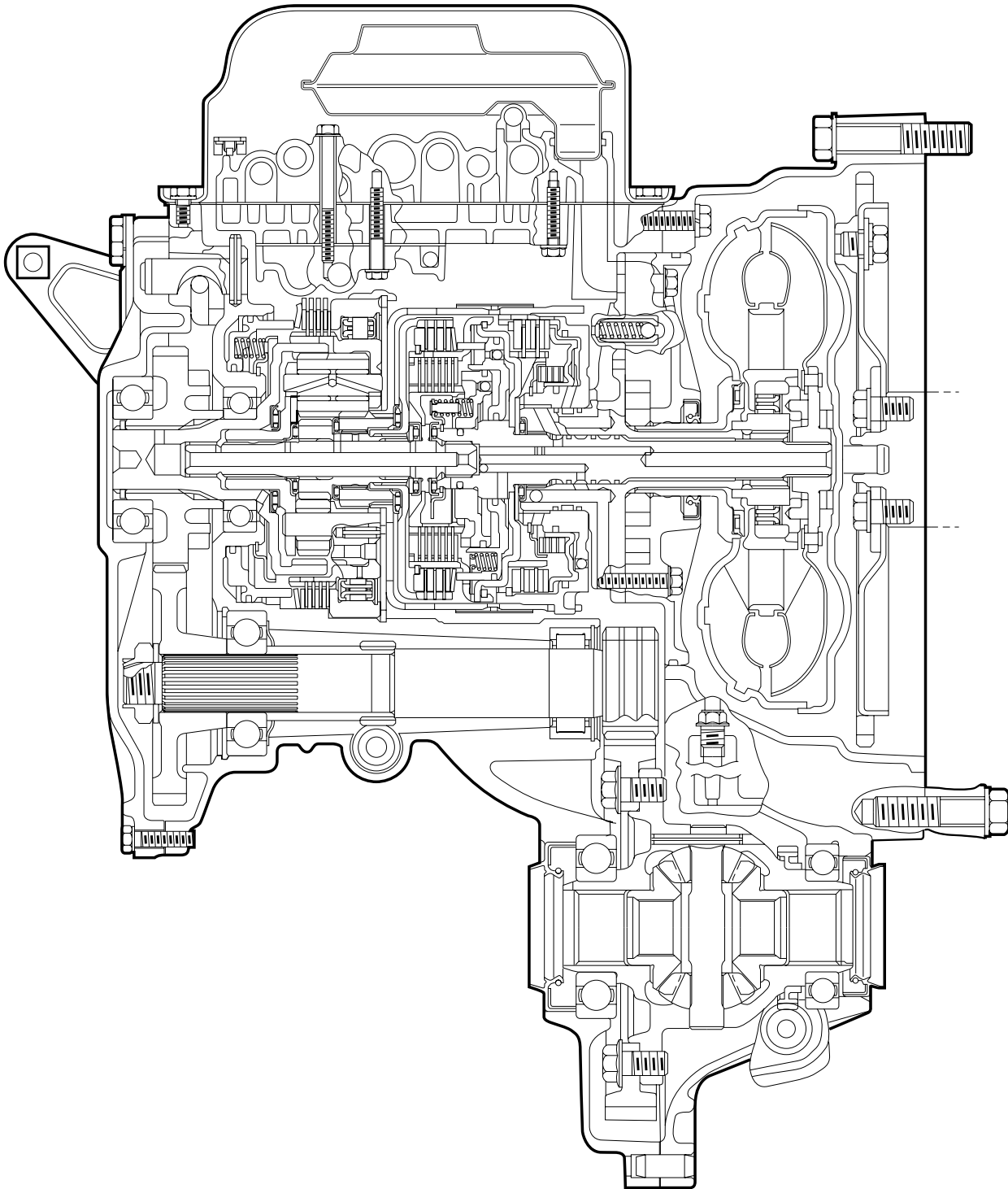


AUTOMATIC TRANSMISSION (TYPE A4LB)

OUTLINE	AT- 2	TORQUE CONVERTOR &	
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OUTLINE

SECTIONAL VIEW OF AUTOMATIC TRANSAXLE



SPECIFICATIONS

Item		Specifications
Torque converter	Type	Three-element, one-stage, two-phase type
	Stall torque ratio/Stall revolution speed	2.0/2600 rpm
	One-way clutch type	Sprag type
Transmission specification	Type	Four forward speeds, one reverse gear, ravingeau planetary gear type
	Control element	Wet type multiple clutch 3 sets
		Band type brake 1 set
		Wet type multiple brake 1 set
		One-way clutch 1 piece
	Gear ratio	1st gear: 2.800 2nd gear: 1.540 3rd gear: 1.000 4th gear: 0.700 reverse gear: 2.333
	Final gear ratio	4.438
	Speedometer gear ratio	19/17
	Oil pump	Internal gear type
	Fluid to be used	ATF DEXRON® III
	Drain and Refill liter	1.9
	Fluid capacity liter	4.0
	Cooling method	Water-cooled (radiator built-in type)
Control system	Gear shift control method	Governor and throttle pressure shift control method
	Automatic gear shift	Four forward speeds, full automatic shift
	Manual control pattern	P—R—N—D ₄ —3—2

MAT00003-00000

PRELIMINARY CHECK

1. Check of transaxle fluid level

NOTE:

- Prior to the fluid level check, be sure to run the vehicle until the engine and transaxle have reached their normal operating temperature.
(Fluid temperature: 70 - 90°C)

2. Check of engine idling speed.

Specified Value: 850 rpm [ISC VSV ... ON]

- Park the vehicle on a level surface. Apply the parking brake.
- With the engine idling, smoothly move the shift lever all through the ranges from P to 2. Finally, return the shift lever to the P range.
- Pull out the transaxle fluid level gauge and wipe it clean.
- Push it back fully into the tube.
- Pull it out and check that the fluid level is in the HOT range.

If the fluid level is too low, add the fluid.

CAUTION:

- Do not overfill the fluid.

NOTE:

- If it is necessary to check the fluid level at a low temperature (20 - 30°C), e.g. at the time of fluid change, first adjust the fluid level so that it may become within the COLD level. Then, recheck the fluid level under the hot conditions.
- If the fluid level fails to reach the cold level on the fluid level gauge, be sure to check the transaxle for fluid leakage. Also, pull out the fluid level gauge and check the fluid for contamination or smell of fluid burning.

3. Check of fluid condition

If the fluid smells burning or it presents a black appearance, change the fluid.

4. Change of transaxle fluid

- Remove the transaxle oil by removing the drain plug with the gasket. Drain the fluid.

NOTE:

- Never reuse the removed gasket.

• Transaxle warming-up method

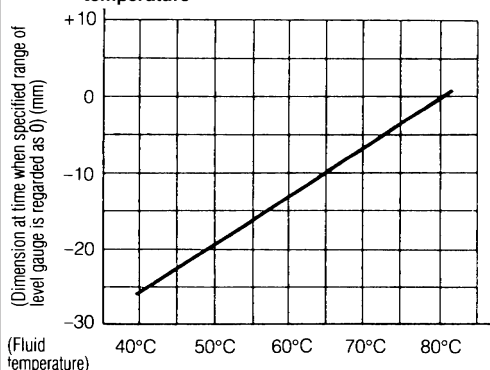
- Warm up the engine.
- If the vehicle runs for about 15 minutes at a speed of 60 km/h or for about 30 minutes at a speed of 40 km/h, the temperature of the fluid inside the transaxle becomes about $80 \pm 10^\circ\text{C}$.

Reference

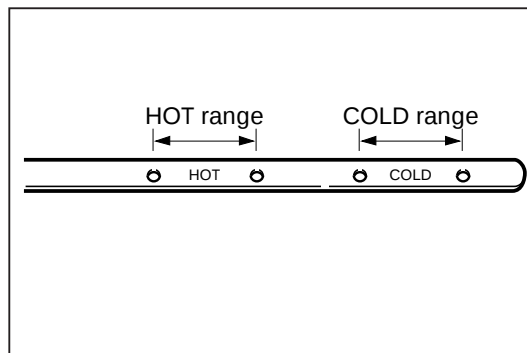
When the engine is cold, if the engine is operated for about 35 minutes at the idling speed after the engine has started, the temperature of the fluid inside the transaxle will rise to about $60 \pm 10^\circ\text{C}$.

Reference

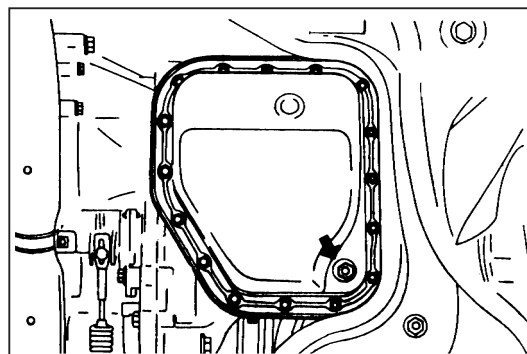
• Change of fluid level as a result of rise in fluid temperature



MAT00004-00002



MAT00005-00003



MAT00006-00004

- (2) With a new gasket interposed, tighten the drain plug securely.

Tightening Torque: 19.6 - 29.4 N·m

- (3) Add new fluid through the filler tube.
- (4) Start the engine. Move the shift lever to all positions from P through 2. Then, move it to the P position.
- (5) With the engine idling, check the fluid level. Add fluid up to the COLD level on the fluid level gauge.
- (6) Check the fluid level at the normal fluid operating temperature (70 - 90°C). Add the fluid, as required.

5. Adjustment of throttle cable

The purpose of this adjustment is to make the full open state of the throttle link of the throttle body at the engine side equal to the full-open position of the throttle valve inside the transaxle.

- (1) Remove the battery and battery carrier.
- (2) Remove the radiator upper support bracket and the radiator reservoir tank hose (at the radiator side).
- (3) Move the radiator upward.

- (4) Reset the automatic adjusting mechanism, following the procedure given below.

NOTE:

- When turning the casing cap with pliers or the like, be sure not to apply a lateral force. If a lateral force should be applied, it may damage (break) the casing cap section.

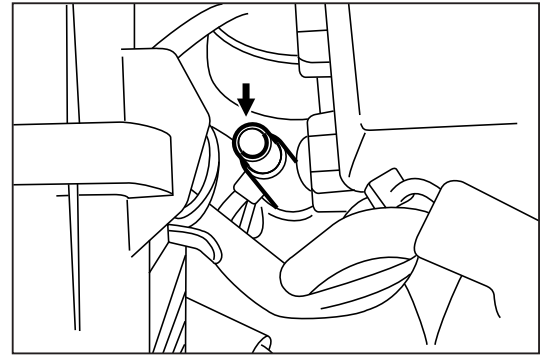
- 1) Turn the casing cap about 60 to 90 degrees. (The circlip will be expanded.)

NOTE:

- When turning the casing cap with pliers or the like, be sure to clamp the hexagonal staked section of the casing cap.

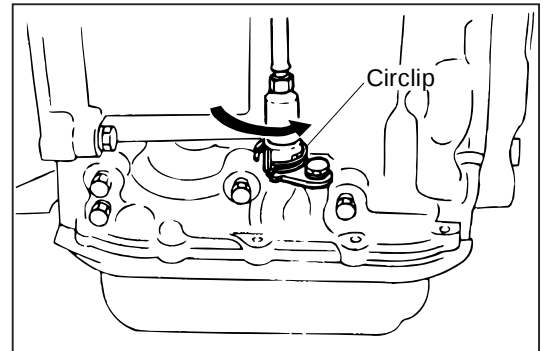
- 2) Pull the casing cap, until it is brought into contact with the stopper.

- 3) Turn the casing cap in the reverse direction of the step 1). (The circlip will be closed so that the casing cap may be secured.)

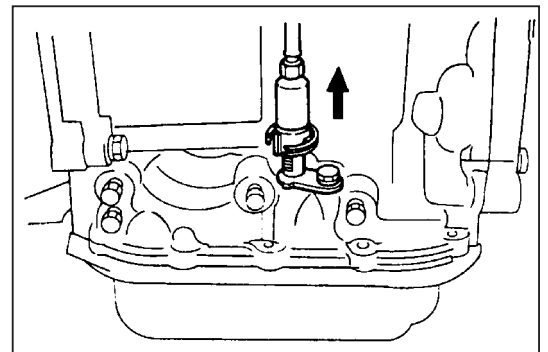


MAT00007-00005

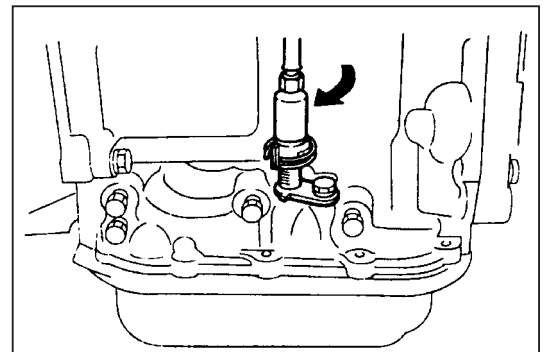
MAT00008-00000



MAT00009-00006

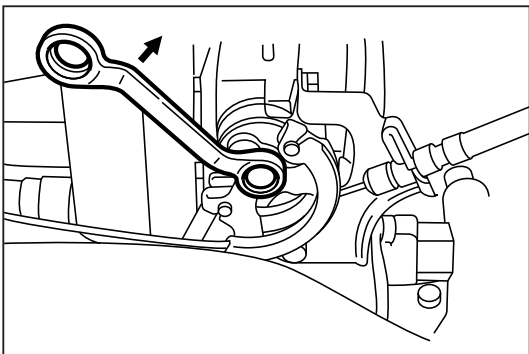


MAT00010-00007



MAT00011-00008

- (5) With a spanner or the like, turn the throttle link at the engine side until it is brought into contact with the full-open stopper. At this time, ensure that a “clicking” sound is emitted, which shows that the play of the throttle cable has been adjusted automatically.
- (6) Install the radiator upper support bracket and radiator reservoir tank hose.
- (7) Install the battery carrier and battery.

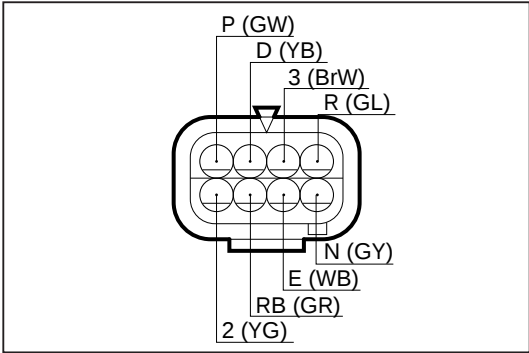


MAT00012-00009

6. Inspection of neutral start switch
- (1) Using an ohmmeter, check the continuity of the terminals for each switch position shown in the table below.

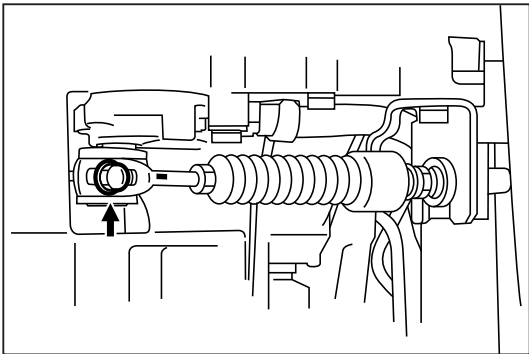
Terminal Range	E	R	RB	P	N	D ₄	3	2
P	○			○				
R		○	○					
N	○				○			
D ₄	○					○		
3	○						○	
2	○							○

If the continuity does not conform to the specifications, replace the switch.



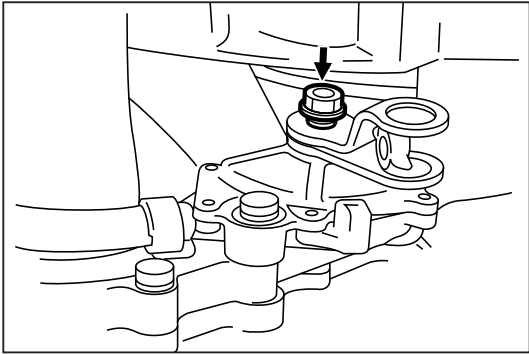
MAT00013-00010

7. Adjustment of neutral start switch
- (1) Remove a bolt of the control cable assembly.



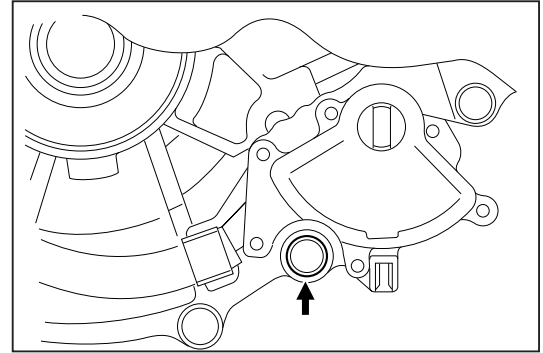
MAT00014-00011

- (2) Remove a nut of the transmission control shaft lever assembly and pull the lever toward you.

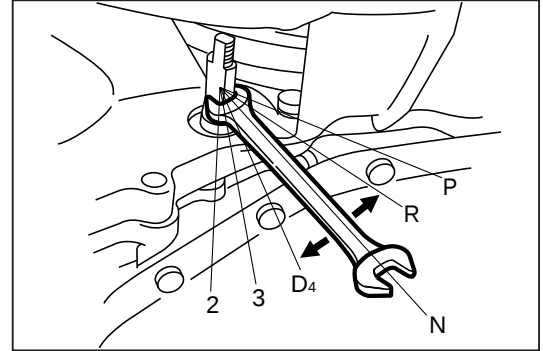


MAT00015-00012

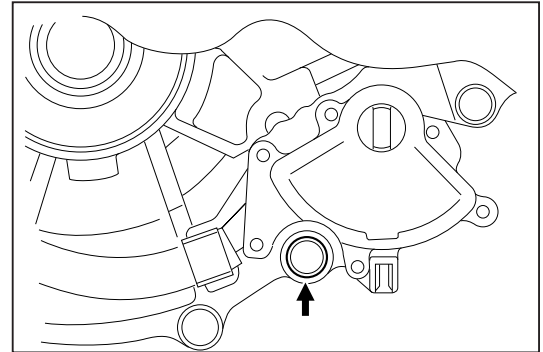
- (3) Remove the adjusting bolt of the neutral start switch assembly and pull out the assembly toward the engine side.



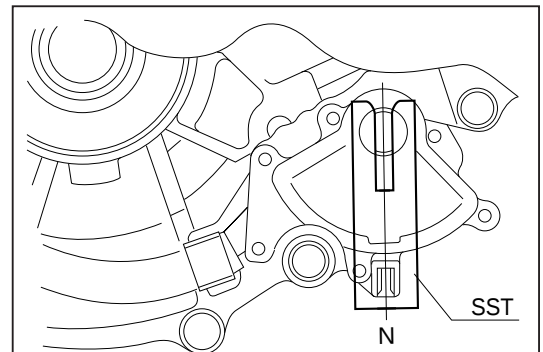
- (4) Back off the manual lever shaft two notches from the parking position.



- (5) Place the neutral start switch assembly and temporarily tighten the bolt.



- (6) Align the groove with the neutral start switch basic line, using the following SST.
SST: 09302-87201-000



- (7) Tighten the bolt.
Tightening Torque: 14.7 - 21.6 N·m

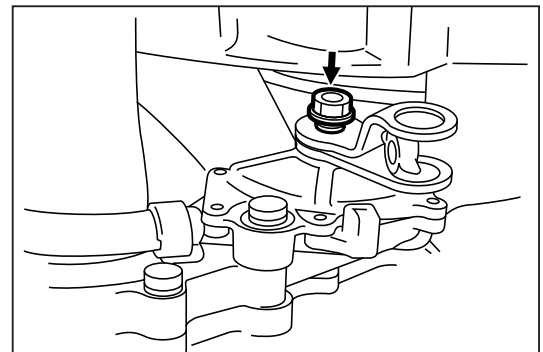
NOTE:

- Make sure that the bolt is tightened to the specified tightening range.

- (8) Install the transmission control shaft lever assembly and tighten it with the nut.
Tightening Torque: 9.8 - 15.7 N·m

NOTE:

- Make sure that the nut is tightened to the specified tightening torque.



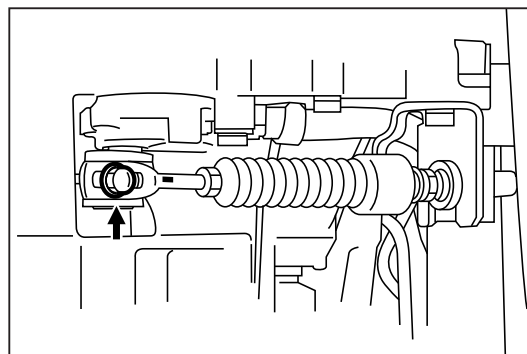
- (9) Tighten the control cable assembly with the bolt.

Tightening Torque: 6.9 - 9.8 N·m

- (10) Check the continuity of the terminals in the neutral start switch connector.

- (11) Inspection of shift lever position

- (12) Inspection of engine idling speed



MAT00021-00018

8. Check of shift lever position

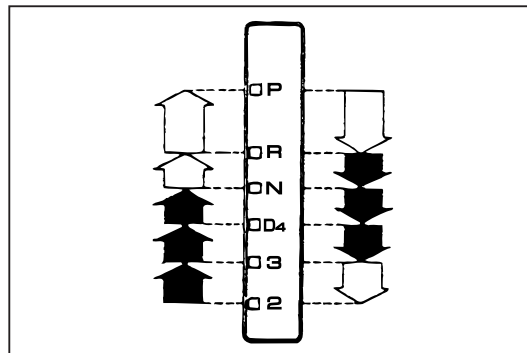
- (1) Move the shift lever from the N range to each range. Ensure that the shift lever button and shift lever can be operated smoothly with a positive detent feeling at each range. Check that the position indicator functions properly.

- (2) Start the engine. Ensure that the vehicle moves forward when you move the shift lever from the N range to the D₄, 3 and 2 ranges, respectively. Make sure that the vehicle moves backward when you move the shift lever to the R range.

- (3) With the ignition switch set to the ON position, move the shift lever from the P to R range and from the N to R range while depressing the brake pedal.

⇨ mark: Shift can be made only while shift lever button is being pushed

➡ mark: Shift can be made without pushing shift lever button



MAT00022-00019

TESTING

STALL TEST

The purpose of this test is to check the overall performance of the automatic transmission and engine by measuring the maximum engine speeds in the D₄ and R ranges.

CAUTION:

- Perform the stall test at the normal fluid operating temperature (70 - 90°C).
- Do not conduct this test continuously for more than five seconds.
- Wait at least one minute before the switching is made from the D₄ range to the R range.
- Be sure to turn OFF the air conditioner (if equipped so on).

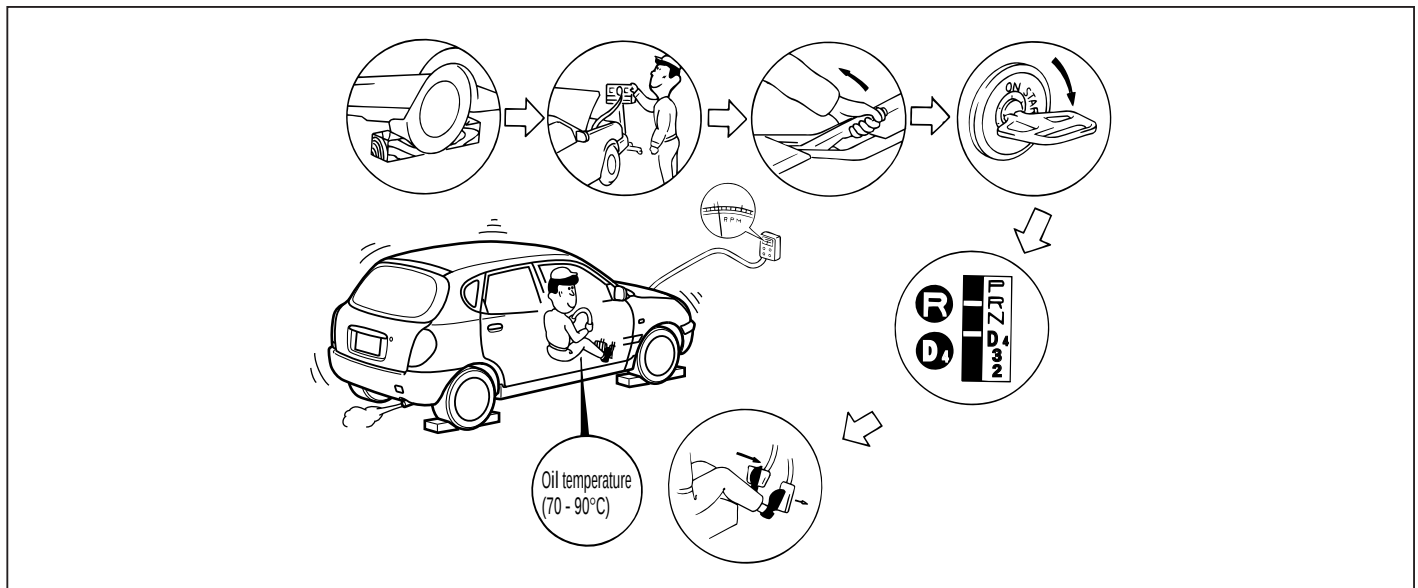
Measurement of stall speed

- Place chocks at the four wheels.
- Install an engine tachometer.
- Fully apply the parking brake.
- Keep depressing the brake pedal firmly by your left foot during the test.
- Start the engine.
- Move the shift lever to the D₄ range. Depress the accelerator pedal fully by your right foot. Quickly read the highest engine rpm at this time.
Stall Rpm: 3050 - 3650 rpm

- Perform the same test in the R range.

Evaluation

- If the engine speed is the same for both ranges (D₄, R) but lower than specified value:
 - Engine output probably insufficient (e.g. throttle valve is not opened fully.)
 - Torque convertor malfunctioning
- If the stall speed at the D₄ range is higher than specified value:
 - Line pressure too low
 - Forward clutch slipping
 - Torque convertor malfunctioning
- If the stall speed in the R range is higher than specified value:
 - Line pressure too low
 - Direct clutch slipping
 - First & reverse brake slipping
- If the stall speed in the R and D₄ ranges is higher than specified value:
 - Line pressure too low
 - Fluid level improper



TIME LAG TEST

When the shift lever is shifted while the engine is idling, there will be a certain time lapse or lag before you can feel a shock. This time lag can be used for checking those conditions of the forward clutch, the direct clutch and the first & reverse brake.

CAUTION:

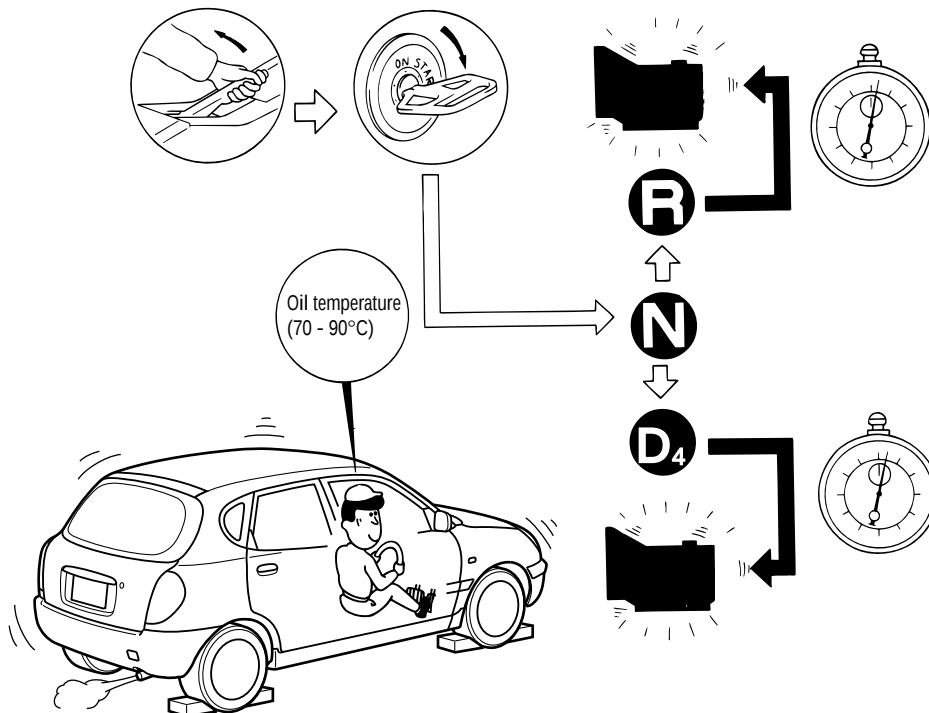
- (a) Perform the time lag test at the normal fluid operating temperature (70 - 90°C).
- (b) Be sure to allow one minute intervals between tests.
- (c) Conduct the measurement three times and take the average value.

Measurement of time lag

- (a) Place chocks at the four wheels.
- (b) Fully apply the parking brake.
- (c) Start the engine and check the idle speed.
- (d) Move the shift lever from the N to the D₄ range. Using a stopwatch, measure the time required from the lever shifting to the time when you feel a shock.
Time Lag: Not to Exceed 1.0 second
- (e) In the same manner, measure the time lag when shifting is made from the N to the R range.
Time Lag: Not to Exceed 1.0 second

Evaluation

- (a) If the N-to-D₄ time lag is longer than the specified value:
 - Line pressure too low
 - Forward clutch worn
- (b) If the N-to-R time lag is longer than the specified value:
 - Line pressure too low
 - Direct clutch worn
 - First & reverse brake worn



HYDRAULIC TEST

1. Measurement of line pressure
 - (a) Warm up the transmission fluid.
 - (b) Remove the transmission case test plug and install the oil pressure gauge (SST).
SST: 09325-87201-000, 09325-87202-000

CAUTION:

- Perform the test at the normal fluid operating temperature (70 - 90°C).

- (c) Fully apply the parking brake and place chocks at the four wheels.
- (d) Start the engine and check the idle speed.
- (e) Move the shift lever to the D₄ range. Depress the brake pedal firmly by your left foot. While manipulating the accelerator pedal by your right foot, measure the line pressure at the engine speeds specified in the table.
- (f) Perform the test in the R range in the same way.
- (g) If the measured pressure does not comply with the specified values, recheck the throttle cable adjustment and perform the test again.

Evaluation

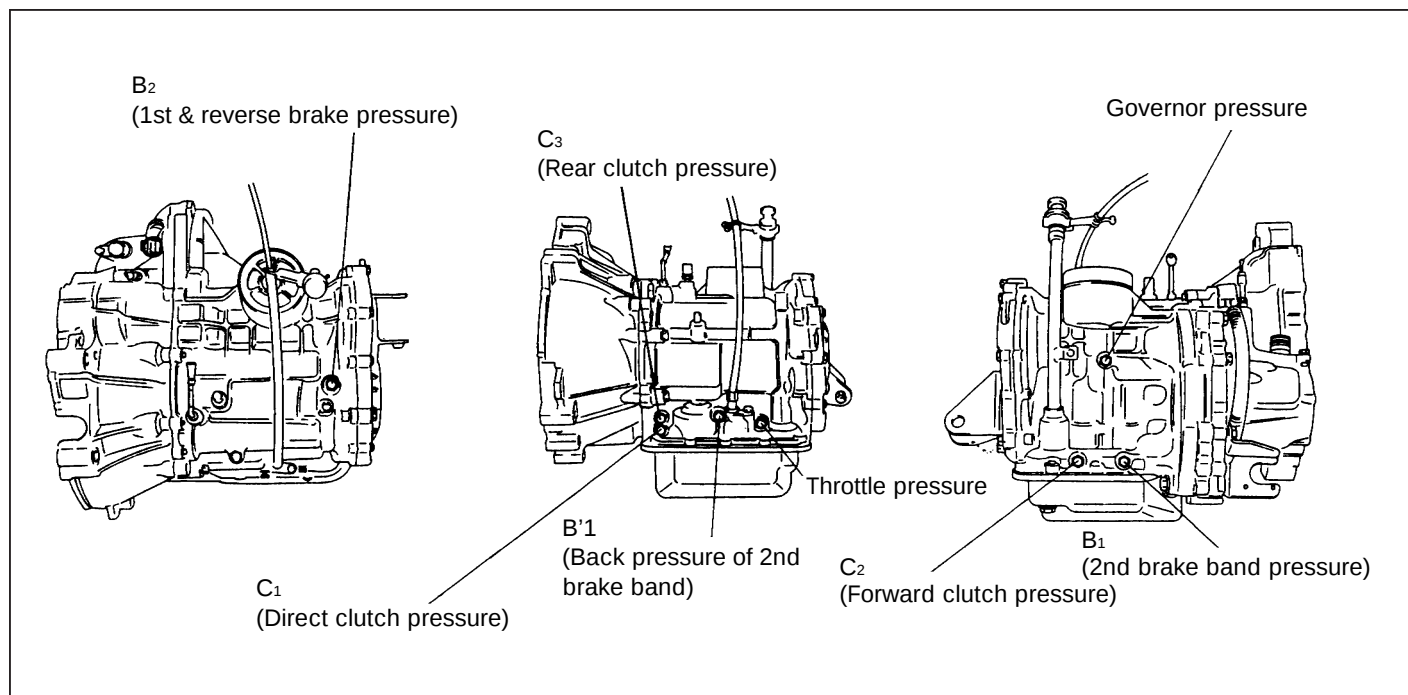
- (a) If the measured values at all ranges are higher than specified value:
 - Primary regulator valve malfunctioning
 - Throttle pressure incorrect
- (b) If the measured values at all ranges are lower than the specified value:
 - Throttle pressure incorrect
 - Oil filter clogged
 - Faulty "O" ring of oil strainer
 - Looseness of the valve body installation bolts
 - Each valve malfunctioning
 - Primary regulator valve malfunctioning
 - Oil pump malfunctioning
- (c) If the pressure is low in the D₄ range only:
 - Fluid leakage at the D₄ range circuit
 - Forward clutch defective
- (d) If the pressure is low in the R range only:
 - Clogged orifice at the reverse oil hole
 - First & reverse brake malfunctioning

2. Measurement of throttle pressure

Evaluation

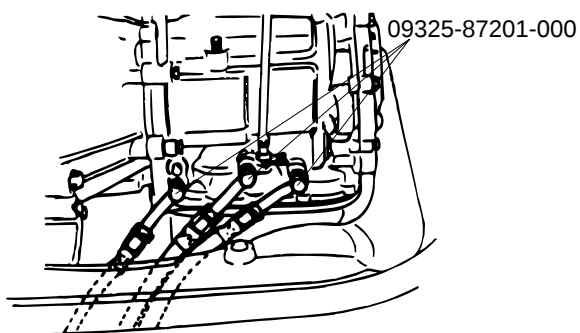
- If the measured values at all ranges are out of specified value
- Throttle cable out of adjustment
- Throttle valve malfunctioning
- Line pressure malfunctioning

3. Location of each inspection plugs

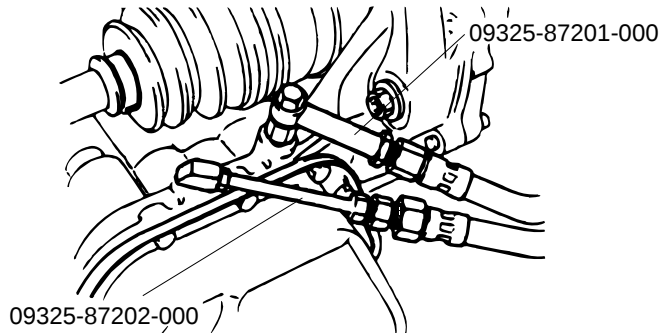


MAT00026-00022

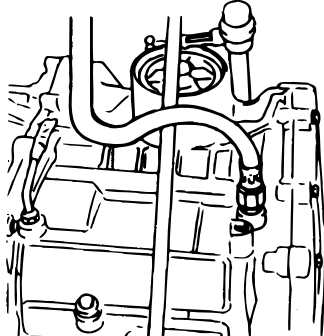
Front surface of transaxle (Line & Throttle pressure)



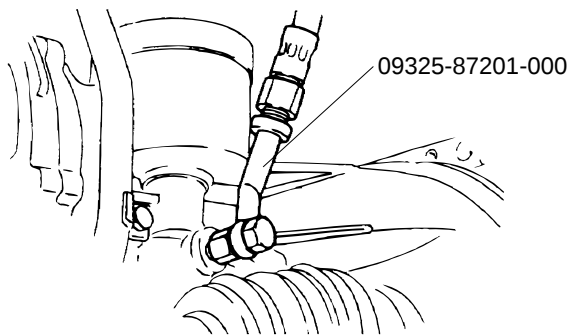
Rear/lower side of transaxle (Line pressure)



Upper surface of transaxle (Line pressure)

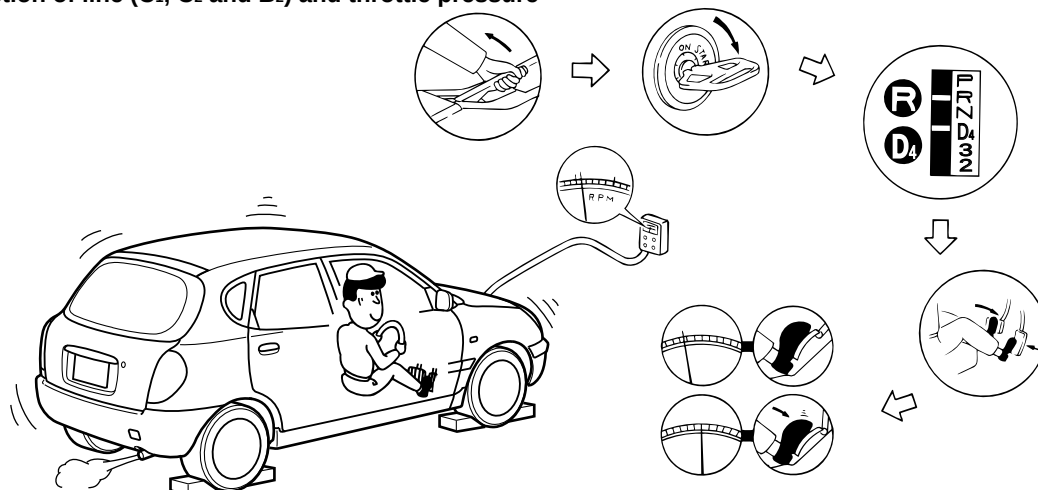


Rear/upper side of transaxle (Governor pressure)

