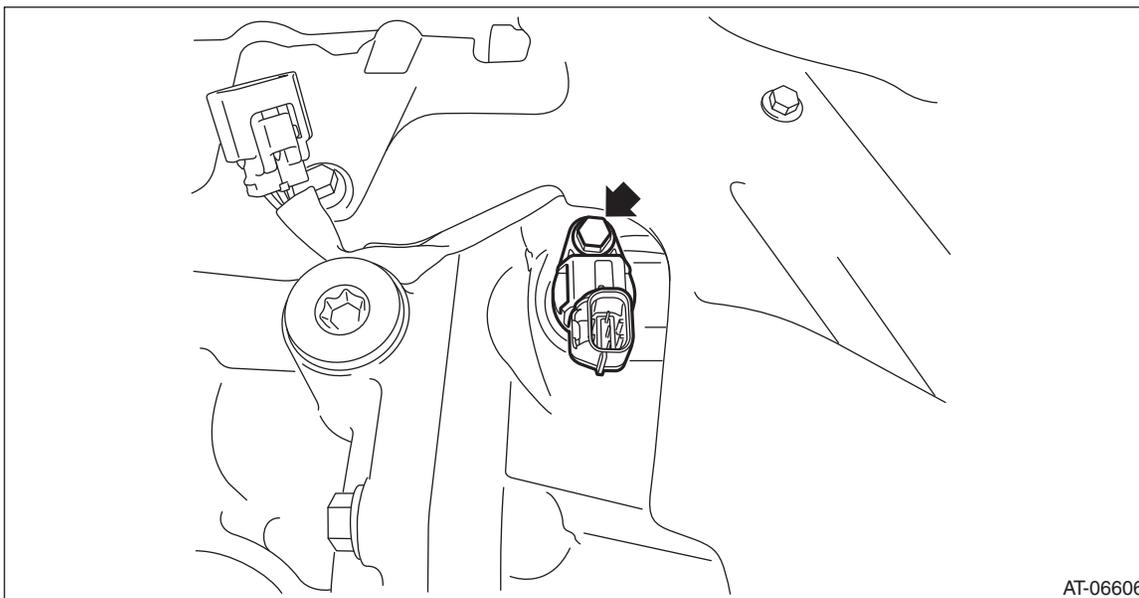
NOTE:

For model with battery sensor, disconnect the ground terminal from battery sensor.

2) Lift up the vehicle.

3) Disconnect the harness connector from the turbine speed sensor.

4) Remove the turbine speed sensor.



B: INSTALLATION

CAUTION:

Be sure to prevent water or oil from contacting the connector terminal of turbine speed sensor. If adhesion occurs, replace with a new part.

1) Install the turbine speed sensor.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)

2) Connect the harness connector.

3) Lower the vehicle.

4) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

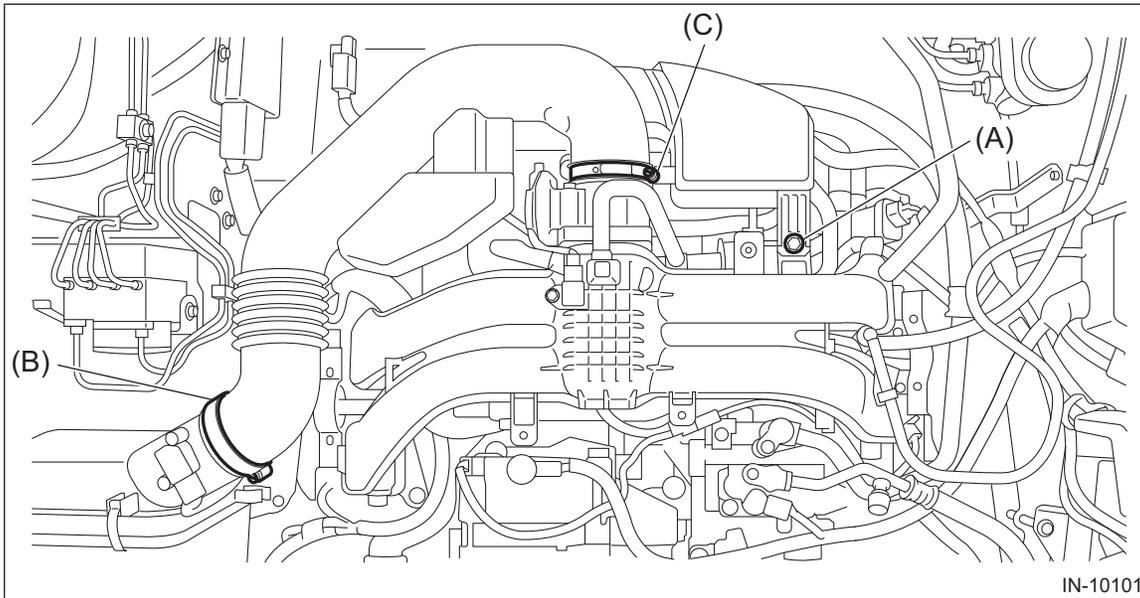
C: INSPECTION

1) Disconnect the ground terminal from battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

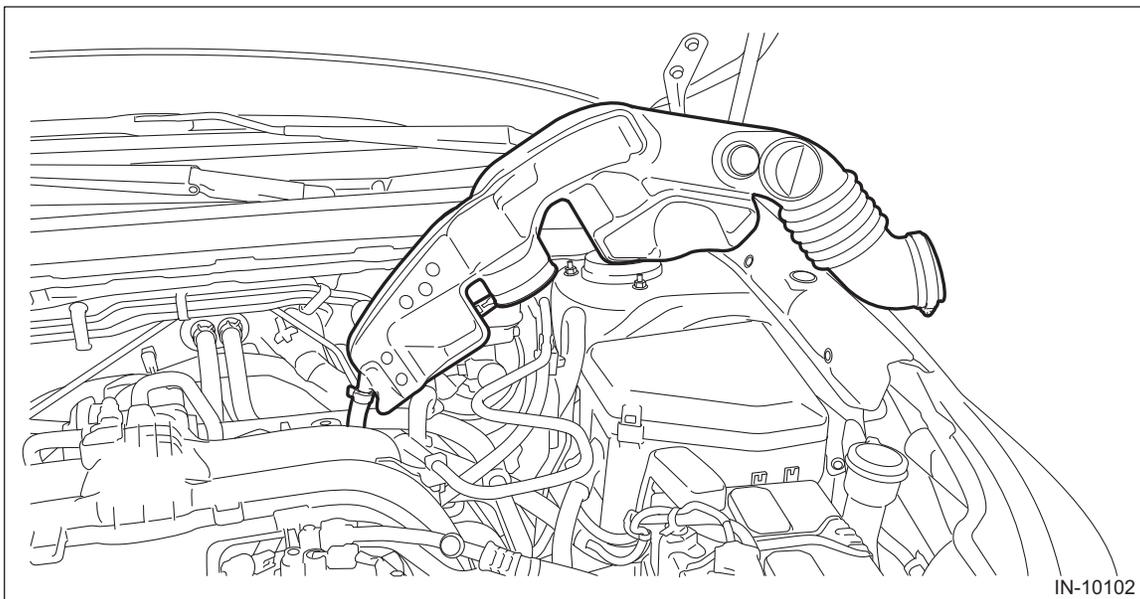
Turbine Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

2) Remove the clip (A), and loosen the clamps (B) and (C).



3) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.

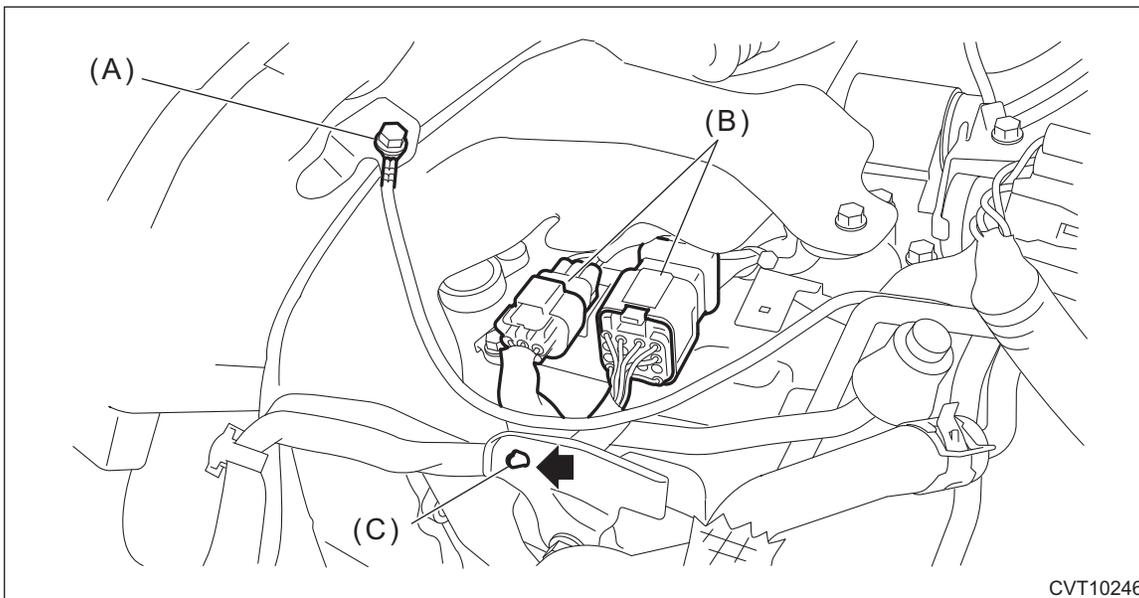


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Turbine Speed Sensor

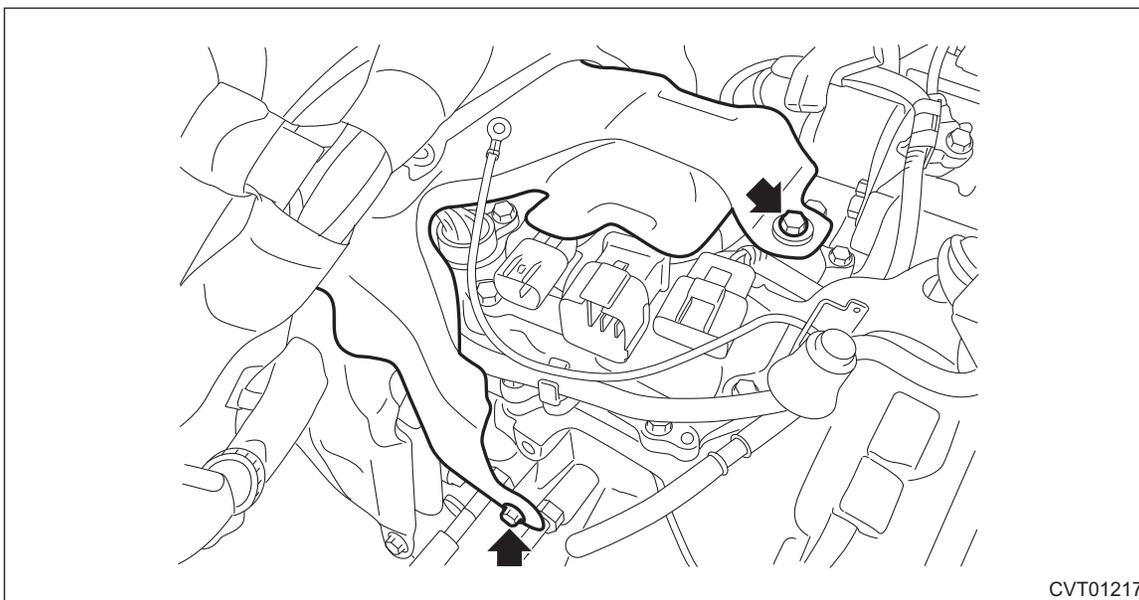
CONTINUOUSLY VARIABLE TRANSMISSION

4) Disconnect the transmission radio ground terminal and transmission harness connector, and remove the harness clip.



- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

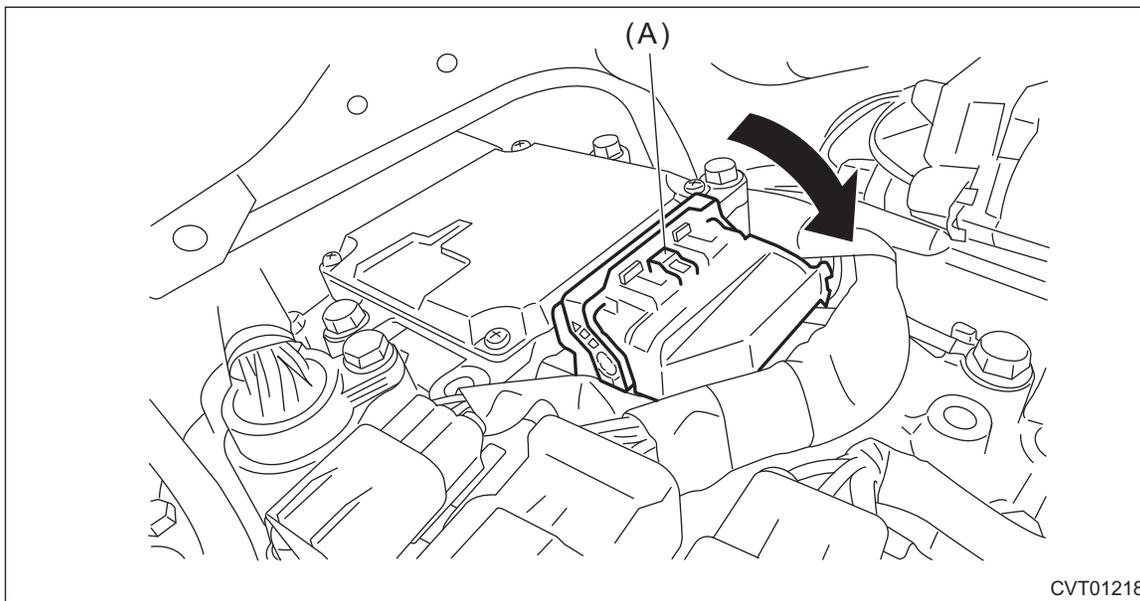
5) Remove the transmission case cover.



Turbine Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

- 6) Move the lock lever in the arrow direction while pressing the lock button, and disconnect the connector.



(A) Lock button

- 7) Set the ST between TCM and transmission harness. <Ref. to CVT(diag)-5, CAUTION, General Description.>

ST 18460AA040 CHECK BOARD

- 8) Connect the transmission radio ground terminal and transmission harness connector, and install the harness clip.

Tightening torque:

13 N·m (1.3 kgf-m, 9.6 ft-lb)

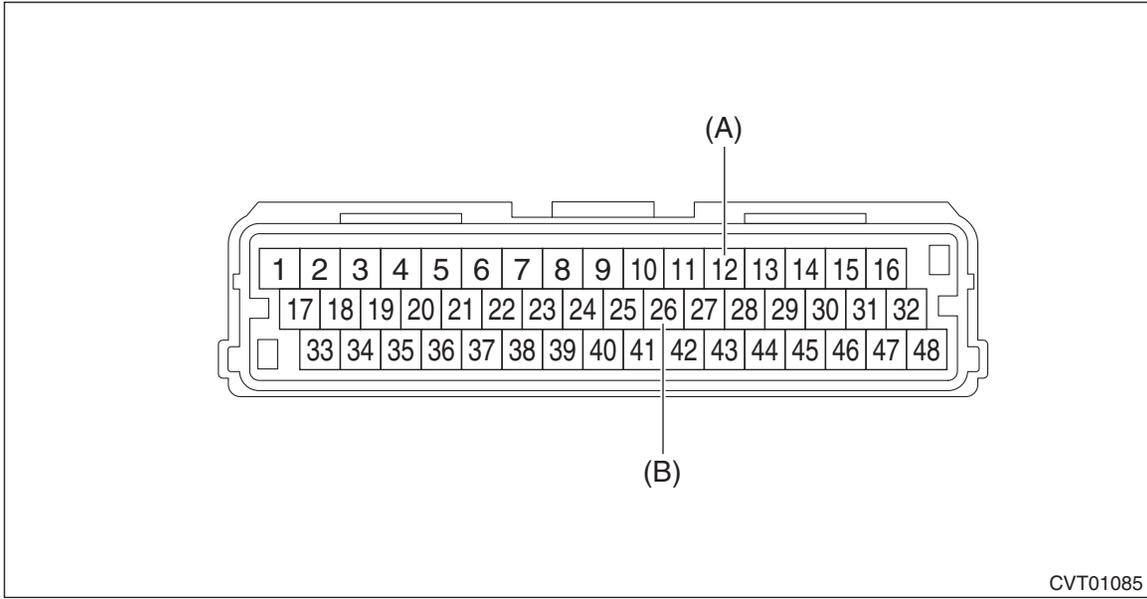
- 9) Install the air intake boot assembly. <Ref. to IN(H4DO)-10, INSTALLATION, Air Intake Boot.>
10) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>
11) Set the probe of oscilloscope to the check board connector.

Turbine Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

Connector & terminal:

(B54) No. 12 (+) — No. 26 (-):



(A) + probe

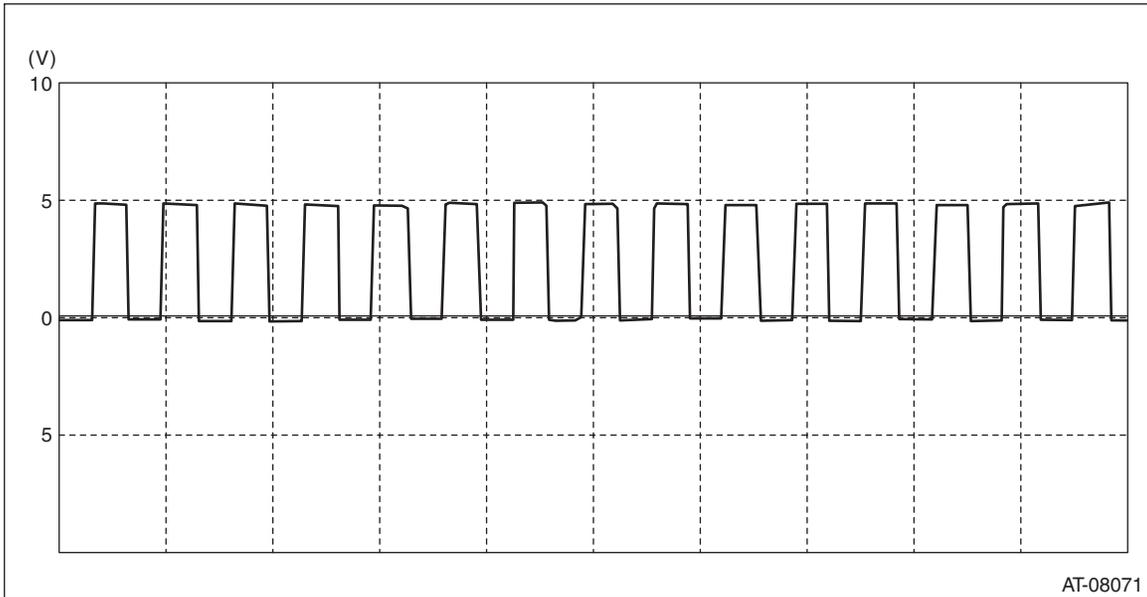
(B) - probe

12) Start and warm up the engine.

13) Check the waveform and output voltage of the turbine speed sensor with engine idling.

NOTE:

The waveform cycle changes as the speed changes.



AT-08071

16. Secondary Speed Sensor

A: REMOVAL

CAUTION:

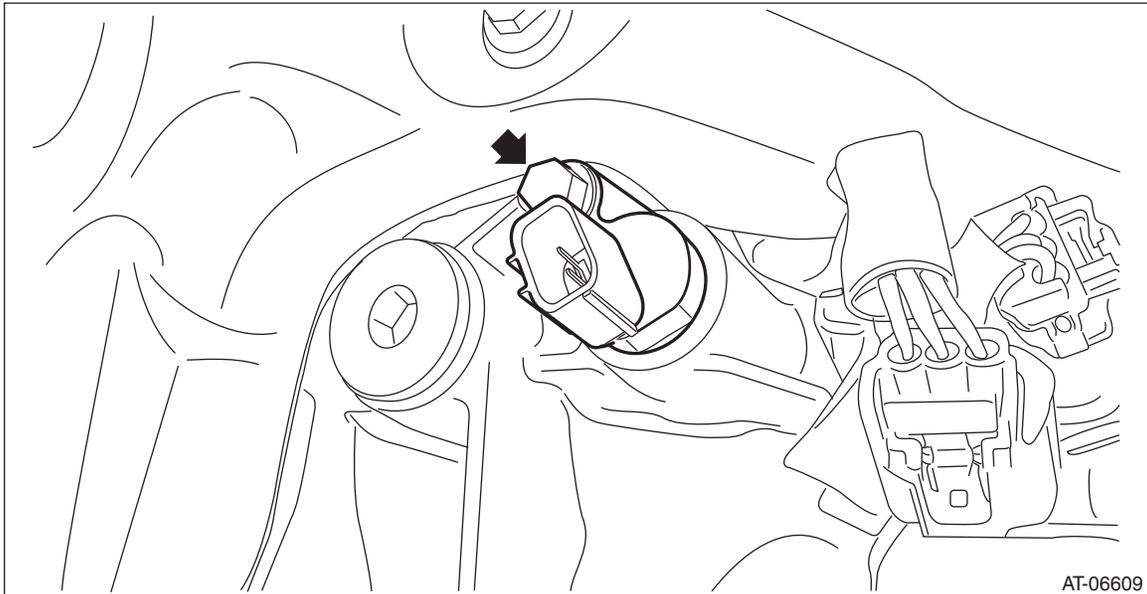
- Be sure to prevent water or oil from contacting the connector terminal of secondary speed sensor. If adhesion occurs, replace with a new part.
- When secondary speed sensor is removed, CVTF leaks. After installing the secondary speed sensor, adjust the CVTF level.

1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

NOTE:

For model with battery sensor, disconnect the ground terminal from battery sensor.

- 2) Lift up the vehicle.
- 3) Disconnect the harness connector from the secondary speed sensor.
- 4) Remove the secondary speed sensor.



B: INSTALLATION

CAUTION:

- Be sure to prevent water or oil from contacting the connector terminal of secondary speed sensor. If adhesion occurs, replace with a new part.
- After installing the secondary speed sensor, adjust the CVTF level.

1) Install the secondary speed sensor.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

Tightening torque:

7 N·m (0.7 kgf·m, 5.2 ft·lb)

- 2) Connect the harness connector.
- 3) Lower the vehicle.
- 4) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>
- 5) Refill CVTF to adjust the CVTF level. <Ref. to CVT(TR580)-39, CVTF.>

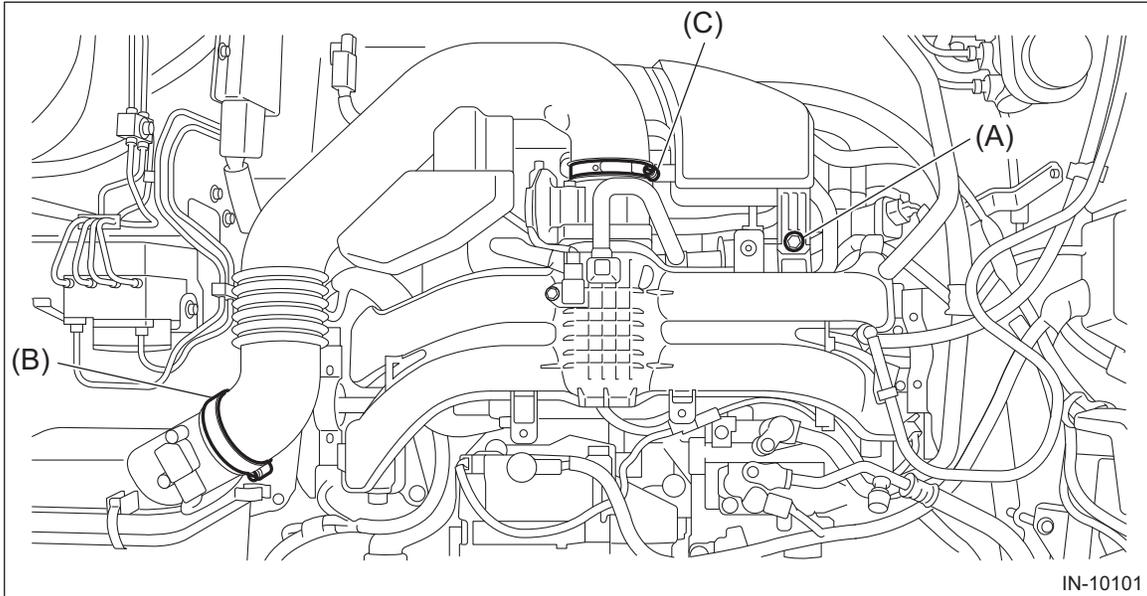
C: INSPECTION

1) Disconnect the ground terminal from battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

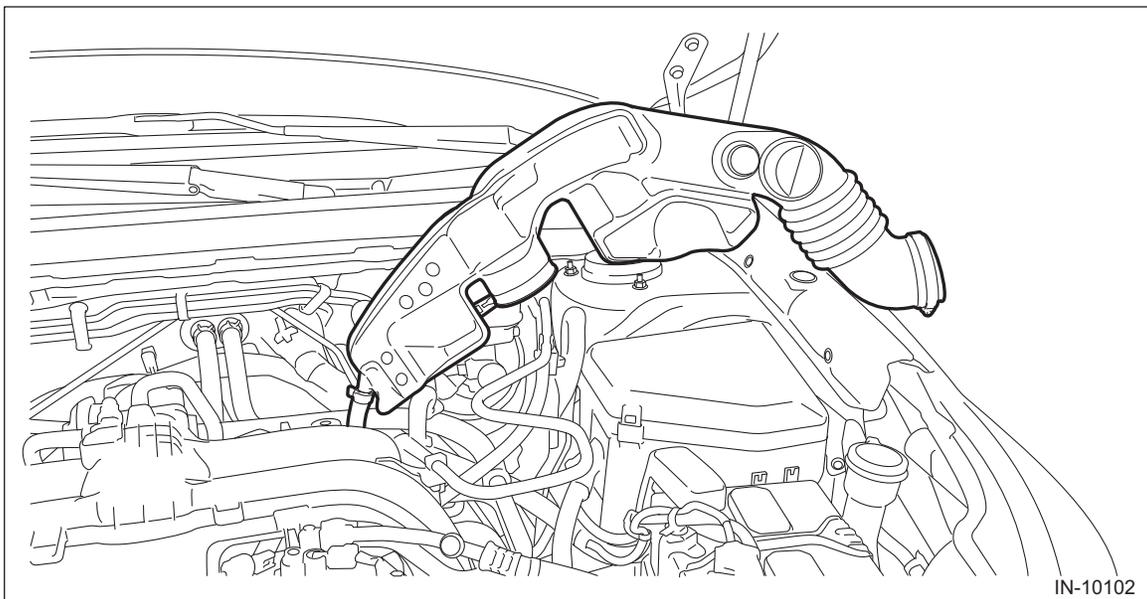
Secondary Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

- 2) Remove the clip (A), and loosen the clamps (B) and (C).



- 3) Remove the air intake boot, and move it to the left side wheel apron.

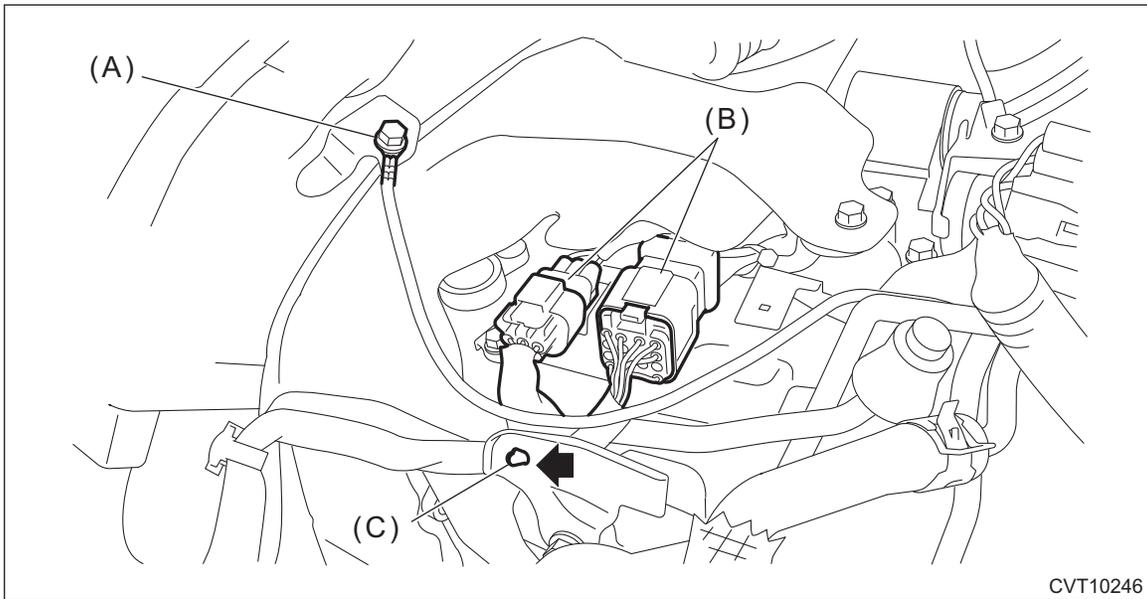


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Secondary Speed Sensor

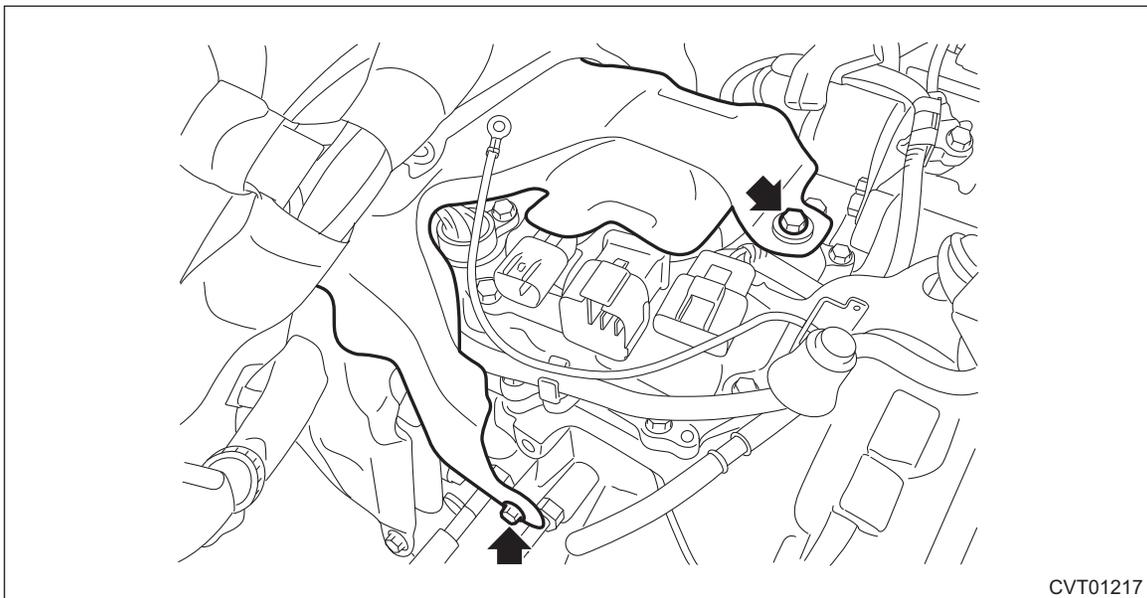
CONTINUOUSLY VARIABLE TRANSMISSION

4) Disconnect the transmission radio ground terminal and transmission harness connector, and remove the harness clip.



- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

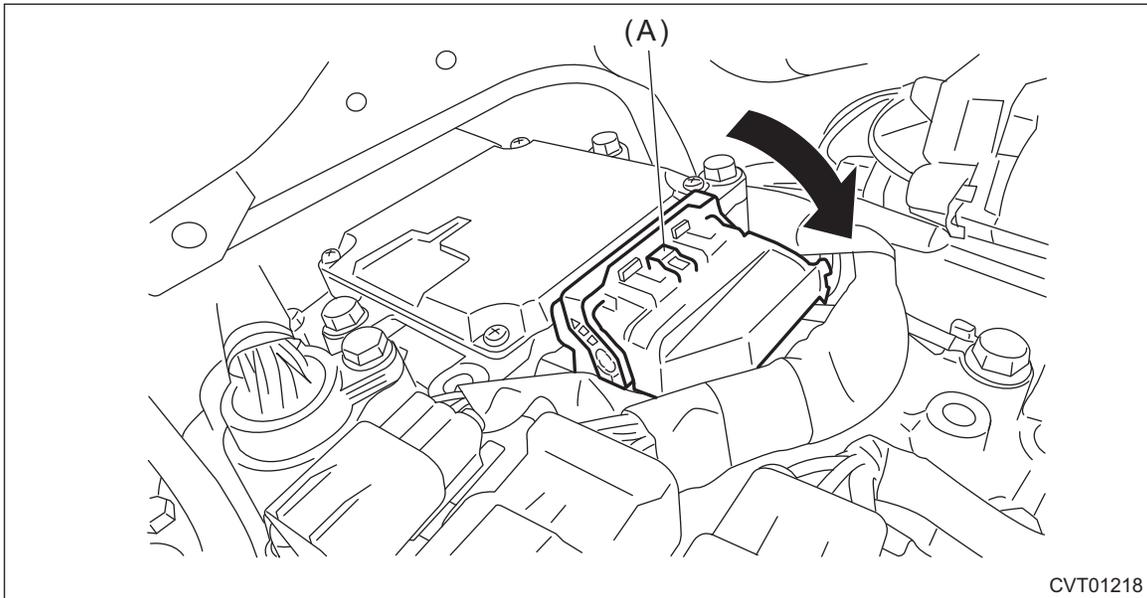
5) Remove the transmission case cover.



Secondary Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

- 6) Move the lock lever in the arrow direction while pressing the lock button, and disconnect the connector.



(A) Lock button

- 7) Set the ST between TCM and transmission harness. <Ref. to CVT(diag)-5, CAUTION, General Description.>

ST 18460AA040 CHECK BOARD

- 8) Connect the transmission radio ground terminal and transmission harness connector, and install the harness clip.

Tightening torque:

13 N·m (1.3 kgf-m, 9.6 ft-lb)

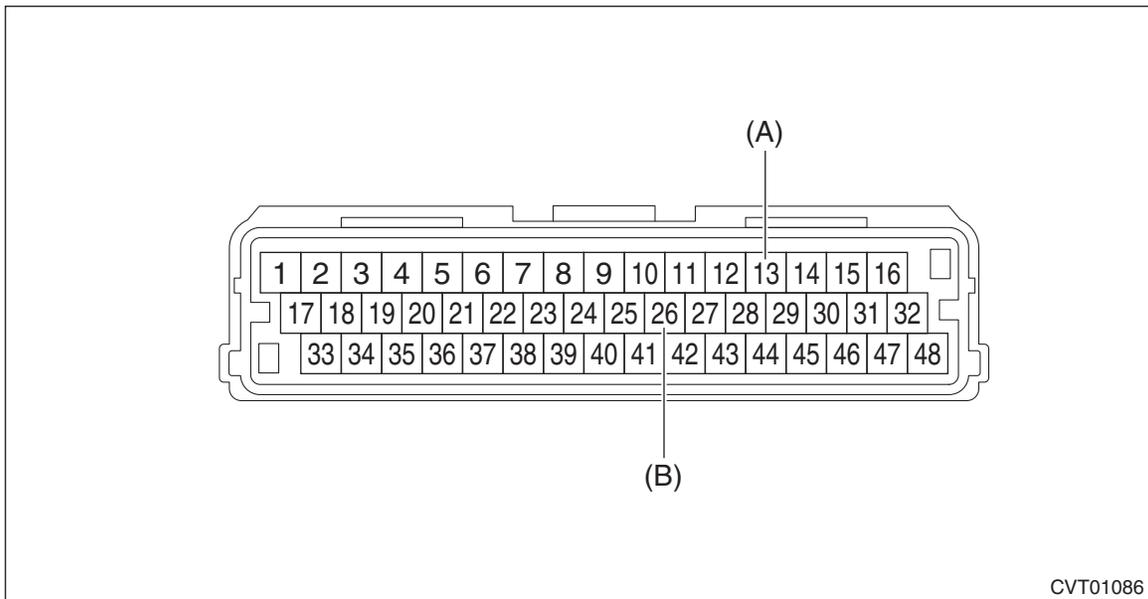
- 9) Install the air intake boot assembly. <Ref. to IN(H4DO)-10, INSTALLATION, Air Intake Boot.>
10) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>
11) Set the probe of oscilloscope to the check board connector.

Secondary Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

Connector & terminal:

(B54) No. 13 (+) — No. 26 (-):



CVT01086

(A) + probe

(B) - probe

12) Start and warm up the engine.

13) Lift up the vehicle.

CAUTION:

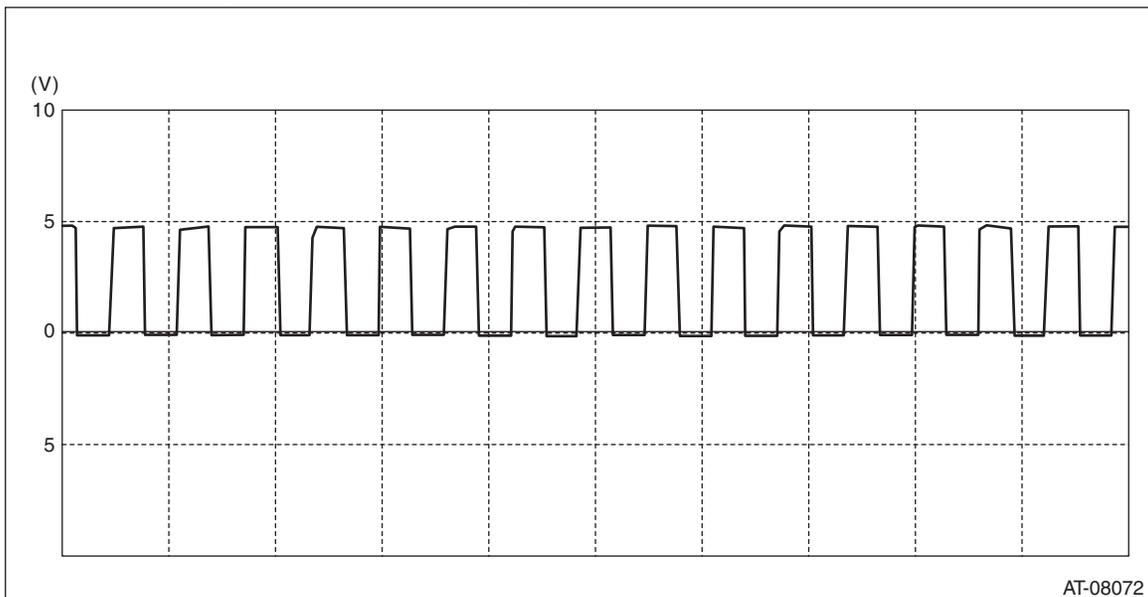
Lift up the vehicle until the tire bottom is 0.3 m (0.98 ft) or more above the ground.

14) Shift the select lever to "D" range.

15) Check the waveform and output voltage of the secondary speed sensor with engine idling.

NOTE:

The waveform cycle changes as the speed changes.



AT-08072

Primary Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

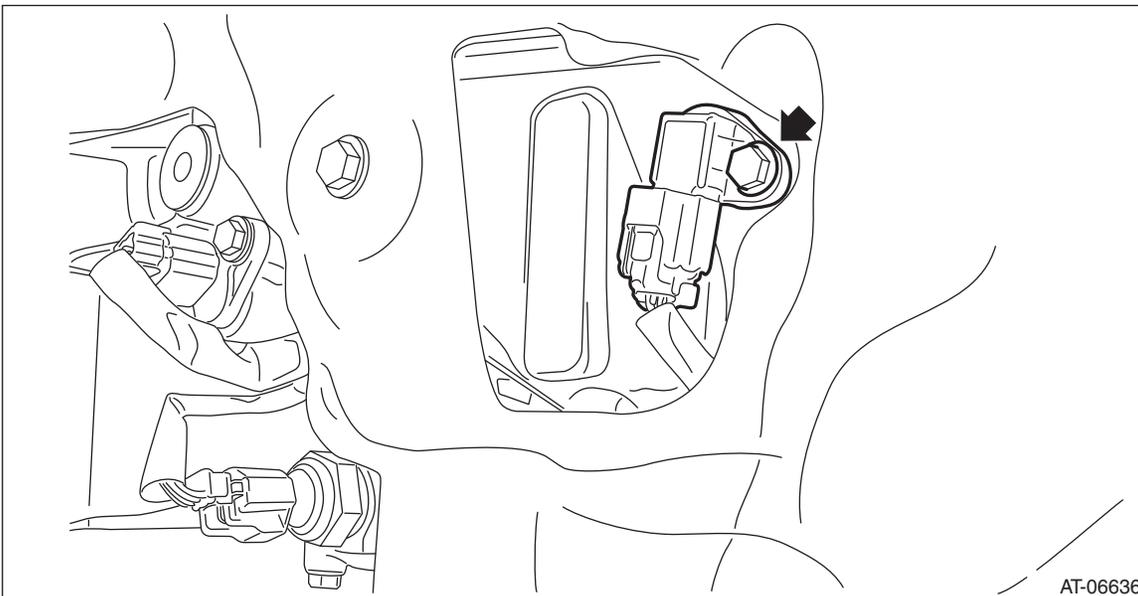
17.Primary Speed Sensor

A: REMOVAL

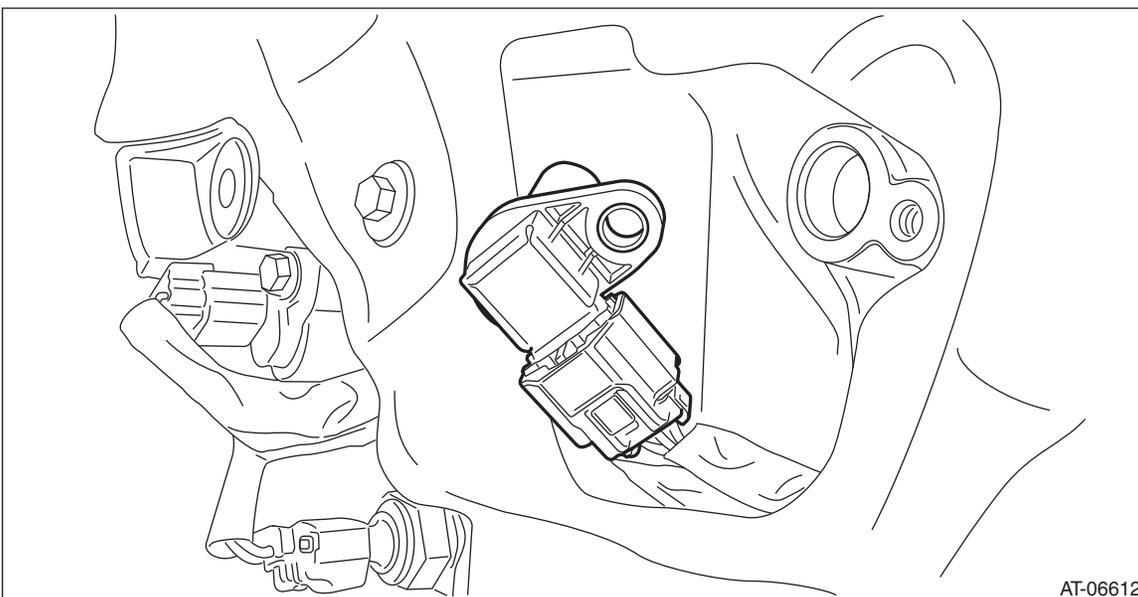
CAUTION:

Be sure to prevent water or oil from contacting the connector terminal of primary speed sensor. If adhesion occurs, replace with a new part.

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the primary speed sensor.



- 3) Disconnect the harness connector from primary speed sensor.



B: INSTALLATION

CAUTION:

Be sure to prevent water or oil from contacting the connector terminal of primary speed sensor. If adhesion occurs, replace with a new part.

- 1) Connect the harness connector.
- 2) Install the primary speed sensor.

Primary Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

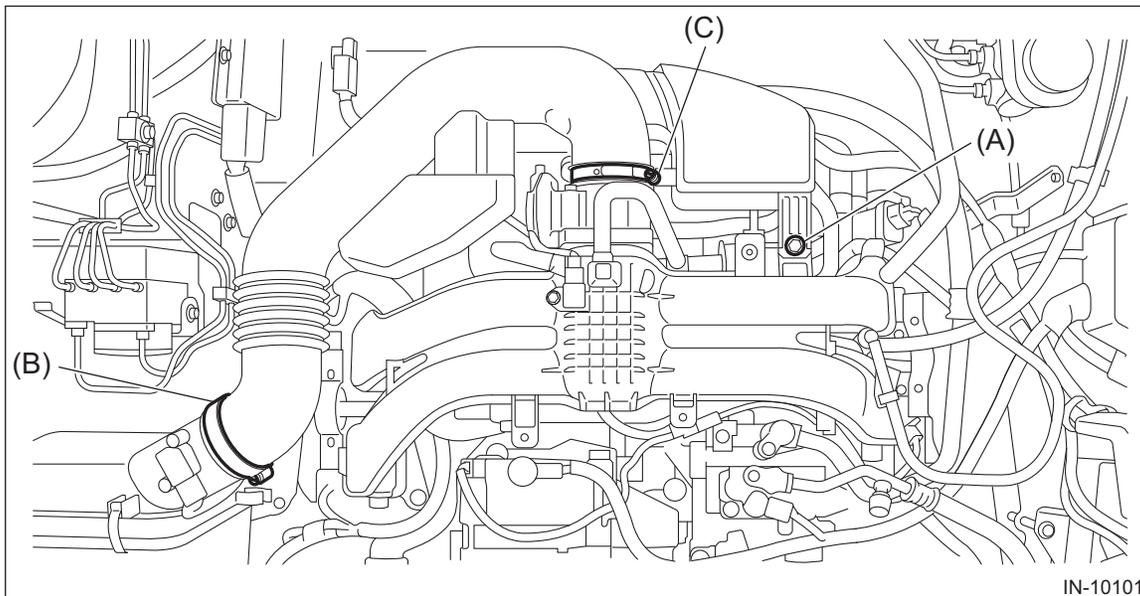
Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)

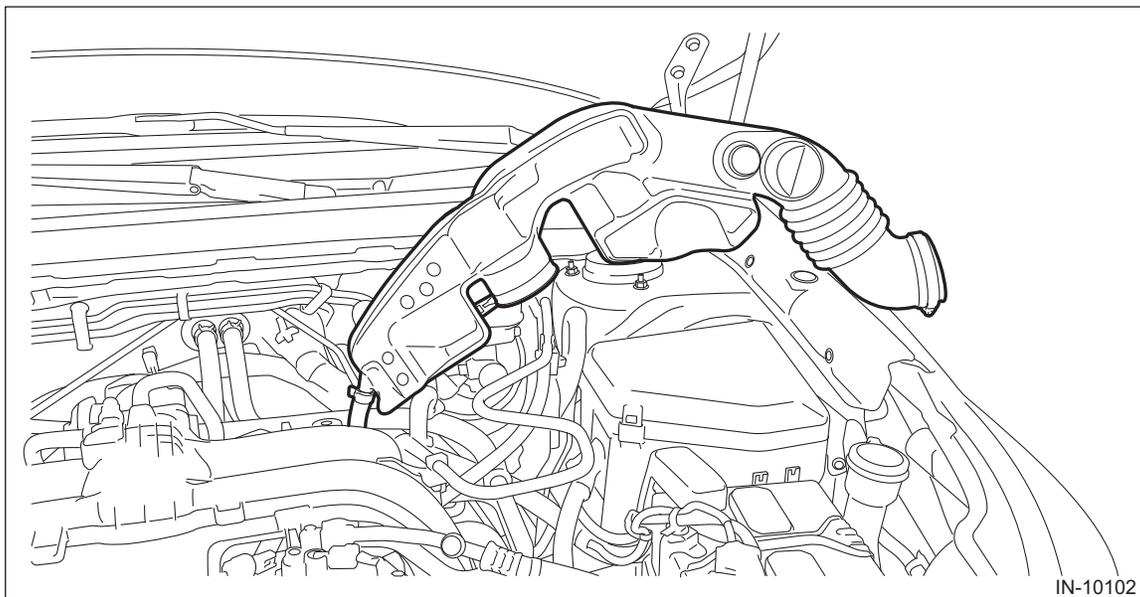
3) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: INSPECTION

- 1) Disconnect the ground terminal from battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>
- 2) Remove the clip (A), and loosen the clamps (B) and (C).



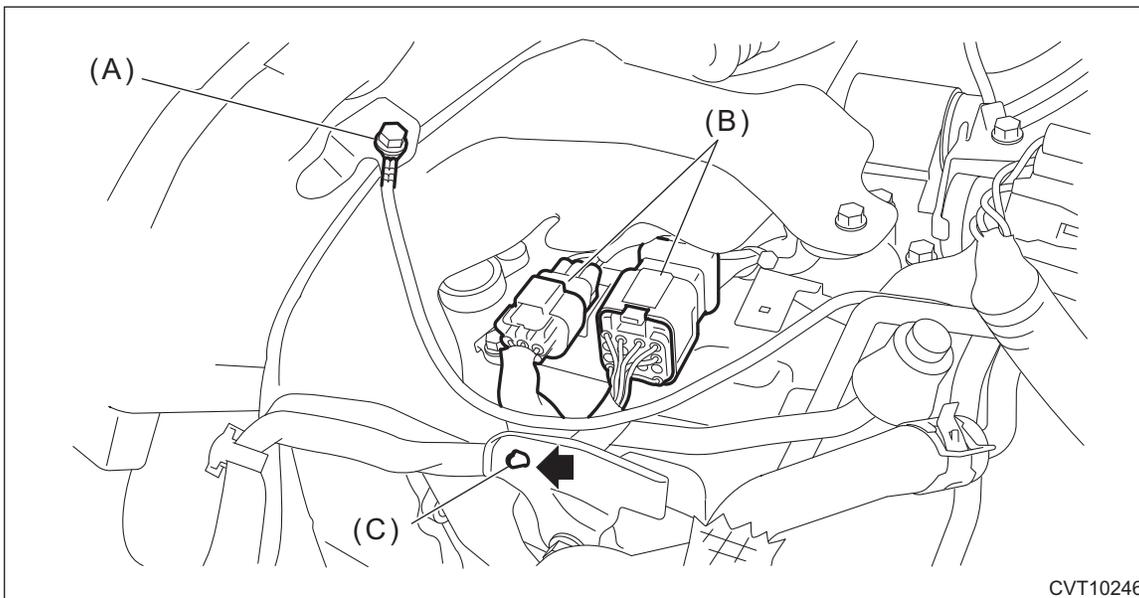
- 3) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.



Primary Speed Sensor

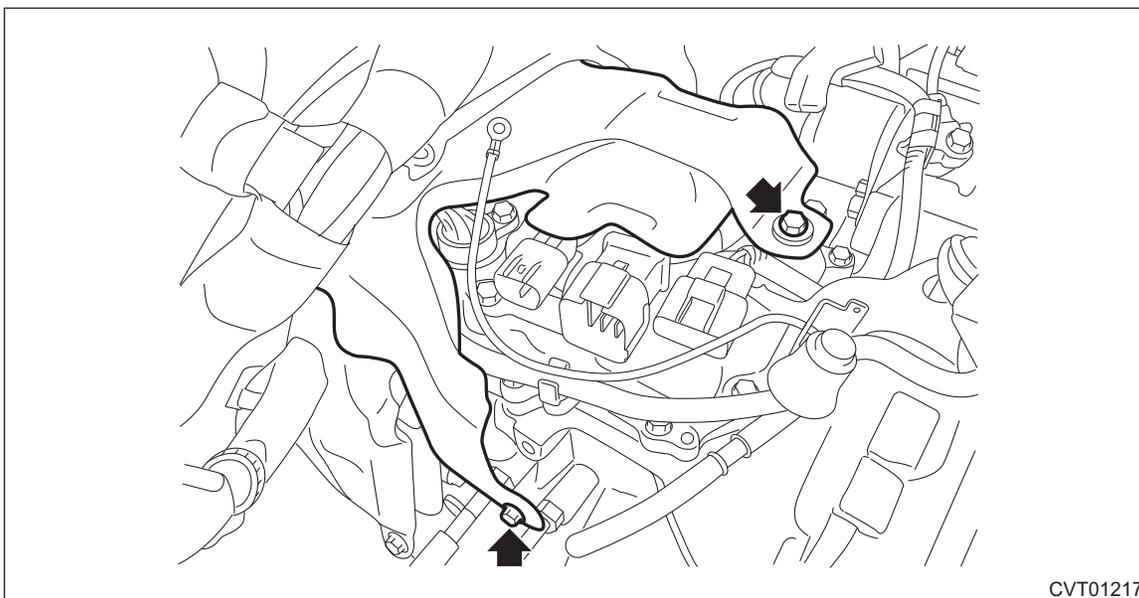
CONTINUOUSLY VARIABLE TRANSMISSION

4) Disconnect the transmission radio ground terminal and transmission harness connector, and remove the harness clip.



- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

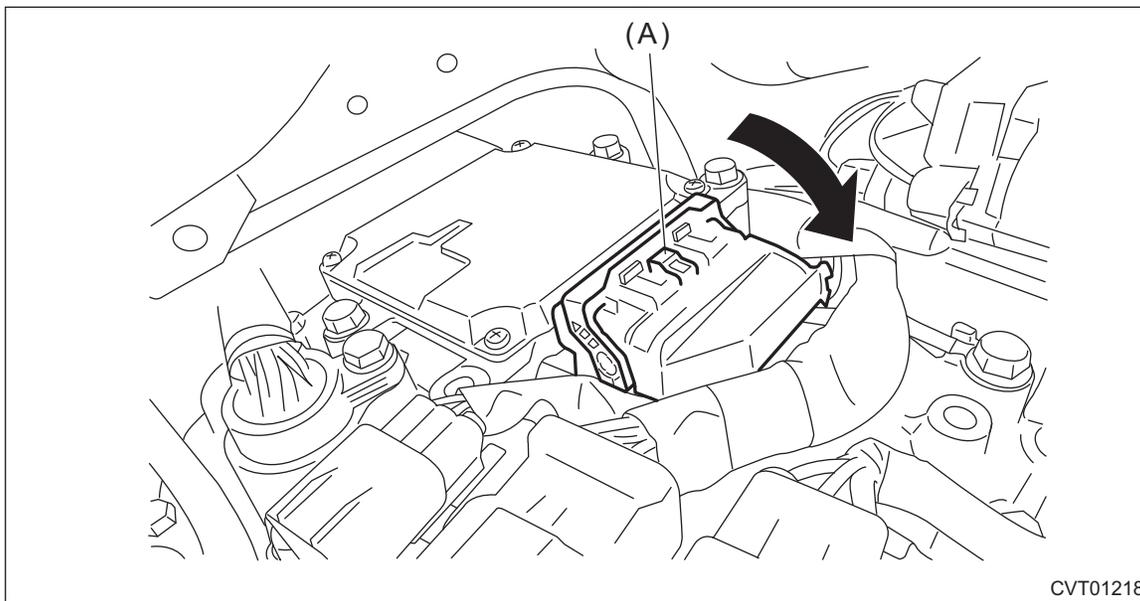
5) Remove the transmission case cover.



Primary Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

- 6) Move the lock lever in the arrow direction while pressing the lock button, and disconnect the connector.



(A) Lock button

- 7) Set the ST between TCM and transmission harness. <Ref. to CVT(diag)-5, CAUTION, General Description.>

ST 18460AA040 CHECK BOARD

- 8) Connect the transmission radio ground terminal and transmission harness connector, and install the harness clip.

Tightening torque:

13 N·m (1.3 kgf-m, 9.6 ft-lb)

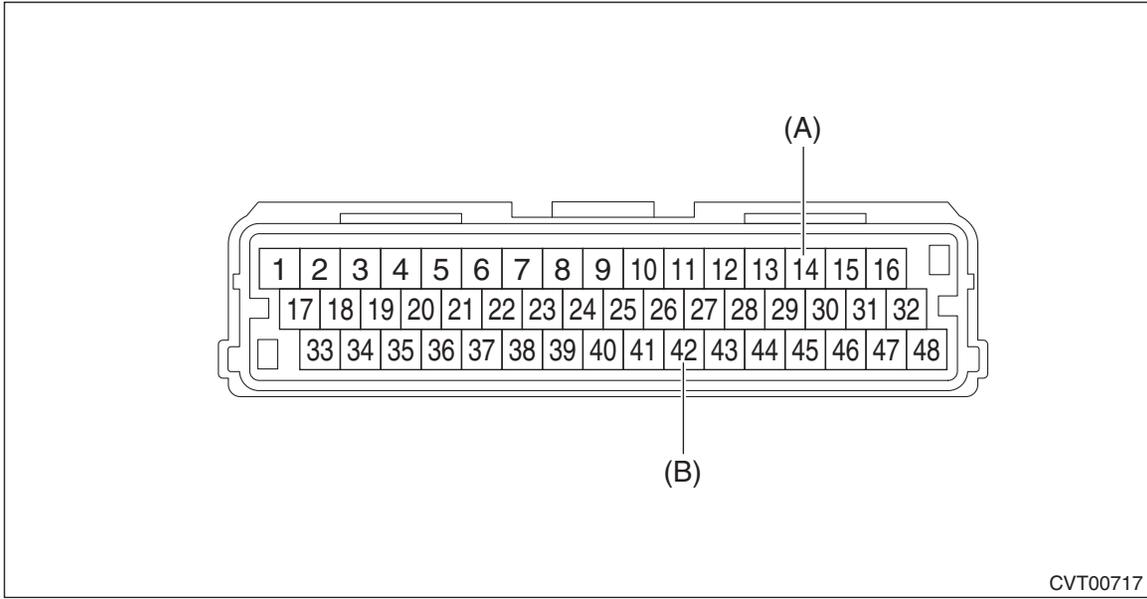
- 9) Install the air intake boot assembly. <Ref. to IN(H4DO)-10, INSTALLATION, Air Intake Boot.>
10) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>
11) Set the probe of oscilloscope to the check board connector.

Primary Speed Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

Connector & terminal:

(B54) No. 14 (+) — No. 42 (-):



(A) + probe

(B) - probe

12) Start and warm up the engine.

13) Lift up the vehicle.

CAUTION:

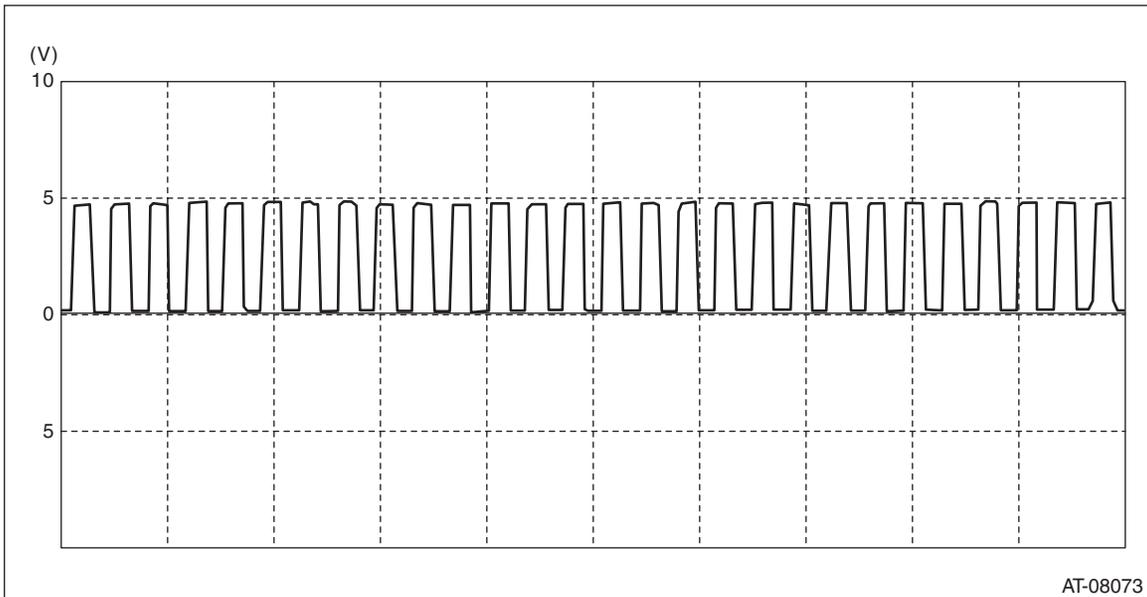
Lift up the vehicle until the tire bottom is 0.3 m (0.98 ft) or more above the ground.

14) Shift the select lever to "D" range.

15) Check the waveform and output voltage of the primary speed sensor with engine idling.

NOTE:

The waveform cycle changes as the speed changes.



18. Secondary Pressure Sensor

A: REMOVAL

CAUTION:

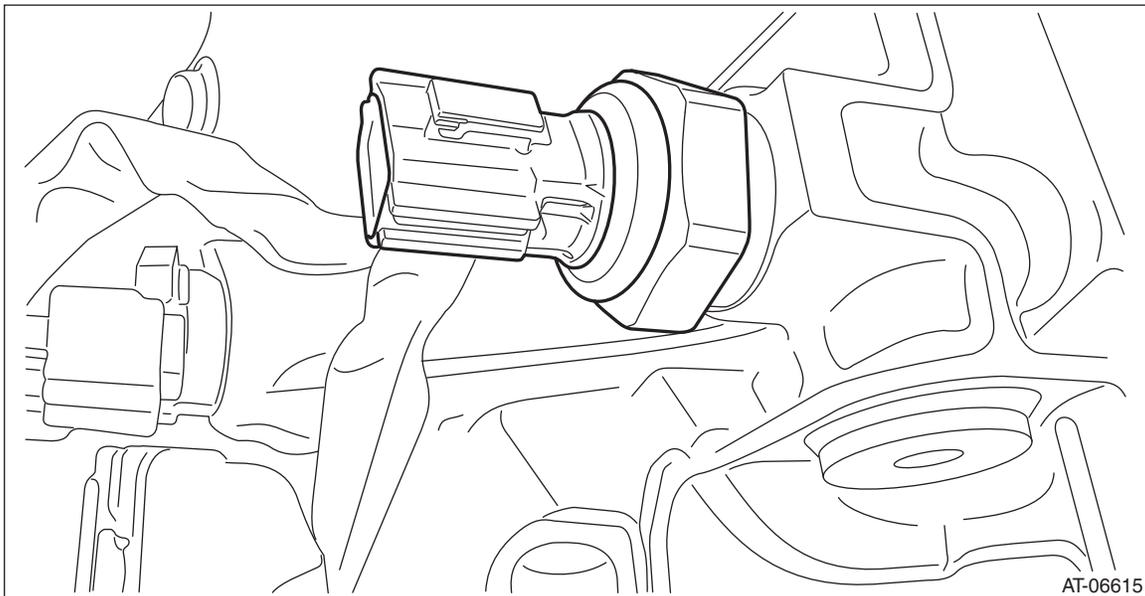
- Be sure to prevent water or oil from contacting the connector terminal of secondary pressure sensor. If adhesion occurs, replace with a new part.
- When secondary pressure sensor is removed, CVTF leaks. After installing the secondary pressure sensor, adjust the CVTF level.

1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

NOTE:

For model with battery sensor, disconnect the ground terminal from battery sensor.

- 2) Lift up the vehicle.
- 3) Remove the secondary pressure sensor connector.
- 4) Remove the secondary pressure sensor.



B: INSTALLATION

CAUTION:

- Be sure to prevent water or oil from contacting the connector terminal of secondary pressure sensor. If adhesion occurs, replace with a new part.
- After installing the secondary pressure sensor, adjust the CVTF level.

1) Install the secondary pressure sensor.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

Tightening torque:

39 N·m (4.0 kgf·m, 28.8 ft·lb)

- 2) Connect the harness connector.
- 3) Lower the vehicle.
- 4) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>
- 5) Refill CVTF to adjust the CVTF level. <Ref. to CVT(TR580)-39, CVTF.>

C: INSPECTION

- 1) Start and warm up the engine.
- 2) Depress the brake pedal, and shift the select lever to “D” range.
- 3) Shift the select lever to “P” or “N” range.
- 4) Depress the brake pedal and hold it.

Secondary Pressure Sensor

CONTINUOUSLY VARIABLE TRANSMISSION

5) Check "secondary pressure sensor voltage" by using Subaru Select Monitor while the engine is idling. <Ref. to CVT(diag)-18, OPERATION, Subaru Select Monitor.>

Specification:

Approx. 0.8 V

6) Check "secondary pressure sensor voltage" with engine stopped and ignition switch turned on by using Subaru Select Monitor. <Ref. to CVT(diag)-18, OPERATION, Subaru Select Monitor.>

Specification:

Approx. 0.5 V

19.Oil Pan and Strainer

A: REMOVAL

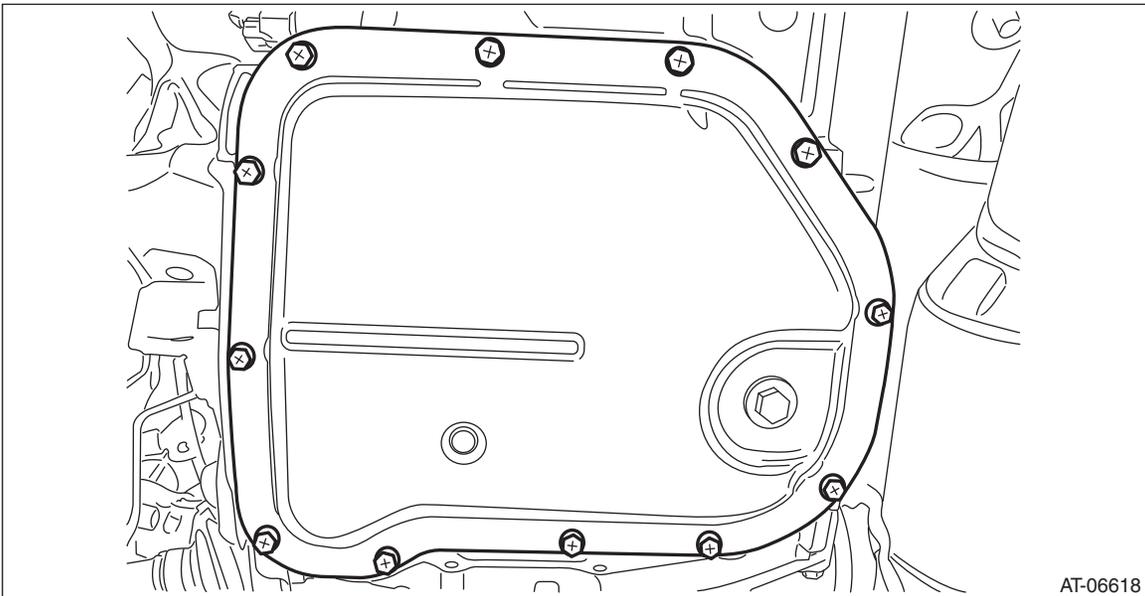
CAUTION:

- Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.
- Be careful not to spill CVTF on the exhaust pipe to prevent it from emitting smoke or causing a fire. If the CVTF adheres, wipe it off completely.

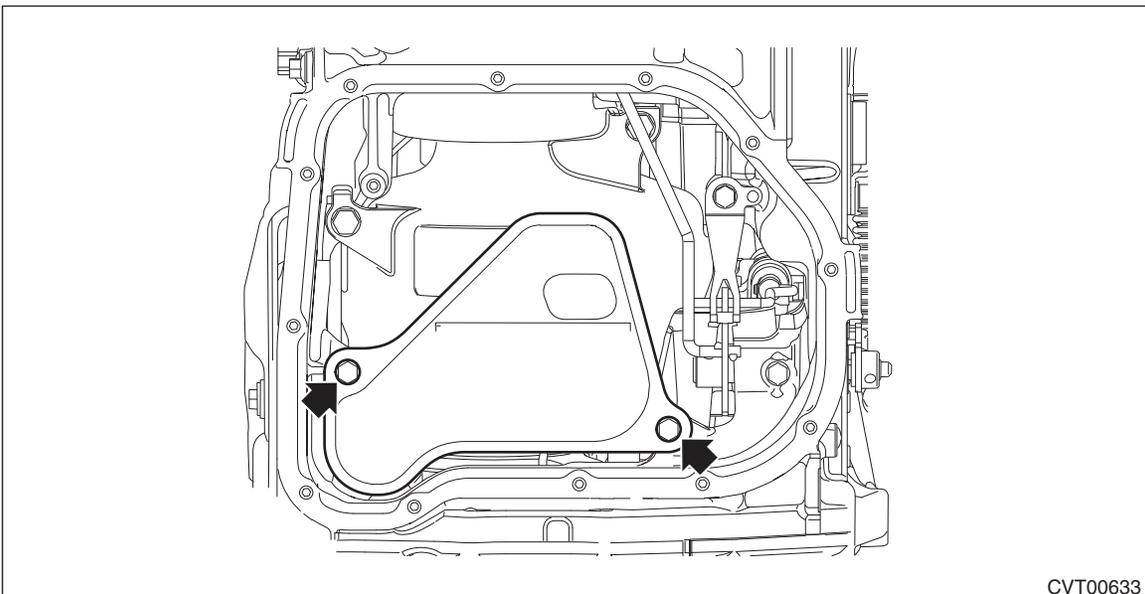
- 1) Lift up the vehicle.
- 2) Remove the under cover - front.
- 3) Clean the transmission exterior.
- 4) Remove the CVTF drain plug to drain CVTF.
- 5) Remove the oil pan.

CAUTION:

Be careful not to allow foreign matter such as dust or dirt to enter the oil pan.



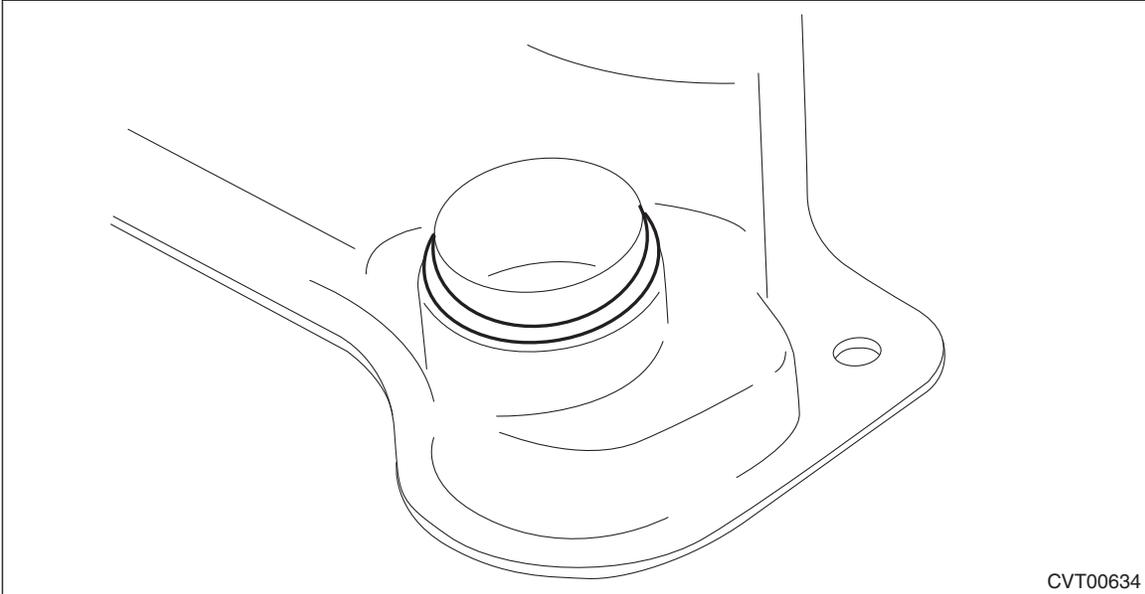
- 6) Remove the magnet.
- 7) Remove the oil strainer.



Oil Pan and Strainer

CONTINUOUSLY VARIABLE TRANSMISSION

8) Remove the O-ring from oil strainer.



CVT00634

B: INSTALLATION

- 1) Clean the mating surface of oil pan and transmission case.
- 2) Install the O-rings.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

- 3) Install the oil strainer.

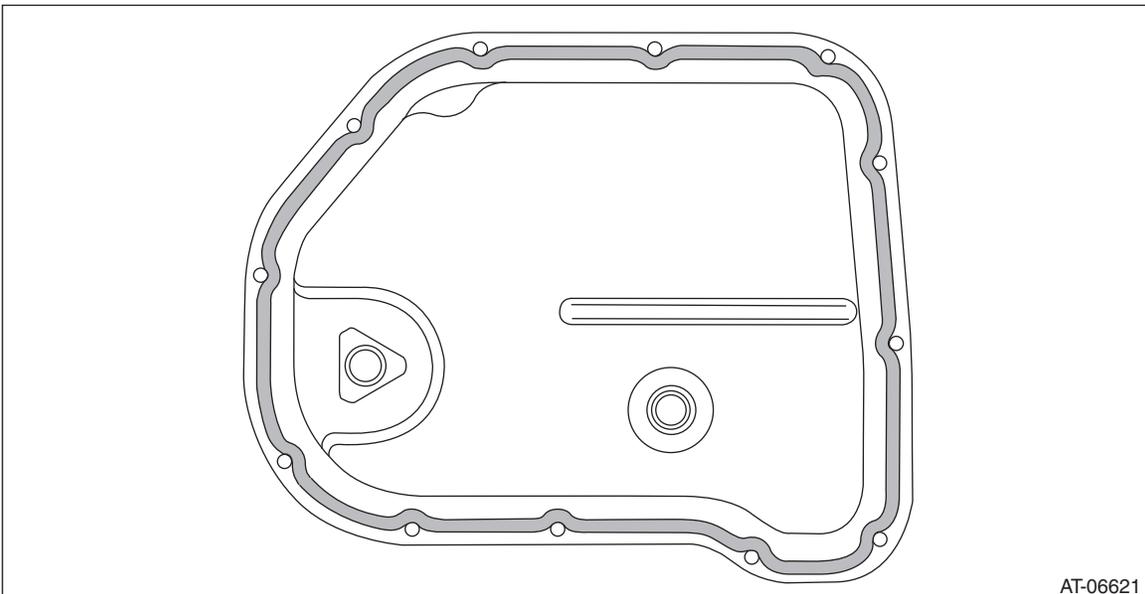
Tightening torque:

9 N·m (0.9 kgf·m, 6.6 ft·lb)

- 4) Clean the magnet.
- 5) Attach the magnet at the specified position of the oil pan.
- 6) Apply liquid gasket all around the oil pan mating surface seamlessly.

Liquid gasket:

THREE BOND 1217B (Part No. K0877YA020) or equivalent



AT-06621

7) Install the oil pan by equally tightening the bolts.

Oil Pan and Strainer

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

5 N·m (0.5 kgf·m, 3.7 ft·lb)

8) Install the under cover - front.

9) Refill CVTF and adjust the level. <Ref. to CVT(TR580)-40, REPLACEMENT, CVTF.>

C: INSPECTION

- Check each part for damage or dust.
- Check oil strainer for clogging.

Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

20. Control Valve Body

A: REMOVAL

CAUTION:

- Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.
- Be careful not to spill CVTF on the exhaust pipe to prevent it from emitting smoke or causing a fire. If the CVTF adheres, wipe it off completely.
- Always clean the engine compartment before removal.

NOTE:

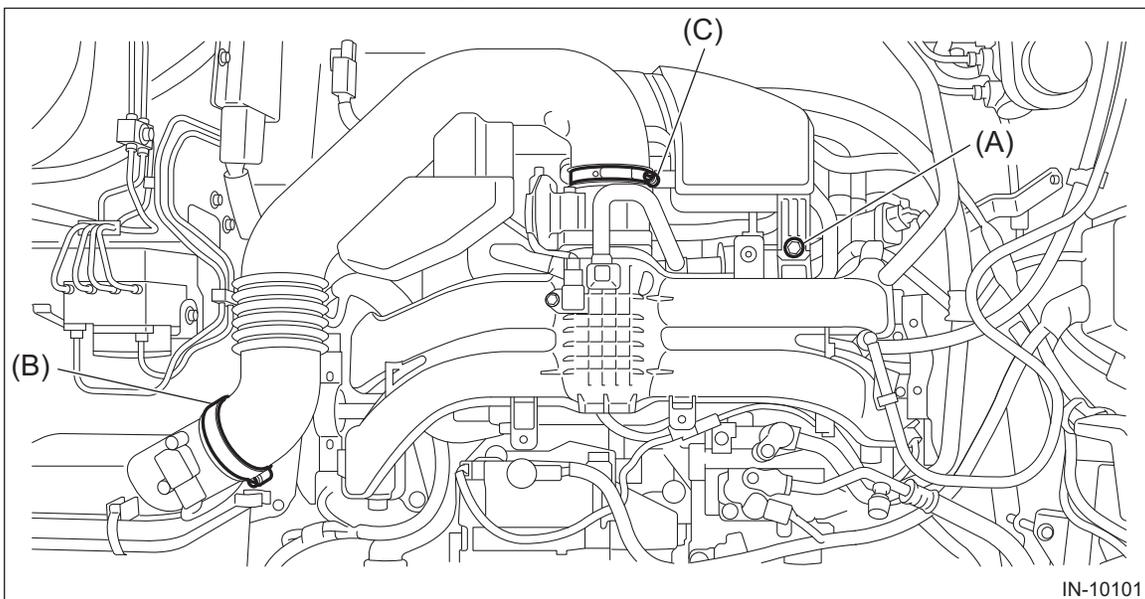
The control valve body is replaced as an assembly only, because it is a non-disassembly part.

1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

NOTE:

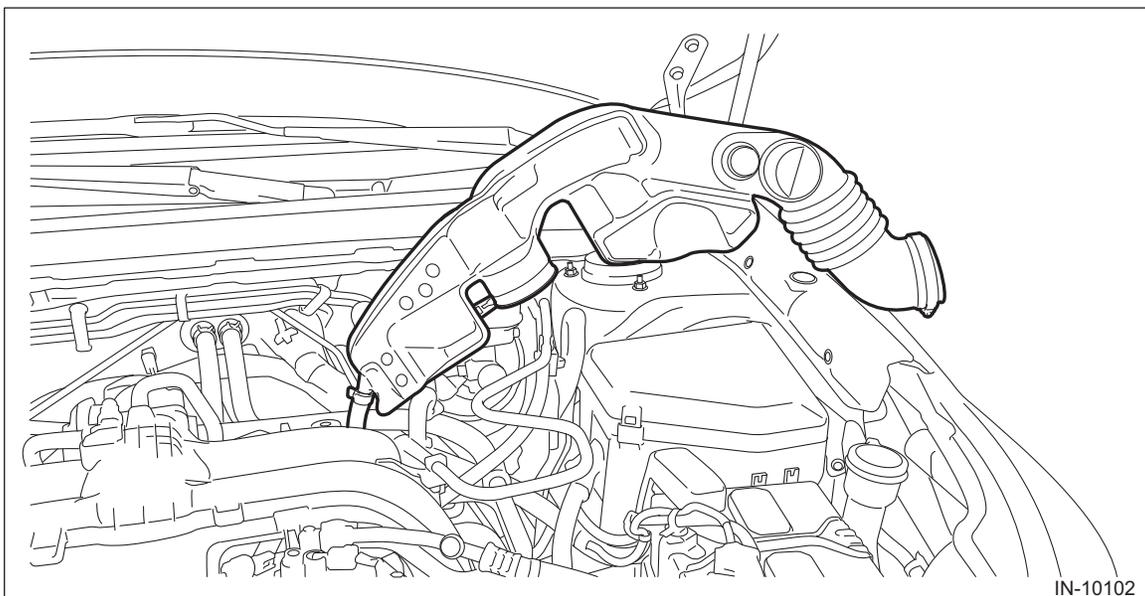
For model with battery sensor, disconnect the ground terminal from battery sensor.

2) Remove the clip (A), and loosen the clamps (B) and (C).



IN-10101

3) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.

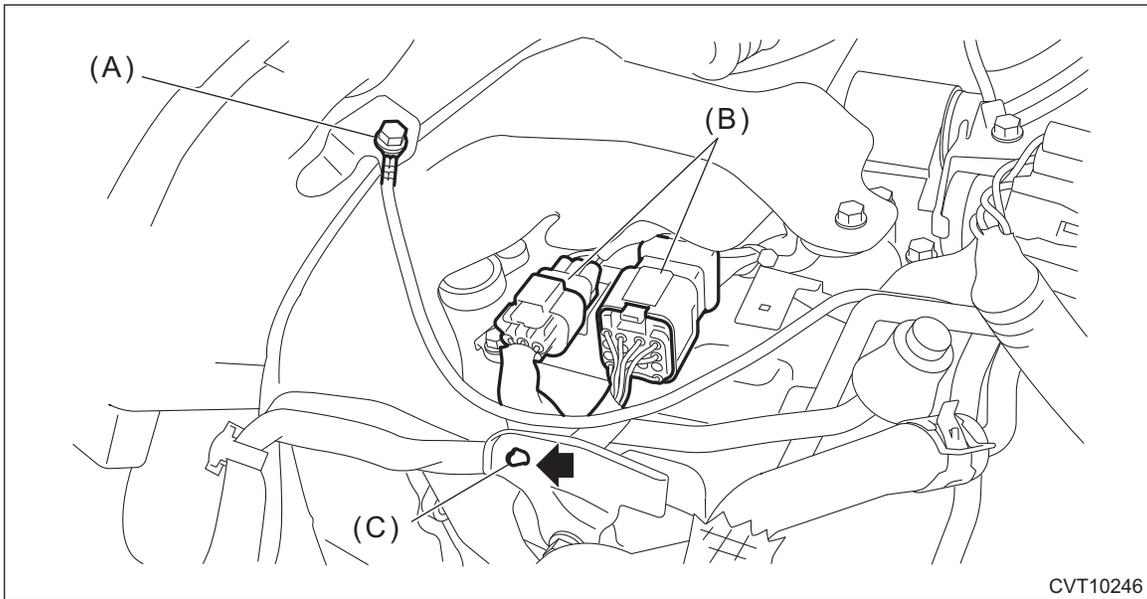


IN-10102

Control Valve Body

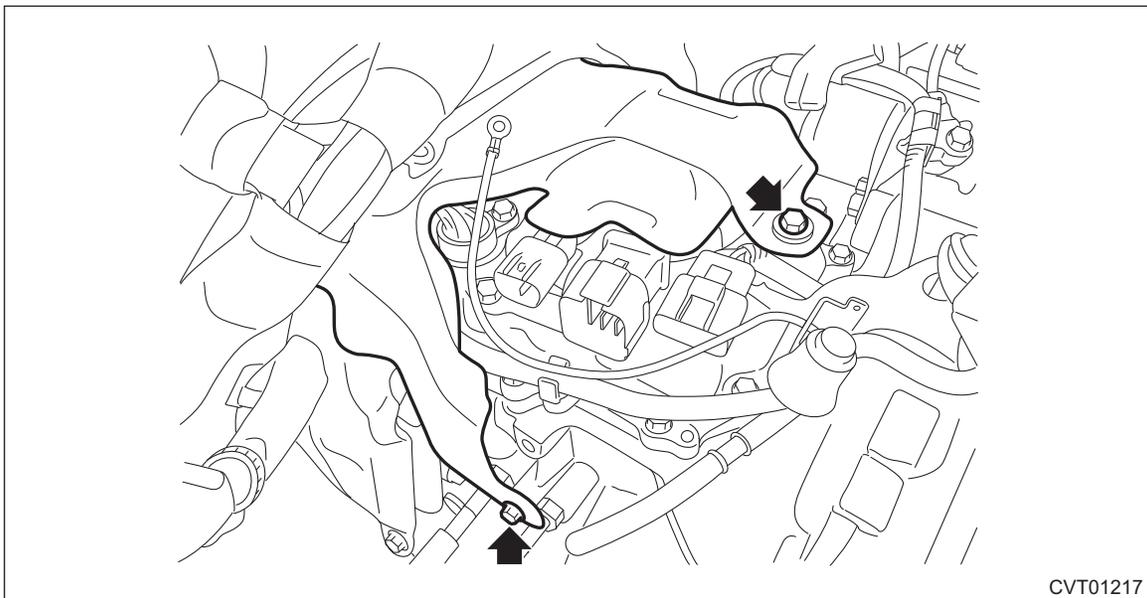
CONTINUOUSLY VARIABLE TRANSMISSION

4) Disconnect the transmission radio ground terminal and transmission harness connector, and remove the harness clip.



- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

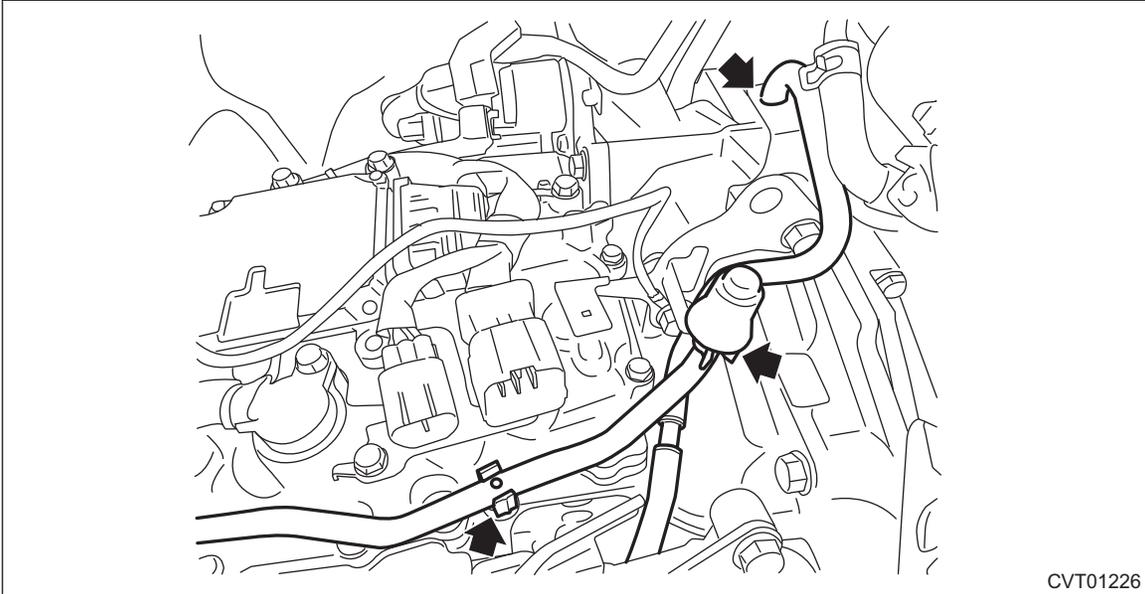
5) Remove the transmission case cover.



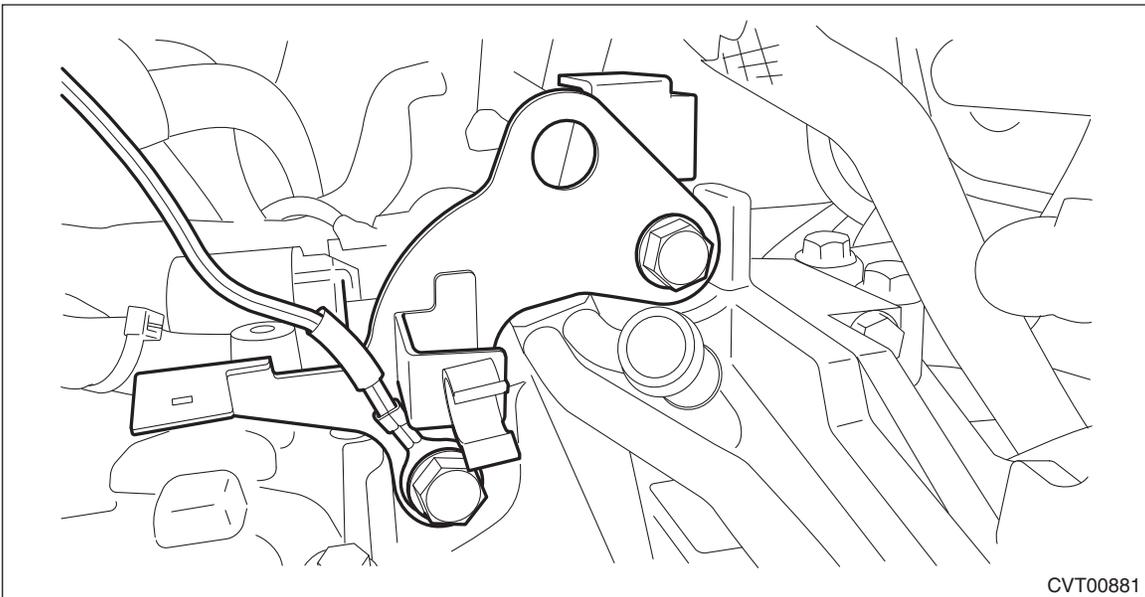
Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

6) Detach the air breather hose.



7) Remove the transmission hanger and transmission radio ground cord.

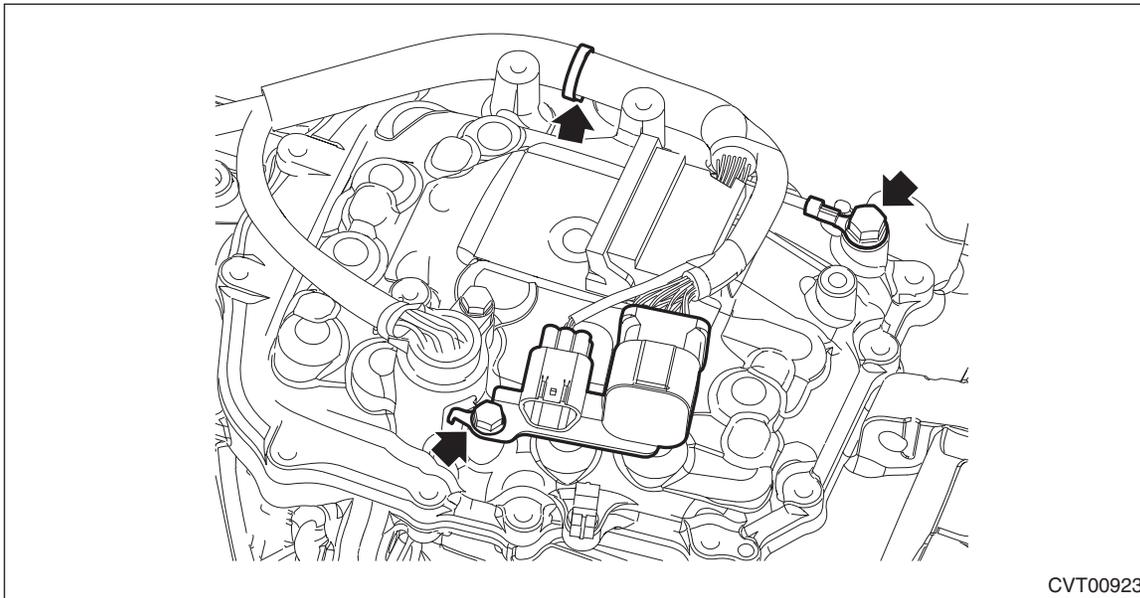


8) Remove the TCM. <Ref. to CVT(TR580)-164, REMOVAL, Transmission Control Module (TCM).>

Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

9) Detach the transmission harness stay and ground terminal, and remove the harness clip.



10) Remove the transmission harness connector from the harness stay.

11) Remove the throttle body, and move it aside so that it will not interfere with the removal of the control valve. <Ref. to FU(H4DO)-14, REMOVAL, Throttle Body.>

NOTE:

Do not remove the preheater hose.

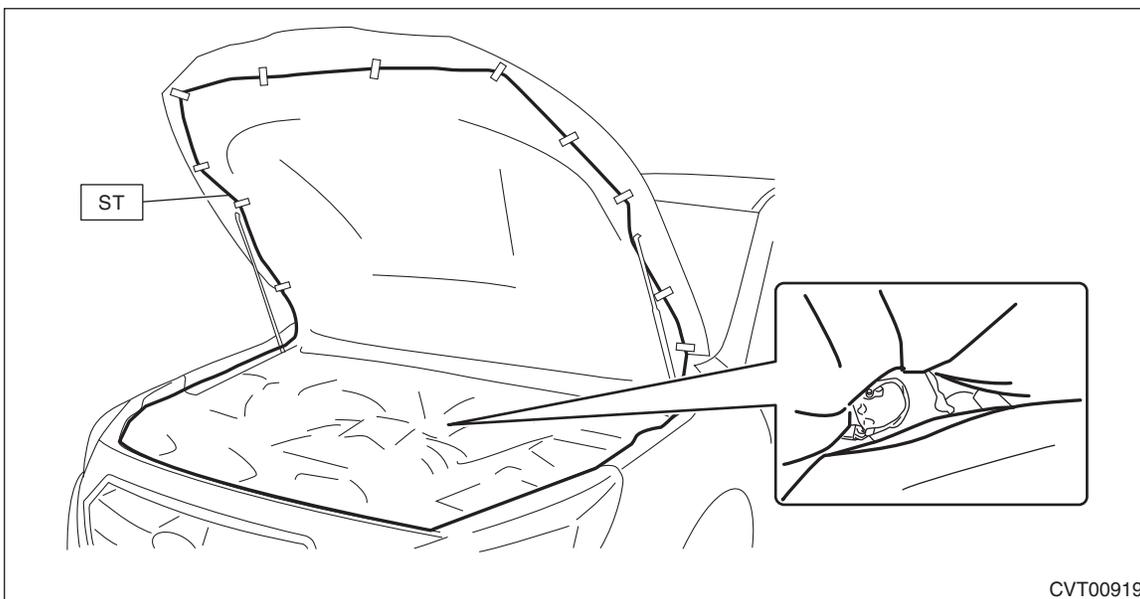
12) Clean the transmission exterior.

13) Fix the ST with tape, and set the ST to the vehicle.

NOTE:

When replacing the control valve body, the sheet is included in the control valve body for repairs.

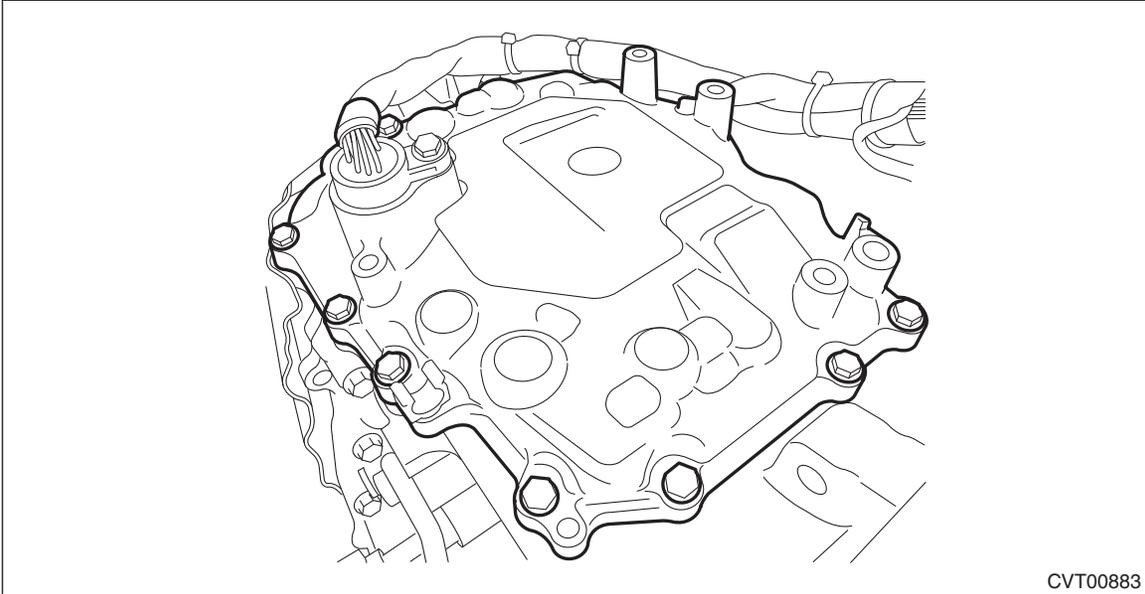
ST 18761AA010 SHEET SPECIAL TOOL



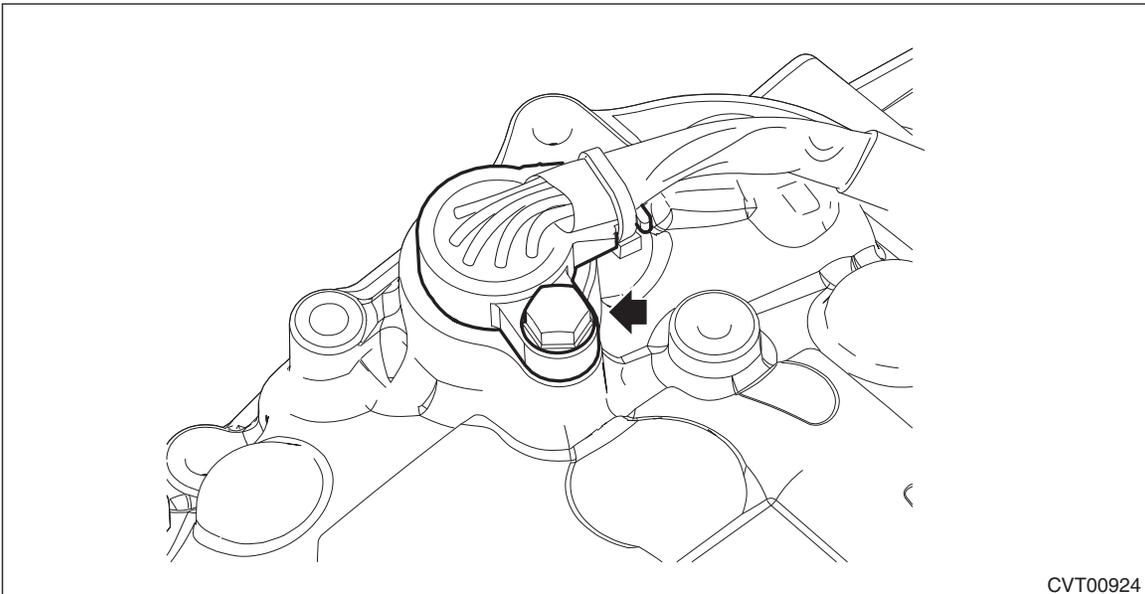
Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

14) Remove the valve cover and gasket.



15) Disconnect the harness connector from the control valve body.
16) Remove the transmission harness.

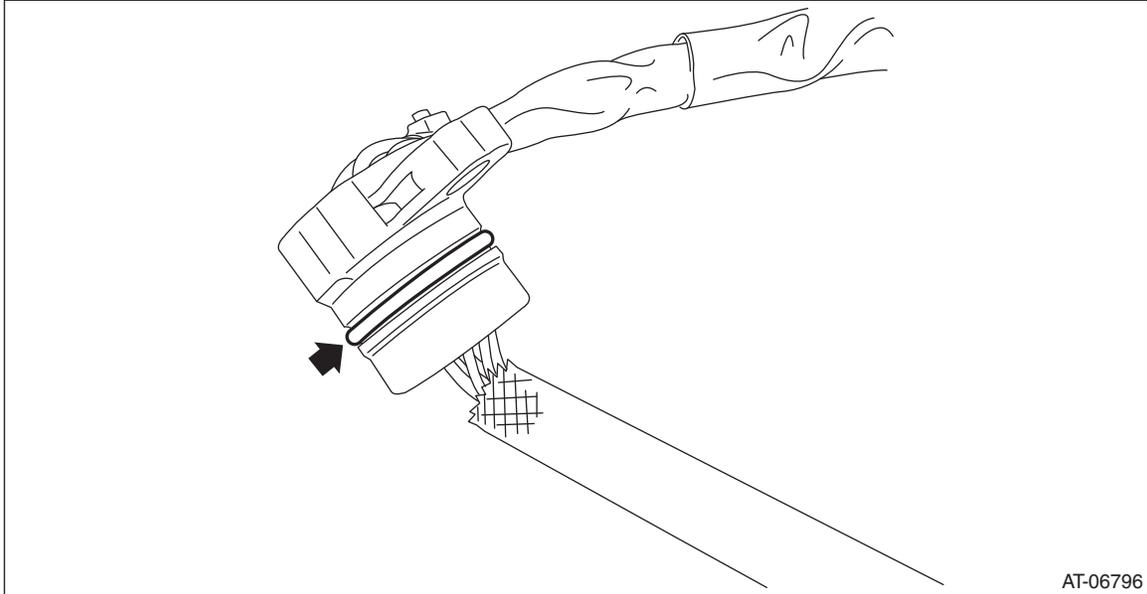


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Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

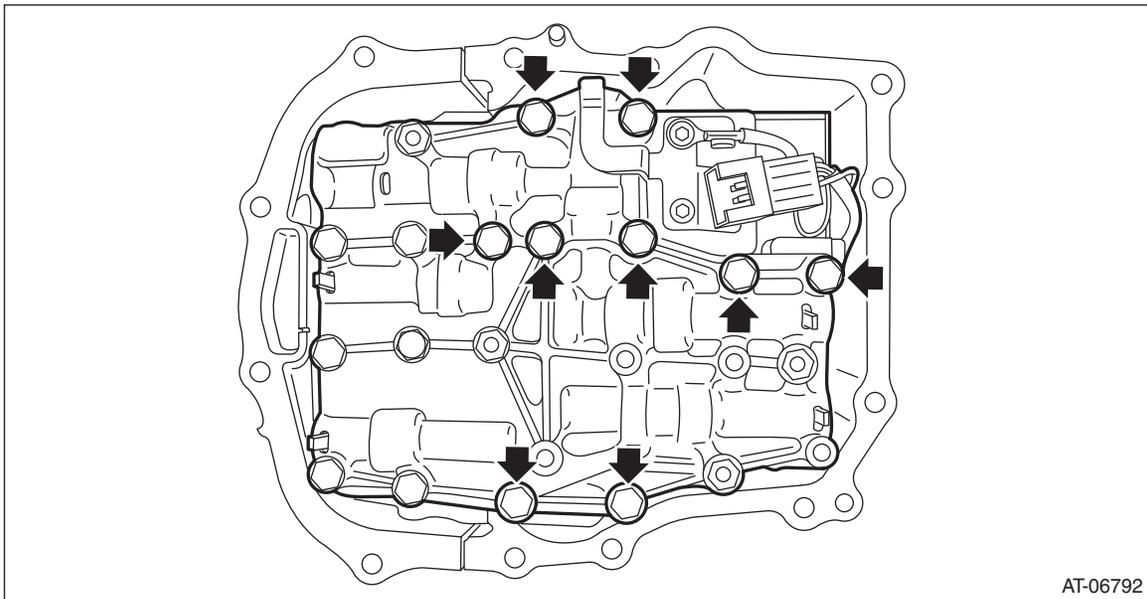
17) Remove the O-rings.



18) Remove the control valve body.

CAUTION:

Be careful not to damage the control valve and air conditioner pipe.

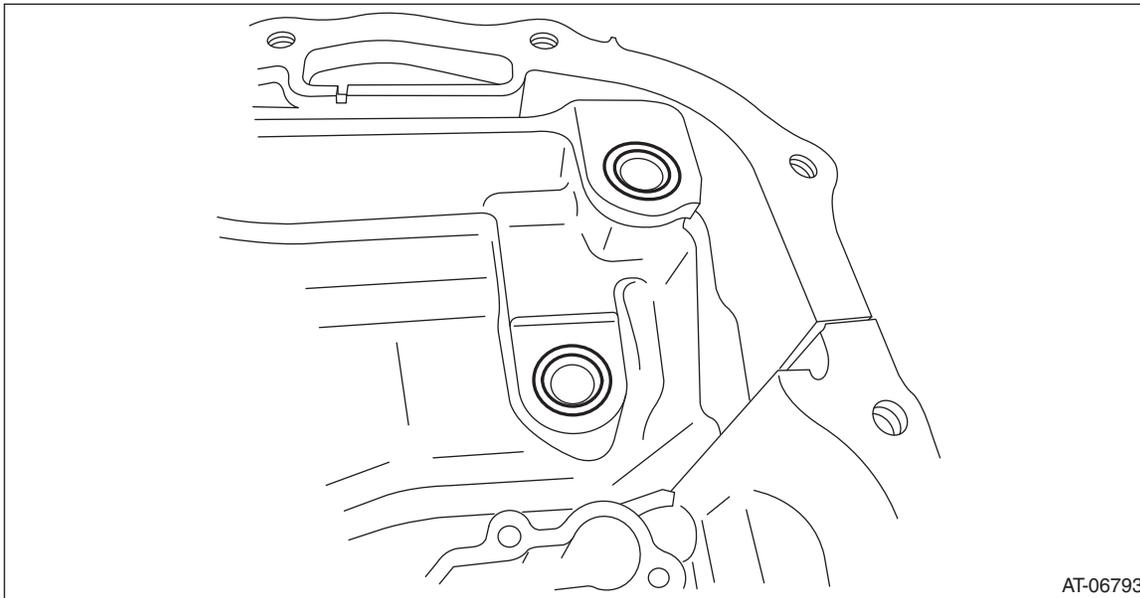


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Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

19) Remove the O-rings.



B: INSTALLATION

1) Clean the mating surface of valve cover and transmission side.

CAUTION:

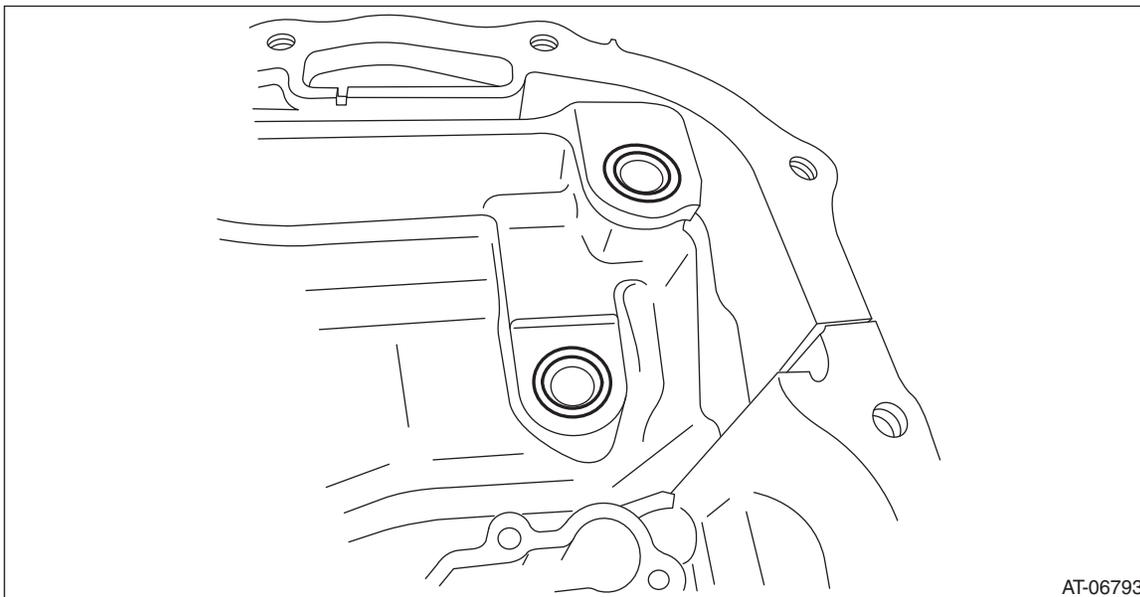
When cleaning the mating surface of the transmission side, be careful not to allow any dust, foreign matter and used liquid gasket to enter the transmission.

2) Check the control valve body for dust and other foreign matter.

3) Install the O-rings.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.



4) Install the control valve body.

(1) Install the control valve body.

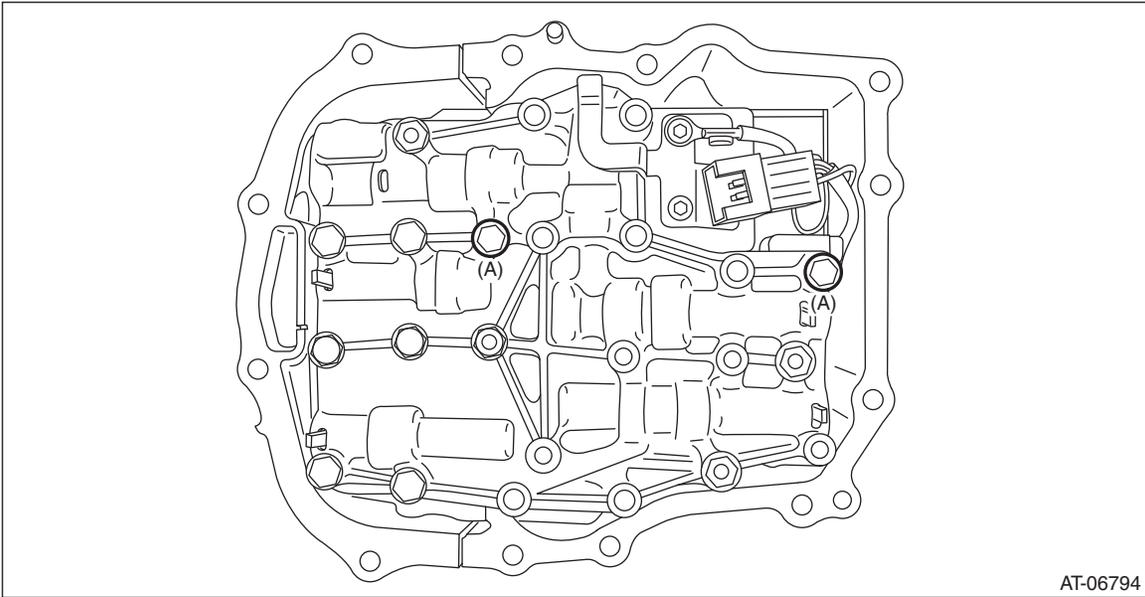
CAUTION:

- Do not damage the O-ring.
- Perform installation so that the O-ring is not displaced.

Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

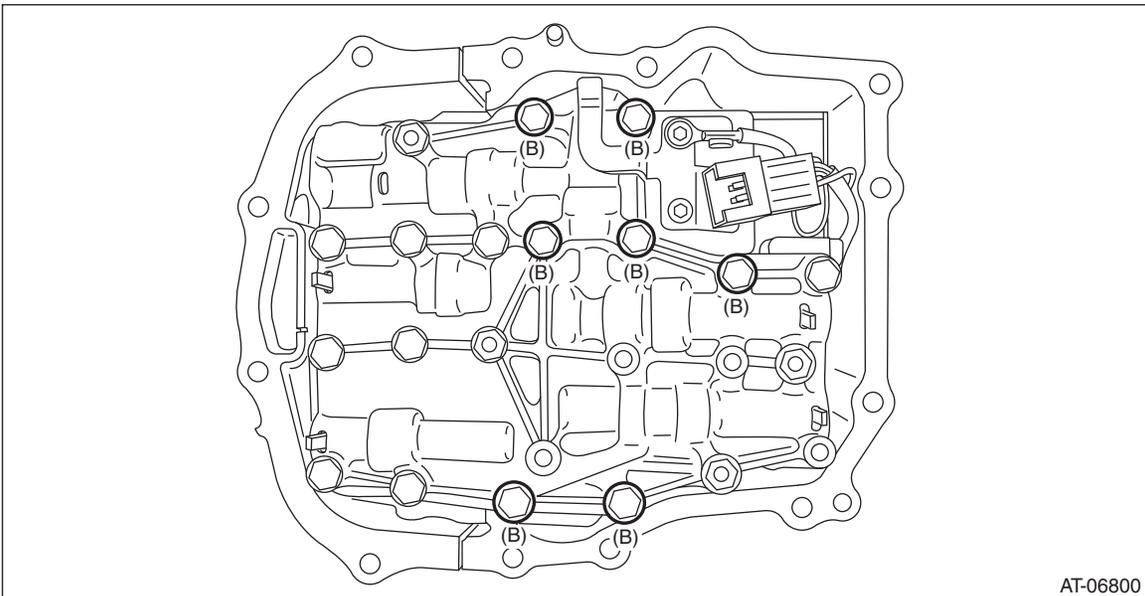
- **Be careful not to damage the control valve and air conditioner pipe.**
(2) Temporarily tighten the bolt (A: silver).



AT-06794

- (3) Attach the bolt (B).

Tightening torque:
9 N·m (0.9 kgf·m, 6.6 ft·lb)



AT-06800

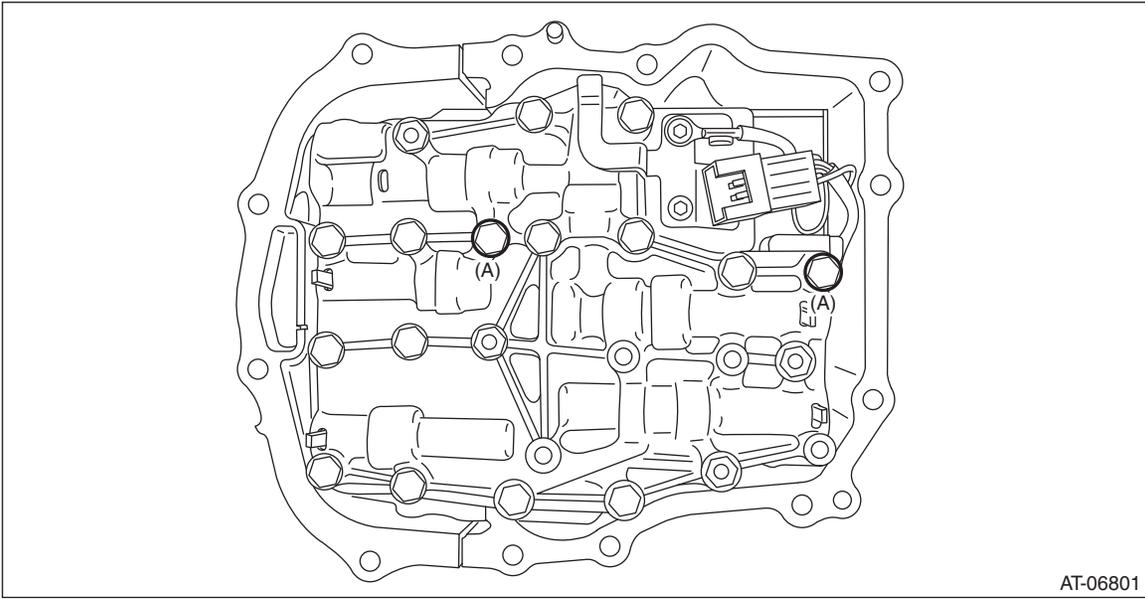
- (4) Tighten the bolt (A: silver).

Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

9 N·m (0.9 kgf·m, 6.6 ft·lb)

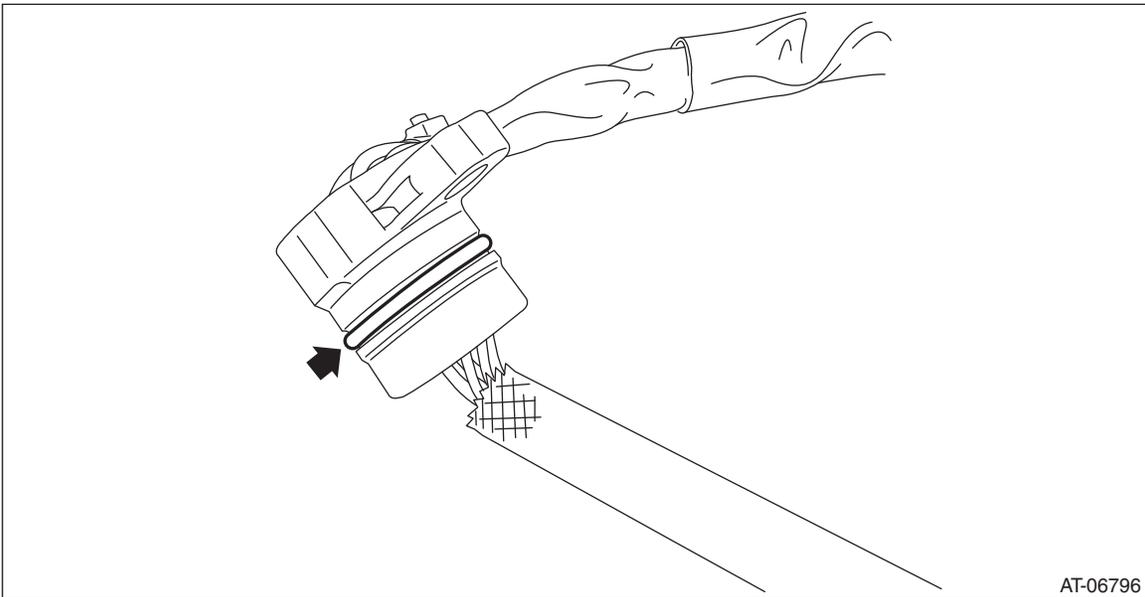


AT-06801

5) Install the O-rings.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.



AT-06796

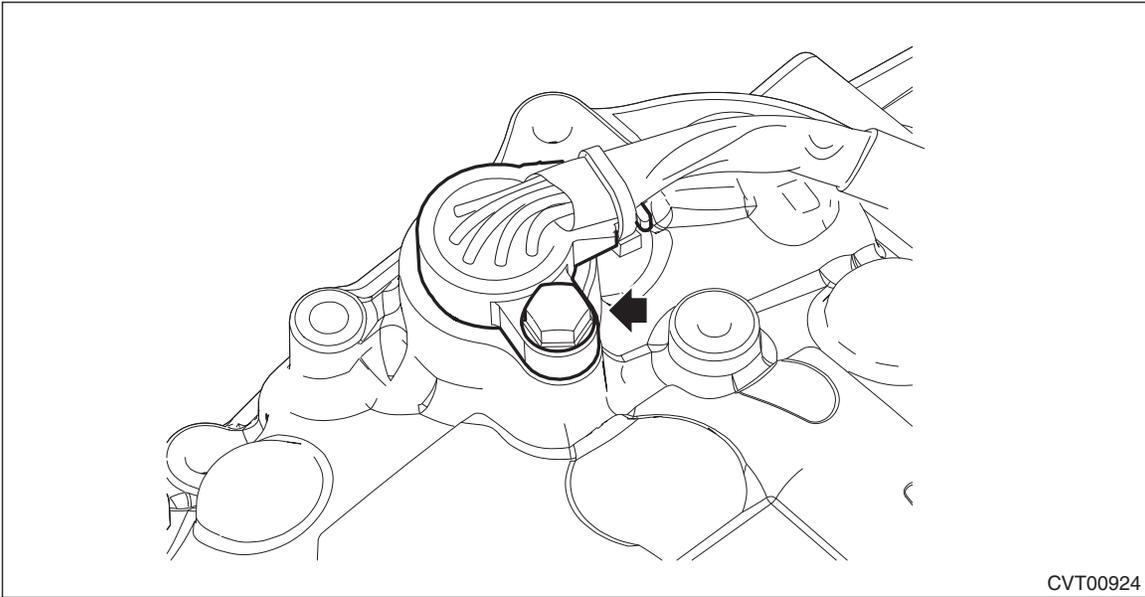
6) Install the transmission harness.

Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

7 N·m (0.7 kgf·m, 5.2 ft·lb)



CVT00924

7) Attach the gasket.

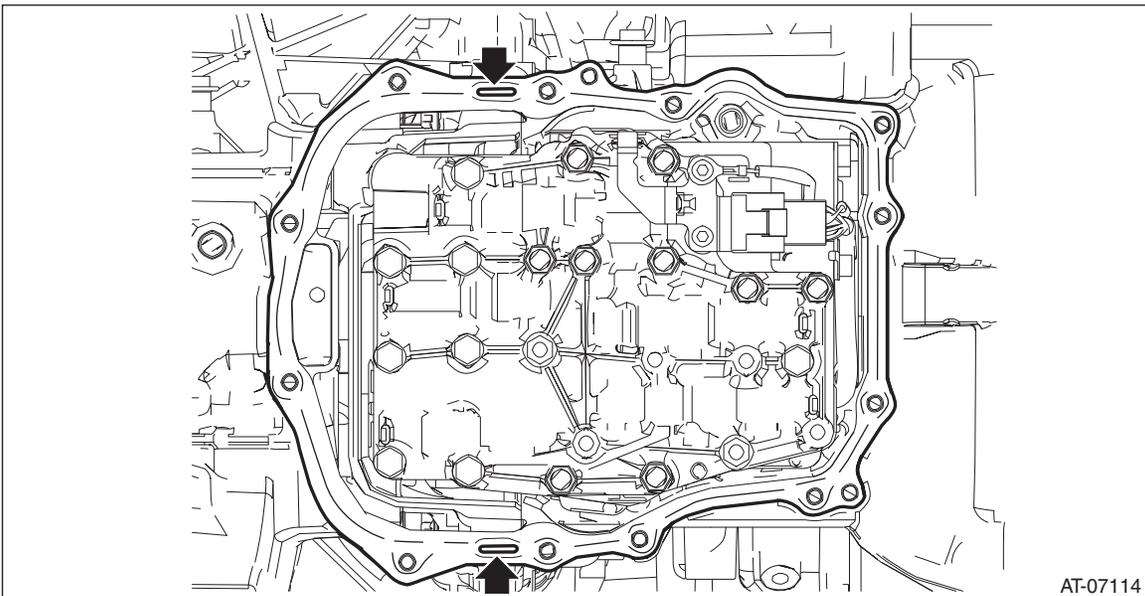
NOTE:

Use a new gasket.

8) Apply liquid gasket to the oval hole of gasket.

Liquid gasket:

THREE BOND 1215B or equivalent



AT-07114

9) Connect the transmission harness connector to the control valve body, and install the valve cover.

CAUTION:

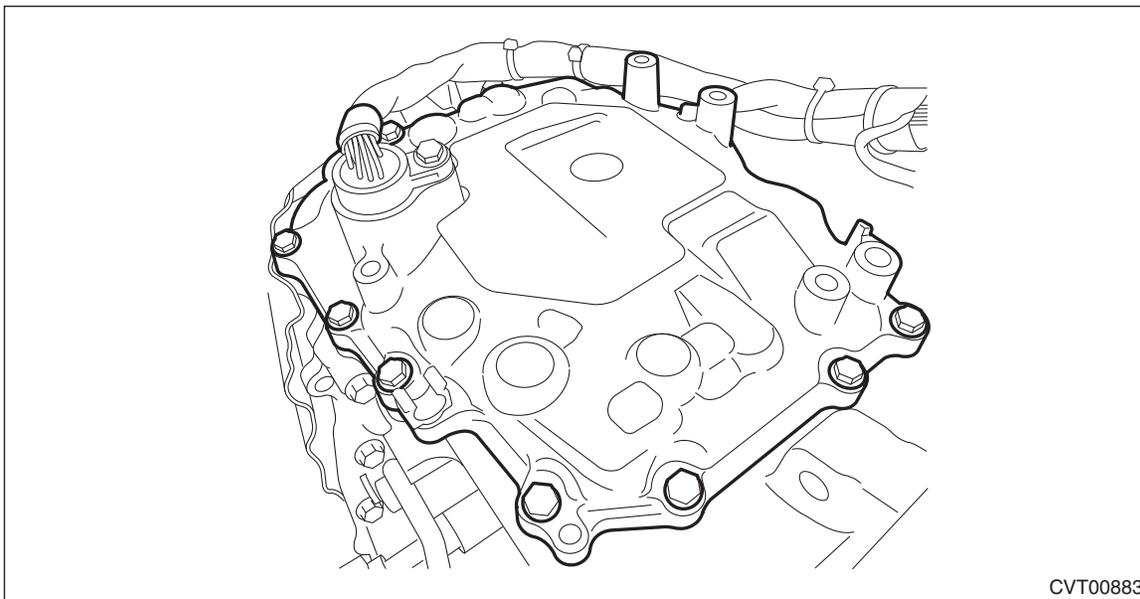
Be careful not to catch the sheet of the ST.

Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

8 N·m (0.8 kgf·m, 5.9 ft·lb)



10) Remove the ST (SHEET SPECIAL TOOL).

11) Install the throttle body. <Ref. to FU(H4DO)-15, INSTALLATION, Throttle Body.>

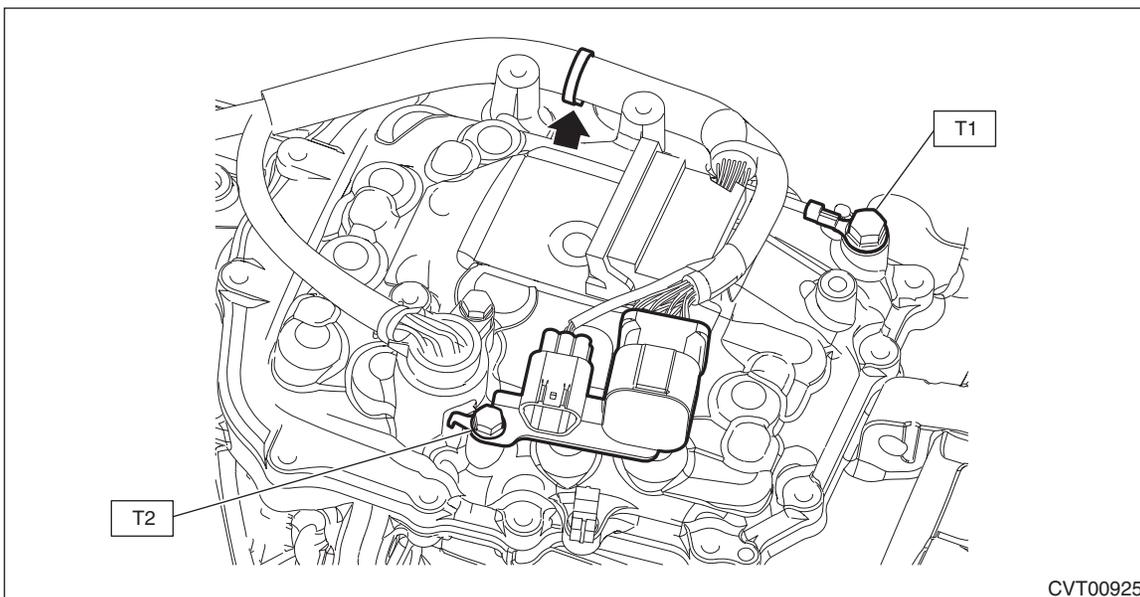
12) Install the transmission harness connector to the harness stay.

13) Install the transmission harness clip, and install the transmission harness stay and transmission ground terminal.

Tightening torque:

T1: 14 N·m (1.4 kgf·m, 10.3 ft·lb)

T2: 7 N·m (0.7 kgf·m, 5.2 ft·lb)



14) Install the TCM. <Ref. to CVT(TR580)-166, INSTALLATION, Transmission Control Module (TCM).>

15) Insert the transmission case cover (small) between transmission case cover (large) and transmission to install.

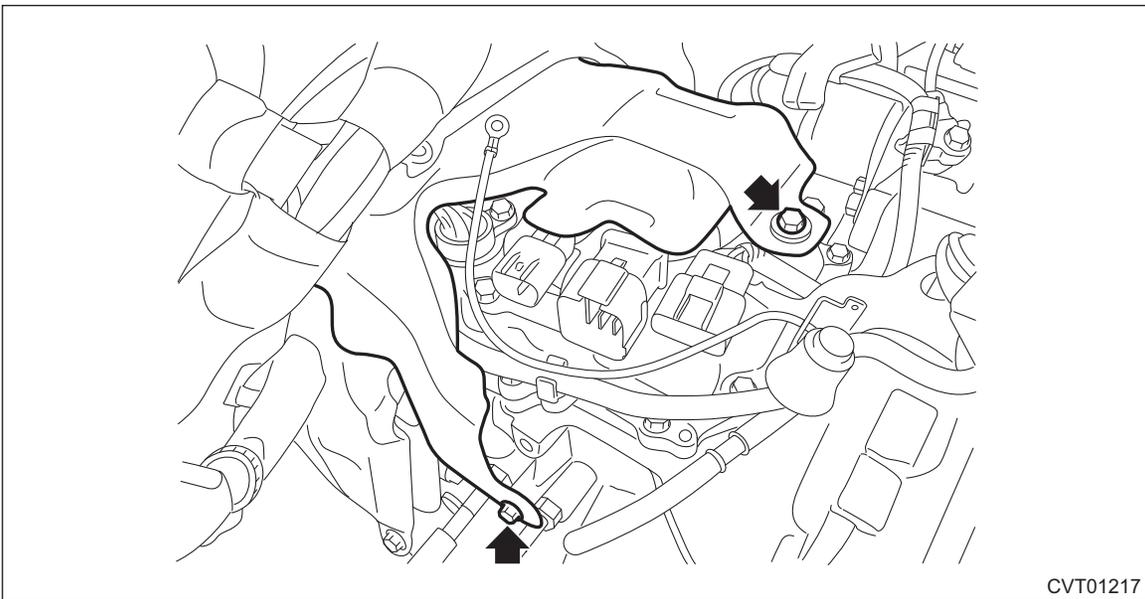
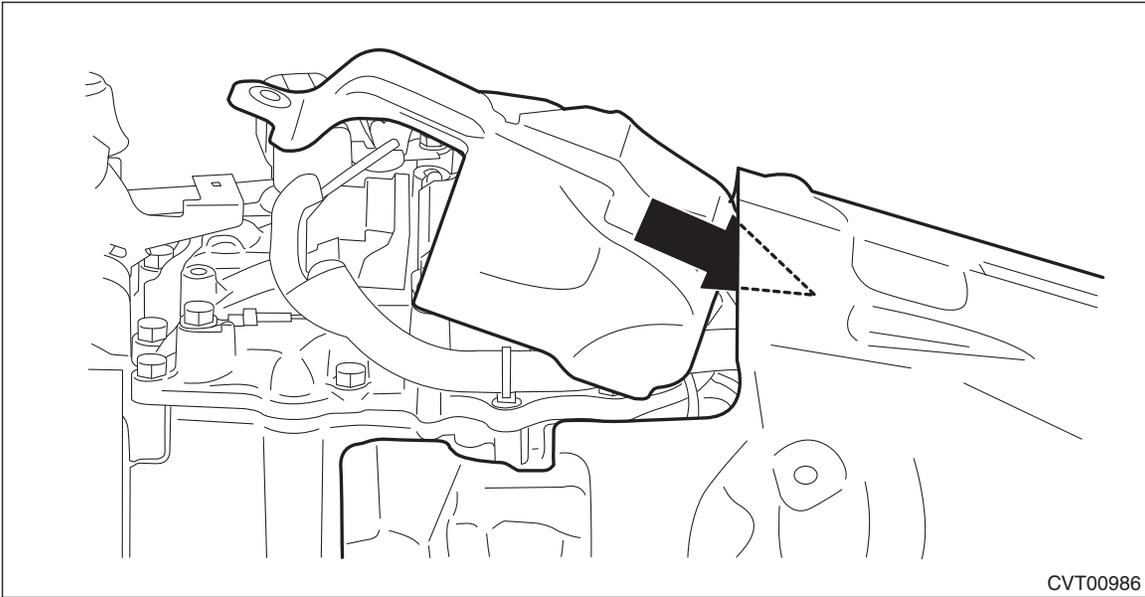
NOTE:

When inserting, be careful that the insulator inside transmission case cover is not turned over.

Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:
7 N·m (0.7 kgf·m, 5.2 ft·lb)



16) Install the transmission hanger and transmission radio ground cord.

CAUTION:

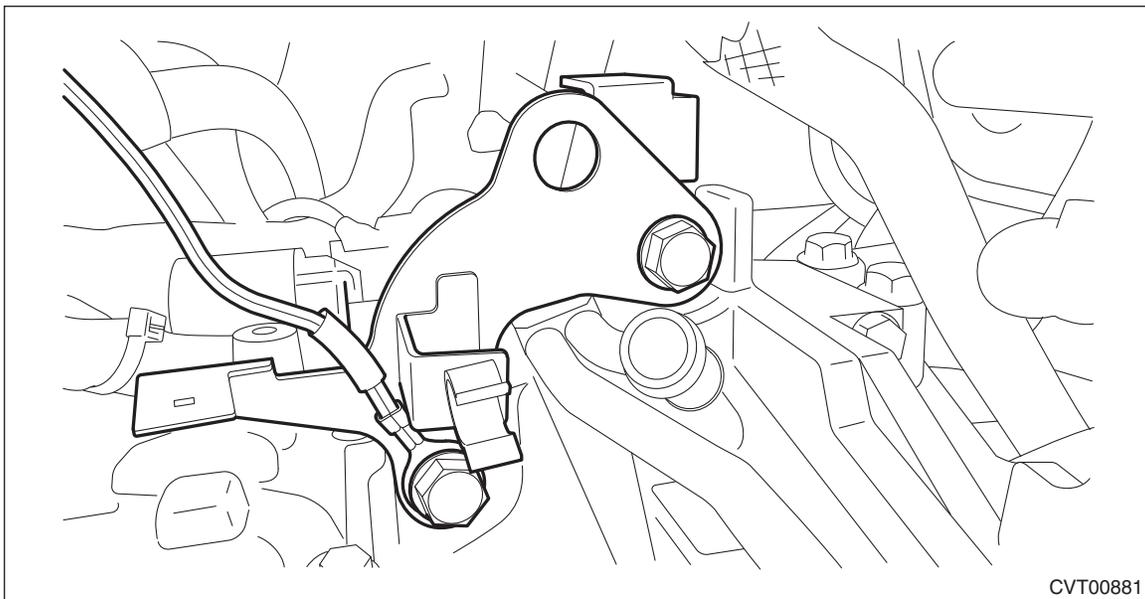
Be careful not to deform or damage the terminal of transmission radio ground cord.

Control Valve Body

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

41 N·m (4.2 kgf·m, 30.2 ft·lb)

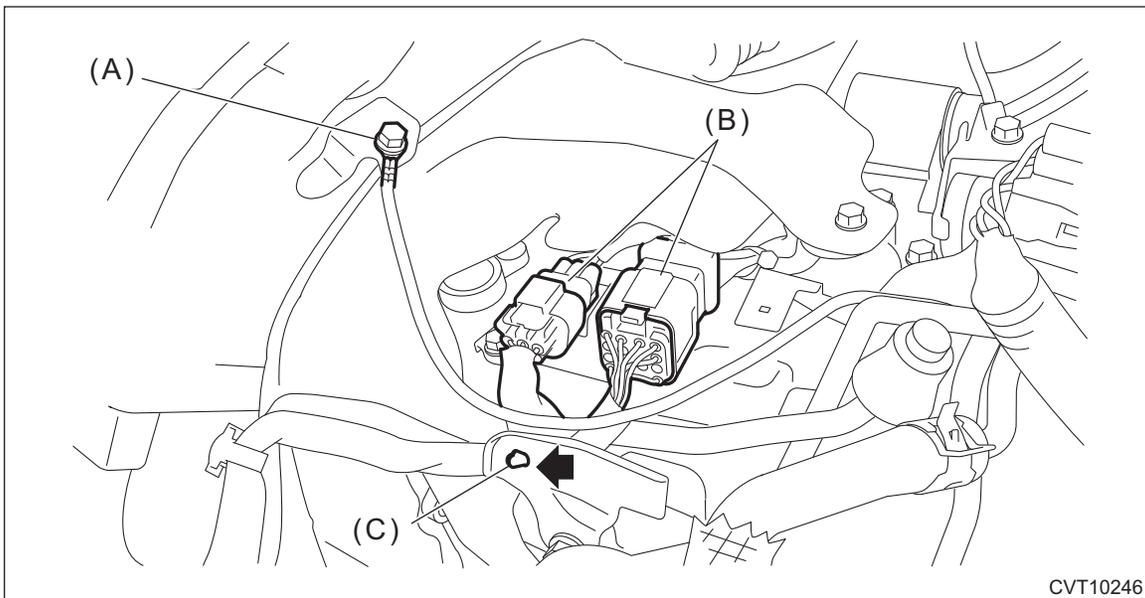


17) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>

18) Connect the transmission radio ground terminal and transmission harness connector, and install the harness clip.

Tightening torque:

13 N·m (1.3 kgf·m, 9.6 ft·lb)



(A) Transmission radio ground terminal

(B) Transmission harness connectors

(C) Harness clip

19) Install the air intake boot assembly. <Ref. to IN(H4DO)-10, INSTALLATION, Air Intake Boot.>

20) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

21) Adjust the CVTF level. <Ref. to CVT(TR580)-39, ADJUSTMENT, CVTF.>

22) Perform the operation of AT learning mode. <Ref. to CVT(diag)-33, Learning Control.>

Control Valve Body

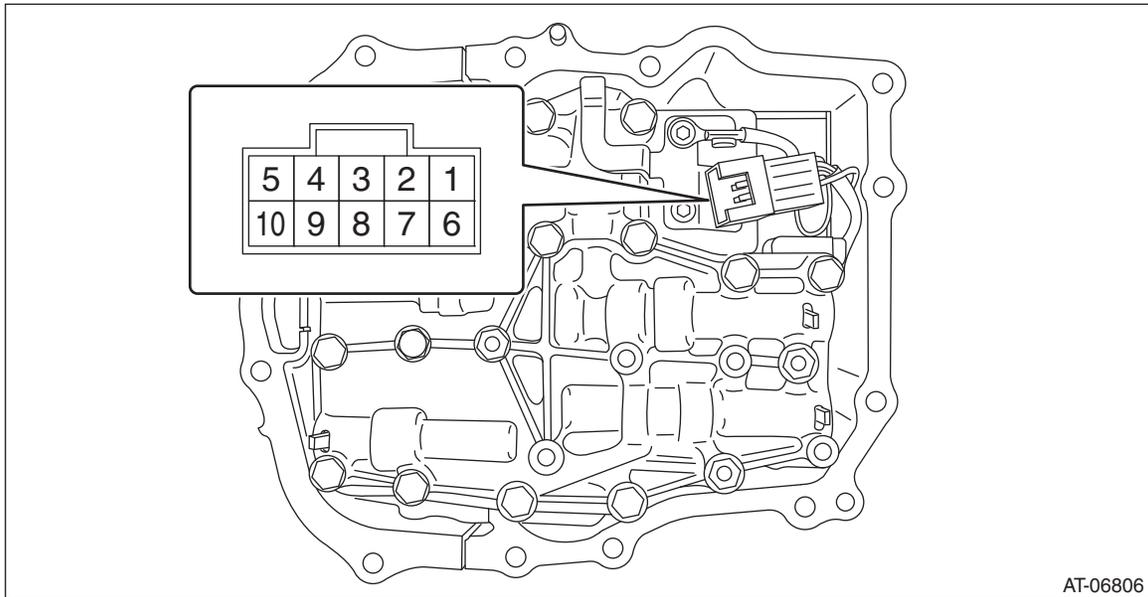
CONTINUOUSLY VARIABLE TRANSMISSION

C: INSPECTION

- Check each part for damage or dust.
- Measure the resistance of each solenoid, sensor and ground wire.

NOTE:

Measurement should be performed at a temperature of 20°C (68°F).



