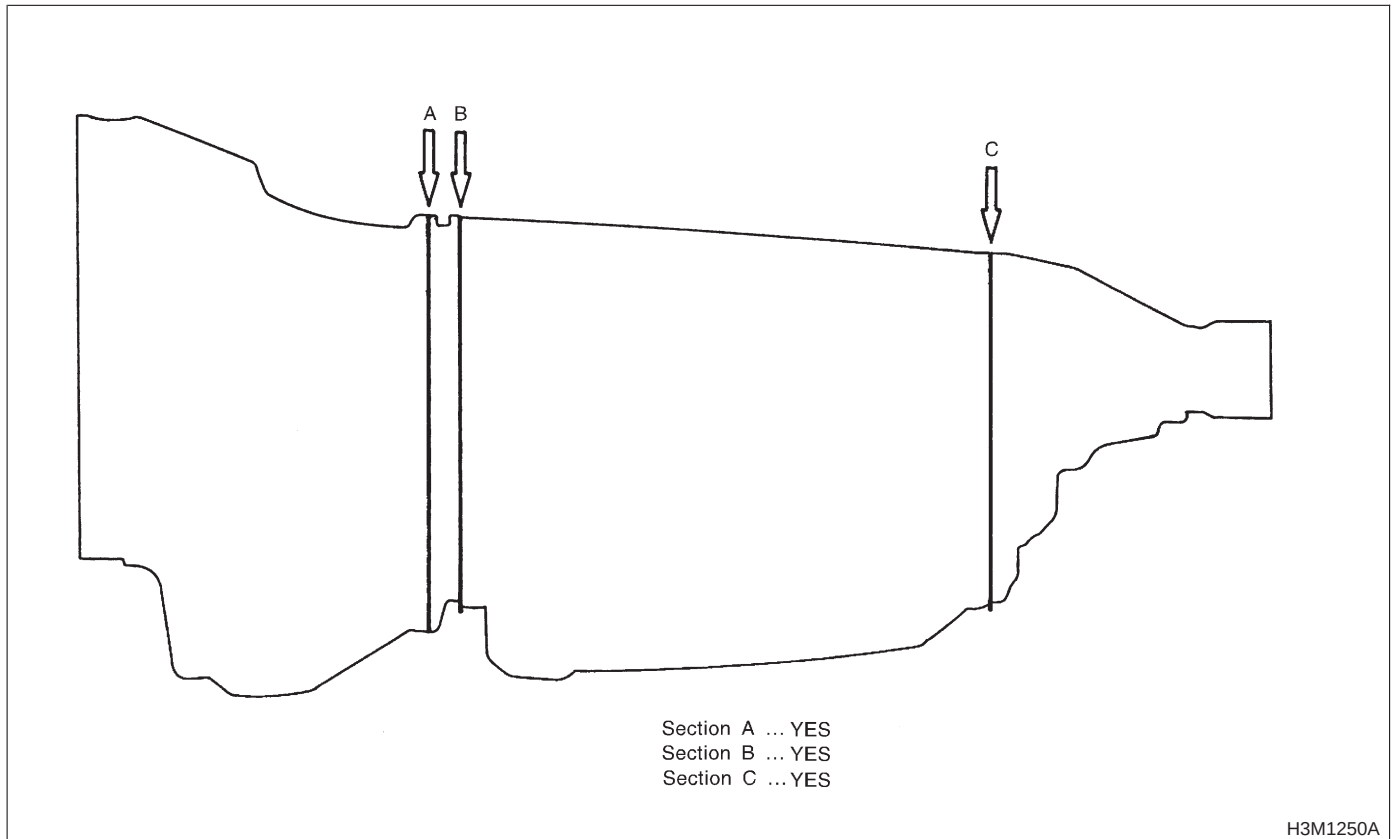


12. Overall Transmission

A: SECTIONS THAT CAN BE DETACHED/ASSEMBLED



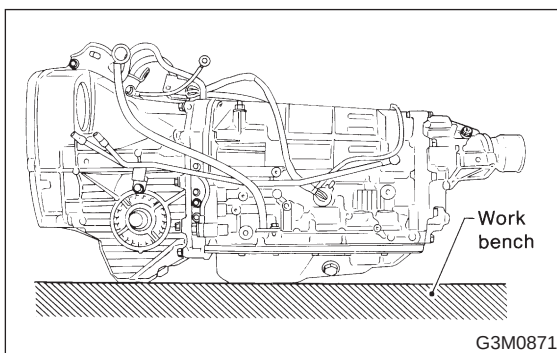
B: DISASSEMBLY

1. EXTERNAL PARTS

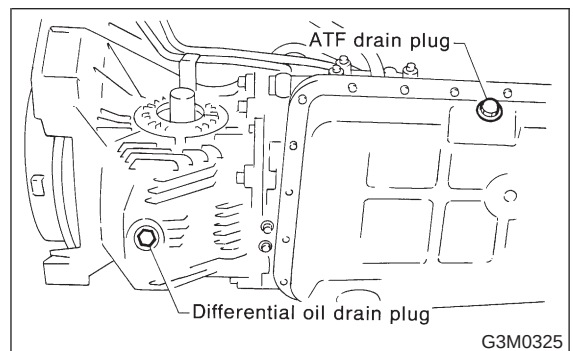
1) Place the transmission unit on a work bench, with the oil pan facing down.

CAUTION:

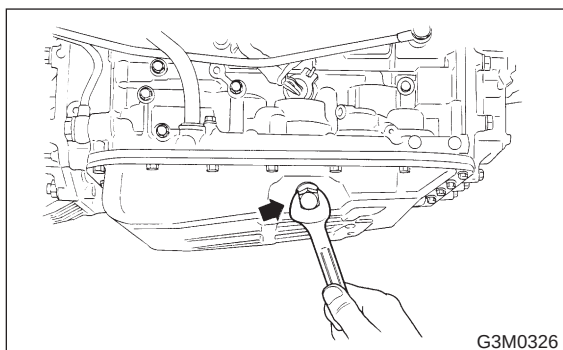
Be careful not to bend or damage external parts.



2) Remove the drain plug, and drain differential oil. Tighten the plug temporarily after draining.



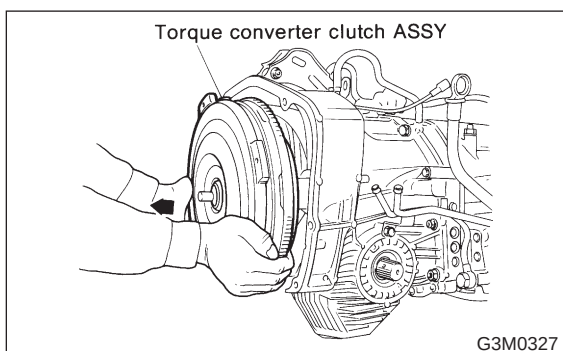
3) Remove the drain plug, and drain automatic transmission fluid (ATF). Tighten the plug temporarily after draining.



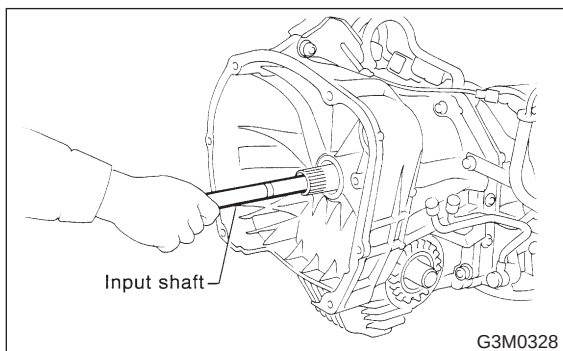
4) Extract the torque converter clutch assembly.

NOTE:

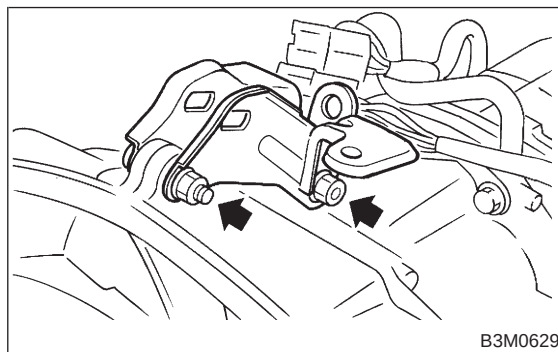
- Extract the torque converter clutch horizontally. Be careful not to scratch the bushing inside the oil pump shaft.
- Note that oil pump shaft also comes out.



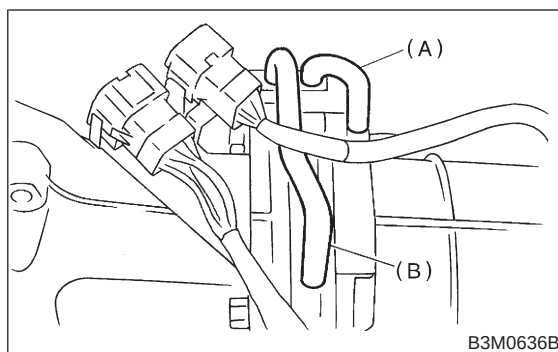
5) Remove the input shaft.



6) Remove the pitching stopper bracket.

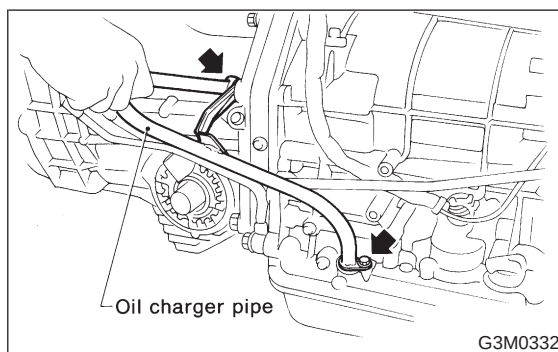


7) Disconnect the air breather hose.



- (A) Air breather hose (Transmission case)
(B) Air breather hose (Oil pump housing)

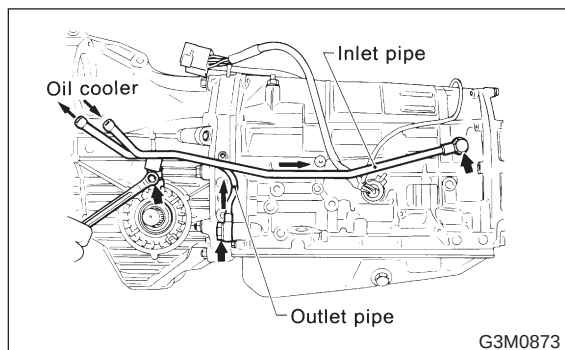
8) Remove the oil charger pipe, and remove the O-ring from the flange face. Attach the O-ring to the pipe.



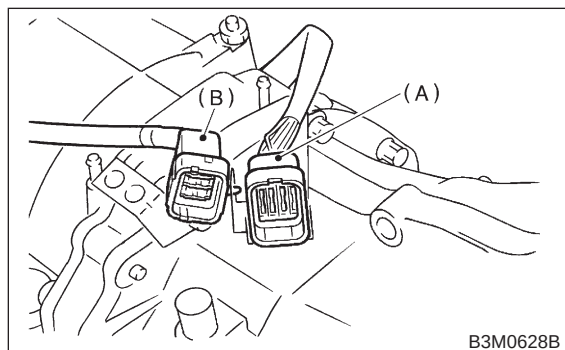
9) Remove the oil cooler inlet and outlet pipes.

CAUTION:

When removing outlet pipes, be careful not to lose balls and springs used with retaining screws.



10) Remove harnesses from bracket.



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

2. SEPARATION OF EACH SECTION

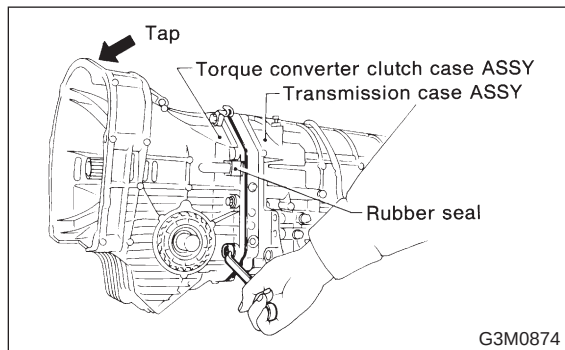
1) Separation of torque converter clutch case and transmission case sections

CAUTION:

- Be careful not to damage the oil seal and bushing inside the torque converter clutch case by the oil pump cover.
- Be careful not to lose the rubber seal.

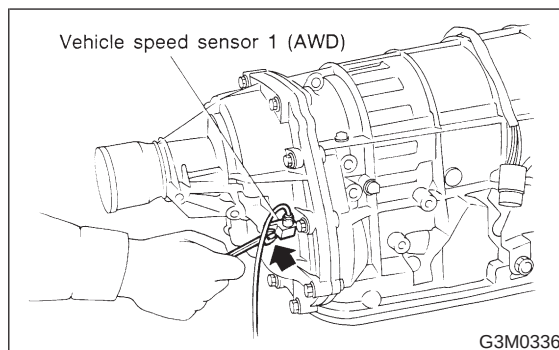
NOTE:

Separate these cases while tapping lightly on the housing.



2) Separation of transmission case and extension sections

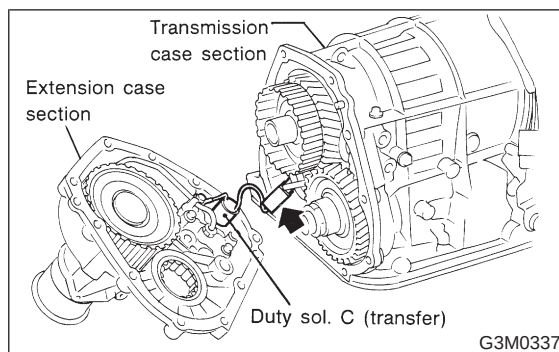
(1) Remove vehicle speed sensor 1.



(2) While pulling the extension slightly, disconnect the connector for the duty solenoid C (transfer).

CAUTION:

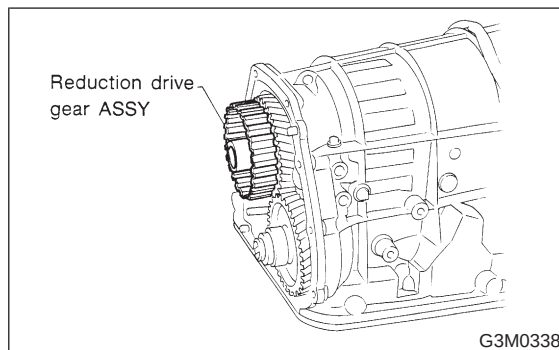
Be careful not to cut the harness.



3) Separate both sections.

3. TRANSMISSION CASE SECTION

1) Remove the reduction drive gear assembly.

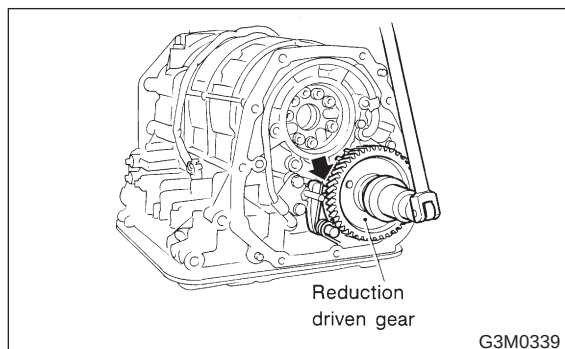


2) Remove the reduction driven gear.

- (1) Straighten the staked portion, and remove the lock nut.

NOTE:

Set the range selector lever to "P".

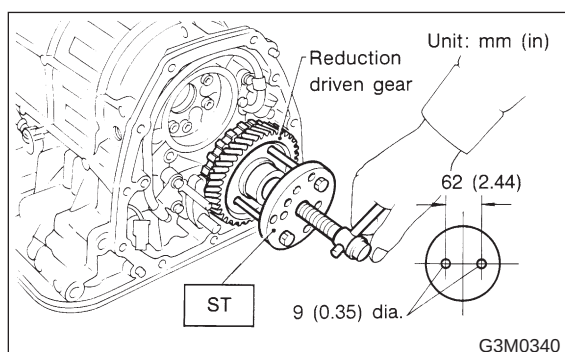


- (2) Using the ST, extract the reduction driven gear.

