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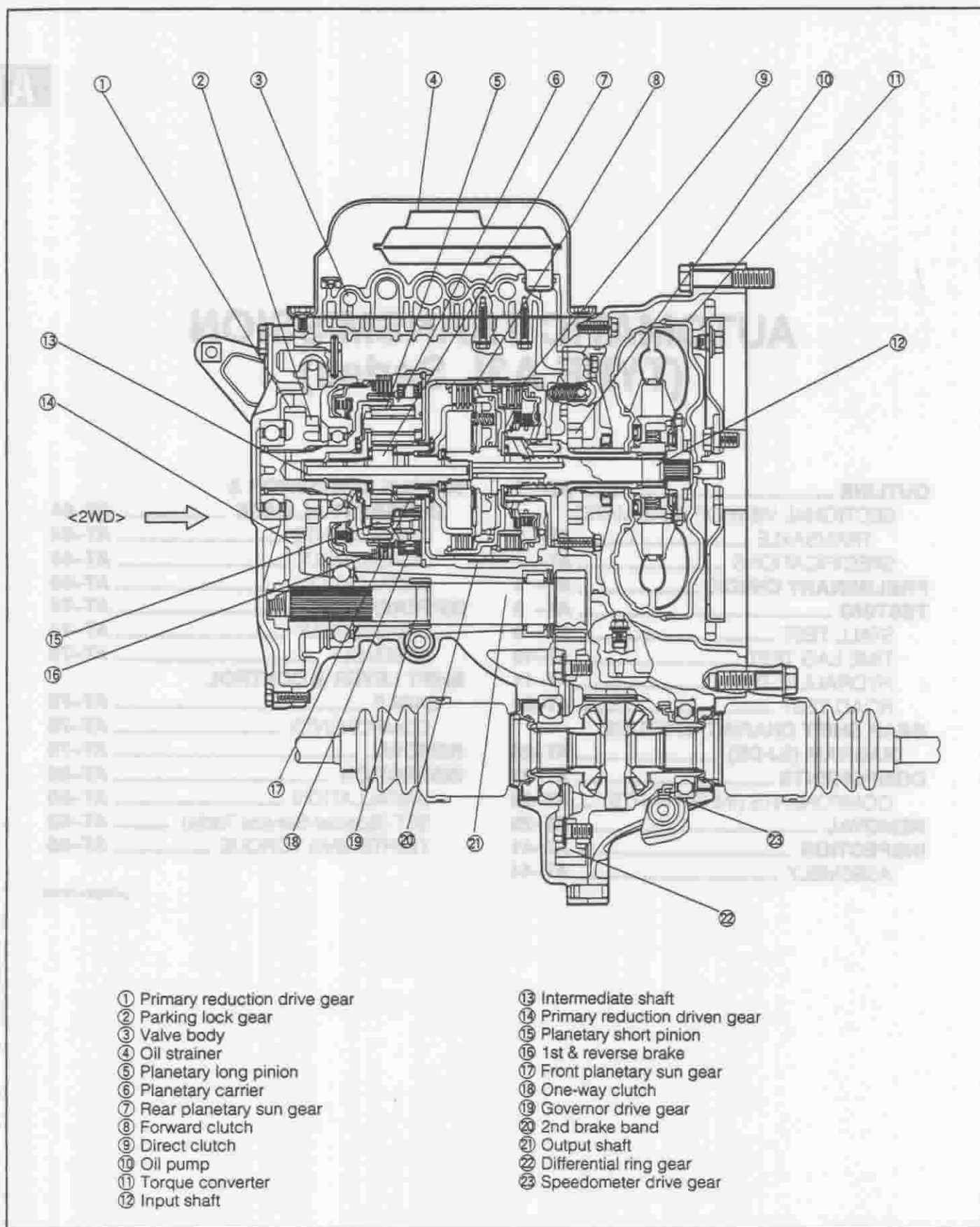
AUTOMATIC TRANSMISSION (TYPE A3L Series)

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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	2.0/2300 - 2900 rpm	
	One-way clutch type	Sprag type	
Transmission type		A3L-B1	
Transmission spec.	Type	Three forward speeds, one reverse gear, planetary gear type	
	Control element	Wet type multiple clutch	2 sets
		Band type brake	1 set
		Wet type multiple brake	1 set
		One-way clutch	1 piece
	Gear ratio	1st gear: 2.730 2nd gear: 1.526 3rd gear: 1.000 reverse gear: 2.290	
	Final gear ratio	3.966	
	Speedometer gear ratio	19/19	
	Oil pump	Internal gear type	
	Fluid to be used	ATF DEXRON® III (or II)	
	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	Three forward speeds, full automatic shift	
	Manual control pattern	P—R—N—D—2—L	

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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. [When air conditioner is turned OFF]

Specified Value: 850 ± 50 rpm

- 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 L. 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.

Fluid To Be Used: DEXRON® III (or II)

Full Capacity: Approx. 4.0 ℓ

Drain and Refill: Approx. 1.9 ℓ

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

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

NOTE:

- Never reuse the removed gasket.

• Transaxle warming-up method

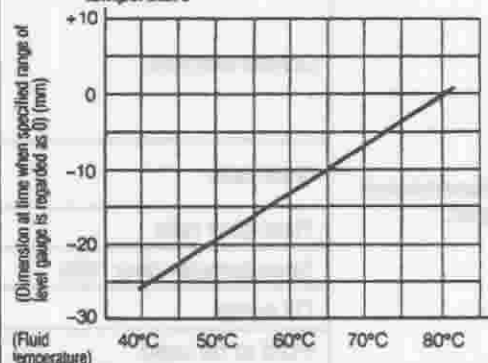
- Warm up the engine.
- If the vehicle runs for about 15 minutes at a speed of 60 km/h or for about 30 minutes at a speed of 40 km/h, the temperature of the fluid inside the transaxle becomes about 80 ± 10°C.

Reference

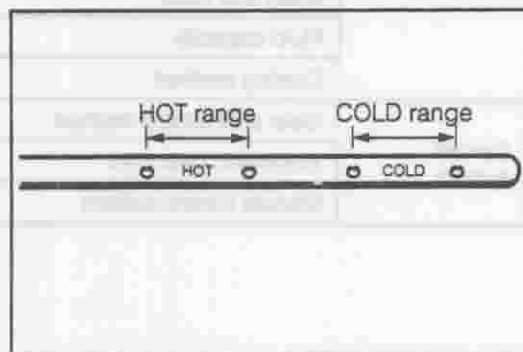
When the engine is cold, if the engine is operated for about 35 minutes at the idling speed after the engine has started, the temperature of the fluid inside the transaxle will rise to about 60 ± 10°C.

Reference

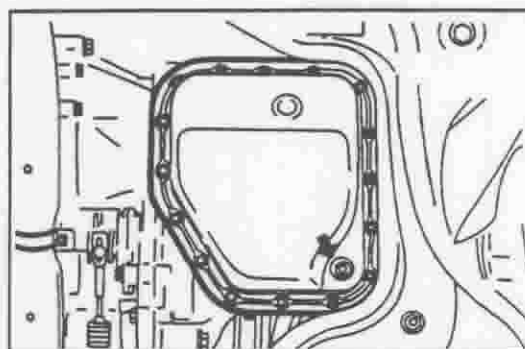
• Change in fluid level as a result of rise in fluid temperature



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LAT00005-00003

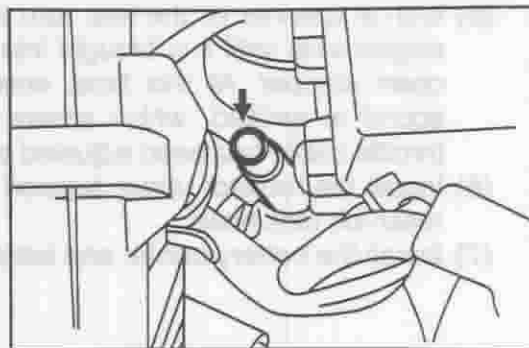


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- (2) With a new gasket interposed, tighten the drain plug securely.

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 L. 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.



LAT00007-00005

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.

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- (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.

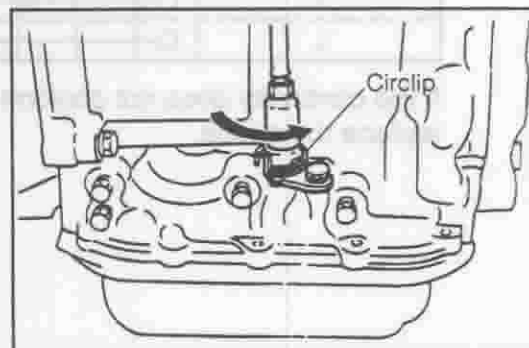
- 1) Turn the casing cap about 60 to 90 degrees. (The circlip will be expanded.)

NOTE:

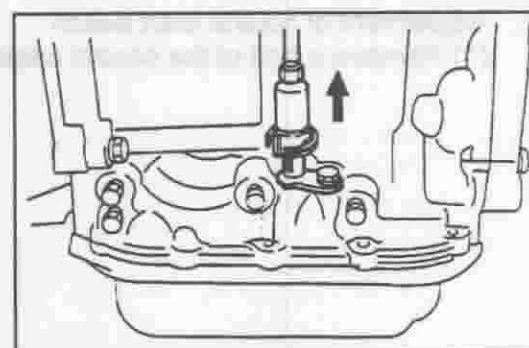
- When turning the casing cap with pliers or the like, be sure to clamp the hexagonal staked section of the casing cap.

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

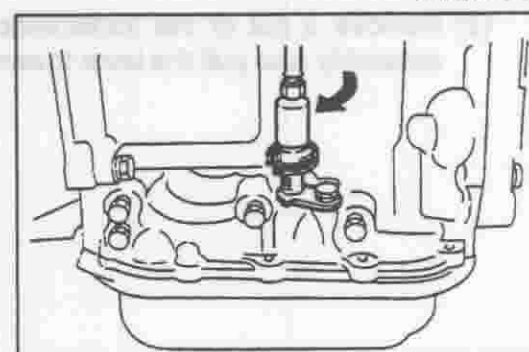
- 3) Turn the casing cap in the reverse direction of the step 1). (The circlip will be closed so that the casing cap may be secured.)



LAT00009-00006

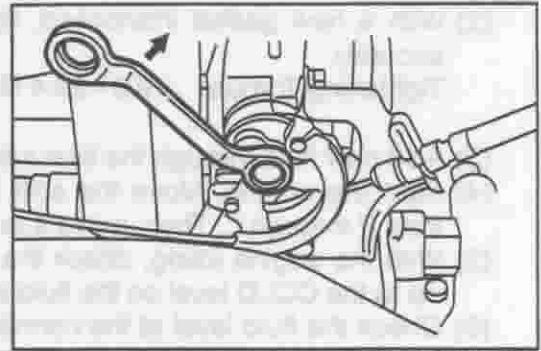


LAT00010-00007



LAT00011-00008

- (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.



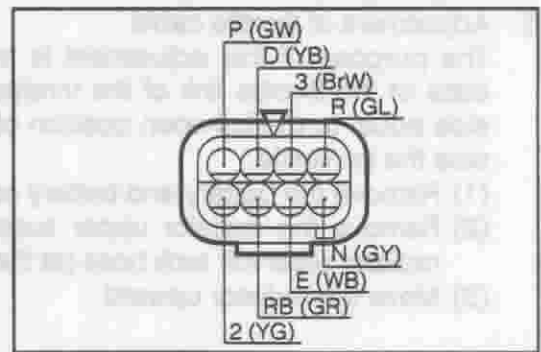
LAT00012-00009

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.

Range \ Terminal	E	R	RB	P	N	D	2	L
P	○			○				
R		○	○					
N	○				○			
D	○					○		
2	○						○	
L	○							○

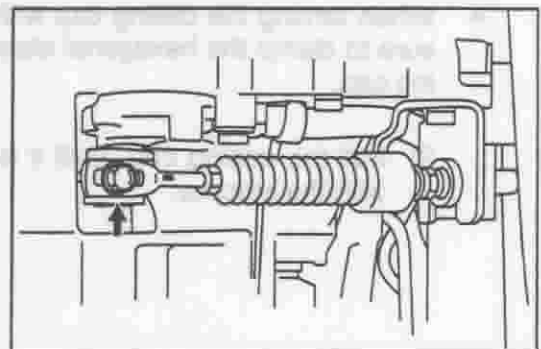
If the continuity does not conform to the specifications, replace the switch.



LAT00013-00010

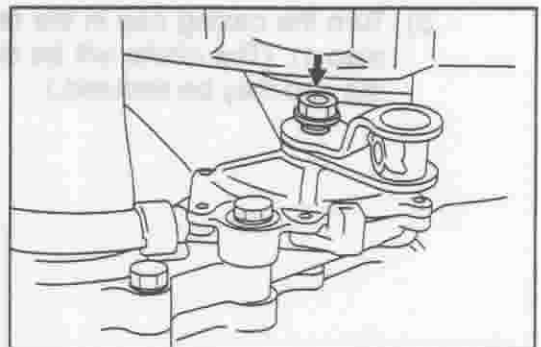
7. Adjustment of neutral start switch

- (1) Remove a bolt of the control cable assembly.



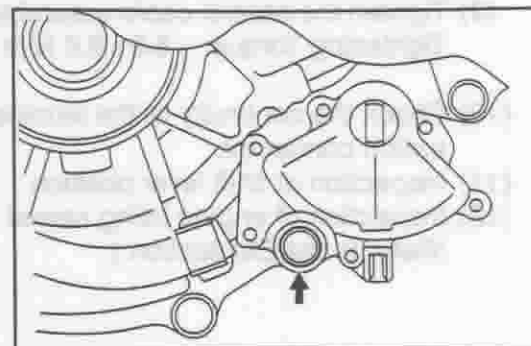
LAT00014-00011

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



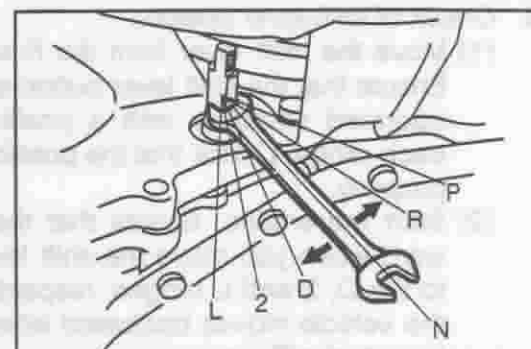
LAT00015-00012

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



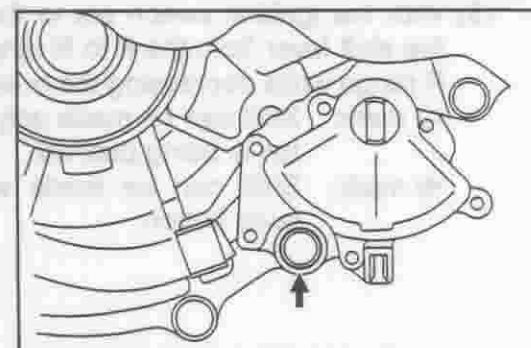
LAT00016-00013

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



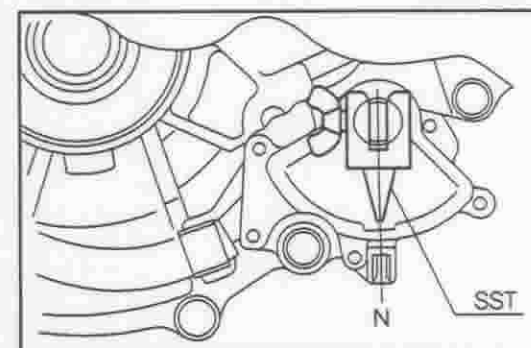
LAT00017-00014

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



LAT00018-00015

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



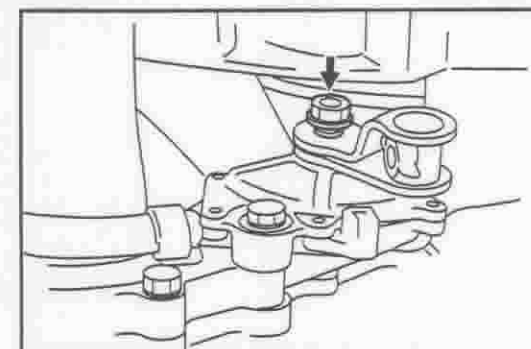
LAT00019-00016

- (7) Tighten the adjusting 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



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NOTE:

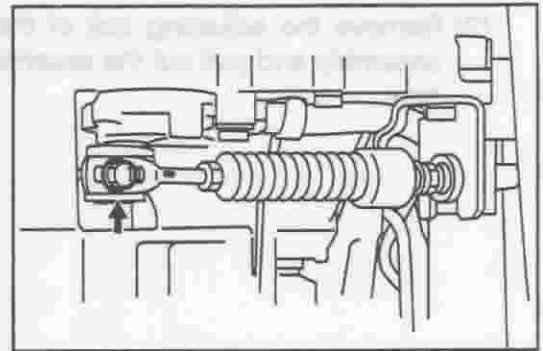
- Make sure that the nut is tightened to the specified tightening torque.

- (9) Tighten the control cable assembly with the bolt.
Tightening Torque: 6.9 - 9.8 N·m

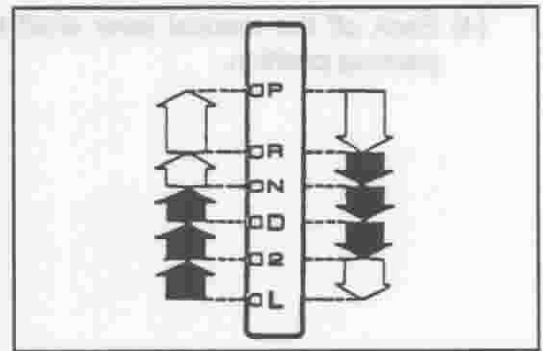
- (10) Check the continuity of the terminals in the neutral start switch connector.
- (11) Inspection of shift lever position
- (12) Inspection of engine idling speed
(Refer to the EM section.)

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 D, 2 and L 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



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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 D 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 D range to the R range.
- Be sure to turn OFF the air conditioner (if equipped so on).