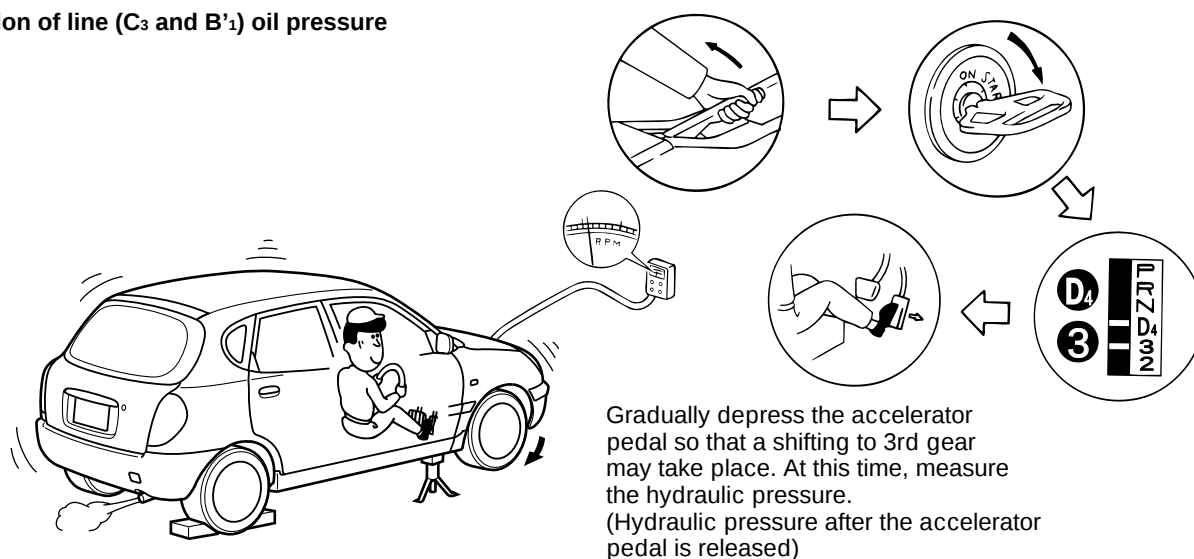


MAT00000-00023

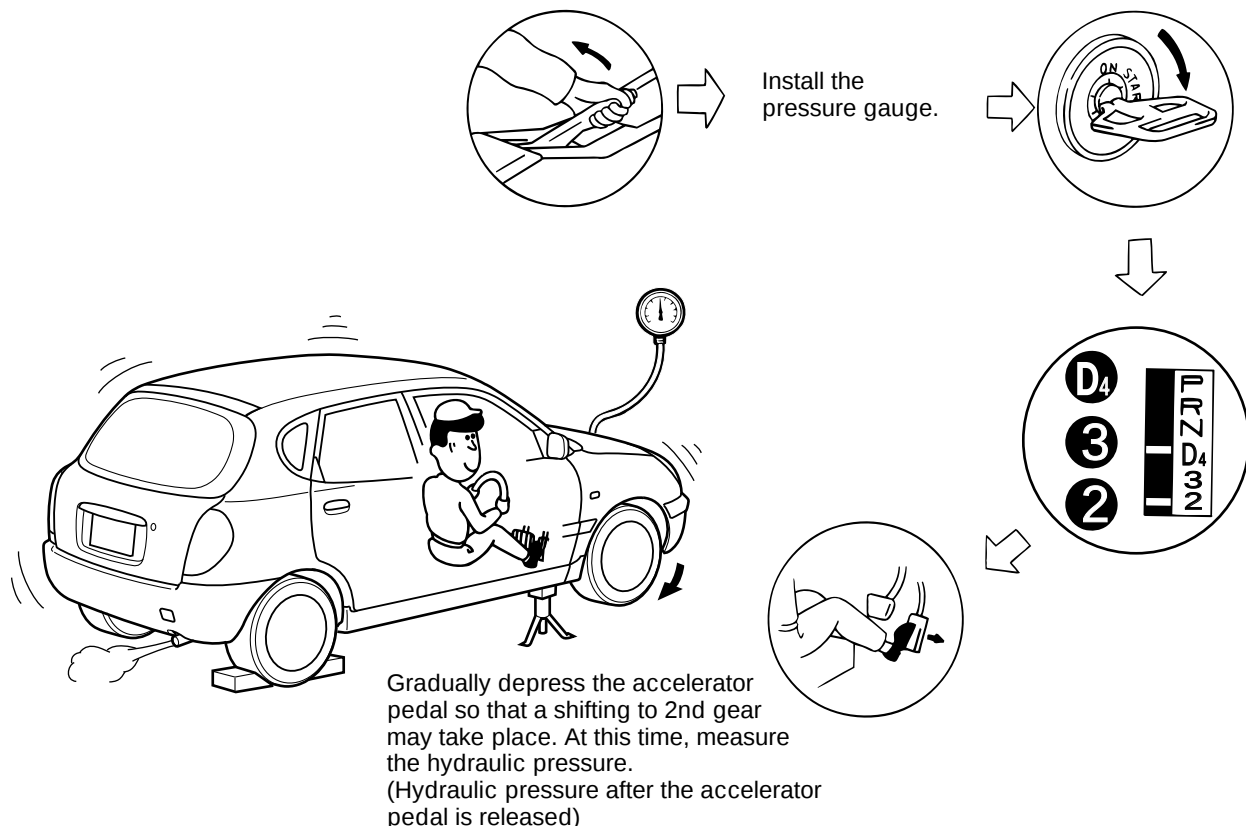
Inspection of line (C₁, C₂ and B₂) and throttle pressure



Inspection of line (C₃ and B'₁) oil pressure



Inspection of line (B₁) pressure



MAT00000-00025

4. Line pressure and throttle pressure specifications

Line pressure (C₁, C₂ and B₂), Throttle pressure specifications

Unit: kPa

Engine RPM		Idling	Stall
		EJ-DE	EJ-DE
Throttle pressure		Less than 29	765 - 804
Line pressure	D ₄ range (C ₂)	539 - 637	843 - 941
	R range (C ₁ , B ₂)		1902 - 2099

Reference of lubricating pressure during idling condition at time of D₄ range:

Line pressure (3 and B₁) ... (Hydraulic pressure after shifting to 3rd gear took place)

Unit: kPa

Engine	EJ-DE
D ₄ and 3 range (3rd)	539 - 637

Line pressure (B₁) ... (Hydraulic pressure after shifting to 2nd gear took place)

Unit: kPa

Engine	EJ-DE
D ₄ and 3 range (2nd)	539 - 637
2 range (2nd)	843 - 941

In the case of D₄ range (2nd gear) and 3 range (2nd gear), first depress the accelerator pedal so that a shifting to 2nd gear may take place. Then, release the accelerator pedal and take the reading at this time.

Reference of lubricating pressure during idling condition at time of D₄ range:

More than 98 kPa

MAT00027-00000

6. Case Where Each Line Pressure and Throttle Pressure Are Deviated from Specified Values:

(1) Proceed to “Case where all line pressures are deviated from specified value”

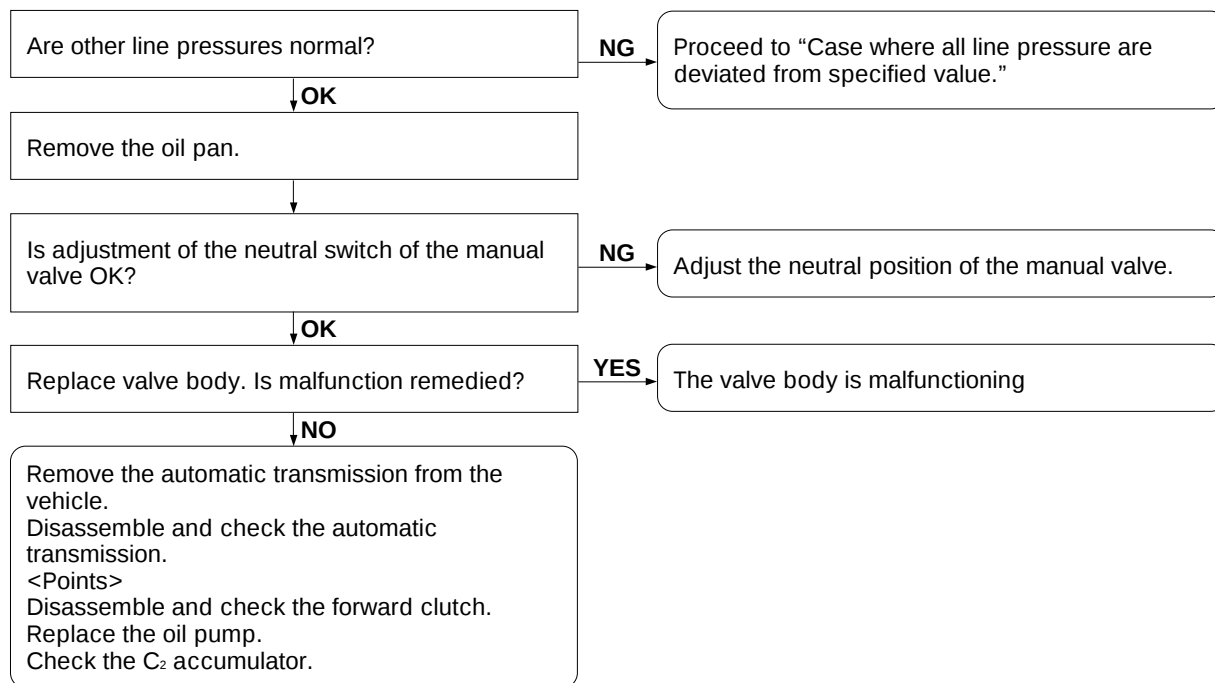
Malfunction Symptoms	Possible causes												
	Primary regulator valve malfunctioning	Release control valve malfunctioning	Valve body check ball defective	Throttle pressure improper	Oil filter restricted	Orifice restricted	Oil pump malfunctioning	Oil strainer “O” ring defective	Valve body/oil pump attaching bolts loose	Foreign matter lodged at mate surface of valve body and oil pump	Valve body and oil pump case casting porosity	Valve malfunctioning	C ₂ , B ₁ accumulator malfunctioning
	Line pressure is too high in [R] range only.	●								●	●		
	Line pressure is too high.	●	●	●		●							
	Line pressure is too low in [R] range only.	●				●			●	●	●		
	Line pressure is too low.	●	●	●	●	●	●	●	●	●	●	●	●
	No line pressure is generated.	●					●						
	Line pressure will not change.	●	●	●									
	Line pressure pulsates.				●		●	●	●	●	●		
Perform the hydraulic pressure (throttle pressure) test. NG “Case where throttle pressure is deviated from specified value” OK Remove the oil pan and oil strainer. Check the oil strainer for restriction. NG Replace the oil strainer. OK Replace valve body. Is malfunction remedied? YES The valve body is malfunctioning. NO Remove the automatic transmission from the vehicle. Disassemble and check the automatic transmission. <Points> Check the C₂, B₁ accumulators. Check the oil pump.													

(2) Case where direct clutch (C_1) pressures is deviated from specified value:

Malfunction Symptoms	Possible causes								
	Line pressure improper	Direct clutch piston malfunctioning	Orifice restricted	C_1 accumulator malfunctioning	Manual valve improperly adjusted	Valve body/oil pump attaching bolts loose	Valve body and oil pump casting porosity	Foreign matter lodged at mate surface of valve body and oil pump	2nd brake band malfunctioning
Direct clutch pressure is too high.	●								
Direct clutch pressure too low.	●	●	●	●	●	●	●	●	●
Are other line pressures normal? NG Proceed to "Case where all line pressure are deviated from specified value." Remove the oil pan. Is adjustment of the neutral switch of the manual valve OK? NG Adjust the neutral position of the manual valve. Replace valve body. Is malfunction remedied? YES The valve body is malfunctioning Remove the automatic transmission from the vehicle. Disassemble and check the automatic transmission. <Points> Disassemble and check the direct clutch. Disassemble and check the 2nd brake band. Check the C_1 accumulator.									

(3) Case where forward clutch (C₂) pressures is deviated from specified value:

Malfunction Symptoms	Possible causes									
	Line pressure improper	Forward clutch piston malfunctioning	Orifice restricted	3-4 shift valve and servo control valve malfunctioning	C ₂ accumulator malfunctioning	Manual valve improperly adjusted	Valve body/oil pump attaching bolts loose	Valve body and oil pump casting porosity	Foreign matter lodged at mate surface of valve body and oil pump	Oil pump malfunctioning
Forward clutch pressure is too high.	●									
Forward clutch pressure too low.	●	●	●	●	●	●	●	●	●	●



(4) Case where rear clutch (C₃) pressures is deviated from specified value:

Malfunction Symptoms	Possible causes								
	Line pressure improper	Rear clutch piston malfunctioning	Orifice restricted	2-3 shift valve and timing valve malfunctioning	Manual valve improperly adjusted	Valve body/oil pump attaching bolts loose	Valve body and oil pump casting porosity	Foreign matter lodged at mate surface of valve body and oil pump	2nd brake band malfunctioning
Rear clutch pressure is too high.	●								
Rear clutch pressure too low.	●	●	●	●	●	●	●	●	●

Are other line pressures normal?

NG

Proceed to "Case where all line pressure are deviated from specified value."

OK

Remove the oil pan.

Is adjustment of the neutral switch of the manual valve OK?

NG

Adjust the neutral position of the manual valve.

OK

Replace valve body. Is malfunction remedied?

YES

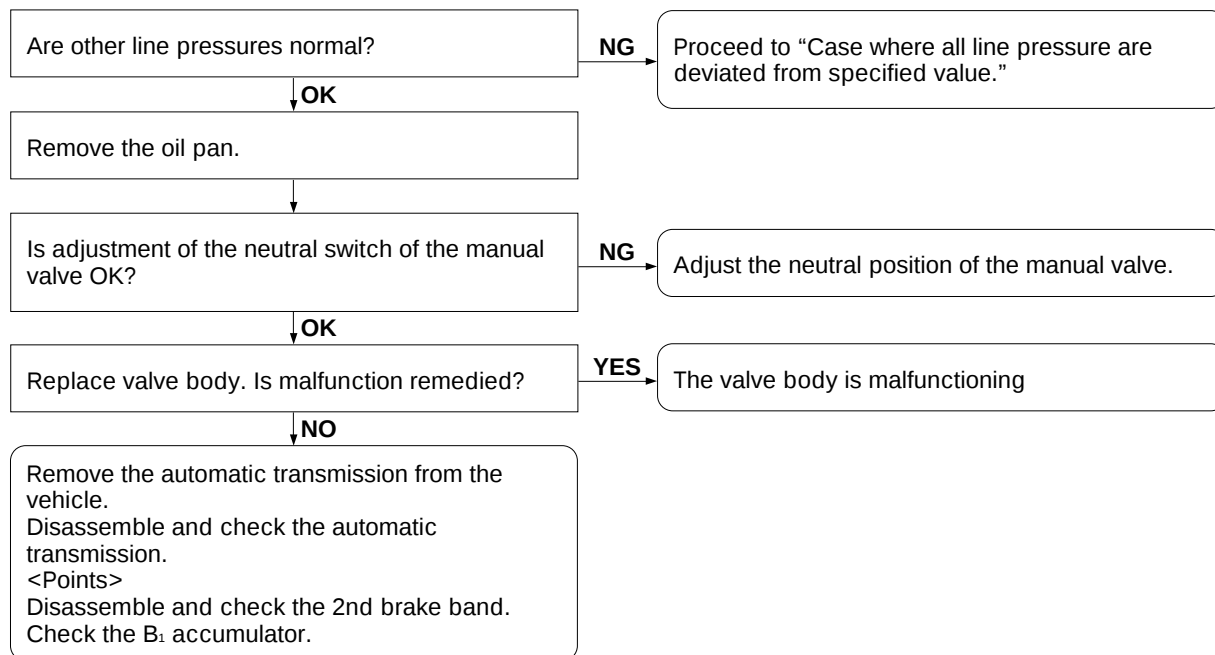
The valve body is malfunctioning

NO

Remove the automatic transmission from the vehicle.
Disassemble and check the automatic transmission.
<Points>
Disassemble and check the rear clutch.
Disassemble and check the 2nd brake band.

(5) Case where 2nd brake band (B₁) pressures is deviated from specified value:

Malfunction Symptoms	Possible causes									
	Line pressure improper	2nd brake band piston malfunctioning	Orifice restricted	B ₁ accumulator malfunctioning	1-2 shift valve malfunctioning	Manual valve improperly adjusted	Valve body/oil pump attaching bolts loose	Valve body, piston and pump casting porosity	Foreign matter lodged at mate surface of valve body and oil pump	
2nd brake band pressure is too high.	●									
2nd brake band pressure too low.	●	●	●	●	●	●	●	●	●	●



(6) Case where 2nd brake band backpressure (B'_1) is deviated from specified value:

Malfunction Symptoms	Possible causes							
	Line pressure improper	2nd brake band piston malfunctioning	Rear clutch piston malfunctioning	Orifice restricted	Manual valve improperly adjusted	Valve body/oil pump attaching bolts loose	Valve body and oil pump casting porosity	Foreign matter lodged at mate surface of valve body and oil pump
2nd brake band back pressure is too high.	●							
2nd brake band back pressure is too low.	●	●	●	●	●	●	●	●

Are other line pressures normal?

NG

Proceed to "Case where all line pressure are deviated from specified value."

OK

Remove the oil pan.

Is adjustment of the neutral switch of the manual valve OK?

NG

Adjust the neutral position of the manual valve.

OK

Replace valve body. Is malfunction remedied?

YES

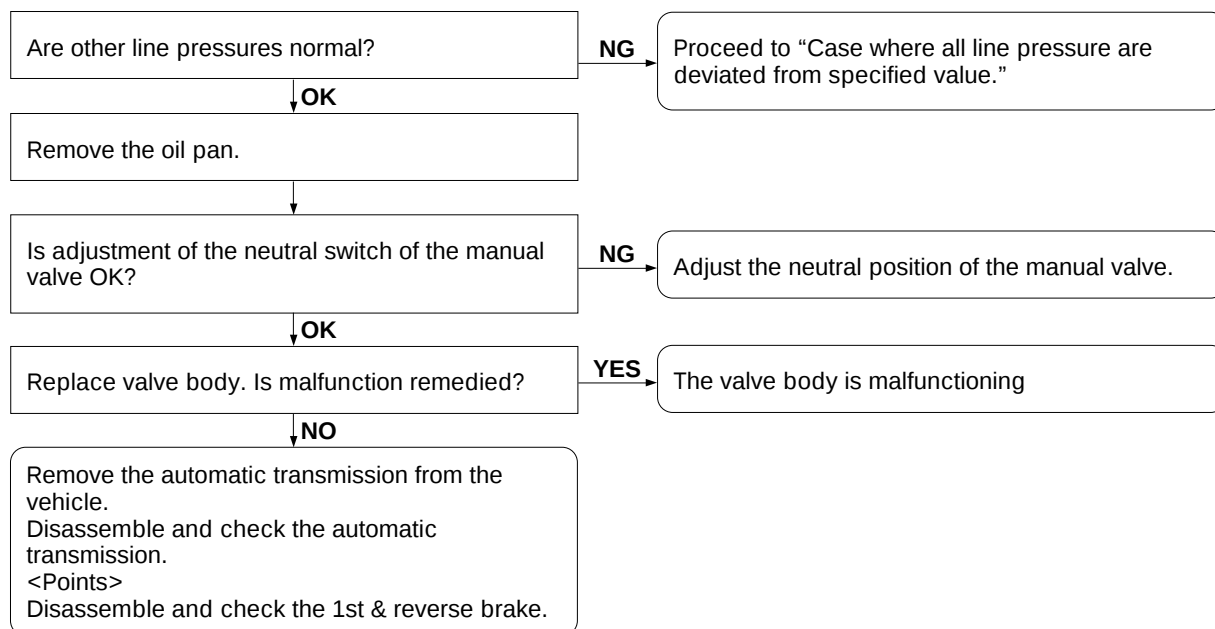
The valve body is malfunctioning

NO

Remove the automatic transmission from the vehicle.
Disassemble and check the automatic transmission.
<Points>
Disassemble and check the 2nd brake band.

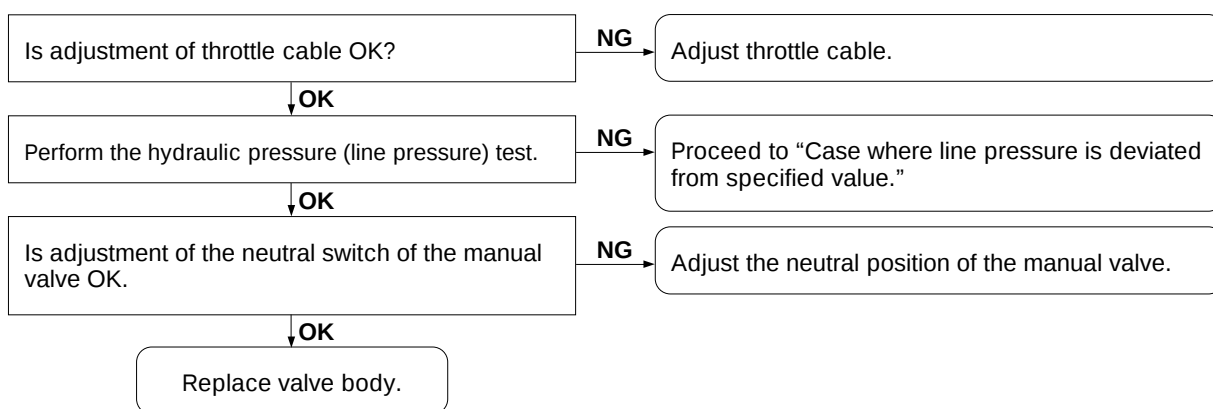
(7) Case where 1st & reverse brake (B₂) pressure is deviated from specified value:

Malfunction Symptoms	Possible causes						
	Line pressure improper	1st & reverse brake piston malfunctioning	Orifice restricted	Manual valve improperly adjusted	Valve body attaching bolts loose	Valve body and piston casting porosity	Foreign matter lodged at mate surface of valve body and oil pump
1st & reverse brake pressure is too high.	●						
1st & reverse brake pressure too low.	●	●	●	●	●	●	●



(8) Case where throttle pressures is deviated from specified value:

Malfunction Symptoms	Possible causes											
	Line pressure improper	Throttle valve malfunctioning	Oil filter restricted	Orifice restricted	Valve body attaching bolts loose	Foreign matter lodged at mate surface of valve body	Valve body casting porosity	Throttle cable improperly adjusted	1-2, 2-3 and 3-4 shift valve malfunctioning	Throttle cam retaining bolt loose	Throttle cam cable disconnected	Throttle cable broken
Throttle pressure too high	●	●		●		●	●	●	●			
Throttle pressure too low	●	●			●	●	●	●	●			●
No throttle pressure is generated.		●	●									
Throttle pressure will not change.		●	●	●						●	●	●
Throttle pressure pulsates.	●	●		●								



(9) Case where governor pressures is deviated from specified value:

Malfunction Symptoms	Possible causes									
	Line pressure improper	Governor valve malfunctioning	Oil filter restricted	Governor washer, ball defective	Governor valve, valve body attaching bolts loose	Foreign matter lodged at mate surface of valve body	Valve body casting porosity	1-2, 2-3 and 3-4 shift valve, timing valve malfunctioning	C ₂ , B ₁ accumulator malfunctioning	Manual valve improperly adjusted
Governor pressure too high	●	●		●	●					
Governor pressure too low	●	●	●	●	●	●	●	●	●	
No governor pressure is generated.	●	●	●	●						●
Governor pressure will not change.		●		●	●	●	●			
Governor pressure is generated in N , R and P .					●	●	●			●
Governor pressure pulsates.	●	●								

Check governor valve.

NG

Replace governor valve.

OK

Perform the hydraulic pressure (line pressure) test.

NG

Proceed to "Case where line pressure is deviated from specified value."

OK

Replace oil pan.

Is adjustment of the neutral switch of the manual valve OK?

NG

Adjust the neutral position of the manual valve.

OK

Replace valve body. Is malfunction remedied?

YES

The valve body is malfunctioning

NO

Remove the automatic transmission from the vehicle.
Disassemble and check the automatic transmission.
<Points>
Check C₂, B₁ accumulators.

ROAD TEST

CAUTION:

- Perform this test at the normal fluid operating temperature (70°C - 80°C)

1. D₄ range test.

Move the Shift lever to the D₄ range. while driving with the accelerator pedal fully depressed, check the following points:

- Check that the 1-2, 2-3 and 3-4 up-shifts take place and also that the shift points conform to those in the automatic shift schedule.
- In the same manner, check for shocks and the slippage during 1-2, 2-3 and 3-4 up-shifts.

- While running in the 4th gear of D₄ range, check to see if the vehicle emits any abnormal noise or vibration.

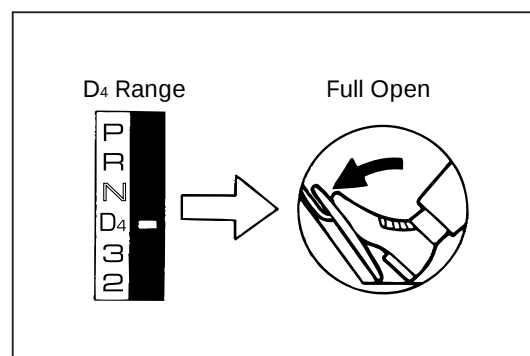
NOTE:

- Extreme care must be exercised during Check for cause of abnormal noise and vibration. These symptoms are caused often by imbalance in the drive shaft, differential, tires, torque converter, etc..

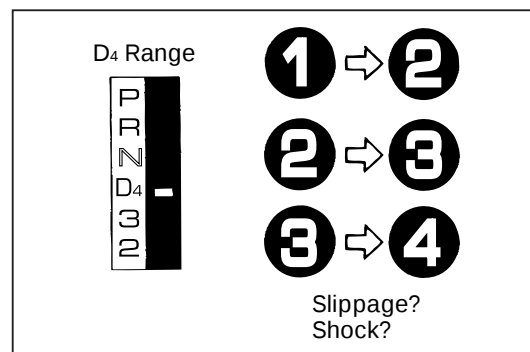
- While running in the 4th gear of D₄ range, Ensure that the kick-down vehicle speed limits for the 4-3, 3-2 and 2-1 kick-downs conform to those indicated in the automatic shift schedule.

- Check for abnormal shocks and slippage during the kick-down.

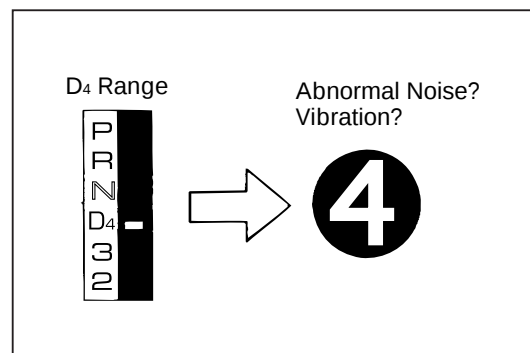
- While running at a speed of about 60 km/h in the 4th gear of the D₄ range, release your foot from the accelerator pedal and move the shift lever to the 2 range. Then check to see if the 3-2 down-shift point conform to those indicated in the automatic shift schedule.



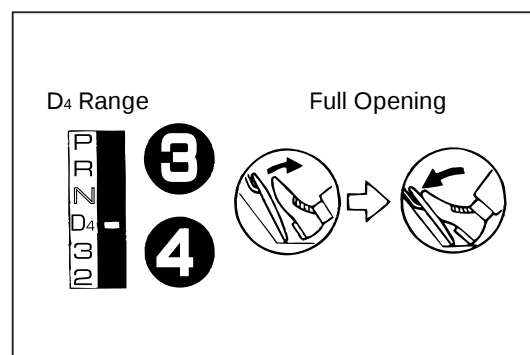
MAT00038-00027



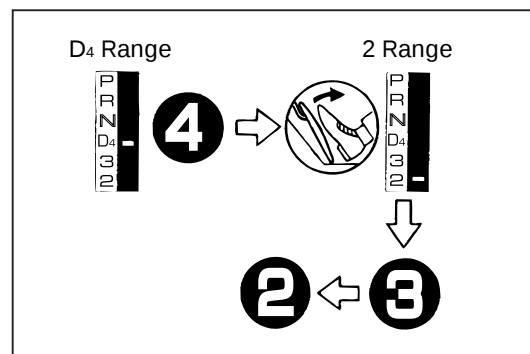
MAT00039-00028



MAT00040-00029



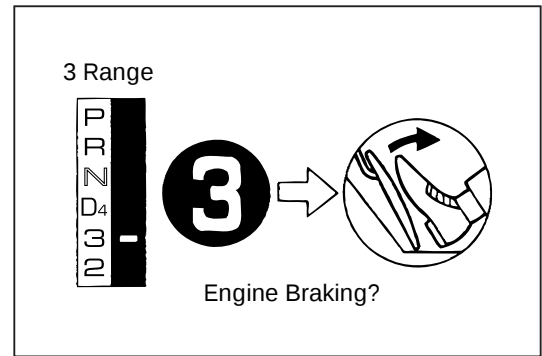
MAT00041-00030



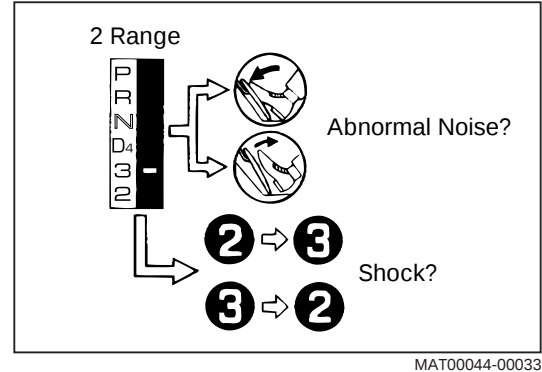
MAT00042-00031

2. 3 range test.

- (a) While running in 3 range of the 3rd gear, release the accelerator pedal and check the engine braking effect.

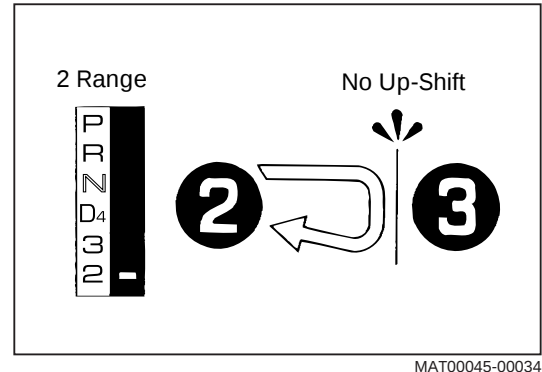


- (b) Check to see if the vehicle emits abnormal noise during acceleration and deceleration.
- (c) Check for shocks during the up-shift and down-shift period.

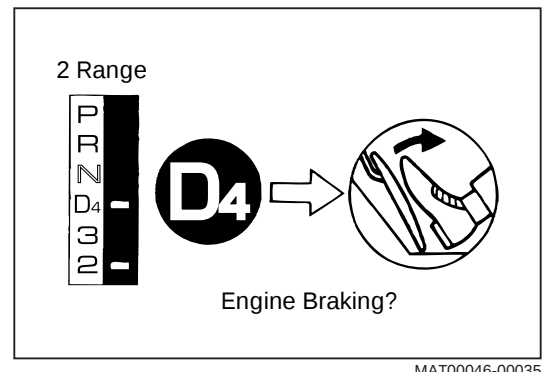


3. 2 range test.

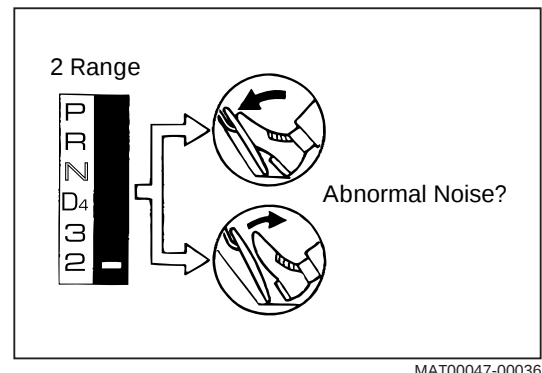
- (a) While running in 2 range,. Ensure that no up-shift to 3rd gear takes place.



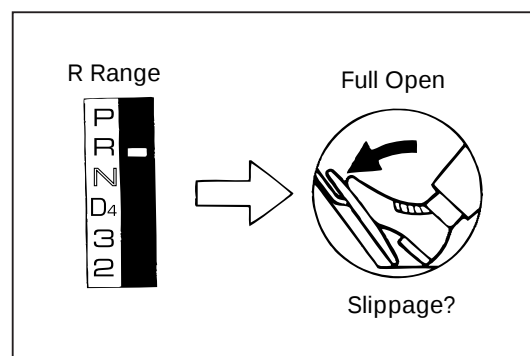
- (b) While running in D₄ range, release the accelerator pedal and move the shift lever to the 2nd range. Check the engine braking effect.



- (c) Check to see if the vehicle emits abnormal noise during acceleration and deceleration.

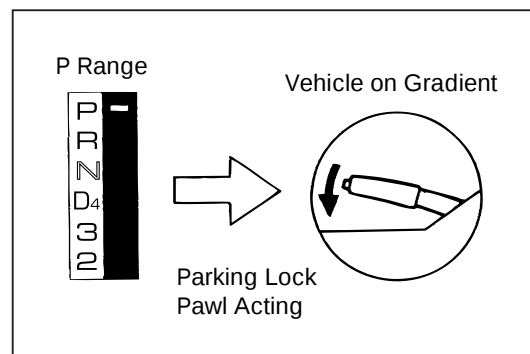


4. R range test.
Move the Shift lever to R range and, while running at full throttle, check to see if slippage is taking place.



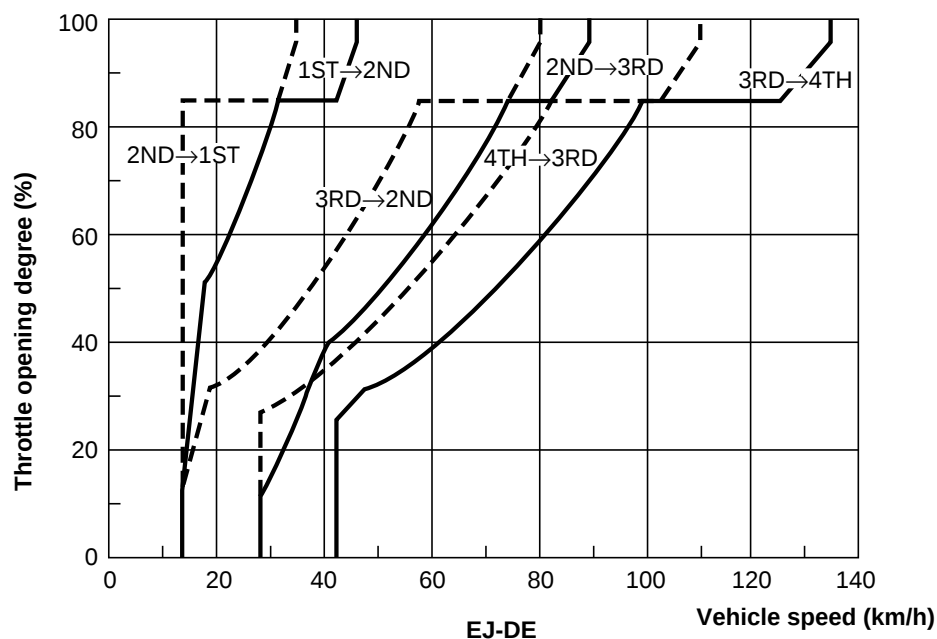
MAT00048-00037

5. P range test.
Stop the vehicle on a gradient (more than 5%) and, after moving the shift lever to the P range, release the parking brake. Then check to see that the parking lock pawl prevents the vehicle from moving.