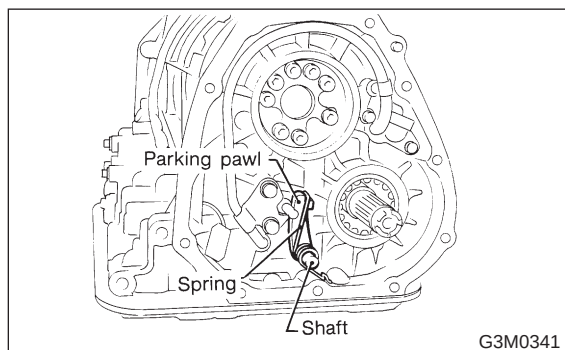
ST 899524100 PULLER SET

NOTE:

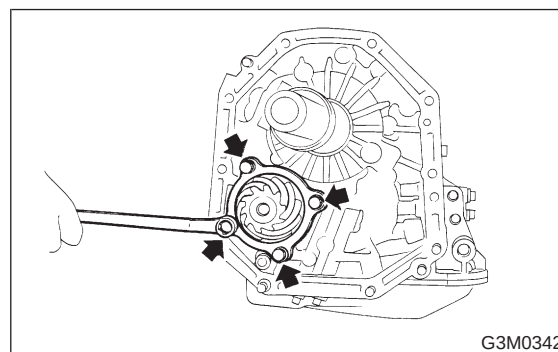
Drill two holes in the puller.



- 3) Remove the parking pawl, return spring and shaft.



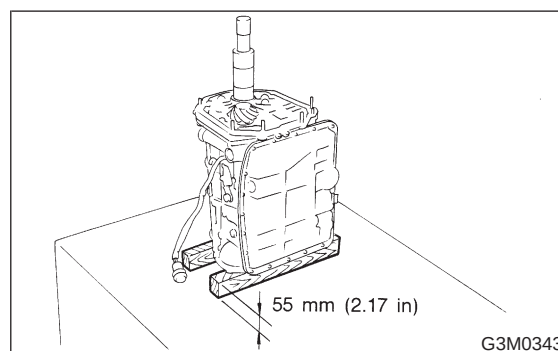
- 4) Loosen the taper roller bearing mounting bolts.



- 5) Place two wooden blocks on the workbench, and stand the transmission case with its rear end facing down.

CAUTION:

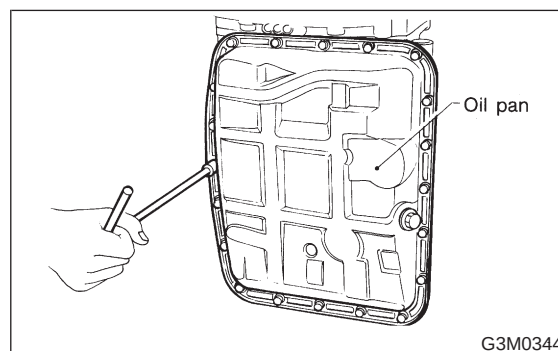
- Be careful not to scratch the rear mating surface of the transmission case.
- Note that the parking rod and drive pinion protrude from the mating surface.



- 6) Remove the oil pan.

NOTE:

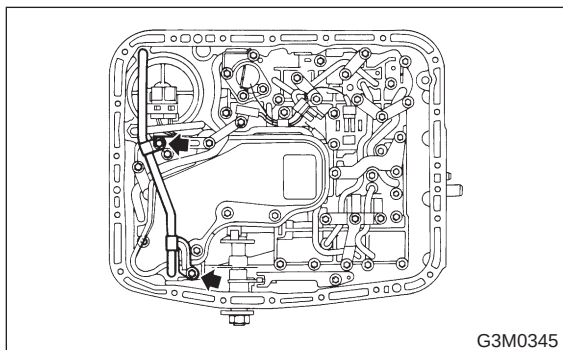
Tap the corners of the oil pan when removing.



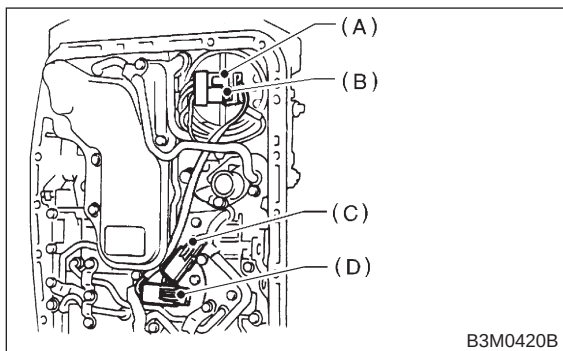
7) Remove the oil cooler outlet pipe.

CAUTION:

Be careful not to twist the pipe.



8) Disconnect the harness connectors for the solenoids and duty solenoids and the ground cord.

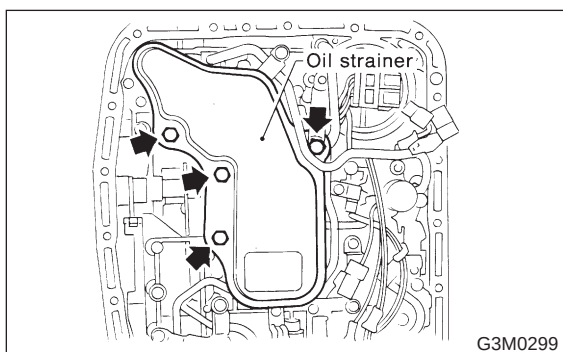


- (A) Shift solenoid 2 and duty solenoid A connector
- (B) Shift solenoid 1 and 3 connector
- (C) Duty solenoid B connector
- (D) ATF temperature sensor connector

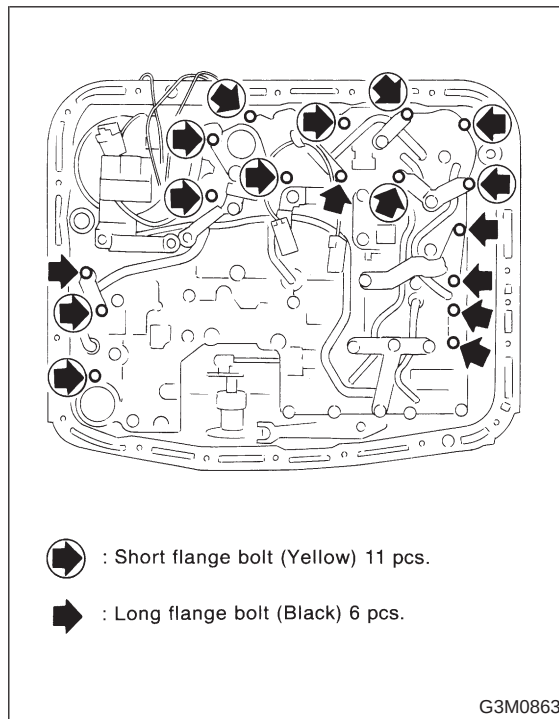
9) Remove the oil strainer.

CAUTION:

Be careful not to damage O-ring on oil strainer.



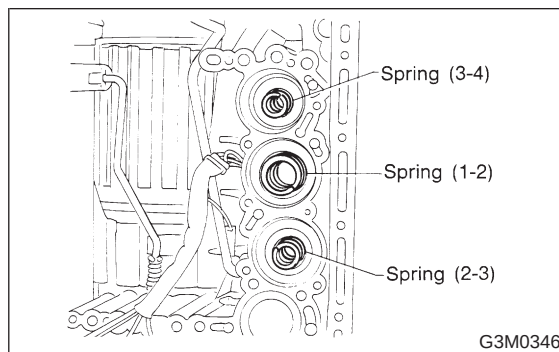
10) Remove the control valve body and the two brackets.



⬇ : Short flange bolt (Yellow) 11 pcs.

⬇ : Long flange bolt (Black) 6 pcs.

11) Remove the three accumulator springs.



Spring (3-4)

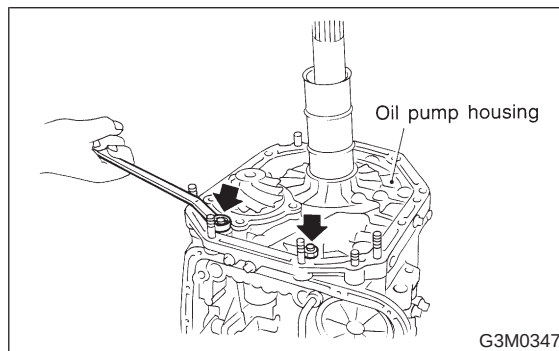
Spring (1-2)

Spring (2-3)

12) Loosen the reverse clutch drum lightly by turning the adjusting screw. Then remove the oil pump housing.

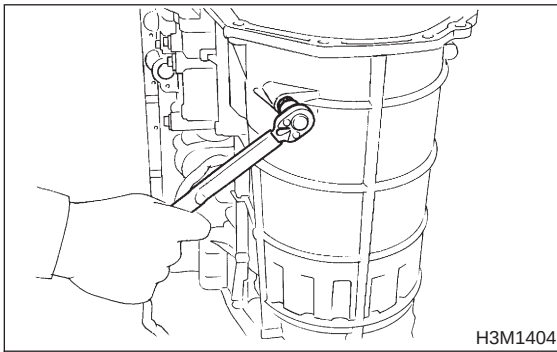
CAUTION:

Be careful not to lose the total end play adjusting thrust washer.



Oil pump housing

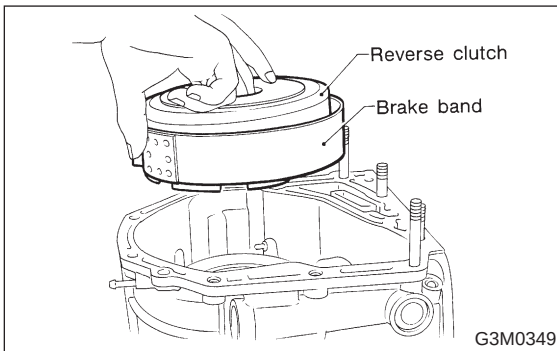
- 13) Loosen the brake band adjusting screw and take out the strut.



- 14) Remove the brake band and reverse clutch.

NOTE:

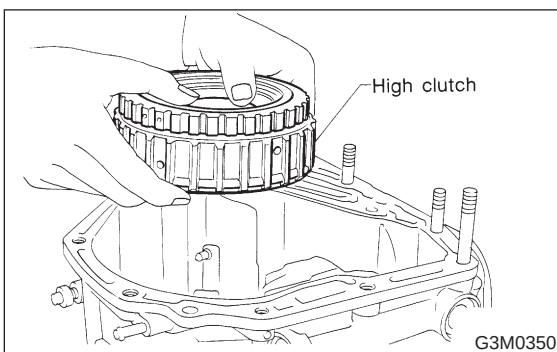
Contract the brake band with a clip.



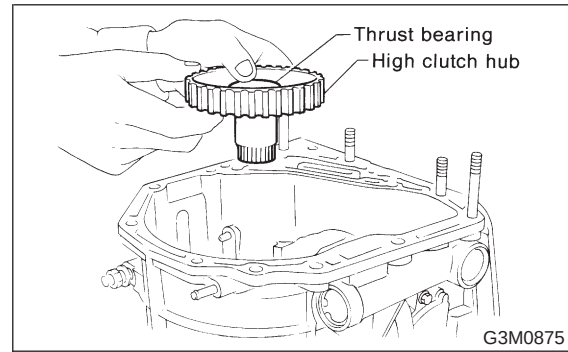
- 15) Take out the high clutch.

CAUTION:

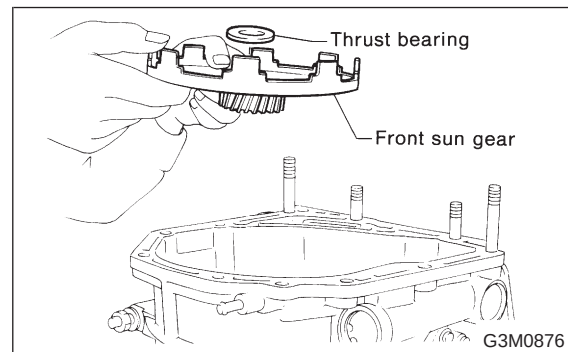
Thrust needle bearing and bearing race are removed together with high clutch. Be careful not to lose them.



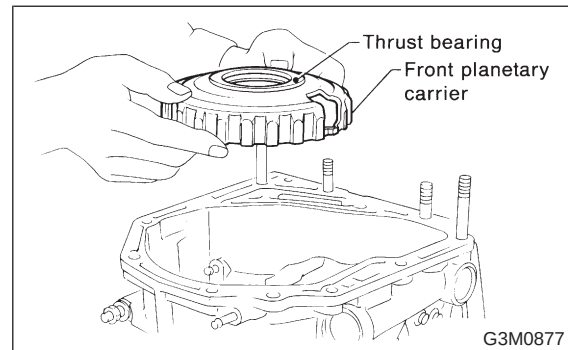
- 16) Take out the high clutch hub and the thrust bearing.



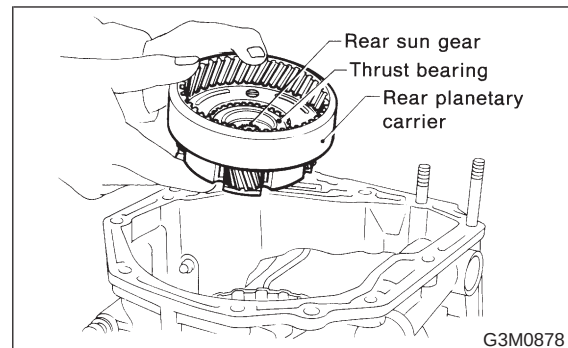
- 17) Take out the front sun gear and the thrust bearing.



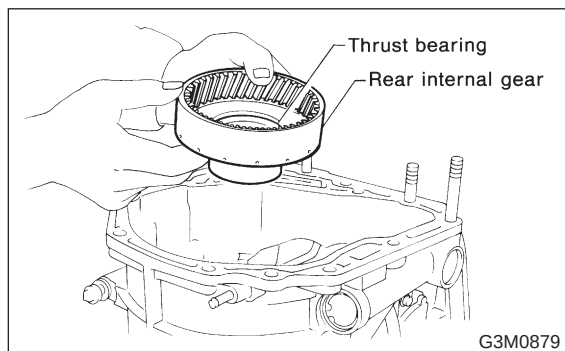
- 18) Take out the front planetary carrier and the thrust bearing.



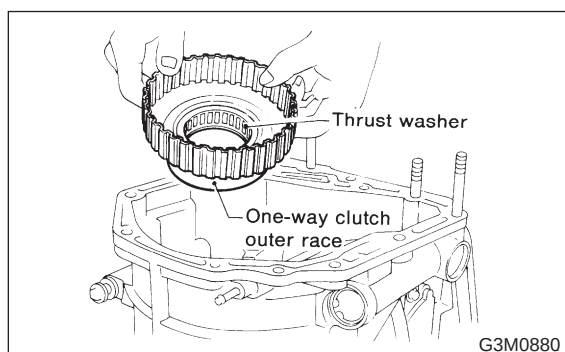
- 19) Take out the rear planetary carrier, rear sun gear and the thrust bearing.



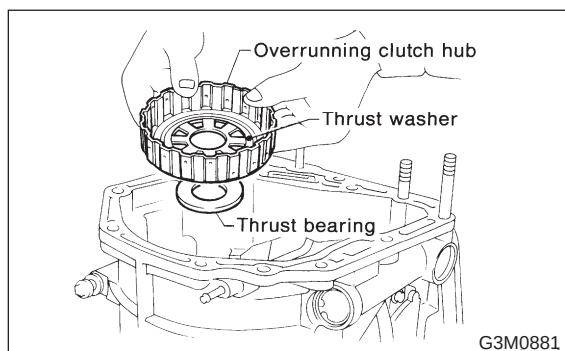
20) Take out the rear internal gear and the thrust bearing.



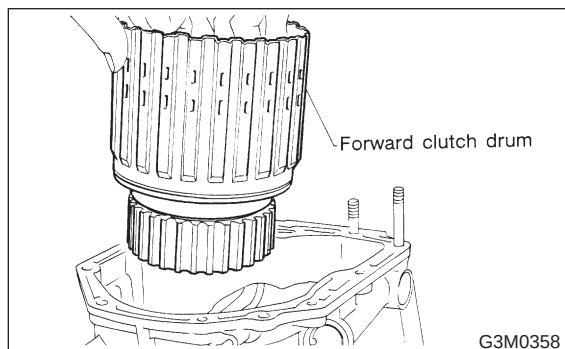
21) Take out the one-way clutch outer race and the thrust washer.



22) Take out the overrunning clutch hub, the thrust washer and the thrust bearing.

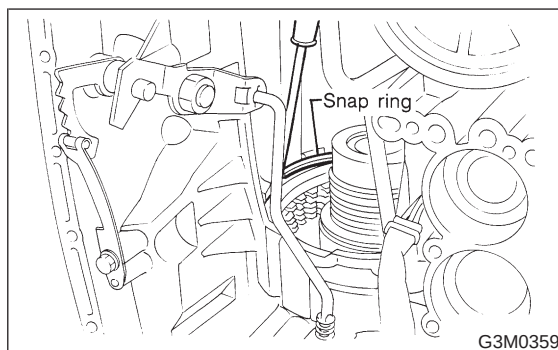


23) Take out the forward clutch drum.

