

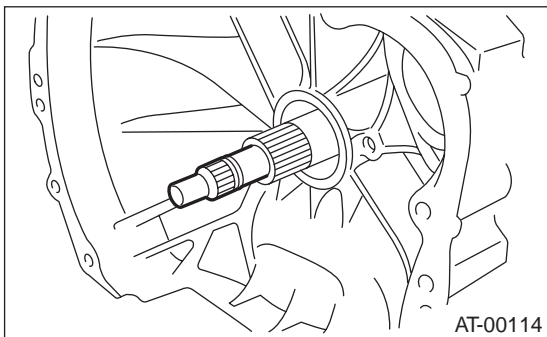
## FRONT DIFFERENTIAL

AUTOMATIC TRANSMISSION

### 37.Front Differential

#### A: REMOVAL

- 1) Remove the transmission assembly from the vehicle. <Ref. to AT-39, REMOVAL, Automatic Transmission Assembly.>
- 2) Extract the torque converter clutch assembly. <Ref. to AT-84, REMOVAL, Torque Converter Clutch Assembly.>
- 3) Remove the input shaft.



- 4) Disconnect the air breather hose. <Ref. to AT-82, REMOVAL, Air Breather Hose.>
- 5) Lift-up lever behind the transmission harness connector and disconnect it from stay.
- 6) Disconnect inhibitor switch from stay.
- 7) Remove the oil charger pipe. <Ref. to AT-83, REMOVAL, Oil Charger Pipe.>
- 8) Remove the oil cooler inlet and outlet pipes. <Ref. to AT-77, REMOVAL, ATF Cooler Pipe and Hose.>
- 9) Separation of torque converter clutch case and transmission case. <Ref. to AT-108, REMOVAL, Torque Converter Clutch Case.>
- 10) Remove the seal pipe if it is attached.
- 11) Remove the differential side retainer with ST.

#### NOTE:

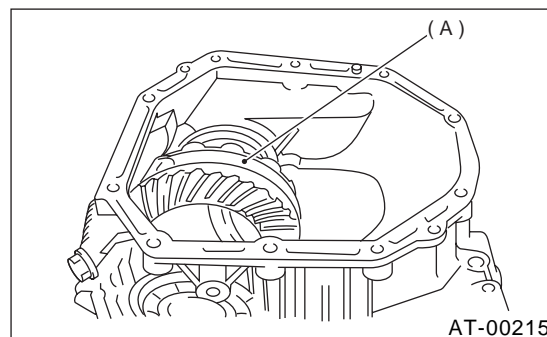
Hold the differential case assembly by hand to avoid damaging retainer mounting hole of the torque converter clutch case.

ST 499787000 WRENCH ASSY

- 12) Remove the differential assembly without damaging installation part of retainer.

#### B: INSTALLATION

- 1) Install the differential assembly to the case, paying special attention not to damage the inside of the case (particularly, the differential side retainer contact surface).

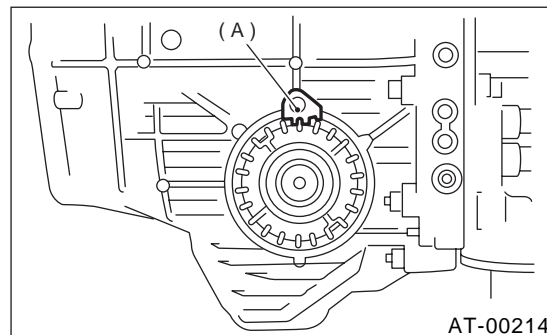


(A) Differential assembly

- 2) Remove the O-rings from left and right side retainer.
- 3) Using ST, install the side retainers. <Ref. to AT-123, REMOVAL, Front Differential.>  
ST 499787000 WRENCH ASSY
- 4) Install the lock plate.

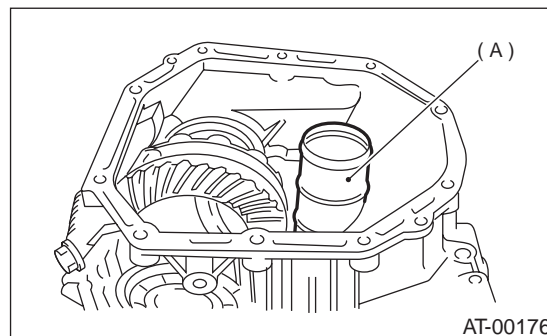
#### Tightening torque:

**25 N·m (2.5 kgf·m, 18.1 ft·lb)**



(A) Lock plate

- 5) Install the new seal pipe to the torque converter clutch case.