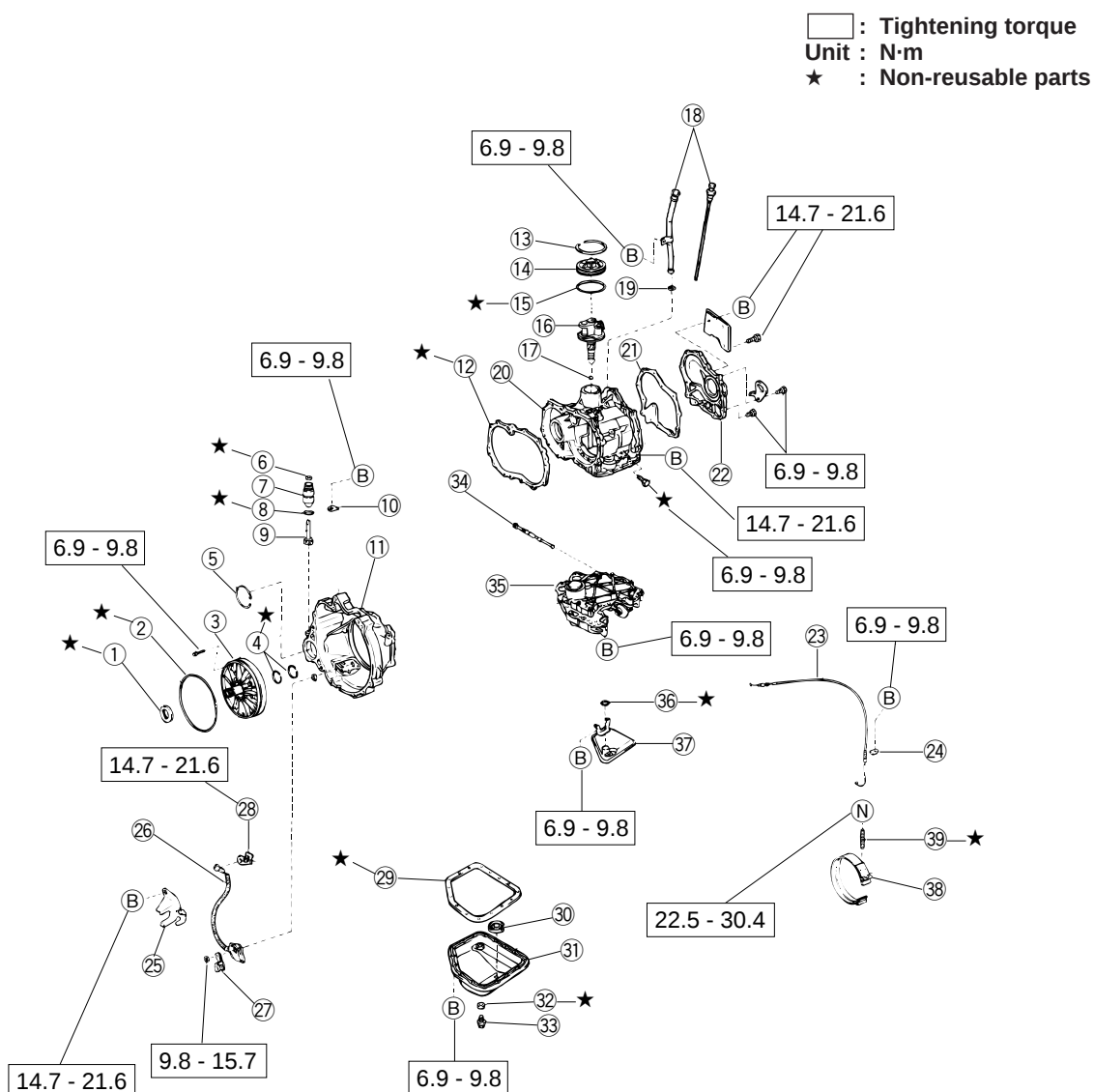
MAT00049-00038

GEAR SHIFT CHARACTERISTICS DIAGRAM



MAT00050-00000

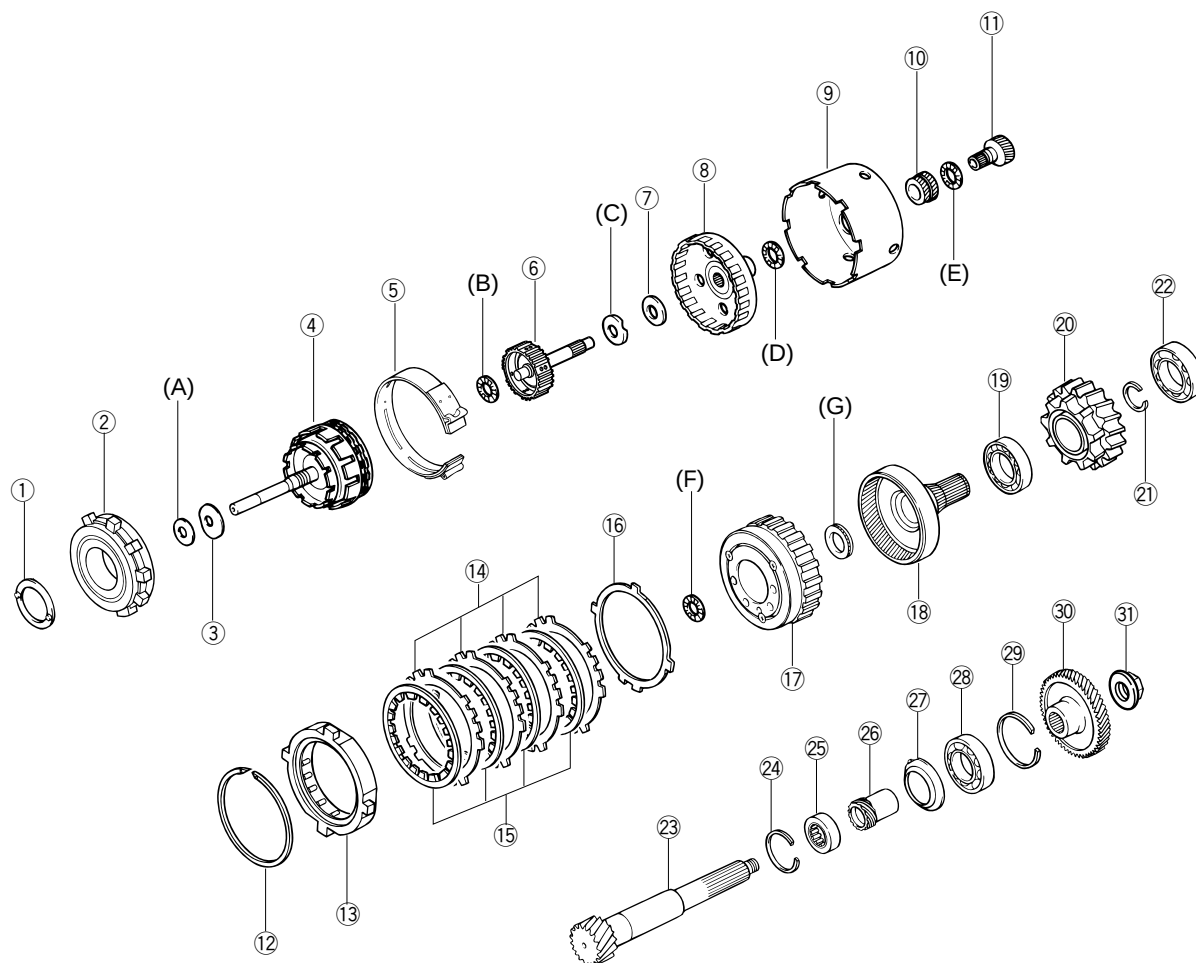
COMPONENTS



- ① T-type oil seal
- ② O-ring
- ③ Stator shaft & oil pump assembly
- ④ Clutch drum oil seal ring
- ⑤ Hole snap ring
- ⑥ V-type oil seal
- ⑦ Speedometer shaft sleeve subassembly
- ⑧ O-ring
- ⑨ Speedometer driven gear
- ⑩ Speedometer sleeve lock plate
- ⑪ Torque converter & differential case
- ⑫ Transmission case gasket
- ⑬ Hole snap ring
- ⑭ Governor cover
- ⑮ O-ring
- ⑯ Governor body assembly
- ⑰ Ball
- ⑱ Transmission oil filler tube subassembly
- ⑲ O-ring
- ⑳ Transaxle case

- ⑳ Transaxle case rear cover gasket
- ㉑ Rear transmission case cover subassembly
- ㉒ Throttle cable
- ㉓ Speedometer sleeve lock plate
- ㉔ Control cable bracket
- ㉕ Neutral start switch assembly
- ㉖ Transmission control shaft lever assembly
- ㉗ Clamp
- ㉘ Transaxle oil pan gasket
- ㉙ Oil cleaner magnet
- ㉚ Transaxle oil pan subassembly
- ㉛ Gasket
- ㉜ Drain plug
- ㉝ Manual valve
- ㉞ Valve body assembly
- ㉟ O-ring (for oil strainer)
- ㊱ Oil strainer subassembly
- ㊲ Transmission brake band assembly
- ㊳ Transmission brake band adjusting anchor bolt

COMPONENTS (INNER PARTS)



- ① Clutch drum thrust washer
- ② Direct clutch subassembly
- ③ Thrust bearing race
- ④ Forward clutch subassembly
- ⑤ 2nd brake band
- ⑥ Intermediate shaft subassembly
- ⑦ Thrust bearing race
- ⑧ Forward clutch hub
- ⑨ 2nd brake drum
- ⑩ Planetary sun gear subassembly
- ⑪ Rear planetary sun gear subassembly
- ⑫ Hole snap ring
- ⑬ One-way clutch
- ⑭ Brake plate
- ⑮ Brake disc
- ⑯ Clutch cushion plate

- ⑰ Planetary gear assembly
- ⑱ Planetary output shaft subassembly
- ⑲ Radial ball bearing
- ⑳ Reduction drive gear
- ㉑ Shaft snap ring
- ㉒ Radial ball bearing
- ㉓ Output shaft
- ㉔ Hole snap ring
- ㉕ Cylindrical roller bearing
- ㉖ Governor drive gear
- ㉗ Oil reserve plate
- ㉘ Radial ball bearing
- ㉙ Hole snap ring
- ㉚ Primary reduction driven gear
- ㉛ Lock nut

(A) - (G) Thrust needle roller bearing
Visually inspect each part for wear and damage.

Thrust bearing specifications (Aprox. mm)

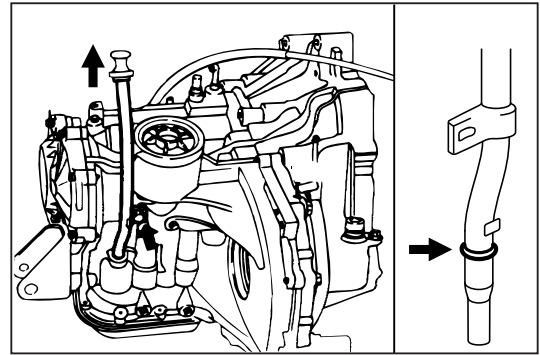
	A, E	B, C, F	D, G
Outer diameter	35.7	32	46.5
Inner diameter	22.7	16.5	25.0
Thickness	2.8	4.1	5.0

REMOVAL

1. Remove the bolt of the transmission oil filler tube sub-assembly.
2. Pull out the tube subassembly toward upside.
3. Remove the O-ring from the tube subassembly.

NOTE:

- Never reuse the removed O-ring.

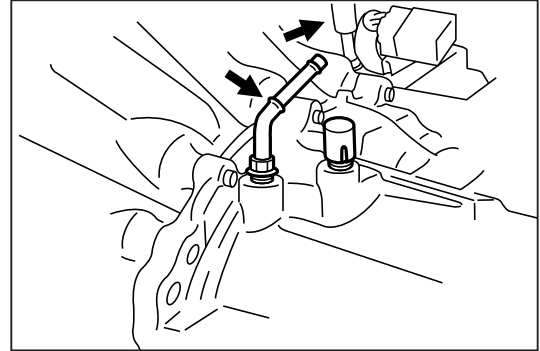


MAT00053-00041

4. Remove the breather union and unions (for oil cooler).

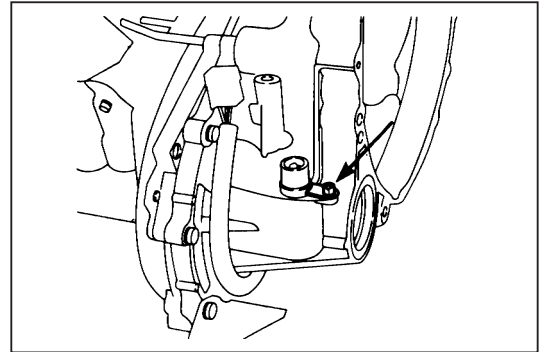
NOTE:

- Never reuse the removed union.



MAT00054-00042

5. Remove the speedometer sleeve lock plate by removing a bolt.
6. Remove the speedometer shaft sleeve subassembly, using the flat driver.

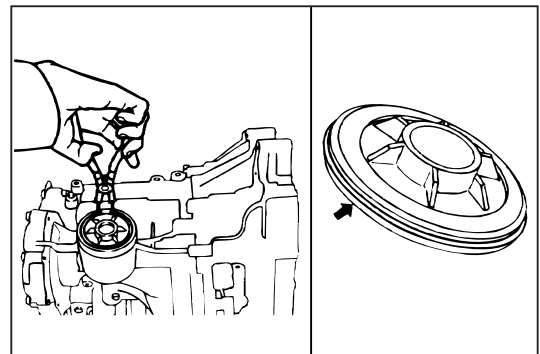


MAT00055-00043

7. Removal of governor valve
 - (1) Remove the hole snap ring, using a snap ring plier.
 - (2) Remove the governor cover with the O-ring installed, using the plier.
 - (3) Remove the O-ring from the governor cover.

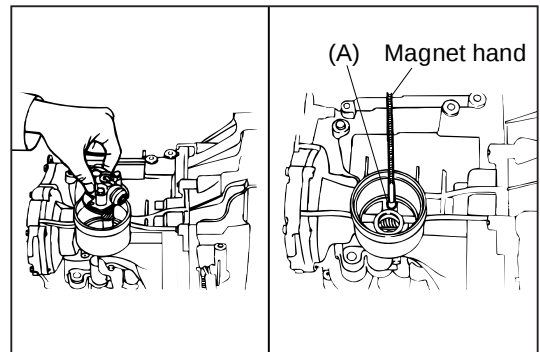
NOTE:

- Never reuse the removed O-ring.



MAT00056-00044

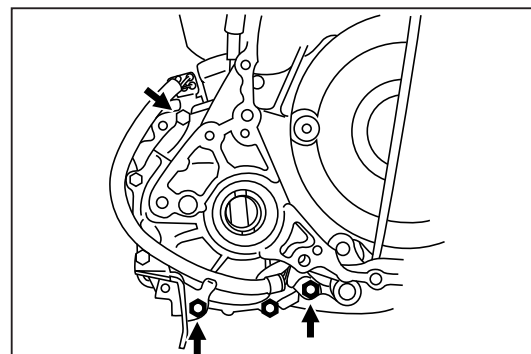
- (4) Remove the governor body assembly.
- (5) Remove the ball (A), using a magnet hand.



MAT00057-00045

8. Removal of neutral start switch assembly

- (1) Remove the control cable bracket.
- (2) Remove the bolt of the clamp.



MAT00058-00046

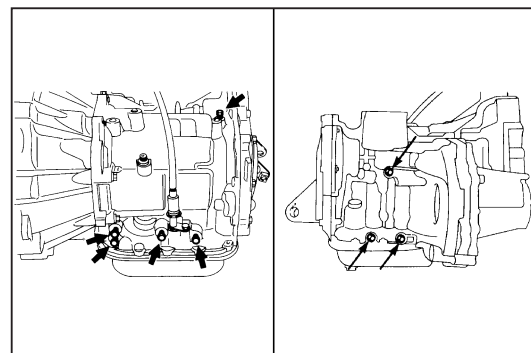
- (3) Remove the transmission control shaft lever assembly.
- (4) Remove the neutral start switch assembly.

MAT00059-00000

9. Remove the eight inspection plugs from the transaxle.

NOTE:

- Never reuse the removed plugs.



MAT00060-00047

10. Remove the valve body assembly.

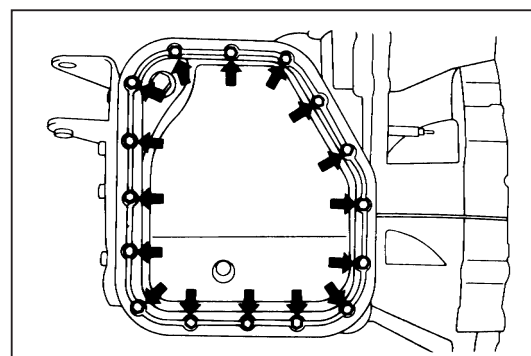
- (1) Remove the transaxle oil pan subassembly with gasket.

CAUTION:

- Do not turn over the transmission, for this will contaminate the valve body with foreign materials deposited at the bottom of the oil pan.

NOTE:

- Never reuse the removed gasket.

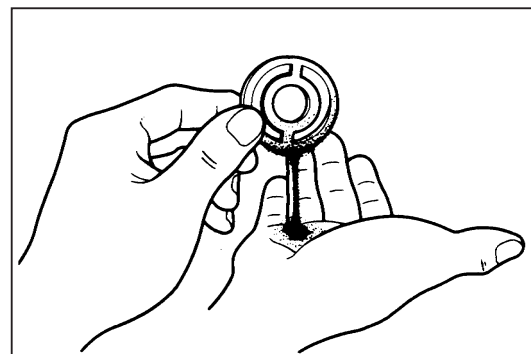


MAT00061-00048

- (2) Check of pan for particles

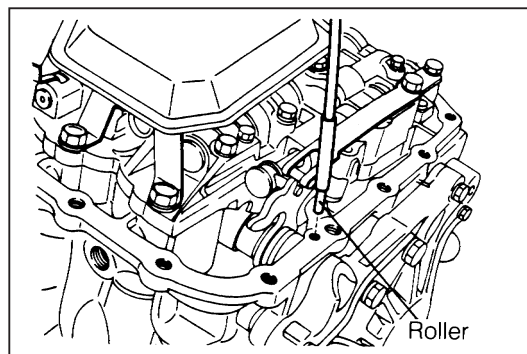
Remove the magnet and use them to collect any steel chips. Inspect the oil pan for any chips and particles collected on the magnet to find out the type of wear of the transmission.

Steel (magnetic) ... Wear of bearing, gear and plate
Brass (nonmagnetic) ... Wear of bush



MAT00062-00049

- (3) Remove the roller for manual valve lever shaft sub-assembly, using a magnet hand.

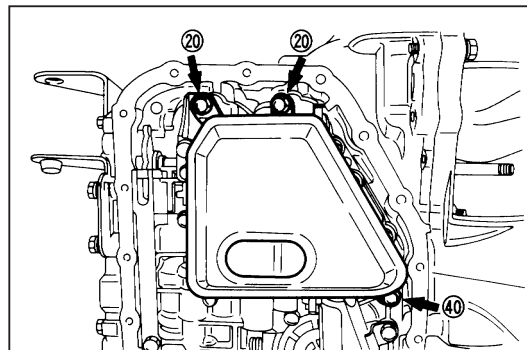


MAT00063-00050

- (4) Remove the oil strainer subassembly by removing the three bolts.

NOTE:

- Be sure to remove the bolts evenly and uniformly.
- The numerals in the right illustration indicate the nominal length of the bolt.
- Be sure to check whether the mesh of oil strainer is clean.

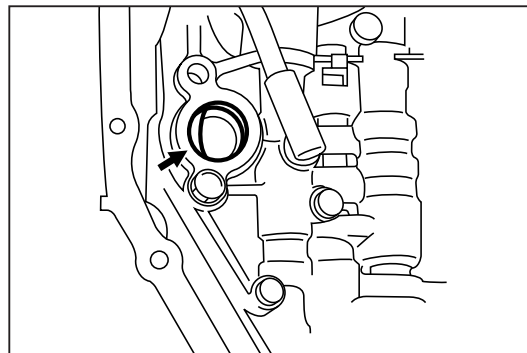


MAT00064-00051

- (5) Remove the O-ring by sticking a needle into the O-ring for the oil strainer from the valve body side.

NOTE:

- Be very careful not to scratch the valve body.
- Never reuse the removed O-ring.



MAT00065-00052

- (6) Disconnect the throttle cable from the throttle valve cam.

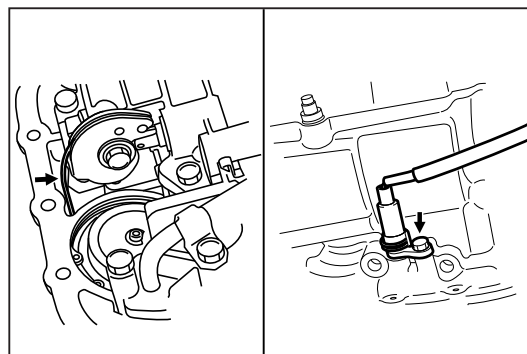
Remove the throttle cable attaching bolt.

Pull out the throttle cable.

Remove the O-ring of the throttle cable.

NOTE:

- Never reuse the removed O-ring.

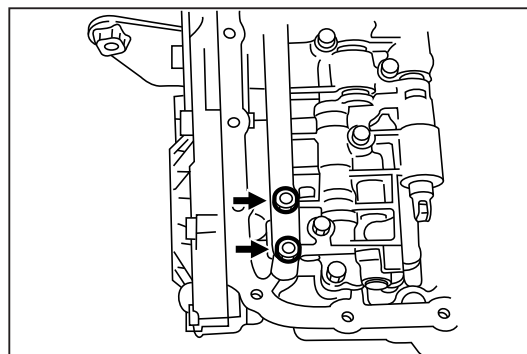


MAT00066-00053

- (7) Remove the manual detent spring.

NOTE:

- Be sure to remove the bolts evenly and uniformly.
- The numerals in the right illustration indicate the nominal length of the bolt.



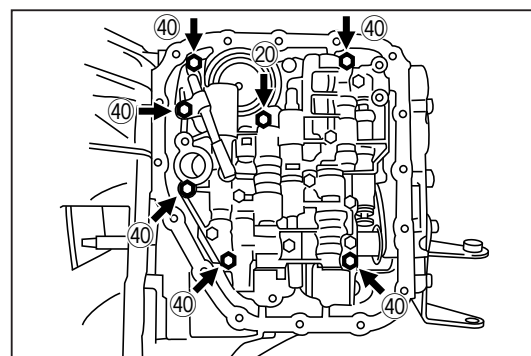
MAT00067-00054

(8) Remove the valve body.

NOTE:

- Be sure to remove the bolts evenly and diagonally.
- The numerals in the right illustration indicate the nominal length of the bolt.

Carefully and slowly remove the manual valve from the valve body assembly toward your side.



MAT00068-00055

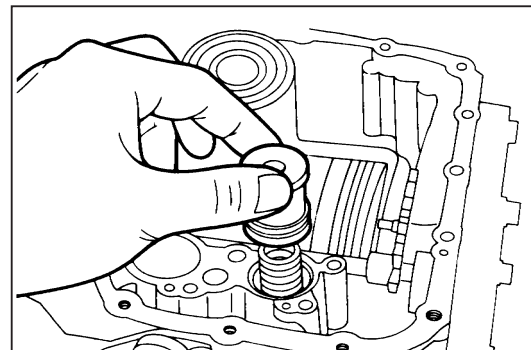
(9) Remove the compression spring of the B₁ accumulator piston.

Lightly hold the arrow-headed section of the accumulator No. 1 piston.

Remove the piston with the accumulator seal No. 1 and No. 2 rings installed by applying compressed air into the oil hole.

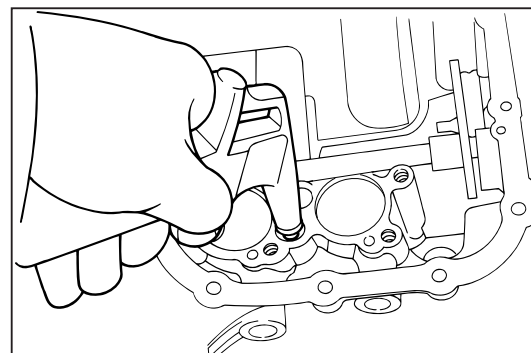
NOTE:

- Be sure to put on protection goggles against oil splash.



MAT00069-00056

(10) Remove the accumulator No. 2 piston with the seal No. 1 ring installed and compression spring.



MAT00070-00057

11. Removal of 2nd brake piston assembly

(1) Remove the lock nut of the transmission brake band adjusting anchor bolt.

(2) Remove the transmission brake band adjusting anchor bolt, using a torx wrench.

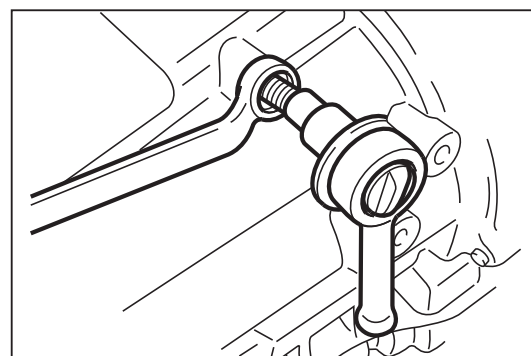
NOTE:

- Never reuse the removed anchor bolt.

(3) Remove the hole snap ring, using snap ring pliers and the following SSTs.

SST: 09202-87002-000 (A)

09202-87002-0A0 (B)



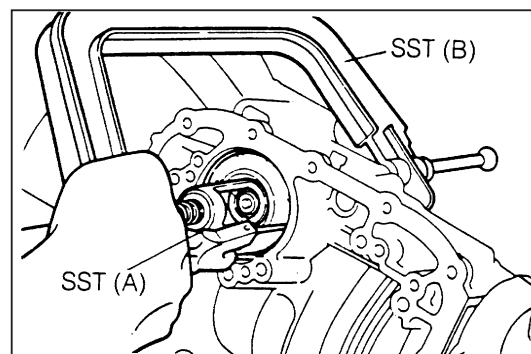
MAT00071-00058

(4) Gradually loosen the SSTs (A) and (B) above, until the compression spring for the 2nd coast brake piston is released fully. Then, remove the SSTs.

NOTE:

- In cases where the 2nd coast brake piston will not come out, slightly loosen the SSTs above. Then, apply a light impact by plastic hammer to remove the piston.

(5) Remove the 2nd brake piston assembly and compression spring.



MAT00072-00059

12. Remove the manual lever subassembly.

- (1) Remove the slotted spring pin, using a pin punch and a hammer.

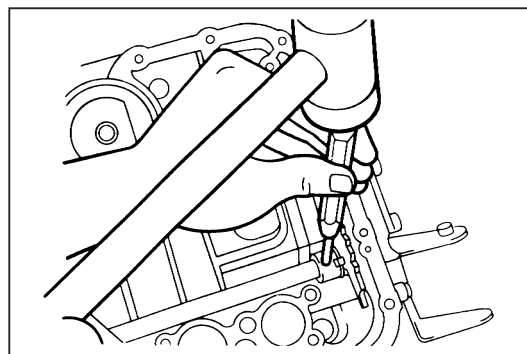
NOTE:

- When removing the pin, be very careful not to drop it into the transmission case.
- Never reuse the removed pin.

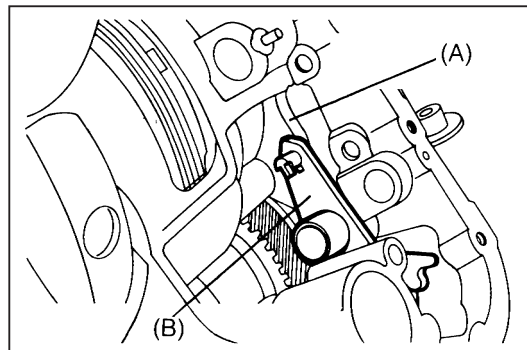
- (2) Pull out the manual valve lever shaft subassembly toward the engine side.

- (3) Push the parking lock rod (A) into the transmission case.

- (4) Remove the manual valve lever by aligning the cut-out groove of the manual valve lever (B) with the protruding section of the parking lock rod.



MAT00073-00060



MAT00074-00061

13. Remove the stator shaft & oil pump assembly.

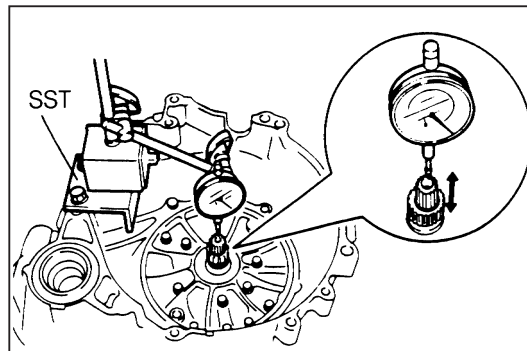
- (1) Measure the input shaft end play, using a dial gauge and following SST.

SST: 09350-87202-000 (09351-87210-000)

Specified Value: 0.28 - 0.92 mm

NOTE:

- Be sure to record the measured value for a guide during the assembly.



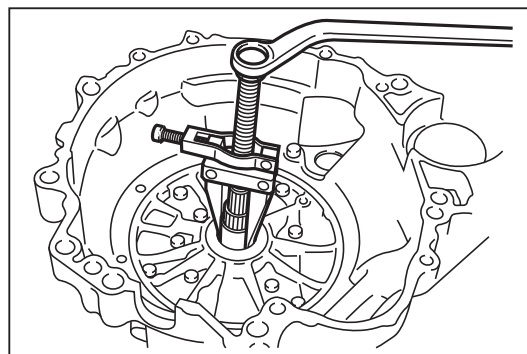
MAT00075-00062

- (2) Remove the T type oil seal, using the following SST.

SST: 09308-10010-000

NOTE:

- Never reuse the removed oil seal.

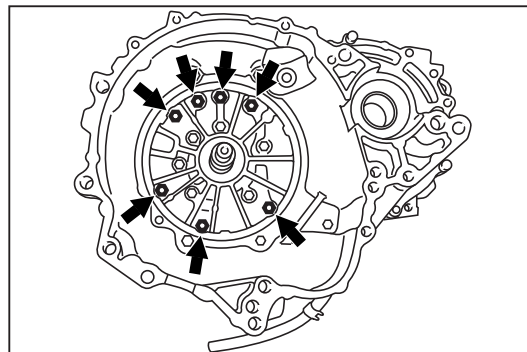


MAT00076-00063

- (3) Remove the seven bolts of the stator shaft & oil pump assembly.

NOTE:

- Be sure to remove the bolts evenly and diagonally.
- Never loosen any bolt other than the specified ones in the right figure.



MAT00077-00064

- (4) Remove the stator shaft & oil pump assembly with the O-ring, using the following SST.
- SST: 09820-00021-000

- (5) Remove the O-ring from the stator shaft & oil pump assembly.

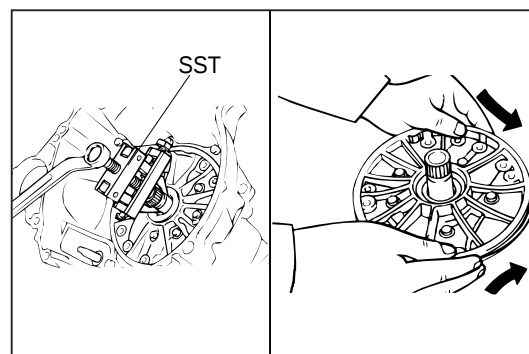
NOTE:

- Never reuse the removed O-ring.

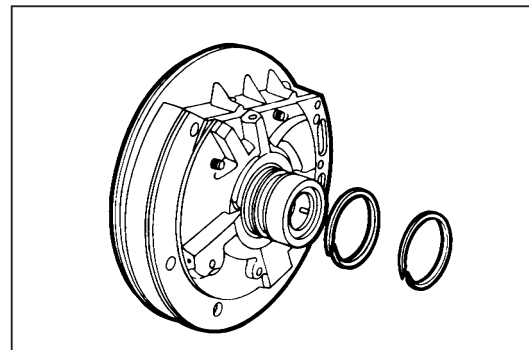
- (6) Remove the two clutch drum oil seal rings.

NOTE:

- Never reuse the removed rings.



MAT00078-00065



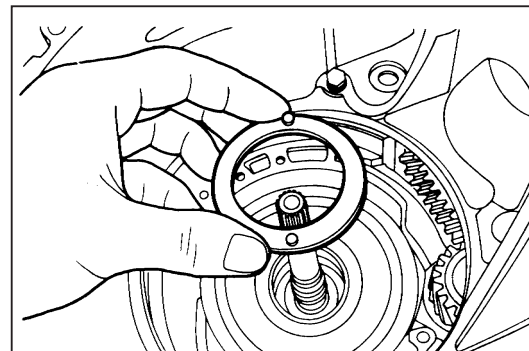
MAT00079-00066

14. Remove the direct clutch and forward clutch.

- (1) Remove the clutch drum thrust washer (resin made) from the direct clutch.

NOTE:

- If no thrust washer (resin made) is provided on the direct clutch, make sure that the thrust washer is installed at the stator shaft & oil pump assembly side.

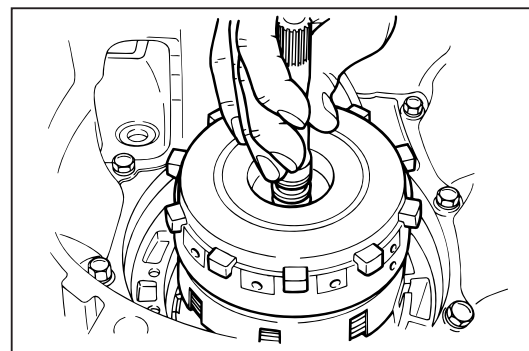


MAT00080-00067

- (2) Remove the direct clutch with forward clutch at the same time and separate it.

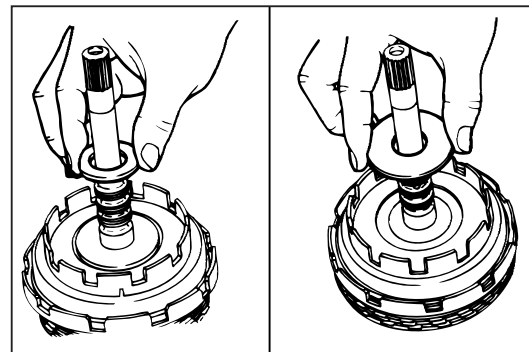
NOTE:

- Do not touch the seal ring.



MAT00081-00068

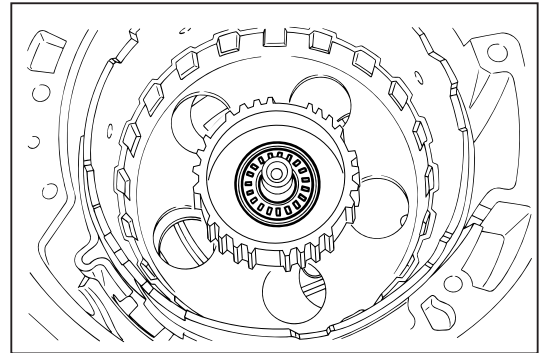
- (3) Remove the thrust needle roller bearing and the thrust bearing race from the forward clutch.



MAT00082-00069

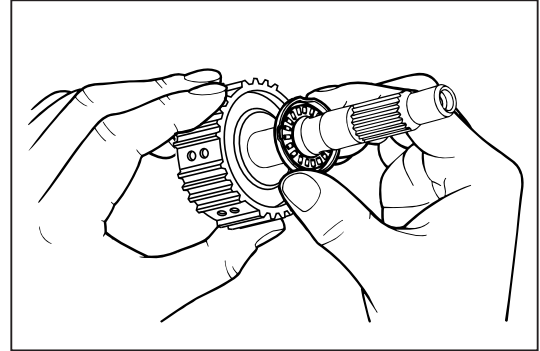
15. Removal of intermediate shaft subassembly

- (1) Remove the thrust needle bearing from the intermediate shaft subassembly.
- (2) Remove the intermediate shaft subassembly.



MAT00083-00070

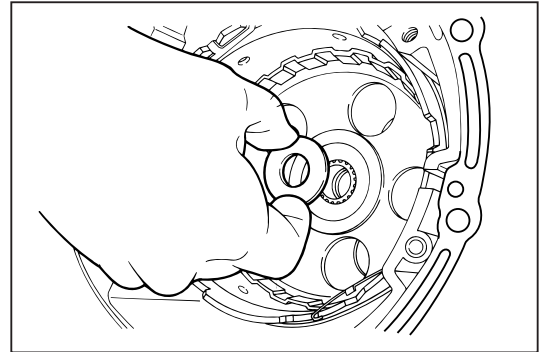
- (3) Remove the thrust needle bearing from the intermediate shaft subassembly.



MAT00084-00071

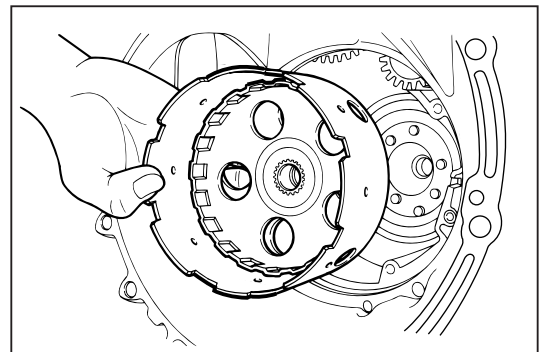
16. Removal of forward clutch hub and 2nd brake drum

- (1) Remove the thrust bearing race from the forward clutch hub.



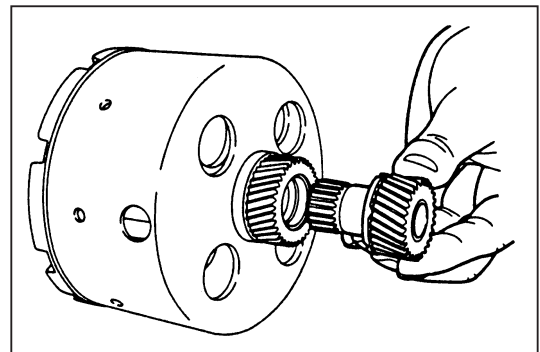
MAT00085-00072

- (2) Remove the 2nd brake drum (together with the forward clutch hub).