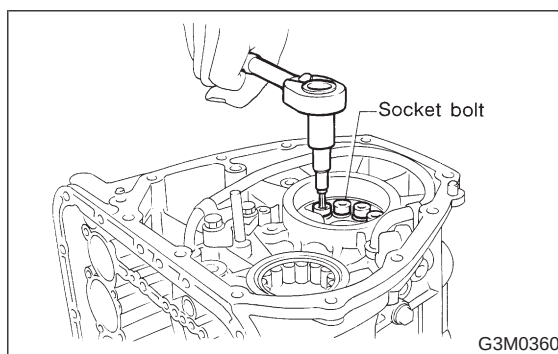


24) Take out the low & reverse brake section.

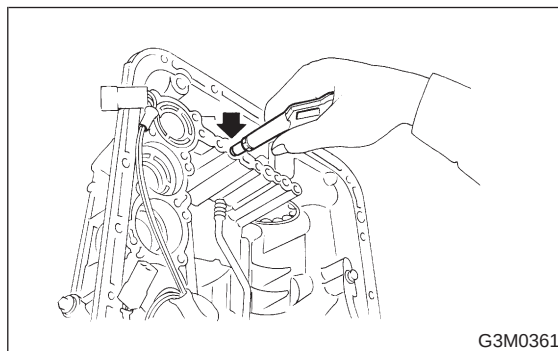
(1) Remove the snap ring. Then remove the retaining plate, drive plates, driven plates, and dish plates as a unit.



(2) Turning the case upside down, take out the one-way clutch inner race and spring retainer.



(3) Take out the low & reverse piston by applying compressed air.

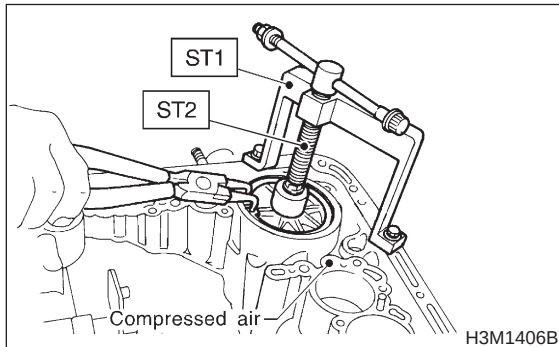


25) After removing the snap ring (inner), take out the servo piston by applying compressed air from the release pressure side.

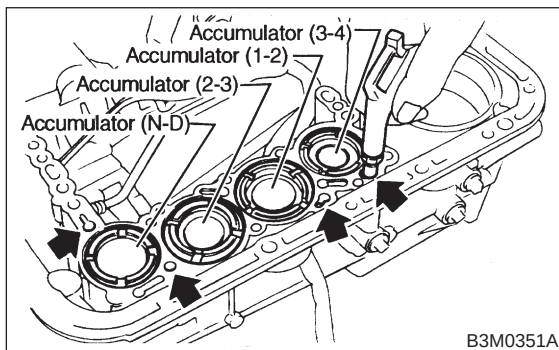
CAUTION:

Hold the servo piston with a rag so that it will not be ejected with the air pressure. In this case, do not allow your finger to be pinched between the pipe and retainer.

ST1 498677010 COMPRESSOR
ST2 399703600 PULLY ASSY

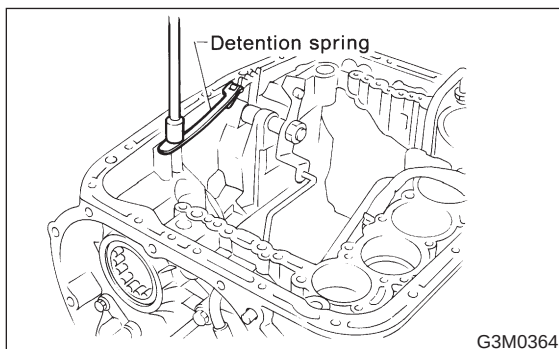


26) Apply compressed air from the operating pressure side, and take out accumulator (3-4), accumulator (1-2), accumulator (2-3), accumulator and spring (N-D).



27) Remove the range select lever.

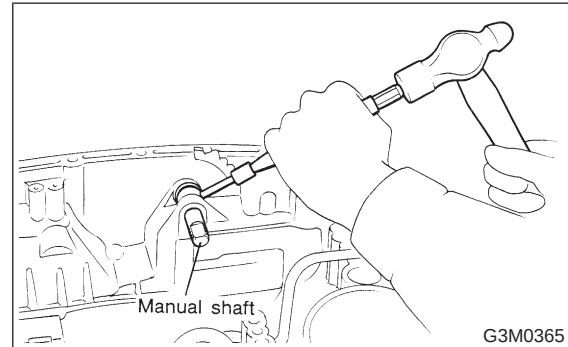
28) Remove the detention spring.



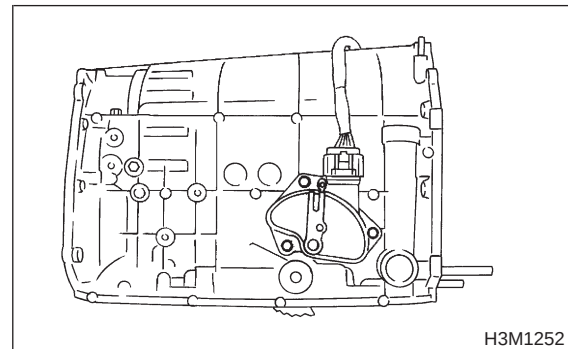
29) Remove the parking rod together with the manual lever. Then remove the manual shaft by pulling off the straight pin.

CAUTION:

Be careful not to damage the lips of the press-fitted oil seal in the case.



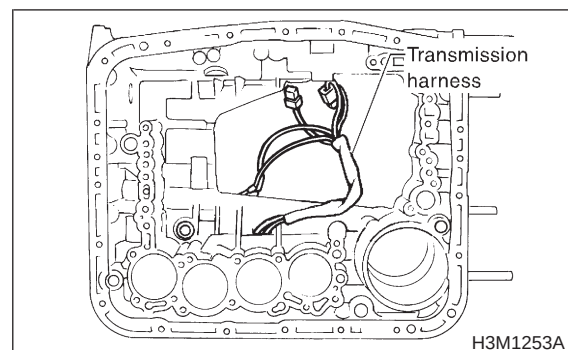
30) Remove the inhibitor switch.



31) Remove the transmission harness.

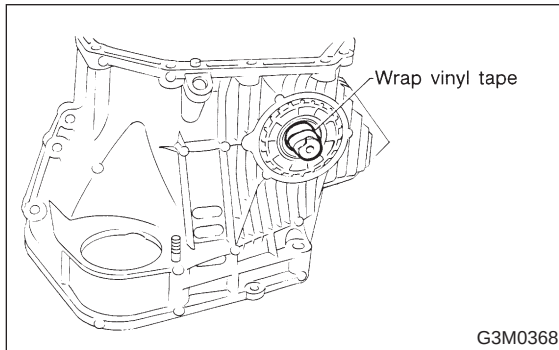
CAUTION:

Be careful not to damage the cord insulation.



4. TORQUE CONVERTER CLUTCH CASE SECTION

- 1) Wrap the axle shaft serration with vinyl tape.

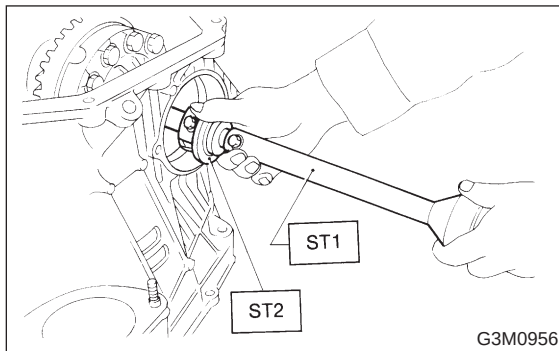


- 2) Remove the differential side retainer with ST.
ST 499787000 WRENCH ASSY

CAUTION:
Hold the differential case assembly by hand to avoid damaging retainer mounting hole of the torque converter clutch case and speedometer gears.

- 3) Extract the axle shaft with ST1 and ST2.
ST1 499095500 REMOVER
ST2 499247300 INSTALLER

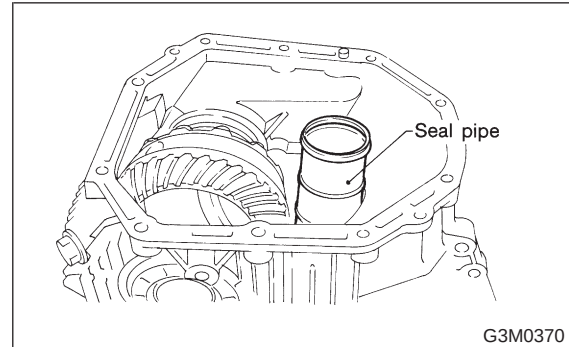
CAUTION:
Do not reuse the circlip.



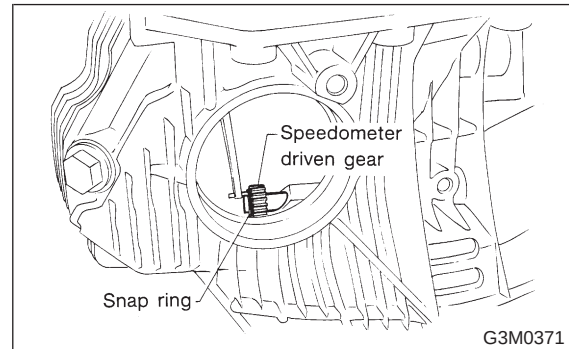
- 4) Remove the differential case assembly.

CAUTION:

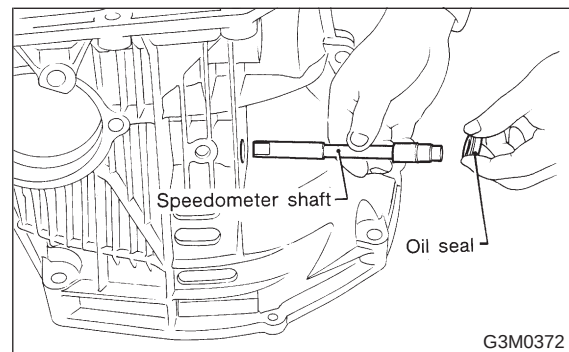
- Be careful not to damage the retainer mounting hole of the torque converter clutch case and the speedometer gears.
- Remove the seal pipe if it is attached. (Reusing is not allowed.)



- 5) Remove the snap ring. Then remove the speedometer driven gear.



- 6) Tap out the speedometer shaft to the outside of the case, and remove the oil seal.

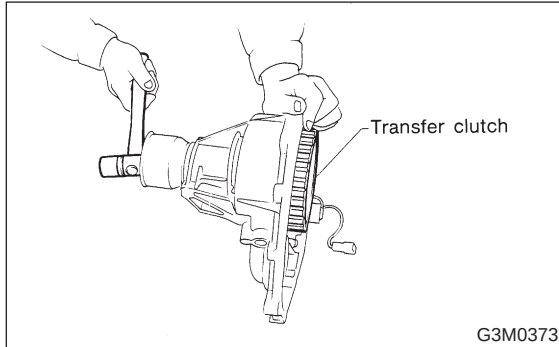


5. EXTENSION SECTION

1) Take out the transfer clutch by lightly tapping the end of the rear drive shaft.

CAUTION:

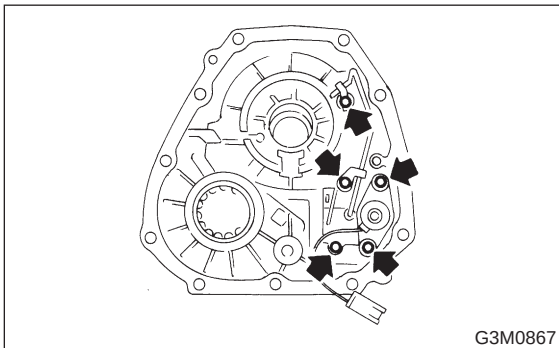
Be careful not to damage the oil seal in the extension.



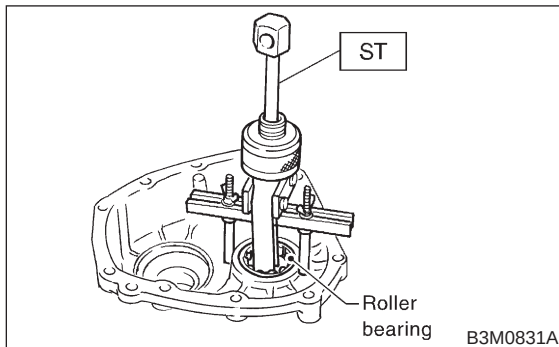
2) Remove duty solenoid C, transfer valve body and the transfer pipe.

CAUTION:

- Take out the inlet filter.
- Do not damage the O-ring.
- Be careful not to bend the pipe.



3) Take out the roller bearing inner race with ST.
ST 398527700 PULLER



4) Take out the roller bearing outer race with ST.

NOTE:

Hook ST in the inner side of the roller bearing outer race.

ST 398527700 PULLER

C: ASSEMBLY OF OVERALL TRANSMISSION**1. TORQUE CONVERTER CLUTCH CASE SECTION**

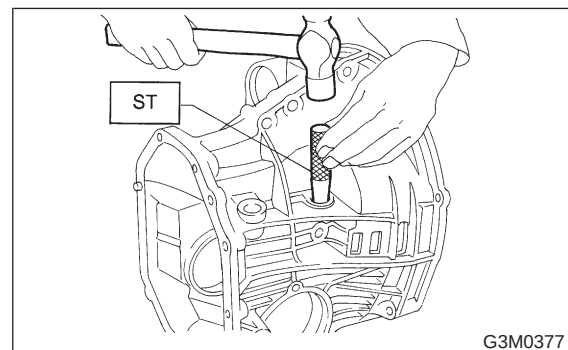
1) Check the appearance of each component and clean.

CAUTION:

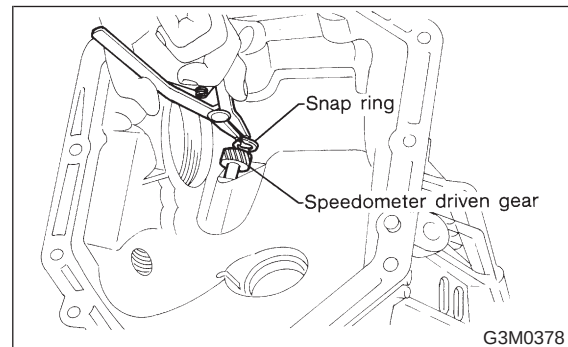
Make sure each part is free of harmful cuts, damage and other faults.

2) Install the washer and snap ring to the speedometer shaft with ST, and set the oil seal. Then force-fit the shaft to the torque converter clutch case.

ST 499827000 PRESS

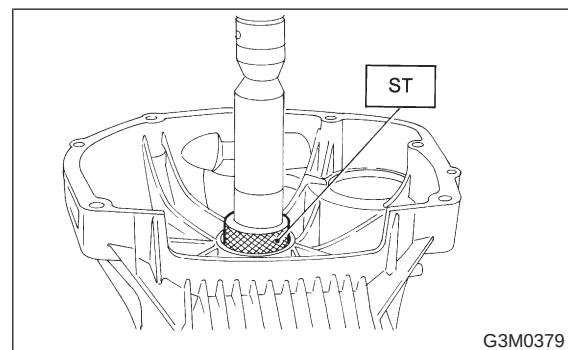


3) Install the speedometer driven gear to the speedometer shaft, and secure with a snap ring.

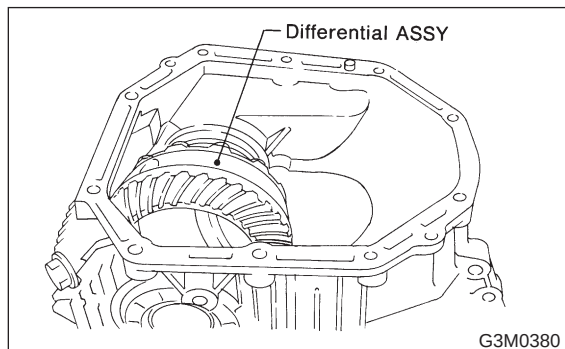


4) Force-fit the oil seal to the torque converter clutch case with ST.

