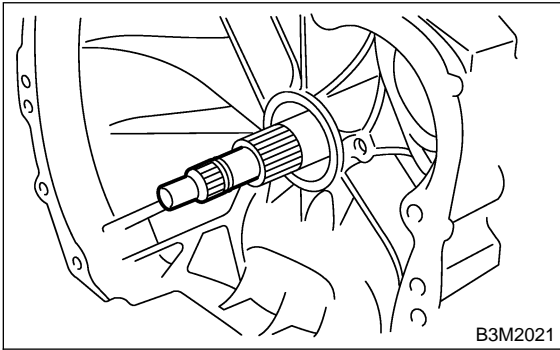


## 19. Drive Pinion Shaft S510216

### A: REMOVAL S510216A18

- 1) Extract the torque converter clutch assembly. <Ref. to AT-35, REMOVAL, Torque Converter Clutch Assembly.>
- 2) Remove the input shaft.

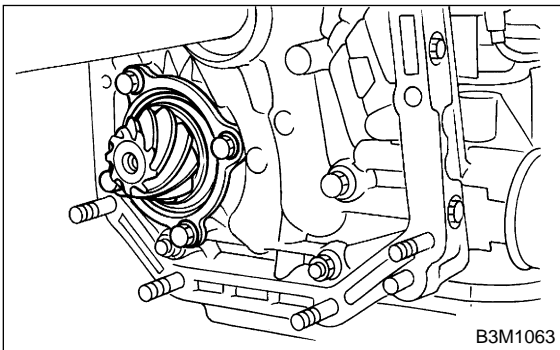


- 3) Disconnect transmission harness connector from stay.

**NOTE:**

Lift-up lever behind the connector and disconnect it from stay.

- 4) Disconnect inhibitor switch connector from stay.
- 5) Disconnect the air breather hose. <Ref. to AT-28, REMOVAL, Air Breather Hose.>
- 6) Remove the oil charger pipe. <Ref. to AT-29, REMOVAL, Oil Charger Pipe.>
- 7) Remove the oil cooler inlet and outlet pipes. <Ref. to AT-30, REMOVAL, Oil Cooler Pipes.>
- 8) Separation of torque converter clutch case and transmission case sections <Ref. to AT-58, REMOVAL, Torque Converter Clutch Case.>
- 9) Separate transmission case and extension case sections. <Ref. to AT-36, REMOVAL, Extension Case.>
- 10) Remove the reduction driven gear.  
Without VTD <Ref. to AT-48, WITHOUT VTD, REMOVAL, Reduction Driven Gear.>  
With VTD <Ref. to AT-48, WITH VTD, REMOVAL, Reduction Driven Gear.>
- 11) Separation of drive pinion shaft and oil pump housing. <Ref. to AT-62, REMOVAL, Oil Pump.>



### B: INSTALLATION S510216A11

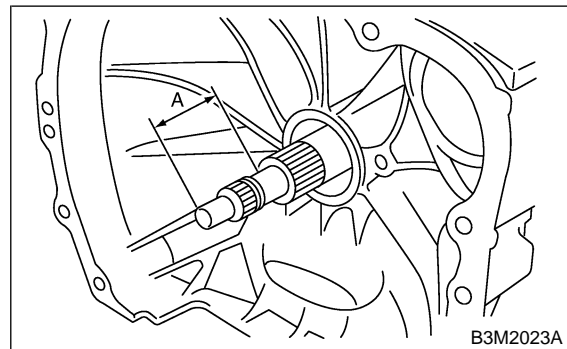
- 1) Assemble the drive pinion assembly to the oil pump housing. <Ref. to AT-63, INSTALLATION, Oil Pump.>
- 2) Install oil pump housing to transmission case. <Ref. to AT-63, INSTALLATION, Oil Pump.>
- 3) Combine the torque converter case with the transmission case. <Ref. to AT-59, INSTALLATION, Torque Converter Clutch Case.>
- 4) Install the reduction driven gear.  
Without VTD <Ref. to AT-48, WITHOUT VTD, INSTALLATION, Reduction Driven Gear.>  
With VTD <Ref. to AT-49, WITH VTD, INSTALLATION, Reduction Driven Gear.>
- 5) Combine the extension case with the transmission case, and install vehicle speed sensor 1 (rear). <Ref. to AT-36, INSTALLATION, Extension Case.>
- 6) Insert inhibitor switch and transmission connector into stay.
- 7) Install air breather hose. <Ref. to AT-28, INSTALLATION, Air Breather Hose.>
- 8) Install the oil charger pipe with O-ring.
- 9) Insert the input shaft while turning lightly by hand.

**CAUTION:**

Be careful not to damage the bushing.