MAT00086-00073

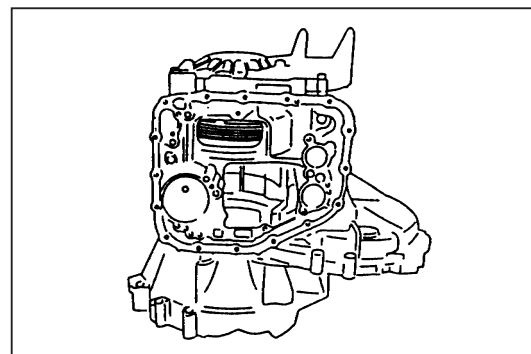
- (3) Remove the rear planetary sun gear subassembly from the 2nd brake drum.
- (4) Remove the thrust needle bearing from the rear planetary sun gear subassembly.



MAT00087-00074

17. Measurement of 1st & reverse brake end play

(1) Turn over the transaxle case.



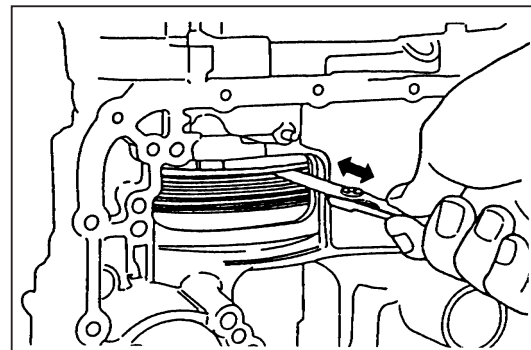
MAT00088-00075

(2) Measure the 1st & reverse brake end play, using a feeler gauge.

Specified Value: 1.04 - 1.41 mm

NOTE:

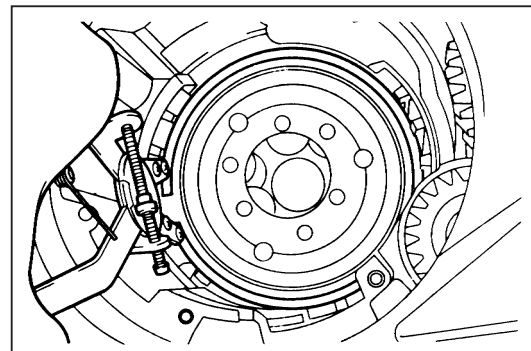
- Be sure to record the measured value for a guide during the assembly.
- The tightness which you encounter during this insertion/withdrawal of the feeler gauge should be virtually the same as the tightness which you would encounter during the thickness adjustment of the valve rocker arm.



MAT00089-00076

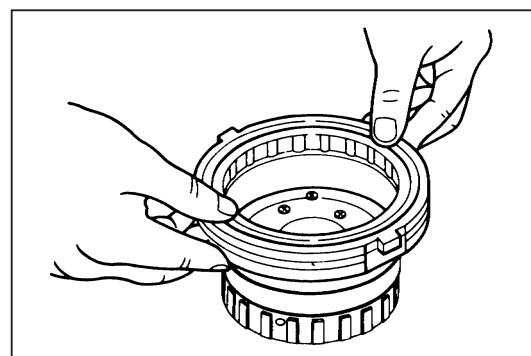
18. Remove the one-way clutch.

(1) Remove the hole snap ring, using snap ring pliers and remove the planetary gear assembly with the one-way clutch installed.



MAT00090-00077

(2) Remove the one-way clutch from the planetary gear assembly.



MAT00091-00078

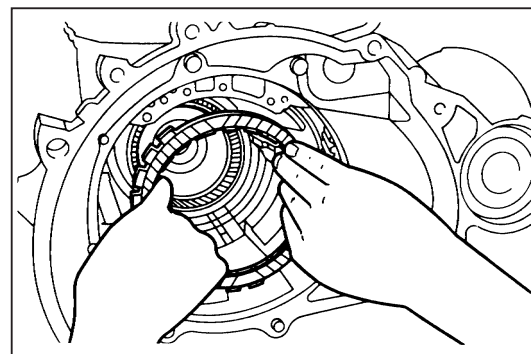
19. Remove the brake plate

(1) Move the brake discs and plates in a set faces toward the front side and remove them in the following order.

D = Brake disc, P = Brake plate

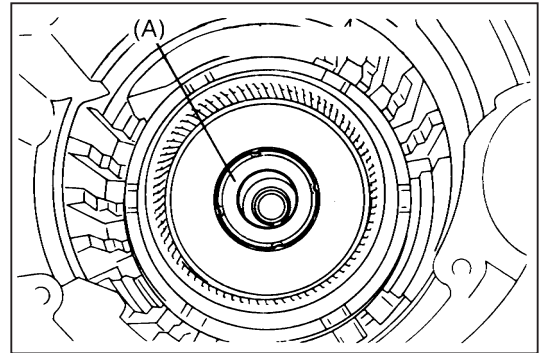
B = Brake cushion plate

D → P → D → P → D → P → D → P → B



MAT00092-00079

- (2) Remove the thrust needle roller bearing (A) from the planetary output shaft subassembly.

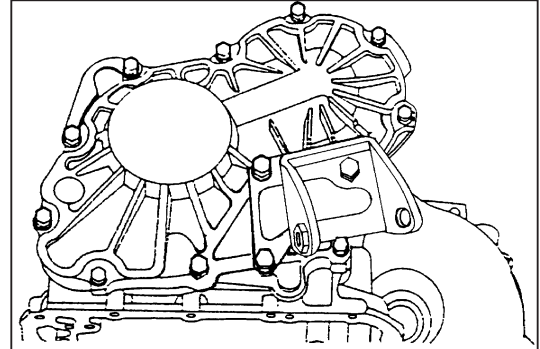


MAT00093-00080

20. Remove the rear transmission case cover.
(1) Remove the rear transmission case cover subassembly.

NOTE:

- Be sure to loosen the bolts evenly and diagonally.

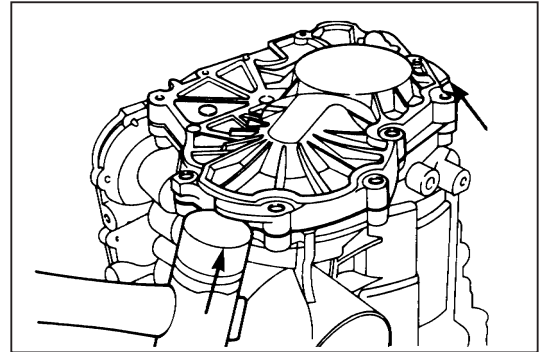


MAT00094-00081

- (2) Lightly and uniformly tap the 2 rib sections of the rear transmission case cover subassembly, using a plastic hammer and remove the transaxle case rear cover gasket.

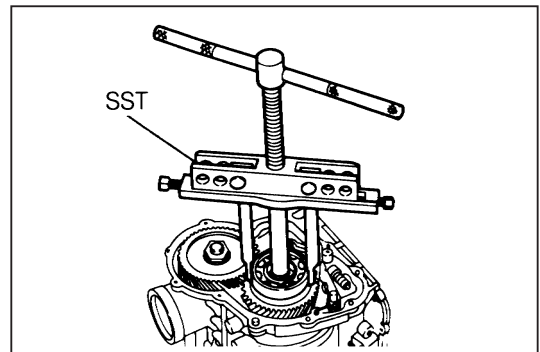
NOTE:

- Never reuse the removed gasket.



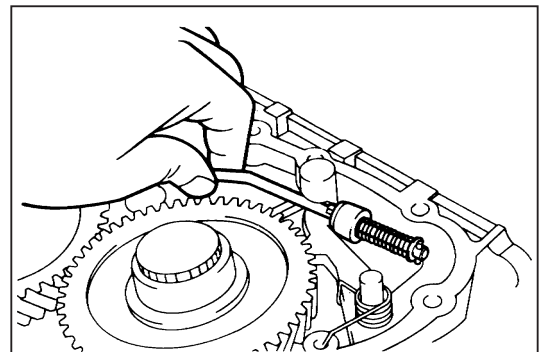
MAT00095-00082

21. Removal of planetary output shaft subassembly.
(1) Remove the radial ball bearing, using the following SST.
SST: 09950-20017-000



MAT00096-00083

- (2) Remove the parking lock rod.



MAT00097-00084

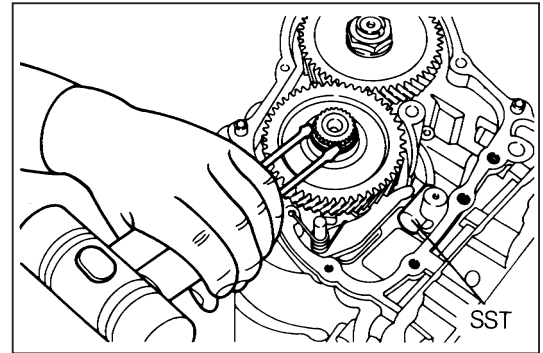
- (3) Insert the following SST between parking lock pawl and cam support.

SST: 09350-87202-000 (09351-87209-000)

- (4) Remove the shaft snap ring, using the 2 flat drivers.

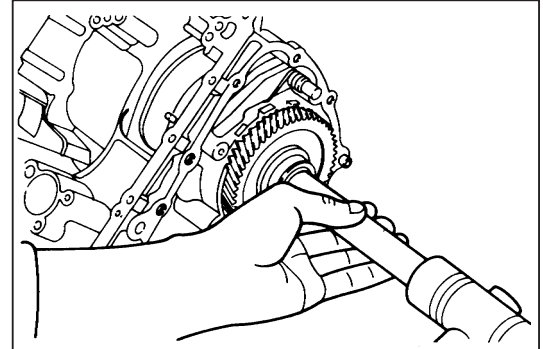
NOTE:

- Never reuse the removed ring.



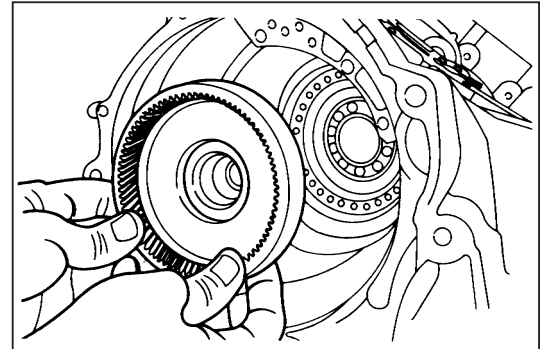
MAT00098-00085

- (5) Tap the planetary output shaft subassembly lightly, using a brass bar and a hammer, until it becomes free.



MAT00099-00086

- (6) Remove the planetary output shaft subassembly.

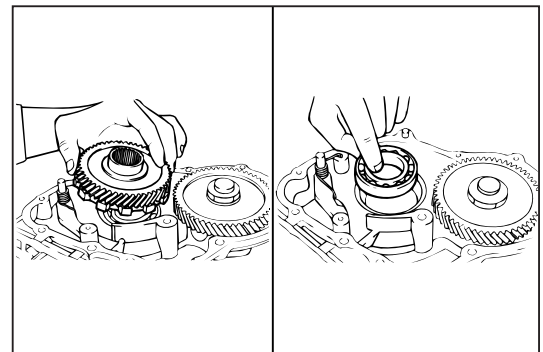


MAT00100-00087

- (7) Remove the reduction drive gear and the radial ball bearing.

NOTE:

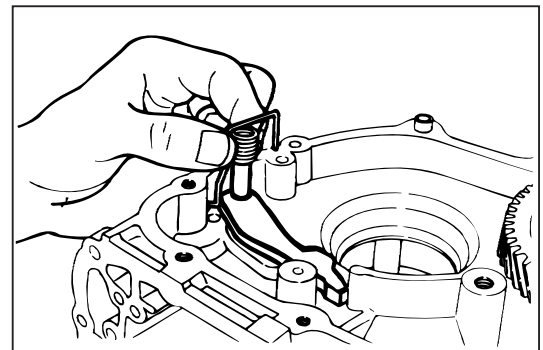
- If any difficulty is encountered in removing the bearing, remove it by applying a light impact from the inside of the transmission case, using a brass bar and a plastic hammer.



MAT000101-00088

22. Remove the parking lock pawl.

- (1) Remove the torsion spring, the parking lock pawl and the parking lock pawl shaft.

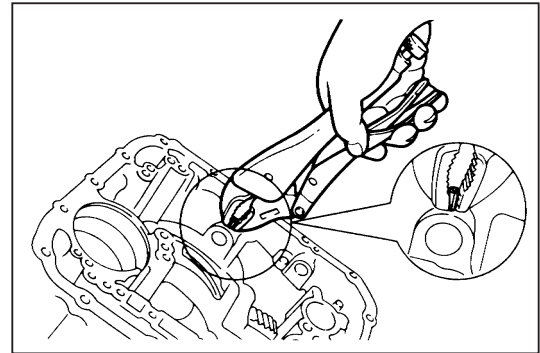


MAT00102-00089

(2) Remove the slotted spring pin, using a vice clip.

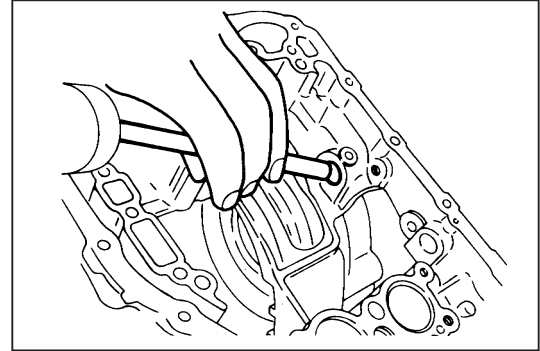
NOTE:

- Securely pinch the pin by vice clip and pull it out with twisting.
- Never reuse the removed pin.



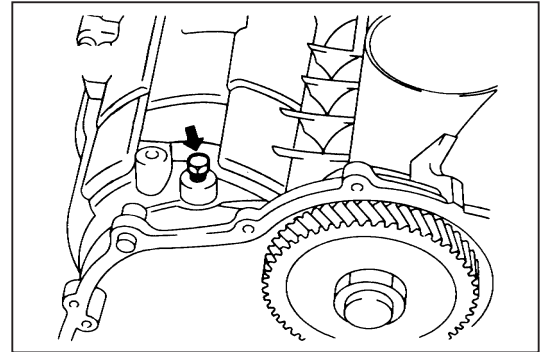
MAT00103-00090

(3) Remove the parking lock pawl cam support, using a brass bar and a hammer.



MAT00104-00091

(4) Temporarily install the removed B₂ inspection plug to the transaxle.



MAT00105-00092

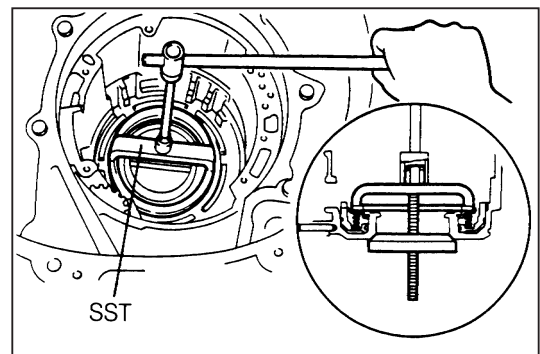
23. Remove the first & reserve brake return spring assembly.

(1) Remove the first & reverse brake return spring by compressing it with a shop press, using the following SST.

SST: 09350-87202-000 (09351-87201-000)

NOTE:

- To prevent the spring seat from being deformed, be sure to stop pressing when the spring seat has been lowered 1 to 2 mm from the shaft snap ring installation position.



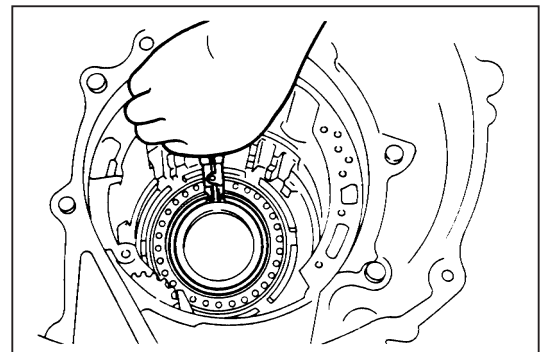
MAT00106-00093

(2) Remove the shaft snap ring, using snap ring pliers.

NOTE:

- Be very careful not to deform the ring by spreading it excessively.

(3) Remove the first & reverse brake return spring.

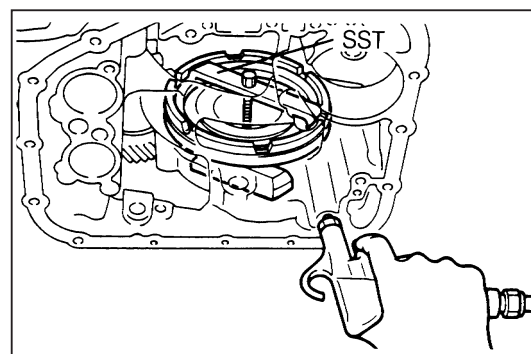


MAT00107-00094

- (4) Hold the first & reverse brake piston, using the following SST (to prevent the piston from being tilted when removing the piston).

SST: 09350-87202-000 (09351-87201-000)

- (5) While applying compressed air of 392 - 784 kPa from the oil hole indicated in the right figure, gradually loosen the bolt of the SST and remove the first & reverse brake piston.

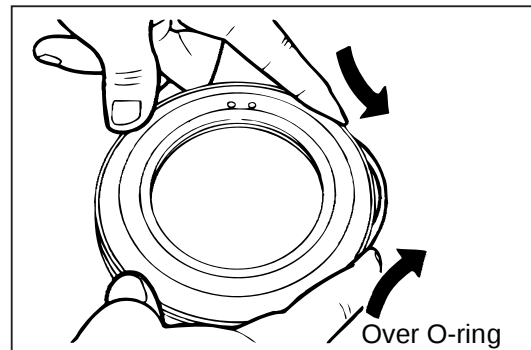


MAT00108-00095

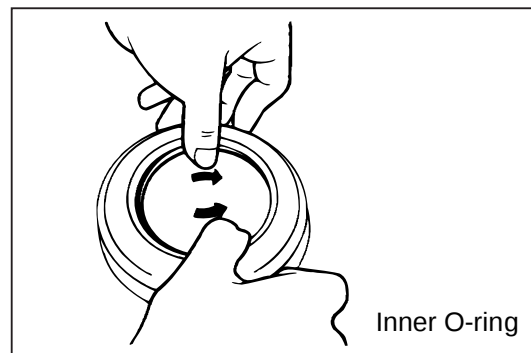
24. Remove the inner and outer O-ring of the first & reverse brake piston.

NOTE:

- Never reuse the removed O-ring.



MAT00109-00096



MAT00000-00097

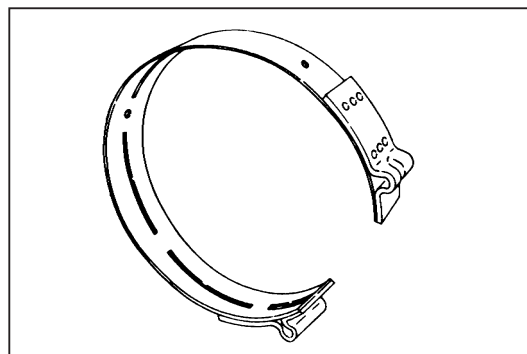
INSPECTION

1. Brake band assembly

If the lining of the brake band is exfoliated or discolored, or even a part of the printed number is defaced, replace it.

NOTE:

- When the brake band assembly is replaced, be sure to check the band contacting surface at the 2nd brake drum side.
- If the surface is damaged or discolored, be sure to replace the drum and the band together.
- Before assembling a new brake band, soak it in the ATF for at least two hours.



MAT00110-00098

2. Direct clutch assembly

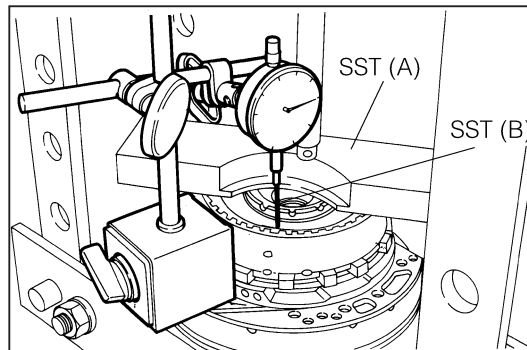
Check of piston stroke of direct clutch

(1) Install the clutch drum thrust washer (resin made) to the oil pump.

(2) Install the direct clutch on the oil pump.

NOTE:

- Be very careful not to scratch the clutch drum oil seal ring of the oil pump.



MAT00111-00099

(3) Secure the direct clutch, using the following SST and a press, to such an extent that the direct clutch will not move in an up-&-down direction.

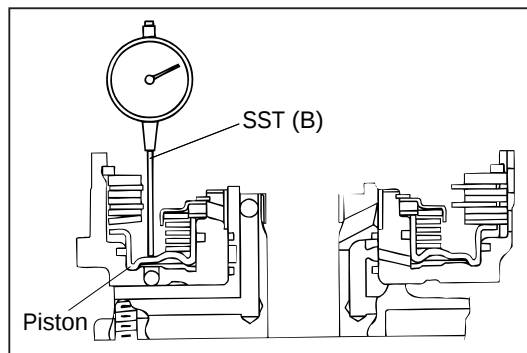
SST: 09527-87301-000 ... (A)

(4) Install the following SST to the dial gauge.

SST: 09350-87202-000 (09351-87203-000) ... (B)

NOTE:

- Make sure that the SST (B) installed to the dial gauge is in contact at right angles with the direct clutch outer piston.

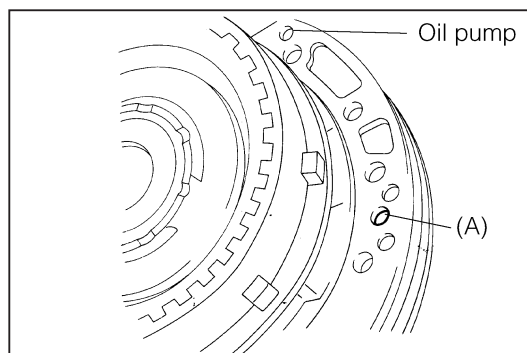


MAT00112-00100

(5) Measure the direct clutch piston stroke while applying and releasing compressed air 392 - 784 kPa through the section (A) as shown in the right figure.

SST: 09527-87301-000,
09350-87202-000 (09351-87203-000)

Piston Stroke: 1.22 - 1.53 mm



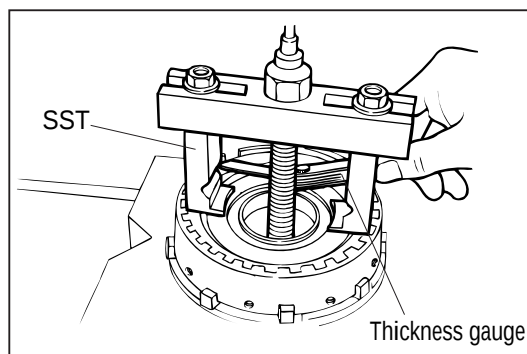
MAT00113-00101

- If the piston stroke is greater than the maximum, replace the direct clutch with a new one.
- Perform the measurement at several points.
- Before assembling a new direct clutch, soak it in the ATF for at least two hours.

(6) While pressing the direct clutch flange 9.8 - 29.4 N, using the following SST and a pushable gauge, measure the end play between the direct clutch flange and the snap ring, using a thickness gauge.

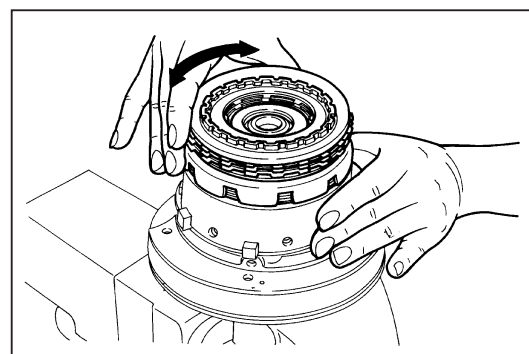
Specified Value: 0.93 $^{+0.15}_{-0.16}$ mm

SST: 09306-87302-000



MAT00114-00102

- (7) Confirmation of turning effort of clutch disc
Insert the input shaft (forward clutch) and rotate it. At this time, ensure that the clutch disc rotates lightly.

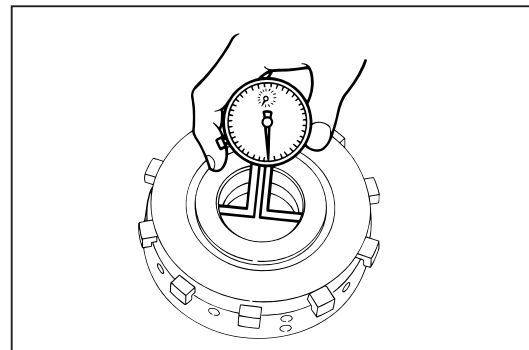


MAT00115-00103

- (8) Measure the bush inner diameter of the direct clutch piston subassembly, using an inner caliper gauge.
Specified Value: 44.000 - 44.025 mm
Allowable Limit: 44.075 mm

NOTE:

- Ensure that the measurement should be performed at the several points.
- If the measured value exceeds the allowable limit, replace the direct clutch drum subassembly with a new one.
- If the measured value exceeds the allowable limit of the bush inner diameter, check the bush contacting surface of the stator shaft of the oil pump assembly. If the contacting surface is scratched or discolored, replace the stator shaft & oil pump assembly with a new one, too.



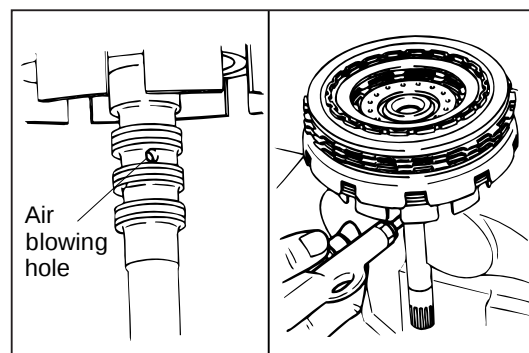
MAT00116-00104

3. Forward clutch assembly

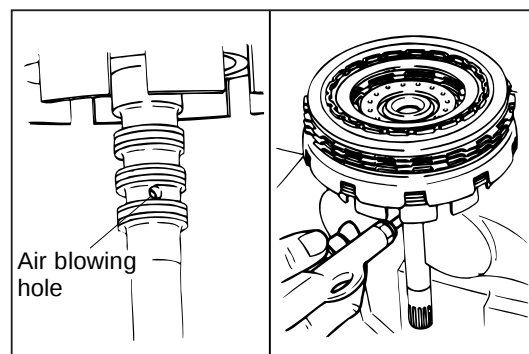
- Operation check of forward clutch piston
 - (1) Secure the input shaft on a vice with aluminum sheets interposed.

NOTE:

- Be very careful not to score the bush contacting surface of the input shaft.
- (2) Blow compressed air of 392 - 784 kPa into the fluid hole of the input shaft indicated in the right figure. At this time, check that the piston slides smoothly.
- Operation check of rear clutch piston
 - (1) Blow compressed air of 392 - 784 kPa into the fluid hole of the input shaft indicated in the right figure. At this time, check that the piston slides smoothly.



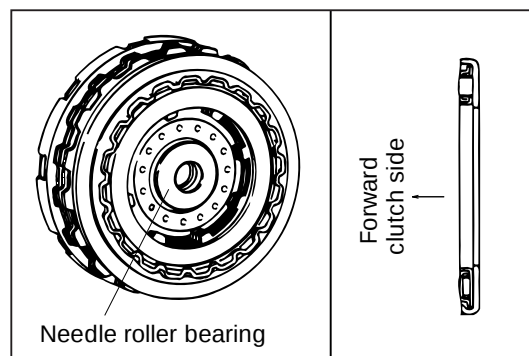
MAT00117-00105



MAT00118-00106

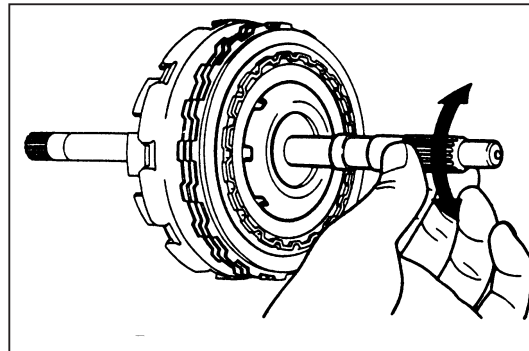
AT-44

- Confirmation of rotating weight of clutch disc
(1) Install the thrust needle bearing to the forward clutch.
REFERENCE:
Dimensions of thrust needle roller bearing:
Refer to page AT-29.



MAT00119-00107

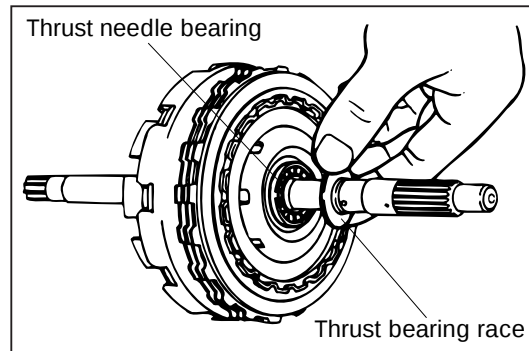
- (2) Assemble the intermediate shaft subassembly and rotate it. Ensure that the clutch No. 3 disc rotates lightly.



MAT00120-00108

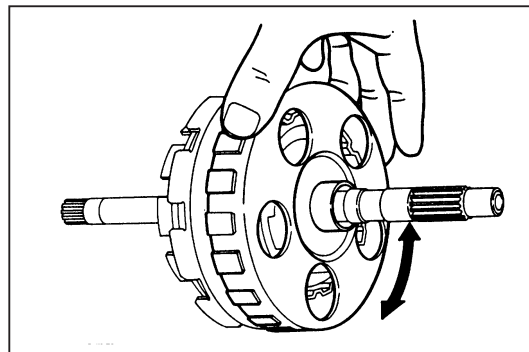
- (3) Assemble the thrust needle bearing and thrust bearing race to the intermediate shaft subassembly.

REFERENCE:
Dimensions of thrust needle bearing:
Refer to page AT-29.



MAT00121-00109

- (4) Assemble the forward clutch hub and rotate it. Ensure that the clutch No. 2 disc rotates lightly.



MAT00122-00110

4. One-way clutch

Hold the one-way clutch and turn the planetary gear assembly.

NOTE:

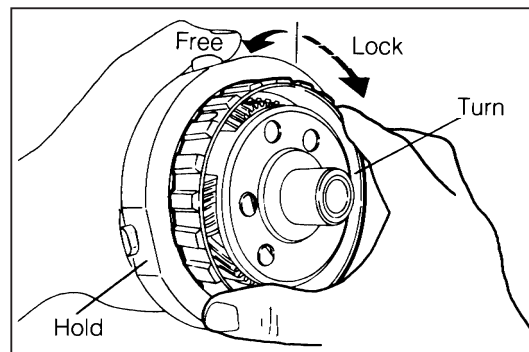
- Ensure that it turns freely when turned counterclockwise and locked when turns clockwise.

5. Thrust bearing specifications

Be sure to install the thrust bearings in the correct direction and position.

NOTE:

- Since the bearings have been staked at the race side, these bearings can not be removed from the race.



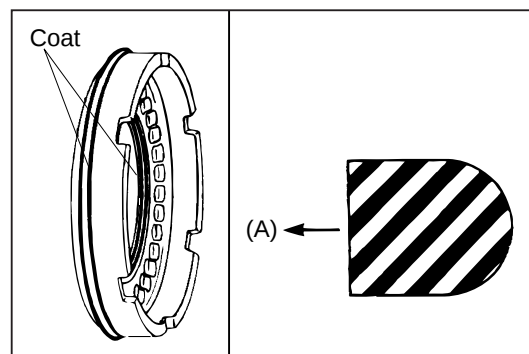
MAT00123-00111

ASSEMBLY**1. Assembly of 1st & reverse brake piston.**

- (1) Coat the new O-rings with ATF and install it to the first & reverse brake piston.

NOTE:

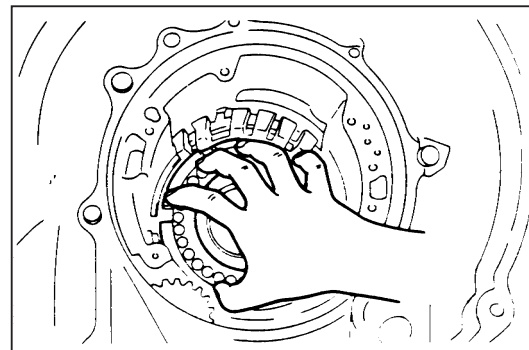
- Be sure to install the (A) section of the new O-rings faces toward the first & reverse brake piston side, for the O-ring has a D-type shape.



MAT00124-00112

- (2) Apply ATF to the outer periphery of the brake piston and to the inserted section of brake piston of the transaxle case.

Insert the brake piston into the transaxle case.



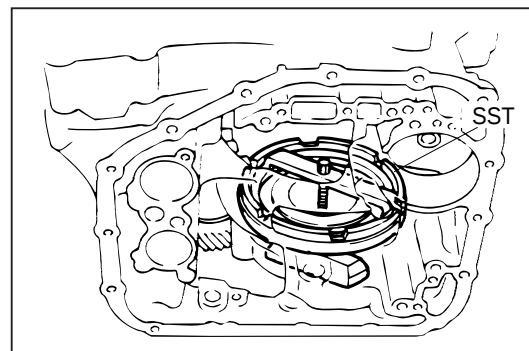
MAT00125-00113

- (3) Install the brake piston, using the following SST.

SST: 09350-87202-000 (09351-87201-000)

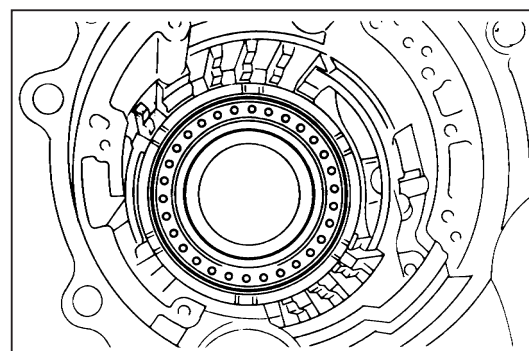
NOTE:

- When installing the piston, care must be exercised to ensure that the O-ring may not deviate from position and may not be scratched.



MAT00126-00114

- (4) Remove the aforesaid SST and place the brake return spring.



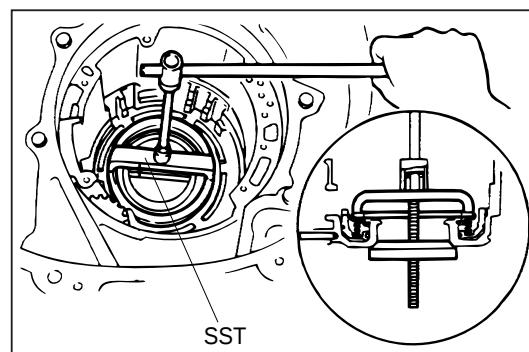
MAT00127-00115

- (5) Compress the brake return spring (seat section), using the following SST.

SST: 09350-87202-000 (09351-87201-000)

NOTE:

- To prevent deformation, be sure to stop tightening the SST when the spring has been lowered 1 to 2 mm from the snap ring installation groove.



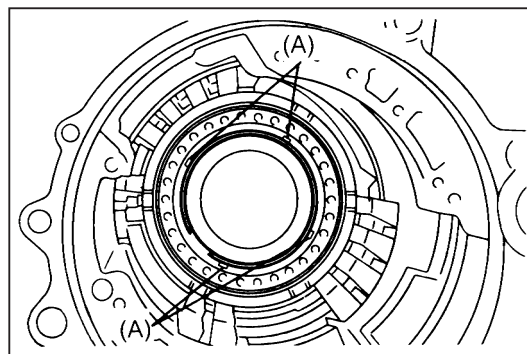
MAT00128-00116

AT-46

(6) Install the shaft snap ring, using snap ring pliers.

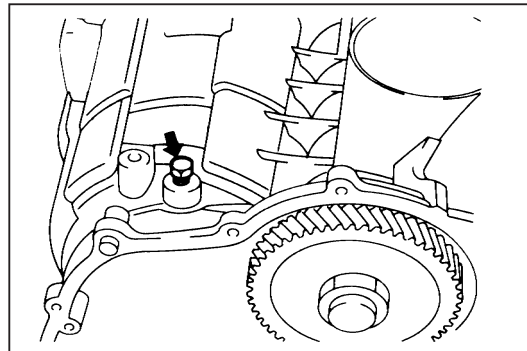
NOTE:

- Do not expand the ring excessively.
- Make sure that the end gap of the shaft snap ring is not aligned with the stopper section (A) of the spring retainer claw.



MAT00129-00117

(7) Remove the B2 inspection plug.

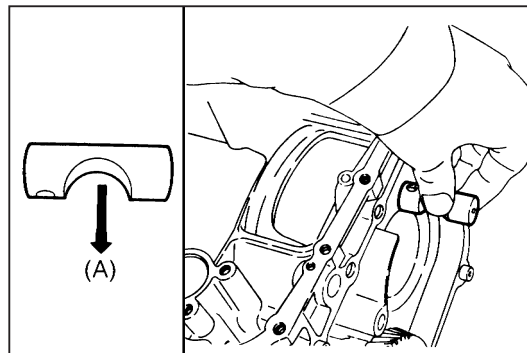


MAT00130-00118

(8) Face the recessed side of the parking lock pawl cam support toward the section (A) at the drive gear side.

(9) Align the parking lock pawl cam support hole with the slotted spring pin installation hole of the transaxle case.

(10) Install the parking lock pawl cam support to the transaxle case.