ST 398437700 DRIFT



5) Install the differential assembly to the case, paying special attention not to damage the speedometer gears (drive and driven) and the inside of the case (particularly, the differential side retainer contact surface).



6) Install the circlip to the axle shaft, insert the shaft into the differential assembly, and tap it into position with a plastic hammer.

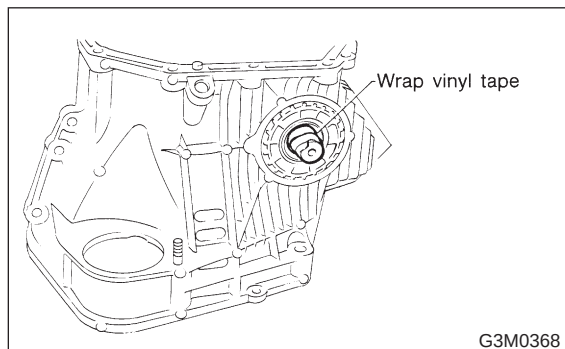
Thrust play:

Approx. 0.3 — 0.5 mm (0.012 — 0.020 in)

CAUTION:

- If no play is felt, check whether the shaft is fully inserted. If shaft insertion is correct, replace the axle shaft.
- Be sure to use a new circlip.

7) Wrap vinyl tape around the splined portion of the axle shaft.



8) Install the oil seal and outer race (taper roller bearing) to the differential side retainer. Then screw in the retainer and the O-ring after coating the threads with oil.

CAUTION:

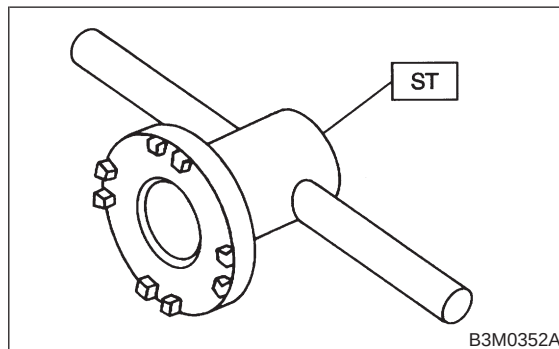
- Pay attention not to damage the oil seal lips.
- Do not confuse the RH and LH oil seals.
- Keep the O-ring removed from the retainer.

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

ST 499787000 WRENCH ASSY

NOTE:

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

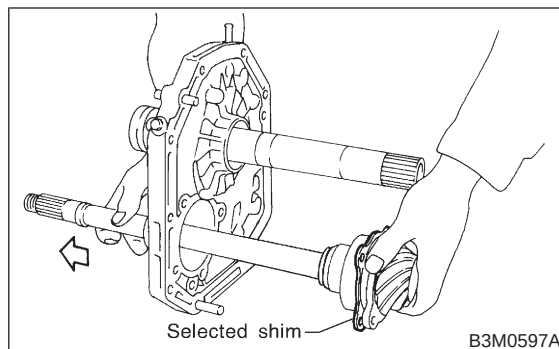


10) Hypoid gear backlash adjustment and tooth contact check

(1) Assemble the drive pinion assembly to the oil pump housing.

CAUTION:

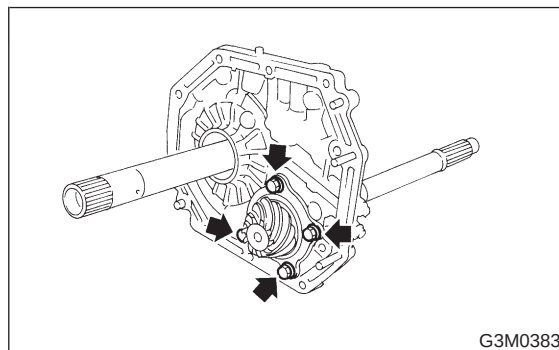
- Be careful not to bend the shims. <Ref. to 3-2 [W16C0].>
- Be careful not to force the pinion against the housing bore.



(2) Tighten four bolts to secure the roller bearing.

Tightening torque:

41±3 N·m (4.2±0.3 kg-m, 30.4±2.2 ft-lb)



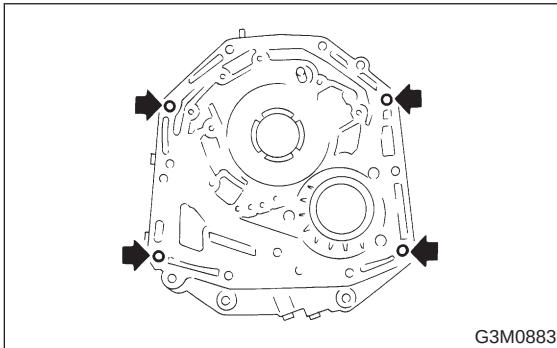
(3) Install the oil pump housing assembly to the torque converter clutch case, and secure evenly by tightening four bolts.

Tightening torque:

$41 \pm 3 \text{ N}\cdot\text{m}$ ($4.2 \pm 0.3 \text{ kg}\cdot\text{m}$, $30.4 \pm 2.2 \text{ ft}\cdot\text{lb}$)

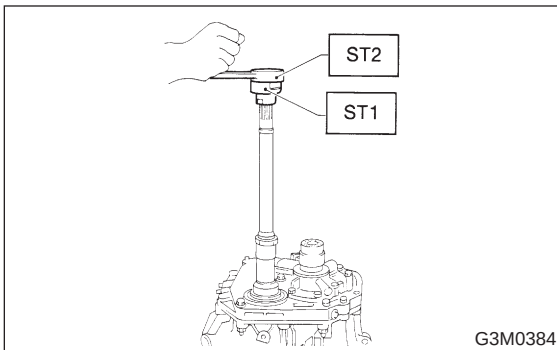
CAUTION:

- 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.

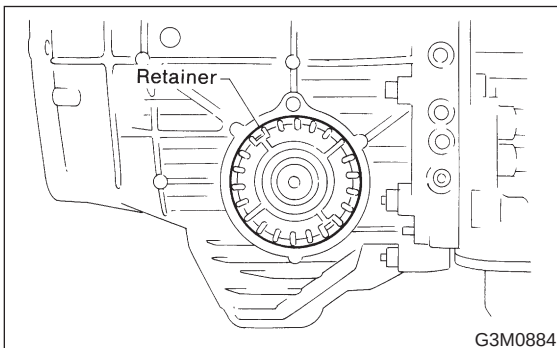


(4) Rotate the drive pinion several times with ST1 and ST2.

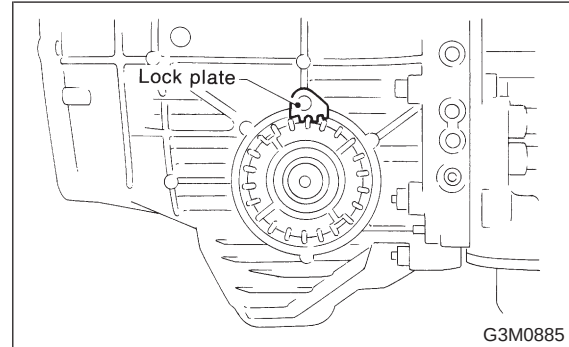
ST1 498937100 HOLDER
ST2 499787100 WRENCH



(5) 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.

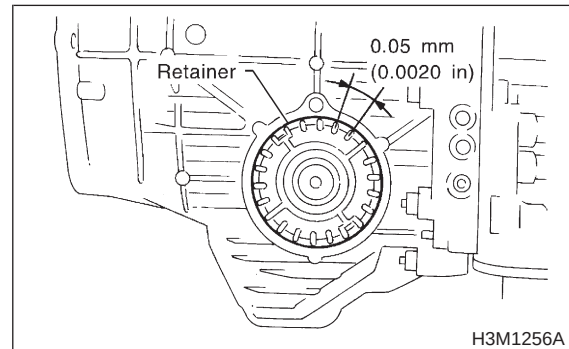


(6) After the “zero” state is established, back off the LH retainer 3 teeth and secure it with the lock plate. Then back off the RH retainer and retighten until it stops. Repeat this procedure several times. Tighten the RH retainer 1-3/4 teeth further. This sets the preload. Finally, secure the retainer with its lock plate.



NOTE:

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



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

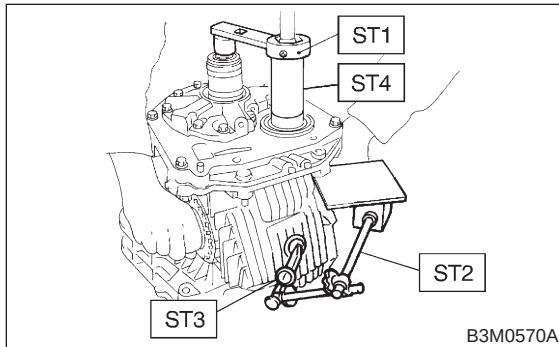
NOTE:

After confirming that the backlash is correct, check the tooth contact.

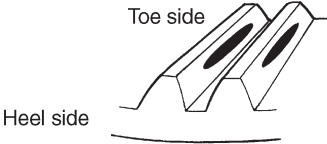
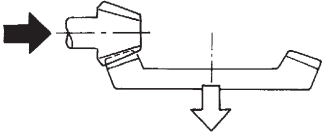
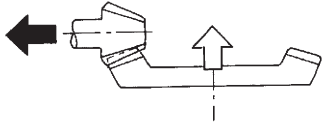
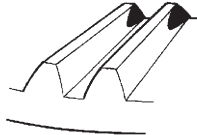
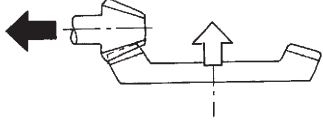
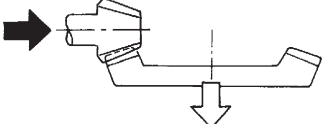
ST1 499787100 WRENCH
ST2 498247001 MAGNET BASE
ST3 498247100 DIAL GAUGE
ST4 499757800 ADAPTER WRENCH

Backlash:

0.13 — 0.18 mm (0.0051 — 0.0071 in)



(8) 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.

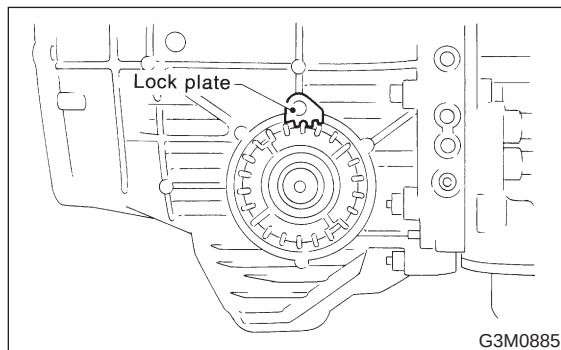
Checking item	Contact pattern	Corrective action
Tooth contact Tooth contact pattern is slightly shifted toward to under no-load rotation. [When loaded, contact pattern moves toward heel.]	 B3M0317A	—
Face contact Backlash is too large.	This may cause noise and chipping at tooth ends.  B3M0319	Increase thickness of drive pinion height adjusting shim in order to bring drive pinion close to crown gear.  B3M0323
Flank contact Backlash is too small.	This may cause noise and stepped wear on surfaces.  B3M0320	Reduce thickness of drive pinion height adjusting shim in order to move drive pinion away from crown gear.  B3M0324
Toe contact (Inside end contact) Contact areas is small.	This may cause chipping at toe ends.  B3M0321	Adjust as for flank contact.  B3M0324
Heel contact (Outside end contact) Contact area is small.	This may cause chipping at heel ends.  B3M0322	Adjust as for face contact.  B3M0323

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

(9) 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:

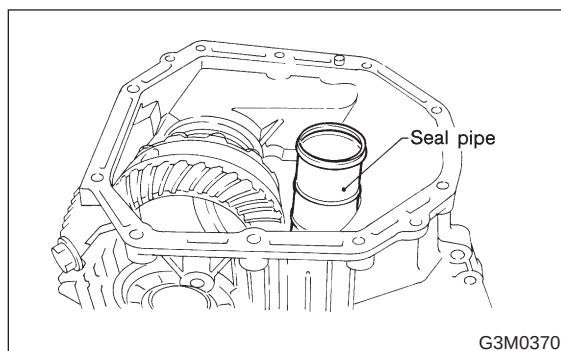
$25 \pm 2 \text{ N}\cdot\text{m}$ ($2.5 \pm 0.2 \text{ kg}\cdot\text{m}$, $18.1 \pm 1.4 \text{ ft}\cdot\text{lb}$)



11) Install the seal pipe to the torque converter clutch case.

CAUTION:

Be sure to use a new seal pipe.

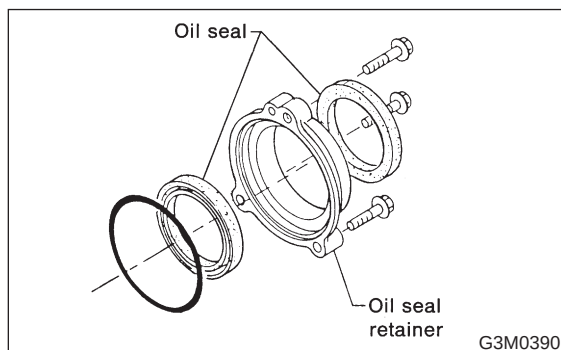


12) Install two oil seals to the oil seal retainer with ST.

ST 499247300 INSTALLER

CAUTION:

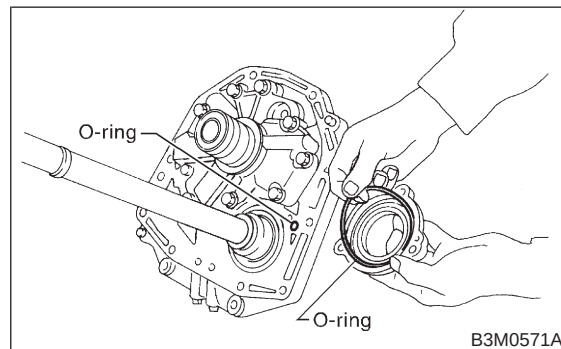
- Always discard old oil seals, and install new ones.
- Pay attention to the orientation of the oil seals.



13) Attach the O-ring to the oil seal retainer with vaseline. Install the seal to the oil pump housing bore.

CAUTION:

Always discard old O-rings and install new ones.



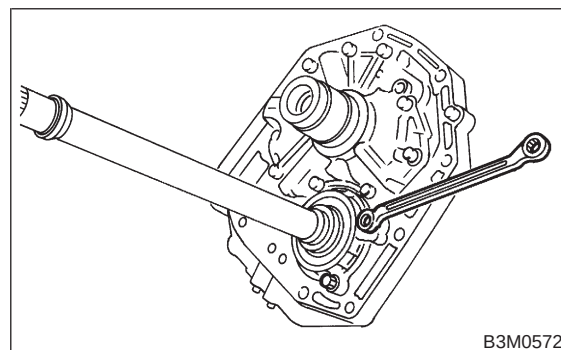
14) Install the oil seal retainer taking care not to damage the oil seal lips. Then secure with three bolts.

NOTE:

Make sure the O-ring is fitted correctly in position.

Tightening torque:

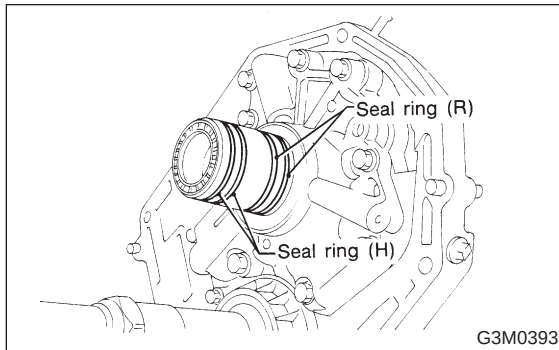
$7 \pm 1 \text{ N}\cdot\text{m}$ ($0.7 \pm 0.1 \text{ kg}\cdot\text{m}$, $5.1 \pm 0.7 \text{ ft}\cdot\text{lb}$)



15) Apply vaseline to the groove on the oil pump cover, and install two (R) seal rings and two (H) seal rings.

NOTE:

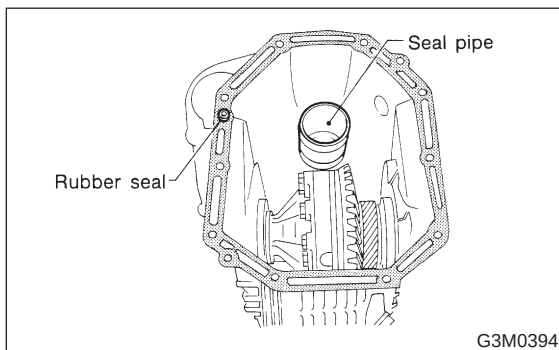
- Fit the seal ring after compressing, and rub vaseline into the seal ring to avoid expansion.
- The "R" seal ring has a large diameter, while "H" has small diameter.