AT-06806

• Solenoid

Solenoid	Terminal No.	Standard
Primary UP solenoid	No. 2 — control valve body	Approx. 10 — 13.5 Ω
Secondary solenoid	No. 3 — control valve body	Approx. 5 — 7 Ω
F&R clutch solenoid	No. 4 — control valve body	Approx. 4 — 6 Ω
Primary DOWN solenoid	No. 7 — control valve body	Approx. 10 — 13.5 Ω
Lock-up duty solenoid	No. 9 — control valve body	Approx. 10 — 13.5 Ω
AWD solenoid	No. 10 — control valve body	Approx. 2 — 4.5 Ω

• Oil temperature sensor

Sensor	Terminal No.	Standard At 20°C (68°F)
Oil temperature sensor	No. 1 — No. 6	Approx. 2.5 k Ω

• Transmission ground

Terminal No.	Standard
No. 8 — control valve body	Less than 1 Ω

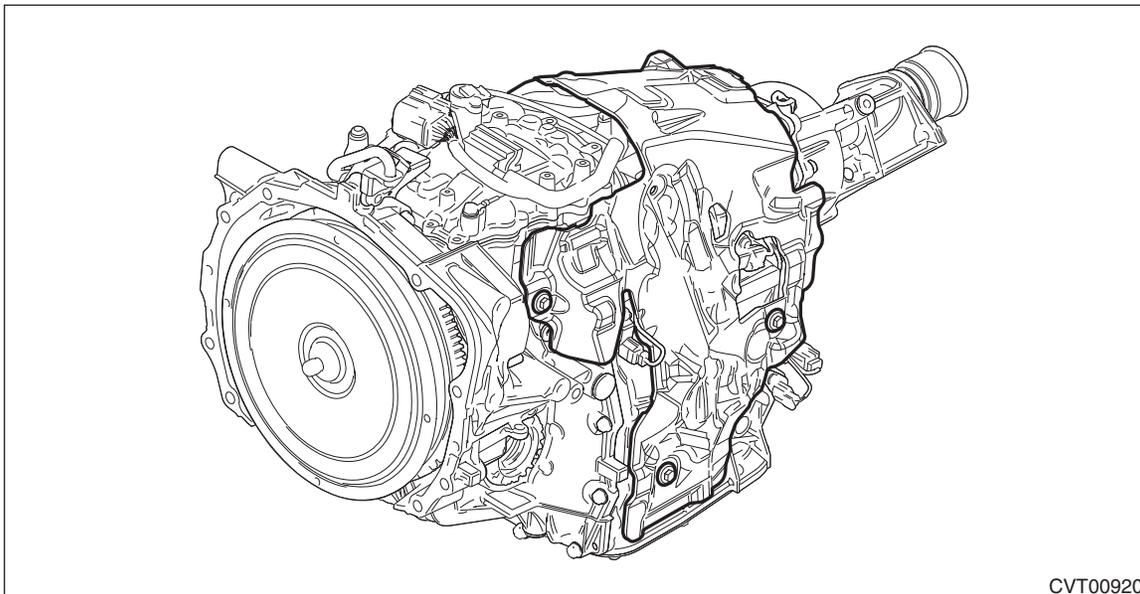
Transmission Harness

CONTINUOUSLY VARIABLE TRANSMISSION

21. Transmission Harness

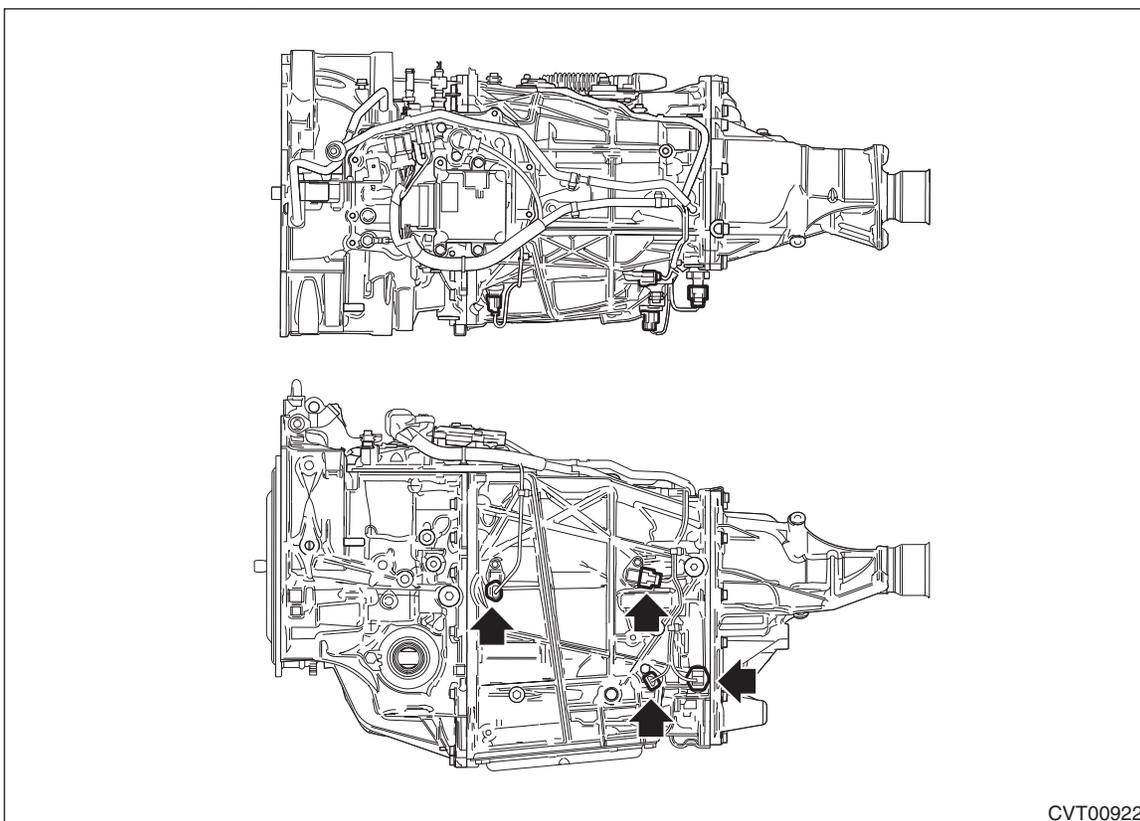
A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the transmission case cover.



CVT00920

- 3) Remove the air breather hose. <Ref. to CVT(TR580)-196, REMOVAL, Air Breather Hose.>
- 4) Remove the transmission hanger and transmission radio ground cord.
- 5) Disconnect the harness connector from the turbine speed sensor, primary speed sensor, secondary speed sensor and secondary pressure sensor.

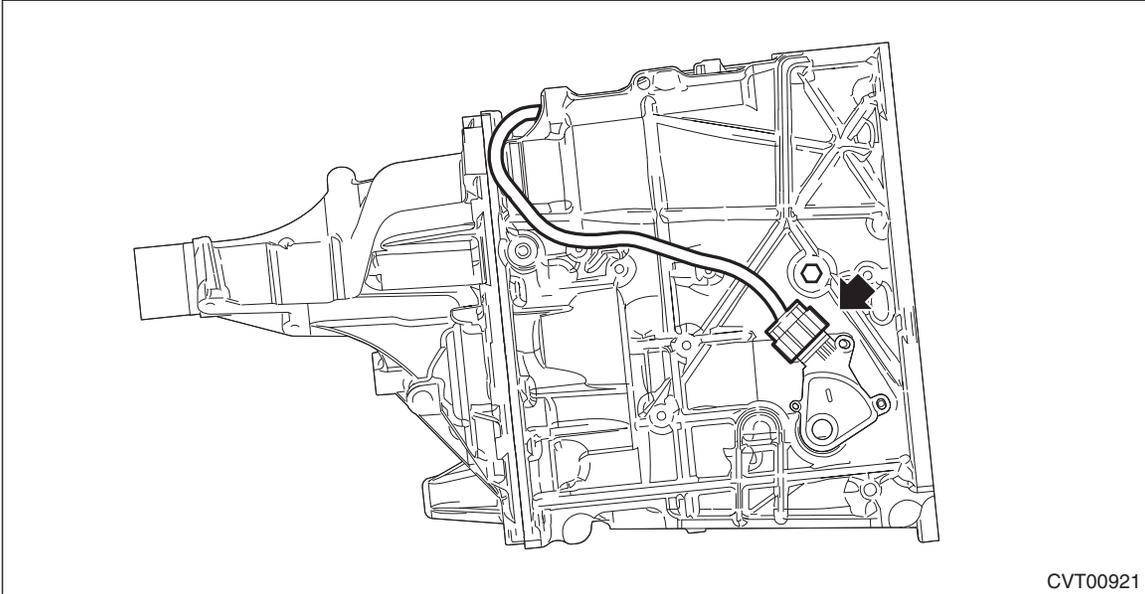


CVT00922

Transmission Harness

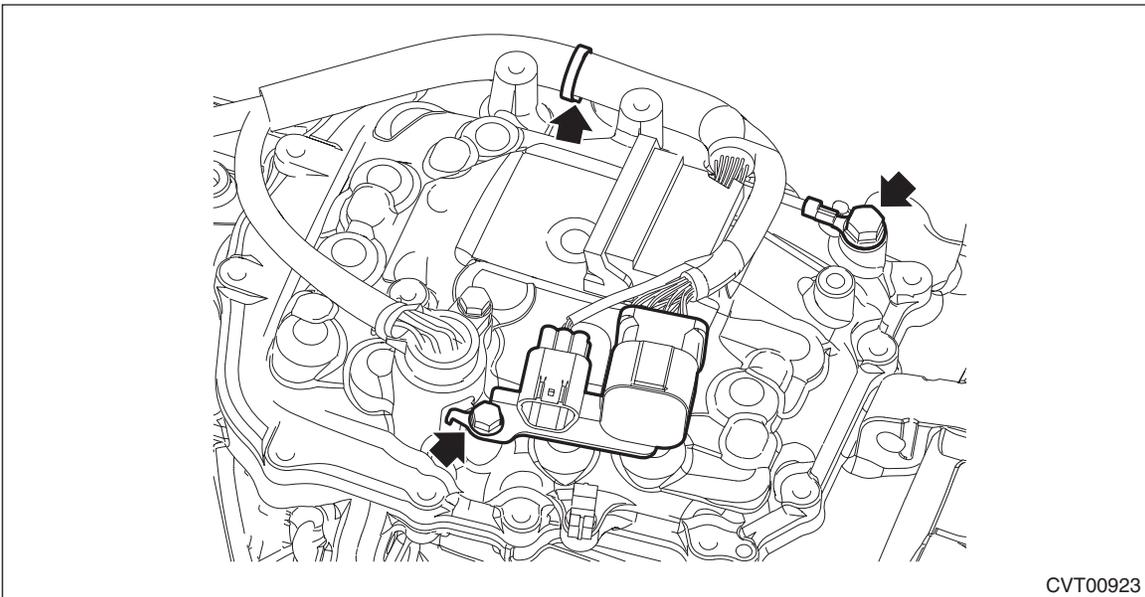
CONTINUOUSLY VARIABLE TRANSMISSION

- 6) Disconnect the harness connector from the inhibitor switch.



CVT00921

- 7) Disconnect the transmission harness stay and ground terminal, and remove the harness clip.



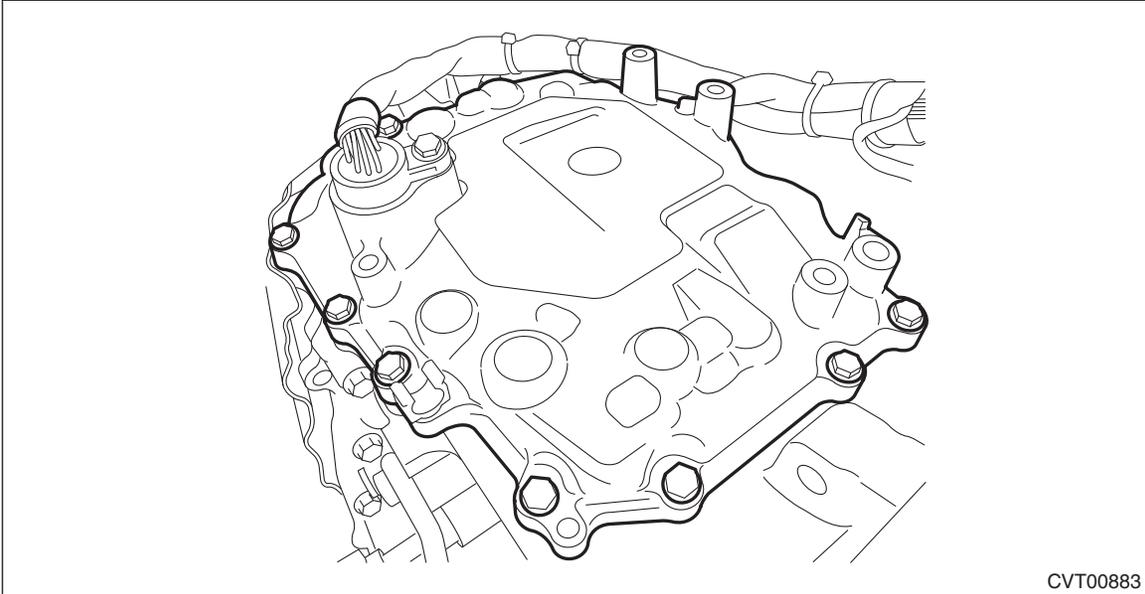
CVT00923

- 8) Remove the transmission harness connector from the transmission harness stay.
9) Clean the transmission exterior.

Transmission Harness

CONTINUOUSLY VARIABLE TRANSMISSION

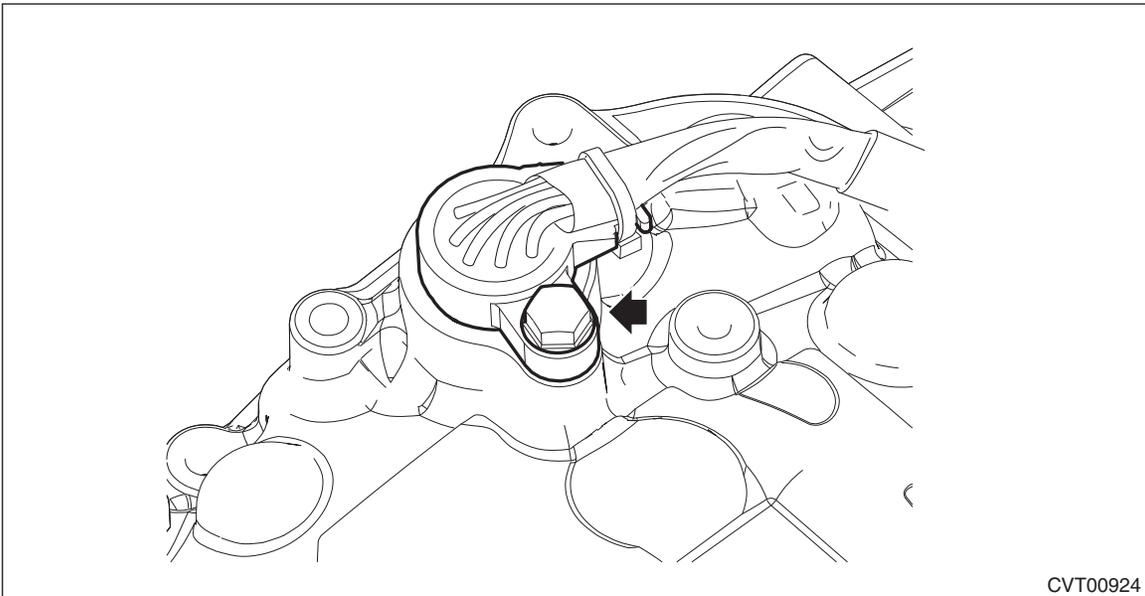
10) Remove the valve cover and gasket.



CVT00883

11) Disconnect the harness connector from the control valve body.

12) Remove the transmission harness.



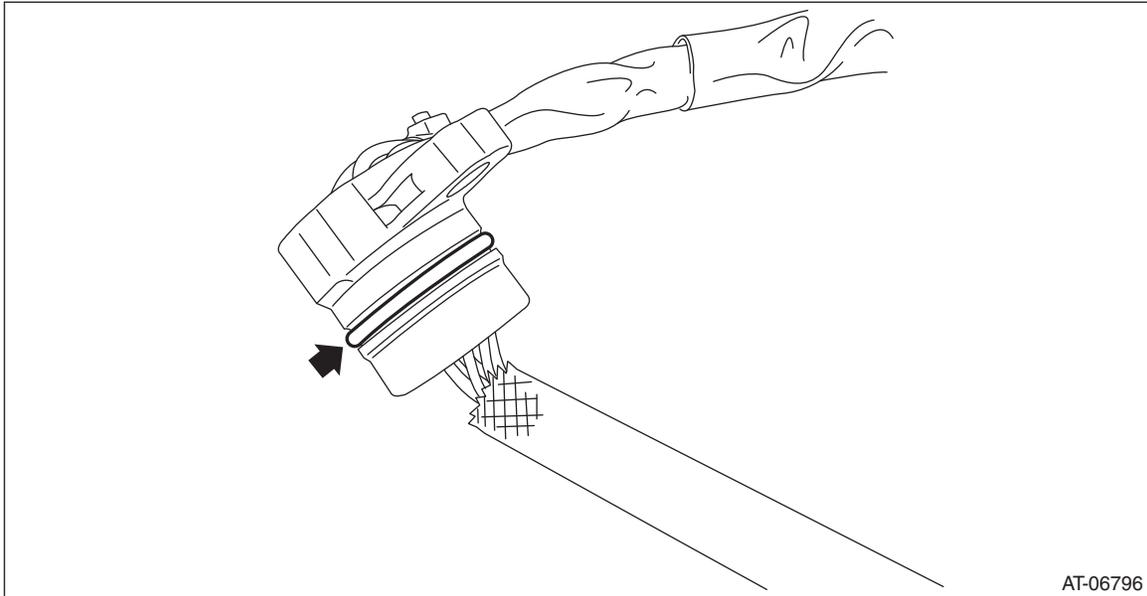
CVT00924

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Transmission Harness

CONTINUOUSLY VARIABLE TRANSMISSION

13) Remove the O-rings.

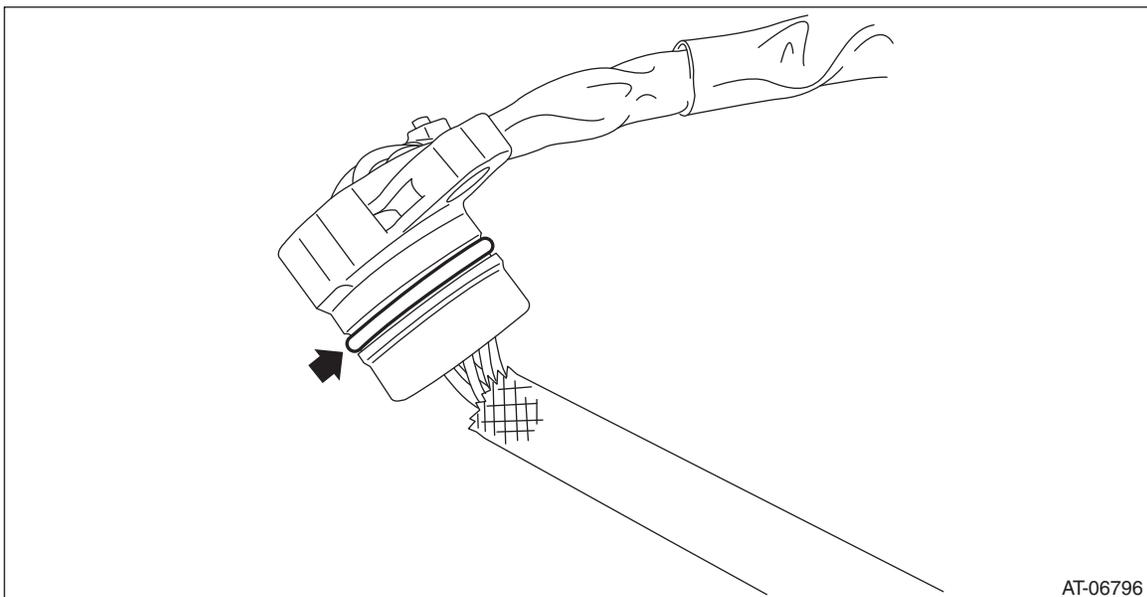


B: INSTALLATION

- 1) Clean the mating surface of valve cover and transmission side.
- 2) Check the control valve body for dust and other foreign matter.
- 3) Install the O-rings.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.



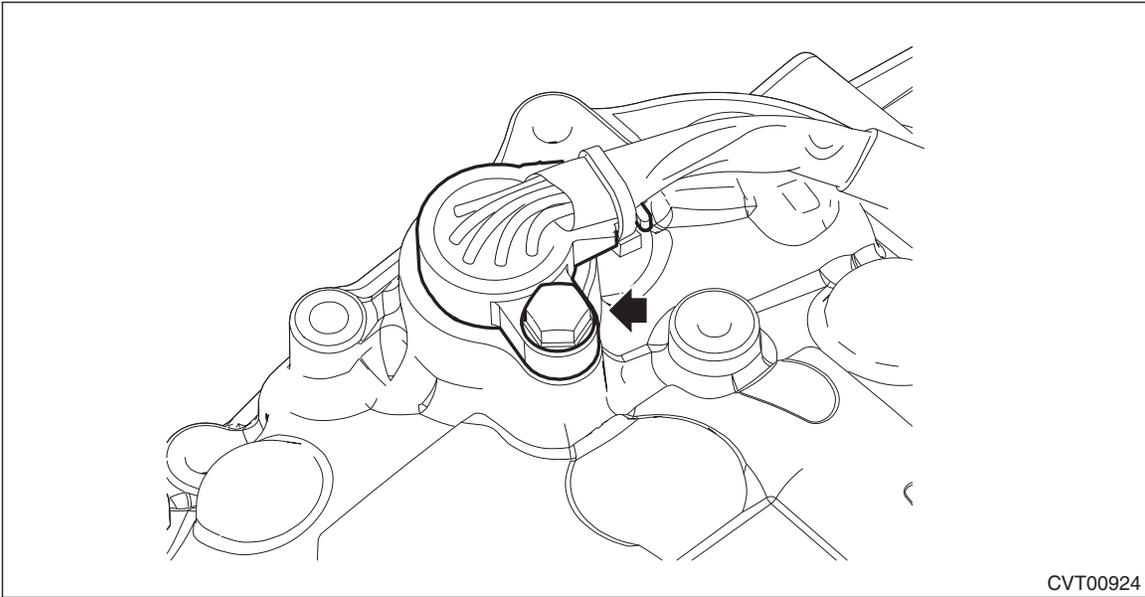
4) Install the transmission harness.

Transmission Harness

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

7 N·m (0.7 kgf·m, 5.2 ft·lb)



CVT00924

5) Attach the gasket.

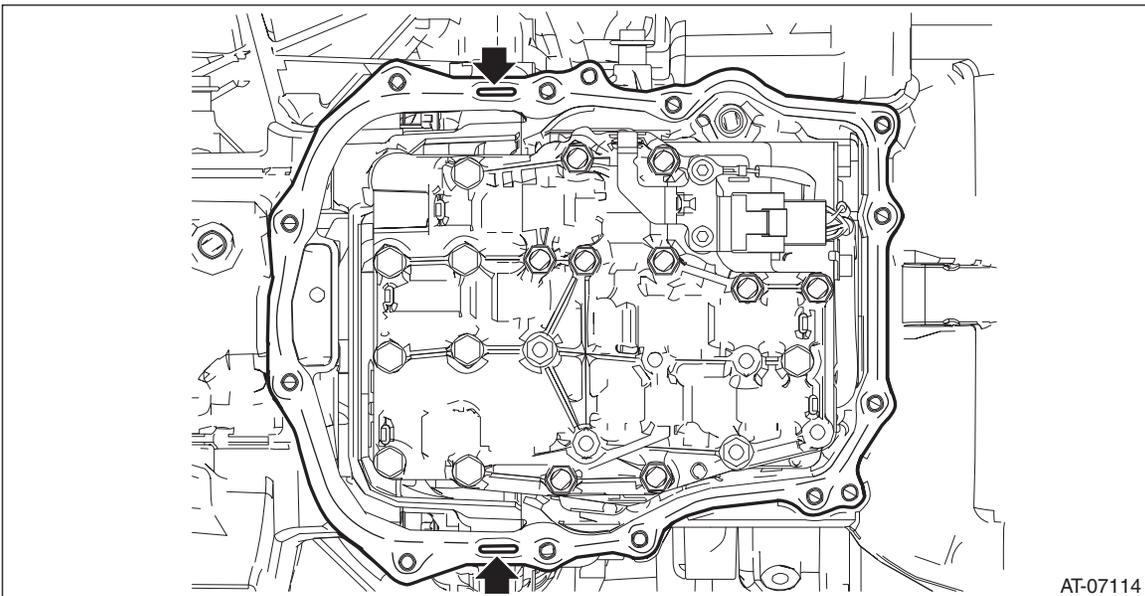
NOTE:

Use a new gasket.

6) Apply liquid gasket to the oval hole of gasket.

Liquid gasket:

THREE BOND 1215B or equivalent



AT-07114

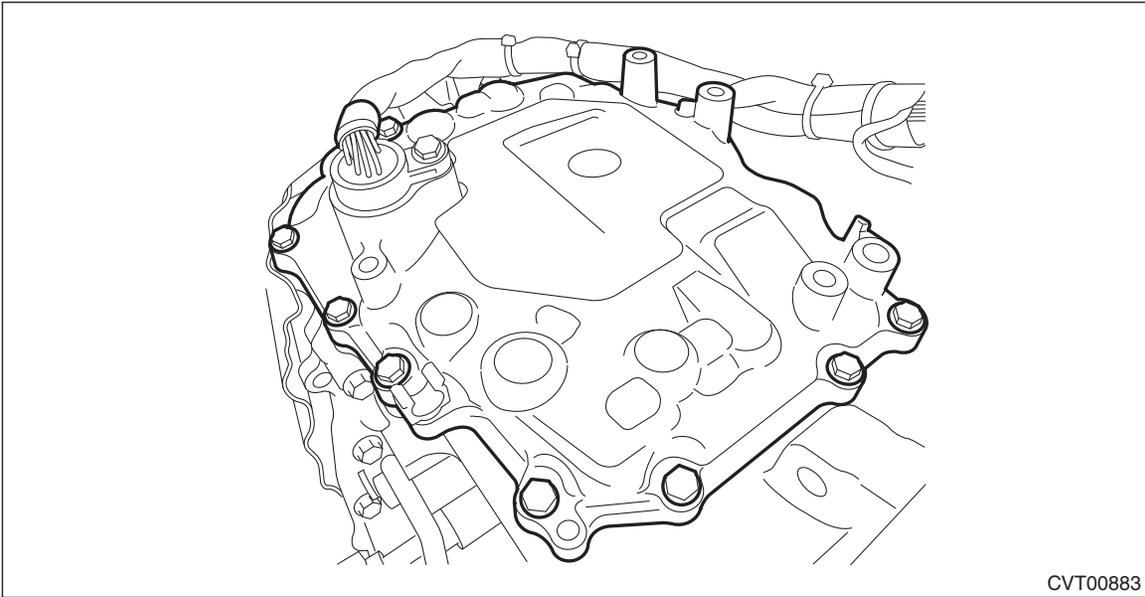
7) Connect the transmission harness connector to the control valve body, and install the valve cover.

Transmission Harness

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

8 N·m (0.8 kgf·m, 5.9 ft·lb)



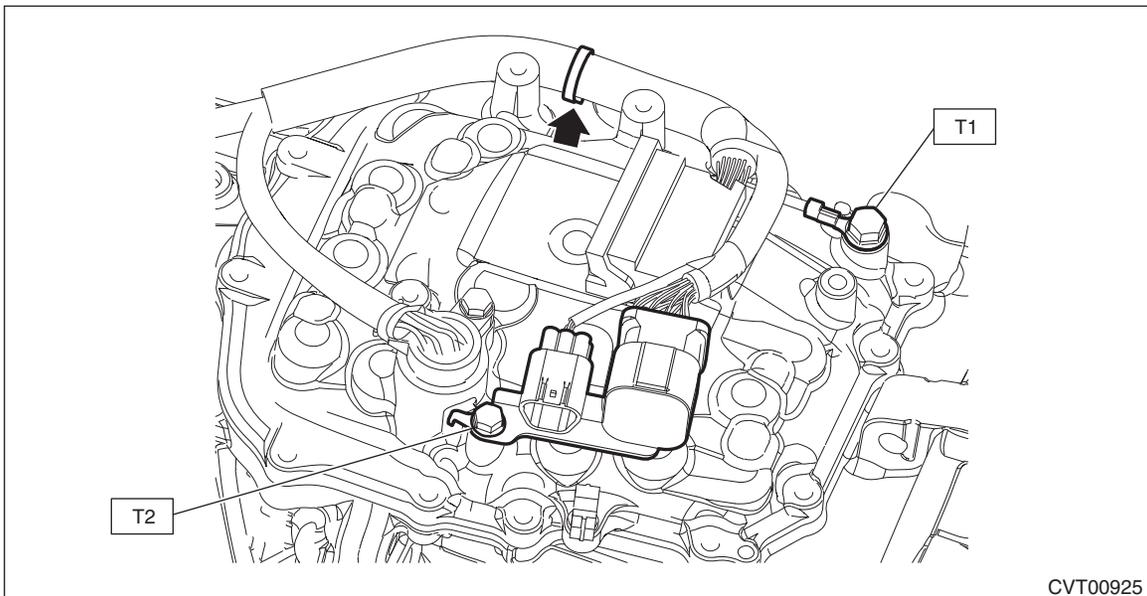
8) Install the transmission harness connector to the harness stay.

9) Install the transmission harness stay, transmission ground terminal and harness clip.

Tightening torque:

T1: 14 N·m (1.4 kgf·m, 10.3 ft·lb)

T2: 7 N·m (0.7 kgf·m, 5.2 ft·lb)

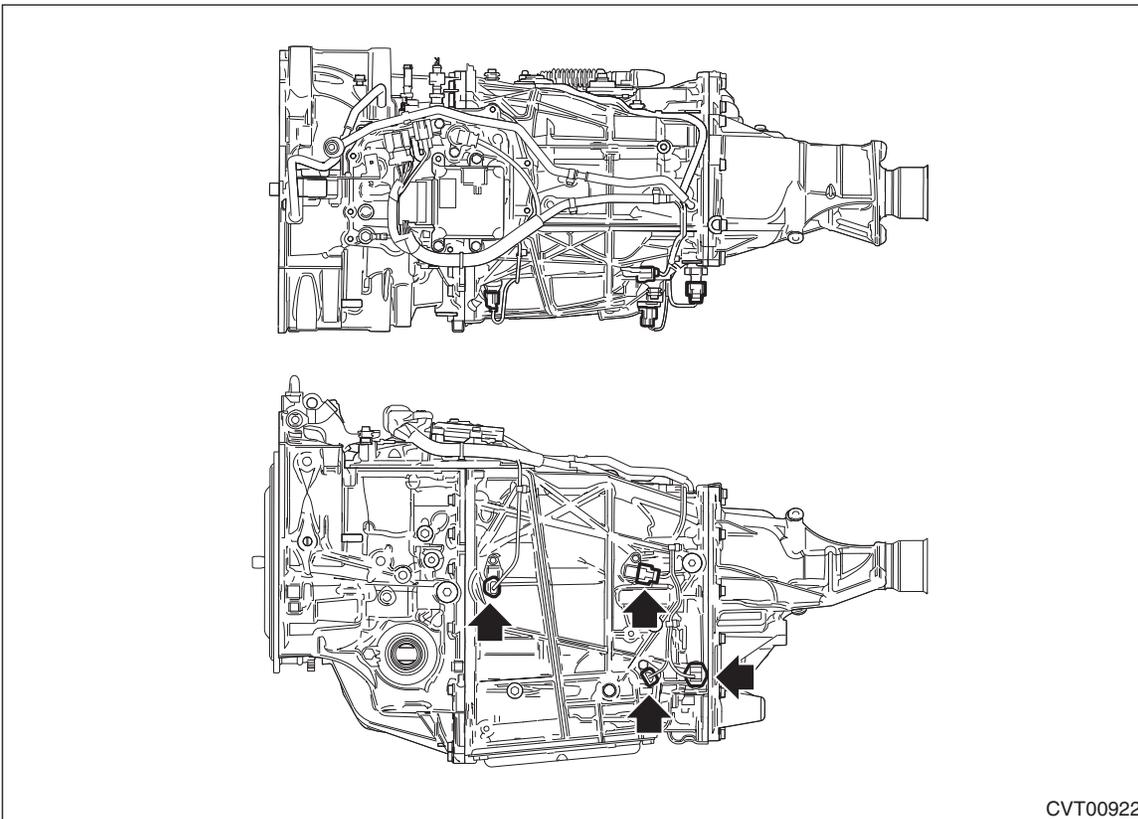


10) Connect the harness connector to the inhibitor switch.

Transmission Harness

CONTINUOUSLY VARIABLE TRANSMISSION

11) Connect the harness connector to the turbine speed sensor, primary speed sensor, secondary speed sensor and secondary pressure sensor.



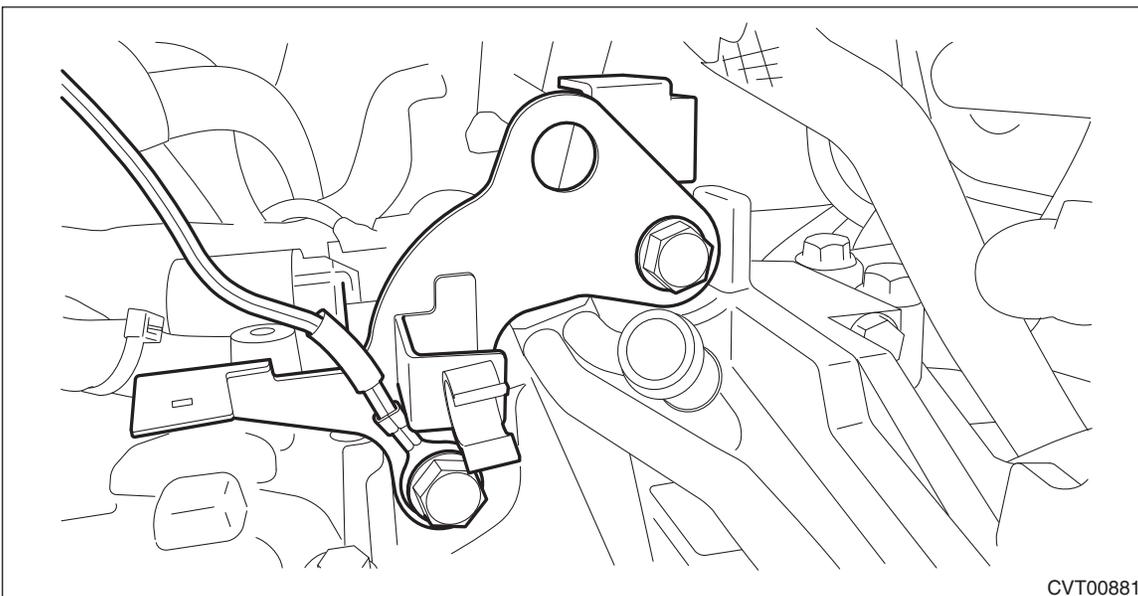
12) Install the transmission hanger and transmission radio ground cord.

CAUTION:

Be careful not to deform or damage the terminal of transmission radio ground cord.

Tightening torque:

41 N·m (4.2 kgf·m, 30.2 ft·lb)



13) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>

14) Install the transmission case cover (large).

Transmission Harness

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

8 N·m (0.8 kgf·m, 5.9 ft-lb)

15) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

16) Adjust the CVTF level. <Ref. to CVT(TR580)-39, ADJUSTMENT, CVTF.>

C: INSPECTION

- 1) Visually check the harness and connector for damage or crack.
- 2) Check the harness terminal for rust, disconnection or poor contact.
- 3) Check the continuity between harness terminals.

NOTE:

For details of transmission harness circuit, refer to wiring diagram. <Ref. to WI-166, WIRING DIAGRAM, CVT Control System.>

Harness continuity standard:

Less than 1 Ω

X MODE Switch

CONTINUOUSLY VARIABLE TRANSMISSION

22.X MODE Switch

A: REMOVAL

NOTE:

Refer to “X Mode Switch” for removal of the X mode switch. <Ref. to CVT(TR690)-144, REMOVAL, X MODE Switch.>

B: INSTALLATION

NOTE:

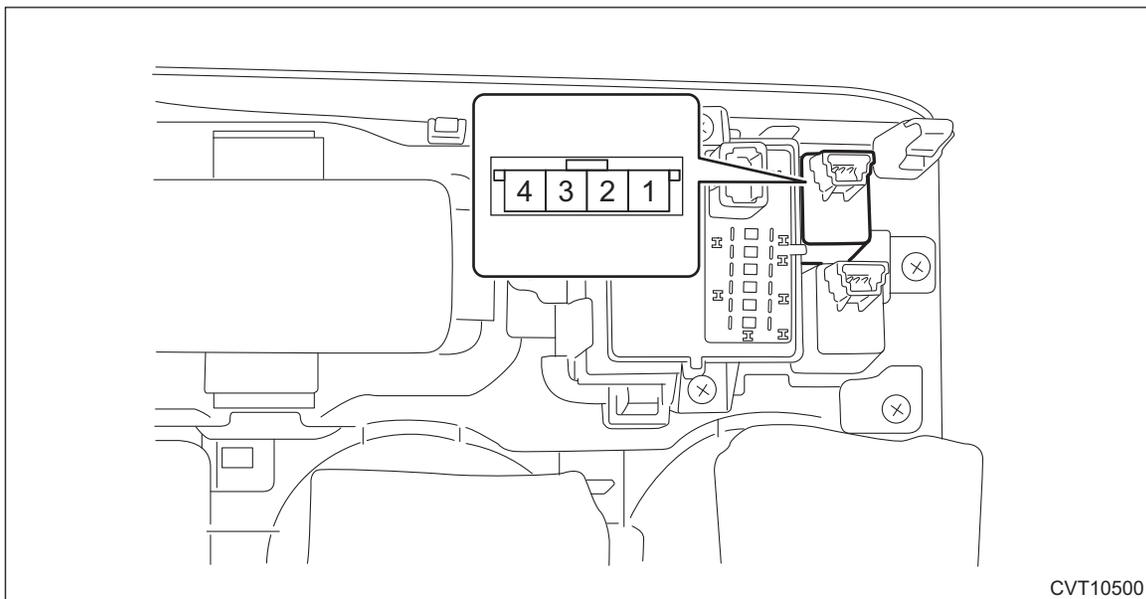
Refer to “X Mode Switch” for installation of the X mode switch. <Ref. to CVT(TR690)-144, INSTALLATION, X MODE Switch.>

C: INSPECTION

1. CHECK SWITCH UNIT

Measure the resistance between harness connector terminals of the X mode switch.

	Terminal No.	Standard
OFF (when measured without operating the switch)	No. 1 — No. 4	1 M Ω or more
ON (when measured with the switch held down)		Less than 1 Ω



2. CHECK X MODE SYSTEM

DIAGNOSIS:

It does not switch to X mode.

CAUTION:

Note that the system performs the following controls when switching to X mode.

1. When the malfunction indicator light comes on while the engine is running, it cannot switch to X mode.
2. If there is a possible engine coolant or engine oil temperature overheat condition, it will not be possible to switch to X mode.
3. If the ignition switch is in ON position before starting engine, switching to X mode is not available.

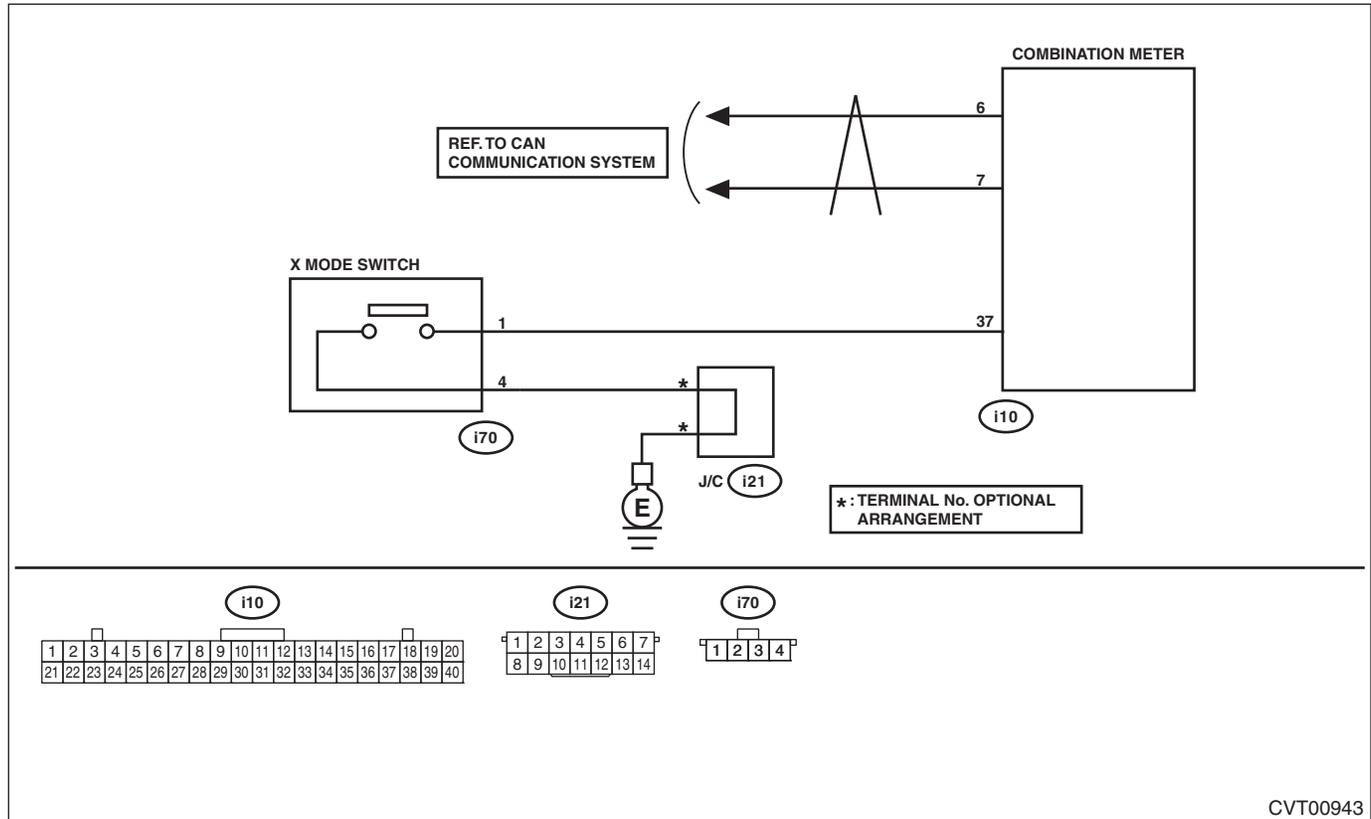
3. PRESSING X MODE SWITCH DOES NOT CHANGE THE X MODE DISPLAY IN THE COMBINATION METER AND MODE DOES NOT SWITCH TO X MODE

Wiring diagram:

X MODE Switch

CONTINUOUSLY VARIABLE TRANSMISSION

<Ref. to WI-166, WIRING DIAGRAM, CVT Control System.>



Step	Check	Yes	No
1 CHECK X MODE SWITCH. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from the combination meter. 3) Measure the resistance when the X mode switch is operated. Connector & terminal (i10) No. 37 — Chassis ground:	Does the resistance change as below? 1 MΩ or more → less than 10 Ω	Go to step 5.	Go to step 2.
2 CHECK HARNESS BETWEEN COMBINATION METER AND X MODE SWITCH CONNECTOR. Measure the resistance of harness between combination meter and X mode switch connector. Connector & terminal (i10) No. 37 — (i70) No. 1:	Is the resistance less than 10 Ω?	Go to step 3.	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit in harness between combination meter and X mode switch connector • Poor contact of connector
3 CHECK HARNESS BETWEEN COMBINATION METER AND X MODE SWITCH CONNECTOR. Measure the resistance of harness between X mode switch connector and chassis ground. Connector & terminal (i70) No. 1 — Chassis ground:	Is the resistance 1 MΩ or more?	Go to step 4.	Repair the short circuit to ground in harness between combination meter and X mode switch connector.

X MODE Switch

CONTINUOUSLY VARIABLE TRANSMISSION

Step	Check	Yes	No
4 CHECK HARNESS BETWEEN X MODE SWITCH CONNECTOR AND CHASSIS GROUND. Measure the resistance between X mode switch connector and chassis ground. Connector & terminal (i70) No. 4 — Chassis ground:	Is the resistance less than 10 Ω ?	Repair the poor contact of X mode switch connector. Replace the X mode switch if faulty. <Ref. to CVT(TR580)-160, X MODE Switch.> <Ref. to CVT(TR690)-144, X MODE Switch.>	Repair the harness and connector. NOTE: In this case, repair the following item: <ul style="list-style-type: none"> • Open circuit in harness between X mode switch connector and chassis ground • Poor contact of joint connector
5 RECHECK FAULT. 1) Connect all connectors. 2) Switch to X mode.	Is there any fault?	Repair the poor contact of combination meter. Replace the meter case assembly if defective.	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. NOTE: In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

4. WHEN SWITCHED TO X MODE, “X” MODE DISPLAY IN COMBINATION METER FLASHES IN AFTER APPROX. 5 SECONDS

Step	Check	Yes	No
1 CHECK DTC.	Is DTC displayed?	Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)” concerning the respective units.	Go to step 2.
2 CHECK COMBINATION METER AND CLOCK DISPLAY. Check for abnormal indication other than “X” blinking. Examples: <ul style="list-style-type: none"> • Malfunction indicator light illuminates. • Fuel economy display area is not ON. NOTE: The system enters into fail mode with ignition ON and engine OFF.	Is there any abnormal indication other than “X” blinking?	For the diagnostic procedure, refer to LAN section. <Ref. to LAN(diag)-2, Basic Diagnostic Procedure.>	Go to step 3.

X MODE Switch

CONTINUOUSLY VARIABLE TRANSMISSION

Step	Check	Yes	No	
3	CHECK ECM AND COMBINATION METER.	Is the part number of ECM and combination meter correct?	Replace the meter case assembly. <Ref. to IDI-11, Combination Meter.>	Replace ECM or meter case assembly with the one with the correct part number. <Ref. to FU(H4DO)-83, Engine Control Module (ECM).> <Ref. to IDI-11, Combination Meter.>

5. WHEN SWITCHED TO X MODE, “X” MODE DISPLAY IN COMBINATION METER FLASHES

NOTE:

In this case, there may be a fault other than in X mode system.

Step	Check	Yes	No	
1	CHECK MALFUNCTION INDICATOR LIGHT. 1) Start the engine. 2) Check if malfunction indicator light illuminates.	Does the malfunction indicator light illuminate?	Read the DTC using Subaru Select Monitor and check the indicated DTC. <Ref. to EN(H4DO)(diag)-67, Read Diagnostic Trouble Code (DTC).>	Go to step 2.
2	CHECK COOLANT TEMPERATURE WARNING LIGHT. 1) Turn the ignition switch to ON. 2) Check the coolant temperature warning light.	Does it indicate overheating?	Inspect for the cause of overheating and repair.	Go to step 3.
3	CHECK ENGINE OIL TEMPERATURE. 1) Turn the ignition switch to ON. 2) Check the value of «Oil Temperature» using Subaru Select Monitor. NOTE: For detailed operation procedures, refer to “Current Data Display For Engine”. <Ref. to EN(H4DO)(diag)-46, Subaru Select Monitor.>	Is the value of «Oil Temperature» 117°C (243°F) or more?	Inspect and repair the cause of engine oil temperature rise. NOTE: Ask the customer whether the vehicle has experienced a long drive in low gear or towing of heavy load. If not, drive the vehicle again after the engine oil temperature lowers, and check if the engine oil temperature rises.	Go to step 4.
4	CHECK COMBINATION METER INDICATION. 1) Start the engine. 2) Switch to X mode. 3) Check X mode display in the combination meter.	Does “X” mode indication in the combination meter blink?	Replace the meter case assembly. <Ref. to IDI-11, Combination Meter.>	Perform test operation and check the malfunction indicator light, engine coolant temperature warning light, and engine oil temperature. If they are normal, finish the diagnosis.

Transmission Control Module (TCM)

CONTINUOUSLY VARIABLE TRANSMISSION

23. Transmission Control Module (TCM)

A: REMOVAL

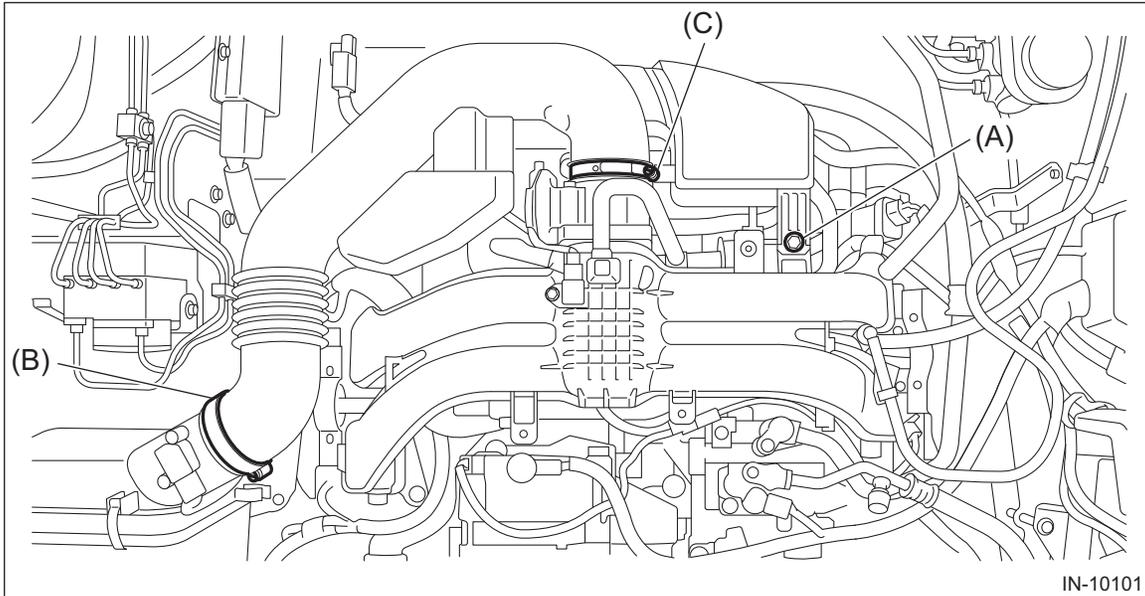
1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

NOTE:

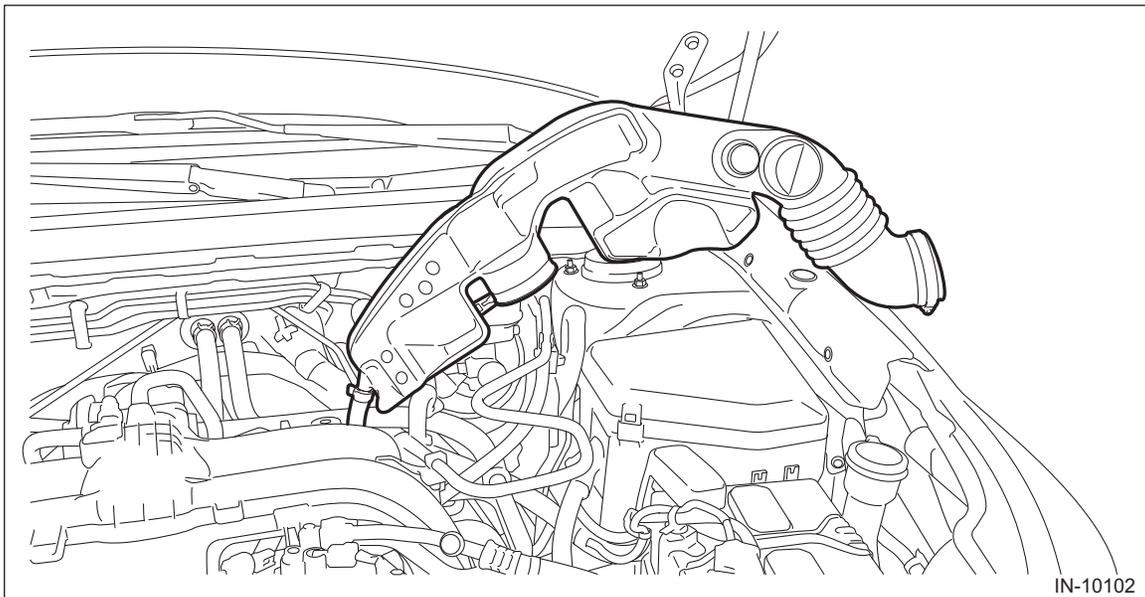
For model with battery sensor, disconnect the ground terminal from battery sensor.

2) Remove the air intake duct. <Ref. to IN(H4DO)-12, REMOVAL, Air Intake Duct.>

3) Remove the clip (A), and loosen the clamps (B) and (C).



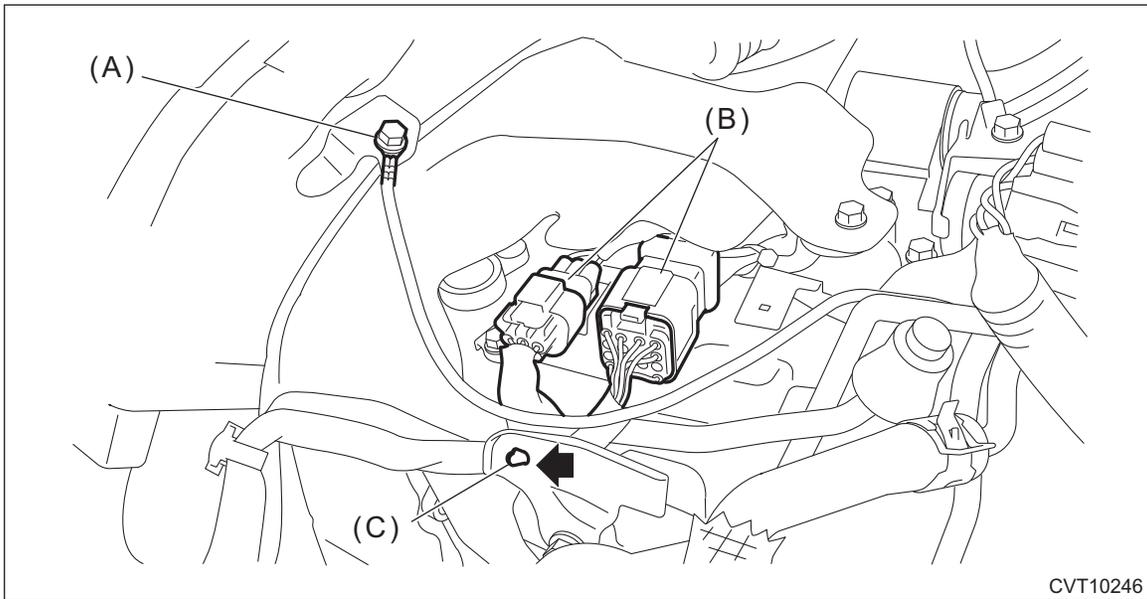
4) Remove the air intake boot from the throttle body, and move it to the left side wheel apron.



Transmission Control Module (TCM)

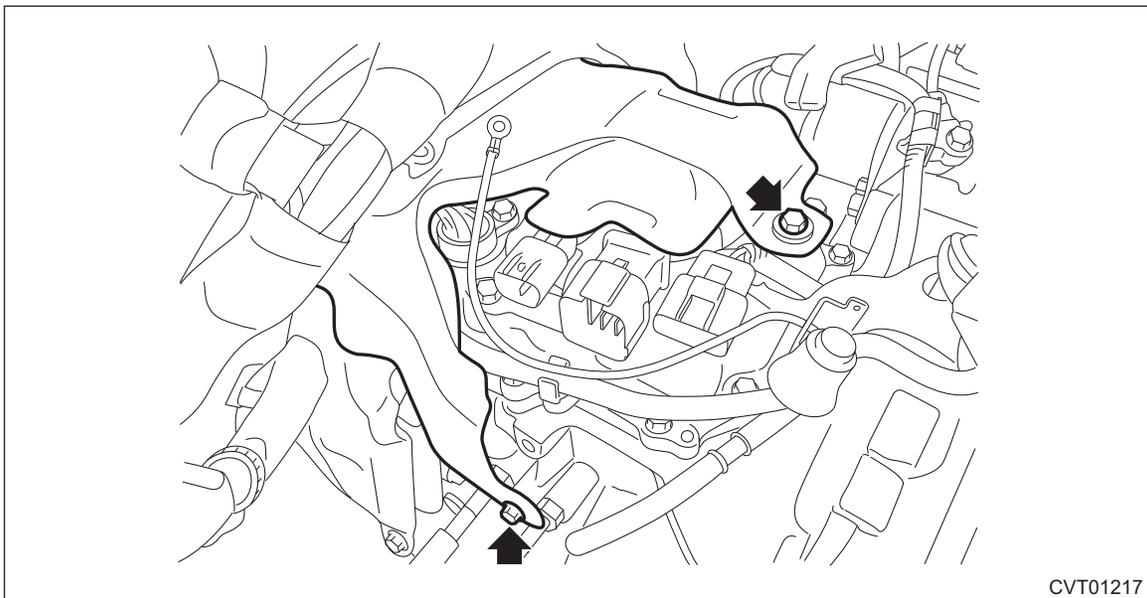
CONTINUOUSLY VARIABLE TRANSMISSION

5) Disconnect the transmission radio ground terminal and transmission harness connector, and remove the harness clip.



- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

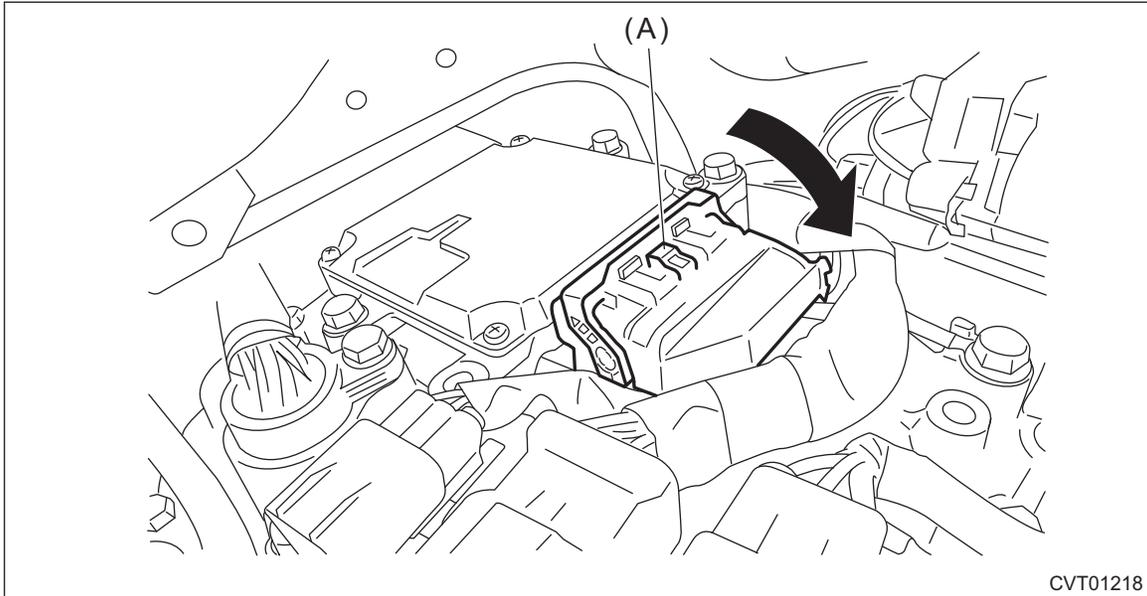
6) Remove the transmission case cover.



Transmission Control Module (TCM)

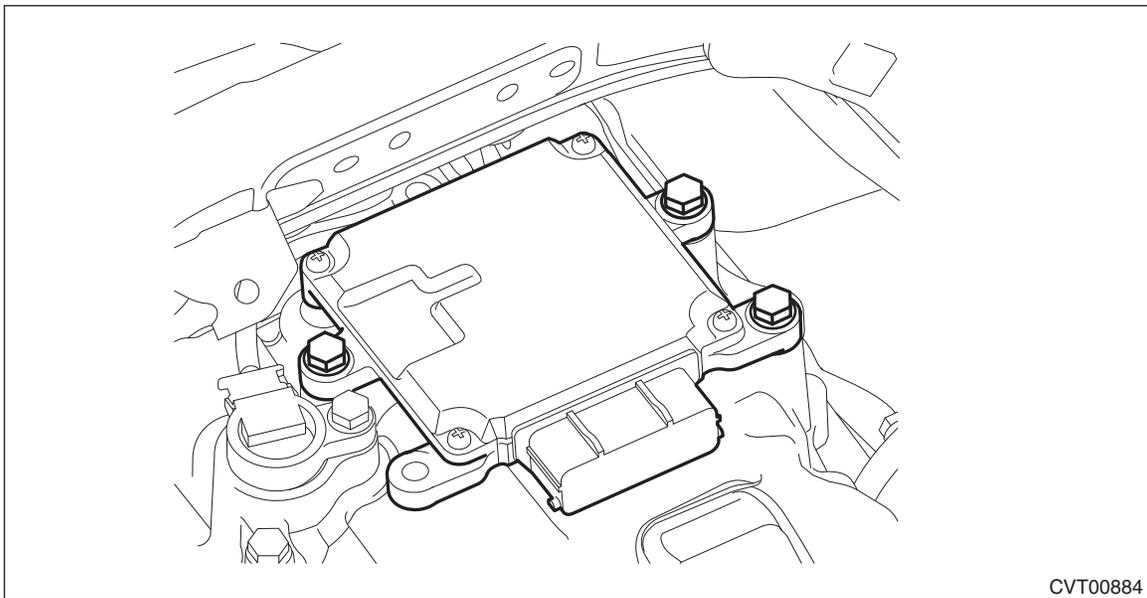
CONTINUOUSLY VARIABLE TRANSMISSION

7) Move the lock lever in the arrow direction while pressing the lock button, and disconnect the connector.



(A) Lock button

8) Remove the TCM.



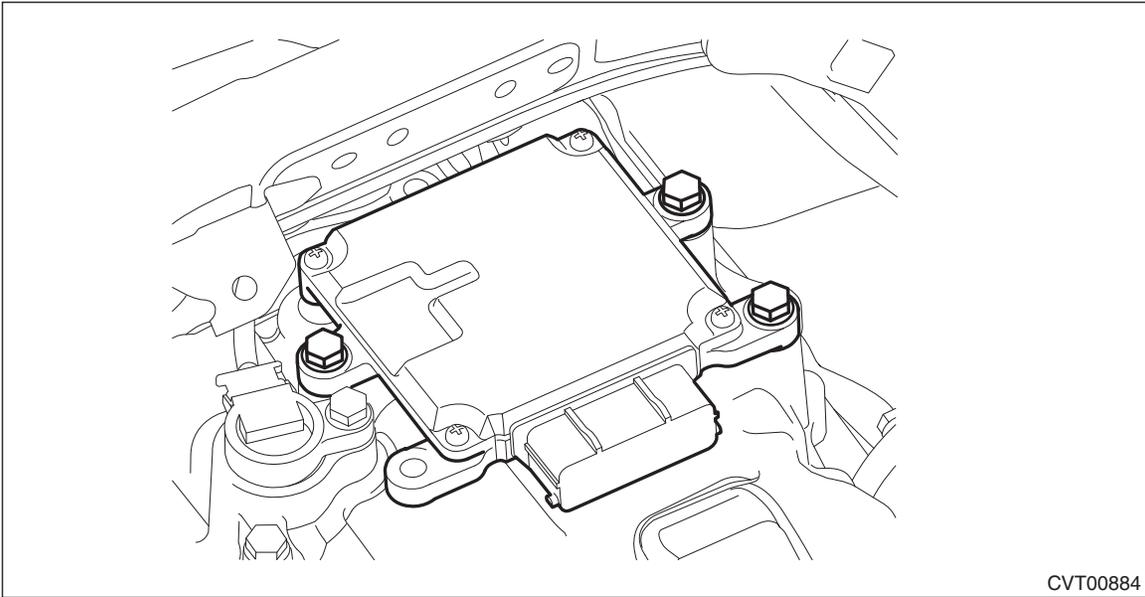
B: INSTALLATION

1) Install the TCM.

Transmission Control Module (TCM)

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:
7 N·m (0.7 kgf-m, 5.2 ft-lb)

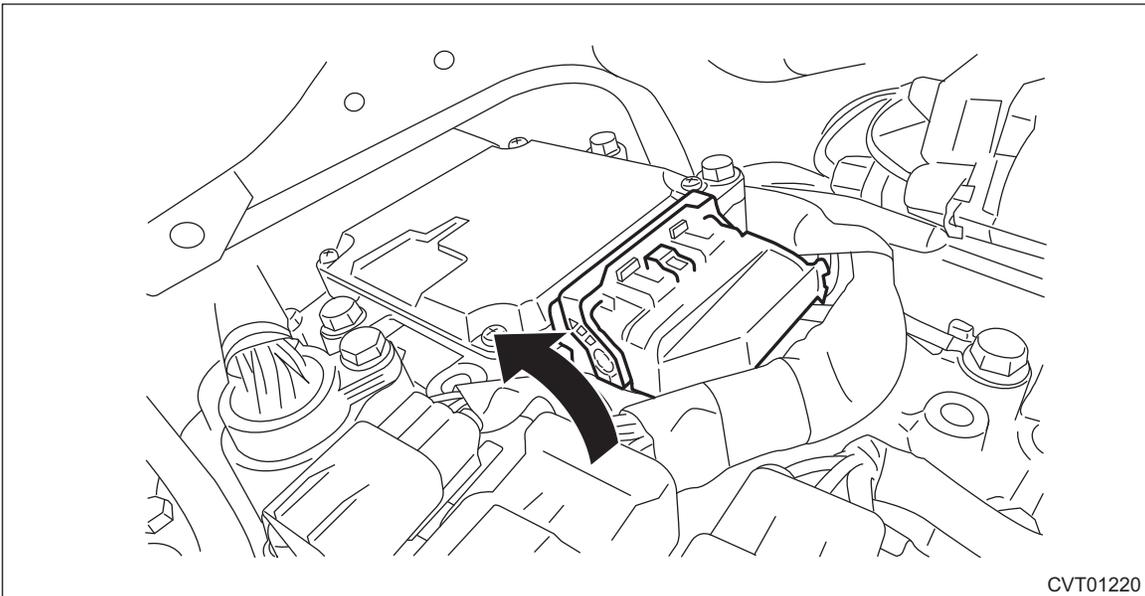


CVT00884

2) Install the harness connector to TCM.

NOTE:

Move the lock lever in the arrow direction, and confirm that a clicking sound is heard.



CVT01220

3) Insert the transmission case cover (small) between transmission case cover (large) and transmission to install.

NOTE:

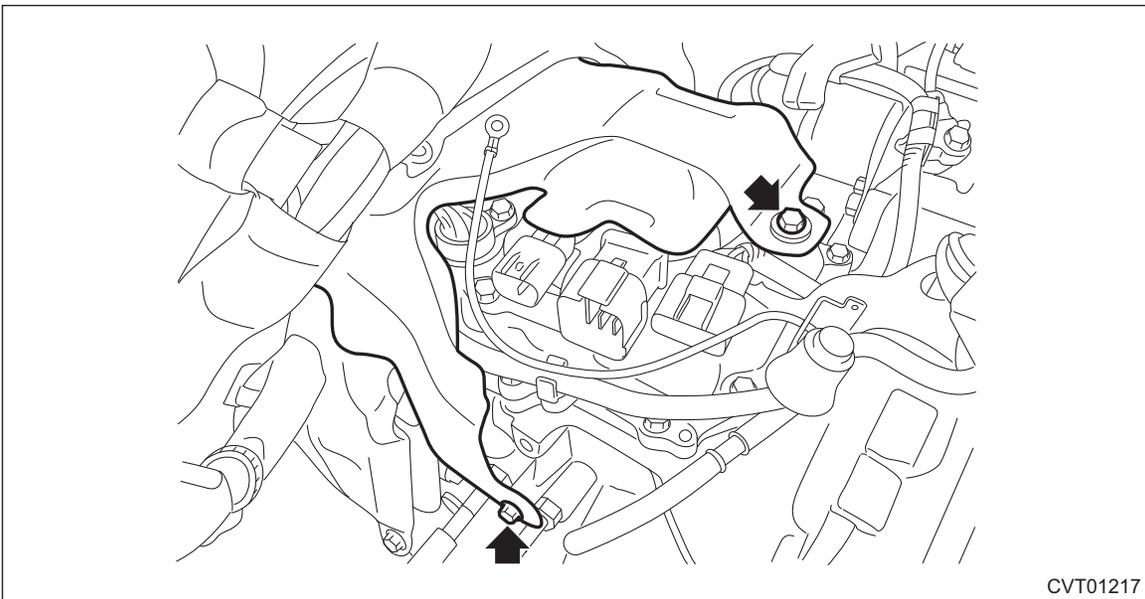
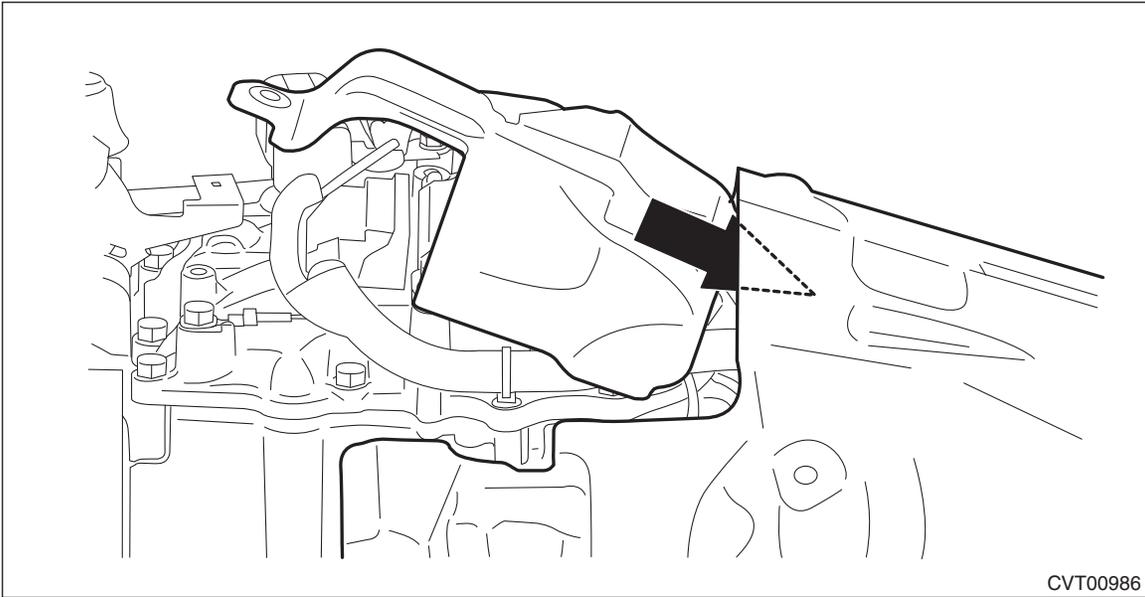
When inserting, be careful that the insulator inside transmission case cover is not turned over.

Transmission Control Module (TCM)

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

7 N·m (0.7 kgf·m, 5.2 ft·lb)



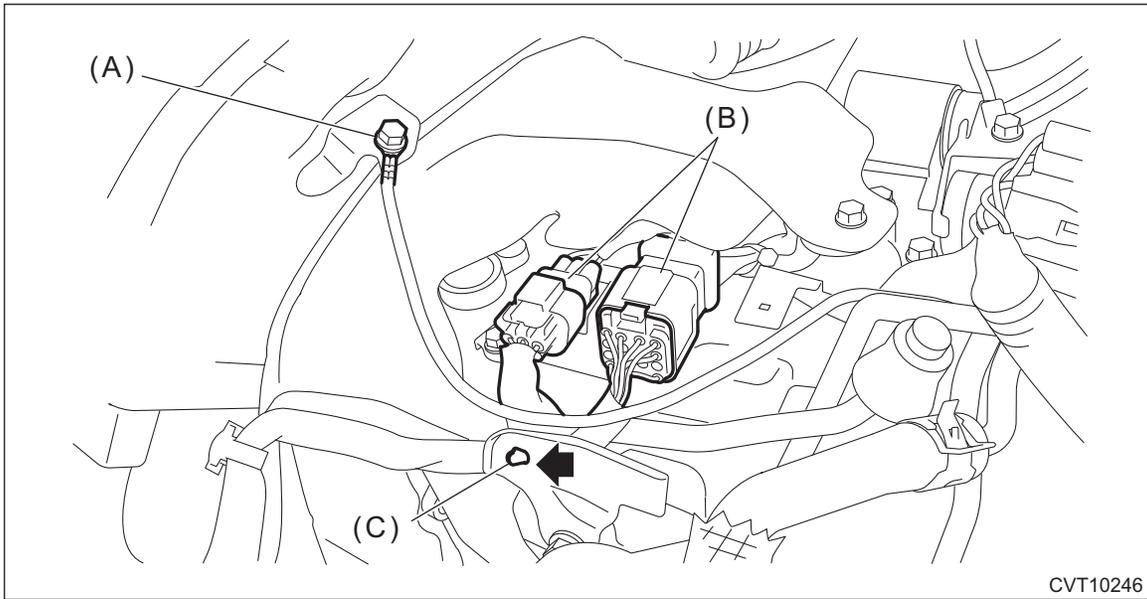
4) Install the harness clip, and connect the following transmission radio ground terminal and transmission harness connector.

Transmission Control Module (TCM)

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

13 N·m (1.3 kgf·m, 9.6 ft-lb)



- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

5) Install the air intake boot assembly. <Ref. to IN(H4DO)-10, INSTALLATION, Air Intake Boot.>

6) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

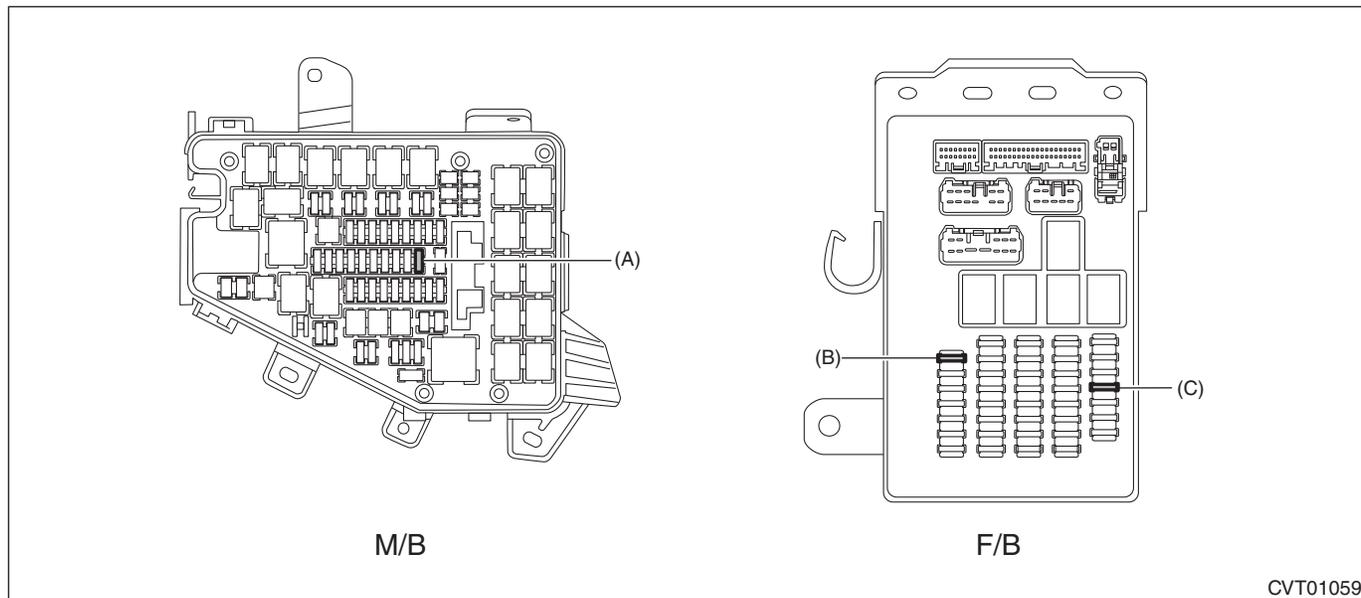
7) Perform the operation of AT learning mode. <Ref. to CVT(diag)-33, Learning Control.>

Relay and Fuse

CONTINUOUSLY VARIABLE TRANSMISSION

24. Relay and Fuse

A: LOCATION



Main fuse box	Fuse 20 A	(A)
Relay & fuse box	Fuse 15 A	(B)
Relay & fuse box	Fuse 7.5 A	(C)

B: INSPECTION

1. CHECK FUSE

Remove the fuse and inspect visually. If the fuse is blown out, replace the fuse.

NOTE:

If the fuse is blown again, check the system.

CVTF Cooler (With Warmer Function)

CONTINUOUSLY VARIABLE TRANSMISSION

25.CVTF Cooler (With Warmer Function)

A: REMOVAL

CAUTION:

If the CVTF and engine coolant is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.

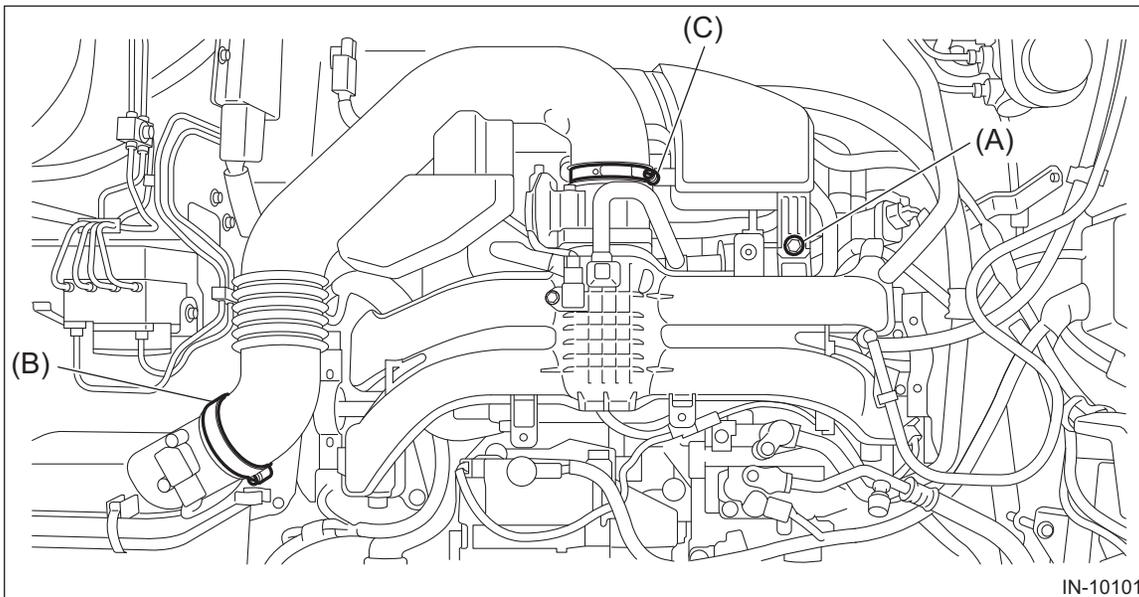
1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

NOTE:

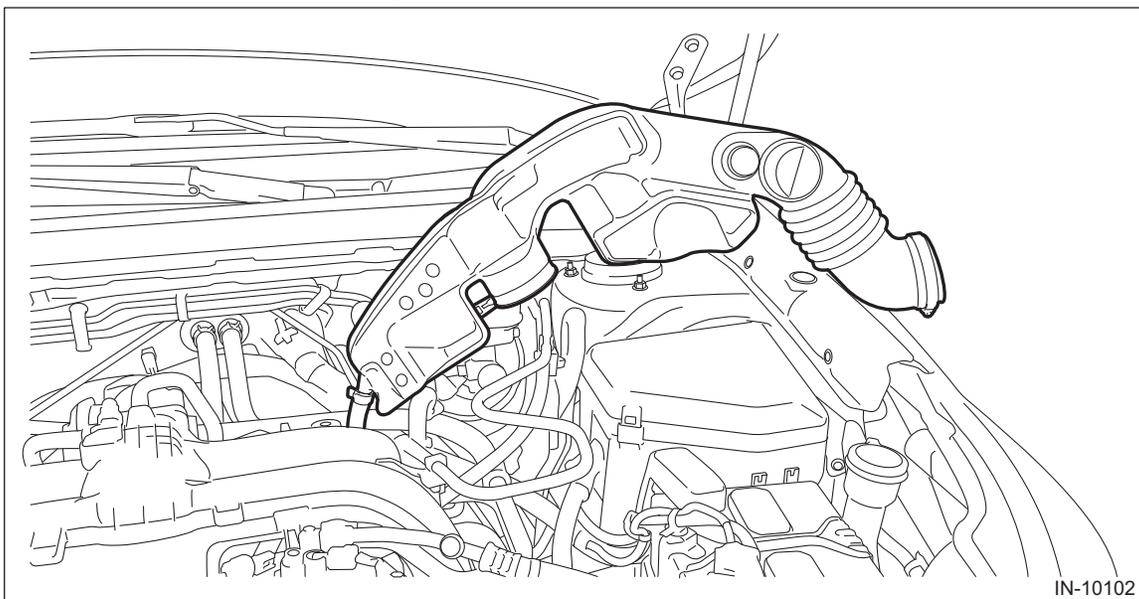
For model with battery sensor, disconnect the ground terminal from battery sensor.

2) Drain engine coolant. <Ref. to CO(H4DO)-15, REPLACEMENT, Engine Coolant.>

3) Remove the clip (A), and loosen the clamps (B) and (C).



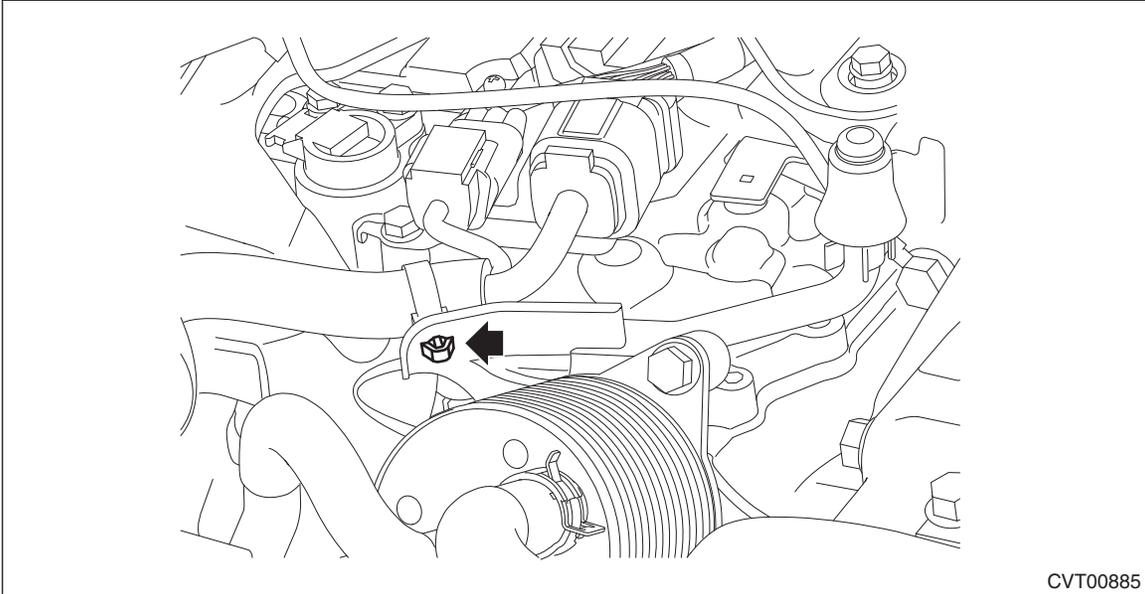
4) Remove the air intake boot assembly, and move it to the left side wheel apron.



CVTF Cooler (With Warmer Function)

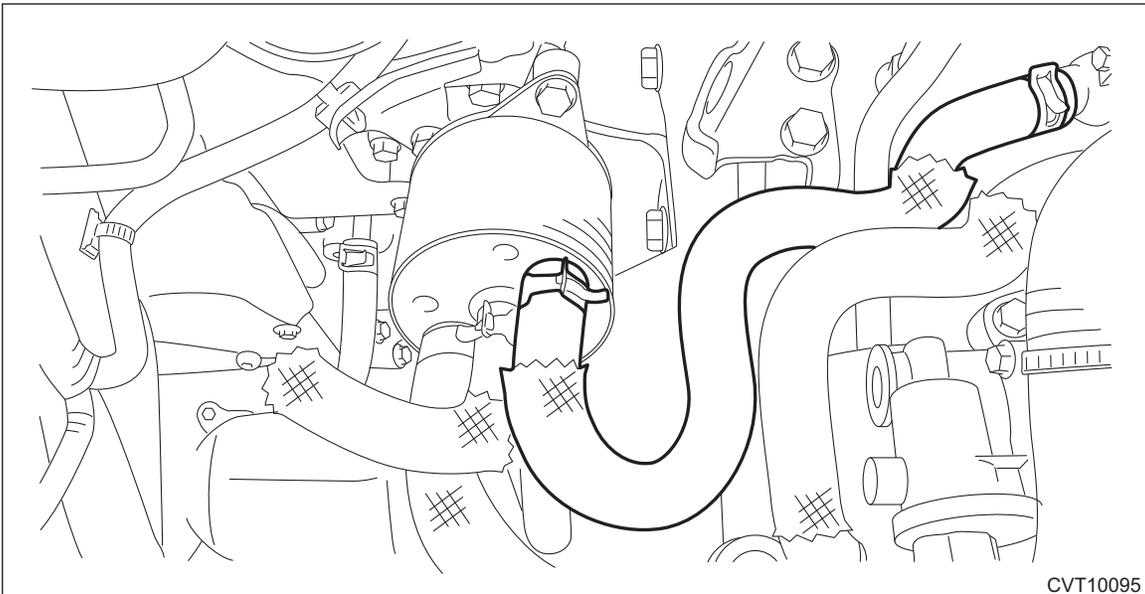
CONTINUOUSLY VARIABLE TRANSMISSION

5) Remove the harness clip.



6) Remove the engine coolant outlet hose.

- Without CVTF cooler (air cool)

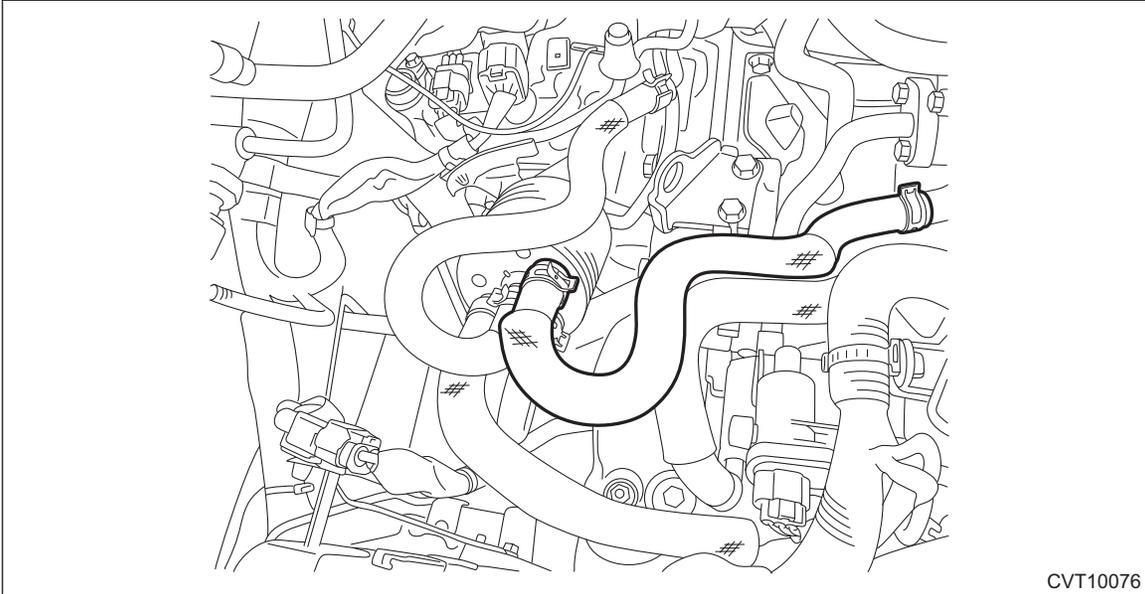


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CVTF Cooler (With Warmer Function)

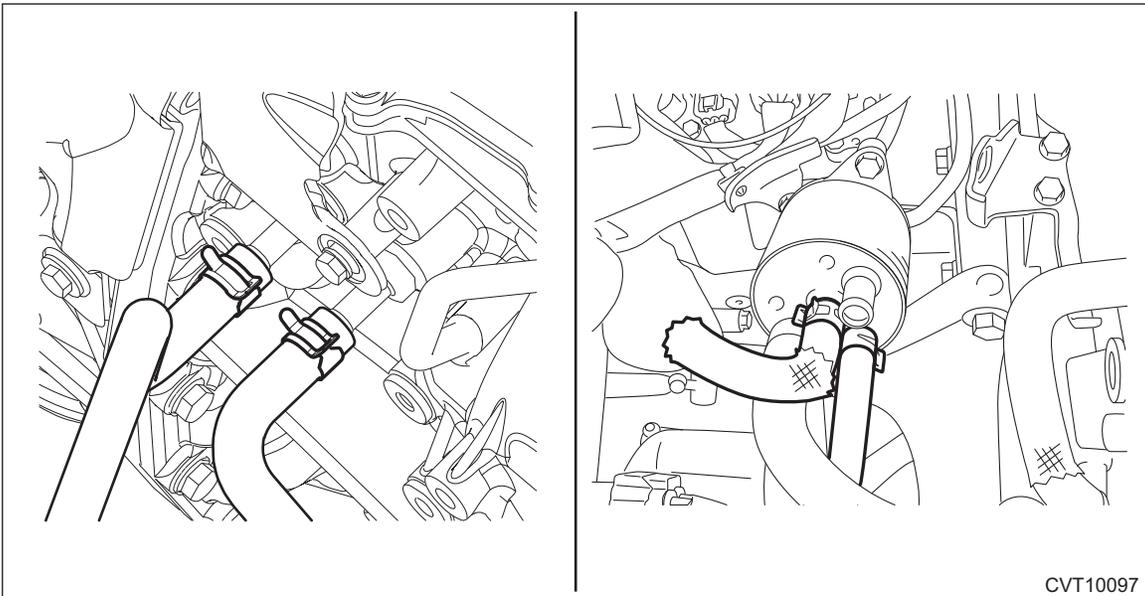
CONTINUOUSLY VARIABLE TRANSMISSION

- With CVTF cooler (air cool)



7) Remove the CVTF inlet hose and outlet hose.

- Without CVTF cooler (air cool)

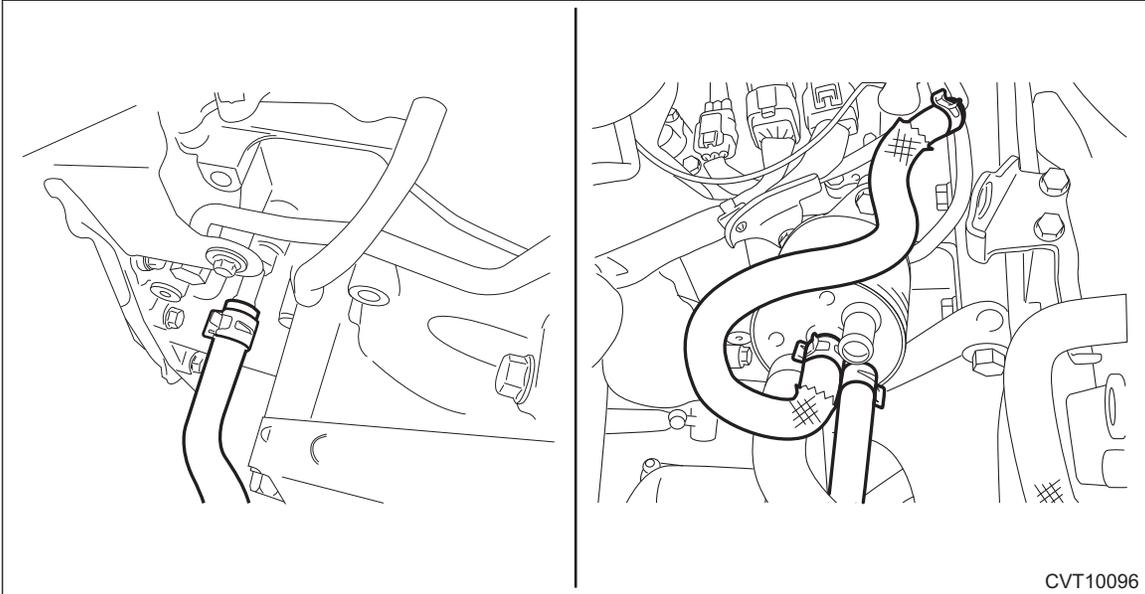


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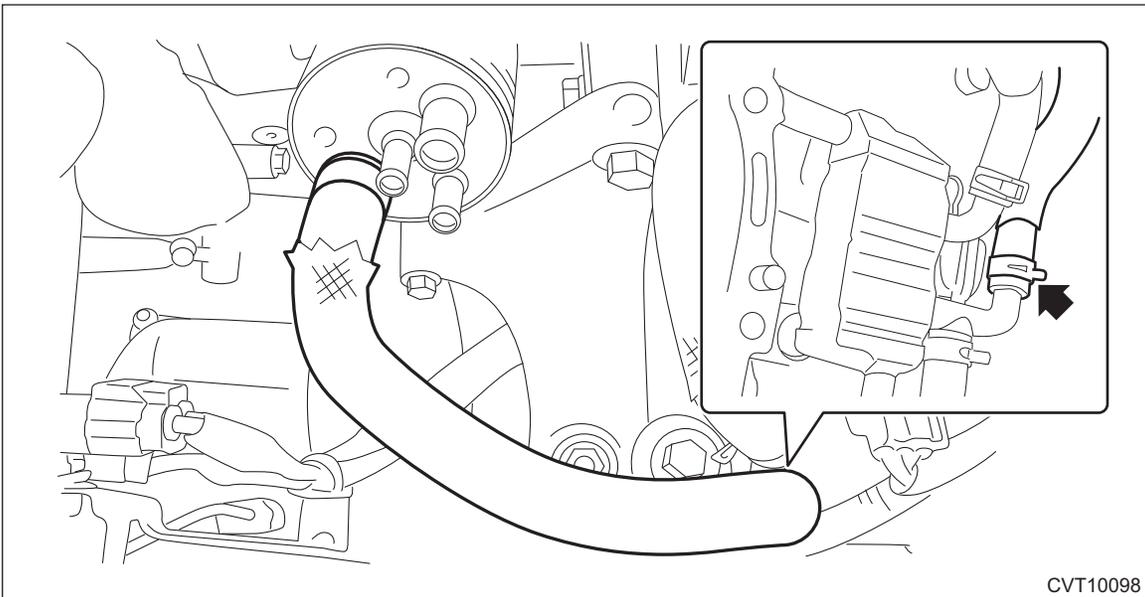
CVTF Cooler (With Warmer Function)

CONTINUOUSLY VARIABLE TRANSMISSION

- With CVTF cooler (air cool)



- 8) Remove the engine coolant inlet hose.

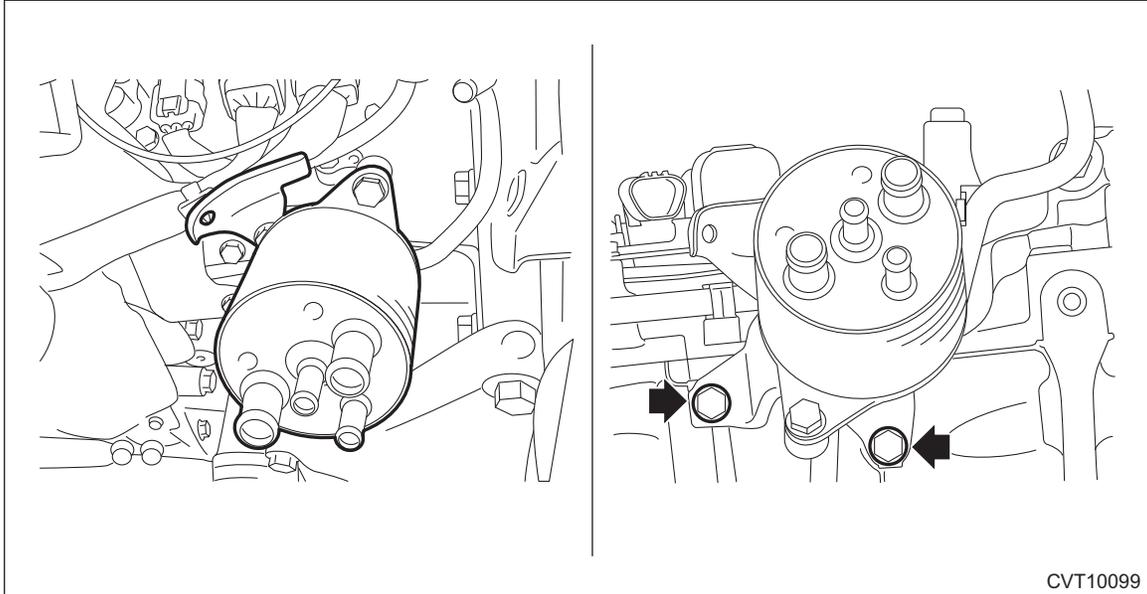


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CVTF Cooler (With Warmer Function)

CONTINUOUSLY VARIABLE TRANSMISSION

9) Remove the CVTF cooler (with warmer feature).

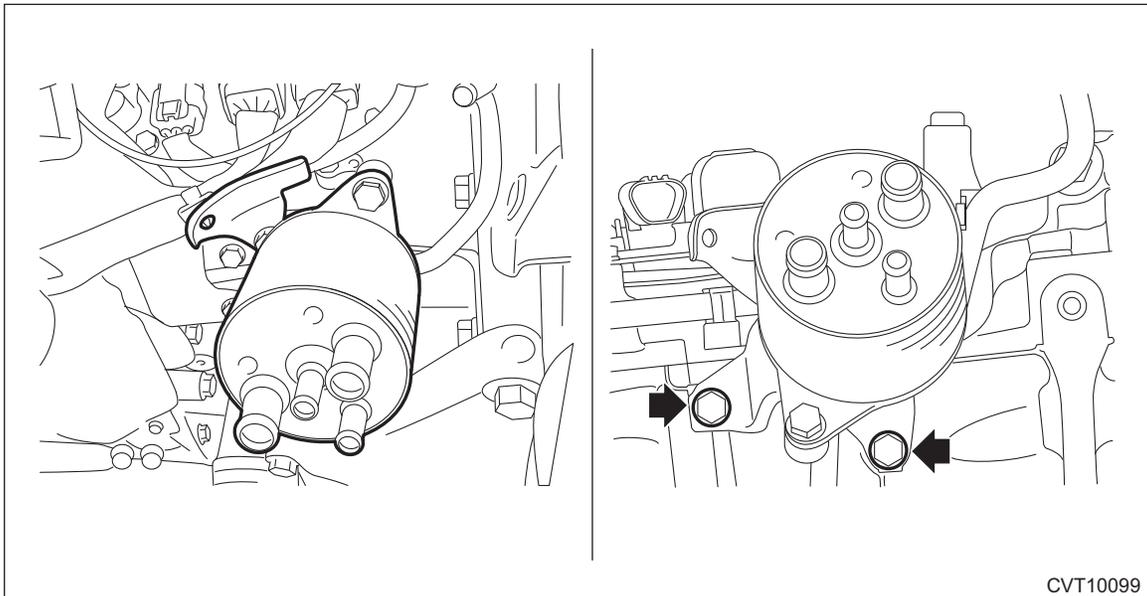


B: INSTALLATION

1) Install the CVTF cooler (with warmer feature).

Tightening torque:

23 N·m (2.3 kgf·m, 17.0 ft·lb)



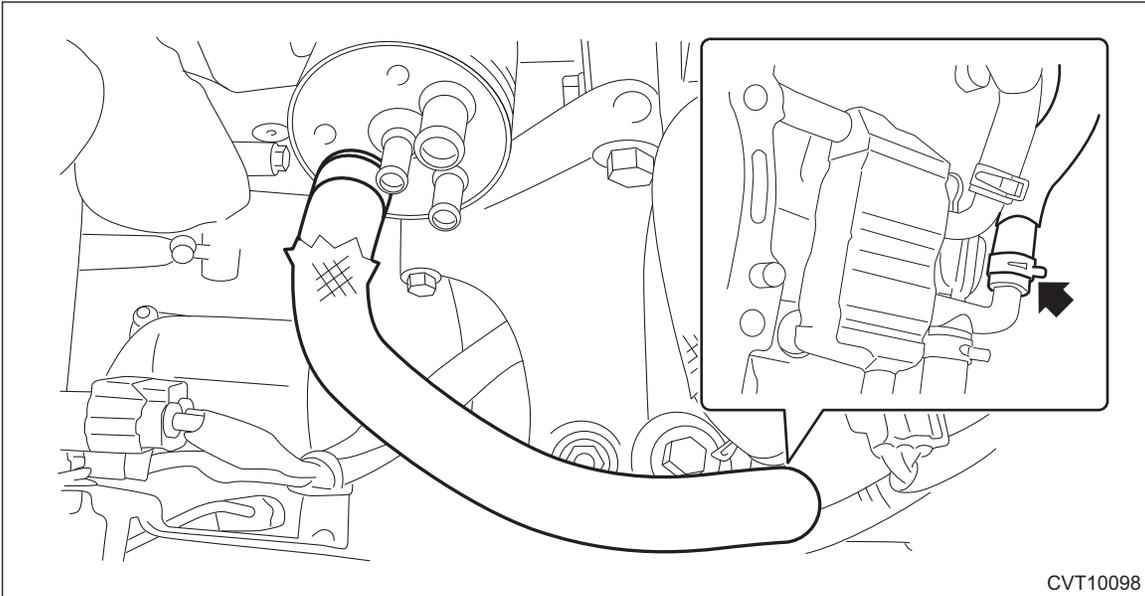
2) Install the engine coolant inlet hose.

CVTF Cooler (With Warmer Function)

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

With the paint on the engine coolant inlet hose facing the vehicle outside, install the hose to the engine side pipe.



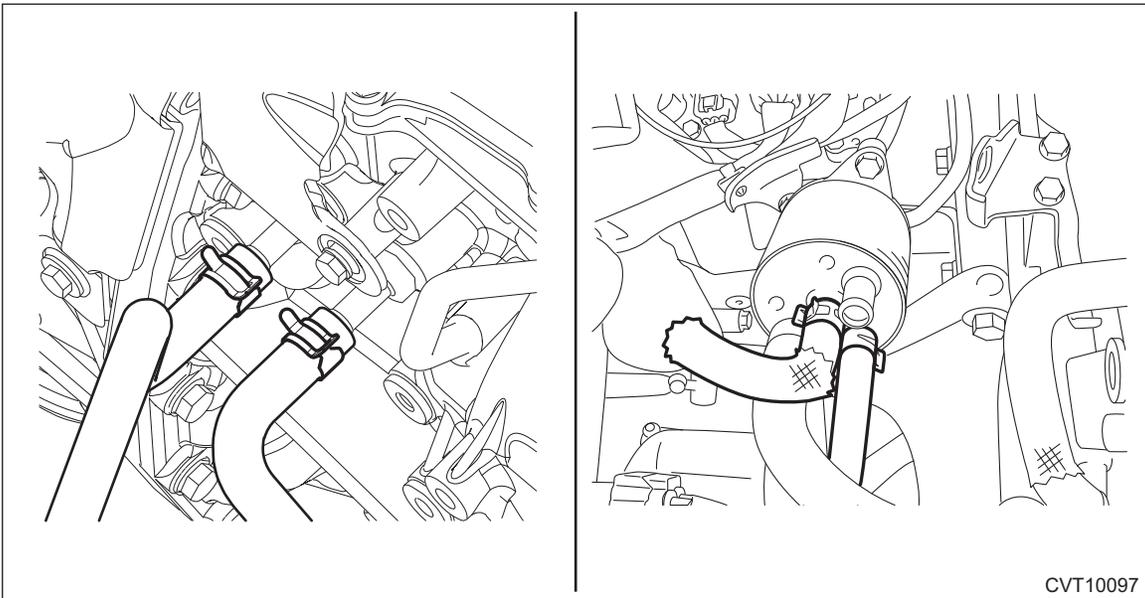
CVT10098

3) Install the CVTF inlet hose and CVTF outlet hose.

NOTE:

Use the new CVTF inlet hose and CVTF outlet hose.

- Without CVTF cooler (air cool)



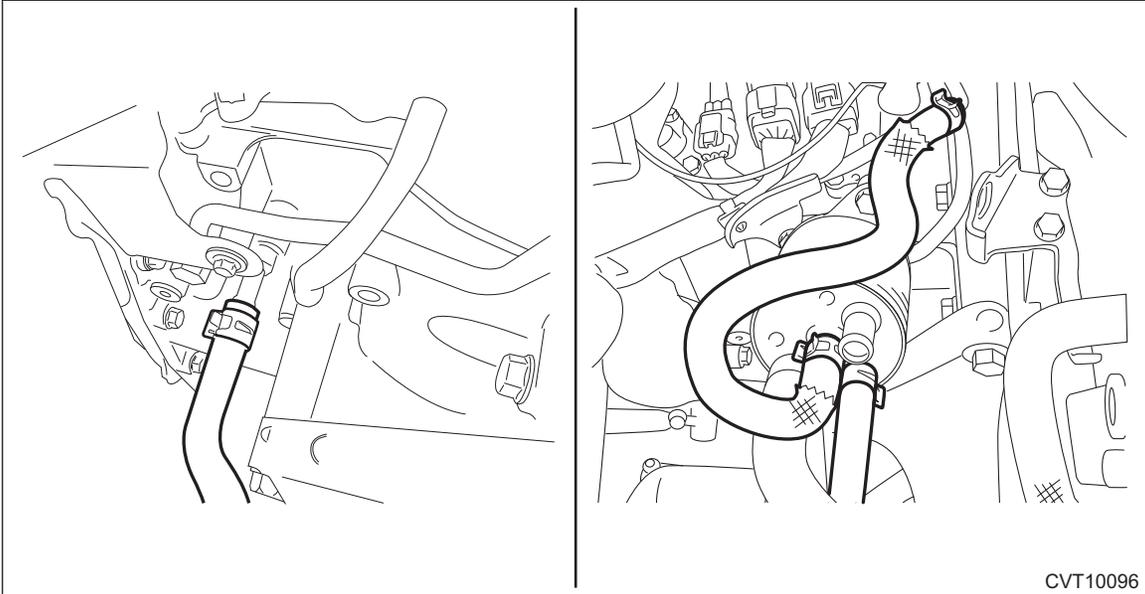
CVT10097

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CVTF Cooler (With Warmer Function)

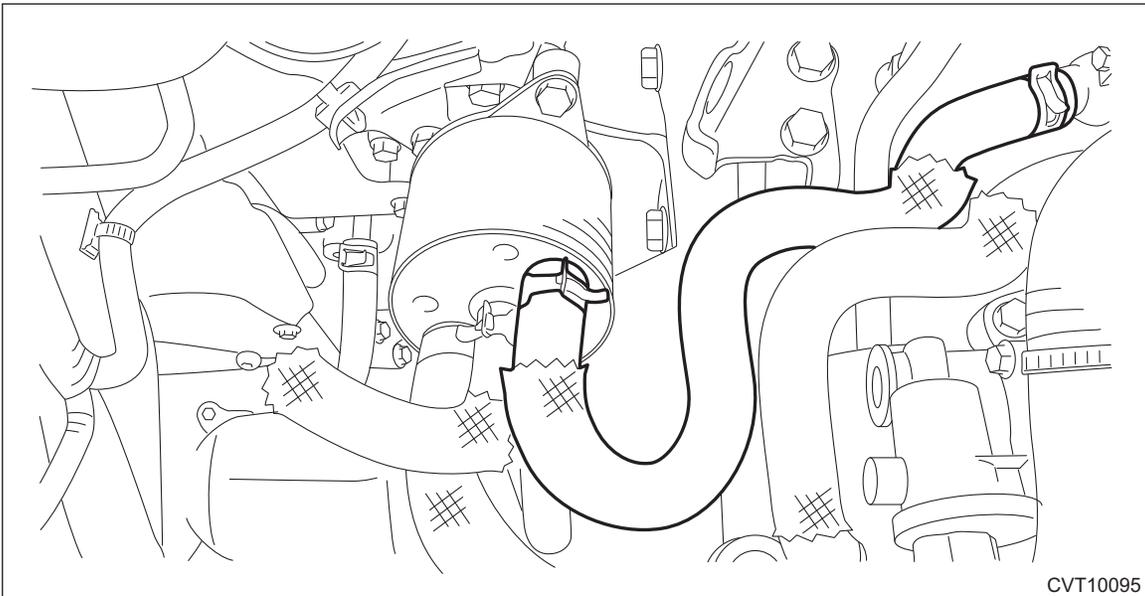
CONTINUOUSLY VARIABLE TRANSMISSION

- With CVTF cooler (air cool)



- 4) Connect the engine coolant outlet hose.

- Without CVTF cooler (air cool)

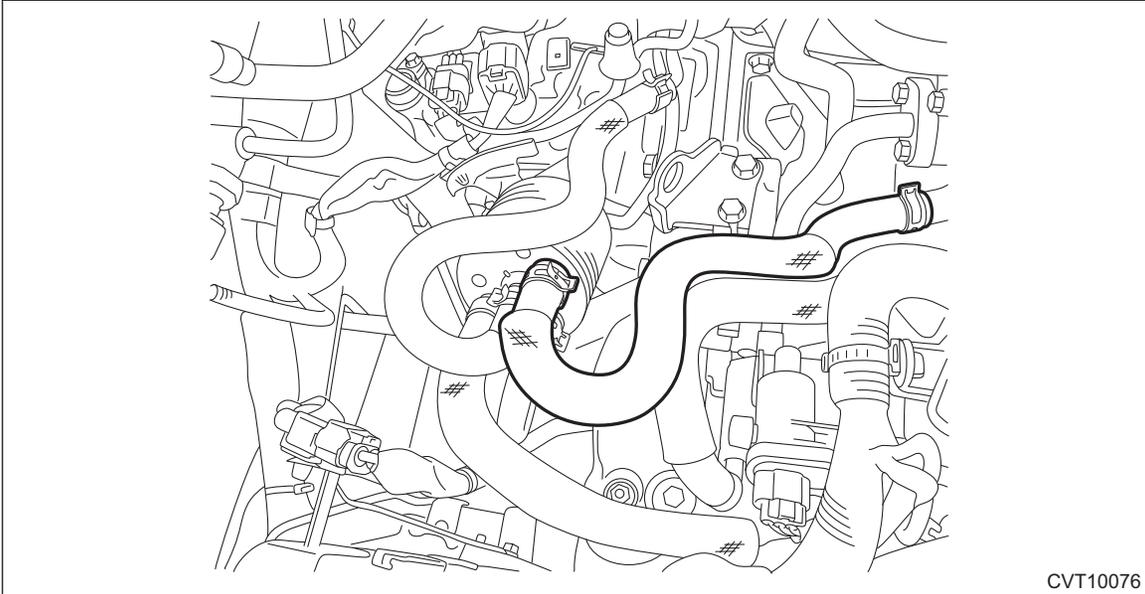


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CVTF Cooler (With Warmer Function)

CONTINUOUSLY VARIABLE TRANSMISSION

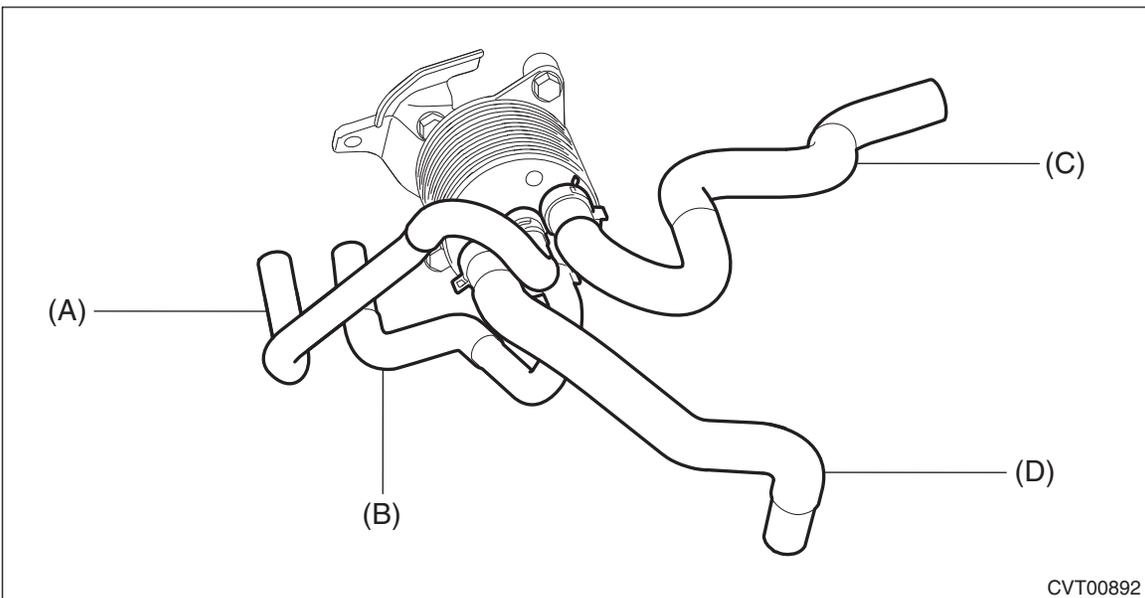
- With CVTF cooler (air cool)



CVT10076

5) Check installation condition of each hose.

- Make sure the hoses do not interfere with each other or with other components.
- Check each hose for bent, excess curve, and twisting conditions.
- Without CVTF cooler (air cool)



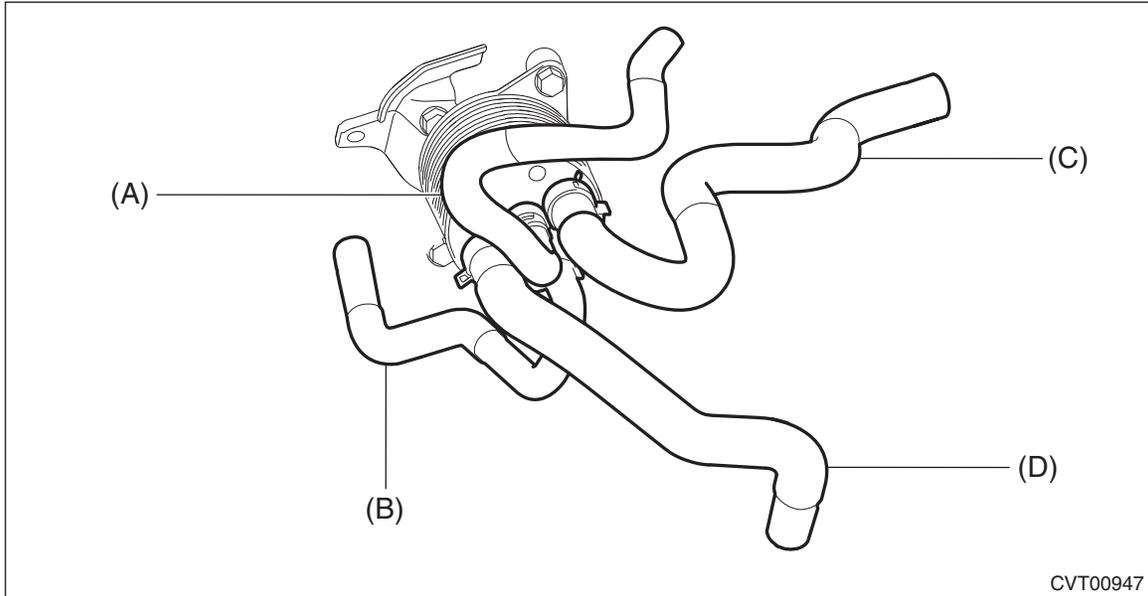
CVT00892

- (A) CVTF cooler inlet hose
- (B) CVTF cooler outlet hose
- (C) Engine coolant outlet hose
- (D) Engine coolant inlet hose

CVTF Cooler (With Warmer Function)

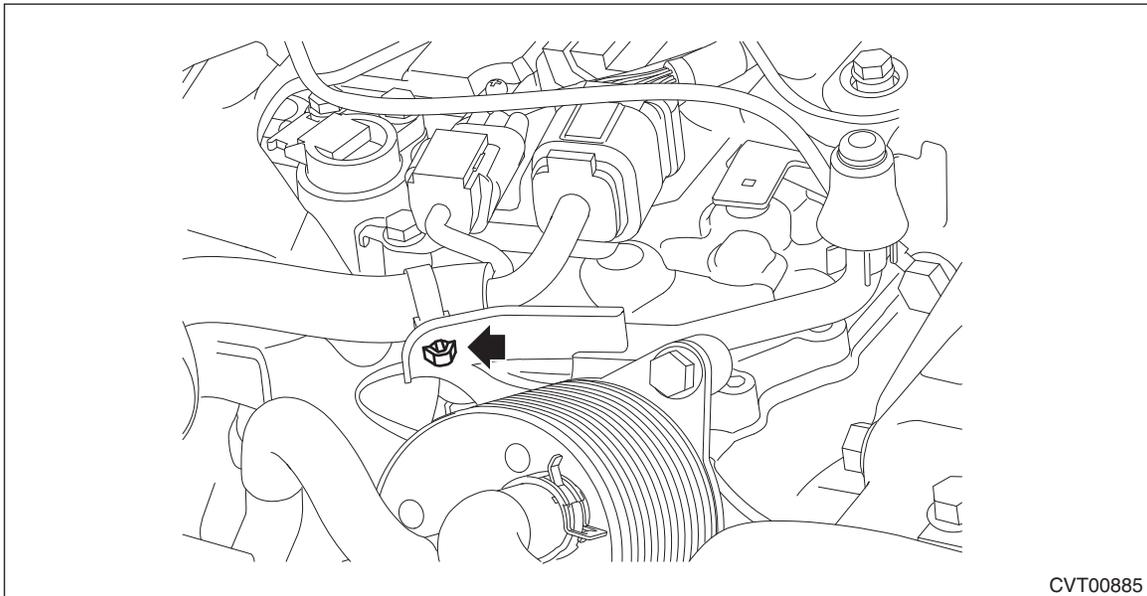
CONTINUOUSLY VARIABLE TRANSMISSION

- With CVTF cooler (air cool)



- (A) CVTF cooler inlet hose
- (B) CVTF cooler outlet hose
- (C) Engine coolant outlet hose
- (D) Engine coolant inlet hose

- 6) Install the harness clip.



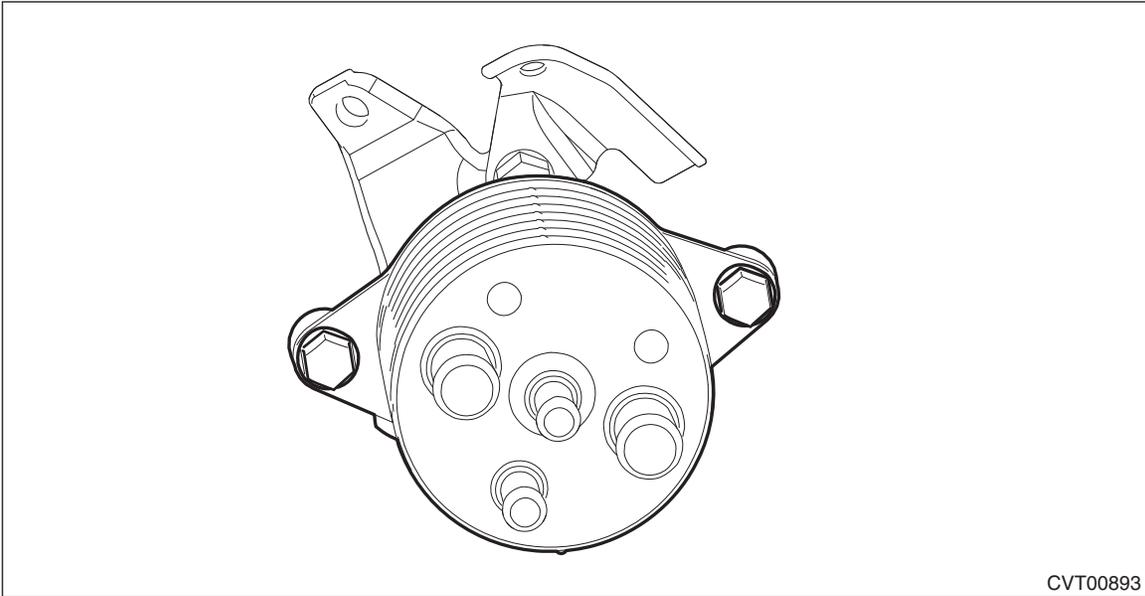
- 7) Install the air intake boot assembly. <Ref. to IN(H4DO)-10, INSTALLATION, Air Intake Boot.>
- 8) Connect the ground terminal to battery sensor. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>
- 9) Fill engine coolant. <Ref. to CO(H4DO)-15, REPLACEMENT, Engine Coolant.>
- 10) Adjust the CVTF level. <Ref. to CVT(TR580)-39, ADJUSTMENT, CVTF.>

CVTF Cooler (With Warmer Function)

CONTINUOUSLY VARIABLE TRANSMISSION

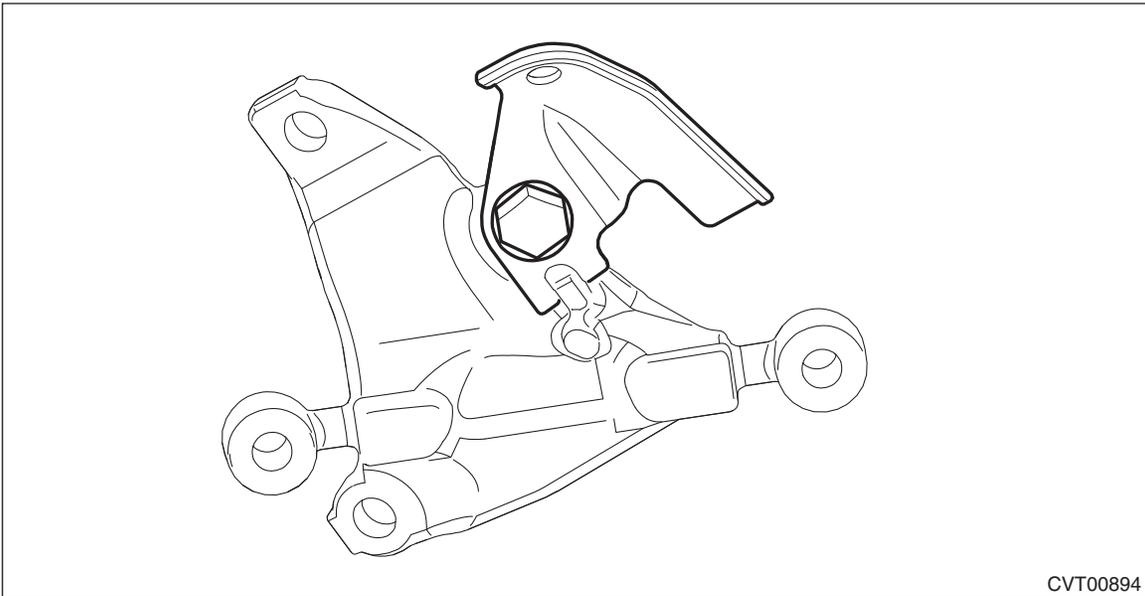
C: DISASSEMBLY

- 1) Remove the CVTF cooler (with warmer feature).



CVT00893

- 2) Remove the harness stay.



CVT00894

D: ASSEMBLY

- 1) Install the harness stay.

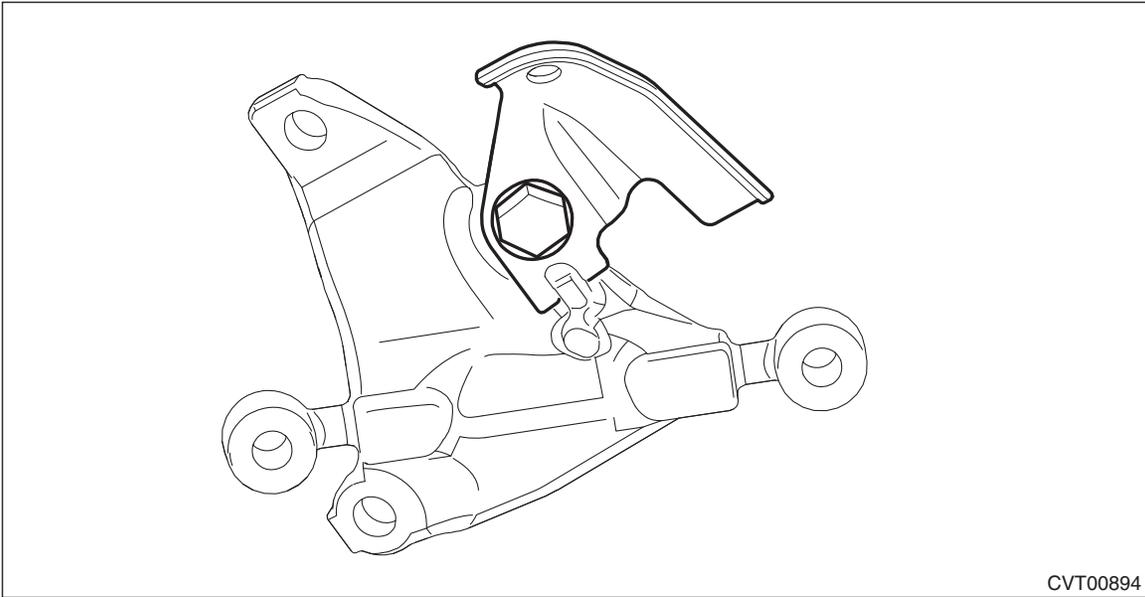
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CVTF Cooler (With Warmer Function)

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

23 N·m (2.3 kgf·m, 17.0 ft·lb)

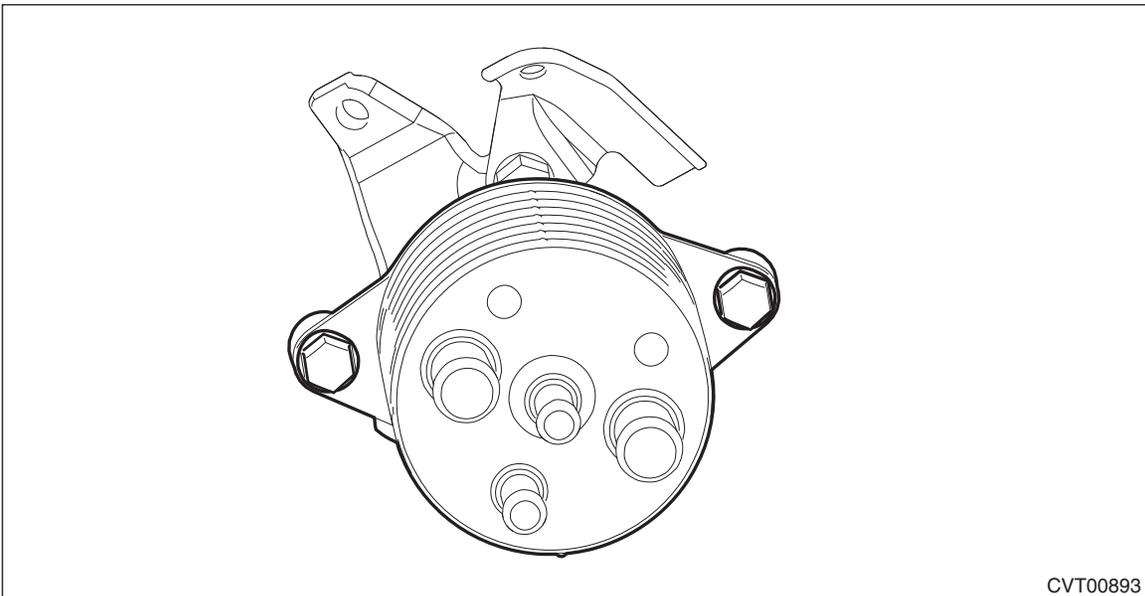


CVT00894

2) Install the CVTF cooler (with warmer feature).

Tightening torque:

23 N·m (2.3 kgf·m, 17.0 ft·lb)



CVT00893

E: INSPECTION

Replace any faulty CVTF cooler hoses, CVTF cooler pipes and clamps found in the inspection below.

- 1) Check that there are no CVTF or engine coolant leaks from the connections.
- 2) Check the clamp for deformation.
- 3) Lightly bend the CVTF cooler hose and check for cracks in the surface or other damages.
- 4) Pinch the CVTF cooler hose with your fingers and check for poor elasticity. Also check for poor elasticity in the parts where the clamp was installed by pressing with your fingernail.
- 5) Check for peeling, cracks, and deformation at the tip of the hose.
- 6) Check the CVTF cooler (with warmer feature) for any damage.

CVTF Cooler Pipe and Hose

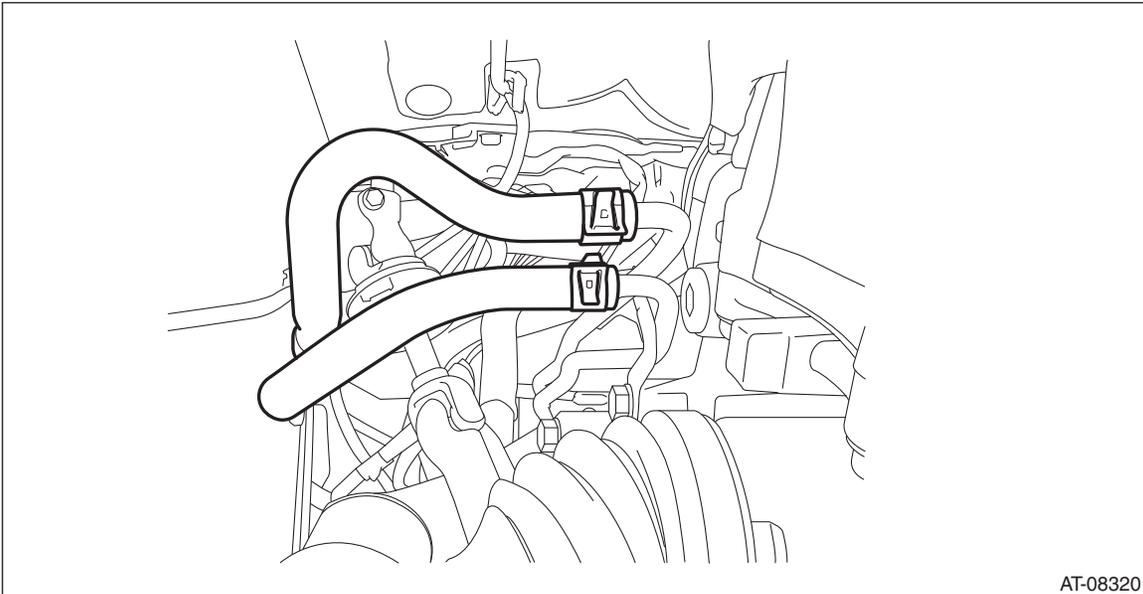
CONTINUOUSLY VARIABLE TRANSMISSION

26. CVTF Cooler Pipe and Hose

A: REMOVAL

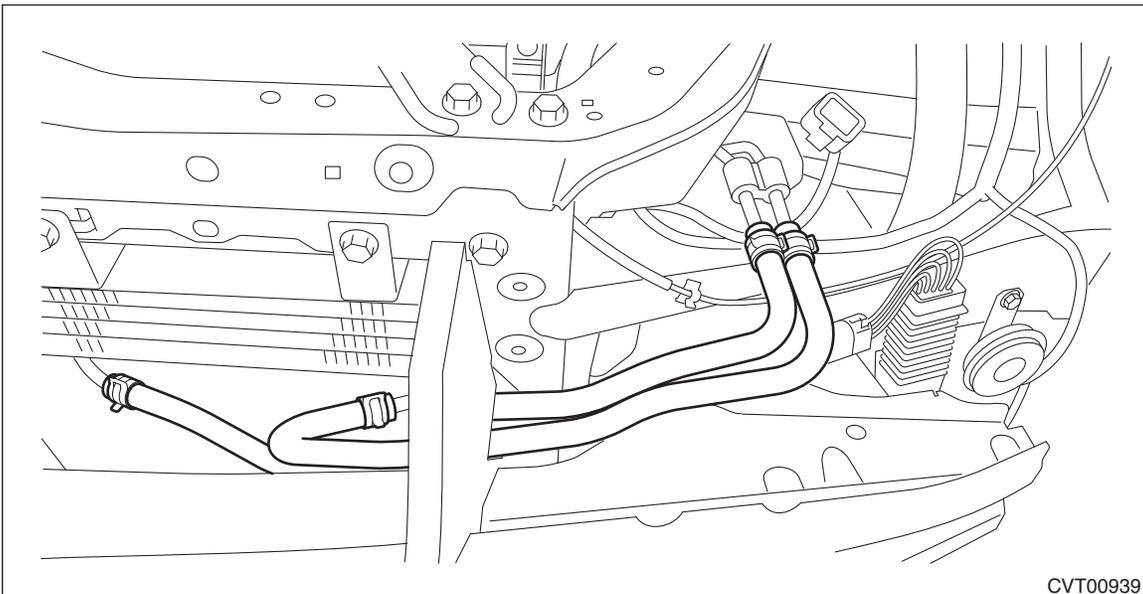
CAUTION:

- Immediately after the vehicle has been running or after idling for a long time, the CVTF will be hot. Be careful not to burn yourself.
 - If the CVTF is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.
 - When removing the CVTF cooler pipe assembly on vehicle side, be careful not to bend the A/C pipe.
- 1) Lift up the vehicle.
 - 2) Remove the under cover - front.
 - 3) Remove the CVTF CVT inlet hose and CVTF CVT outlet hose.



AT-08320

- 4) Lower the vehicle.
- 5) Remove the battery and battery box. <Ref. to SC(H4DO)-49, REMOVAL, Battery.>
- 6) Remove the front bumper. <Ref. to EI-32, REMOVAL, Front Bumper.>
- 7) Remove the headlight assembly LH. <Ref. to LI-37, REMOVAL, Headlight Assembly.>
- 8) Remove the CVTF cooler (air cool) inlet hose and the CVTF cooler (air cool) outlet hose.

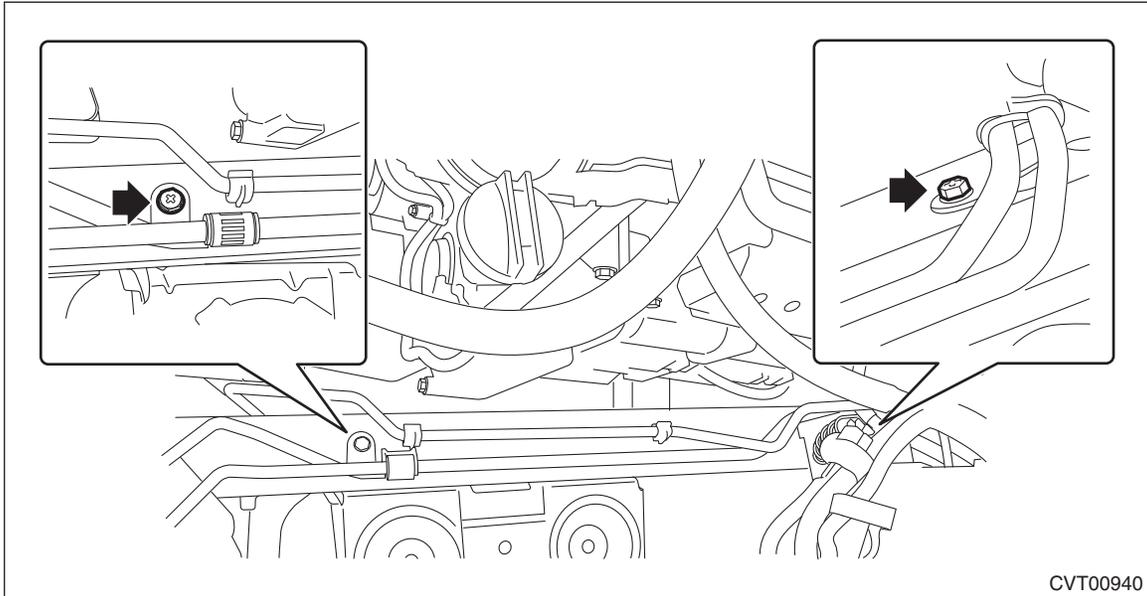


CVT00939

CVTF Cooler Pipe and Hose

CONTINUOUSLY VARIABLE TRANSMISSION

9) Remove the CVTF cooler pipe assembly mounting bolt.

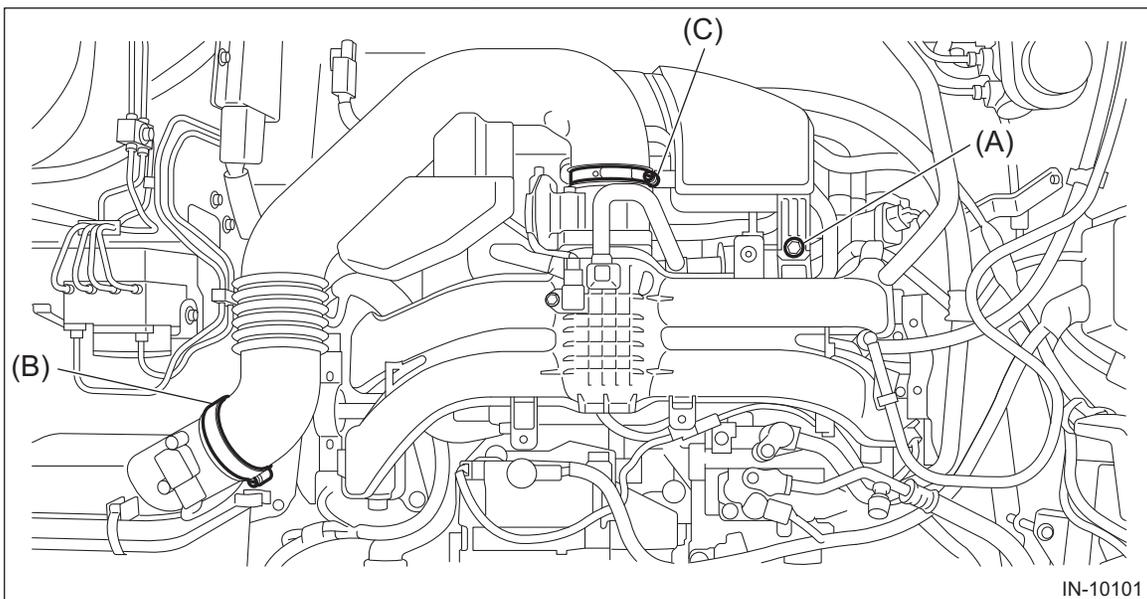


CVT00940

10) Detach the A/C pipe from clip.

11) Remove the CVTF cooler pipe assembly.

12) Remove the clip (A), and loosen the clamps (B) and (C).



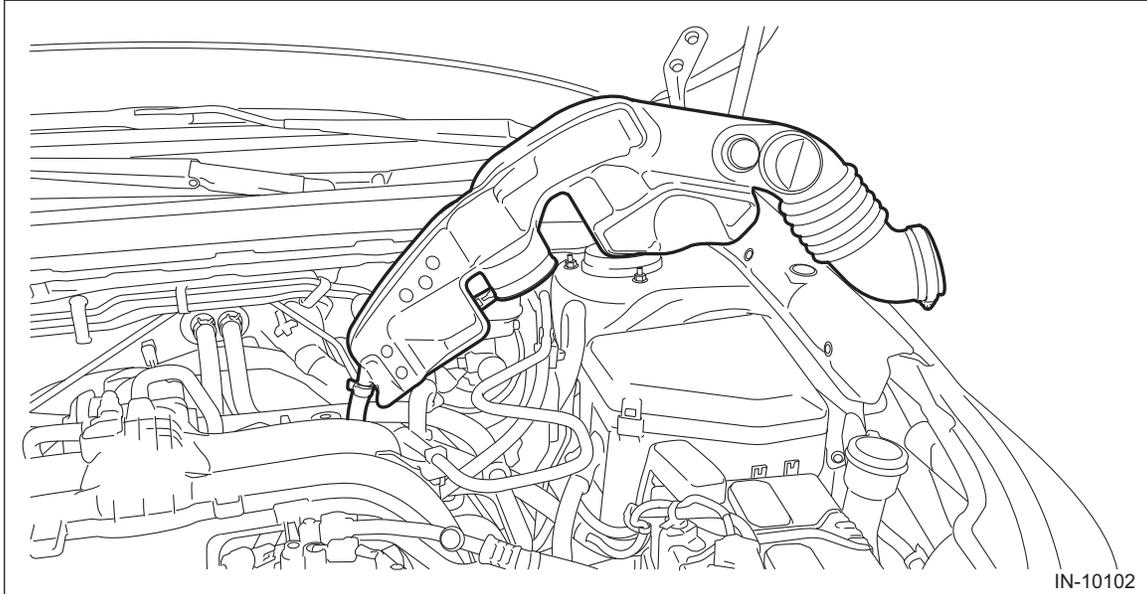
IN-10101

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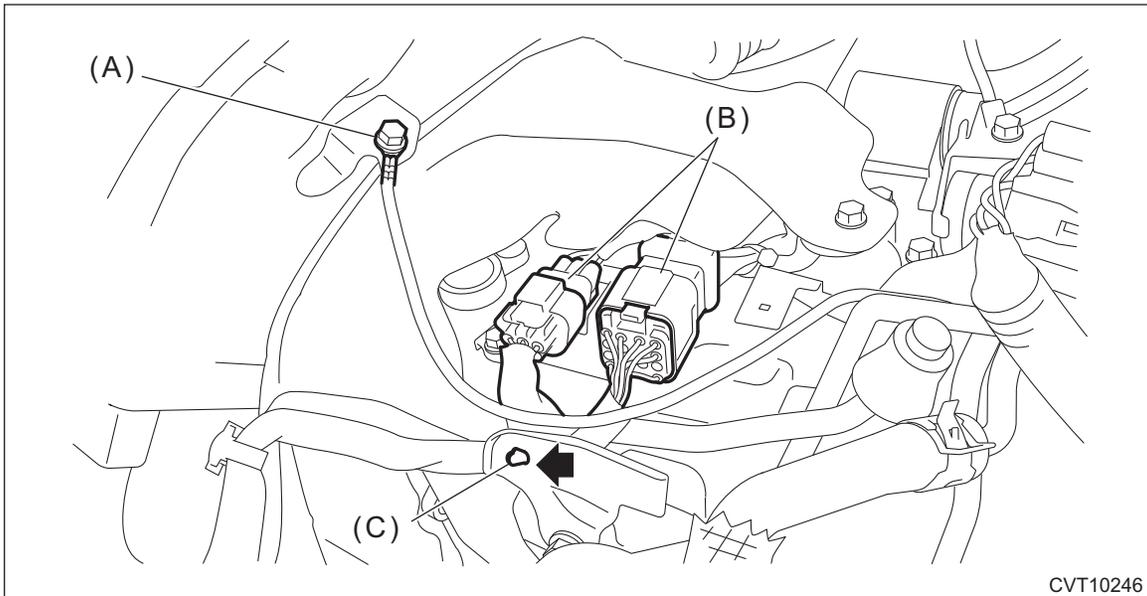
CVTF Cooler Pipe and Hose

CONTINUOUSLY VARIABLE TRANSMISSION

13) Remove the air intake boot assembly, and move it to the left side wheel apron.



14) Disconnect the transmission radio ground terminal and transmission harness connector, and remove the harness clip.