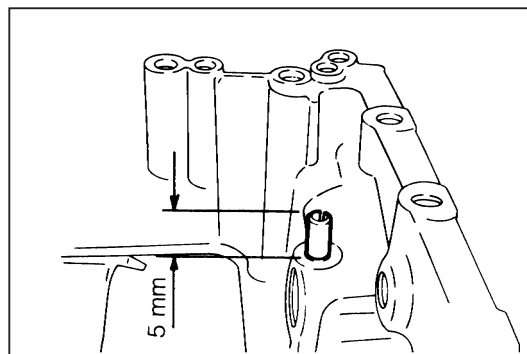


MAT00131-00119

(11) Drive a new slotted spring pin, using a pin punch and a hammer.

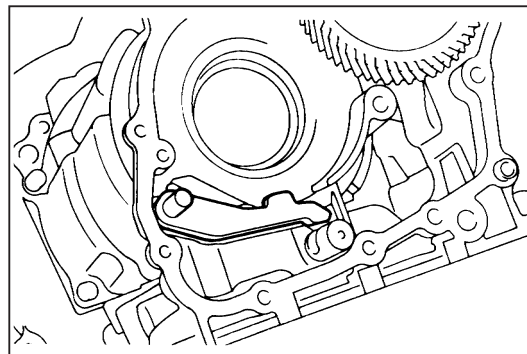
NOTE:

- After driving a new pin, make sure that its protruding length is approx. 5 mm.



MAT00132-00120

(12) Install the parking lock pawl shaft and the parking lock pawl to the transaxle case.

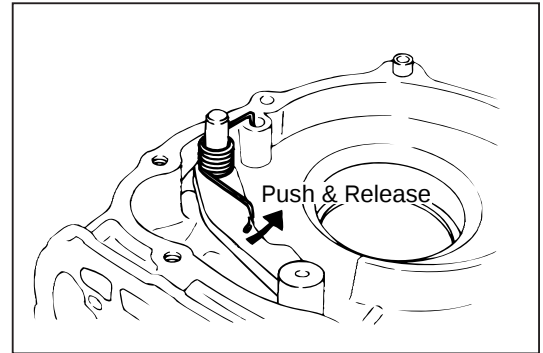


MAT00133-00121

(13) Install the torsion spring, as indicated in the right figure.

NOTE:

- Push the parking lock pawl and release it. At this time, make sure that the pawl returns to the original position.



MAT00134-00122

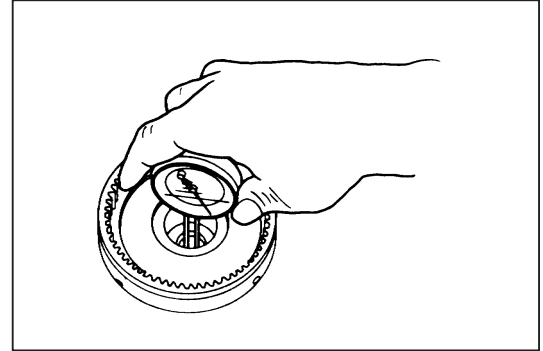
2. Measure the inner diameter of the planetary output shaft subassembly, using an inner caliper gauge.

Specified Value: 12.000 - 12.018 mm

Allowable Limit: 12.068 mm

NOTE:

- Perform the measurement at several points. Calculate the mean value.
- If the measured value exceeds the allowable limit, replace the planetary output shaft subassembly with a new one. Moreover, when replacing it, be sure to check the bush contacting surface of the intermediate shaft for scratch or discoloration. If the surface is scratched or discolored, replace the intermediate shaft with a new part.

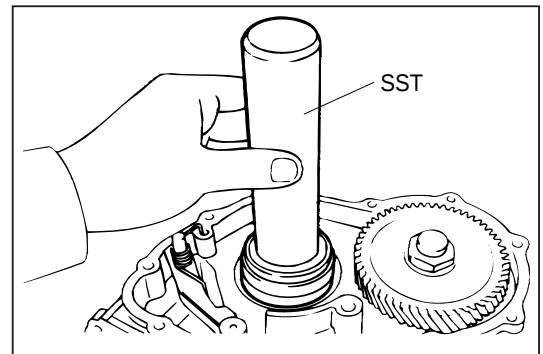


MAT00135-00123

3. Assembly of planetary output shaft subassembly and reduction drive gear.

(1) Install the radial ball bearing to the transaxle case, using the following SST.

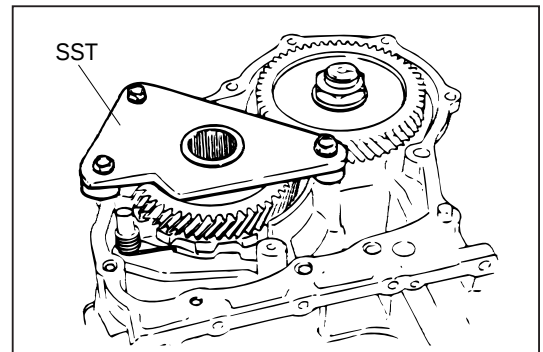
SST: 09310-87301-000



MAT00136-00124

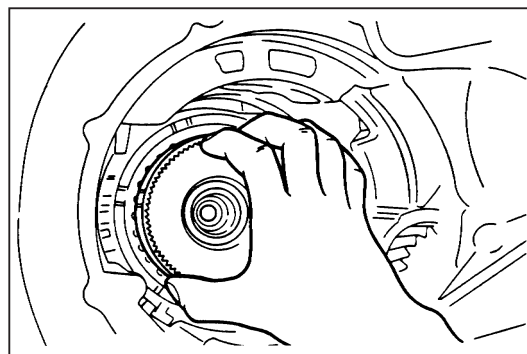
(2) To prevent the reduction drive gear from dropping, install the following SST to the transaxle case.

SST: 09350-87202-000 (09351-87205-000)



MAT00137-00125

- (3) Insert the planetary output shaft subassembly into the reduction drive gear subassembly, until you feel the resistance with your hand.



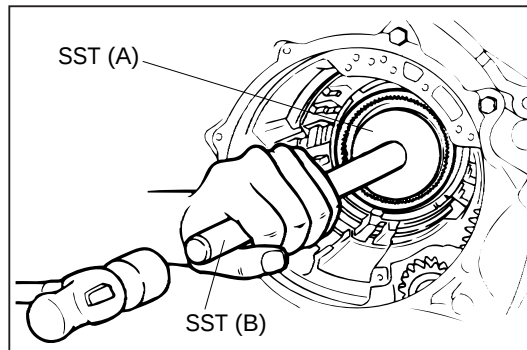
MAT00138-00126

- (4) Drive the reduction drive shaft subassembly, using the following SSTs.

SST: 09608-30011-000

(Use No. 2 in the SST set.) ... (A)

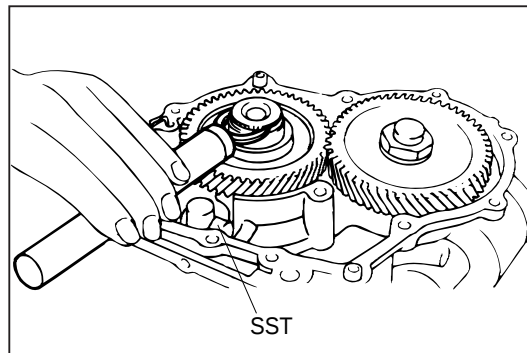
09631-12020-000 ... (B)



MAT00139-00127

- (5) Insert the following SST between the parking lock pawl and the cam support so as to prevent the reduction drive gear from rotating.

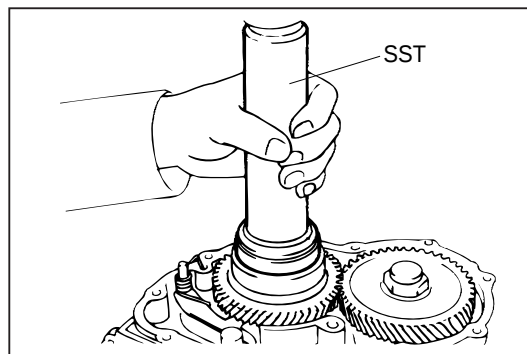
SST: 09350-87202-000 (09351-87209-000)



MAT00140-00128

- (7) Install the radial ball bearing to the reduction drive gear, using the following SST.

SST: 09310-87301-000

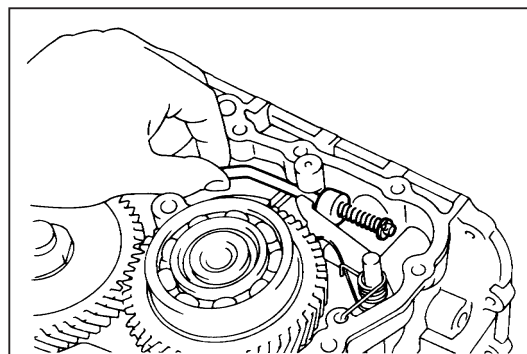


MAT00141-00129

NOTE:

- Make sure that the bearing is installed positively to the edge surface of the reduction drive gear.

- (8) Install the parking rod subassembly between lock pawl and the cam support.



MAT00142-00130

- (9) With a new gasket interposed, tighten the 13 bolts of the rear transmission case cover subassembly provided with the engine hanger No. 2 and engine mounting lower left bracket.

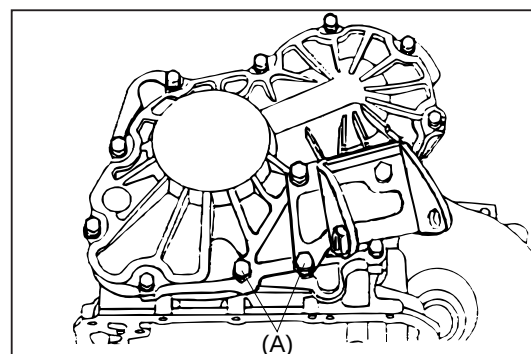
Tightening Torque:

M6: 6.9 - 9.8 N·m

M8: 14.7 - 21.6 N·m

NOTE:

- Be sure to tighten the bolts alternately and diagonally.
- Use two new bolts at the (A) sections.



MAT00143-00131

- (10) Install the thrust needle roller bearing to the planetary output shaft subassembly.

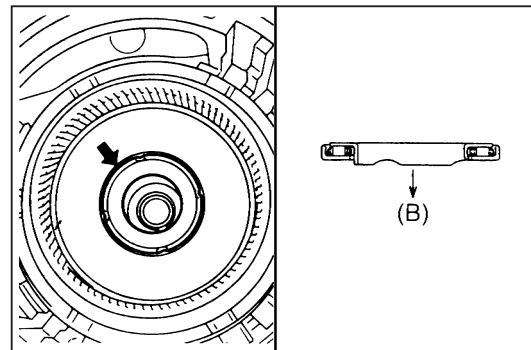
Reference Value:

Thrust needle roller bearing dimension:

Refer to page AT-29.

NOTE:

- Be sure to install the (B) section of the bearing faces toward the reduction drive shaft side.

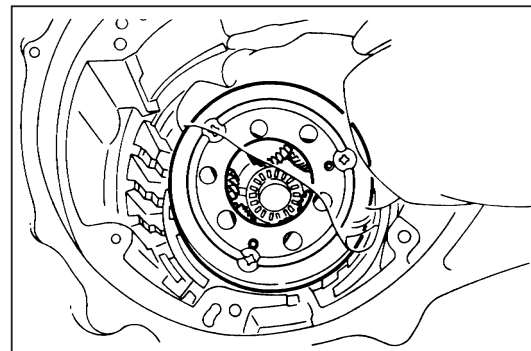


MAT00144-00132

4. Install the planetary gear assembly.

NOTE:

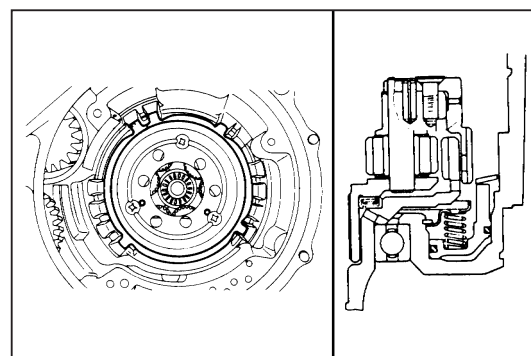
- Ensure that the assembly rotates smoothly.



MAT00145-00133

5. Installation of first & reverse brake

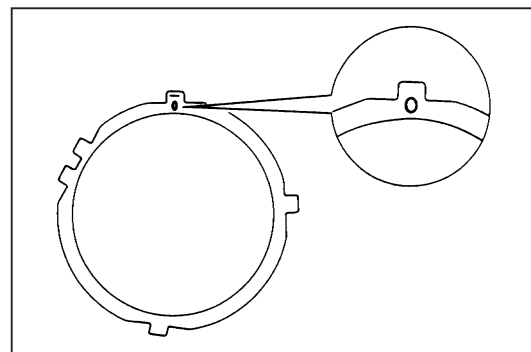
- (1) Install the brake cushion plate.



MAT00146-00134

NOTE:

- Ensure that the stamped mark "O" of the plate faces toward upper side.



MAT00147-00135

AT-50

(2) Install the plates and discs in the following order.

P = Brake plate, D = Brake disc

P → D → P → D → P → D → P → D

NOTE:

- Before assembling new discs, soak them in the ATF for at least two hours.

NOTE:

- Be sure to align the cut-out section of the brake plate with the protruding section of the transaxle when installing the brake plate.

(3) Coat the sliding section of the one-way clutch and planetary gear assembly with the ATF.

(4) Install the one-way clutch.

NOTE:

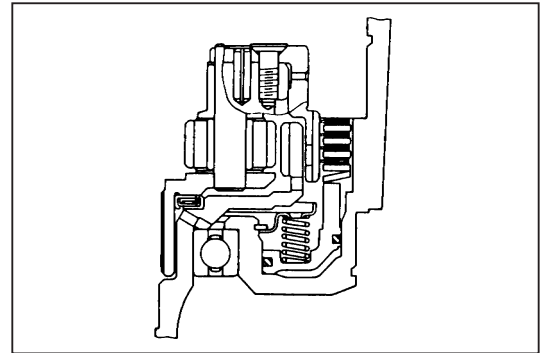
- Ensure that the one-way clutch with the snap ring faces toward the upside.
- Align the cut-out section at the inside of the transaxle case with the protruding section provided with the groove (O mark) of the one-way clutch.

(5) Measure and record the thickness of the hole snap ring.

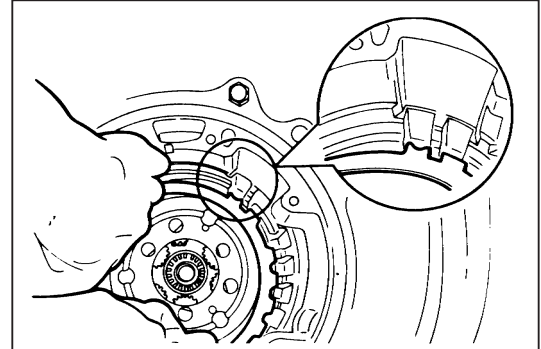
NOTE:

- Replace any scratched or deformed hole snap ring with a new part.

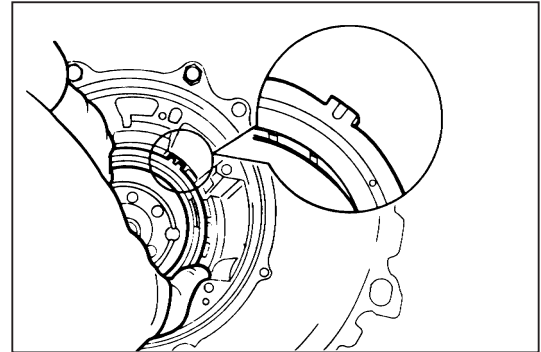
(6) Install the hole snap ring to the grooved section of the transaxle case.



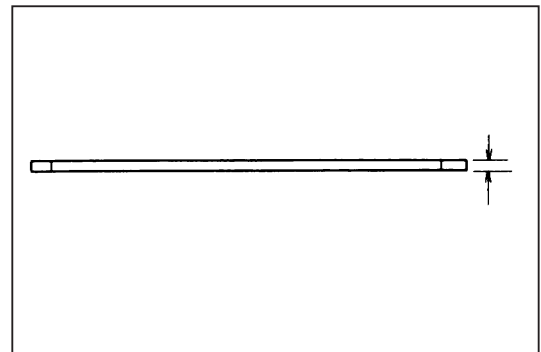
MAT00148-00136



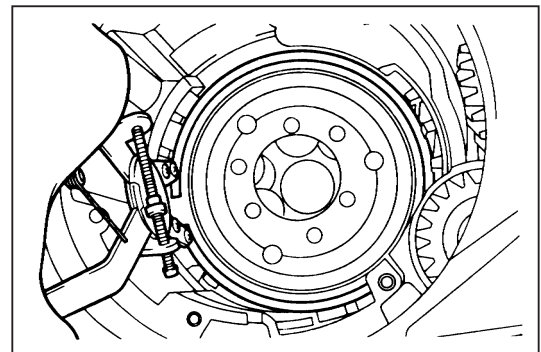
MAT00149-00137



MAT00150-00138



MAT00151-00139



MAT00152-00140

6. Measurement of first & reverse brake end play

(1) Turn over the transaxle case.

(2) Measure the first & reverse brake end play, using a flat thickness gauge.

Specified Value: 1.04 - 1.41 mm

NOTE:

- The tightness which you encounter during this insertion/withdrawal of the flat thickness gauge should be virtually the same as the tightness which you would encounter during the thickness adjustment of the valve rocker arm.
- If the measured end play fails to conform to the specified value above, select a snap ring from the right lower table, using the following calculation formula. Then, install it.

Calculation formula

$$A = B - C + D$$

A = Thickness of new snap ring to be selected

(Refer to the 1st.)

B = Measured value of end play

C = Specified value of end play

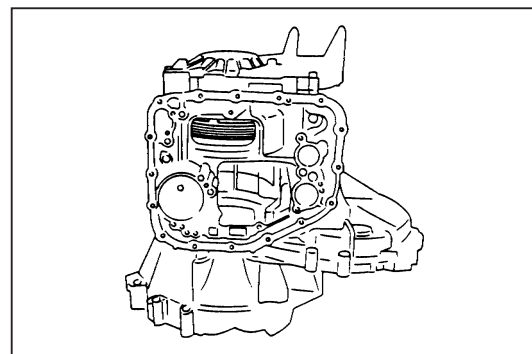
D = Thickness of snap ring that has been already installed

7. Installation of transmission brake band assembly-related parts

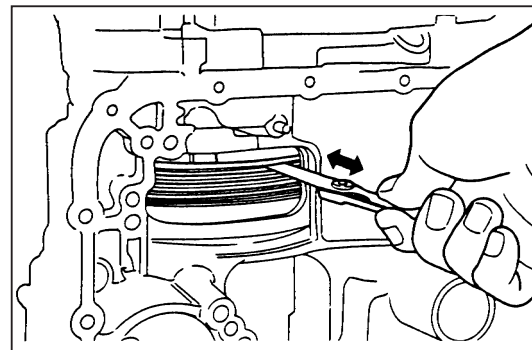
- Install the compression spring to the second brake piston assembly.
- Install the 2nd brake piston assembly to the transmission case together with the compression spring.
- While compressing the 2nd brake piston with the following SSTs, install the hole snap ring, using snap ring pliers.

SSTs: 09202-87002-000 ... (A)

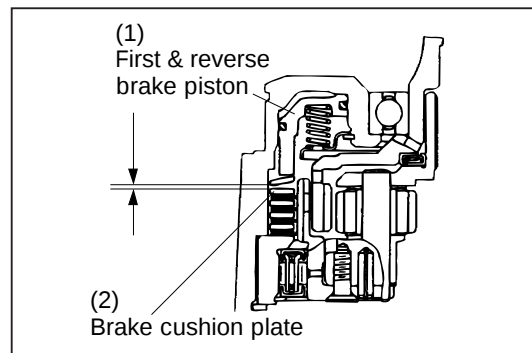
09202-87202-0A0 ... (B)



MAT00153-00141



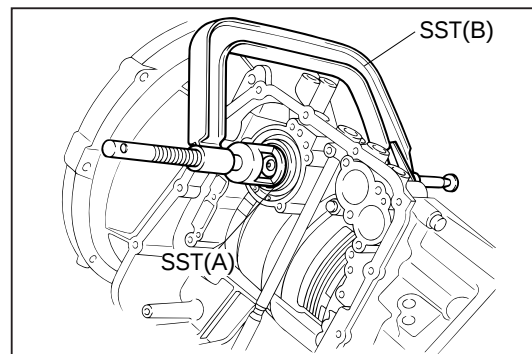
MAT00154-00142



MAT00155-00143

Snap ring thickness Unit: mm	Part No.	Color
2.00	90045-21119-000	Silver
2.25	90045-21120-000	Blue
2.50	90045-21121-000	Brown
2.75	90045-21123-000	Black

MAT00156-00000

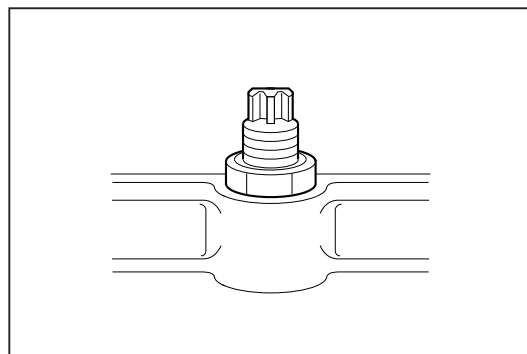


MAT00157-00144

(4) Install a new brake band adjusting anchor bolt to the transmission.

NOTE:

- Be sure to tighten the anchor bolt, until the head section of the anchor bolt appears at the inside of the transmission case, as indicated in the right figure.

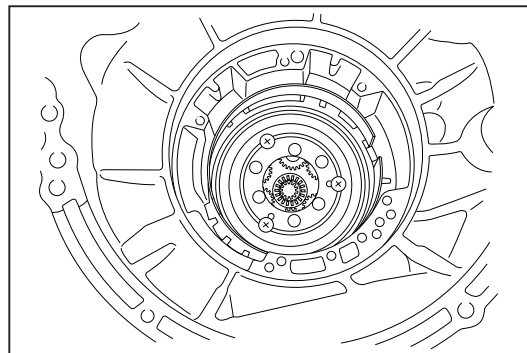


MAT00158-00145

(5) With the brake band assembly contracted, assemble the band while aligning its recessed section with the head of the brake band anchor bolt and with the head of the 2nd coast brake piston rod.

NOTE:

- Before assembling the brake band assembly, soak it in the ATF for at least two hours.



MAT00159-00146

8. Assembly of forward clutch hub and 2nd brake drum

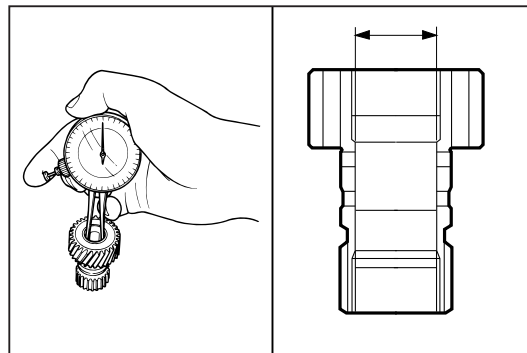
(1) Measure the bush bore diameter of the rear planetary sun gear subassembly.

Specified Value: 15.500 - 15.518 mm

Allowable limit: 15.568 mm

NOTE:

- The measurement should be performed at several points. Determine the mean value.
- If the bore diameter exceeds the allowable limit, replace the rear planetary sun gear subassembly.
- When replacing the rear planetary sun gear subassembly, be sure to check the bush contacting surface of the intermediate shaft subassembly. If the contacting surface is scored or discolored, replace the intermediate shaft subassembly, too, with a new one at the same time.



MAT00160-00147

(2) Assemble the thrust needle roller bearing to the rear planetary sun gear subassembly.

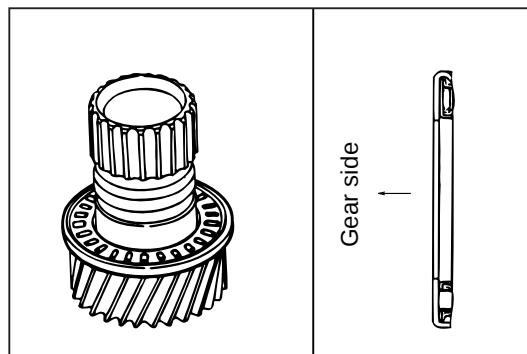
NOTE:

- Make sure that the thrust needle roller bearing is assembled in the correct direction.

REFERENCE:

Dimensions of thrust needle roller bearing:

Refer to page AT-29.

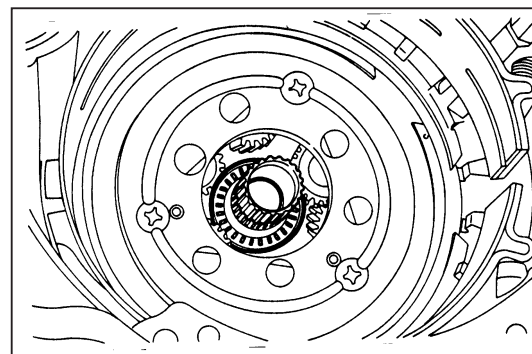


MAT00161-00148

- (3) Assemble the rear planetary sun gear subassembly to the planetary gear assembly.

NOTE:

- Apply ATF to the bush section.



MAT00162-00149

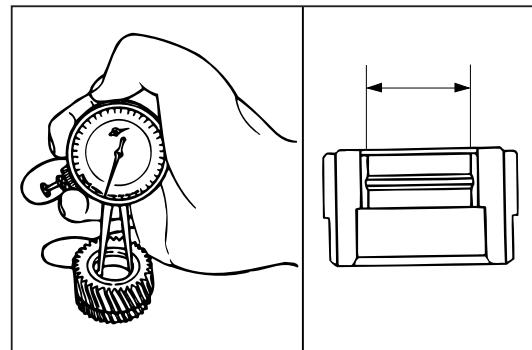
- (4) Measure the bush bore diameter of the planetary sun gear subassembly.

Specified Value: 22.020 - 22.038 mm

Allowable Limit: 22.088 mm

NOTE:

- The measurement should be performed at several points. Determine the mean value.
- If the bore diameter exceeds the allowable limit, replace the planetary sun gear subassembly.
- When replacing the planetary sun gear subassembly, be sure to check the bush contacting surface of the rear planetary sun gear subassembly. If the contacting surface is scored or discolored, replace the rear planetary sun gear subassembly with a new one, too, at the same time.

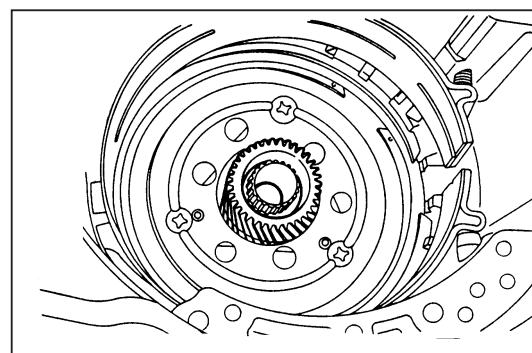


MAT00163-00150

- (5) Assemble the planetary sun gear subassembly to the planetary gear assembly.

NOTE:

- Apply ATF to the bush section.



MAT00164-00151

- (6) Assemble the thrust needle roller bearing to the 2nd brake drum.

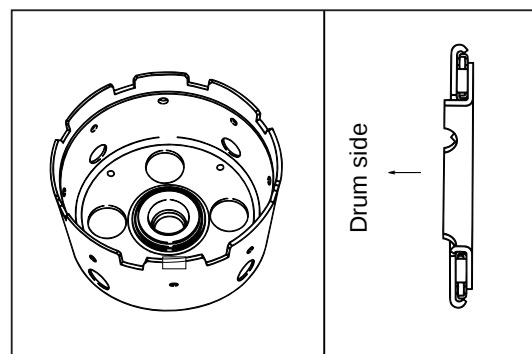
NOTE:

- Make sure that the thrust needle roller bearing is assembled in the correct direction.

REFERENCE:

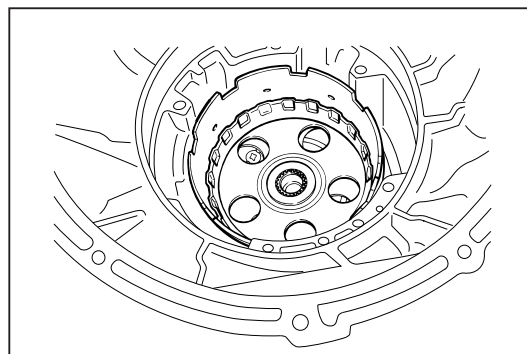
Dimensions of thrust needle roller bearing:

Refer to page AT-29.



MAT00165-00152

- (7) Assemble the forward clutch hub to the 2nd brake drum.
- (8) Assemble the 2nd brake drum to the transmission case.



MAT00166-00153

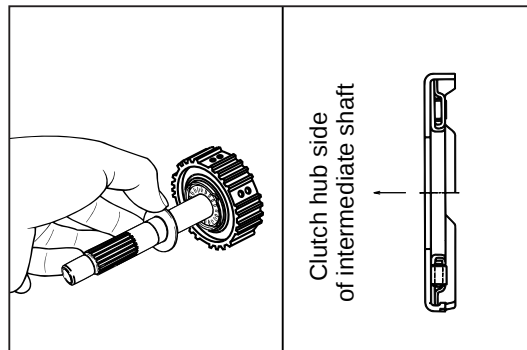
9. Assembly of intermediate shaft subassembly
 - (1) Assemble the thrust needle roller bearing and thrust bearing race to the intermediate shaft subassembly.

NOTE:

- Make sure that the thrust needle roller bearing is assembled in the correct direction.

REFERENCE:

Dimensions of thrust needle roller bearing:
Refer to page AT-29.

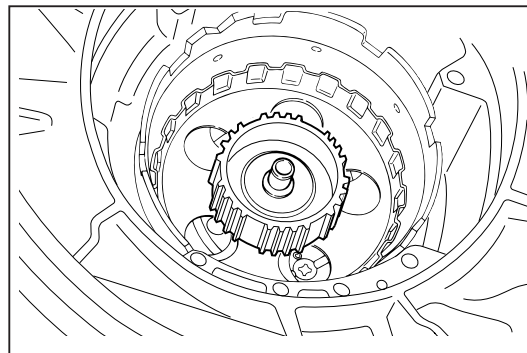


MAT00167-00154

- (2) Assemble the intermediate shaft subassembly.

NOTE:

- Be sure to apply ATF to the intermediate shaft subassembly before assembling.



MAT00168-00155

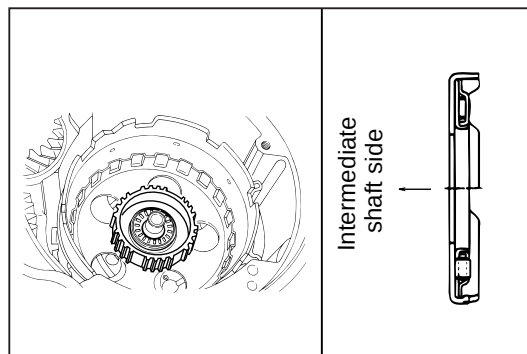
10. Assemble the thrust needle roller bearing to the intermediate shaft subassembly.

NOTE:

- Make sure that the thrust needle roller bearing is assembled in the correct direction.

REFERENCE:

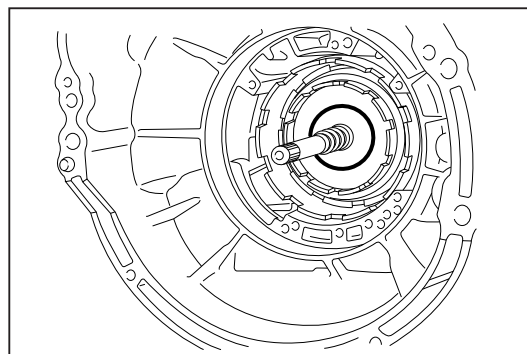
Dimensions of thrust needle roller bearing:
Refer to page AT-29.



MAT00169-00156

11. Align the pawls of the clutch disc of the forward clutch with each other.

While aligning the pawls of the clutch disc of the forward clutch with the groove of the forward clutch hub and with the groove of the intermediate shaft subassembly, assemble these parts.



MAT00170-00157

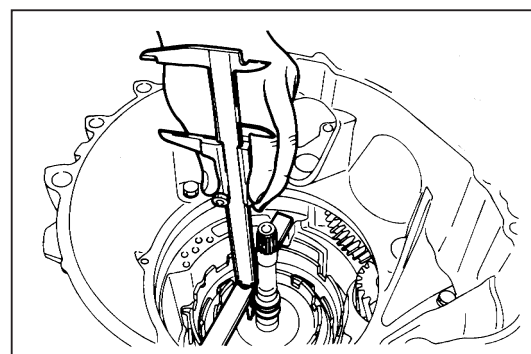
12. Measure the height of the forward clutch between the installation section of the oil pump and the thrust bearing race of the forward clutch, using the following SST.

SST: 09350-87202-000 (09351-87208-000)

Specified Value: Approx. 54 mm

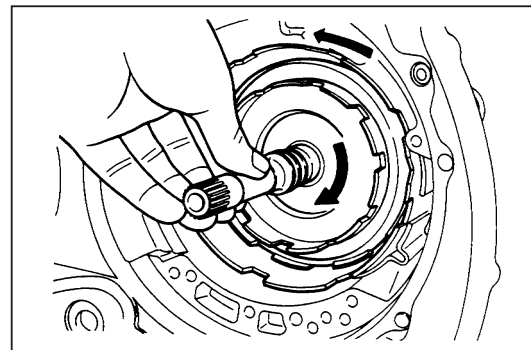
NOTE:

- If the measured value is less than 54 mm, the pawl section of the forward clutch disc is probably not fitted in the groove of the forward clutch hub. Be sure to perform the operation of the step again.



MAT00171-00158

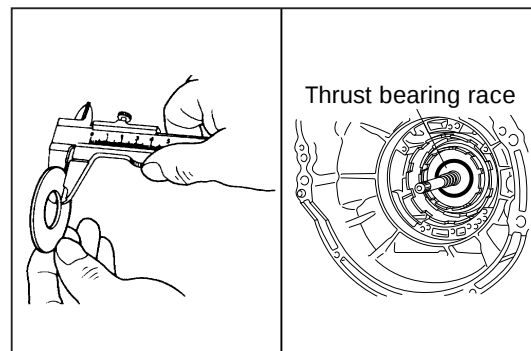
13. Turn the forward clutch clockwise and counterclockwise. At this time, ensure that the forward clutch turns lightly and the 2nd brake drum makes a relative movement with the forward clutch.



MAT00172-00159

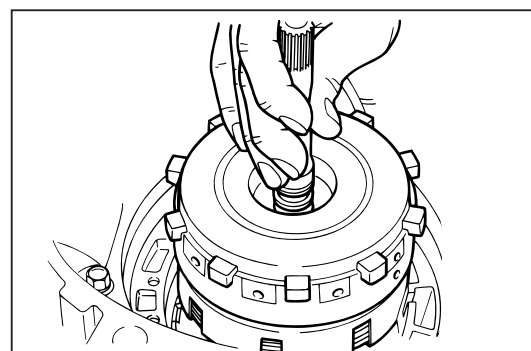
14. Installation of direct clutch

- (1) Measure and record the thickness of the thrust bearing race.
- (2) Install the thrust bearing race.



MAT00173-00160

- (3) Install the direct clutch to the 2nd brake drum as turning clock wise and counter clock wise.



MAT00174-00161

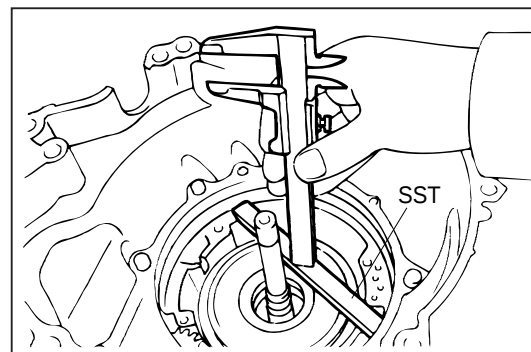
- (4) Confirm the height of the oil pump attaching surface from the direct clutch upper surface, using the following SST.

SST: 09350-87202-000 (09351-87208-000)

Specified Height: Approx. 22 mm

NOTE:

- If the measured value is less than 22 mm, the two pawls of the clutch disc are probably not fitted into the groove of the forward clutch. Be sure to perform the operation of the step (3) above again.



MAT00175-00162

15. Inspection of stator shaft & oil pump assembly

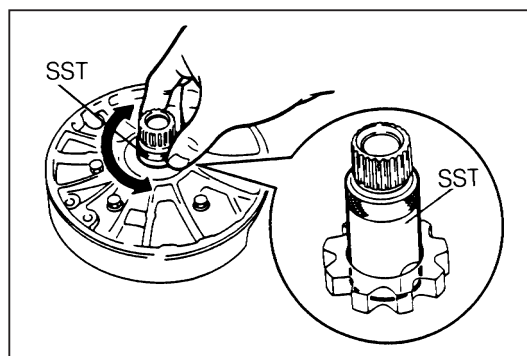
(1) Inspection of oil pump operation

Ensure that the oil pump drive gear rotates smoothly, using the following SST.

SST: 09350-87202-000 (09351-87206-000)

NOTE:

- Be sure to insert the flat sections (2 points) of the SST into the flat sections of the oil pump drive gear.

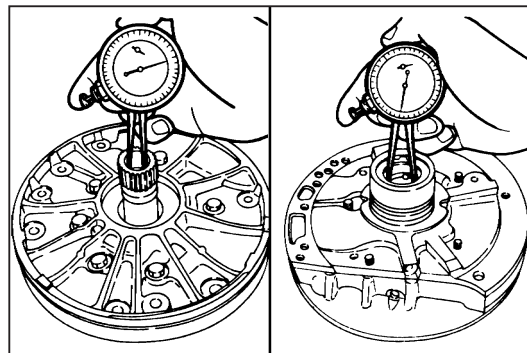


MAT00176-00163

(2) Measure the inner diameter of the oil pump bush section, using an inner caliper gauge.