**Normal protrusion A:**

**50 — 55 mm (1.97 — 2.17 in)**

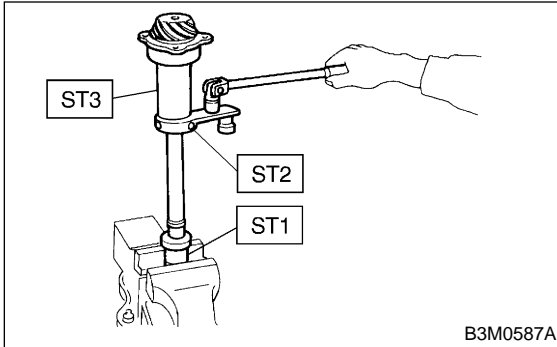


- 10) Install the torque converter clutch assembly. <Ref. to AT-35, INSTALLATION, Torque Converter Clutch Assembly.>

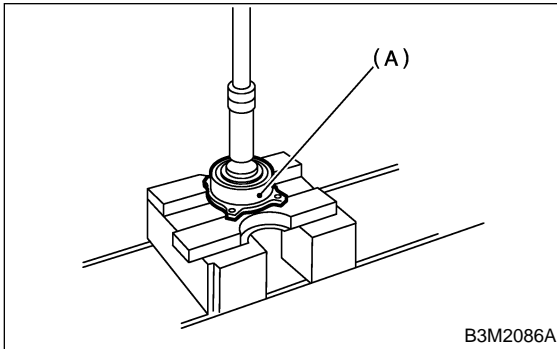
## C: DISASSEMBLY S510216A06

1) Straighten the staked portion of the lock nut, and remove the lock nut while locking the rear spline portion of the shaft with ST1 and ST2. Then pull off the drive pinion collar.

ST1 498937110 HOLDER  
 ST2 499787700 WRENCH  
 ST3 499787500 ADAPTER

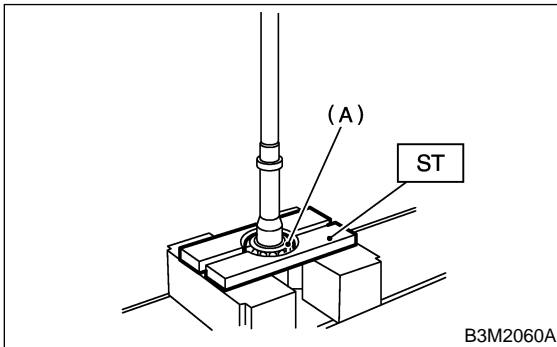


2) Remove the O-ring.  
 3) Using a press, separate the rear roller bearing and outer race from the shaft.



(A) Outer race

4) Using a press and ST, separate the front roller bearing from the shaft.  
 ST 498517000 REPLACER

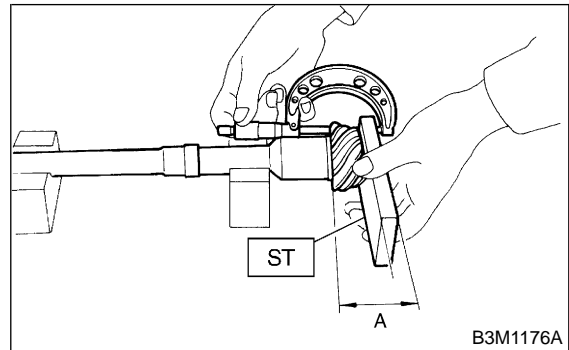


(A) Front roller bearing

## D: ASSEMBLY S510216A02

1) Measure dimension "A" of the drive pinion shaft.

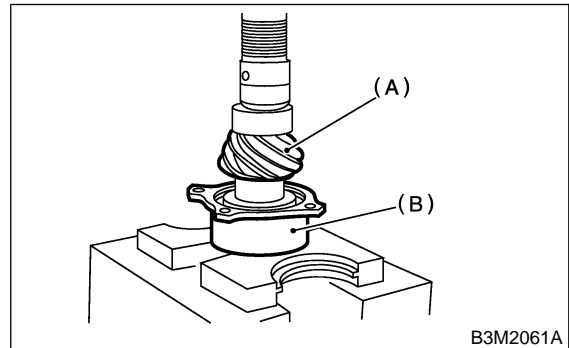
ST 398643600 GAUGE



2) Using a press, force-fit the roller bearing in position.

**CAUTION:**  
 Do not change the relative positions of the outer race and bearing cone.

**NOTE:**  
 If too much pressure is applied, the roller bearing will not turn easily.



(A) Drive pinion shaft  
 (B) Roller bearing

3) After fitting the O-ring to the shaft, attach the drive pinion collar to the shaft.

**NOTE:**  
 Be careful not to damage the O-ring.

# DRIVE PINION SHAFT

Automatic Transmission

4) Tighten the lock washer and lock nut with ST1, ST2 and ST3.