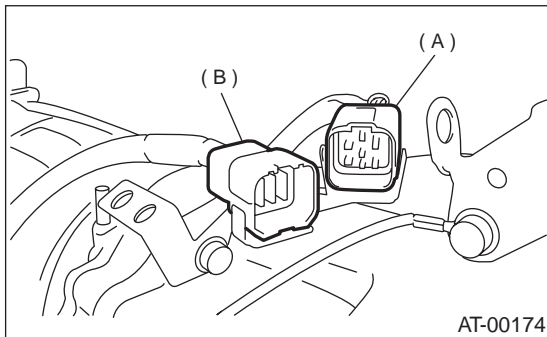
(A) Seal pipe

### AT-123

## FRONT DIFFERENTIAL

### AUTOMATIC TRANSMISSION

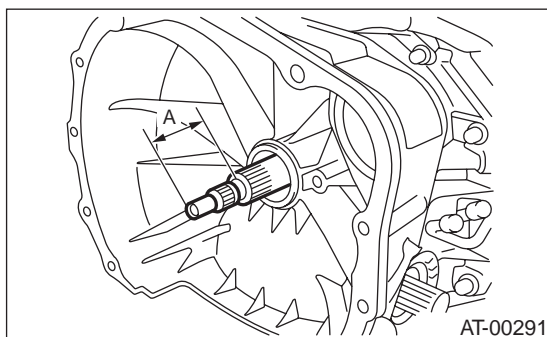
- 6) Install the torque converter clutch case to transmission case. <Ref. to AT-109, INSTALLATION, Torque Converter Clutch Case.>
- 7) Install air breather hose.
- 8) Insert inhibitor switch and transmission connector into stay.



- (A) Transmission harness  
(B) Inhibitor switch harness

- 9) Install oil cooler pipes. <Ref. to AT-79, INSTALLATION, ATF Cooler Pipe and Hose.>
- 10) Install the oil charger pipe with O-ring <Ref. to AT-83, INSTALLATION, Oil Charger Pipe.>
- 11) Insert the input shaft while turning lightly by hand. At this time, not to damage the bushing.

**Normal protrusion A:**  
50 — 55 mm (1.97 — 2.17 in)



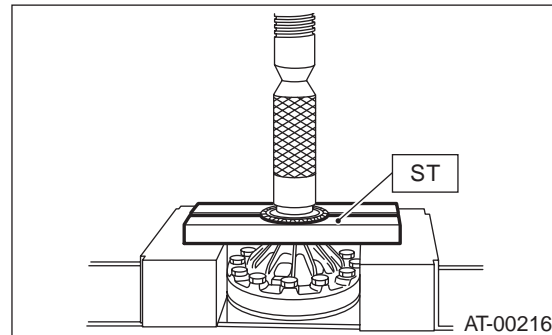
- 12) Install the torque converter clutch assembly. <Ref. to AT-84, INSTALLATION, Torque Converter Clutch Assembly.>
- 13) Install the transmission assembly to the vehicle. <Ref. to AT-42, INSTALLATION, Automatic Transmission Assembly.>

### C: DISASSEMBLY

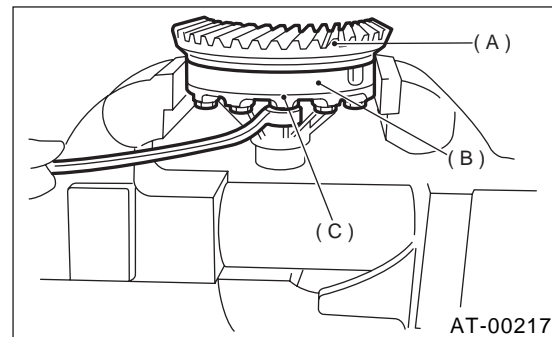
#### 1. DIFFERENTIAL CASE ASSEMBLY

- 1) Using a press and ST, remove the taper roller bearing.