Unit: mm

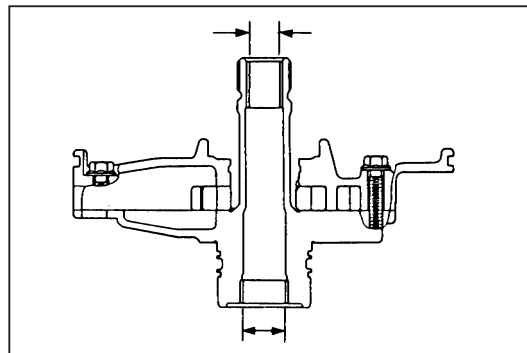
	Specified value	Allowable limit
Front side	15.50 - 15.52	15.57
Rear side	21.10 - 21.12	21.17



MAT00177-00164

NOTE:

- Perform the measurement at several points. Calculate the mean value.
- If the actually measured value exceeds the allowable limit, replace the stator shaft & oil pump assembly with a new one.
- When replacing it, be sure to check the bush contacting surface of the input shaft subassembly. If the surface is scratched or discolored, replace the shaft with a new one, too.



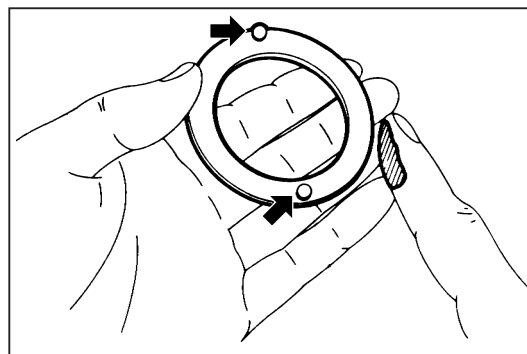
MAT00178-00165

16. Check of input shaft end play

(1) Apply vaseline to the protruding sections (2 points) of the clutch drum thrust washer.

NOTE:

- Be sure to apply vaseline properly.

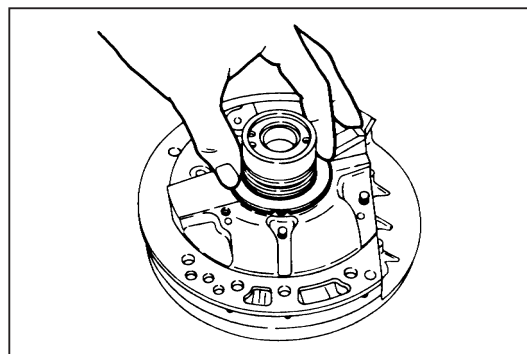


MAT00179-00166

(2) Install the clutch drum thrust washer by aligning its protruding section with the recessed section of the oil pump assembly.

NOTE:

- Be sure to apply vaseline enough to prevent the washer from dropping.

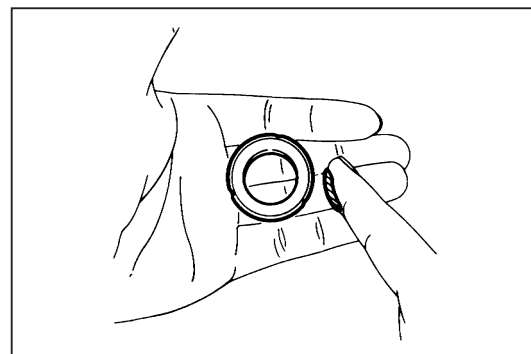


MAT00180-00167

- (3) Apply a small amount of vaseline to the race side of the thrust needle roller bearing.

NOTE:

- Be sure to apply vaseline enough to prevent the bearing from dropping.



MAT00181-00168

- (4) Install the thrust needle roller bearing to the oil pump assembly.

NOTE:

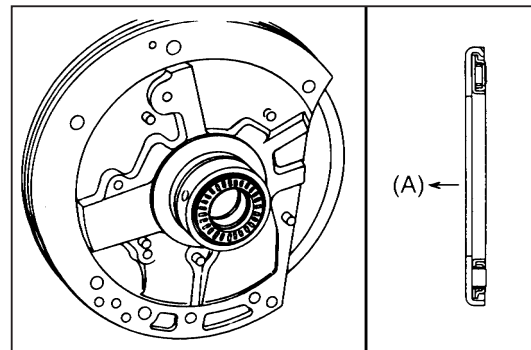
- Ensure that the section (A) of the bearing race faces toward the oil pump assembly side.
- Reference Value:

Thrust needle roller bearing dimensions:

Outer Diameter: 35.7 mm

Inner Diameter: 22.0 mm

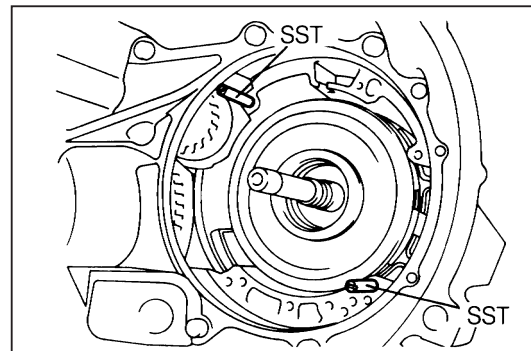
Thickness : 2.8 mm



MAT00182-00169

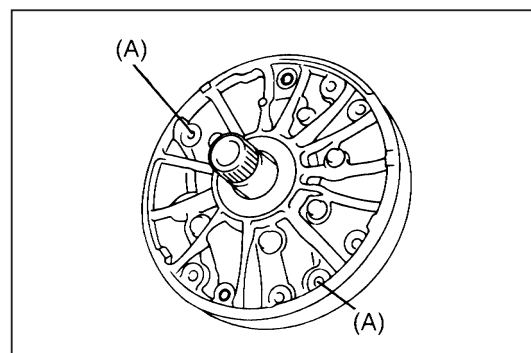
- (5) Install the following SST to the transaxle case.

SST: 09350-87202-000 (09351-87207-000)



MAT00183-00170

- (6) Align the attaching holes (sections (A)) of the stator shaft & oil pump assembly with the SST that has been installed at the step (5).

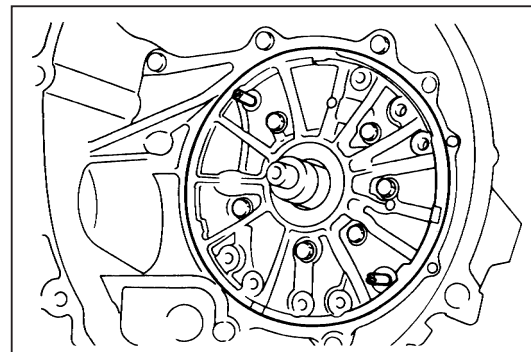


MAT00184-00171

- (7) Apply the ATF to the outer periphery of the stator shaft & oil pump assembly and install it to the transaxle case.

NOTE:

- Be very careful not to damage or twist the O-ring during the installation.



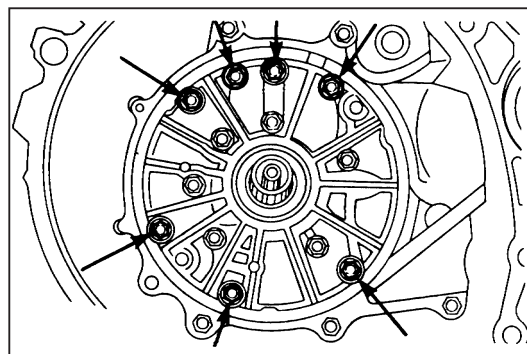
MAT00185-00172

- (8) Tighten the seven bolts of the stator shaft & oil pump assembly.

Tightening Torque: 6.9 - 9.8 N·m

NOTE:

- Be sure to tighten the bolts alternately and diagonally.



MAT00186-00173

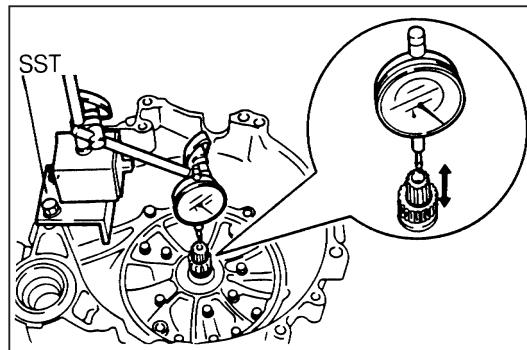
- (9) Measure the input shaft end play with a dial gauge and the following SST.

SST: 09350-87202-000 (09351-87210-000)

Specified Value: 0.28 - 0.92 mm

NOTE:

- If the measured end play exceeds the specified value, remove the stator shaft & oil pump assembly and the direct clutch from the transaxle case. Then, select the thickness of the thrust bearing race from the right lower table. Proceed to perform the operations of the steps from 14-(1) to 16-(9).



MAT00187-00174

Thrust Bearing Race Availability

Thrust bearing race thickness Unit: mm	Part No.	Number of cut
1.6	35789-87208-000	1
2.0	35789-87209-000	0
2.4	35789-87210-000	2

MAT00188-00000

17. Assembly of stator shaft & oil pump assembly

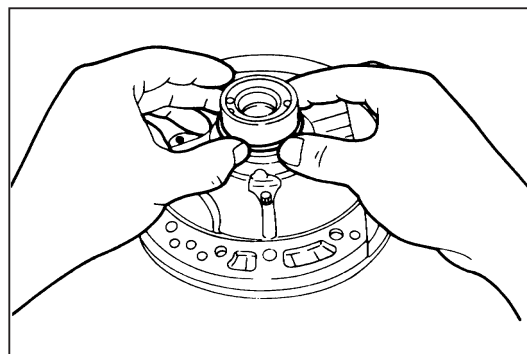
- (1) Coat two new clutch drum oil seal rings with the ATF and install it to the stator shaft & oil pump assembly.

NOTE:

- Do not spread the new oil seal rings excessively.

- (2) Coat and install the new O-ring.

- (3) Assemble the stator shaft & oil pump assembly, following the procedure given in the steps 16-(1) through 16-(8).



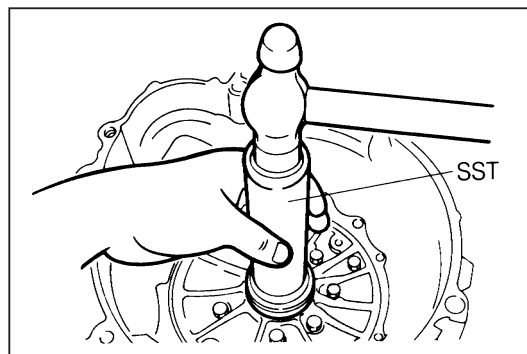
MAT00189-00175

- (4) Install a new T-type oil seal, using the following SST.

SST: 09310-87301-000

NOTE:

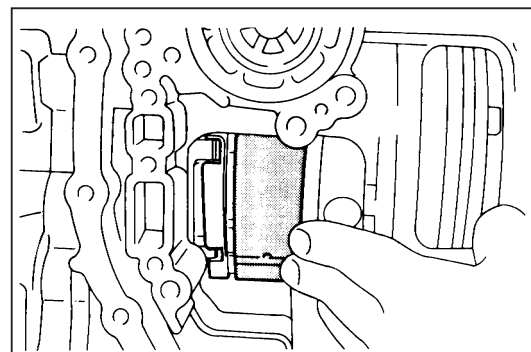
- Make sure that the T-type oil seal is in contact at right angles with the assembly.



MAT00190-00176

18. Adjustment of brake band

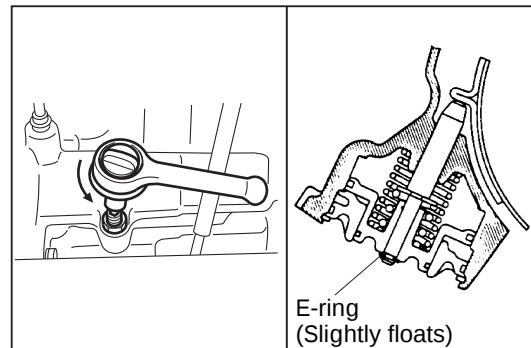
(1) Set the brake band parallel to the 2nd brake drum.



MAT00191-00177

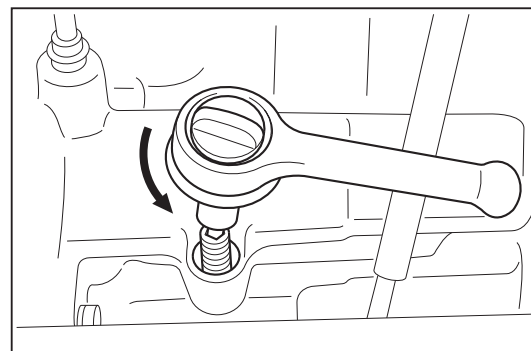
(2) Tighten the brake band adjusting anchor bolt, until the E-ring of the 2nd coast brake piston slightly floats.

(3) At the time when the E-ring floats, stop tightening the bolt.



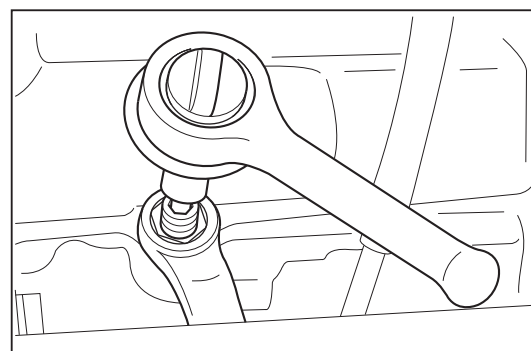
MAT00192-00178

(4) Under the condition of the step (3) above, loosen the brake band anchor bolt 3.2 turns counterclockwise.



MAT00193-00179

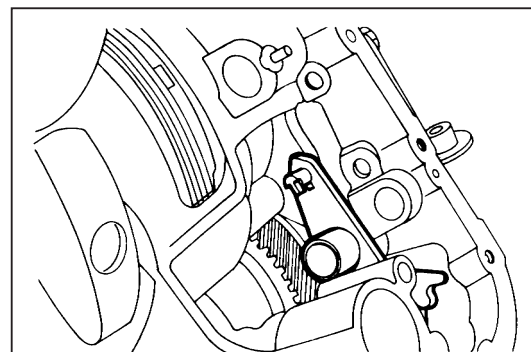
(5) Install the nut to the brake band anchor bolt. While holding the brake band anchor bolt with a torx wrench, tighten the nut.
Tightening Torque: 22.5 - 30.4 N·m



MAT00194-00180

19. Installation of manual valve lever shaft assembly

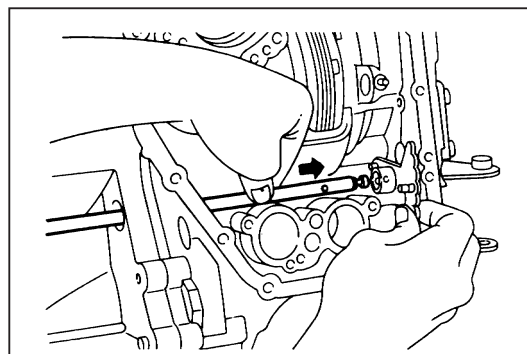
(1) Install the cut-out groove of the manual valve lever and the protruding section of the parking lock rod to the manual valve lever.



MAT00195-00181

AT-60

- (2) Install the manual lever shaft subassembly from the engine side.

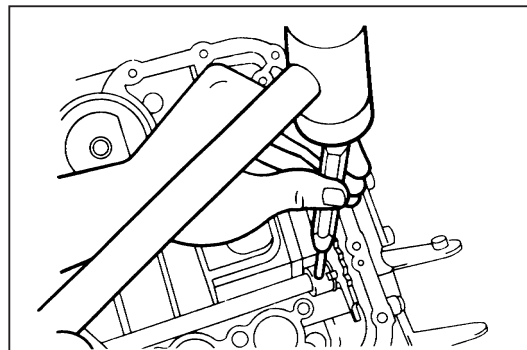


MAT00196-00182

- (3) Install a new slotted spring pin, using a pin punch and a hammer.

NOTE:

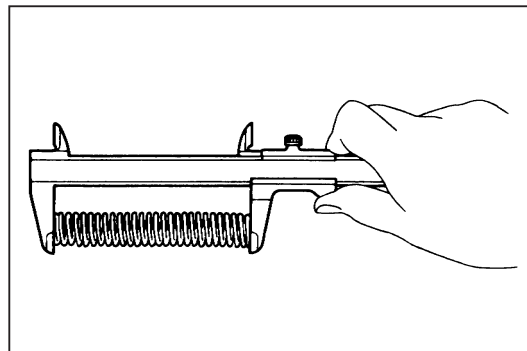
- Be sure to install the pin, until it reaches the edge surface of the manual valve lever.



MAT00197-00183

20. Install the accumulators

- (1) Measure the free length and outer diameter of the accumulator compression springs.
(Refer to the below list)



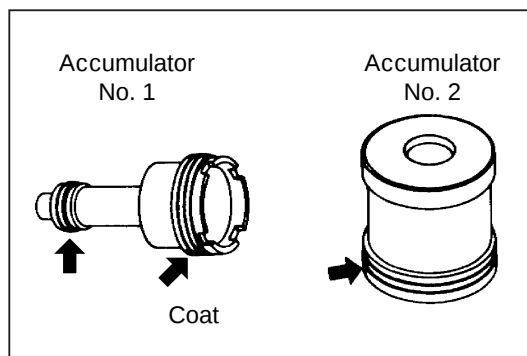
MAT00198-00184

- (2) Coat a new No. 1 and No. 2 accumulator piston seal rings on the section of right figure with ATF.

NOTE:

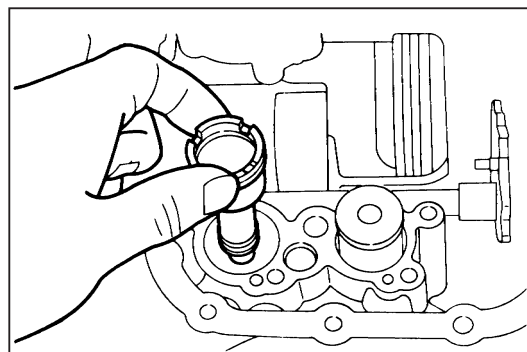
- Do not spread the seal ring end excessively.

		Accumulator compression spring (approx.)	
		B ₁	C ₂
Free length	(mm)	53	107
Outer diameter	(mm)	14.5 and 20	18



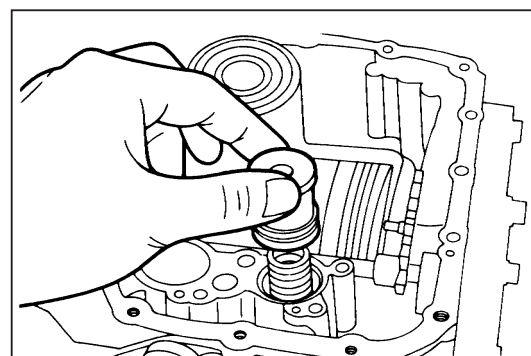
MAT00199-00185

- (3) Install the accumulator No. 1 piston and the compression spring to the transaxle case.



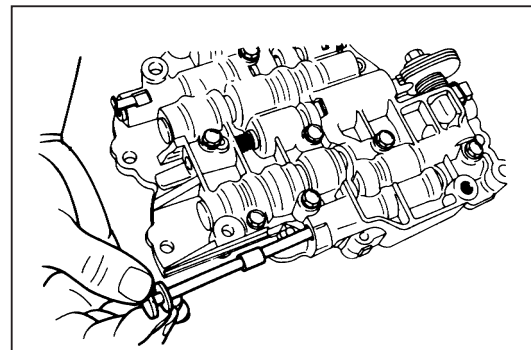
MAT00200-00186

- (4) Install the compression spring and accumulator No. 2 piston to the transaxle case.



MAT00201-00187

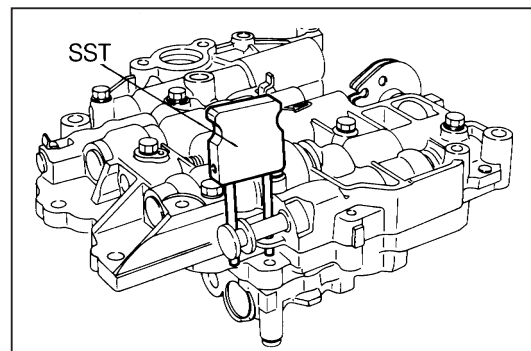
21. Install the valve body assembly and the throttle cable.
 - (1) Coat the outer periphery of the manual valve with the ATF and install it to the valve body assembly.



MAT00202-00188

- (2) Ensure that the manual valve operates smoothly and set it to the neutral position, using the following SST.

SST: 09350-87202-000 (09351-87211-000)

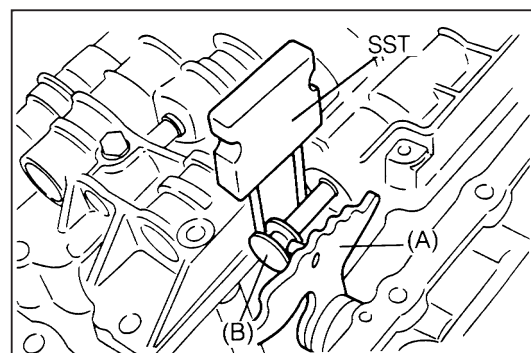


MAT00203-00189

- (3) Install the valve body assembly with the aforesaid SST to the transaxle case.

NOTE:

- Ensure that the protrusion of the manual valve lever (A) and grooved section of the manual valve (B) are matched securely.



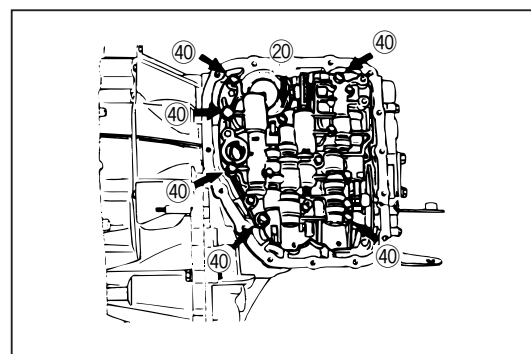
MAT00204-00190

- (4) Temporarily tighten the seven bolts of the valve body assembly.
- (5) Tighten the bolts.

Tightening Torque: 6.9 - 9.8 N·m

NOTE:

- The numeral in the right illustration indicates the nominal length of the bolt.
- If the bolt is tightened with any oil getting to the bolt's threaded portion, it may cause the bolt looseness. Therefore, be sure to clean the bolt threaded portion by applying compressed air.



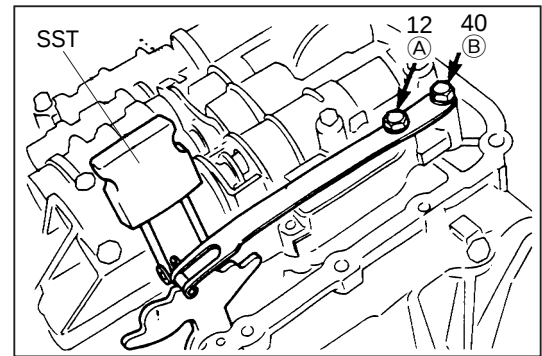
MAT00205-00191

- (6) Tighten the ① bolt firstly. Then, proceed to tighten the ② bolt of the manual detent spring.

Tightening Torque: 6.9 - 9.8 N·m

NOTE:

- The numeral in the right figure indicates the nominal length of the bolt.
- Be sure to tighten the bolts alternately.

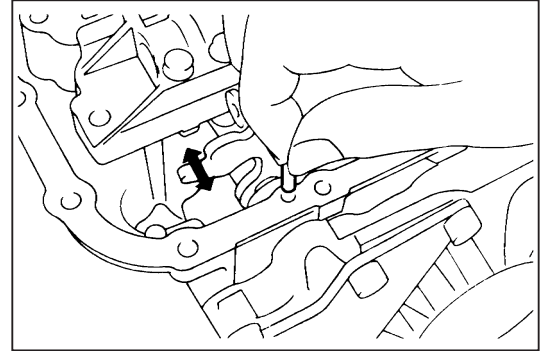


MAT00206-00192

- (7) Install the roller for the manual valve lever shaft sub-assembly as illustrated in the right figure.

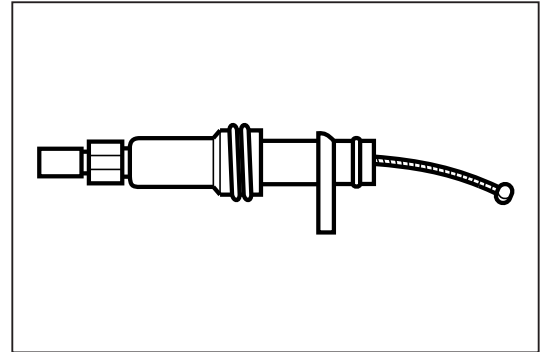
NOTE:

- Make sure that the roller edge surface is lower than the transaxle case edge surface.



MAT00207-00193

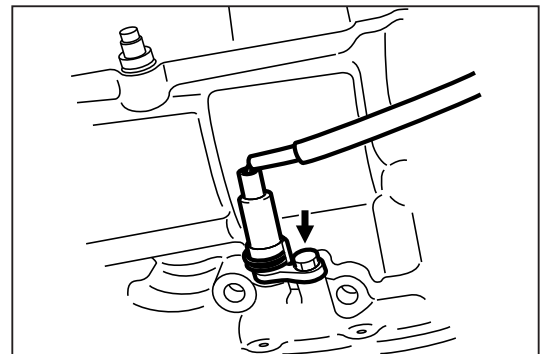
- (8) Coat a new O-ring with the ATF and install it to the throttle cable.



MAT00208-00194

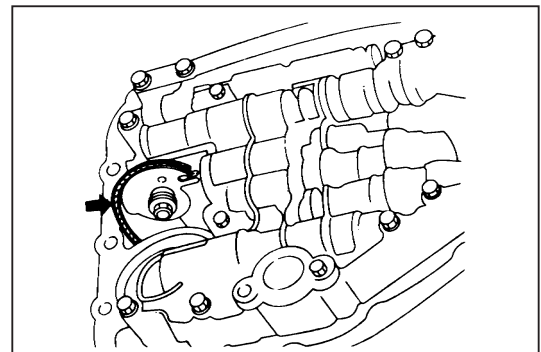
- (9) Insert the throttle cable to the transaxle case and tighten it with a bolt.

Tightening Torque: 6.9 - 9.8 N·m



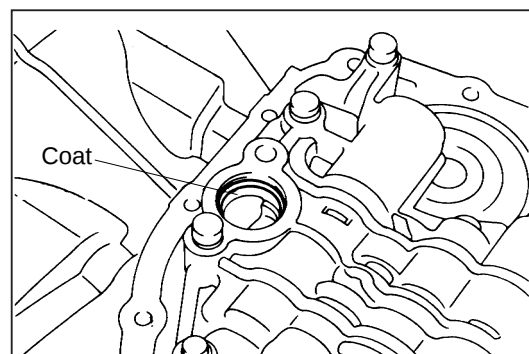
MAT00209-00195

- (10) Connect the throttle cable to the throttle valve cam.



MAT00210-00196

- (11) Coat the new O-ring (A) with ATF and install it to the groove section of the valve body.

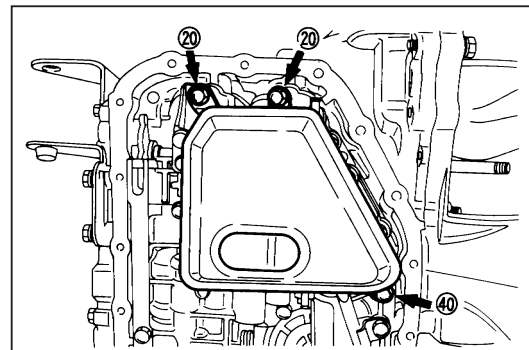


MAT00211-00197

- (12) Apply ATF to the O-ring contact section of the oil strainer and install the oil strainer with the 3 bolts.
Tightening Torque: 6.9 - 9.8 N·m

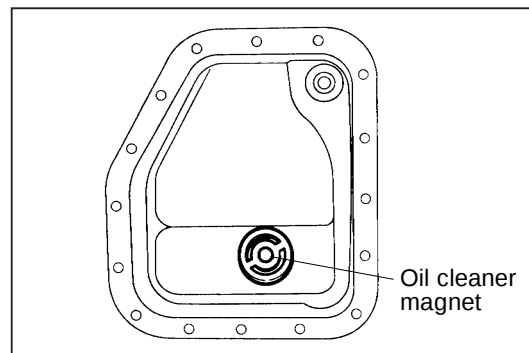
NOTE:

- The numeral in the right illustration indicates the nominal length of the bolt.
- Be sure to tighten the bolts alternately and diagonally.



MAT00212-00198

- (13) Place the oil cleaner magnet in the protrusion of the transaxle oil pan subassembly.

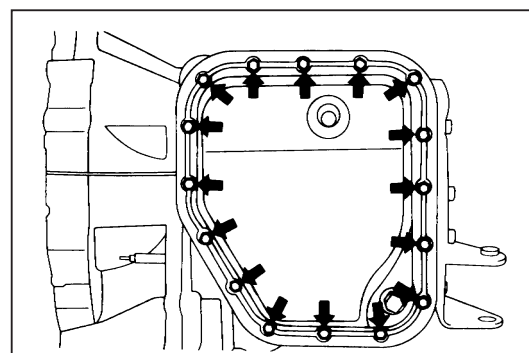


MAT00213-00199

- (14) With a new gasket interposed, tighten the transaxle oil pan subassembly with the 16 bolts.
Tightening Torque: 6.9 - 9.8 N·m

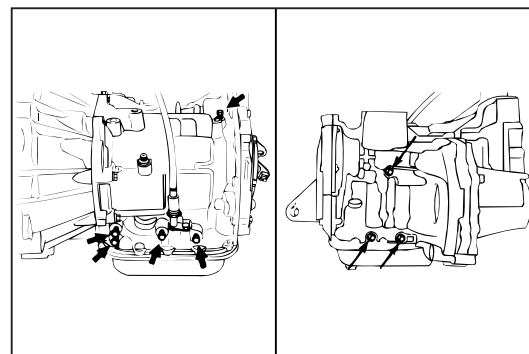
NOTE:

- Be sure to tighten the bolts alternately and diagonally.
- When installing the transaxle oil pan, be very careful not to allow the oil pan to come in contact with any inside part.



MAT00214-00200

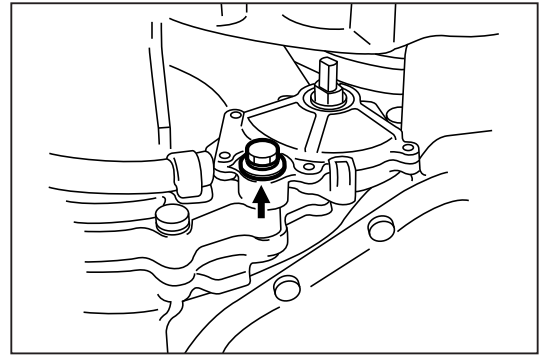
22. Tighten eight new inspection plugs to the transaxle case.
Tightening Torque: 6.9 - 9.8 N·m



MAT00215-00201

23. Adjustment of neutral start switch

(1) Temporarily tighten the bolt of the neutral start switch assembly.



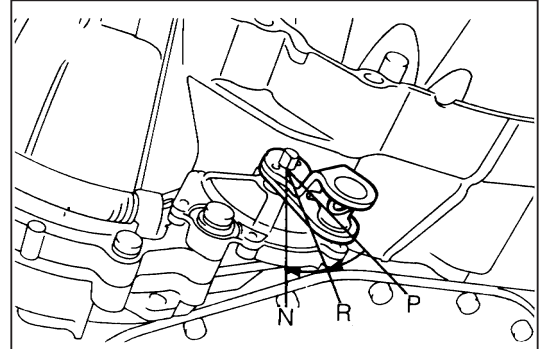
MAT00216-00202

(2) Place the transmission control shaft lever subassembly.

(3) Push the lever toward the front side (ie: P range)

(4) Back off the lever two notches to the NEUTRAL position

(5) Remove the lever subassembly.



MAT00217-00203

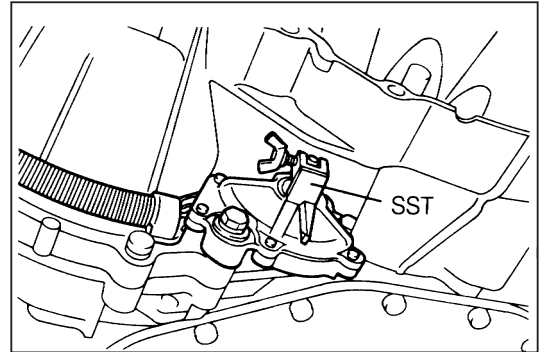
(6) Install the following SST

SST: 09302-87201-000

(7) Adjust the neutral start switch assembly until the neutral basic line should be aligned with SST above.

(8) Tighten the bolt.

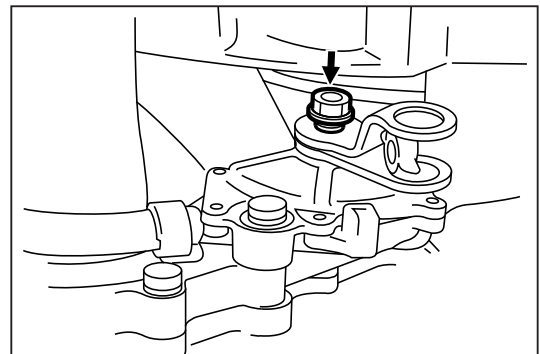
Tightening Torque: 14.7 - 21.6 N·m



MAT00218-00204

24. Tighten the lever subassembly with a nut.

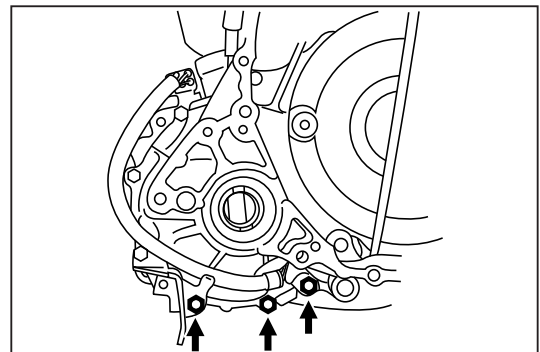
Tightening Torque: 9.8 - 15.7 N·m



MAT00219-00205

25. Tighten the clamp with a bolt and tighten the control cable bracket.

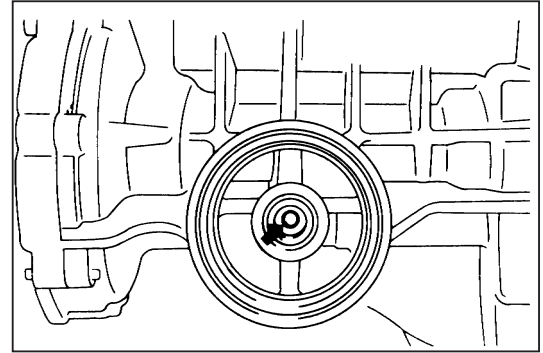
Tightening Torque: 14.7 - 21.6 N·m



MAT00220-00206

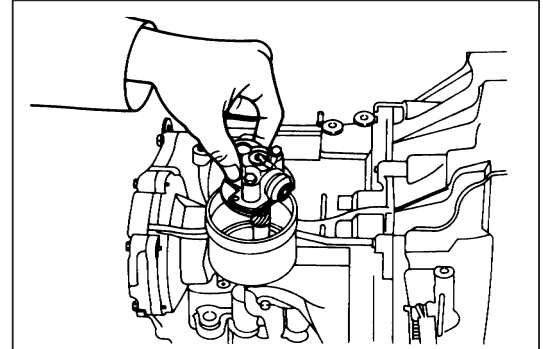
26. Installation of governor valve.

(1) Place the ball into the transaxle case.



MAT00221-00207

(2) Coat the whole of governor body assembly with ATF and install it into the transaxle case.



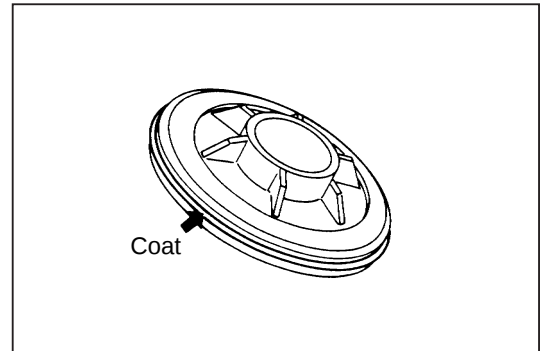
MAT00222-00208

(3) Coat the new O-ring with ATF and install it to the governor cover.

(4) Install the governor cover to the transaxle case.

NOTE:

- Be very careful not to damage the new O-ring during installation.

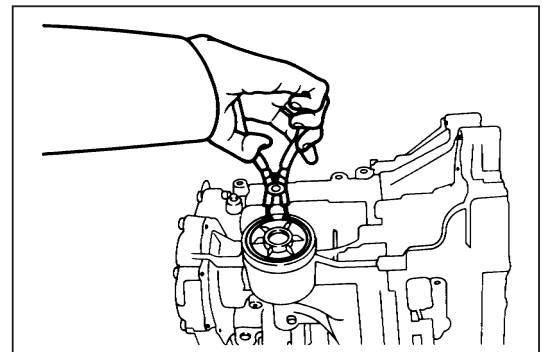


MAT00223-00209

(5) Install the hole snap ring, using the standard plier.