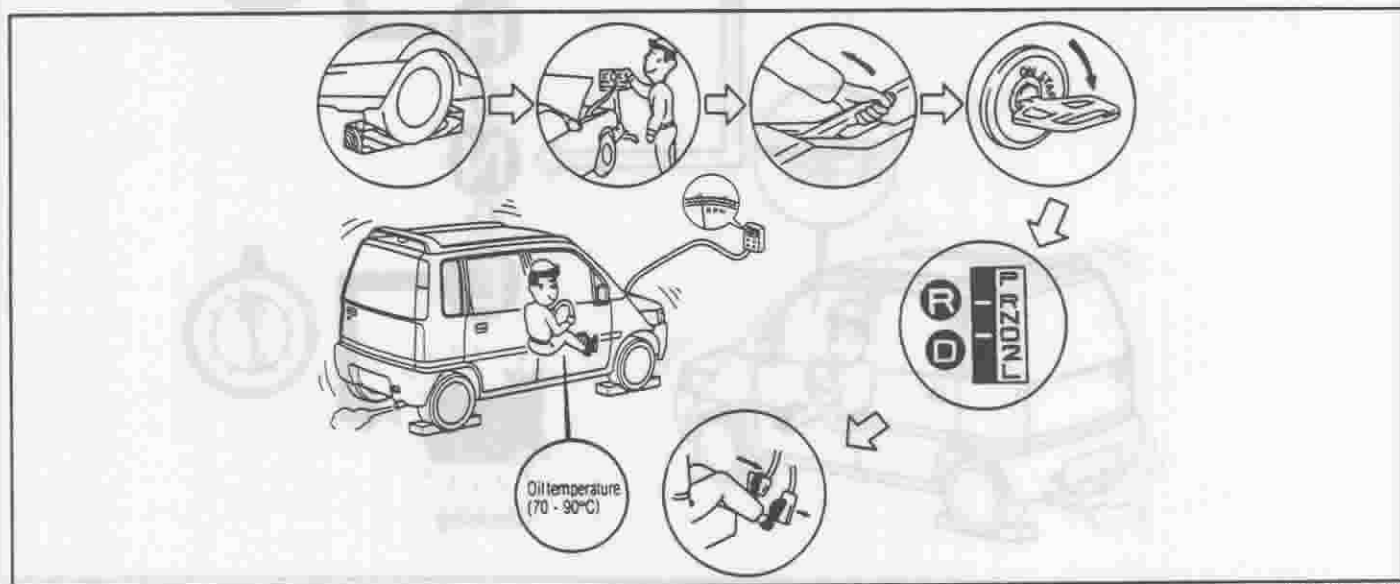
Measurement of stall speed

- 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 D range. Depress the accelerator pedal fully by your right foot. Quickly read the highest engine rpm at this time.
Stall R.P.M.: 2300 - 2900 rpm (EJ-DE Engine)

- Perform the same test in the R range.

Evaluation

- If the engine speed is the same for both ranges (D, R) but lower than specified value:
 - Engine output probably insufficient (e.g. throttle valve is not opened fully.)
 - Torque converter malfunctioning
- If the stall speed at the D range is higher than specified value:
 - Line pressure too low
 - Forward clutch slipping
 - Torque converter 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 D 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:

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

Measurement of time lag

- Place chocks at the four wheels.
- Fully apply the parking brake.
- Start the engine and check the idle speed.
(Refer to the EM Section.)
- Move the shift lever from the N to the D range. Using a stopwatch, measure the time required from the lever shifting to the time when you feel a shock.

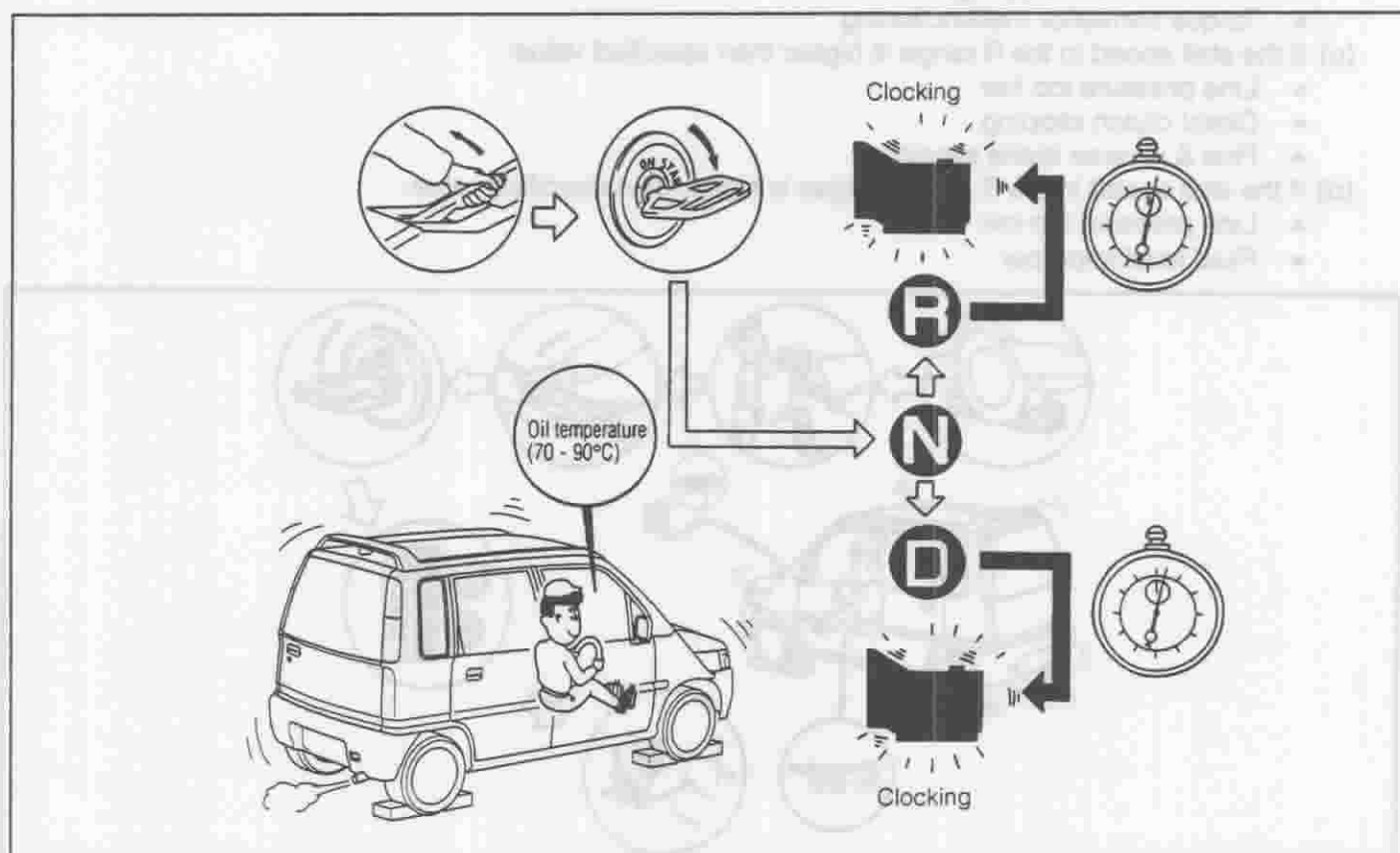
Time Lag: Not to Exceed 1.0 second

- 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 seconds

Evaluation

- If the N-to-D time lag is longer than the specified value:
 - Line pressure too low
 - Forward clutch worn
- 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 D 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

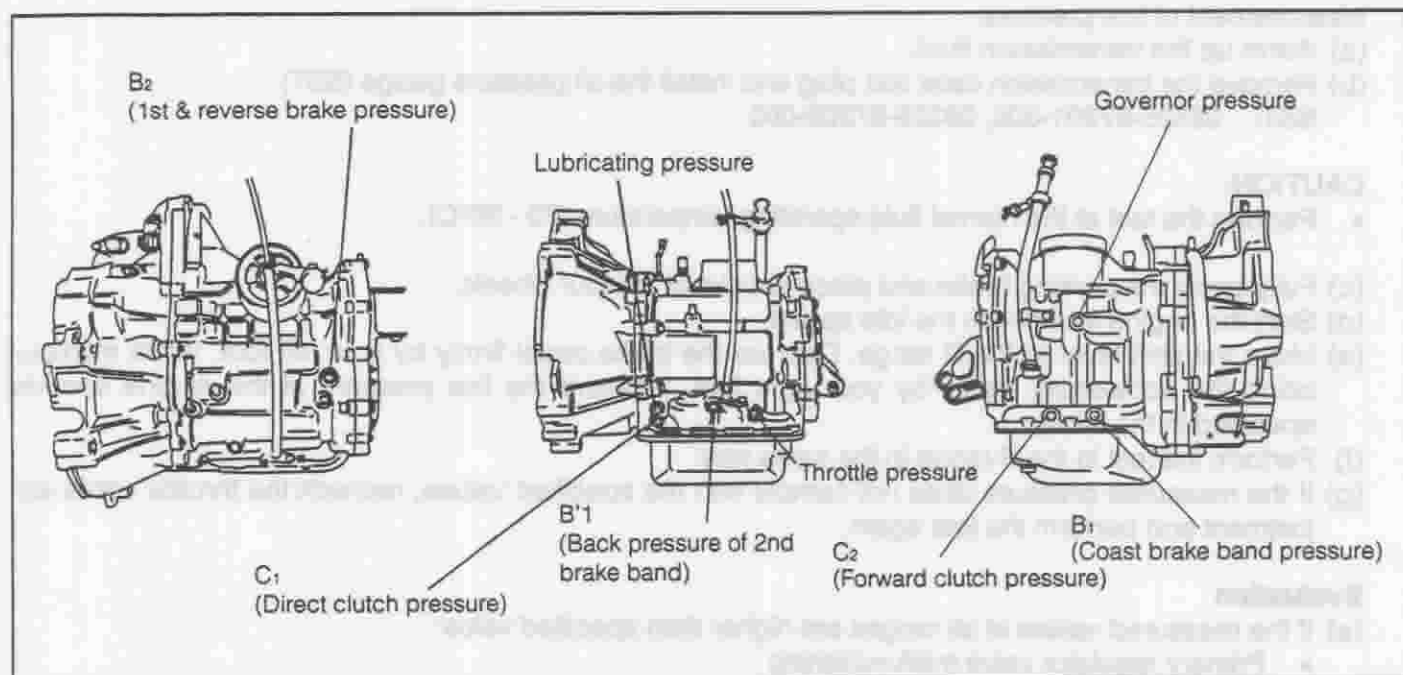
- (a) If the measured values at all ranges are higher than specified value:
 - Primary regulator valve malfunctioning
 - Throttle pressure incorrect
- (b) If the measured values at all ranges are lower than the specified value:
 - Throttle pressure incorrect
 - Oil filter clogged
 - Faulty "O" ring of 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 D range only:
 - Fluid leakage at the D 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

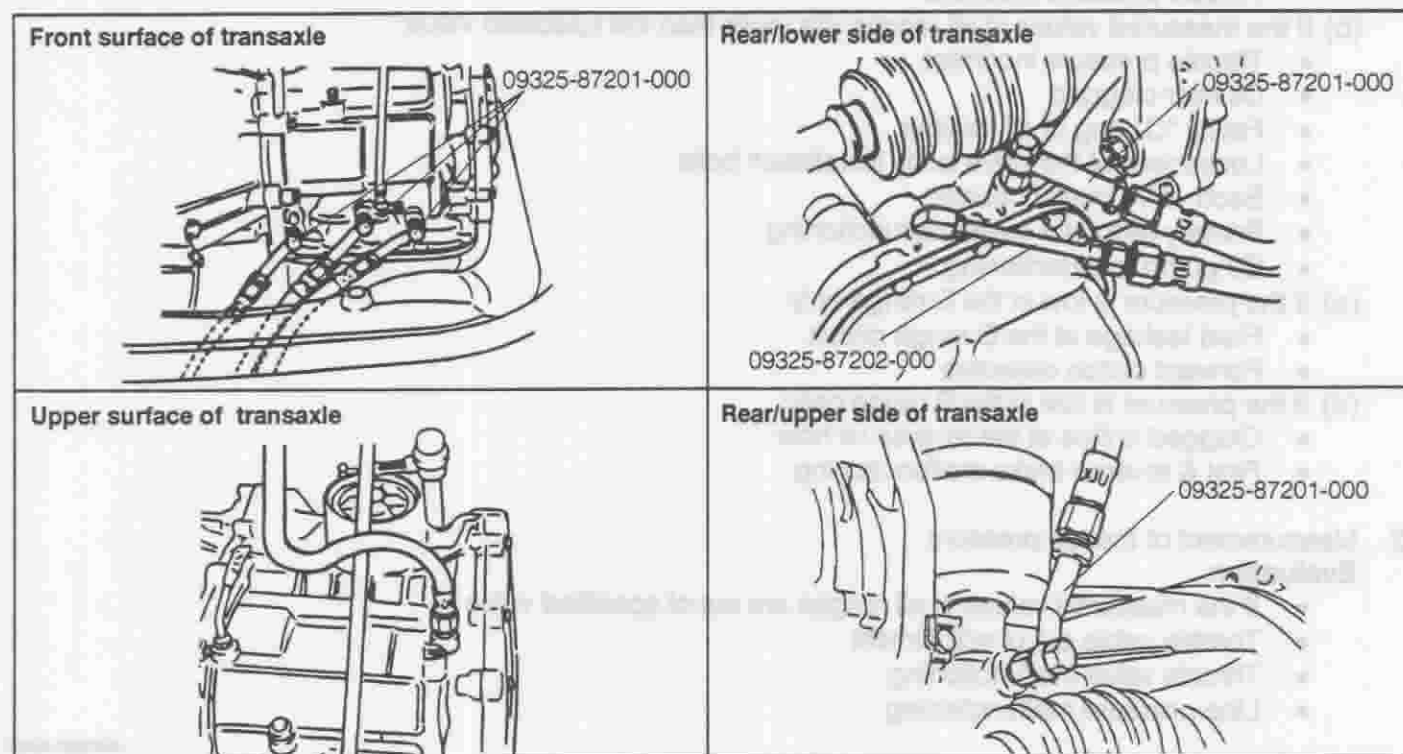
Evaluation

- 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

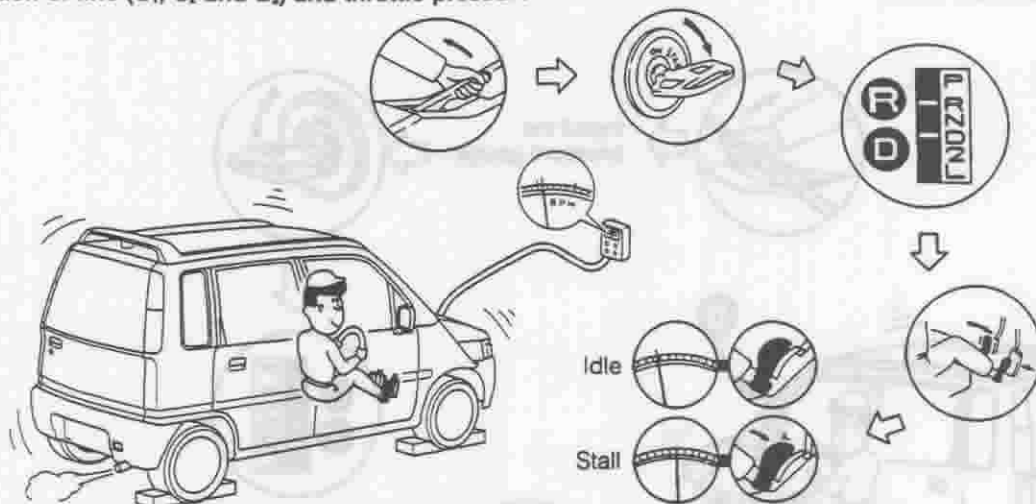


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Inspection of line (C₁, C₂ and B₂) and throttle pressure

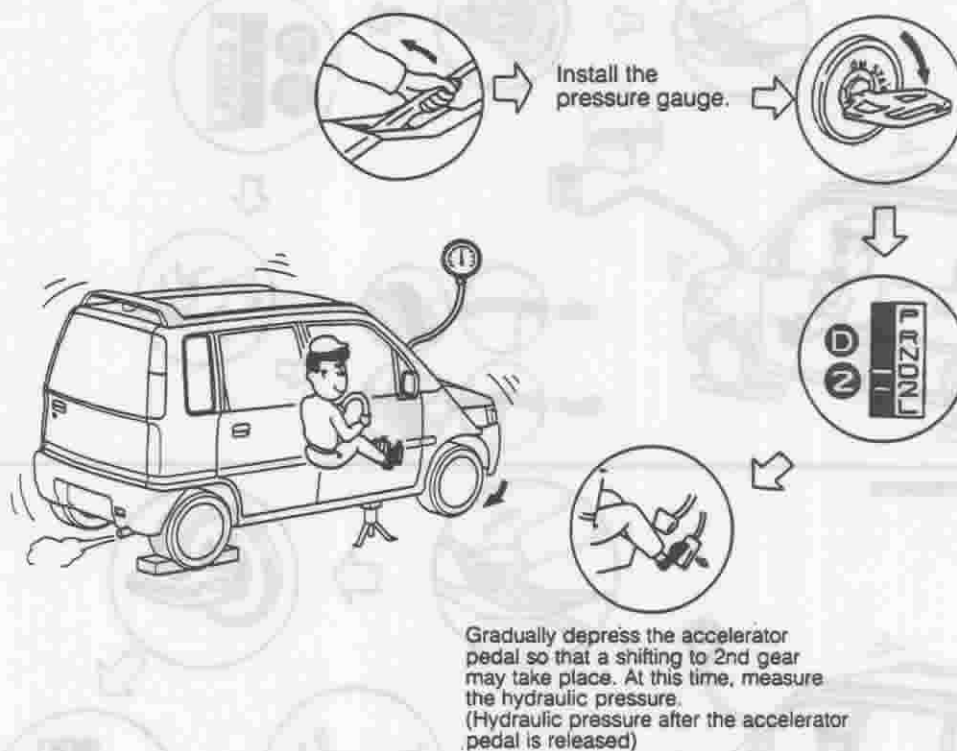


Inspection of line (B₁) oil pressure



LAT00000-00024

Inspection of line (B₁) oil pressure



LAT00000-00025

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	735 - 833
D range	(C ₂)	539 - 637	843 - 941
R range	(C ₁ , B ₂)		1905 - 2101

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

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

Unit: kPa

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

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

Unit: kPa

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

In the case of D 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 D range: More than 98 kPa

LAT00027-00000

5. Measurement of governor pressure

- Warm up the transmission fluid. (70 - 90°C).
- Jack up the vehicle.
- Remove the transmission case test plug and install the oil pressure gauge (SST).

SST: 09325-87201-000

CAUTION:

- Perform the test at the normal fluid operating temperature (70 - 90°C).
- Ensure that the parking brake is not applied.
- Start the engine.
- Move the shift lever to the D range and measure the governor pressure at the engine speeds specified in the table.