Calculate lock washer and lock nut specifications using the following formula.

$$T2 = L2 / (L1 + L2) \times T1$$

T1: 116 N·m (11.8 kgf·m, 85.3 ft·lb)

[Required torque setting]

T2: Tightening torque

L1: ST2 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)	98 (10.0, 72)
0.45 (17.72)	100 (10.2, 73.8)
0.5 (19.69)	101 (10.3, 74.5)
0.55 (21.65)	102 (10.4, 75)

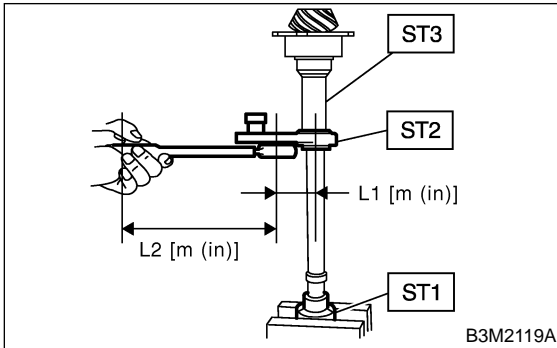
ST1 498937110 HOLDER

ST2 499787700 WRENCH

ST3 499787500 ADAPTER

NOTE:

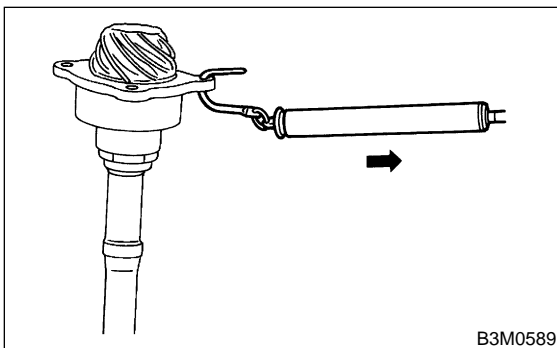
- Pay attention to the orientation of lock washer.
- Install ST2 to torque wrench as straight as possible.



5) Measure the starting torque of the bearing. Make sure the starting torque is within the specified range. If out of the allowable range, replace the roller bearing.

**Starting torque:**

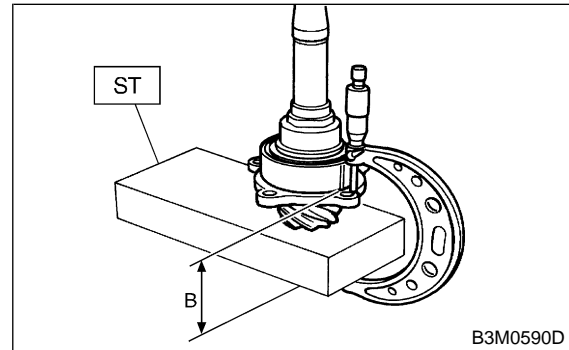
**7.6 — 38.1 N (0.776 — 3.88 kgf, 5.6 — 28.1 ft)**



6) Stake the lock nut securely at two places.

7) Measure dimension "B" of the drive pinion shaft.

ST 398643600 GAUGE



8) Determine the thickness "t" (mm) of the drive pinion shim.

NOTE:

The number of shims must be three or less.

$$t = 6.5 \pm 0.0625 - (B - A)$$

Available drive pinion shims	
Part No.	Thickness mm (in)
31451AA050	0.150 (0.0059)
31451AA060	0.175 (0.0069)
31451AA070	0.200 (0.0079)
31451AA080	0.225 (0.0089)
31451AA090	0.250 (0.0098)
31451AA100	0.275 (0.0108)

## E: INSPECTION

S510216A10

- Make sure that all component parts are free of harmful cuts, gouges, and other faults.
- Adjust the teeth alignment. <Ref. to AT-71, ADJUSTMENT, Drive Pinion Shaft.>

## F: ADJUSTMENT SS10216A01

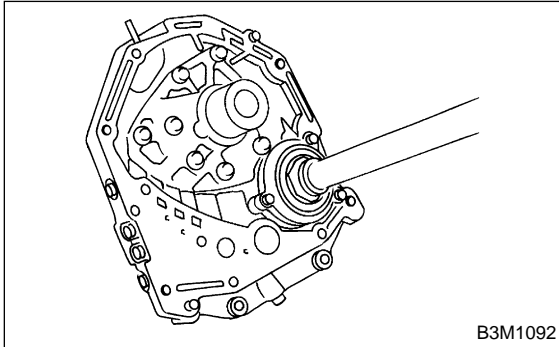
1) Install the oil pump housing assembly to the torque converter clutch case, and secure evenly by tightening four bolts.