ST 498077000 REMOVER

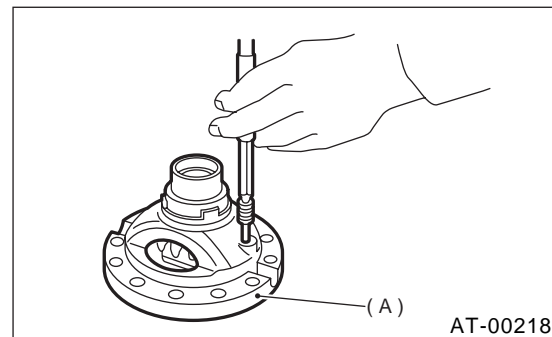


- 2) Secure the case in a vise and remove the crown gear tightening bolts, then separate the crown gear, case (RH) and case (LH).



- (A) Crown gear  
(B) Differential case (RH)  
(C) Differential case (LH)

- 3) Pull out the straight pin and shaft, and remove the differential bevel gear, washer, and differential bevel pinion.



- (A) Differential case (RH)

AT-124

## FRONT DIFFERENTIAL

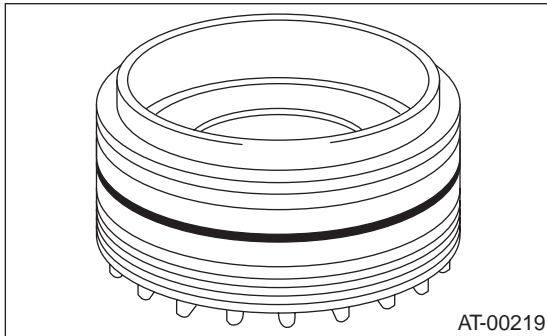
AUTOMATIC TRANSMISSION

### 2. SIDE RETAINER

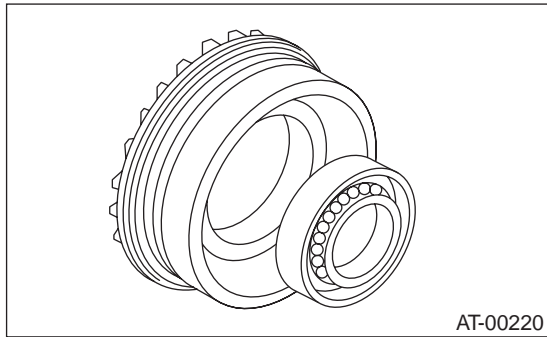
**NOTE:**

After adjusting the drive pinion backlash and tooth contact, remove and install the oil seal and O-ring.

1) Remove O-ring.

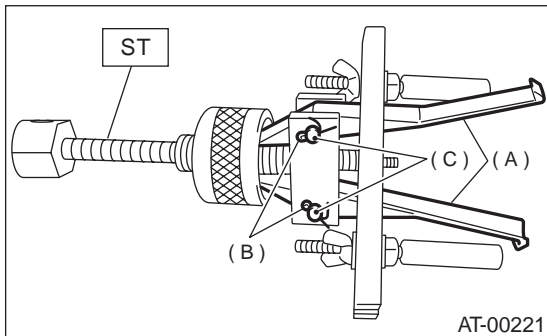


2) Remove oil seal.



3) Take out either split pin, remove claw.

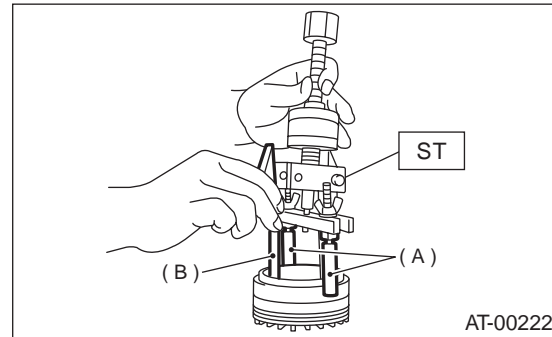
ST 398527700 PULLER ASSY



- (A) Claw
- (B) Split pin
- (C) Pin

4) Securely attach two claws to outer race, set ST to side retainer.