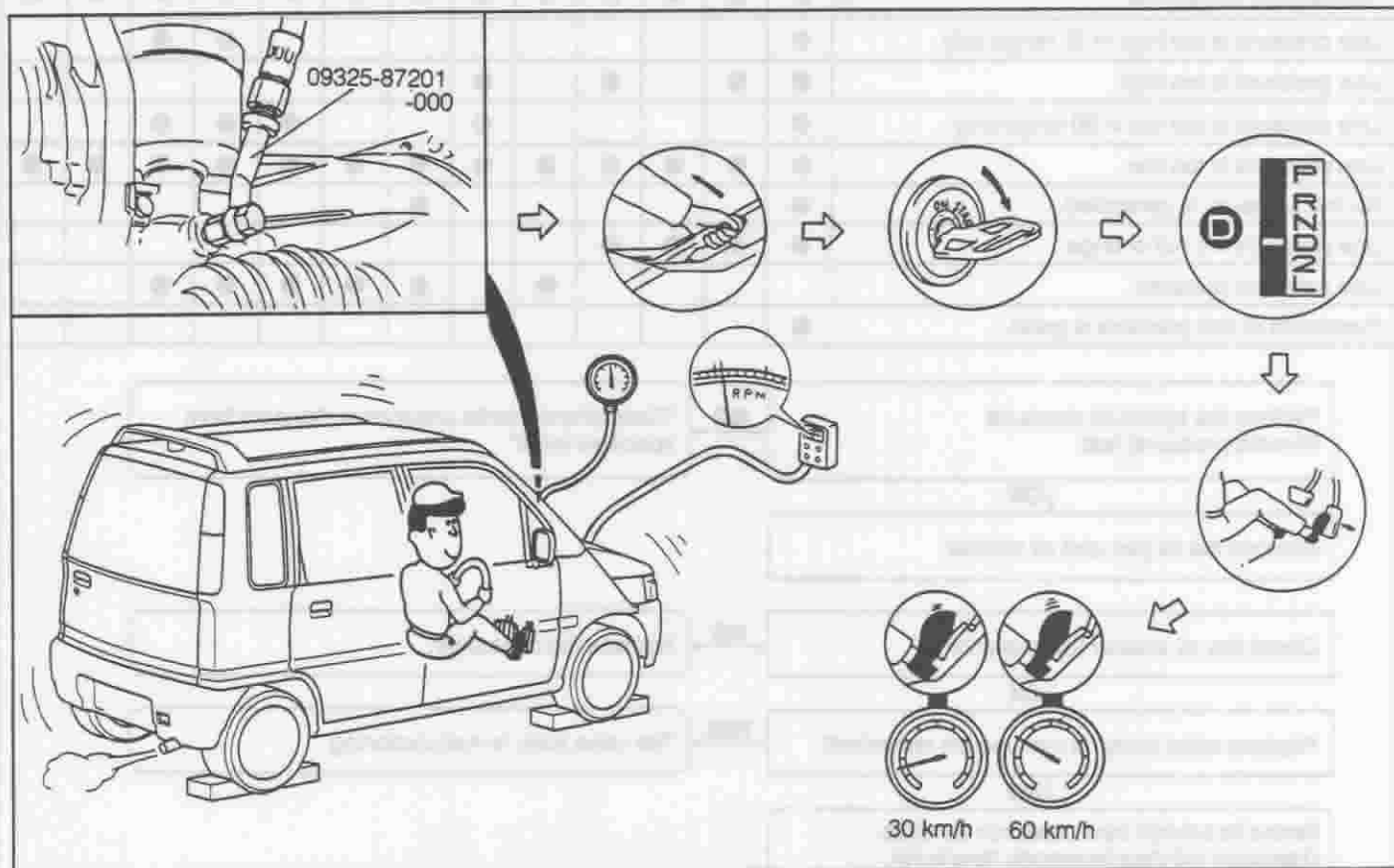
Evaluation

If the governor pressure is incorrect:

- Line pressure incorrect
- Fluid leakage in the governor pressure circuit
- Governor valve malfunctioning

Unit: kPa

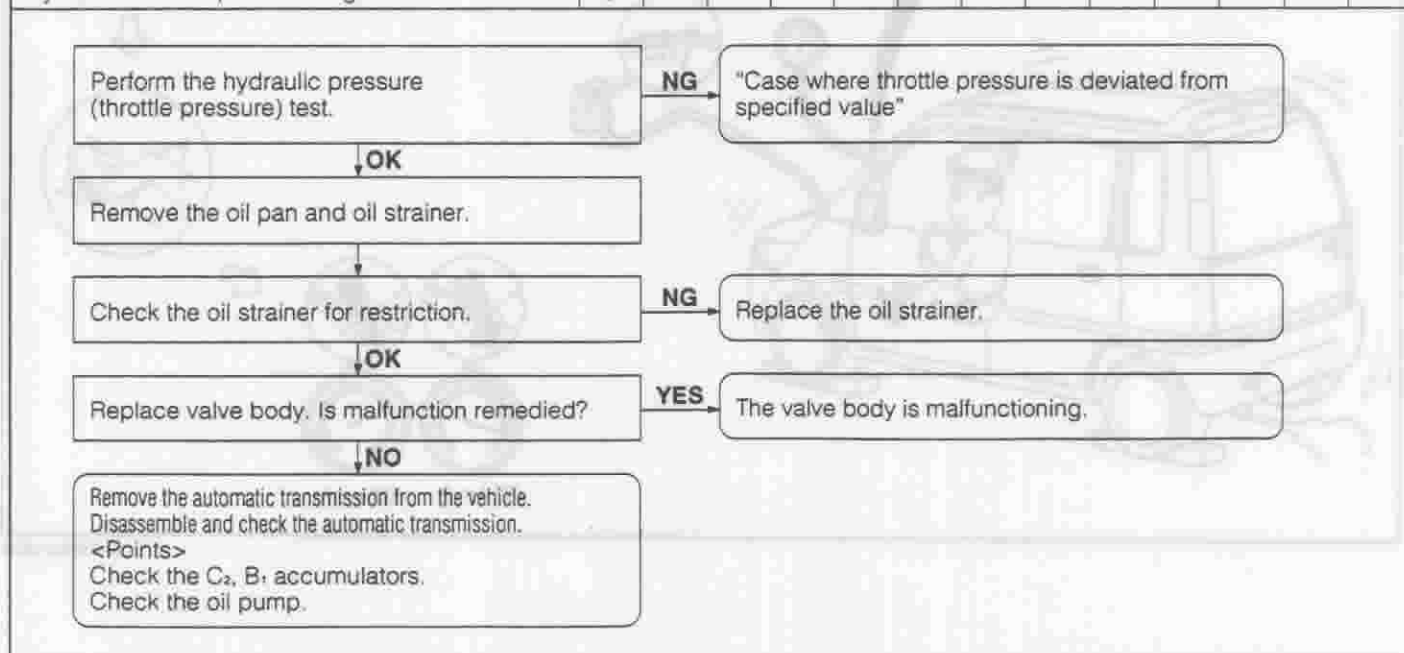
Vehicle speed (Reference)	Governor pressure
	EJ-DE
30 km/h	158 - 216
60 km/h	347 - 376



LAT00026-00026

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
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.					●		●	●	●	●	●
Hysteresis of line pressure is great.	●										



(2) Case where direct clutch (C₁) 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?

↓ OK

Remove the oil pan.

↓

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

↓ OK

Replace valve body. Is malfunction remedied?

↓ NO

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 C₁ accumulator.

NG

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

NG

Adjust the neutral position of the manual valve.

YES

The valve body is malfunctioning

(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	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.	●	●	●	●	●	●	●	●	●	●

Are other line pressures normal?

↓ OK

Remove the oil pan.

↓

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

↓ OK

Replace valve body. Is malfunction remedied?

↓ NO

Remove the automatic transmission from the vehicle.
Disassemble and check the automatic transmission.
<Points>
Disassemble and check the forward clutch.
Replace the oil pump.
Check the C₂ accumulator.

NG

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

NG

Adjust the neutral position of the manual valve.

YES

The valve body is malfunctioning

(4) 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.	●	●	●	●	●	●	●	●	●	●

Are other line pressures normal?

↓ OK

Remove the oil pan.

↓

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

↓ OK

Replace valve body. Is malfunction remedied?

↓ NO

Remove the automatic transmission from the vehicle.
Disassemble and check the automatic transmission.
<Points>
Disassemble and check the 2nd brake band.
Check the B₁ accumulator.

NG

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

NG

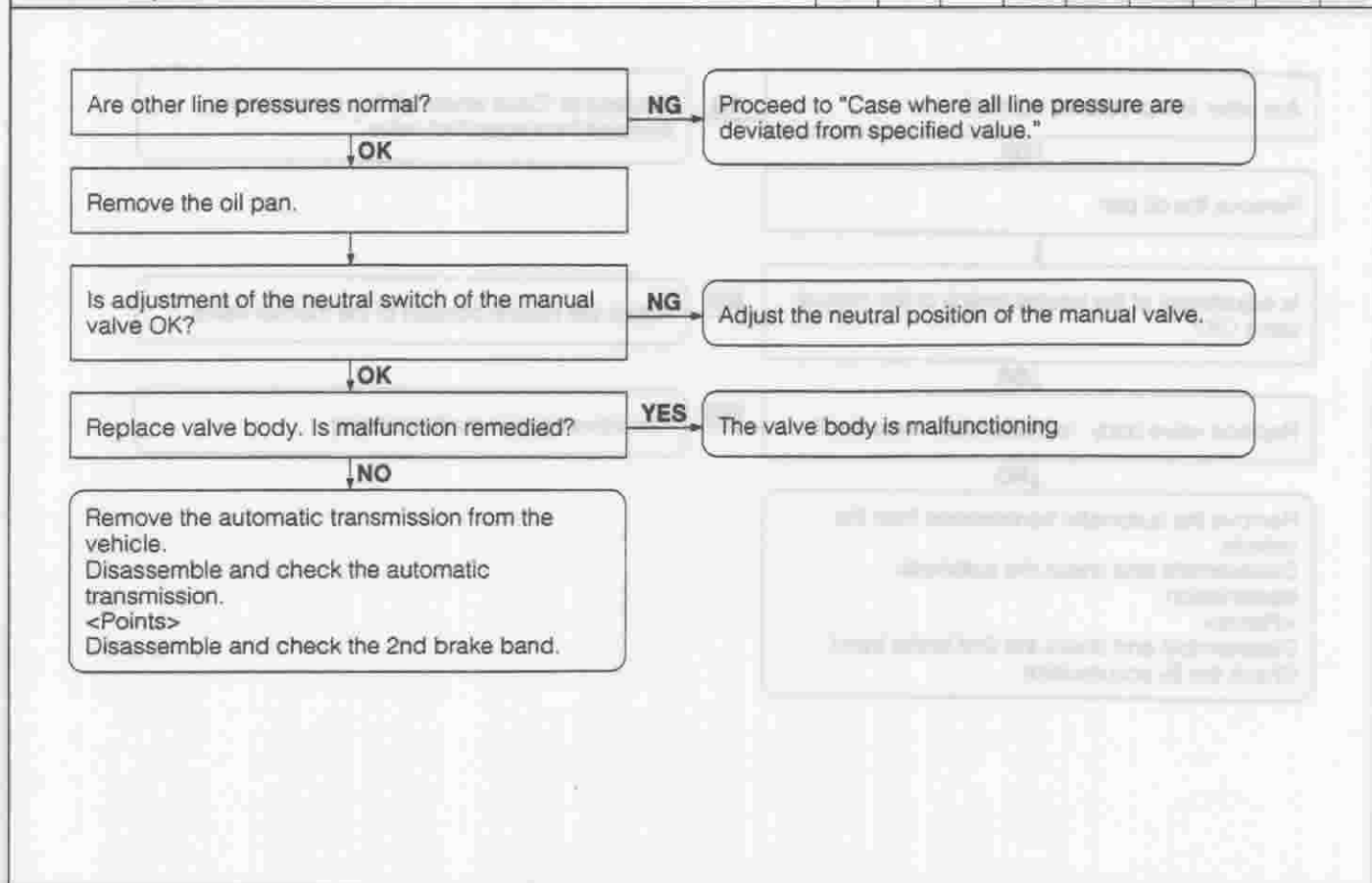
Adjust the neutral position of the manual valve.

YES

The valve body is malfunctioning

(5) Case where 2nd brake band (B₁) backpressure 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	2-3 shift valve and timing valve malfunctioning	
Rear clutch pressure is too high.	●									
Rear clutch pressure too low.	●	●	●	●	●	●	●	●	●	●



(6) 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.	●	●	●	●	●	●	●

Are other line pressures normal?

↓ OK

Remove the oil pan.

↓

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

↓ OK

Replace valve body. Is malfunction remedied?

↓ NO

Remove the automatic transmission from the vehicle.
Disassemble and check the automatic transmission.
<Points>
Disassemble and check the 1st & reverse brake.

NG

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

NG

Adjust the neutral position of the manual valve.

YES

The valve body is malfunctioning

(7) 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 shift valve, 2-3 shift valve malfunctioning	Throttle cam retaining bolt loose	Throttle cam cable disconnected	Throttle cable broken	Neutral position of manual valve improperly adjusted
Throttle pressure too high	●	●		●		●	●	●	●				
Throttle pressure too low	●	●			●	●	●	●	●				●
No throttle pressure is generated.		●	●										
Throttle pressure will not change.		●	●	●						●	●	●	
Throttle pressure pulsates.	●	●		●									
Hysteresis of throttle pressure is great.		●											

Is adjustment of throttle cable OK?

NG

Adjust throttle cable.

Perform the hydraulic pressure (line pressure) test.

NG

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

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

NG

Adjust the neutral position of the manual valve.

Replace valve body.

(8) 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 shift valve, 2-3 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.	●	●								
Hysteresis of governor pressure is great.	●	●			●	●	●			

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 C ₂ , B ₁ accumulators.		

ROAD TEST

CAUTION:

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

1. D range test.

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

- (a) Check that the 1-2 and 2-3 up-shifts take place and also that the shift points conform to those in the automatic shift schedule.

- (b) In the same manner, check for shocks and the slippage during 1-2 and 2-3 up-shifts.

- (c) While running in the 3rd gear of D range, check to see if the vehicle emits any abnormal noise or vibration.

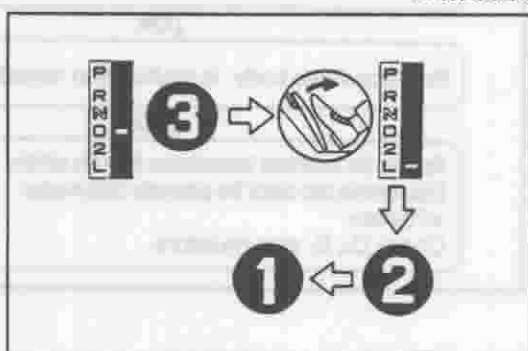
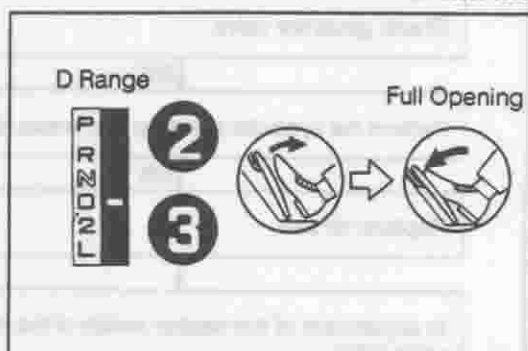
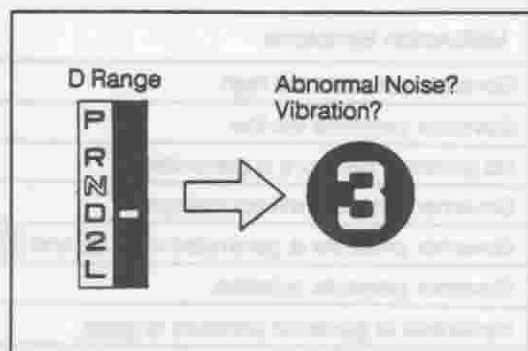
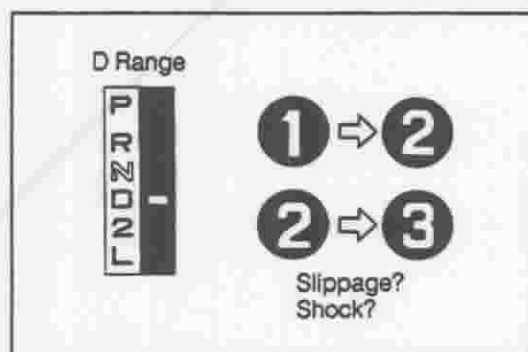
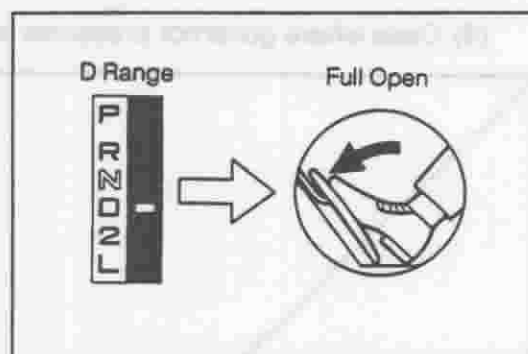
NOTE:

- 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..

- (d) While running in the 3rd gear of D range, Ensure that the kick-down vehicle speed limits for the 3-1 and 3-2 kick-downs conform to those indicated in the automatic shift schedule.

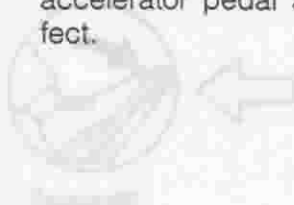
- (e) Check for abnormal shocks and slippage during the kick-down.

- (f) While running at a speed of about 60 km/h in the 3rd gear of the D range, release your foot from the accelerator pedal and move the shift lever to the L range. Then check to see if the 2-1 down-shift point conform to those indicated in the automatic shift schedule.

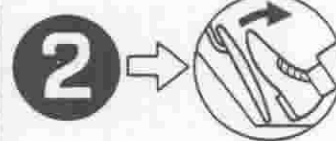


2. 2 range test.

- (a) While running in 2 range of the 2nd gear, release the accelerator pedal and check the engine braking effect.



2 Range

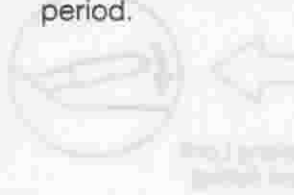


Engine Braking?

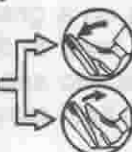
LAT00042-00032

- (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.



2 Range



Abnormal Noise?

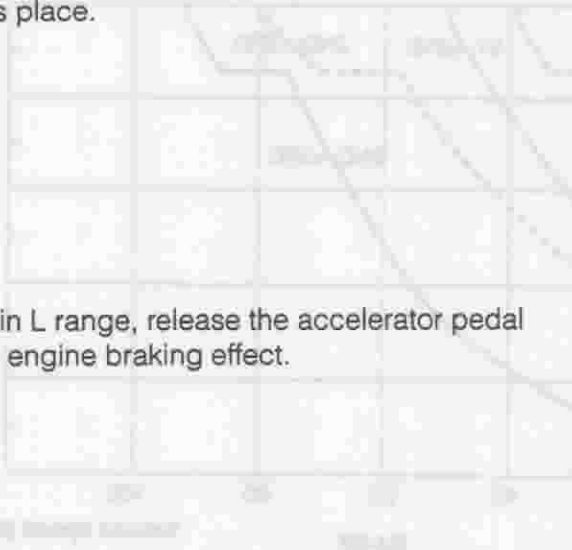


Shock?

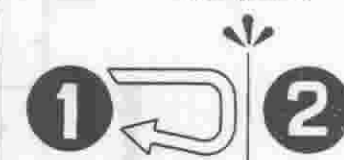
LAT00043-00033

3. L range test.

- (a) While running in L range, ensure that no up-shift to 2nd gear takes place.