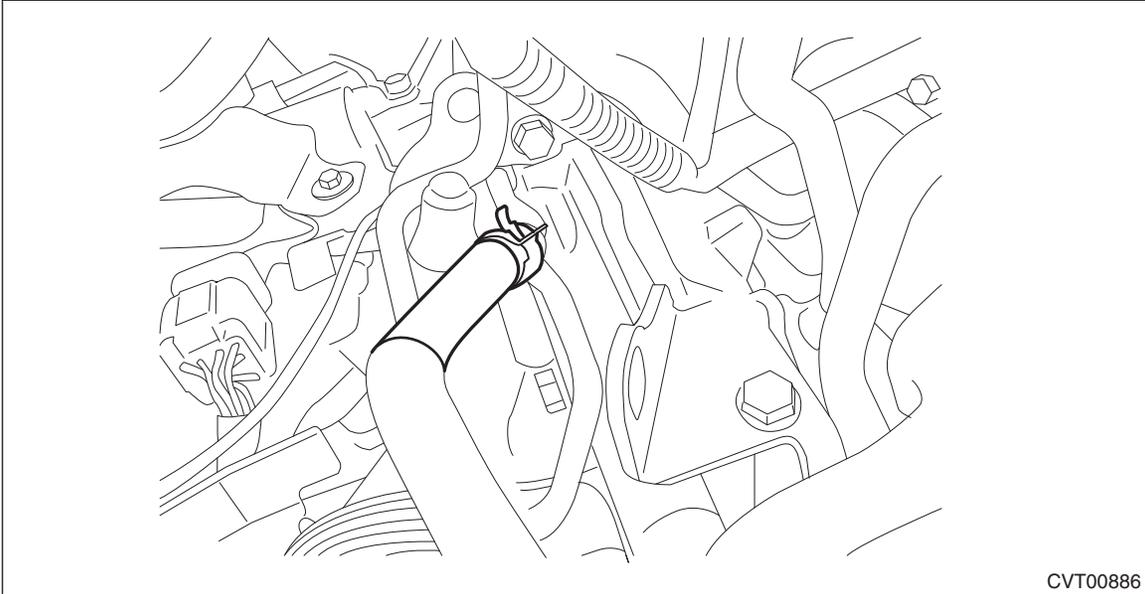


- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

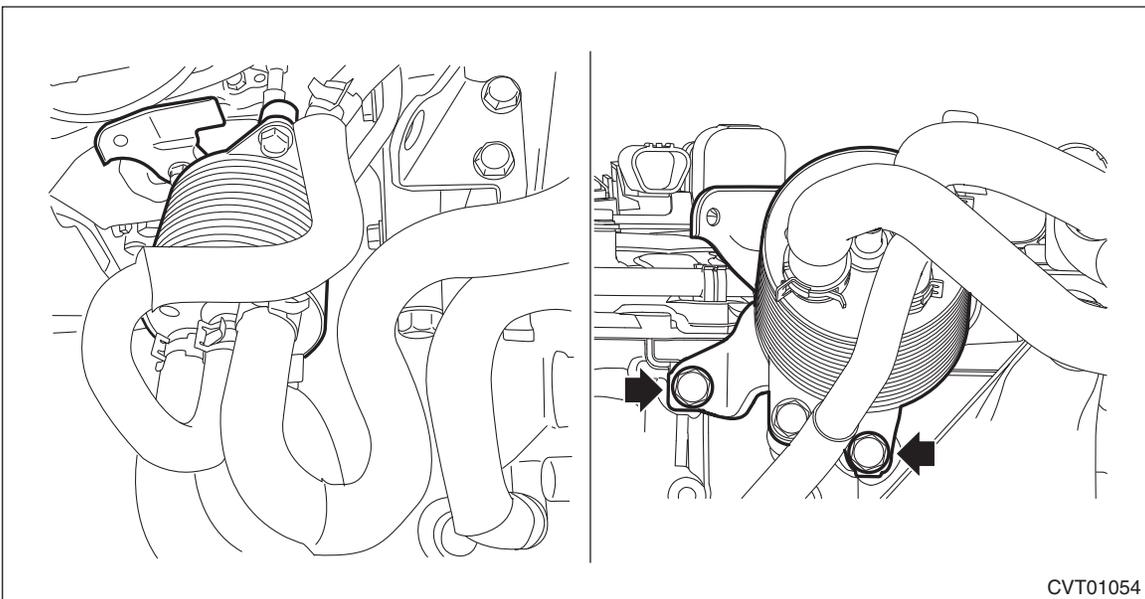
CVTF Cooler Pipe and Hose

CONTINUOUSLY VARIABLE TRANSMISSION

15) Remove the CVTF cooler hose.



16) Remove the CVTF cooler (with warmer feature), and fix it on the vehicle with a string.

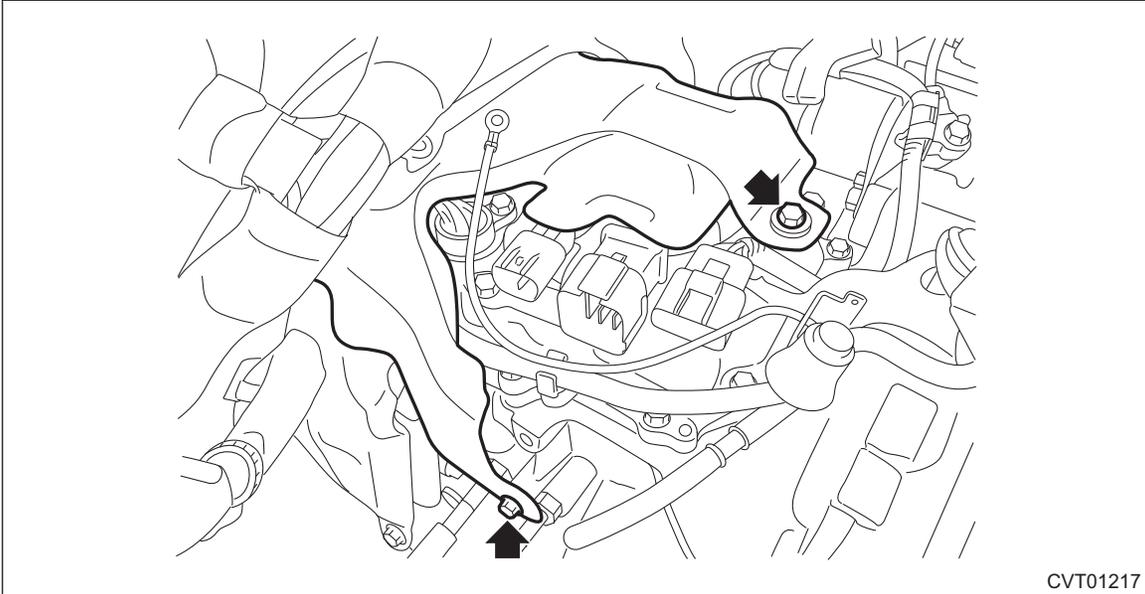


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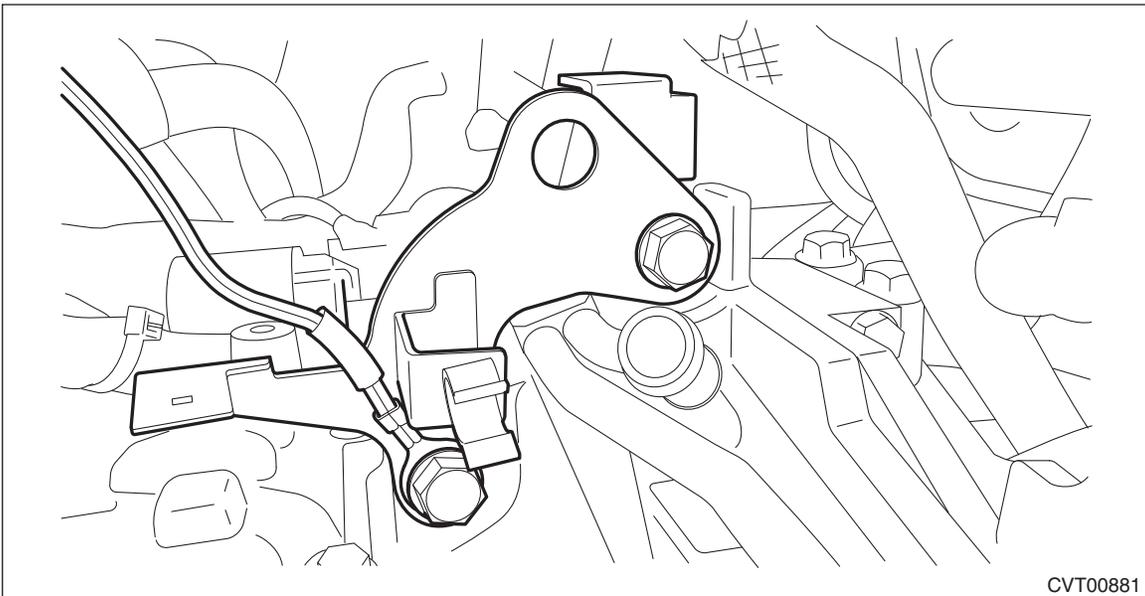
CVTF Cooler Pipe and Hose

CONTINUOUSLY VARIABLE TRANSMISSION

17) Remove the transmission case cover.



18) Remove the air breather hose from the transmission hanger, and remove the transmission hanger and the transmission radio ground cord.

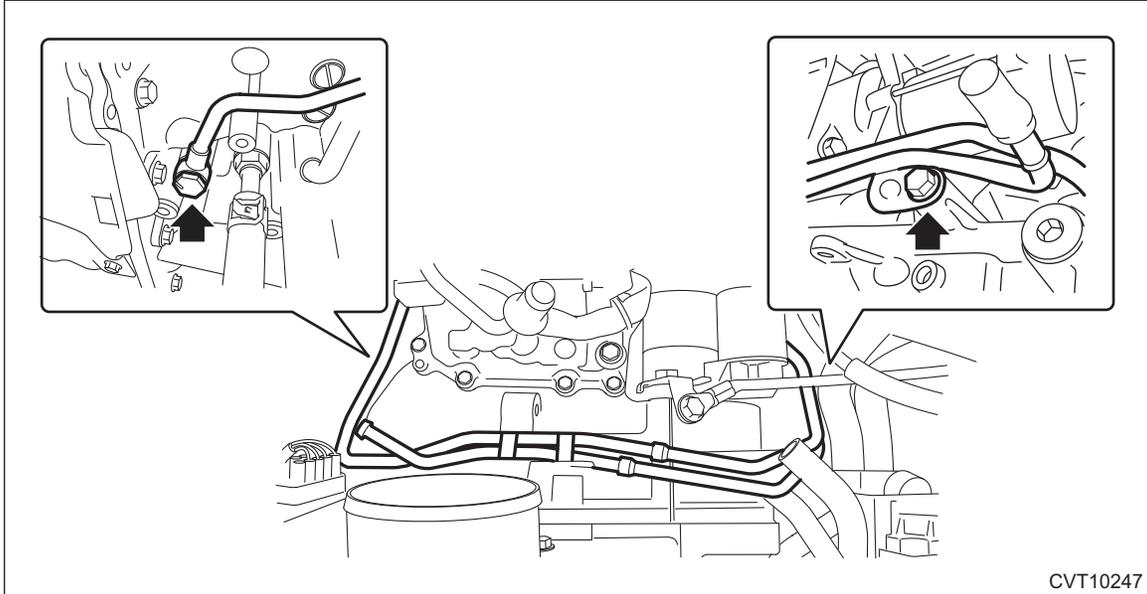


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CVTF Cooler Pipe and Hose

CONTINUOUSLY VARIABLE TRANSMISSION

19) Remove the CVTF cooler pipe COMPL from the transmission body.



CVT10247

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CVTF Cooler Pipe and Hose

CONTINUOUSLY VARIABLE TRANSMISSION

B: INSTALLATION

CAUTION:

When installing the CVTF cooler pipe assembly on vehicle side, be careful not to bend the A/C pipe.

1) Temporarily install the CVTF cooler pipe COMPL, transmission hanger and transmission radio ground cord to the transmission.

NOTE:

Use a new gasket.

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

CAUTION:

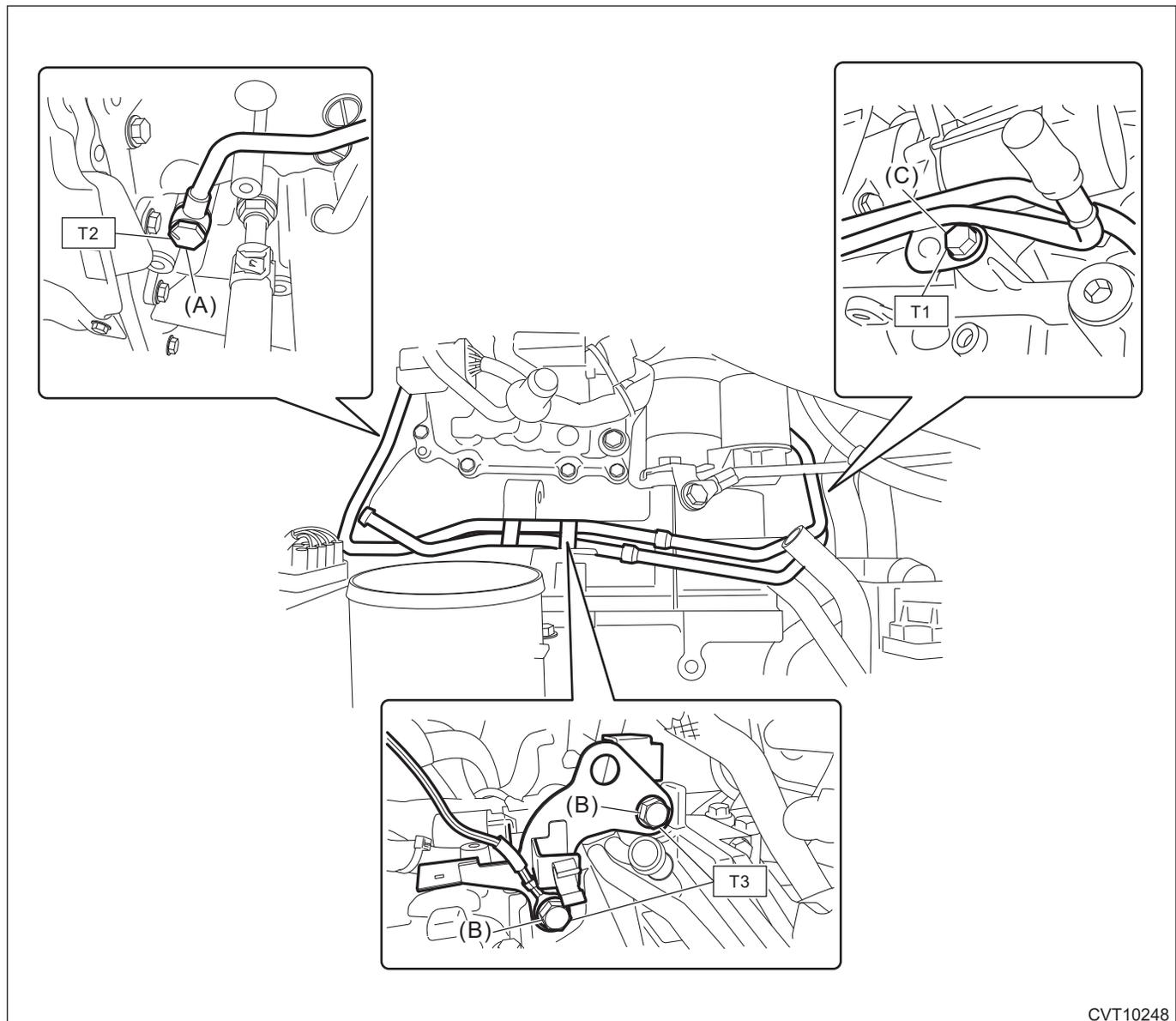
Be careful not to deform or damage the terminal of transmission radio ground cord.

Tightening torque:

T1: 35 N·m (3.6 kgf-m, 25.8 ft-lb)

T2: 40 N·m (4.1 kgf-m, 29.5 ft-lb)

T3: 41 N·m (4.2 kgf-m, 30.2 ft-lb)



3) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>

4) Insert the transmission case cover (small) between transmission case cover (large) and transmission to install.

CVTF Cooler Pipe and Hose

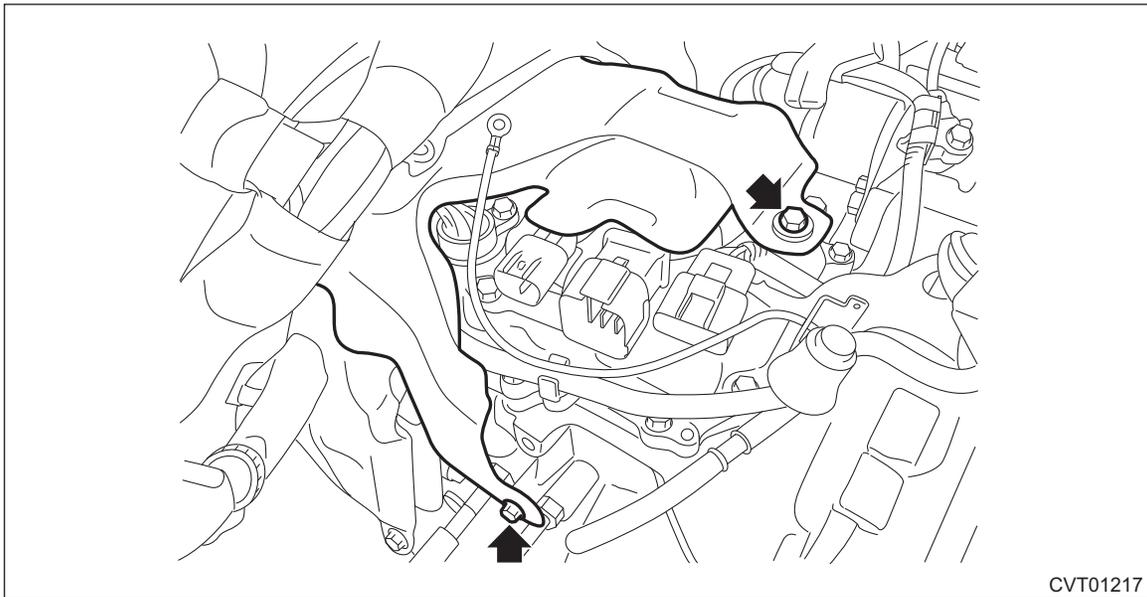
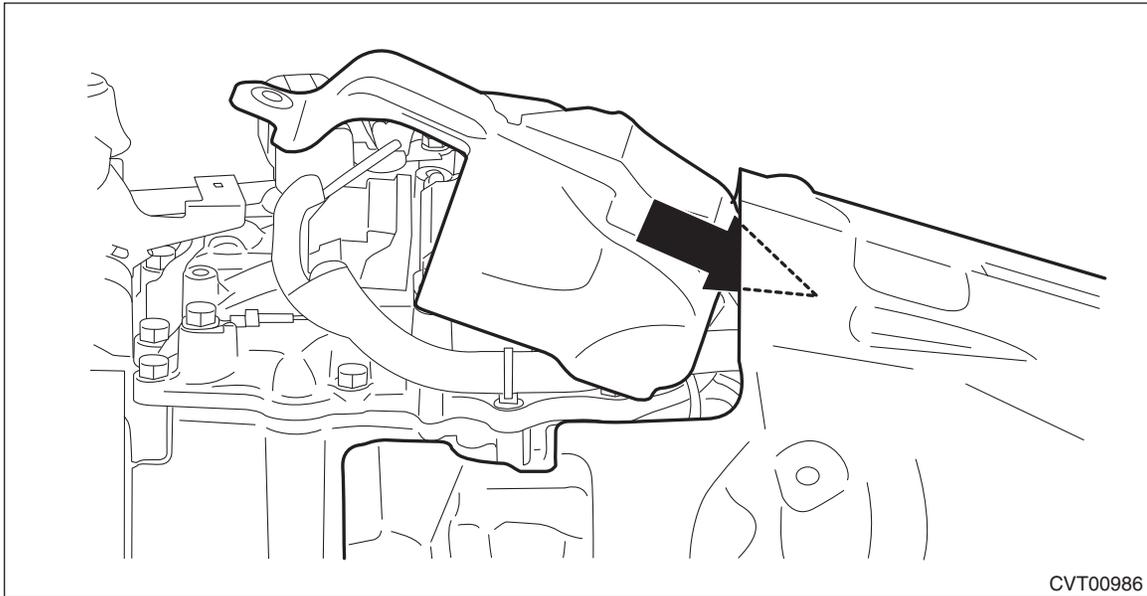
CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

When inserting, be careful that the insulator inside transmission case cover is not turned over.

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)



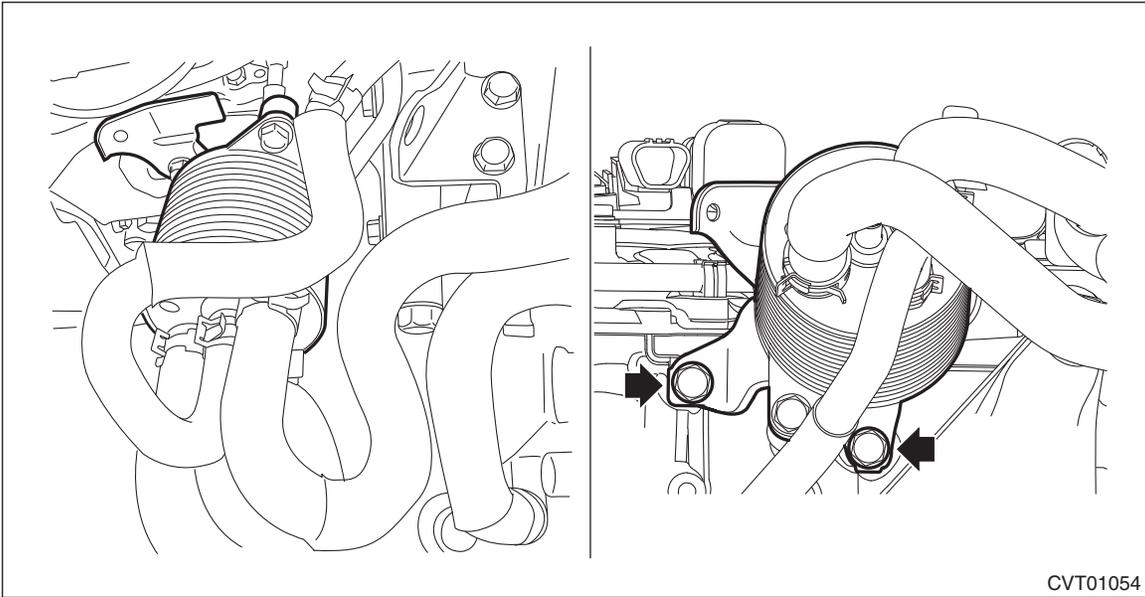
5) Install the CVTF cooler (with warmer feature).

CVTF Cooler Pipe and Hose

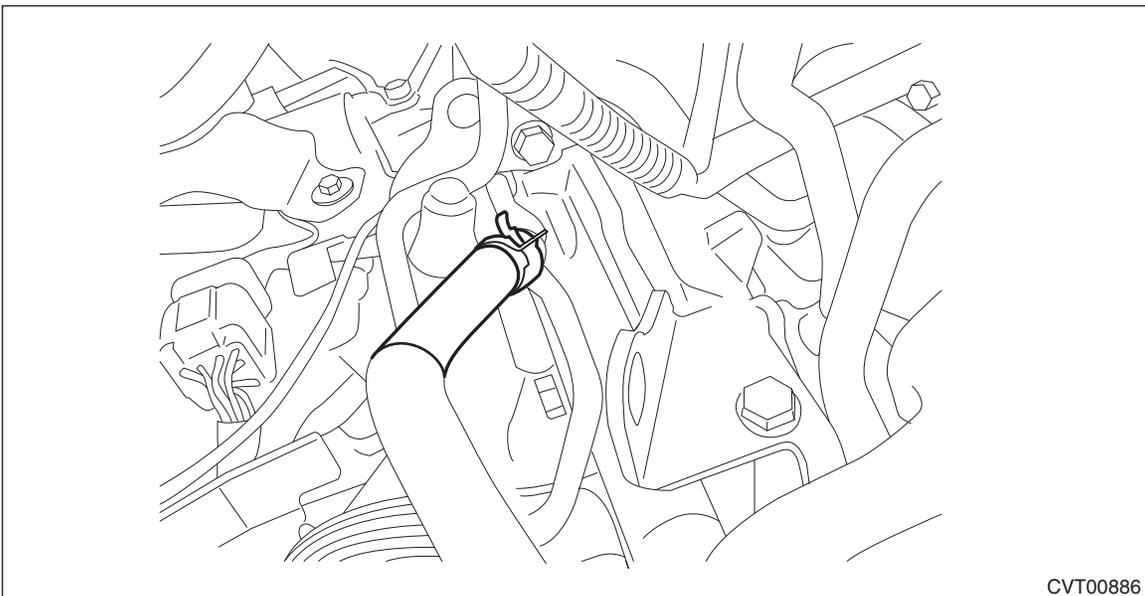
CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

23 N·m (2.3 kgf·m, 17.0 ft·lb)



- 6) Replace the CVTF cooler hose with a new part. <Ref. to CVT(TR580)-180, DISASSEMBLY, CVTF Cooler (With Warmer Function).> <Ref. to CVT(TR580)-180, ASSEMBLY, CVTF Cooler (With Warmer Function).>
- 7) Install the CVTF cooler hose.



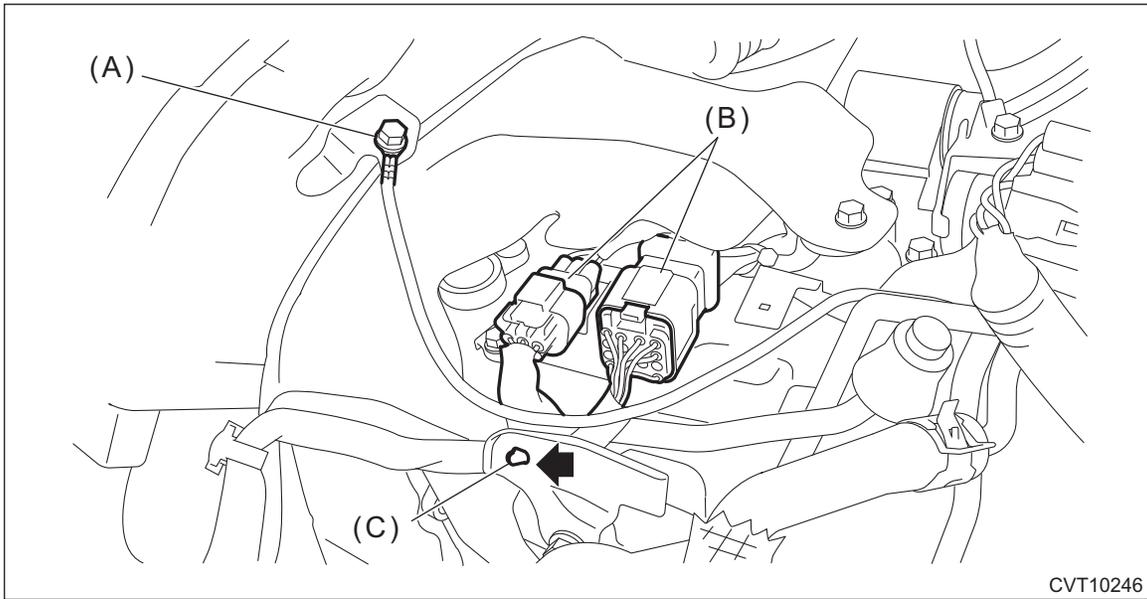
- 8) Install the harness clip, and connect the following transmission radio ground terminal and transmission harness connector.

CVTF Cooler Pipe and Hose

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

13 N·m (1.3 kgf·m, 9.6 ft·lb)

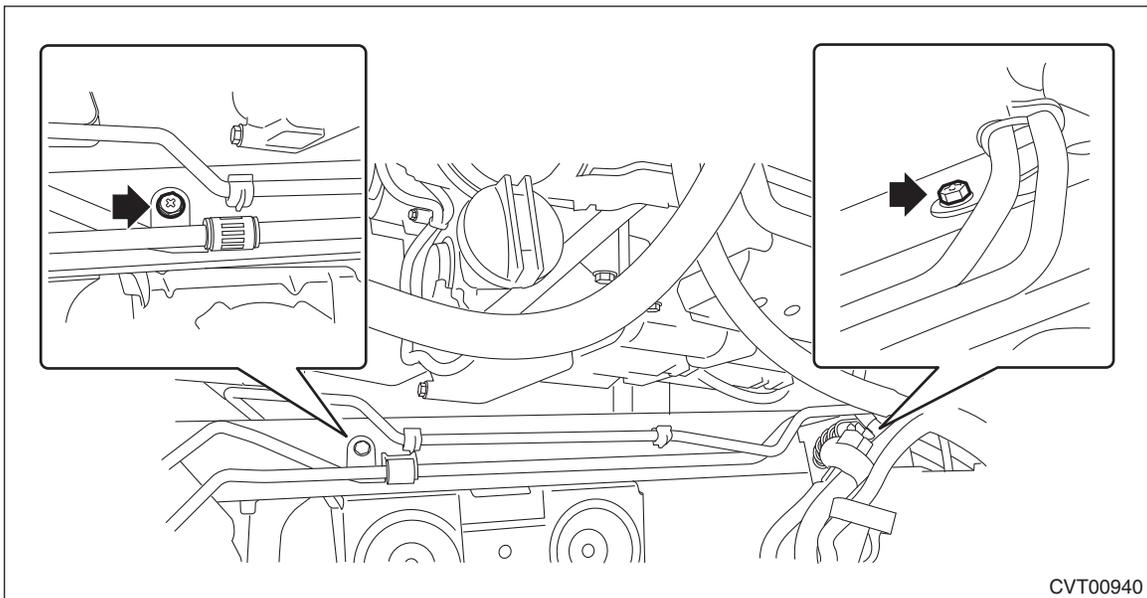


- (A) Transmission radio ground terminal
- (B) Transmission harness connectors
- (C) Harness clip

9) Install the CVTF cooler pipe assembly.

Tightening torque:

7.5 N·m (0.8 kgf·m, 5.5 ft·lb)



10) Install the A/C pipe to clip.

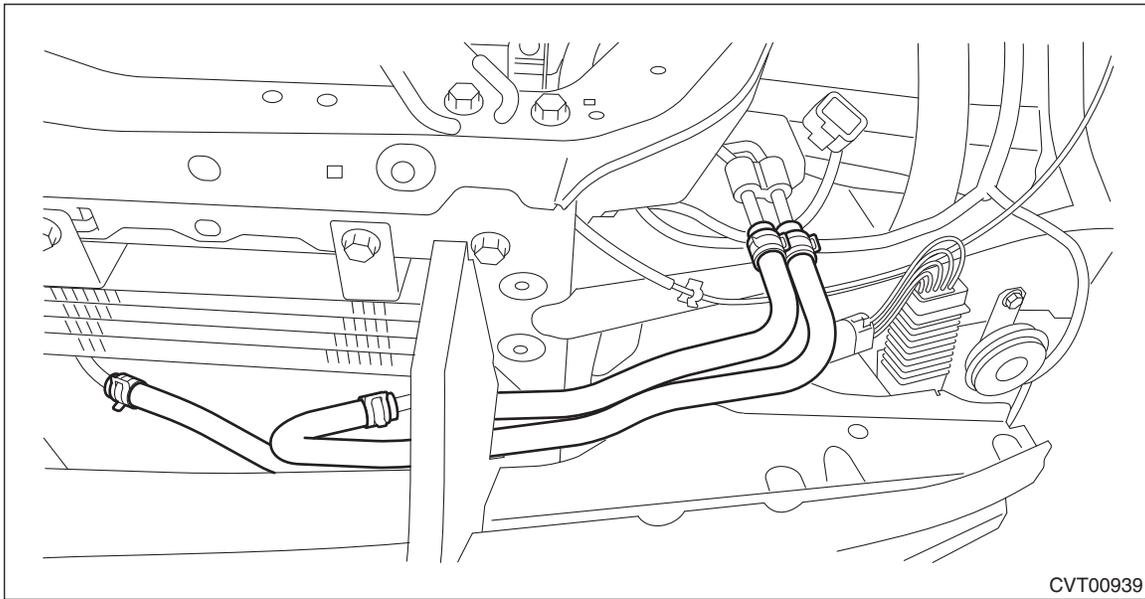
11) Install the CVTF cooler (air cool) inlet hose and the CVTF cooler (air cool) outlet hose.

CVTF Cooler Pipe and Hose

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Use new CVTF cooler (air cool) inlet hose and the CVTF cooler (air cool) outlet hose.



12) Install the headlight assembly LH. <Ref. to LI-38, INSTALLATION, Headlight Assembly.>

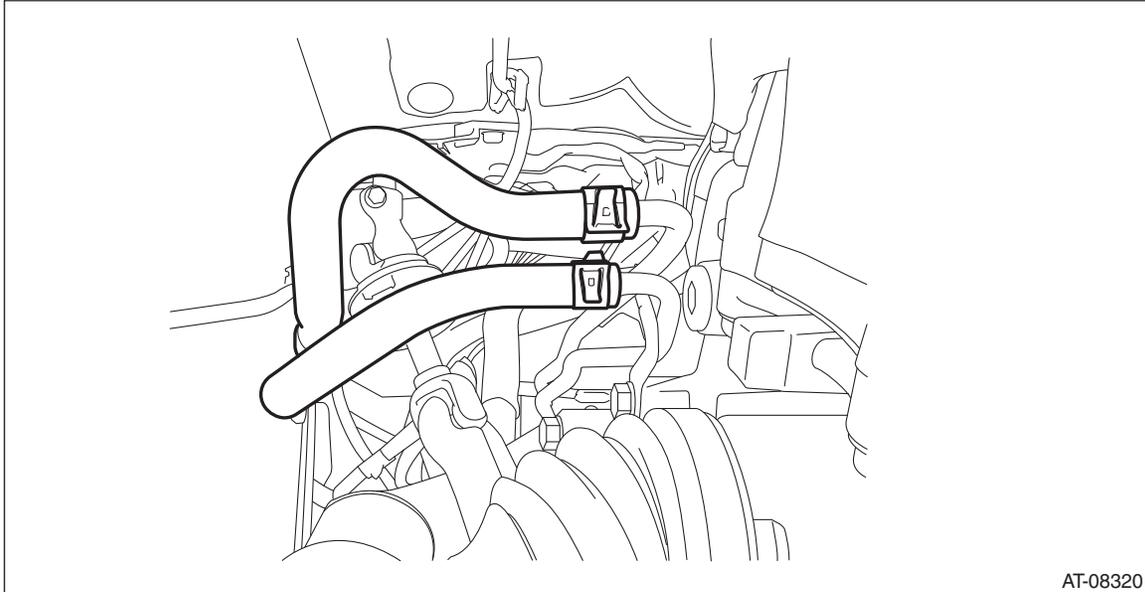
13) Install the front bumper. <Ref. to EI-35, INSTALLATION, Front Bumper.>

14) Lift up the vehicle.

15) Install the CVTF CVT inlet hose and CVTF CVT outlet hose.

NOTE:

Use new CVTF CVT inlet hose and CVTF CVT outlet hose.



16) Lower the vehicle.

17) Install the air intake boot assembly. <Ref. to IN(H4DO)-10, INSTALLATION, Air Intake Boot.>

18) Install the battery box and battery. <Ref. to SC(H4DO)-49, INSTALLATION, Battery.>

19) Adjust the CVTF level and check there is no leakage. <Ref. to CVT(TR580)-39, ADJUSTMENT, CVTF.>

C: INSPECTION

Repair or replace any faulty hoses, pipes, clamps, and washers found in the inspection below.

- Check for CVTF leaks in joints at the transmission, CVTF cooler (air cool), pipes, and hoses.
- Check the clamp for deformation.
- Lightly bend the hose and check for cracks in the surface or other damages.

CVTF Cooler Pipe and Hose

CONTINUOUSLY VARIABLE TRANSMISSION

- Pinch the hose with your fingers and check for poor elasticity. Also check for poor elasticity in the parts where the clamp was installed by pressing with your fingernail.
- Check for peeling, cracks, and deformation at the tip of the hose.

CVTF Cooler (Air Cooling)

CONTINUOUSLY VARIABLE TRANSMISSION

27.CVTF Cooler (Air Cooling)

A: REMOVAL

1) Disconnect the ground cable from battery. <Ref. to RC-3, BATTERY, NOTE, Repair Contents.>

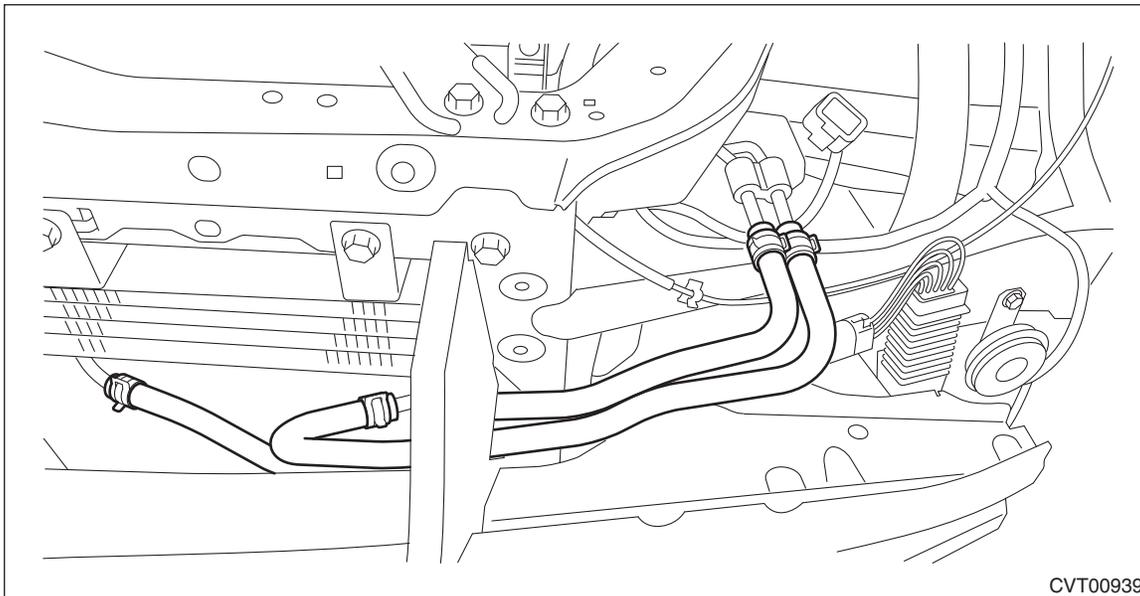
NOTE:

For model with battery sensor, disconnect the ground terminal from battery sensor.

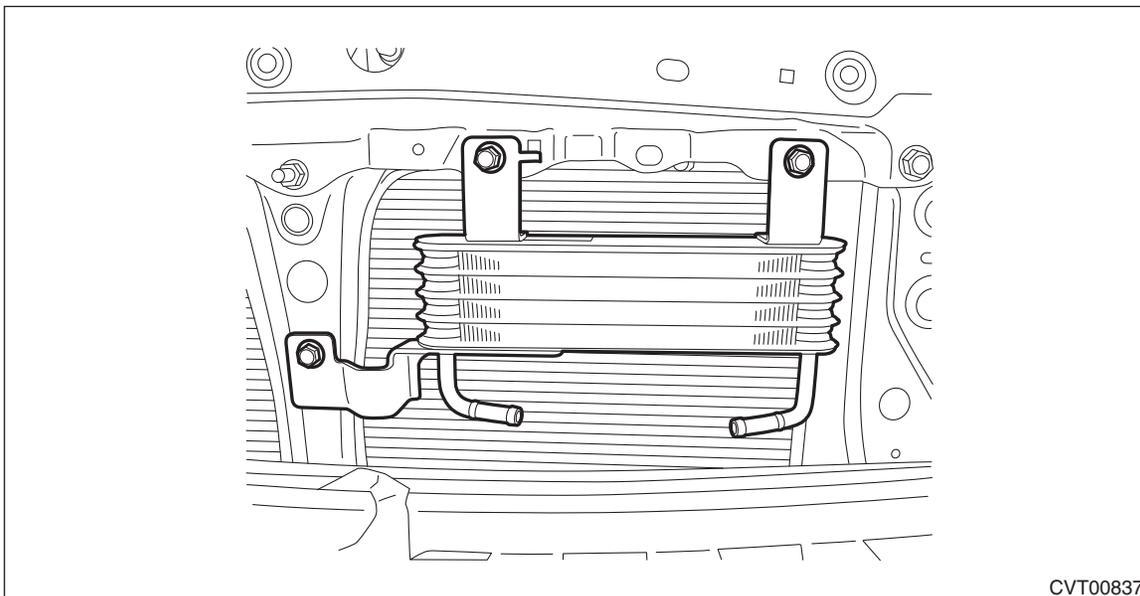
2) Remove the front bumper. <Ref. to EI-32, REMOVAL, Front Bumper.>

3) Remove the headlight assembly LH. <Ref. to LI-37, REMOVAL, Headlight Assembly.>

4) Remove the CVTF cooler (air cool) inlet hose and the CVTF cooler (air cool) outlet hose.



5) Remove the CVTF cooler (air cool).



B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:

12 N·m (1.2 kgf·m, 8.9 ft·lb)

NOTE:

Use new CVTF cooler (air cool) inlet hose and the CVTF cooler (air cool) outlet hose.

C: INSPECTION

Check that the CVTF cooler (air cool) has no deformation, cracks or other damages.

Air Breather Hose

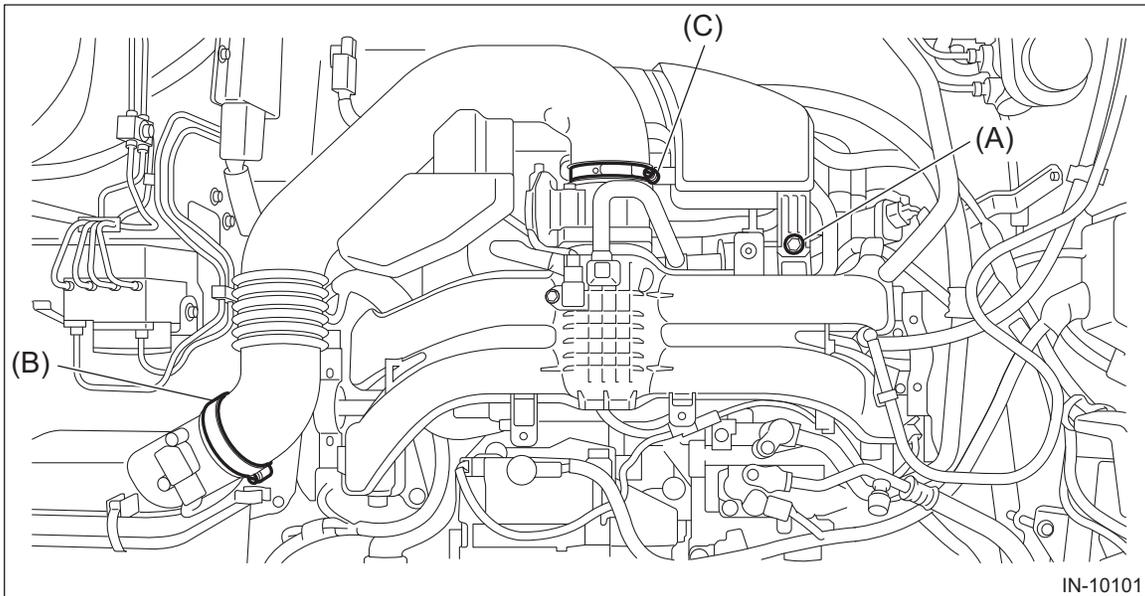
CONTINUOUSLY VARIABLE TRANSMISSION

28. Air Breather Hose

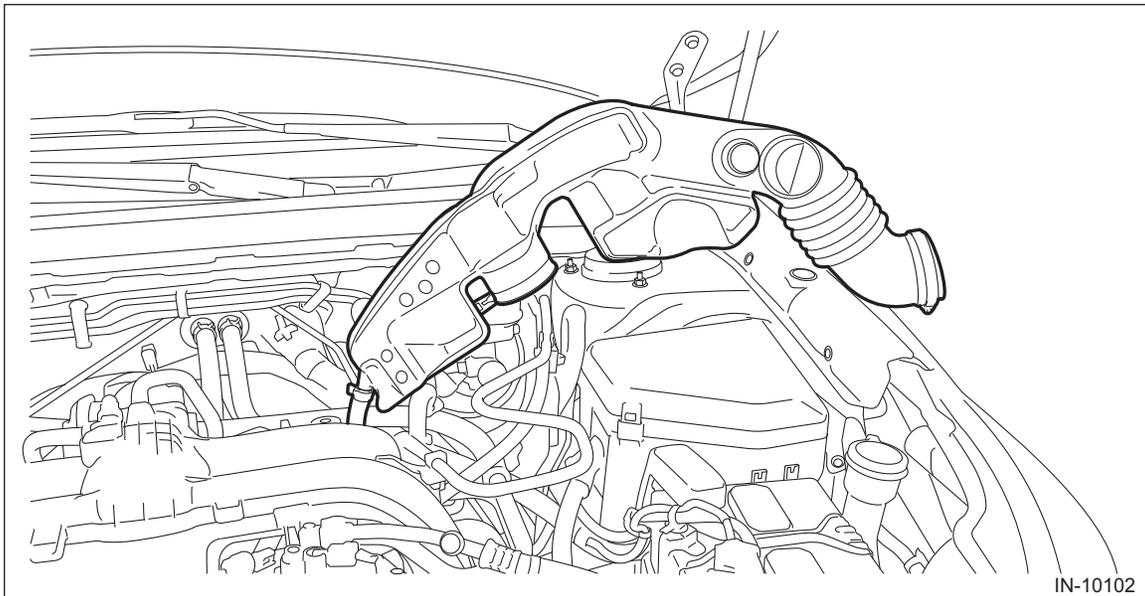
A: REMOVAL

1. FRONT DIFFERENTIAL SIDE

1) Remove the clip (A), and loosen the clamps (B) and (C).



2) Remove the air intake boot assembly, and move it to the left side wheel apron.

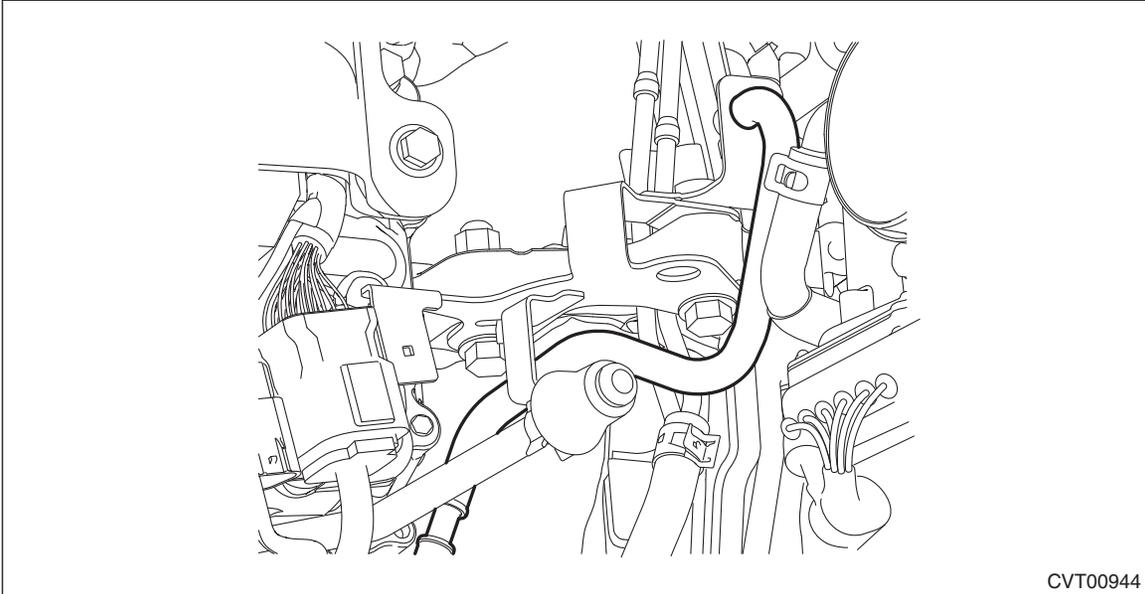


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Air Breather Hose

CONTINUOUSLY VARIABLE TRANSMISSION

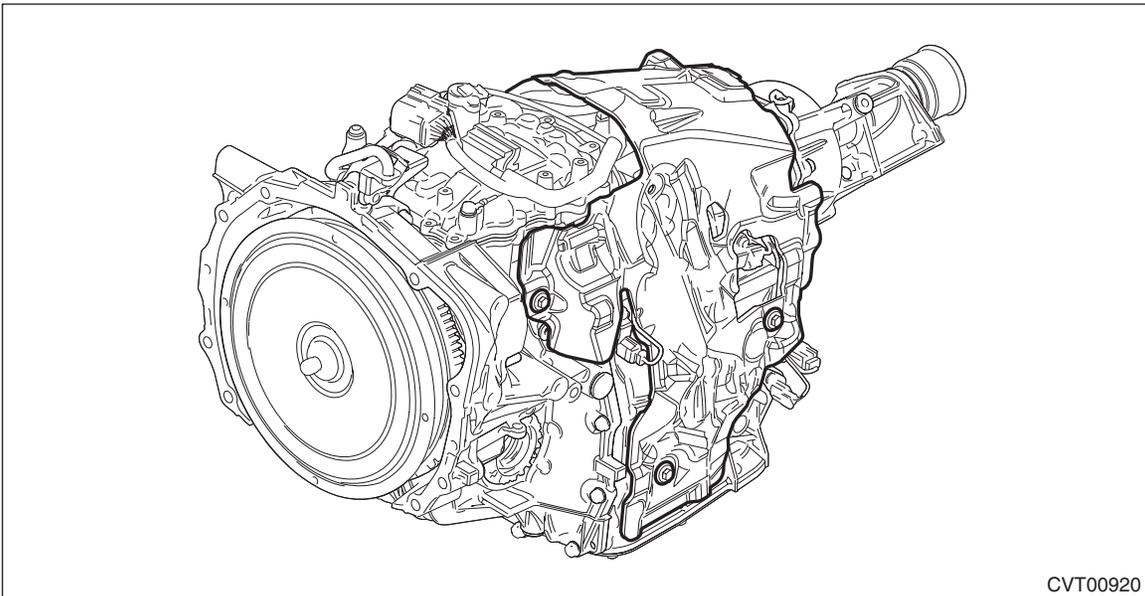
3) Remove the air breather hose.



2. TRANSMISSION CASE SIDE

1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>

2) Remove the transmission case cover.

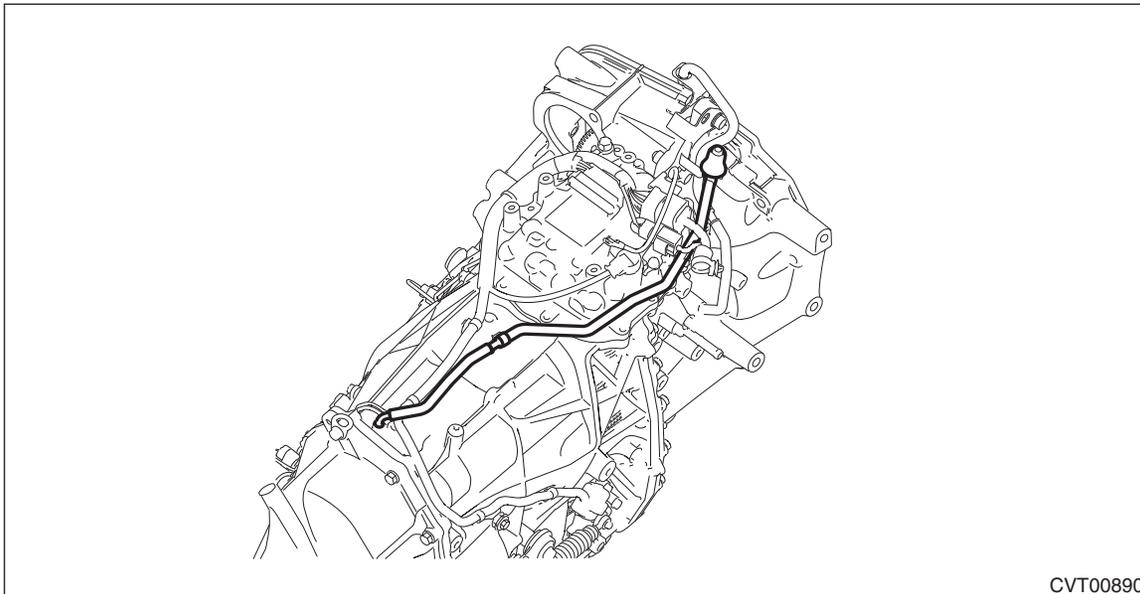


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Air Breather Hose

CONTINUOUSLY VARIABLE TRANSMISSION

3) Remove the air breather hose.



CVT00890

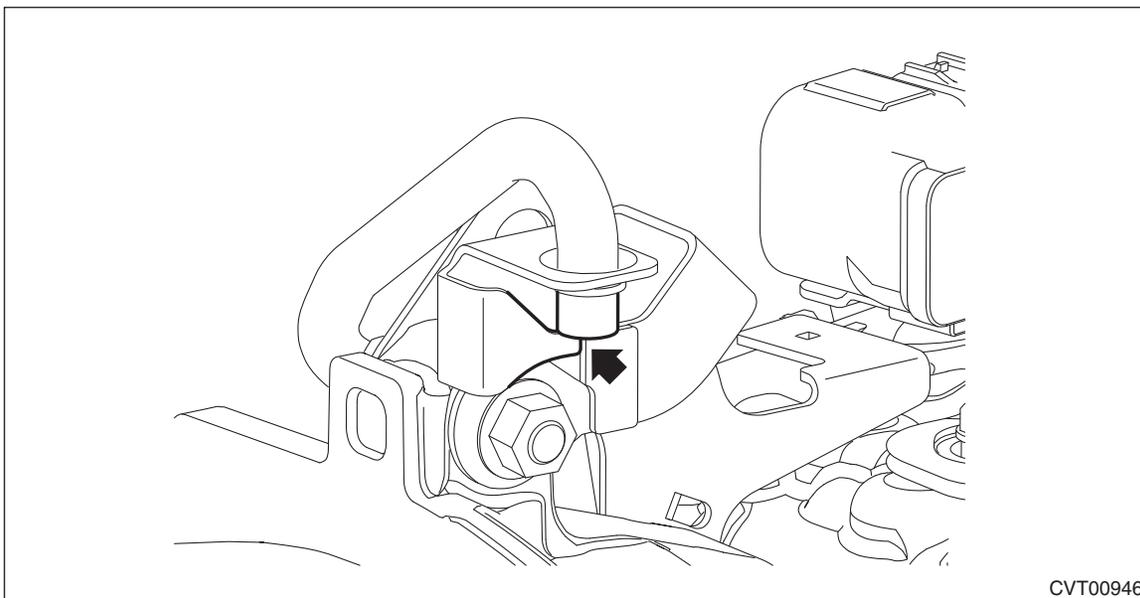
B: INSTALLATION

1. FRONT DIFFERENTIAL SIDE

1) Install the air breather hose.

NOTE:

Securely insert the air breather hose until the hose end contacts the catch of the transmission hanger.



CVT00946

2) Install the air intake boot assembly. <Ref. to IN(H4DO)-10, INSTALLATION, Air Intake Boot.>

2. TRANSMISSION CASE SIDE

1) Install the air breather hose.

2) Install the transmission case cover.

Tightening torque:

8 N·m (0.8 kgf·m, 5.9 ft·lb)

3) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: INSPECTION

Check the hose for peeling, crack or clogging.

Drive Plate

CONTINUOUSLY VARIABLE TRANSMISSION

29. Drive Plate

A: REMOVAL

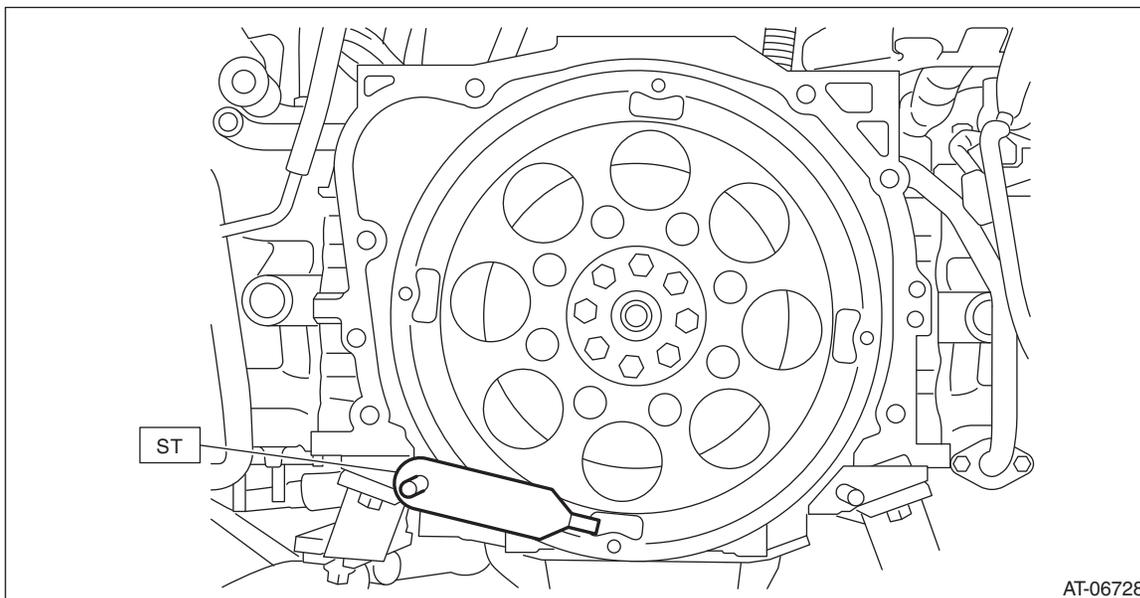
1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>

2) Set the ST.

NOTE:

Set the ST to the drive plate referring to the illustration.

ST 498497300 CRANKSHAFT STOPPER



3) Remove the drive plate and reinforcement drive plate.

B: INSTALLATION

1) Temporarily install the drive plate and reinforcement drive plate.

NOTE:

Align the knock pin hole of the crankshaft position sensor plate to the knock pin of the crankshaft to secure the knock pin.

2) Set the ST.

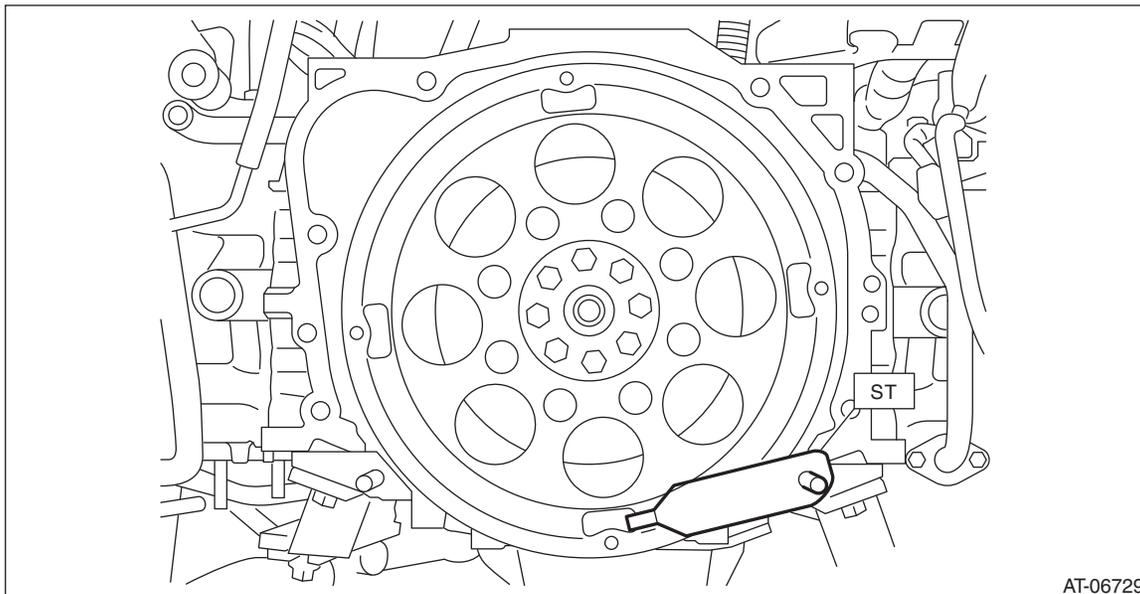
Drive Plate

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Set the ST to the drive plate referring to the illustration.

ST 498497300 CRANKSHAFT STOPPER



3) Tighten the drive plate mounting bolt in two stages.

(1) Tighten the drive plate mounting bolt.

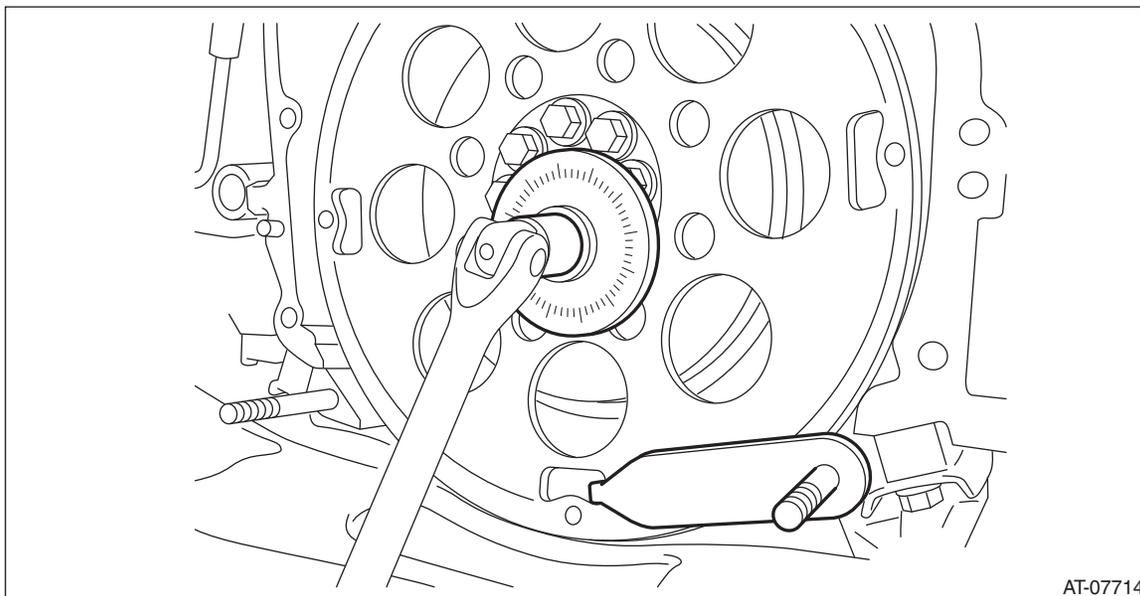
Tightening torque:

30 N·m (3.1 kgf·m, 22.1 ft·lb)

(2) While checking the tightening angle with the angle gauge, tighten the drive plate mounting bolts to the specified angle.

Tightening angle:

30° — 35°



4) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: INSPECTION

Check the drive cable for damage.

Torque Converter Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

30. Torque Converter Assembly

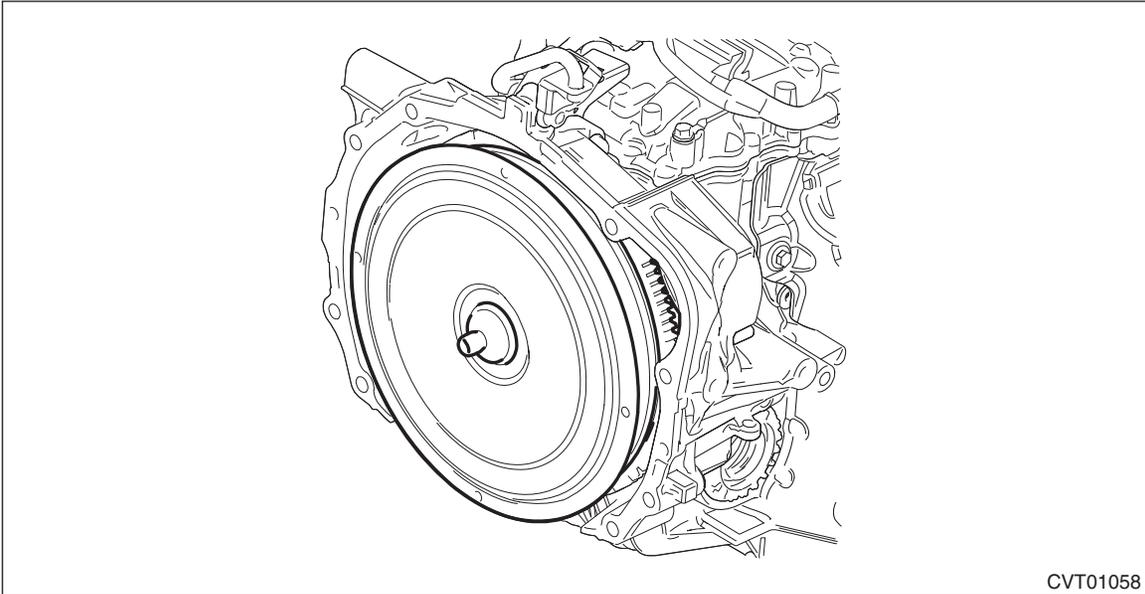
A: REMOVAL

1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>

2) Pull out the torque converter assembly horizontally.

CAUTION:

Do not scratch the inside of engaging parts.



3) Remove the O-ring from the input shaft.

B: INSTALLATION

1) Install the O-ring to the input shaft.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

2) While holding the torque converter assembly by hand, carefully install it into the torque converter case.

NOTE:

- Apply CVTF to the oil seal lip.
- Do not damage the oil seal and O-ring.

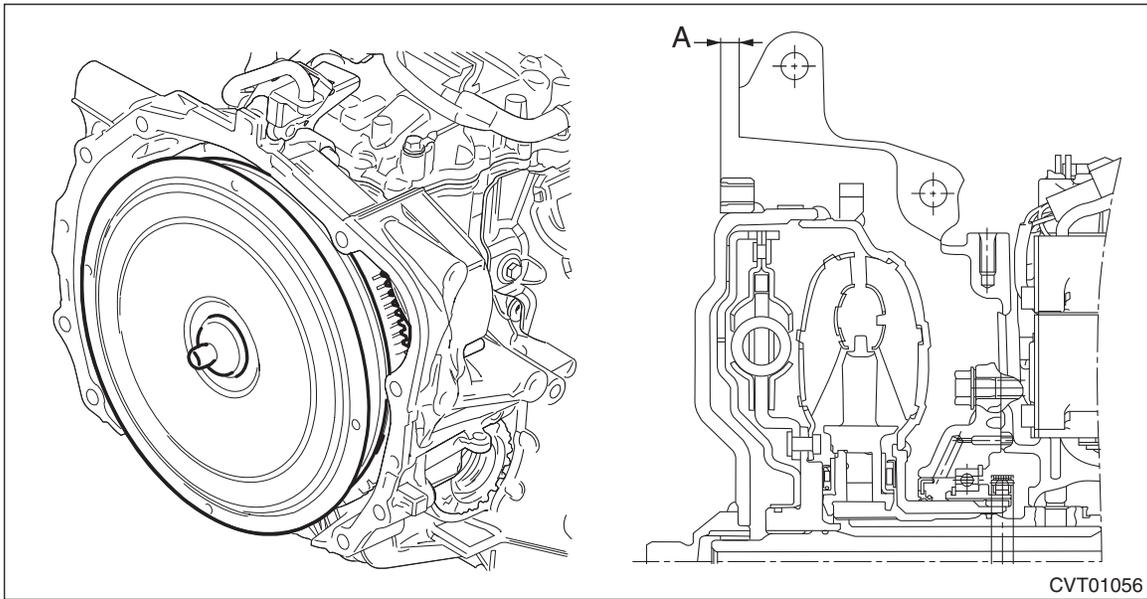
3) Engage the splines while gently rotating the torque converter assembly by hand, and securely insert the assembly.

4) Measure depth "A", from converter case end surface to drive plate contacting surface.

Torque Converter Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Standard (reference):
6.8 mm (0.268 in) or less



5) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: INSPECTION

- Check the protrusion of torque converter center (front boss) is not deformed or damaged.
- Check the ring gear and exterior for break or damage.

Preparation for Overhaul

CONTINUOUSLY VARIABLE TRANSMISSION

31.Preparation for Overhaul

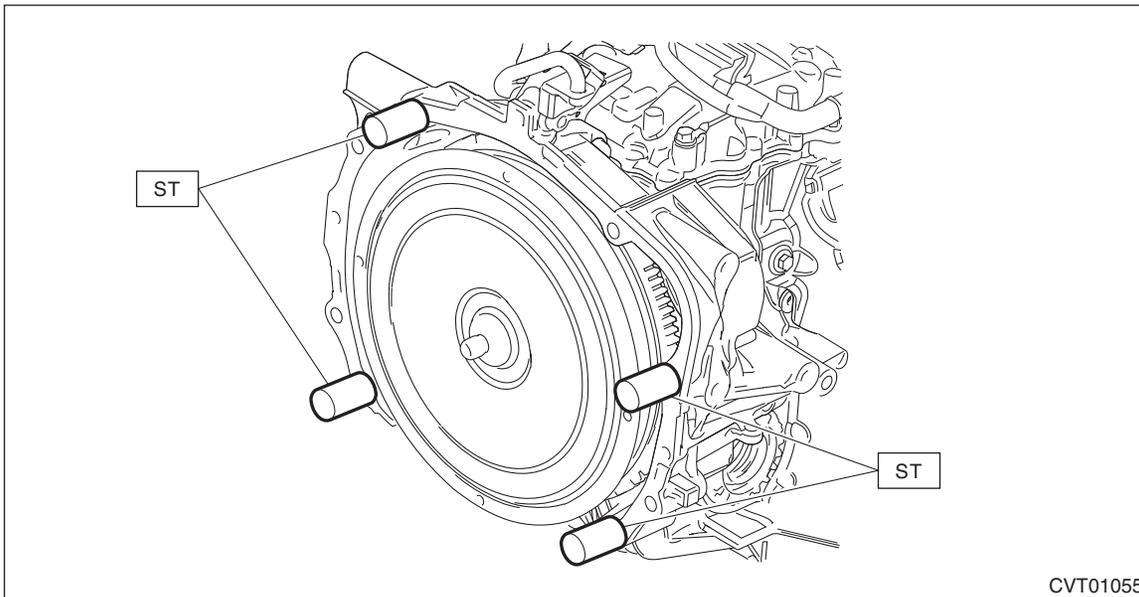
A: GENERAL DESCRIPTION

Before disassembling and assembling the transmission, follow the following procedures to prepare.

B: PROCEDURE

- 1) Clean the transmission exterior.
- 2) Attach the ST on the transmission assembly.

ST 18632AA000 STAND ASSY



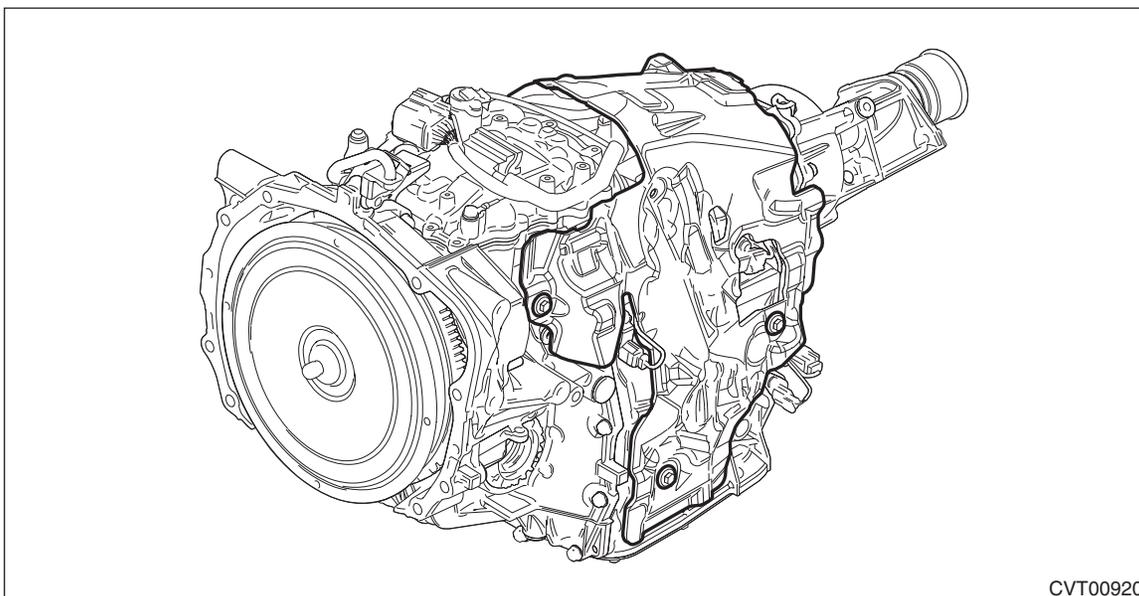
- 3) Remove the torque converter assembly. <Ref. to CVT(TR580)-202, Torque Converter Assembly.>
- 4) Remove the transmission case cover on the transmission upper side.

NOTE:

Install using the following tightening torque.

Tightening torque:

8 N·m (0.8 kgf·m, 5.9 ft·lb)



- 5) Place the transmission assembly on end.

Preparation for Overhaul

CONTINUOUSLY VARIABLE TRANSMISSION

6) When completely overhauling the transmission, refill approx. 10 L (2.6 US qt, 8.8 Imp qt) of CVTF through the transmission right side plug, and install the plug. Then, install the transmission case cover.

CAUTION:

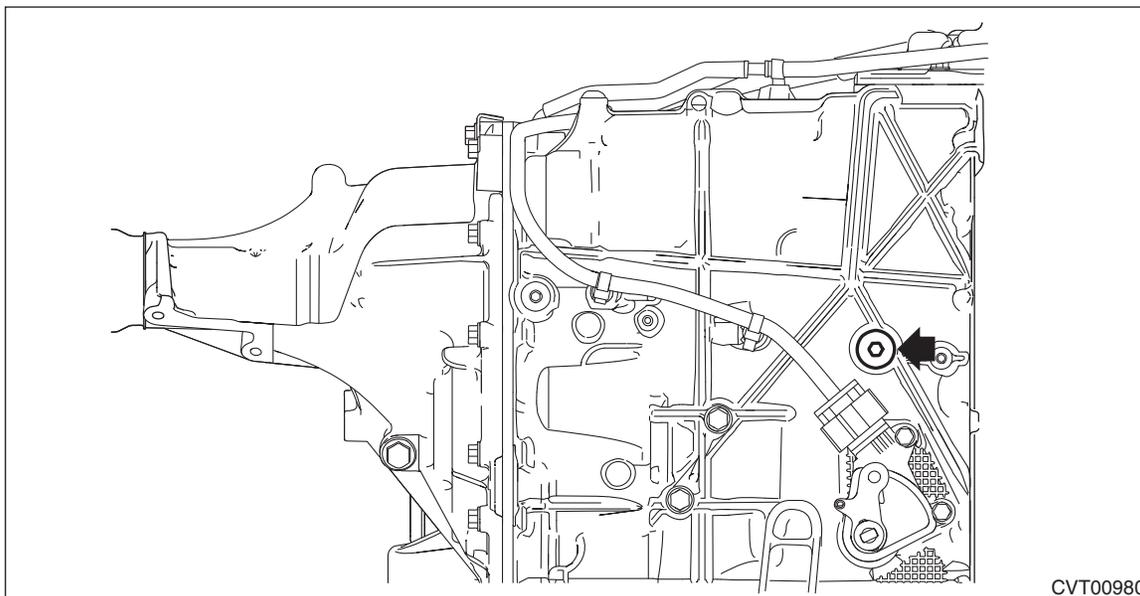
Always use specified CVTF. Using other fluid will cause malfunction. <Ref. to CVT(TR580)-4, HYDRAULIC CONTROL AND LUBRICATION, SPECIFICATION, General Description.>

NOTE:

Use a new gasket.

Tightening torque:

50 N·m (5.1 kgf·m, 36.9 ft·lb)



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Extension Case

CONTINUOUSLY VARIABLE TRANSMISSION

32.Extension Case

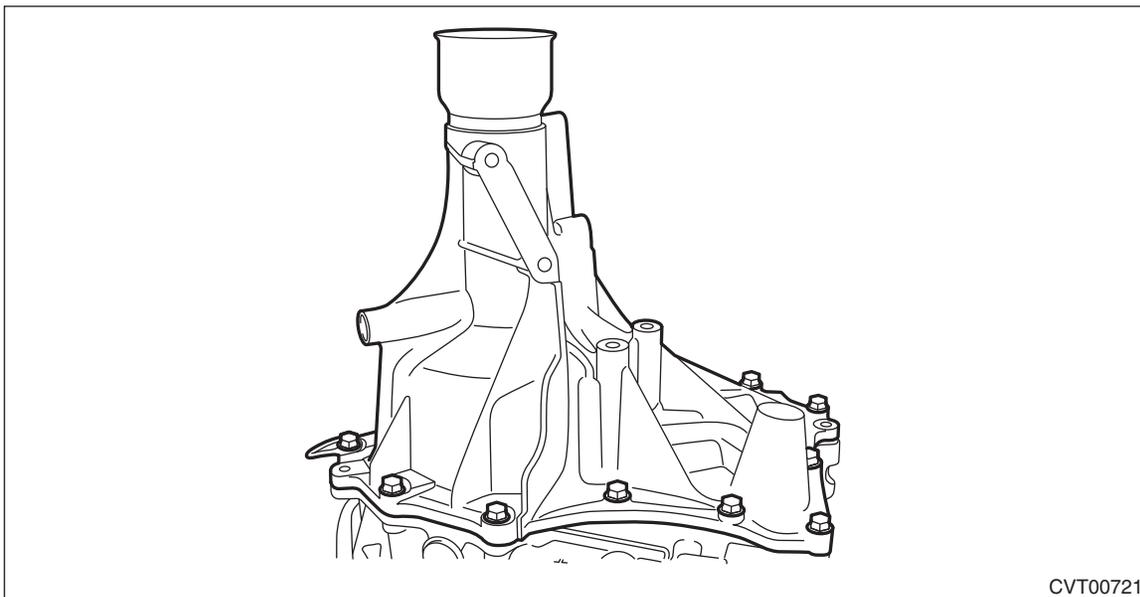
A: REMOVAL

1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>

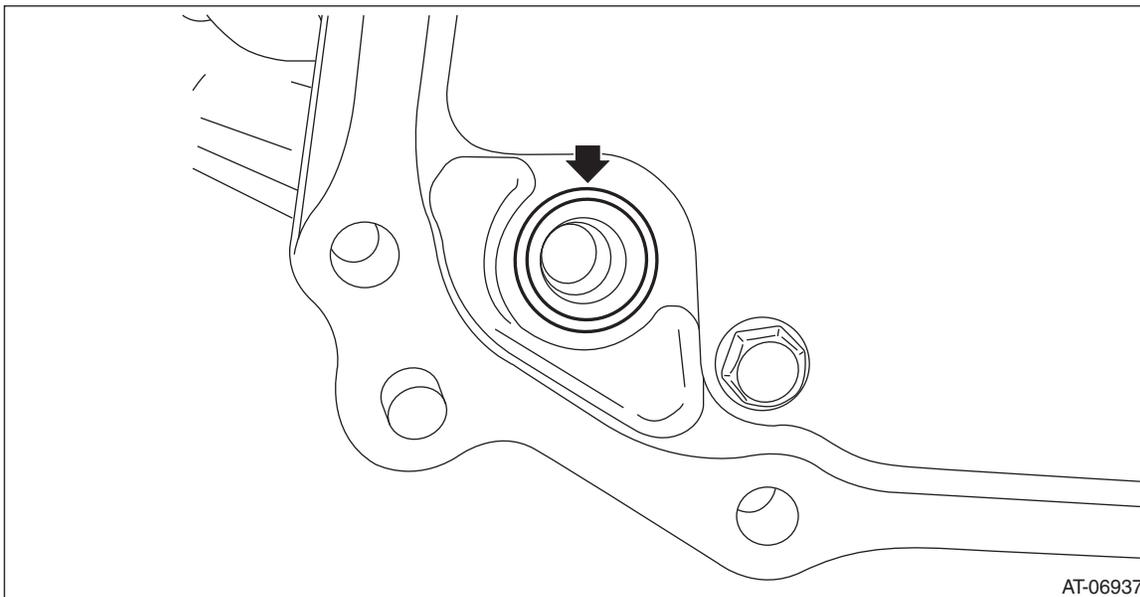
2) Remove the extension case and transmission hanger.

NOTE:

The total number of extension case mounting bolts is 13.



3) Remove the O-rings.



B: INSTALLATION

1) Clean the mating surface of extension case and transmission case.

2) Select the transfer drive gear shim. <Ref. to CVT(TR580)-263, ADJUSTMENT, Reduction Drive Gear.>

3) Select the transfer driven gear shim. <Ref. to CVT(TR580)-221, ADJUSTMENT, Transfer Clutch.>

4) Attach the selected transfer drive gear shim to extension case with vaseline.

5) Attach the selected transfer driven gear shim to extension case with vaseline.

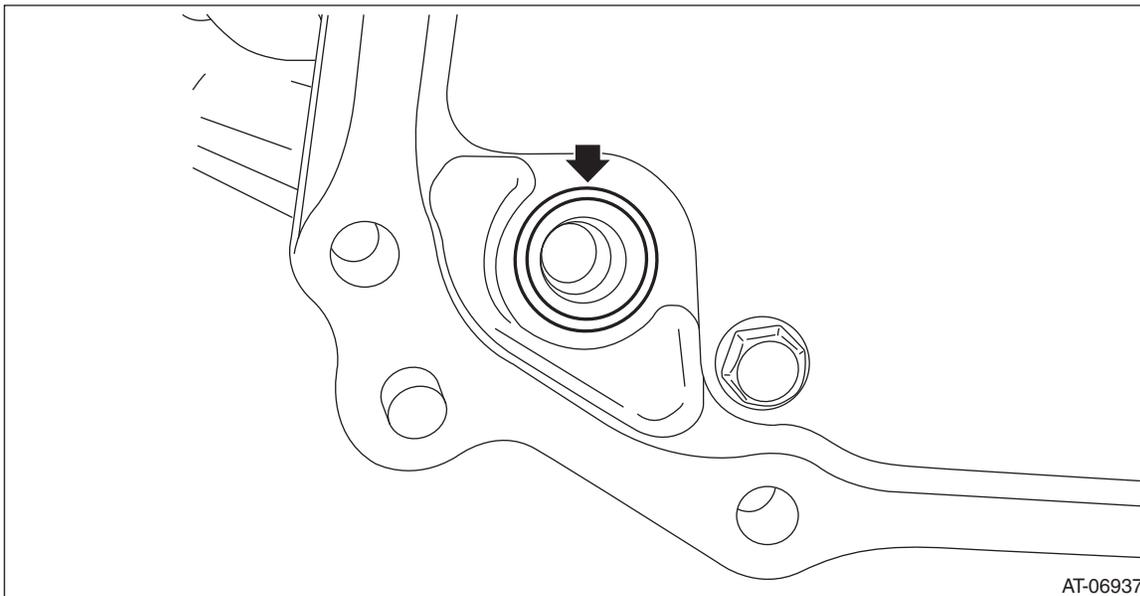
6) Install the O-ring to the transmission case.

Extension Case

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

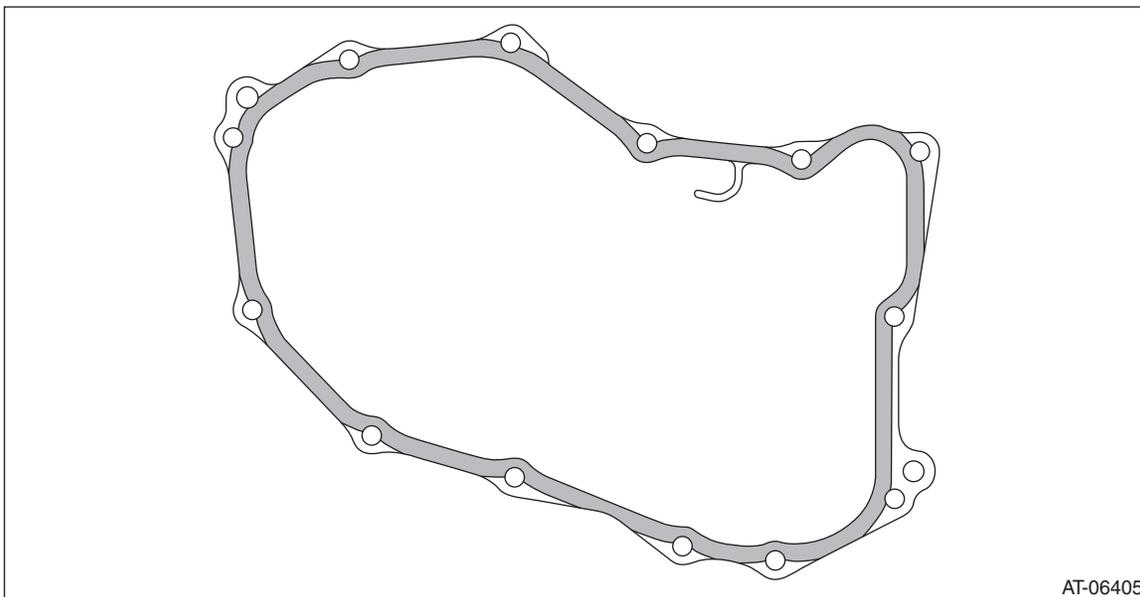
- Use new O-rings.
- Apply CVTF to the O-rings.



7) Apply liquid gasket to extension case seamlessly.

Liquid gasket:

THREE BOND 1215B or equivalent



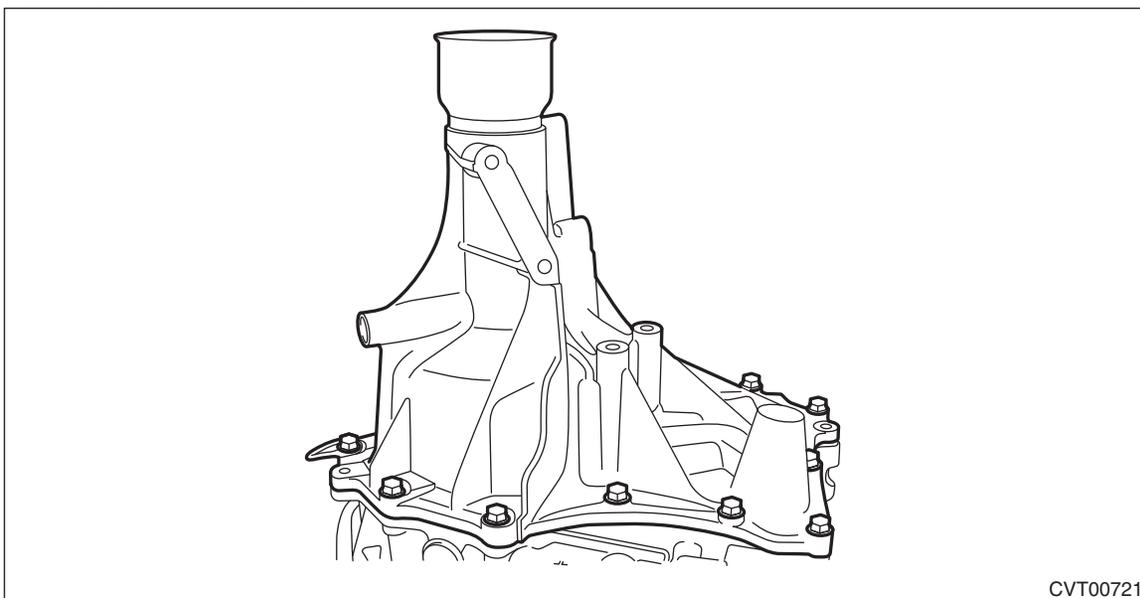
8) Install the extension case to transmission hanger.

Extension Case

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

25 N·m (2.5 kgf·m, 18.4 ft·lb)



9) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: DISASSEMBLY

- 1) Remove the dust cover from extension case.
- 2) Remove the extension case oil seal from the extension case. <Ref. to CVT(TR580)-103, REPLACEMENT, Differential Side Retainer Oil Seal.>
- 3) Remove all plugs.

D: ASSEMBLY

- 1) Press-fit the dust cover into extension case.
- 2) Install the extension case oil seal to extension case. <Ref. to CVT(TR580)-103, REPLACEMENT, Differential Side Retainer Oil Seal.>
- 3) Install all plugs.

NOTE:

- Use a new O-ring or a gasket.
- Apply CVTF to the O-rings.

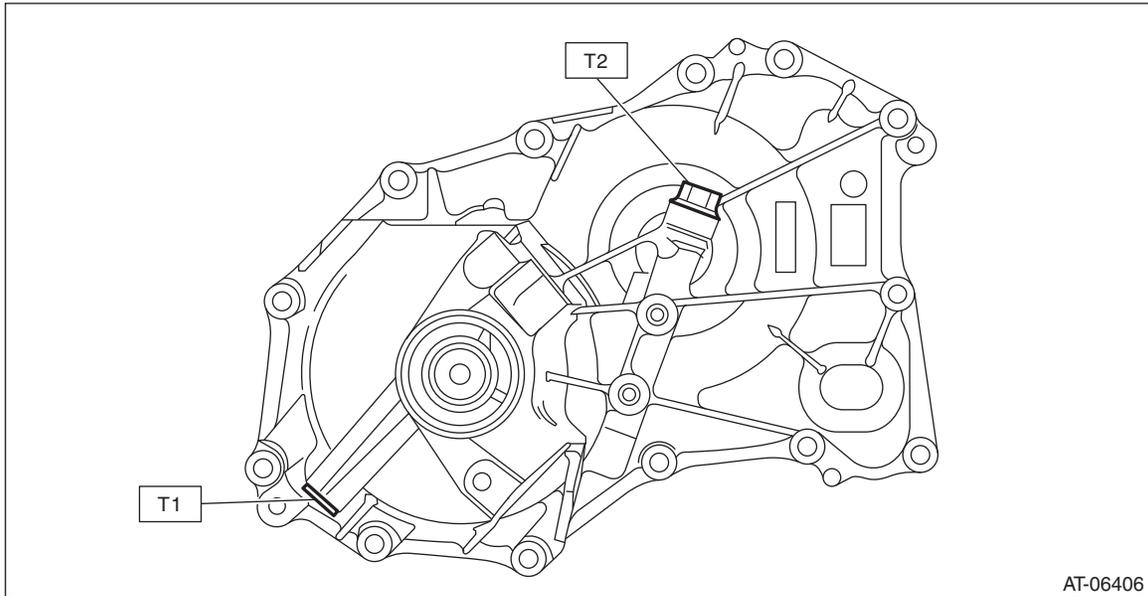
Extension Case

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

T1: 22 N·m (2.2 kgf-m, 16.2 ft-lb)

T2: 35 N·m (3.6 kgf-m, 25.8 ft-lb)



AT-06406

E: INSPECTION

- Check there is no leak of CVTF from the joint between extension case and transmission case.
- Check there is no damage or cracks on the extension case and other parts.

F: ADJUSTMENT

NOTE:

When replacing the extension case, select the transfer drive gear shim and transfer driven gear shim. <Ref. to CVT(TR580)-263, ADJUSTMENT, Reduction Drive Gear.> <Ref. to CVT(TR580)-221, ADJUSTMENT, Transfer Clutch.>

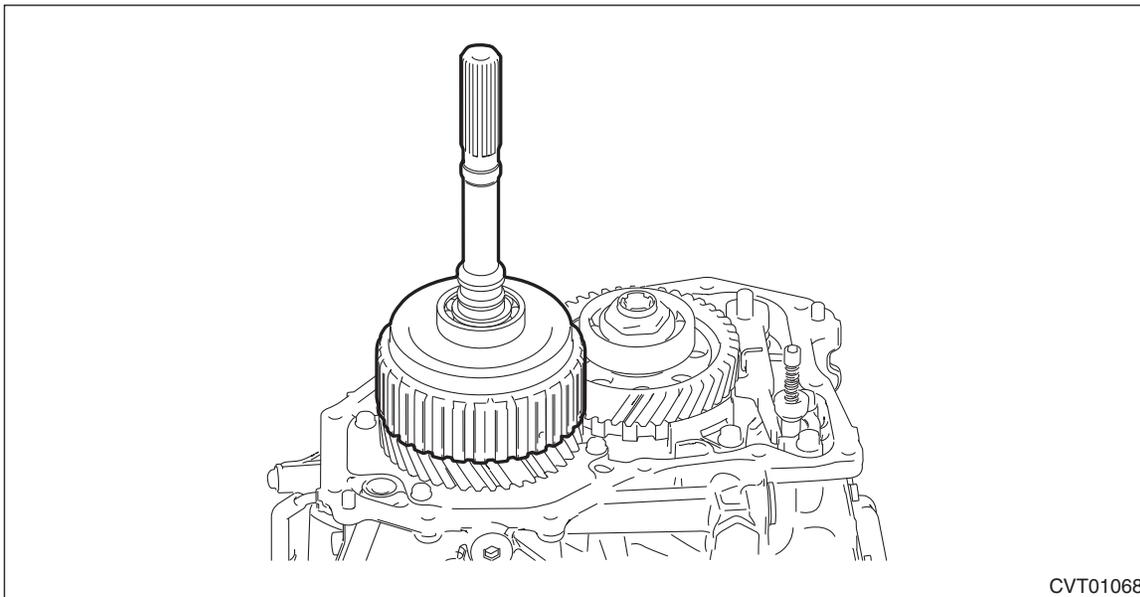
Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

33. Transfer Clutch

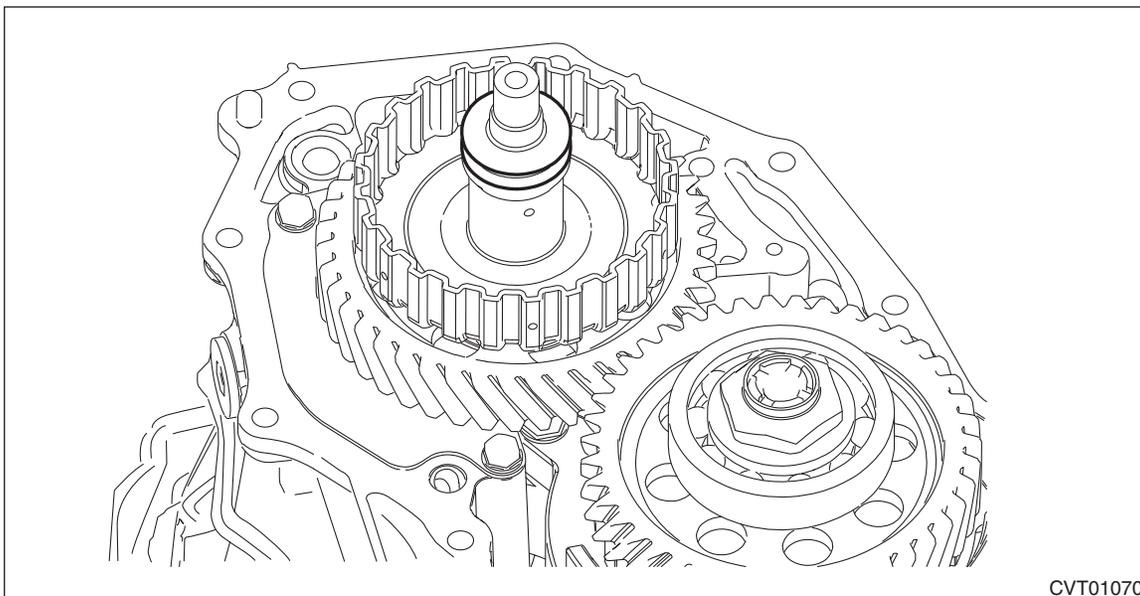
A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 3) Remove the transfer clutch assembly.



CVT01068

- 4) Remove the thrust bearing.

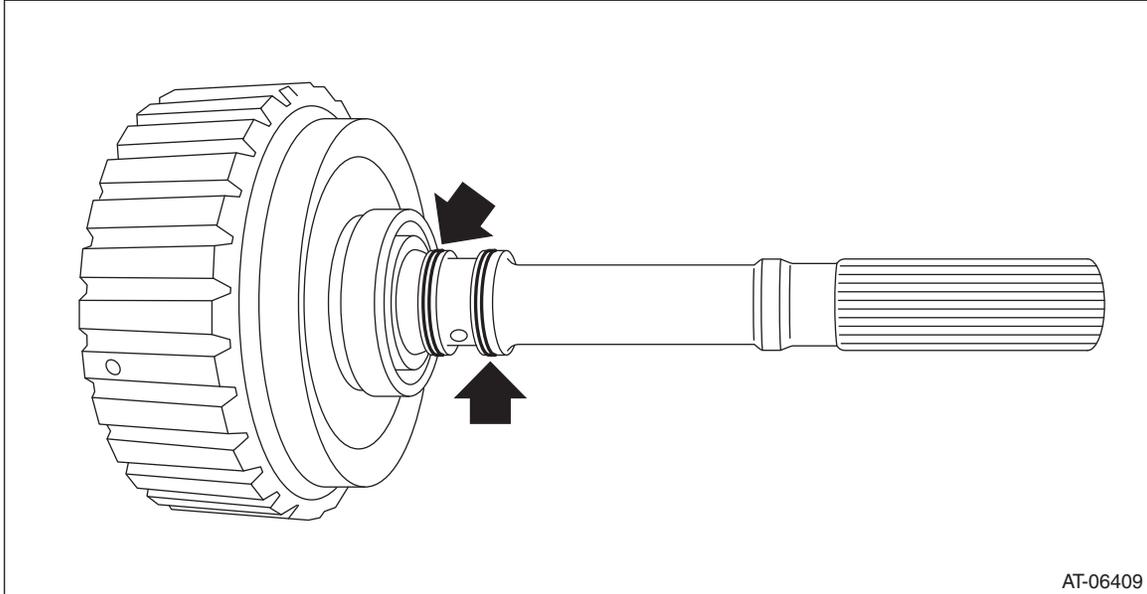


CVT01070

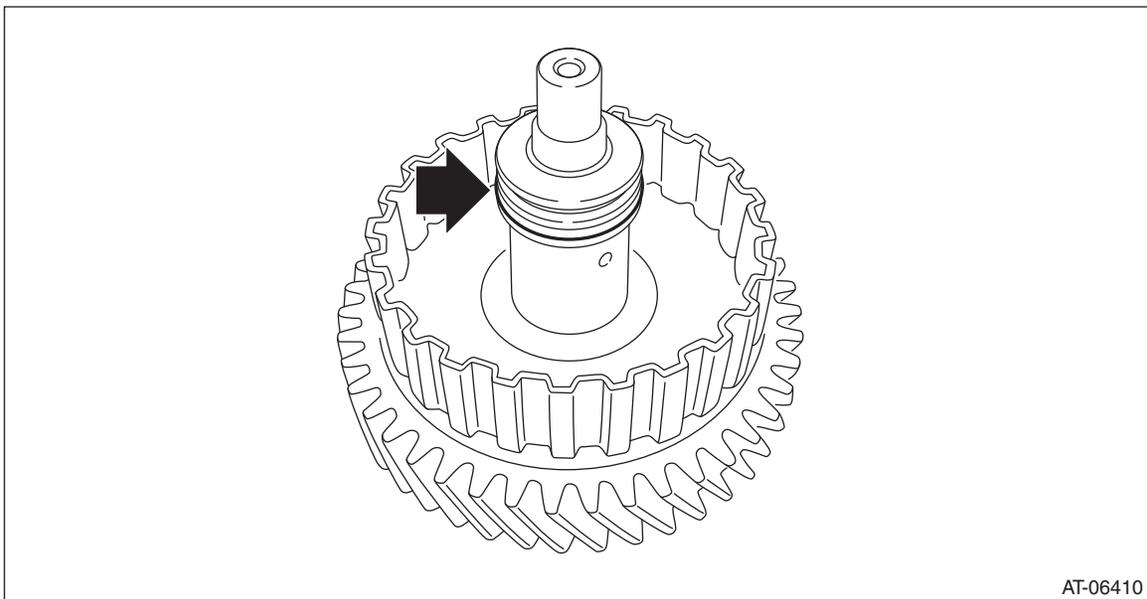
Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

- 5) Remove the seal ring from transfer clutch assembly.



- 6) Remove the seal ring from the transfer driven gear assembly.



B: INSTALLATION

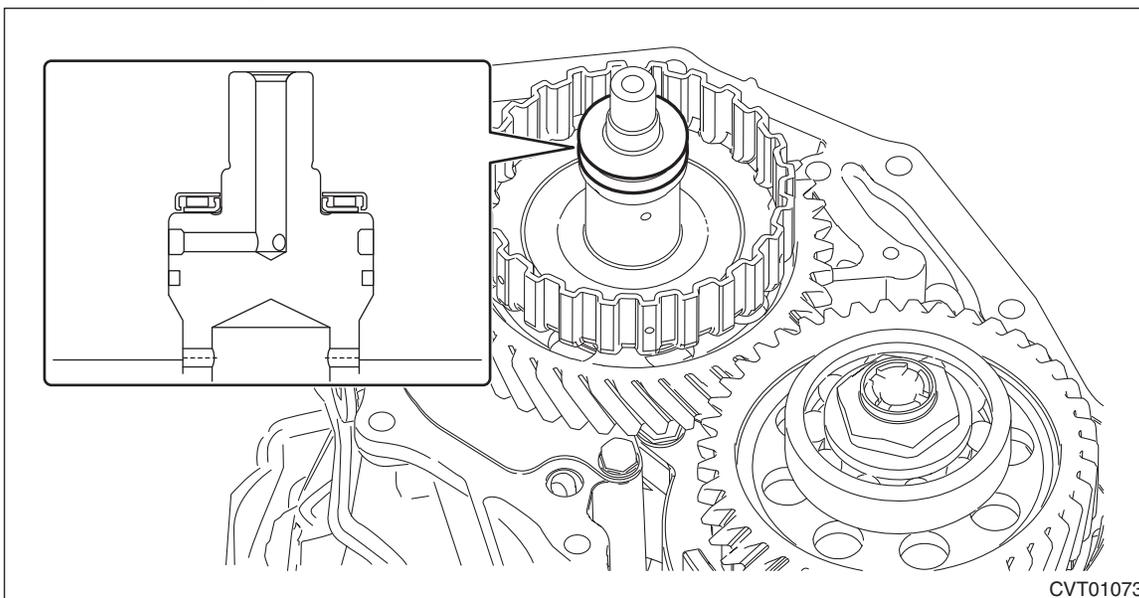
- 1) Install the thrust bearing.

Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

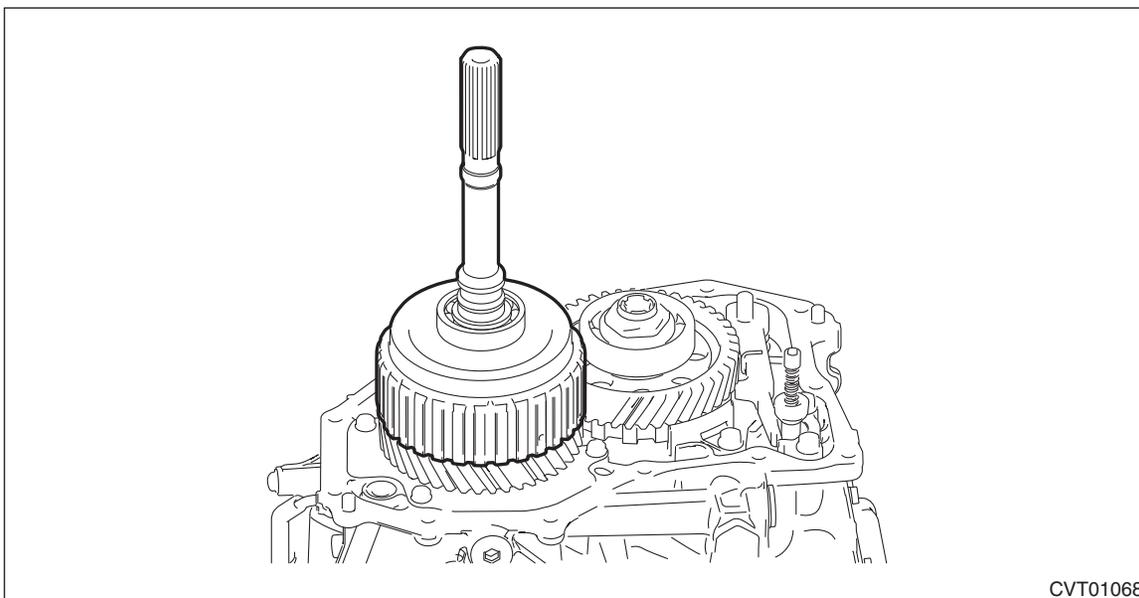
NOTE:

Make sure to install in the right direction.



CVT01073

2) Install the transfer clutch assembly.



CVT01068

3) Select the transfer driven gear shim. <Ref. to CVT(TR580)-221, ADJUSTMENT, Transfer Clutch.>

4) Attach the selected transfer driven gear shim to extension case with vaseline.

5) Remove the transfer clutch assembly.

6) Install the seal ring to the transfer clutch assembly.

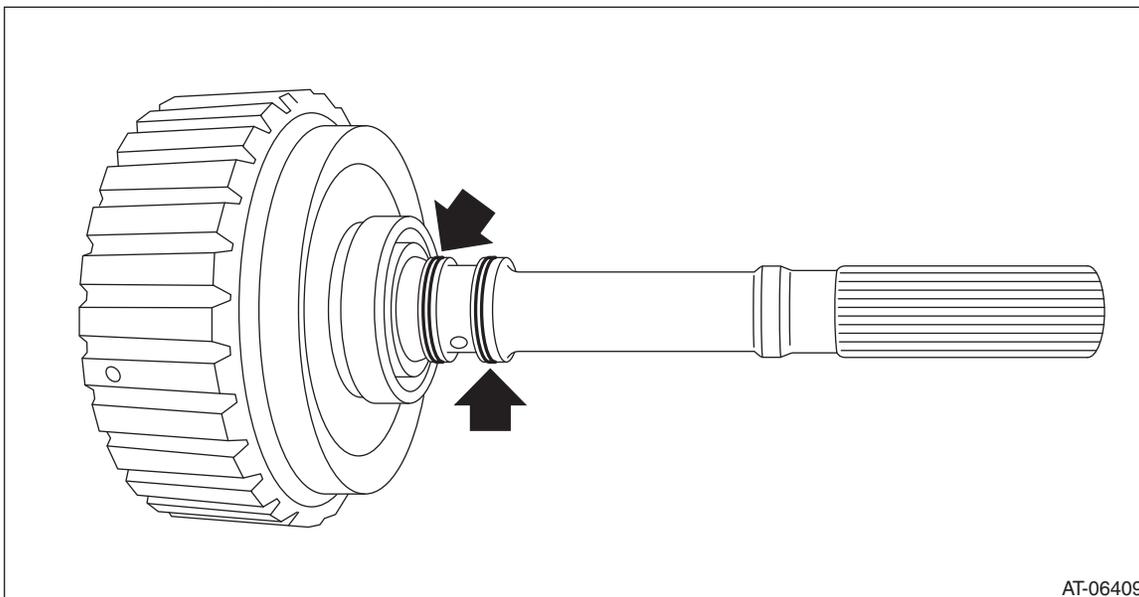
NOTE:

- Use new seal rings.
- When installing the seal rings, do not expand the seal rings too much.

Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

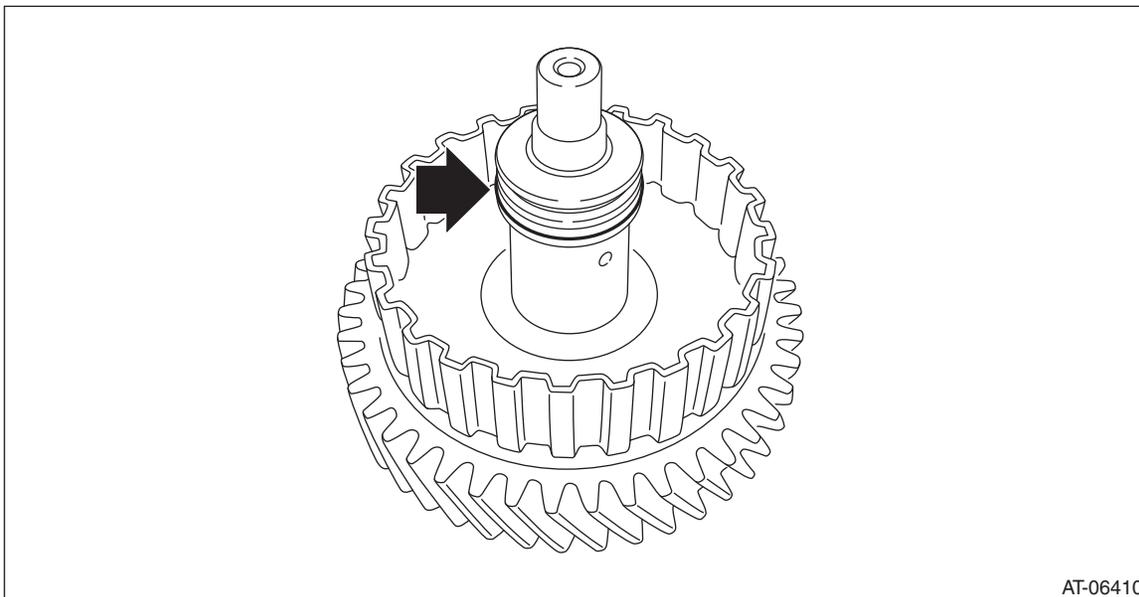
- Apply CVTF to the seal rings.



- 7) Install the seal ring to the transfer driven gear assembly.

NOTE:

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



- 8) Install the transfer clutch assembly.

9) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>

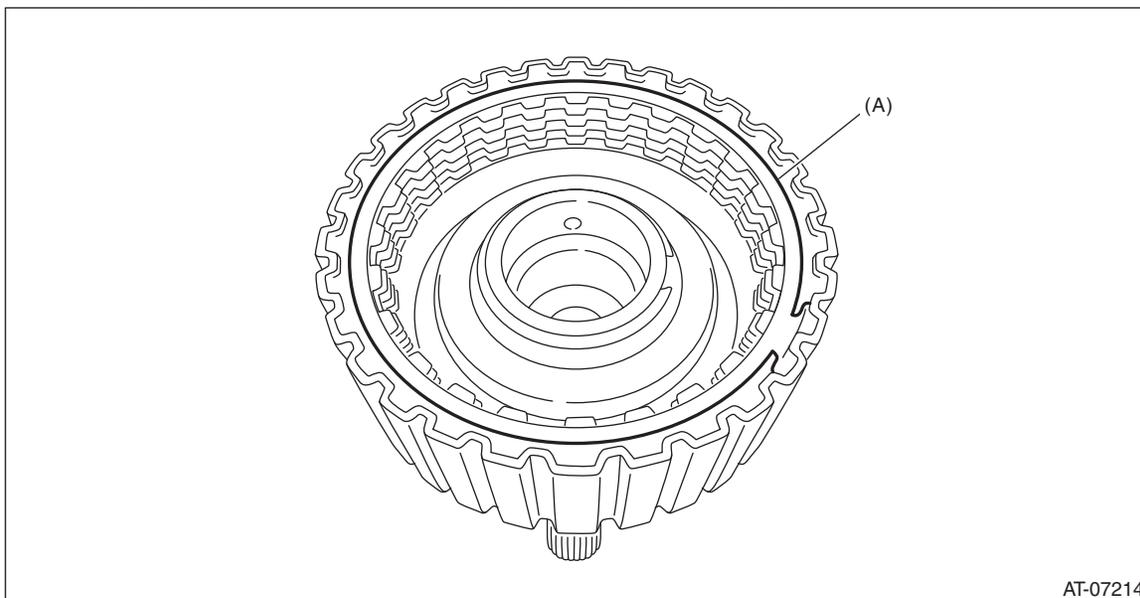
10) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

C: DISASSEMBLY

1) Remove the snap ring, and then remove the pressure plate, drive plate and driven plate.

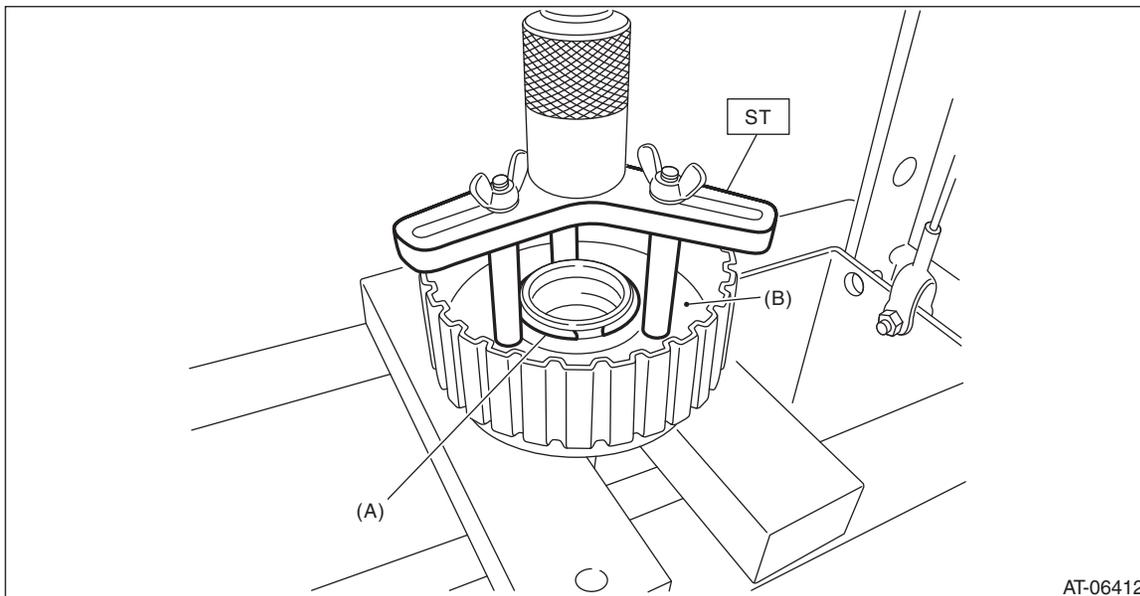


AT-07214

(A) Snap ring

2) Compress the return spring using the ST to remove the snap ring.

ST 18762AA001 COMPRESSOR SPECIAL TOOL



AT-06412

(A) Snap ring

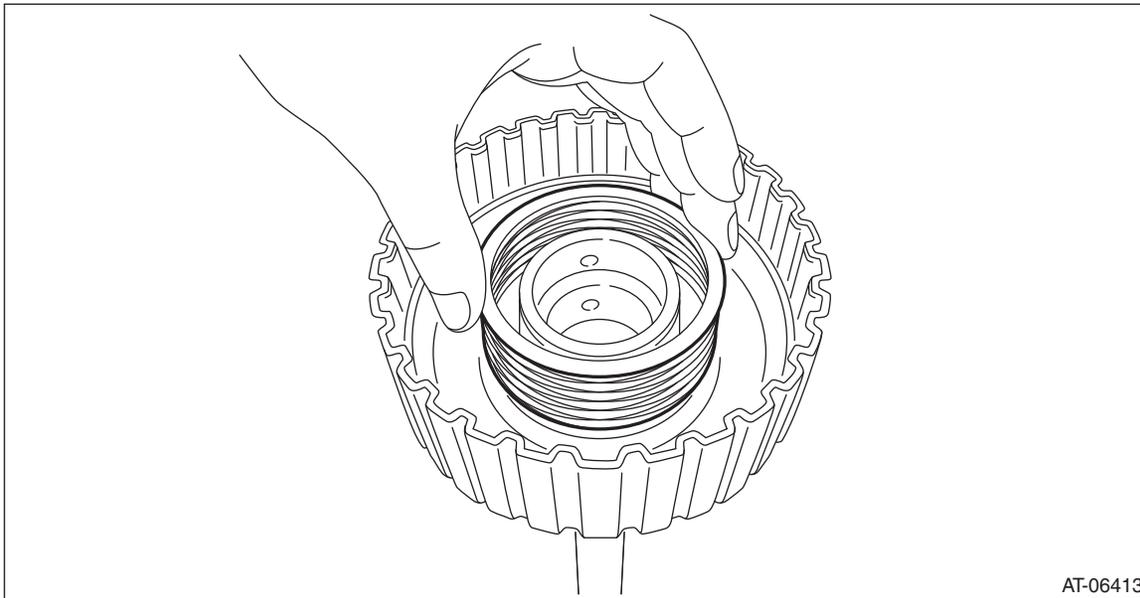
(B) Transfer clutch piston seal

3) Remove the transfer clutch piston seal.

Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

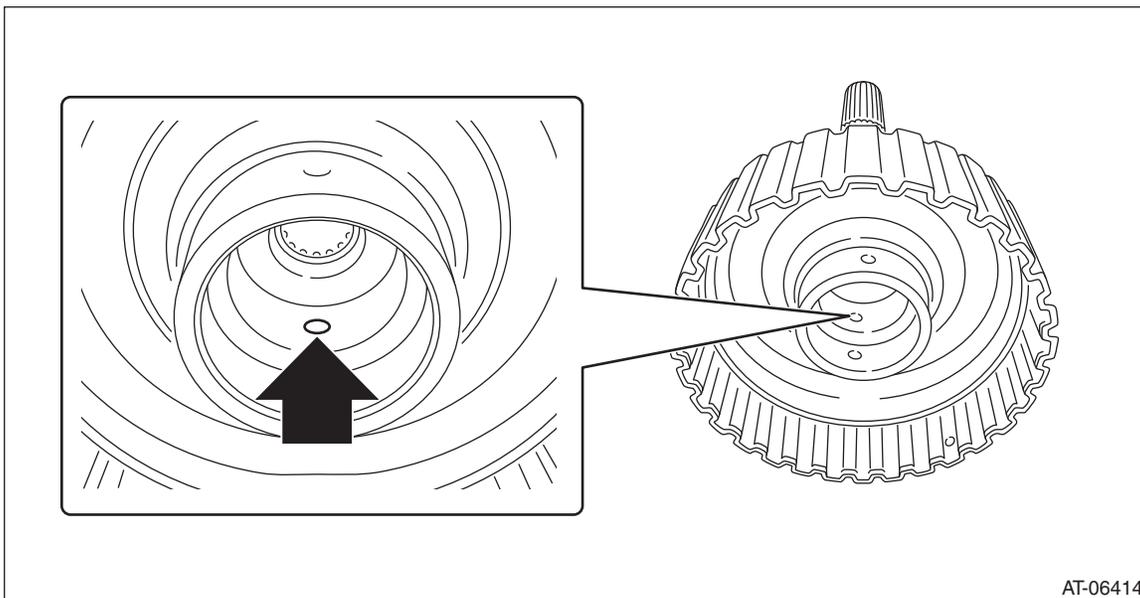
4) Remove the return spring.



5) Remove the transfer clutch piston by blowing compressed air through transfer clutch assembly hole.

NOTE:

Plug the holes through which the compressed air is not blown.

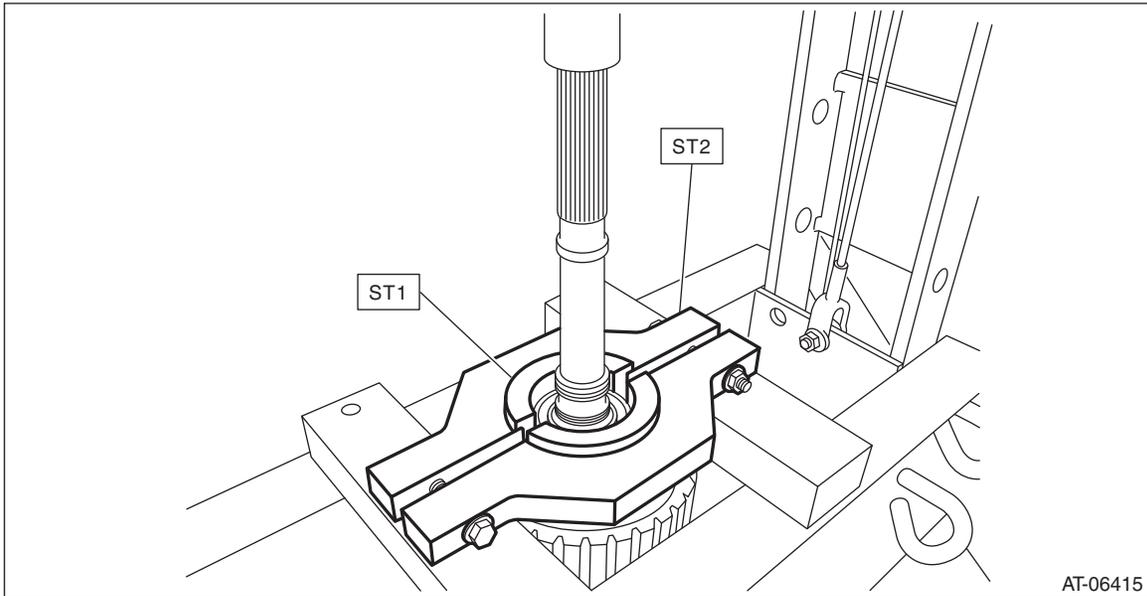


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Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

- 6) Remove the ball bearing using ST.
ST1 18767AA010 BEARING REMOVER
ST2 18723AA000 REMOVER



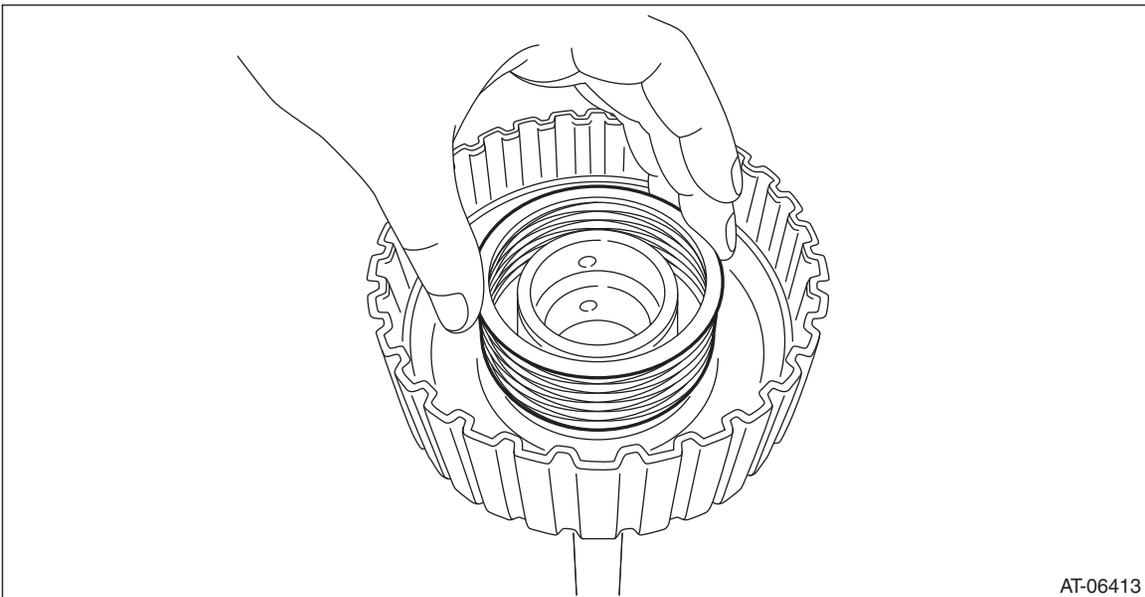
D: ASSEMBLY

- 1) Install the transfer clutch piston.

NOTE:

Apply CVTF to the transfer clutch piston lip.

- 2) Install the return spring.



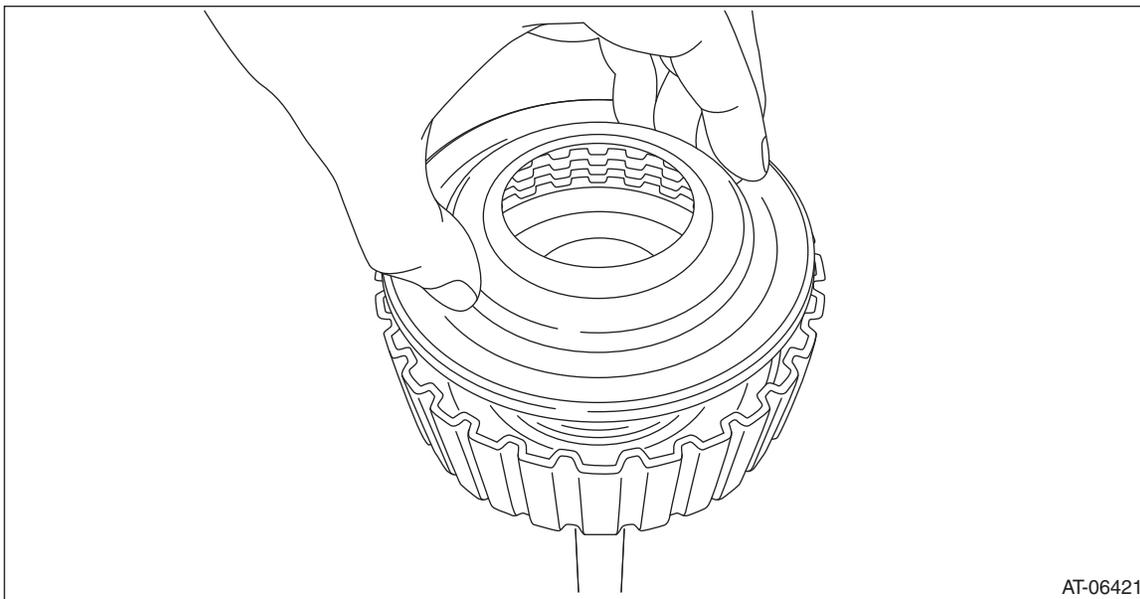
- 3) Install the transfer clutch piston seal.

Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

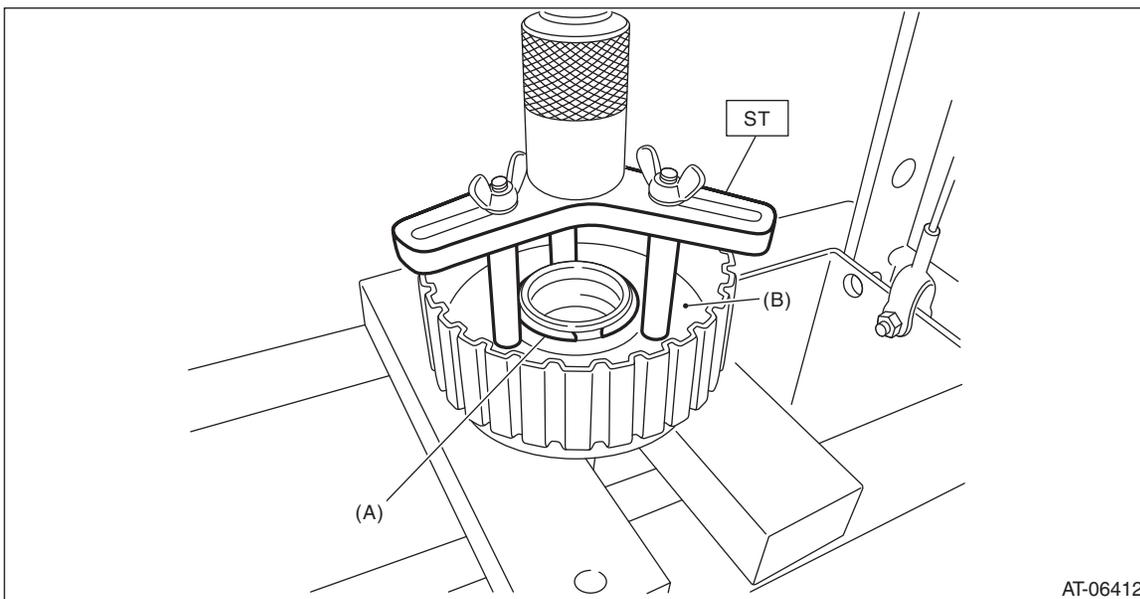
NOTE:

Apply CVTF to the lip section of transfer clutch piston seal.



AT-06421

4) Compress the return spring using the ST to install the snap ring.
ST 18762AA001 COMPRESSOR SPECIAL TOOL



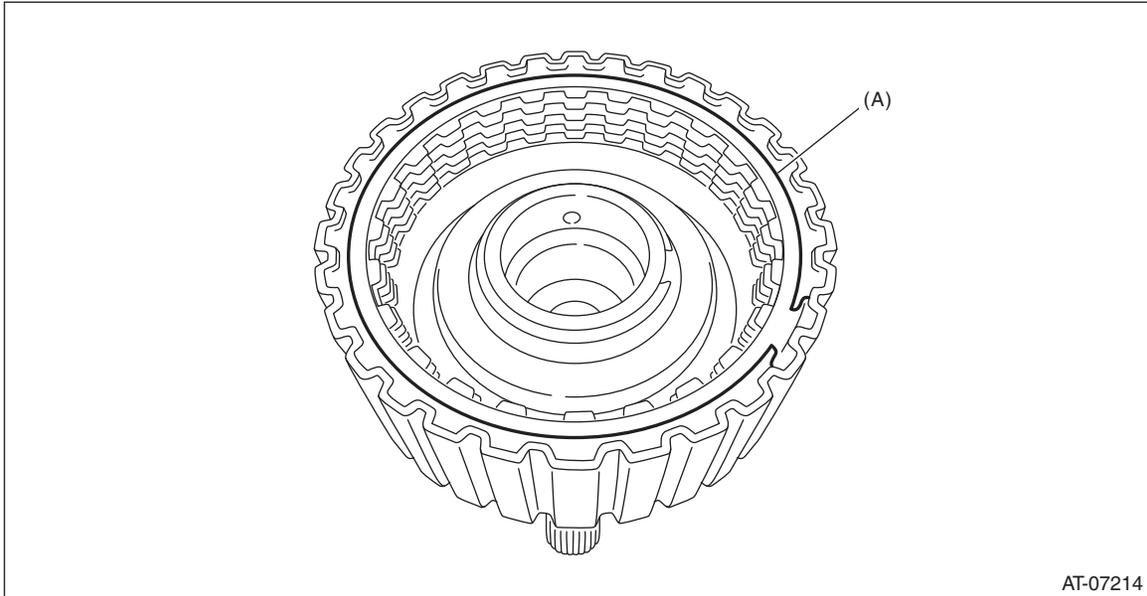
AT-06412

- (A) Snap ring
- (B) Transfer clutch piston seal

Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

5) Install the pressure plate, driven plate, drive plate and snap ring.

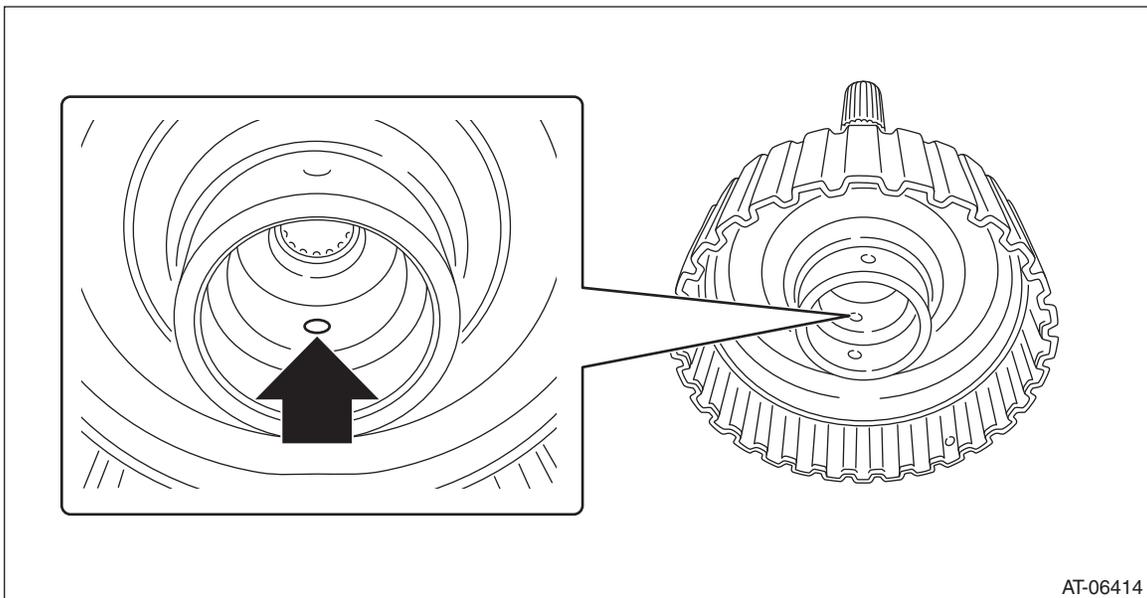


(A) Snap ring

6) Blow compressed air through transfer clutch assembly hole, and check the transfer clutch piston operation.

NOTE:

Plug the holes through which the compressed air is not blown.



7) Before measuring clearance "A", place same thickness shims on both sides to prevent the plate from tilting.

8) When the clearance "A" exceeds the limit for use, select the transfer clutch plate set and pressure plate, and adjust the clearance "A" within the initial specified value.

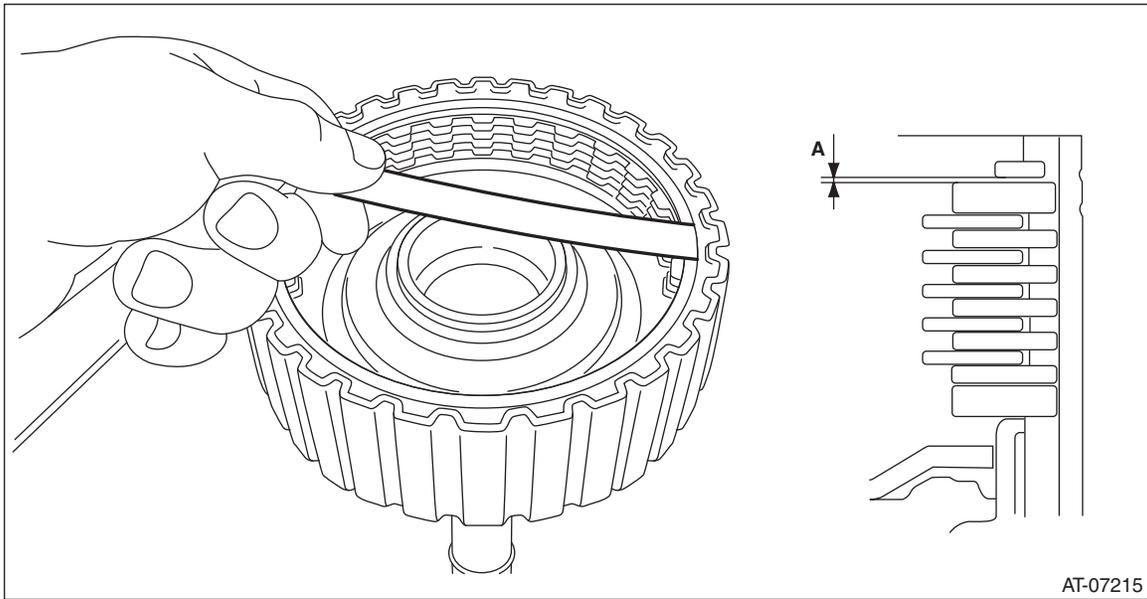
Initial standard:

0.7 — 1.1 mm (0.028 — 0.043 in)

Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

Limit thickness:
1.45 mm (0.057 in)



AT-07215

- (1) Measure the thickness of the pressure plate for the transfer clutch plate set that has been used before replacement.
- (2) Select the transfer clutch plate set that uses the pressure plate of which the value is close to the measured value in (1), and check the clearance "A".

Transfer clutch plate set	
Part No.	Pressure plate thickness mm (in)
31523AA410	3.3 (0.130)
31523AA420	3.7 (0.146)
31523AA430	4.1 (0.161)
31523AA440	4.5 (0.177)

- (3) When the clearance "A" exceeds the limit for use in step (2), replace the pressure plate installed on the lower side of the transfer clutch plate set, and check the clearance "A" again.

Pressure plate	
Part No.	Thickness mm (in)
31593AA151	3.3 (0.130)
31593AA161	3.7 (0.146)

- (4) When the clearance "A" exceeds the limit for use in step (3), select the transfer clutch plate set that was not used in step (2), and adjust the clearance "A" again.
- 9) Check the clearance between snap ring and pressure plate. <Ref. to CVT(TR580)-220, INSPECTION, Transfer Clutch.>
- 10) Using the ST, install the ball bearing.

Transfer Clutch

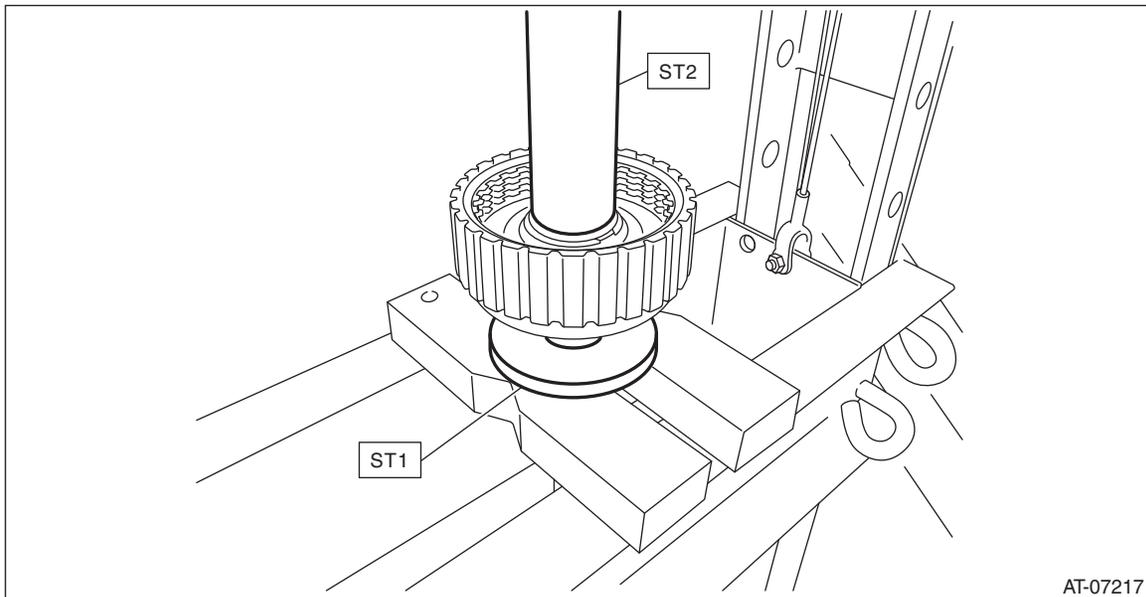
CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Use a new ball bearing.

ST1 398177700 INSTALLER

ST2 499277200 INSTALLER



E: INSPECTION

- Inspect the drive plate facing for wear and damage.
- Driven plate for discoloration (burned color)
- Make sure the snap ring is not worn and the return spring has no permanent distortion, damage, or deformation.
- Check the lip seal for damage.
- Inspect the extension end play, and adjust it to within the standard value. <Ref. to CVT(TR580)-221, ADJUSTMENT, Transfer Clutch.>
 - 1) Before measuring clearance "A" between snap ring and driven plate, place same thickness shims on both sides to prevent the plate from tilting.
 - 2) When clearance "A" exceeds the limit for use, replace the drive plate and driven plate as a set, and select the pressure plate within the initial specified value.