ST 398527700 PULLER ASSY



- (A) Shaft
- (B) Claw

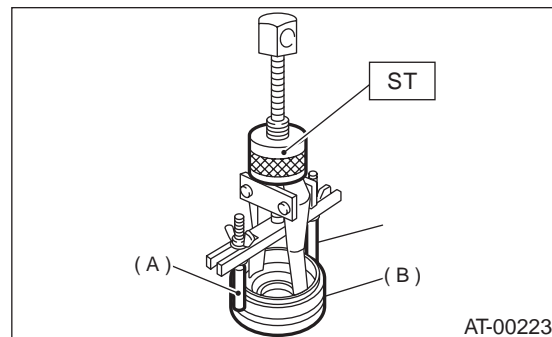
5) Return removed claw to the original position, and install pin and split pin.

6) Hold the shaft of ST to avoid removing from side retainer, and then remove the bearing outer race.

ST 398527700 PULLER ASSY

**NOTE:**

Replace bearing inner and outer races as a single unit.



- (A) Shaft
- (B) Side retainer

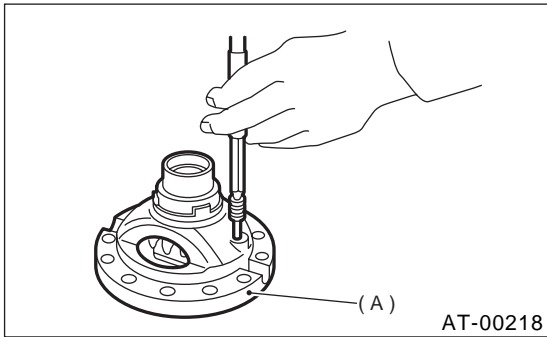
## FRONT DIFFERENTIAL

### AUTOMATIC TRANSMISSION

#### D: ASSEMBLY

##### 1. DIFFERENTIAL CASE ASSEMBLY

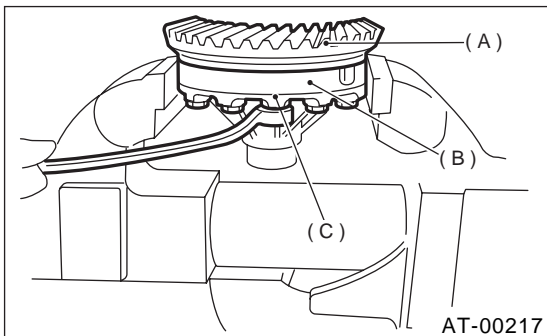
- 1) Install the washer, differential bevel gear and differential bevel pinion in the differential case (RH). Insert the pinion shaft.
- 2) Install straight pin from reverse direction.



(A) Differential case (RH)

- 3) Install the washer and differential bevel gear to the differential case (LH). Then put the case over the differential case (RH), and connect both cases.
- 4) Install the crown gear and secure by tightening the bolt.

**Standard tightening torque:**  
**62 N·m (6.3 kgf·m, 45.6 ft·lb)**



- (A) Crown gear  
 (B) Differential case (RH)  
 (C) Differential case (LH)

##### 5) Measurement of backlash (Selection of washer)

- (1) Measure the gear backlash with ST1 and ST2, and insert ST2 through the access window of the case.

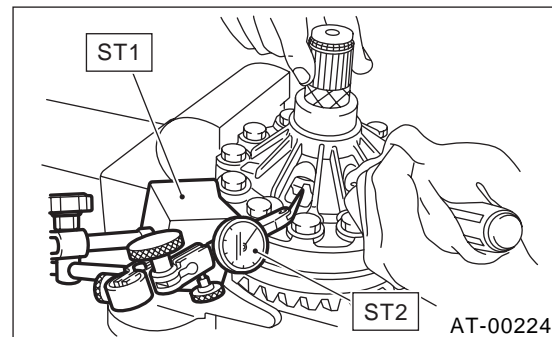
ST1 498247001 MAGNET BASE  
 ST2 498247100 DIAL GAUGE

#### NOTE:

- Measure the backlash by applying a pinion tooth between two bevel gear teeth.
- Fix bevel pinion gear in place with a screwdriver or similar tool when measuring.

**Standard value:**

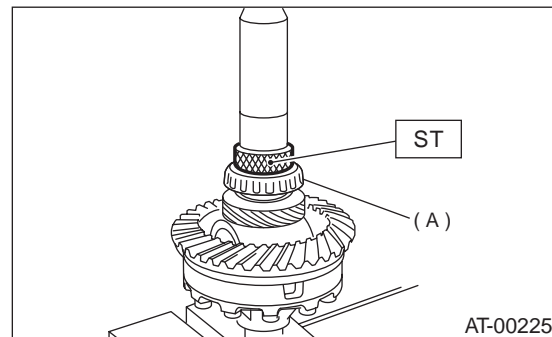
**0.13 — 0.18 mm (0.0051 — 0.0071 in)**



- (2) If backlash is not as specified, select a washer from the table below.