L Range

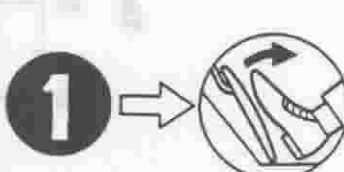


No Up-Shift

LAT00044-00034

- (b) While running in L range, release the accelerator pedal and check the engine braking effect.

L Range

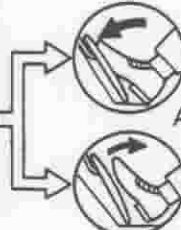


Engine Braking?

LAT00045-00035

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

L Range

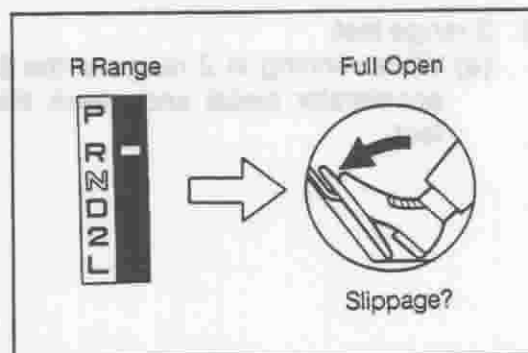


Abnormal Noise?

LAT00046-00036

4. R range test.

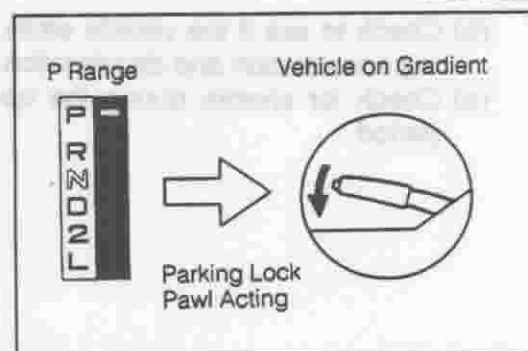
Move the Shift lever to R range and, while running at full throttle, check to see if slippage is taking place.



LAT00047-00037

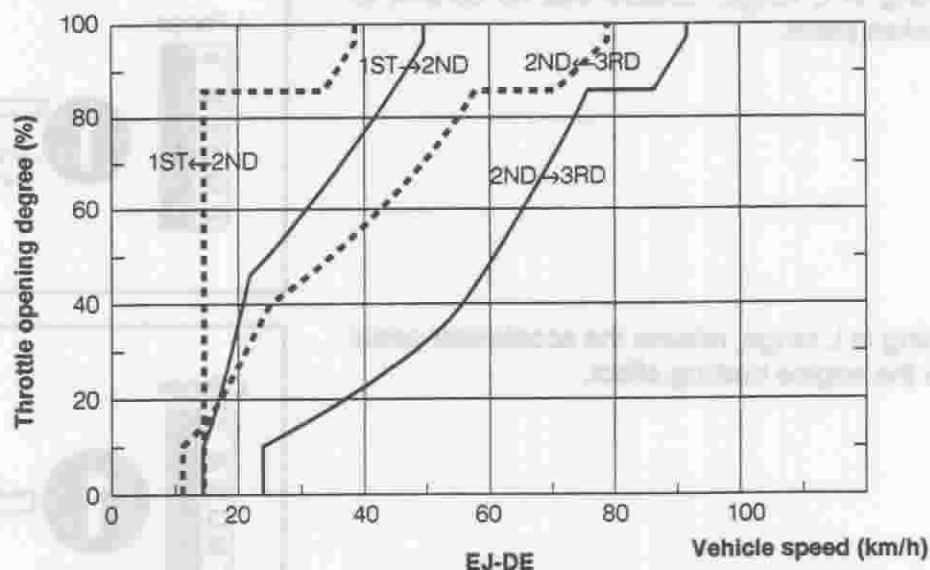
5. P range test.

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.



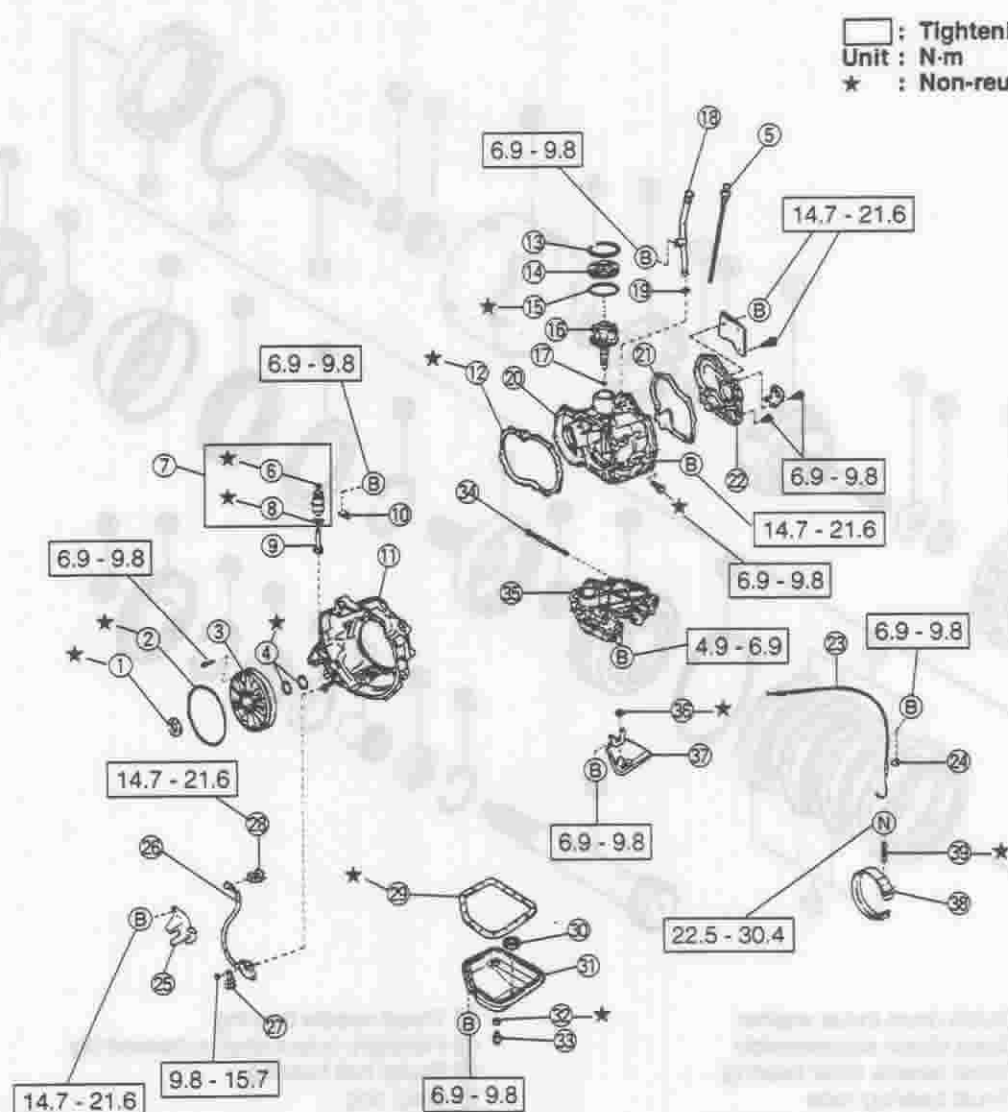
LAT00048-00038

GEAR SHIFT CHARACTERISTICS DIAGRAM (EJ-DE)



LAT00049-00000

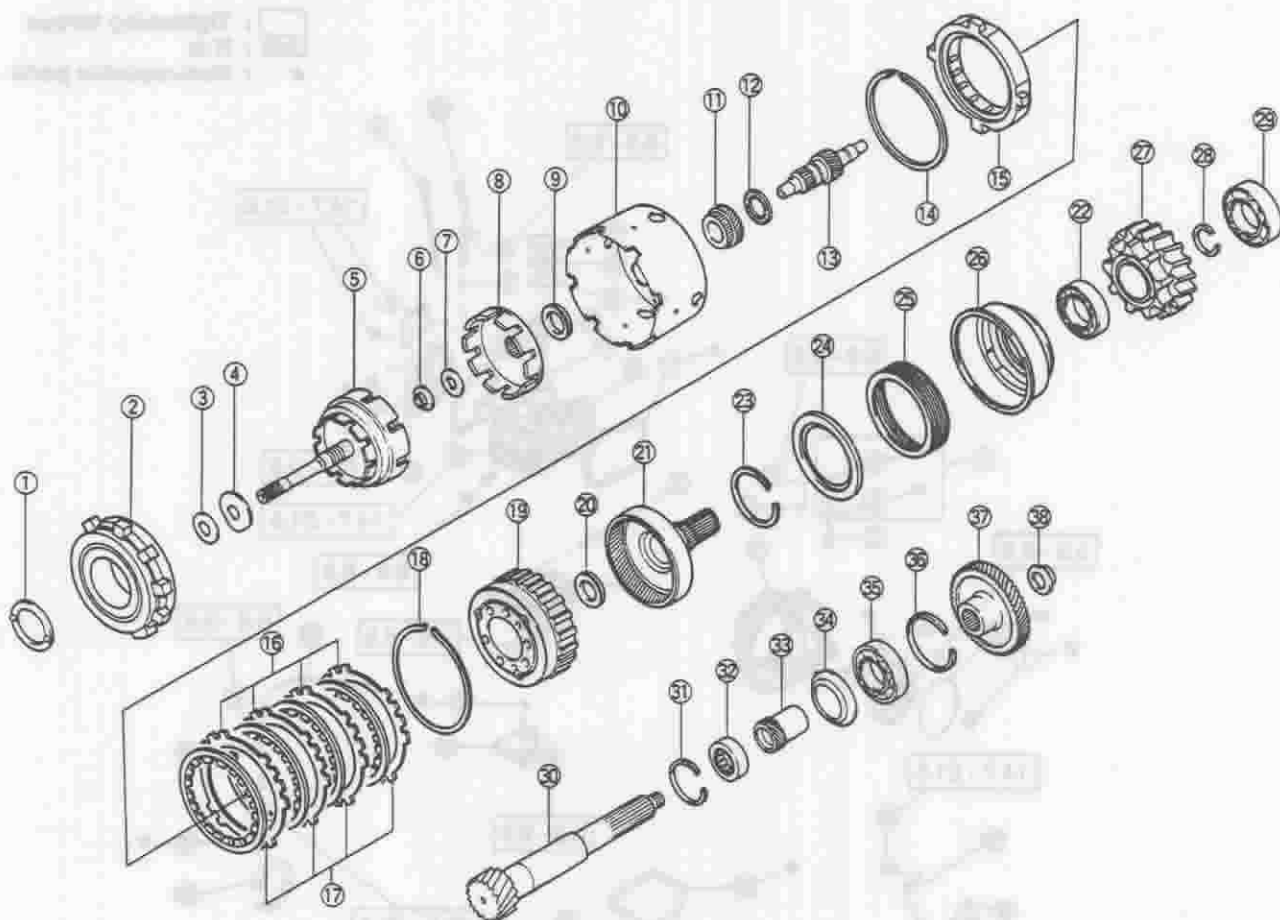
COMPONENTS



- ① T-type oil seal
- ② O-ring
- ③ Stator shaft & oil pump assembly
- ④ Clutch drum oil seal ring
- ⑤ Oil level gauge subassembly
- ⑥ V-type oil seal
- ⑦ Speedometer shaft sleeve subassembly
- ⑧ O-ring
- ⑨ Speedometer driven gear
- ⑩ Speedometer sleeve lock plate
- ⑪ Torque convertor & 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

- ㉑ Transaxle case rear cover gasket
- ㉒ Rear transmission case cover subassembly
- ㉓ Throttle cable
- ㉔ Speedometer sleeve lock plate
- ㉕ Control cable bracket
- ㉖ Neutral start switch assembly
- ㉗ Transmission control shaft lever assembly
- ㉘ Clamp
- ㉙ Transaxle oil pan gasket
- ㉚ Oil cleaner magnet
- ㉛ Transaxle oil pan subassembly
- ㉜ Gasket
- ㉝ Drain plug
- ㉞ Manual valve
- ㉟ Valve body assembly
- ㊱ O-ring (for oil strainer)
- ㊲ Oil strainer subassembly
- ㊳ Transmission brake band assembly
- ㊴ Transmission brake band adjusting anchor bolt

COMPONENTS (INNER PARTS)



- ① Clutch drum thrust washer
- ② Direct clutch subassembly
- ③ Thrust needle roller bearing
- ④ Thrust bearing race
- ⑤ Forward clutch subassembly
- ⑥ Thrust needle roller bearing
- ⑦ Thrust needle roller bearing race
- ⑧ Forward clutch hub
- ⑨ Thrust needle roller bearing
- ⑩ 2nd brake drum
- ⑪ Planetary sun gear subassembly
- ⑫ Thrust needle bearing
- ⑬ Intermediate shaft
- ⑭ Hole snap ring
- ⑮ One-way clutch
- ⑯ Brake plate
- ⑰ Brake disc
- ⑱ Brake cushion plate
- ⑲ Planetary gear assembly

- ⑳ Thrust needle bearing
- ㉑ Planetary output shaft subassembly
- ㉒ Radial ball bearing
- ㉓ Snap ring
- ㉔ Spring seat
- ㉕ Return spring
- ㉖ 1st & reverse piston
- ㉗ Reduction drive gear subassembly
- ㉘ Snap ring
- ㉙ Radial ball bearing
- ㉚ Output shaft
- ㉛ Snap ring
- ㉜ Cylindrical roller bearing
- ㉝ Governor drive gear
- ㉞ Oil reserve plate
- ㉟ Radial ball bearing
- ㊱ Snap ring
- ㊲ Primary reduction driven gear
- ㊳ Lock nut

Thrust bearing specifications

Unit: mm

	③	⑥	⑨	⑫	㉑
Outer diameter	35.1	31.0	46.5	35.1	46.5
Inner diameter	22.0	16.5	25.0	22.0	25.0
Thickness	2.8	5.3	5.0	2.8	5.0

REMOVAL

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

NOTE:

- Never reuse the removed O-ring.

4. Remove the unions (for oil cooler).

NOTE:

- Never reuse the removed union.

5. Remove the breather.

- (1) Pull up the breather cap (resin made).
- (2) Remove the breather, using a box wrench.

6. Remove the speedometer sleeve lock plate by removing the bolt.

7. Remove the speedometer shaft sleeve subassembly, using a flat screwdriver.

8. Removal of governor valve

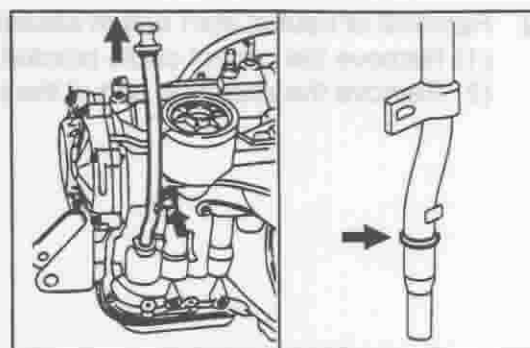
- (1) Remove the hole snap ring, using snap ring pliers.
- (2) Remove the governor cover with the O-ring installed, using the pliers.
- (3) Remove the O-ring from the governor cover.

NOTE:

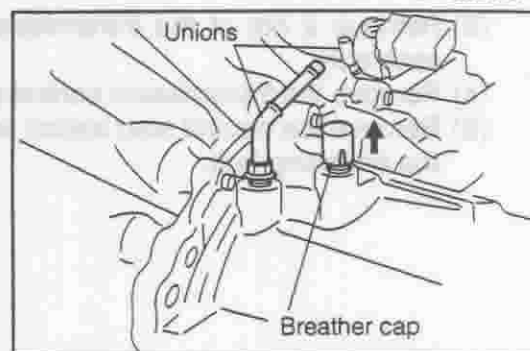
- Never reuse the removed O-ring.

- (4) Remove the governor body assembly.

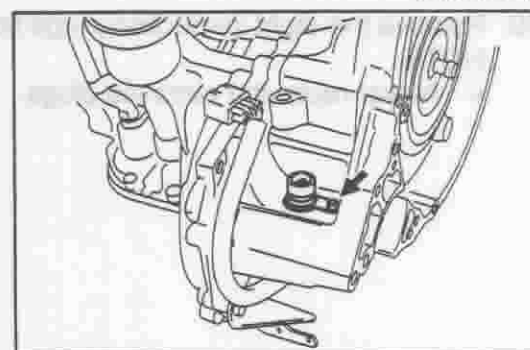
- (5) Remove the ball (A), using a magnet hand.



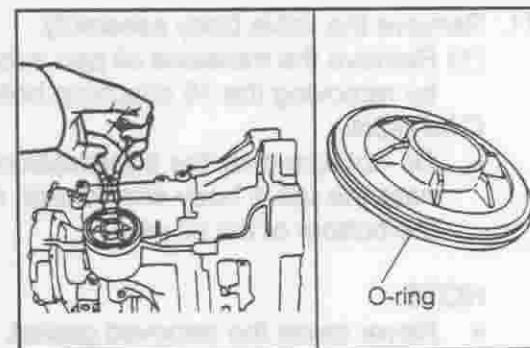
LAT00052-00041



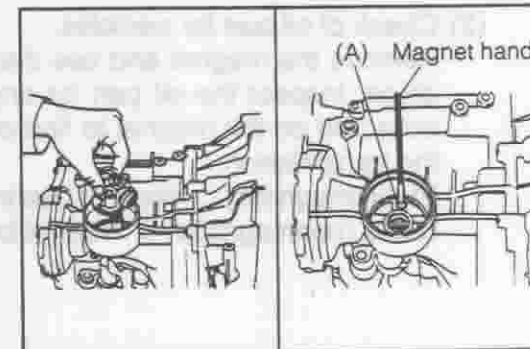
LAT00053-00042



LAT00054-00043



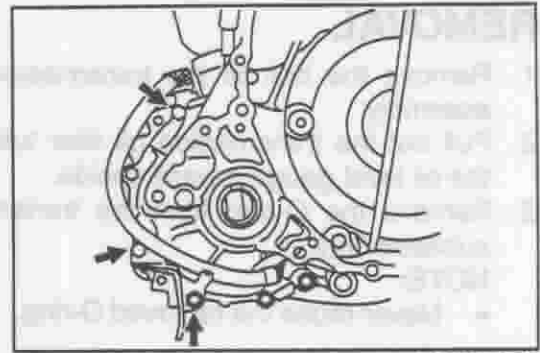
LAT00055-00044



LAT00056-00045

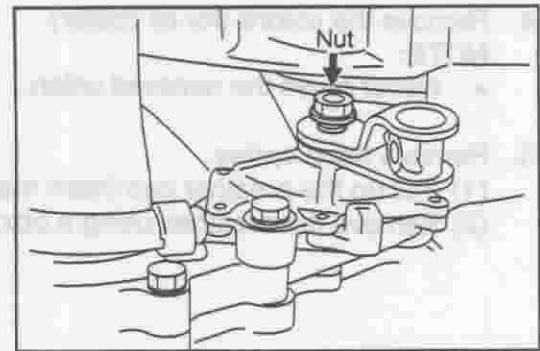
9. Removal of neutral start switch assembly

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



LAT00057-00046

- (3) Remove a nut of the transmission control shaft lever assembly.
- (4) Remove the transmission control shaft lever assembly.
- (5) Remove the neutral start switch assembly by removing the attaching bolt.