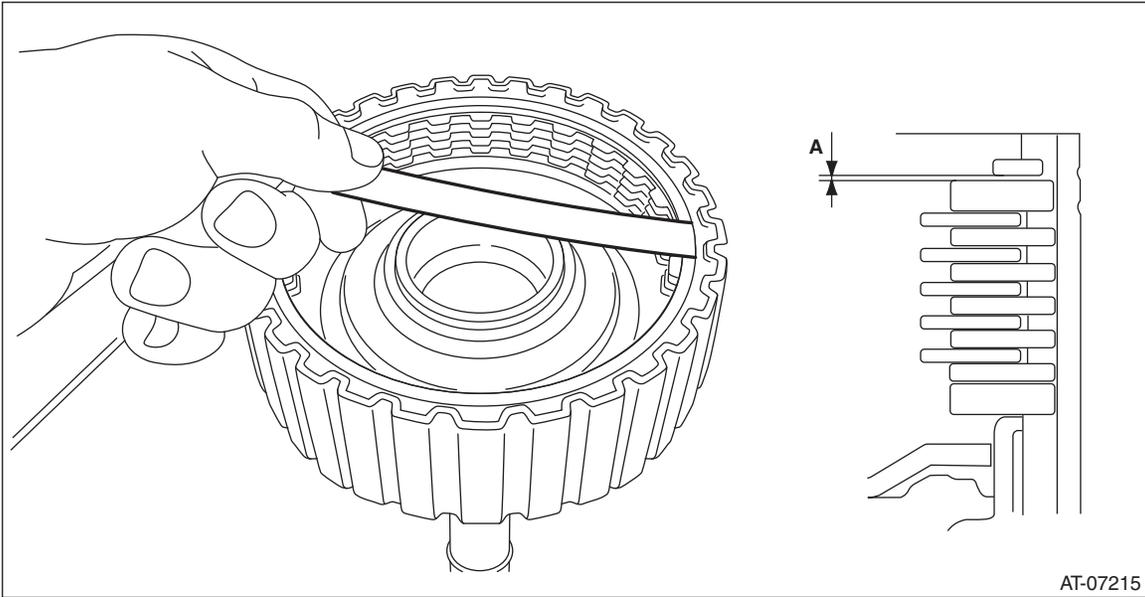
Initial standard:

0.7 — 1.1 mm (0.028 — 0.043 in)

Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

Limit thickness:
1.45 mm (0.057 in)



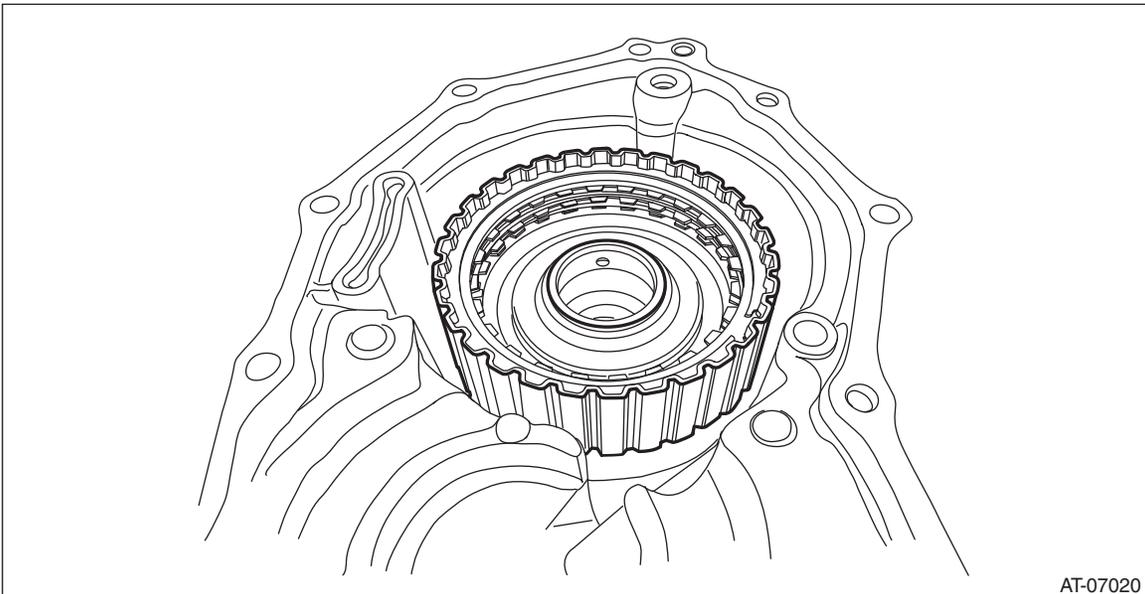
3) Check for tight corner braking phenomenon when the vehicle is moved forward with the steering fully turned. If tight corner braking occurs, perform the following procedures.

(1) With the steering wheel held at fully turned position, drive the vehicle in “D” range and with vehicle speed at approx. 5 km/h (3 MPH) in both clockwise and counterclockwise directions for approx. ten times each, while repeating acceleration and braking intermittently.

(2) If the tight corner braking phenomenon still persists, drive the vehicle again in a circle for several laps.

F: ADJUSTMENT

1) Install the transfer clutch assembly to the extension case with the transfer driven gear shims and thrust bearings removed.



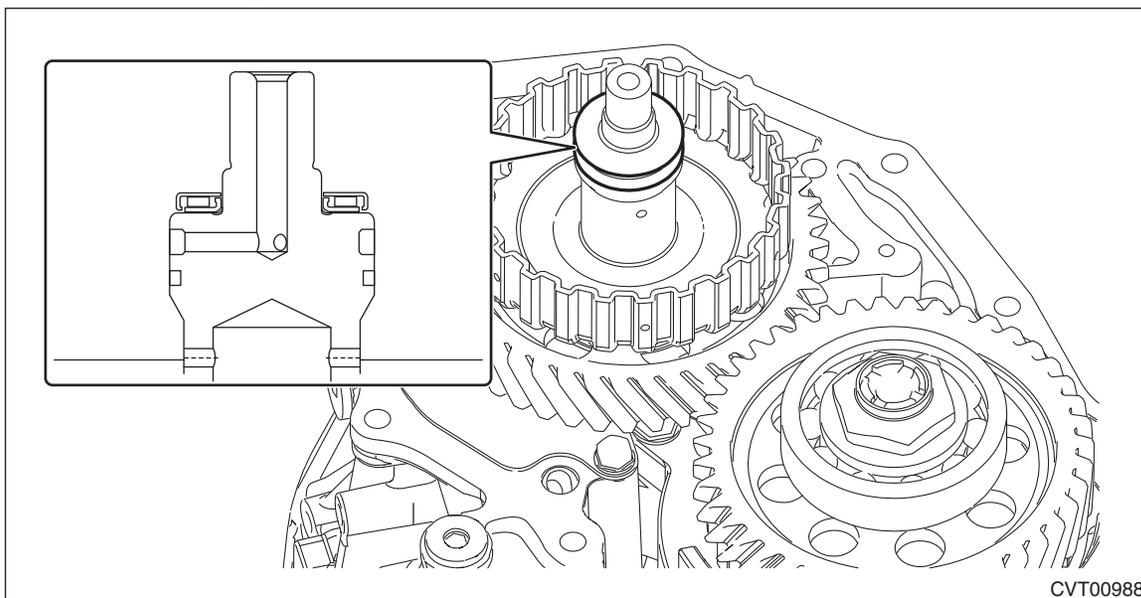
2) Install the thrust bearing.

Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

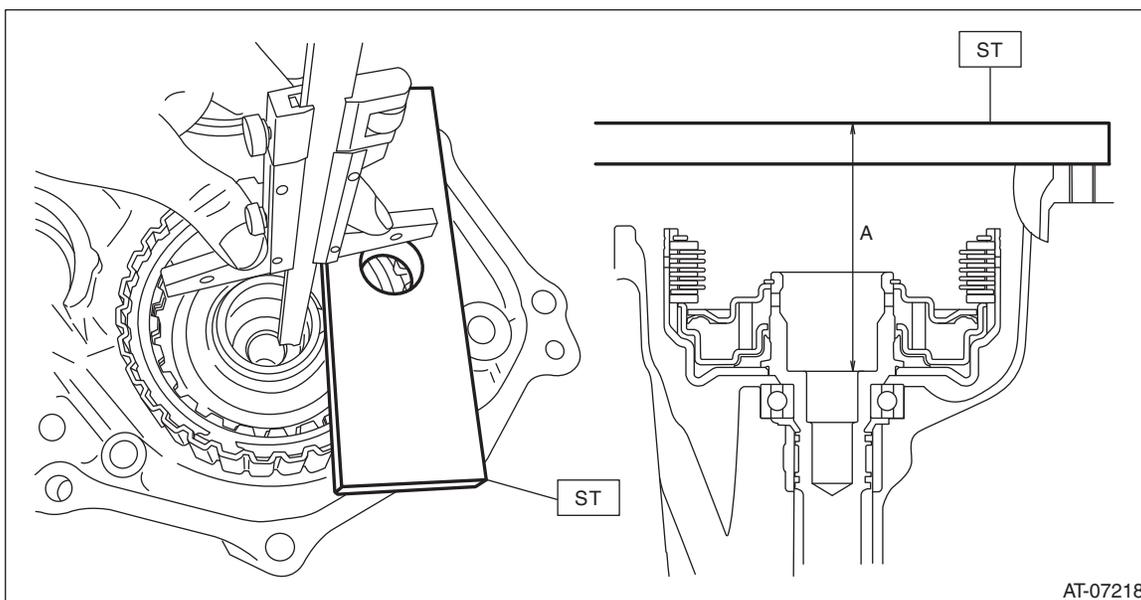
NOTE:

Make sure to install in the right direction.



3) Using the ST, measure the height "A" from the ST end face to the thrust bearing catch surface of the transfer clutch assembly.

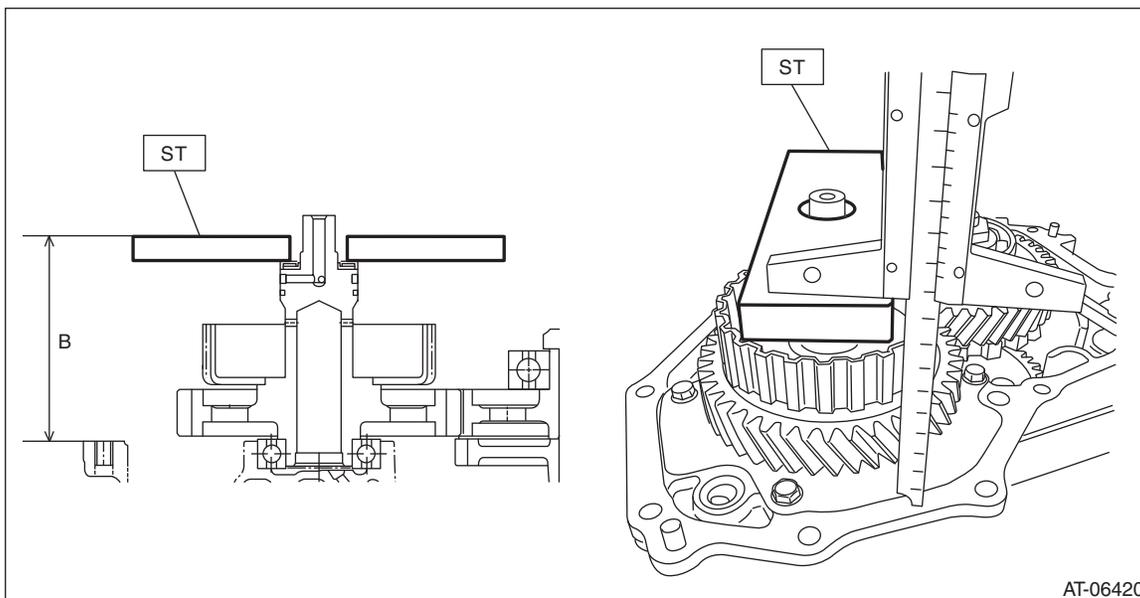
ST 499575500 GAUGE



Transfer Clutch

CONTINUOUSLY VARIABLE TRANSMISSION

- 4) Using the ST, measure the height "B" from the transmission case mating surface to the end of ST.
ST 499575500 GAUGE



AT-06420

- 5) Obtain the thickness of transfer driven gear shim using the following formula to select one to three transfer driven gear shims.

$$T \text{ (mm)} = A - B - (0.05 - 0.25)$$

$$[T \text{ (in)} = A - B - (0.002 - 0.01)]$$

T: Transfer driven gear shim thickness

A: Height from the ST end face to the transfer clutch assembly thrust bearing catch surface

B: Height from the mating surface of the transmission case to the end of the ST

0.05 — 0.25 mm (0.002 — 0.01 in): Clearance

Transfer driven gear shim	
Part No.	Thickness mm (in)
33280AA030	0.3 (0.012)
33280AA040	0.4 (0.016)
33280AA050	0.5 (0.020)

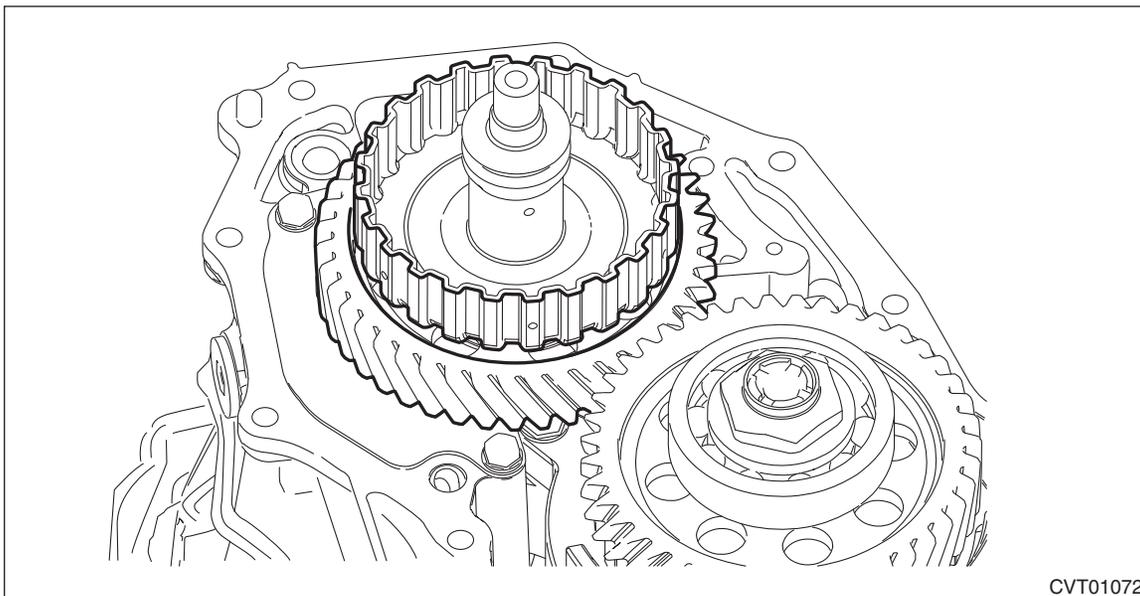
Transfer Driven Gear

CONTINUOUSLY VARIABLE TRANSMISSION

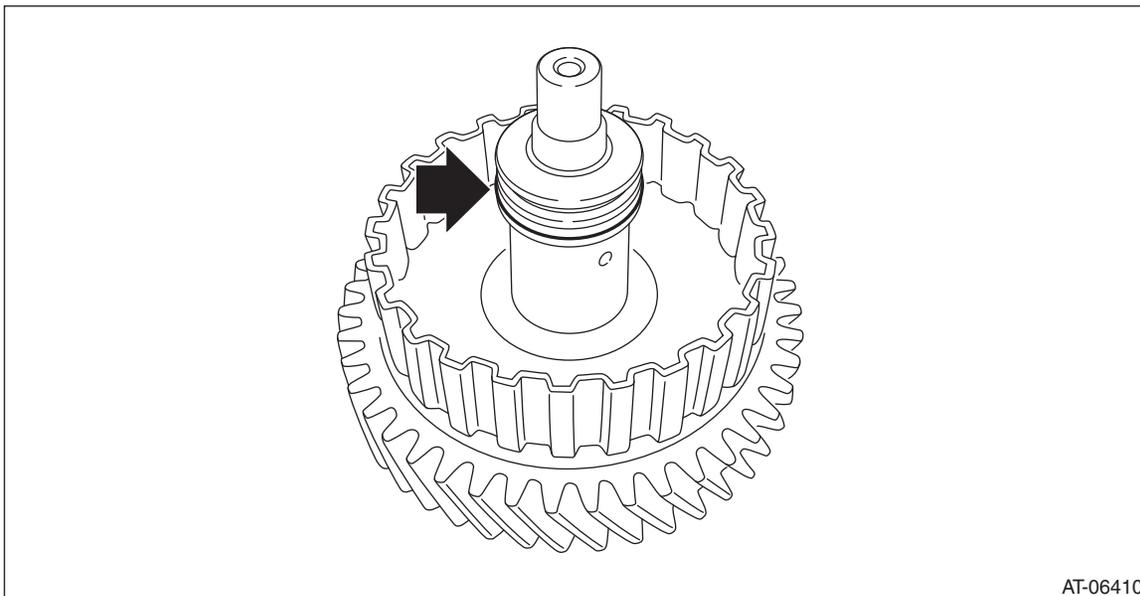
34. Transfer Driven Gear

A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 3) Remove the transfer clutch assembly. <Ref. to CVT(TR580)-210, REMOVAL, Transfer Clutch.>
- 4) Remove the transfer driven gear assembly.



- 5) Remove the seal ring from the transfer driven gear assembly.



B: INSTALLATION

- 1) Install the seal ring to the transfer driven gear assembly.

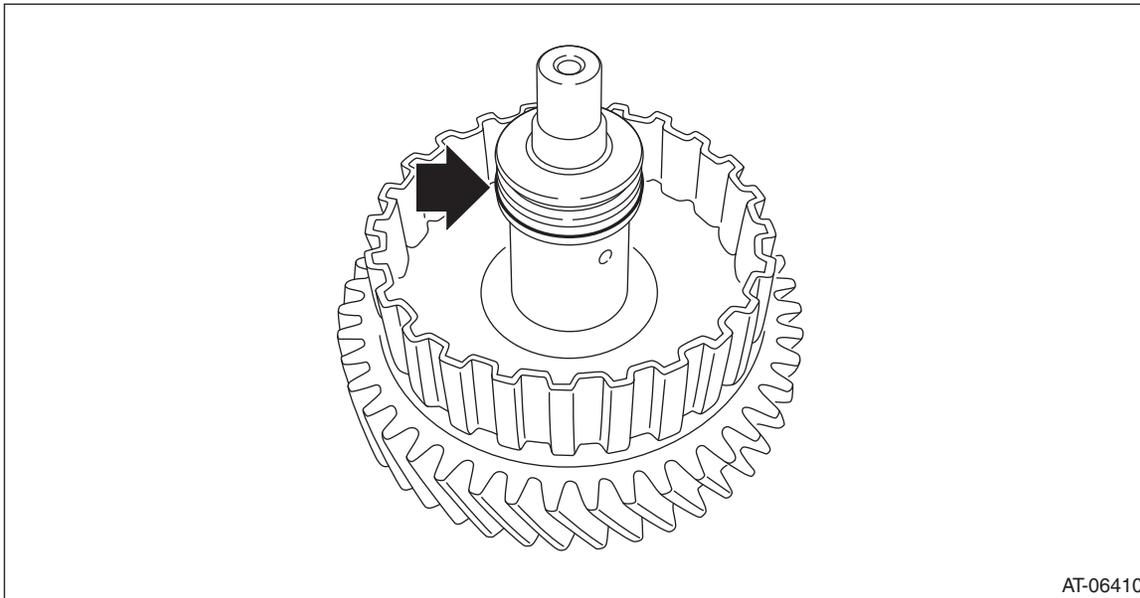
NOTE:

- Install a new seal ring.
- When installing the seal rings, do not expand the seal rings too much.

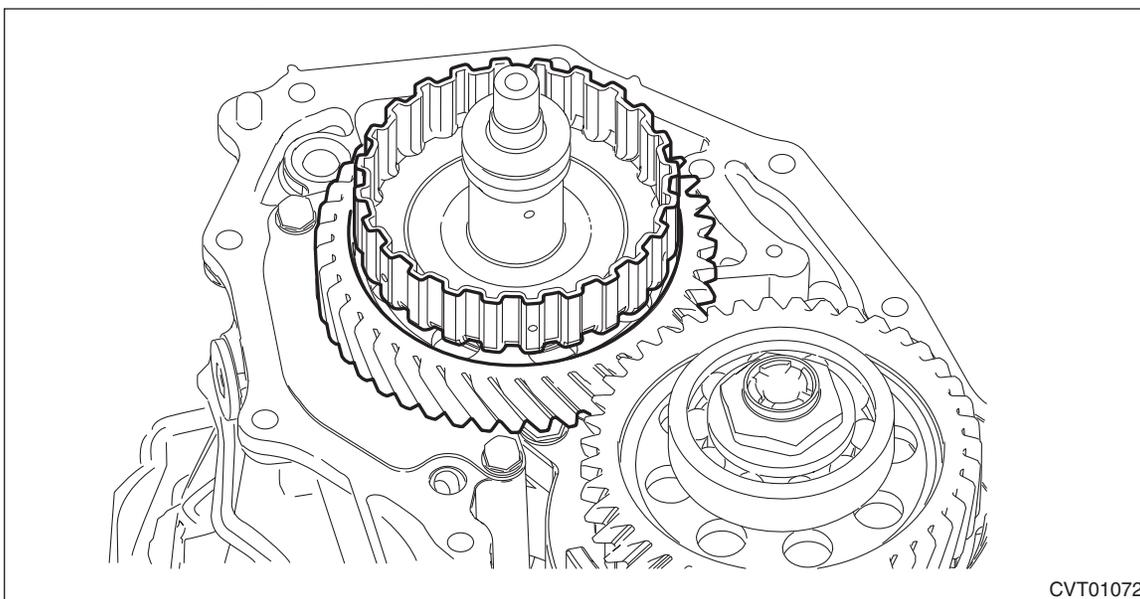
Transfer Driven Gear

CONTINUOUSLY VARIABLE TRANSMISSION

- Apply CVTF to the seal rings.



- 2) Install the transfer driven gear assembly.



- 3) Install the transfer clutch assembly. <Ref. to CVT(TR580)-211, INSTALLATION, Transfer Clutch.>
- 4) Select the transfer driven gear shim. <Ref. to CVT(TR580)-221, ADJUSTMENT, Transfer Clutch.>
- 5) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 6) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

Transfer Driven Gear

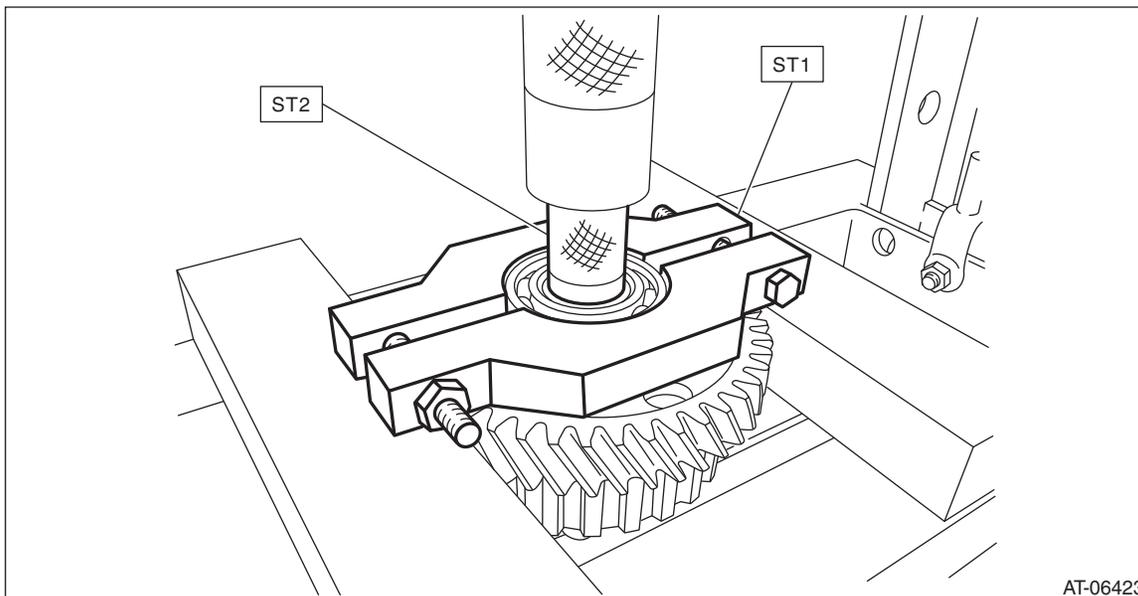
CONTINUOUSLY VARIABLE TRANSMISSION

C: DISASSEMBLY

1) Remove the ball bearing using ST.

ST1 498077400 BEARING REMOVER

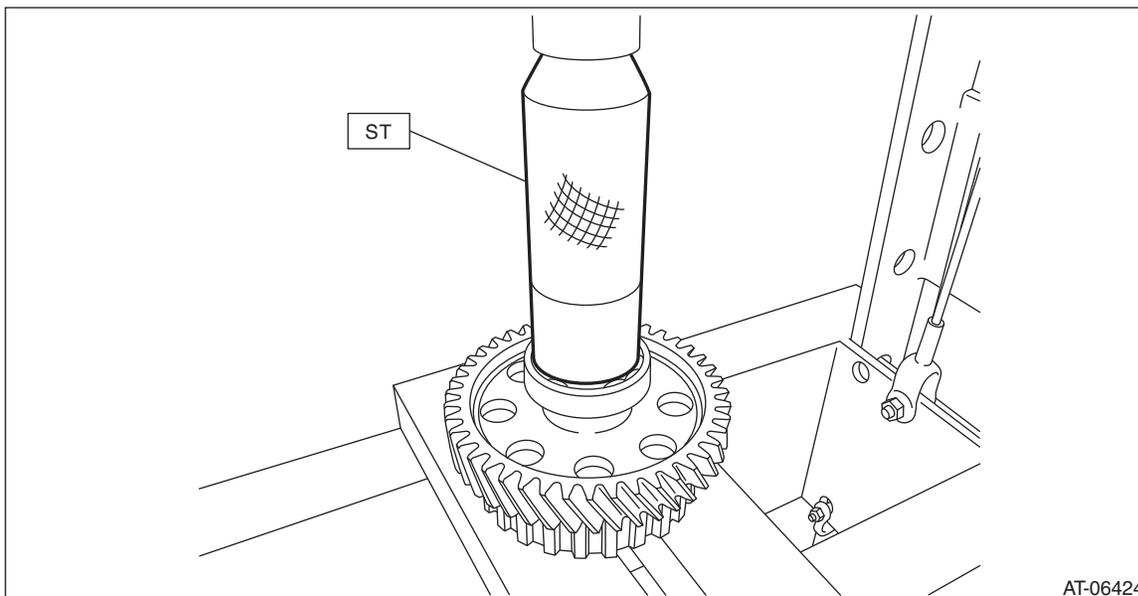
ST2 899864100 REMOVER



D: ASSEMBLY

1) Using the ST, install the ball bearing.

ST 899580100 INSTALLER



E: INSPECTION

- Check the ball bearing for smooth rotation.
- Check the ball bearing for excessive looseness.
- Check the transfer driven gear for breakage or damage.

F: ADJUSTMENT

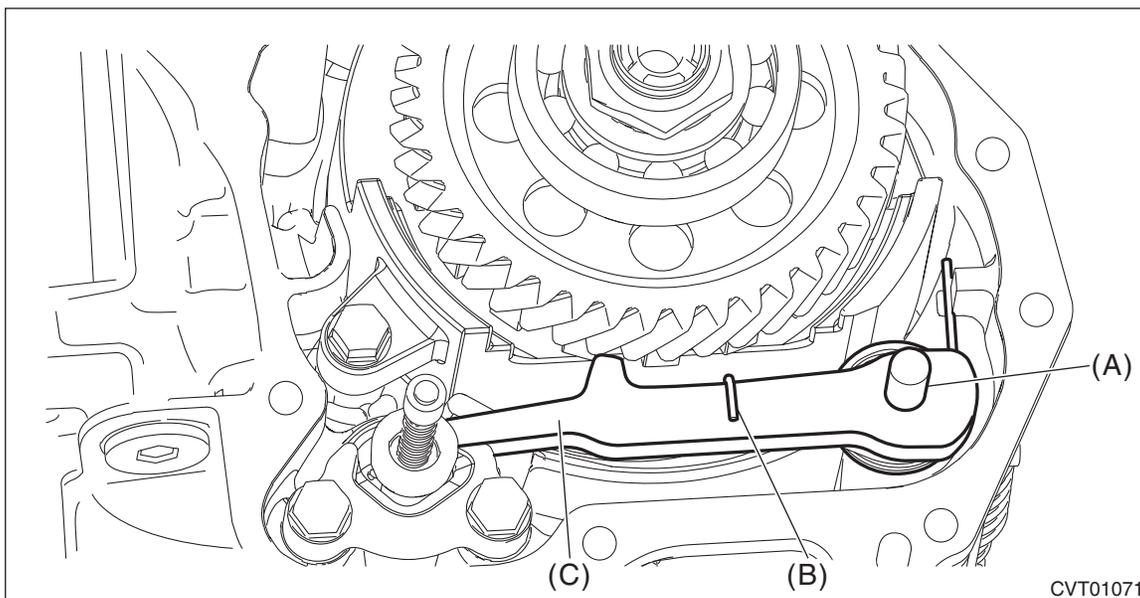
NOTE:

When the transfer driven gear or bearing is replaced, select the transfer driven gear shim. <Ref. to CVT(TR580)-221, ADJUSTMENT, Transfer Clutch.>

35. Parking Pawl

A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Shift the range select lever to "N" range.
- 3) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 4) Remove the parking pawl shaft, return spring and parking pawl.



- (A) Parking pawl shaft
- (B) Return spring
- (C) Parking pawl

B: INSTALLATION

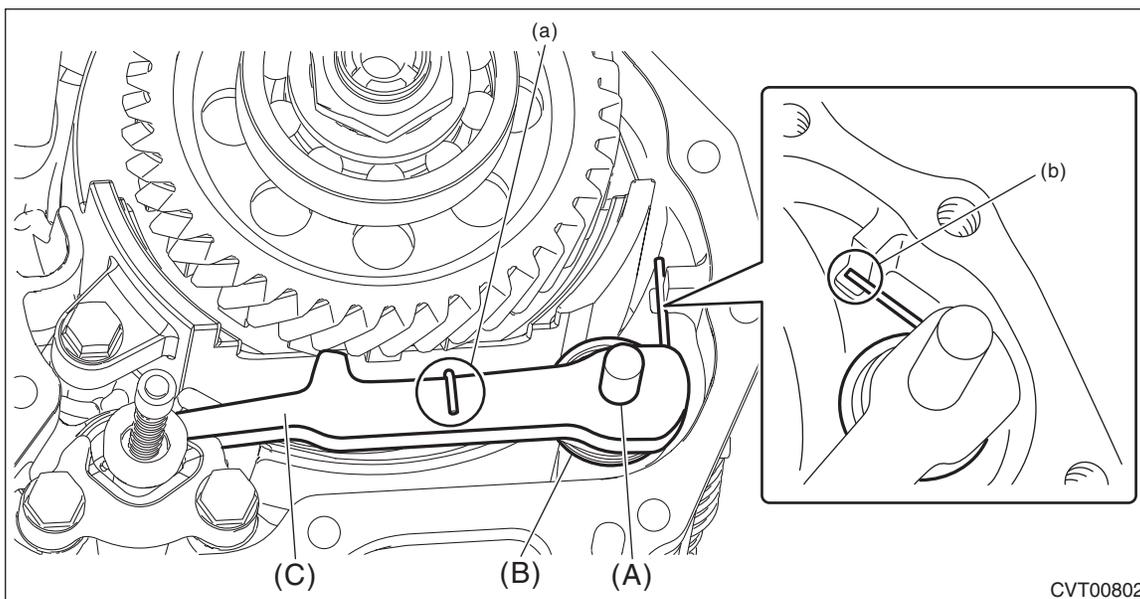
- 1) Set the range select lever to the "N" range.
- 2) Install the parking pawl shaft, return spring and parking pawl.

Parking Pawl

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Make sure that the end of return spring sticks out of parking pawl as shown in (a). Make sure that the other end contacts the rib of transmission case as shown in (b).



- (A) Parking pawl shaft
- (B) Return spring
- (C) Parking pawl

3) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>

4) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

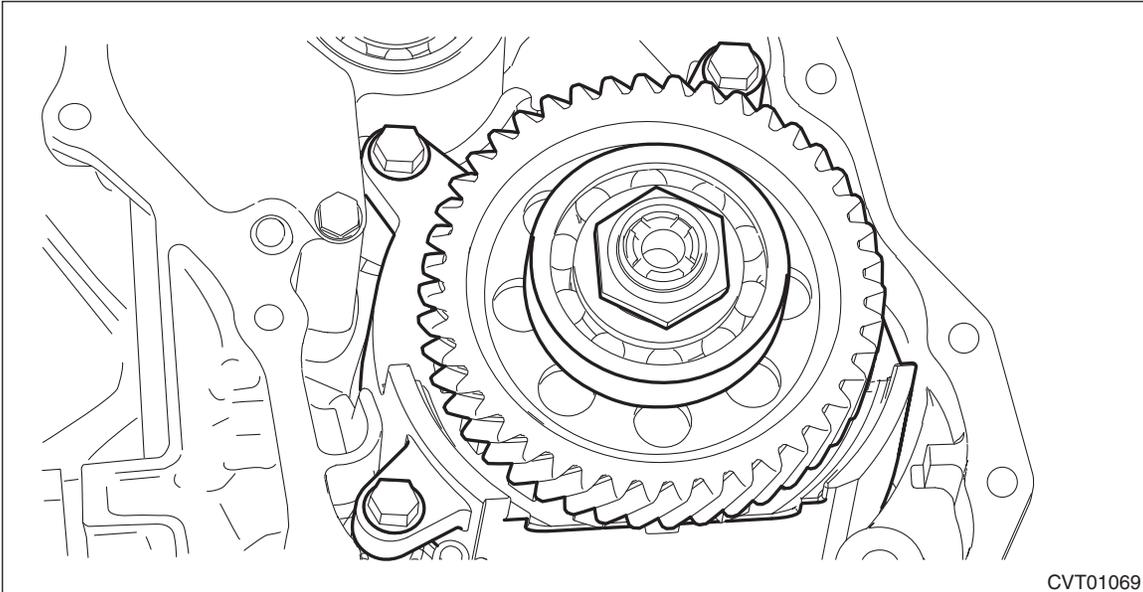
C: INSPECTION

- Check the parking pawl for breakage or damage.
- Check for worn, broken and/or damaged return spring.

36.Reduction Driven Gear

A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 3) Remove the transfer clutch assembly. <Ref. to CVT(TR580)-210, REMOVAL, Transfer Clutch.>
- 4) Remove the transfer driven gear assembly. <Ref. to CVT(TR580)-224, REMOVAL, Transfer Driven Gear.>
- 5) Remove the parking pawl. <Ref. to CVT(TR580)-227, REMOVAL, Parking Pawl.>
- 6) Remove the reduction driven gear assembly and spacer oil.

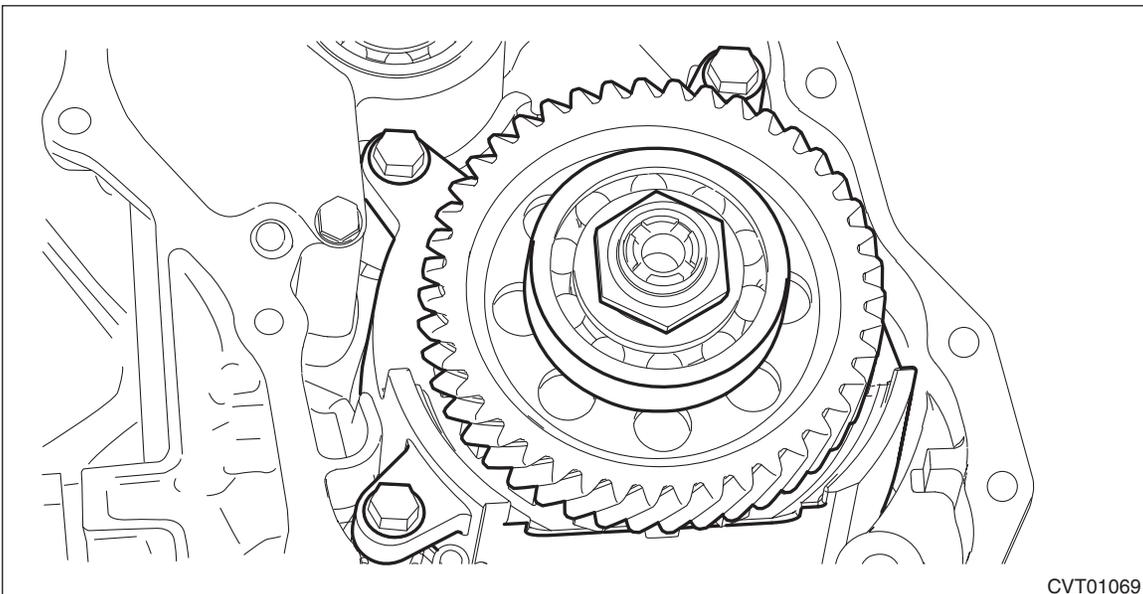


B: INSTALLATION

- 1) Install the reduction driven gear assembly and spacer oil.

Tightening torque:

17 N·m (1.7 kgf·m, 12.5 ft·lb)



- 2) Select the transfer drive gear shim. <Ref. to CVT(TR580)-263, ADJUSTMENT, Reduction Drive Gear.>
- 3) Install the parking pawl. <Ref. to CVT(TR580)-227, INSTALLATION, Parking Pawl.>

Reduction Driven Gear

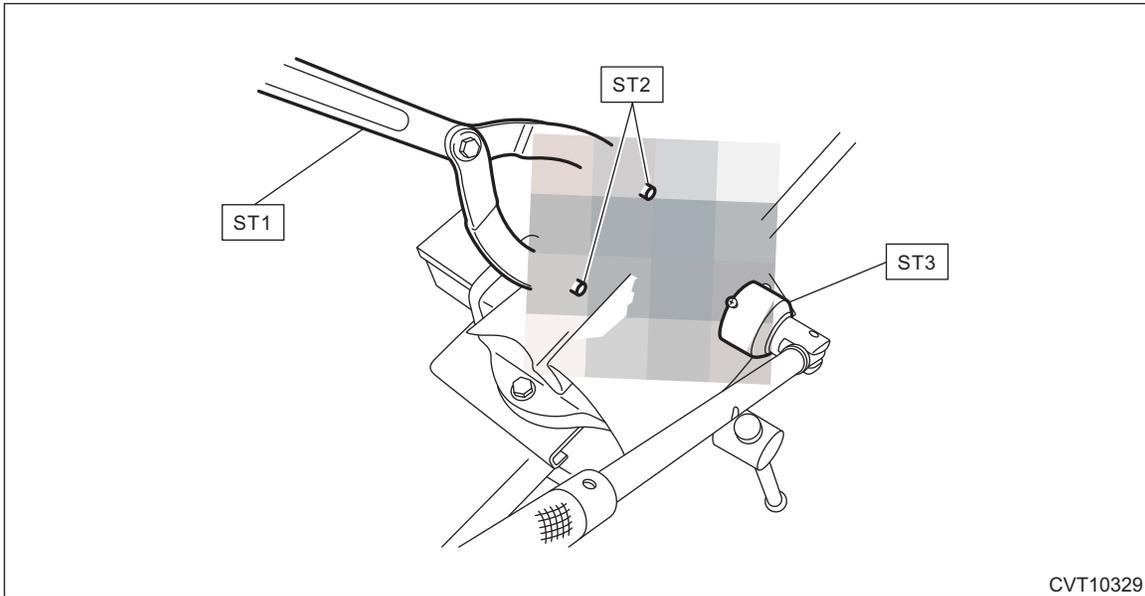
CONTINUOUSLY VARIABLE TRANSMISSION

- 4) Attach the selected transfer drive gear shim to extension case with vaseline.
- 5) Install the transfer driven gear assembly. <Ref. to CVT(TR580)-224, INSTALLATION, Transfer Driven Gear.>
- 6) Install the transfer clutch assembly. <Ref. to CVT(TR580)-211, INSTALLATION, Transfer Clutch.>
- 7) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 8) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: DISASSEMBLY

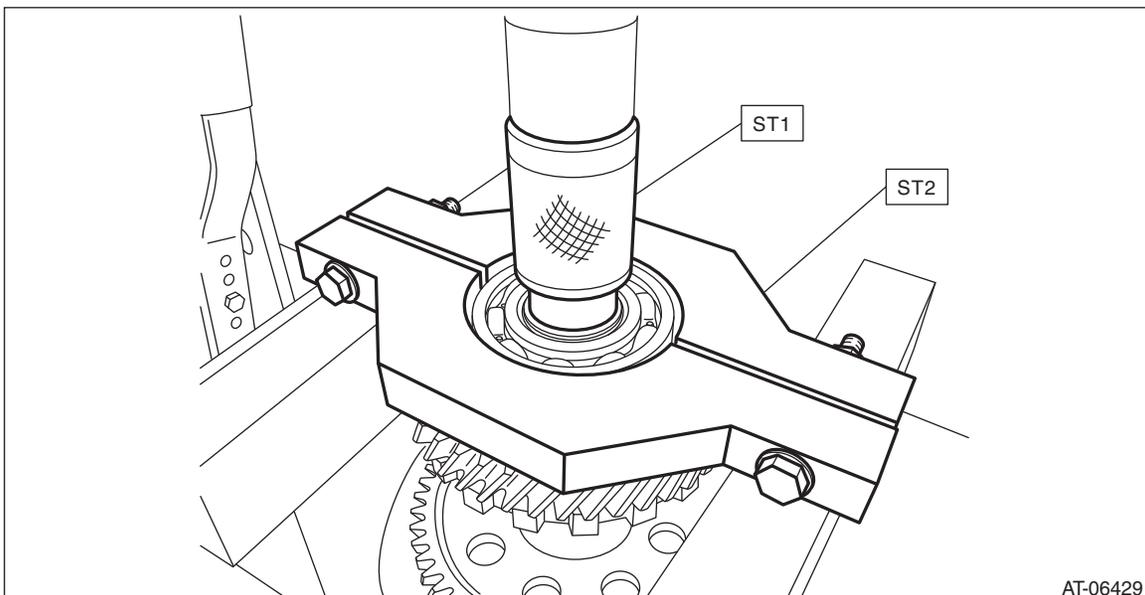
- 1) Flatten the tab of the lock nut.
- 2) Using the ST, counter the rotation of the reduction driven gear assembly, and remove the lock nut.

ST1 18355AA000 PULLEY WRENCH
ST2 18334AA000 PIN SET
ST3 499987003 SOCKET WRENCH (35)



- 3) Remove the ball bearing using ST.

ST1 499757002 INSTALLER
ST2 498077300 REMOVER

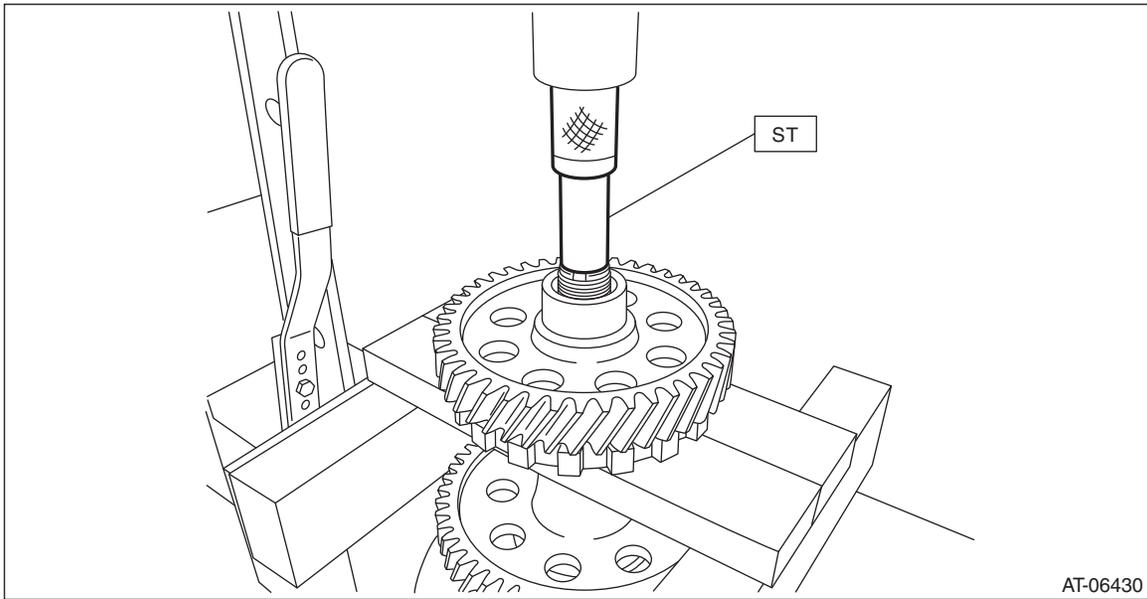


Reduction Driven Gear

CONTINUOUSLY VARIABLE TRANSMISSION

4) Using the ST, remove the parking gear and transfer drive gear.

ST 899864100 REMOVER



5) Remove the snap ring from reduction driven gear.

D: ASSEMBLY

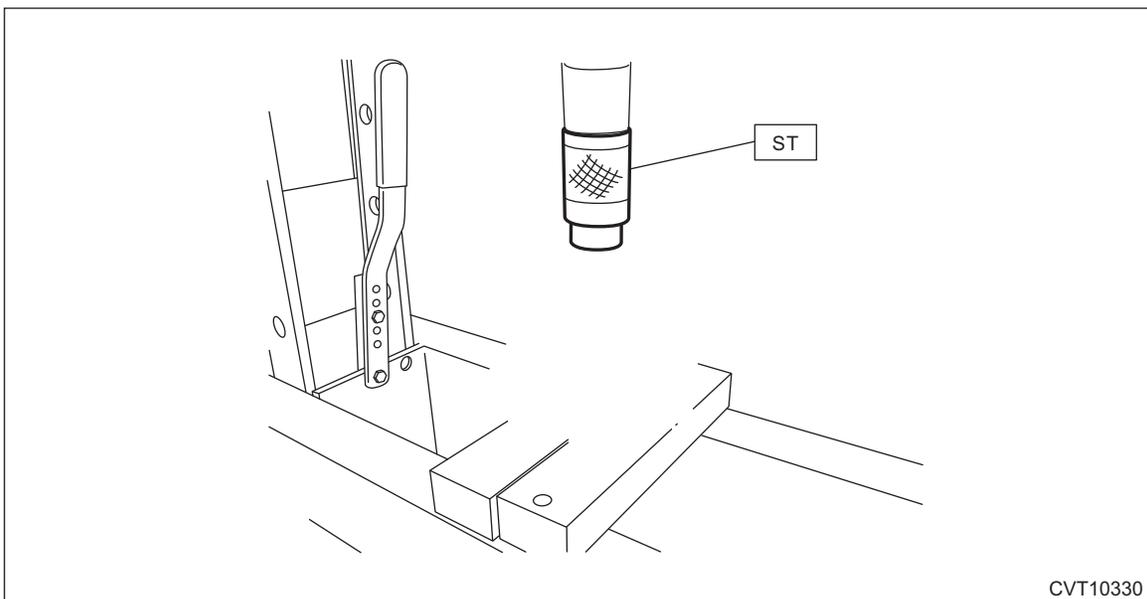
1) Install the snap ring to reduction driven gear.

NOTE:

Use a new reduction driven gear COMPL.

2) Using the ST, install the parking gear.

ST 499757002 INSTALLER

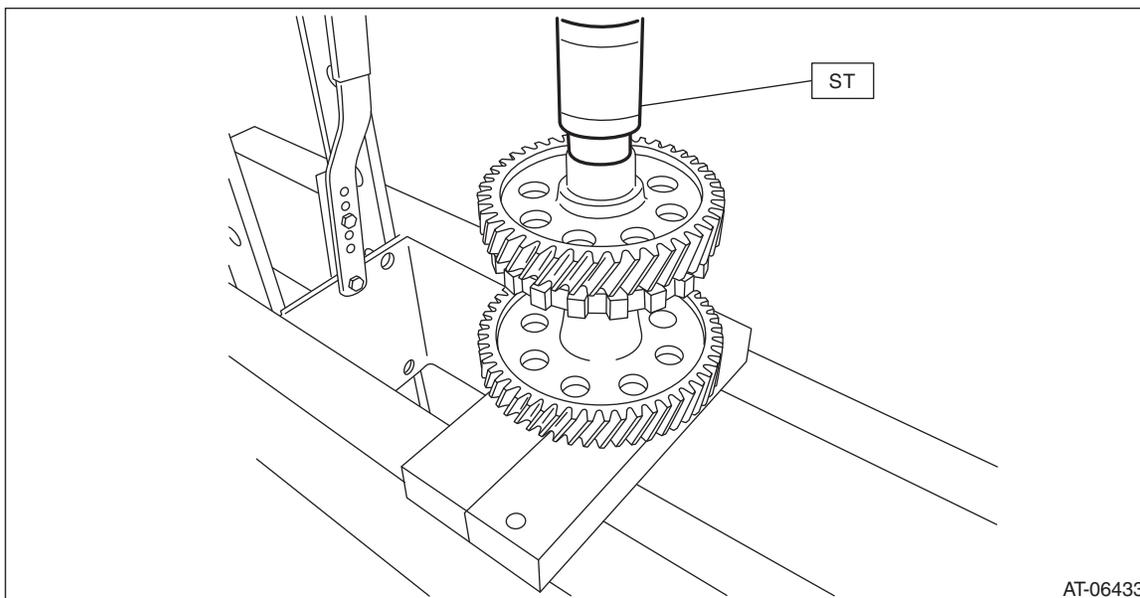


Reduction Driven Gear

CONTINUOUSLY VARIABLE TRANSMISSION

3) Using the ST, install the transfer drive gear.

ST 499757002 INSTALLER

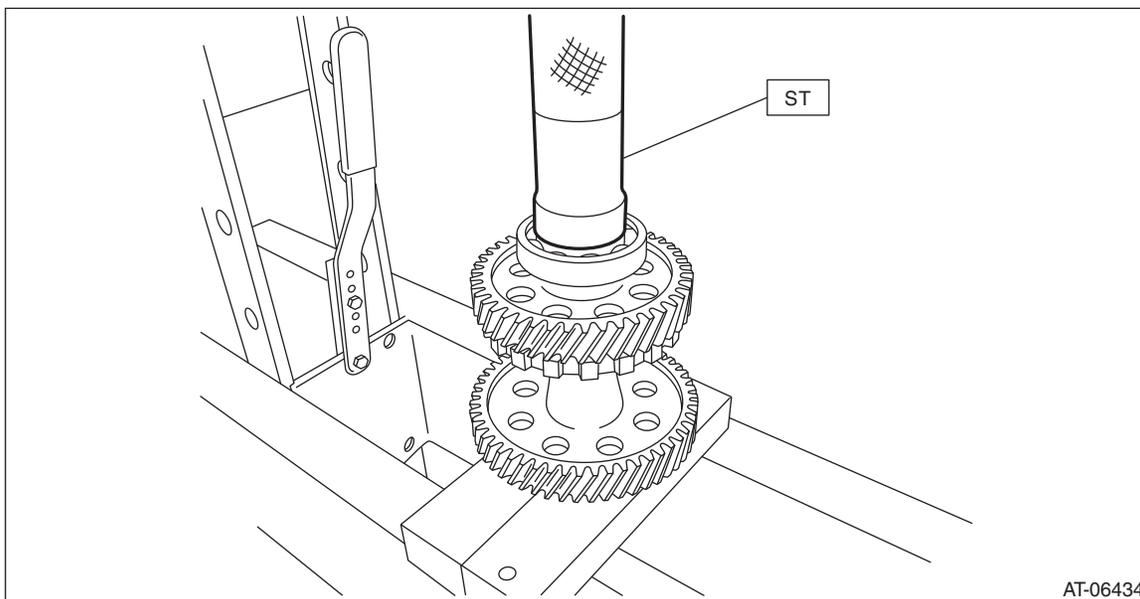


4) Using the ST, install the ball bearing.

NOTE:

Use a new ball bearing.

ST 499277100 BUSHING 1-2 INSTALLER



5) Using the ST, counter the rotation of the reduction driven gear assembly, and install the lock nut.

NOTE:

Use a new lock nut.

ST1 18355AA000 PULLEY WRENCH

ST2 18334AA000 PIN SET

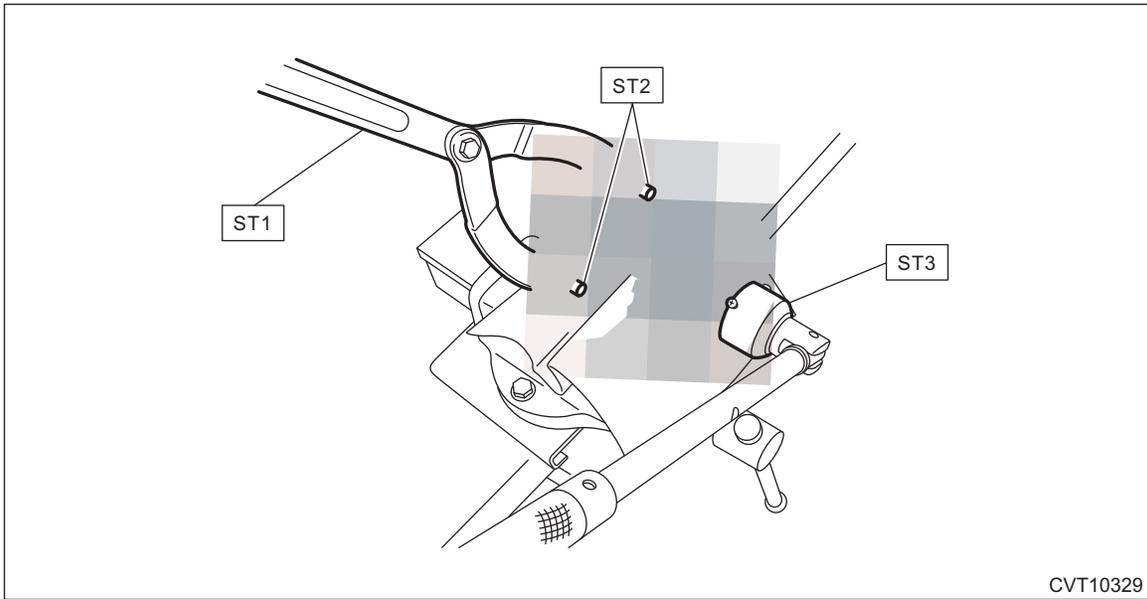
ST3 499987003 SOCKET WRENCH (35)

Reduction Driven Gear

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

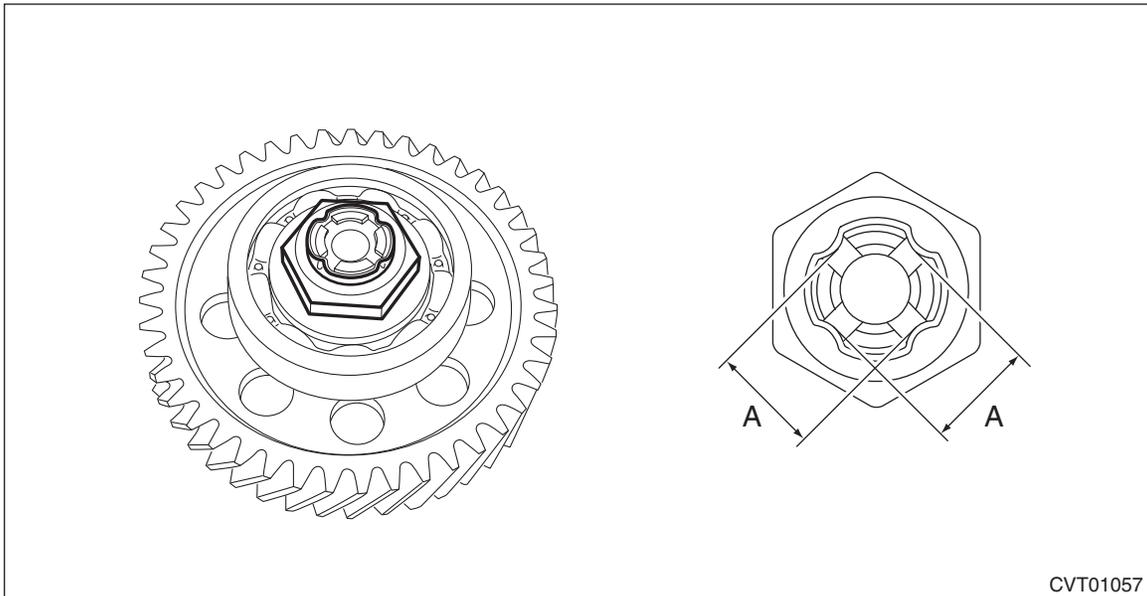
95 N·m (9.7 kgf·m, 70.1 ft·lb)



6) Crimp the lock nut at four locations so that the dimension of A becomes 18.9 mm (0.74 in) or less.

CAUTION:

Do not allow the lock nut to be cracked during crimping operation.



E: INSPECTION

- Check the ball bearing for smooth rotation.
- Check the ball bearing for excessive looseness.
- Make sure each gear is not broken or damaged.

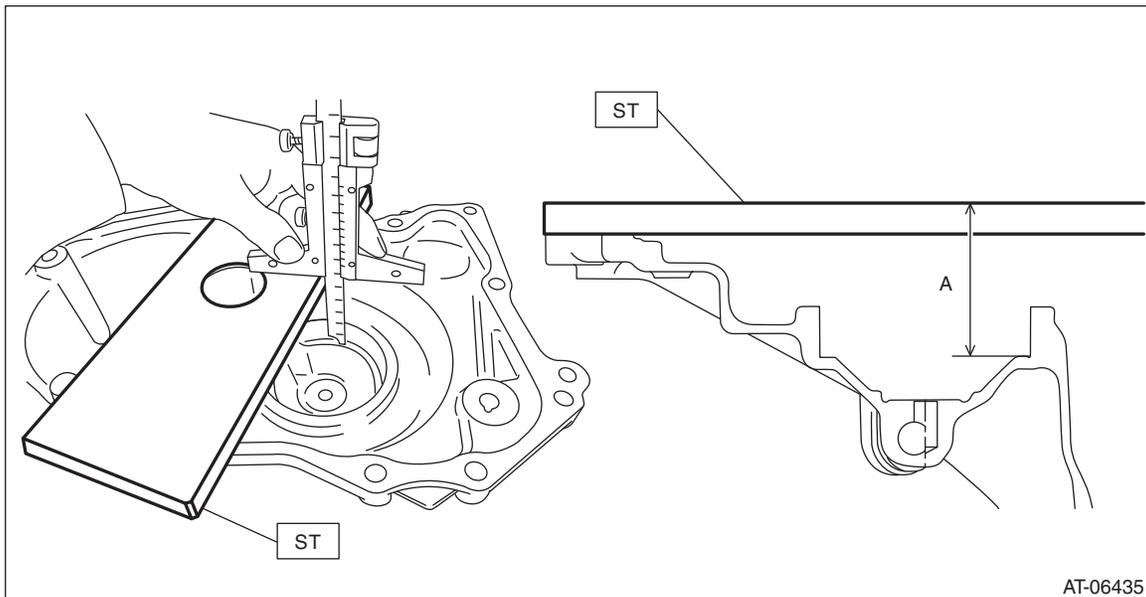
Reduction Driven Gear

CONTINUOUSLY VARIABLE TRANSMISSION

F: ADJUSTMENT

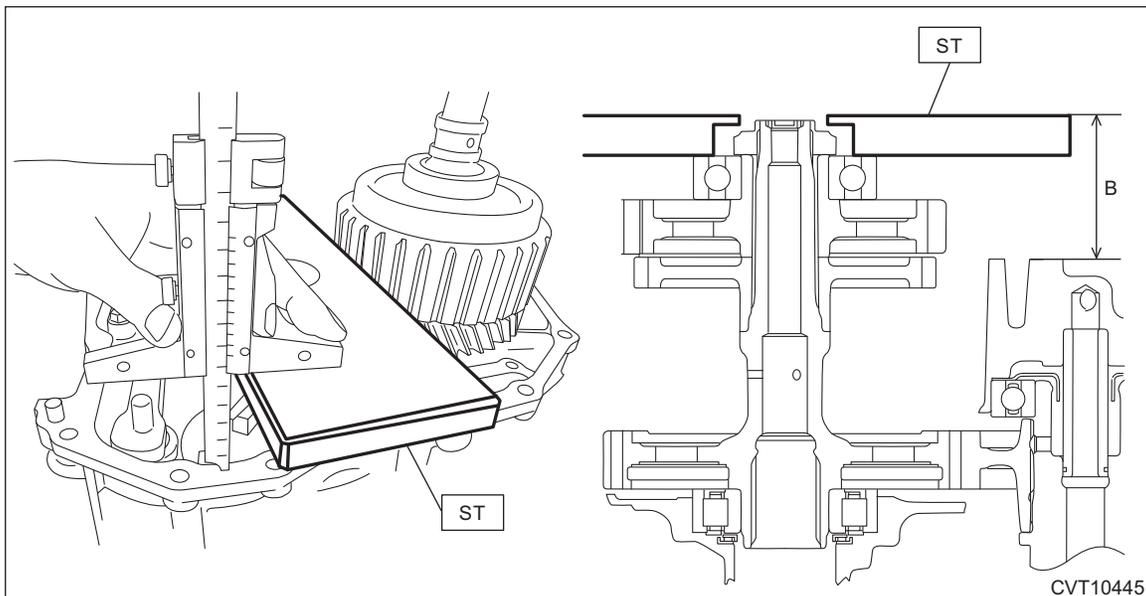
1) Measure the height "A" from the ST upper face to the ball bearing catch surface.

ST 499575600 GAUGE



2) Measure the height "B" from the ST to the mating surface of the transmission case.

ST 499575600 GAUGE



3) Obtain the thickness of transfer drive gear shim using the following formula to select one to three transfer drive gear shims.

$$T \text{ (mm)} = A - B - (0.05 - 0.25)$$

$$[T \text{ (in)} = A - B - (0.002 - 0.01)]$$

T: Shim thickness

A: Height from the ST upper face to the ball bearing catch surface

B: Height from ST to transmission case mating surface

0.05 — 0.25 mm (0.002 — 0.01 in): Clearance

Transfer drive gear shim	
Part No.	Thickness mm (in)
33279AA090	0.3 (0.012)
33279AA100	0.4 (0.016)

Reduction Driven Gear

CONTINUOUSLY VARIABLE TRANSMISSION

Transfer drive gear shim	
Part No.	Thickness mm (in)
33279AA110	0.5 (0.020)

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Transmission Control Device

CONTINUOUSLY VARIABLE TRANSMISSION

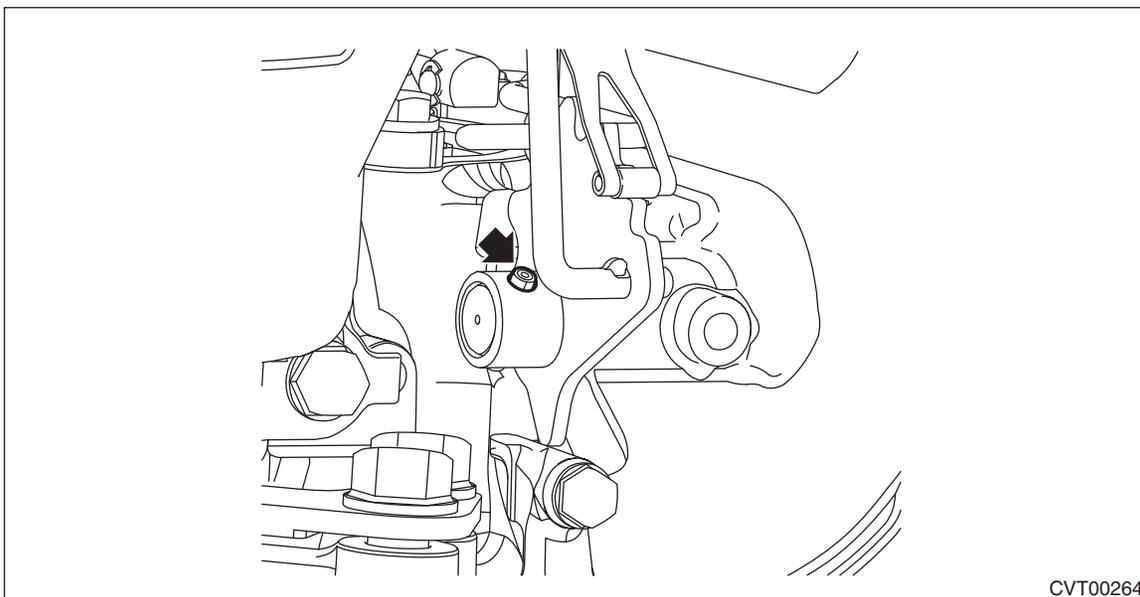
37. Transmission Control Device

A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the inhibitor switch. <Ref. to CVT(TR580)-112, REMOVAL, Inhibitor Switch.>
- 3) Remove the oil pan and oil strainer. <Ref. to CVT(TR580)-135, REMOVAL, Oil Pan and Strainer.>
- 4) Shift the manual plate to "N" range, and remove the spring pin.

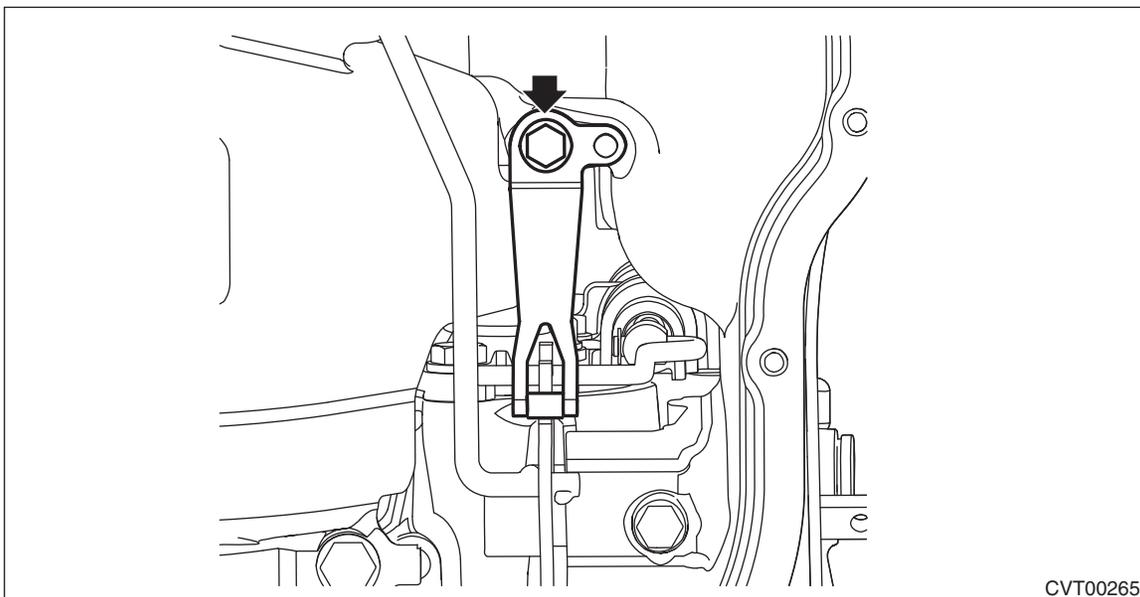
NOTE:

Prevent the spring pin from dropping in the transmission using paper towel etc.



CVT00264

- 5) Remove the detent spring.



CVT00265

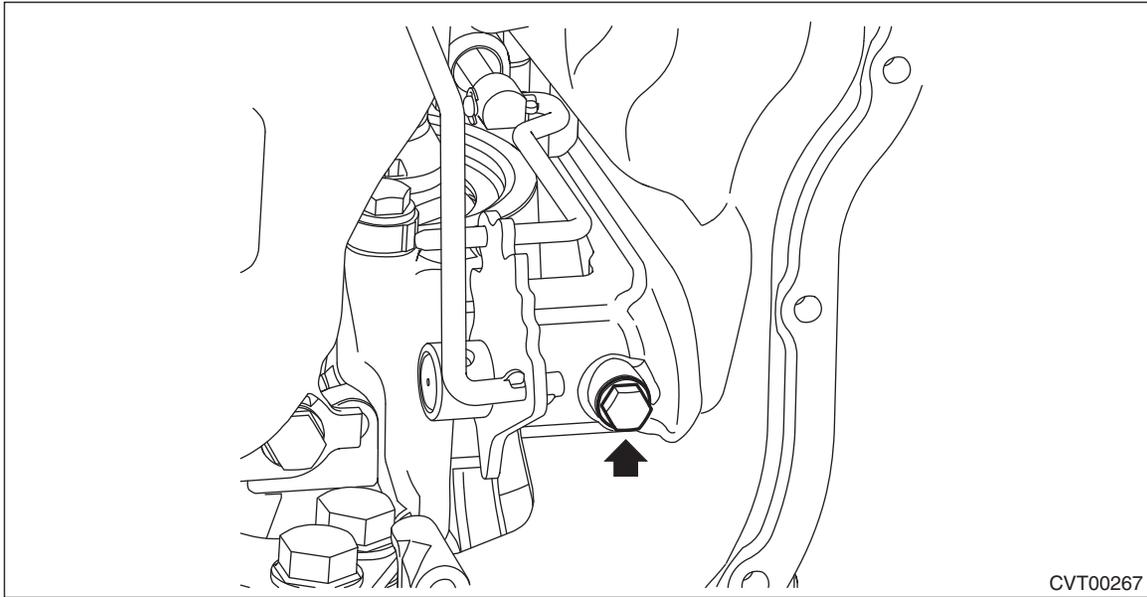
- 6) Remove the bolt, and remove the shifter arm shaft.

Transmission Control Device

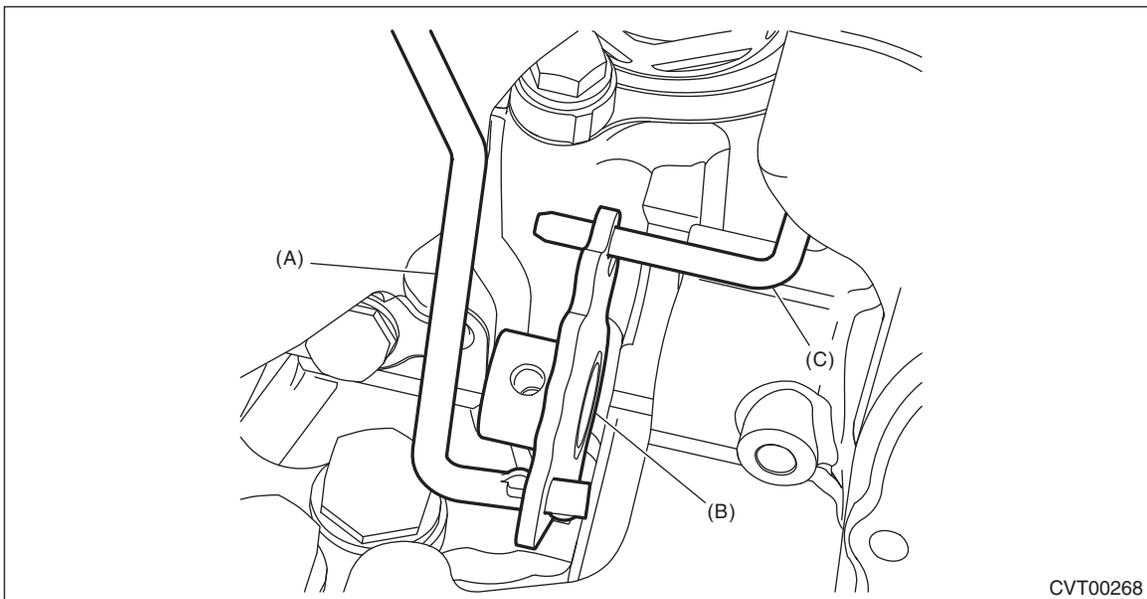
CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Do not damage the lip of oil seal press-fitted in the case.



7) Remove the manual plate from the shifter arm shaft, and remove the shift connecting rod of the manual valve.



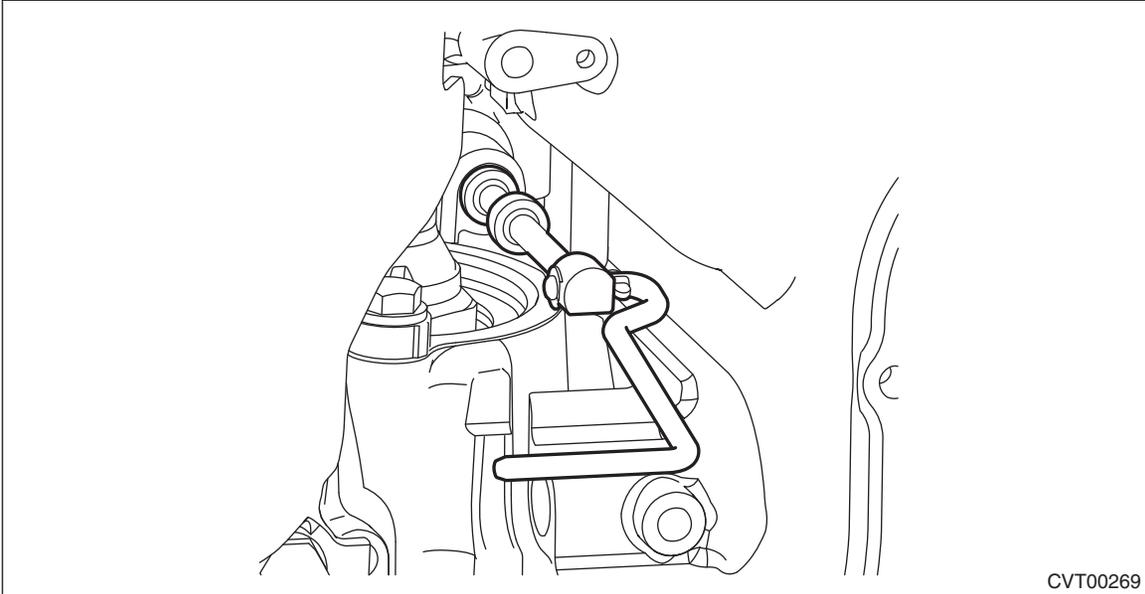
- (A) Parking rod
- (B) Manual plate
- (C) Shift connecting rod

8) Remove the manual plate and parking rod.

Transmission Control Device

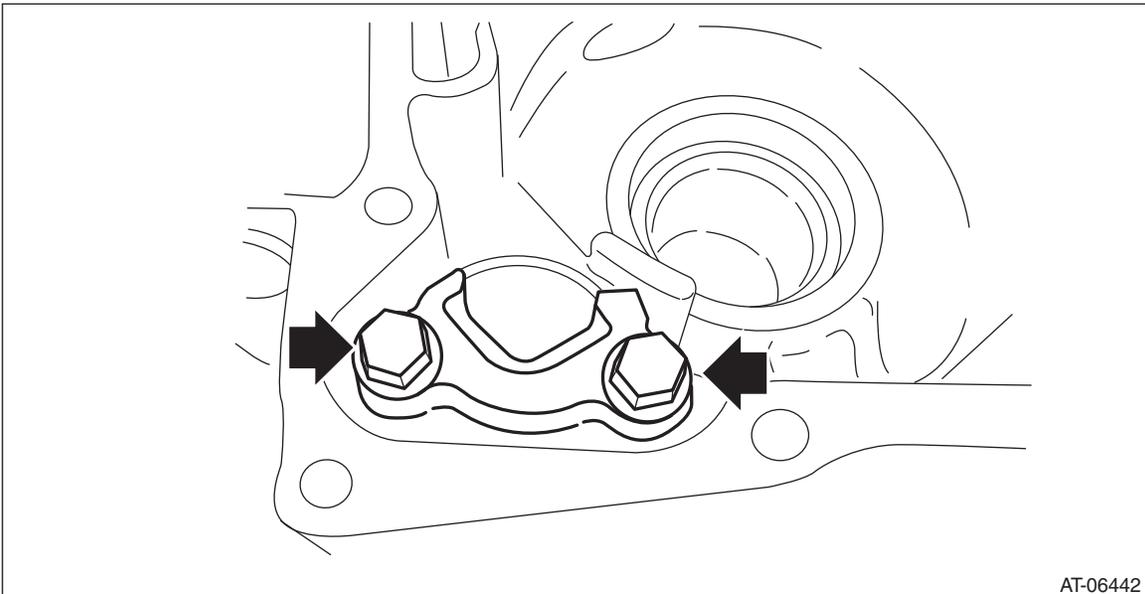
CONTINUOUSLY VARIABLE TRANSMISSION

9) Remove the manual valve.



10) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>

11) Remove the parking support.



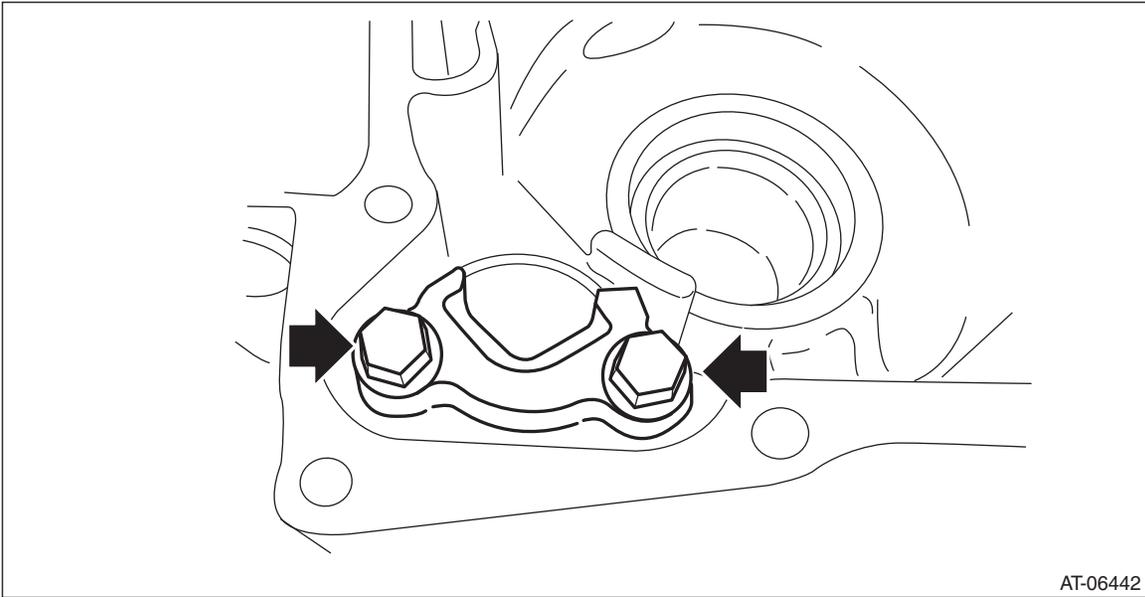
B: INSTALLATION

1) Install the parking support.

Transmission Control Device

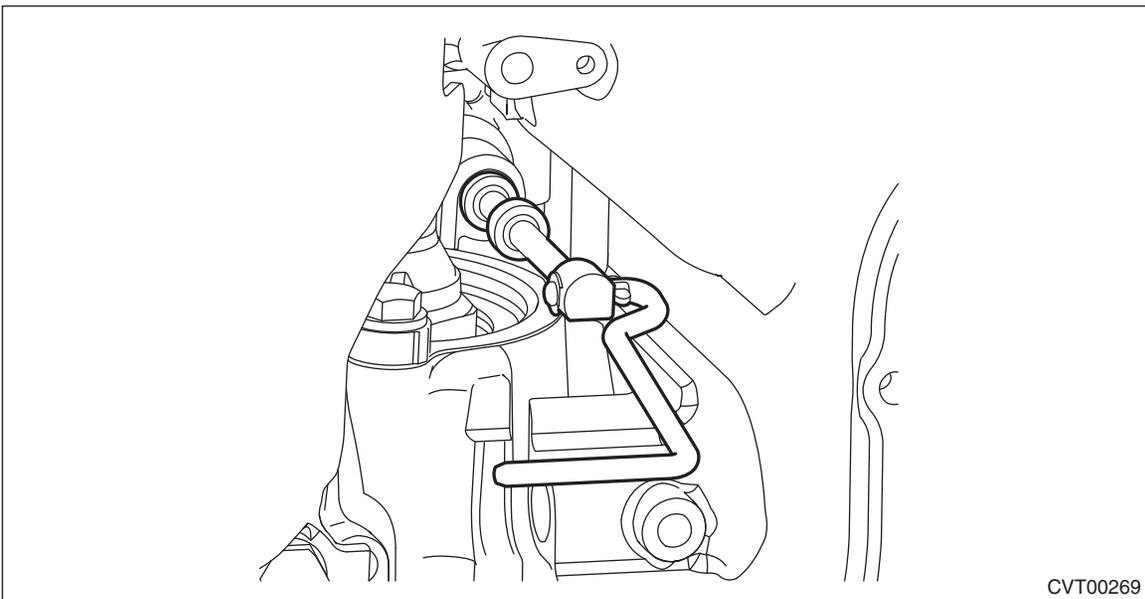
CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:
25 N·m (2.5 kgf·m, 18.4 ft·lb)



AT-06442

- 2) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 3) Install the manual valve.



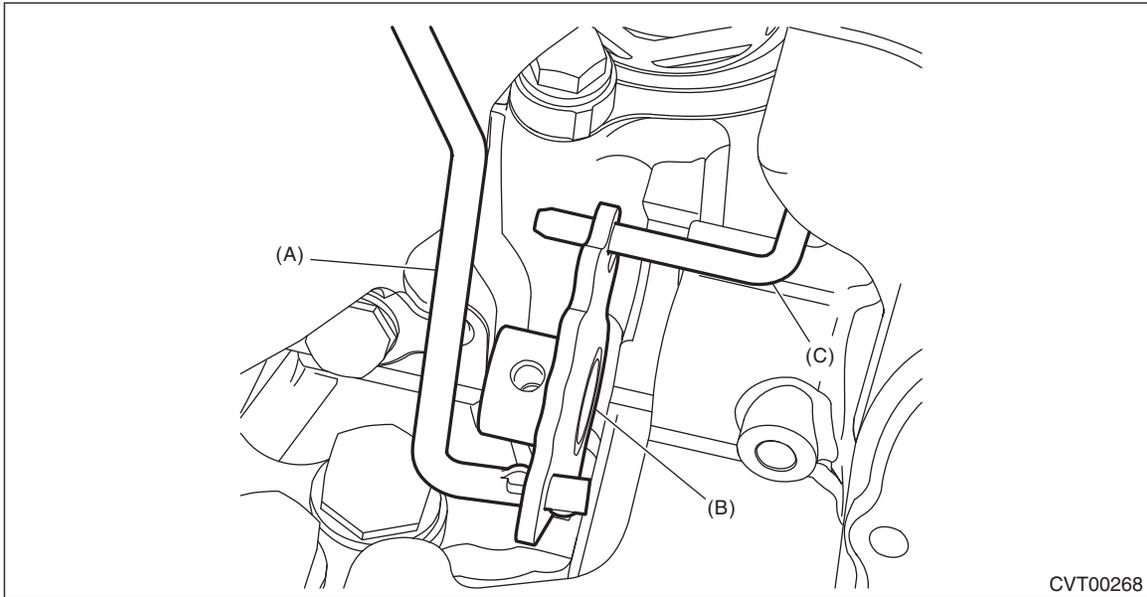
CVT00269

- 4) Install the parking rod to the manual plate.

Transmission Control Device

CONTINUOUSLY VARIABLE TRANSMISSION

5) Insert the parking rod into the transmission case, and install the shift connecting rod of the manual valve to the manual plate.



- (A) Parking rod
- (B) Manual plate
- (C) Shift connecting rod

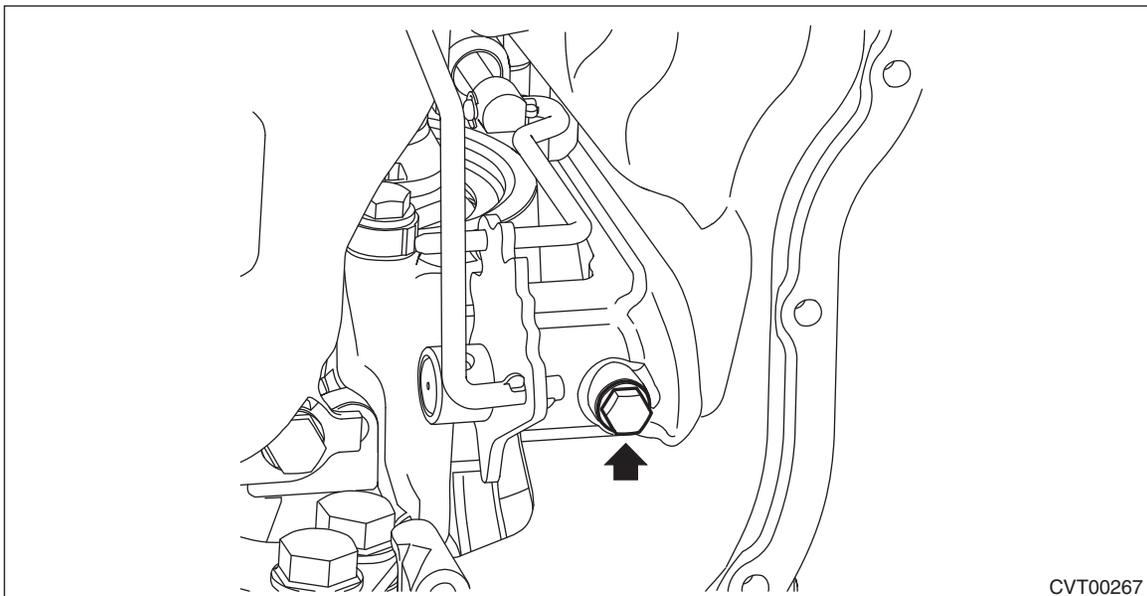
6) Insert the shifter arm shaft to the transmission assembly, install the manual plate to the shifter arm shaft, and secure the shifter arm shaft with a bolt.

NOTE:

Do not damage the lip of oil seal press-fitted in the case.

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)



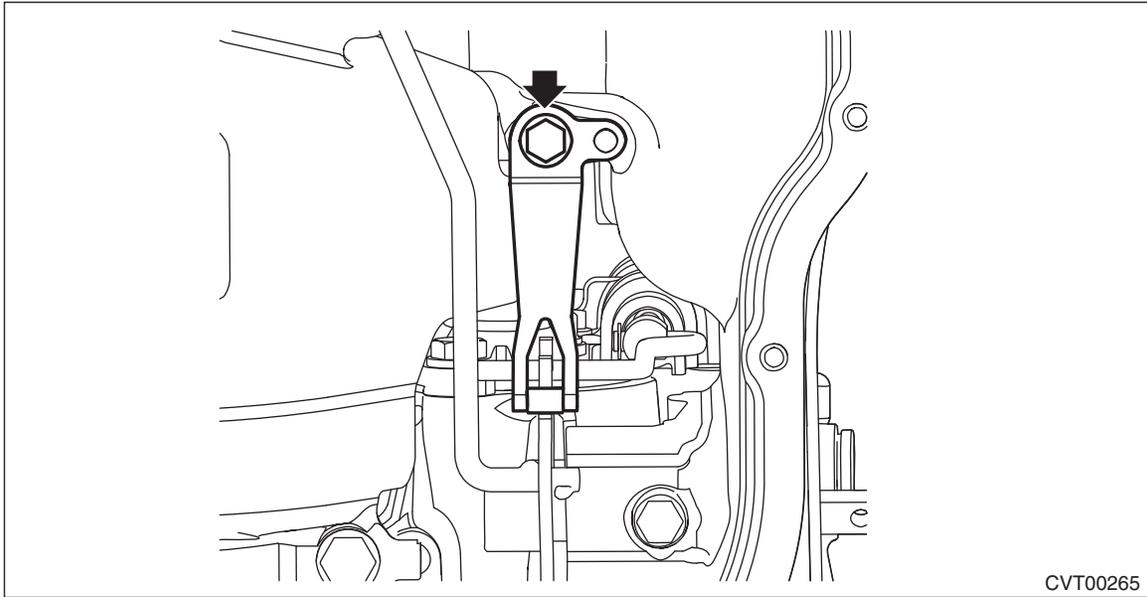
7) Install the detent spring.

Transmission Control Device

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

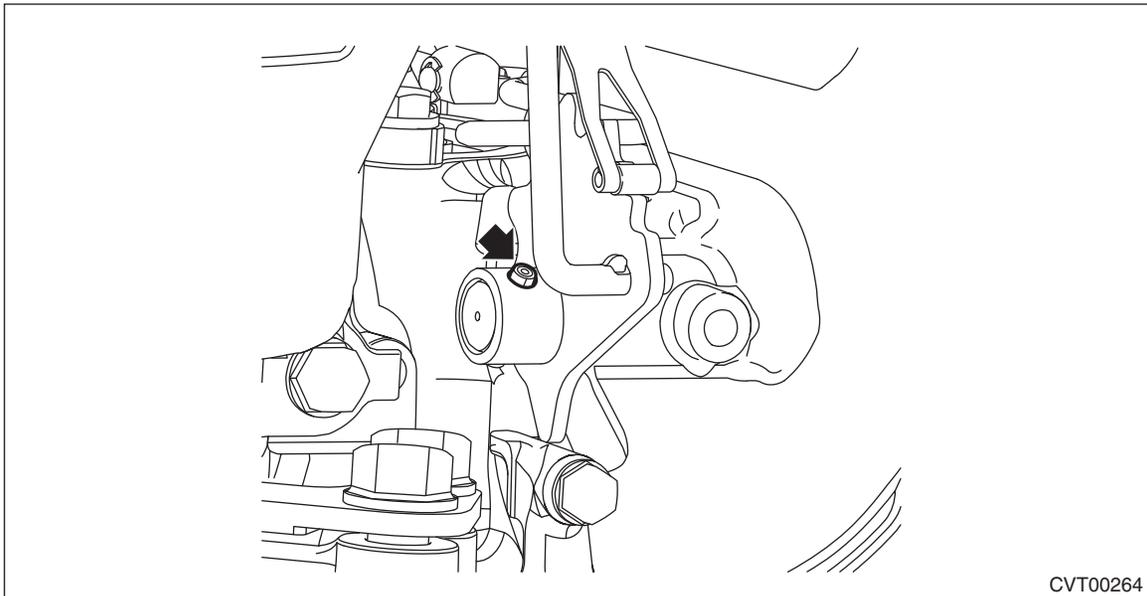
7 N·m (0.7 kgf·m, 5.2 ft·lb)



8) Install the spring pin.

NOTE:

Use new spring pin.



9) Install the inhibitor switch. <Ref. to CVT(TR580)-115, INSTALLATION, Inhibitor Switch.>

10) Adjust the inhibitor switch. <Ref. to CVT(TR580)-111, ADJUSTMENT, Inhibitor Switch.>

11) Install the oil strainer and oil pan. <Ref. to CVT(TR580)-136, INSTALLATION, Oil Pan and Strainer.>

12) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: INSPECTION

Make sure that the manual plate and detent spring are not worn or otherwise damaged.

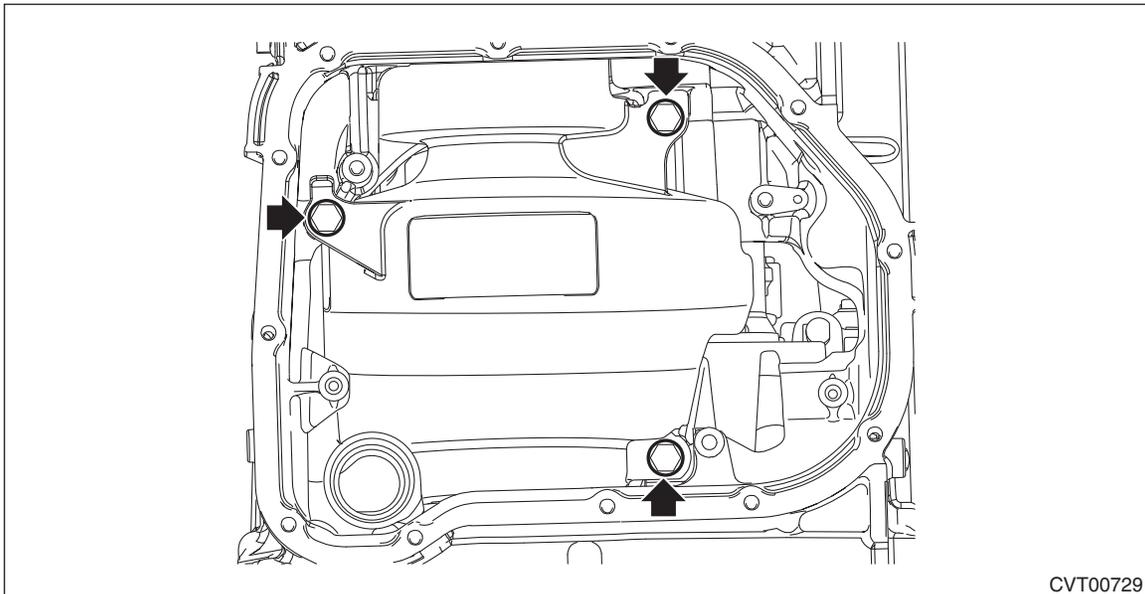
Transmission Case

CONTINUOUSLY VARIABLE TRANSMISSION

38. Transmission Case

A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the air breather hose. <Ref. to CVT(TR580)-196, REMOVAL, Air Breather Hose.>
- 3) Remove the control valve body. <Ref. to CVT(TR580)-138, REMOVAL, Control Valve Body.>
- 4) Remove the transmission harness. <Ref. to CVT(TR580)-152, REMOVAL, Transmission Harness.>
- 5) Remove the turbine speed sensor. <Ref. to CVT(TR580)-118, REMOVAL, Turbine Speed Sensor.>
- 6) Remove the secondary speed sensor. <Ref. to CVT(TR580)-123, REMOVAL, Secondary Speed Sensor.>
- 7) Remove the primary speed sensor. <Ref. to CVT(TR580)-128, REMOVAL, Primary Speed Sensor.>
- 8) Remove the inhibitor switch. <Ref. to CVT(TR580)-112, REMOVAL, Inhibitor Switch.>
- 9) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 10) Remove the transfer clutch assembly. <Ref. to CVT(TR580)-210, REMOVAL, Transfer Clutch.>
- 11) Remove the transfer driven gear assembly. <Ref. to CVT(TR580)-224, REMOVAL, Transfer Driven Gear.>
- 12) Remove the parking pawl. <Ref. to CVT(TR580)-227, REMOVAL, Parking Pawl.>
- 13) Remove the reduction driven gear assembly. <Ref. to CVT(TR580)-229, REMOVAL, Reduction Driven Gear.>
- 14) Remove the oil pan and oil strainer. <Ref. to CVT(TR580)-135, REMOVAL, Oil Pan and Strainer.>
- 15) Remove the transmission control device. <Ref. to CVT(TR580)-236, REMOVAL, Transmission Control Device.>
- 16) Remove the oil baffle securing bolt.

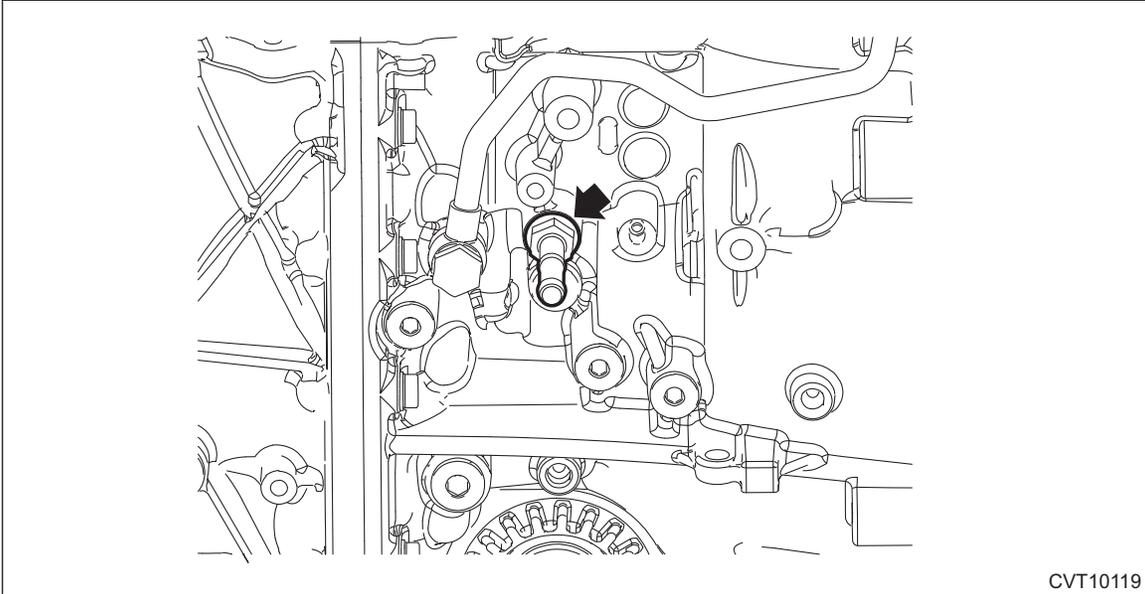


CVT00729

Transmission Case

CONTINUOUSLY VARIABLE TRANSMISSION

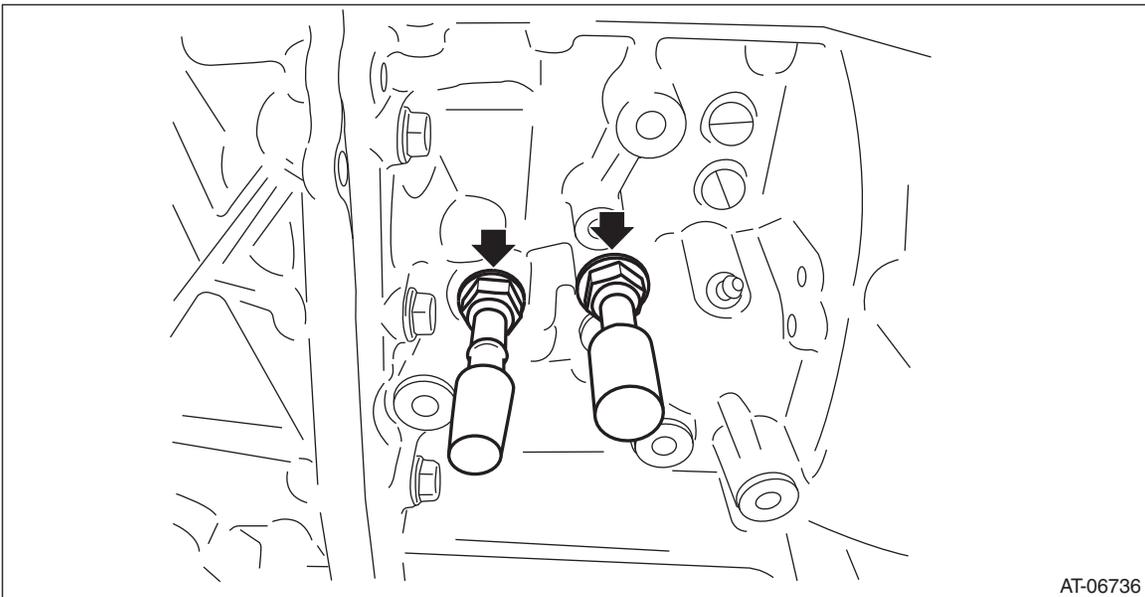
17) Remove the oil cooler pipe. (With CVTF cooler (air cool))



CVT10119

18) Remove the CVTF cooler pipe COMPL. (With CVTF cooler (air cool)) <Ref. to CVT(TR580)-182, REMOVAL, CVTF Cooler Pipe and Hose.>

19) Remove the oil cooler pipe. (Without CVTF cooler (air cool))



AT-06736

20) Remove the transmission case.

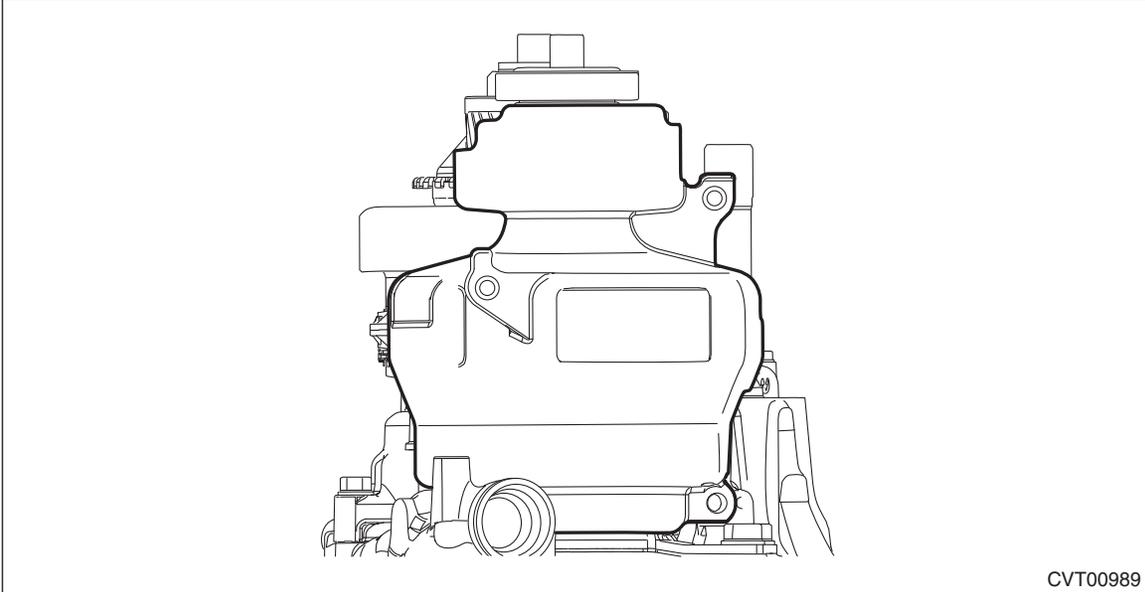
NOTE:

The total number of transmission case mounting bolts is 15.

Transmission Case

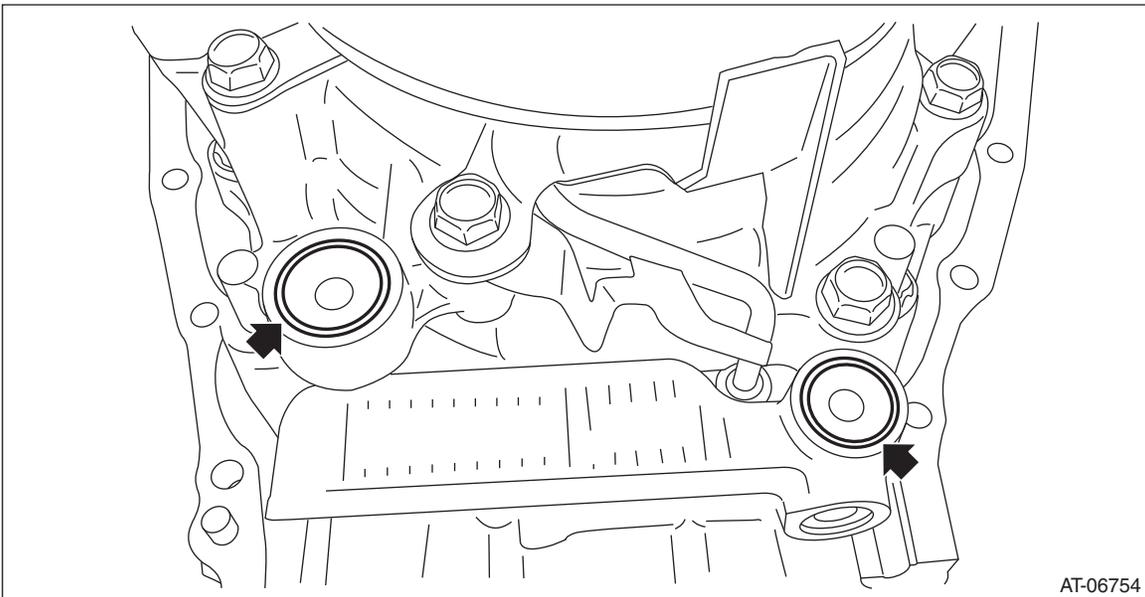
CONTINUOUSLY VARIABLE TRANSMISSION

21) Remove the oil baffle.



CVT00989

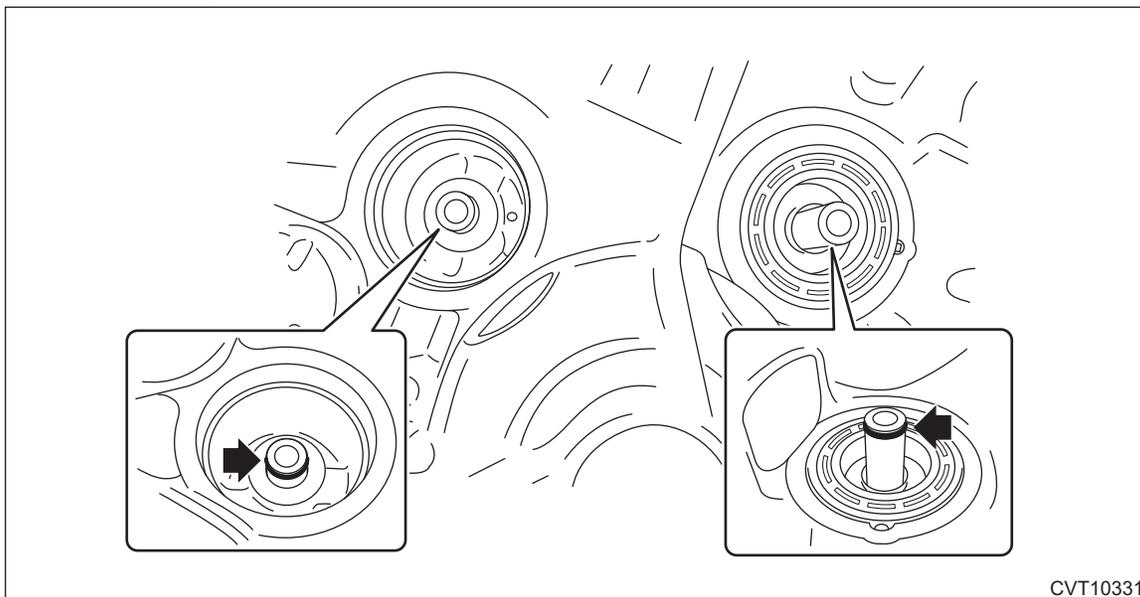
22) Remove the O-rings.



AT-06754

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23) Remove the seal rings.

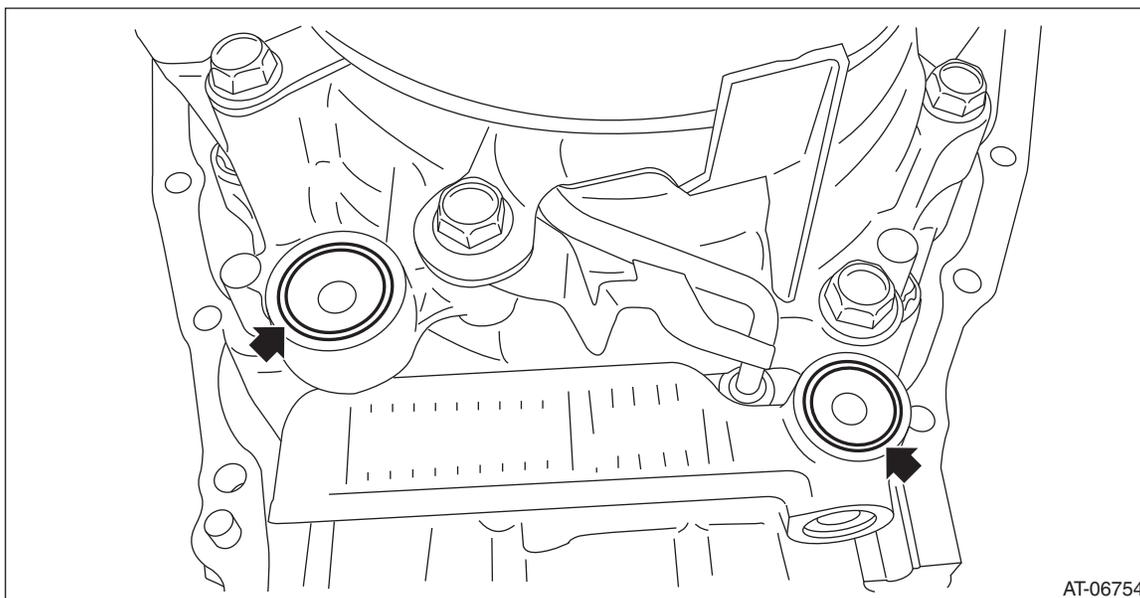


B: INSTALLATION

- 1) Clean the mating surface of transmission case and converter case.
- 2) Select the reduction gear shim. <Ref. to CVT(TR580)-263, ADJUSTMENT, Reduction Drive Gear.>
- 3) Remove the transmission case, and install the selected reduction gear shim to the reduction drive gear.
- 4) Install the O-rings to the reverse clutch housing and drive pinion retainer.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.



5) Install the seal rings.

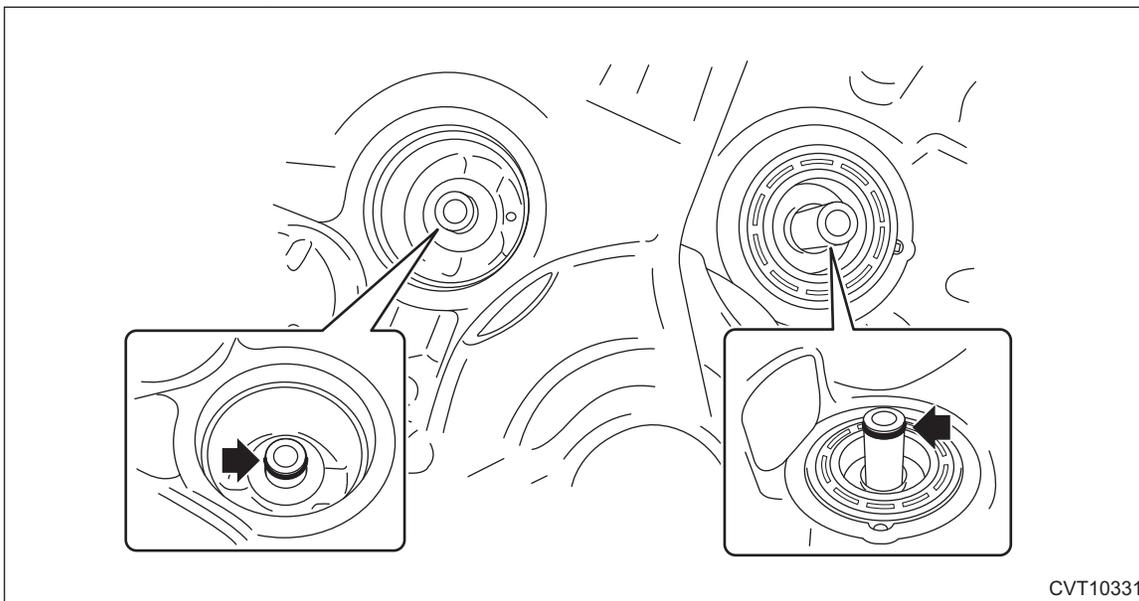
NOTE:

- Use new seal rings.
- When installing the seal rings, do not expand the seal rings too much.

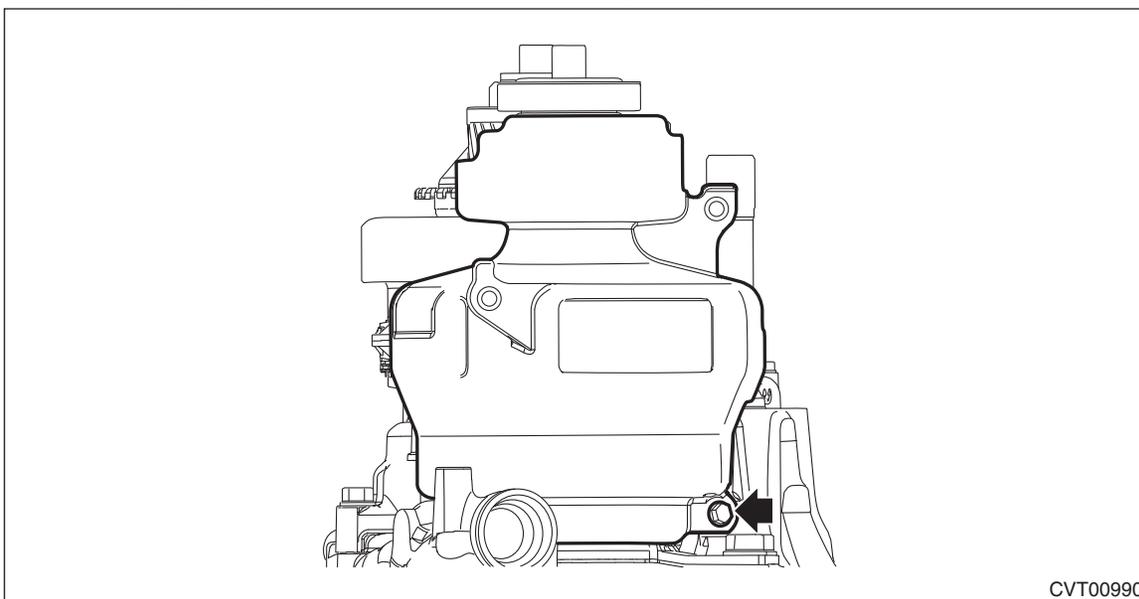
Transmission Case

CONTINUOUSLY VARIABLE TRANSMISSION

- Apply CVTF to the seal rings.



- 6) Cover the secondary pulley with the oil baffle, and temporarily install it with bolts.

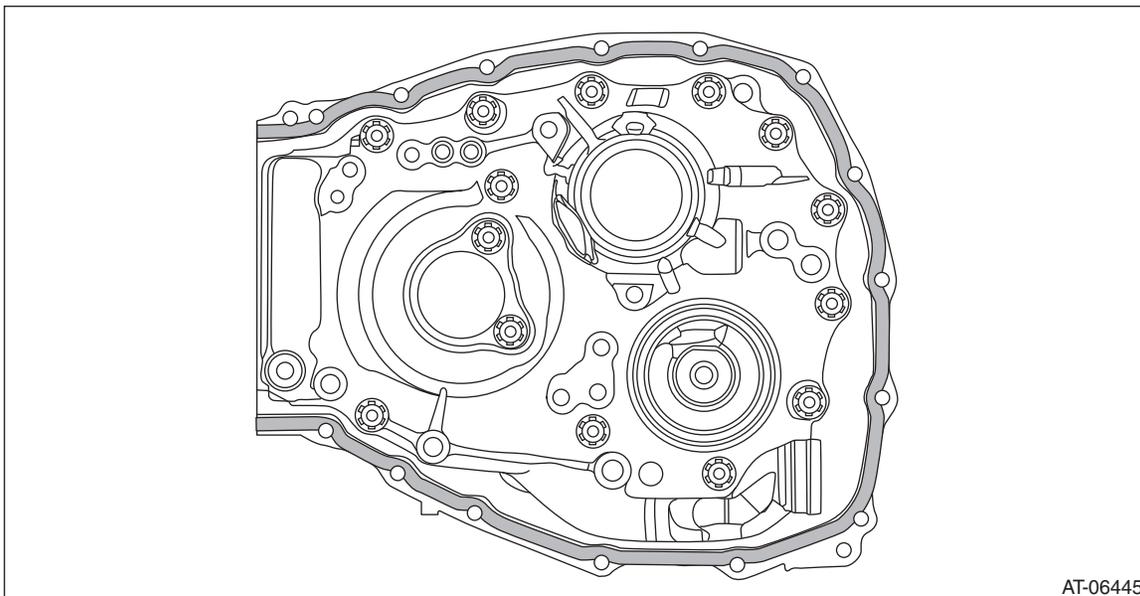


- 7) Apply liquid gasket seamlessly to the mating surface of transmission case.

Transmission Case

CONTINUOUSLY VARIABLE TRANSMISSION

Liquid gasket:
THREE BOND 1215B or equivalent



8) Install the transmission case.

NOTE:

The total number of transmission case mounting bolts is 15.

Tightening torque:

22 N·m (2.2 kgf·m, 16.2 ft·lb)

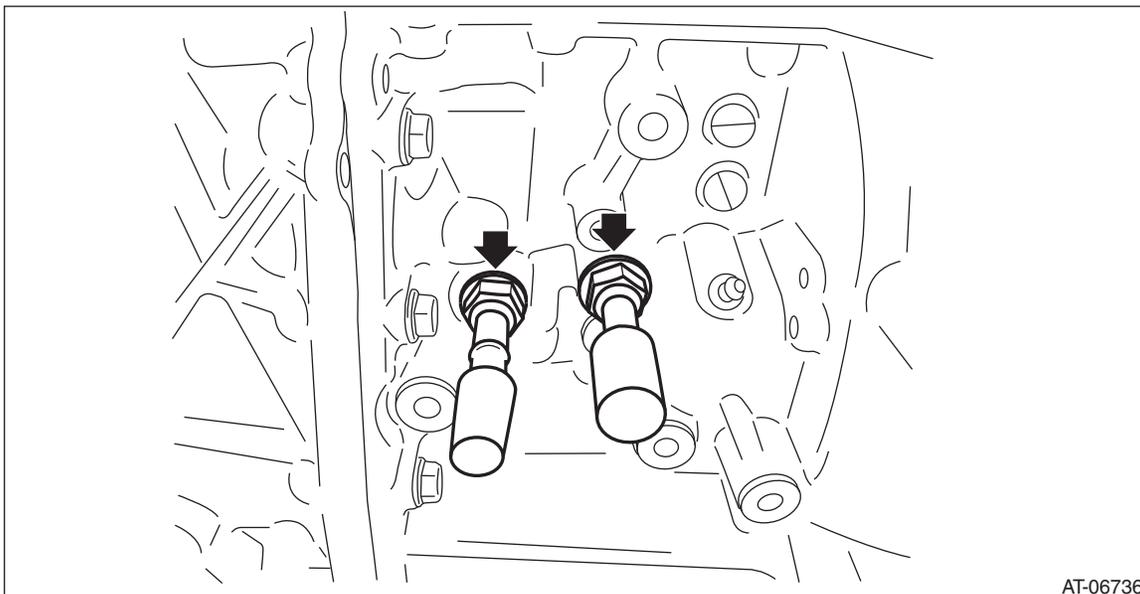
9) Install the oil cooler pipe. (Without CVTF cooler (air cool))

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

Tightening torque:

25 N·m (2.5 kgf·m, 18.4 ft·lb)



10) Install the CVTF cooler pipe COMPL and oil cooler pipe. (With CVTF cooler (air cool)) <Ref. to CVT(TR580)-188, INSTALLATION, CVTF Cooler Pipe and Hose.>

11) Install the oil cooler pipe. (With CVTF cooler (air cool))

CVT(TR580)-247

Transmission Case

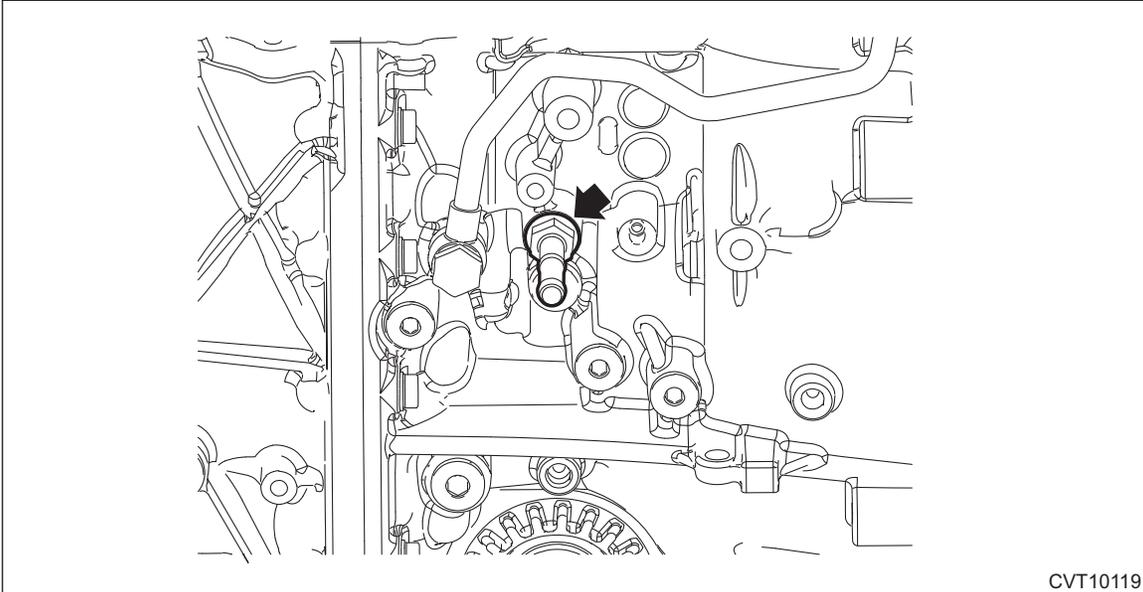
CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

Tightening torque:

25 N·m (2.5 kgf·m, 18.4 ft·lb)

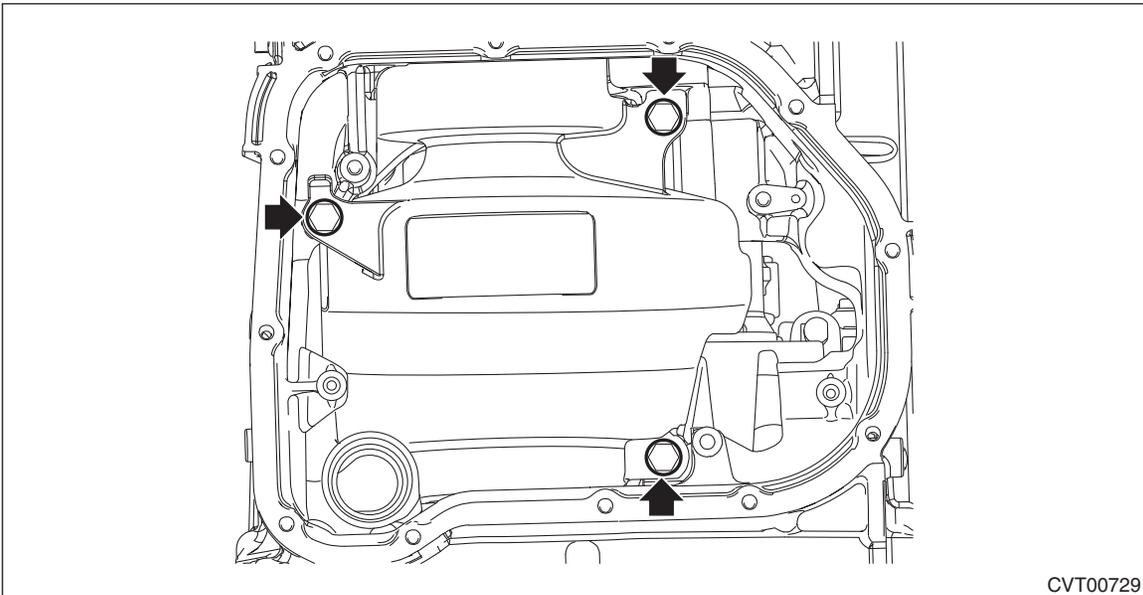


CVT10119

12) Install the oil baffle securing bolt.

Tightening torque:

16 N·m (1.6 kgf·m, 11.8 ft·lb)



CVT00729

13) Install the transmission control device. <Ref. to CVT(TR580)-238, INSTALLATION, Transmission Control Device.>

14) Install the oil pan and oil strainer. <Ref. to CVT(TR580)-136, INSTALLATION, Oil Pan and Strainer.>

15) Install the reduction driven gear assembly. <Ref. to CVT(TR580)-229, INSTALLATION, Reduction Driven Gear.>

16) Install the parking pawl. <Ref. to CVT(TR580)-227, INSTALLATION, Parking Pawl.>

17) Install the transfer driven gear assembly. <Ref. to CVT(TR580)-224, INSTALLATION, Transfer Driven Gear.>

18) Install the transfer clutch assembly. <Ref. to CVT(TR580)-211, INSTALLATION, Transfer Clutch.>

CVT(TR580)-248

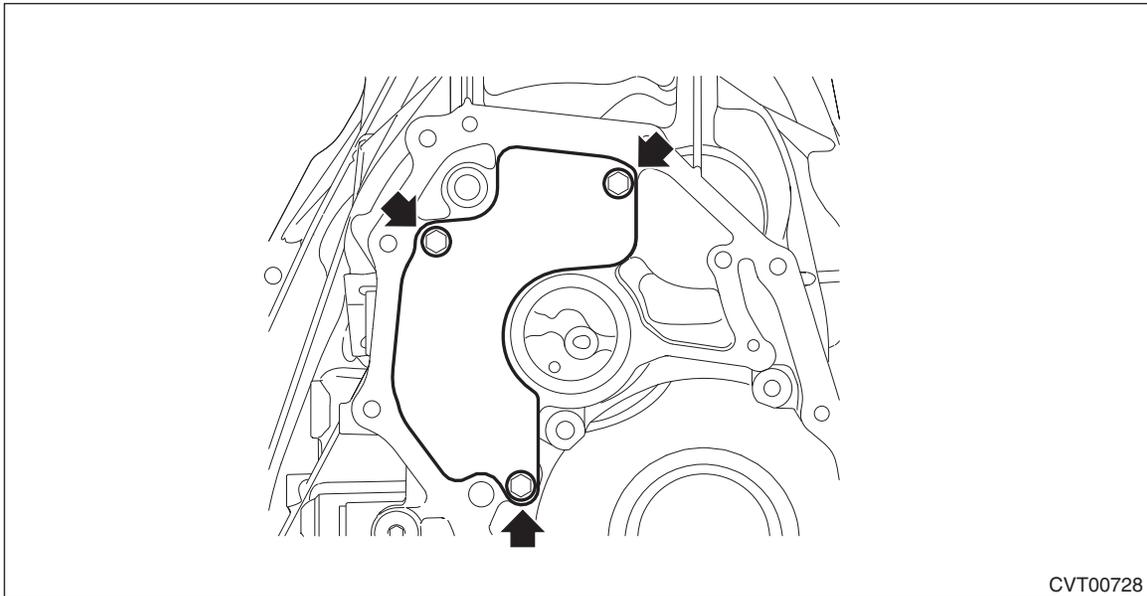
Transmission Case

CONTINUOUSLY VARIABLE TRANSMISSION

- 19) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 20) Install the inhibitor switch. <Ref. to CVT(TR580)-115, INSTALLATION, Inhibitor Switch.>
- 21) Install the secondary speed sensor. <Ref. to CVT(TR580)-123, INSTALLATION, Secondary Speed Sensor.>
- 22) Install the primary speed sensor. <Ref. to CVT(TR580)-128, INSTALLATION, Primary Speed Sensor.>
- 23) Install the turbine speed sensor. <Ref. to CVT(TR580)-118, INSTALLATION, Turbine Speed Sensor.>
- 24) Install the transmission harness. <Ref. to CVT(TR580)-155, INSTALLATION, Transmission Harness.>
- 25) Install the control valve body. <Ref. to CVT(TR580)-144, INSTALLATION, Control Valve Body.>
- 26) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>
- 27) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

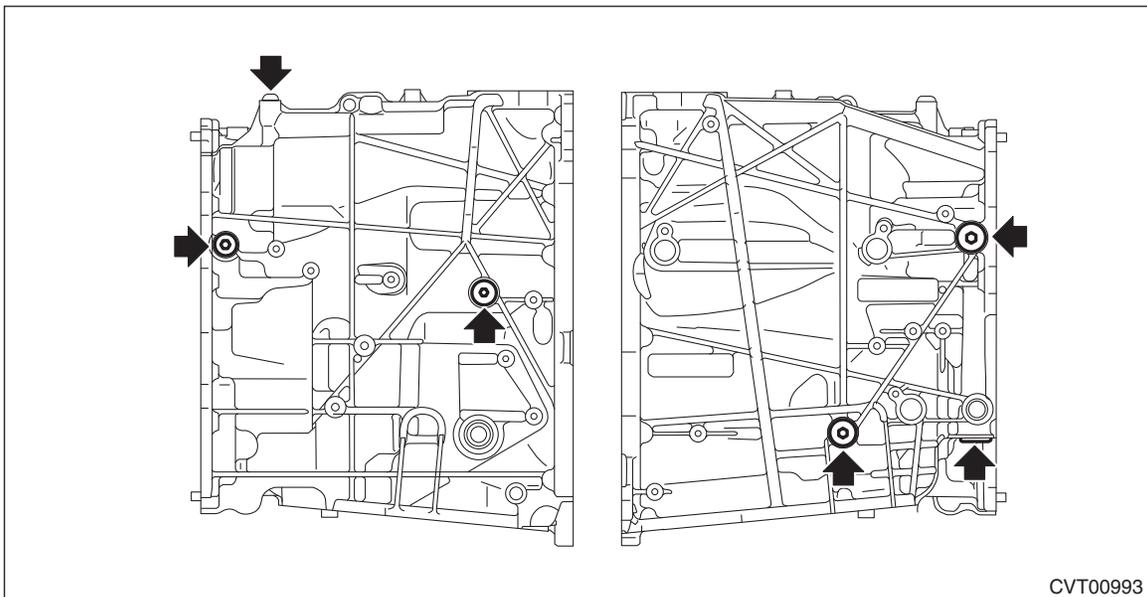
C: DISASSEMBLY

- 1) Remove the oil stopper plate.



CVT00728

- 2) Remove all plugs from the transmission case.

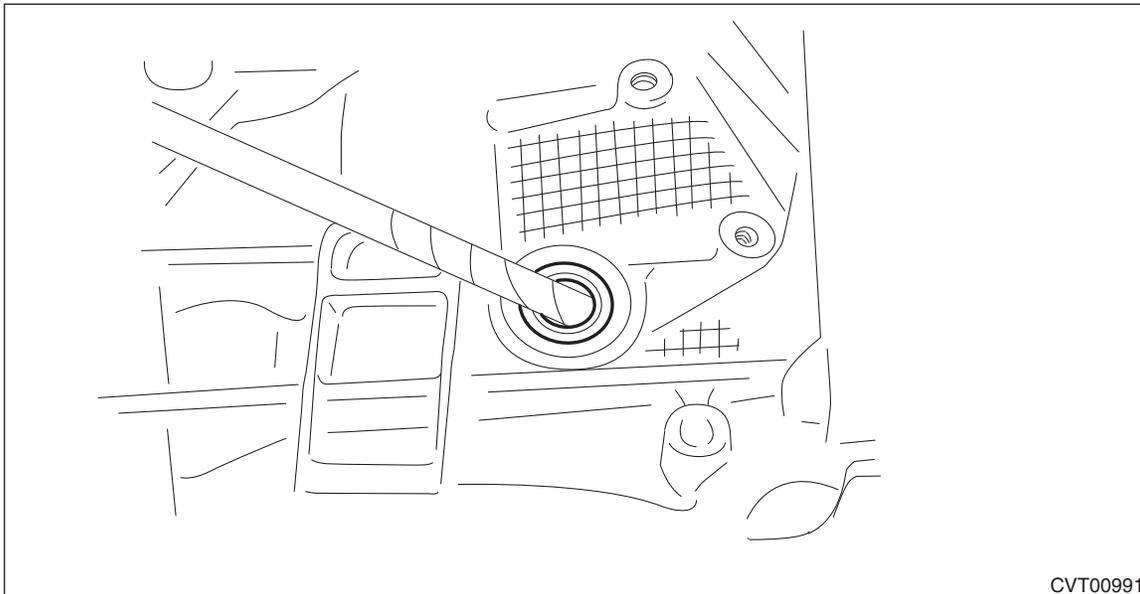


CVT00993

Transmission Case

CONTINUOUSLY VARIABLE TRANSMISSION

3) Remove the oil seal using a screwdriver wrapped with cloth etc.



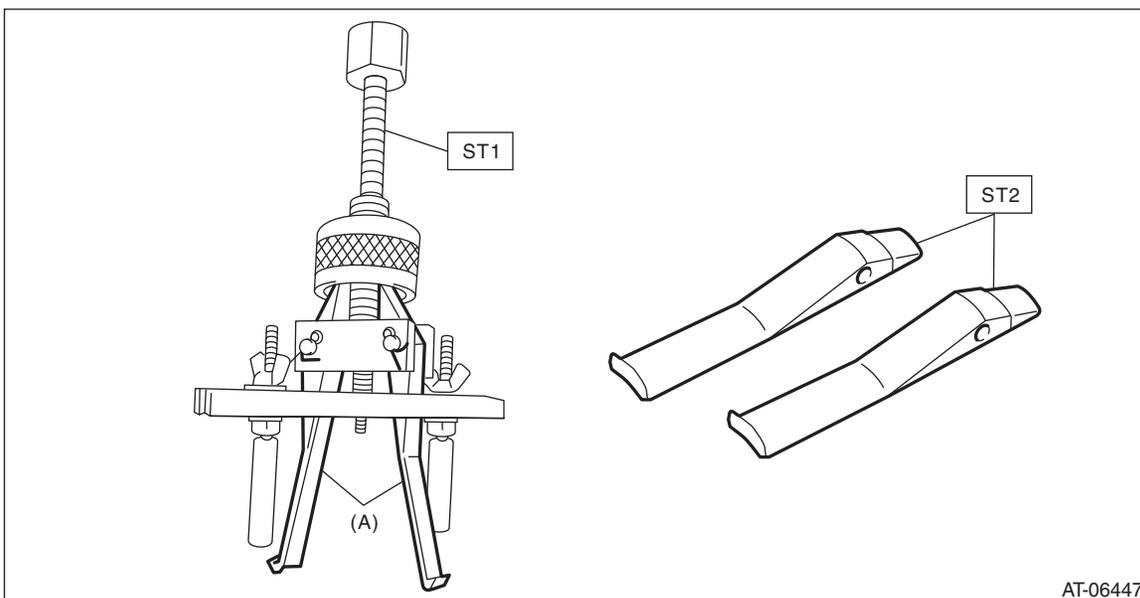
CVT00991

4) Using the ST, remove the ball bearing of the secondary pulley.

(1) Remove the claw of ST1, and attach the claw of ST2.

ST1 398527700 PULLER ASSY

ST2 18760AA000 CLAW



AT-06447

(A) Claw

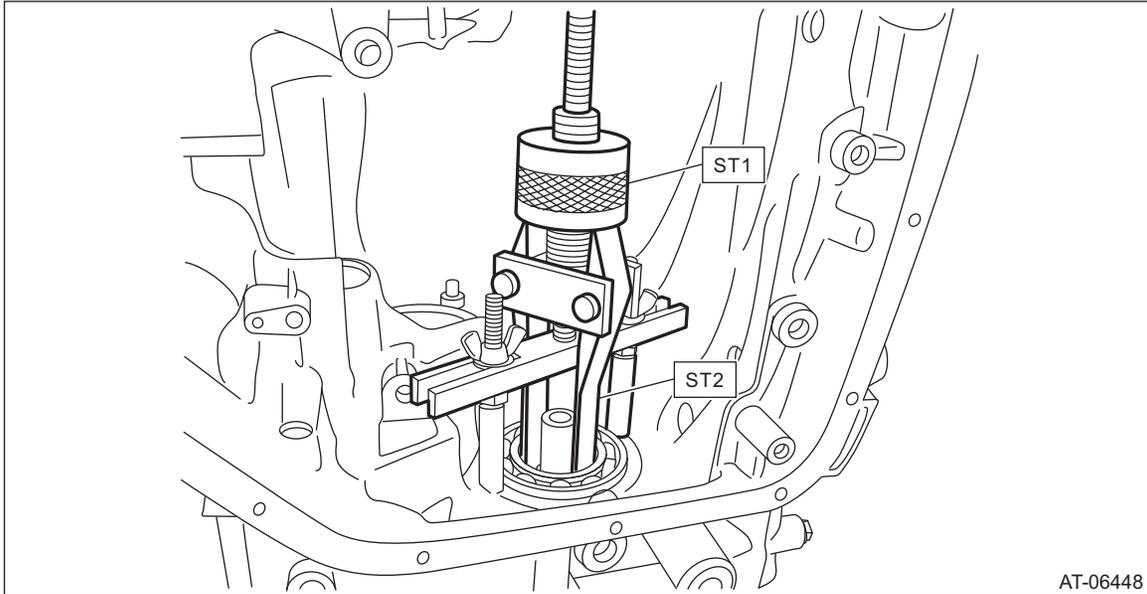
Transmission Case

CONTINUOUSLY VARIABLE TRANSMISSION

(2) Using the ST, remove the ball bearing of the secondary pulley.

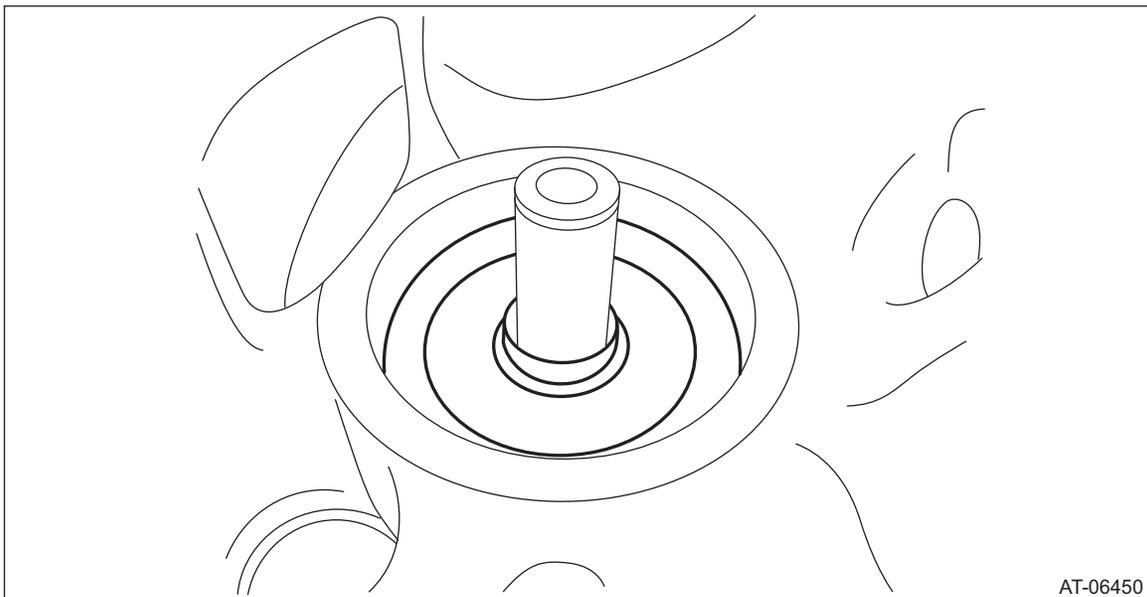
ST1 398527700 PULLER ASSY

ST2 18760AA000 CLAW



AT-06448

5) Remove the oil guide.



AT-06450

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Transmission Case

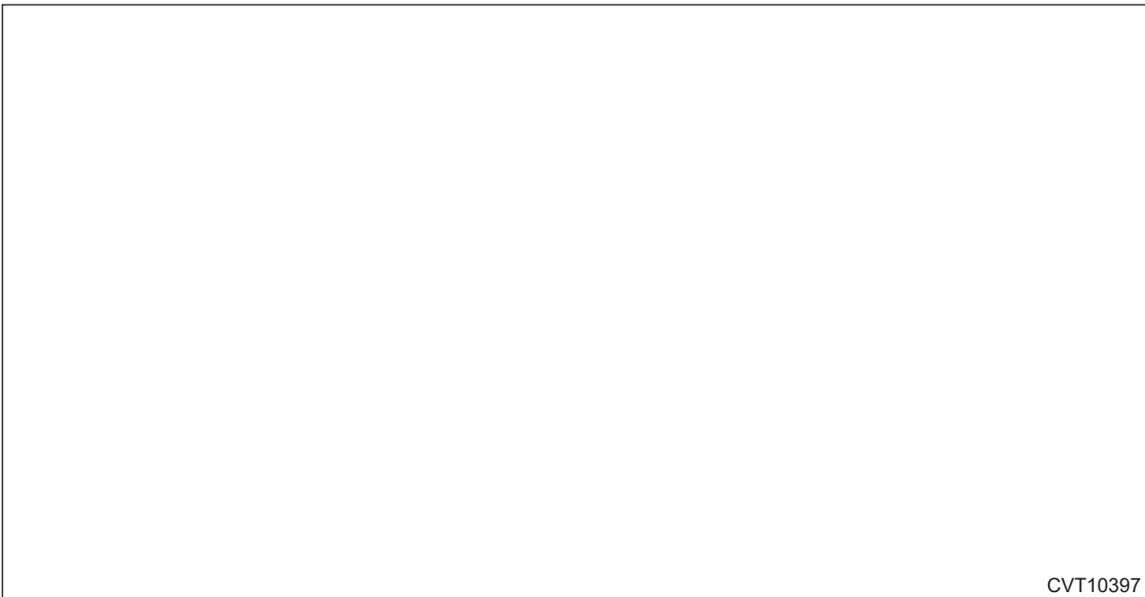
CONTINUOUSLY VARIABLE TRANSMISSION

6) Remove the roller bearing of reduction driven gear.



CVT10396

7) Remove the thrust bearing.