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

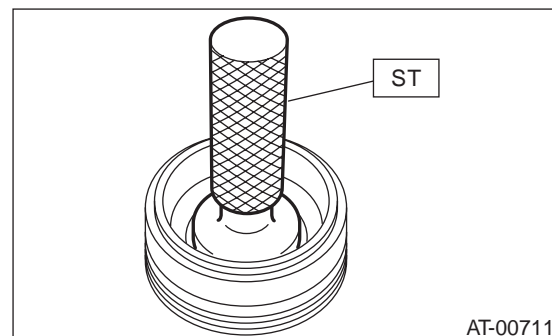
- 6) Using ST, install taper roller bearing.  
 ST 398437700 DRIFT



(A) Taper roller bearing

##### 2. SIDE RETAINER

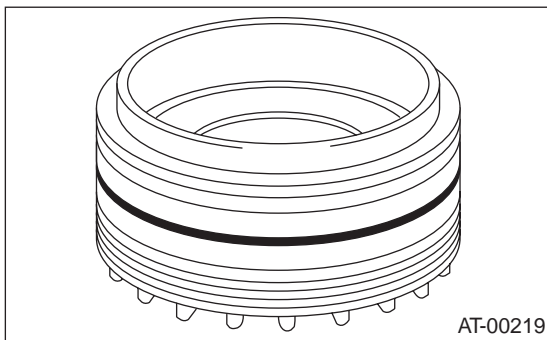
- 1) Install bearing outer race to side retainer.
- 2) Install a new oil seal using the ST and hammer.  
 ST 499797000 INSTALLER



## FRONT DIFFERENTIAL

AUTOMATIC TRANSMISSION

3) Install new O-ring.



### E: INSPECTION

- Check each component for harmful cuts, damage and other faults.
- Measure the backlash and adjust to within specifications.

<Ref. to AT-127, ADJUSTMENT, Front Differential.>

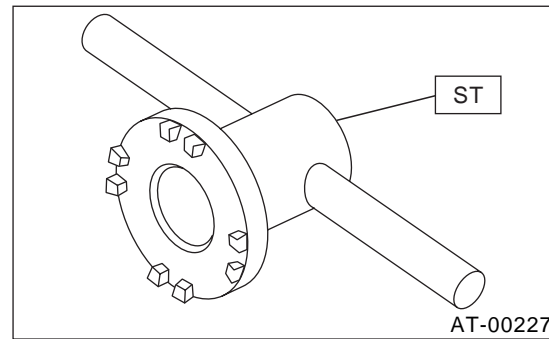
### F: ADJUSTMENT

1) Using ST, screw in the retainer until light contact is felt.

#### NOTE:

Screw in the RH side slightly deeper than the LH side.

ST 499787000 WRENCH ASSY



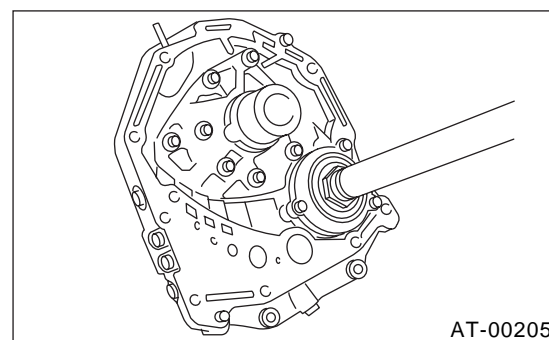
- 2) Remove the oil pump housing.
- 3) Thoroughly remove the liquid gasket from the case mating surface beforehand.
- 4) Install the oil pump housing assembly to the torque converter clutch case, and secure evenly by tightening four bolts.