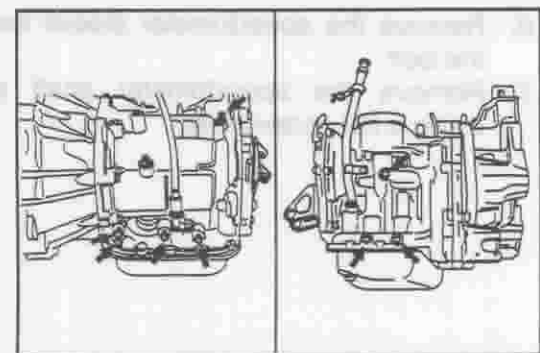


LAT00058-00080

10. Remove the eight inspection plugs from the transaxle.

NOTE:

- Never reuse the removed plugs.



LAT00059-00047

11. Remove the valve body assembly.

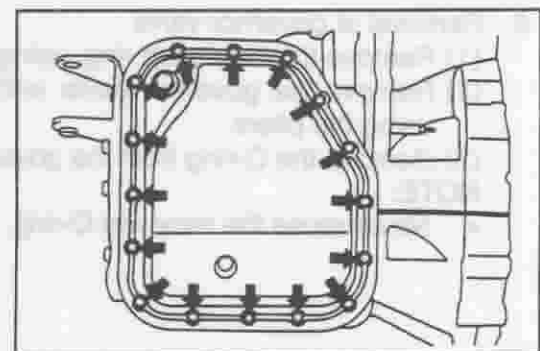
- (1) Remove the transaxle oil pan subassembly with gasket by removing the 16 attaching bolts.

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.



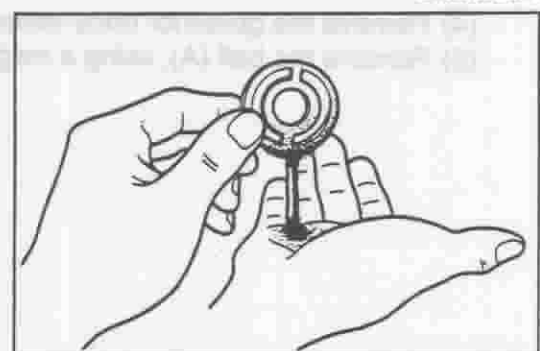
LAT00060-00048

- (2) Check of oil 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.

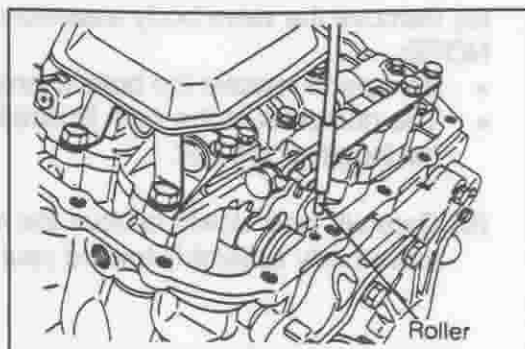
Steel (magnetic) ... Wear of bearing, gear and plate

Brass (nonmagnetic) ... Wear of bush



LAT00061-00049

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

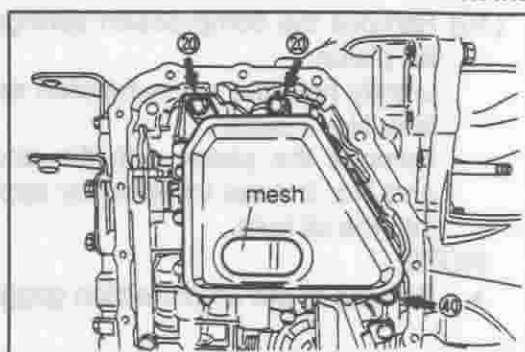


LAT00062-00050

- (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.

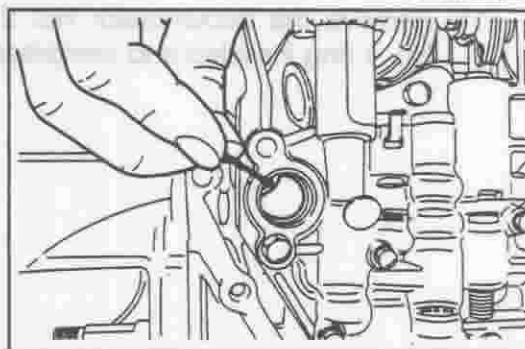


LAT00063-00051

- (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.

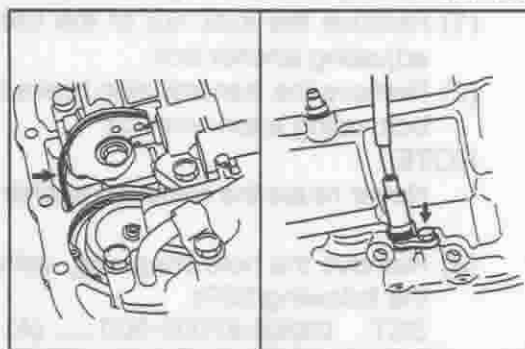


LAT00064-00052

- (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.

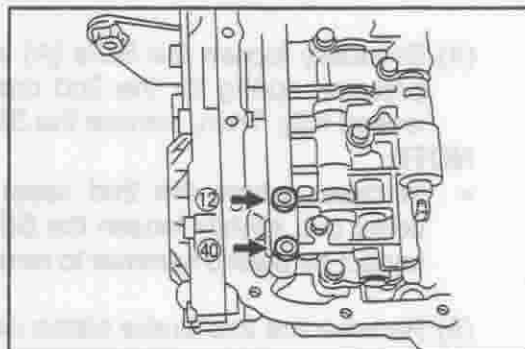


LAT00065-00053

- (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.



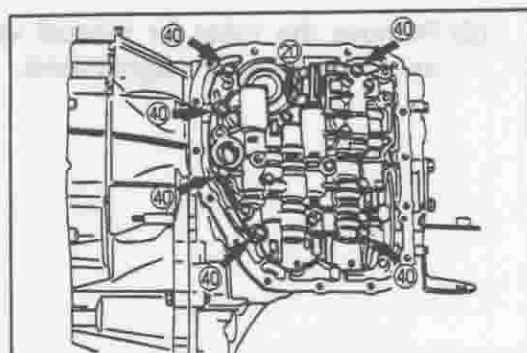
LAT00066-00054

(8) Remove the valve body assembly.

NOTE:

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

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



LAT00067-00055

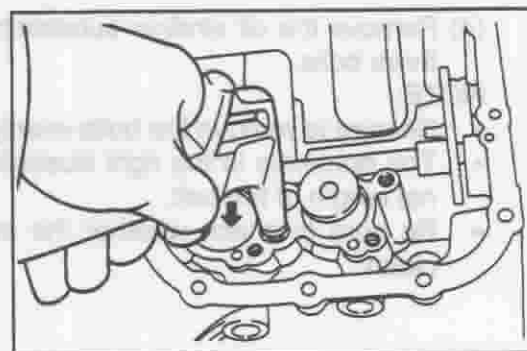
(10) Remove the compression springs of the B₁ accumulator piston.

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.

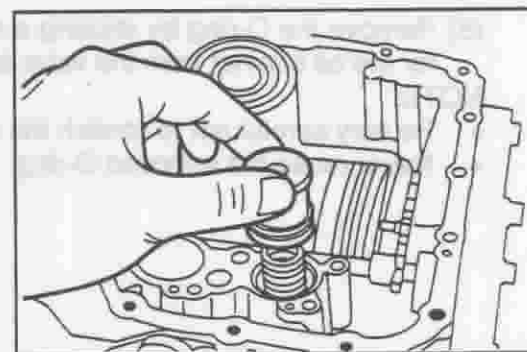
NOTE:

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



LAT00068-00056

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



LAT00069-00057

12. 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.

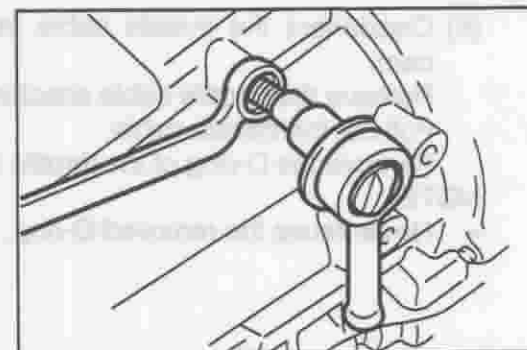
NOTE:

- 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)



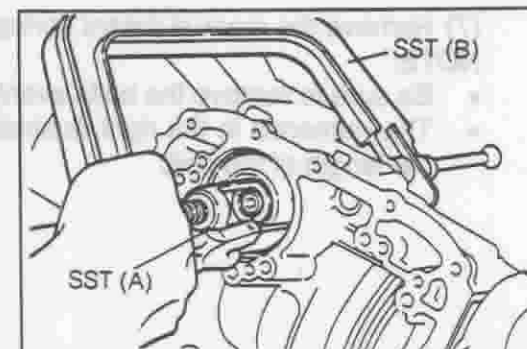
LAT00070-00058

(4) Gradually loosen the SSTs (A) and (B), 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. Then, apply a light impact by plastic hammer to remove the piston.

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



LAT00071-00059

13. Remove the manual lever subassembly.

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

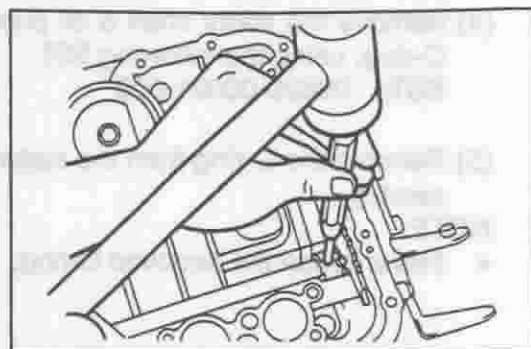
NOTE:

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

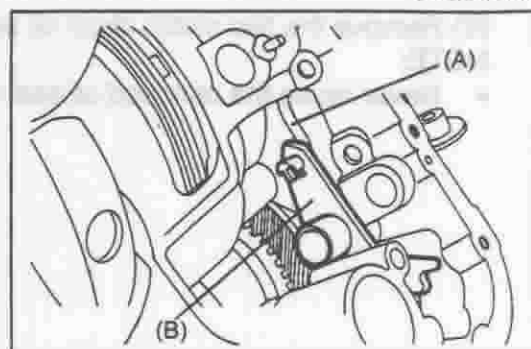
- (2) Pull out the manual valve lever shaft subassembly toward the engine side.

- (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.



LAT00072-00050



LAT00073-00051

14. Remove the stator shaft & oil pump assembly.

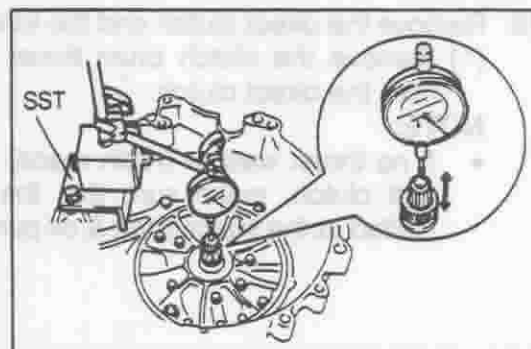
- (1) Measure the input shaft end play, using a dial gauge and following SST.

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.



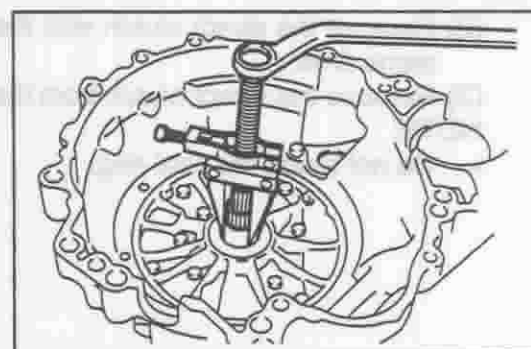
LAT00074-00052

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

SST: 09308-10010-000

NOTE:

- Never reuse the removed oil seal.

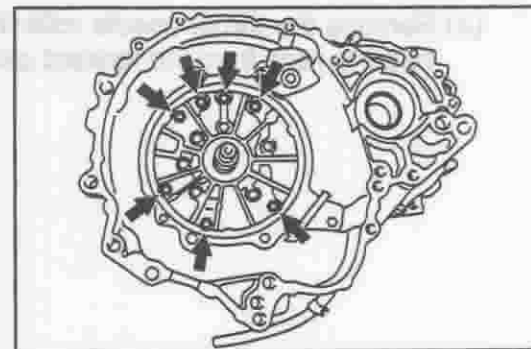


LAT00075-00053

- (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.



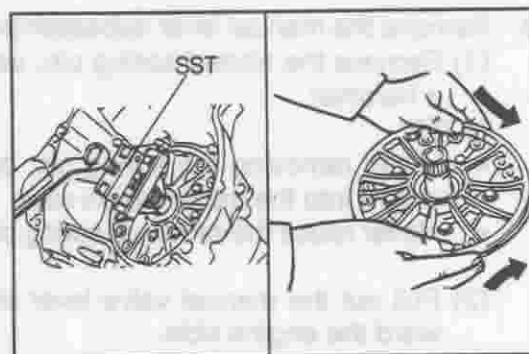
LAT00076-00054

- (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.

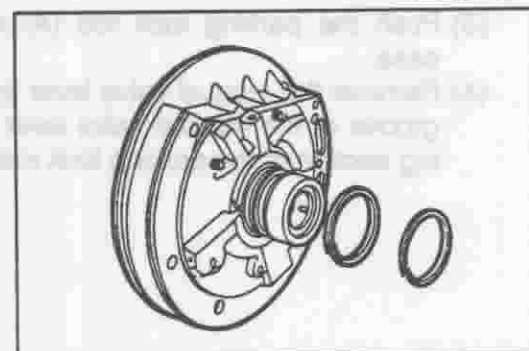


LAT00077-00065

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

NOTE:

- Never reuse the removed oil seal rings.



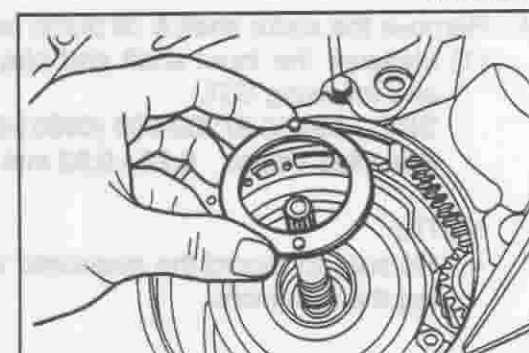
LAT00078-00066

15. Remove the direct clutch and the 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.



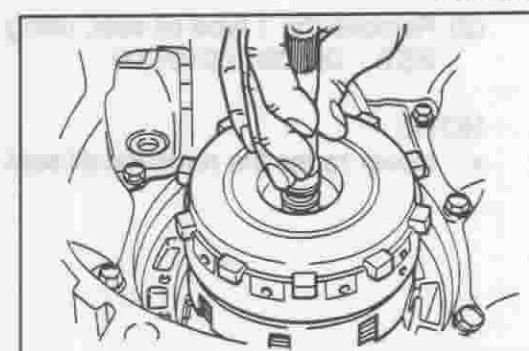
LAT00079-00067

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

- (3) Remove the direct clutch from the forward clutch.

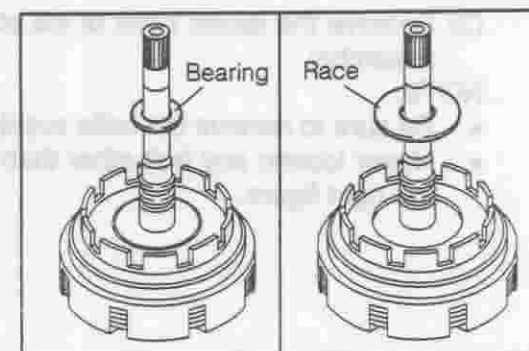
NOTE:

- Do not touch the seal ring.



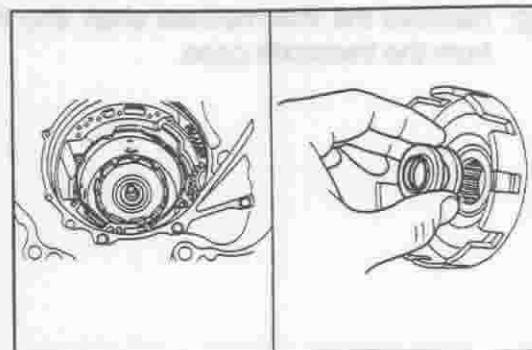
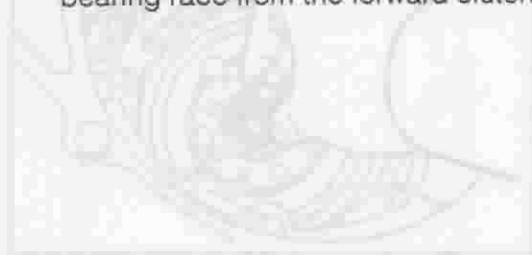
LAT00080-00068

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



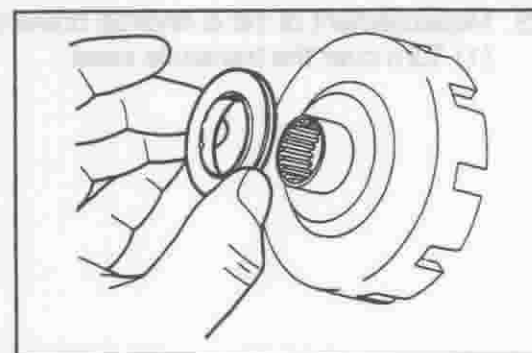
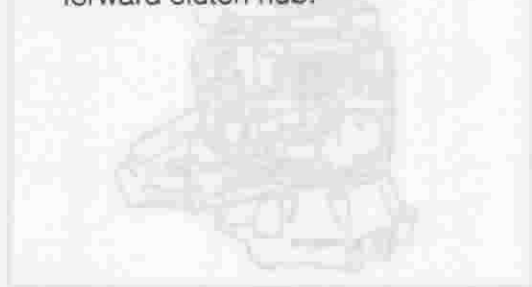
LAT00081-00069

16. Remove the forward clutch hub from the transaxle case.
17. Remove the thrust needle bearing and the thrust needle bearing race from the forward clutch hub.