### NOTE:

- Thoroughly remove the liquid gasket from the case mating surface beforehand.
- Use an old gasket or an aluminum washer so as not to damage the mating surface of the housing.

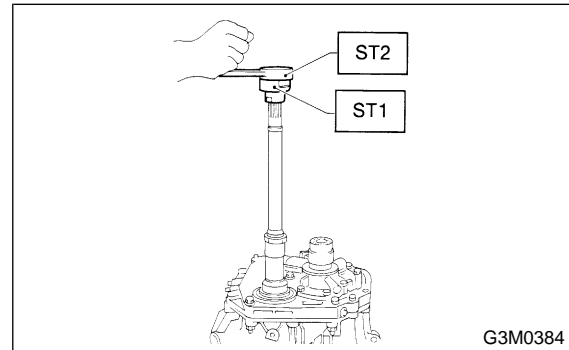
### Tightening torque:

**41 N·m (4.2 kgf-m, 30.4 ft-lb)**



2) Rotate the drive pinion several times with ST1 and ST2.

ST1 498937110 HOLDER  
ST2 499787700 WRENCH

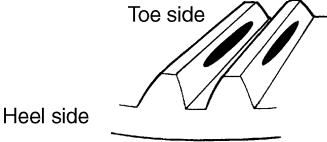

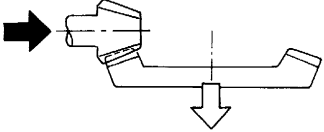
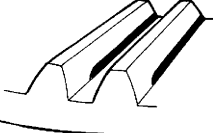
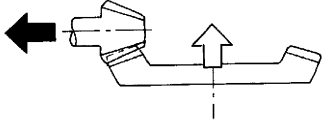
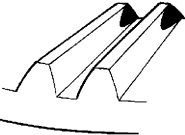
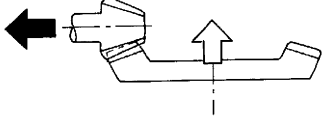

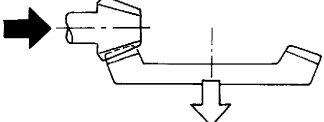




3) Apply red lead evenly to the surfaces of three or four teeth of the crown gear. Rotate the drive pinion in the forward and reverse directions several times. Then remove the oil pump housing, and check the tooth contact pattern.

If tooth contact is improper, readjust the backlash or shim thickness. <Ref. to AT-78, ADJUSTMENT, Front Differential.>

# DRIVE PINION SHAFT

Automatic Transmission

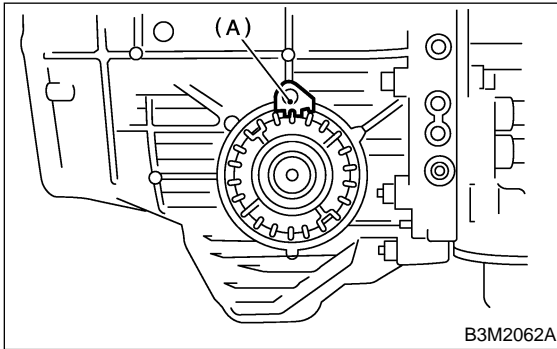
Checking item	Contact pattern	Corrective action
<p>Tooth contact Tooth contact pattern is slightly shifted toward to under no-load rotation. [When loaded, contact pattern moves toward heel.]</p>	 <p style="text-align: center;">B3M0317A</p>	<p style="text-align: center;">—</p>
<p>Face contact Backlash is too large.</p>	 <p style="text-align: center;">B3M0319</p>	<p>Increase thickness of drive pinion height adjusting shim in order to bring drive pinion close to crown gear.</p>  <p style="text-align: right;">B3M0323</p>
<p>Flank contact Backlash is too small.</p>	 <p style="text-align: center;">B3M0320</p>	<p>Reduce thickness of drive pinion height adjusting shim in order to move drive pinion away from crown gear.</p>  <p style="text-align: right;">B3M0324</p>
<p>Toe contact (Inside end contact) Contact areas is small.</p>	 <p style="text-align: center;">B3M0321</p>	<p>Adjust as for flank contact.</p>  <p style="text-align: right;">B3M0324</p>
<p>Heel contact (Outside end contact) Contact area is small.</p>	 <p style="text-align: center;">B3M0322</p>	<p>Adjust as for face contact.</p>  <p style="text-align: right;">B3M0323</p>

 : Adjusting direction of drive pinion  
 : Adjusting direction of crown gear

4) If tooth contact is correct, mark the retainer position and loosen it. After fitting the O-ring, screw in the retainer to the marked position. Then tighten the lock plate to the specified torque.

**Tightening torque:**

**25 N·m (2.5 kgf·m, 18.1 ft·lb)**



(A) Lock plate