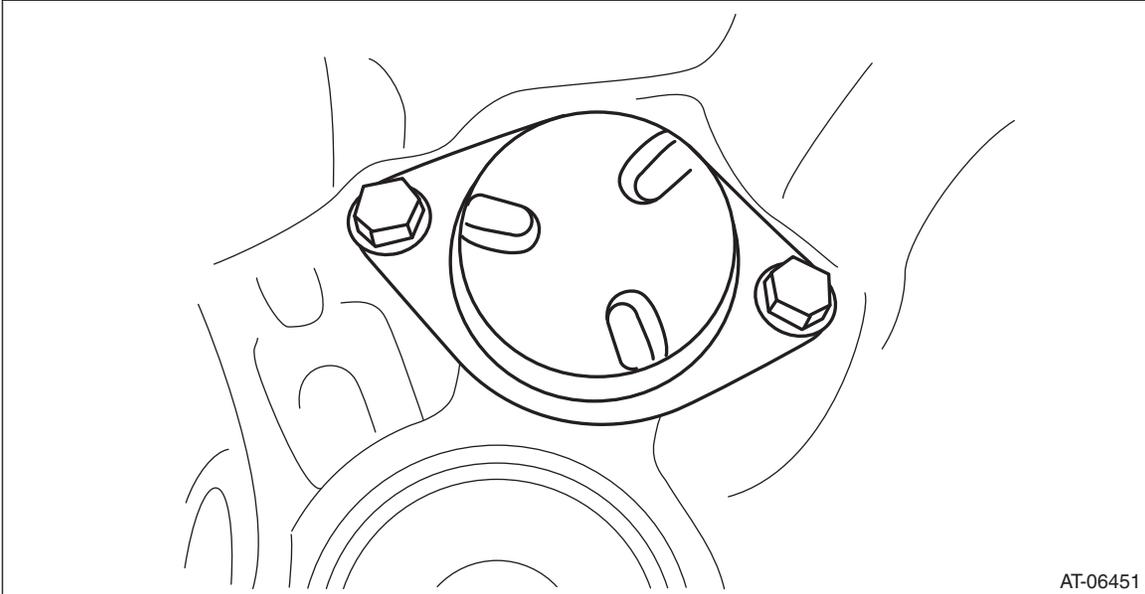
CVT10397

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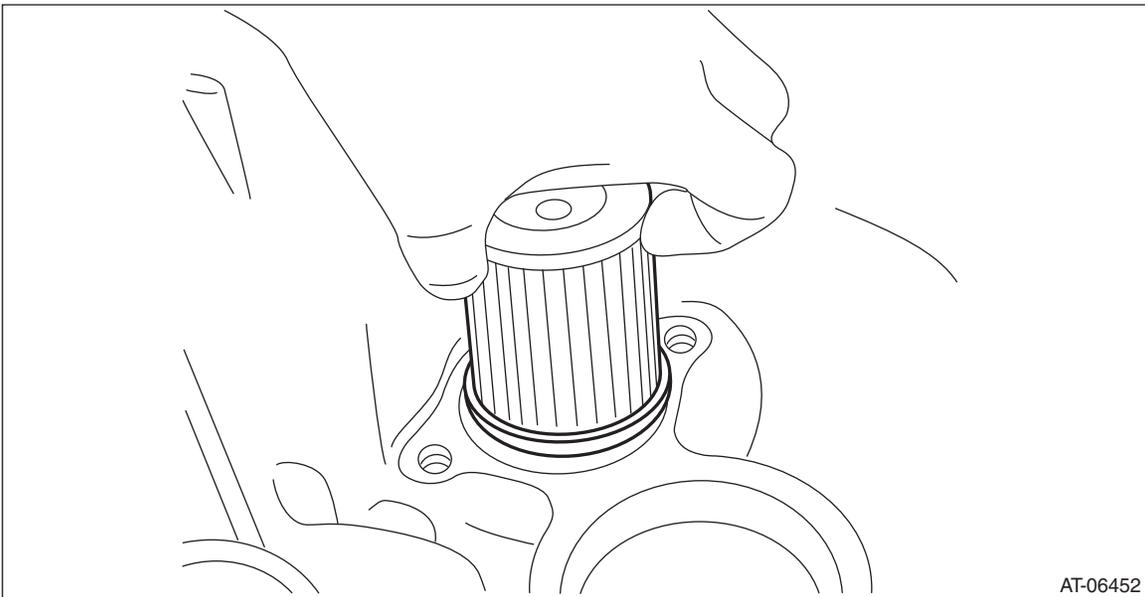
Transmission Case

CONTINUOUSLY VARIABLE TRANSMISSION

8) Remove the CVTF filter cover and gasket.



9) Remove the CVTF filter.



D: ASSEMBLY

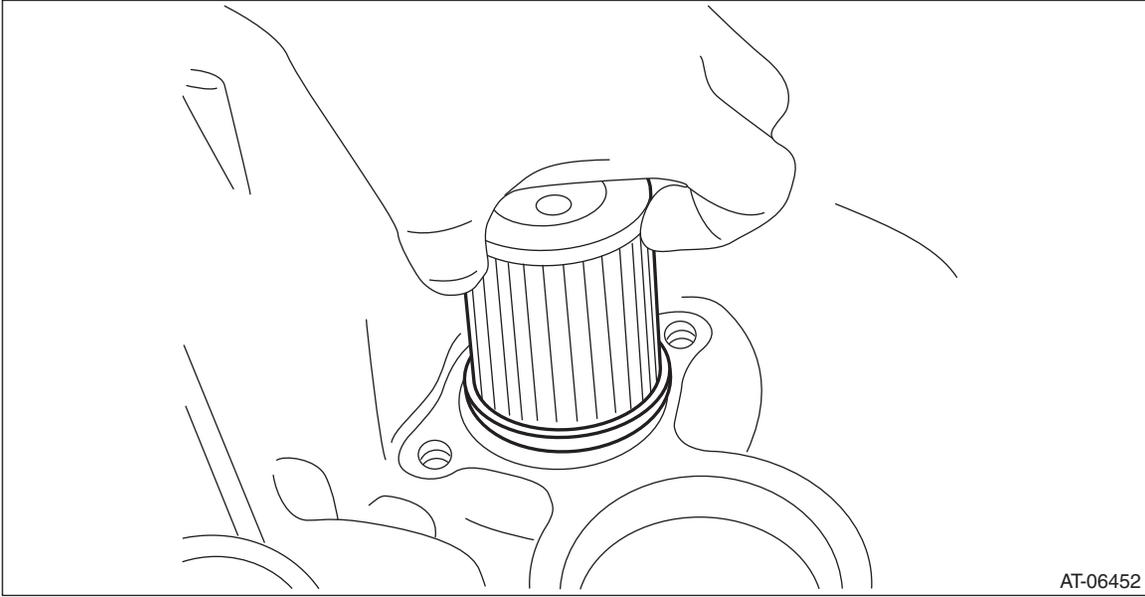
1) Face the O-ring side of the CVTF filter to the transmission case side, and install the CVTF filter.

Transmission Case

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Apply CVTF to the O-ring of CVTF filter.



AT-06452

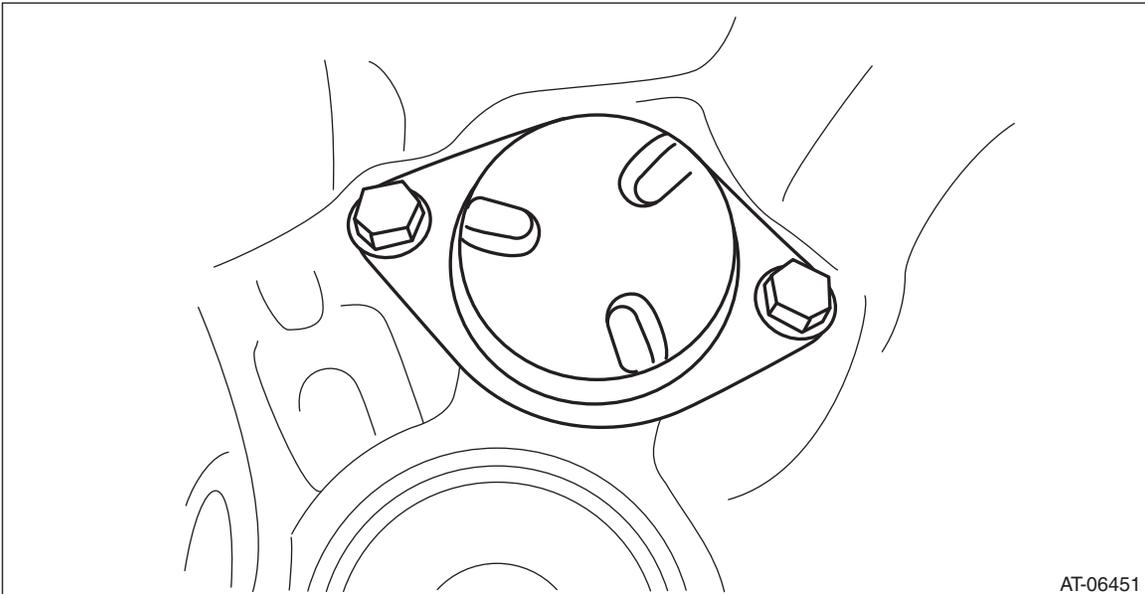
2) Install the CVTF filter cover and gasket.

NOTE:

Use a new gasket.

Tightening torque:

17 N·m (1.7 kgf·m, 12.5 ft·lb)



AT-06451

3) Using the ST, install the oil seal.

NOTE:

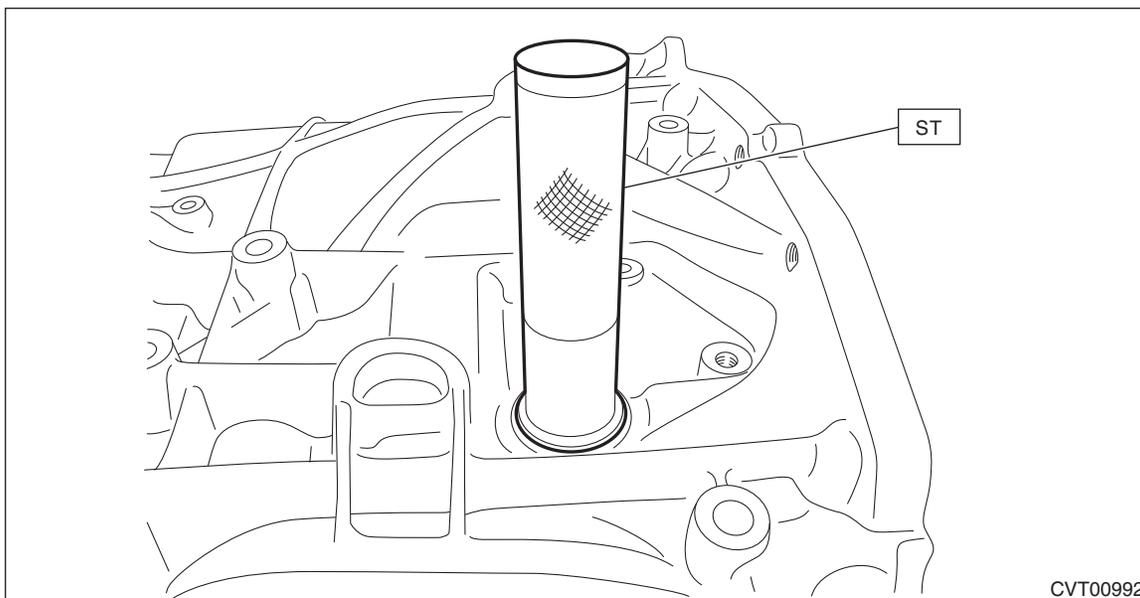
- Use a new oil seal.

Transmission Case

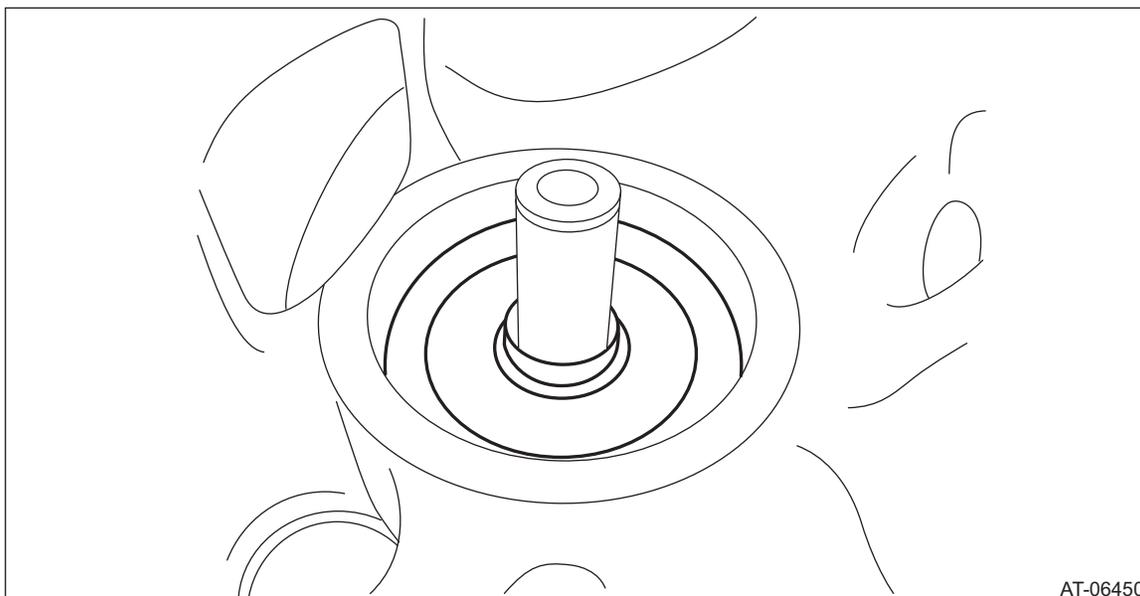
CONTINUOUSLY VARIABLE TRANSMISSION

- Apply CVTF to the oil seal lip and press-fitting surface.

ST 18657AA010 INSTALLER



- 4) Install the oil guide.



- 5) Press-fit the roll pin into the ball bearing on the secondary pulley side.

(1) Hold the roll pin with a knock pin punch or the like, and press-fit with a hammer.

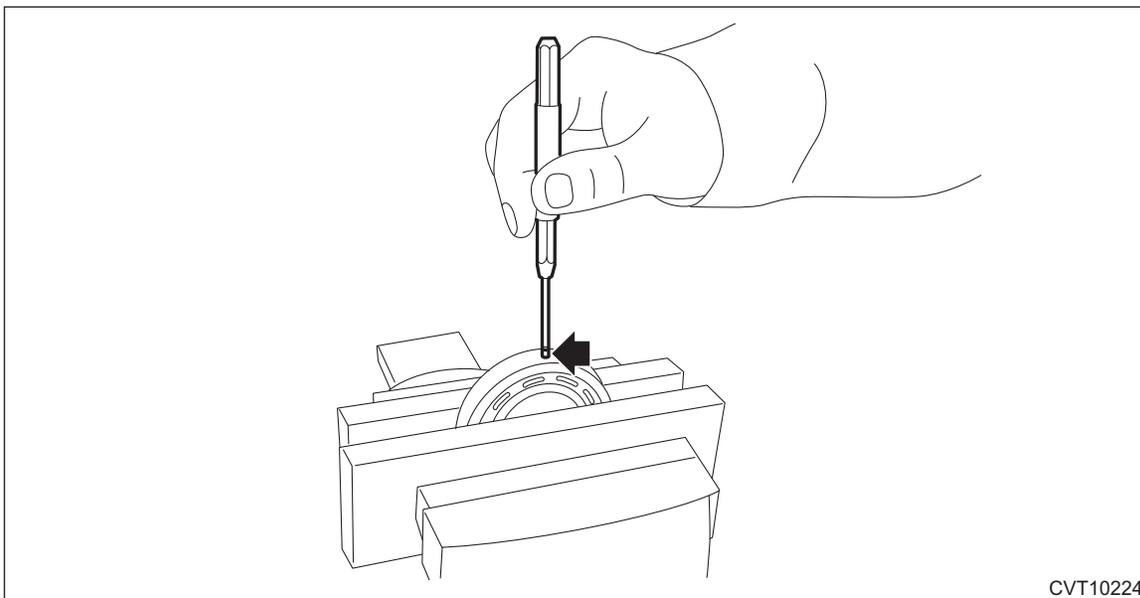
NOTE:

- Use a new ball bearing.

Transmission Case

CONTINUOUSLY VARIABLE TRANSMISSION

- When securing the ball bearing with a vise, place a wood piece therebetween to avoid scratching the bearing race.

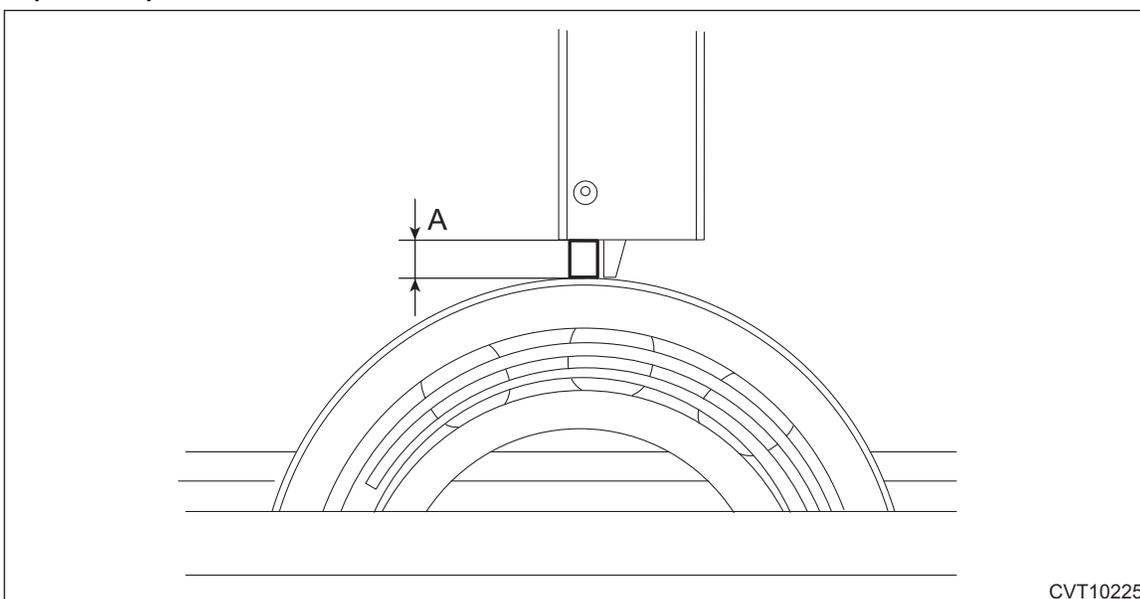


CVT10224

- (2) Measure the height "A" of the roll pin.

Specification:

4.4 mm (0.173 in) or less



CVT10225

- 6) Using ST1, ST2 and ST3, install the ball bearing on the secondary pulley side.

NOTE:

- Align the roll pin to the cutout of the transmission case.

Transmission Case

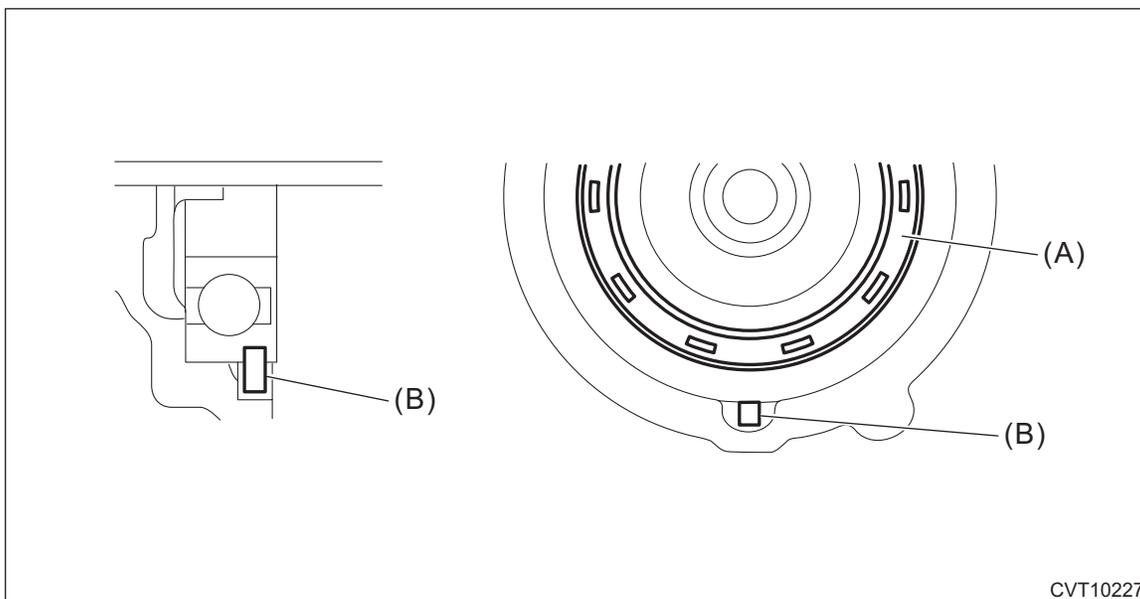
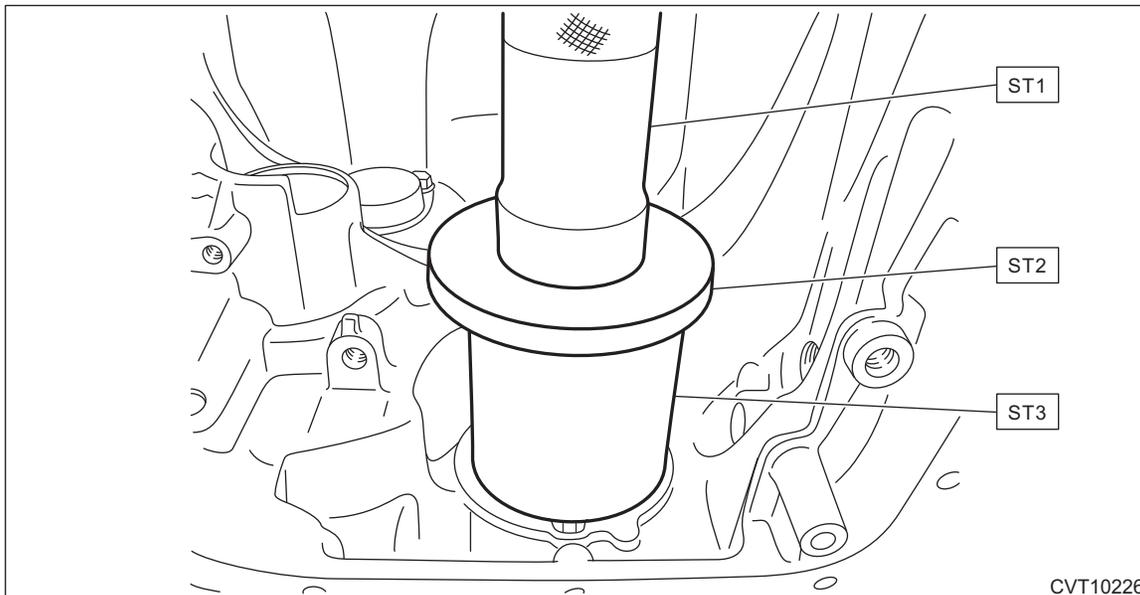
CONTINUOUSLY VARIABLE TRANSMISSION

- Press-fit the pin so that it is positioned on near side (the retainer should be seen on your side).

ST1 499277100 BUSHING 1-2 INSTALLER

ST2 398177700 INSTALLER

ST3 28499TC010 PRESS SNAP RING



(A) Retainer

(B) Roll pin

7) Install all plugs.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.
- For the plug (A), fill the CVTF, and then tighten the plug using a new O-ring.

Transmission Case

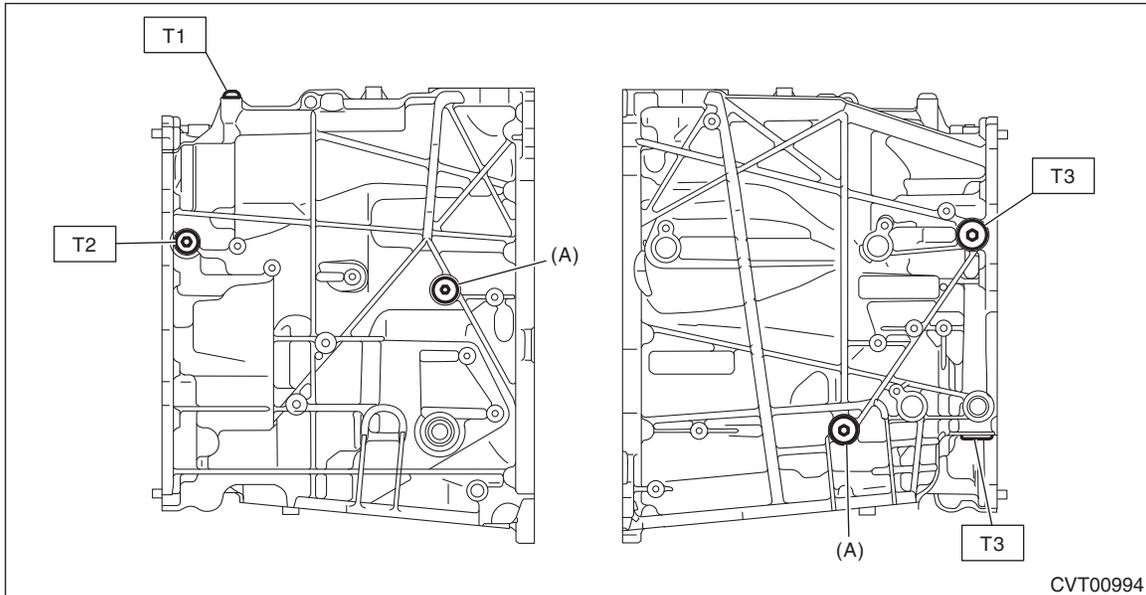
CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

T1: 13 N·m (1.3 kgf-m, 9.6 ft-lb)

T2: 22 N·m (2.2 kgf-m, 16.2 ft-lb)

T3: 50 N·m (5.1 kgf-m, 36.9 ft-lb)



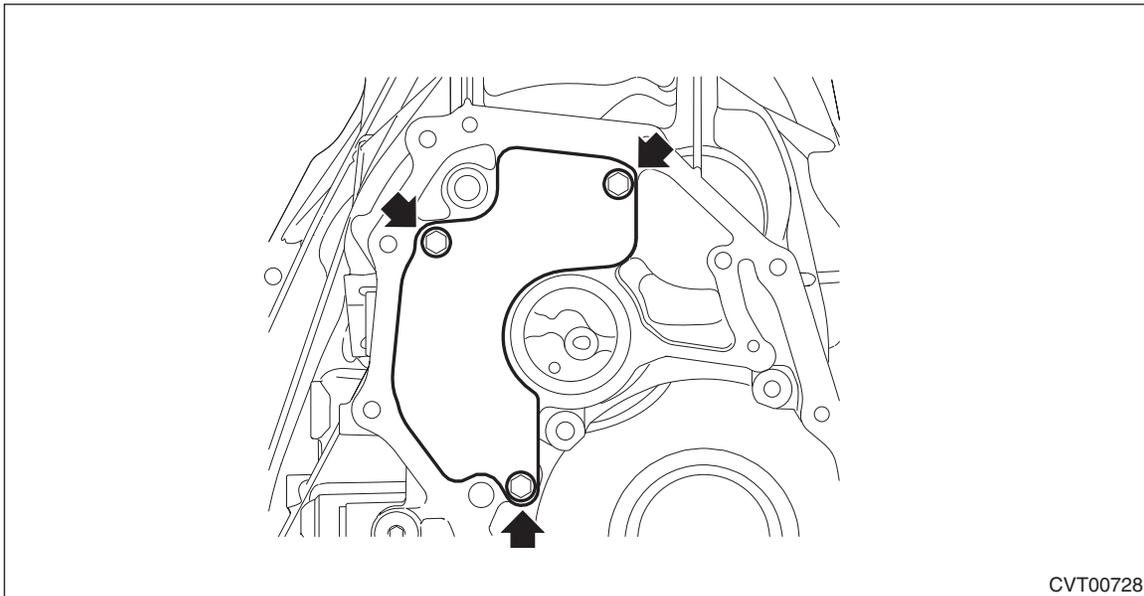
8) Install the oil stopper plate.

NOTE:

Use a new bolt.

Tightening torque:

9 N·m (0.9 kgf-m, 6.6 ft-lb)



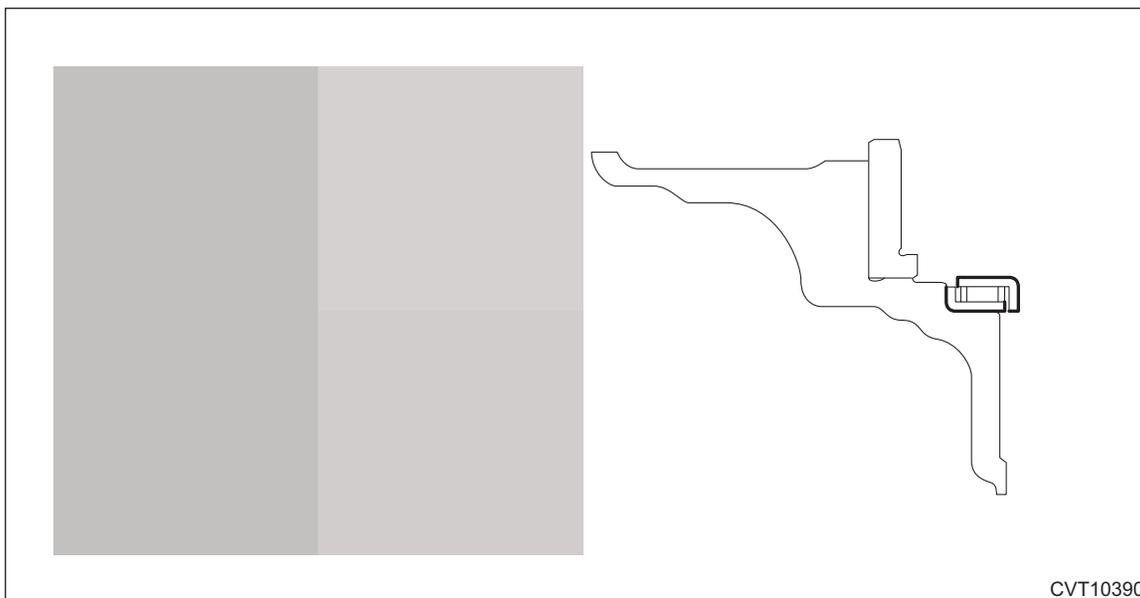
9) Install the thrust bearing to the transmission case.

Transmission Case

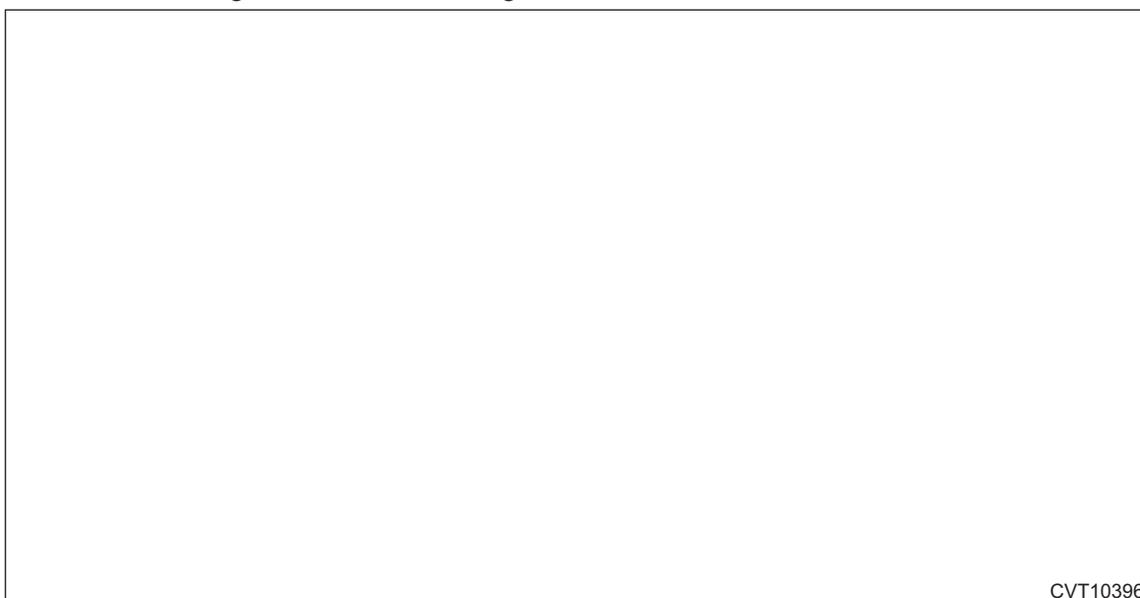
CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Face the temper color surface to the transmission side.



10) Install the roller bearing of reduction driven gear.



E: INSPECTION

- Check the transmission case for damage.
- Check for leakage of CVTF from the connection between converter case and transmission case.
- Check the bearing for smooth operation.
- Check the bearing for seizure or wear.

F: ADJUSTMENT

NOTE:

When replacing the transmission case with a new part, perform the following check and adjustment for the selection.

- Select the transfer driven gear shim. <Ref. to CVT(TR580)-221, ADJUSTMENT, Transfer Clutch.>
- Select the transfer drive gear shim. <Ref. to CVT(TR580)-234, ADJUSTMENT, Reduction Driven Gear.>
- Select the reduction drive gear shim. <Ref. to CVT(TR580)-263, ADJUSTMENT, Reduction Drive Gear.>

CVTF Filter

CONTINUOUSLY VARIABLE TRANSMISSION

39. CVTF Filter

A: REMOVAL

NOTE:

- Although CVTF filter is a maintenance-free part, replace it if a large quantity of wear debris and metal particles are found in CVTF and CVTF filter.
- For removal of CVTF filter, refer to “Transmission Case”. <Ref. to CVT(TR580)-242, REMOVAL, Transmission Case.> <Ref. to CVT(TR580)-249, DISASSEMBLY, Transmission Case.>

B: INSTALLATION

NOTE:

For installation of CVTF filter, refer to “Transmission Case”. <Ref. to CVT(TR580)-253, ASSEMBLY, Transmission Case.> <Ref. to CVT(TR580)-245, INSTALLATION, Transmission Case.>

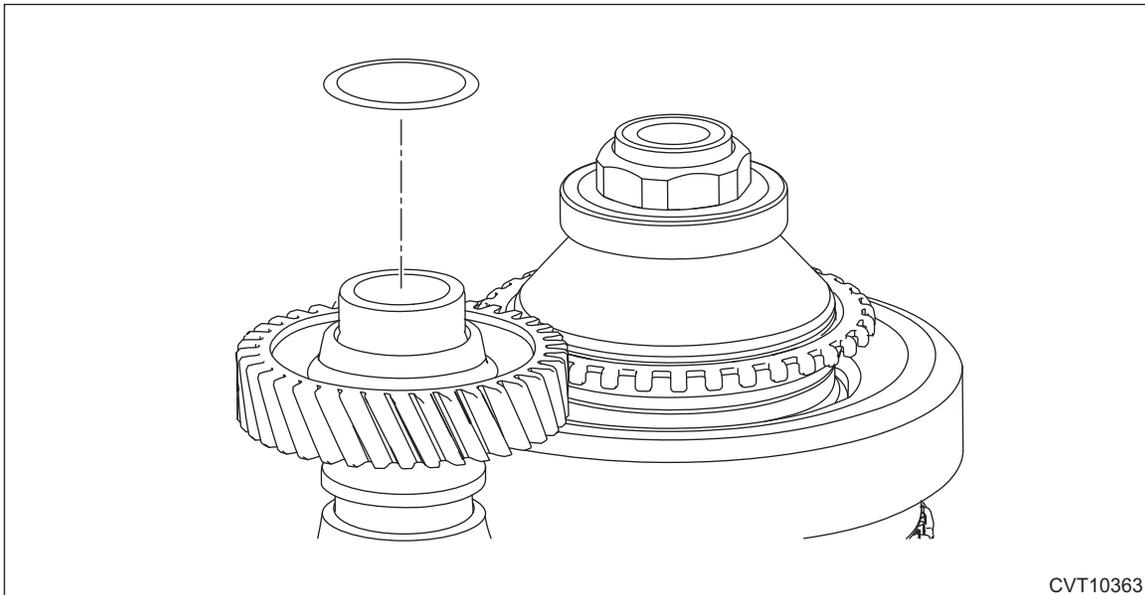
C: INSPECTION

- Check if a large quantity of wear debris or metal particles are in CVTF and CVTF filter.
- Check for broken part or damaged O-ring.

40.Reduction Drive Gear

A: REMOVAL

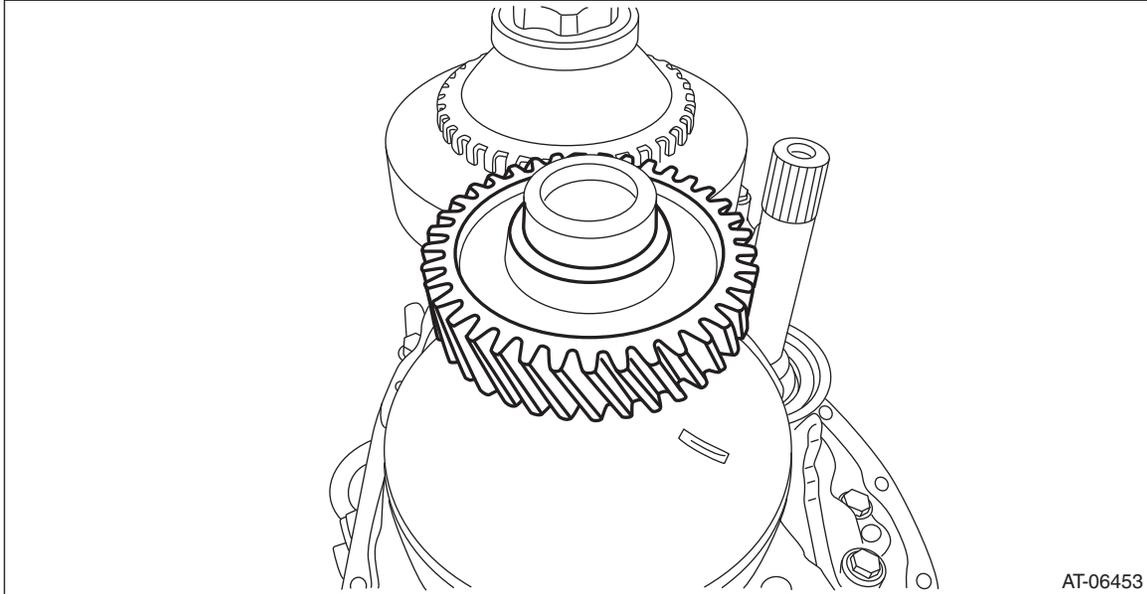
- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the air breather hose. <Ref. to CVT(TR580)-196, REMOVAL, Air Breather Hose.>
- 3) Remove the control valve body. <Ref. to CVT(TR580)-138, REMOVAL, Control Valve Body.>
- 4) Remove the transmission harness. <Ref. to CVT(TR580)-152, REMOVAL, Transmission Harness.>
- 5) Remove the turbine speed sensor. <Ref. to CVT(TR580)-118, REMOVAL, Turbine Speed Sensor.>
- 6) Remove the secondary speed sensor. <Ref. to CVT(TR580)-123, REMOVAL, Secondary Speed Sensor.>
- 7) Remove the primary speed sensor. <Ref. to CVT(TR580)-128, REMOVAL, Primary Speed Sensor.>
- 8) Remove the inhibitor switch. <Ref. to CVT(TR580)-112, REMOVAL, Inhibitor Switch.>
- 9) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 10) Remove the transfer clutch assembly. <Ref. to CVT(TR580)-210, REMOVAL, Transfer Clutch.>
- 11) Remove the transfer driven gear assembly. <Ref. to CVT(TR580)-224, REMOVAL, Transfer Driven Gear.>
- 12) Remove the parking pawl. <Ref. to CVT(TR580)-227, REMOVAL, Parking Pawl.>
- 13) Remove the reduction driven gear assembly. <Ref. to CVT(TR580)-229, REMOVAL, Reduction Driven Gear.>
- 14) Remove the oil pan and oil strainer. <Ref. to CVT(TR580)-135, REMOVAL, Oil Pan and Strainer.>
- 15) Remove the transmission control device. <Ref. to CVT(TR580)-236, REMOVAL, Transmission Control Device.>
- 16) Remove the transmission case. <Ref. to CVT(TR580)-242, REMOVAL, Transmission Case.>
- 17) Remove the reduction drive gear shim.



Reduction Drive Gear

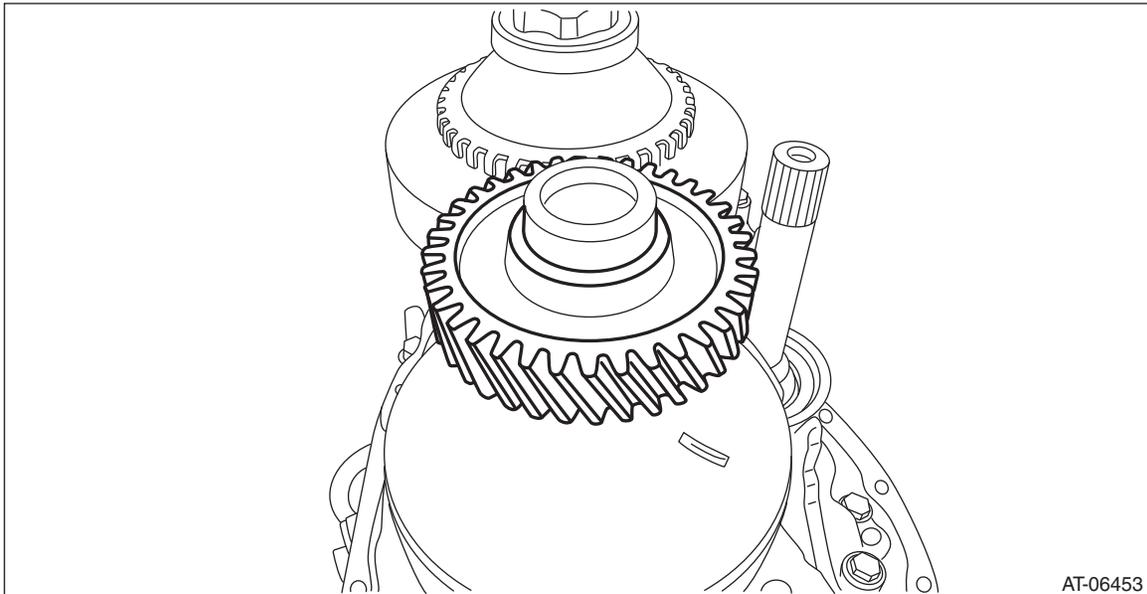
CONTINUOUSLY VARIABLE TRANSMISSION

18) Remove the reduction drive gear.



B: INSTALLATION

1) Install the reduction drive gear to secondary pulley.



- 2) Select the reduction drive gear shim. <Ref. to CVT(TR580)-263, ADJUSTMENT, Reduction Drive Gear.>
- 3) Install the selected reduction drive gear shim.
- 4) Install the transmission case. <Ref. to CVT(TR580)-245, INSTALLATION, Transmission Case.>
- 5) Install the transmission control device. <Ref. to CVT(TR580)-238, INSTALLATION, Transmission Control Device.>
- 6) Install the oil strainer and oil pan. <Ref. to CVT(TR580)-136, INSTALLATION, Oil Pan and Strainer.>
- 7) Install the reduction driven gear assembly. <Ref. to CVT(TR580)-229, INSTALLATION, Reduction Driven Gear.>
- 8) Install the parking pawl. <Ref. to CVT(TR580)-227, INSTALLATION, Parking Pawl.>
- 9) Install the transfer driven gear assembly. <Ref. to CVT(TR580)-224, INSTALLATION, Transfer Driven Gear.>
- 10) Install the transfer clutch assembly. <Ref. to CVT(TR580)-211, INSTALLATION, Transfer Clutch.>
- 11) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 12) Install the inhibitor switch. <Ref. to CVT(TR580)-115, INSTALLATION, Inhibitor Switch.>

Reduction Drive Gear

CONTINUOUSLY VARIABLE TRANSMISSION

- 13) Install the secondary speed sensor. <Ref. to CVT(TR580)-123, INSTALLATION, Secondary Speed Sensor.>
- 14) Install the primary speed sensor. <Ref. to CVT(TR580)-128, INSTALLATION, Primary Speed Sensor.>
- 15) Install the turbine speed sensor. <Ref. to CVT(TR580)-118, INSTALLATION, Turbine Speed Sensor.>
- 16) Install the transmission harness. <Ref. to CVT(TR580)-155, INSTALLATION, Transmission Harness.>
- 17) Install the control valve body. <Ref. to CVT(TR580)-144, INSTALLATION, Control Valve Body.>
- 18) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>
- 19) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: INSPECTION

Check the reduction drive gear for breakage or damage.

D: ADJUSTMENT

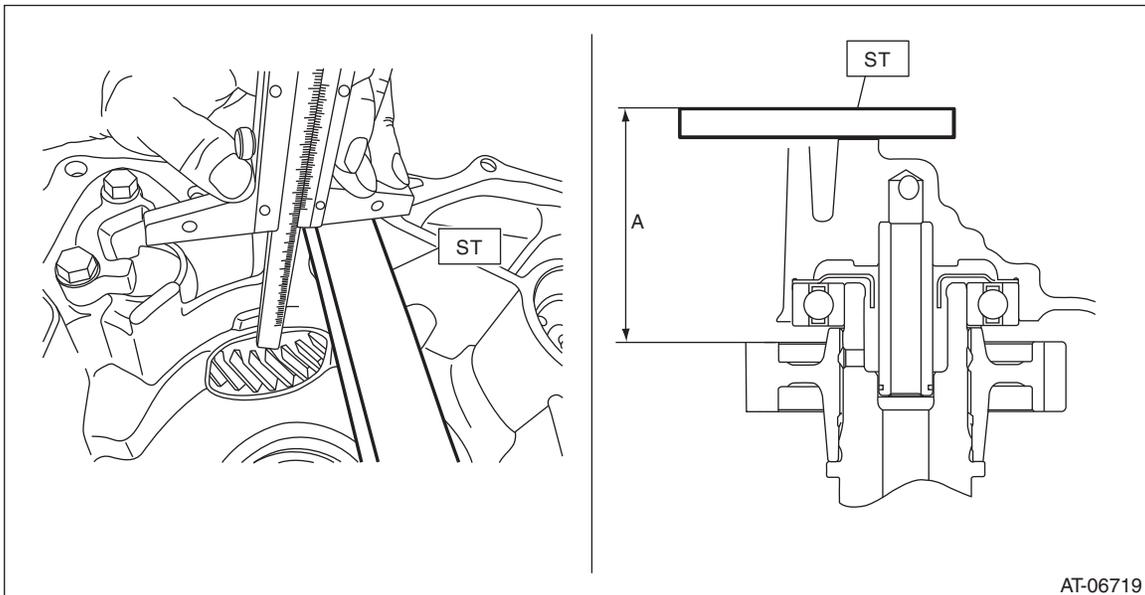
- 1) Remove the reduction drive gear shim.
- 2) Install the transmission case, and secure it with four or five bolts.

Tightening torque:

22 N·m (2.2 kgf·m, 16.2 ft·lb)

- 3) Measure depth "A" from the ST upper face to the reduction drive gear end face.

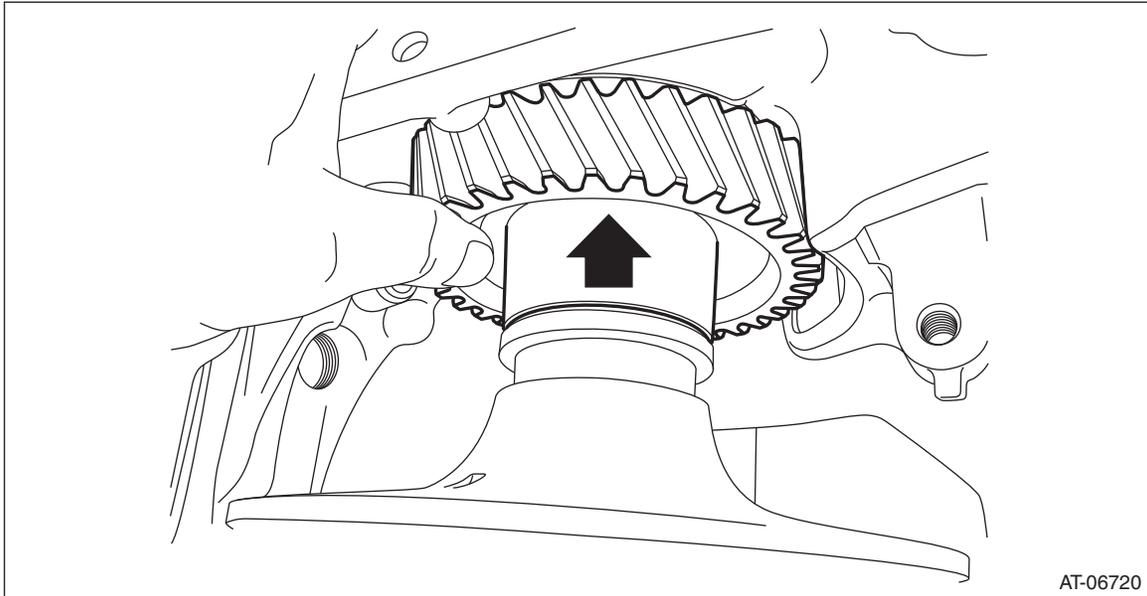
ST 499575400 GAUGE



Reduction Drive Gear

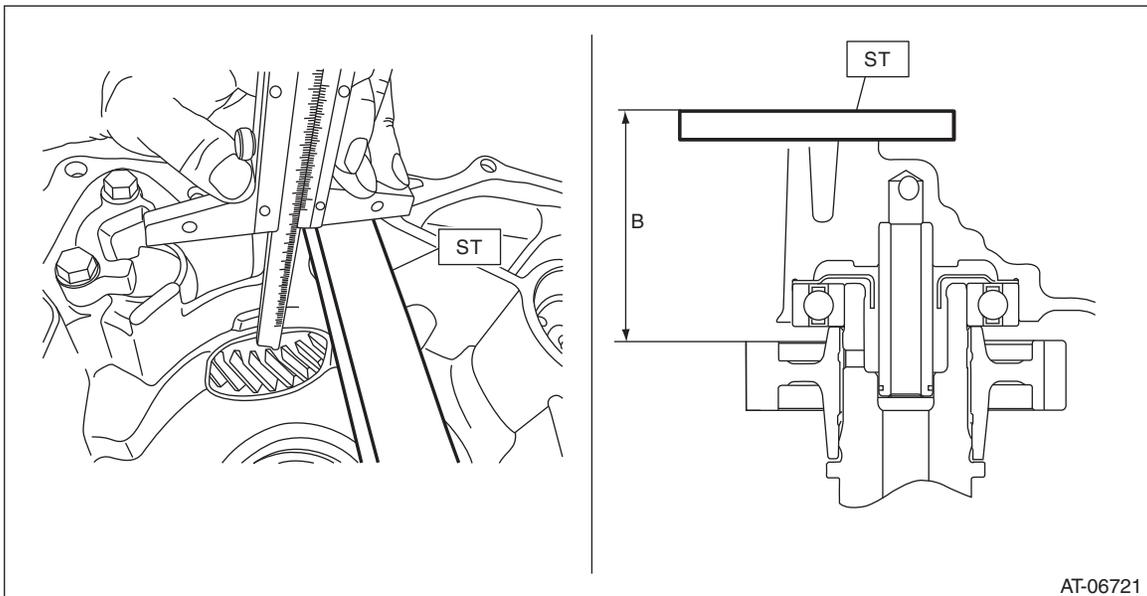
CONTINUOUSLY VARIABLE TRANSMISSION

4) Raise and hold the reduction drive gear.



AT-06720

5) Measure depth "B" from the ST upper face to the reduction drive gear end face.
ST 499575400 GAUGE



AT-06721

6) Calculate the following formula.

$$T \text{ mm} = A - B$$

$$[T \text{ in} = A - B]$$

T: Moving distance of reduction drive gear

A: Depth from the ST upper face to the reduction drive gear end surface

B: Depth from the ST upper face to the reduction drive gear end surface

Moving distance of transfer drive gear [T]	Total shim thickness mm (in)
0.420 — 0.519(0.0165 — 0.0204)	0.3 (0.012)
0.520 — 0.619(0.0205 — 0.0242)	0.4 (0.016)
0.620 — 0.719(0.0244 — 0.0283)	0.5 (0.020)
0.720 — 0.819(0.0283 — 0.0322)	0.6 (0.024)
0.820 — 0.919(0.0323 — 0.0362)	0.7 (0.028)
0.920 — 1.019(0.0362 — 0.0401)	0.8 (0.031)
1.020 — 1.119(0.0402 — 0.0441)	0.9 (0.035)

Reduction Drive Gear

CONTINUOUSLY VARIABLE TRANSMISSION

Moving distance of transfer drive gear [T]	Total shim thickness mm (in)
1.120 — 1.219(0.0441 — 0.0480)	1.0 (0.039)
1.220 — 1.319(0.0480 — 0.0519)	1.1 (0.043)
1.320 — 1.419(0.0520 — 0.0559)	1.2 (0.047)
1.420 — 1.519(0.0559 — 0.0598)	1.3 (0.051)
1.520 — 1.619(0.0598 — 0.0637)	1.4 (0.055)
1.620 — 1.719(0.0638 — 0.0677)	1.5 (0.059)
1.720 — 1.819(0.0677 — 0.0716)	1.6 (0.063)
1.820 — 1.920(0.0717 — 0.0756)	1.7 (0.067)

7) Select one to three reduction drive gear shims so that the total thickness meets the value obtained from step 5).

Part No.	Reduction drive gear shim thickness mm (in)
31288AA261	0.3 (0.012)
31288AA271	0.4 (0.016)
31288AA281	0.5 (0.020)
31288AA291	0.6 (0.024)

Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

41. Primary Pulley and Secondary Pulley

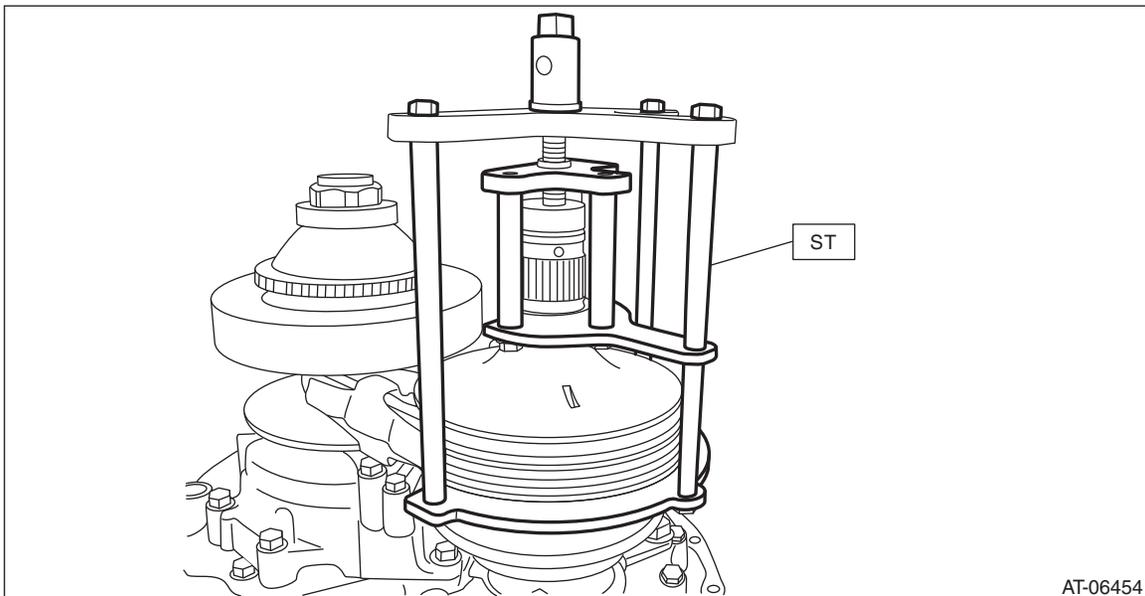
A: REMOVAL

NOTE:

Always replace primary pulley and secondary pulley as an assembly because they are non-disassembled parts.

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the air breather hose. <Ref. to CVT(TR580)-196, REMOVAL, Air Breather Hose.>
- 3) Remove the control valve body. <Ref. to CVT(TR580)-138, REMOVAL, Control Valve Body.>
- 4) Remove the transmission harness. <Ref. to CVT(TR580)-152, REMOVAL, Transmission Harness.>
- 5) Remove the turbine speed sensor. <Ref. to CVT(TR580)-118, REMOVAL, Turbine Speed Sensor.>
- 6) Remove the secondary speed sensor. <Ref. to CVT(TR580)-123, REMOVAL, Secondary Speed Sensor.>
- 7) Remove the primary speed sensor. <Ref. to CVT(TR580)-128, REMOVAL, Primary Speed Sensor.>
- 8) Remove the inhibitor switch. <Ref. to CVT(TR580)-112, REMOVAL, Inhibitor Switch.>
- 9) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 10) Remove the transfer clutch assembly. <Ref. to CVT(TR580)-210, REMOVAL, Transfer Clutch.>
- 11) Remove the transfer driven gear assembly. <Ref. to CVT(TR580)-224, REMOVAL, Transfer Driven Gear.>
- 12) Remove the parking pawl. <Ref. to CVT(TR580)-227, REMOVAL, Parking Pawl.>
- 13) Remove the reduction driven gear assembly. <Ref. to CVT(TR580)-229, REMOVAL, Reduction Driven Gear.>
- 14) Remove the oil pan and oil strainer. <Ref. to CVT(TR580)-135, REMOVAL, Oil Pan and Strainer.>
- 15) Remove the transmission control device. <Ref. to CVT(TR580)-236, REMOVAL, Transmission Control Device.>
- 16) Remove the transmission case. <Ref. to CVT(TR580)-242, REMOVAL, Transmission Case.>
- 17) Remove the reduction drive gear. <Ref. to CVT(TR580)-261, REMOVAL, Reduction Drive Gear.>
- 18) Set the ST to secondary pulley, expand the V groove of pulley, and then completely loosen the variator chain.

ST 18769AA010 EXPANDER PULLEY



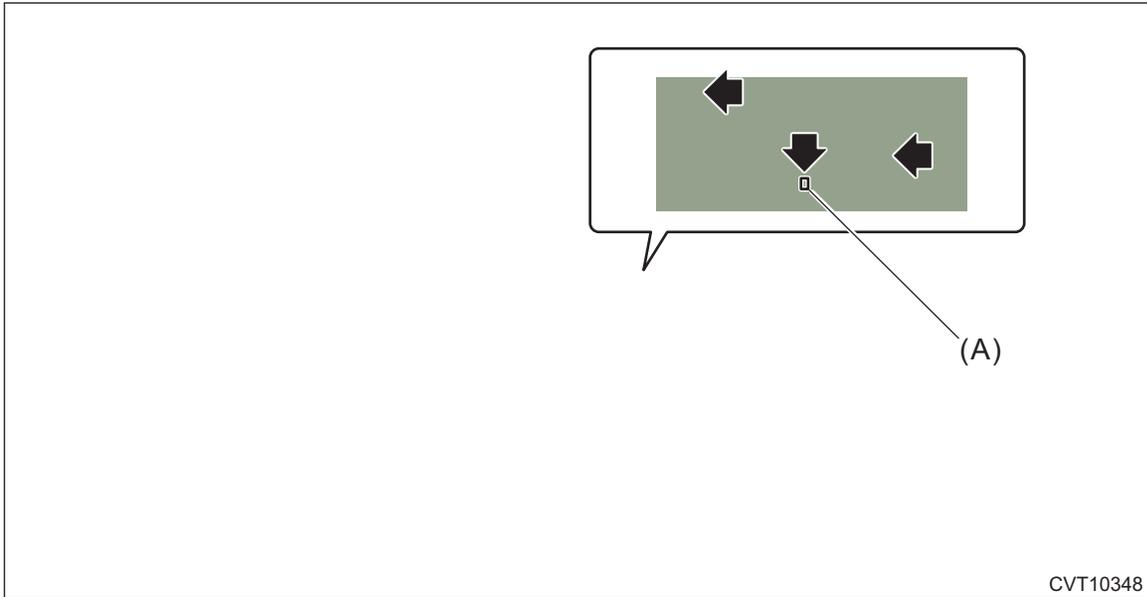
AT-06454

- 19) Remove the chain guide.
 - (1) Remove the chain guide from lubrication pipe.

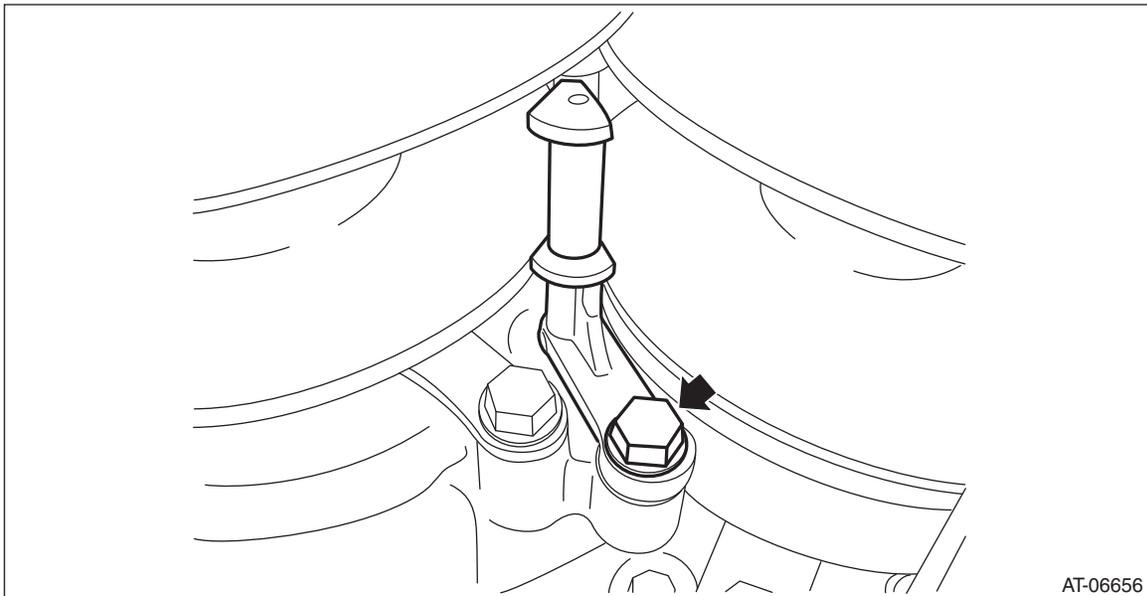
Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

(2) Slide the chain guide on the upper side in the direction of arrow by pressing the claw (A) down, and remove the chain guide.



(3) Remove the lubrication pipe.

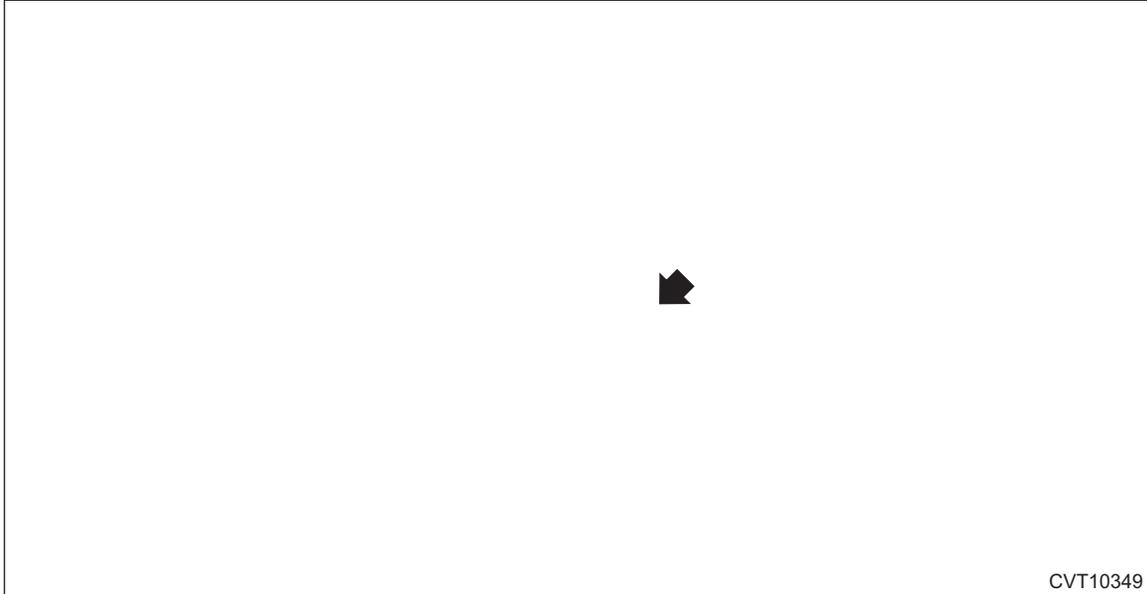


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Primary Pulley and Secondary Pulley

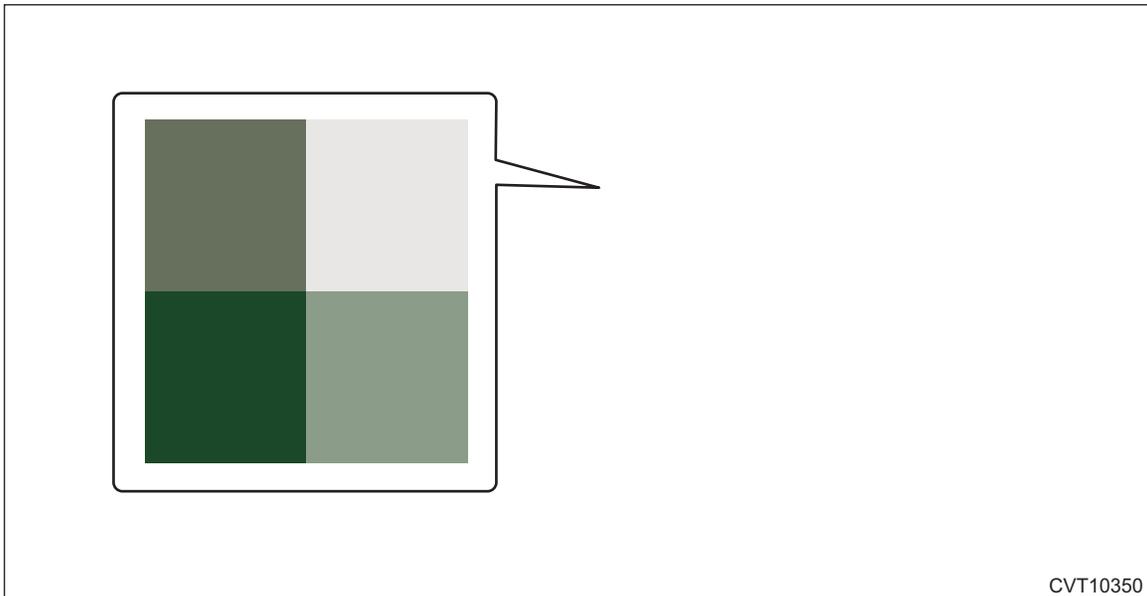
CONTINUOUSLY VARIABLE TRANSMISSION

(4) Remove the support rod mounting bolts.



(5) Raise the support rod to remove the chain guide from the support rod, and then remove the support rod.

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

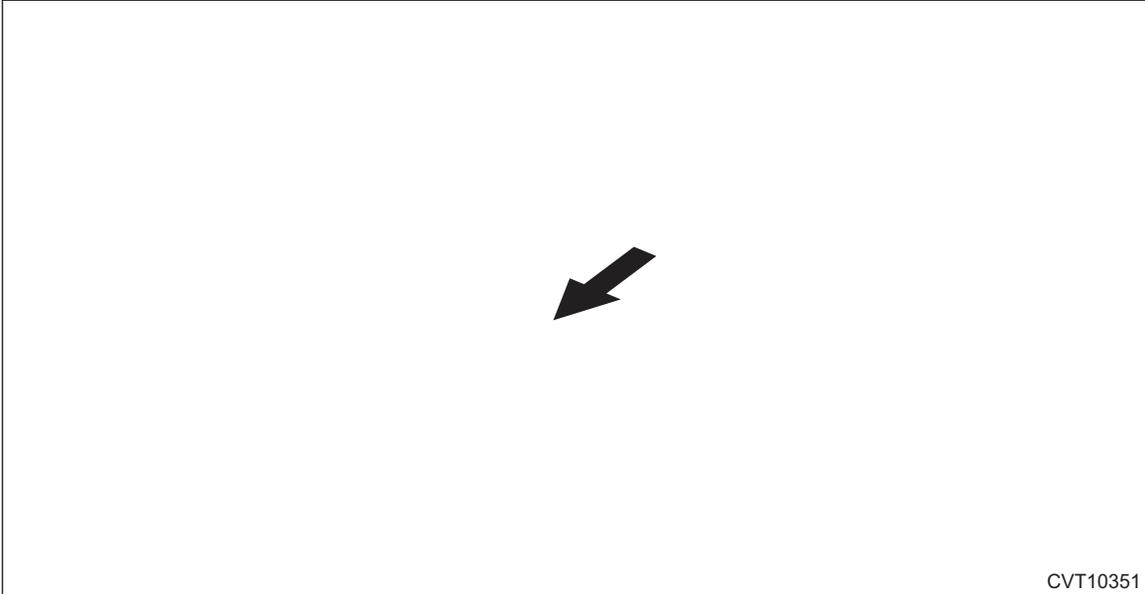


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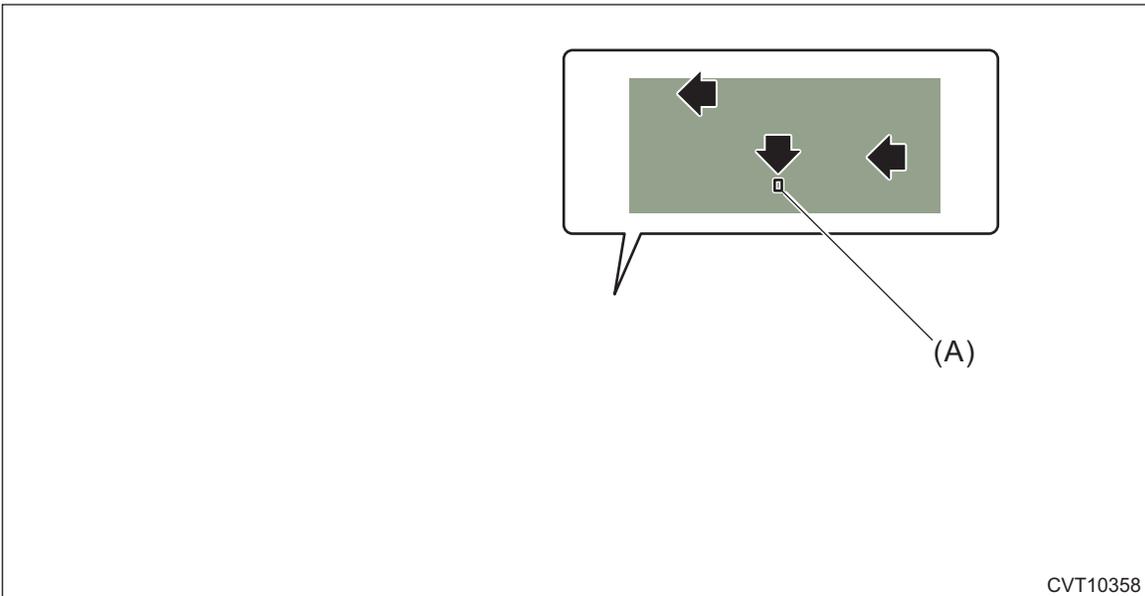
Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

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



(7) Slide the chain guide on the upper side in the direction of arrow by pressing the claw (A) down, and remove the chain guide.

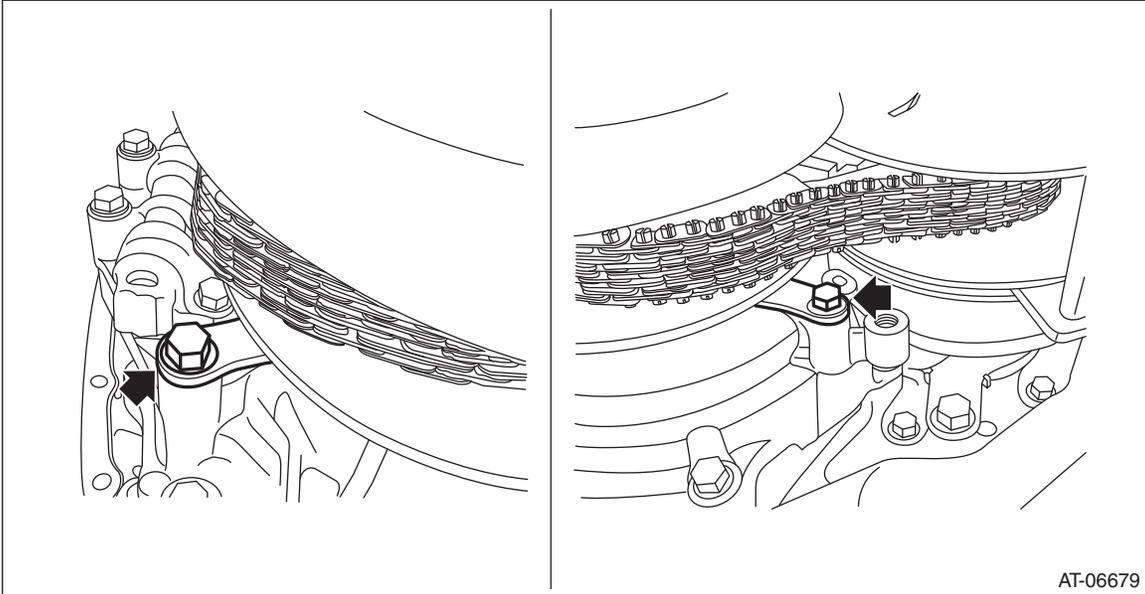


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Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

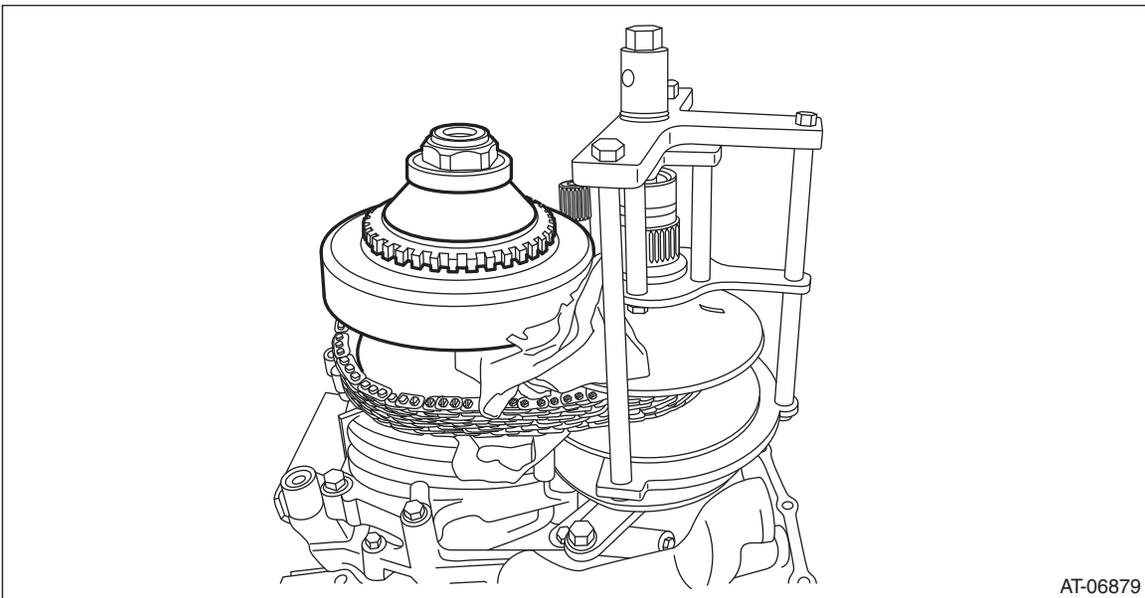
20) Remove the primary pulley mounting bolt.



21) Remove the primary pulley from the reverse brake housing and intersect the V groove of secondary pulley and the V groove of primary pulley. Remove the variator chain from primary pulley, and 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.



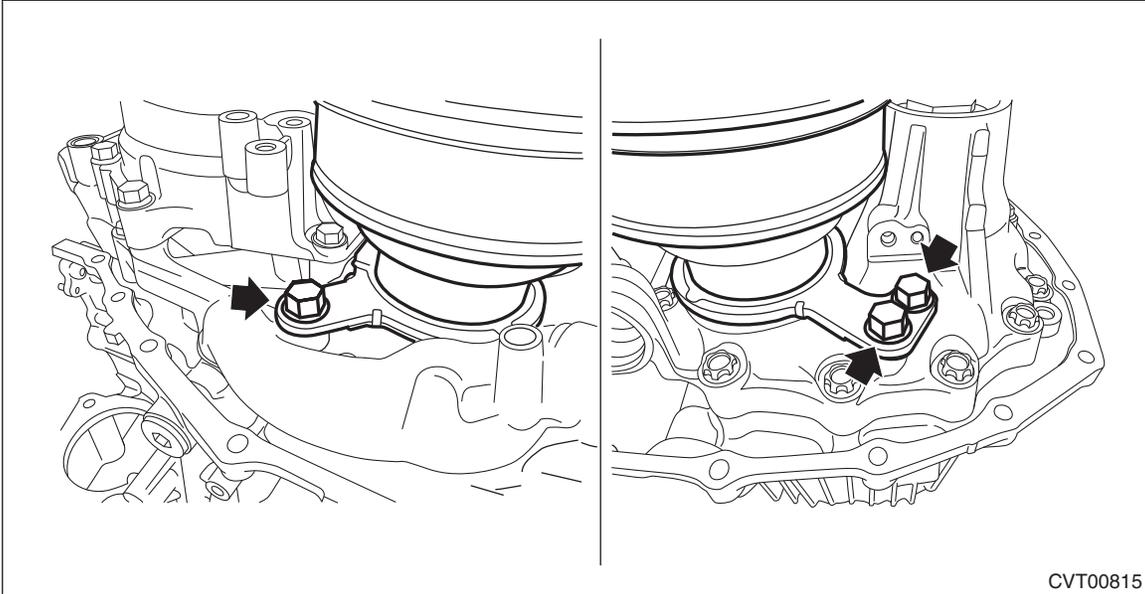
22) Remove the ST (EXPANDER PULLEY) from the secondary pulley.

23) Remove the variator chain from secondary pulley.

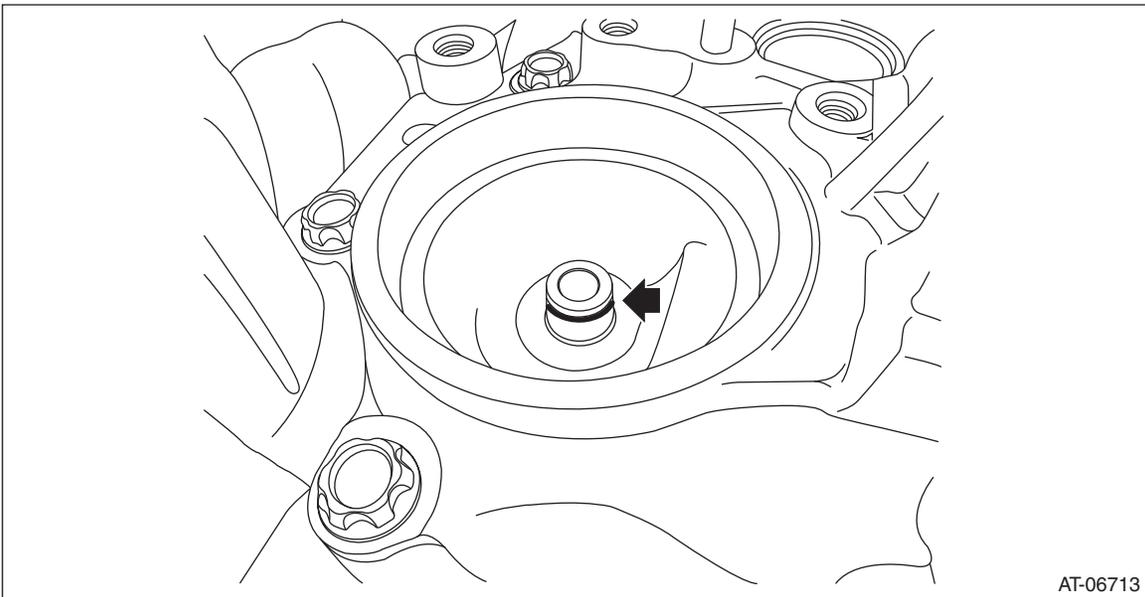
Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

24) Remove the secondary pulley mounting bolts, and remove the secondary pulley.



25) Remove the seal ring from drive pinion retainer.

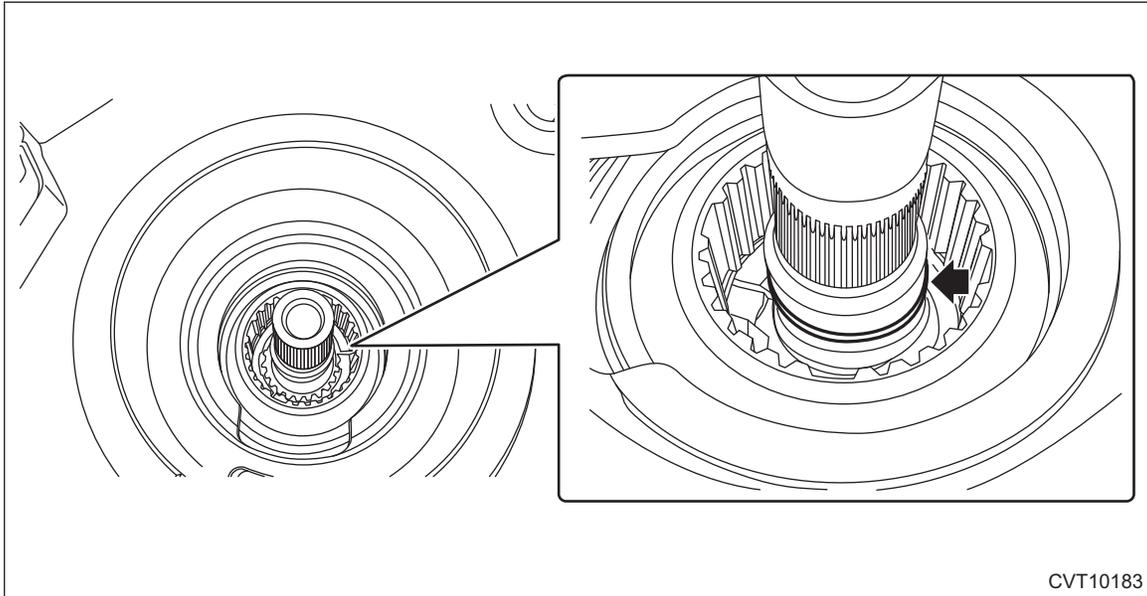


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Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

26) Remove the seal ring from the input shaft.



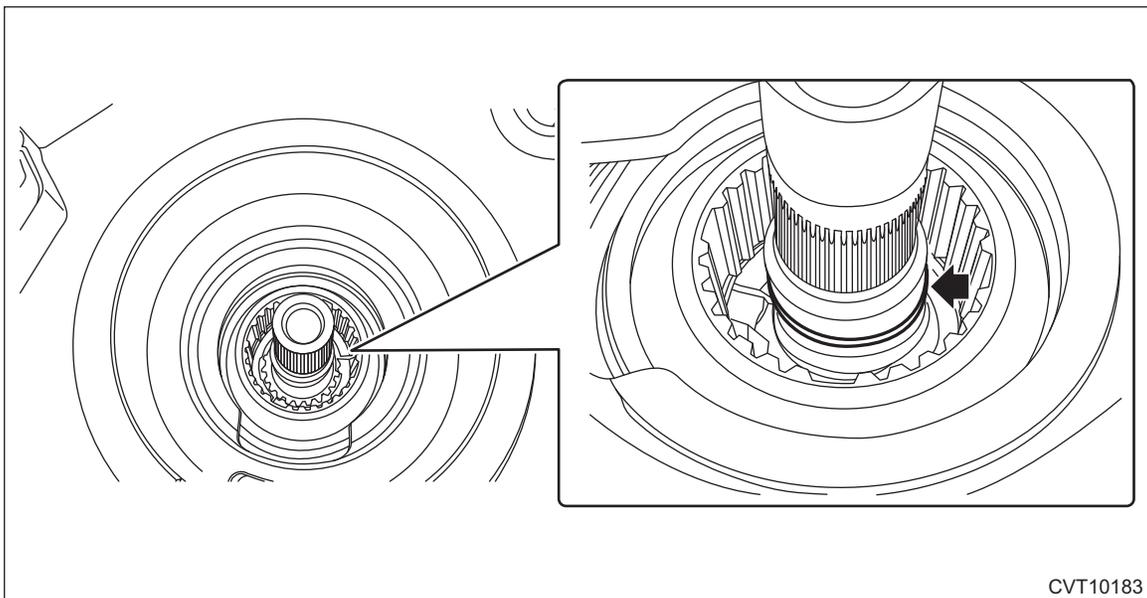
B: INSTALLATION

1) Select shims for pulley alignment. <Ref. to CVT(TR580)-279, ADJUSTMENT, Primary Pulley and Secondary Pulley.>

2) Install the seal ring to the input shaft.

NOTE:

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



3) Install the seal ring to drive pinion retainer.

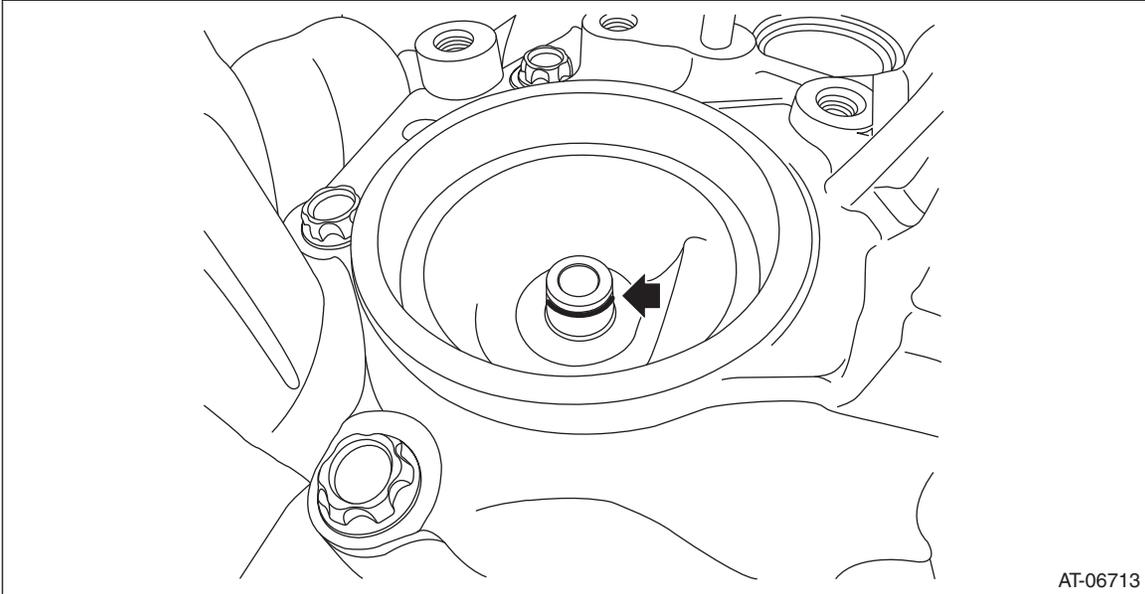
NOTE:

- Use new seal rings.
- When installing the seal rings, do not expand the seal rings too much.

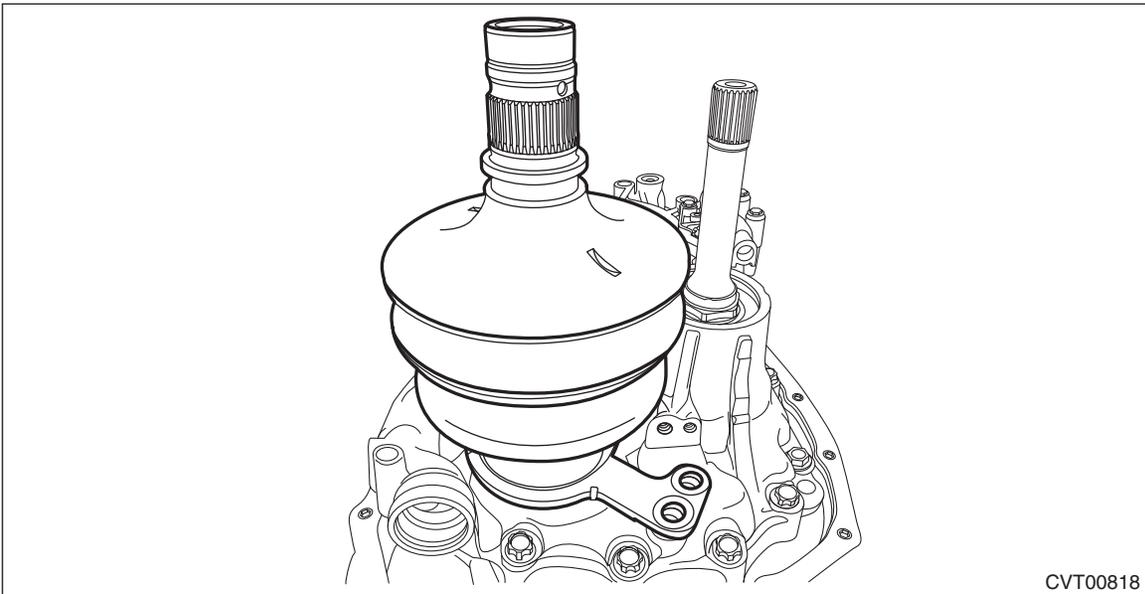
Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

- Apply CVTF to the seal rings.



- 4) Install the selected shims to the primary pulley bearing catch surface.
- 5) Install the secondary pulley to the drive pinion retainer.



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

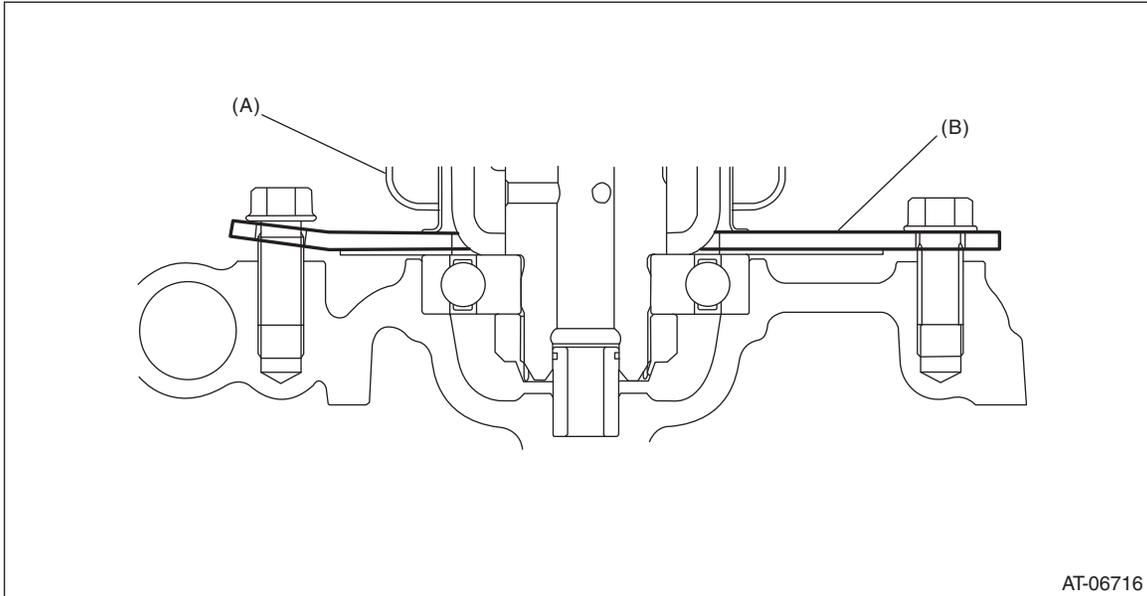
NOTE:

- Be careful not to tilt the bearing retainer of the secondary pulley.

Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

- Apply CVTF to the bolt.

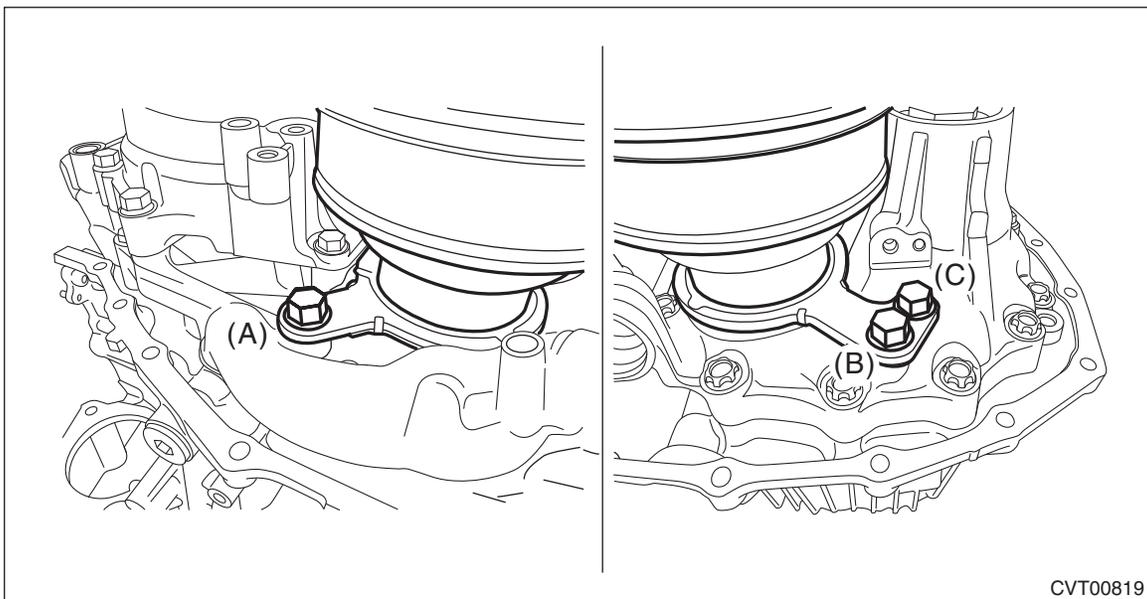


- (A) Secondary pulley
- (B) Bearing retainer

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

Tightening torque:

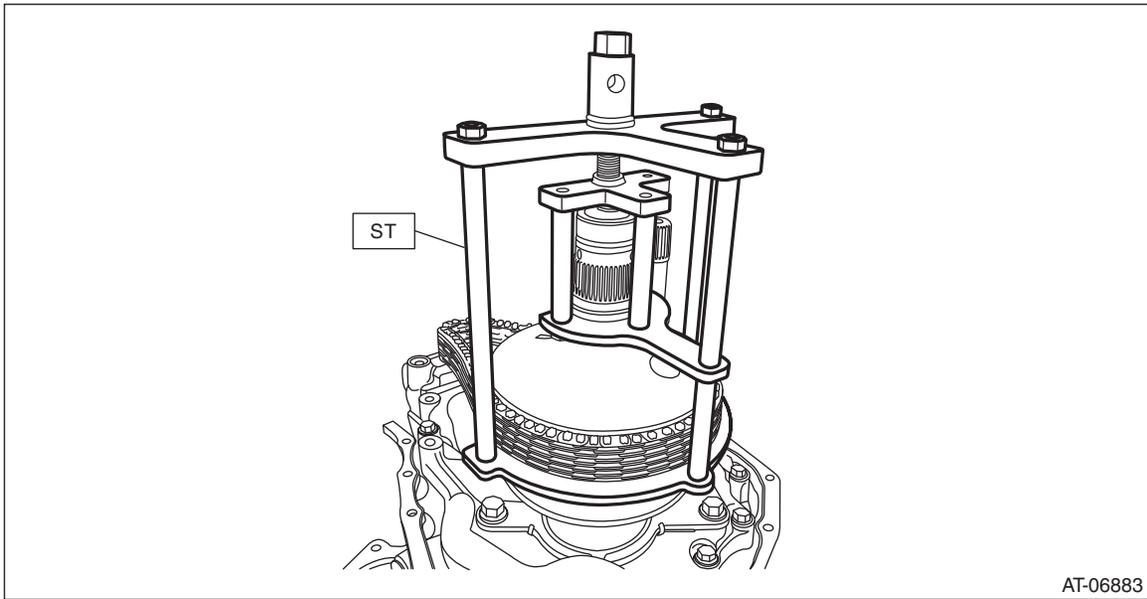
67.5 N·m (6.9 kgf-m, 49.8 ft-lb)



Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

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

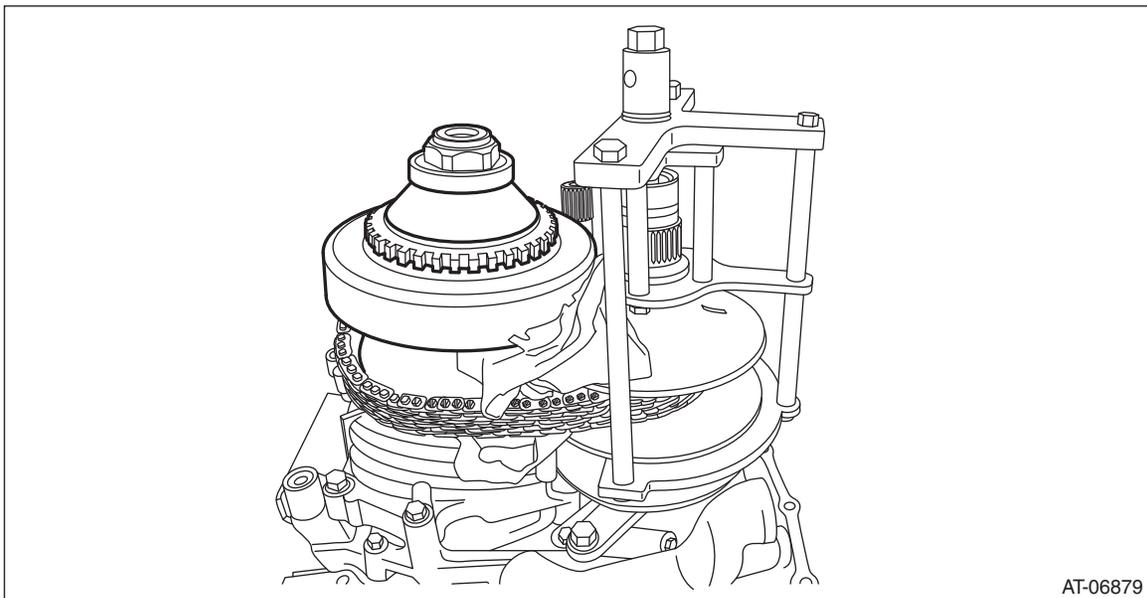


- 8) Expand the V groove of the secondary pulley.
9) Install the primary pulley to the reverse brake housing together with the variator chain.

CAUTION:

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

- (1) Intersect the V groove of primary pulley and the V groove of secondary pulley and install the secondary pulley while placing the variator chain on secondary pulley.



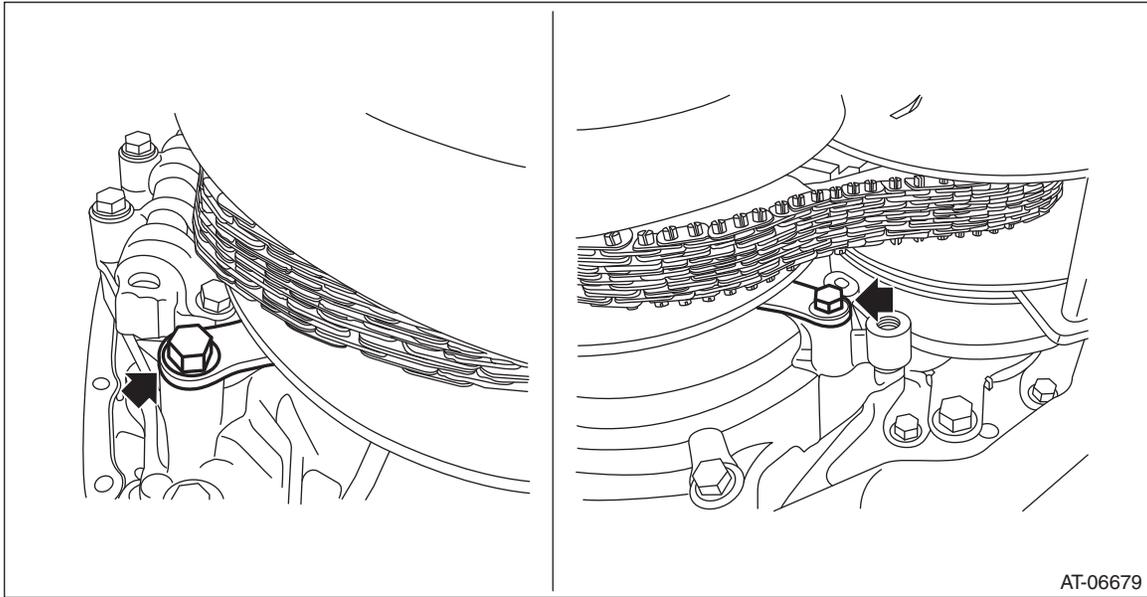
- (2) Install the primary pulley to the reverse brake housing so that the bolt hole of primary bearing retainer and the bolt hole of reverse brake housing are aligned.
10) Install the primary pulley bolt.

Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

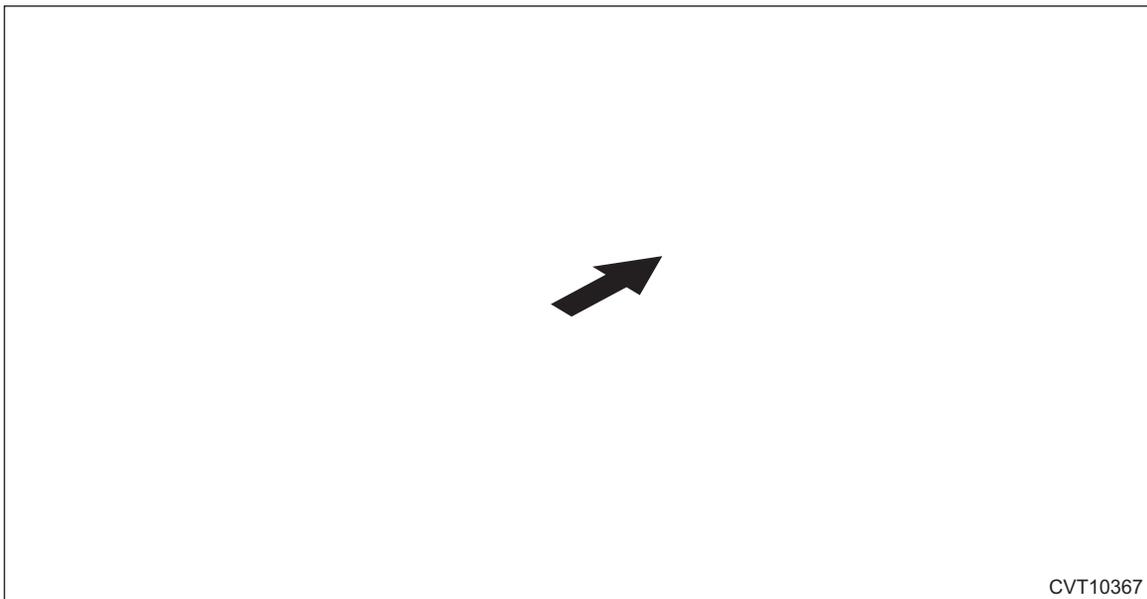
Tightening torque:

21 N·m (2.1 kgf·m, 15.5 ft·lb)



11) Install the chain guide.

(1) Install the chain guide to the variator chain and move it to the primary pulley side.



(2) Place the support rod inside of the variator chain.

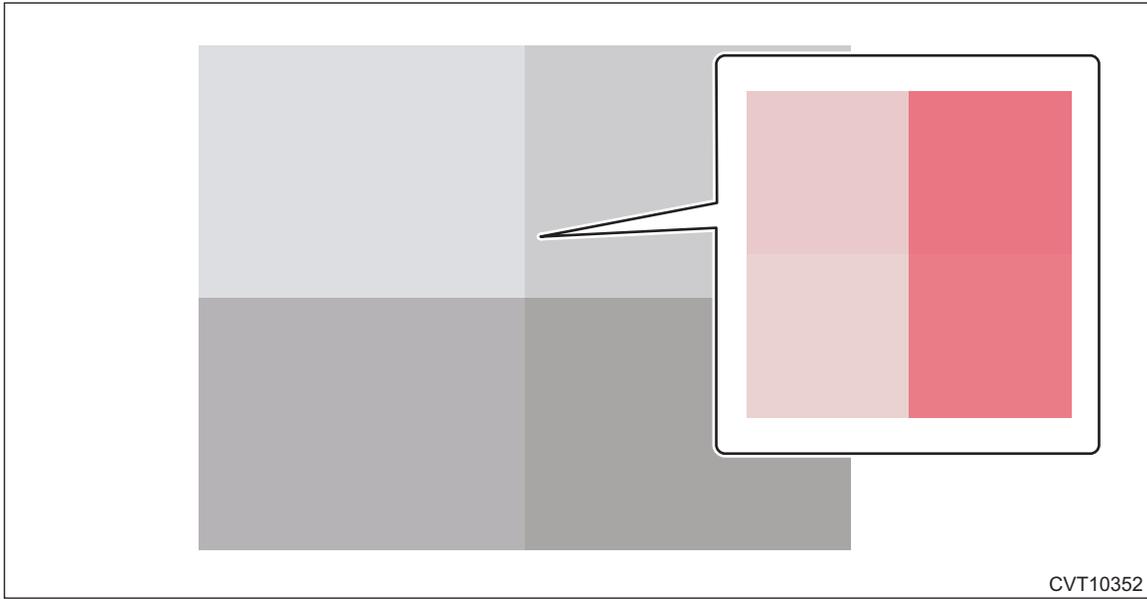
CAUTION:

Protect the both pulleys and variator chain from scratching.

Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

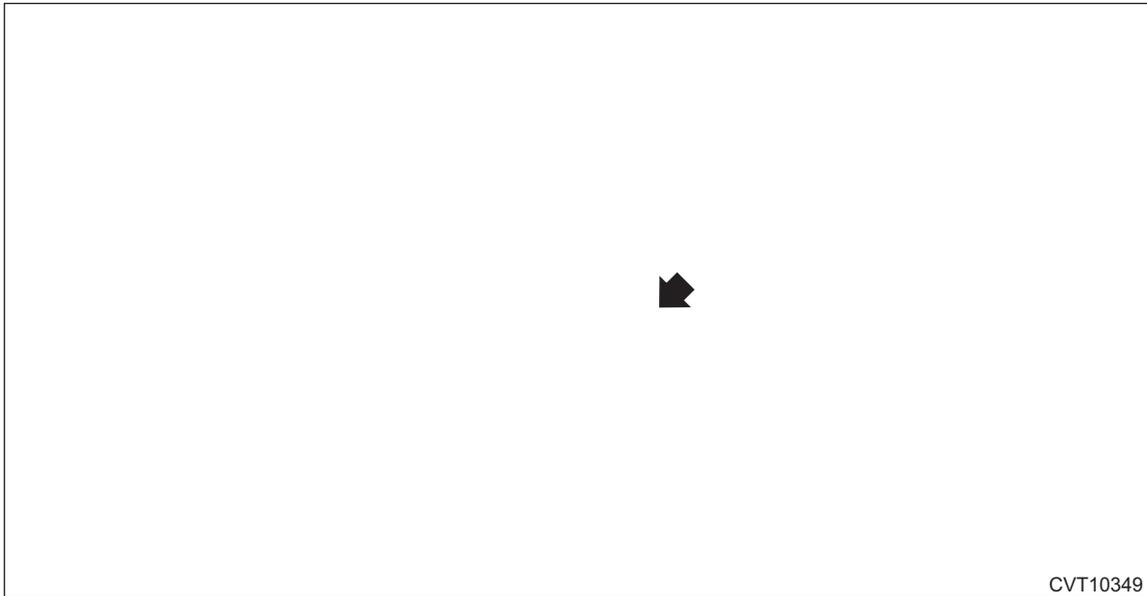
(3) While holding the support rod, press the chain guide so that the support rod runs through between the protrusions of chain guide and install the chain guide to the support rod.



(4) Install the support rod.

Tightening torque:

21 N·m (2.1 kgf-m, 15.5 ft-lb)



(5) Install the lubrication pipe.

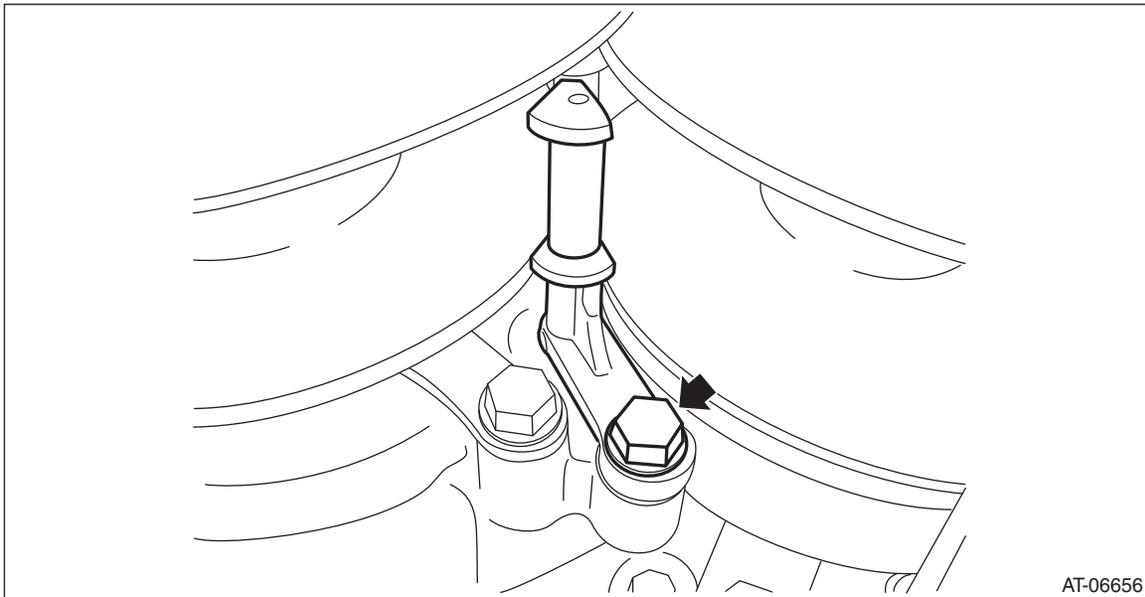
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Primary Pulley and Secondary Pulley

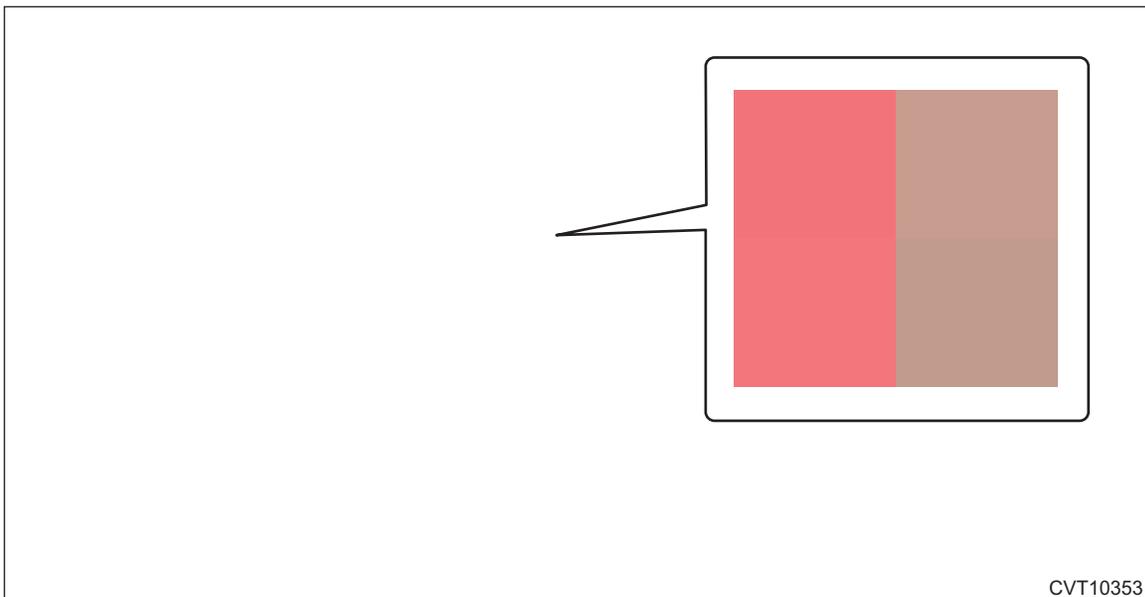
CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

21 N·m (2.1 kgf·m, 15.5 ft·lb)



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



- 12) Install the reduction drive gear. <Ref. to CVT(TR580)-262, INSTALLATION, Reduction Drive Gear.>
- 13) Select the reduction drive gear shim. <Ref. to CVT(TR580)-263, ADJUSTMENT, Reduction Drive Gear.>
- 14) Install the transmission case. <Ref. to CVT(TR580)-245, INSTALLATION, Transmission Case.>
- 15) Install the transmission control device. <Ref. to CVT(TR580)-238, INSTALLATION, Transmission Control Device.>
- 16) Install the oil strainer and oil pan. <Ref. to CVT(TR580)-136, INSTALLATION, Oil Pan and Strainer.>
- 17) Install the reduction driven gear assembly. <Ref. to CVT(TR580)-229, INSTALLATION, Reduction Driven Gear.>
- 18) Install the transfer driven gear assembly. <Ref. to CVT(TR580)-224, INSTALLATION, Transfer Driven Gear.>
- 19) Install the transfer clutch assembly. <Ref. to CVT(TR580)-211, INSTALLATION, Transfer Clutch.>
- 20) Install the parking pawl. <Ref. to CVT(TR580)-227, INSTALLATION, Parking Pawl.>
- 21) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 22) Install the inhibitor switch. <Ref. to CVT(TR580)-115, INSTALLATION, Inhibitor Switch.>

Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

- 23) Install the secondary speed sensor. <Ref. to CVT(TR580)-123, INSTALLATION, Secondary Speed Sensor.>
- 24) Install the primary speed sensor. <Ref. to CVT(TR580)-128, INSTALLATION, Primary Speed Sensor.>
- 25) Install the turbine speed sensor. <Ref. to CVT(TR580)-118, INSTALLATION, Turbine Speed Sensor.>
- 26) Install the transmission harness. <Ref. to CVT(TR580)-155, INSTALLATION, Transmission Harness.>
- 27) Install the control valve body. <Ref. to CVT(TR580)-144, INSTALLATION, Control Valve Body.>
- 28) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>
- 29) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: INSPECTION

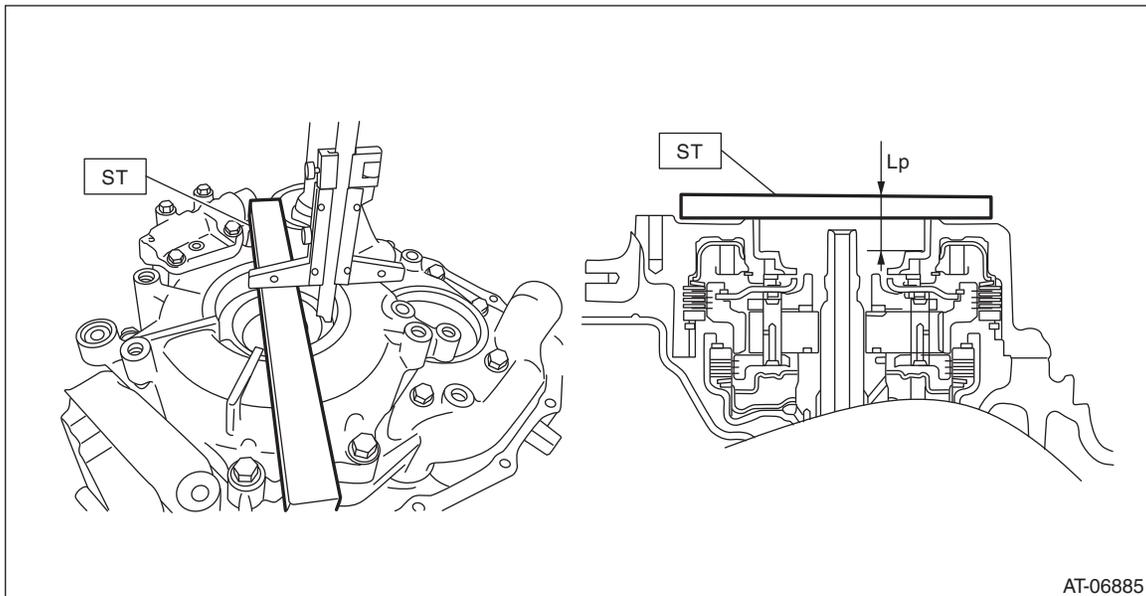
- Check the surface of primary and secondary pulley cones for damage or wear.
- Check the primary and secondary pulley for damage.
- Check the bearing for seizure or wear.
- Apply CVTF to bearing and rotate the bearing to check for noise or dragging etc.

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

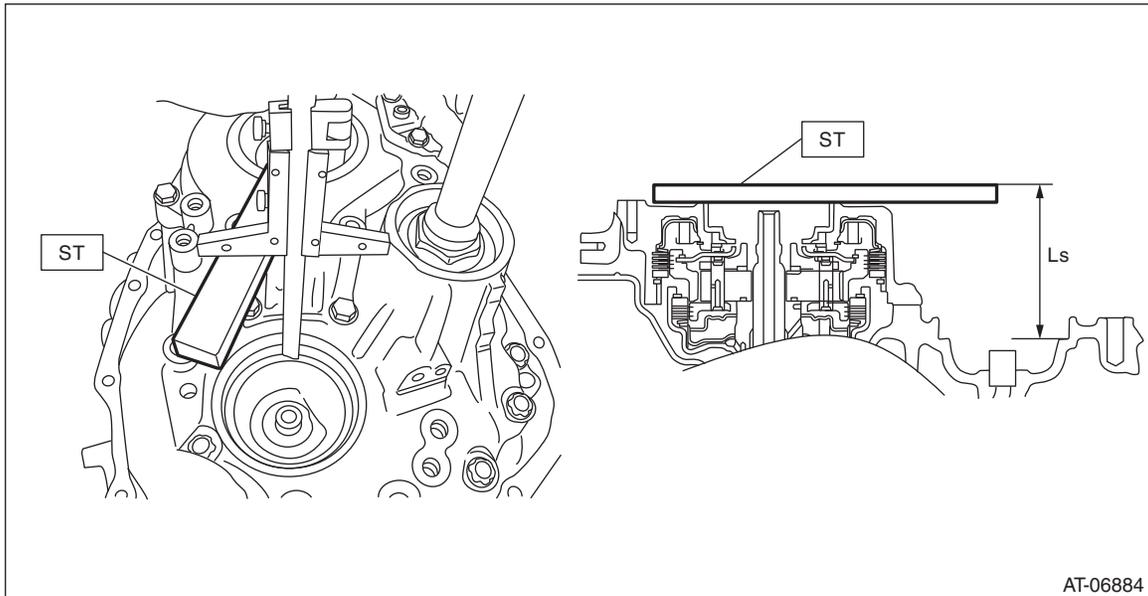


Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

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:

$$T \text{ (mm)} = B - A + L_p - L_s - 28.602$$

$$[T \text{ (in)} = B - A + L_p - L_s - 1.126]$$

T: Pulley alignment

A: Specified primary pulley dimension

B: Specified secondary pulley dimension

L_p: Depth from the ST upper face to the primary pulley bearing catch surface

L_s: 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)

Primary Pulley and Secondary Pulley

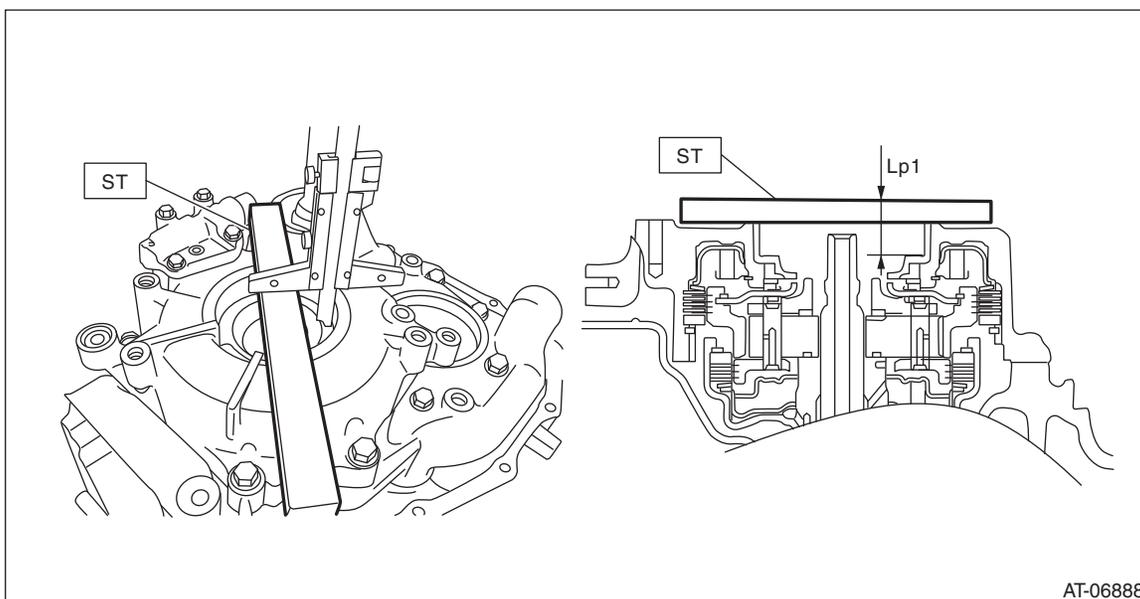
CONTINUOUSLY VARIABLE TRANSMISSION

Part No.	Shim thickness mm (in)
32451AA100	0.6 (0.024)

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

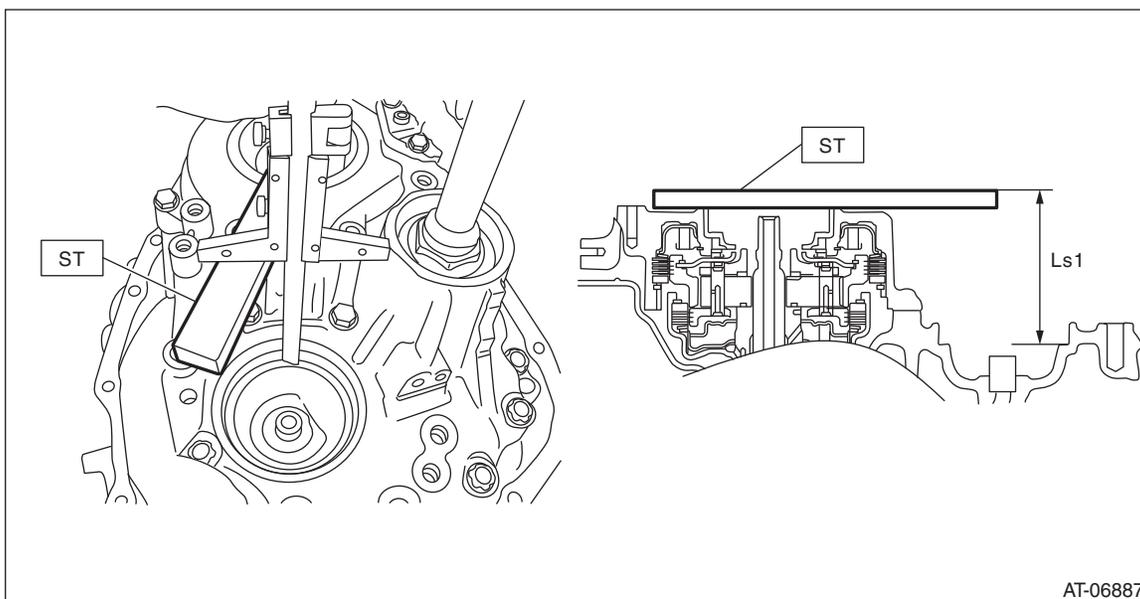
- 1) Clean the mating surface of current drive pinion retainer and converter case.
- 2) Measure and record the shim thickness that is attached on the current reverse brake housing.
- 3) Using the current drive pinion retainer, measure depth "Lp1" from the ST upper face to the primary pulley bearing catch 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



Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

5) Calculate the “LD1” using the following formula and record it.

Calculation formula:

$$LD1 \text{ mm (in)} = Ls1 - Lp1$$

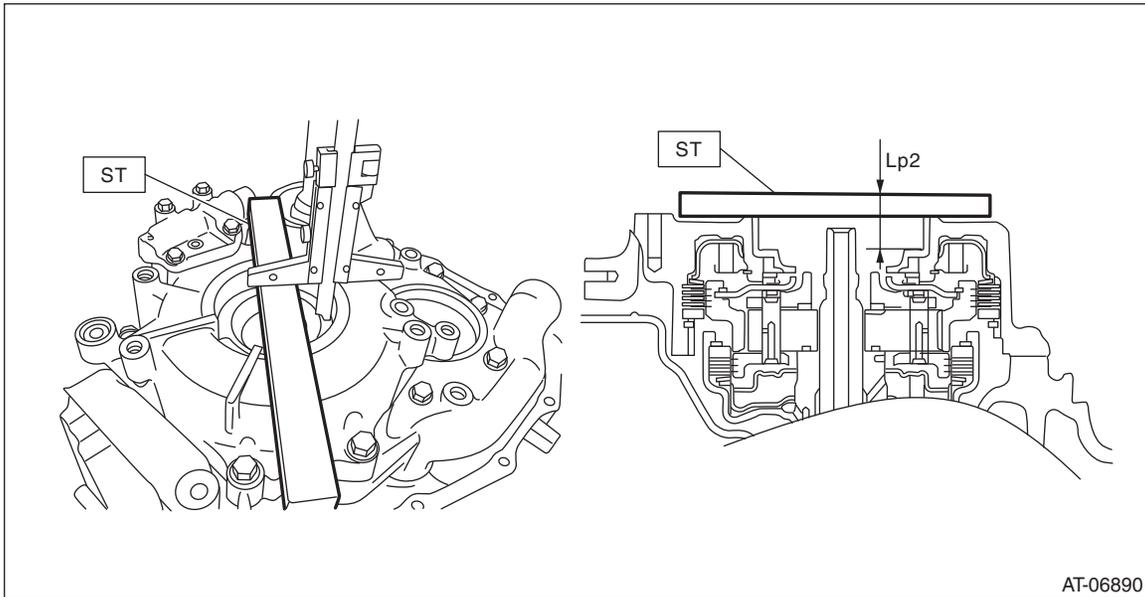
LD1: Height from the primary pulley bearing catch surface to the secondary pulley bearing catch surface

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

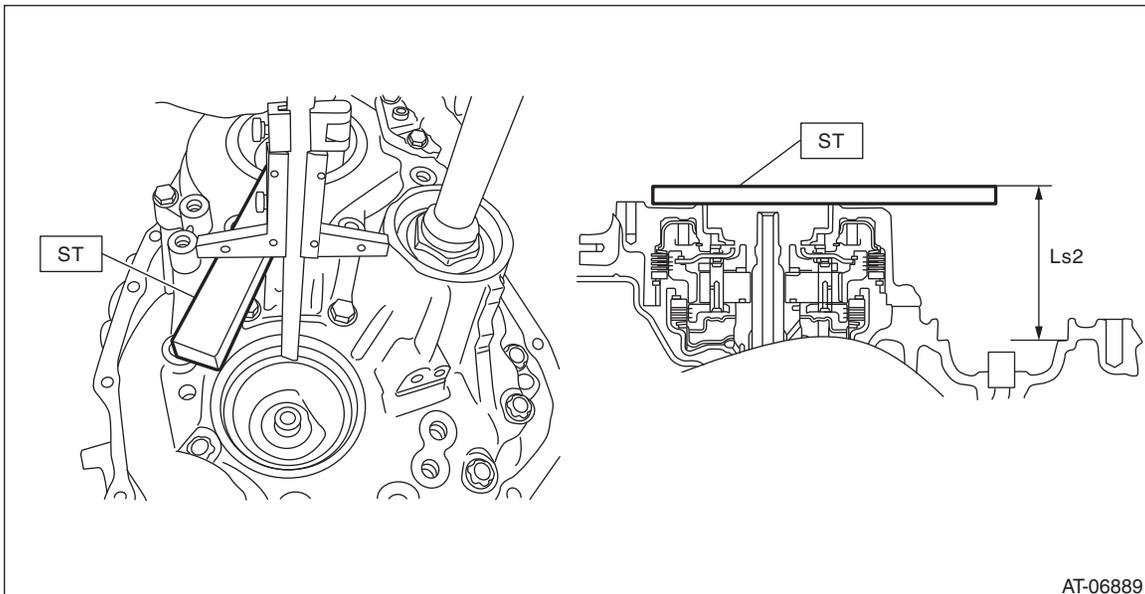
6) Using the new drive pinion retainer or new reverse brake housing, measure the depth “Lp2” from the ST upper face to the primary pulley bearing catch surface at several points and calculate the average.

ST 499575400 GAUGE



7) Using the new drive pinion retainer or new reverse brake housing, measure the 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:

$$LD2 \text{ mm (in)} = Ls2 - Lp2$$

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

Primary Pulley and Secondary Pulley

CONTINUOUSLY VARIABLE TRANSMISSION

9) Calculate the recorded values of “LD1” and “LD2” to obtain the positive number to select the shims.

Calculation formula: $T1 \text{ mm (in)} = LD1 - LD2$ or $T2 \text{ mm (in)} = LD2 - LD1$

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.
0.251 — 0.350 (0.00988 — 0.01378)	Select a shim which is 0.3 mm (0.012 in) thinner 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) thinner 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) thinner 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) 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)

Variator Chain

CONTINUOUSLY VARIABLE TRANSMISSION

42. Variator Chain

A: REMOVAL

For removal of variator chain, refer to “Primary Pulley and Secondary Pulley”. <Ref. to CVT(TR580)-266, REMOVAL, Primary Pulley and Secondary Pulley.>

B: INSTALLATION

For installation of variator chain, refer to “Primary Pulley and Secondary Pulley”. <Ref. to CVT(TR580)-272, INSTALLATION, Primary Pulley and Secondary Pulley.>

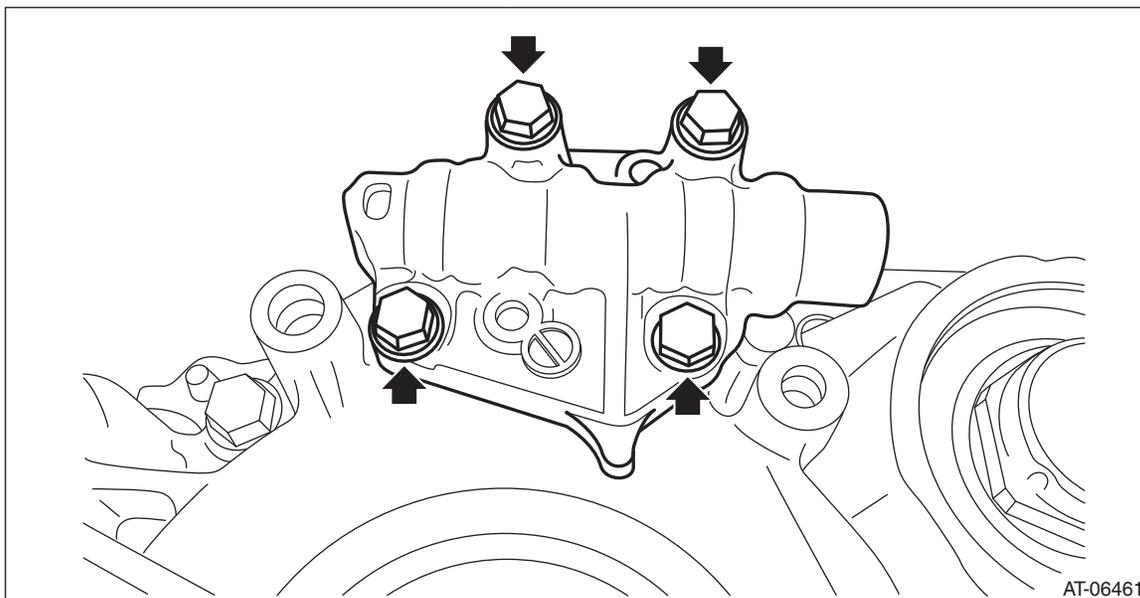
C: INSPECTION

Check the variator chain for damage and wear.

43.Reverse Brake Assembly

A: REMOVAL

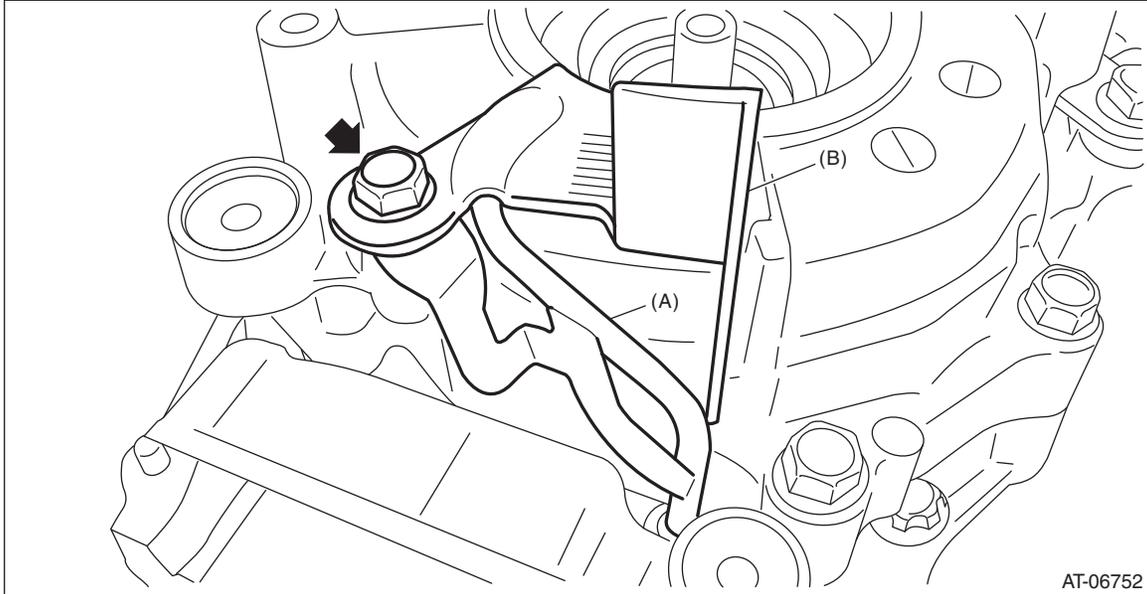
- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the air breather hose. <Ref. to CVT(TR580)-196, REMOVAL, Air Breather Hose.>
- 3) Remove the control valve body. <Ref. to CVT(TR580)-138, REMOVAL, Control Valve Body.>
- 4) Remove the transmission harness. <Ref. to CVT(TR580)-152, REMOVAL, Transmission Harness.>
- 5) Remove the turbine speed sensor. <Ref. to CVT(TR580)-118, REMOVAL, Turbine Speed Sensor.>
- 6) Remove the secondary speed sensor. <Ref. to CVT(TR580)-123, REMOVAL, Secondary Speed Sensor.>
- 7) Remove the primary speed sensor. <Ref. to CVT(TR580)-128, REMOVAL, Primary Speed Sensor.>
- 8) Remove the inhibitor switch. <Ref. to CVT(TR580)-112, REMOVAL, Inhibitor Switch.>
- 9) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 10) Remove the transfer clutch assembly. <Ref. to CVT(TR580)-210, REMOVAL, Transfer Clutch.>
- 11) Remove the transfer driven gear assembly. <Ref. to CVT(TR580)-224, REMOVAL, Transfer Driven Gear.>
- 12) Remove the parking pawl. <Ref. to CVT(TR580)-227, REMOVAL, Parking Pawl.>
- 13) Remove the reduction driven gear assembly. <Ref. to CVT(TR580)-229, REMOVAL, Reduction Driven Gear.>
- 14) Remove the oil pan and oil strainer. <Ref. to CVT(TR580)-135, REMOVAL, Oil Pan and Strainer.>
- 15) Remove the transmission control device. <Ref. to CVT(TR580)-236, REMOVAL, Transmission Control Device.>
- 16) Remove the transmission case. <Ref. to CVT(TR580)-242, REMOVAL, Transmission Case.>
- 17) Remove the reduction drive gear. <Ref. to CVT(TR580)-261, REMOVAL, Reduction Drive Gear.>
- 18) Remove the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TR580)-266, REMOVAL, Primary Pulley and Secondary Pulley.>
- 19) Remove the manual valve assembly and separator plate.



Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

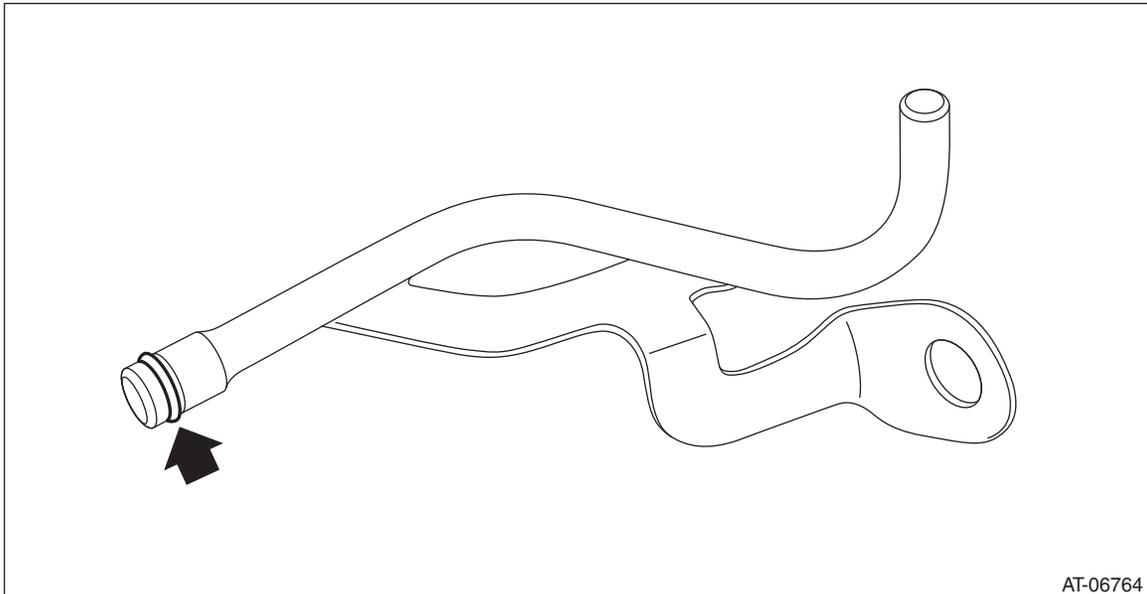
20) Remove the oil guide and lubrication pipe.



(A) Lubrication pipe

(B) Oil guide

21) Remove the O-ring from lubrication pipe.

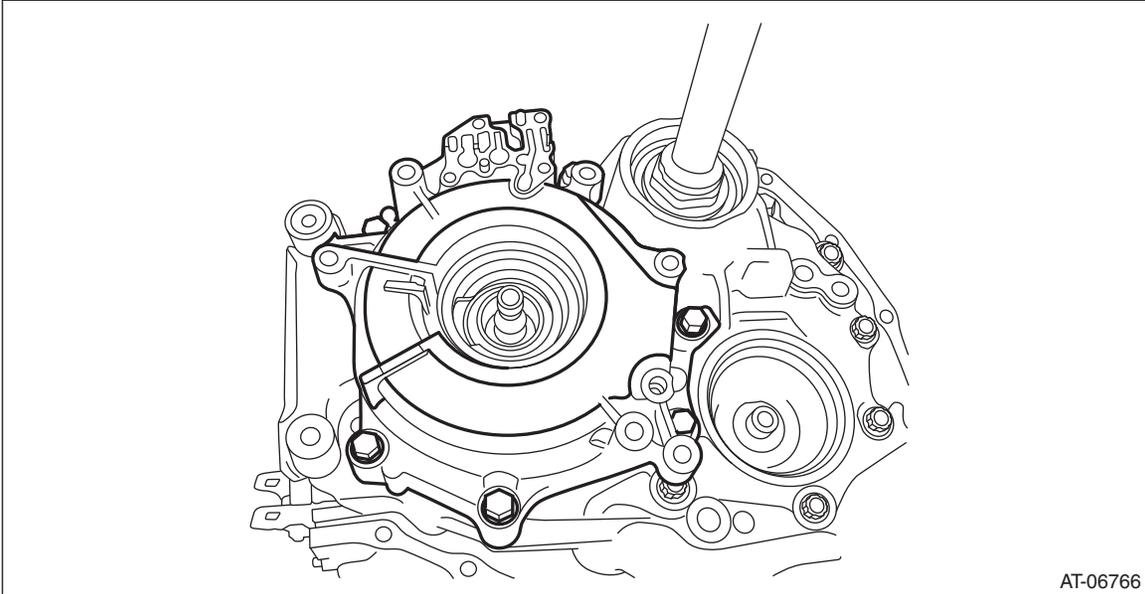


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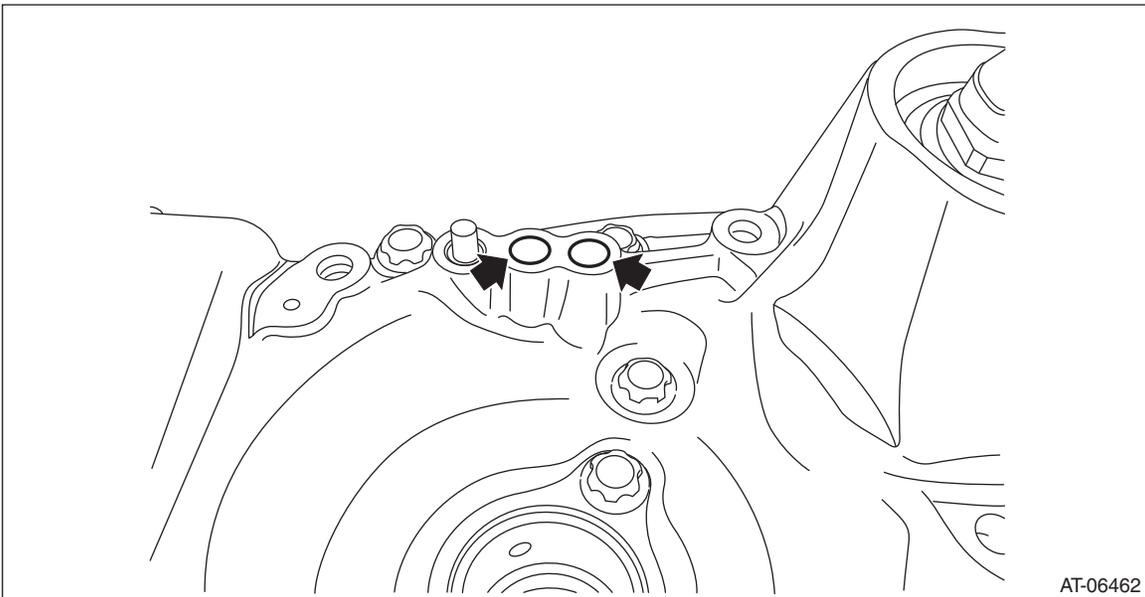
Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

22) Remove the reverse brake assembly.