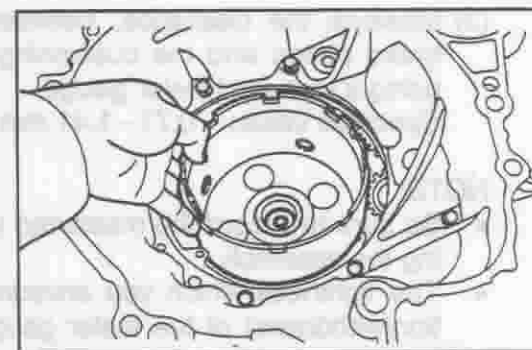
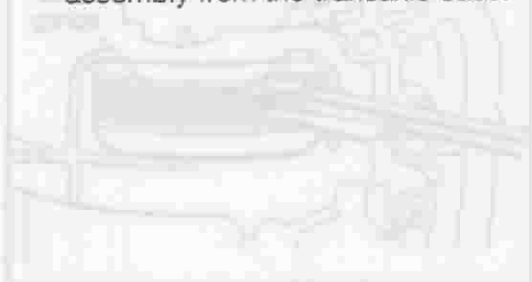
LAT00082-00070

18. Remove the thrust needle bearing from the back side of forward clutch hub.



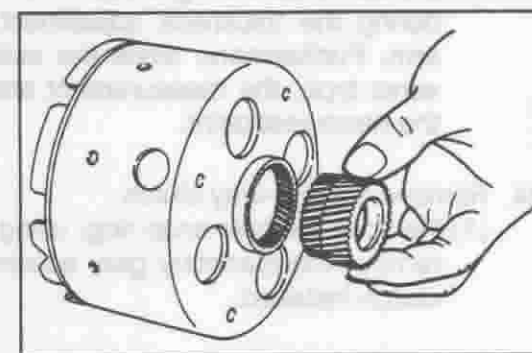
LAT00083-00071

19. Remove the 2nd brake drum with the planetary sun gear assembly from the transaxle case.



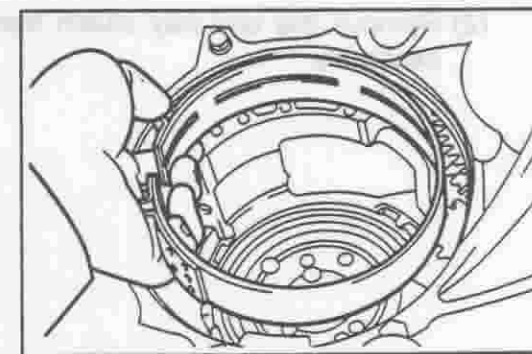
LAT00084-00072

20. Remove the planetary sun gear assembly from the 2nd brake drum.



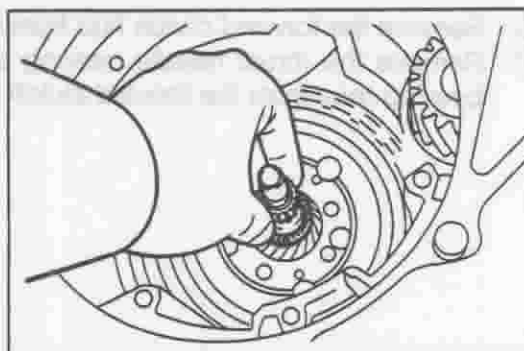
LAT00085-00073

21. Remove the transmission brake band assembly.



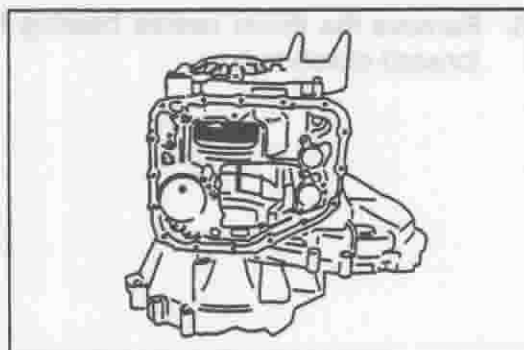
LAT00086-00074

22. Remove the intermediate shaft and thrust needle bearing from the transaxle case.



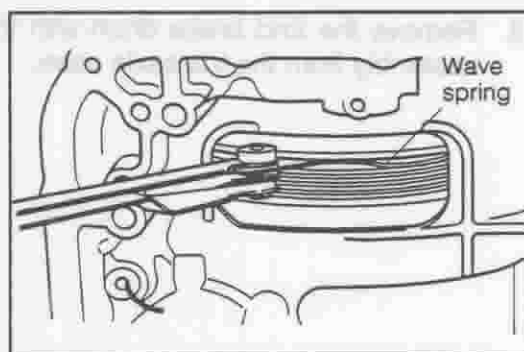
LAT00087-00075

23. Measurement of 1st & reverse brake clearance
(1) Turn over the transaxle case.



LAT00088-00076

- (2) Measure the clearance, between the 1st & reverse brake piston and the cushioning plate (wave spring) using a standard feeler gauge.
Specified Value: 0.71 - 1.41 mm



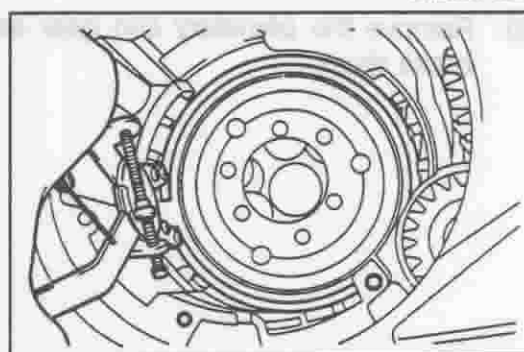
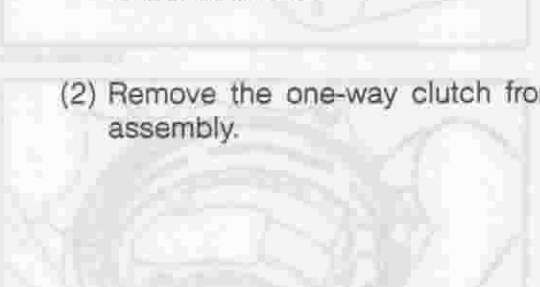
LAT00089-00077

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. Furthermore, since the cushioning plate is of a wave type, the measurement should be performed at the narrowest point.

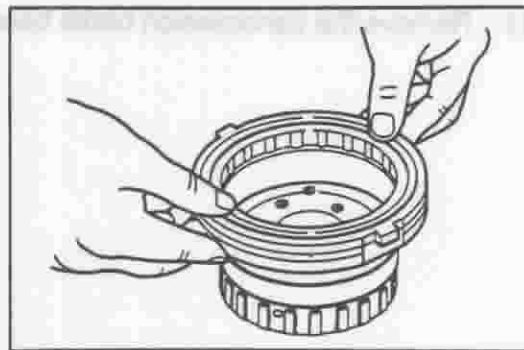
24. Remove the one-way clutch.

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



LAT00090-00078

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



LAT00091-00079

25. Remove the brake plates and the brake disc.

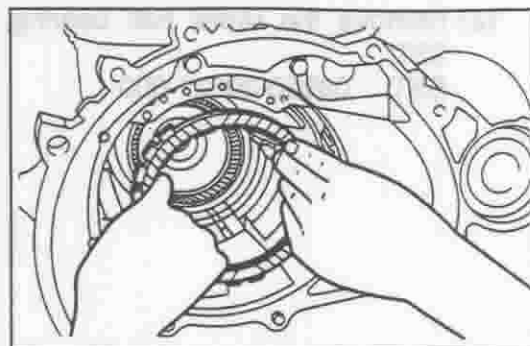
- (1) Remove the brake discs, brake plates and brake cushion plate.

Stack the removed discs, plates and cushion plate in the same sequence in which they were assembled.

D = Brake disc, P = Brake plate

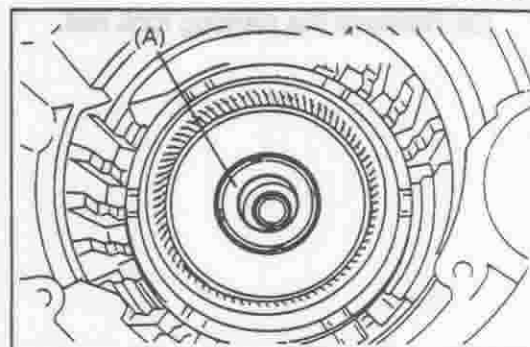
B = Brake cushion plate

D → P → D → P → D → P → D → P → D → P → B



LAT00082-00080

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



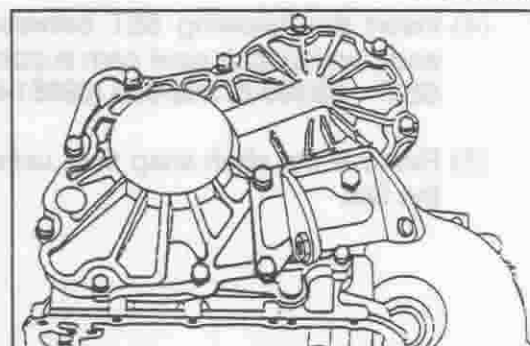
LAT00083-00081

26. Remove the rear transmission case cover and the transaxle case rear cover gasket.

- (1) Remove the bolts from the rear transmission case cover subassembly.

NOTE:

- Be sure to loosen the bolts evenly and diagonally.



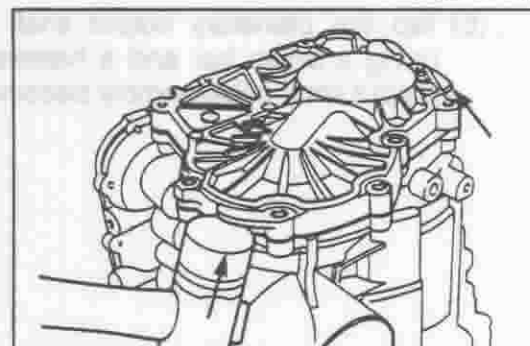
LAT00084-00082

- (2) Perform the removal by lightly and evenly tapping the rear transmission case cover at the two rib sections, using a plastic hammer.

- (3) Remove the transaxle case rear cover gasket.

NOTE:

- Never reuse the removed gasket.



LAT00085-00083

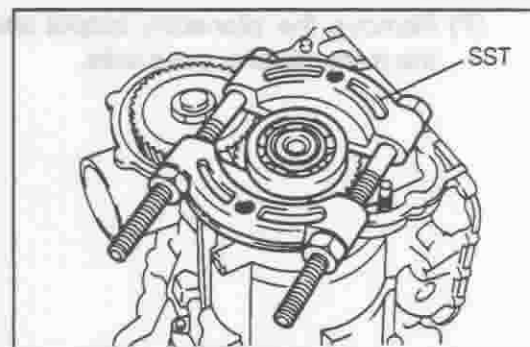
27. Removal of planetary output shaft subassembly.

- (1) Lift the radial ball bearing slightly, using the following SST.

SST: 09950-87701-000

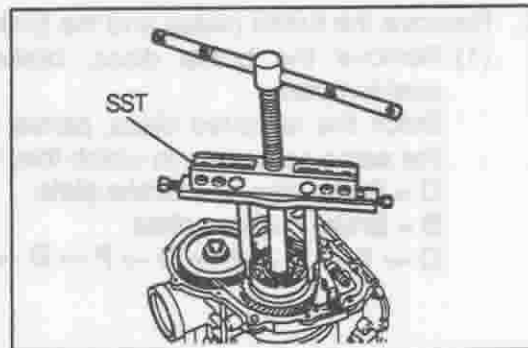
NOTE:

- Be very careful not to damage the shaft section of the reduction drive gear when using the above SST.



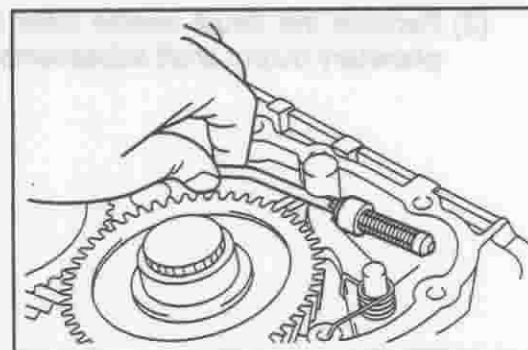
LAT00086-00281

- (2) Remove the radial ball bearing, using the following SST.
SST: 09950-20017-000



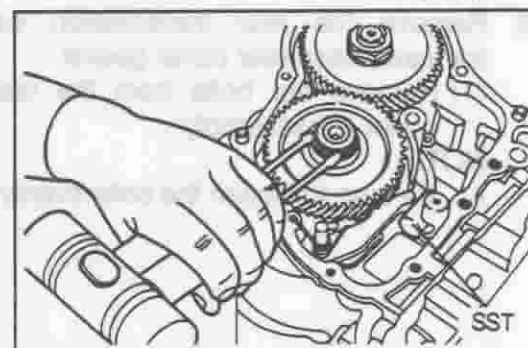
LAT00097-00084

- (3) Remove the parking lock rod.



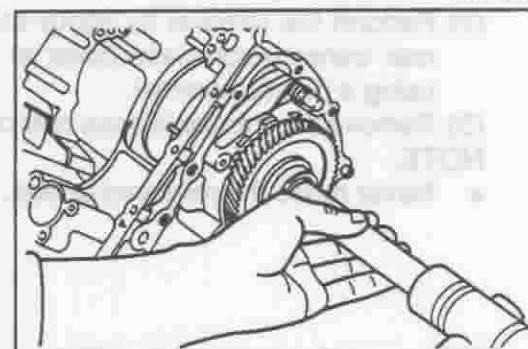
LAT00098-00085

- (4) Insert the following SST between parking lock pawl and parking lock pawl cam support.
SST: 09350-87202-000 (09351-87209-000)



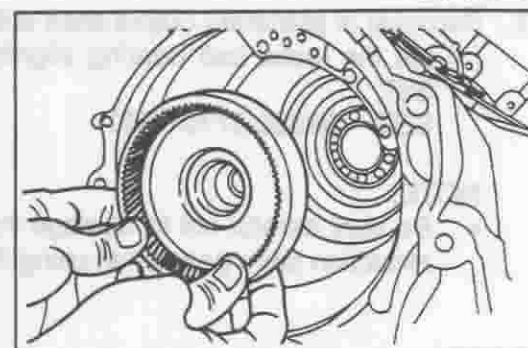
LAT00099-00086

- (5) Remove the shaft snap ring, using the 2 flat drivers or the like.



LAT00100-00087

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



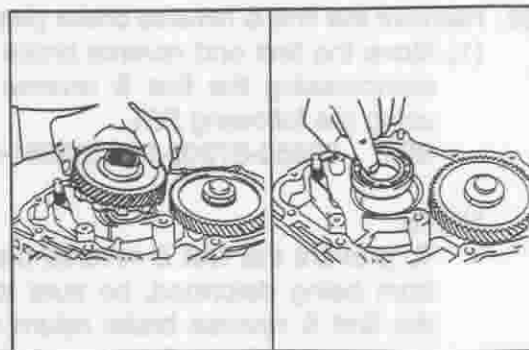
LAT00101-00088

- (7) Remove the planetary output shaft subassembly from the transmission case side.

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

NOTE:

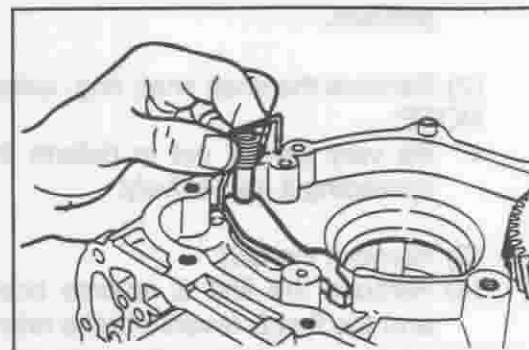
- If any difficulty is encountered in removing the radial ball bearing, remove it by applying a light impact from the inside of the transmission case, using a suitable brass bar in combination with a plastic hammer.



LAT00102-00089

28. Remove the parking lock pawl

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

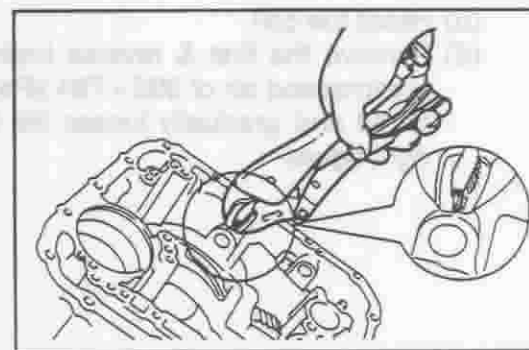


LAT00103-00090

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

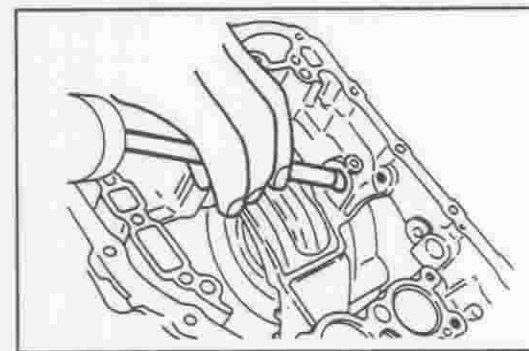
NOTE:

- Securely pinch the slotted spring pin by means of a vice clip. Turn the pin clockwise and counterclockwise and pull the slotted spring pin.
- Never reuse the removed slotted spring pin.



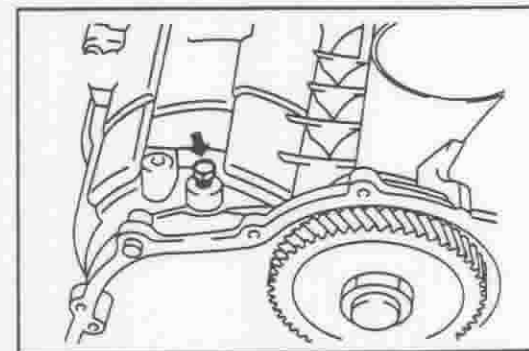
LAT00104-00091

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



LAT00105-00092

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



LAT00106-00093

29. Remove the first & reverse brake piston.

- (1) Move the first and reverse brake return spring seat by compressing the first & reverse brake return spring, using the following SST.

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

NOTE:

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

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

NOTE:

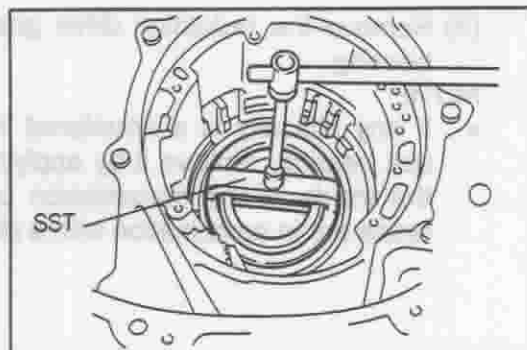
- Be very careful not to deform the shaft snap ring by spreading it excessively.

- (3) Remove the SST.

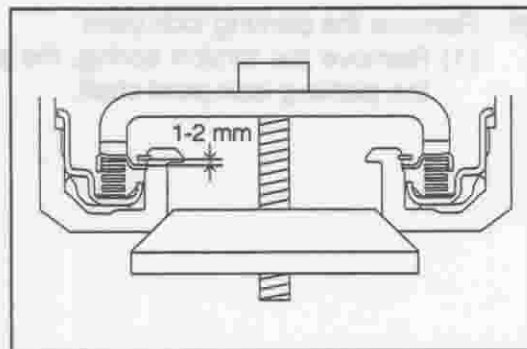
- (4) Remove the first & reverse brake return spring seat and the first & reverse brake return spring.