16) Install the rubber seal to the torque converter clutch case.

CAUTION:

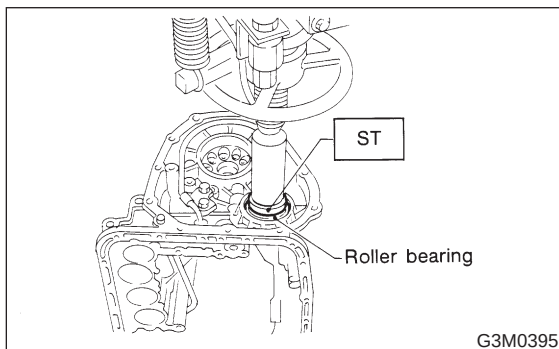
Be careful not to lose the rubber seal.



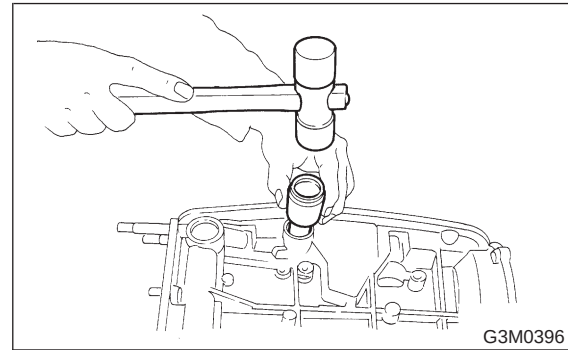
2. TRANSMISSION CASE SECTION

1) Press-fit the roller bearing to the transmission case with ST.

ST 398487700 DRIFT



2) Using a plastic hammer, force-fit the oil seal.



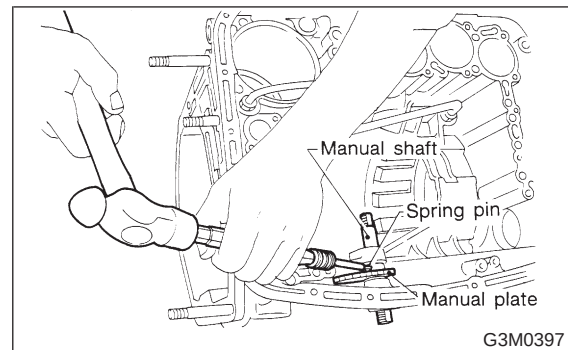
3) Install the manual plate and shaft, and secure with a spring pin.

CAUTION:

Be careful not to damage the oil seal lip.

NOTE:

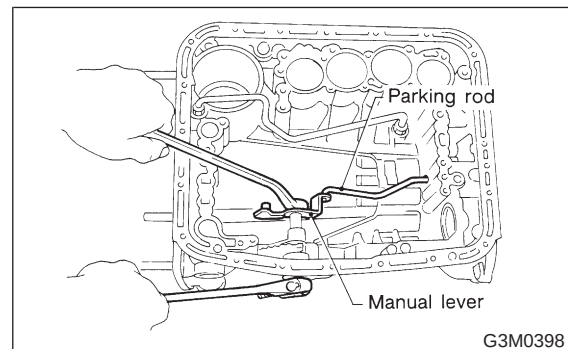
After installation, make sure of smooth movement.



4) Assemble the manual lever and parking rod to the inside shaft, and secure with a nut.

Tightening torque:

$47 \pm 2 \text{ N} \cdot \text{m}$ ($4.8 \pm 0.2 \text{ kg} \cdot \text{m}$, $34.7 \pm 1.4 \text{ ft} \cdot \text{lb}$)



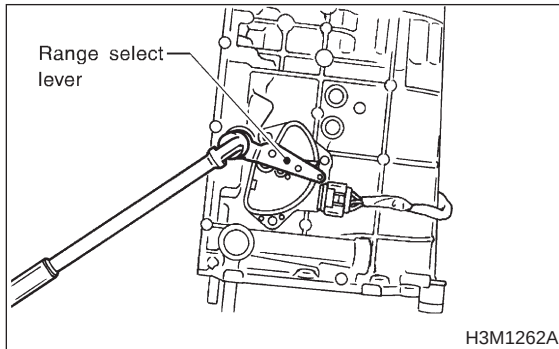
5) Install inhibitor switch.

(1) Install the inhibitor switch to the transmission case. Fit the projecting portion of the switch in the recessed portion of the case, and tighten three bolts temporarily.

- (2) Insert the range select lever into the shaft, and tighten the nut.

Tightening torque:

$47 \pm 5 \text{ N}\cdot\text{m}$ ($4.8 \pm 0.5 \text{ kg}\cdot\text{m}$, $34.7 \pm 3.6 \text{ ft}\cdot\text{lb}$)



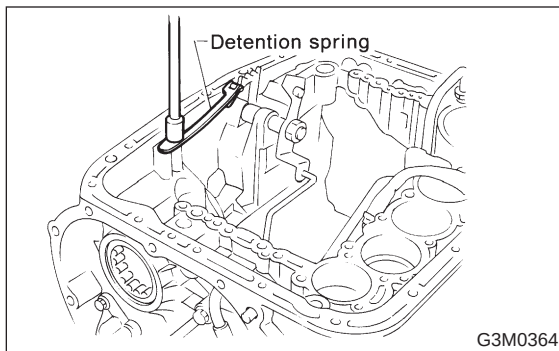
- 6) Install the detention spring.

NOTE:

Position the spring so that its center is aligned with the center of the manual plate.

Tightening torque:

$6 \pm 1 \text{ N}\cdot\text{m}$ ($0.6 \pm 0.1 \text{ kg}\cdot\text{m}$, $4.3 \pm 0.7 \text{ ft}\cdot\text{lb}$)



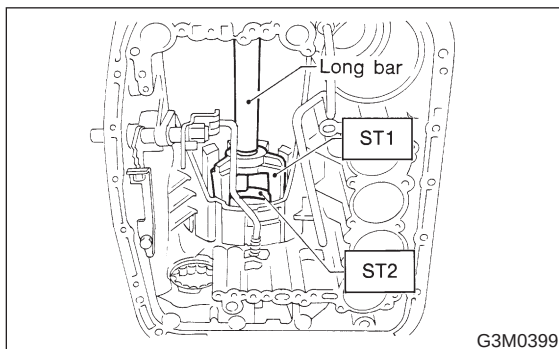
- 7) Install the lathe cut seal rings to the I.D./O.D. of the low and reverse piston. Then install the piston into the case with a press, ST1 and ST2.

ST1 398673600 COMPRESSOR

ST2 498627000 SEAT

CAUTION:

- Be careful not to tilt the piston when installing.
- Be careful not to damage the lip seal.



- 8) Install the one-way clutch inner race.

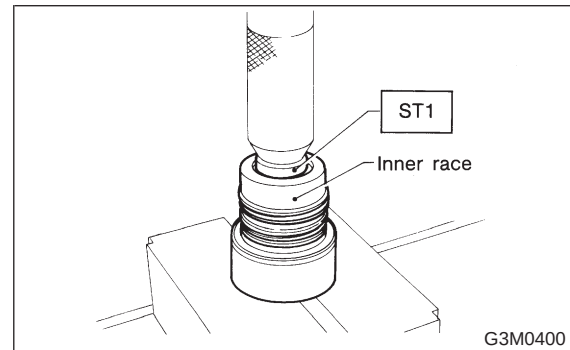
- (1) Using a press and ST1, install the needle bearing to the inner race.

ST1 398497701 INSTALLER

NOTE:

Use the following ST when removing.

ST 398527700 PULLER ASSY



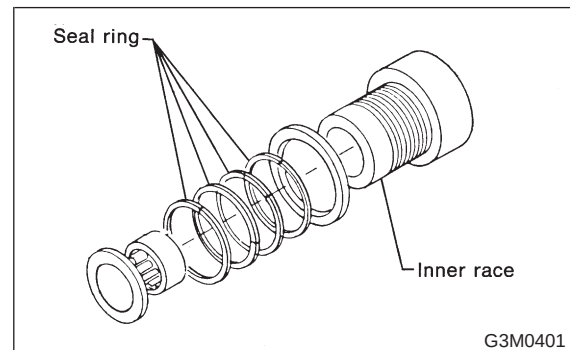
- (2) Install four seal rings and thrust washer.

CAUTION:

Always discard old seal rings, and install new ones.

NOTE:

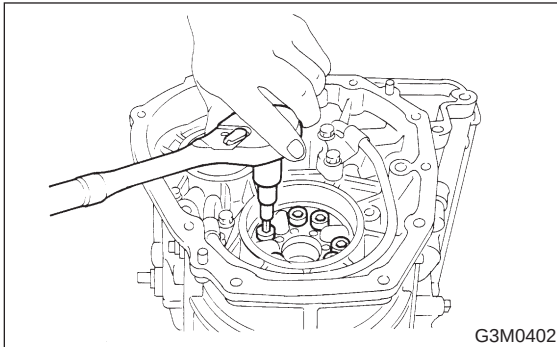
Apply vaseline to the groove of the inner race and to the seal ring after installation, so that the seal ring will not expand.



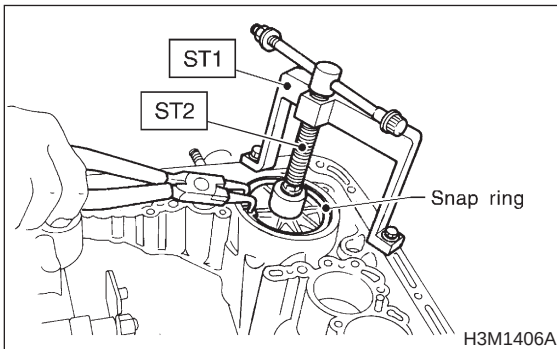
- (3) Place the spring retainer on the inner race. Install the spring to the recessed portion of the piston. Then tighten eight socket head bolts from the rear side of the transmission case.

CAUTION:
Be sure to tighten evenly.

Tightening torque:
 $25 \pm 2 \text{ N}\cdot\text{m}$ ($2.5 \pm 0.2 \text{ kg}\cdot\text{m}$, $18.1 \pm 1.4 \text{ ft}\cdot\text{lb}$)



- 9) Install the band servo sub assembly.
10) Press the O.D. servo retainer into position with ST1 and ST2, and secure with a snap ring.
ST1 498677010 COMPRESSOR
ST2 399703600 PULLER ASSY



CAUTION:
Perform the following operations with the transmission case set vertically on wooden blocks.

- 11) Measure the drive plates thickness of the low & reverse brake.

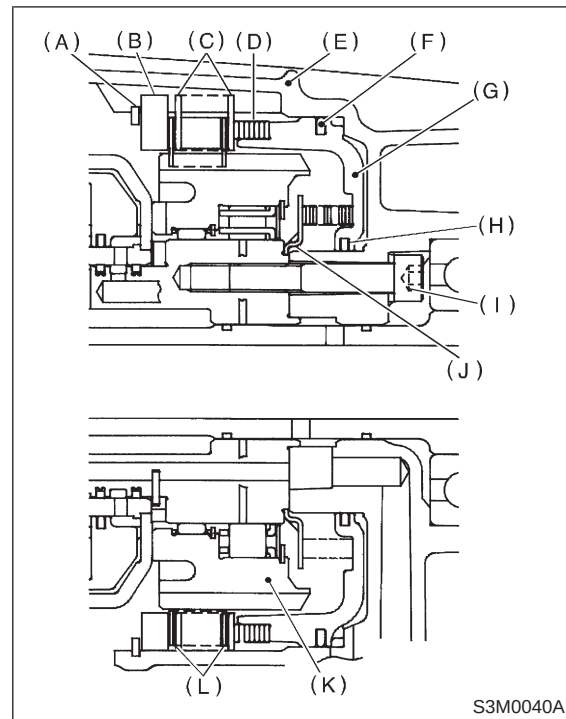
Standard value: 1.8 mm (0.071 in)

Allowable limit: 1.6 mm (0.063 in)

- 12) Installation of the low & reverse brake:

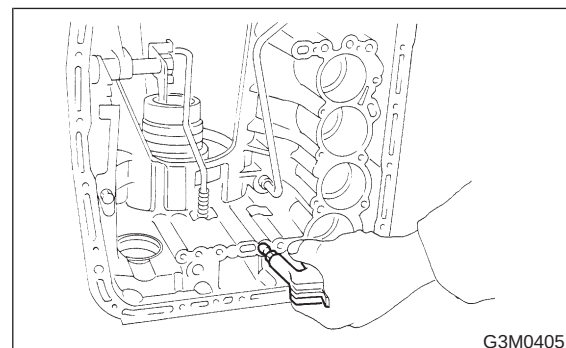
- (1) Install dish plate, driven plates, drive plates, and a retaining plate, and secure with a snap ring.

NOTE:
Pay attention to the orientation of the dish plate.



- (A) Snap ring
- (B) Retaining plate
- (C) Driven plate
- (D) Dish plate
- (E) Transmission case
- (F) Lathe cut seal ring
- (G) Piston
- (H) Lathe cut seal ring
- (I) Bolt
- (J) Clutch spring retainer
- (K) Forward clutch drum
- (L) Drive plate

- (2) Apply compressed air intermittently to check for operation.



- (3) Check the clearance. (Selection of retaining plate)

NOTE:

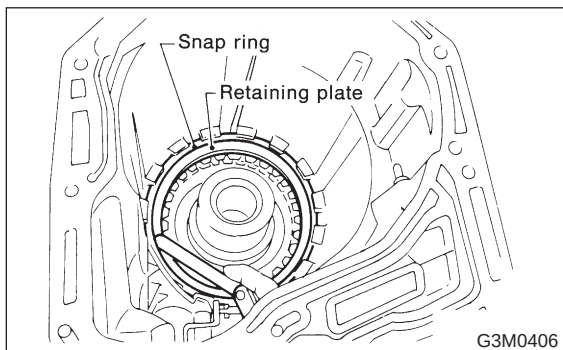
Before measuring clearance, place the same thickness of shim on both sides to prevent retaining plate from tilting.

Standard value:

0.7 — 1.0 mm (0.028 — 0.039 in)

Allowable limit:

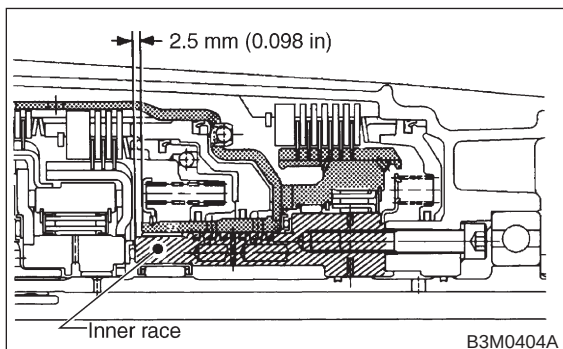
2.2 mm (0.087 in)



Available retaining plates	
Part No.	Thickness mm (in)
31667AA180	6.5 (0.256)
31667AA190	6.8 (0.268)
31667AA200	7.1 (0.280)
31667AA210	7.4 (0.291)
31667AA220	7.7 (0.303)
31667AA230	8.0 (0.315)
31667AA240	8.2 (0.323)
31667AA250	8.4 (0.331)
31667AA310	8.6 (0.339)

- 13) Install the forward clutch drum.

- (1) Install carefully while rotating the forward clutch drum slowly paying special attention not to damage the seal ring.
- (2) Installation is completed when the forward clutch drum recedes 2.5 mm (0.098 in) from the inner race surface.



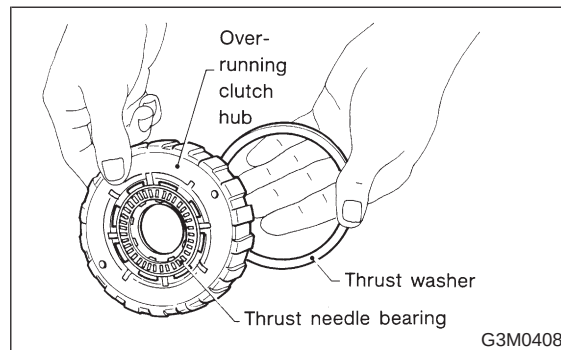
- 14) Assemble the overrunning clutch hub.