23) Remove the O-rings.



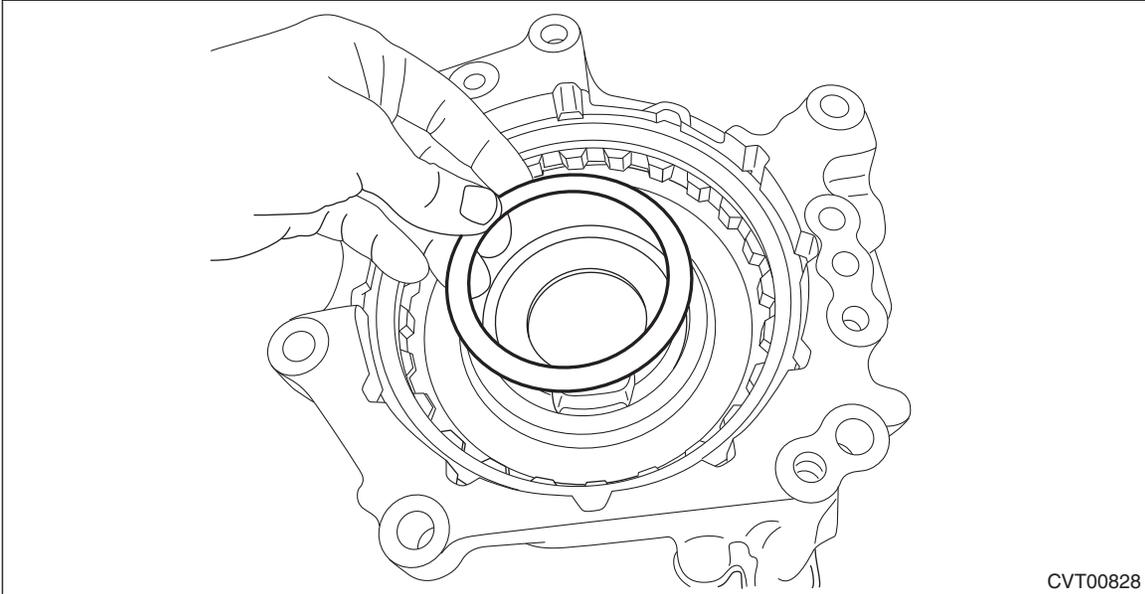
B: INSTALLATION

1) Select a washer. <Ref. to CVT(TR580)-317, ADJUSTMENT, Forward Clutch Assembly.>

Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

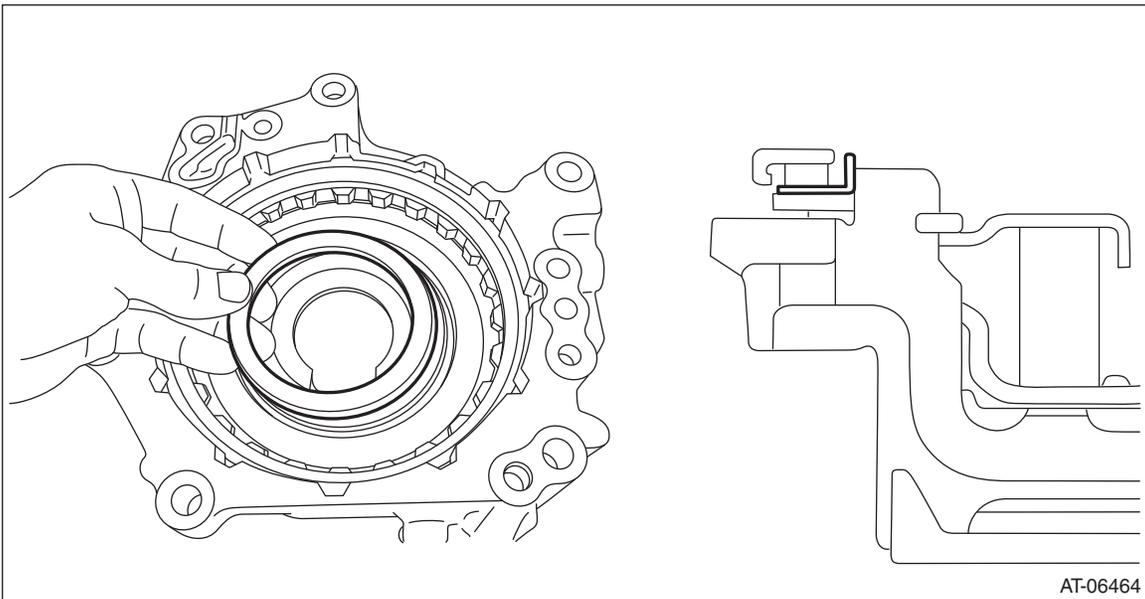
2) Install the selected washer to the reverse brake housing.



3) Install the thrust bearing to the reverse brake housing.

NOTE:

Face the temper color surface to the reverse brake side.

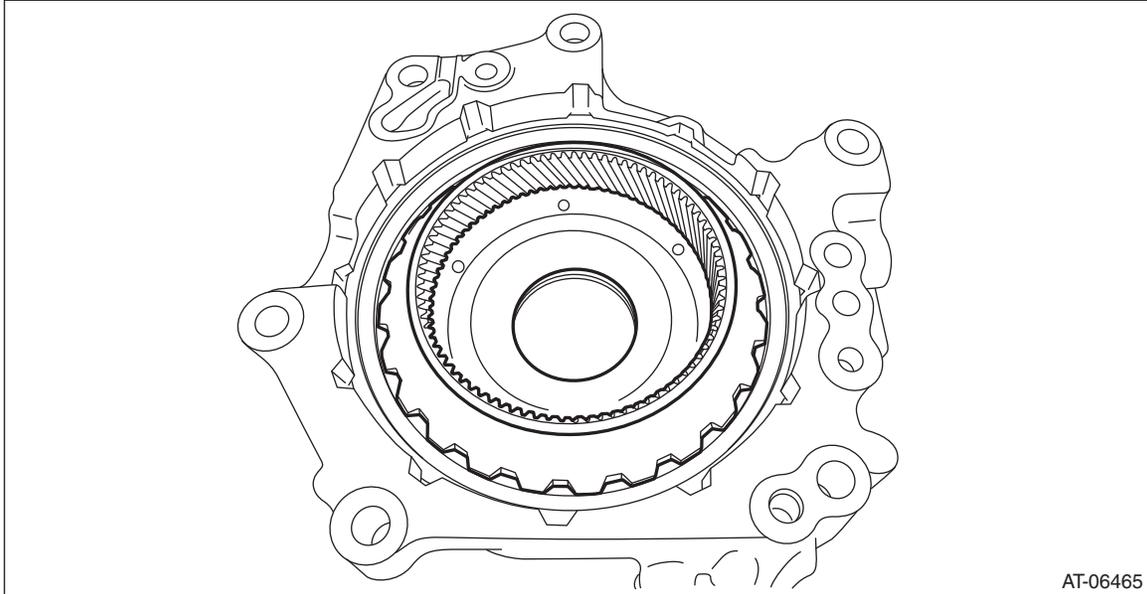


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Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

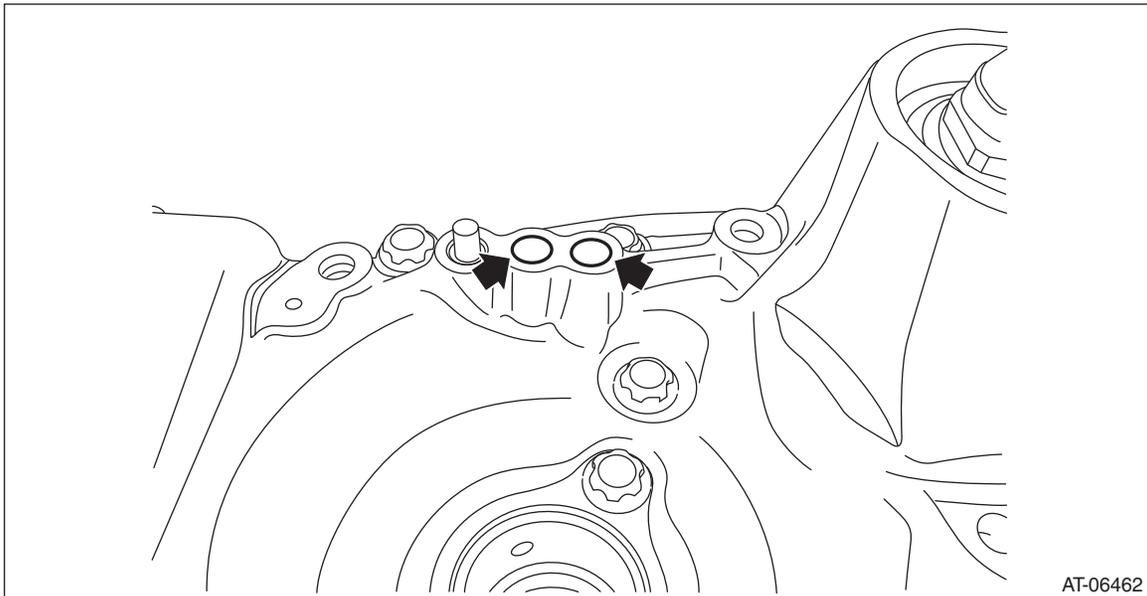
- 4) Remove the internal gear from the forward clutch assembly, and install it to the reverse brake housing.



- 5) Install the O-rings.

NOTE:

- Install a new O-ring.
- Apply CVTF to the O-rings.



- 6) Install the reverse brake assembly and internal gear as a unit to the drive pinion retainer.

NOTE:

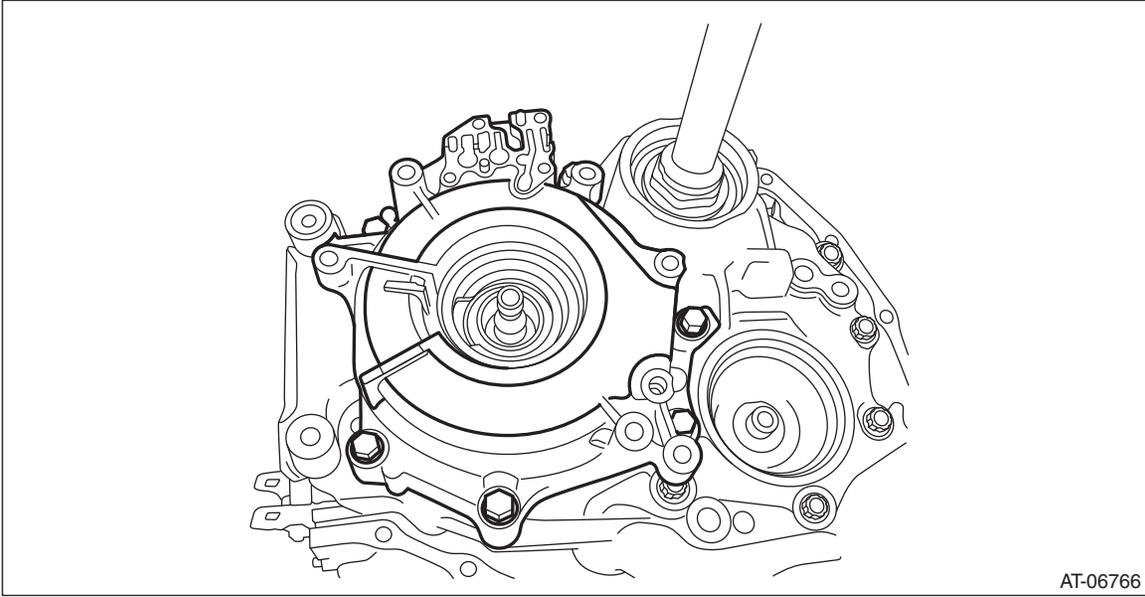
Slowly rotate the input shaft by hand to engage the internal gear and pinion gear of planetary carrier.

Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

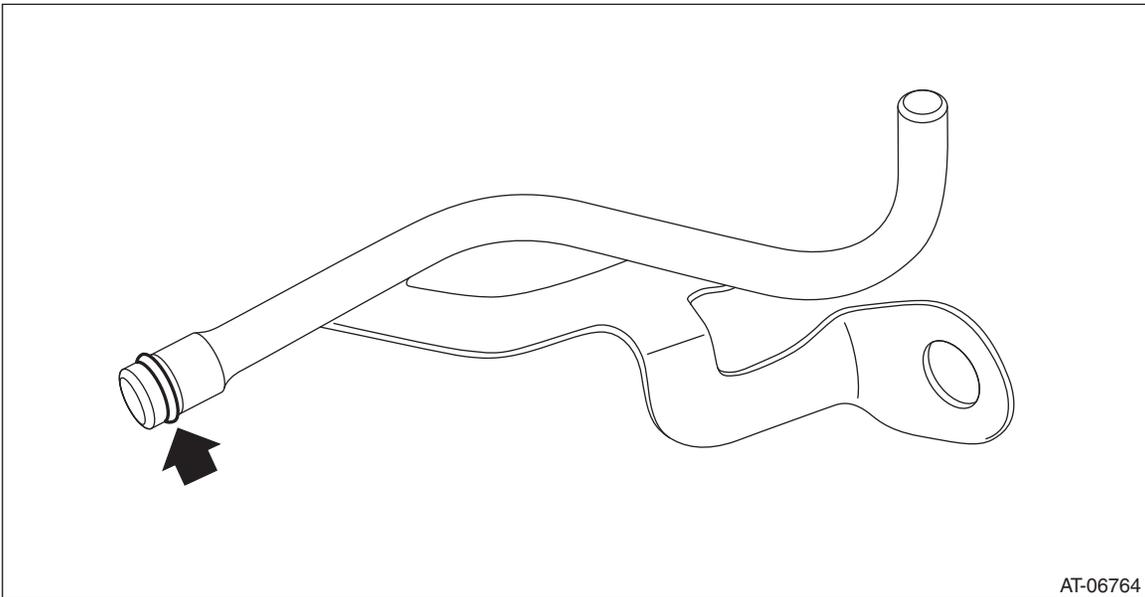
37 N·m (3.8 kgf·m, 27.3 ft·lb)



7) Install the O-ring to the lubrication pipe.

NOTE:

- Install a new O-ring.
- Apply CVTF to the O-rings.



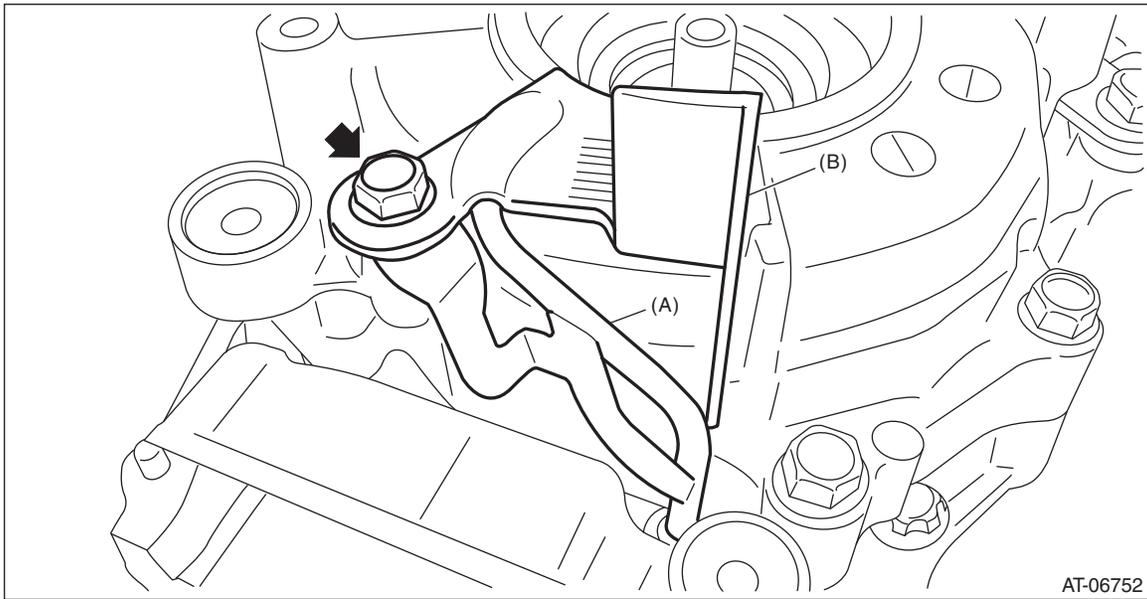
8) Install the lubrication pipe and oil guide.

Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

16 N·m (1.6 kgf·m, 11.8 ft·lb)



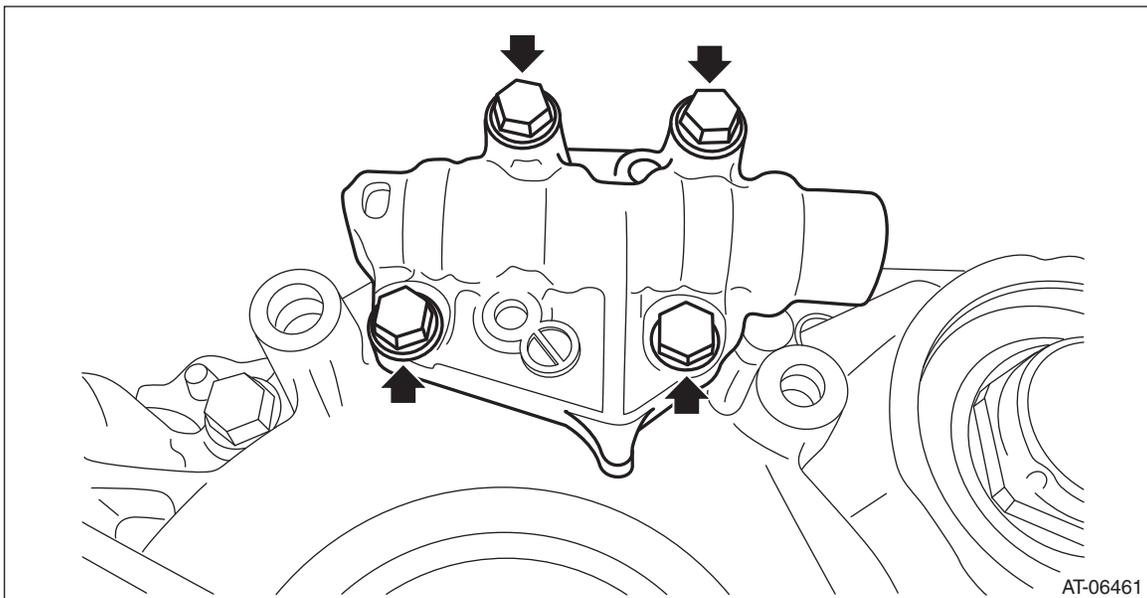
(A) Lubrication pipe

(B) Oil guide

9) Install the manual valve assembly and separator plate.

Tightening torque:

9 N·m (0.9 kgf·m, 6.6 ft·lb)



10) Install the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TR580)-272, INSTALLATION, Primary Pulley and Secondary Pulley.>

11) Select shims for pulley alignment. <Ref. to CVT(TR580)-279, ADJUSTMENT, Primary Pulley and Secondary Pulley.>

12) Install the reduction drive gear. <Ref. to CVT(TR580)-262, INSTALLATION, Reduction Drive Gear.>

13) Install the transmission case. <Ref. to CVT(TR580)-245, INSTALLATION, Transmission Case.>

14) Install the transmission control device. <Ref. to CVT(TR580)-238, INSTALLATION, Transmission Control Device.>

15) Install the oil strainer and oil pan. <Ref. to CVT(TR580)-136, INSTALLATION, Oil Pan and Strainer.>

CVT(TR580)-291

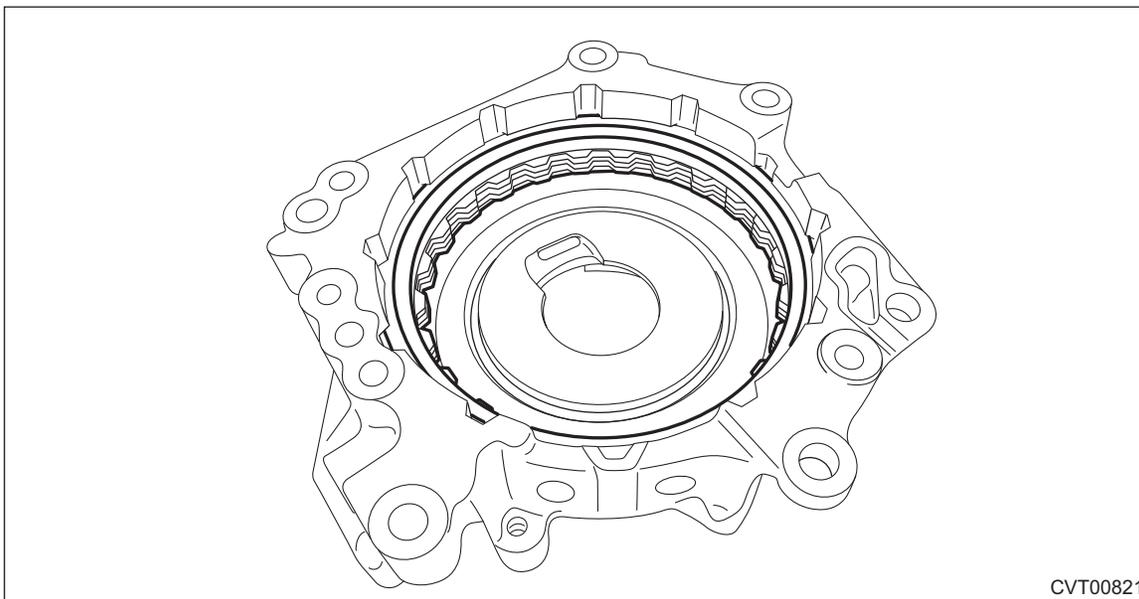
Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 16) Install the reduction driven gear assembly. <Ref. to CVT(TR580)-229, INSTALLATION, Reduction Driven Gear.>
- 17) Install the transfer driven gear assembly. <Ref. to CVT(TR580)-224, INSTALLATION, Transfer Driven Gear.>
- 18) Install the transfer clutch assembly. <Ref. to CVT(TR580)-211, INSTALLATION, Transfer Clutch.>
- 19) Install the parking pawl. <Ref. to CVT(TR580)-227, INSTALLATION, Parking Pawl.>
- 20) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 21) Install the inhibitor switch. <Ref. to CVT(TR580)-115, INSTALLATION, Inhibitor Switch.>
- 22) Install the secondary speed sensor. <Ref. to CVT(TR580)-123, INSTALLATION, Secondary Speed Sensor.>
- 23) Install the primary speed sensor. <Ref. to CVT(TR580)-128, INSTALLATION, Primary Speed Sensor.>
- 24) Install the turbine speed sensor. <Ref. to CVT(TR580)-118, INSTALLATION, Turbine Speed Sensor.>
- 25) Install the transmission harness. <Ref. to CVT(TR580)-155, INSTALLATION, Transmission Harness.>
- 26) Install the control valve body. <Ref. to CVT(TR580)-144, INSTALLATION, Control Valve Body.>
- 27) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>
- 28) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: DISASSEMBLY

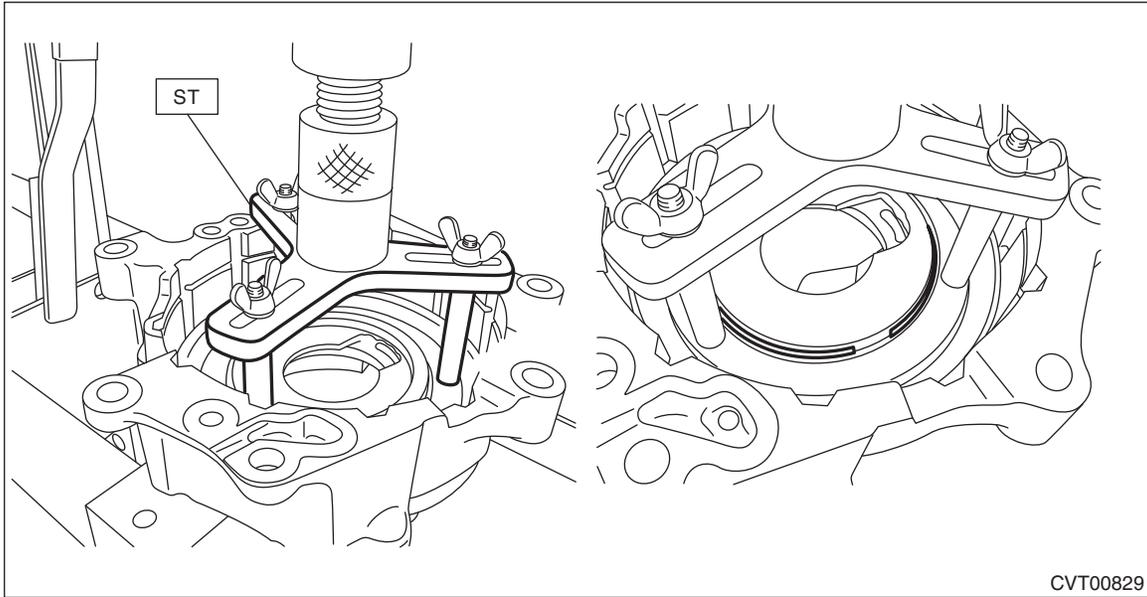
- 1) Remove the snap ring.
- 2) Remove the retaining plate, drive plate, driven plate and dish plate.



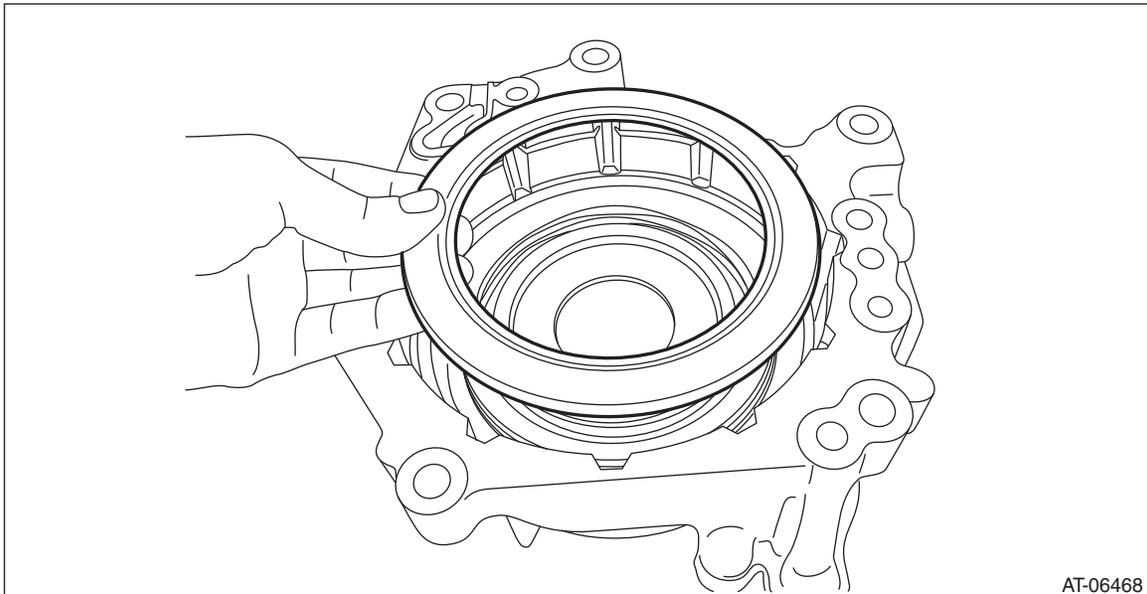
Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 3) Compress the return spring using the ST to remove the snap ring.
ST 18762AA001 COMPRESSOR SPECIAL TOOL



- 4) Using the ST, remove the snap ring and spring retainer.

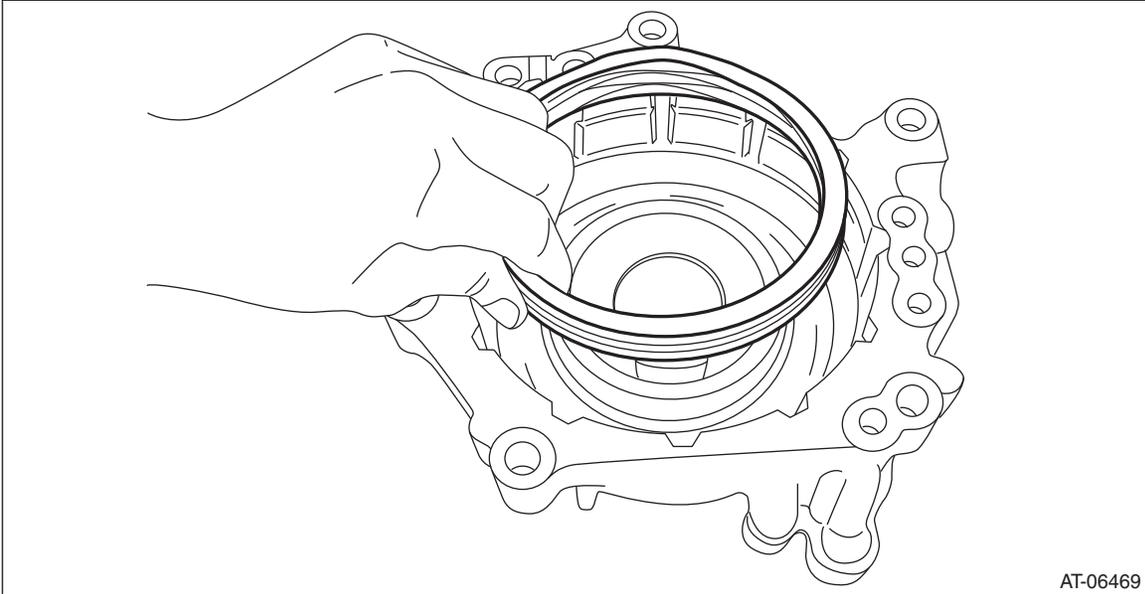


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Reverse Brake Assembly

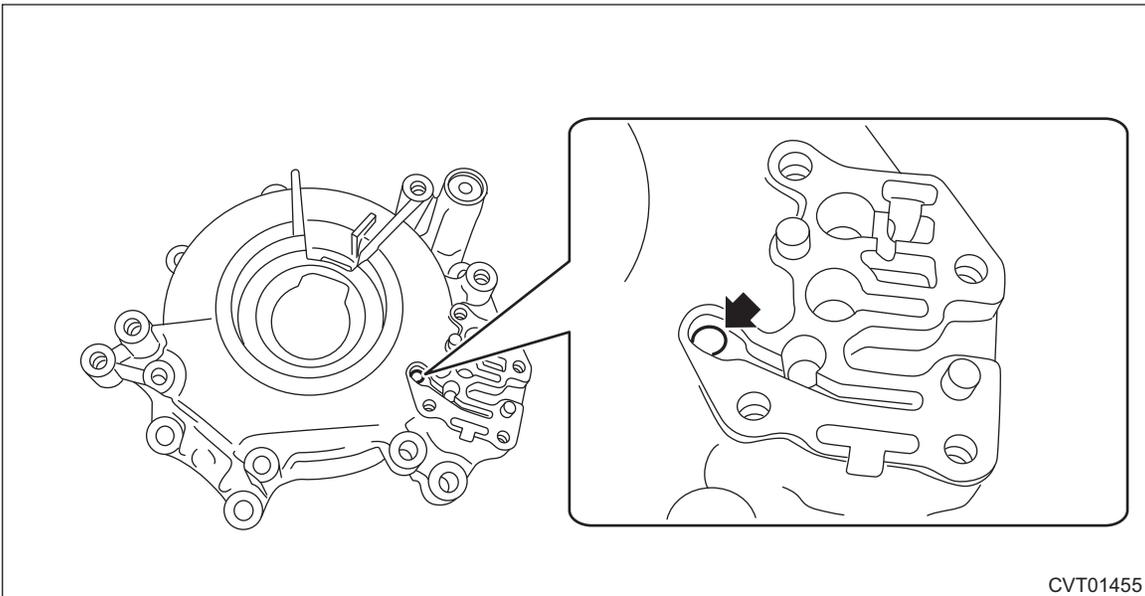
CONTINUOUSLY VARIABLE TRANSMISSION

5) Remove the return spring.



AT-06469

6) Remove the reverse brake piston by blowing compressed air intermittently from the reverse brake housing hole.



CVT01455

D: ASSEMBLY

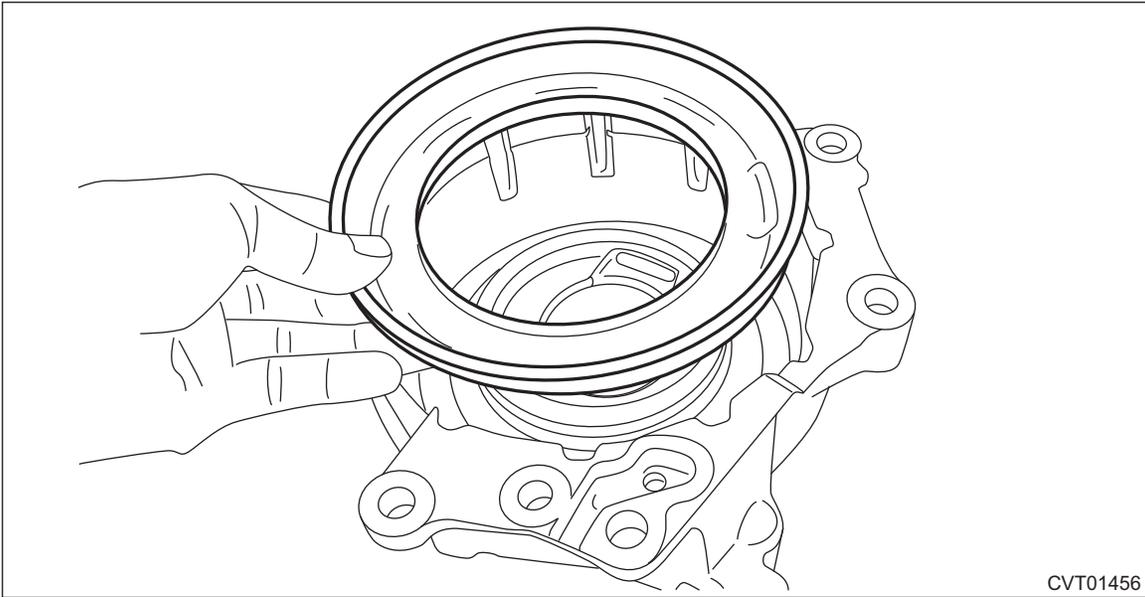
1) Install the reverse brake piston.

Reverse Brake Assembly

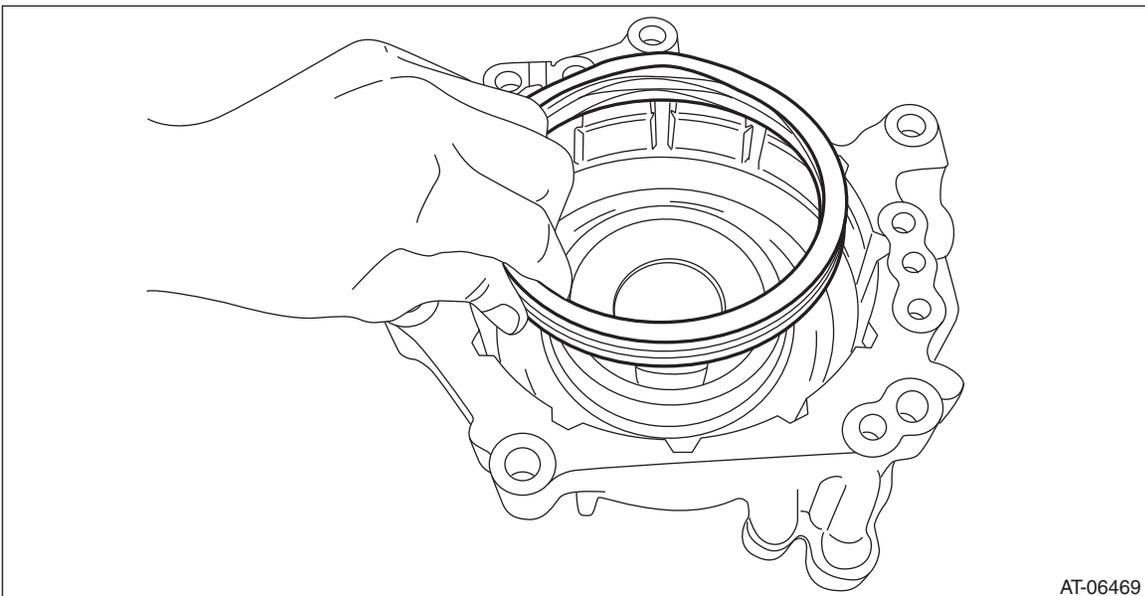
CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Apply CVTF to the sealing area of reverse brake piston.



2) Install the return spring.

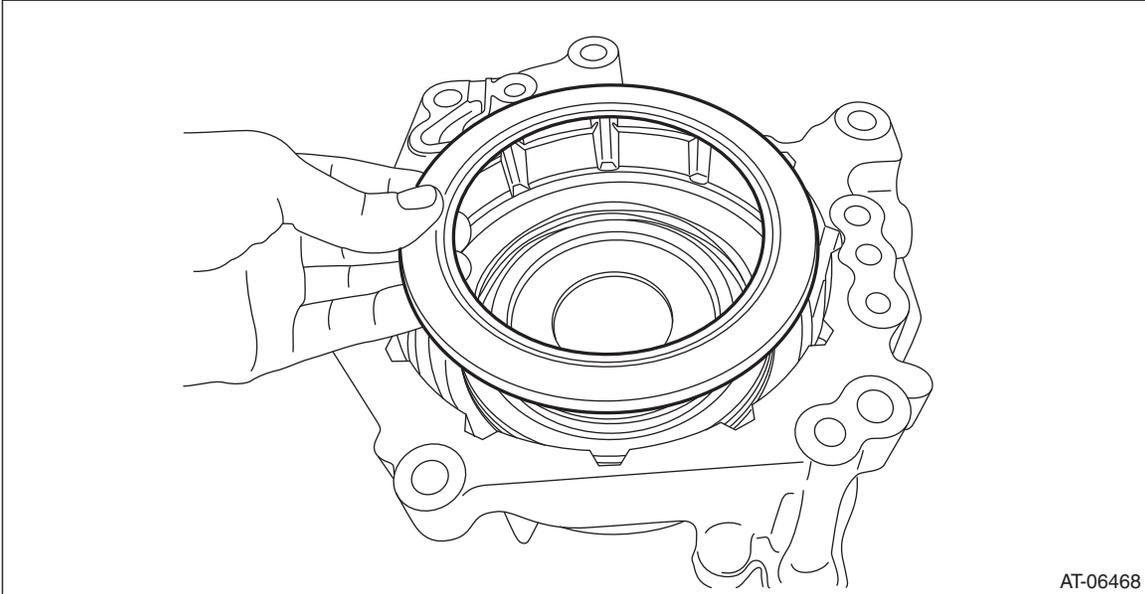


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Reverse Brake Assembly

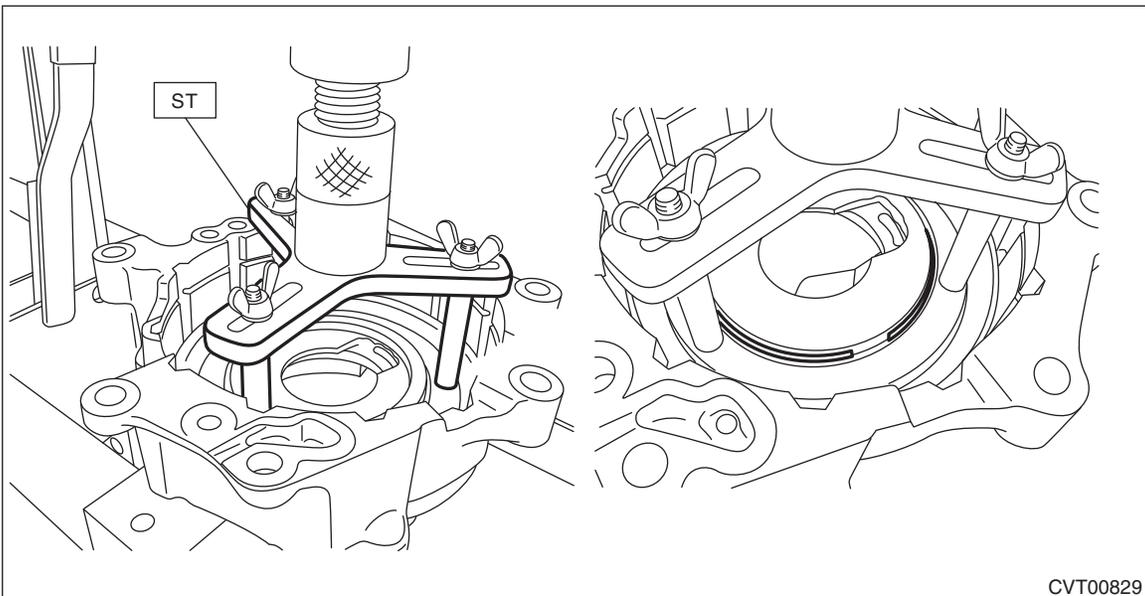
CONTINUOUSLY VARIABLE TRANSMISSION

3) Install the spring retainer.



AT-06468

4) Compress the return spring using the ST to install the snap ring.
ST 18762AA001 COMPRESSOR SPECIAL TOOL



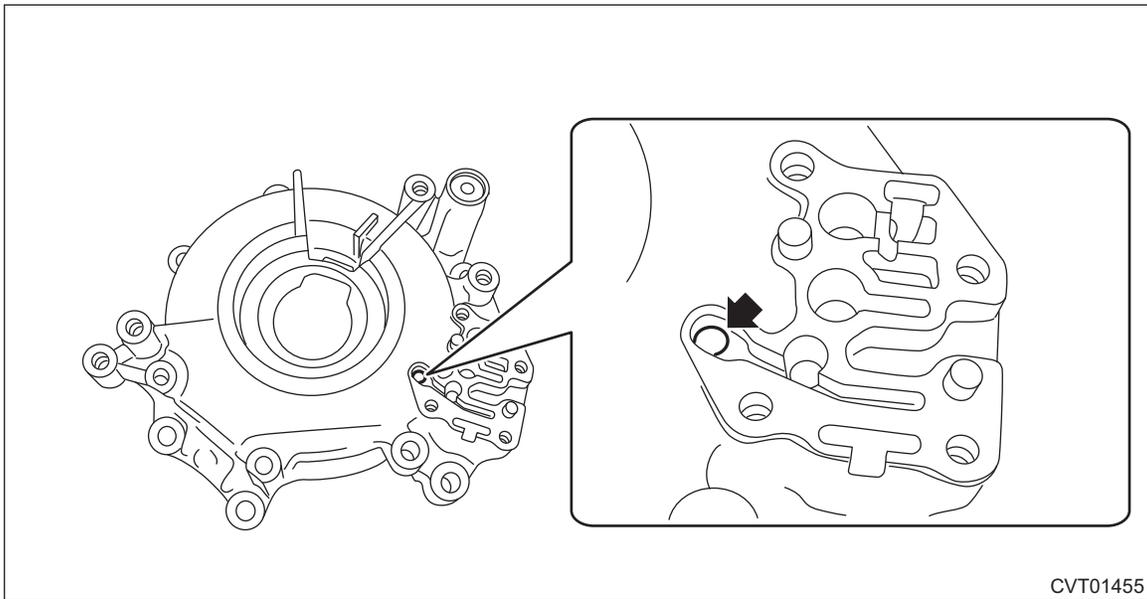
CVT00829

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Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

5) Check the operation of reverse brake piston by blowing compressed air intermittently from the reverse brake housing hole.



CVT01455

6) Place the driven plate, drive plate and retaining plate neatly in this order on surface table.
7) Set the dial gauge to retaining plate, and read its scale.

NOTE:

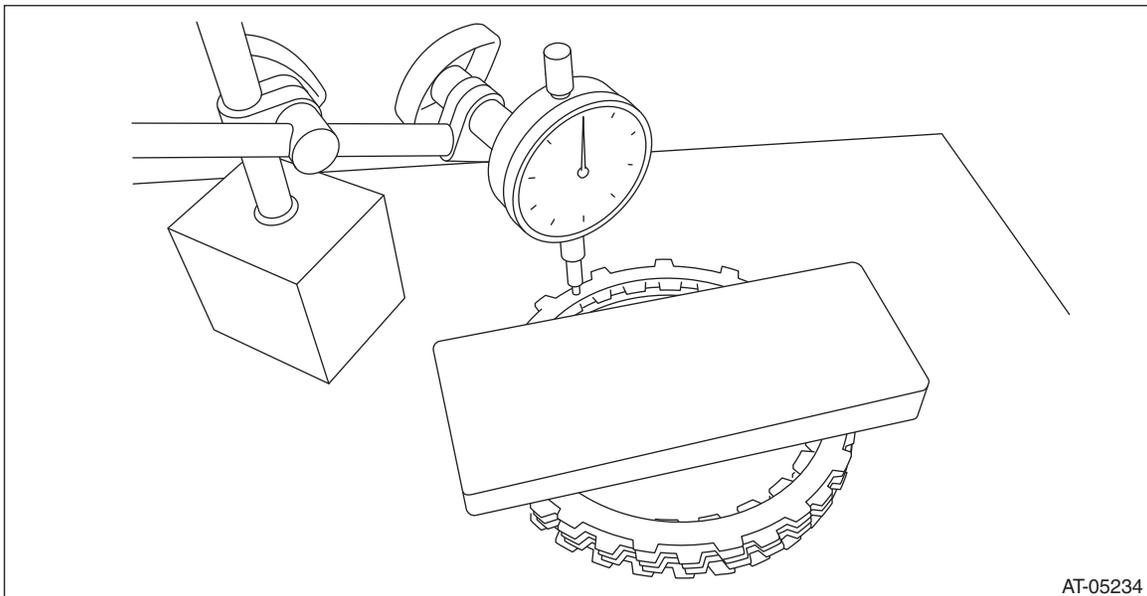
The value, which is read in the gauge at this time, is zero point.

8) Scale and record the weight “Z” of a flat board which will be put on retaining plate.

NOTE:

- Use a stiff board which does not bend against load as a flat board to be put on retaining plate.
- Use a flat board weighing less than 29 N (3.0 kgf, 6.5 lb).

9) Put the flat board on retaining plate.



AT-05234

10) Using the following formula, read the push/pull gauge and calculate “N”.

$$N = 29 \text{ N (3.0 kgf, 6.5 lb)} - Z$$

29 N (3.0 kgf, 6.5 lb): Load applied to clutch plate

Z: Flat board weight

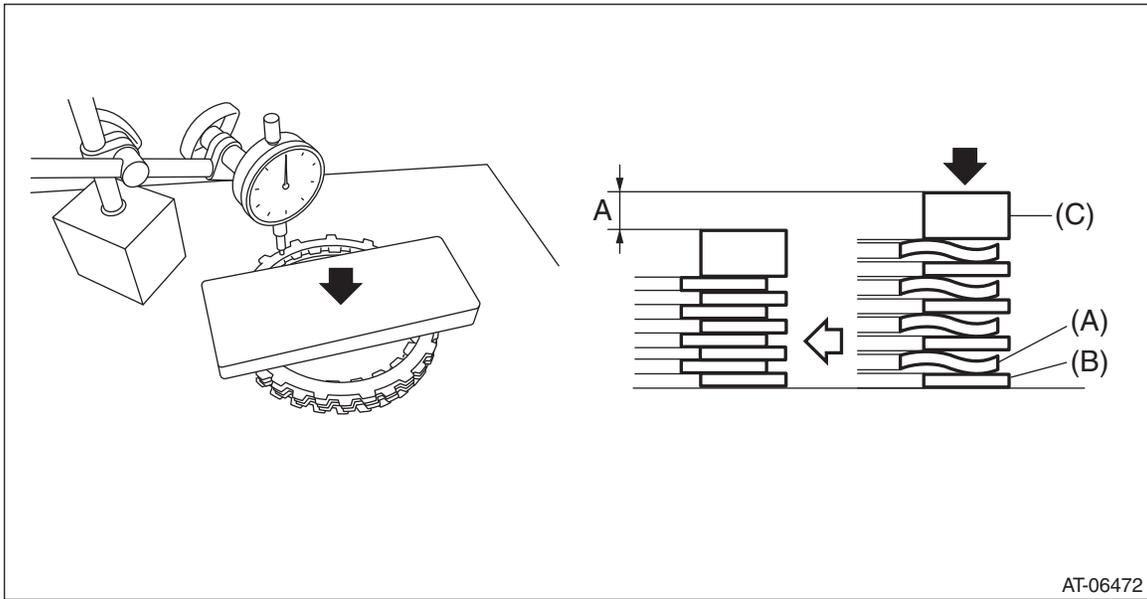
11) Press the center of retaining plate by applying a force of “N” using push/pull gauge, and then measure and record the compression amount “A”.

Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Measure at four points with a 90° interval and calculate the average.

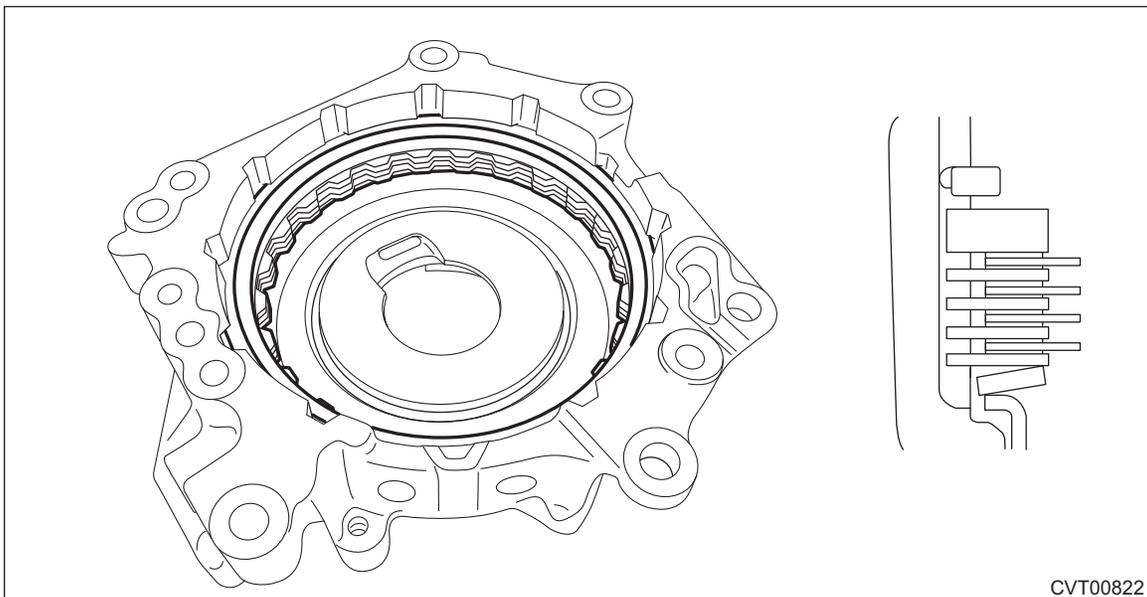


- (A) Drive plate
- (B) Driven plate
- (C) Retaining plate

12) Install the dish plate, drive plate, driven plate, retaining plate and snap ring to the reverse brake housing.

NOTE:

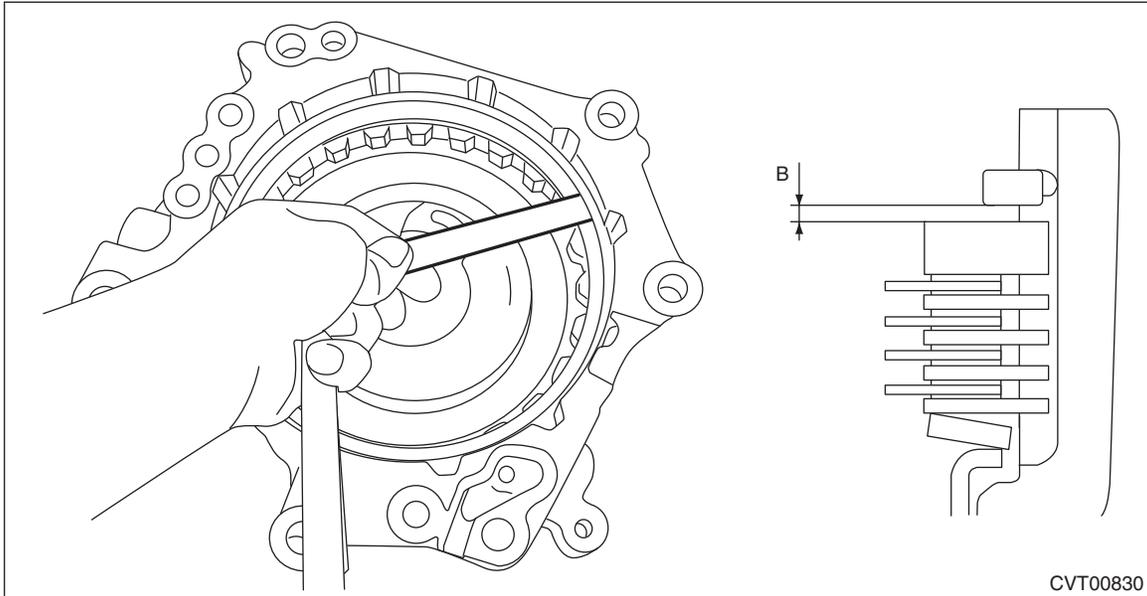
Install the dish plate in the correct direction.



Reverse Brake Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

13) Measure and record the clearance “B” between the retaining plate and snap ring.



14) Piston stroke calculation

Calculate with A and B dimensions recorded before. If it exceeds the limit, replace with a new drive plate and adjust within the initial standard value.

$$S \text{ mm (in)} = A + B$$

S: Piston stroke

A: Compression amount of drive plate and dish plate

B: Clearance between retaining plate and snap ring

Initial standard:

1.8 — 2.2 mm (0.071 — 0.087 in)

Limit thickness:

2.4 mm (0.094 in)

Retaining plate	
Part No.	Thickness mm (in)
31567AB750	4.2 (0.165)
31567AB800	4.4 (0.173)
31567AB810	4.6 (0.181)
31567AB820	4.8 (0.189)

E: INSPECTION

- Inspect the drive plate facing for wear and damage.
- Check the driven plate for discoloration (burnt color).
- Check for worn snap ring, fatigue or damaged return spring or deformed spring retainer.
- Make sure the clearance between retaining plate and snap ring of reverse brake is within the limit. If it exceeds the limit, replace with a new drive plate and select and adjust the retaining plate within the initial standard value. <Ref. to CVT(TR580)-294, ASSEMBLY, Reverse Brake Assembly.>

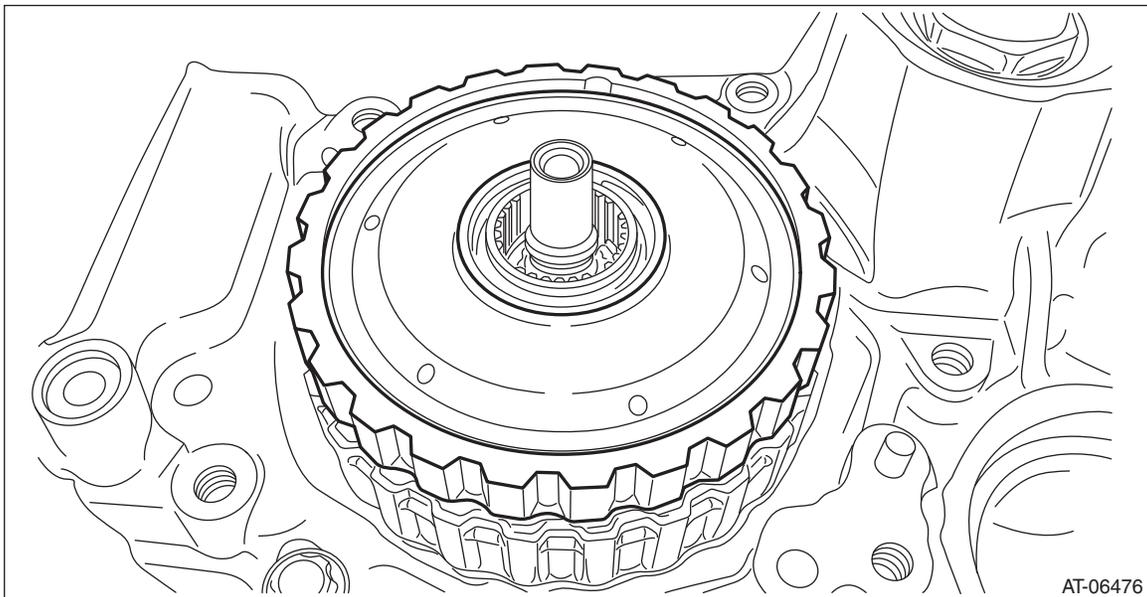
Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

44. Forward Clutch Assembly

A: REMOVAL

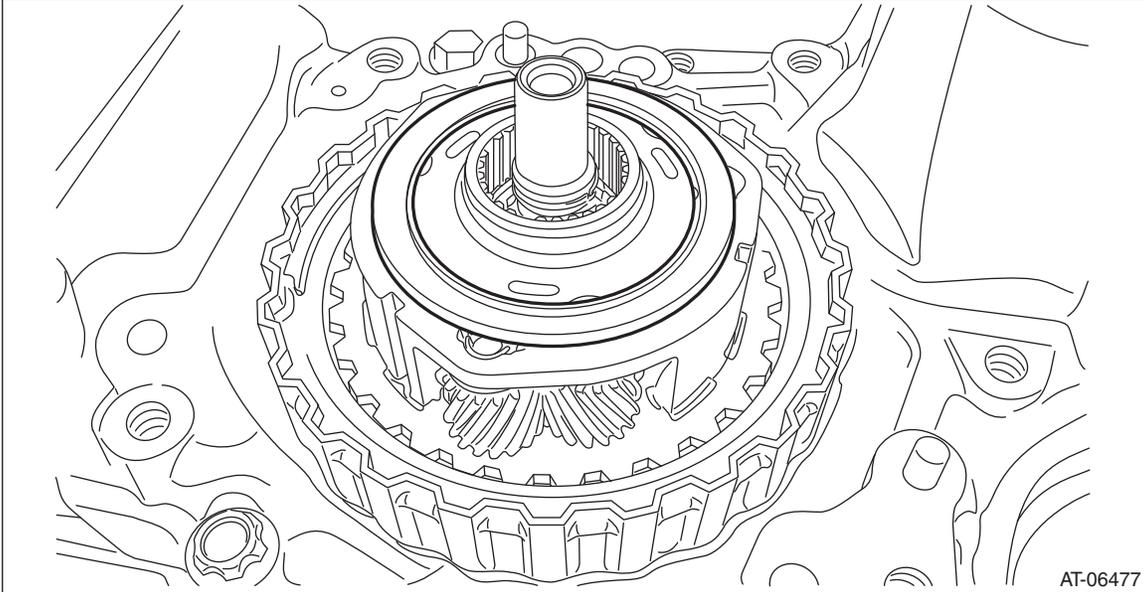
- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the air breather hose. <Ref. to CVT(TR580)-196, REMOVAL, Air Breather Hose.>
- 3) Remove the control valve body. <Ref. to CVT(TR580)-138, REMOVAL, Control Valve Body.>
- 4) Remove the transmission harness. <Ref. to CVT(TR580)-152, REMOVAL, Transmission Harness.>
- 5) Remove the turbine speed sensor. <Ref. to CVT(TR580)-118, REMOVAL, Turbine Speed Sensor.>
- 6) Remove the secondary speed sensor. <Ref. to CVT(TR580)-123, REMOVAL, Secondary Speed Sensor.>
- 7) Remove the primary speed sensor. <Ref. to CVT(TR580)-128, REMOVAL, Primary Speed Sensor.>
- 8) Remove the inhibitor switch. <Ref. to CVT(TR580)-112, REMOVAL, Inhibitor Switch.>
- 9) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 10) Remove the transfer clutch assembly. <Ref. to CVT(TR580)-210, REMOVAL, Transfer Clutch.>
- 11) Remove the transfer driven gear assembly. <Ref. to CVT(TR580)-224, REMOVAL, Transfer Driven Gear.>
- 12) Remove the parking pawl. <Ref. to CVT(TR580)-227, REMOVAL, Parking Pawl.>
- 13) Remove the reduction driven gear assembly. <Ref. to CVT(TR580)-229, REMOVAL, Reduction Driven Gear.>
- 14) Remove the oil pan and oil strainer. <Ref. to CVT(TR580)-135, REMOVAL, Oil Pan and Strainer.>
- 15) Remove the transmission control device. <Ref. to CVT(TR580)-236, REMOVAL, Transmission Control Device.>
- 16) Remove the transmission case. <Ref. to CVT(TR580)-242, REMOVAL, Transmission Case.>
- 17) Remove the reduction drive gear. <Ref. to CVT(TR580)-261, REMOVAL, Reduction Drive Gear.>
- 18) Remove the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TR580)-266, REMOVAL, Primary Pulley and Secondary Pulley.>
- 19) Remove the reverse brake assembly. <Ref. to CVT(TR580)-285, REMOVAL, Reverse Brake Assembly.>
- 20) Remove the internal gear.



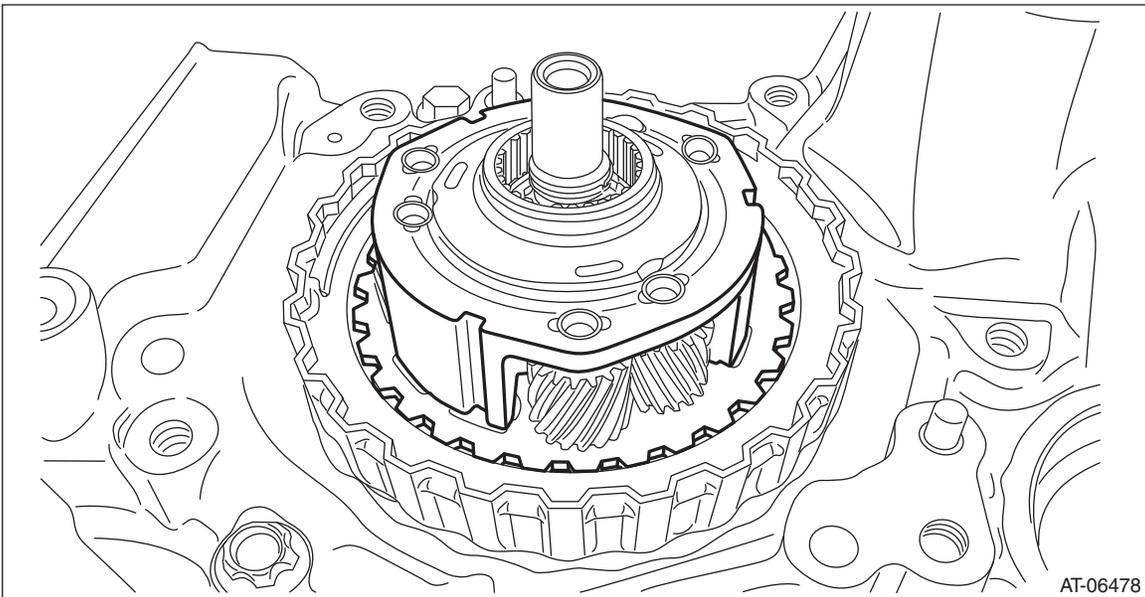
Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

21) Remove the thrust bearing.



22) Remove the planetary carrier.

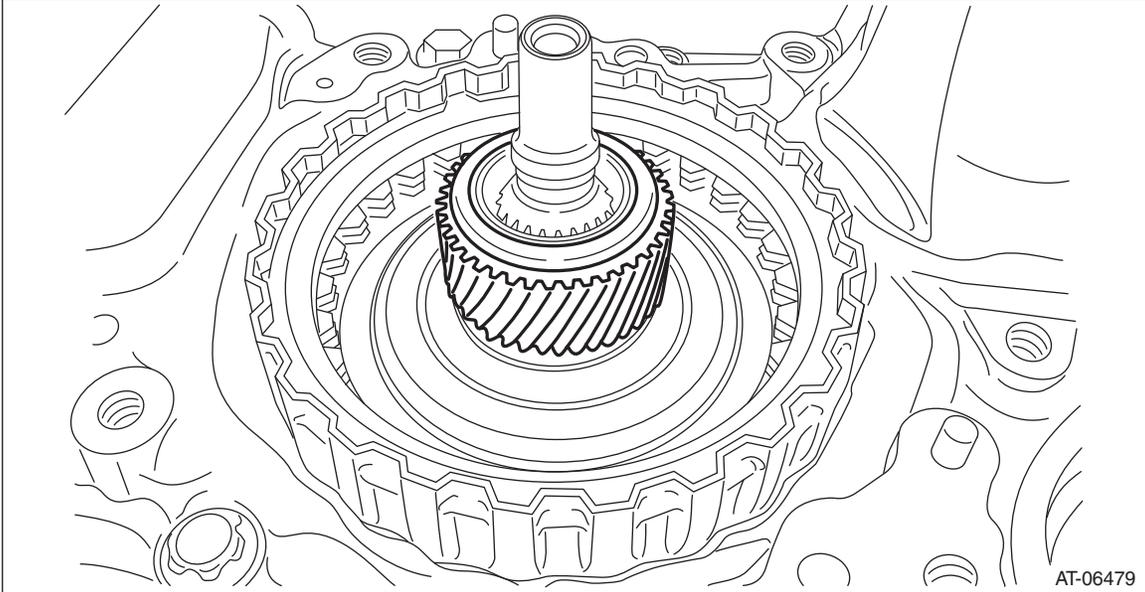


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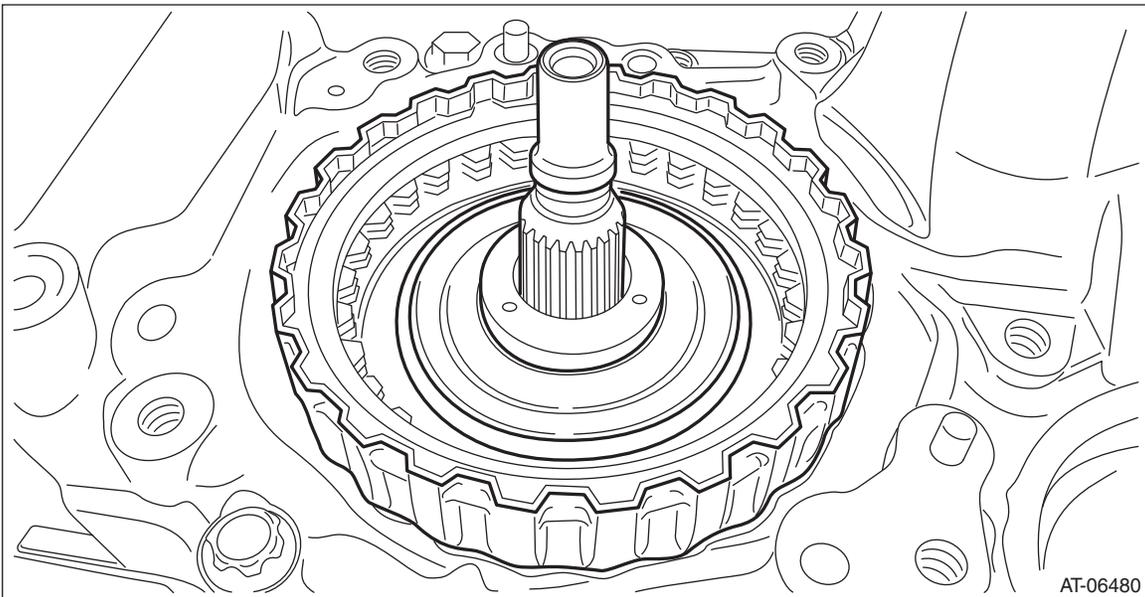
Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

23) Remove the thrust bearing and sun gear.



24) Remove the forward clutch assembly.

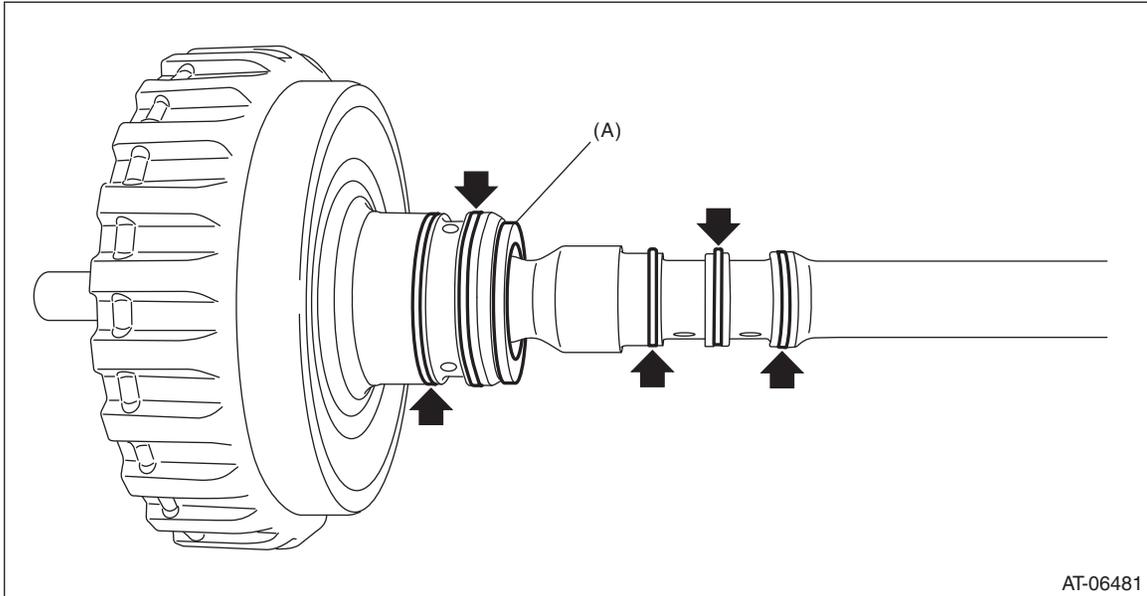


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Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

25) Remove the thrust bearing and seal ring.



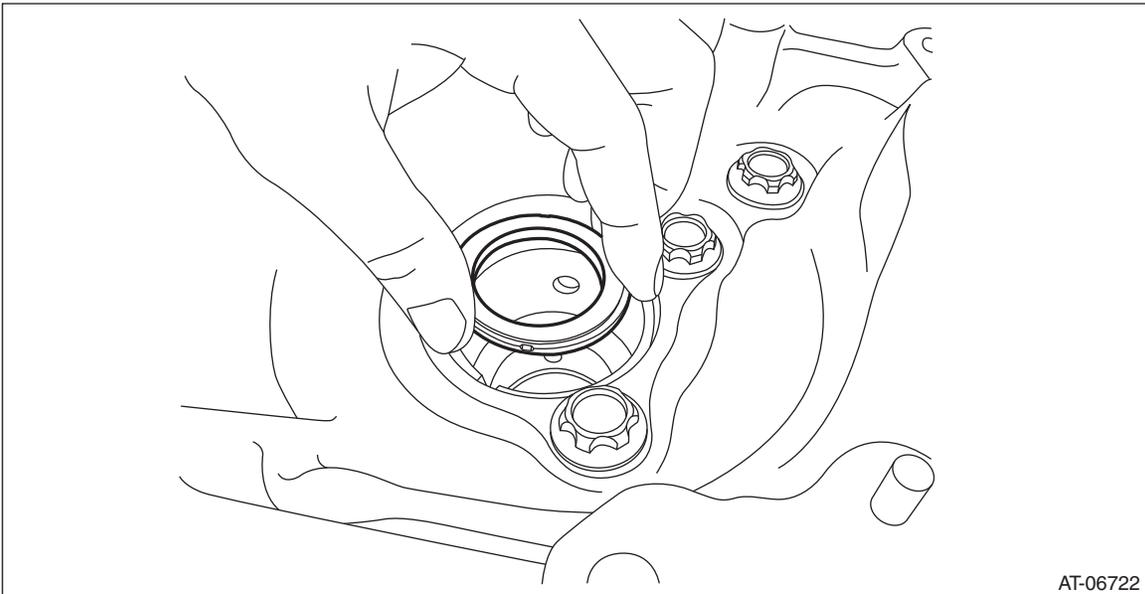
(A) Thrust bearing

B: INSTALLATION

1) Install the thrust bearing to the converter case.

NOTE:

Face the temper color surface to the converter case side.



2) Install the seal ring to the input shaft.

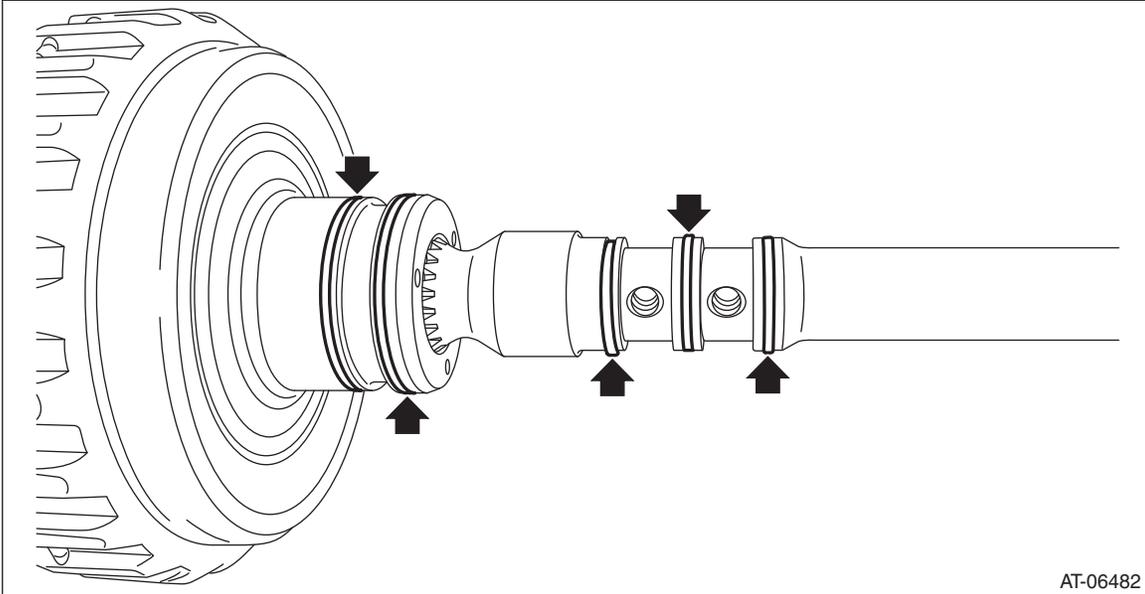
NOTE:

- Use new seal rings.
- When installing the seal rings, do not expand the seal rings too much.

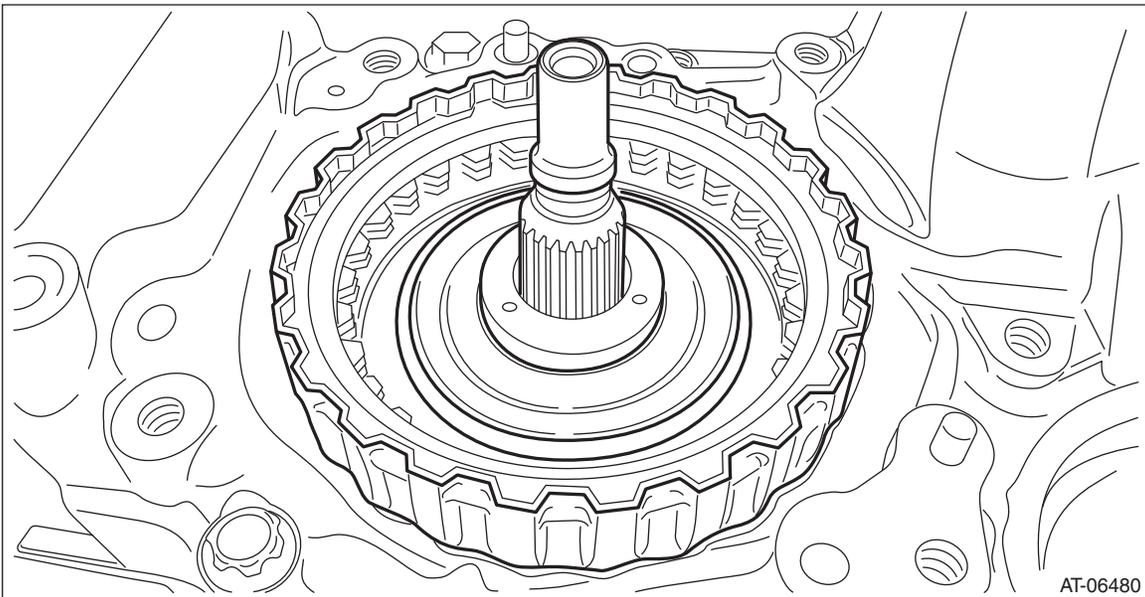
Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- Apply CVTF to the seal rings.



- 3) Install the forward clutch assembly to the converter case.



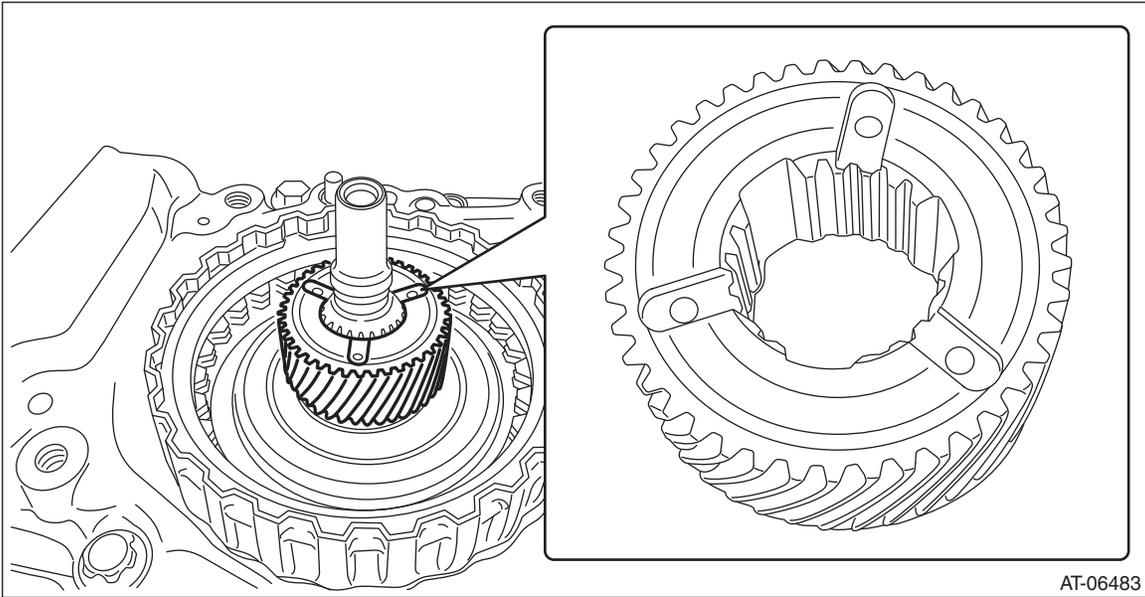
- 4) Install the sun gear.

Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

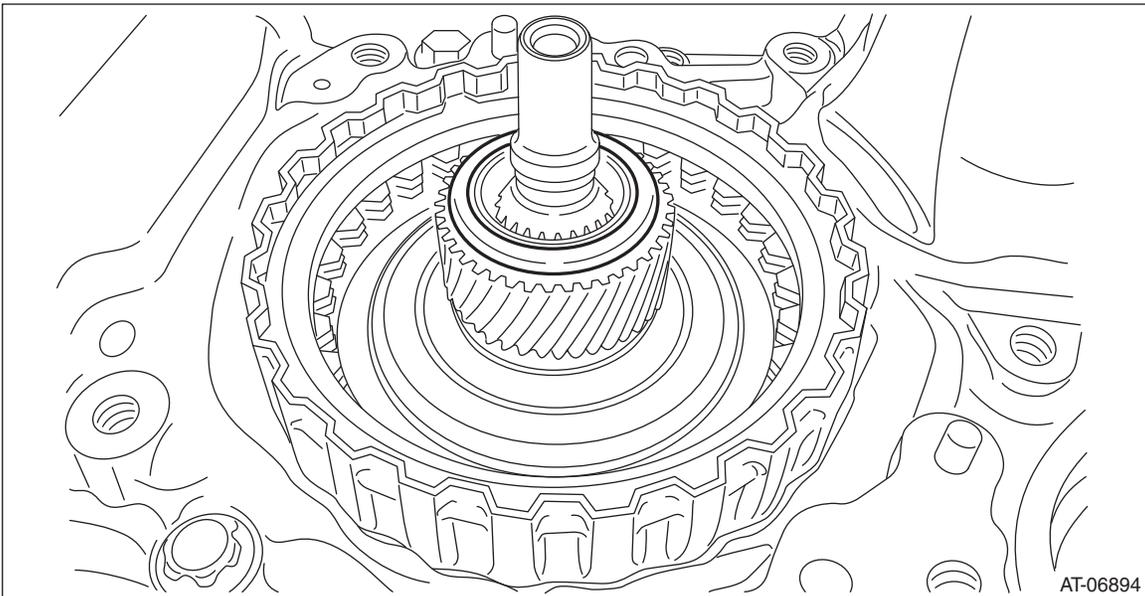
Face the end face of the sun gear to the reverse brake side as shown in the figure.



5) Install the thrust bearing to the sun gear.

NOTE:

Face the temper color surface to the reverse brake side.

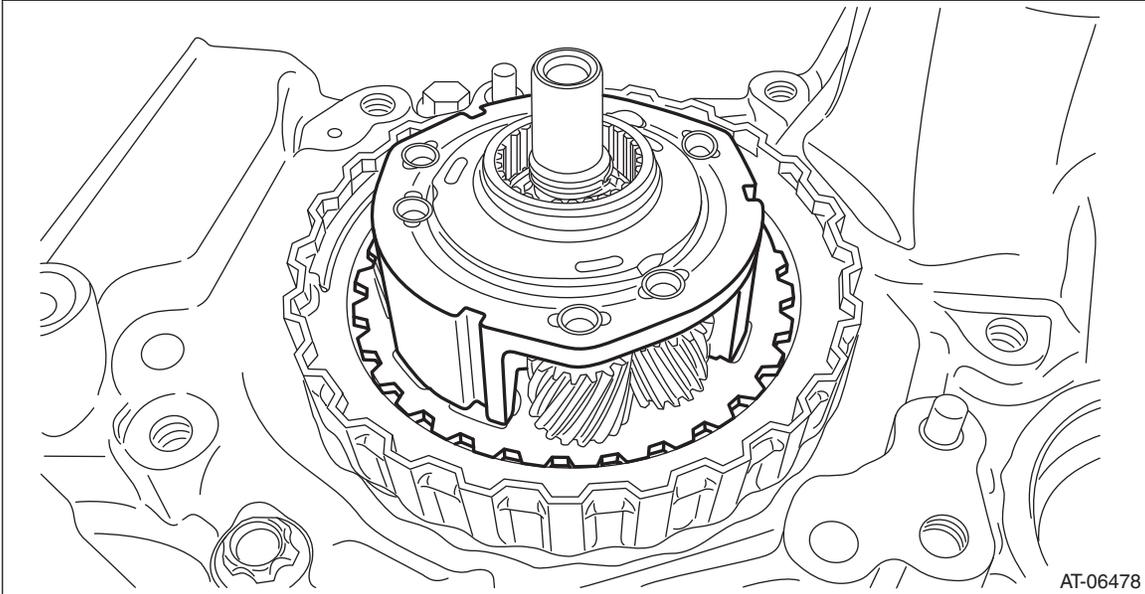


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Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

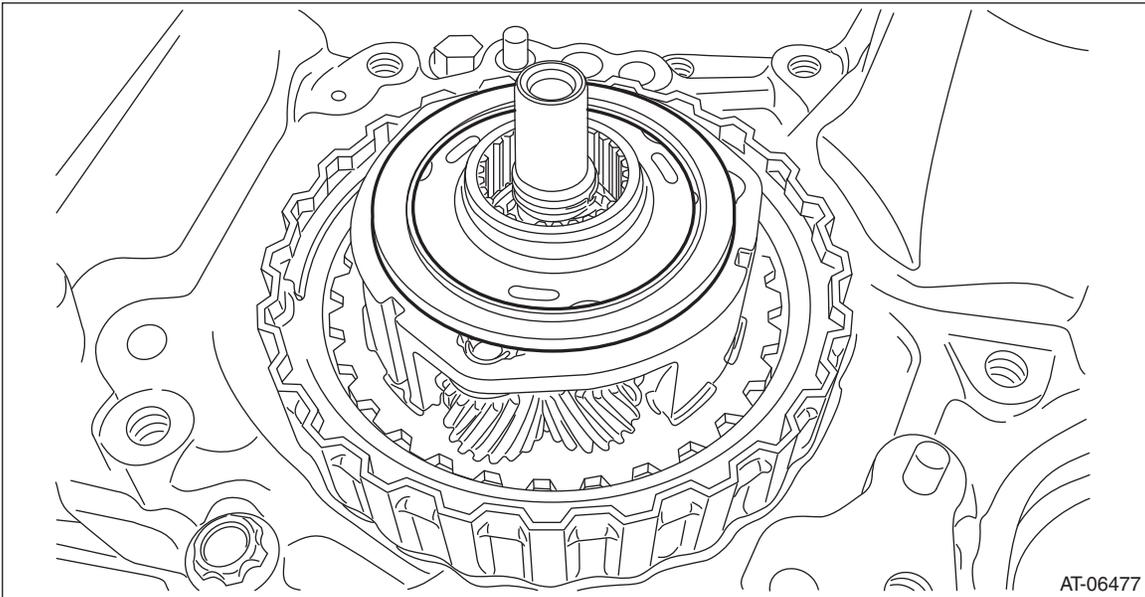
6) Install the planetary carrier.



7) Install the thrust bearing.

NOTE:

Face the temper color surface to the reverse brake side.

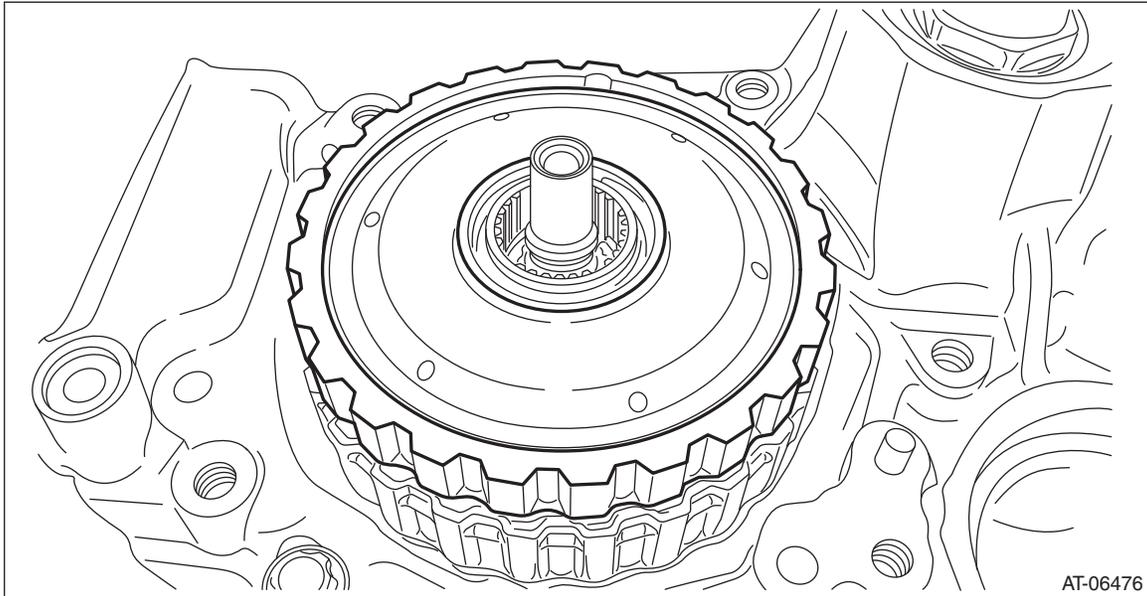


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Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

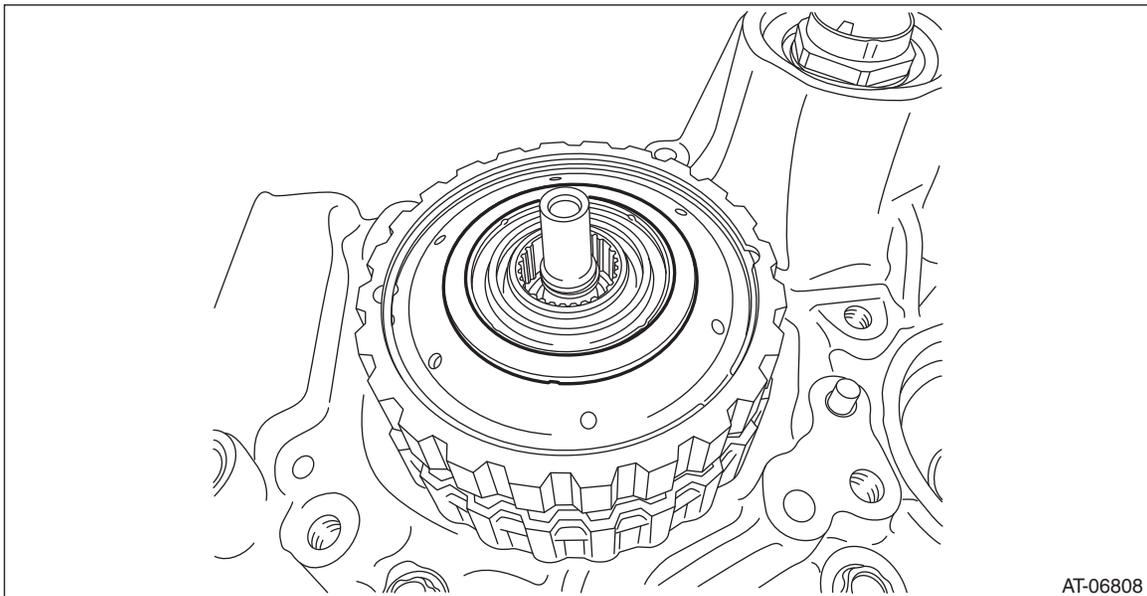
8) Install the internal gear.



9) Install the thrust bearing to the internal gear.

NOTE:

Face the temper color surface to the reverse brake side.



10) Select a washer. <Ref. to CVT(TR580)-317, ADJUSTMENT, Forward Clutch Assembly.>

11) Install the reverse brake assembly. <Ref. to CVT(TR580)-287, INSTALLATION, Reverse Brake Assembly.>

12) Install the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TR580)-272, INSTALLATION, Primary Pulley and Secondary Pulley.>

13) Install the reduction drive gear. <Ref. to CVT(TR580)-262, INSTALLATION, Reduction Drive Gear.>

14) Install the transmission case. <Ref. to CVT(TR580)-245, INSTALLATION, Transmission Case.>

15) Install the transmission control device. <Ref. to CVT(TR580)-238, INSTALLATION, Transmission Control Device.>

16) Install the oil strainer and oil pan. <Ref. to CVT(TR580)-136, INSTALLATION, Oil Pan and Strainer.>

17) Install the reduction driven gear assembly. <Ref. to CVT(TR580)-229, INSTALLATION, Reduction Driven Gear.>

18) Install the transfer driven gear assembly. <Ref. to CVT(TR580)-224, INSTALLATION, Transfer Driven Gear.>

CVT(TR580)-307

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Forward Clutch Assembly

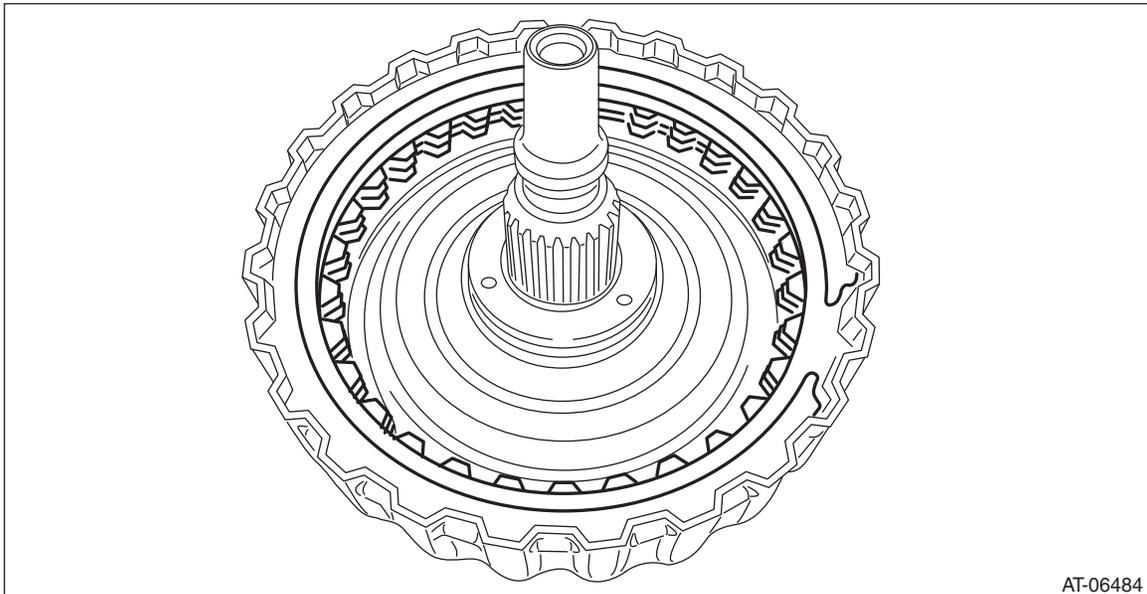
CONTINUOUSLY VARIABLE TRANSMISSION

- 19) Install the transfer clutch assembly. <Ref. to CVT(TR580)-211, INSTALLATION, Transfer Clutch.>
- 20) Install the parking pawl. <Ref. to CVT(TR580)-227, INSTALLATION, Parking Pawl.>
- 21) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 22) Install the inhibitor switch. <Ref. to CVT(TR580)-115, INSTALLATION, Inhibitor Switch.>
- 23) Install the secondary speed sensor. <Ref. to CVT(TR580)-123, INSTALLATION, Secondary Speed Sensor.>
- 24) Install the primary speed sensor. <Ref. to CVT(TR580)-128, INSTALLATION, Primary Speed Sensor.>
- 25) Install the turbine speed sensor. <Ref. to CVT(TR580)-118, INSTALLATION, Turbine Speed Sensor.>
- 26) Install the transmission harness. <Ref. to CVT(TR580)-155, INSTALLATION, Transmission Harness.>
- 27) Install the control valve body. <Ref. to CVT(TR580)-144, INSTALLATION, Control Valve Body.>
- 28) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>
- 29) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: DISASSEMBLY

1. FORWARD CLUTCH ASSEMBLY

- 1) Remove the snap ring.
- 2) Remove the retaining plate, drive plate, driven plate and dish plate.



AT-06484

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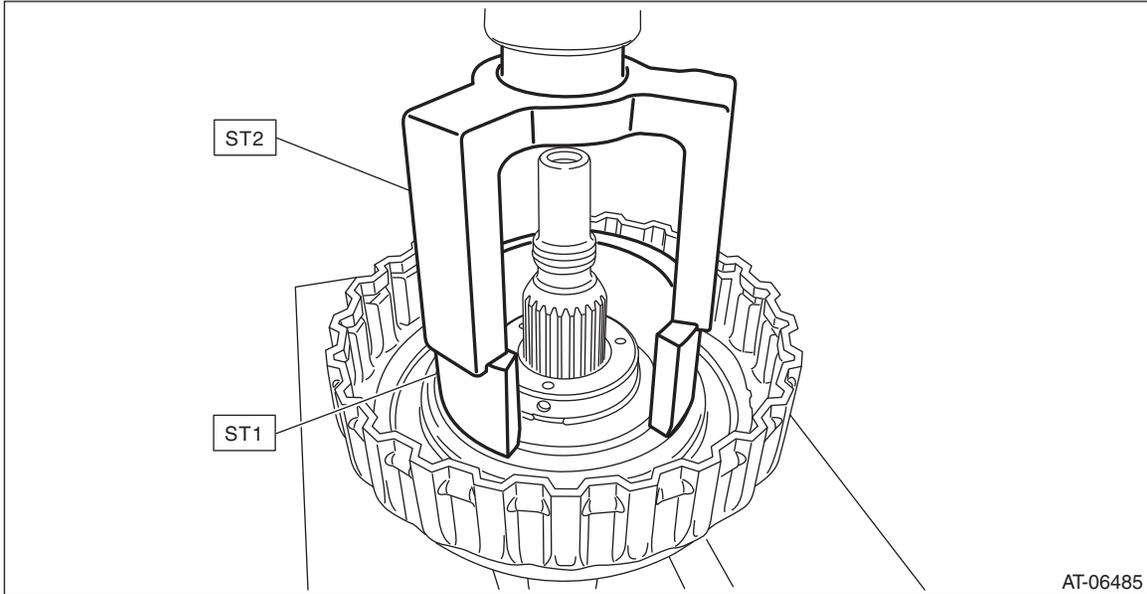
Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

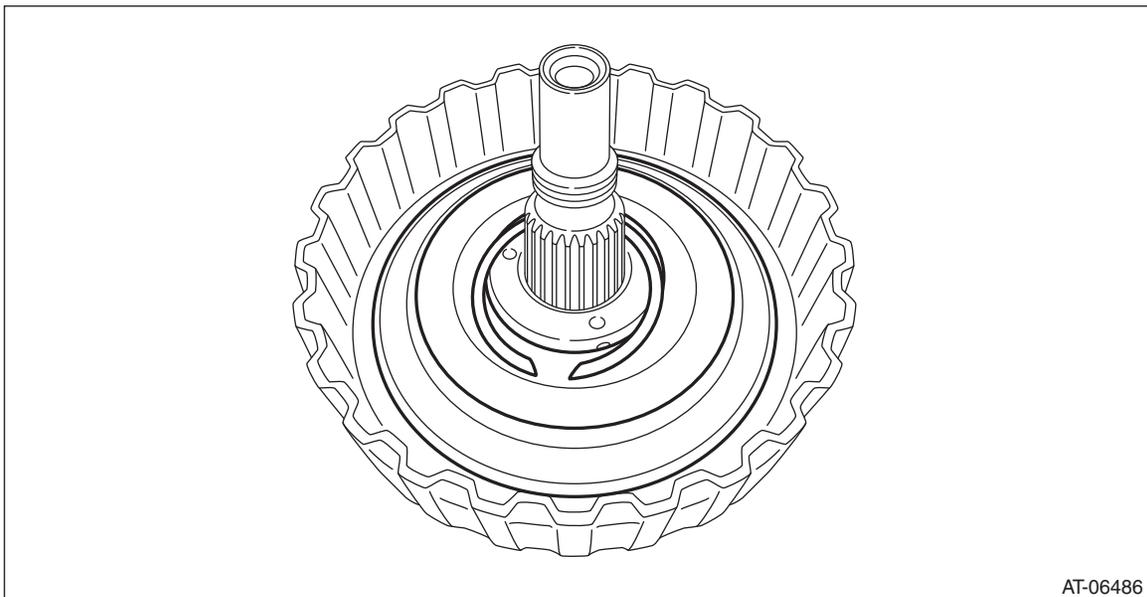
3) Compress the return spring using the ST to remove the snap ring.

ST1 18762AA010 COMPRESSOR SPECIAL TOOL

ST2 398673600 COMPRESSOR



4) Remove the chamber COMPL and snap ring.

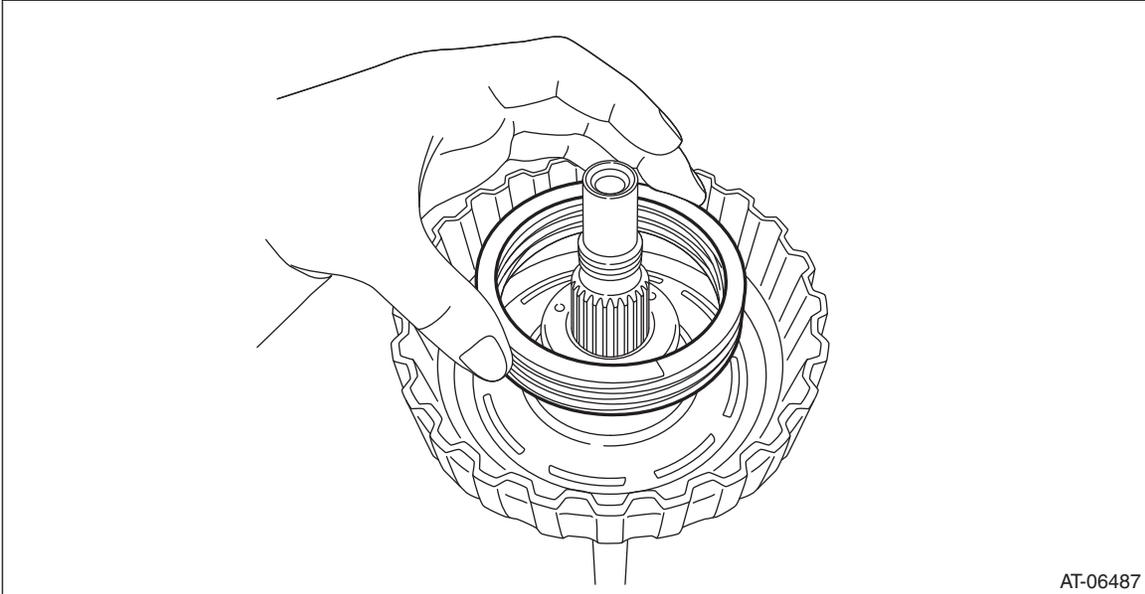


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Forward Clutch Assembly

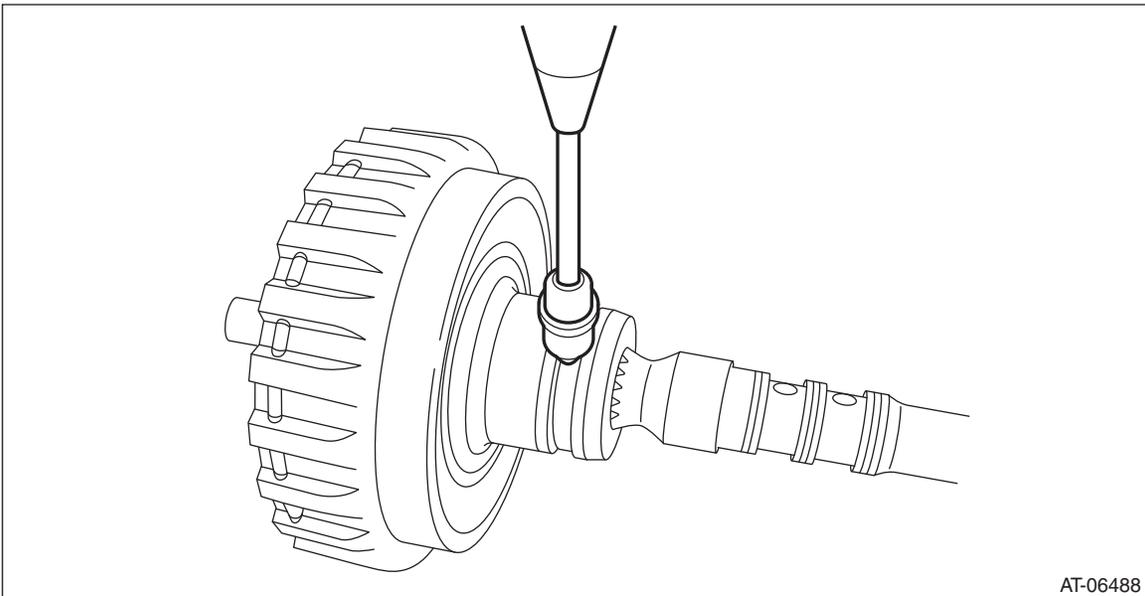
CONTINUOUSLY VARIABLE TRANSMISSION

5) Remove the return spring.



AT-06487

6) Remove the forward clutch piston by blowing compressed air intermittently from the forward clutch carrier hole.



AT-06488

2. PLANETARY CARRIER ASSEMBLY

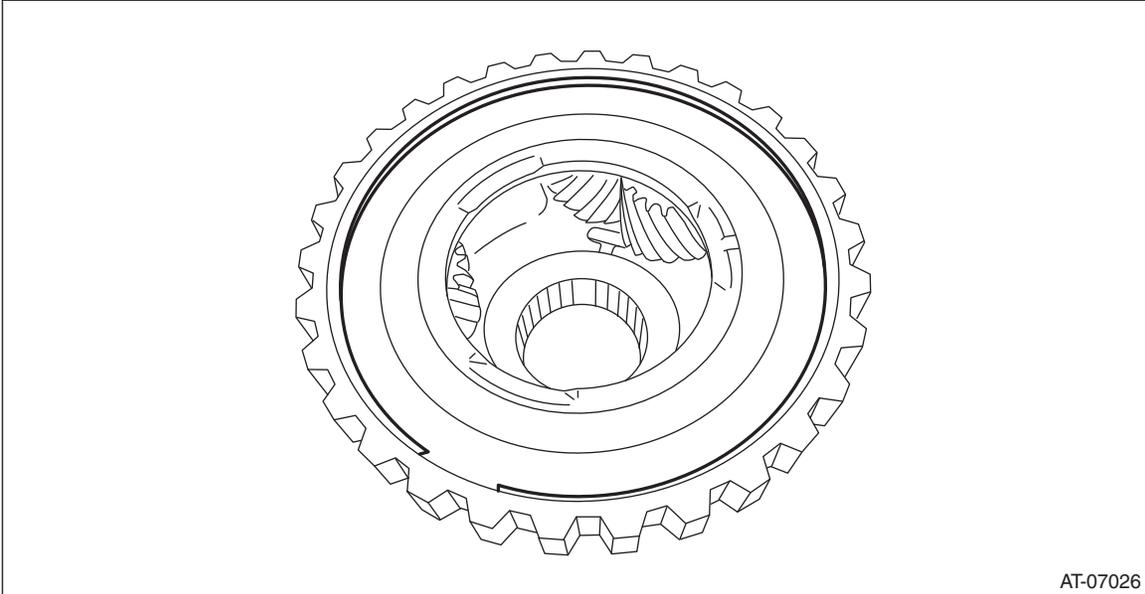
NOTE:

Disassemble the balance oil guide only.

Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 1) Remove the snap ring.

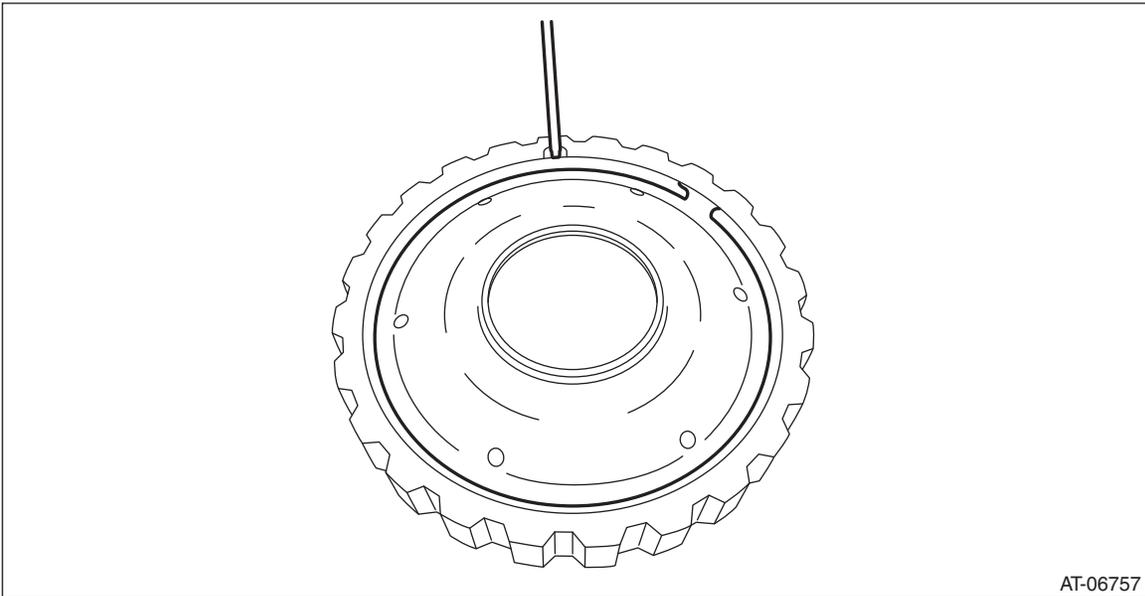


AT-07026

- 2) Remove the balance oil guide.

3. INTERNAL GEAR

- 1) Remove the snap ring.



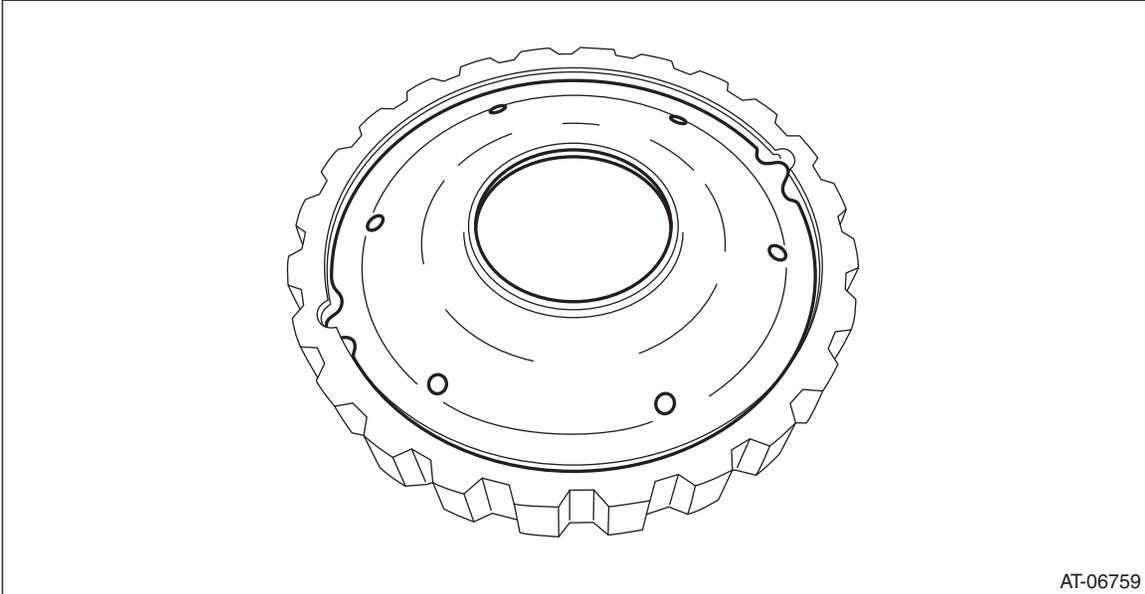
AT-06757

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Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

2) Remove the thrust gear plate.



AT-06759

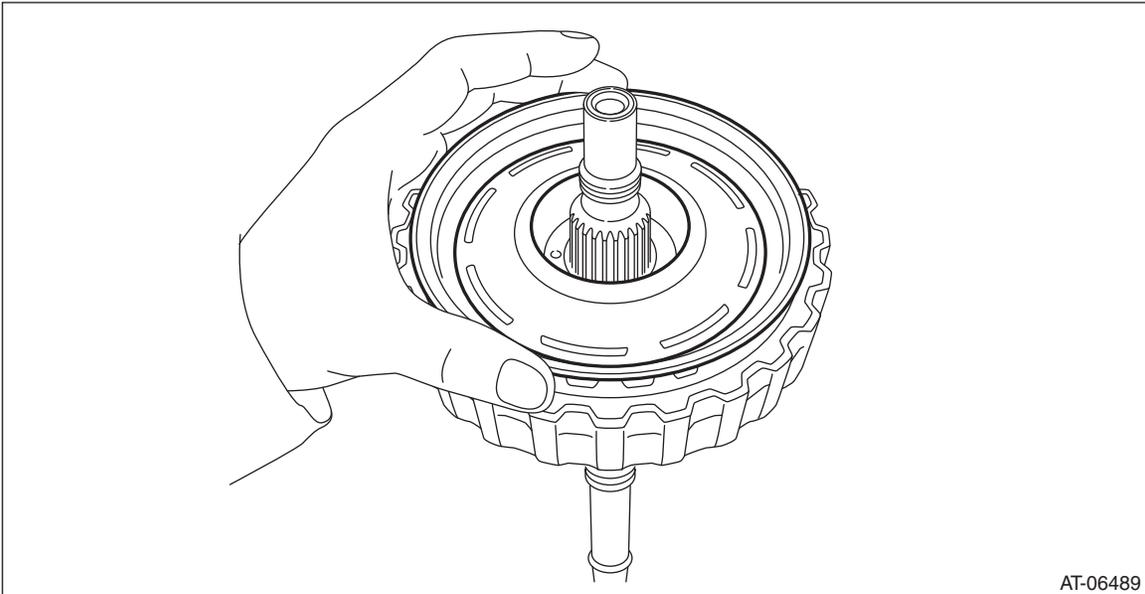
D: ASSEMBLY

1. FORWARD CLUTCH ASSEMBLY

1) Install the forward clutch piston to forward clutch drum.

NOTE:

- Apply CVTF to the seal of forward clutch piston.
- Insert it all the way to the end.



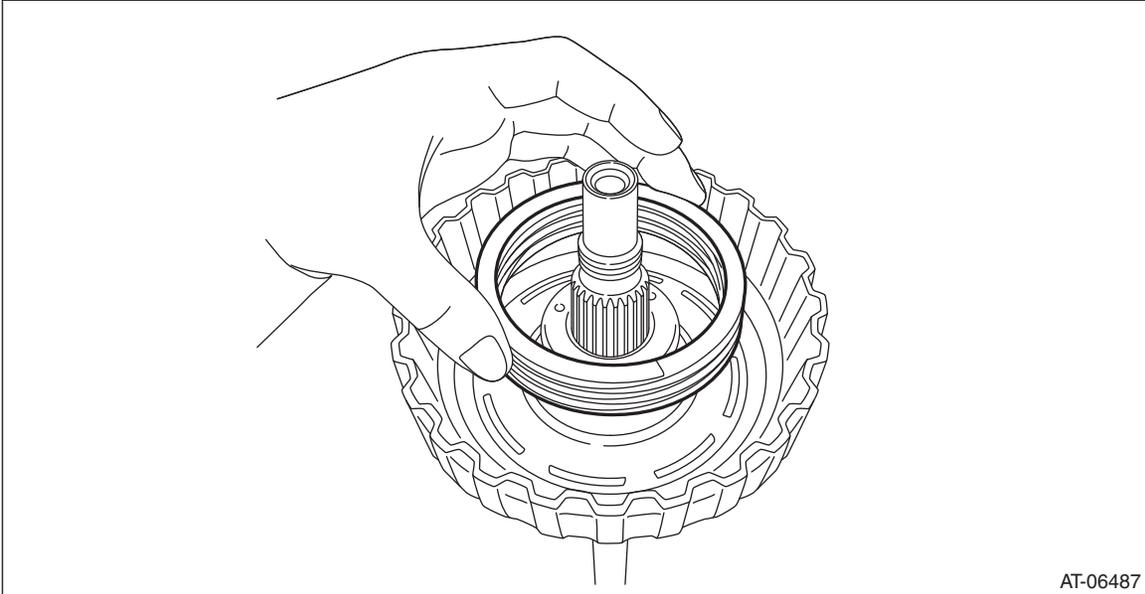
AT-06489

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Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

2) Install the return spring.

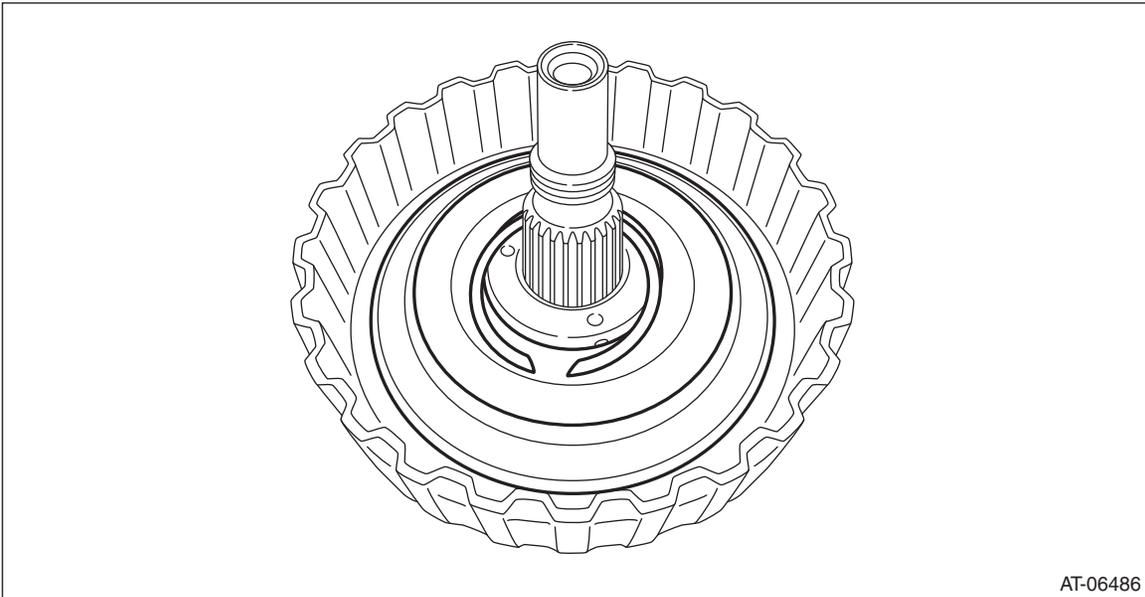


AT-06487

3) Install the chamber COMPL.

NOTE:

Apply CVTF to the sealing area of chamber COMPL.



AT-06486

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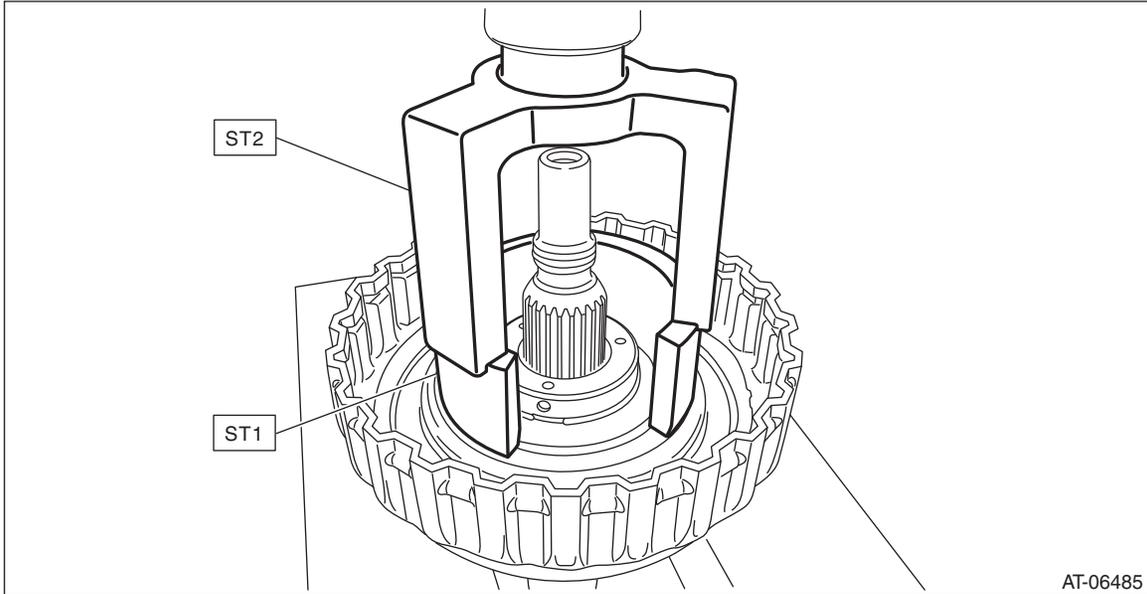
Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

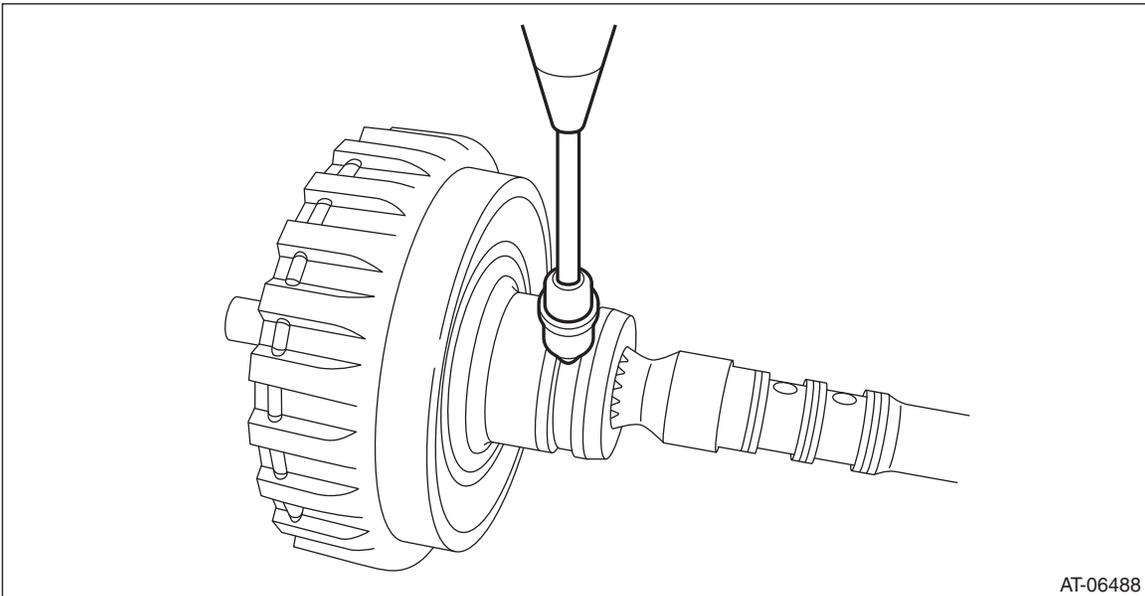
4) Compress the return spring using the ST to install the snap ring.

ST1 18762AA010 COMPRESSOR SPECIAL TOOL

ST2 398673600 COMPRESSOR



5) Check the operation of forward clutch piston by blowing compressed air intermittently from the forward clutch carrier hole.



6) Place the driven plate, drive plate and retaining plate neatly in this order on surface table.

7) Set the dial gauge to retaining plate, and read its scale.

NOTE:

The value, which is read in the gauge at this time, is zero point.

8) Scale and record the weight "Z" of a flat board which will be put on retaining plate.

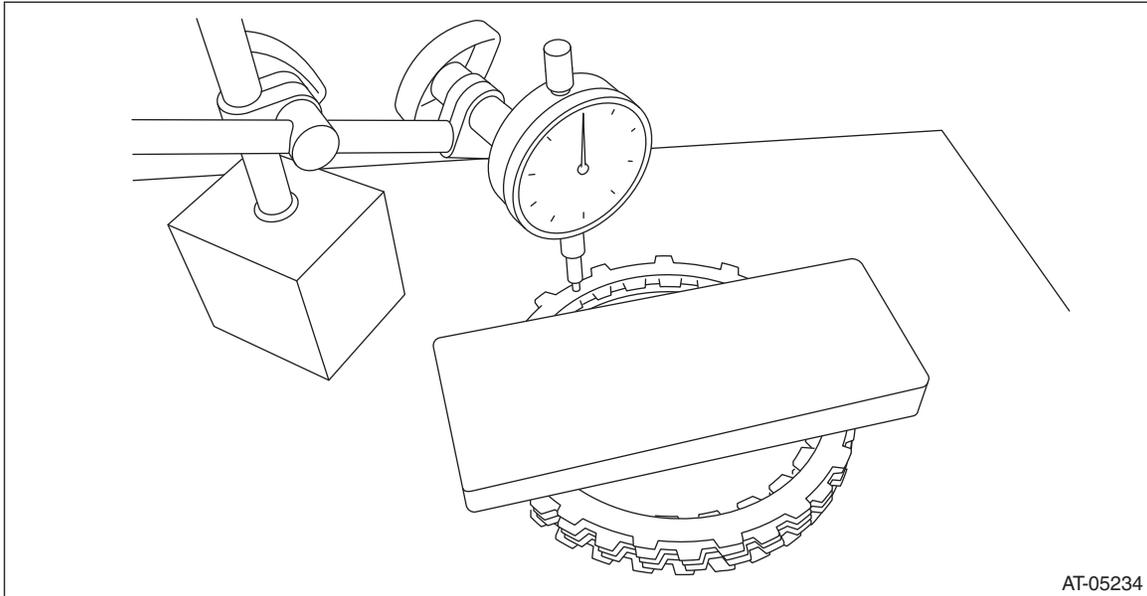
NOTE:

- Use a stiff board which does not bend against load as a flat board to be put on retaining plate.
- Use a flat board weighing less than 52 N (5.3 kgf, 11.7 lb).

Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

9) Put the flat board on retaining plate.



10) Using the following formula, read the push/pull gauge and calculate “N”.

$$N = 52 \text{ N (5.3 kgf, 11.7 lb)} - Z$$

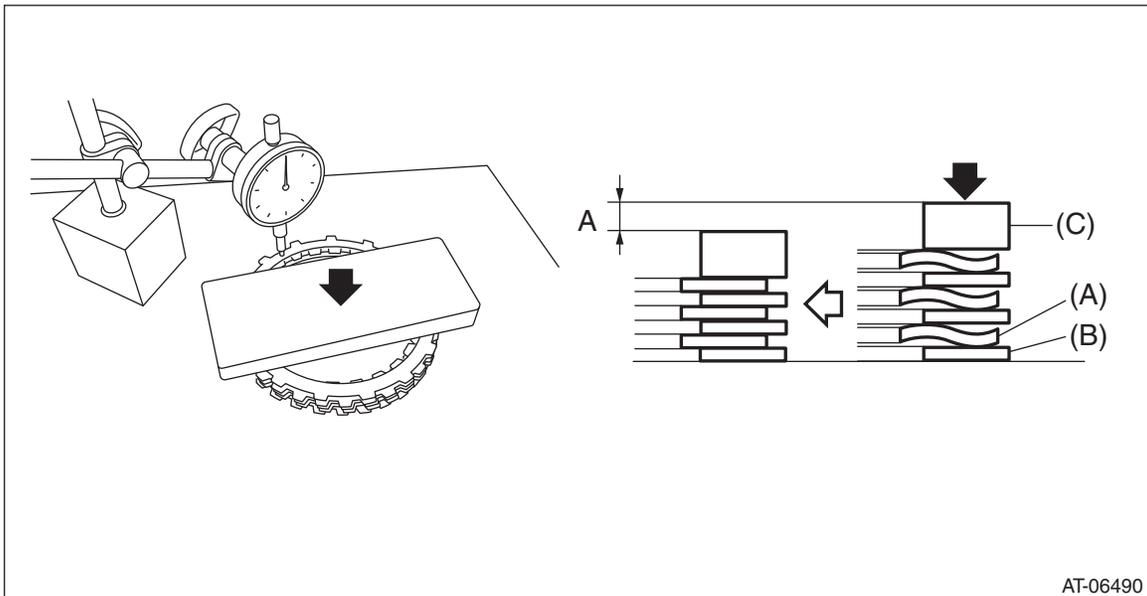
52 N (5.3 kgf, 11.7 lb): Load applied to clutch plate

Z: Flat board weight

11) Press the center of retaining plate by applying a force of “N” using push/pull gauge, and then measure and record the compression amount “A”.

NOTE:

Measure at four points with a 90° interval and calculate the average.



- (A) Driven plate
- (B) Drive plate
- (C) Retaining plate

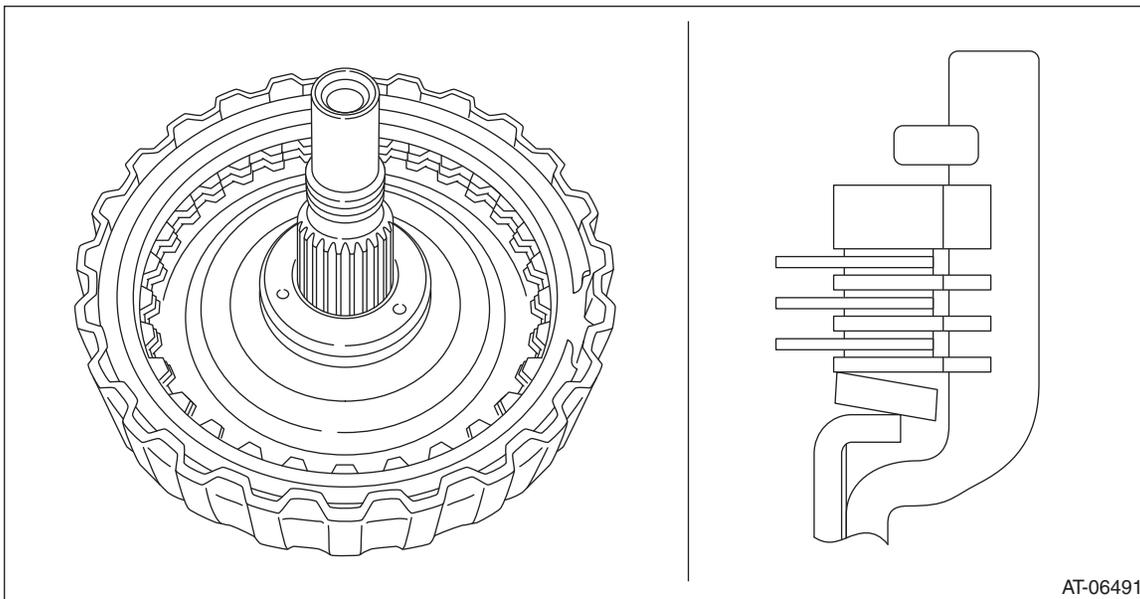
12) Install the dish plate, drive plate, driven plate, retaining plate and snap ring to the forward clutch carrier.

Forward Clutch Assembly

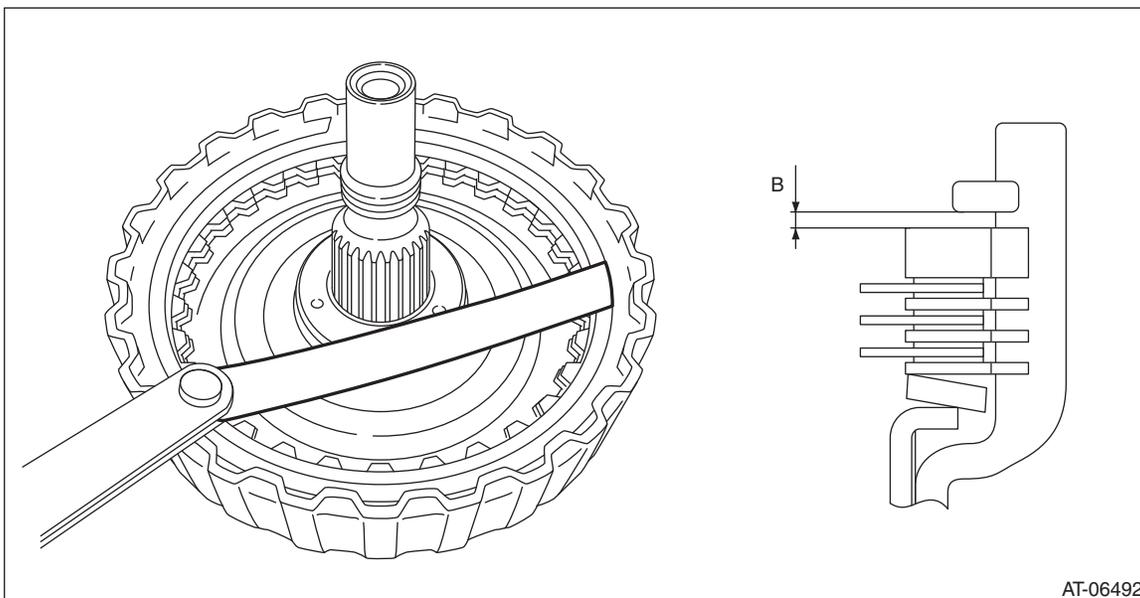
CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

Install the dish plate in the correct direction.



13) Measure and record the clearance “B” between the retaining plate and snap ring.



14) Piston stroke calculation

Calculate with A and B dimensions recorded before.

If it exceeds the limit, replace with a new drive plate and adjust within the initial standard value.

$$S \text{ mm (in)} = A + B$$

S: Piston stroke

A: Compression amount of drive plate and dish plate

B: Clearance between retaining plate and snap ring

Initial standard:

1.0 — 1.4 mm (0.040 — 0.055 in)

Limit thickness:

1.6 mm (0.063 in)

Retaining plate	
Item number	Thickness mm (in)
31567AB760	4.2 (0.165)

Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Retaining plate	
Item number	Thickness mm (in)
31567AB770	4.4 (0.173)
31567AB780	4.6 (0.181)
31567AB790	4.8 (0.189)
31567AB830	5.0 (0.197)

2. PLANETARY CARRIER ASSEMBLY

- 1) Install the balance oil guide.
- 2) Install the snap ring.

3. INTERNAL GEAR

- 1) Install the thrust gear plate.
- 2) Install the snap ring.

E: INSPECTION

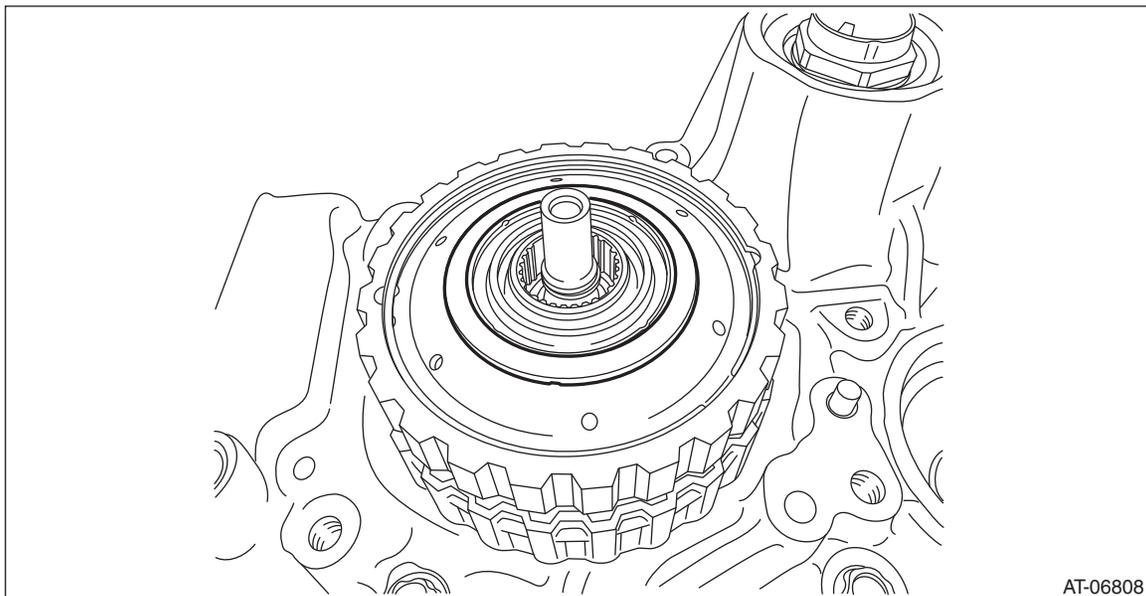
- Check the forward clutch drum, internal gear, sun gear and forward clutch piston lip for wear or damage.
- Inspect the drive plate facing for wear and damage.
- Check the driven plate for discoloration (burnt color).
- Check for worn snap ring, fatigue or damaged return spring or deformed spring retainer.
- Make sure the clearance between retaining plate and internal gear of forward clutch is within the limit. If it exceeds the standard, replace the forward clutch. <Ref. to CVT(TR580)-312, ASSEMBLY, Forward Clutch Assembly.>

F: ADJUSTMENT

- 1) Install the thrust bearing to the internal gear.

NOTE:

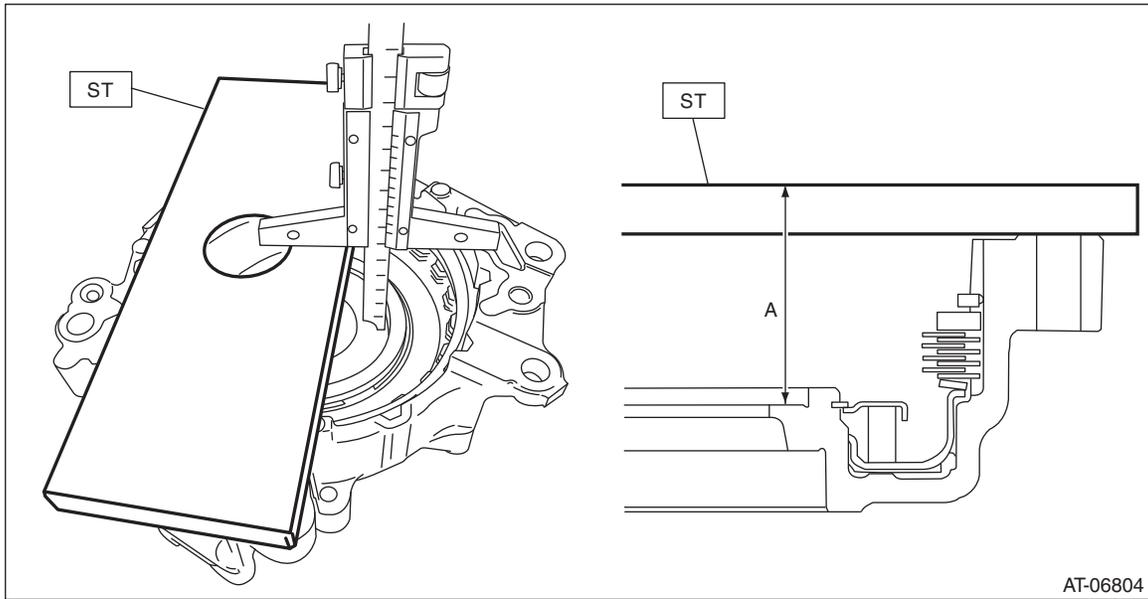
Face the temper color surface to the reverse brake side.