- (5) Reset the SST.

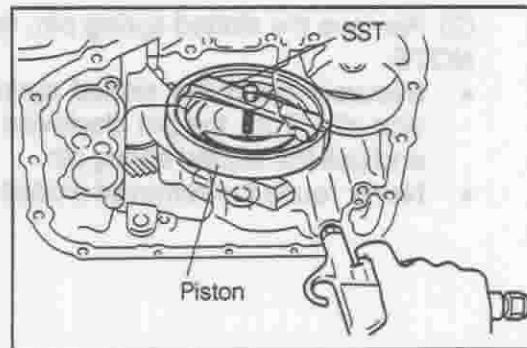
- (6) Remove the first & reverse brake piston by applying compressed air of 392 - 784 kPa from the oil hole indicated and gradually loosen the bolt of the SST in the right figure.



LAT00107-00094



LAT00108-00095



LAT00109-00096

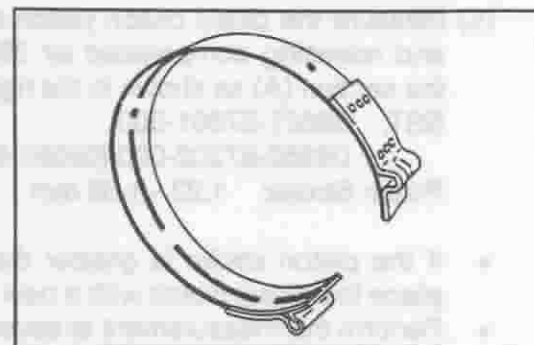
INSPECTION

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.



LAT00111-00099

2. Direct clutch assembly

Check the inner diameter

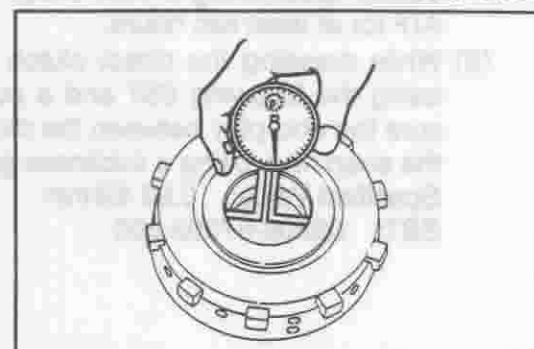
Measure the bush inner diameter of the direct clutch piston subassembly, using an inner caliper gauge.

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.



LAT00117-00105

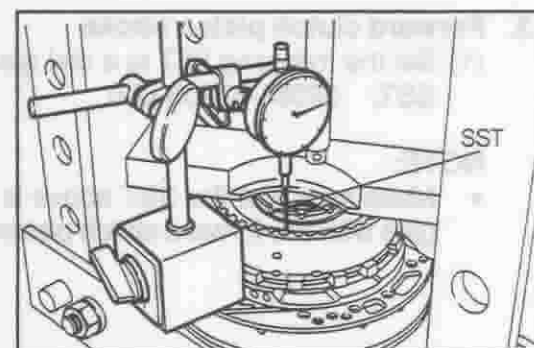
Check of piston stroke of direct clutch

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

(2) Install the direct clutch on the stator.

NOTE:

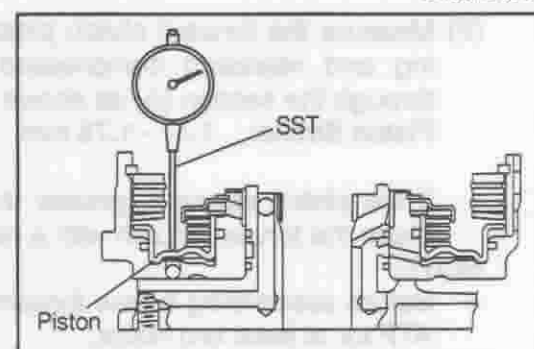
- Be very careful not to scratch the clutch drum oil seal rings of the stator.
- (3) Secure the direct clutch, using the plate and a press, to such an extent that the direct clutch will not move in an up-&-down direction.
- (4) Install the following SST to the dial gauge.
- SST: 09350-87202-000 (09351-87203-000)



LAT00112-00100

NOTE:

- Make sure that the SST (B) installed to the dial gauge is in contact at right angles with the direct clutch outer piston. Make sure that the SST is not in contact with any part other than the piston.



LAT00113-00101

- (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)

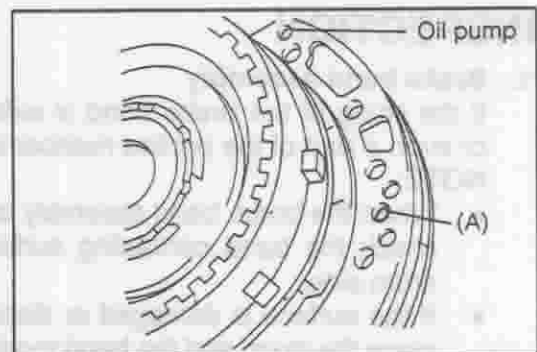
Piston Stroke: 1.22 - 1.53 mm

- 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.

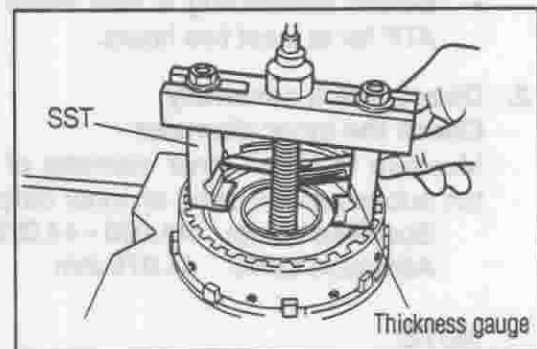
- (6) While pressing the direct clutch flange 9.8 - 29.4 N, using the following SST and a pushable gauge, measure the end play between the direct clutch flange and the snap ring, using a thickness gauge.

Specified Value: 0.93 ± 0.15 mm

SST: 09306-87302-000

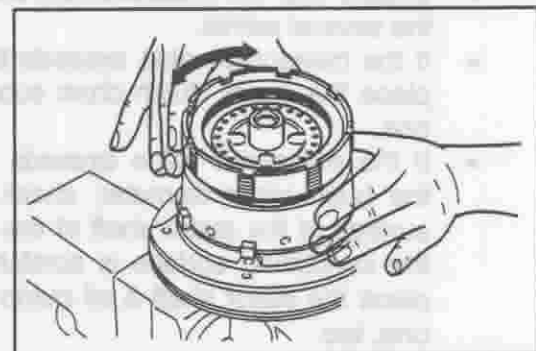


LAT00114-00102



LAT00115-00103

- (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.



LAT00115-00104

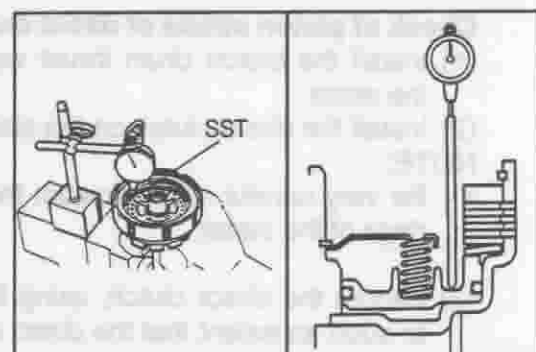
3. Forward clutch piston stroke

- (1) Set the following SST to a dial gauge.

SST: 09351-87203-000

NOTE:

- Make sure that the SST above is in contact at right angles with the forward clutch piston subassembly.



LAT00293-00282

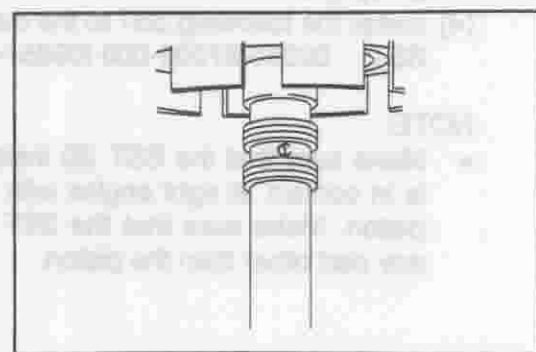
- (2) Measure the forward clutch piston stroke while applying and releasing compressed air 392 - 784 kPa through the section (A) as shown in the right figure.

Piston Stroke: 1.47 - 1.78 mm

If the piston stroke is greater than the maximum, replace the forward clutch with a new one.

NOTE:

- Before assembling a new forward clutch, soak it in the ATF for at least two hours.



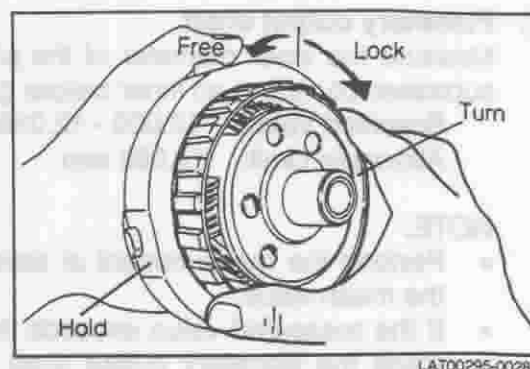
LAT00294-00283

4. One-way clutch

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

NOTE:

- Ensure that the one-way clutch turns freely when turned counterclockwise and locked when turns clockwise.



LAT00295-00284

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.

Approx

Unit: mm

No.	③	⑥	⑨	⑫	⑮
Outer diameter	35.1	31.0	46.5	35.1	46.5
Inner diameter	22.0	16.5	25.0	22.0	25.0
Thickness	2.8	5.3	5.0	2.8	5.0

The numbers above are corresponding to those in the figure on page AT-28.

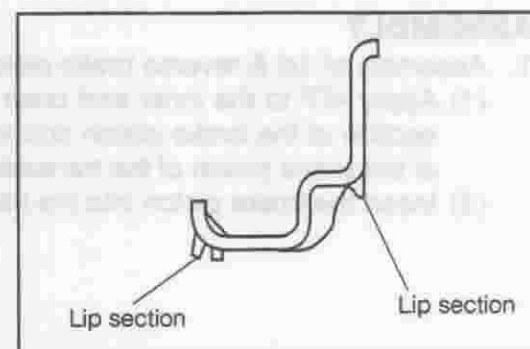
LAT00296-00000

6. 1st & reverse brake piston

Visually check to see if the lip section exhibits damage or abnormal wear.

NOTE:

- If any abnormality is found, replace the 1st & reverse piston with a new one.



LAT00125-00113

7. Planetary output shaft

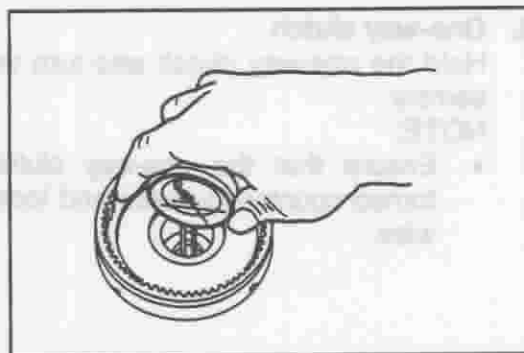
Measure the inner diameter of the planetary output shaft subassembly, using an inner caliper gauge.

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.



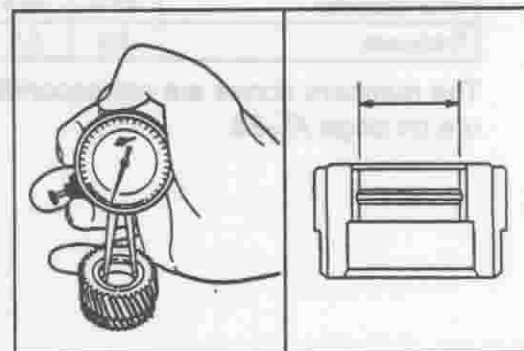
LAT00136-00124

8. Planetary sun gear

Measure the inner diameter of the planetary sun gear subassembly, using an inner caliper gauge.

Specified Value: 22.020 - 22.038 mm

Allowable Limit: 22.088 mm

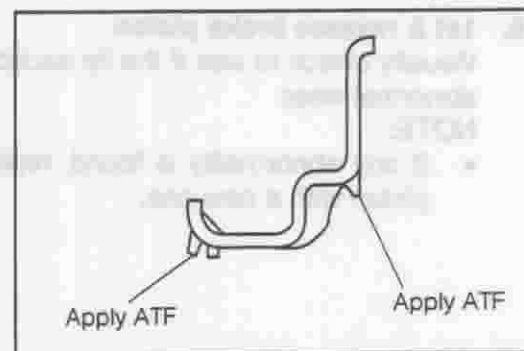


LAT00297-00146

ASSEMBLY

1. Assembly of 1st & reverse brake piston

- (1) Apply ATF to the inner and outer peripheries of the lip section of the brake piston and to the inserted section of the brake piston of the transaxle case.
- (2) Insert the brake piston into the transaxle case.



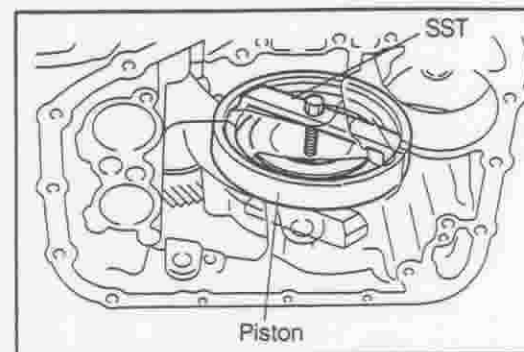
LAT00126-00114

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

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

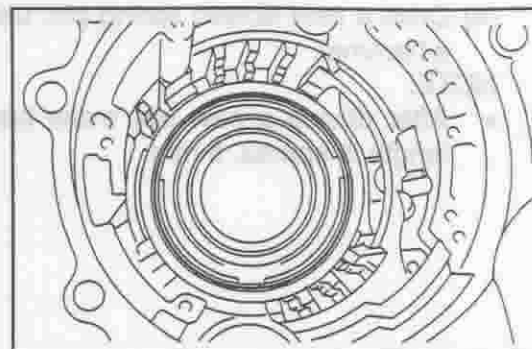
NOTE:

- When installing the piston, care must be exercised to ensure that the lip section of the brake piston may not be caught in the case or be damaged during the installation.



LAT00127-00115

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



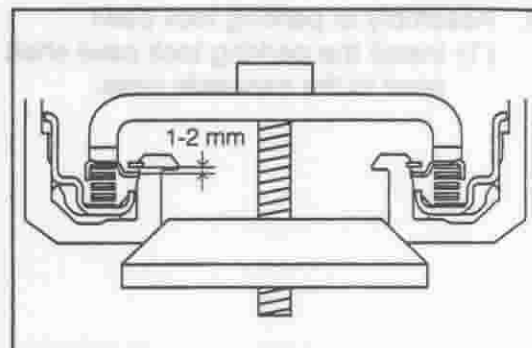
LAT00128-00116

- (5) Compress the brake return spring seat, 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.

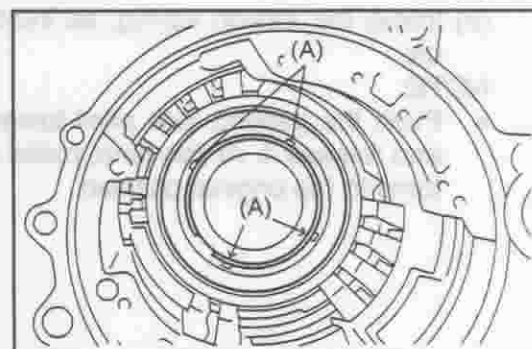


LAT00129-00117

- (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.



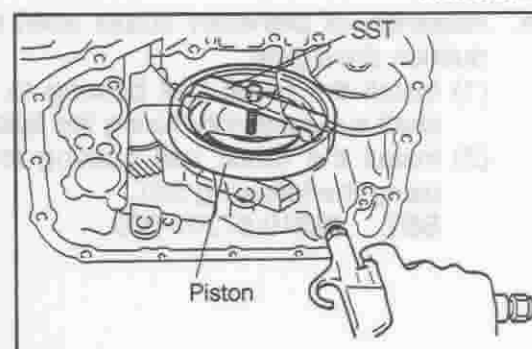
LAT00130-00118

Confirmation of operation

1. When compressed air of 392 - 784 kPa is applied, ensure that the 1st & reverse piston operates smoothly without exhibiting air leakage.

NOTE:

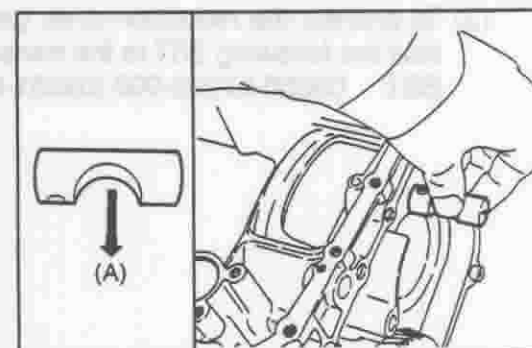
- In cases where the operation is not smooth, perform the overhaul and check again.
- In cases where air leakage is present, check to see if the lip section of the piston is damaged, the piston inserted section of the case is damaged, or the piston is assembled slantingly.



LAT00131-00119

2. Assembly of parking lock pawl cam

- (1) Face the recessed side of the parking lock pawl cam support (A) toward the section at the drive gear side.
- (2) Align the hole of the parking lock pawl cam support with the slotted spring pin installation hole of the transaxle case.
- (3) Install the parking lock pawl cam support to the transaxle case.

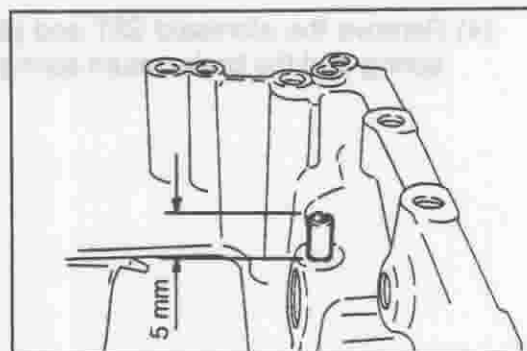


LAT00132-00120

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

NOTE:

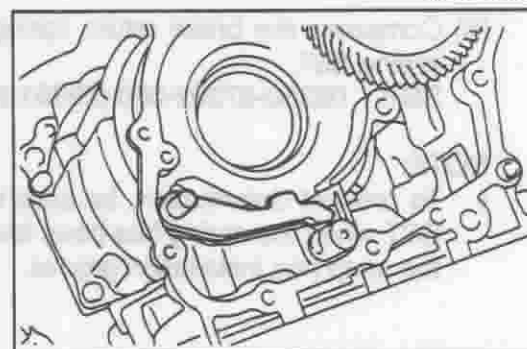
- After driving a new pin, make sure that its protruding length is approx. 5 mm.