CAUTION:

Install thrust needle bearing in the correct direction. <Ref. to 3-2 [S1B2].>

NOTE:

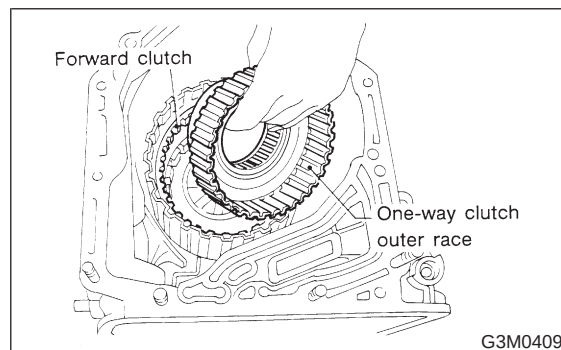
- Join the thrust needle bearing and thrust washer with vaseline, and then install them together.
- Make sure that the splines are engaged correctly.



- 15) Install the one-way clutch outer race.

NOTE:

Make sure the forward clutch splines are engaged correctly.



16) Assemble the rear internal gear.

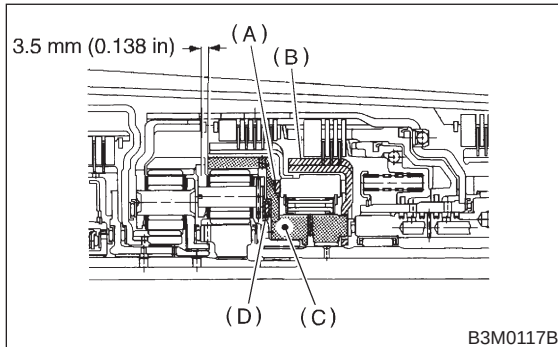
- (1) Join the thrust needle bearing and thrust washer to the internal gear with vaseline, and install the internal gear while rotating it.
- (2) Securely engage the bearing with the dog of the overrunning clutch hub.

CAUTION:

Install thrust needle bearing in the correct direction. <Ref. to 3-2 [S1B2].>

NOTE:

Installation is complete when the snap ring top surface of the forward clutch drum recedes approximately 3.5 mm (0.138 in).



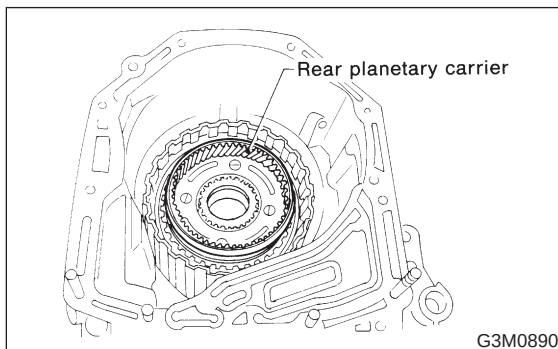
- (A) Thrust washer
- (B) Overrunning clutch hub
- (C) Rear internal gear
- (D) Thrust needle bearing

17) Install the rear planetary carrier.

Attach the thrust needle bearing to the inside of the carrier with vaseline. Then install the carrier while rotating slowly.

CAUTION:

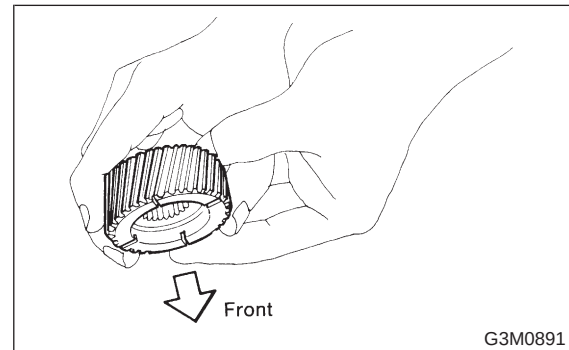
Install thrust needle bearing in the correct direction. <Ref. to 3-2 [S1B2].>



18) Install the rear sun gear.

NOTE:

Install the gear with the oil groove facing up.

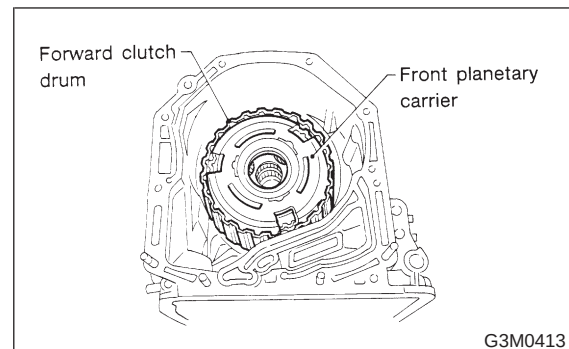


19) Install the front planetary carrier.

Attach the thrust needle bearings to both sides of the carrier with vaseline. Install the carrier carefully, while aligning with the splines of the forward clutch drum, and while rotating the pinion.

CAUTION:

Install thrust needle bearing in the correct direction. <Ref. to 3-2 [S1B2].>

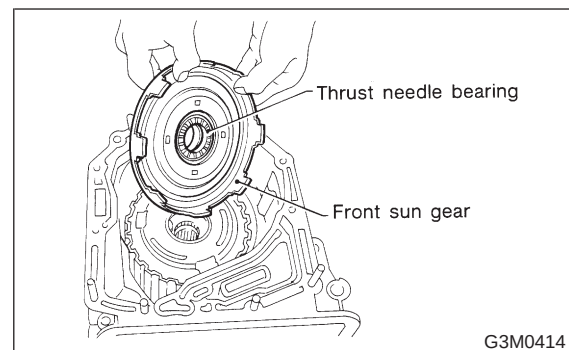


20) Install the front sun gear.

Attach the thrust needle bearing to the gear, and install the gear while turning slowly.

CAUTION:

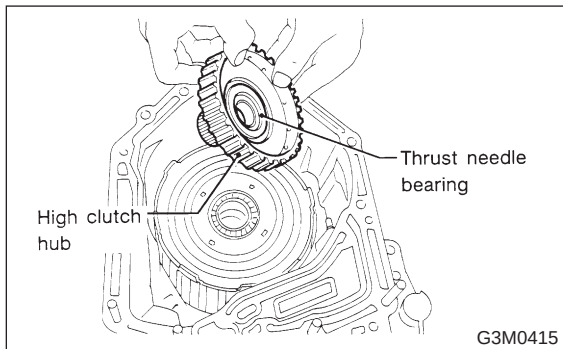
Install thrust needle bearing in the correct direction. <Ref. to 3-2 [S1B2].>



21) Install the high clutch hub.
Attach the thrust needle bearing to the hub with vaseline and install the hub by correctly engaging the splines of the front planetary carrier.

CAUTION:

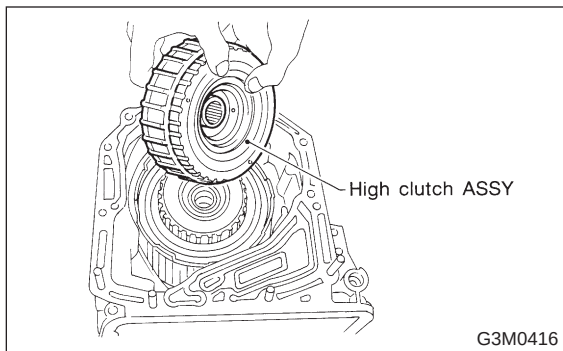
Install thrust needle bearing in the correct direction. <Ref. to 3-2 [S1B2].>



22) Install the high clutch assembly.

NOTE:

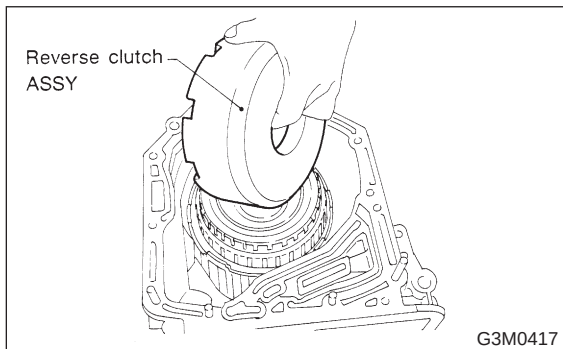
Correctly engage the high clutch hub and clutch splines.



23) Install the reverse clutch assembly.

NOTE:

Engage the high clutch outer spline with the reverse clutch spline and the front sun gear with the cut-out portion of the reverse clutch drum correctly when installing.



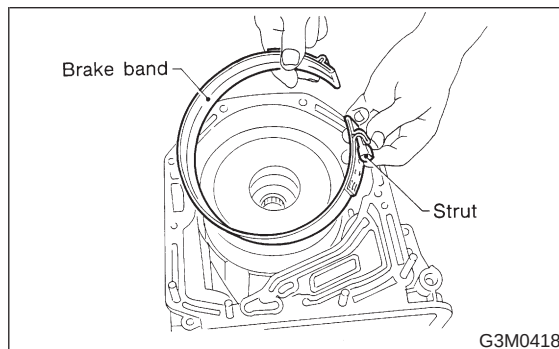
24) Install the brake band.

CAUTION:

Be careful not to damage the brake band when installing.

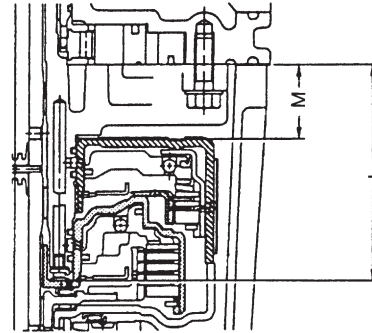
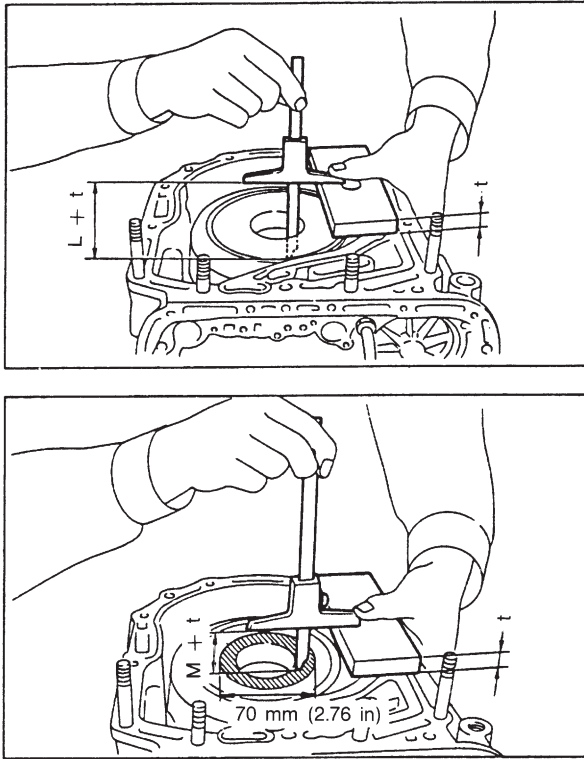
NOTE:

Install the strut to the band servo piston stem. Then tighten it temporarily to avoid tilting the band.



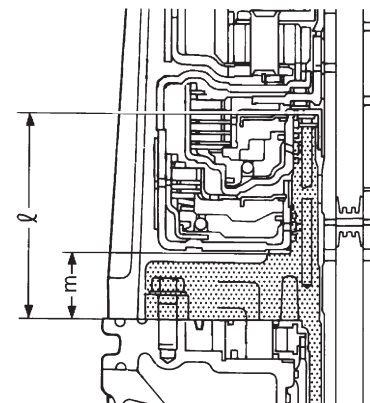
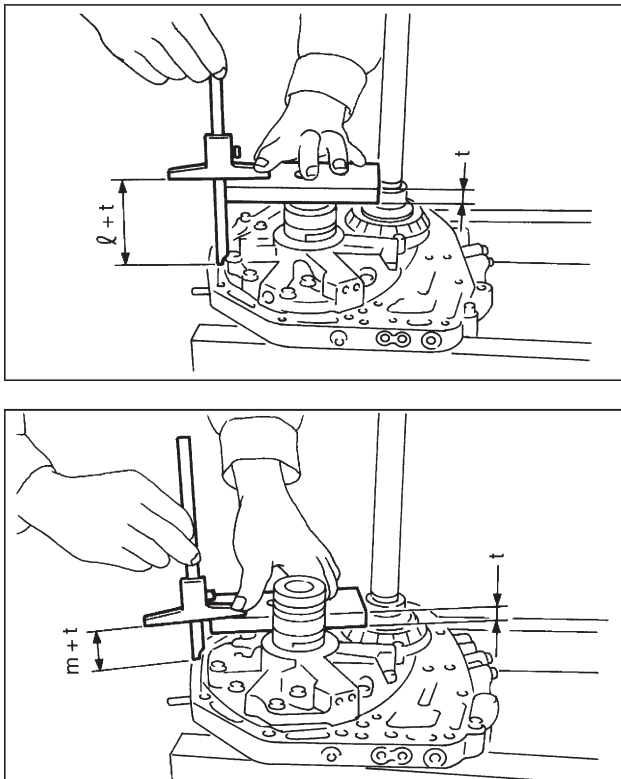
25) Adjustment of total end play and reverse clutch end play

- (1) Measure the distance from the transmission case mating surface to the recessed portion of the high clutch drum "L", and the distance to the top surface of the reverse clutch drum "M".



G3M0419

- (2) Measure the distance from the oil pump housing mating surface to the top surface of the oil pump cover with needle bearing, and to the thrust surface of the reverse clutch.



B3M0573A

(3) Equation for calculation

- Total end play
 $C = (L + 0.4 \text{ mm}) - \ell$

C	Clearance between concave portion of high clutch and end of clutch drum support
L	Length from case mating surface to concave portion of high clutch
0.4	Gasket thickness
ℓ	Height from housing mating surface to upper surface of clutch drum support

Select suitable bearing race from among those listed in this table so that clearance C is in the 0.25 — 0.55 mm (0.0098 — 0.0217 in) range.	Part No.	Thickness mm (in)
	803031021	0.8 (0.031)
	803031022	1.0 (0.039)
	803031023	1.2 (0.047)
	803031024	1.4 (0.055)
	803031025	1.6 (0.063)
	803031026	1.8 (0.071)
	803031027	2.0 (0.079)

- Reverse clutch end play
 $C = (M + 0.4 \text{ mm}) - m$

C	Clearance between oil pump housing hose and end of reverse clutch
M	Distance from case mating surface to upper surface of reverse clutch
0.4	Gasket thickness
m	Height from housing mating surface to thrust-receiving area of reverse clutch

Select suitable thrust washer from among those listed in this table so that clearance C is in the 0.55 — 0.90 mm (0.0217 — 0.0354 in) range.	Part No.	Thickness mm (in)
	31299AA000	0.7 (0.028)
	31299AA010	0.9 (0.035)
	31299AA020	1.1 (0.043)
	31299AA030	1.3 (0.051)
	31299AA040	1.5 (0.059)
	31299AA050	1.7 (0.067)
	31299AA060	1.9 (0.075)

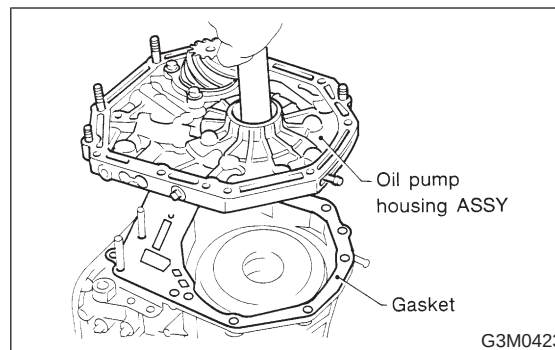
26) Install the oil pump housing assembly.

- (1) After completing end play adjustment, insert the bearing race in the recess of the high clutch. Attach the thrust washer and thrust needle bearing to the oil pump cover with vaseline.

(2) After correctly installing the gasket to the case mating surface, carefully install the oil pump housing assembly. Be careful to avoid hitting the drive pinion against the inside of the case.

CAUTION:

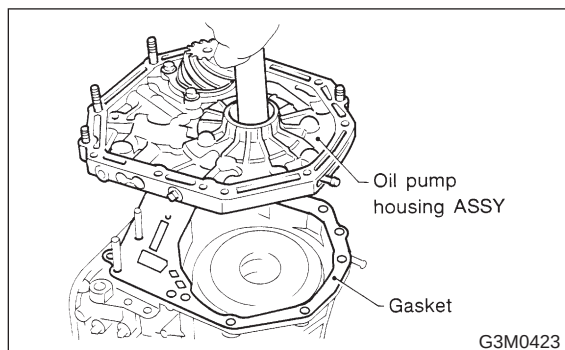
- Be careful not to damage the seal ring.
- Be sure to use a new gasket.



- (3) Install both parts with dowel pins aligned. Make sure no clearance exists at the mating surface.