Forward Clutch Assembly

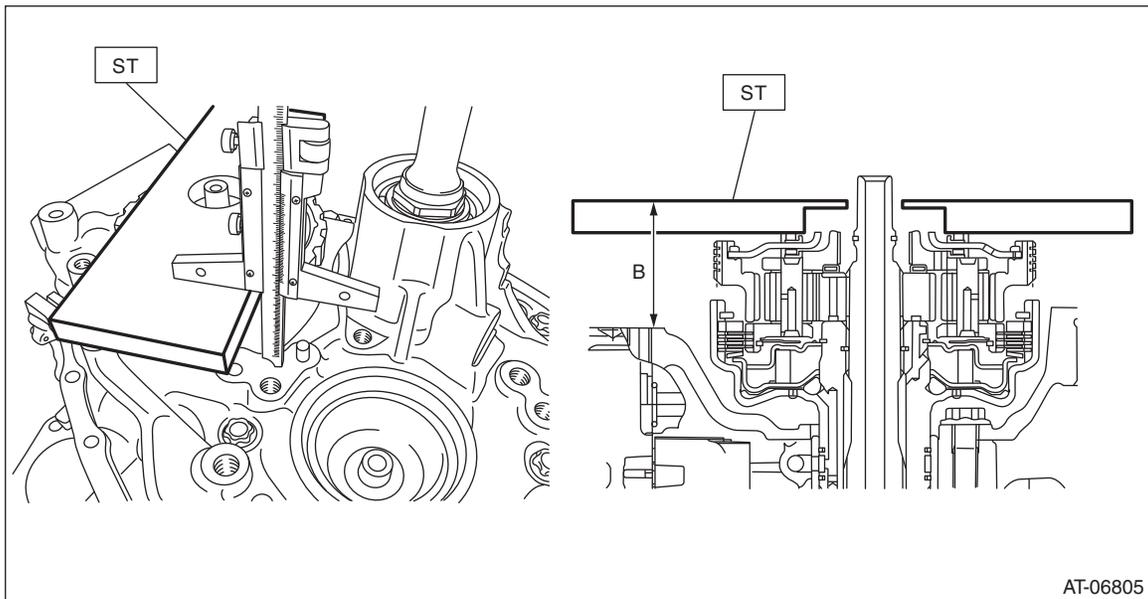
CONTINUOUSLY VARIABLE TRANSMISSION

- 2) Measure depth "A" from the ST upper face to the washer mounting surface.
ST 499575600 GAUGE



AT-06804

- 3) Measure the height "B" from the ST upper face to the mating surface of the drive pinion retainer.
ST 499575600 GAUGE



AT-06805

- 4) Obtain the thickness of washer using the following formula to select the washer.

$$T \text{ (mm)} = A - B - (0.35 - 0.70)$$

$$[T \text{ (in)} = A - B - (0.014 - 0.028)]$$

T: Washer thickness

A: Depth from the ST upper face to the washer mounting surface

B: Height from ST upper face to the drive pinion retainer mating surface

0.35 — 0.70 mm (0.014 — 0.028 in): Clearance

Washer	
Part No.	Thickness mm (in)
803064020	1.3 (0.051)
803064021	1.55 (0.061)
803064022	1.8 (0.071)
803064023	2.05 (0.081)

Forward Clutch Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Washer	
Part No.	Thickness mm (in)
803064024	2.3 (0.091)
803064025	2.55 (0.100)

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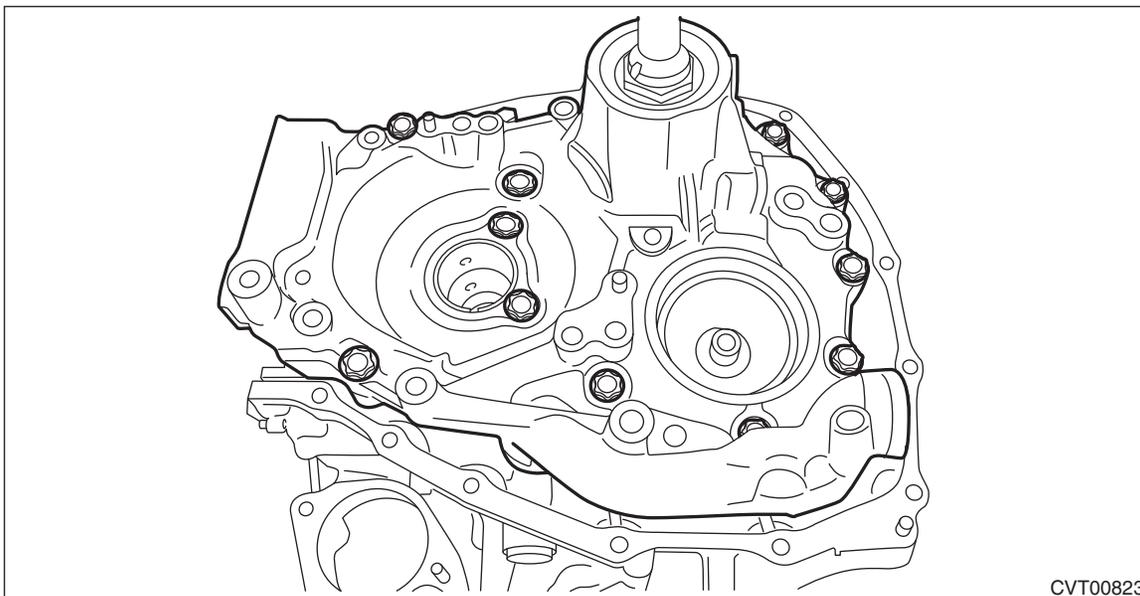
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

45. Drive Pinion Shaft Assembly

A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the air breather hose. <Ref. to CVT(TR580)-196, REMOVAL, Air Breather Hose.>
- 3) Remove the control valve body. <Ref. to CVT(TR580)-138, REMOVAL, Control Valve Body.>
- 4) Remove the transmission harness. <Ref. to CVT(TR580)-152, REMOVAL, Transmission Harness.>
- 5) Remove the turbine speed sensor. <Ref. to CVT(TR580)-118, REMOVAL, Turbine Speed Sensor.>
- 6) Remove the secondary speed sensor. <Ref. to CVT(TR580)-123, REMOVAL, Secondary Speed Sensor.>
- 7) Remove the primary speed sensor. <Ref. to CVT(TR580)-128, REMOVAL, Primary Speed Sensor.>
- 8) Remove the inhibitor switch. <Ref. to CVT(TR580)-112, REMOVAL, Inhibitor Switch.>
- 9) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 10) Remove the transfer clutch assembly. <Ref. to CVT(TR580)-210, REMOVAL, Transfer Clutch.>
- 11) Remove the transfer driven gear assembly. <Ref. to CVT(TR580)-224, REMOVAL, Transfer Driven Gear.>
- 12) Remove the parking pawl. <Ref. to CVT(TR580)-227, REMOVAL, Parking Pawl.>
- 13) Remove the reduction driven gear assembly. <Ref. to CVT(TR580)-229, REMOVAL, Reduction Driven Gear.>
- 14) Remove the oil pan and oil strainer. <Ref. to CVT(TR580)-135, REMOVAL, Oil Pan and Strainer.>
- 15) Remove the transmission control device. <Ref. to CVT(TR580)-236, REMOVAL, Transmission Control Device.>
- 16) Remove the transmission case. <Ref. to CVT(TR580)-242, REMOVAL, Transmission Case.>
- 17) Remove the reduction drive gear. <Ref. to CVT(TR580)-261, REMOVAL, Reduction Drive Gear.>
- 18) Remove the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TR580)-266, REMOVAL, Primary Pulley and Secondary Pulley.>
- 19) Remove the reverse brake assembly. <Ref. to CVT(TR580)-285, REMOVAL, Reverse Brake Assembly.>
- 20) Remove the forward clutch assembly. <Ref. to CVT(TR580)-300, REMOVAL, Forward Clutch Assembly.>
- 21) Using the ST, remove the drive pinion retainer.
ST 18270KA020 SOCKET (E20)

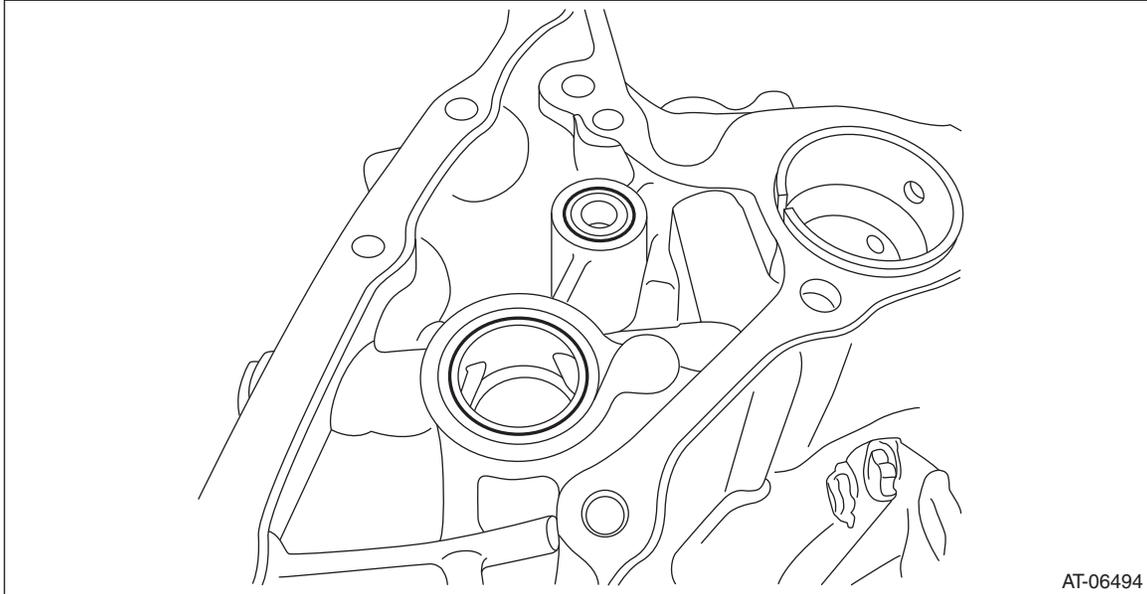


CVT(TR580)-320

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

22) Remove the O-rings.

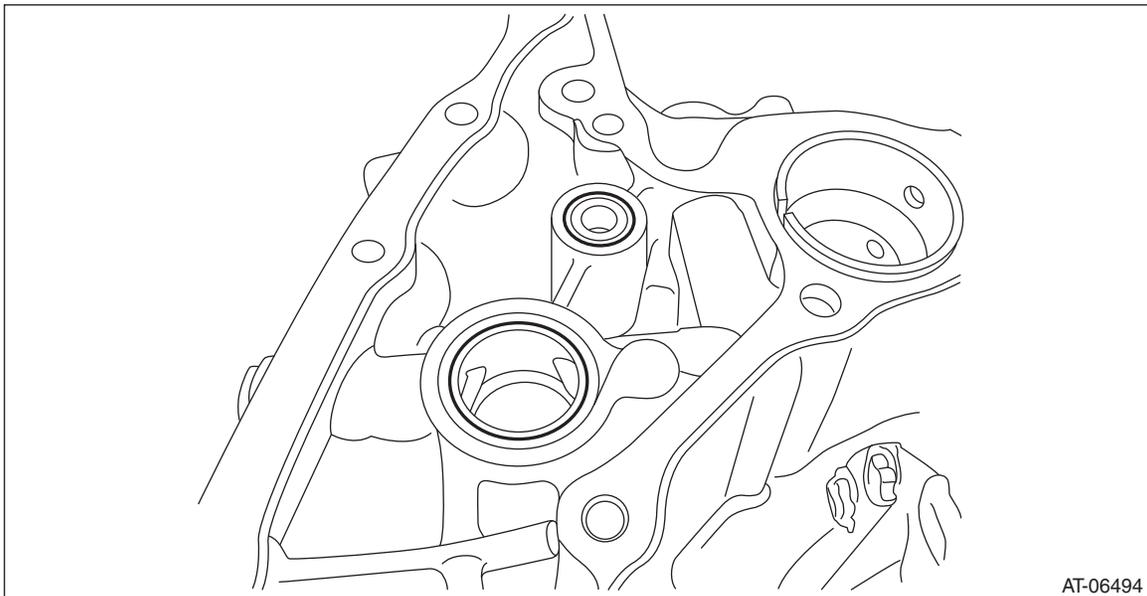


B: INSTALLATION

- 1) Clean the mating surface of drive pinion retainer and converter case.
- 2) Adjust the backlash and tooth contact between drive pinion shaft assembly and the front differential side gear. <Ref. to CVT(TR580)-345, ADJUSTMENT, Drive Pinion Shaft Assembly.>
- 3) Install O-rings in two locations to the converter case.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

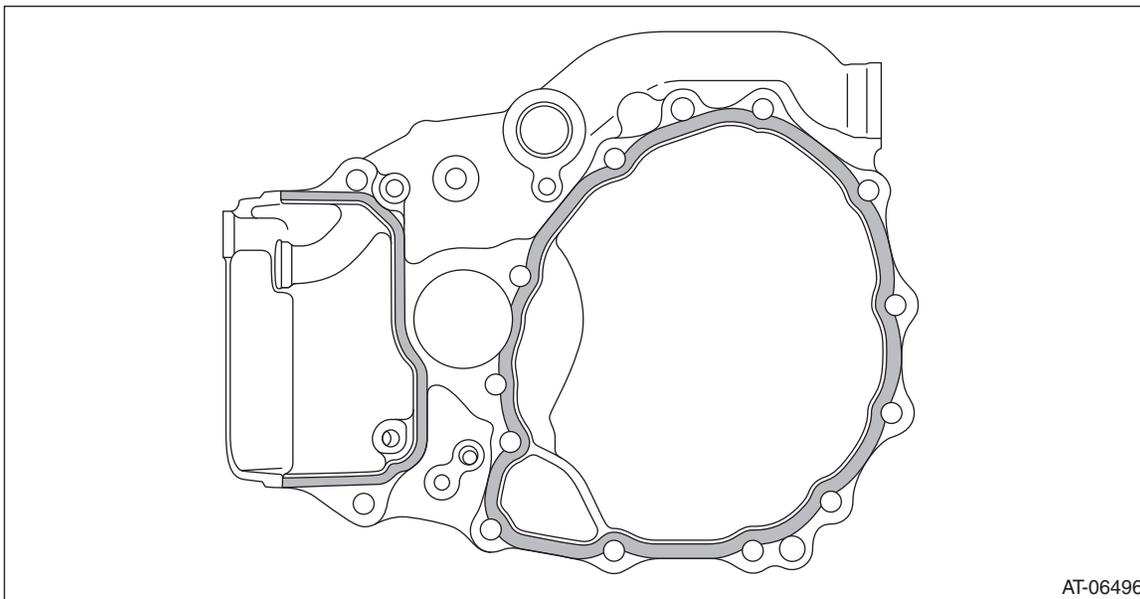


4) Apply liquid gasket seamlessly to the mating surface of drive pinion retainer.

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Liquid gasket:
THREE BOND 1215B or equivalent



AT-06496

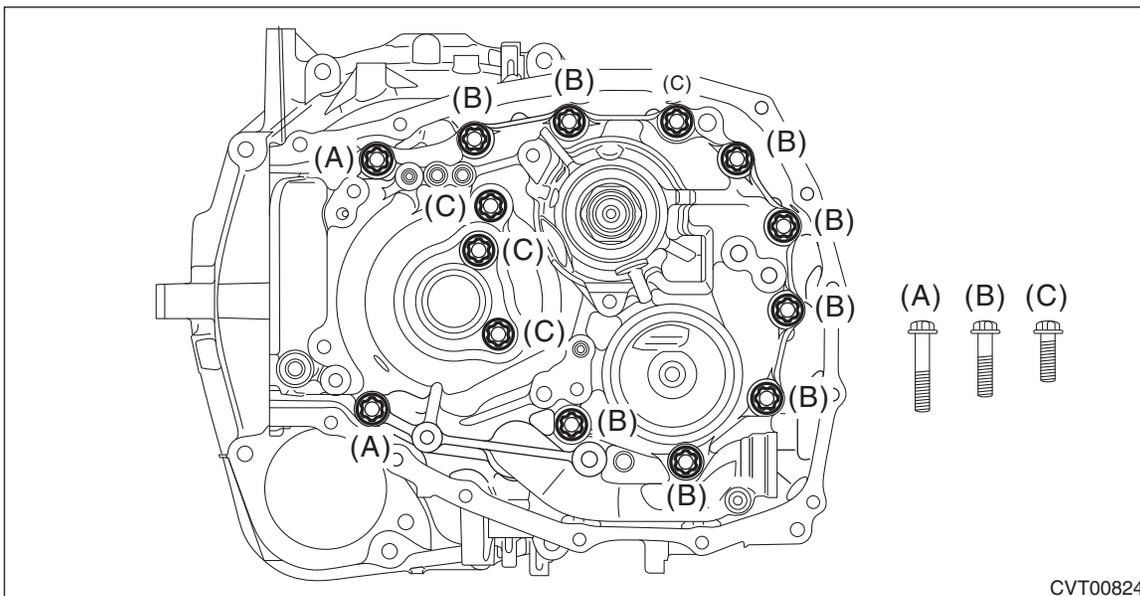
5) Install the drive pinion retainer to converter case, and tighten the bolt using the ST.
ST 18270KA020 SOCKET (E20)

NOTE:

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

Tightening torque:

43 N·m (4.4 kgf·m, 31.7 ft·lb)



CVT00824

6) Install the forward clutch assembly. <Ref. to CVT(TR580)-303, INSTALLATION, Forward Clutch Assembly.>

7) Install the reverse brake assembly. <Ref. to CVT(TR580)-287, INSTALLATION, Reverse Brake Assembly.>

8) Install the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TR580)-272, INSTALLATION, Primary Pulley and Secondary Pulley.>

9) Install the reduction drive gear. <Ref. to CVT(TR580)-262, INSTALLATION, Reduction Drive Gear.>

10) Install the transmission case. <Ref. to CVT(TR580)-245, INSTALLATION, Transmission Case.>

CVT(TR580)-322

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Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 11) Install the transmission control device. <Ref. to CVT(TR580)-238, INSTALLATION, Transmission Control Device.>
- 12) Install the oil strainer and oil pan. <Ref. to CVT(TR580)-136, INSTALLATION, Oil Pan and Strainer.>
- 13) Install the reduction driven gear assembly. <Ref. to CVT(TR580)-229, INSTALLATION, Reduction Driven Gear.>
- 14) Install the transfer driven gear assembly. <Ref. to CVT(TR580)-224, INSTALLATION, Transfer Driven Gear.>
- 15) Install the transfer clutch assembly. <Ref. to CVT(TR580)-211, INSTALLATION, Transfer Clutch.>
- 16) Install the parking pawl. <Ref. to CVT(TR580)-227, INSTALLATION, Parking Pawl.>
- 17) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 18) Install the inhibitor switch. <Ref. to CVT(TR580)-115, INSTALLATION, Inhibitor Switch.>
- 19) Install the secondary speed sensor. <Ref. to CVT(TR580)-123, INSTALLATION, Secondary Speed Sensor.>
- 20) Install the primary speed sensor. <Ref. to CVT(TR580)-128, INSTALLATION, Primary Speed Sensor.>
- 21) Install the turbine speed sensor. <Ref. to CVT(TR580)-118, INSTALLATION, Turbine Speed Sensor.>
- 22) Install the transmission harness. <Ref. to CVT(TR580)-155, INSTALLATION, Transmission Harness.>
- 23) Install the control valve body. <Ref. to CVT(TR580)-144, INSTALLATION, Control Valve Body.>
- 24) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>
- 25) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

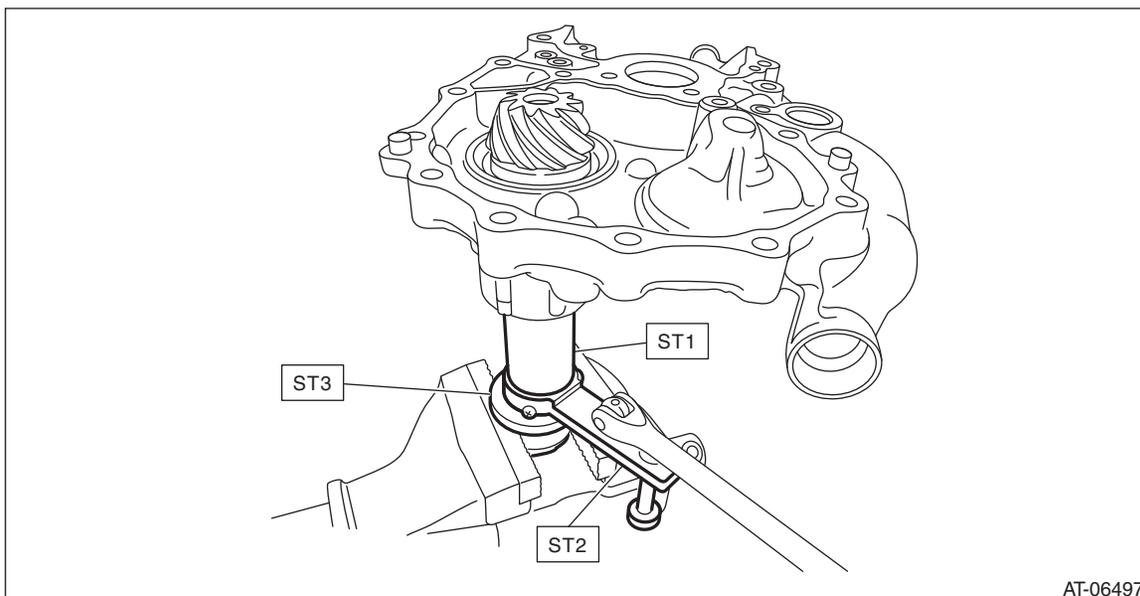
C: DISASSEMBLY

- 1) Flatten the tab of the lock nut.
- 2) Using ST1, ST2 and ST3, fix at the spline portion of drive pinion shaft to remove the lock nut.

ST1 499787500 ADAPTER

ST2 499787700 WRENCH

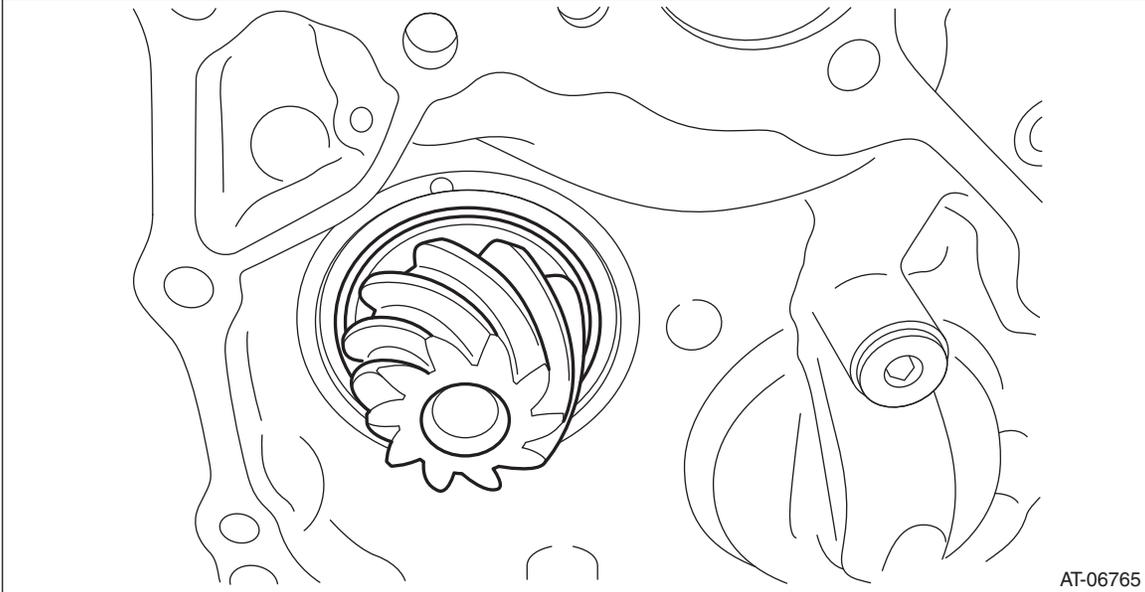
ST3 498937110 HOLDER



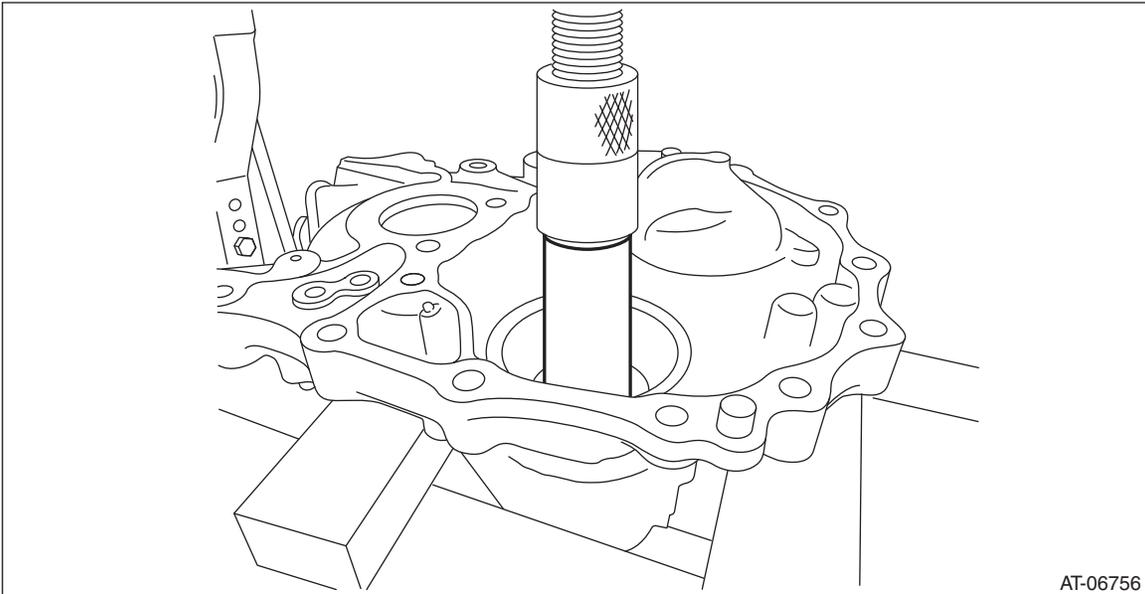
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

3) Remove the drive pinion shaft from the drive pinion retainer.



4) Using the round bar with diameter of 36 mm (1.42 in) or 37 mm (1.46 in), remove the bearing inner race and plug.

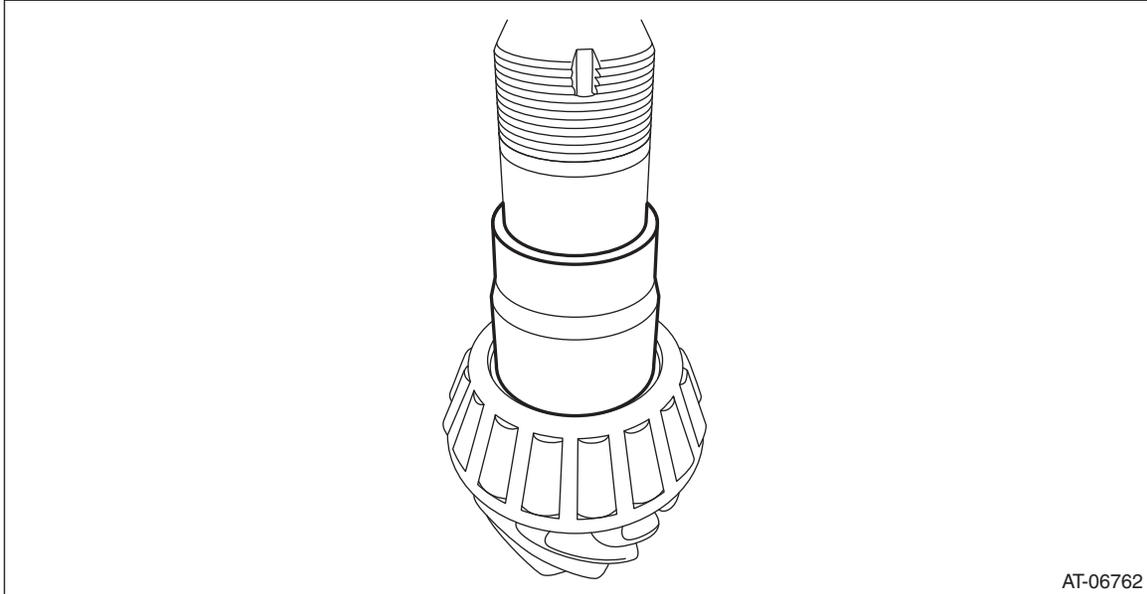


5) Remove the drive pinion washer.

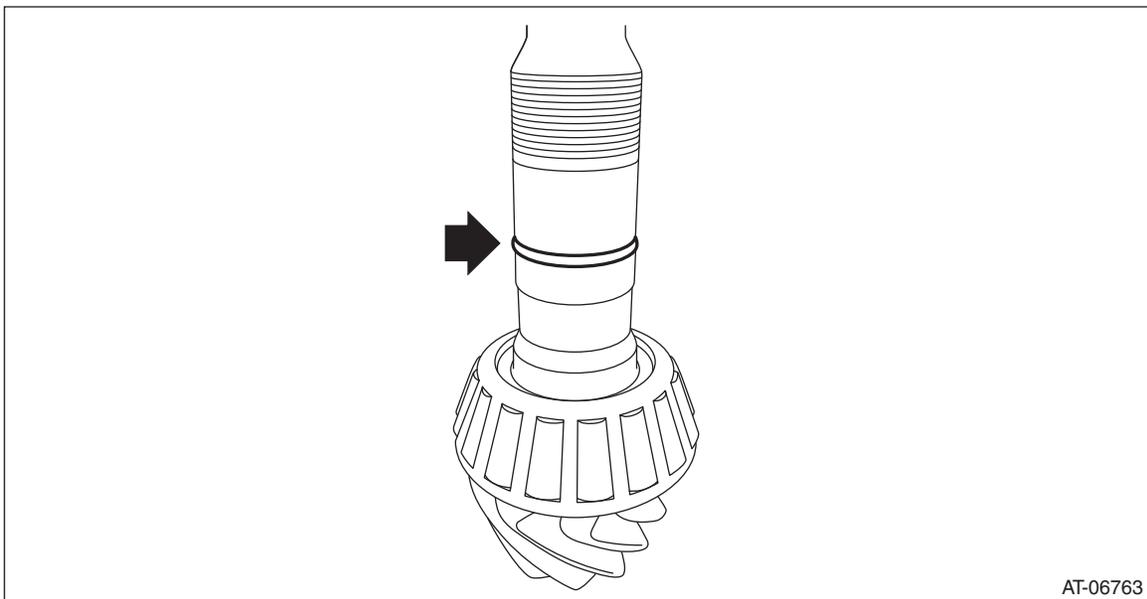
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

6) Remove the drive pinion spacer.



7) Remove the O-rings.

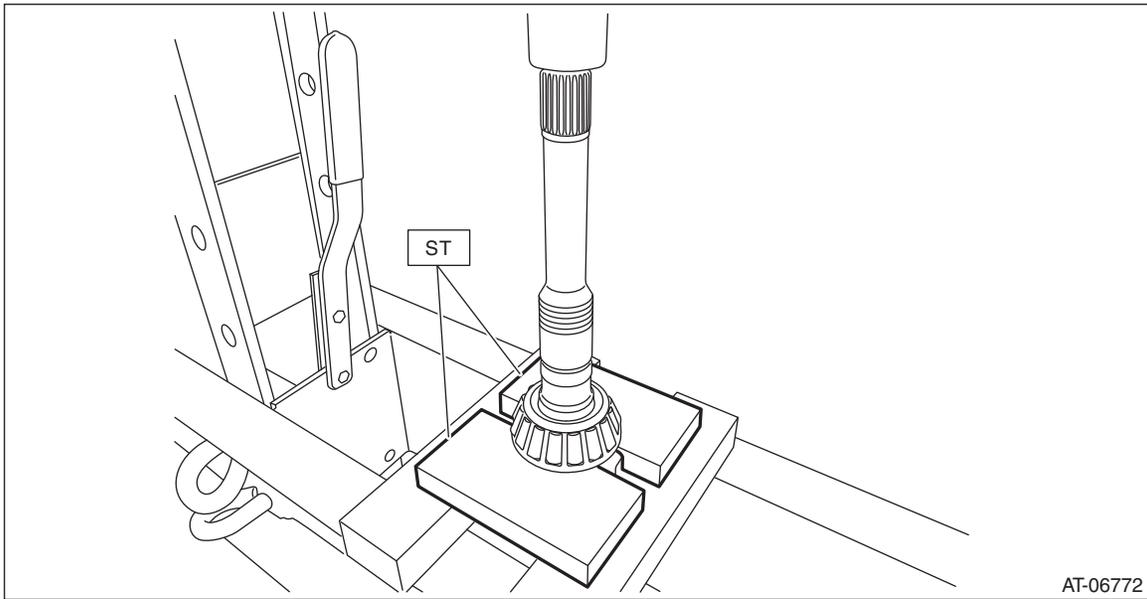


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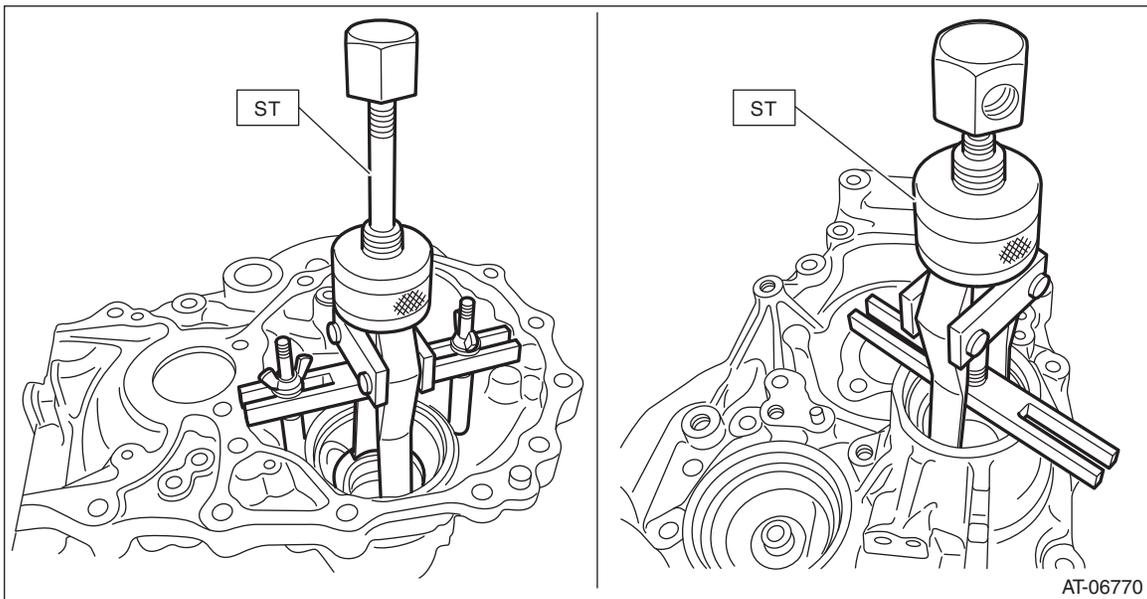
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 8) Remove the inner race and drive pinion shim from drive pinion shaft using ST.
ST 498515500 REMOVER



- 9) Using the ST, remove the outer race.
ST 398527700 PULLER ASSY



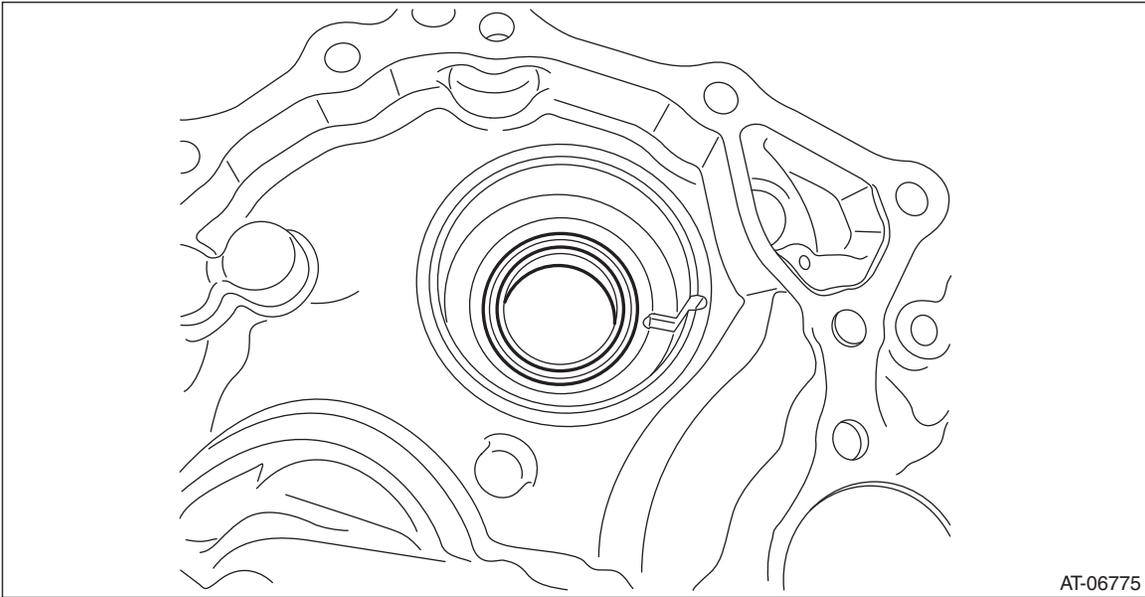
- 10) Remove the two oil seals using a screwdriver wrapped with cloth, etc.

Drive Pinion Shaft Assembly

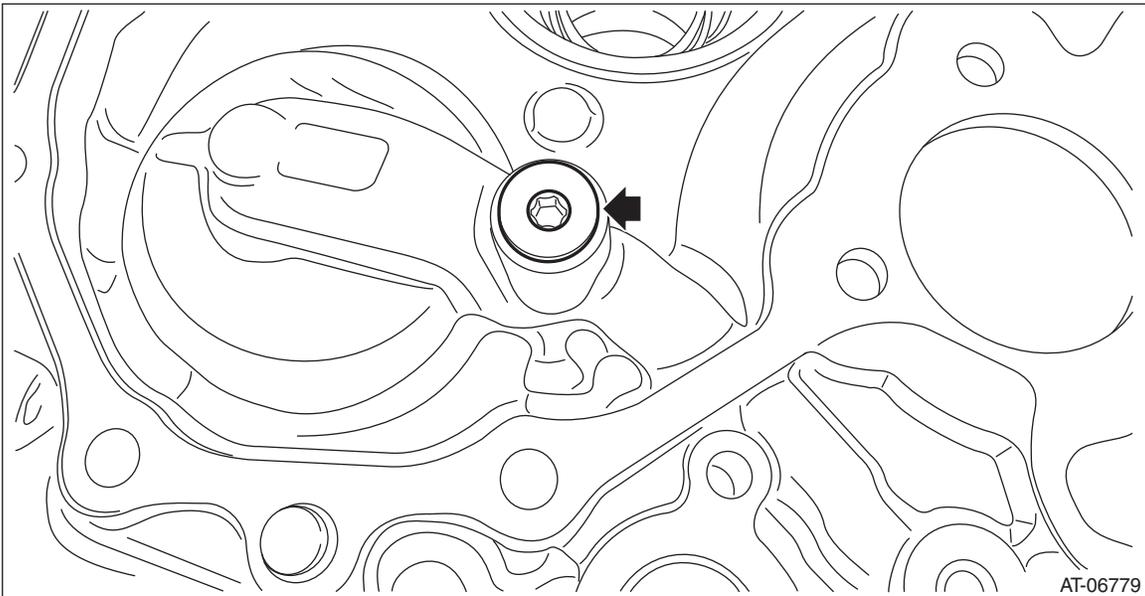
CONTINUOUSLY VARIABLE TRANSMISSION

CAUTION:

Do not damage the fitting surface of oil seal.



11) Remove the plug from drive pinion retainer.



D: ASSEMBLY

1) Install the plug to drive pinion retainer.

NOTE:

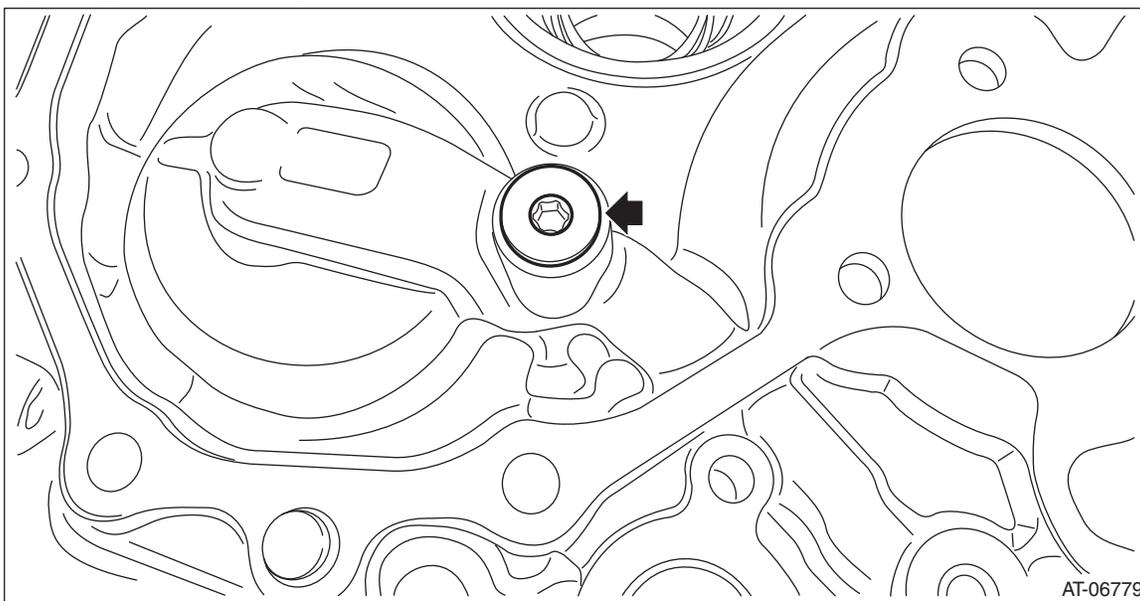
- Use new O-rings.
- Apply CVTF to the O-rings.

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

22 N·m (2.2 kgf·m, 16.2 ft·lb)

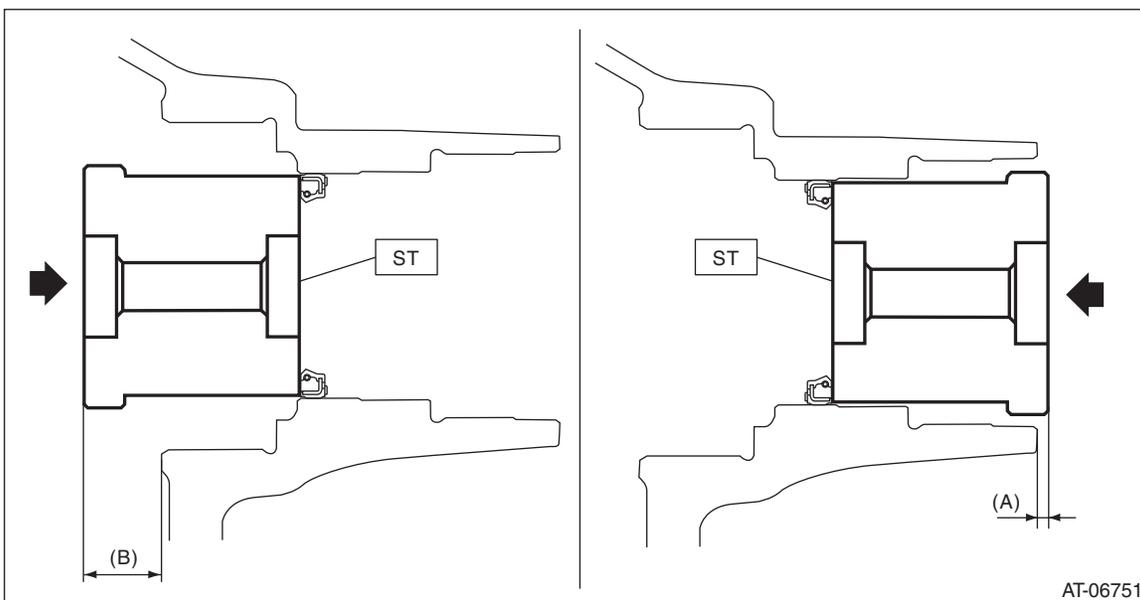


2) Using the ST, install the oil seal to drive pinion retainer.

NOTE:

- Apply CVTF to the oil seal press-fitting surface and lip.
- Install the oil seal in the correct direction.

ST 927720000 HOUSING BUSHING INSTALLER AND REMOVER



(A) 2.8 mm (0.11 in)

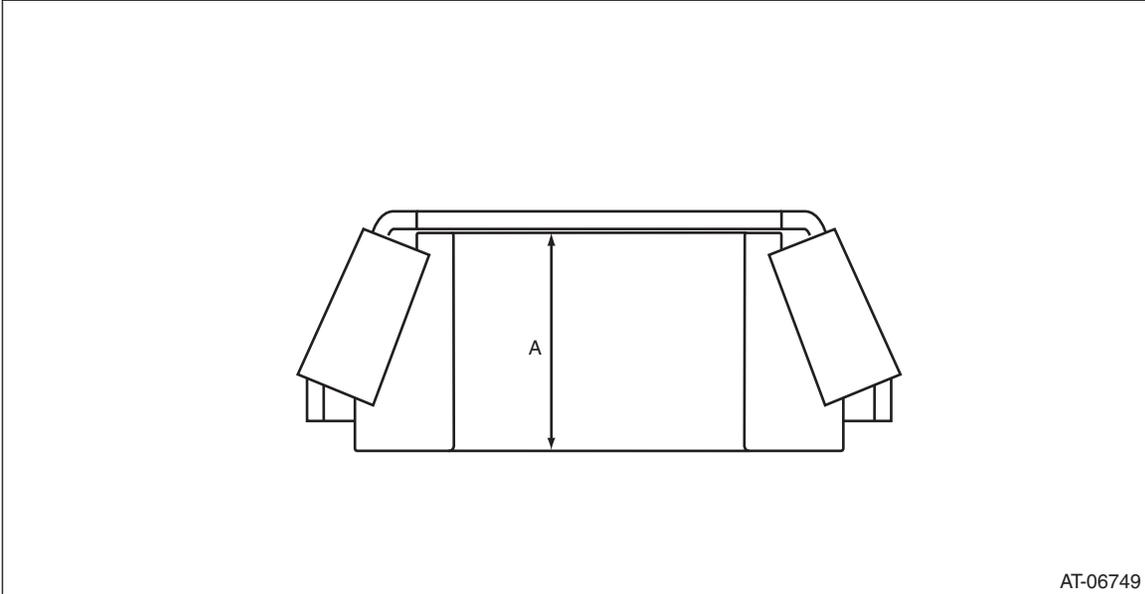
(B) 18.7 mm (0.74 in)

3) Select the drive pinion washer.

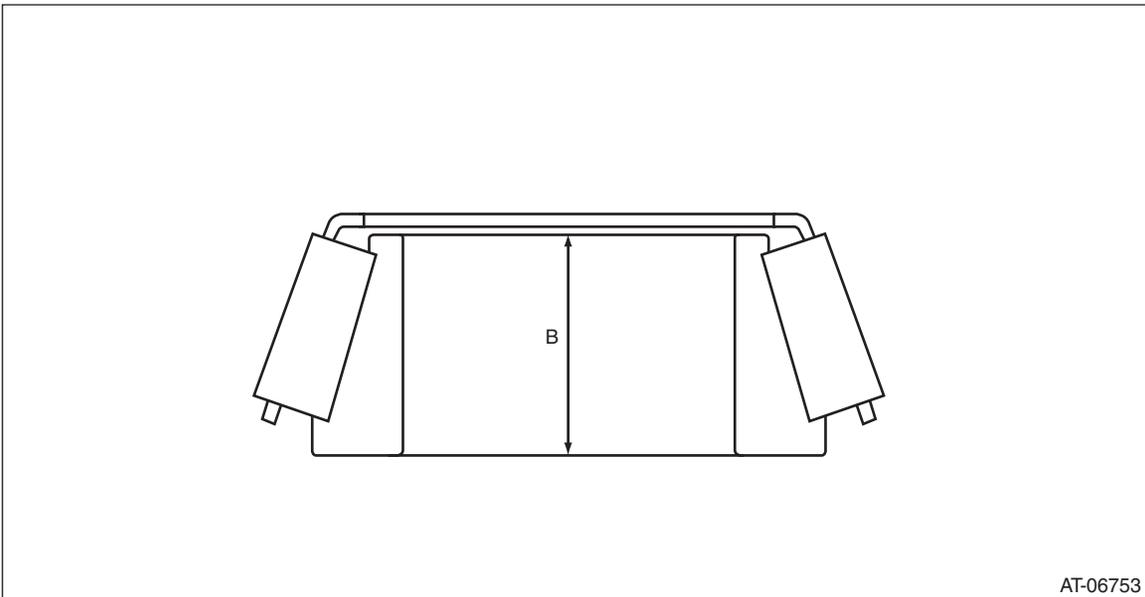
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- (1) Measure the roller bearing inner race width "A" on the front side.



- (2) Measure the roller bearing inner race width "B" on the rear side.

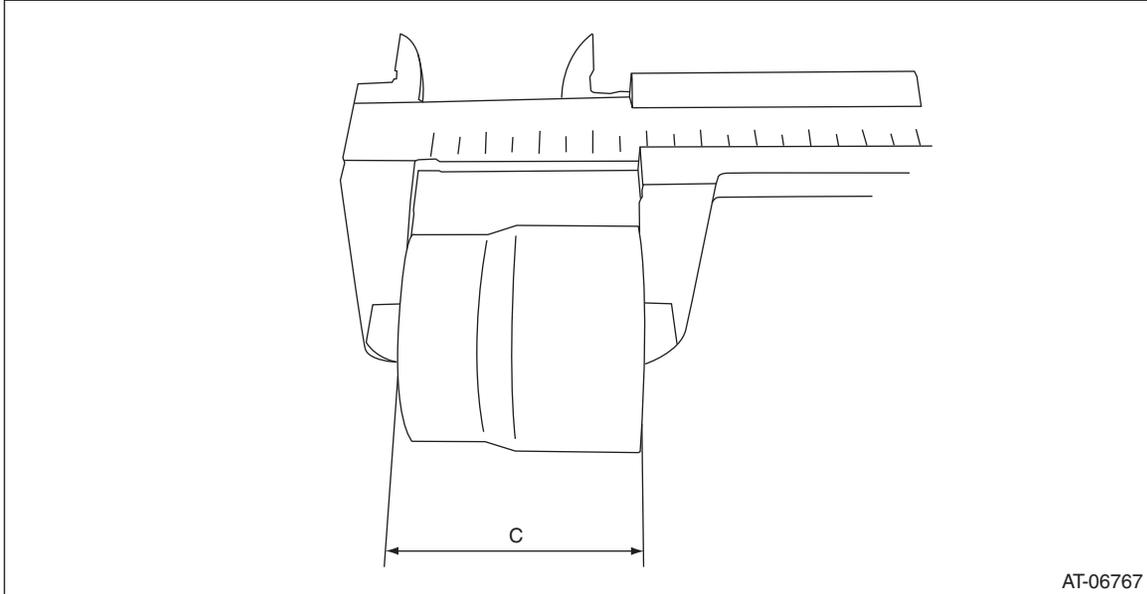


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Drive Pinion Shaft Assembly

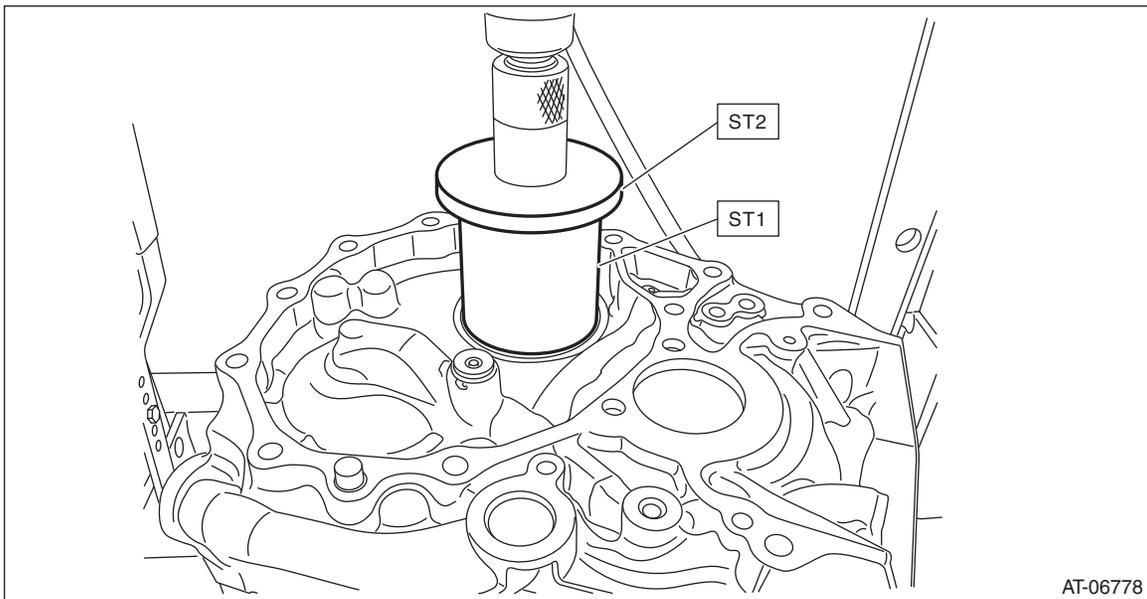
CONTINUOUSLY VARIABLE TRANSMISSION

(3) Measure the spacer width "C".



(4) Using the ST, install the front roller bearing outer race to the drive pinion retainer.

ST1 28499TC010 INSTALLER
ST2 398177700 INSTALLER

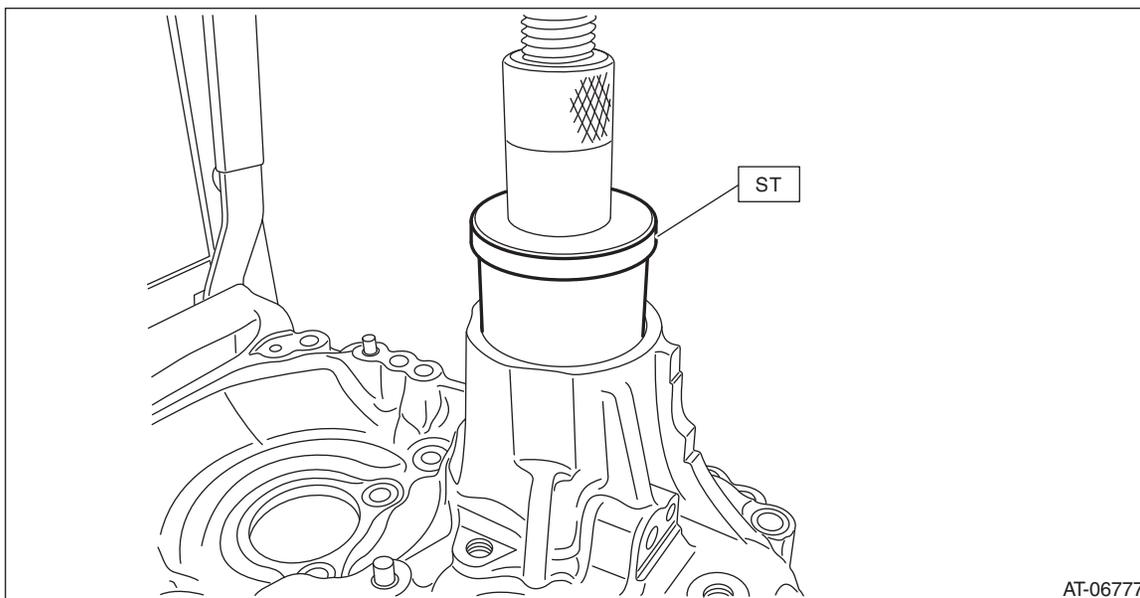


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Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- (5) Using the ST, install the rear roller bearing outer race to the drive pinion retainer.
ST 20099AE020 INSTALLER

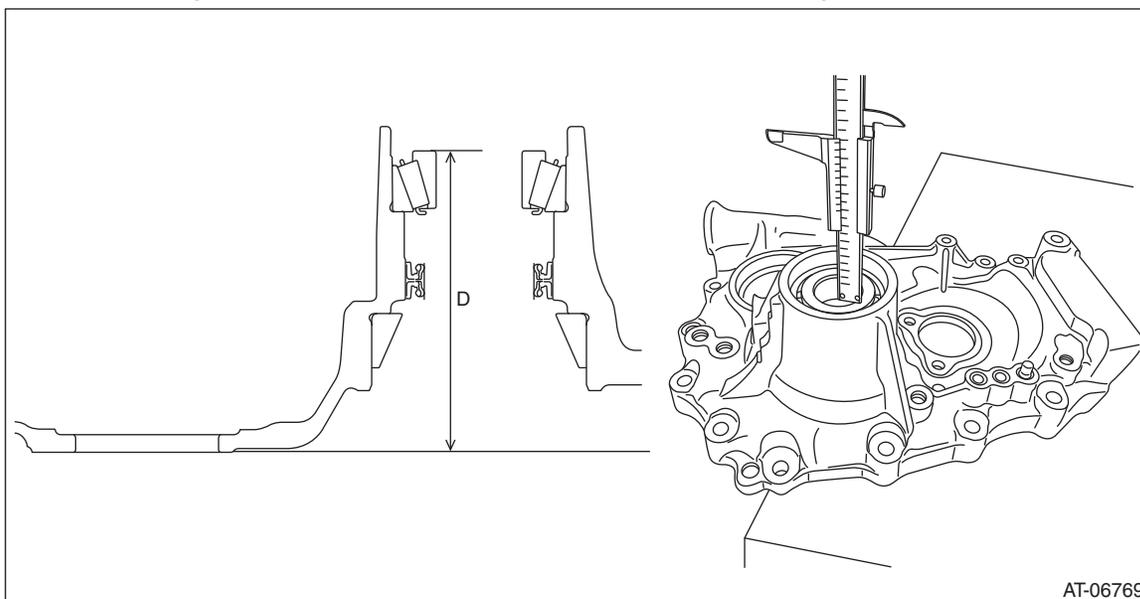


- (6) Place the drive pinion retainer on the surface plate, and install the inner race to the rear roller bearing outer race.

NOTE:

Place the drive pinion retainer so that the mating surface of the drive pinion retainer (mating surface with the converter case) contacts the surface plate.

- (7) Measure the height "D" from the end face of the rear roller bearing inner race to the surface plate.

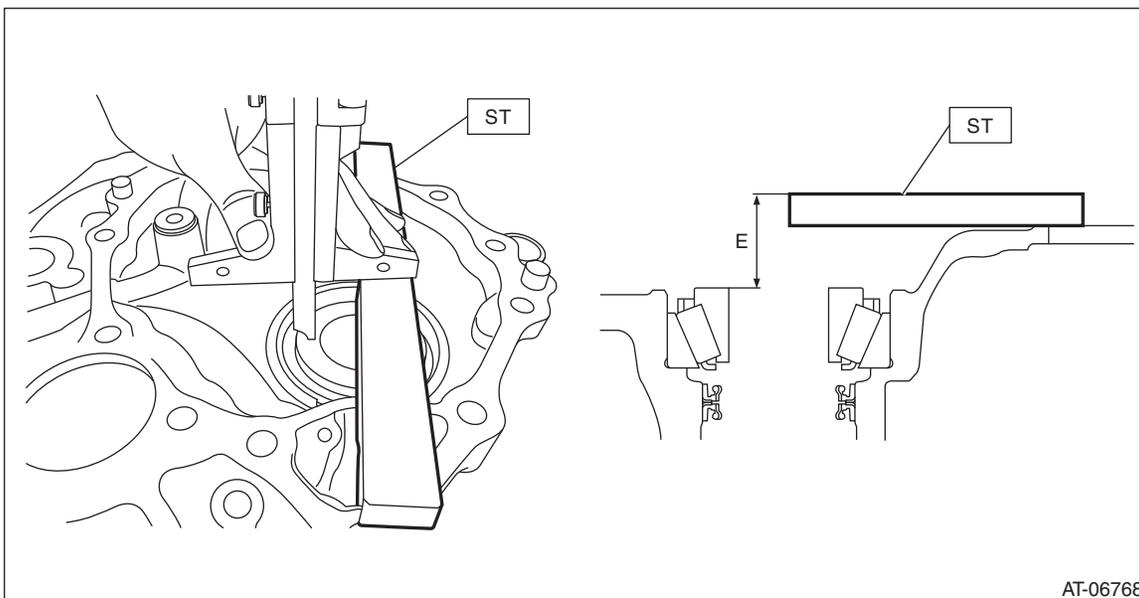


- (8) Install the inner race to the front roller bearing outer race.

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

(9) Measure the depth "E" from the end face of the front roller bearing inner race to the end face of the ST.
ST 499575400 GAUGE



(10) Using following formula, select one to three drive pinion washers.

$$T \text{ (mm)} = D - (A + B + C + E - 15) - (0 \pm 0.0125)$$

$$[T \text{ (in)} = D - (A + B + C + E - 0.591) - (0 \pm 0.0005)]$$

A: Front roller bearing width

B: Rear roller bearing width

C: Spacer width

D: Height from end face of rear roller bearing inner race to surface plate

E: Depth from end face of front roller bearing inner race to end face of ST

15 mm (0.591 in): Thickness of ST

T: Drive pinion washer thickness

0 ± 0.0125 mm (0 ± 0.0005 in): Clearance

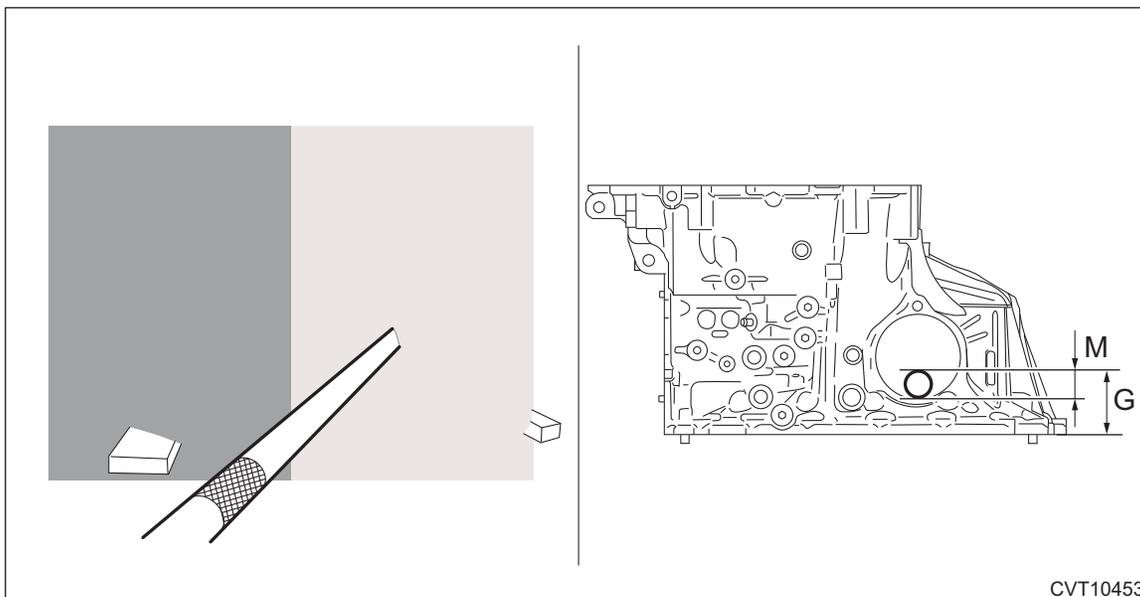
Drive pinion washer	
Part No.	Thickness mm (in)
38336AA750	0.150 (0.0059)
38336AA760	0.175 (0.0069)
38336AA770	0.200 (0.0079)
38336AA780	0.225 (0.0089)
38336AA790	0.250 (0.0098)
38336AA800	0.275 (0.0108)
38336AA810	0.300 (0.0118)
38336AA820	0.400 (0.0157)

4) Measure and record the drive pinion shim thickness to be reused. If it is not reusable, select a drive pinion shim.

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

(1) Using a high precision round bar, measure the height “G” from transmission case mating surface of converter case to the top end of the round bar. Also measure the diameter “M” of the round bar and record it.



(2) Using the following formula, calculate height “A1” from the transmission case mating surface of converter case to the lower edge of differential side retainer hole.

$$A1 \text{ mm} = G - M$$

$$[A1 \text{ in} = G - M]$$

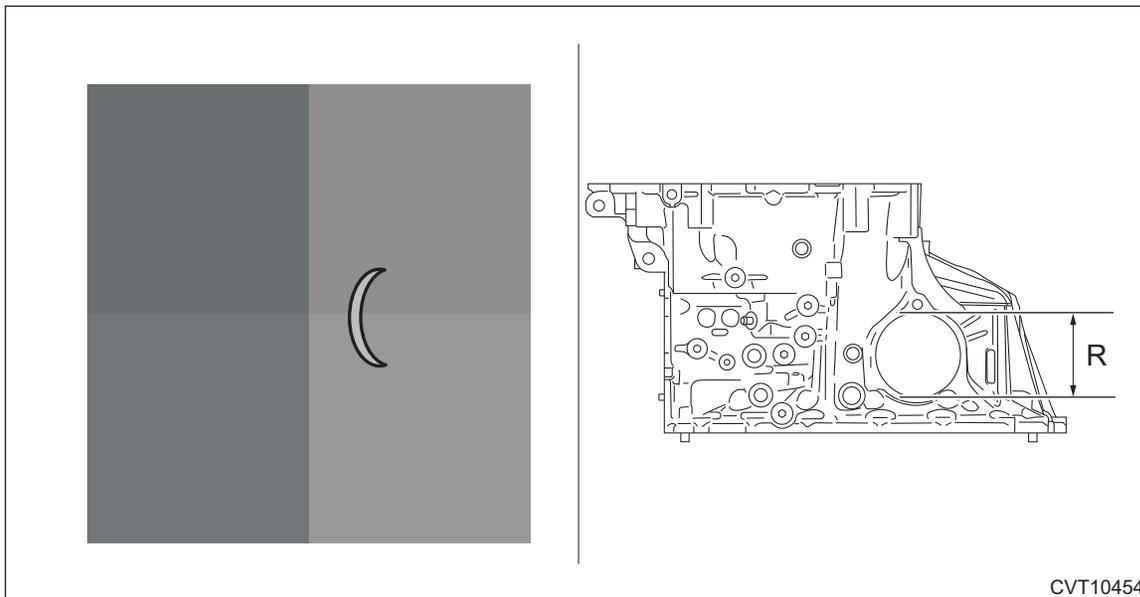
G: Height from transmission case mating surface of converter case to the top end of round bar

M: Diameter of round bar

(3) Measure the inner diameter “R” of the differential side retainer hole of the converter case.

NOTE:

Perform the measurement on the contact surface of the bearing outer race.



(4) Using the following formula, calculate the radius “A2” of the differential side retainer hole.

$$A2 \text{ mm} = R/2$$

$$[A2 \text{ in} = R/2]$$

R: Inner diameter of differential side retainer hole of converter case

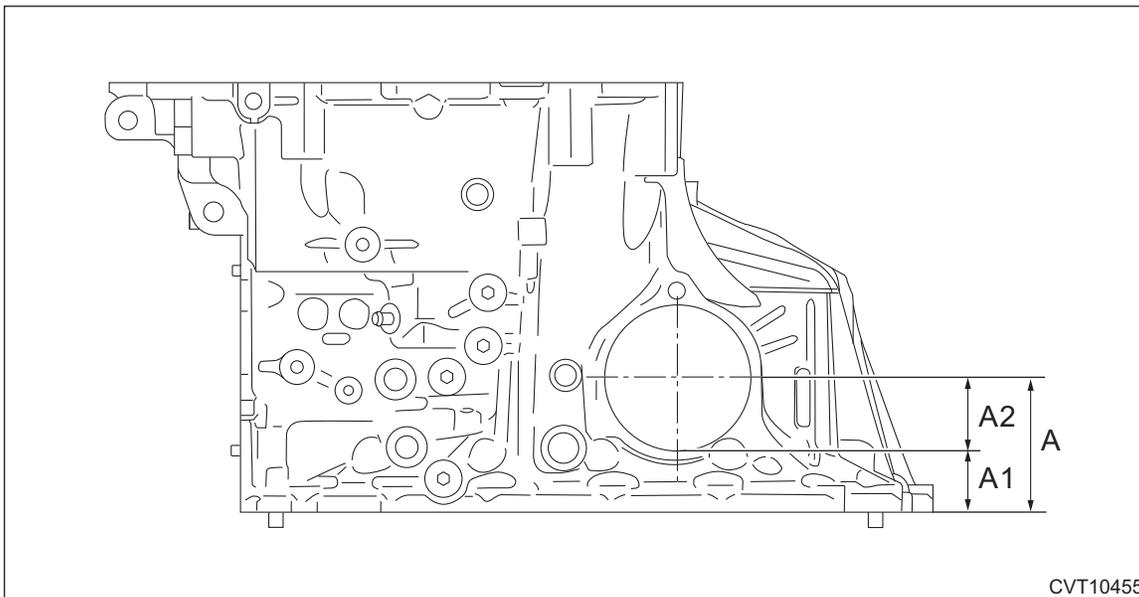
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

(5) Using the following formula, calculate the distance “A” from the transmission case mating surface of converter case to the center of differential.

$$A \text{ mm} = A1 + A2$$

$$[A \text{ in} = A1 + A2]$$



(6) Measure the depth “B1” from the ST to the drive pinion retainer mating surface. Then using the following formula, calculate the height “B” from the transmission case mating surface of converter case to the drive pinion retainer mating surface.

Preparation tool:

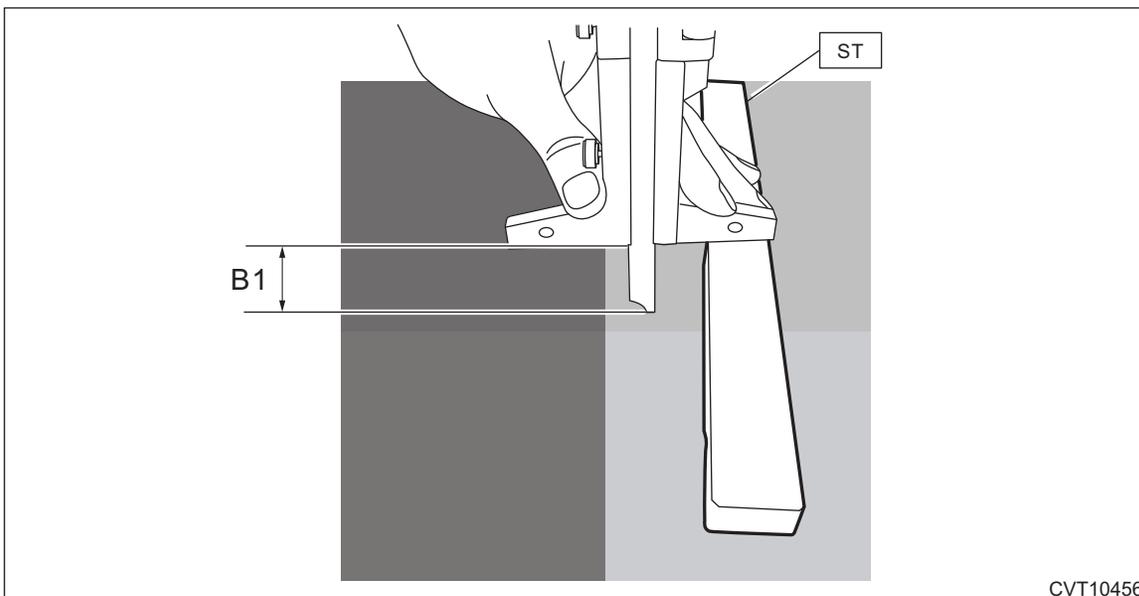
ST: GAUGE (499575400)

$$B \text{ mm} = B1 - 15$$

$$[B \text{ in} = B1 - 0.591]$$

B1: Depth from ST to drive pinion retainer mating surface

15 mm (0.591 in): Thickness of ST



Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

(7) Using following formula, select one to three drive pinion washers.

$$T \text{ mm} = (A - B + E - 15) - 90.8 + (0 \pm 0.0125)$$

$$[T \text{ in} = (A - B + E - 0.591) - 3.575 + (0 \pm 0.0005)]$$

A: Distance from the transmission case mating surface of converter case to the center of differential

B: Height from the transmission case mating surface of converter case to the drive pinion retainer mating surface

E: Depth from end face of front roller bearing inner race to the end face of ST, measured in step (9) of "3. Select the drive pinion washer."

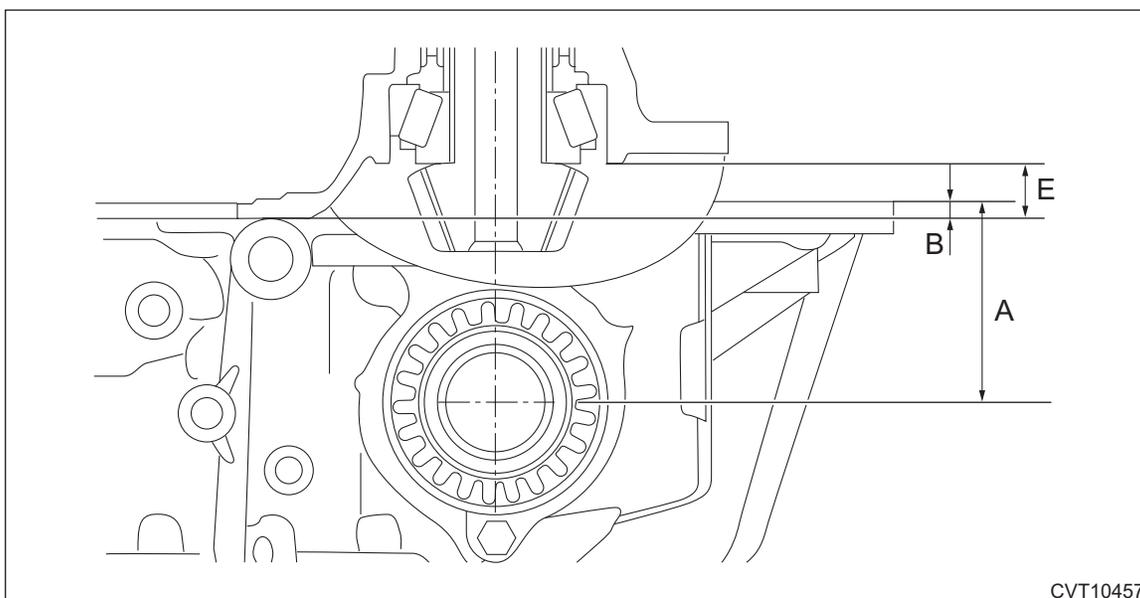
15 mm (0.591 in): Thickness of ST

T: Drive pinion shim thickness

90.8 mm (3.575 in): Ideal distance from the differential center to the drive pinion end surface

0±0.0125 mm (0±0.0005 in): Clearance

Drive pinion shim	
Part No.	Thickness mm (in)
31451AA320	0.150 (0.0059)
31451AA330	0.175 (0.0069)
31451AA340	0.200 (0.0079)
31451AA350	0.225 (0.0089)
31451AA360	0.250 (0.0098)
31451AA370	0.275 (0.0108)



CVT10457

5) Install the drive pinion shim that is reused for the drive pinion shaft.

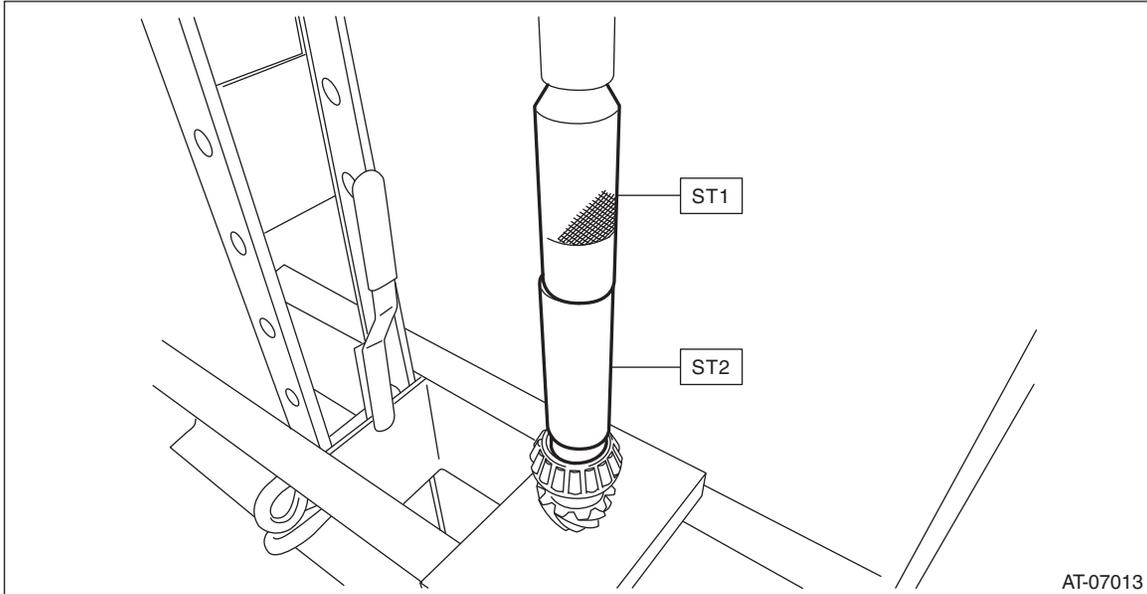
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

6) Using the ST1 and ST2, press-fit the inner race to the drive pinion shaft.

ST1 899580100 INSTALLER

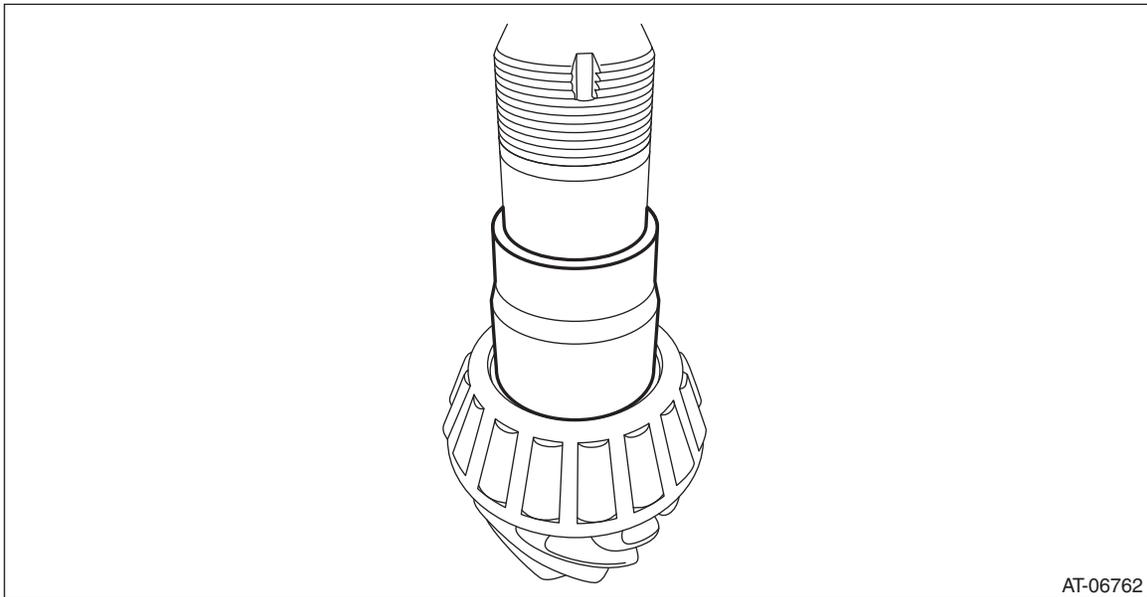
ST2 927130000 EXTENSION DRIVE SHAFT



7) Install the drive pinion spacer.

NOTE:

Replace the O-ring with a new part after tooth contact inspection.

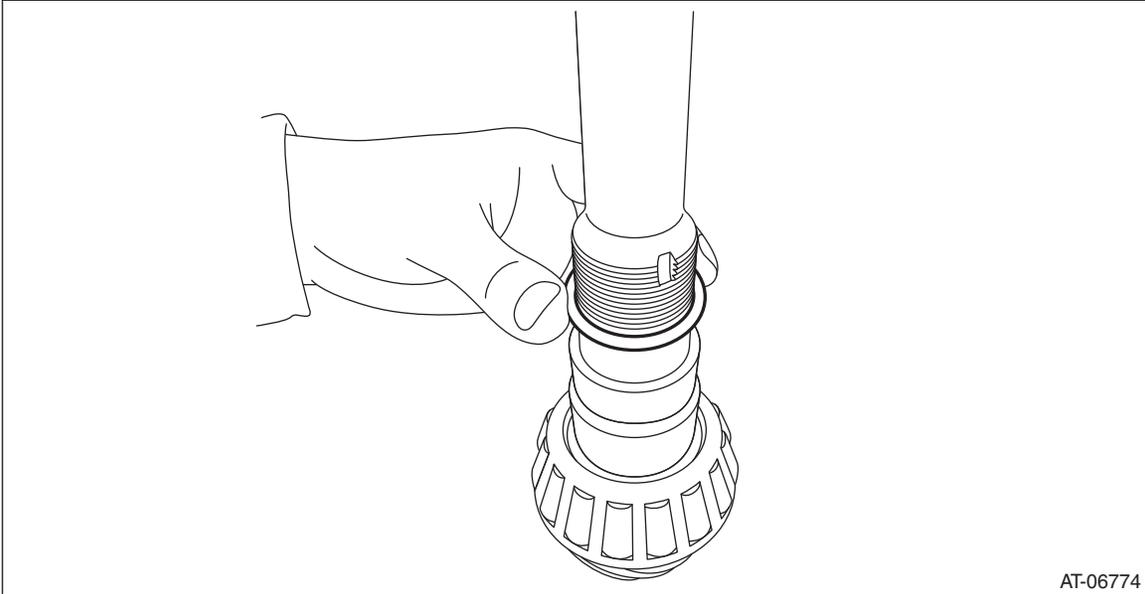


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Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

8) Install the selected drive pinion washer.



9) Insert the drive pinion shaft into the drive pinion retainer.

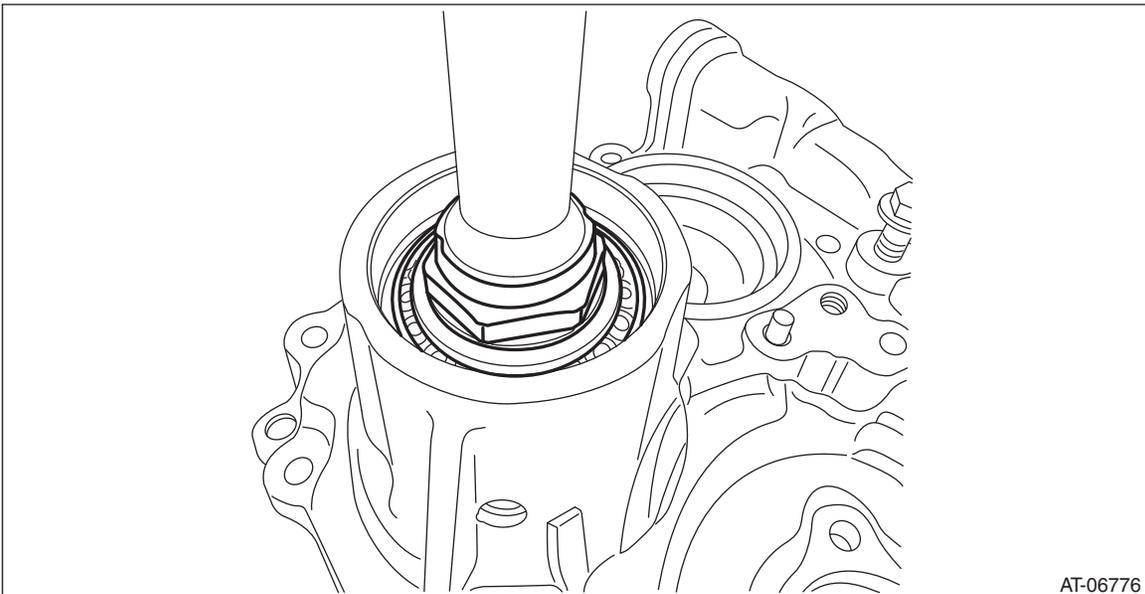
CAUTION:

Be careful not to damage the oil seal.

10) Install the inner bearing and lock nut.

NOTE:

- Use a new lock nut.
- Apply differential gear oil to the threaded portion of the drive pinion shaft.



11) Using the ST, tighten the lock nut to the specified torque so that the starting torque of the drive pinion shaft is within the specified range.

CAUTION:

Before inspecting the starting torque, apply differential gear oil to roller of bearing and rotate the bearing several times.

NOTE:

- Tighten the lock nut while directly aligning ST2 and torque wrench.
- If the starting torque is not within the specified range, select the drive pinion washer, and repeat the step until the starting torque is within the specified range.

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- When a thicker drive pinion washer is selected, the starting torque decreases. When a thinner drive pinion washer is selected, the starting torque increases.

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Starting torque:

5.1 — 17.1 N (0.5 — 1.7 kgf, 1.1 — 3.8 lbf)

ST1 499787500 ADAPTER

ST2 499787700 WRENCH

ST3 498937110 HOLDER

Using the following formula, calculate the tightening torque for a torque wrench.

$$T2 = L2 / (L1 + L2) \times T1$$

T1: 170 — 250 N·m (17.3 — 25.5 kgf·m, 125.4 — 184.4 ft·lb) [Specified tightening torque range]

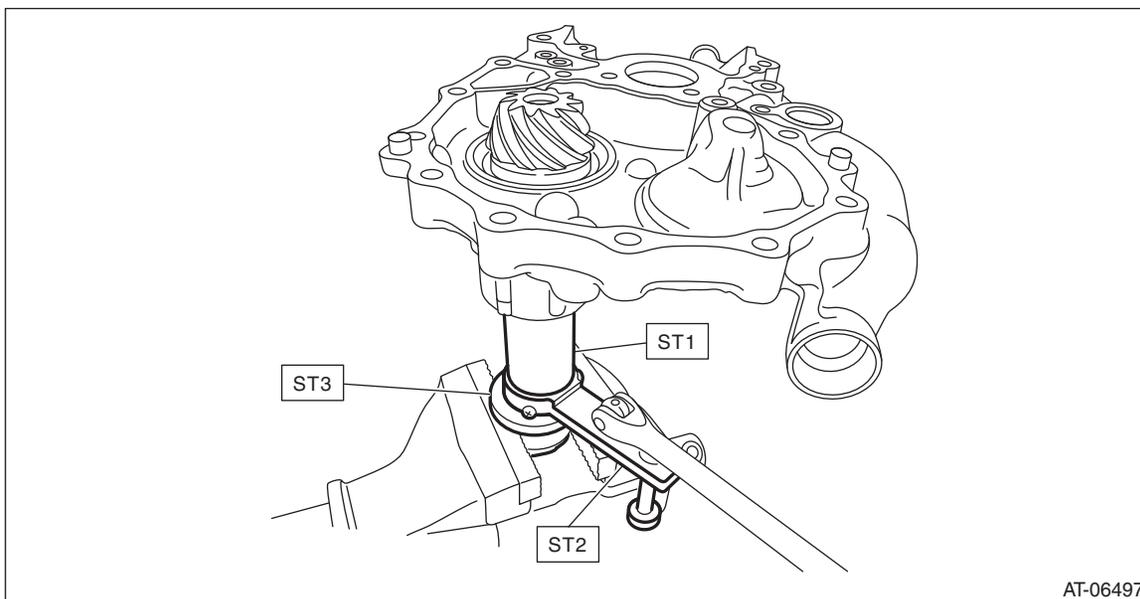
T2: Tightening torque

L1: ST1 length 0.072 m (2.83 in)

L2: Torque wrench length

Example:

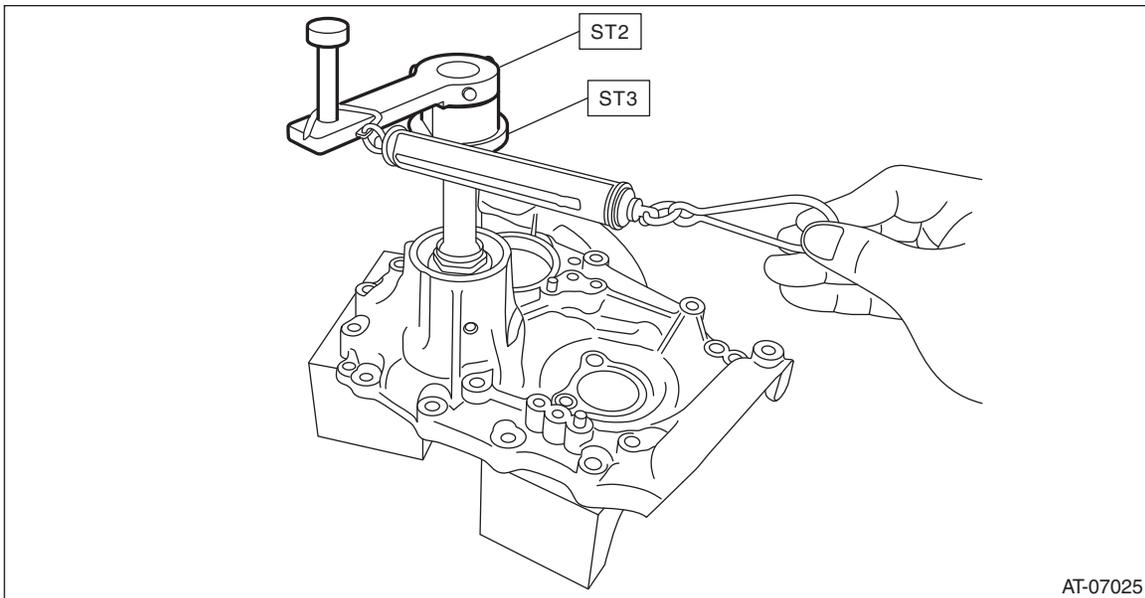
Torque wrench length m (in)	Tightening torque N·m (kgf·m, ft·lb)
0.4 (15.75)	144 — 211 (14.7 — 21.5, 106.2 — 155.6)
0.45 (17.72)	147 — 215 (15.0 — 21.9, 108.4 — 158.6)
0.5 (19.69)	149 — 218 (15.2 — 22.2, 109.9 — 160.8)
0.55 (21.65)	150 — 221 (15.3 — 22.5, 110.6 — 163.0)



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Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION



12) Install the drive pinion retainer to the converter case, and check the backlash and tooth contact. <Ref. to CVT(TR580)-345, ADJUSTMENT, Drive Pinion Shaft Assembly.> <Ref. to CVT(TR580)-368, ADJUSTMENT, Front Differential Assembly.>

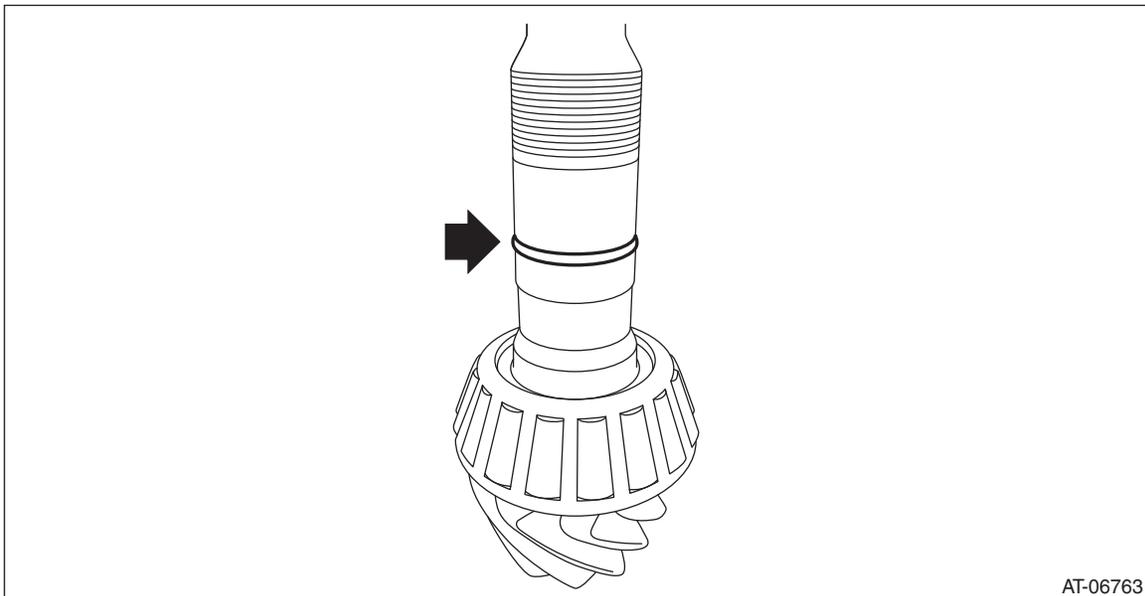
13) Remove the drive pinion retainer from converter case. <Ref. to CVT(TR580)-320, REMOVAL, Drive Pinion Shaft Assembly.>

14) Remove the drive pinion spacer from the drive pinion shaft. <Ref. to CVT(TR580)-323, DISASSEMBLY, Drive Pinion Shaft Assembly.>

15) Install the O-ring to the drive pinion shaft.

NOTE:

- Use new O-rings.
- Apply CVTF to the O-rings.

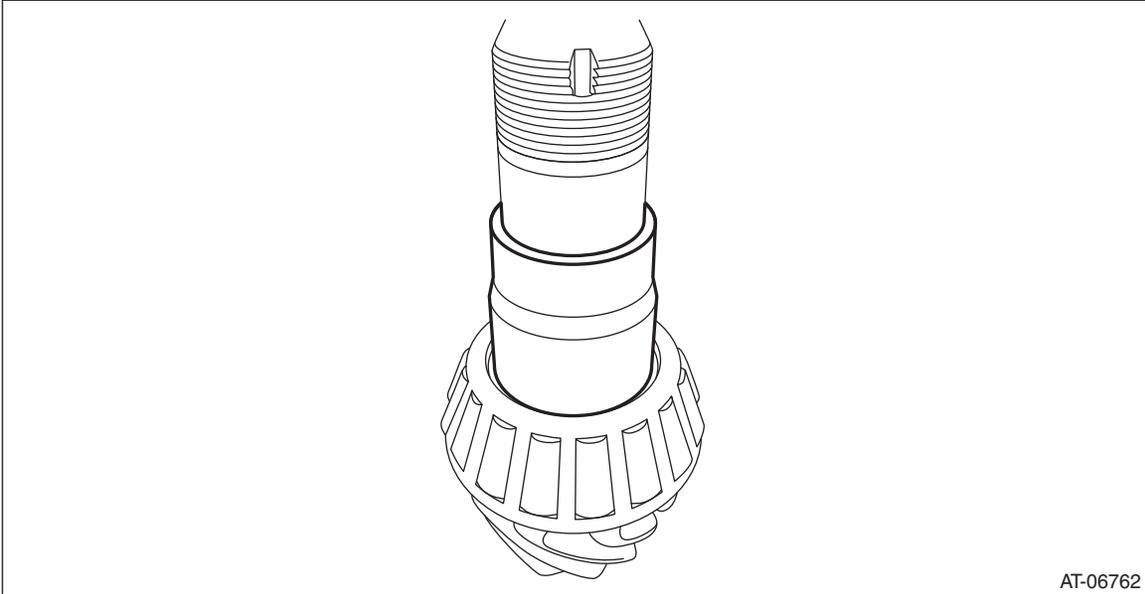


CVT(TR580)-340

Drive Pinion Shaft Assembly

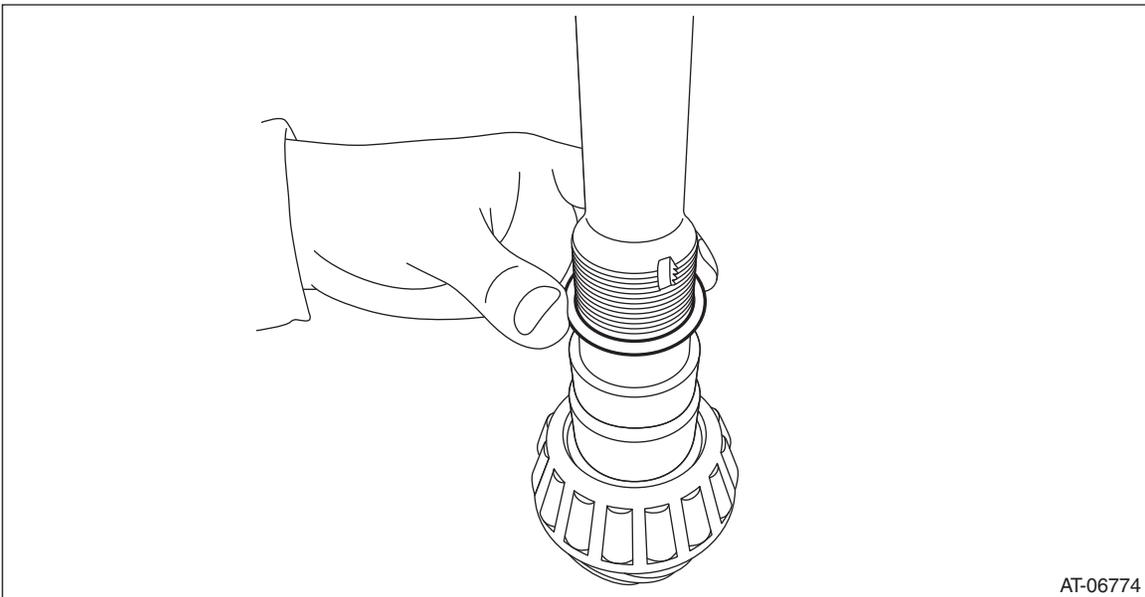
CONTINUOUSLY VARIABLE TRANSMISSION

16) Install the drive pinion spacer to the drive pinion shaft.



AT-06762

17) Install the drive pinion washer.



AT-06774

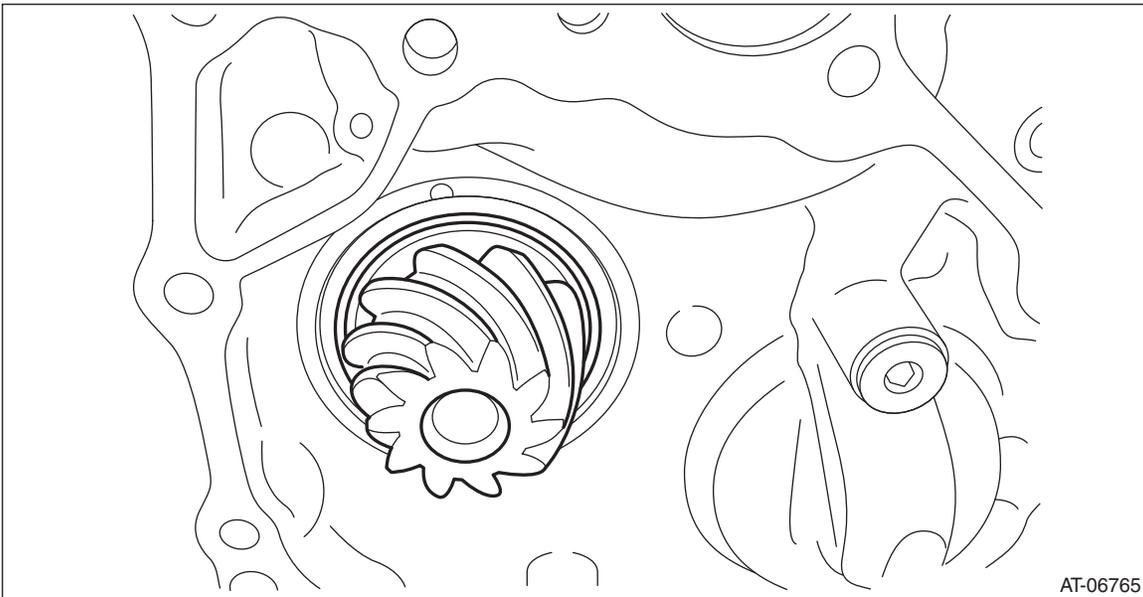
18) Insert the drive pinion shaft into the drive pinion retainer.

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

CAUTION:

Be careful not to damage the oil seal.

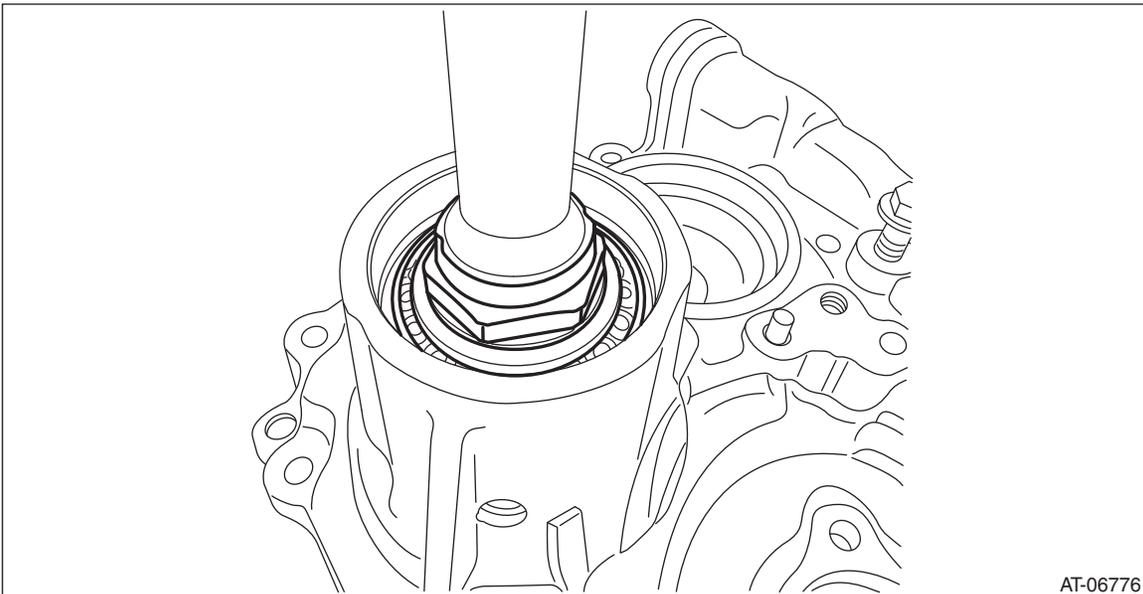


AT-06765

19) Install the inner bearing and lock nut.

NOTE:

Apply differential gear oil to the threaded portion of the drive pinion shaft.



AT-06776

20) Using the ST, tighten the lock nut to the specified torque so that the starting torque of the drive pinion shaft is within the specified range.

CAUTION:

Before inspecting the starting torque, apply differential gear oil to roller of bearing and rotate the bearing several times.

NOTE:

- Tighten the lock nut while directly aligning ST2 and torque wrench.
- If the starting torque is not within the specified range, select the drive pinion washer, and repeat the step until the starting torque is within the specified range.
- When a thicker drive pinion washer is selected, the starting torque decreases. When a thinner drive pinion washer is selected, the starting torque increases.

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Starting torque:

5.1 — 17.1 N (0.5 — 1.7 kgf, 1.1 — 3.8 lbf)

ST1 499787500 ADAPTER

ST2 499787700 WRENCH

ST3 498937110 HOLDER

Using the following formula, calculate the tightening torque for a torque wrench.

$$T2 = L2 / (L1 + L2) \times T1$$

T1: 170 — 250 N·m (17.3 — 25.5 kgf·m, 125.4 — 184.4 ft·lb) [Specified tightening torque range]

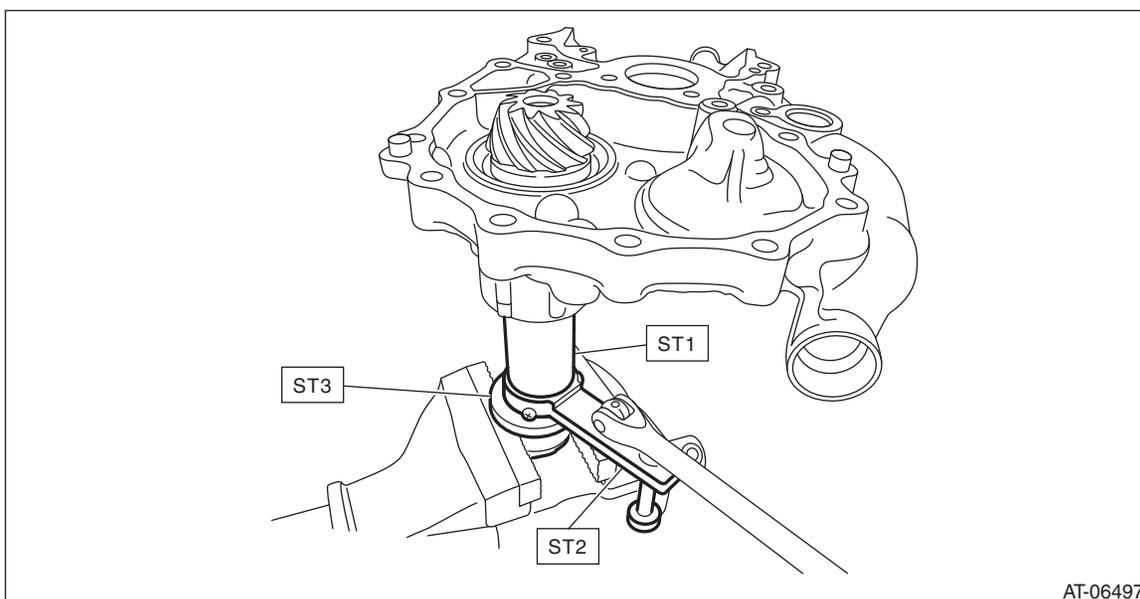
T2: Tightening torque

L1: ST1 length 0.072 m (2.83 in)

L2: Torque wrench length

Example:

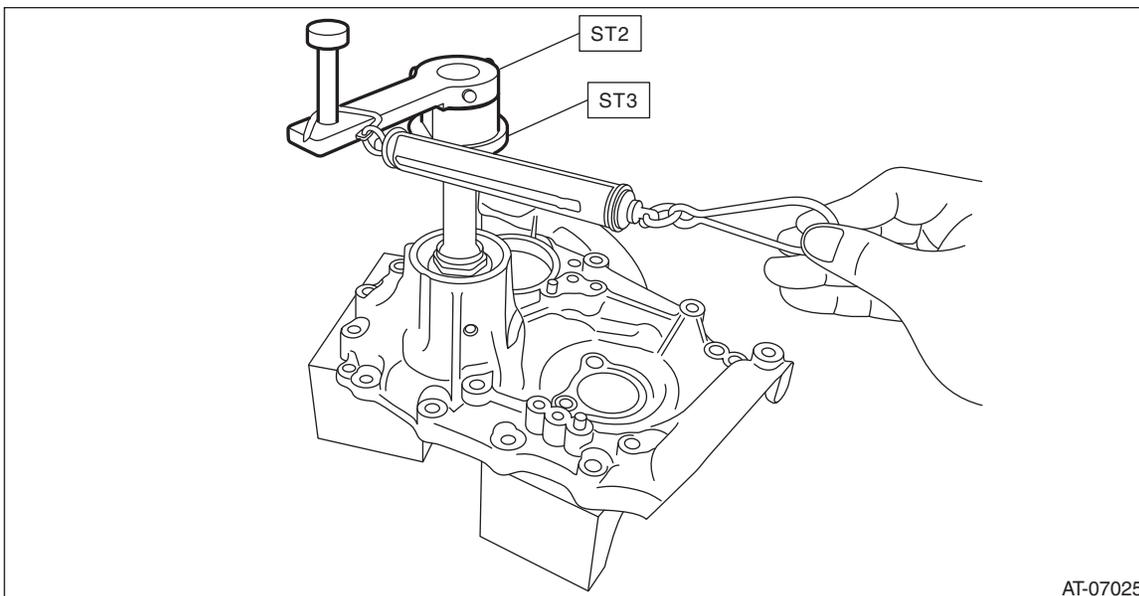
Torque wrench length m (in)	Tightening torque N·m (kgf·m, ft·lb)
0.4 (15.75)	144 — 211 (14.7 — 21.5, 106.2 — 155.6)
0.45 (17.72)	147 — 215 (15.0 — 21.9, 108.4 — 158.6)
0.5 (19.69)	149 — 218 (15.2 — 22.2, 109.9 — 160.8)
0.55 (21.65)	150 — 221 (15.3 — 22.5, 110.6 — 163.0)



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Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

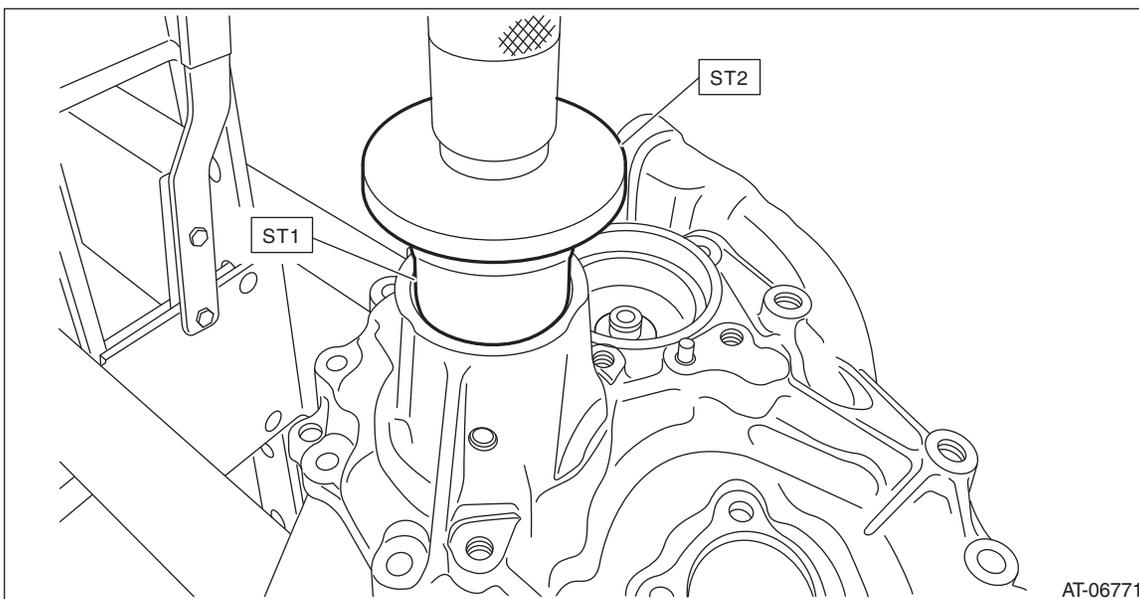


21) Crimp the lock nut in 2 locations.

22) Using the ST, install the plug.

ST1 499755602 PRESS SNAP RING

ST2 398177700 INSTALLER



E: INSPECTION

- Make sure that all component parts are free of scratches, holes and other faults.
- Check the tooth contact. <Ref. to CVT(TR580)-345, ADJUSTMENT, Drive Pinion Shaft Assembly.>
- Apply CVTF to bearing and rotate the bearing to check for noise or dragging etc.
- Check the starting torque of drive pinion shaft.

CAUTION:

Before measuring, apply differential gear oil to roller of bearing and rotate the bearing several times.

ST1 498937110 HOLDER

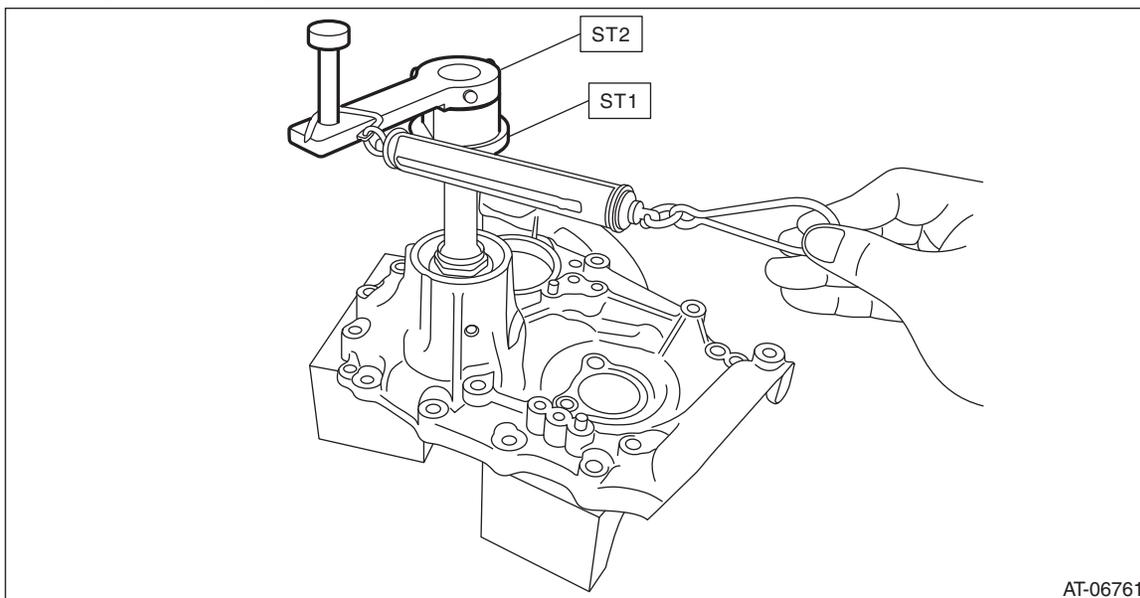
ST2 499787700 WRENCH

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Starting torque:

5.1 — 17.1 N (0.5 — 1.7 kgf, 1.1 — 3.8 lbf)



AT-06761

F: ADJUSTMENT

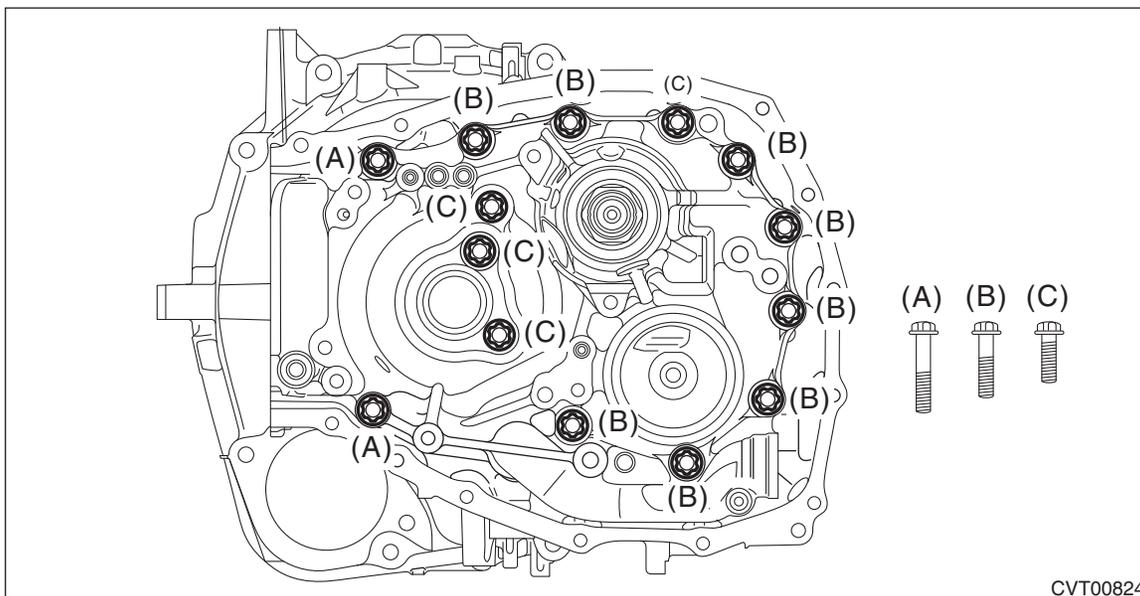
- 1) Remove the liquid gasket from the mating surface completely.
- 2) Using the ST, install the drive pinion retainer to converter case.
ST 18270KA020 SOCKET (E20)

NOTE:

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

Tightening torque:

43 N·m (4.4 kgf·m, 31.7 ft·lb)



CVT00824

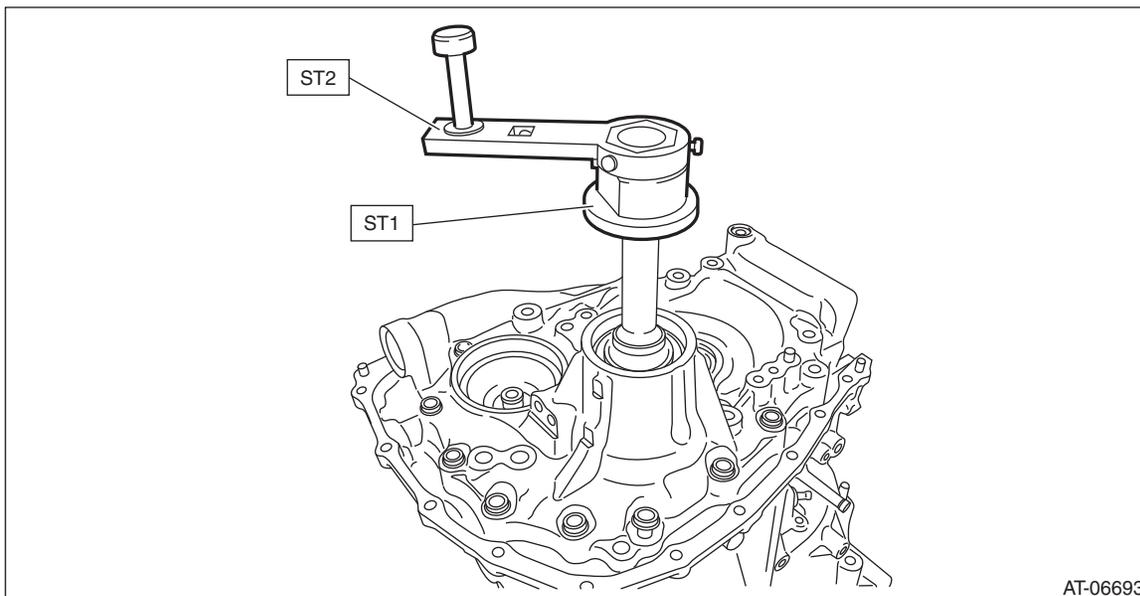
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

3) Rotate the drive pinion several times using ST1 and ST2.

ST1 498937110 HOLDER

ST2 499787700 WRENCH



4) Adjust the drive pinion and hypoid driven gear backlash. <Ref. to CVT(TR580)-368, ADJUSTMENT, Front Differential Assembly.>

5) Using the ST, remove the drive pinion retainer from converter case.

ST 18270KA020 SOCKET (E20)

6) Apply lead-free red dye evenly on the both sides of three to four teeth of the hypoid driven gear. Then install the drive pinion retainer and rotate the drive pinion in both directions several times. Remove the drive pinion retainer and check the tooth contact pattern.

If the teeth contact is inappropriate, adjust the backlash or thickness of the shim. <Ref. to CVT(TR580)-368, ADJUSTMENT, Front Differential Assembly.>

NOTE:

After correction, wipe off the lead-free red dye.

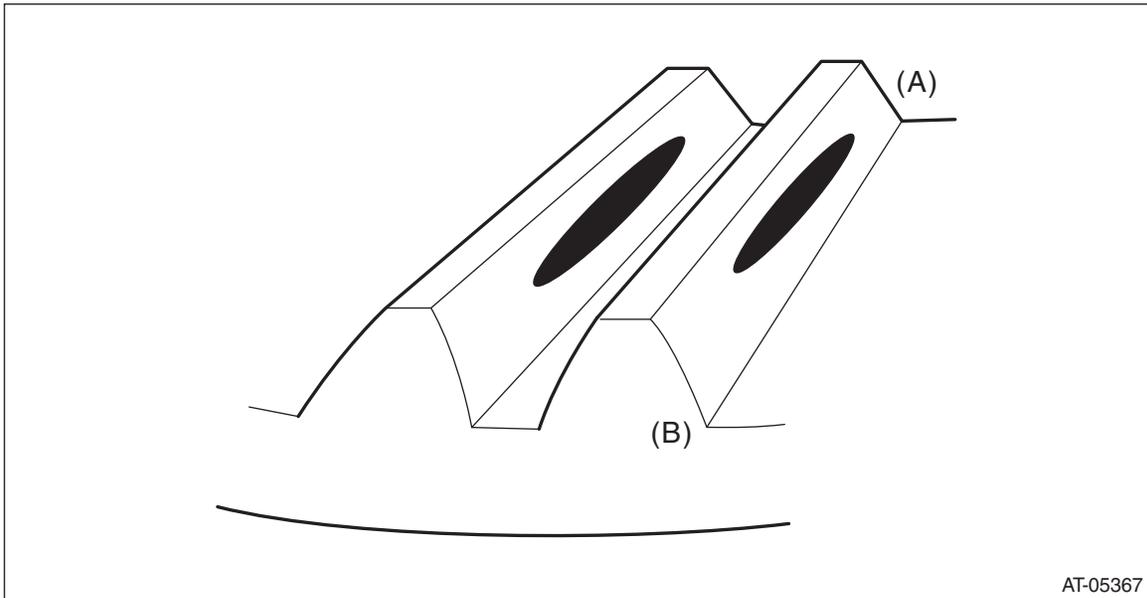
Drive pinion shim	
Part No.	Thickness mm (in)
31451AA320	0.150 (0.0059)
31451AA330	0.175 (0.0069)
31451AA340	0.200 (0.0079)
31451AA350	0.225 (0.0089)
31451AA360	0.250 (0.0098)
31451AA370	0.275 (0.0108)

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- Correct tooth contact

**Check item: Tooth contact surface is slightly shifted toward the toe side under a no-load condition.
(When driving, it moves towards the heel side.)**



- (A) Toe side
- (B) Heel side

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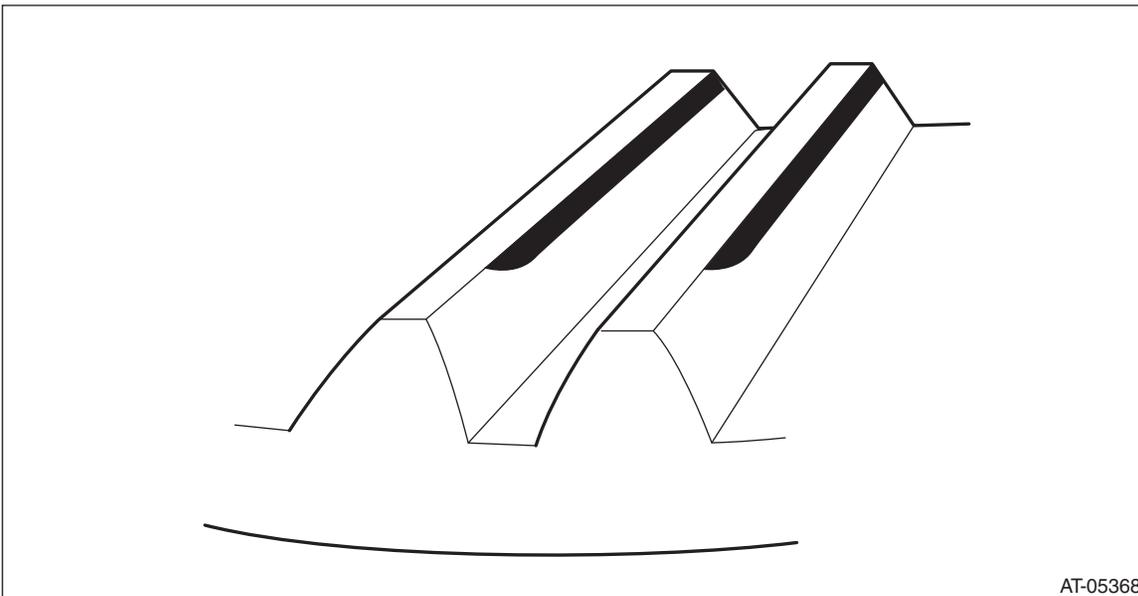
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- Face contact

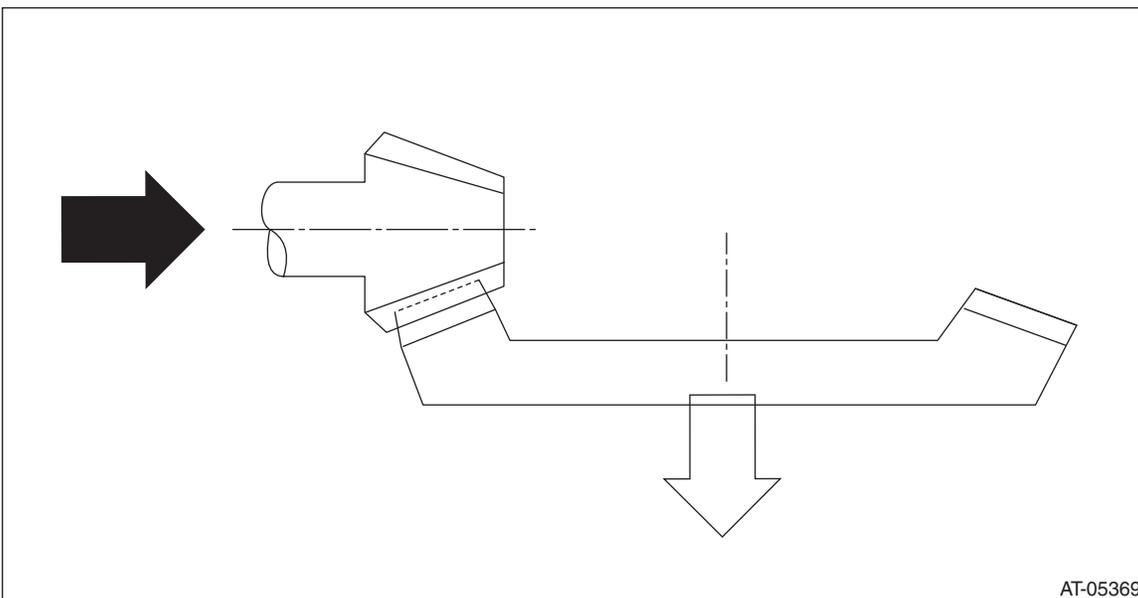
Check item: Backlash is too large.

Contact pattern



AT-05368

Corrective action: Increase thickness of drive pinion shim according to the procedures for moving the drive pinion close to hypoid driven gear.



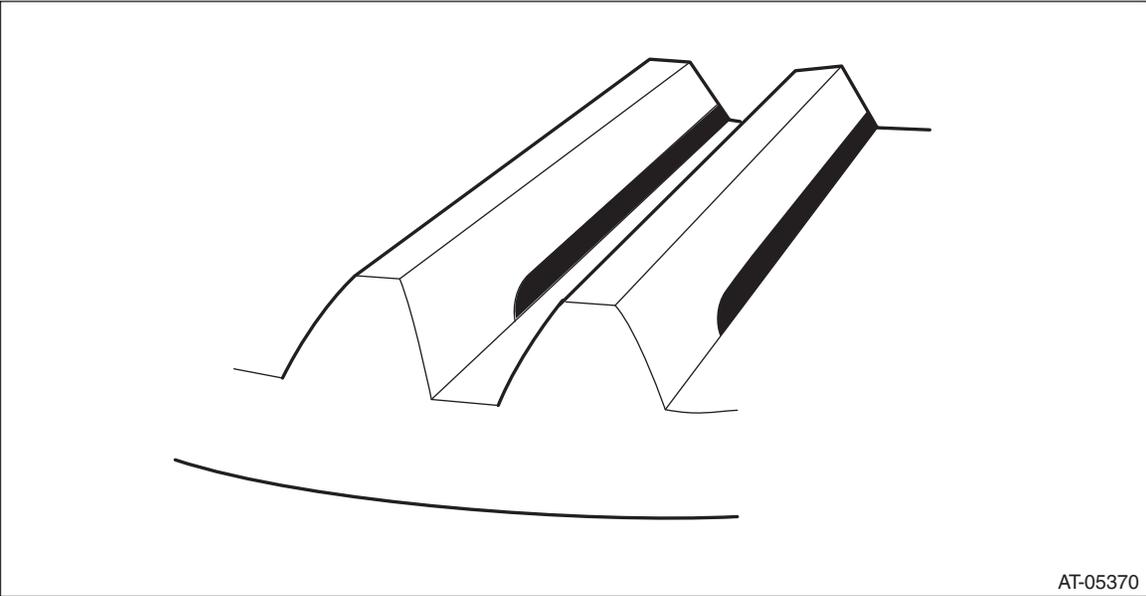
AT-05369

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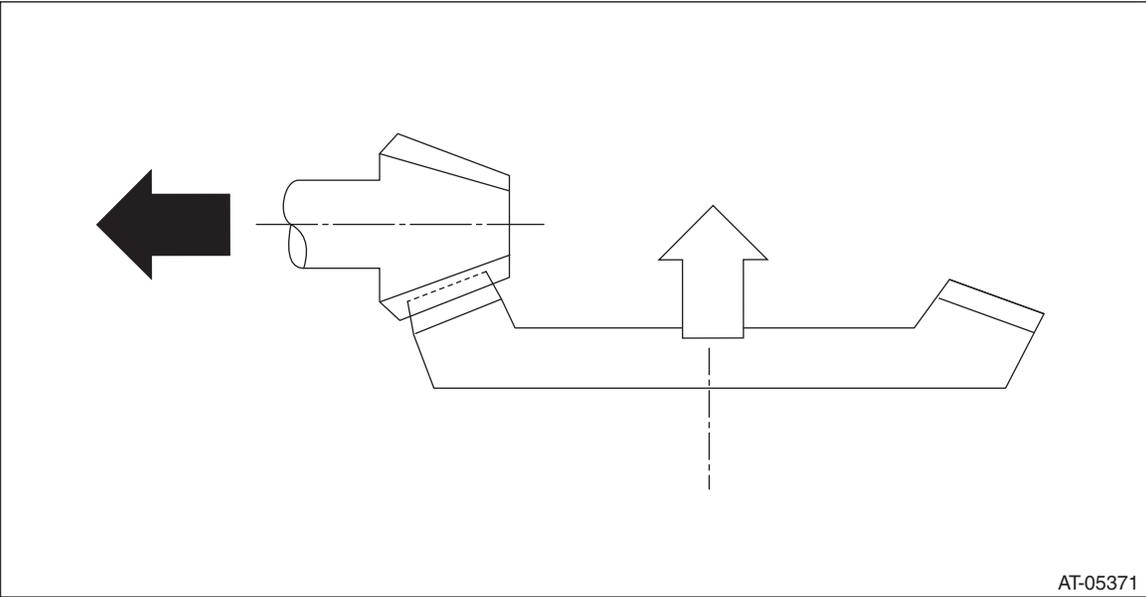
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- Flank contact
- Check item: Backlash is too small.**
Contact pattern



Corrective action: Reduce the thickness of the drive pinion shim according to the procedures for moving the drive pinion away from the hypoid driven gear.



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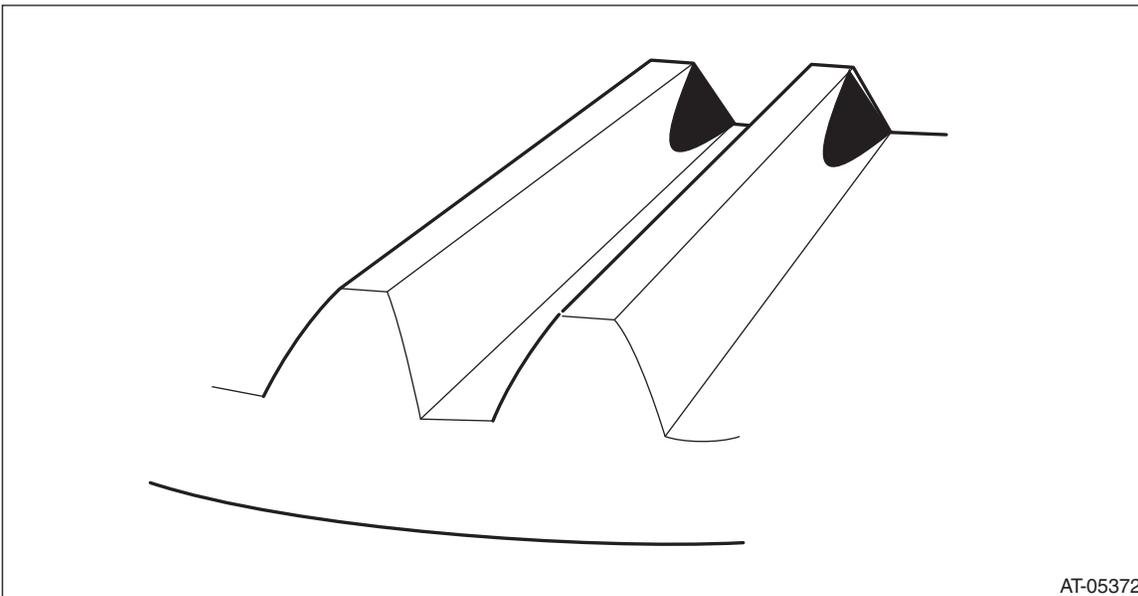
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

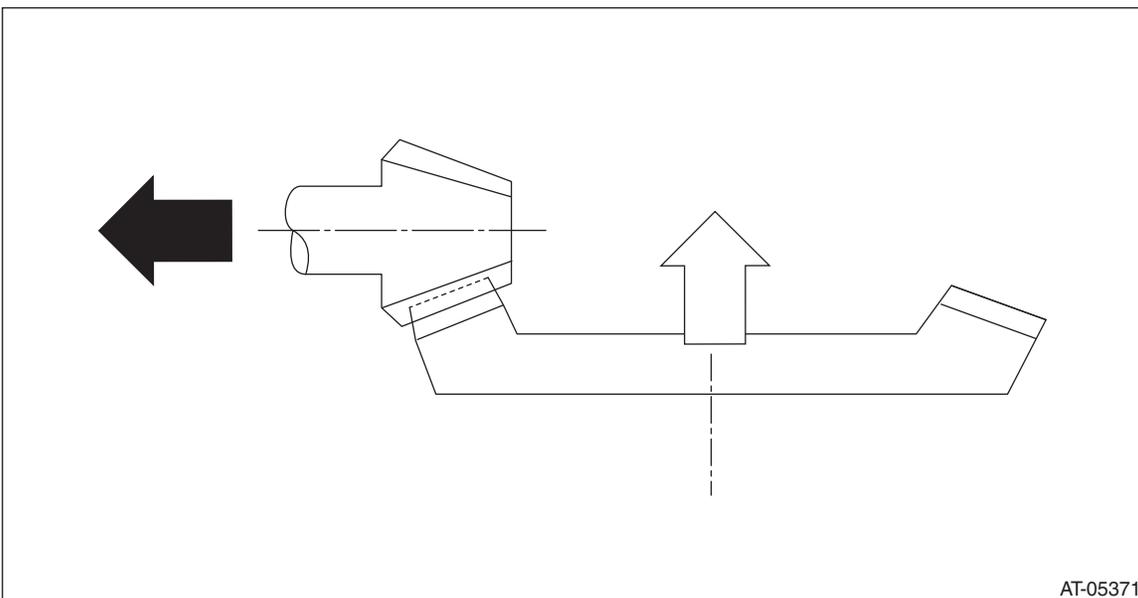
- Toe contact (inside contact)

Check item: Teeth contact area is too small.

Contact pattern



Corrective action: Reduce the thickness of the drive pinion shim according to the procedures for moving the drive pinion away from the hypoid driven gear side.



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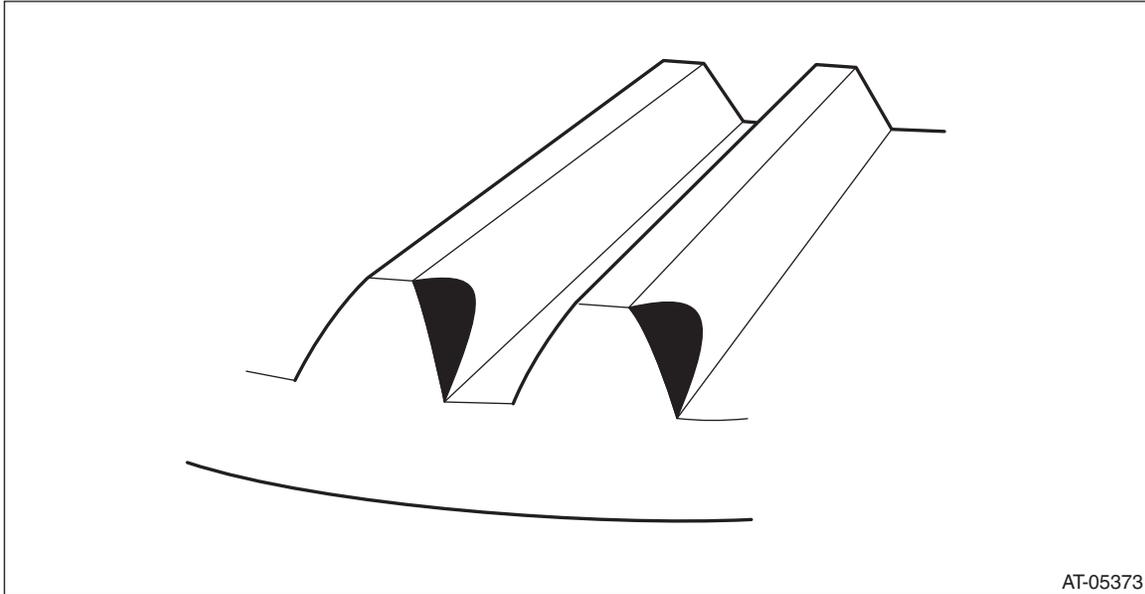
Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

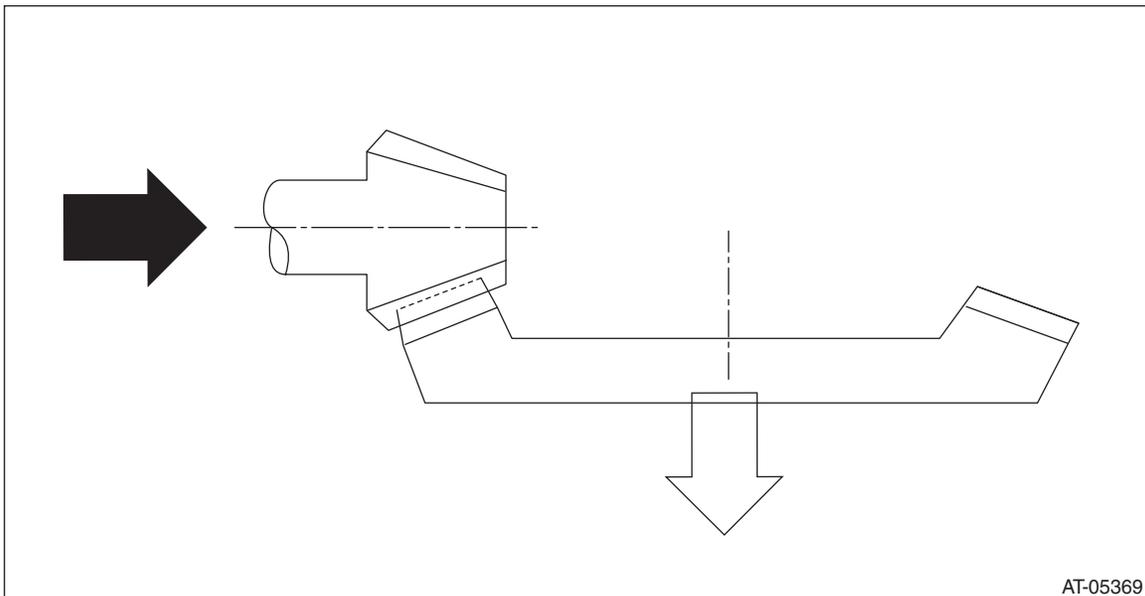
- Heel contact (outside end contact)

Check item: Teeth contact area is too small.

Contact pattern



Corrective action: Increase the thickness of the drive pinion shim according to the procedures for moving the drive pinion closer to the hypoid driven gear.



7) 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

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

ST 18658AA020 WRENCH COMPL RETAINER

9) Replace the differential side retainer oil seal with a new part. <Ref. to CVT(TR580)-103, Differential Side Retainer Oil Seal.>

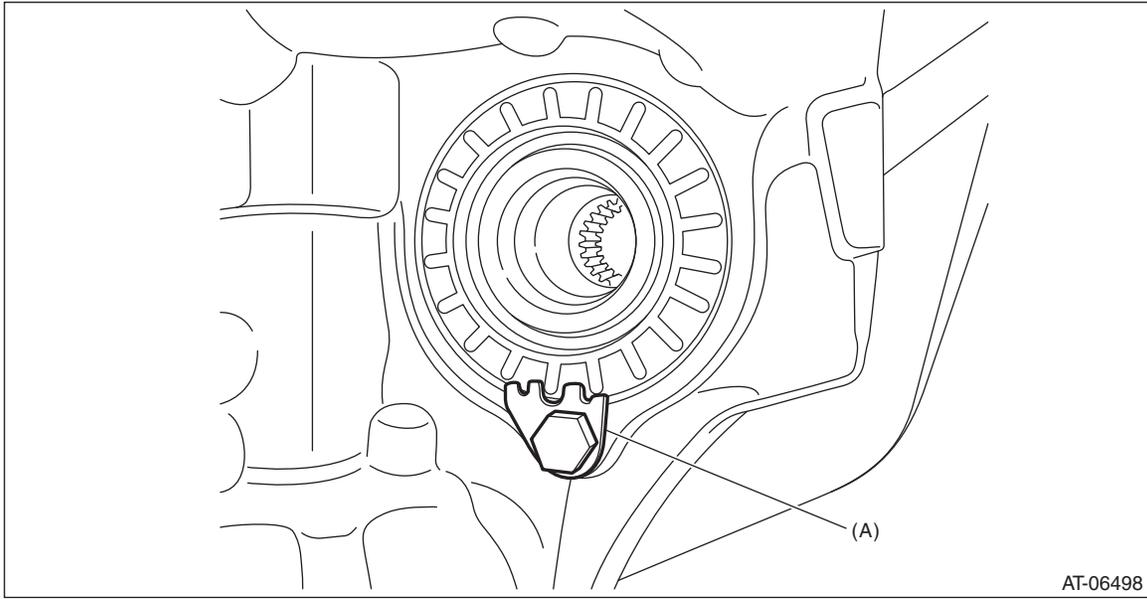
10) Install the lock plate.