NOTE:

- Ensure that the ring should be installed to the groove section of the transaxle case.

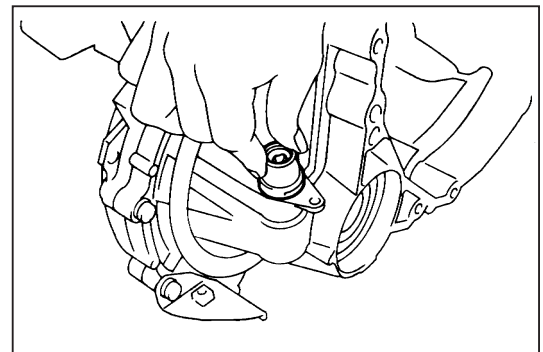


MAT00224-00210

27. Coat the new O-ring section of the speedometer shaft sleeve with the ATF and insert the speedometer driven gear subassembly into the transaxle case.

NOTE:

- It is recommended to hold the speedometer shaft sleeve during the installation of the speedometer driven gear subassembly.

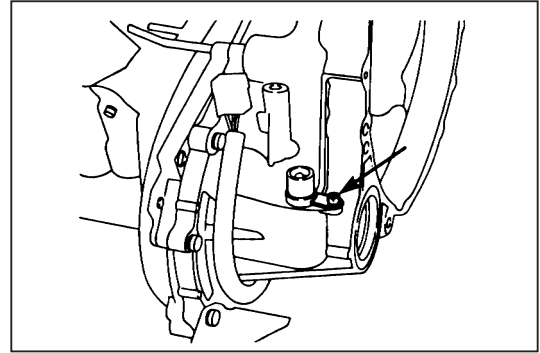


MAT00225-00211

AT-66

28. Place the speedometer sleeve lock plate and tighten it with the bolt.

Tightening Torque: 6.9 - 9.8 N·m



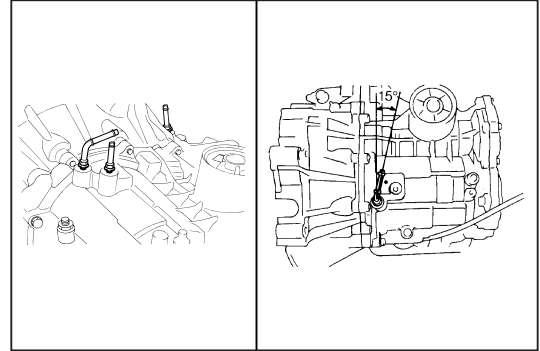
MAT00226-00212

29. Tighten the new unions (for the oil cooler).

Tightening Torque: 6.9 - 15.7 N·m

NOTE:

- Be sure to align the union installation position with the mating mark position (protruding section) provided on the transaxle.



MAT00227-00213

30. Tighten the breather union.

Tightening Torque: 6.9 - 9.8 N·m

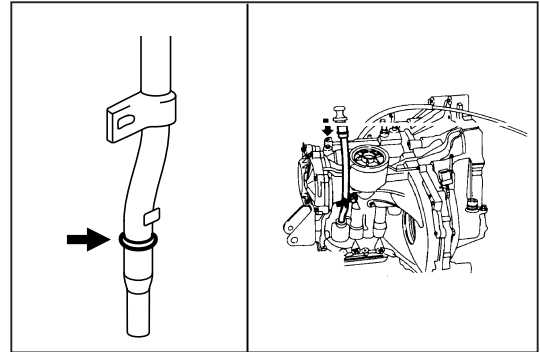
31. Coat a new O-ring with the ATF and install it to the transmission oil filler tube subassembly.

NOTE:

- Be very careful not to twist or damage of the O-ring during installation.

32. Insert the transmission oil filler tube subassembly to the transaxle case and tighten it with the bolt.

Tightening Torque: 6.9 - 9.8 N·m



MAT00228-00214

33. Install the transaxle case assembly to the vehicle.

34. Adjust the throttle cable.

35. Operation check of shift lever position.

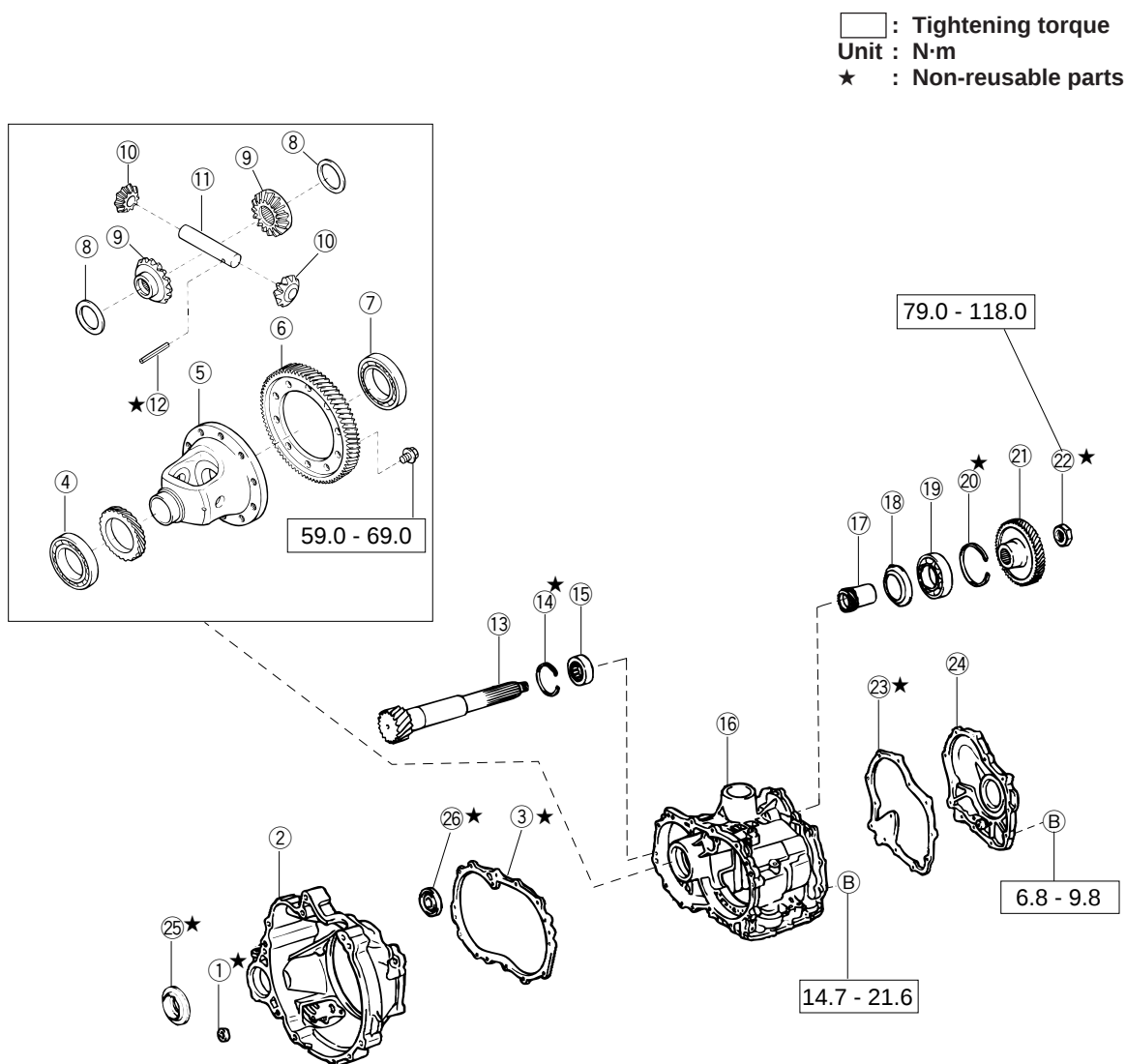
36. Fill the new ATF: Refer to page AT-3.

CAUTION:

- Never overfill the new fluid.

MAT00229-00000

TORQUE CONVERTOR & DIFFERENTIAL CASE COMPONENTS



- ① T-type oil seal
- ② Torque convertor & differential case
- ③ Transmission case gasket
- ④, ⑦, ⑱ Radial ball bearing
- ⑤ Differential case
- ⑥ Differential ring gear
- ⑧ Differential side gear thrust washer
- ⑨ Differential side gear
- ⑩ Differential pinion
- ⑪ Differential pinion shaft
- ⑫ Slotted spring pin
- ⑬ Output shaft

- ⑭, ⑳ Hole snap ring
- ⑮ Cylindrical roller bearing
- ⑯ Transaxle case
- ⑰ Governor drive gear assembly
- ⑱ Oil reserve plate
- ㉑ Primary reduction driven gear
- ㉒ Lock nut
- ㉓ Transaxle case rear cover gasket
- ㉔ Rear transmission case cover subassembly
- ㉕ T-type oil seal (for RH drive shaft)
- ㉖ T-type oil seal (for LH drive shaft)

AT-68

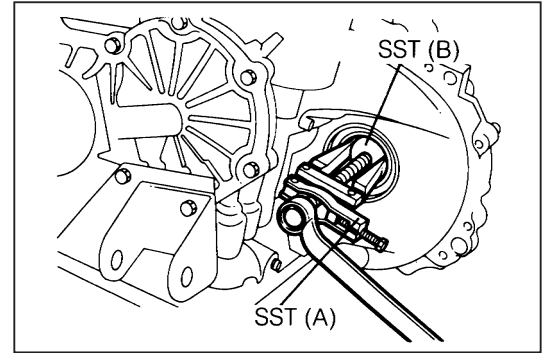
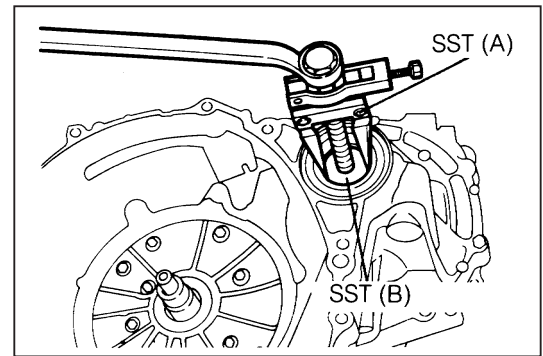
DISASSEMBLY

1. Remove the transaxle case assembly from the vehicle.
2. Remove the T-type oil seal, using the following SST.

SST: 09308-10010-000 ... (A)
09950-20017-000 ... (B)

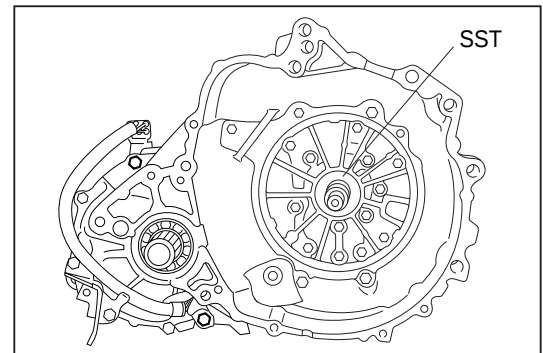
NOTE:

- Never reuse the removed oil seal.



3. Remove the neutral start switch & oil pump assembly.
4. Install the following SST to the transaxle case.

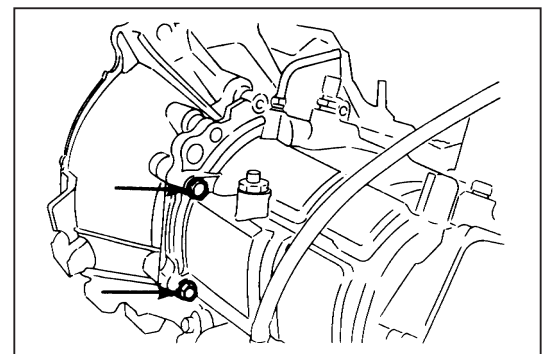
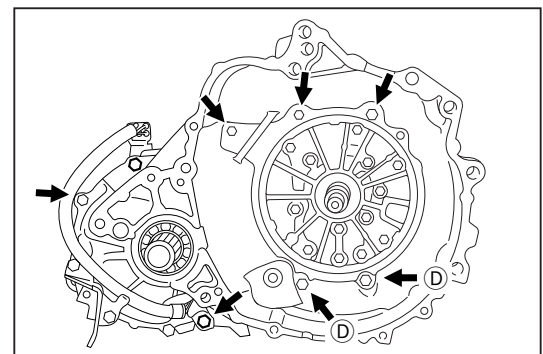
SST: 09350-87202-000 (09351-87212-000)



5. Remove the nine bolts.

NOTE:

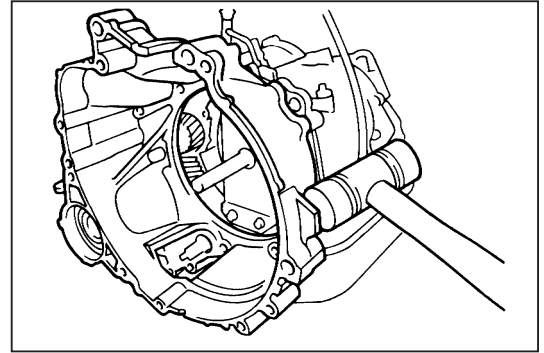
- Never reuse the removed bolt ① as illustration in the right figure.



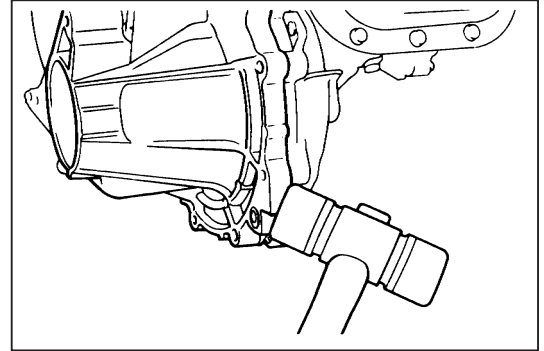
6. Lightly and uniformly tap the two lib sections of the torque convertor & differential case, using the plastic hammer and remove the transmission gasket.

NOTE:

- Never reuse the removed gasket.



MAT00234-00221

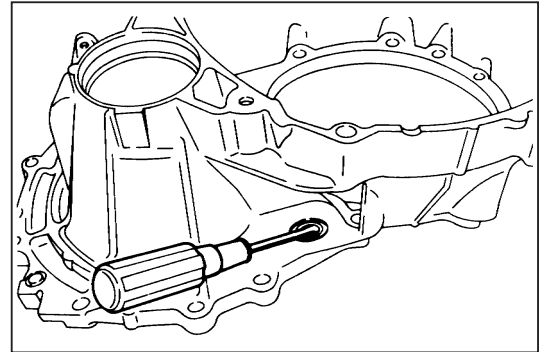


MAT00000-00222

7. Remove the T-type oil seal, using the flat driver.

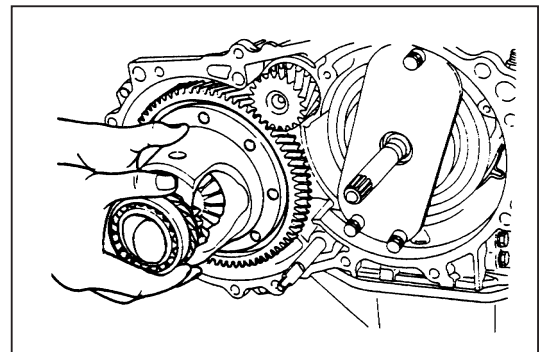
NOTE:

- Never reuse the removed oil seal.



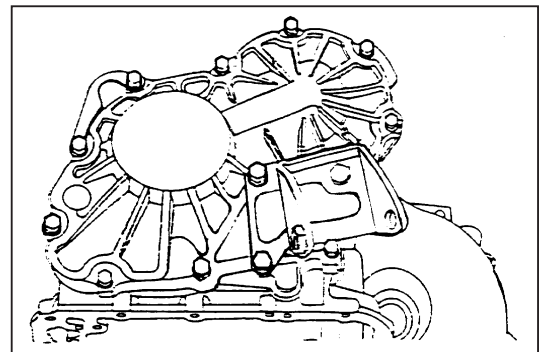
MAT00235-00223

8. Remove the differential assembly.



MAT00237-00225

9. Remove the governor valve assembly and the bolts of the rear transmission case cover subassembly.

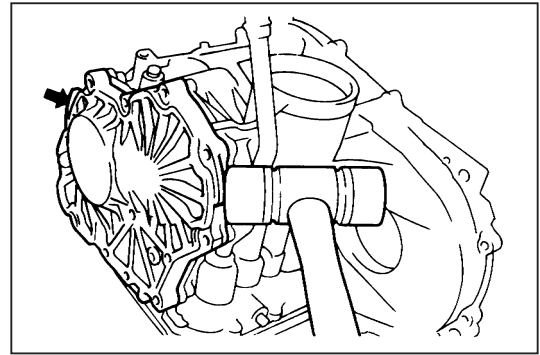


MAT00238-00226

10. Lightly and uniformly tap the two lib sections of the rear transmission case subassembly, using the plastic hammer and remove the transaxle case rear cover gasket.

NOTE:

- Never reuse the removed gasket.

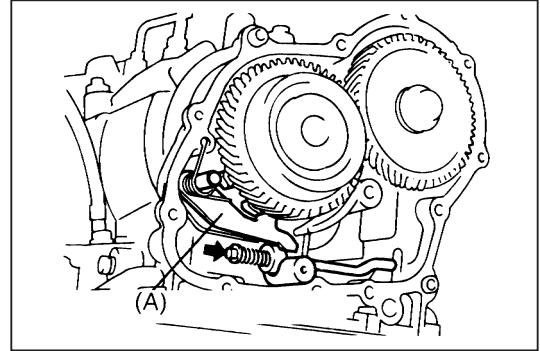


MAT00239-00227

11. Lock the reduction drive gear subassembly by moving the parking lock rod in the arrow headed direction.

NOTE:

- Ensure that the reduction drive gear subassembly should be locked with the parking lock pawl (A).

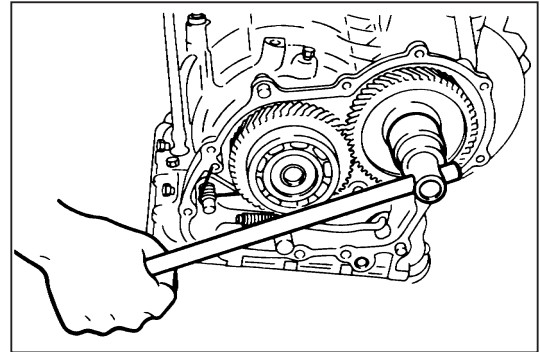


MAT00240-00228

12. Raise the lock section of the lock nut, using the chisel and hammer or the like and remove the lock nut.

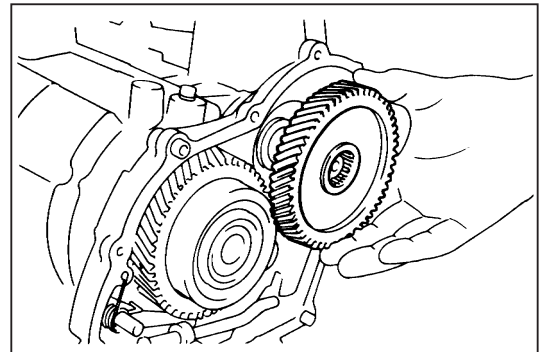
NOTE:

- Never reuse the removed lock nut.



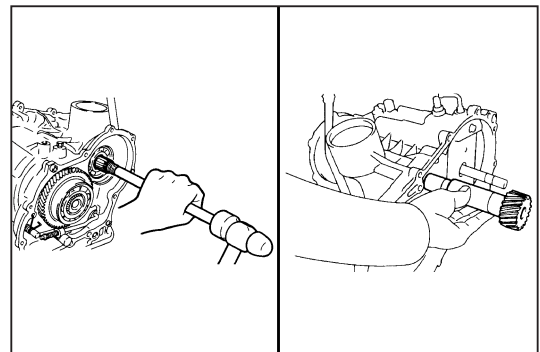
MAT00241-00229

13. Remove the primary reduction driven gear.



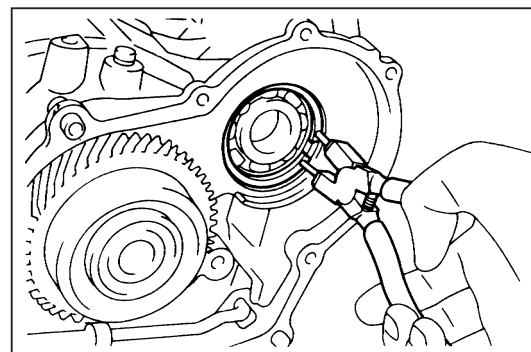
MAT00242-00230

14. Tap the output shaft lightly until the resistance of output shaft is free, using the brass bar and hammer and remove the output shaft.



MAT00243-00231

15. Remove the hole snap ring, using the snap ring plier.

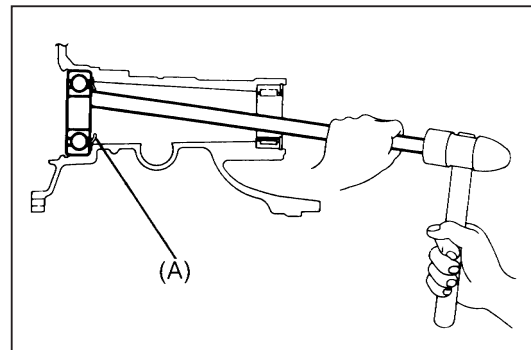


MAT00244-00232

16. Remove the radial ball bearing, using a brass bar and a hammer.

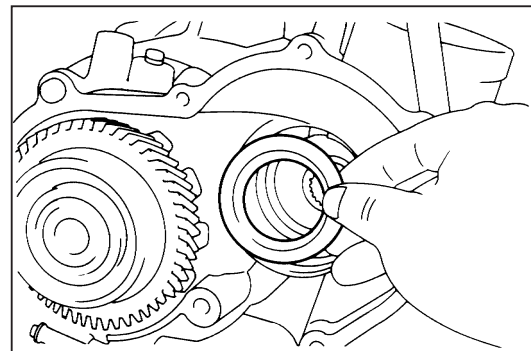
CAUTION:

- Be very careful not to damage the oil reserve plate section (A). If the section (A), is damaged, replace the oil reserve plate (it may cause abnormal noise).



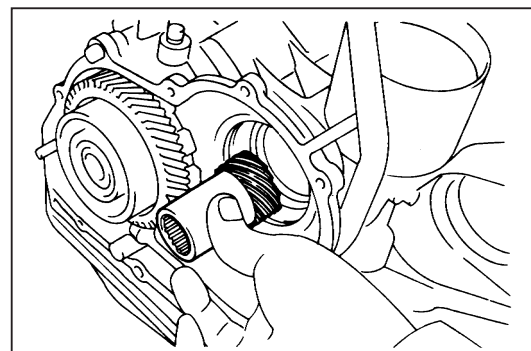
MAT00245-00233

17. Remove the oil reserve plate.



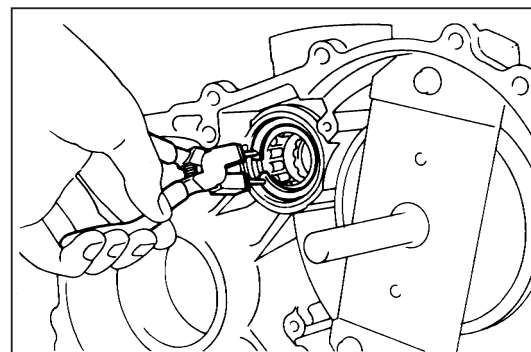
MAT00246-00234

18. Remove the governor drive gear assembly.



MAT00247-00235

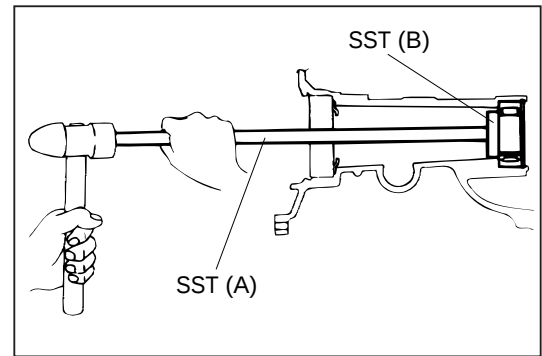
19. Remove the hole snap ring, using snap ring pliers.



MAT00248-00236

20. Remove the cylindrical roller bearing, using the following SST.

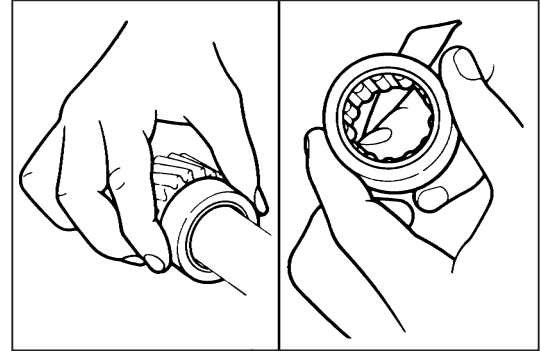
SSTs: 09631-12020-000 ... (A)
09630-24013-000 (09620-24030-000) ... (B)



MAT00249-00237

INSTALLATION

1. Ensure that the cylindrical roller bearing turns smoothly without any binding when turned.



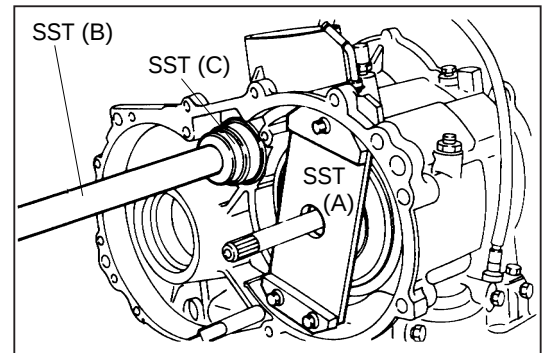
MAT00250-00238

2. Install the following SST to the transaxle case.

SST: 09350-87202-000
(09351-87212-000) ... (A)

3. Install the cylindrical roller bearing, using the following SSTs.

SSTs: 09631-12020-000 ... (B)
09630-24013-000 ... (C)

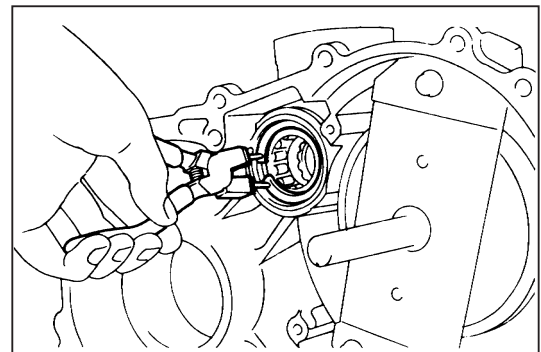


MAT00251-00239

4. Install the hole snap ring, using the snap ring plier.

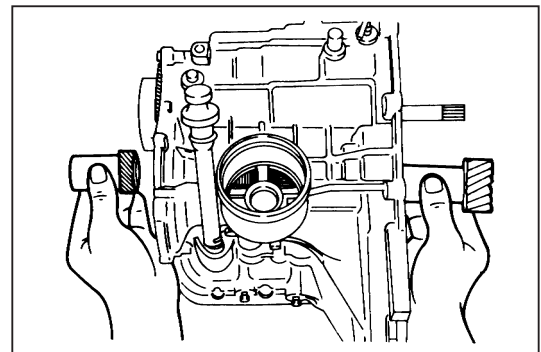
NOTE:

- Ensure that the ring should be installed to the groove section of the transaxle case.



MAT00252-00240

5. Insert the output shaft and governor drive gear assembly to the transaxle case.

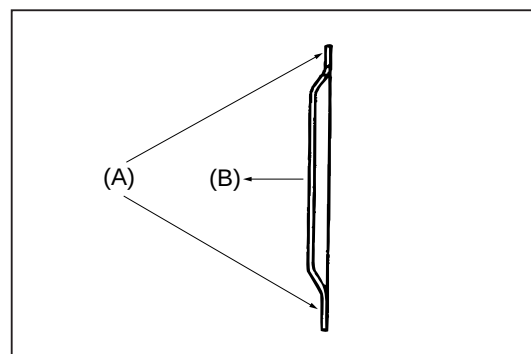


MAT00253-00241

6. Apply vaseline to the (A) section of the oil reserve plate and install it.

NOTE:

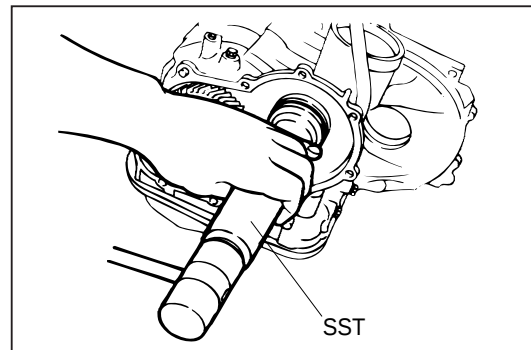
- Ensure that the (B) section faces toward the inner side of transaxle case.



MAT00254-00242

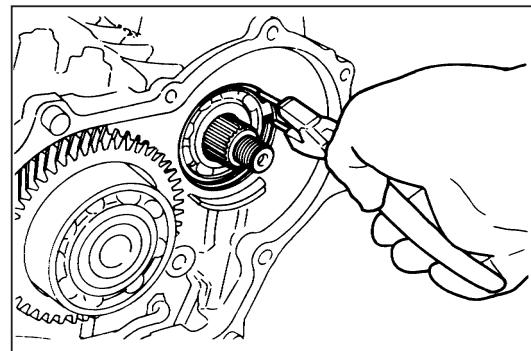
7. Temporarily install the radial ball bearing to the output shaft, until you feel the resistance.
8. Install the bearing, using the following SST.

SST: 09310-87301-000



MAT00255-00243

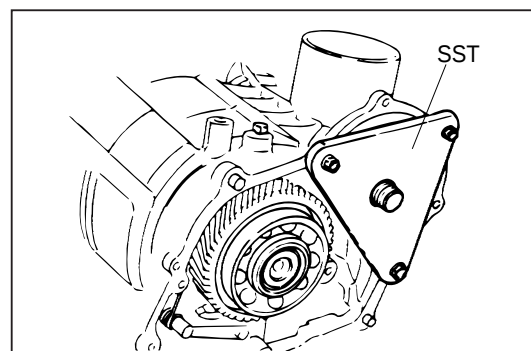
9. Install the hole snap ring, using snap ring pliers.



MAT00256-00244

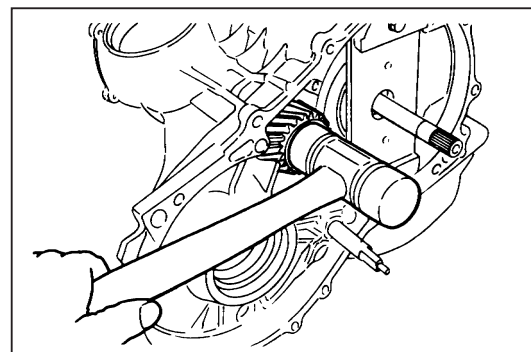
10. Install the following SST to the transaxle case so that the bearing may be held during the installation of the output shaft.

SST: 09350-87202-000 (09351-87214-000)



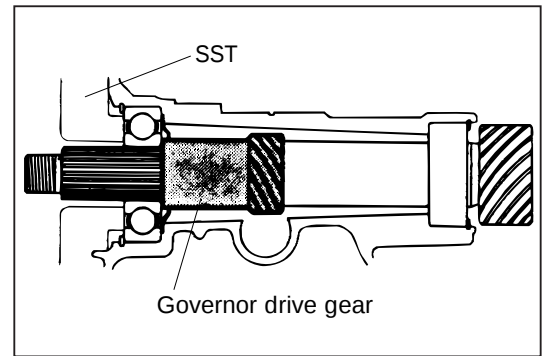
MAT00257-00245

11. Lightly tap the output shaft once or twice by means of a plastic hammer so as to positively install the governor drive gear.
12. Check to see if the governor drive gear moved in a fore-&-aft direction.



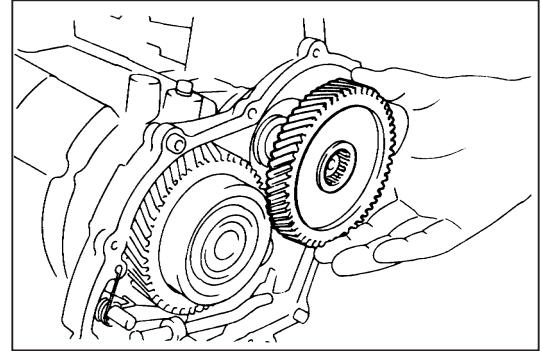
MAT00258-00246

13. If the gear moved in a fore-&-aft direction, repeat operations of the steps 11 and 12 above, until the governor drive gear no longer moves in a fore-&-aft direction.



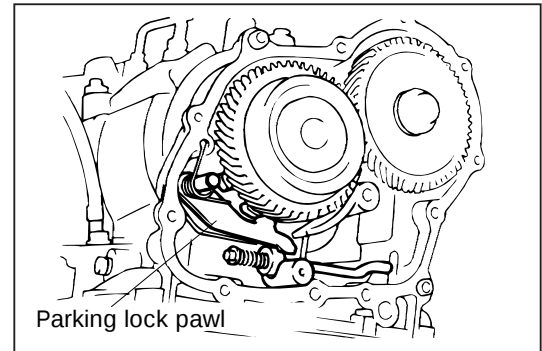
MAT00259-00247

14. Unlock the parking lock pawl other than P range and install the primary reduction driven gear to the output shaft.



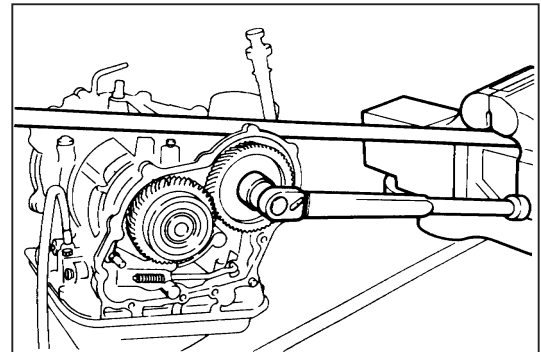
MAT00260-00248

15. Lock the parking lock pawl to the P range.



MAT00261-00249

16. Tighten a new lock nut.
Tightening Torque: 79.0 - 118.0 N·m



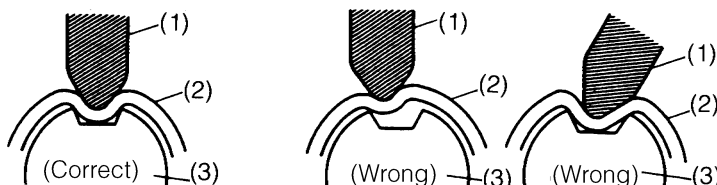
MAT00262-00250

17. Stake a new lock nut, using a punch and a hammer.

NOTE:

- When staking the lock nut, point a suitable staking tool toward the output shaft axis center and stake the lock nut securely, as shown in the figure below. (Poor staking may cause abnormal noise.)

- (1) Suitable staking tool
(2) New nut
(3) Shaft



MAT00263-00251

18. With the new rear transmission case cover gasket interposed, tighten the 13 bolts of the rear transmission case cover.

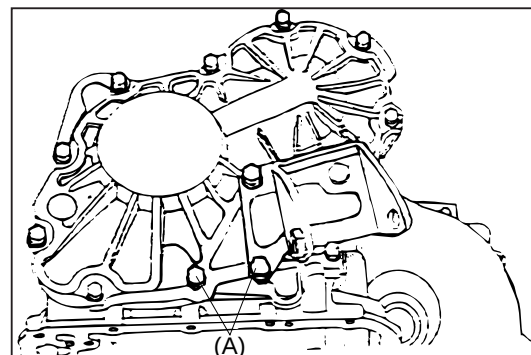
Tightening Torque:

M6: 6.9 - 9.8 N·m

M8: 14.7 - 21.6 N·m

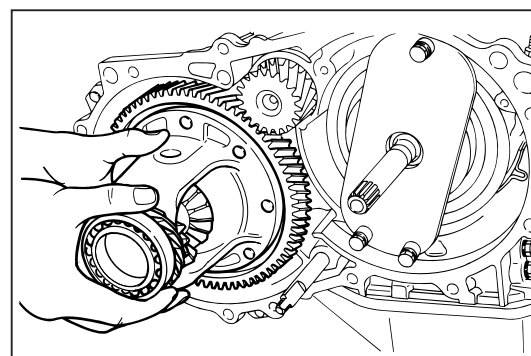
NOTE:

- Be sure to use the new two bolts as illustration in the right figure (A).



MAT00264-00252

19. Install the governor body assembly (See page AT-65) and the differential assembly to the transaxle case.

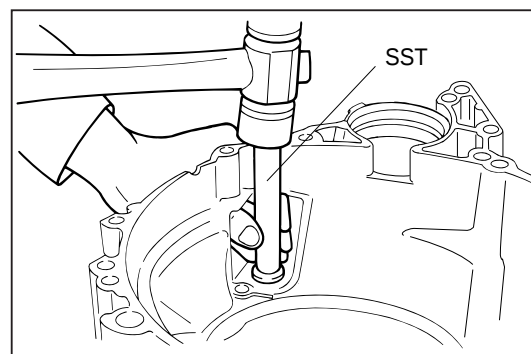


MAT00265-00253

20. Install the new T-type oil seal, using the following SST.
SST: 09301-87702-000

NOTE:

- When replacing the oil seal, remove the manual lever shaft first. Then replace the oil seal and install the shaft.