#### NOTE:

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)**



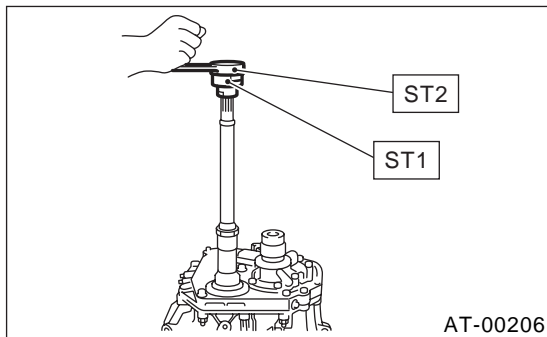
AT-127

## FRONT DIFFERENTIAL

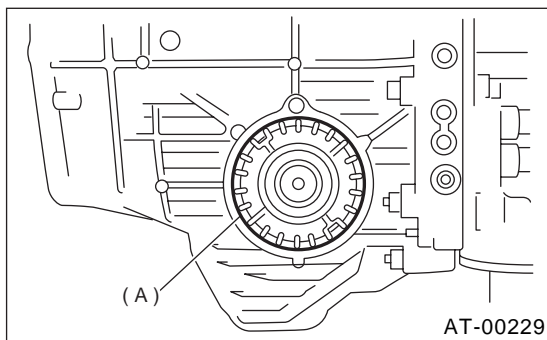
### AUTOMATIC TRANSMISSION

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

ST1 498937110 HOLDER  
ST2 499787700 WRENCH

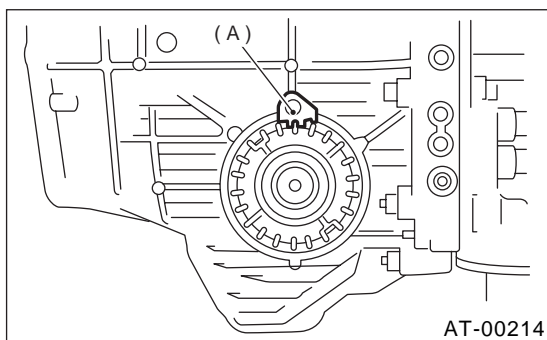


6) Tighten the LH retainer until contact is felt while rotating the shaft. Then loosen the RH retainer. Keep tightening the LH retainer and loosening the RH retainer until the pinion shaft can no longer be turned. This is the "zero" state.



(A) Retainer

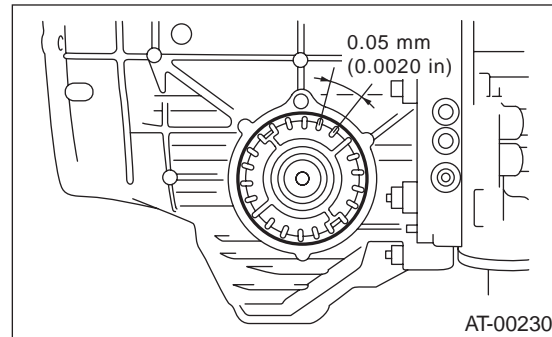
7) After the "zero" state is established, back off the LH retainer 3 notches and secure it with the lock plate. Then back off the RH retainer and retighten until it stops. Rotate drive pinion a few times. Tighten the RH retainer 1-3/4 notches further. This sets the preload. Finally, secure the retainer with its lock plate.



(A) Lock plate

#### NOTE:

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

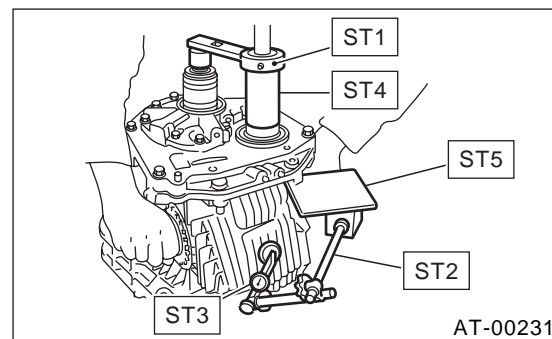


8) Turn the drive pinion several rotations with ST1 and check to see if the backlash is within the standard value with ST2, ST3, ST4 and ST5.

ST1 499787700 WRENCH  
ST2 498247001 MAGNET BASE  
ST3 498247100 DIAL GAUGE  
ST4 499787500 ADAPTER  
ST5 498255400 PLATE

#### Backlash:

**0.13 — 0.18 mm (0.0051 — 0.0071 in)**



9) Adjust the tooth contact between front differential and drive shaft. <Ref. to AT-120, ADJUSTMENT, Drive Pinion Shaft.>

## AT-128