Drive Pinion Shaft Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

25 N·m (2.5 kgf·m, 18.4 ft·lb)



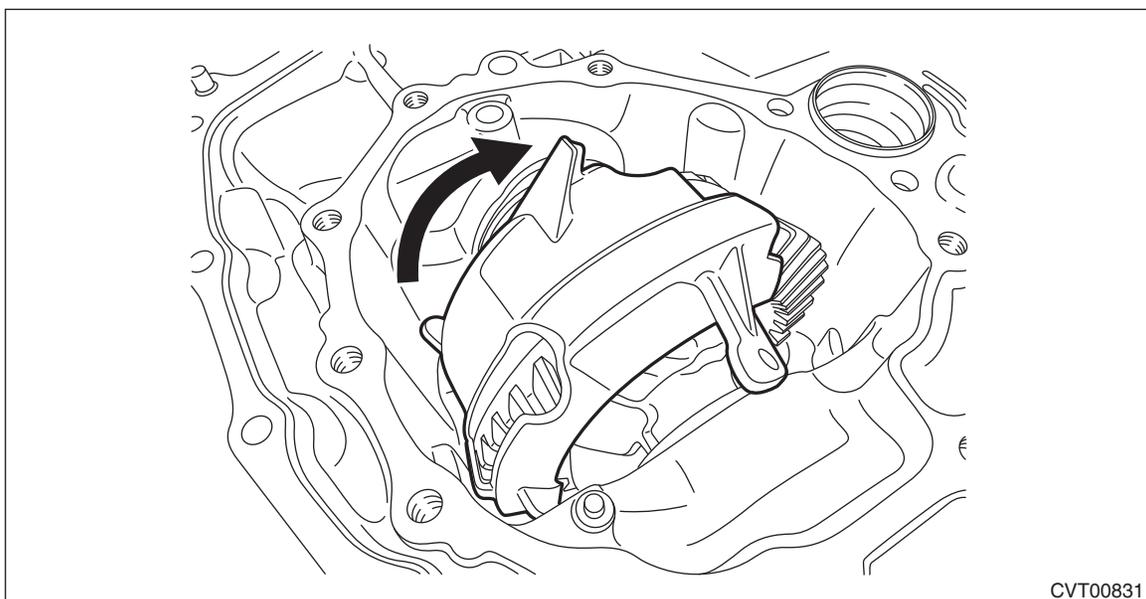
(A) Lock plate

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46. Front Differential Assembly

A: REMOVAL

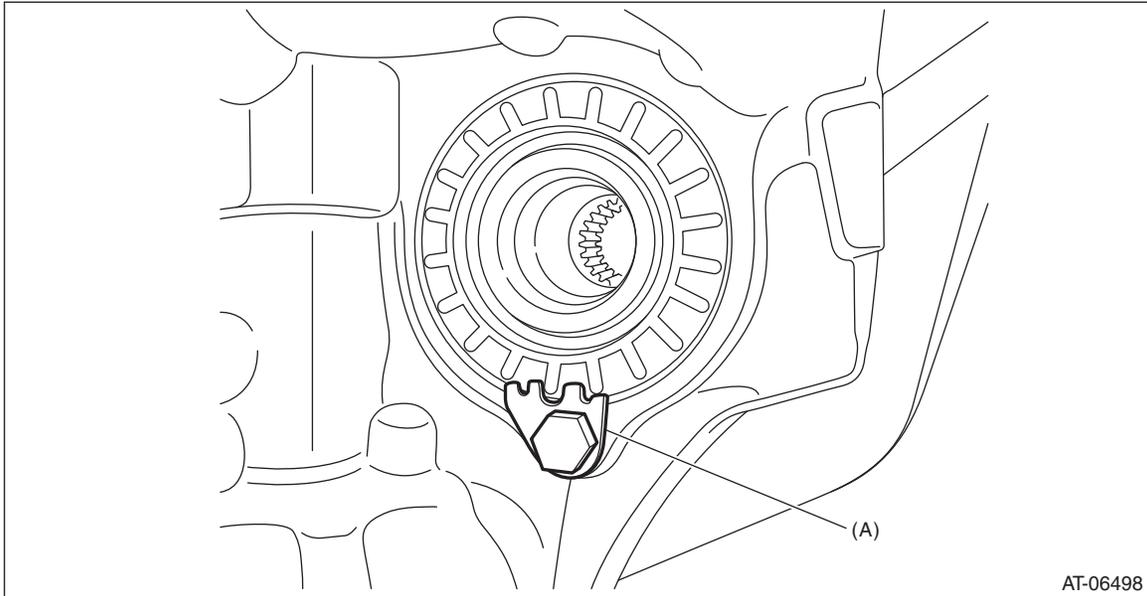
- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the air breather hose. <Ref. to CVT(TR580)-196, REMOVAL, Air Breather Hose.>
- 3) Remove the control valve body. <Ref. to CVT(TR580)-138, REMOVAL, Control Valve Body.>
- 4) Remove the transmission harness. <Ref. to CVT(TR580)-152, REMOVAL, Transmission Harness.>
- 5) Remove the turbine speed sensor. <Ref. to CVT(TR580)-118, REMOVAL, Turbine Speed Sensor.>
- 6) Remove the secondary speed sensor. <Ref. to CVT(TR580)-123, REMOVAL, Secondary Speed Sensor.>
- 7) Remove the primary speed sensor. <Ref. to CVT(TR580)-128, REMOVAL, Primary Speed Sensor.>
- 8) Remove the inhibitor switch. <Ref. to CVT(TR580)-112, REMOVAL, Inhibitor Switch.>
- 9) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 10) Remove the transfer clutch assembly. <Ref. to CVT(TR580)-210, REMOVAL, Transfer Clutch.>
- 11) Remove the transfer driven gear assembly. <Ref. to CVT(TR580)-224, REMOVAL, Transfer Driven Gear.>
- 12) Remove the parking pawl. <Ref. to CVT(TR580)-227, REMOVAL, Parking Pawl.>
- 13) Remove the reduction driven gear assembly. <Ref. to CVT(TR580)-229, REMOVAL, Reduction Driven Gear.>
- 14) Remove the oil pan and oil strainer. <Ref. to CVT(TR580)-135, REMOVAL, Oil Pan and Strainer.>
- 15) Remove the transmission control device. <Ref. to CVT(TR580)-236, REMOVAL, Transmission Control Device.>
- 16) Remove the transmission case. <Ref. to CVT(TR580)-242, REMOVAL, Transmission Case.>
- 17) Remove the reduction drive gear. <Ref. to CVT(TR580)-261, REMOVAL, Reduction Drive Gear.>
- 18) Remove the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TR580)-266, REMOVAL, Primary Pulley and Secondary Pulley.>
- 19) Remove the reverse brake assembly. <Ref. to CVT(TR580)-285, REMOVAL, Reverse Brake Assembly.>
- 20) Remove the forward clutch assembly. <Ref. to CVT(TR580)-300, REMOVAL, Forward Clutch Assembly.>
- 21) Remove the drive pinion shaft assembly. <Ref. to CVT(TR580)-320, REMOVAL, Drive Pinion Shaft Assembly.>
- 22) Remove the oil baffle.



Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

23) Remove the lock plates on both sides.



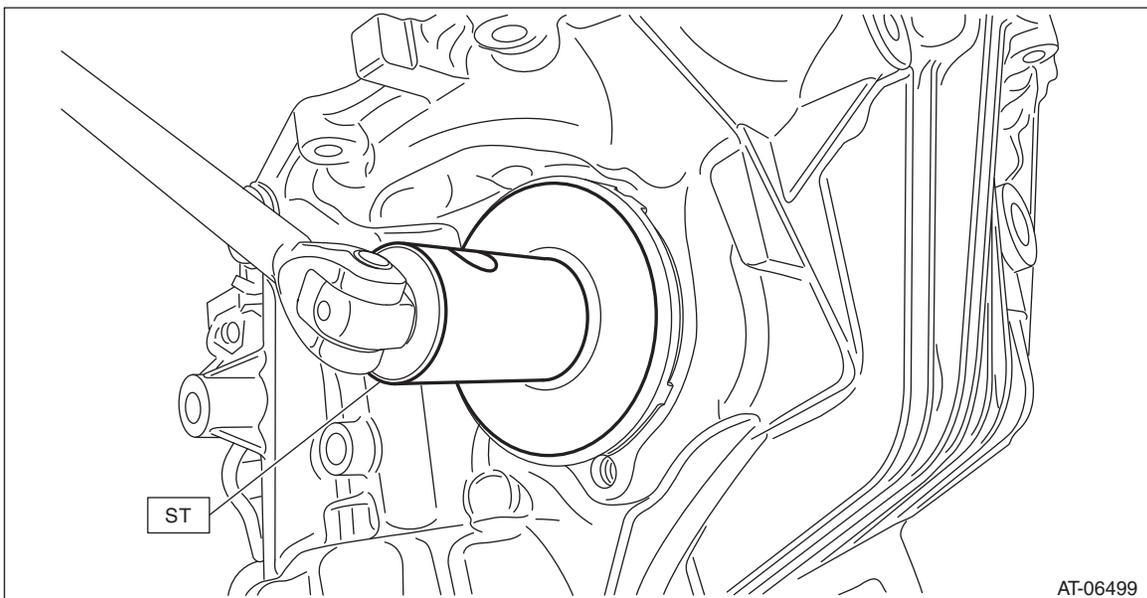
(A) Lock plate

24) 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.

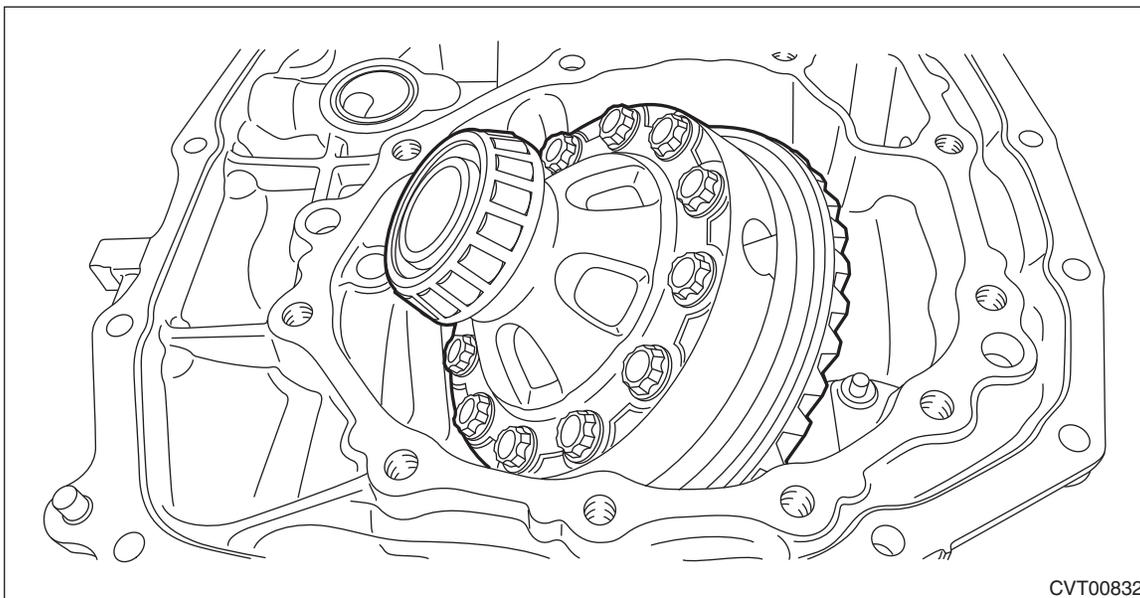
ST 18658AA020 WRENCH COMPL RETAINER



Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

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



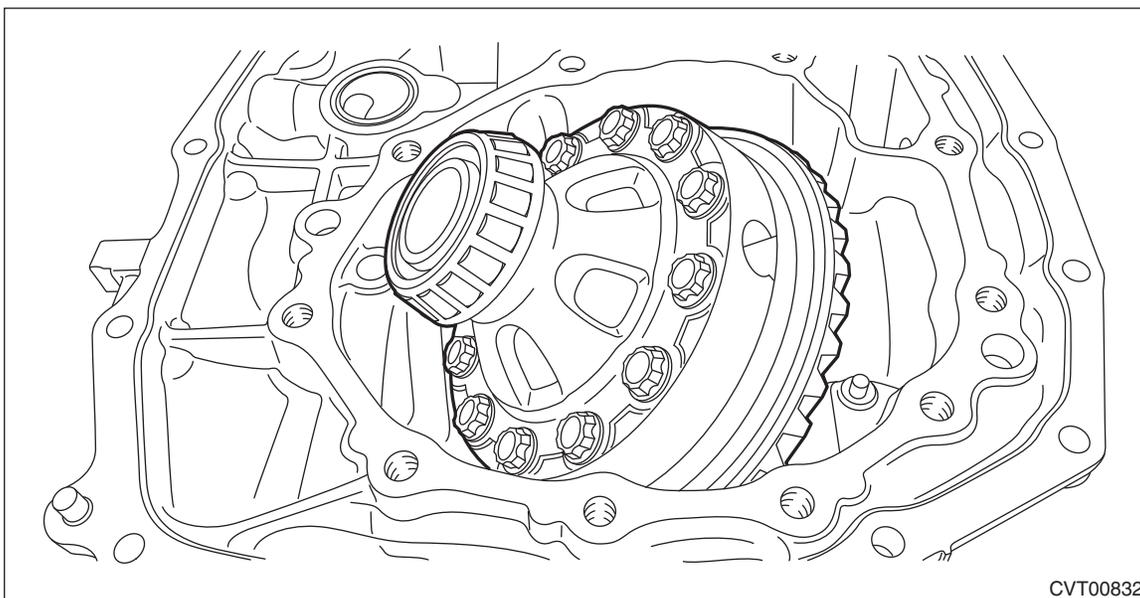
26) Remove the oil seals and O-rings from both differential side retainers. <Ref. to CVT(TR580)-361, SIDE RETAINER, DISASSEMBLY, Front Differential Assembly.>

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).

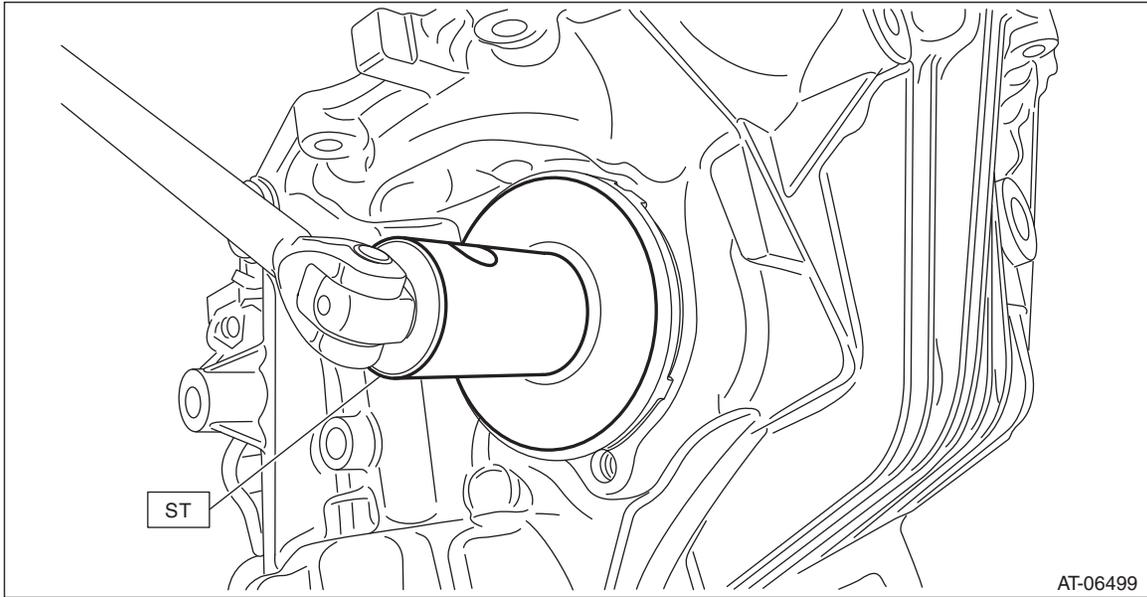


2) Install the bearing outer race.

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(TR580)-368, ADJUSTMENT, Front Differential Assembly.>
5) Inspect and adjust the tooth contact. <Ref. to CVT(TR580)-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.

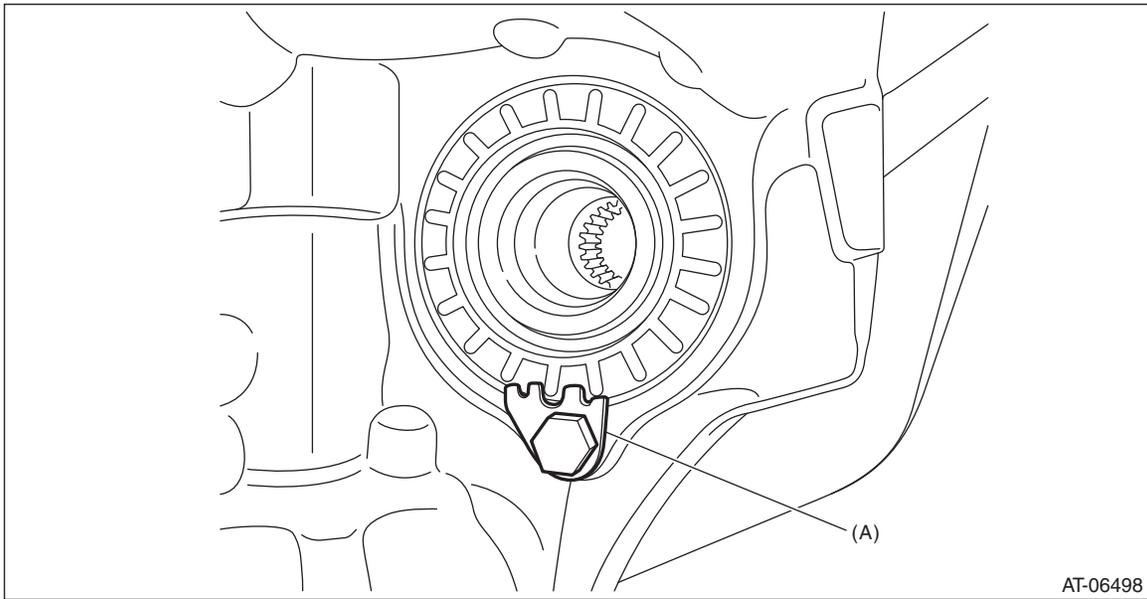
ST 18658AA020 WRENCH COMPL RETAINER

- 8) Install the oil seal to the differential side retainer. <Ref. to CVT(TR580)-103, Differential Side Retainer Oil Seal.>
9) Install the lock plate.

Front Differential Assembly

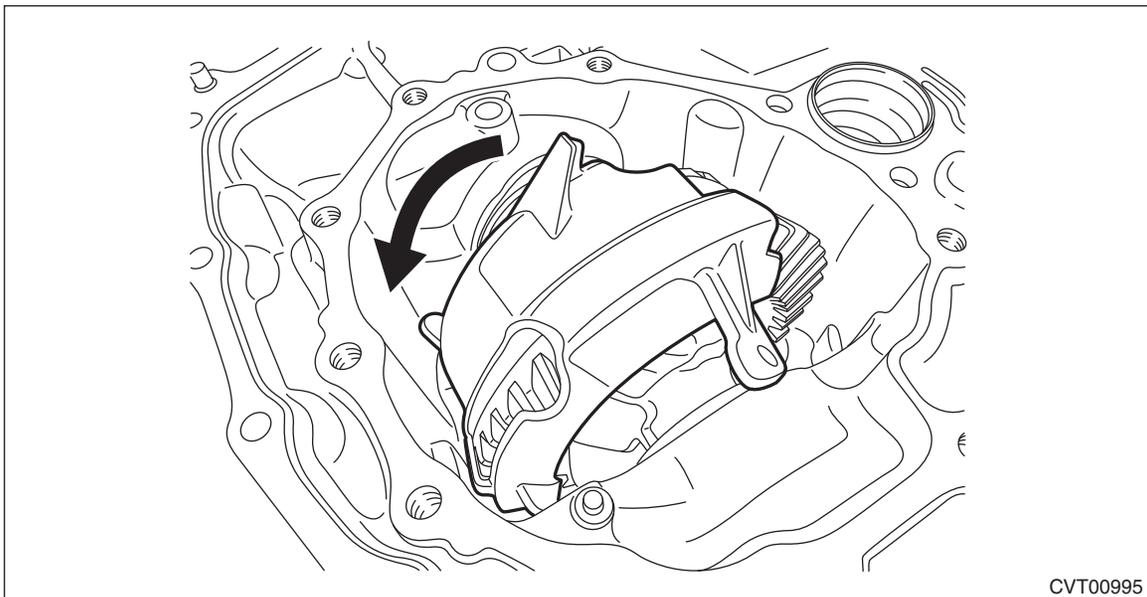
CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:
25 N·m (2.5 kgf·m, 18.4 ft·lb)



(A) Lock plate

10) Install the oil baffle.



CVT00995

- 11) Install the drive pinion shaft assembly. <Ref. to CVT(TR580)-321, INSTALLATION, Drive Pinion Shaft Assembly.>
- 12) Install the forward clutch assembly. <Ref. to CVT(TR580)-303, INSTALLATION, Forward Clutch Assembly.>
- 13) Install the reverse brake assembly. <Ref. to CVT(TR580)-287, INSTALLATION, Reverse Brake Assembly.>
- 14) Install the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TR580)-272, INSTALLATION, Primary Pulley and Secondary Pulley.>
- 15) Install the reduction drive gear. <Ref. to CVT(TR580)-262, INSTALLATION, Reduction Drive Gear.>
- 16) Install the transmission case. <Ref. to CVT(TR580)-245, INSTALLATION, Transmission Case.>
- 17) Install the oil strainer and oil pan. <Ref. to CVT(TR580)-136, INSTALLATION, Oil Pan and Strainer.>
- 18) Install the transmission control device. <Ref. to CVT(TR580)-238, INSTALLATION, Transmission Control Device.>

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

- 19) Install the reduction driven gear assembly. <Ref. to CVT(TR580)-229, INSTALLATION, Reduction Driven Gear.>
- 20) Install the transfer driven gear assembly. <Ref. to CVT(TR580)-224, INSTALLATION, Transfer Driven Gear.>
- 21) Install the transfer clutch assembly. <Ref. to CVT(TR580)-211, INSTALLATION, Transfer Clutch.>
- 22) Install the parking pawl. <Ref. to CVT(TR580)-227, INSTALLATION, Parking Pawl.>
- 23) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 24) Install the inhibitor switch. <Ref. to CVT(TR580)-115, INSTALLATION, Inhibitor Switch.>
- 25) Install the secondary speed sensor. <Ref. to CVT(TR580)-123, INSTALLATION, Secondary Speed Sensor.>
- 26) Install the primary speed sensor. <Ref. to CVT(TR580)-128, INSTALLATION, Primary Speed Sensor.>
- 27) Install the turbine speed sensor. <Ref. to CVT(TR580)-118, INSTALLATION, Turbine Speed Sensor.>
- 28) Install the transmission harness. <Ref. to CVT(TR580)-155, INSTALLATION, Transmission Harness.>
- 29) Install the control valve body. <Ref. to CVT(TR580)-144, INSTALLATION, Control Valve Body.>
- 30) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>
- 31) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: DISASSEMBLY

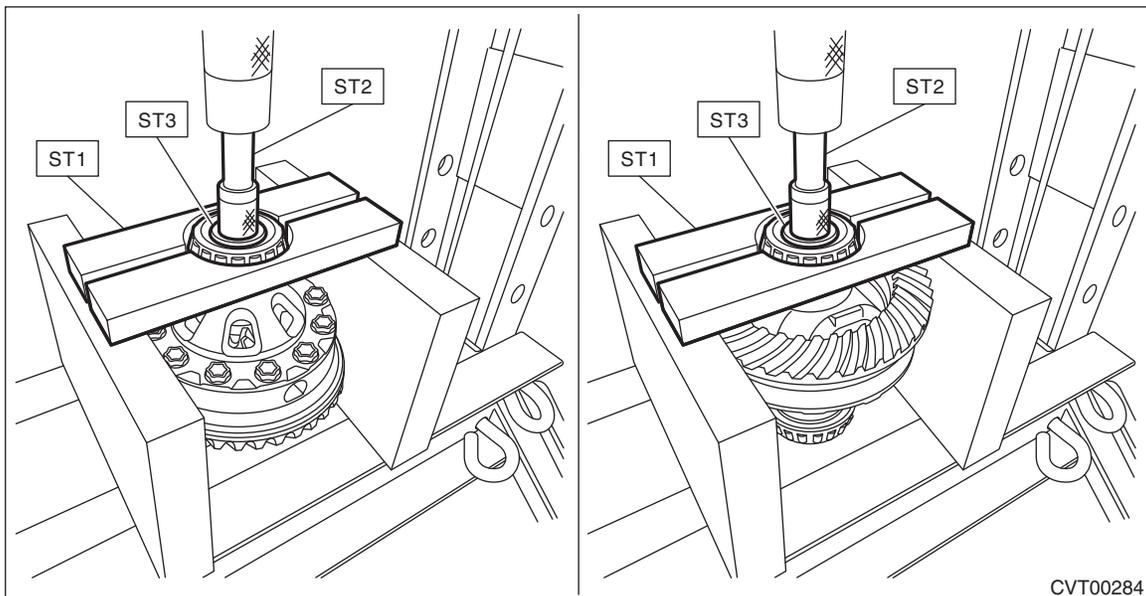
1. DIFFERENTIAL CASE ASSEMBLY

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

ST1 498077000 REMOVER

ST2 899864100 REMOVER

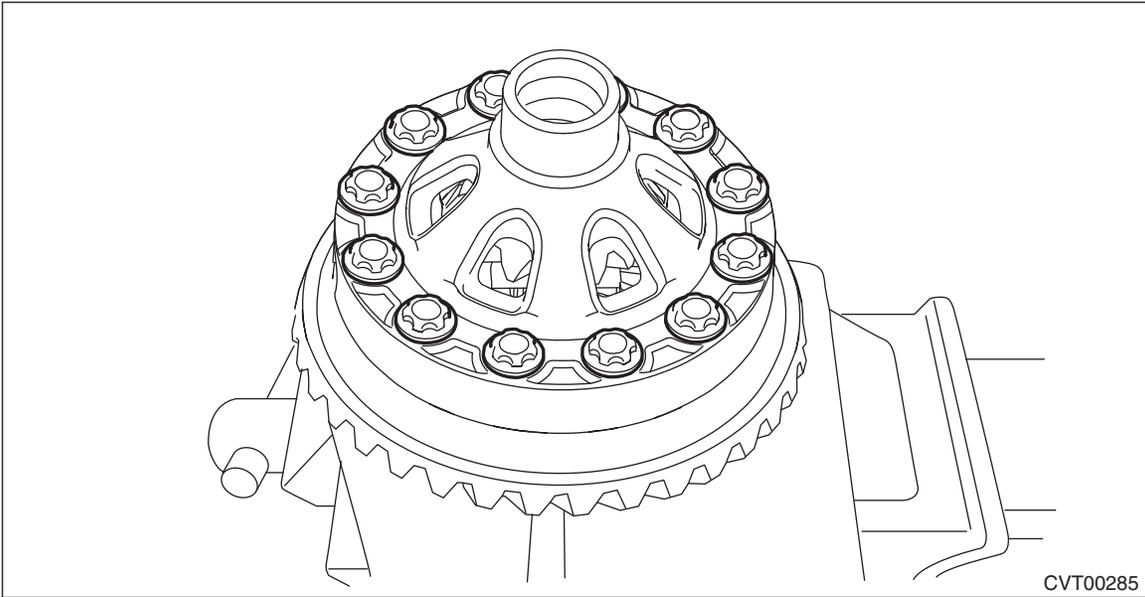
ST3 398497701 SEAT



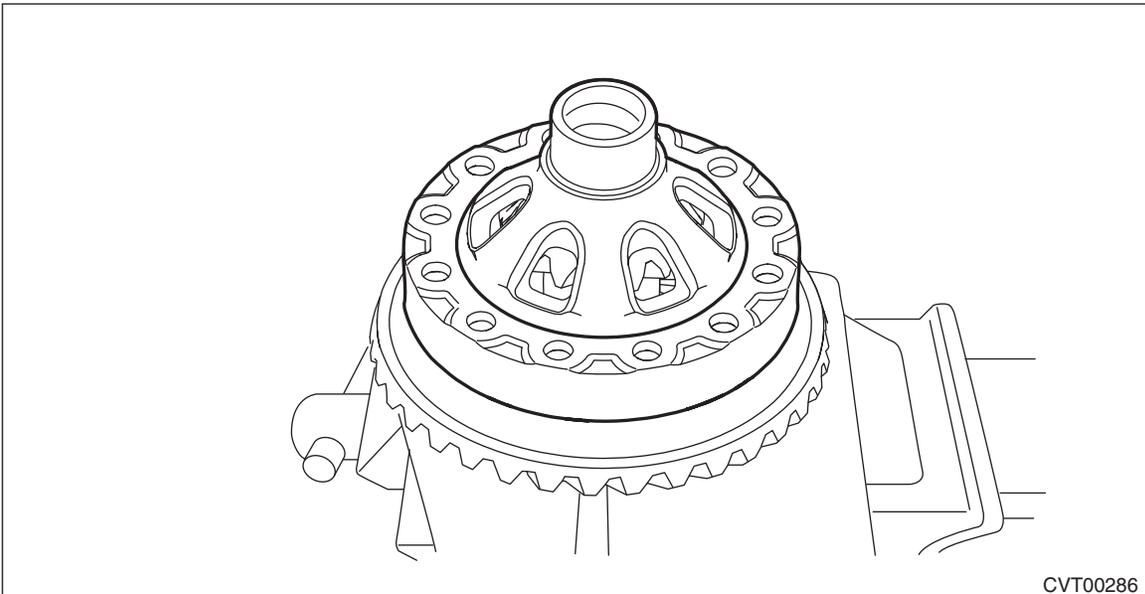
Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

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



- 3) Remove the differential case (LH).

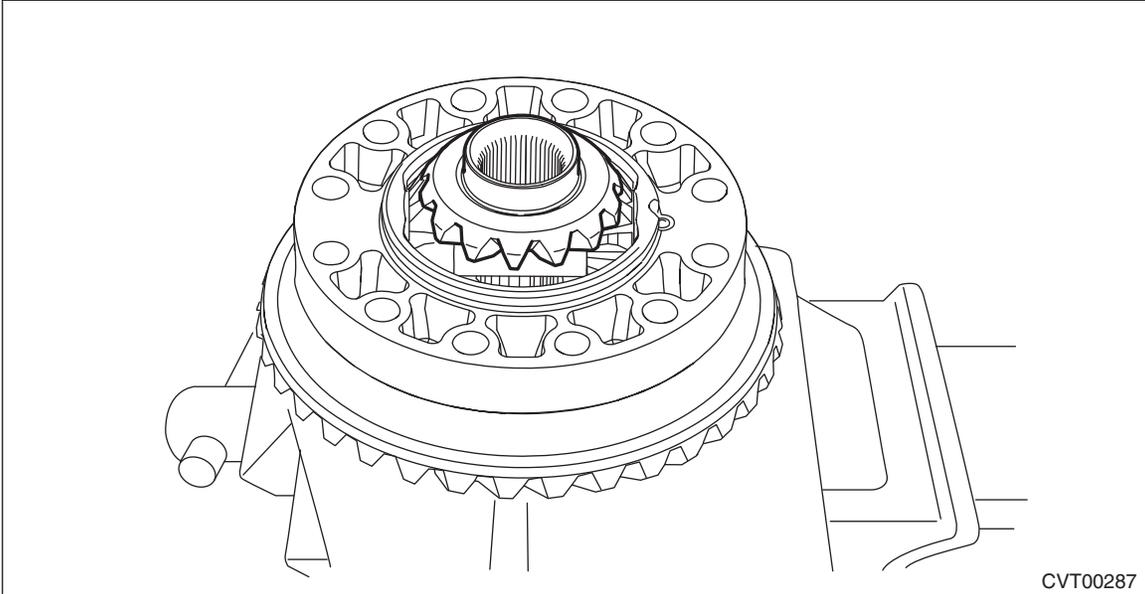


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Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

4) Remove the differential bevel gear and washer.



5) Remove the straight pin.

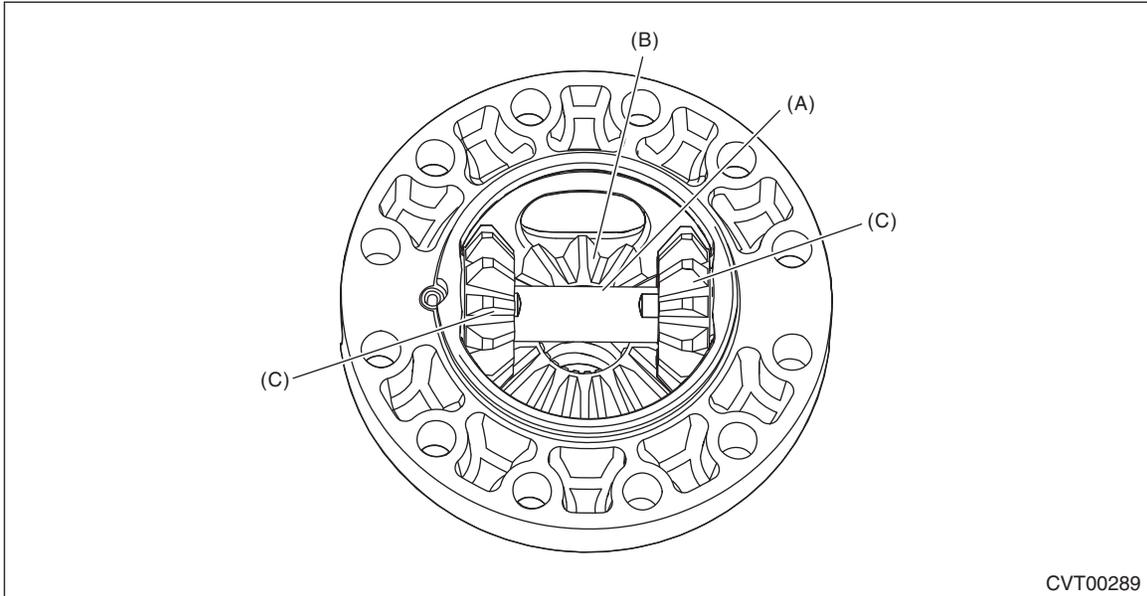


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Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

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



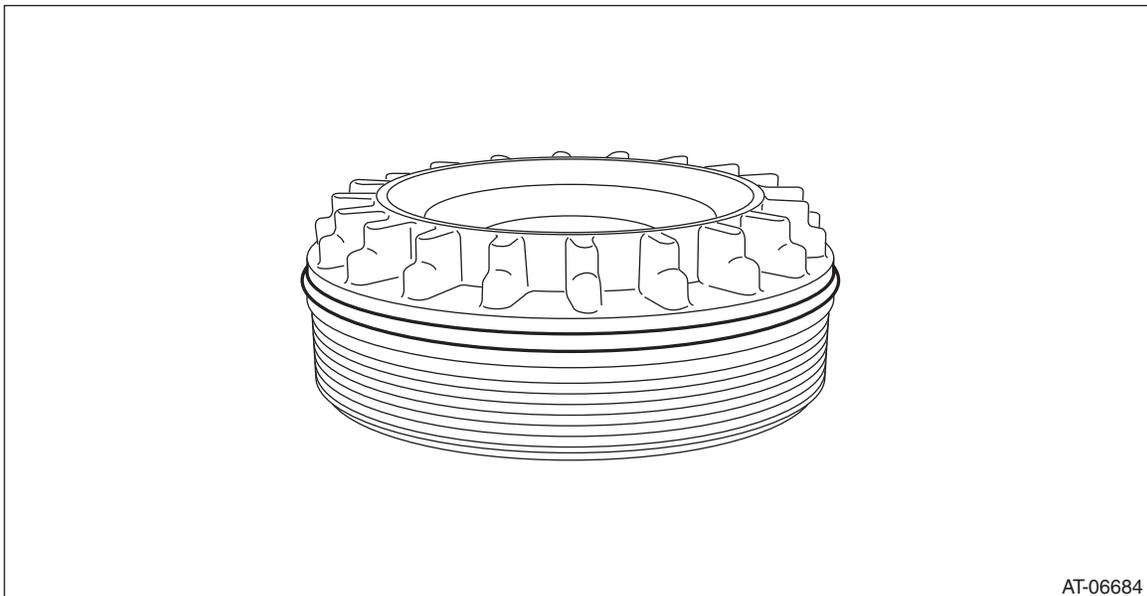
- (A) Pinion shaft
- (B) Differential bevel gear
- (C) Differential bevel pinion

2. SIDE RETAINER

NOTE:

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

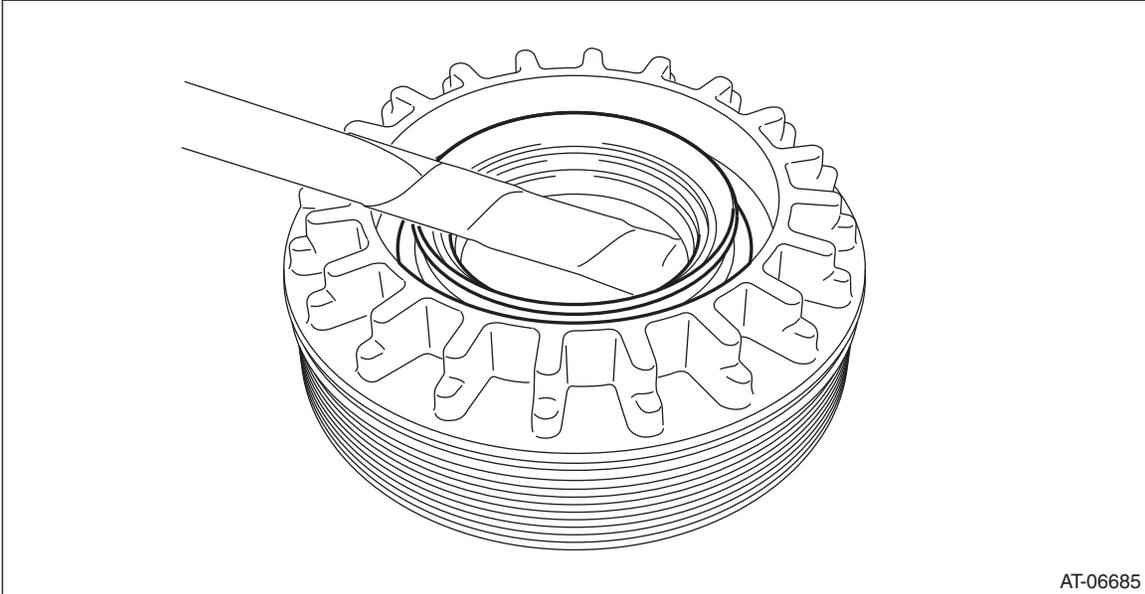
1) Remove the O-rings.



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).



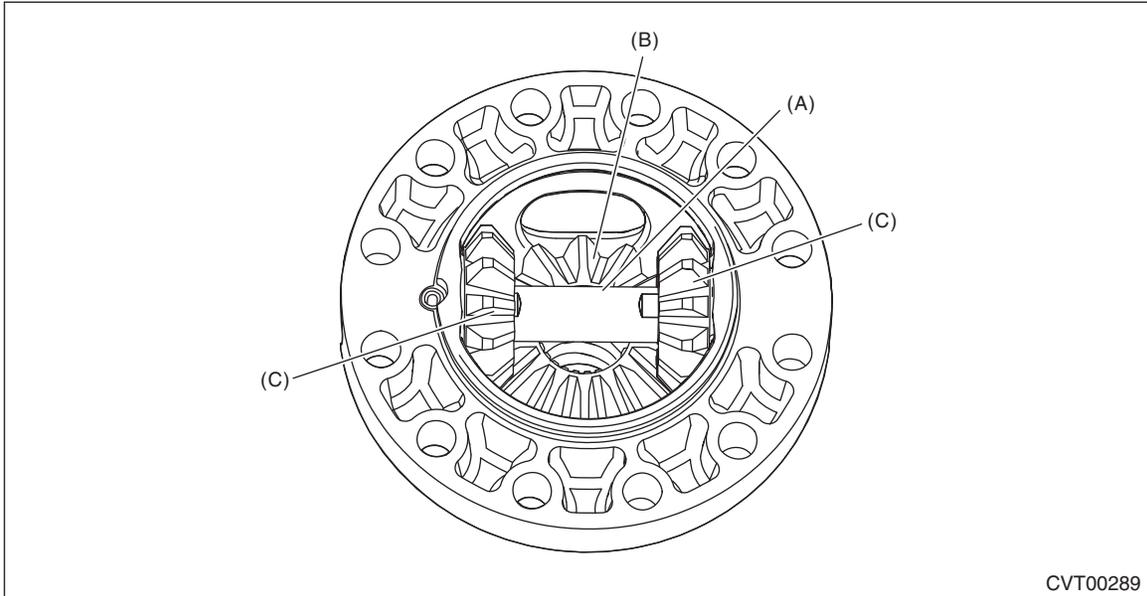
CVT00290

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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.

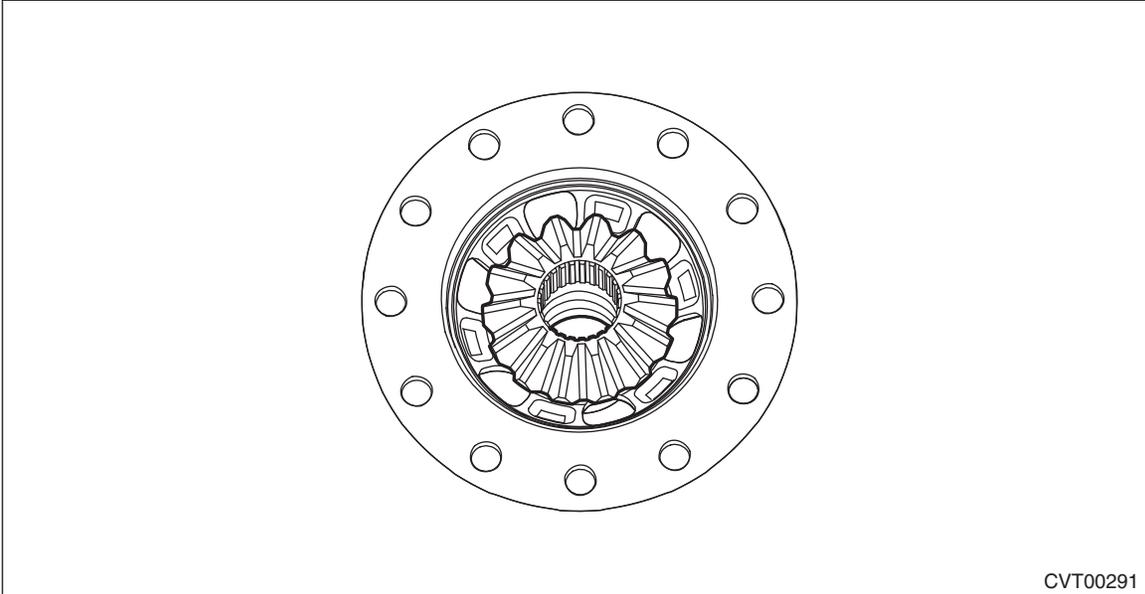


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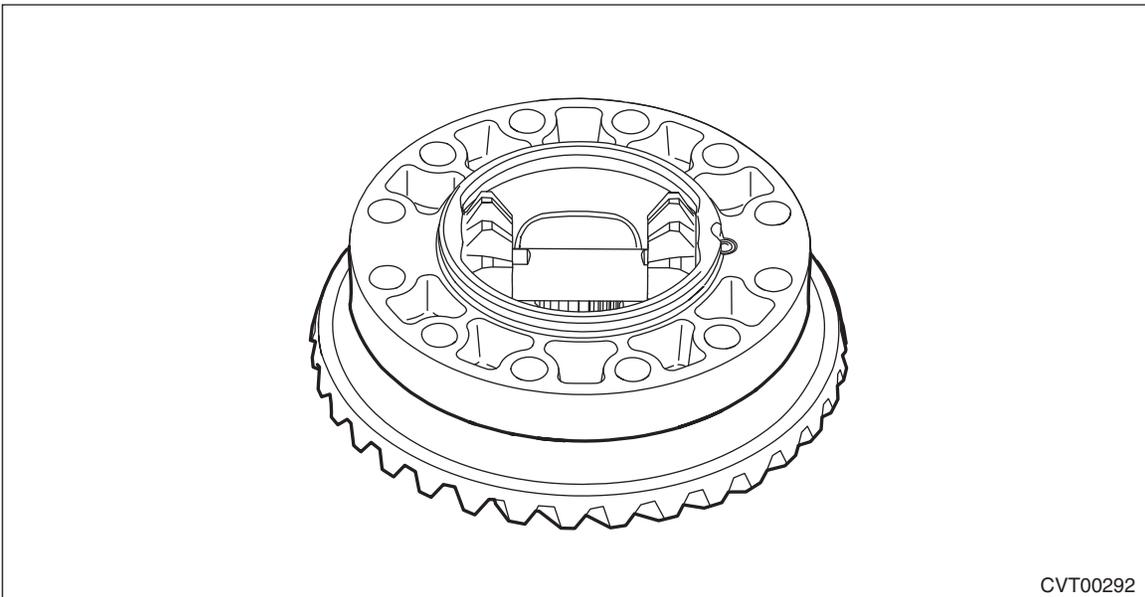
Front Differential Assembly

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).

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

ST 18270KA020 SOCKET (E20)

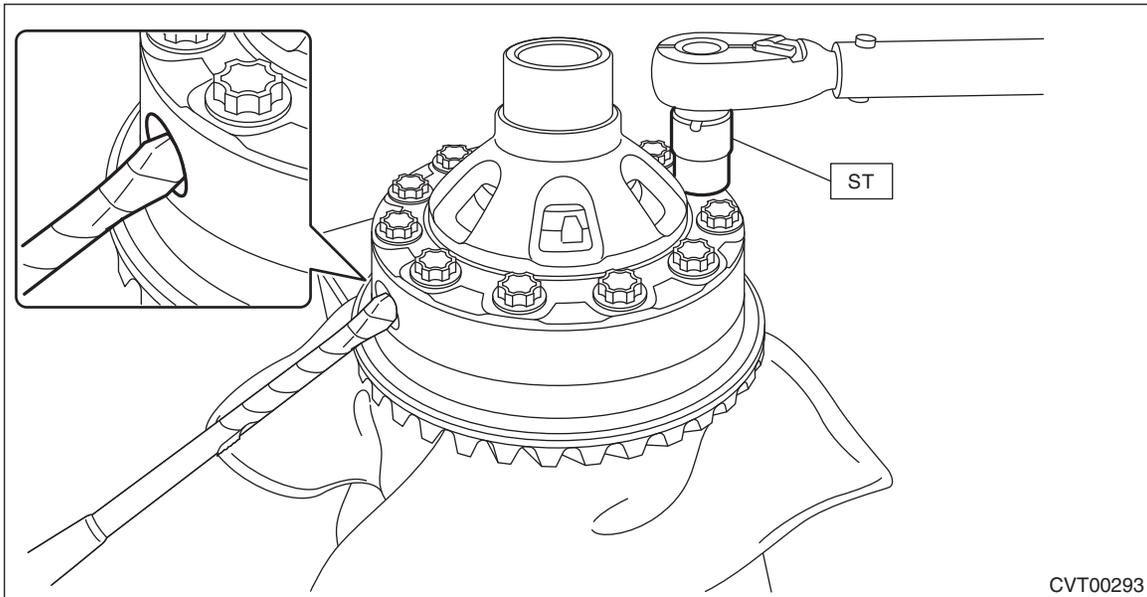
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Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

64 N·m (6.5 kgf·m, 47.2 ft·lb)



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:

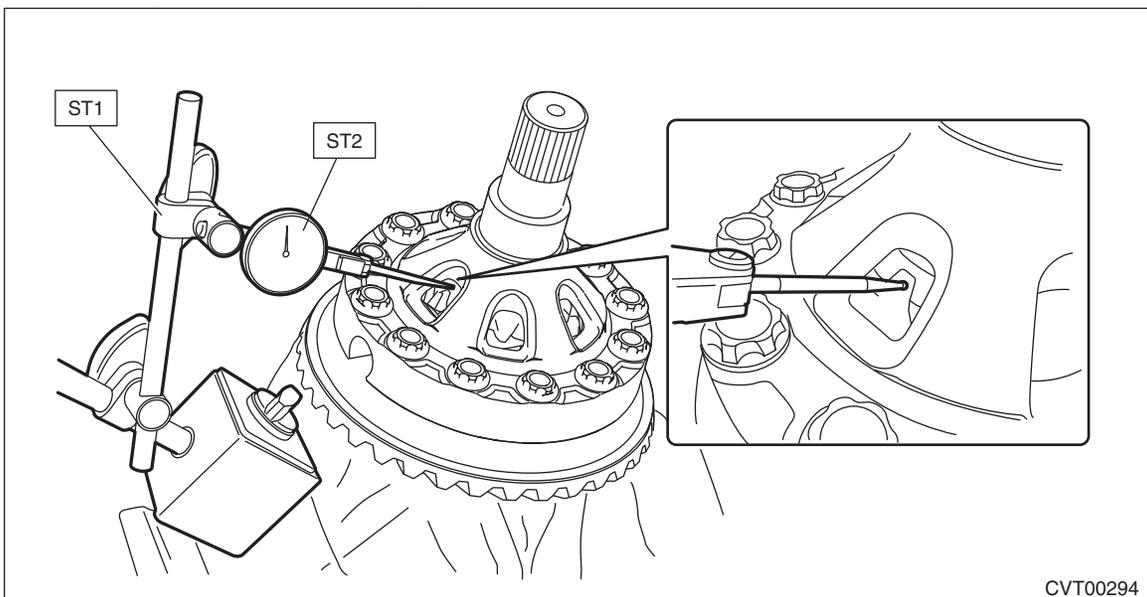
- Measure the backlash by applying a differential bevel pinion tooth between two differential bevel gear teeth.
- When measuring, fix the differential bevel pinion in place with a screwdriver covered with cloth, or a similar tool.

ST1 498247001 MAGNET BASE

ST2 498247100 DIAL GAUGE

Specification:

0.13 — 0.18 mm (0.0051 — 0.0071 in)



Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

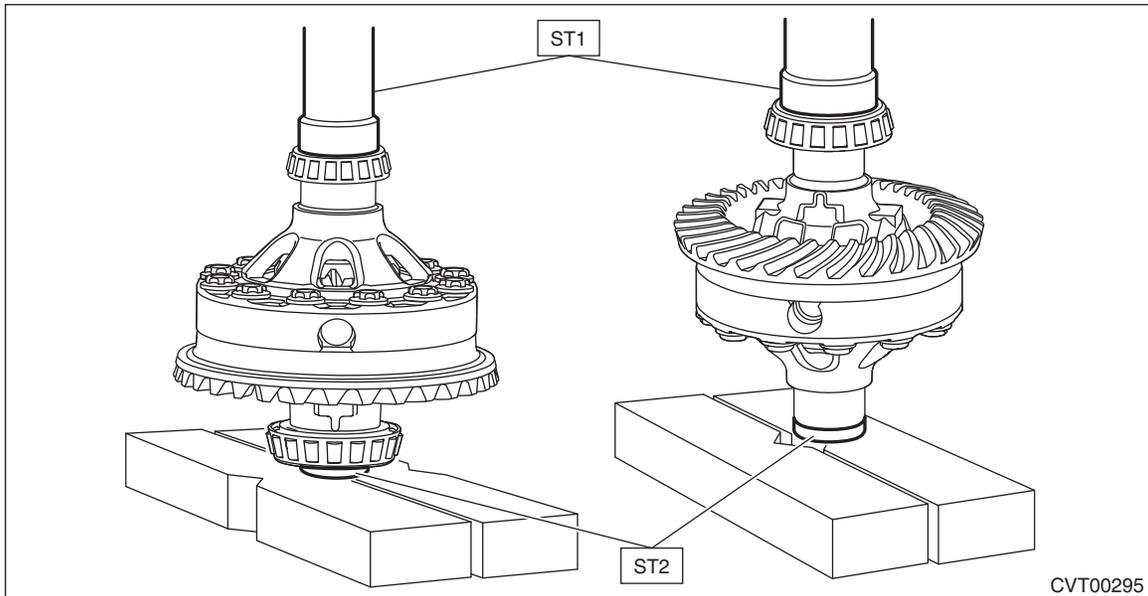
(3) If the backlash is not within specification, select a washer from the table below and replace.

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



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.

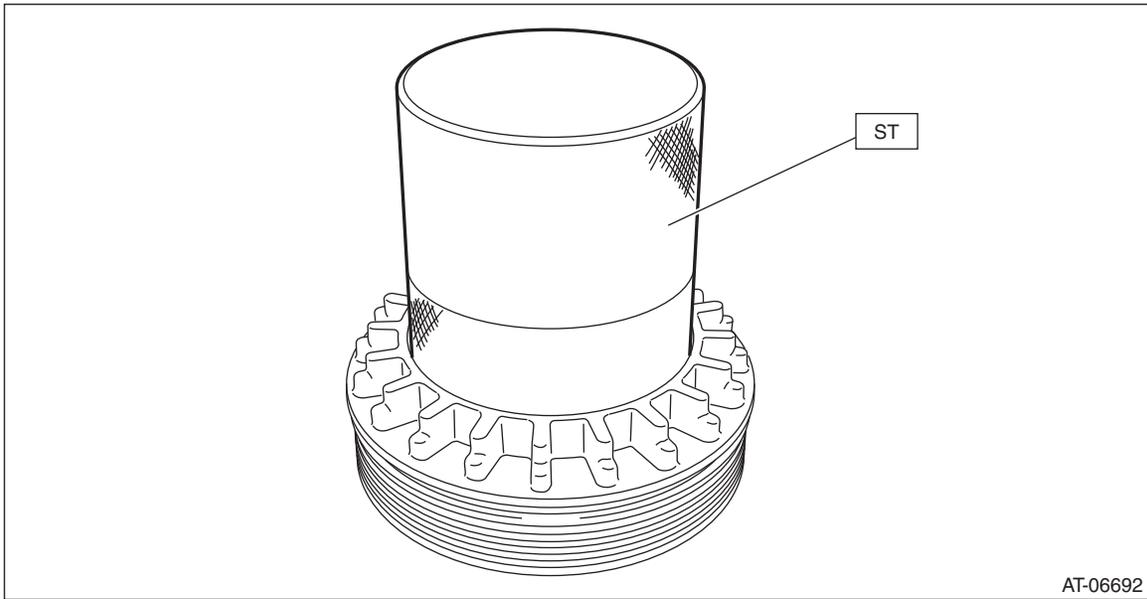
NOTE:

- Use a new oil seal.
- Apply differential gear oil to the oil seal lip and press-fitting surface.

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

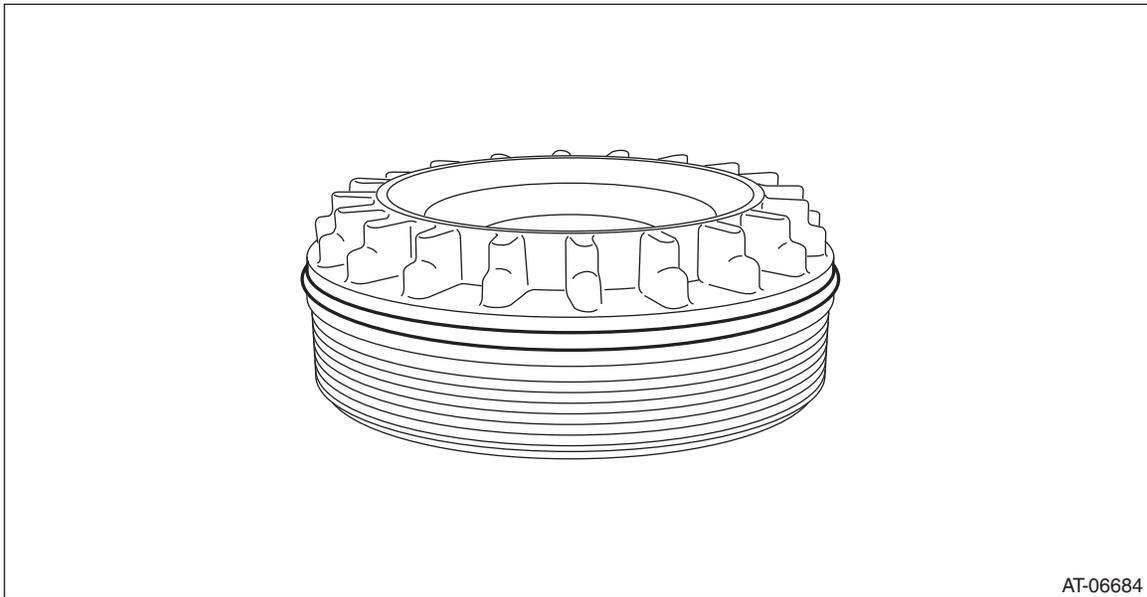
- Oil seal has an identification mark (R, L). When installing oil seals, do not confuse the left and right.
- ST 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER



2) Install the O-rings.

NOTE:

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



E: INSPECTION

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

ST1 498247001 MAGNET BASE

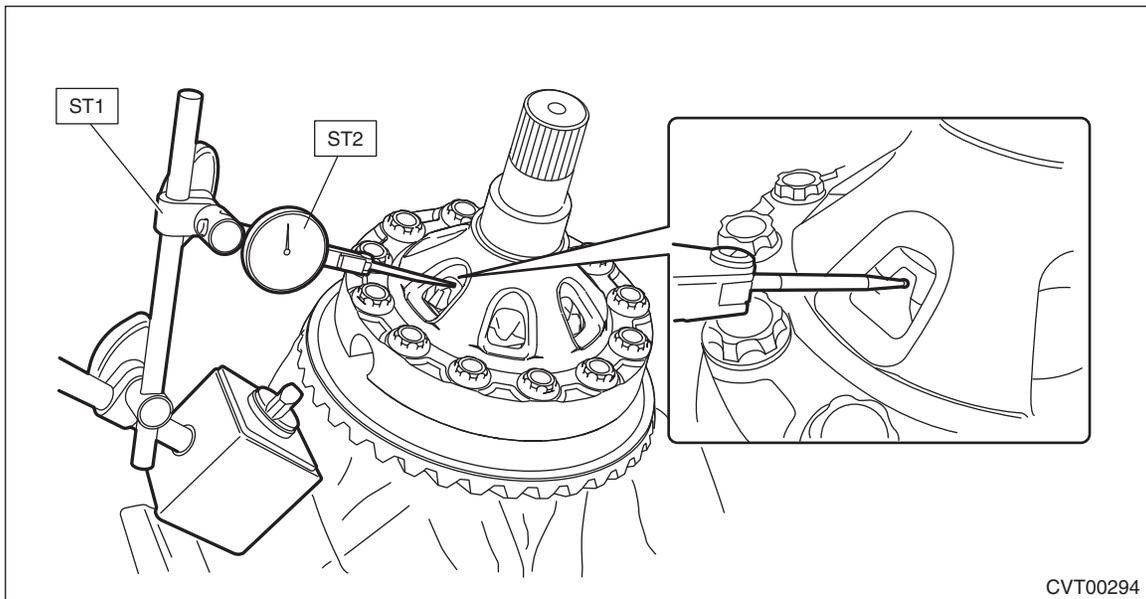
ST2 498247100 DIAL GAUGE

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Specification:

0.13 — 0.18 mm (0.0051 — 0.0071 in)



- Measure the hypoid gear backlash, and then adjust it to be within specification. <Ref. to CVT(TR580)-368, ADJUSTMENT, Front Differential Assembly.>

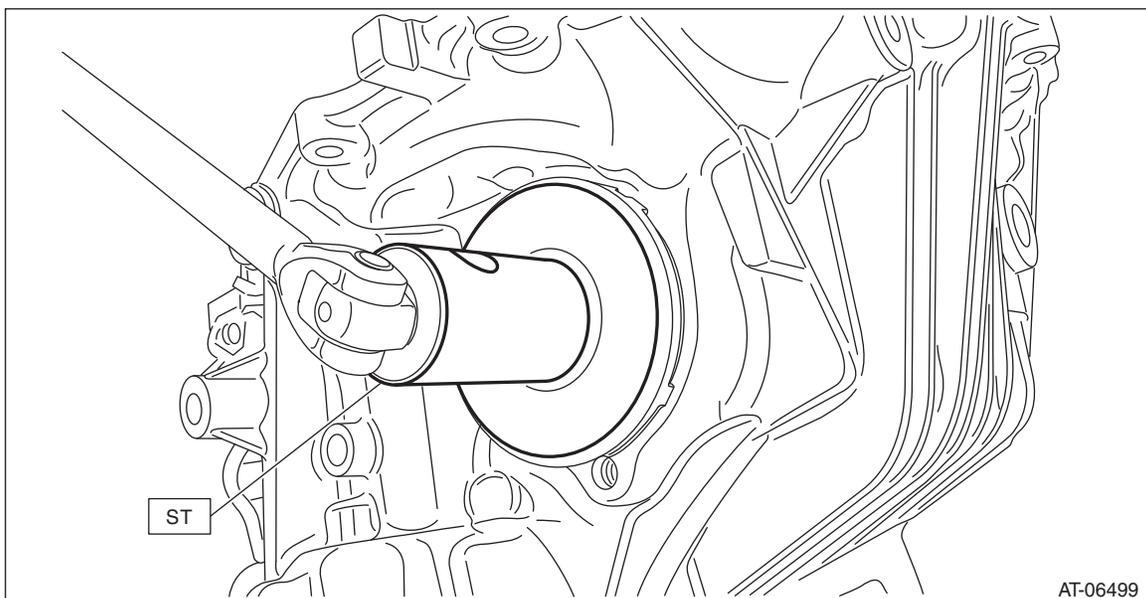
F: ADJUSTMENT

- 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:

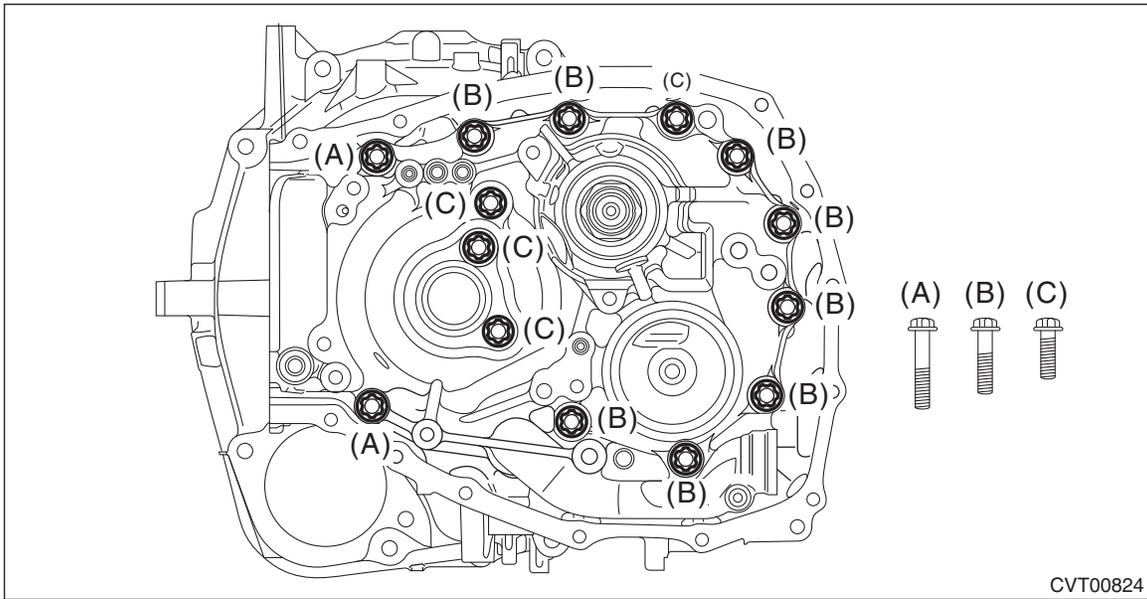
Do not confuse the three different-length bolts when installing.

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

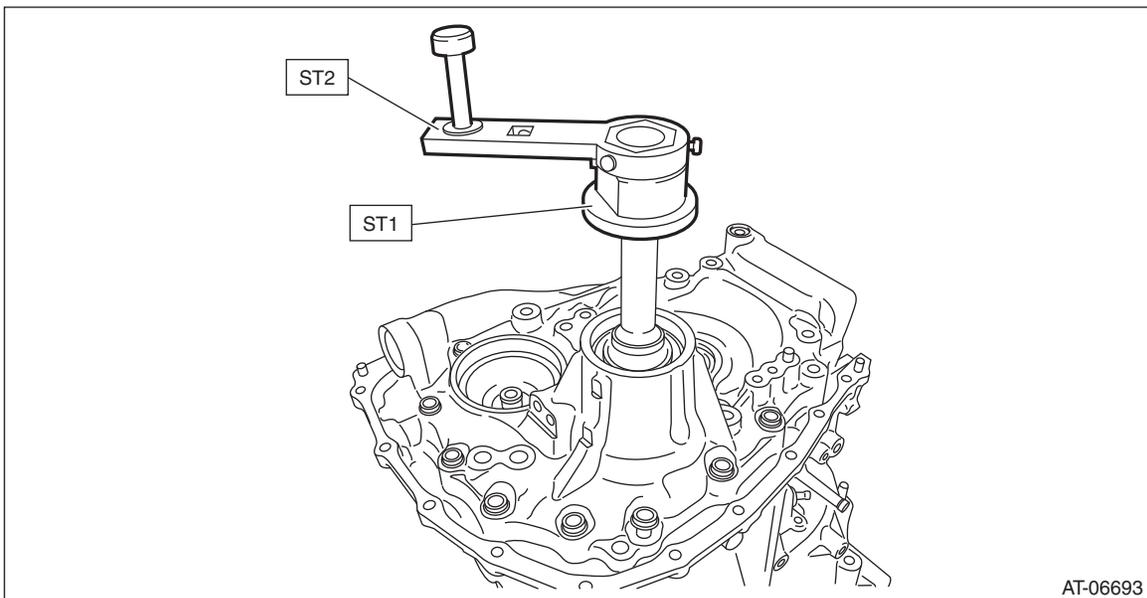
43 N·m (4.4 kgf·m, 31.7 ft·lb)



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

ST1 498937110 HOLDER

ST2 499787700 WRENCH

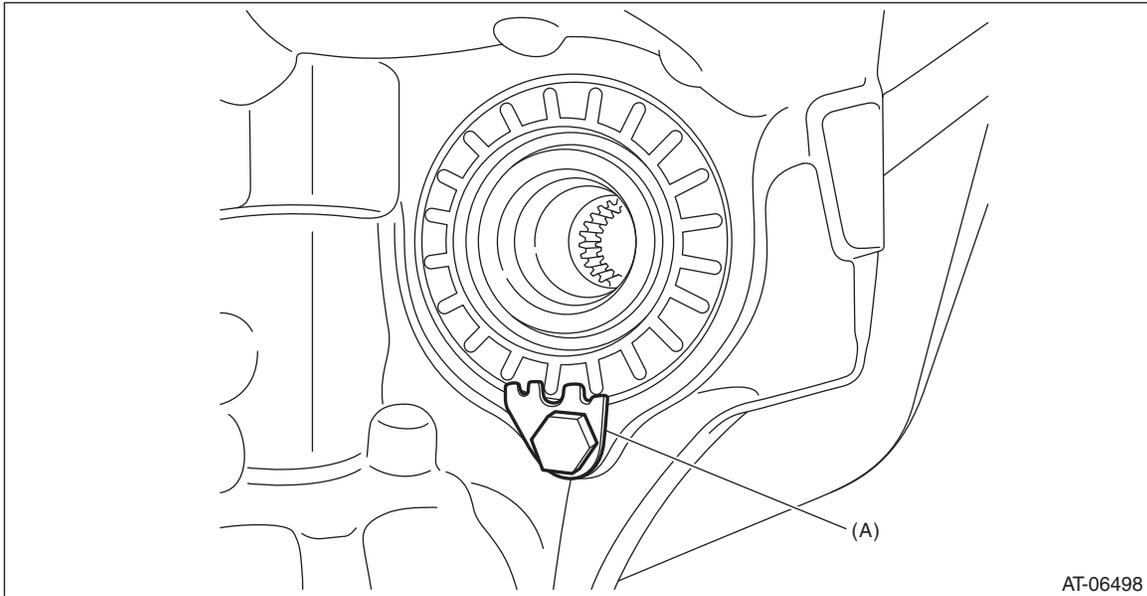


5) While rotating the pinion shaft, tighten the retainer LH and loosen the retainer RH until the shaft can't be turned anymore. The backlash is "zero" when the pinion shaft comes to the point where it doesn't rotate.

Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

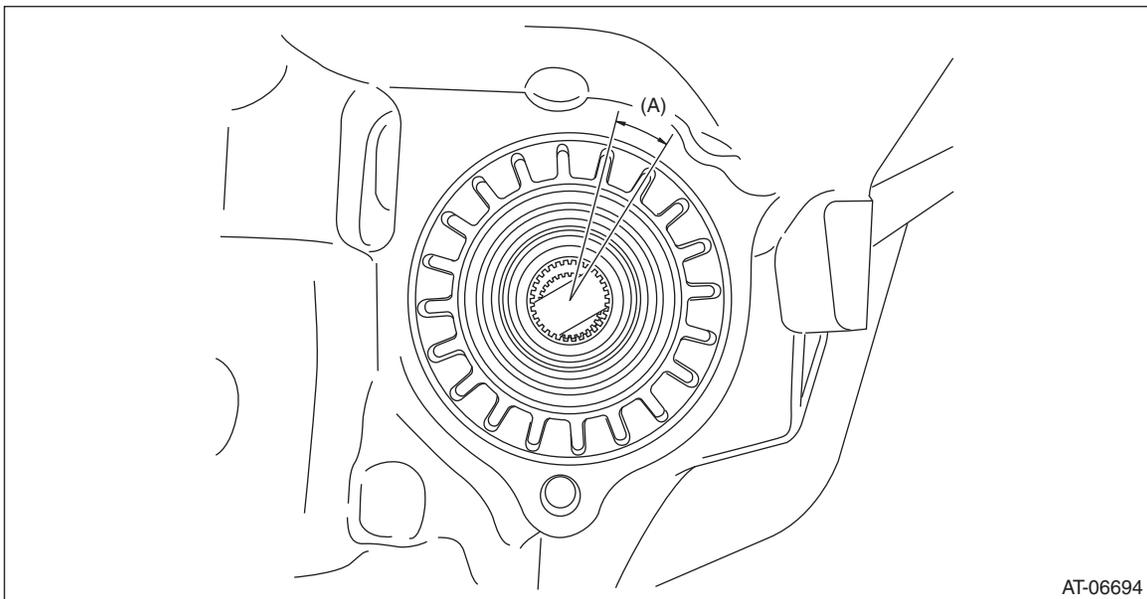
6) After the “zero” state is established, loosen the retainer LH by 3 notches and secure it with the lock plate. Retighten the retainer RH until it stops. Rotate the drive pinion 2 or 3 times. Tighten the retainer RH further 1-3/4 notches. This sets the preload. Finally, secure the retainer with its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



(A) Lock plate

NOTE:

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



(A) 1 tooth

7) Insert the two SUBARU genuine axle shafts into differential case.
Part No. 38415AA070Axle shaft

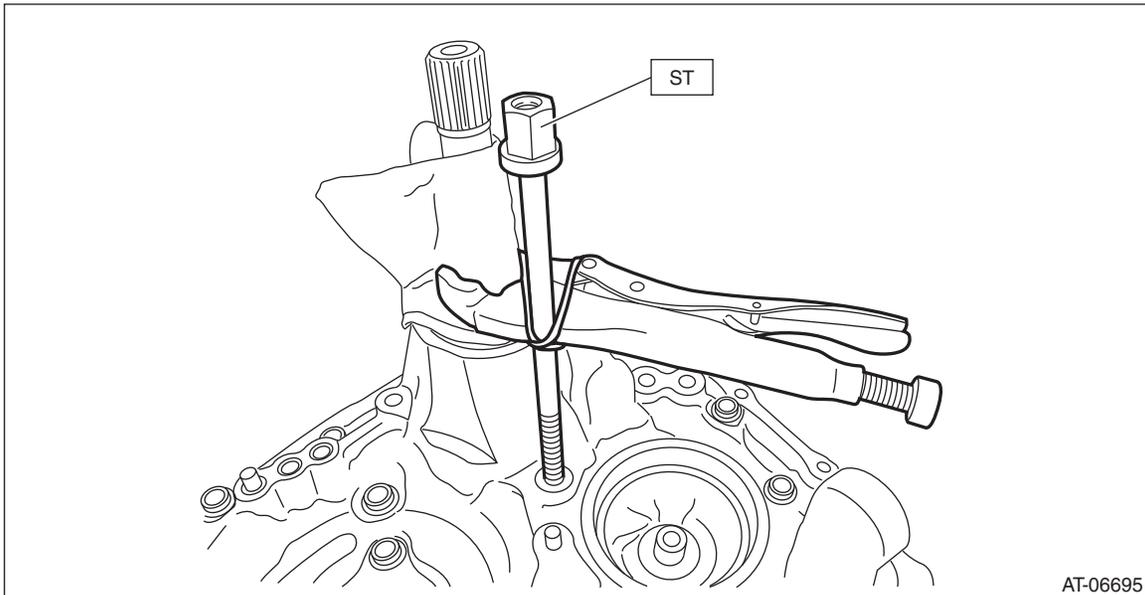
Front Differential Assembly

CONTINUOUSLY VARIABLE TRANSMISSION

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



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

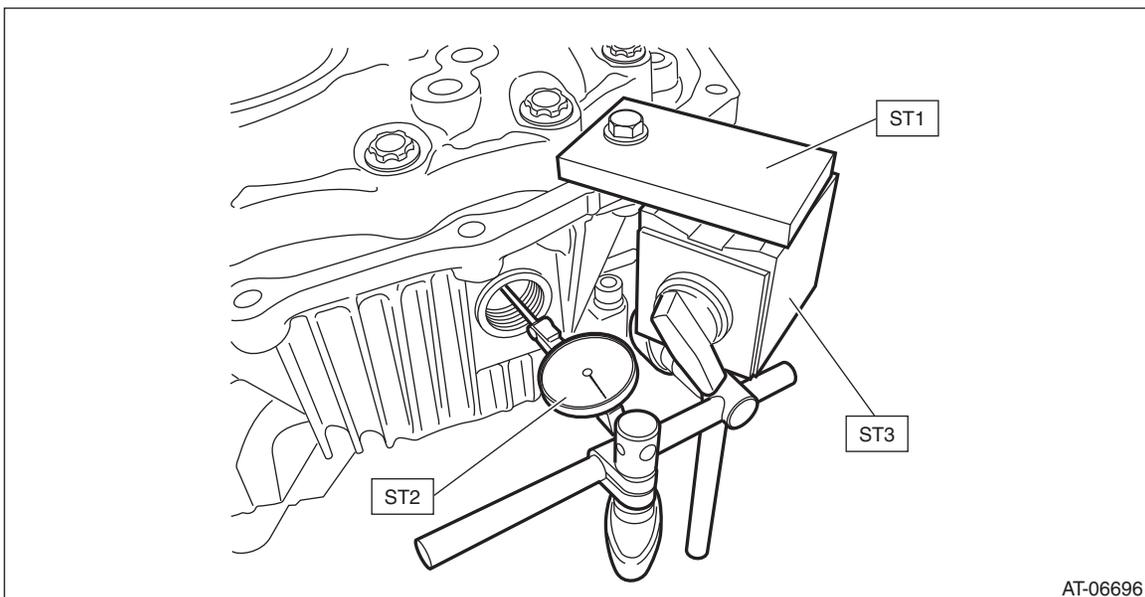
ST1 498255400 PLATE

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(TR580)-345, ADJUSTMENT, Drive Pinion Shaft Assembly.>

Oil Pump Chain

CONTINUOUSLY VARIABLE TRANSMISSION

47.Oil Pump Chain

A: REMOVAL

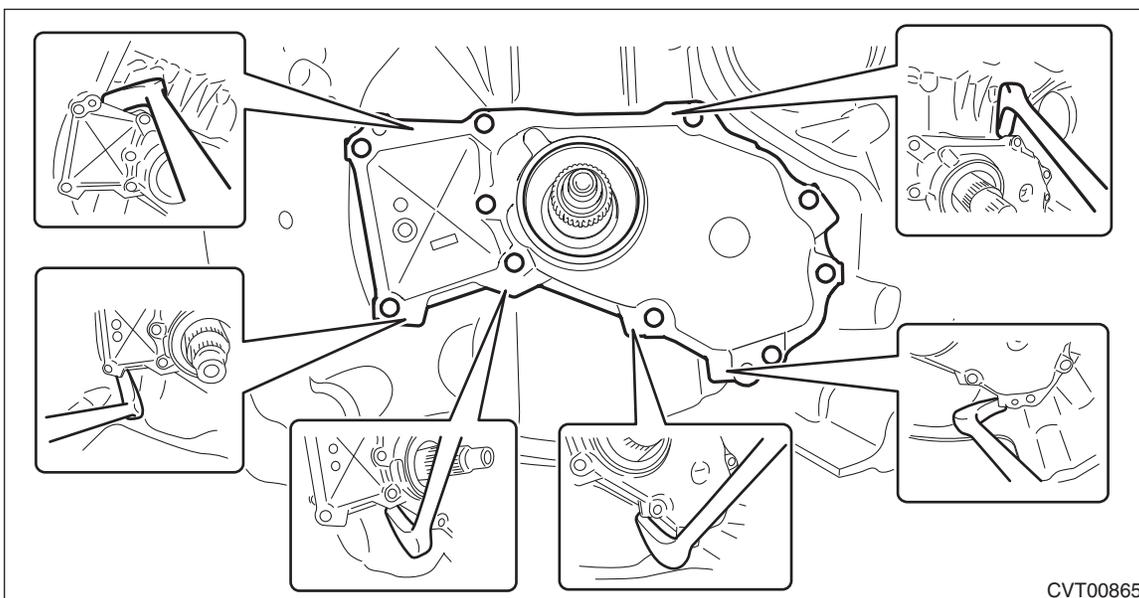
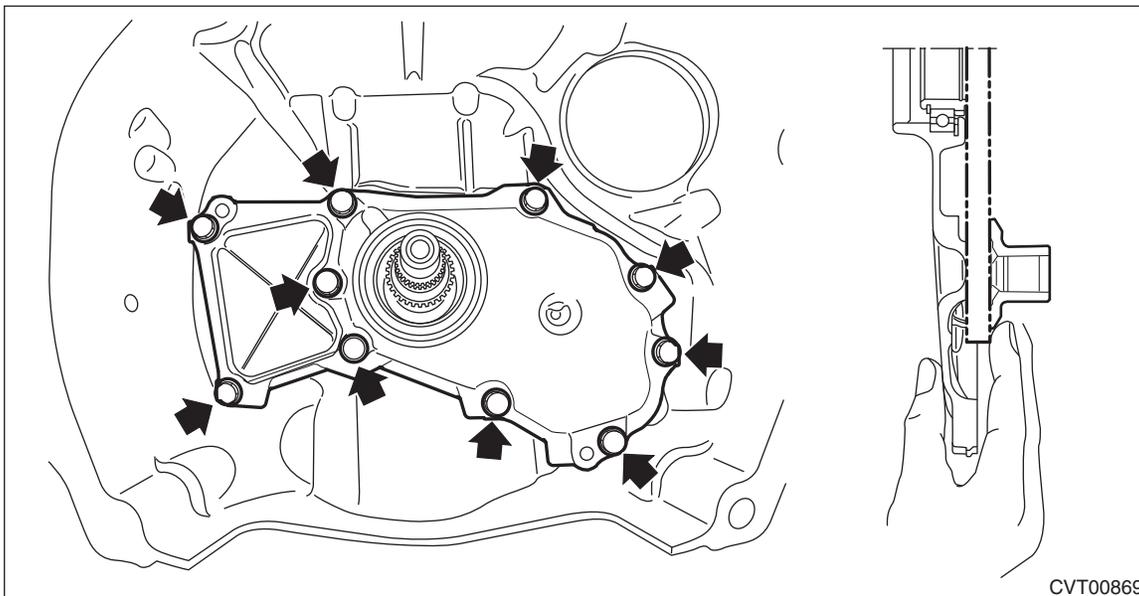
1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>

2) Remove the torque converter assembly. <Ref. to CVT(TR580)-202, REMOVAL, Torque Converter Assembly.>

3) Remove the oil pump chain cover.

NOTE:

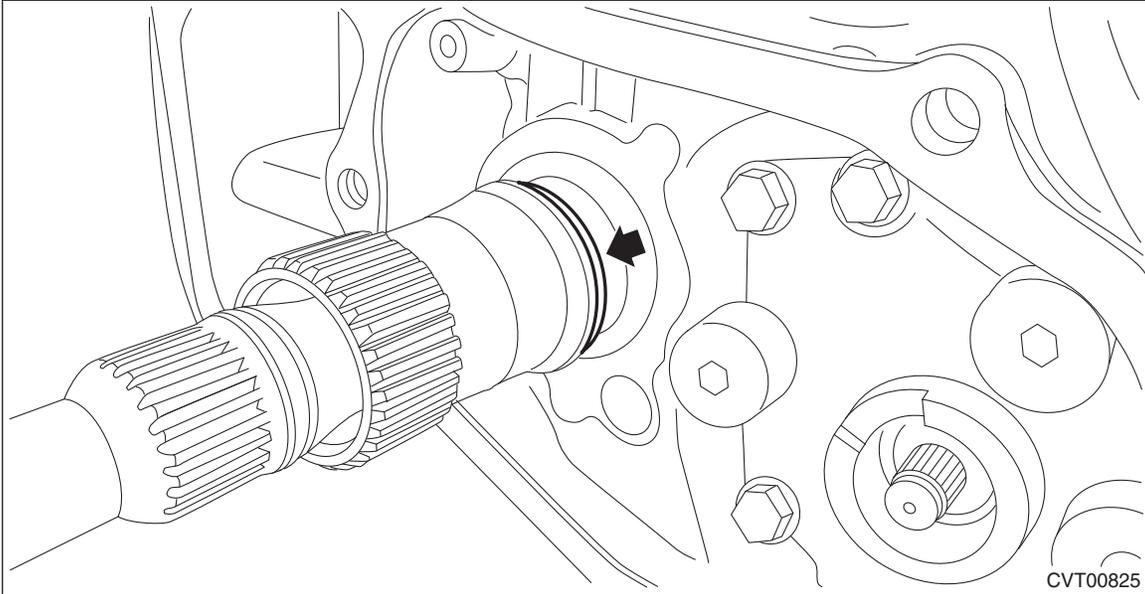
Oil pump chain cover may be hard to remove because the driven sprocket is installed to the shaft side of the oil pump. Do not remove it forcibly. Remove it while holding the driven sprocket by hand.



Oil Pump Chain

CONTINUOUSLY VARIABLE TRANSMISSION

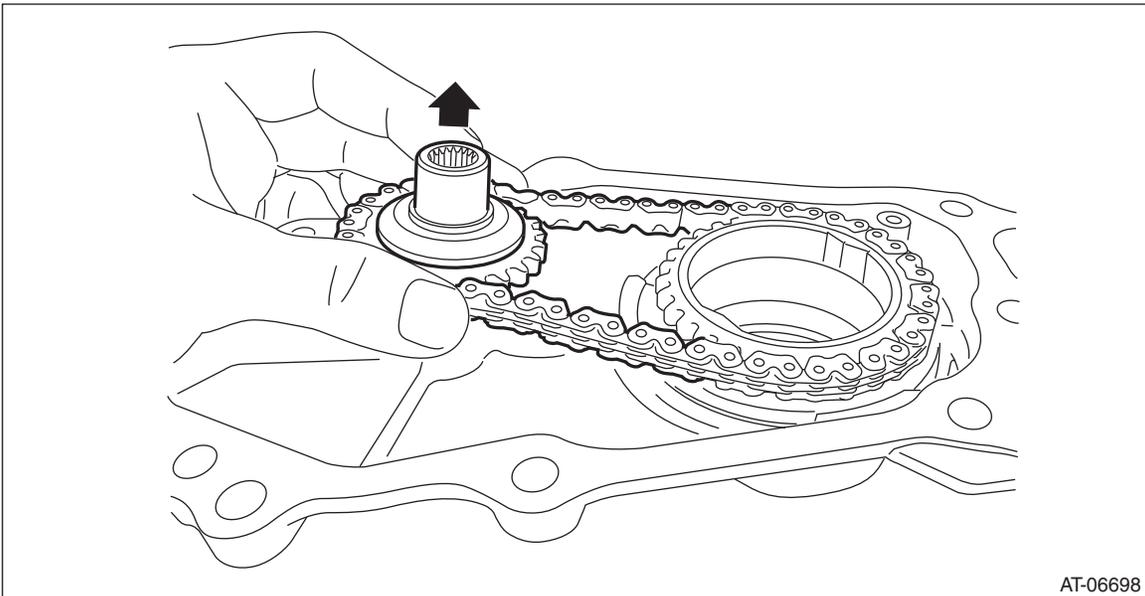
4) Remove the seal rings.



5) Remove the driven sprocket from oil pump chain cover to remove the oil pump chain.

NOTE:

- The driven sprocket is replaced as an assembly only, because it is a non-disassembly part.
- If the ball bearing is removed from the driven sprocket, replace with a new part.

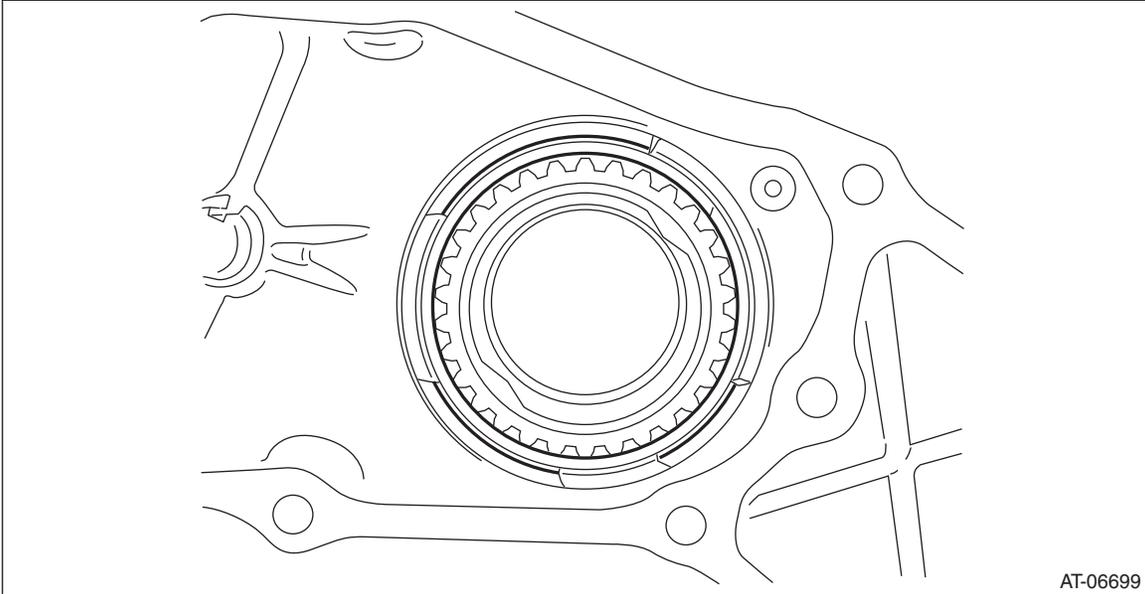


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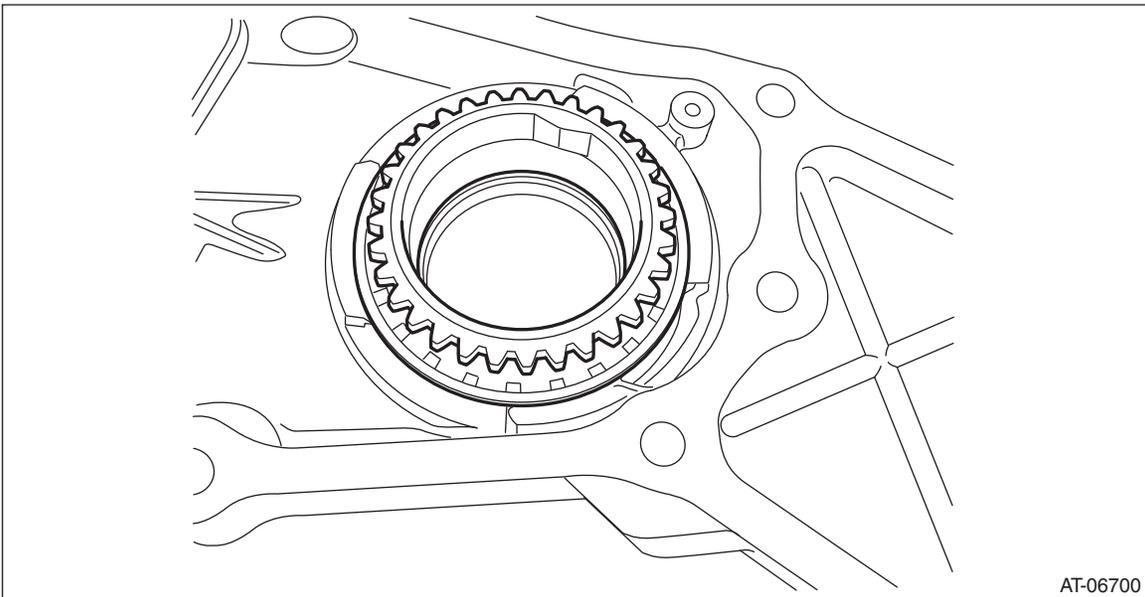
Oil Pump Chain

CONTINUOUSLY VARIABLE TRANSMISSION

6) Remove the snap ring.



7) Remove the drive sprocket.

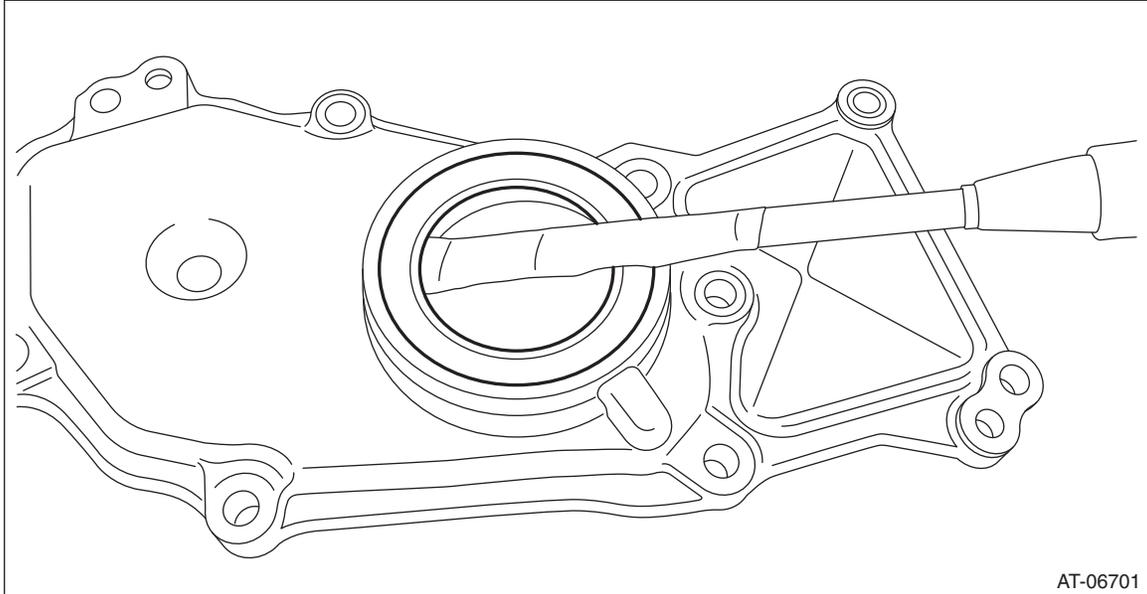


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Oil Pump Chain

CONTINUOUSLY VARIABLE TRANSMISSION

8) Remove the oil seal from the oil pump chain cover.



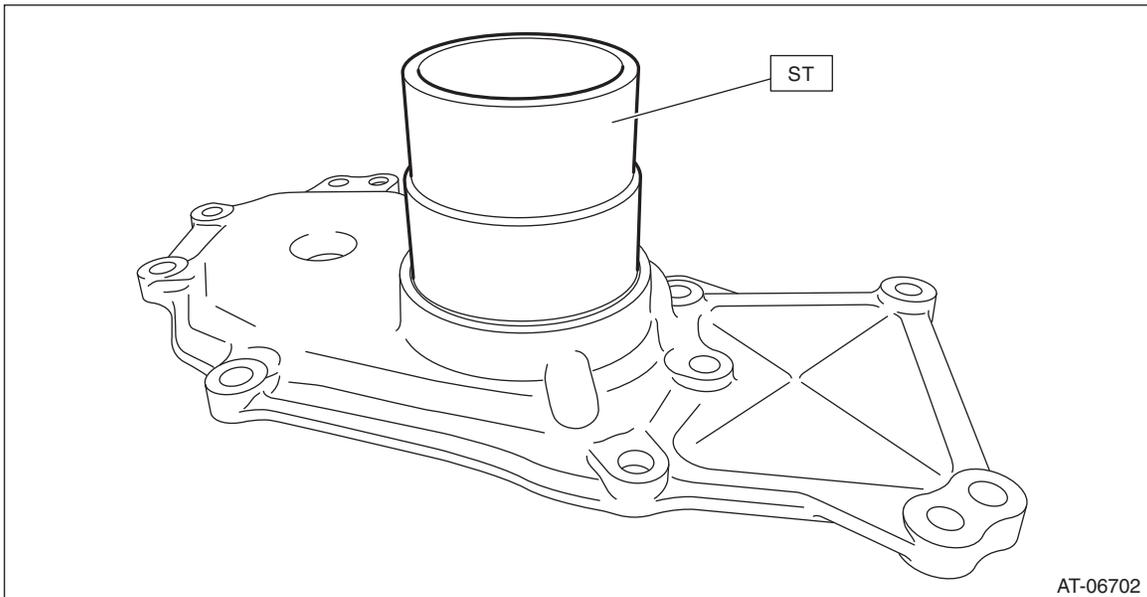
B: INSTALLATION

- 1) Clean the mating surface of oil pump chain cover and converter case.
- 2) Using the ST, install the oil seal.

NOTE:

- Use a new oil seal.
- Apply CVTF to the oil seal lip and press-fitting surface.

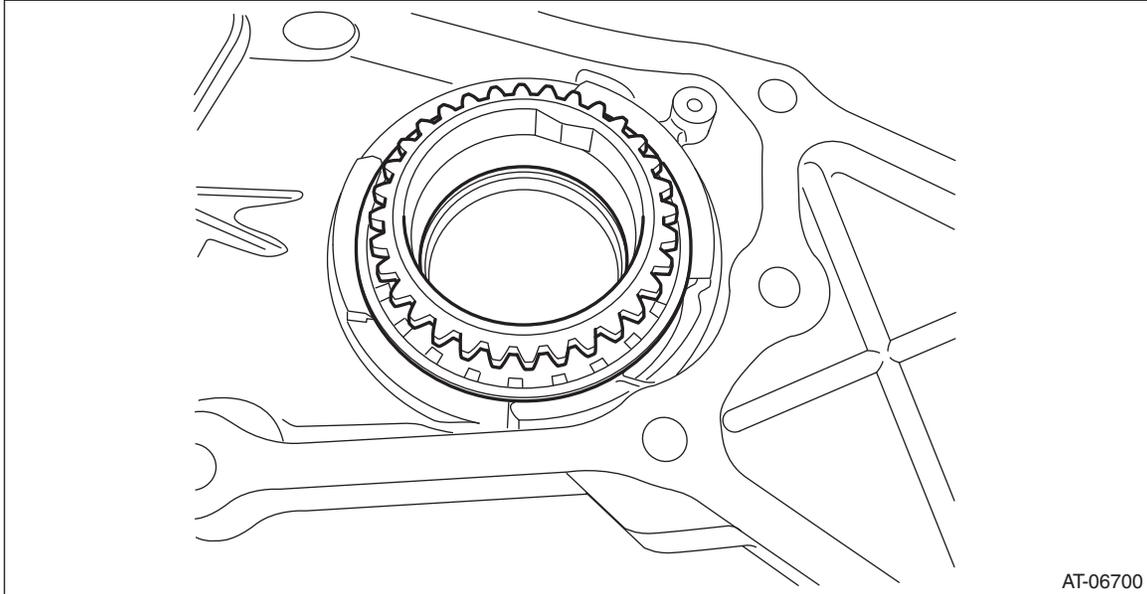
ST 499755602 PRESS SNAP RING



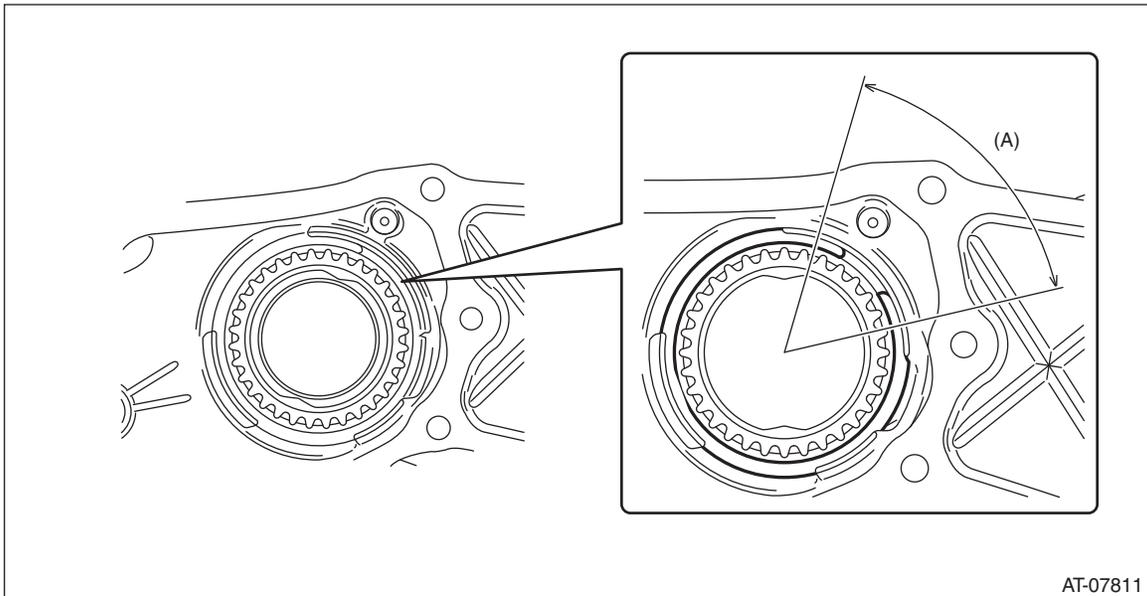
Oil Pump Chain

CONTINUOUSLY VARIABLE TRANSMISSION

3) Install the drive sprocket.



4) Install the snap ring so that its cutout portion is securely fitted into the snap ring groove of the oil pump chain cover.



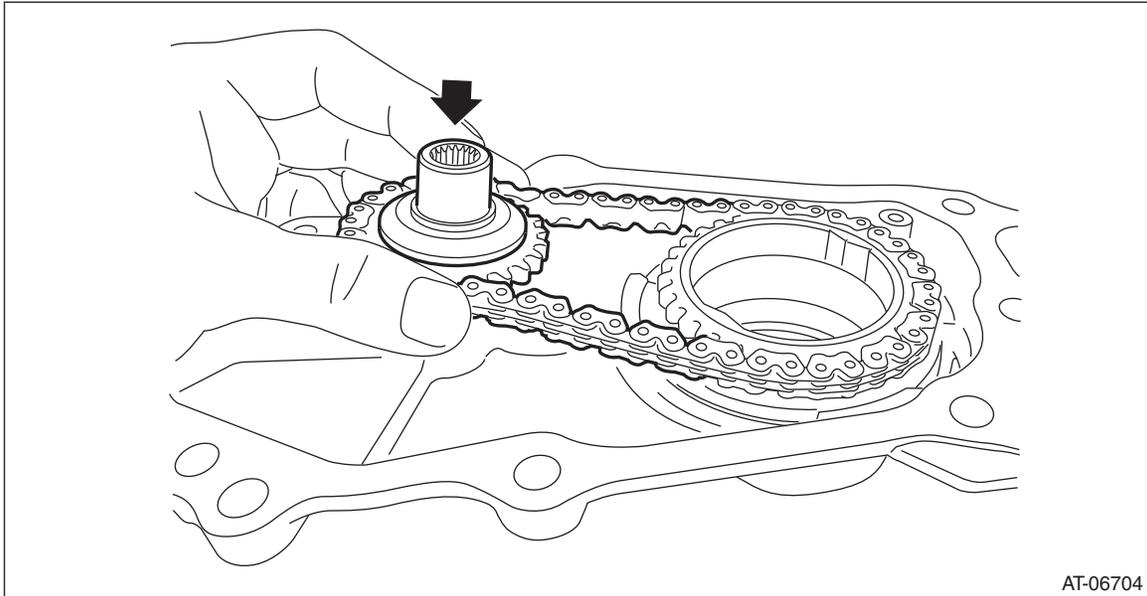
(A) Installation range of cutout portion for snap ring

5) Place the oil pump chain on drive sprocket.

Oil Pump Chain

CONTINUOUSLY VARIABLE TRANSMISSION

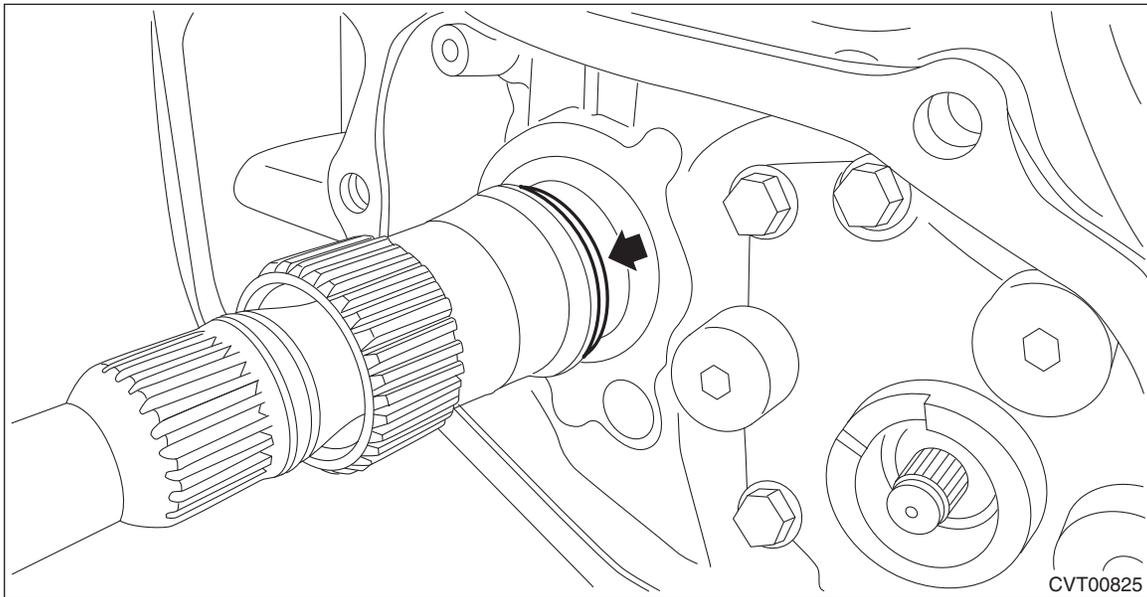
6) Place the oil pump chain on driven sprocket and install the driven sprocket to oil pump chain cover.



7) Install the seal rings.

NOTE:

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



8) Apply liquid gasket seamlessly to the mating surface of oil pump chain cover.

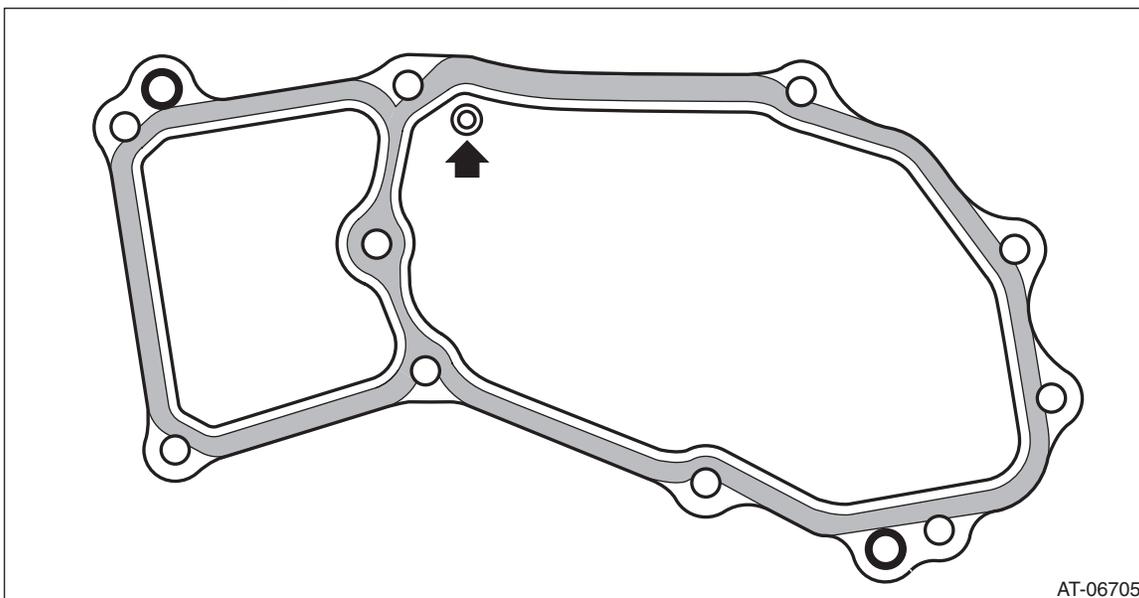
CAUTION:

Do not apply liquid gasket at the arrowed hole.

Oil Pump Chain

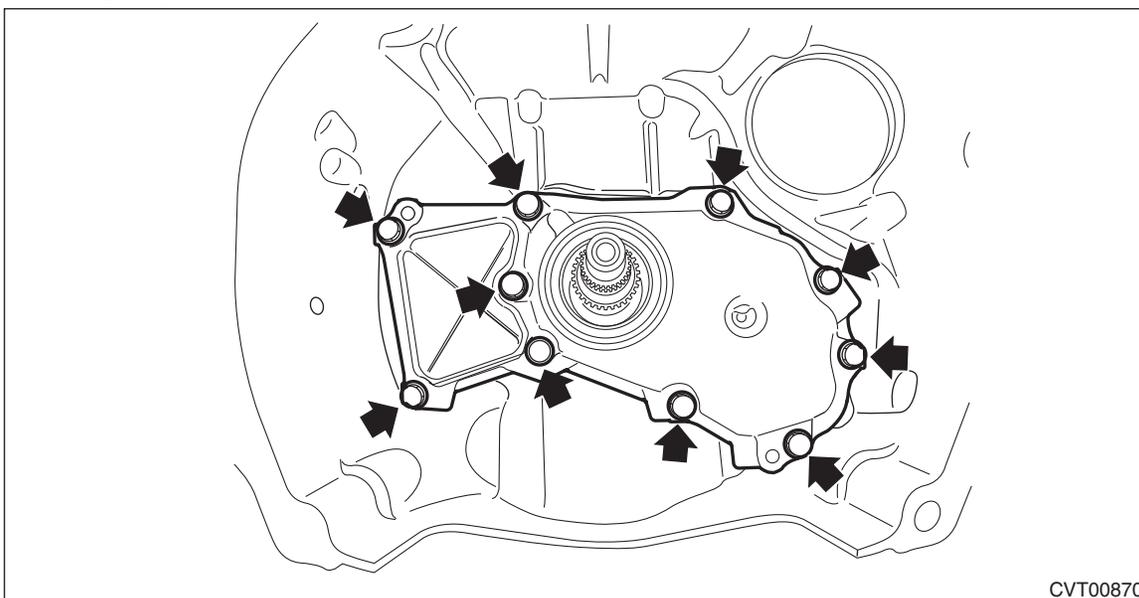
CONTINUOUSLY VARIABLE TRANSMISSION

Liquid gasket:
THREE BOND 1215B or equivalent



9) Install the oil pump chain cover.

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



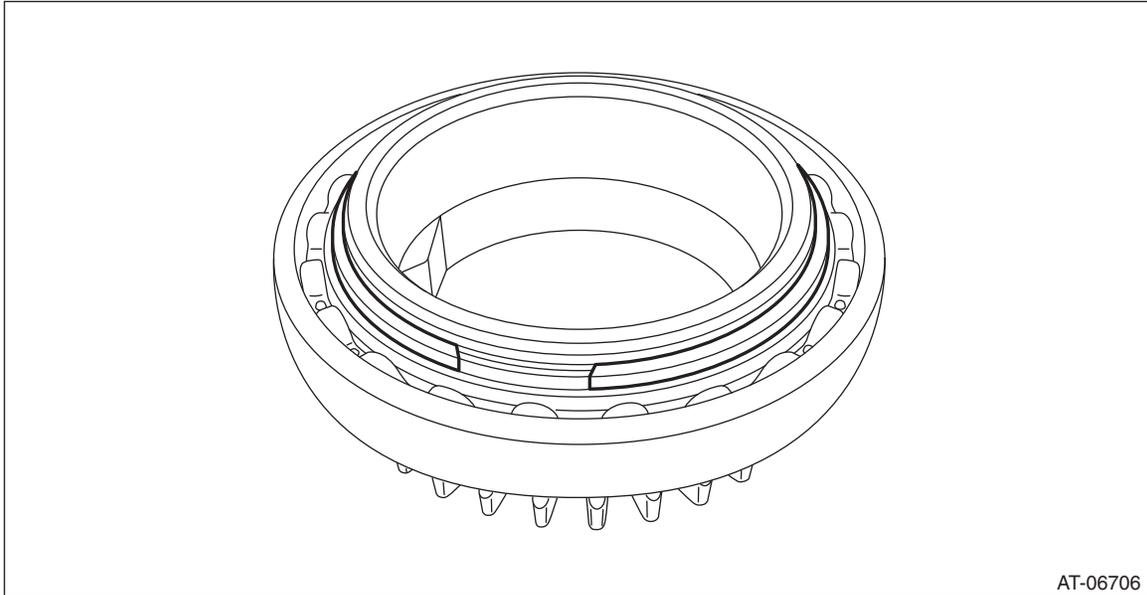
10) Install the torque converter assembly. <Ref. to CVT(TR580)-202, INSTALLATION, Torque Converter Assembly.>

11) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: DISASSEMBLY

1. DRIVE SPROCKET

1) Remove the snap ring.

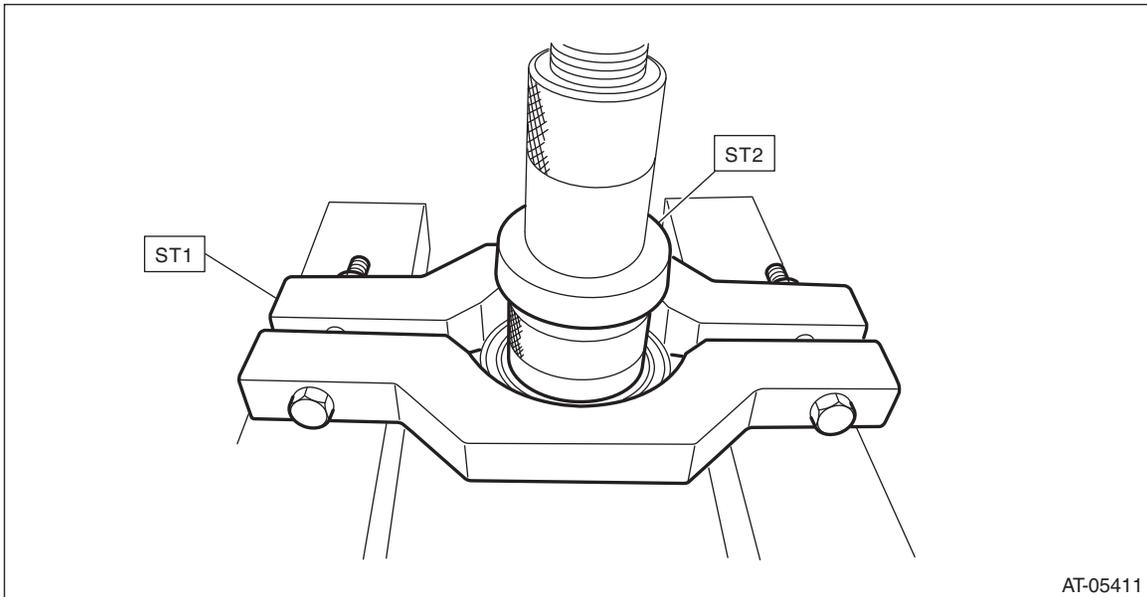


AT-06706

2) Remove the ball bearing using ST.

ST1 498077600 REMOVER

ST2 399513600 INSTALLER



AT-05411

D: ASSEMBLY

1. DRIVE SPROCKET

1) Using the ST, install the ball bearing.

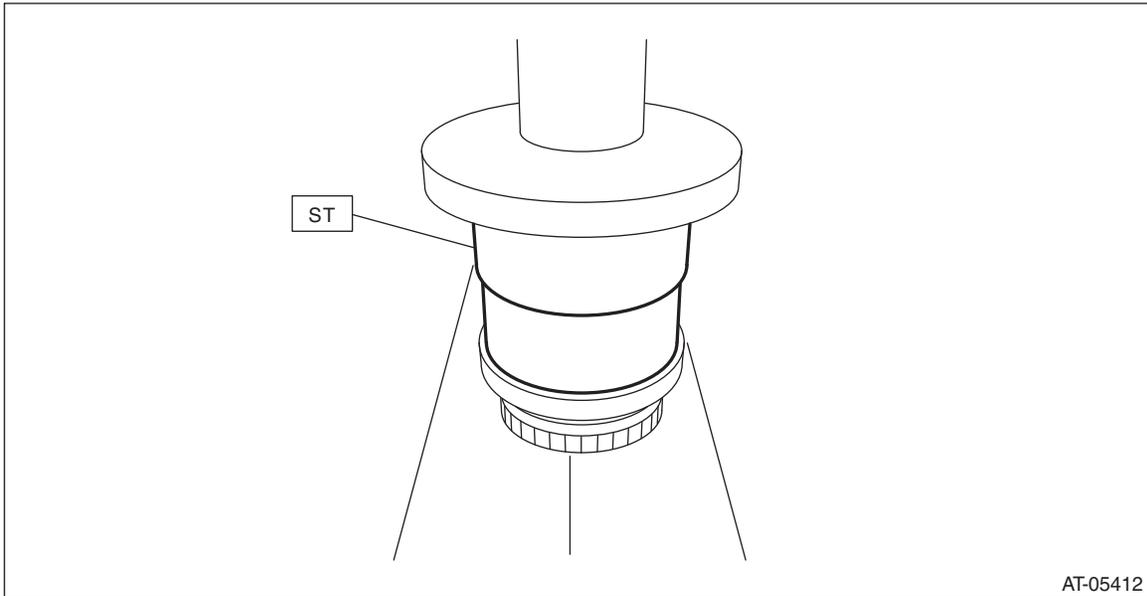
Oil Pump Chain

CONTINUOUSLY VARIABLE TRANSMISSION

NOTE:

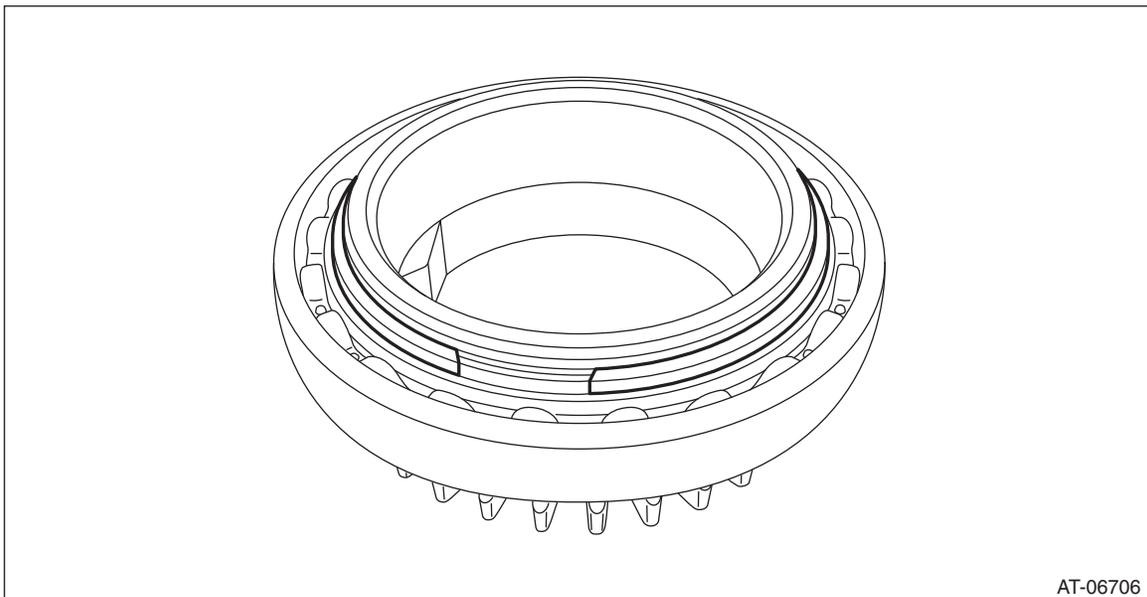
Use a new ball bearing.

ST 499755502 PRESS SNAP RING



AT-05412

2) Install the snap ring.



AT-06706

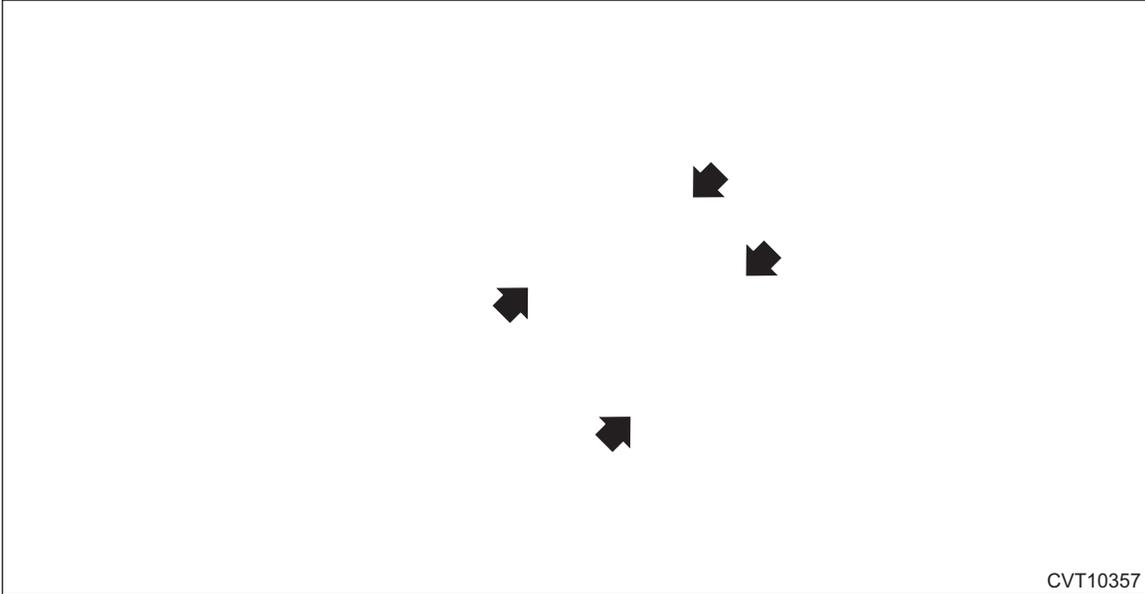
E: INSPECTION

- Check the oil pump chain for damage.
- Replace if gear teeth are broken, damaged, sharpen or excessively worn.
- Check the bearing for seizure or wear.
- Apply CVTF to bearing and rotate the bearing to check for noise or dragging etc.
- Check the oil pump chain cover for damage.
- Check for leakage of CVTF from the mating surface of oil pump chain cover.
- Check the oil seal for damage.

48.Oil Pump

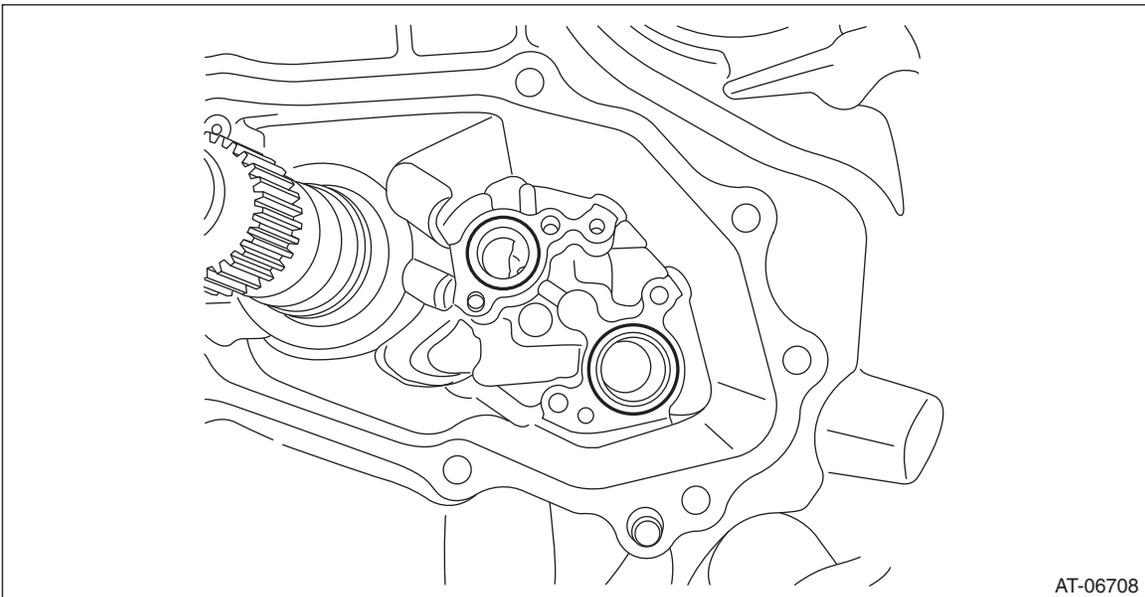
A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the torque converter assembly. <Ref. to CVT(TR580)-202, REMOVAL, Torque Converter Assembly.>
- 3) Remove the oil pump chain cover. <Ref. to CVT(TR580)-372, REMOVAL, Oil Pump Chain.>
- 4) Remove the oil pump and the plate.



CVT10357

- 5) Remove the O-rings.



AT-06708

B: INSTALLATION

- 1) Install the O-rings.

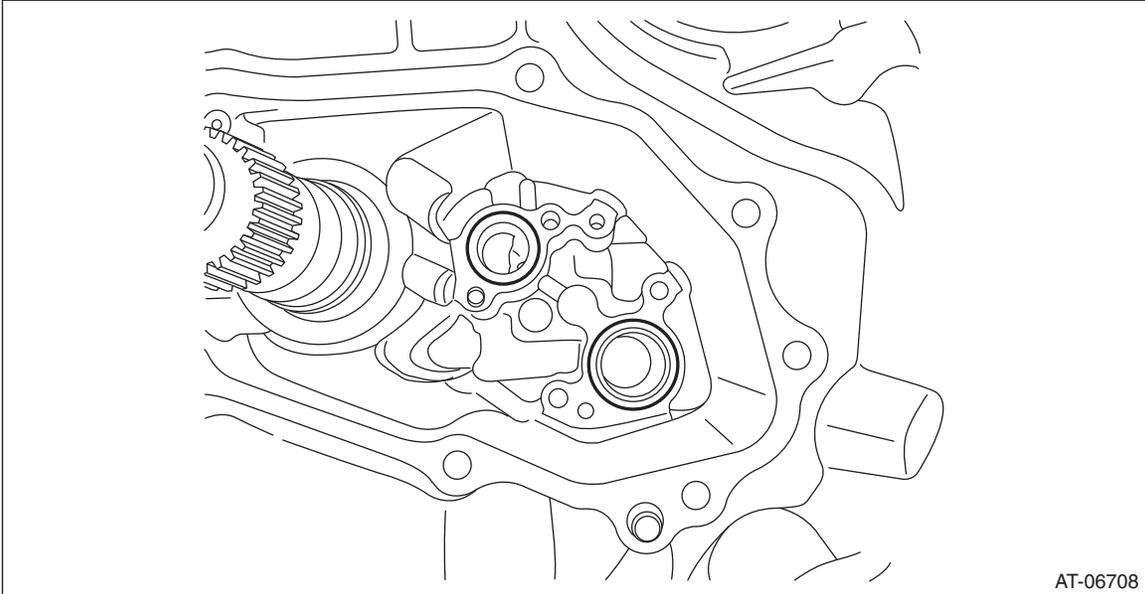
NOTE:

- Use new O-rings.

Oil Pump

CONTINUOUSLY VARIABLE TRANSMISSION

- Apply CVTF to the O-rings.



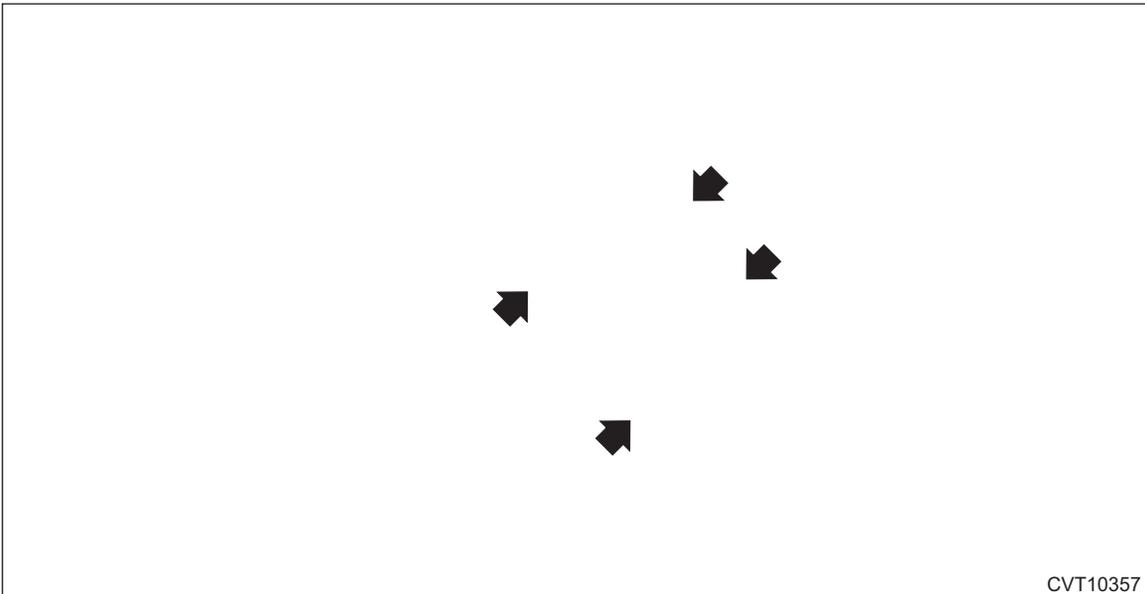
2) Install the plate and the oil pump.

NOTE:

Apply CVTF to the bolt.

Tightening torque:

8.5 N·m (0.9 kgf-m, 6.3 ft-lb)



3) Install the oil pump chain cover. <Ref. to CVT(TR580)-375, INSTALLATION, Oil Pump Chain.>

4) Install the torque converter assembly. <Ref. to CVT(TR580)-202, INSTALLATION, Torque Converter Assembly.>

5) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: INSPECTION

Check the following items.

- Check the oil pump for damage and wear.
- Rotate the oil pump by hand, and check that it rotates smoothly.

Oil Pump

CONTINUOUSLY VARIABLE TRANSMISSION

- 1) Measure the secondary pressure. <Ref. to CVT(TR580)-52, INSPECTION, Secondary Pressure (Line Pressure) Test.>
 - 2) Remove the oil pan and oil strainer. <Ref. to CVT(TR580)-135, REMOVAL, Oil Pan and Strainer.>
 - 3) Check oil strainer for clogging.
- When oil strainer has no clogging, replace the oil pump.

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Converter Case

CONTINUOUSLY VARIABLE TRANSMISSION

49. Converter Case

A: REMOVAL

- 1) Remove the transmission assembly. <Ref. to CVT(TR580)-64, REMOVAL, Automatic Transmission Assembly.>
- 2) Remove the air breather hose. <Ref. to CVT(TR580)-196, REMOVAL, Air Breather Hose.>
- 3) Remove the control valve body. <Ref. to CVT(TR580)-138, REMOVAL, Control Valve Body.>
- 4) Remove the transmission harness. <Ref. to CVT(TR580)-152, REMOVAL, Transmission Harness.>
- 5) Remove the turbine speed sensor. <Ref. to CVT(TR580)-118, REMOVAL, Turbine Speed Sensor.>
- 6) Remove the secondary speed sensor. <Ref. to CVT(TR580)-123, REMOVAL, Secondary Speed Sensor.>
- 7) Remove the primary speed sensor. <Ref. to CVT(TR580)-128, REMOVAL, Primary Speed Sensor.>
- 8) Remove the inhibitor switch. <Ref. to CVT(TR580)-112, REMOVAL, Inhibitor Switch.>
- 9) Remove the extension case. <Ref. to CVT(TR580)-206, REMOVAL, Extension Case.>
- 10) Remove the transfer clutch assembly. <Ref. to CVT(TR580)-210, REMOVAL, Transfer Clutch.>
- 11) Remove the transfer driven gear assembly. <Ref. to CVT(TR580)-224, REMOVAL, Transfer Driven Gear.>
- 12) Remove the parking pawl. <Ref. to CVT(TR580)-227, REMOVAL, Parking Pawl.>
- 13) Remove the reduction driven gear assembly. <Ref. to CVT(TR580)-229, REMOVAL, Reduction Driven Gear.>
- 14) Remove the oil pan and oil strainer. <Ref. to CVT(TR580)-135, REMOVAL, Oil Pan and Strainer.>
- 15) Remove the transmission control device. <Ref. to CVT(TR580)-236, REMOVAL, Transmission Control Device.>
- 16) Remove the transmission case. <Ref. to CVT(TR580)-242, REMOVAL, Transmission Case.>
- 17) Remove the reduction drive gear. <Ref. to CVT(TR580)-261, REMOVAL, Reduction Drive Gear.>
- 18) Remove the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TR580)-266, REMOVAL, Primary Pulley and Secondary Pulley.>
- 19) Remove the reverse brake assembly. <Ref. to CVT(TR580)-285, REMOVAL, Reverse Brake Assembly.>
- 20) Remove the forward clutch assembly. <Ref. to CVT(TR580)-300, REMOVAL, Forward Clutch Assembly.>
- 21) Remove the drive pinion shaft assembly. <Ref. to CVT(TR580)-320, REMOVAL, Drive Pinion Shaft Assembly.>
- 22) Remove the front differential assembly. <Ref. to CVT(TR580)-353, REMOVAL, Front Differential Assembly.>
- 23) Remove the oil pump chain cover. <Ref. to CVT(TR580)-372, REMOVAL, Oil Pump Chain.>
- 24) Remove the oil pump. <Ref. to CVT(TR580)-381, REMOVAL, Oil Pump.>

B: INSTALLATION

- 1) Install the oil pump. <Ref. to CVT(TR580)-381, INSTALLATION, Oil Pump.>
- 2) Install the oil pump chain cover. <Ref. to CVT(TR580)-375, INSTALLATION, Oil Pump Chain.>
- 3) Install the front differential assembly. <Ref. to CVT(TR580)-355, INSTALLATION, Front Differential Assembly.>
- 4) Install the drive pinion shaft assembly. <Ref. to CVT(TR580)-321, INSTALLATION, Drive Pinion Shaft Assembly.>
- 5) Install the forward clutch assembly. <Ref. to CVT(TR580)-303, INSTALLATION, Forward Clutch Assembly.>
- 6) Install the reverse brake assembly. <Ref. to CVT(TR580)-287, INSTALLATION, Reverse Brake Assembly.>
- 7) Install the primary pulley, secondary pulley and variator chain. <Ref. to CVT(TR580)-272, INSTALLATION, Primary Pulley and Secondary Pulley.>
- 8) Install the reduction drive gear. <Ref. to CVT(TR580)-262, INSTALLATION, Reduction Drive Gear.>
- 9) Install the transmission case. <Ref. to CVT(TR580)-245, INSTALLATION, Transmission Case.>
- 10) Install the transmission control device. <Ref. to CVT(TR580)-238, INSTALLATION, Transmission Control Device.>
- 11) Install the oil strainer and oil pan. <Ref. to CVT(TR580)-136, INSTALLATION, Oil Pan and Strainer.>

CVT(TR580)-384

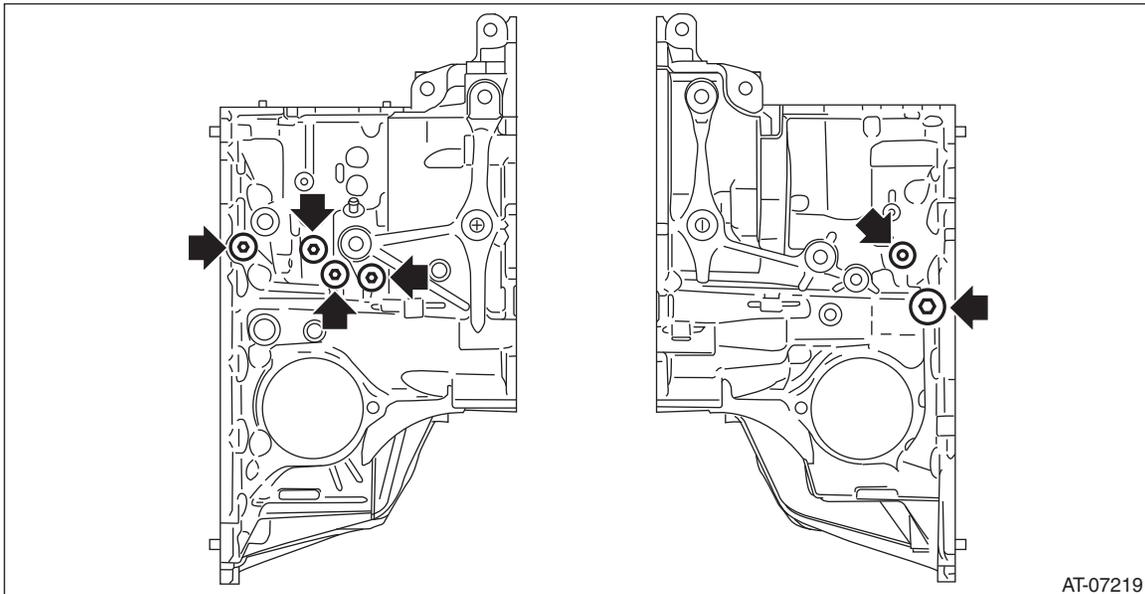
Converter Case

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- 12) Install the reduction driven gear assembly. <Ref. to CVT(TR580)-229, INSTALLATION, Reduction Driven Gear.>
- 13) Install the transfer driven gear assembly. <Ref. to CVT(TR580)-224, INSTALLATION, Transfer Driven Gear.>
- 14) Install the transfer clutch assembly. <Ref. to CVT(TR580)-211, INSTALLATION, Transfer Clutch.>
- 15) Install the parking pawl. <Ref. to CVT(TR580)-227, INSTALLATION, Parking Pawl.>
- 16) Install the extension case. <Ref. to CVT(TR580)-206, INSTALLATION, Extension Case.>
- 17) Install the inhibitor switch. <Ref. to CVT(TR580)-115, INSTALLATION, Inhibitor Switch.>
- 18) Install the secondary speed sensor. <Ref. to CVT(TR580)-123, INSTALLATION, Secondary Speed Sensor.>
- 19) Install the primary speed sensor. <Ref. to CVT(TR580)-128, INSTALLATION, Primary Speed Sensor.>
- 20) Install the turbine speed sensor. <Ref. to CVT(TR580)-118, INSTALLATION, Turbine Speed Sensor.>
- 21) Install the transmission harness. <Ref. to CVT(TR580)-155, INSTALLATION, Transmission Harness.>
- 22) Install the control valve body. <Ref. to CVT(TR580)-144, INSTALLATION, Control Valve Body.>
- 23) Install the air breather hose. <Ref. to CVT(TR580)-198, INSTALLATION, Air Breather Hose.>
- 24) Install the transmission assembly. <Ref. to CVT(TR580)-81, INSTALLATION, Automatic Transmission Assembly.>

C: DISASSEMBLY

- 1) Remove the transmission hanger and transmission radio ground cord, if mounted.
- 2) Remove the filler plug, oil drain plug and overflow drain plug. <Ref. to CVT(TR580)-44, REPLACEMENT, Differential Gear Oil.>
- 3) Remove all plugs.



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D: ASSEMBLY

- 1) Install the oil drain plug.

Tightening torque:

70 N·m (7.1 kgf·m, 51.6 ft·lb)

- 2) Install the overflow drain plug.

NOTE:

Overflow plug of differential gear oil is temporarily attached.

- 3) Install all plugs.

NOTE:

Use new O-rings.

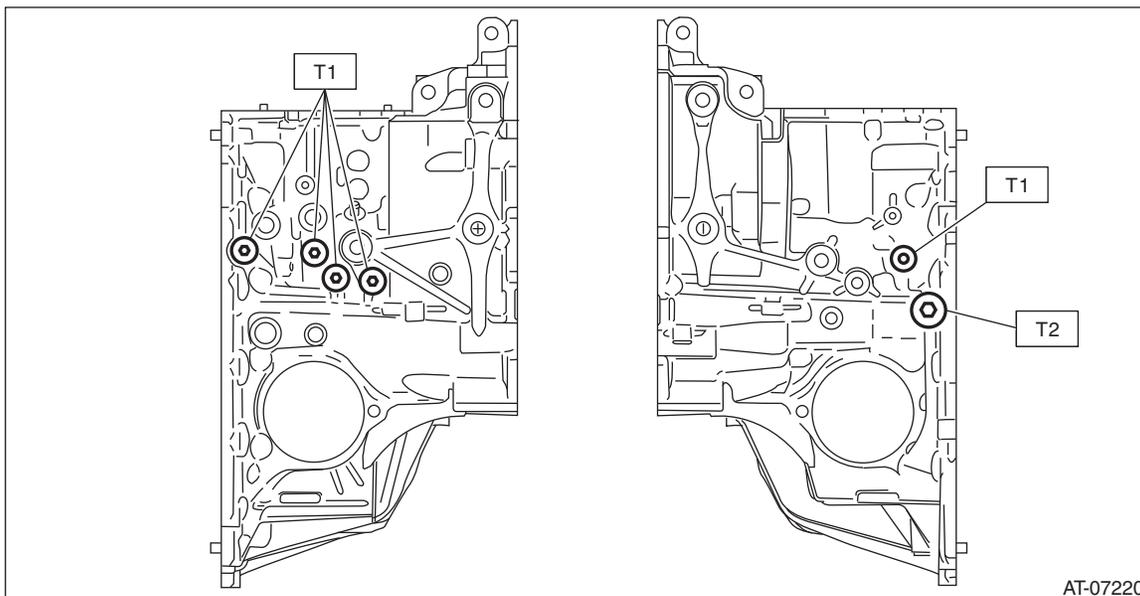
Converter Case

CONTINUOUSLY VARIABLE TRANSMISSION

Tightening torque:

T1: 22 N·m (2.2 kgf-m, 16.2 ft-lb)

T2: 22.5 N·m (2.3 kgf-m, 16.6 ft-lb)



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4) Install the transmission hanger and transmission radio ground cord.

CAUTION:

Be careful not to deform or damage the terminal of transmission radio ground cord.

Tightening torque:

41 N·m (4.2 kgf-m, 30.2 ft-lb)

E: INSPECTION

- Check for leakage of CVTF from the connection between converter case and transmission case.
- Check there is no damage or cracks on the converter case.

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50. Diagnostics with Phenomenon

A: INSPECTION

Symptoms	Faulty parts
Stall speed is low after warming-up, with select lever in "D" or "R" range.	Engine control system
Vehicle does not move despite engine speed rising up, with select lever in "D" or "R" range.	<ul style="list-style-type: none"> • Engine control system • Select cable • CVTF • Secondary pressure circuit • Pulley, gear and variator chain • Forward/reverse changeover section • TCM • Control valve body • Inhibitor switch
Vehicle does not move by engine stall, with select lever in "D" or "R" range.	<ul style="list-style-type: none"> • Parking mechanism • Select cable • Bearing • Forward/reverse changeover section
Excessive shock occurs at starting, with select lever in "D" or "R" range.	<ul style="list-style-type: none"> • Secondary pressure circuit • Pulley, gear and variator chain
Acceleration speed from standstill is insufficient, with select lever in "D" or "R" range.	<ul style="list-style-type: none"> • Control valve body • Forward/reverse changeover section
Engine speed suddenly rises up during driving, with select lever in "D" or "R" range.	<ul style="list-style-type: none"> • Control valve body • Secondary pressure circuit • Primary pressure circuit
Vibration occurs during driving, with select lever in "D" or "R" range.	<ul style="list-style-type: none"> • Secondary pressure circuit • Primary pressure circuit • Forward/reverse changeover section • Pulley and variator chain • Torque converter assembly • Hydraulic pressure circuit to torque converter • Control valve body
Sudden braking occurs during driving, with select lever in "D" or "R" range.	<ul style="list-style-type: none"> • Secondary pressure circuit • Primary pressure circuit • Control valve body
During deceleration, lockup clutch does not disengage until just before halting, with select lever in "D" or "R" range.	<ul style="list-style-type: none"> • Control valve body • Torque converter assembly
Engine stalls with vehicle at a standstill, with select lever in "D" or "R" range.	<ul style="list-style-type: none"> • Engine control system • Control valve body
Excessive lockup shock occurs during driving, with select lever in "D" range.	Control valve body
Slipping occurs at lockup, or lockup does not occur during driving, with select lever in "D" range.	<ul style="list-style-type: none"> • Control valve body • Lockup hydraulic line • Torque converter assembly
Excessive shift shock occurs when shifting the select lever from "N" range to "D" range, or from "N" range to "R" range.	<ul style="list-style-type: none"> • Inhibitor switch • Control valve body • Forward/reverse changeover section
Vehicle does not keep at standstill with select lever in "P" range, or parking cannot be released when shifting from "P" range to another range.	<ul style="list-style-type: none"> • Select cable • Parking mechanism
Select lever does not shift smoothly.	<ul style="list-style-type: none"> • Select cable • Inhibitor switch • Detent spring • Manual plate

Diagnostics with Phenomenon

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