NOTE:

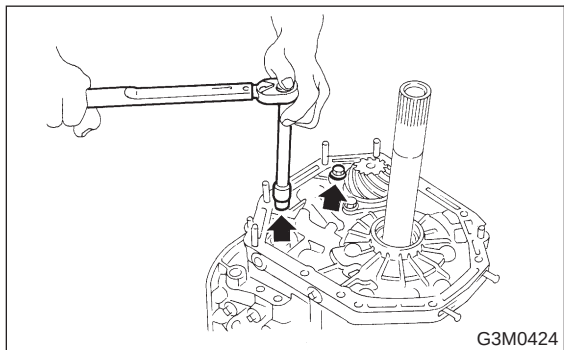
Any clearance suggests a damaged seal ring.



- (4) Secure the housing with two nuts.

Tightening torque:

$41 \pm 3 \text{ N}\cdot\text{m}$ ($4.2 \pm 0.3 \text{ kg}\cdot\text{m}$, $30.4 \pm 2.2 \text{ ft}\cdot\text{lb}$)

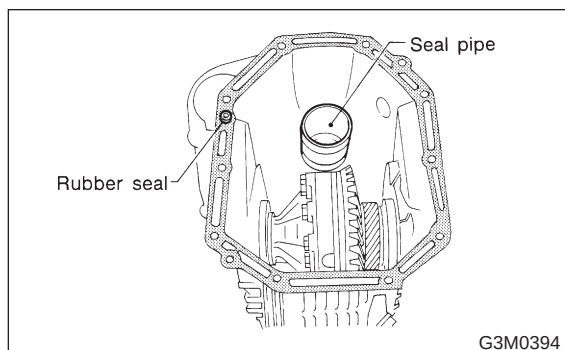


3. TORQUE CONVERTER CLUTCH CASE AND TRANSMISSION CASE

- 1) Apply proper amount of liquid gasket (THREE BOND Part No. 1215) to the entire torque converter clutch case mating surface.

NOTE:

Make sure that the rubber seal and seal pipe are fitted in position.



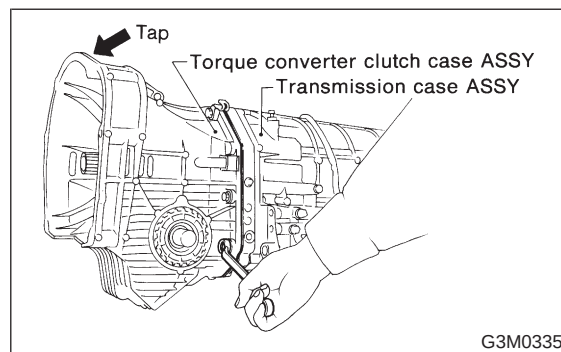
- 2) Install the torque converter clutch case assembly to the transmission case assembly, and secure with six bolts and four nuts.

CAUTION:

When installing, be careful not to damage the torque converter clutch case bushing and oil seal.

Tightening torque:

$41 \pm 3 \text{ N}\cdot\text{m}$ ($4.2 \pm 0.3 \text{ kg}\cdot\text{m}$, $30.4 \pm 2.2 \text{ ft}\cdot\text{lb}$)



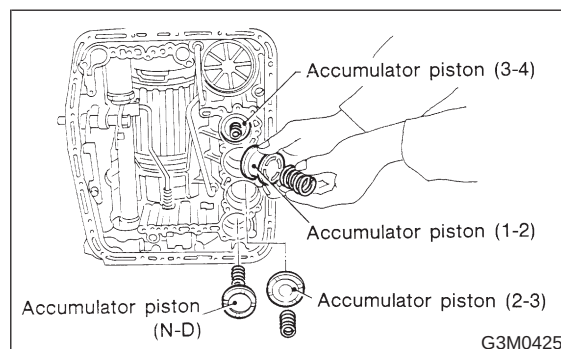
4. CONTROL VALVE AND OIL PAN

- 1) Install four accumulators with oil pans facing upward.

CAUTION:

Be careful not to confuse the springs and installation positions.

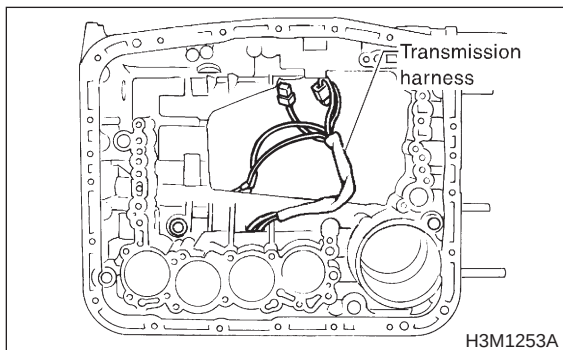
Spring specification		
Accumulator spring	Outer diameter mm (in)	Free length mm (in)
1 — 2	28.5 (1.122)	44.5 (1.752)
2 — 3	20.5 (0.807)	31.0 (1.220)
3 — 4	17.3 (0.681)	43.7 (1.720)
N — D	17.8 (0.701)	36.5 (1.437)



2) Install and route the transmission harness.

CAUTION:

Be careful not to damage the harness.



3) Install the control valve assembly.

(1) Set the select lever in range "2".

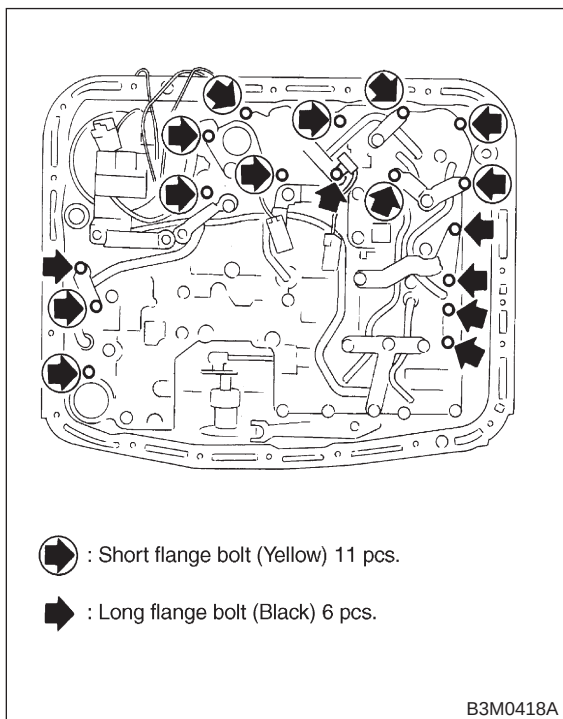
(2) Install the two brackets, ATF temperature sensor and the control valve by engaging the manual valve and manual lever, then tighten the 17 bolts.

CAUTION:

- Be careful not to pinch the harness roll the gasket.
- Tighten the control valve mounting bolts evenly.

Tightening torque:

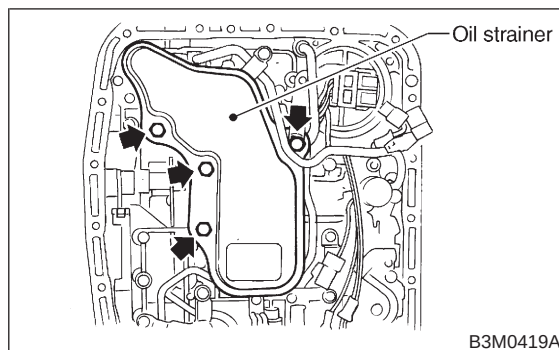
8 ± 1 N·m (0.8 ± 0.1 kg-m, 5.8 ± 0.7 ft-lb)



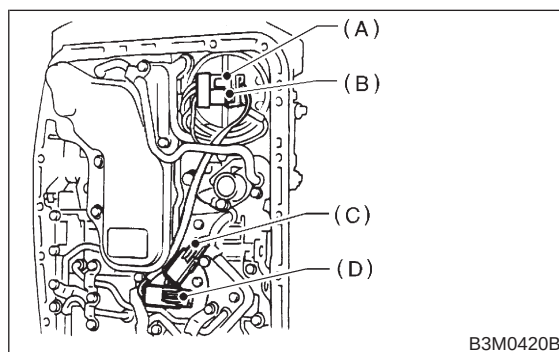
4) Install the oil strainer to the control valve. Be careful not to cut or break the O-ring. Then tighten four bolts.

Tightening torque:

8 ± 1 N·m (0.8 ± 0.1 kg-m, 5.8 ± 0.7 ft-lb)



5) Secure four solenoid valve connectors.



- (A) Shift solenoid 2 and duty solenoid A connector
- (B) Shift solenoid 1 and 3 connector
- (C) Duty solenoid B connector
- (D) ATF temperature sensor connector

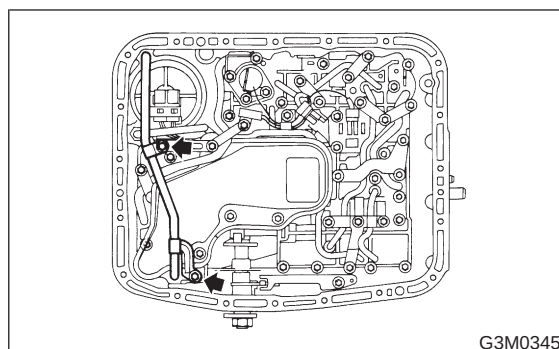
6) Install the oil cooler outlet pipe, and secure with two bolts.

CAUTION:

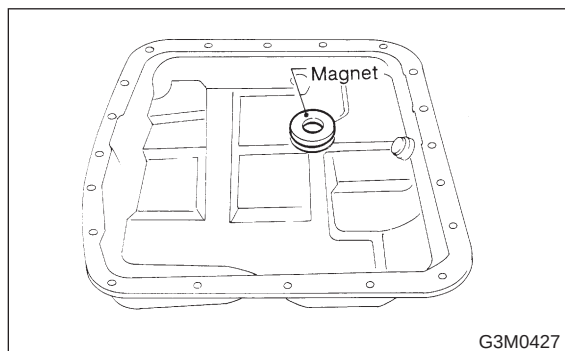
Fit the pipe into position. Be careful to avoid twisting.

Tightening torque:

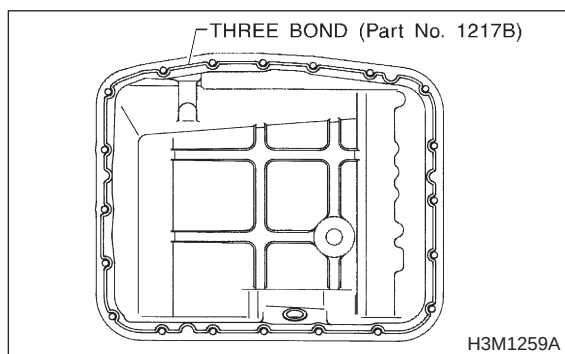
8 ± 1 N·m (0.8 ± 0.1 kg-m, 5.8 ± 0.7 ft-lb)



- 7) Install the oil pan.
(1) Attach the magnet at the specified position.



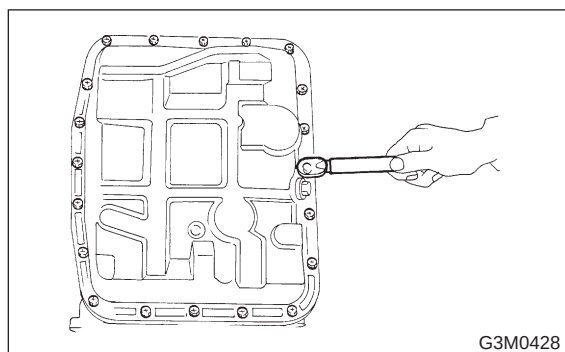
- (2) Apply proper amount of liquid gasket (THREE BOND Part No. 1217B) to the entire oil pan mating surface.



- (3) Install the oil pan to transmission case.

NOTE:
Tighten the bolts evenly.

Tightening torque:
 $4.9 \pm 0.5 \text{ N} \cdot \text{m}$ ($0.50 \pm 0.05 \text{ kg} \cdot \text{m}$, $3.6 \pm 0.4 \text{ ft} \cdot \text{lb}$)



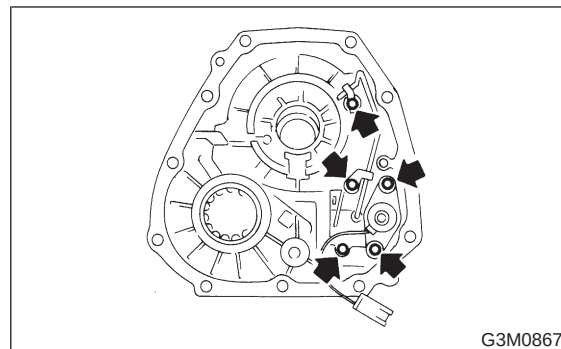
- 2) Install the transfer clutch valve assembly, transfer pipe, and the stay then secure with five bolts.

Tightening torque:

$8 \pm 1 \text{ N} \cdot \text{m}$ ($0.8 \pm 0.1 \text{ kg} \cdot \text{m}$, $5.8 \pm 0.7 \text{ ft} \cdot \text{lb}$)

CAUTION:

- Be sure to tighten the going lead with one of these bolts.
- Be sure to use a new gasket.



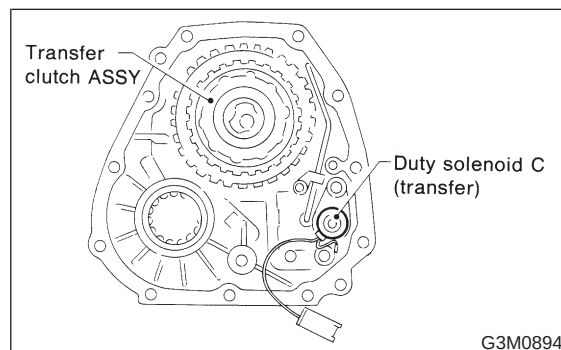
- 3) Install the transfer clutch assembly to the case.

CAUTION:

Be careful not to damage the seal rings.

NOTE:

Insert the clutch assembly fully into position until the bearing shoulder bottoms.



5. EXTENSION SECTION

NOTE:

When installing new oil seal into extension case, press it with ST.

ST 498057300 INSTALLER

- 1) Install the filter in the extension case.

NOTE:

Pay attention to the orientation of the filter.

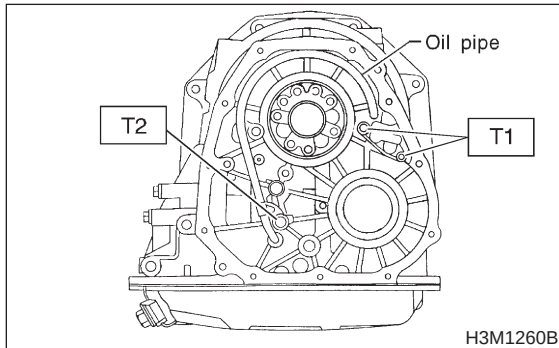
6. CONNECTION OF EACH SECTION

1) Install oil pipe.

Tightening torque:

T1: $7.8 \pm 1.0 \text{ N} \cdot \text{m}$ ($0.80 \pm 0.10 \text{ kg} \cdot \text{m}$, $5.8 \pm 0.7 \text{ ft} \cdot \text{lb}$)

T2: $24.5 \pm 2.0 \text{ N} \cdot \text{m}$ ($2.50 \pm 0.20 \text{ kg} \cdot \text{m}$, $18.1 \pm 1.4 \text{ ft} \cdot \text{lb}$)



2) Install the reduction driven gear.

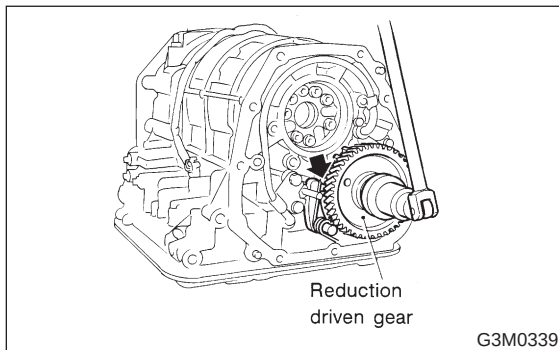
3) Install the parking pawl and shaft, set the select lever in the "P" range and tighten the drive pinion lock nut.

NOTE:

After tightening, stake the lock nut securely.

Tightening torque:

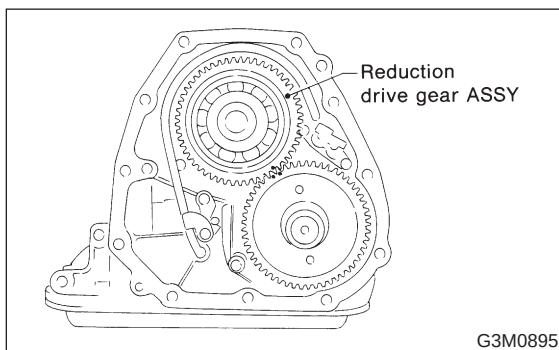
$98 \pm 5 \text{ N} \cdot \text{m}$ ($10.0 \pm 0.5 \text{ kg} \cdot \text{m}$, $72.3 \pm 3.6 \text{ ft} \cdot \text{lb}$)



4) Install the reduction drive gear.