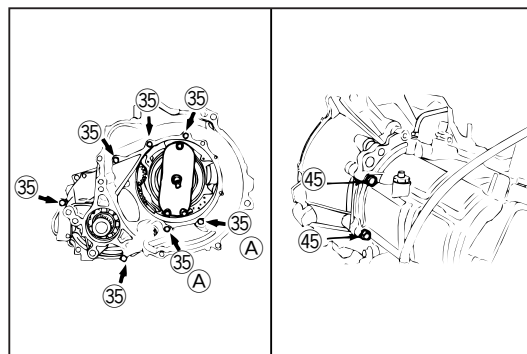


MAT00267-00255

21. With the new transmission case gasket interposed, tighten the nine bolts of the torque converter & differential case.
Tightening Torque: 14.7 - 21.6 N·m

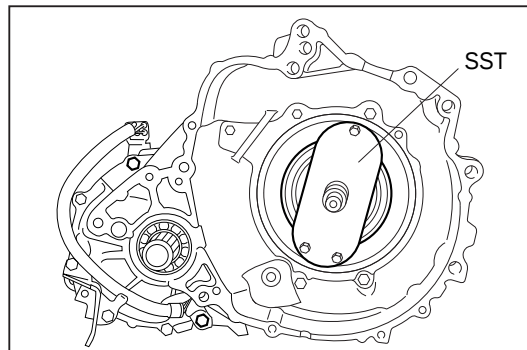
NOTE:

- Be sure to use the new bolt (A) as illustration right figure.
- The numeral in the right illustration indicates the nominal length of the bolt.



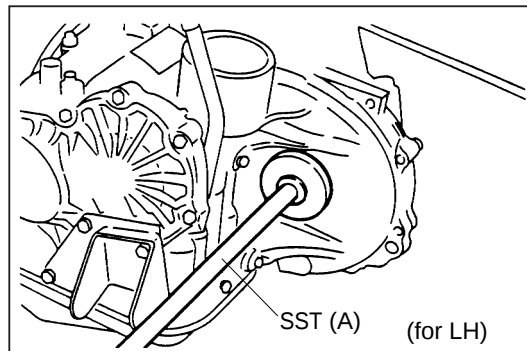
MAT00268-00256

22. Remove the following SST from the transaxle case.
SST: 09350-87202-000 (09351-87212-000)

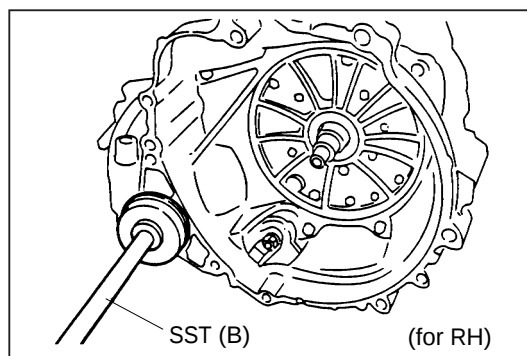


MAT00269-00257

23. Install the new T-type oil seal, using the following SST.
SST: 09517-87205-000 ... (A) ... (for LH)
09517-87203-000 ... (B) ... (for RH)



MAT00270-00258



MAT00000-00259

24. Install the starter shaft & oil pump assembly
25. Install and adjust the neutral start switch assembly
26. Install the speedometer driven gear and shaft sleeve
27. Install the transaxle case assembly to the vehicle
28. Adjust the throttle cable
29. Operation check of shift lever position
30. Install the drive shaft assembly
31. Fill the new ATF

CAUTION:

- Do not over fill the new fluid.

MAT00271-00000

DIFFERENTIAL

DISASSEMBLY

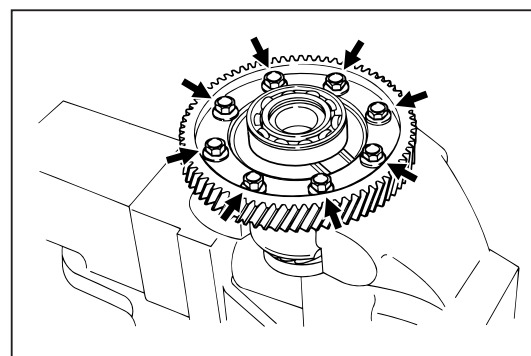
1. Remove the transaxle case assembly from the vehicle.
2. Remove the torque converter & differential case.

3. Remove the differential ring gear by removing the 8 bolts.
4. Clamp the differential case in a vice, using the soft jaws.
5. Remove the radial ball bearing, using the following SSTs
SSTs: 09950-20017-000, 09950-87701-000

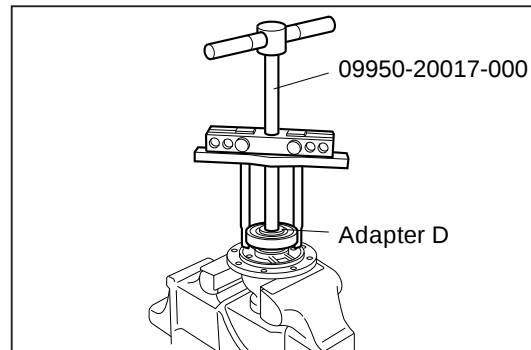
NOTE:

- Never reuse the removed bearing.

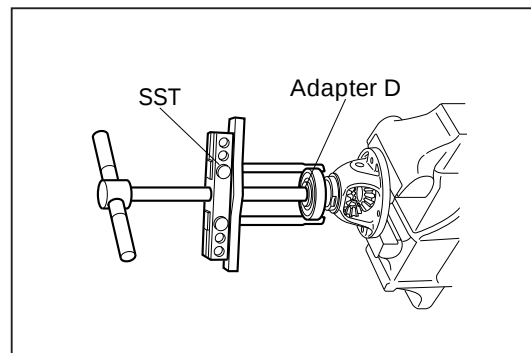
6. Remove the radial ball bearing and speedometer drive gear.



MAT00272-00260



MAT00273-00261

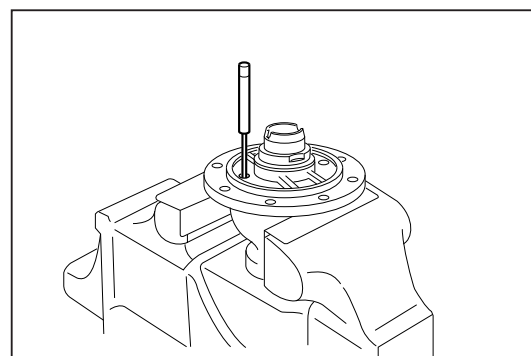


MAT00000-00262

7. Turn over the differential case.
8. Clamp the differential case in a vice, using the soft jaws and remove the slotted spring pin, using the pin punch and hammer.

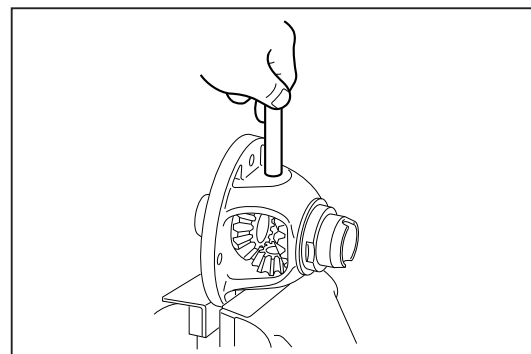
NOTE:

- Never reuse the removed slotted spring pin.



MAT00274-00263

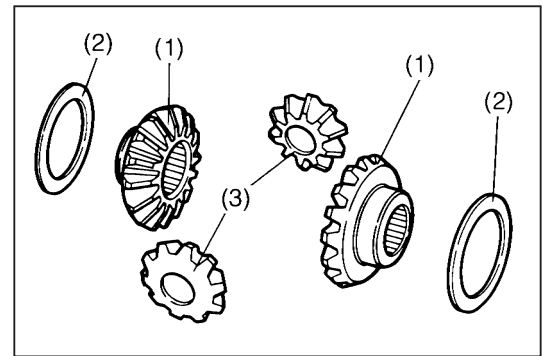
9. Remove the differential pinion shaft from the differential case.



MAT00275-00264

10. Remove the following parts.

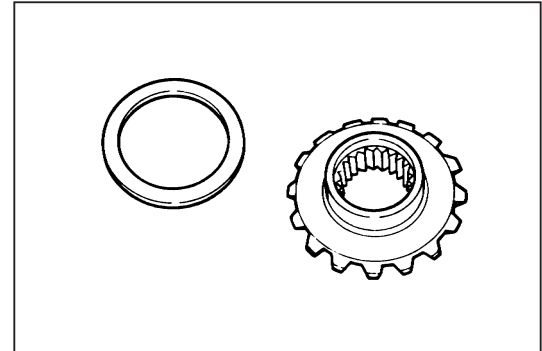
- | | |
|--|-------|
| (1) Differential side gear | 2 pcs |
| (2) Differential side gear thrust washer | 2 pcs |
| (3) Differential pinion gear | 2 pcs |



MAT00276-00265

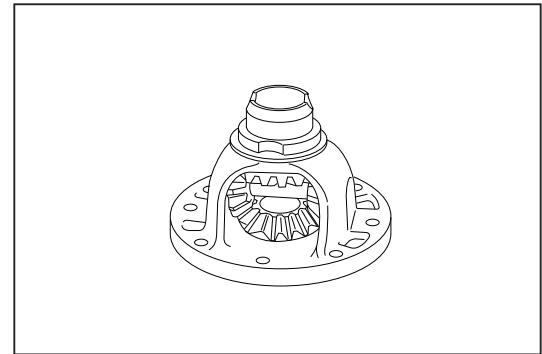
ASSEMBLY

1. Coat the differential side gear thrust washer with ATF and install it to the differential side gear.



MAT00277-00266

2. Install the aforesaid parts to the differential case.

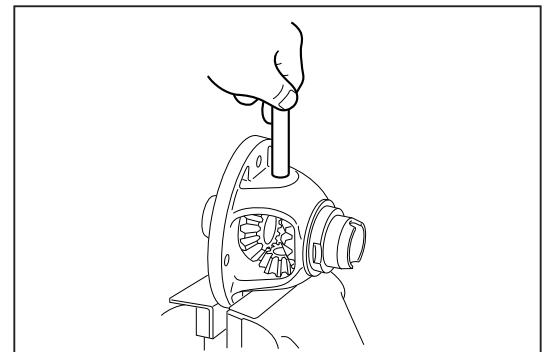


MAT00278-00267

3. Coat the differential pinion shaft with ATF and install it to the differential case.

NOTE:

- Ensure that the installation hole section of the slotted spring pin should be aligned with differential pinion shaft and differential case.

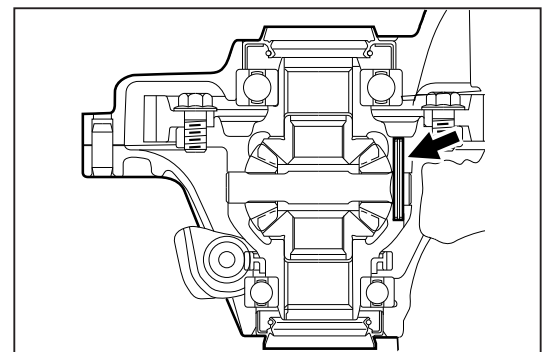


MAT00279-00268

4. Install the new slotted spring pin, using the pin punch and hammer.

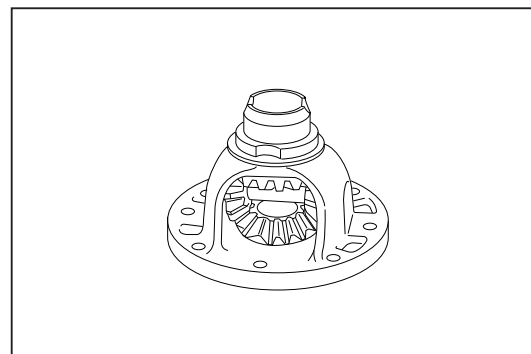
NOTE:

- Be sure to drive the new pin until the end surface of the differential case.



MAT00280-00269

5. Ensure that the differential side gear turns smoothly.



MAT00281-00270

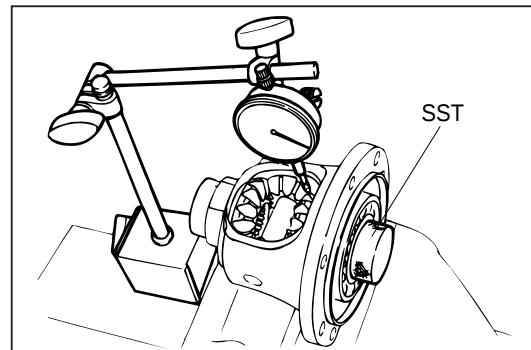
6. Backlash inspection

(1) Insert the following SST to the differential side gear section.

SST: 09350-87202-000 (09351-87213-000)

(2) Measure the side gear backlash while pushing the pinion gear against the differential case side.

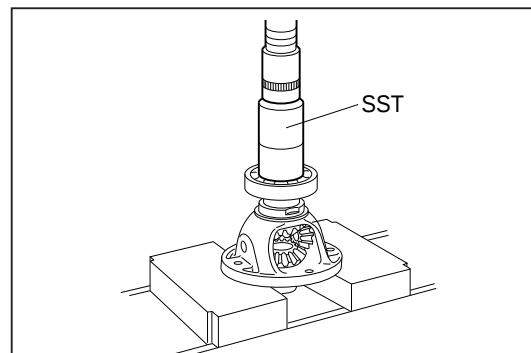
Specified Value: 0.02 - 0.2 mm



MAT00282-00271

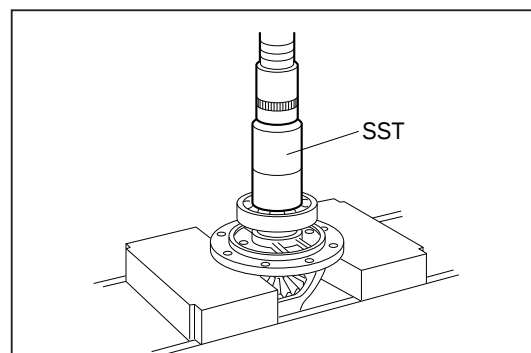
7. Install the speedometer drive gear and press a new radial ball bearing (width: 15 mm), using the following SST.

SST: 09636-20010-000



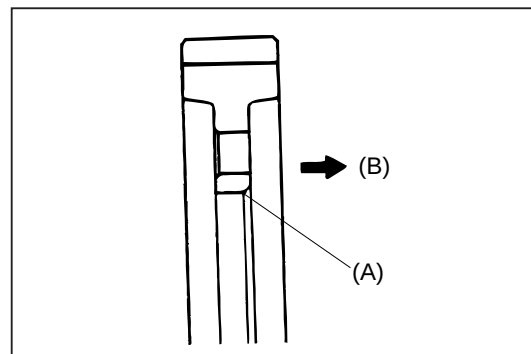
MAT00283-00272

8. To the differential case ring gear side, install a new radial ball bearing (width: 14 mm), using the same SST.



MAT00284-00273

9. Install the largely-chamfered side (A) of the differential ring gear bore section to the differential case side (B).

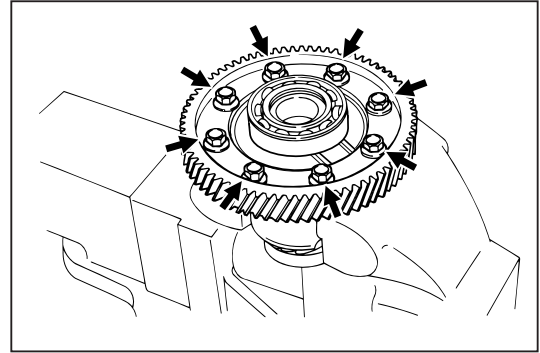


MAT00285-00274

AT-80

10. Clamp the differential case in a vice, using soft jaws and tighten the differential ring gear with the eight bolts.

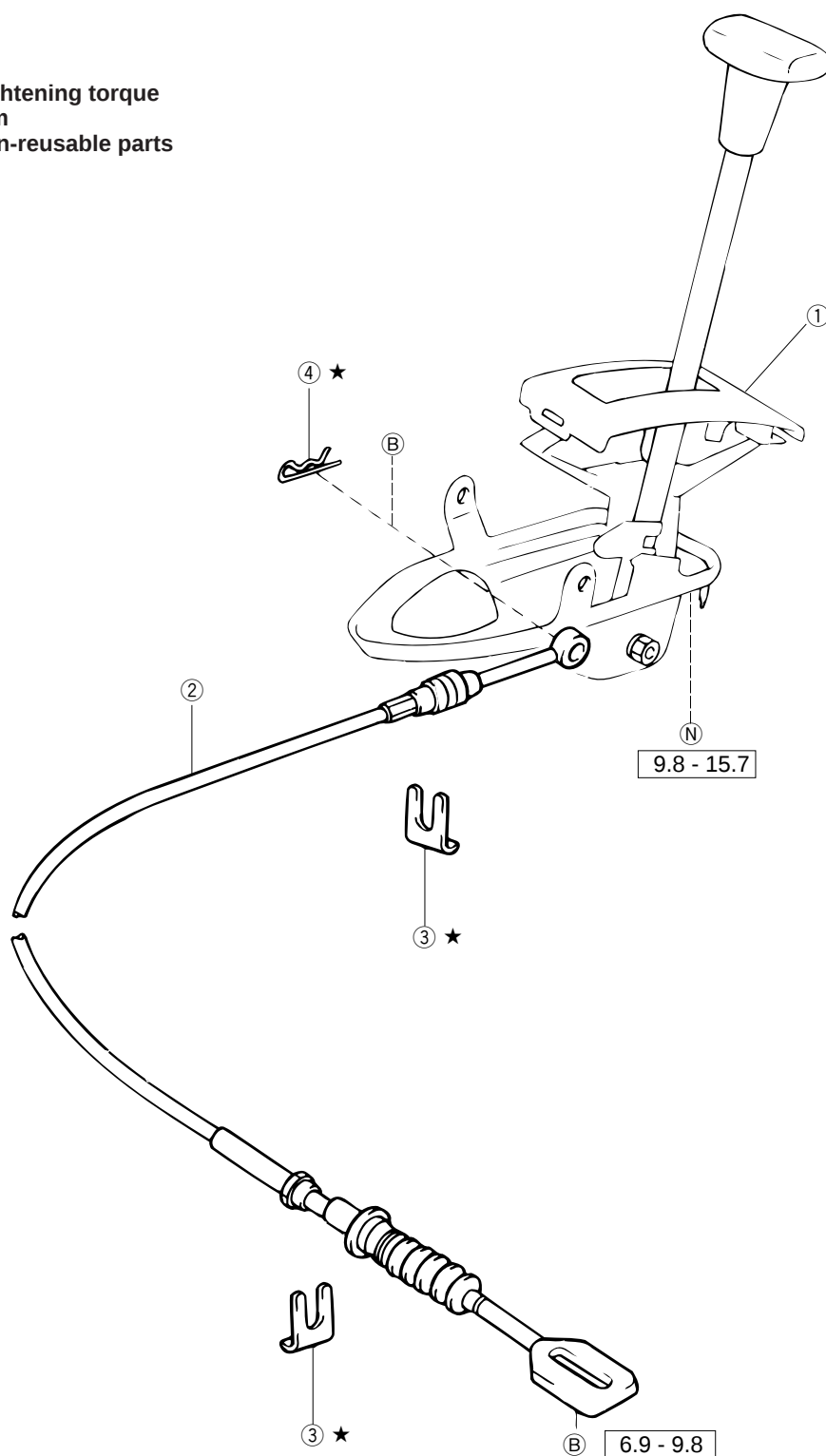
Tightening Torque: 59.0 - 69.0 N·m



MAT00286-00275

SHIFT LEVER & CONTROL CABLE COMPONENTS

 : Tightening torque
 Unit : N·m
 ★ : Non-reusable parts



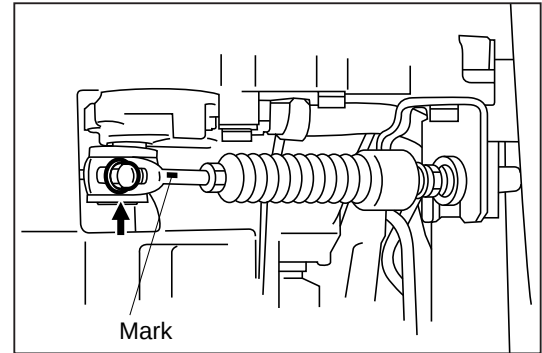
- ① Shift lever assembly
- ② Control cable assembly
- ③ Clamp
- ④ Clip

REMOVAL

1. Jack up the vehicle. Support the vehicle at the specified positions with safety stands.
2. Move the shift lever to the N range.
Remove the control cable from the neutral start switch
3. Remove the clamp from the bracket.

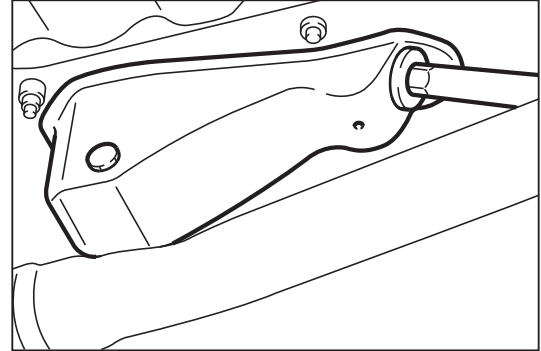
NOTE:

- Prior to the removal, be sure to put a mark on the inner cable.



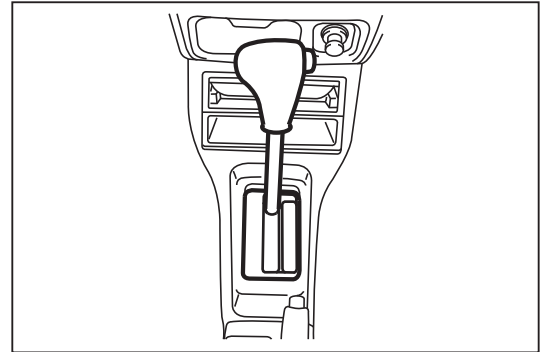
MAT00288-00277

4. Remove the attaching bolt from the shift lever assembly.
5. Remove the shift lever attaching nut from the body.



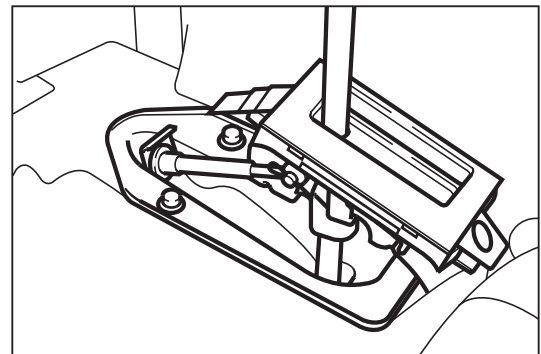
MAT00289-00278

6. Remove the console box.



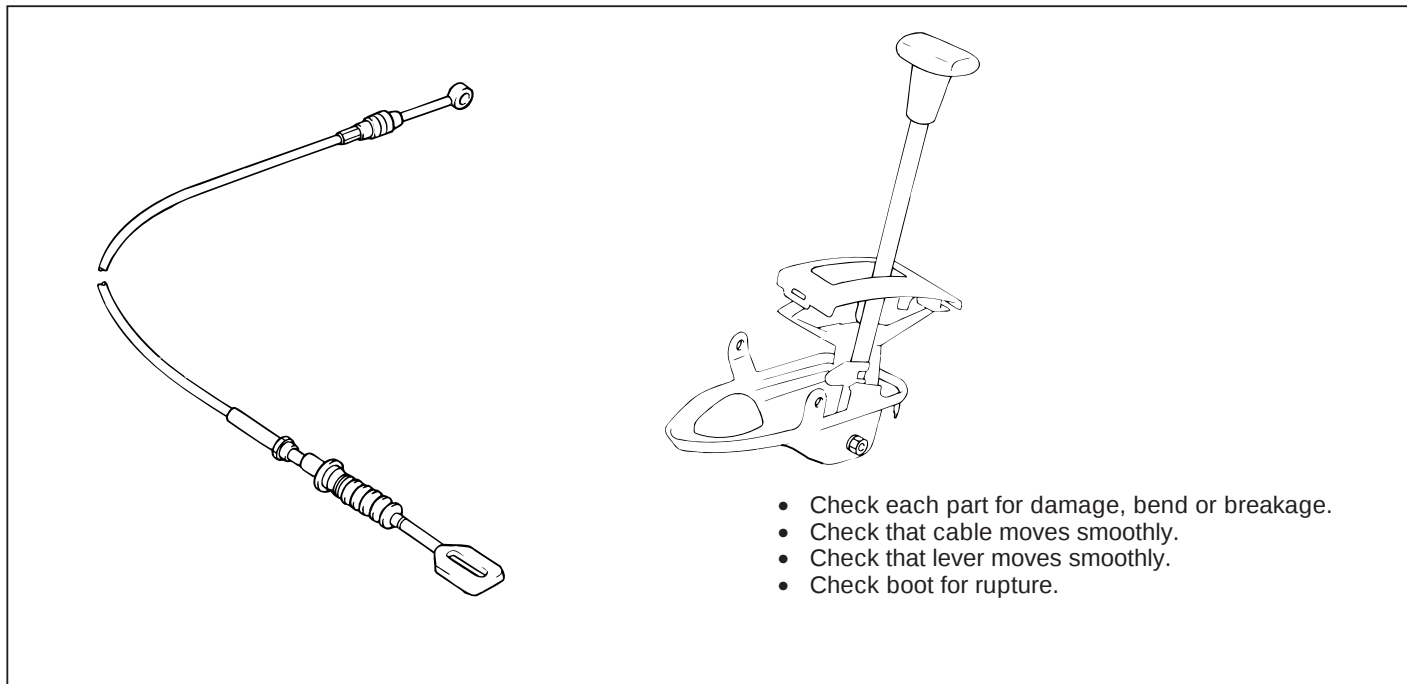
MAT00290-00279

7. Remove the clip.
Disconnect the control cable from the shift lever assembly.
8. Remove the shift lever attaching bolt from the floor.
Disconnect the connector of the shift lever indicator lamp.
9. Take out the shift lever assembly from the vehicle.



MAT00291-00280

INSPECTION

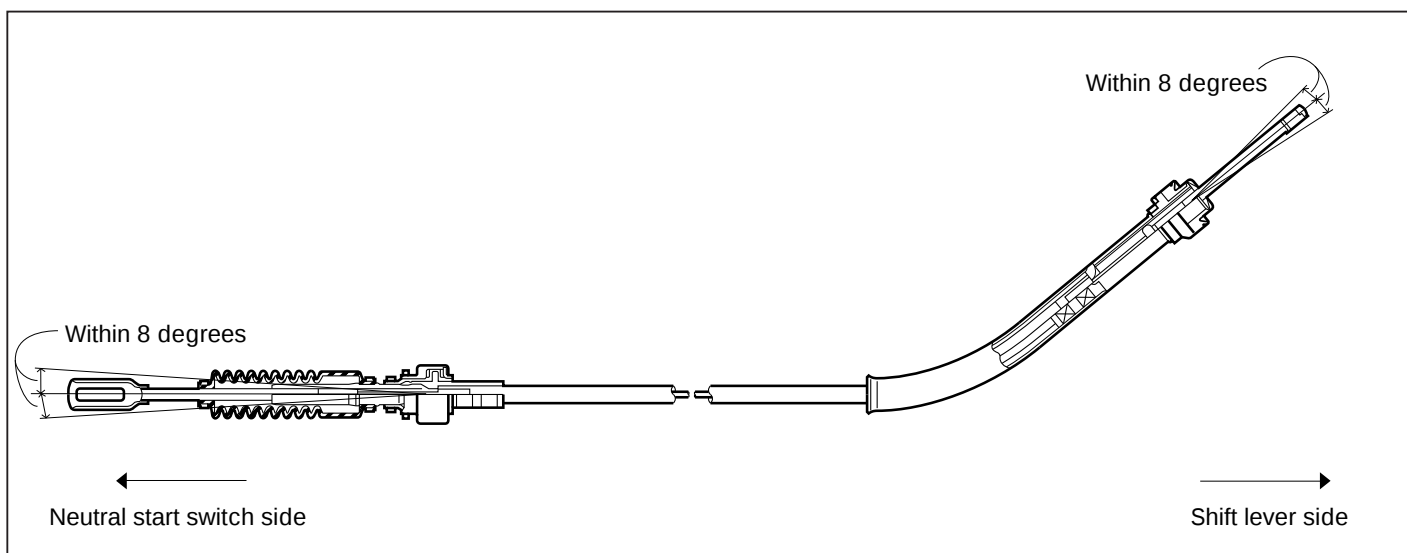


MAT00292-00281

INSTALLATION

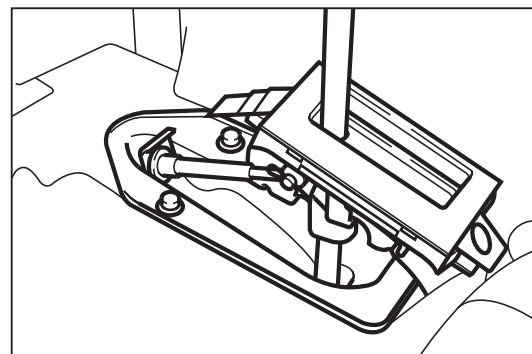
NOTE:

- Never rock the control cable end in excess of 8 degrees.
- Never rock the cable end at the shift lever side with the cable end pulled out fully.



MAT00293-00282

1. Install the shift lever assembly to the vehicle.
2. Tighten the shift lever assembly with the bolts and nuts.
Tightening Torque: 9.8 - 15.7 N·m
3. Connect the connector of the shift lever indicator lamp.



MAT00294-00283

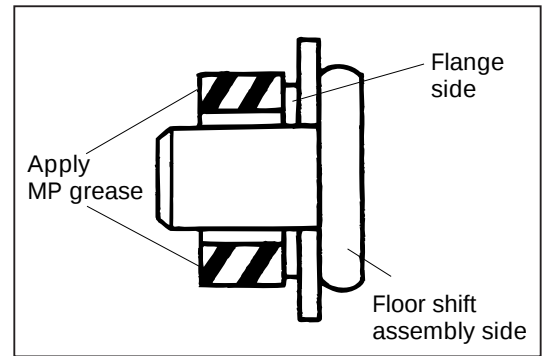
AT-84

4. Connect the control cable to the shift lever. Install the clip to the shift lever.

NOTE:

- Prior to the installation, be sure to apply MP grease to the joint section of the control cable assembly and the front shift assembly.

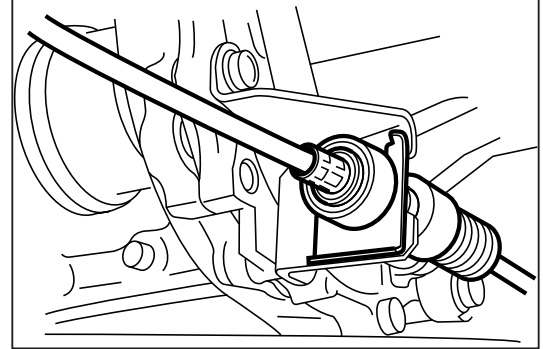
5. Install the console box.



MAT00295-00284

6. Install the control cable to the shift lever assembly.
Shift lever assembly.

Tightening Torque: 14.7 - 21.6 N·m

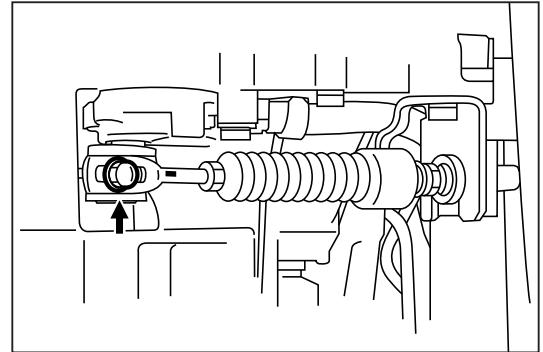


MAT00296-00285

7. Install the control cable to the bracket with the new clamp.
NOTE:

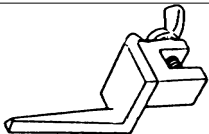
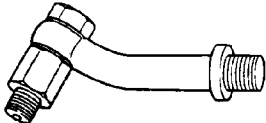
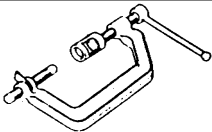
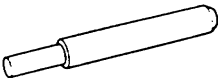
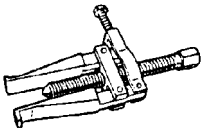
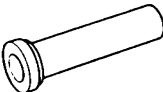
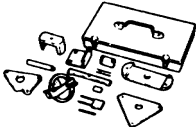
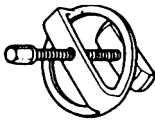
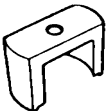
- Do not tap the cable proper during the clamp installation.
- If you inadvertently tap the cable, do not use such tapped cable.
- Use a new clamp.

8. Install the control cable to the neutral start switch.
Tightening Torque: 6.9 - 9.8 N·m



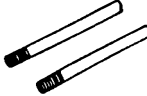
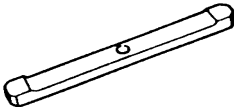
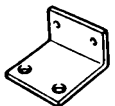
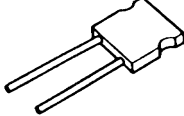
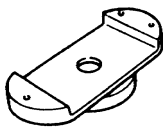
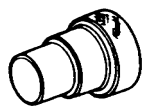
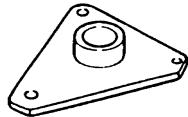
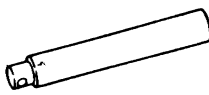
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SST (Special Service Tools)

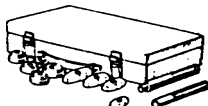
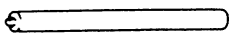
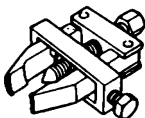
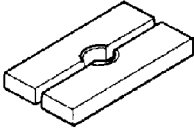
Shape	Part No.	Part name
	09302-87201-000	Gauge neutral start switch adjust
	09325-87201-000	Adaptor, automatic transmission pressure gauge, No. 1
	09325-87202-000	Adaptor, automatic transmission pressure gauge, No. 2
	09202-87002-000	Remover & replacer value cutter
	09301-87702-000	Tool clutch guide
	09308-10010-000	Puller oil seal
	09310-87301-000	Replacer counter shaft front bearing
	09350-87202-000	Tool set automatic transmission
   	09351-87201-000	Compressor piston spring No. 1
	09351-87202-000	Compressor piston spring No. 2
	09351-87203-000	Attachment dial gauge
	09351-87204-000	Compressor spring

*It should be noted that 09350-87202 contains SSTs other than those posted in this section.

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Shape	Part No.	Part name
	09351-87205-000	Holder reduction drive gear holding
	09351-87206-000	Driver oil pump
	09351-87207-000	Guide oil pump
	09351-87208-000	Measure direct & forward clutch
	09351-87209-000	Stopper drive gear
	09351-87210-000	Base dial gauge stand
	09351-87211-000	Tool manual value setting
	09351-87212-000	Holder direct clutch
	09351-87213-000	Gauge centering side gear
	09351-87214-000	Holder ball bearing
	09611-87506-000	Handle
	09518-87709-000	Replacer oil seal No. 8

*It should be noted that 09350-87202 contains SSTs other than those posted in this section.

Shape	Part No.	Part name
	09608-30011-000	Tool set front hub & drive pinion bearing
	09620-24013-000	Tool set steering rack oil seal
	09631-12020-000	Handle
	09636-20010-000	Replacer, upper ball joint dust cover
	09820-00021-000	Puller alternator rear bearing
	09950-20017-000	Puller universal
	09950-87701-000	Bearing remover
	09306-87302-000	Puller, counter gear front bearing
	09527-87301-000	Remover, rear axle shaft bearing

TIGHTENING TORQUE

Tightening components	Tightening torque	
	N·m	kgf-m
Drive plate × Crank shaft	39.0 - 49.0	4.0 - 5.0
Transaxle × Engine direct-connecting bolt	49.0 - 69.0	5.0 - 7.0
Torque convertor × Drive plate	29.0 - 44.0	3.0 - 4.5
Rear transmission case cover × Transmission case (M6)	6.9 - 9.8	0.7 - 1.0
Engine mounting lower left bracket × Transmission case (M8)	14.7 - 21.6	1.5 - 2.2
Starter shaft & oil pump × Transmission case	6.9 - 9.8	0.7 - 1.0
Nut (for brake band anchor bolt) × Transmission case	22.5 - 30.4	2.3 - 3.1
Valve body × Transmission case	6.9 - 9.8	0.7 - 1.0
Manual detent spring × Transmission case		
Oil strainer × Transmission case		
Inspection plugs × Transmission case, Throttle cable × Transmission case		
Transaxle oil pan × Transmission case		
Inspection plugs × Transmission case		
Control cable bracket × Transmission case, Transaxle oil pan × Drain plug	19.6 - 29.4	2.0 - 3.0
Neutral start switch × Transmission case	14.7 - 21.6	1.5 - 2.2
Transmission control shaft lever × Manual shaft lever	9.8 - 15.7	1.0 - 1.6
Control cable bracket × Transmission case	6.9 - 9.8	0.7 - 1.0
Unions × Transmission case		
Speedometer sleeve lock plate × Transmission case		
Transmission oil filler tube × Transmission case		
Lock nut × Primary reduction drive gear	19.6 - 29.4	2.0 - 3.0
Torque convertor × Differential case	14.7 - 21.6	1.5 - 2.2
Differential ring gear × Differential case	59.0 - 69.0	6.0 - 7.0
Control cable × Shift lever assembly	14.7 - 21.6	1.5 - 2.2
Control cable × Neutral start switch	6.9 - 9.8	0.7 - 1.0

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