NOTE:

Insert it fully into position until the bearing shoulder bottoms.

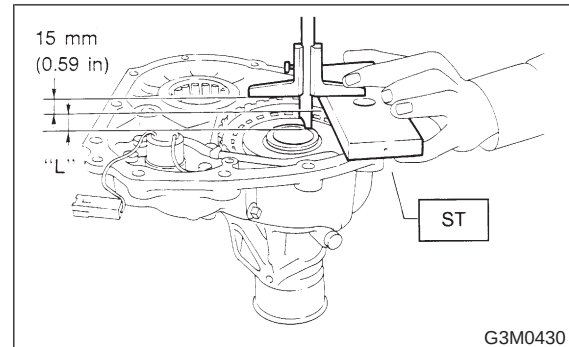


5) Measurement and adjustment of extension end play

(1) Measure distance L from end of extension case and rear drive shaft with ST.

L = Measured value - 15 mm

ST 398643600 GAUGE

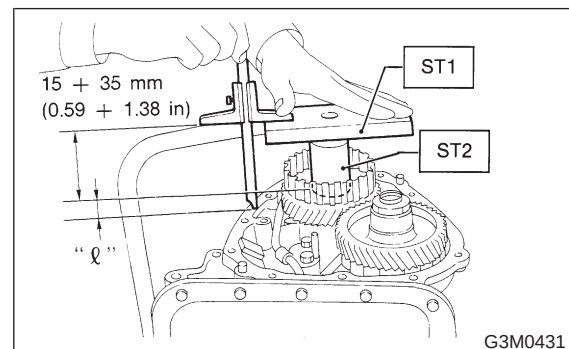


(2) Measure the distance "ℓ" from the transmission case mating surface to the reduction drive gear end surface with ST1 and ST2.

ℓ = Measured value - 50 mm

ST1 398643600 GAUGE

ST2 499577000 GAUGE



(3) Calculation equation:

$$T = (L + 0.4 \text{ mm}) - \ell$$

T	Clearance between end of reduction drive gear and end of rear drive shaft.
L	Distance from end of extension case to end of rear drive shaft.
0.4	Gasket thickness
ℓ	Height from end of transmission case to end of reduction drive gear.

(4) Select suitable thrust needle bearing from among those listed in the following table to adjust clearance in the 0.05 — 0.20 mm (0.0020 — 0.0079 in) range.

NOTE:

Select from one to five shims so that clearance is within specifications.

Thrust needle bearing	
Part No.	Thickness mm (in)
806536020	3.8 (0.150)
806535030	4.0 (0.157)
806535040	4.2 (0.165)
806535050	4.4 (0.173)
806535060	4.6 (0.181)
806535070	4.8 (0.189)
806535090	5.0 (0.197)

6) Installation of extension case and transmission case.

(1) Attach the selected thrust needle bearing to the end surface of reduction drive gear with vaseline.

(2) Set the parking return spring.

(3) Remove the transfer clutch from the extension case.

Set the needle bearing on the reduction drive shaft and then install transfer clutch to the transfer clutch hub.

NOTE:

Be sure to engage the spline teeth correctly.

(4) With gasket inserted between them, install the extension case to the transmission case.

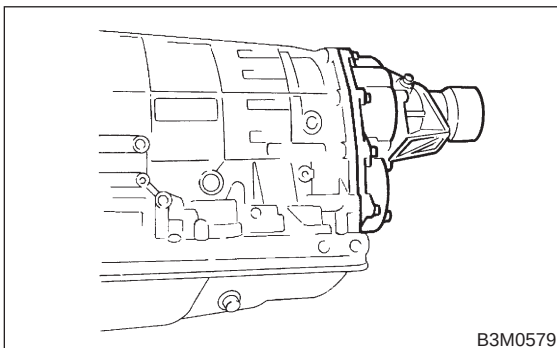
CAUTION:

- Be sure to use a new gasket.
- After inserting the extension case halfway, connect the connector for duty solenoid C. Be careful not to jam the cord in the case.
- Be careful not to damage the rear drive shaft seal ring.

(5) Tighten bolts to secure the case.

Tightening torque:

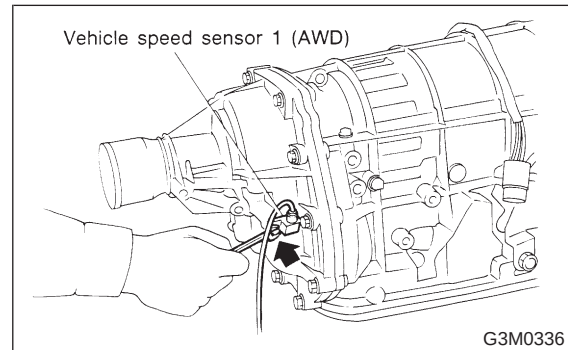
25 ± 2 N·m (2.5 ± 0.2 kg-m, 18.1 ± 1.4 ft-lb)



7) Install the vehicle speed sensor 1.

Tightening torque:

7 ± 1 N·m (0.7 ± 0.1 kg-m, 5.1 ± 0.7 ft-lb)



7. EXTERNAL PARTS

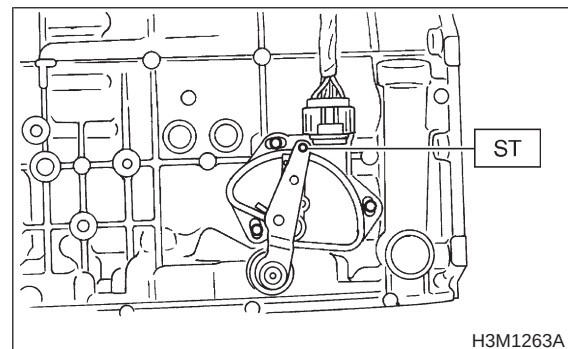
1) Adjustment of inhibitor switch.

(1) With the selector lever set to "N" adjust the inhibitor switch so that the hole of range select lever is aligned with the inhibitor switch hole with ST.

NOTE:

Ensure that gauge moves properly.

ST 499267300 STOPPER PIN

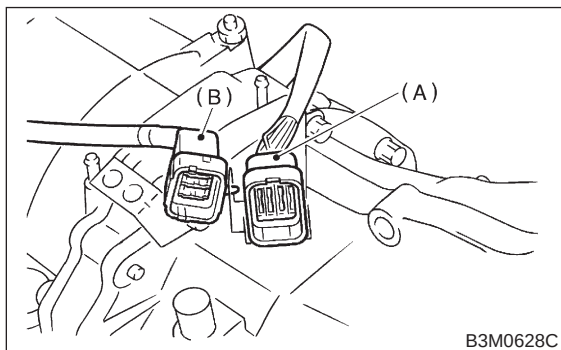


(2) With hole aligned, tighten three bolts to secure the inhibitor switch.

Tightening torque:

3.4 ± 0.5 N·m (0.35 ± 0.05 kg-m, 2.5 ± 0.4 ft-lb)

- 2) Clip the following cords and harness.



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

- 3) Install the oil cooler outlet pipe.

CAUTION:

Be sure to use a new aluminum washer.

Tightening torque:

$34 \pm 3 \text{ N} \cdot \text{m}$ ($3.5 \pm 0.3 \text{ kg} \cdot \text{m}$, $25.3 \pm 2.2 \text{ ft} \cdot \text{lb}$)

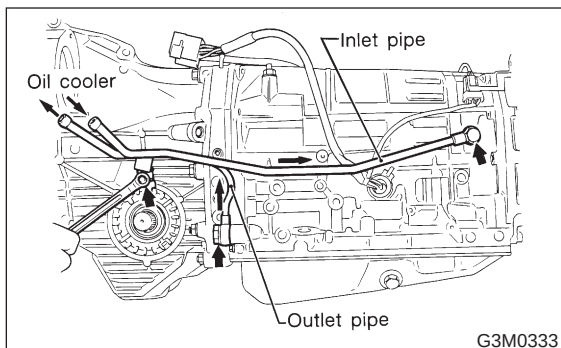
- 4) Install the oil cooler inlet pipe.

CAUTION:

Be sure to use a new aluminum washer.

Tightening torque:

$25 \pm 2 \text{ N} \cdot \text{m}$ ($2.5 \pm 0.2 \text{ kg} \cdot \text{m}$, $18.1 \pm 1.4 \text{ ft} \cdot \text{lb}$)



- 5) Install the oil charge pipe.

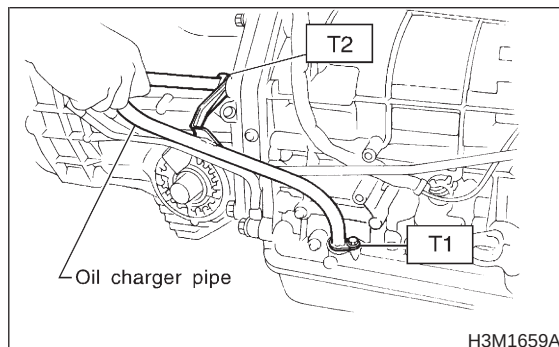
CAUTION:

Be careful not to damage the O-ring.

Tightening torque:

$T1: 6.4 \pm 0.5 \text{ N} \cdot \text{m}$ ($0.65 \pm 0.05 \text{ kg} \cdot \text{m}$, $4.7 \pm 0.4 \text{ ft} \cdot \text{lb}$)

$T2: 41 \pm 3 \text{ N} \cdot \text{m}$ ($4.2 \pm 0.3 \text{ kg} \cdot \text{m}$, $30.4 \pm 2.2 \text{ ft} \cdot \text{lb}$)



- 6) Adjustment of brake band

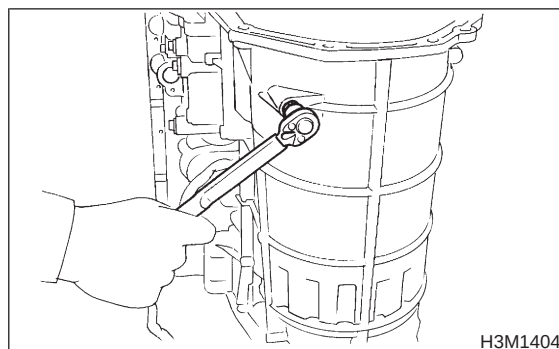
After tightening the brake band adjusting screw to $9 \text{ N} \cdot \text{m}$ ($0.9 \text{ kg} \cdot \text{m}$, $6.5 \text{ ft} \cdot \text{lb}$) torque, back it off three turns. Then secure with a lock nut.

NOTE:

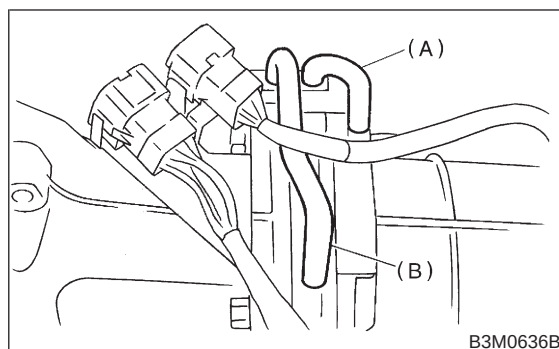
When tightening the lock nut, be careful not to turn the adjusting screw.

Tightening torque:

$26 \pm 2 \text{ N} \cdot \text{m}$ ($2.7 \pm 0.2 \text{ kg} \cdot \text{m}$, $19.5 \pm 1.4 \text{ ft} \cdot \text{lb}$)



- 7) Install the air breather hose.

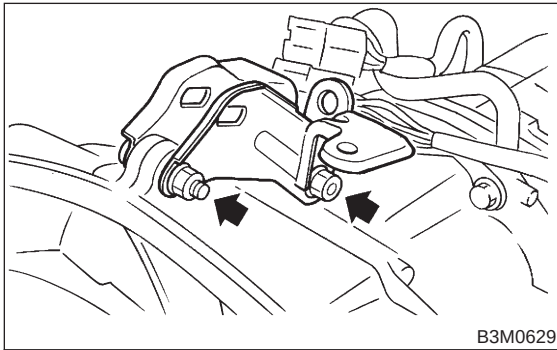


- (A) Air breather hose (Transmission case)
(B) Air breather hose (Oil pump housing)

8) Install the pitching stopper bracket.

Tightening torque:

$41 \pm 3 \text{ N}\cdot\text{m}$ ($4.2 \pm 0.3 \text{ kg}\cdot\text{m}$, $30.4 \pm 2.2 \text{ ft}\cdot\text{lb}$)

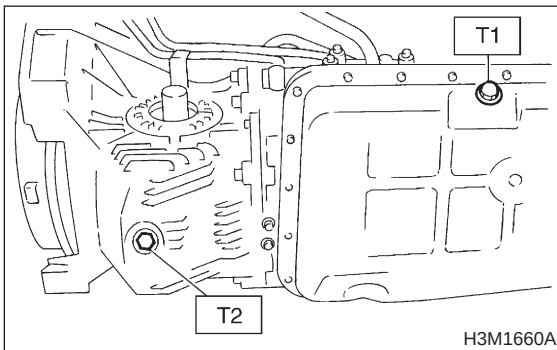


9) Tighten the ATF and differential gear oil drain plugs.

Tightening torque:

T1: $25 \pm 2 \text{ N}\cdot\text{m}$ ($2.5 \pm 0.2 \text{ kg}\cdot\text{m}$, $18.1 \pm 1.4 \text{ ft}\cdot\text{lb}$)

T2: $44 \pm 3 \text{ N}\cdot\text{m}$ ($4.5 \pm 0.3 \text{ kg}\cdot\text{m}$, $32.5 \pm 2.2 \text{ ft}\cdot\text{lb}$)



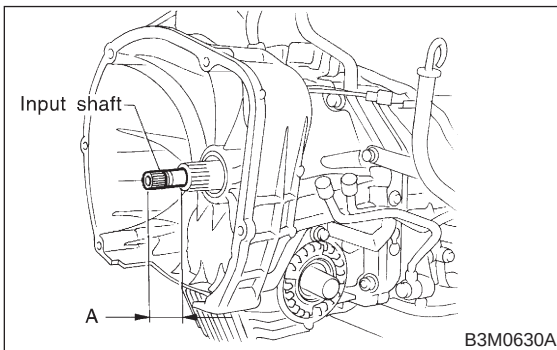
10) Insert the input shaft while turning lightly by hand.

CAUTION:

Be careful not to damage the bushing.

Normal protrusion A:

$28 - 32 \text{ mm}$ ($1.10 - 1.26 \text{ in}$)



11) Install the torque converter clutch assembly.

(1) Install the oil pump shaft to the torque converter clutch.

NOTE:

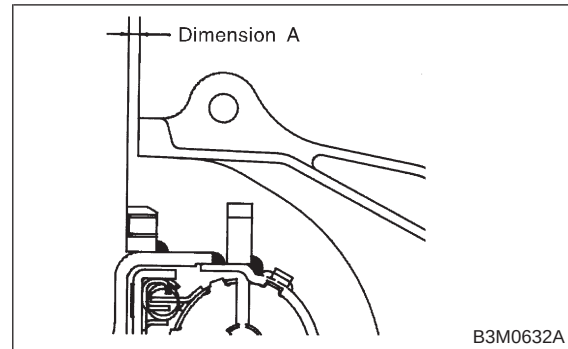
Make sure the clip fits securely in its groove.

(2) Holding the torque converter clutch assembly by hand, carefully install it to the torque converter clutch case. Be careful not to damage the bushing. Also avoid undue contact between the oil pump shaft bushing and stator shaft portion of the oil pump cover.

(3) Rotate the shaft lightly by hand to engage the splines securely.

Dimension A:

$7.9 - 8.1 \text{ mm}$ ($0.311 - 0.319 \text{ in}$)



12) Fill ATF and differential gear oil.

<Ref. to 3-2 [S1A0].>

NOTE:

After filling oil, insert the oil level gauge into the oil inlet.

Differential gear oil capacity:

$1.1 - 1.3 \text{ l}$ ($1.2 - 1.4 \text{ US qt}$, $1.0 - 1.1 \text{ Imp qt}$)

Automatic transmission fluid capacity:

$9.5 - 9.8 \text{ l}$ ($10.0 - 10.3 \text{ US qt}$, $8.4 - 8.6 \text{ Imp qt}$)

Recommended fluid:

Dexron II or Dexron III type automatic transmission