LAT00133-00121

3. Assembly of parking lock pawl.

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

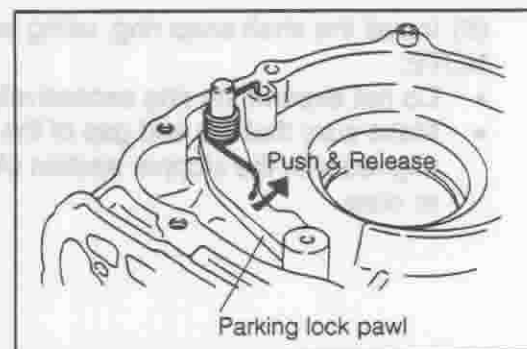


LAT00134-00122

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

NOTE:

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

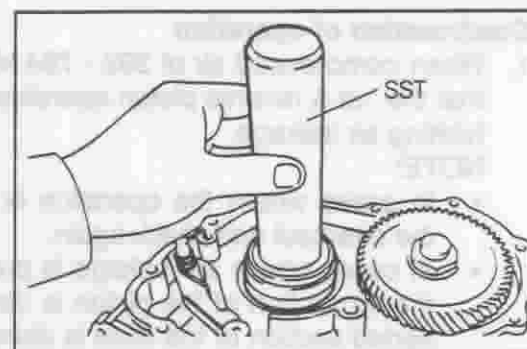


LAT00135-00123

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

- (1) Install the radial ball bearing to the planetary output shaft subassembly. Using the following SST.
- (2) Install the radial ball bearing to the transaxle case, using the following SST.

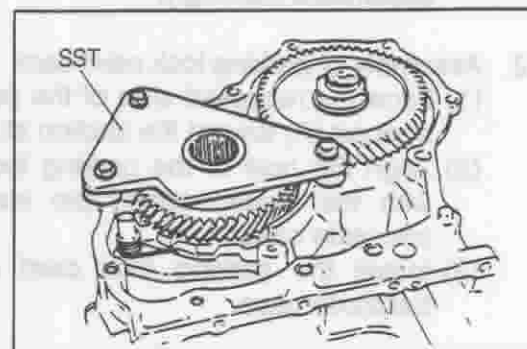
SST: 09310-87301-000



LAT00137-00125

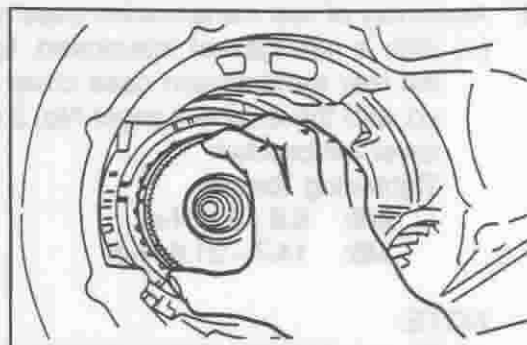
- (3) To prevent the reduction drive gear from dropping, install the following SST to the transaxle case.

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



LAT00138-00126

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



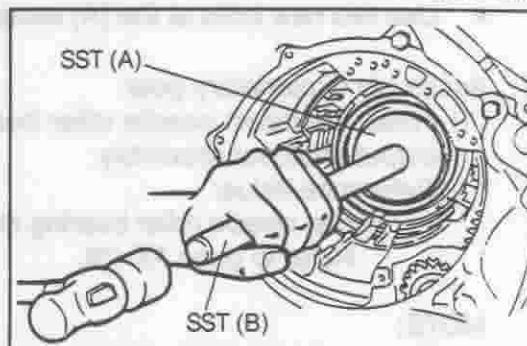
LAT00139-00127

- (5) Drive the planetary output shaft subassembly, using the following SSTs.

SST: 09608-30011-000

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

09631-12020-000 ... (B)

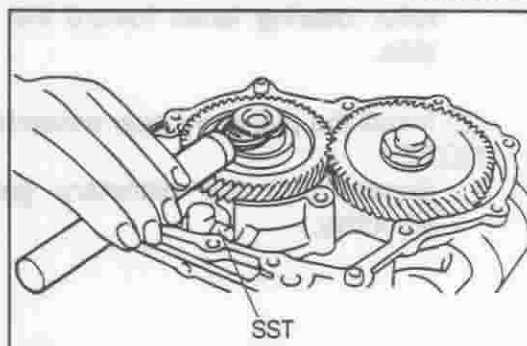


LAT00140-00128

- (6) 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)

- (7) Install the shaft snap ring to the grooved section of the planetary output shaft subassembly, using a brass bar and a hammer.



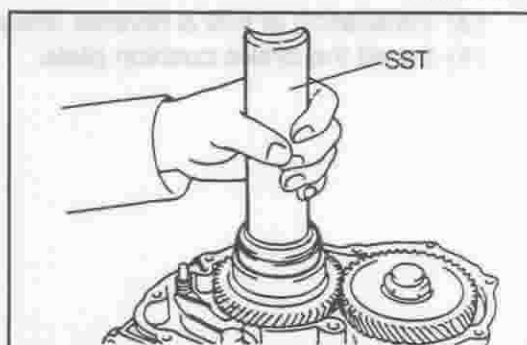
LAT00141-00129

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

SST: 09310-87301-000

NOTE:

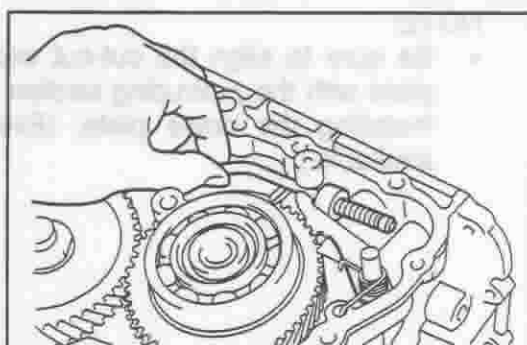
- Make sure that the bearing is installed positively to the edge surface of the reduction drive gear.



LAT00142-00130

5. Assembly of parking rod subassembly.

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



LAT00143-00131

6. Assembly of rear transmission case cover subassembly

- (1) 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.

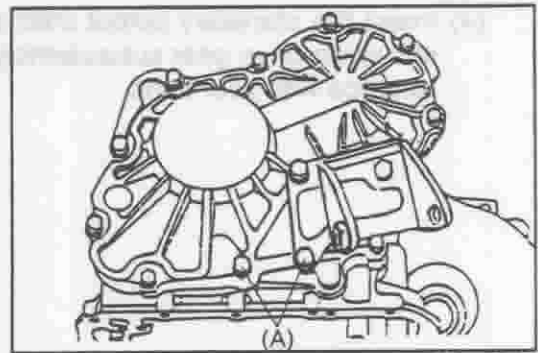
Tightening Torque:

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.



LAT00144-00132

7. Assembly of planetary gear

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

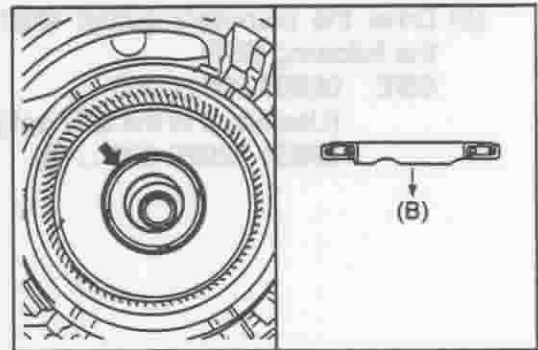
Reference Value:

Thrust needle roller bearing dimension:

Refer to page AT-28.

NOTE:

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

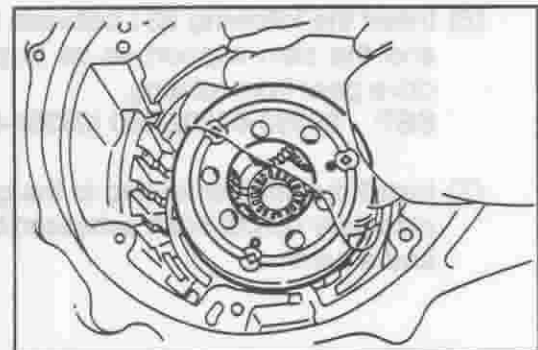


LAT00145-00133

- (2) Install the planetary gear assembly.

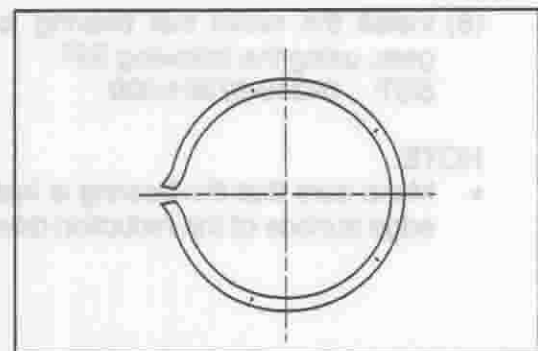
NOTE:

- Ensure that the planetary gear assembly rotates smoothly.



LAT00146-00134

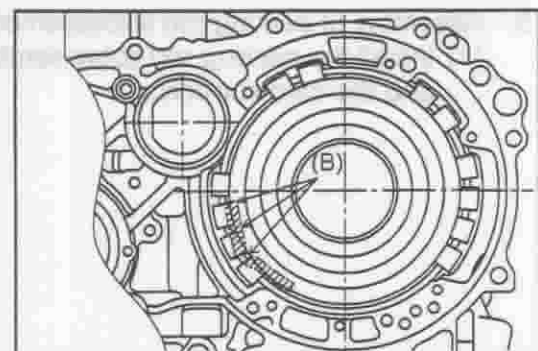
- (3) Installation of first & reverse brake
- (4) Install the brake cushion plate.



LAT00147-00135

NOTE:

- Be sure to align the cut-out section (B) of the brake plate with the protruding section of the transaxle when installing the brake plate. (Every cut-out section is available.)



LAT00148-00136

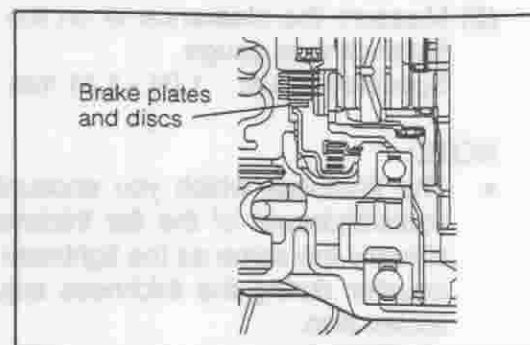
(5) Install the plates and discs in the following order.

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 2 hours.



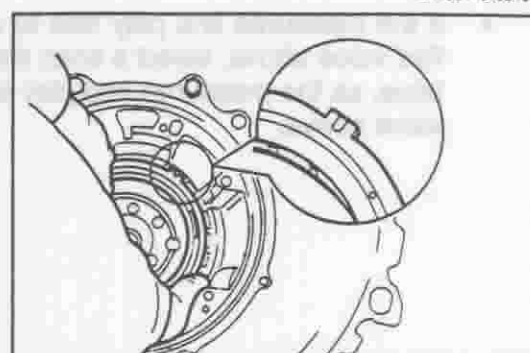
LAT00149-00137

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

(7) 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.

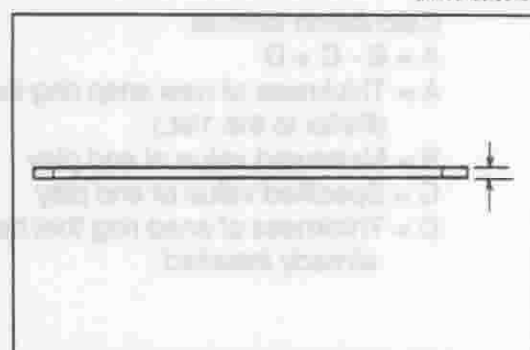


LAT00150-00138

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

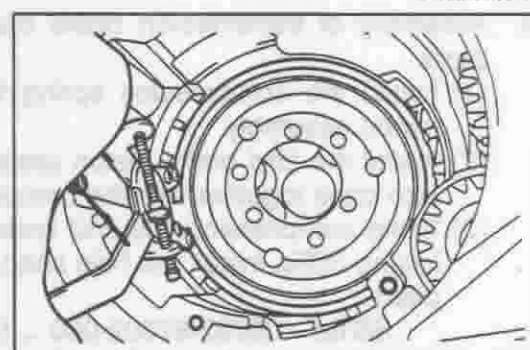
NOTE:

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



LAT00151-00139

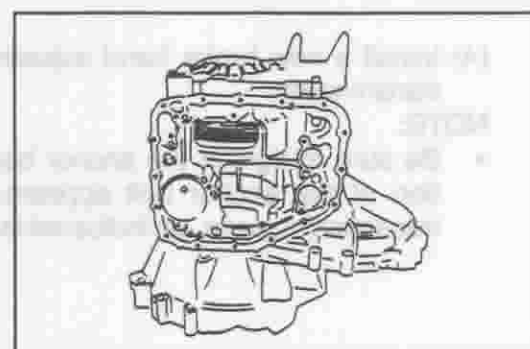
(9) Install the hole snap ring to the grooved section of the transaxle case.



LAT00152-00140

8. Measurement of first & reverse brake clearance

(1) Turn over the transaxle case.

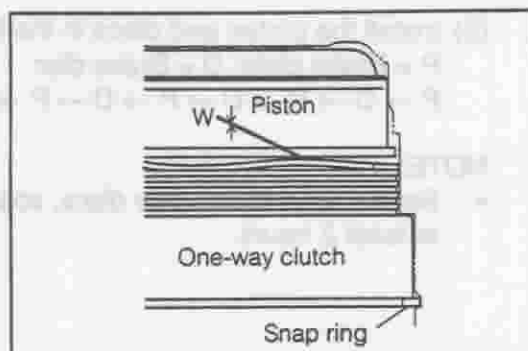


LAT00153-00285

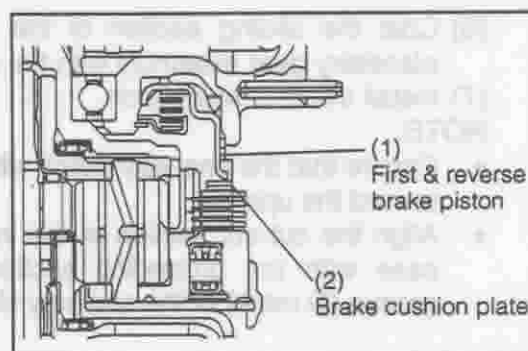
- (2) Measure the clearance W on the right figure, using a flat thickness gauge.
Specified Value: 1.04 - 1.41 mm

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, as the measured end play will meet the specified value above.



LAT00154-00141



LAT00155-00142

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

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

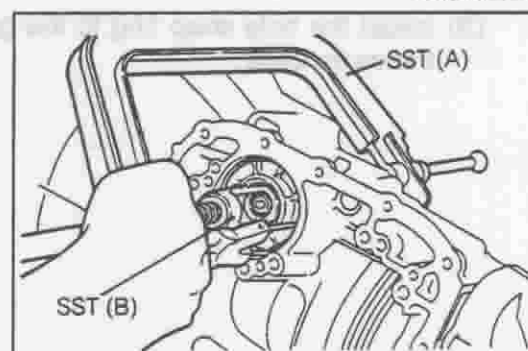
LAT00156-00000

9. Assembly 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)

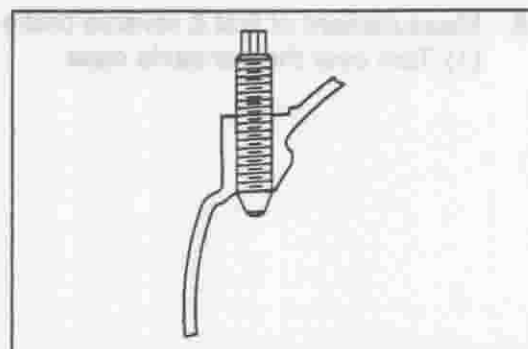


LAT00157-00143

- 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.

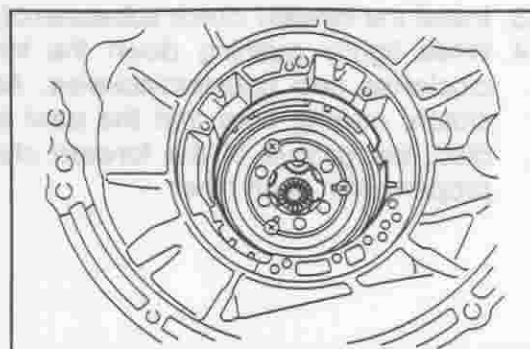


LAT00158-00144

- (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:

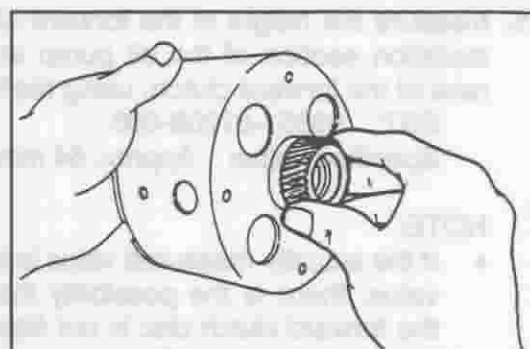
- Before assembling the brake band assembly, soak it in the ATF for at least two hours.



LAT00159-00145

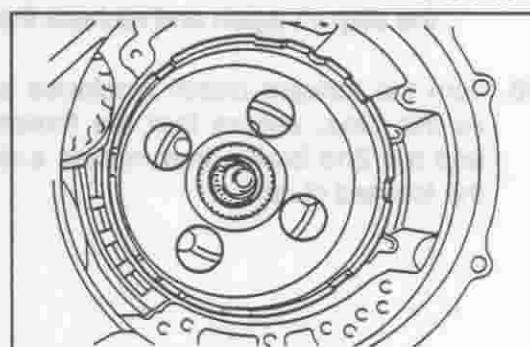
10. Assembly of forward clutch hub and 2nd brake drum

- (1) Install the planetary sun gear to the 2nd brake drum.



LAT00161-00147

- (2) Apply ATF to the bush section of the planetary sun gear and install the 2nd brake drum.

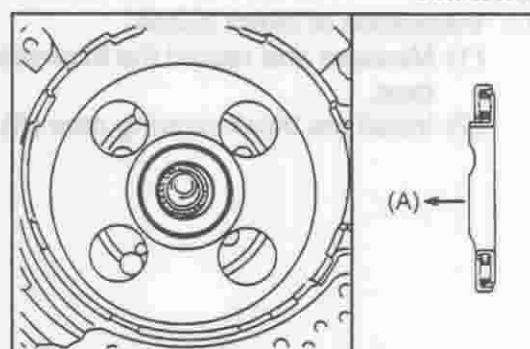


LAT00162-00148

- (3) Coat the bearing with ATF and install the thrust needle roller bearing to the planetary sun gear.

NOTE:

- Ensure that (A) section of the needle roller bearing faces toward the planetary sun gear.
- Reference Value:
Thrust needle roller bearing dimension:
Refer to page AT-28.



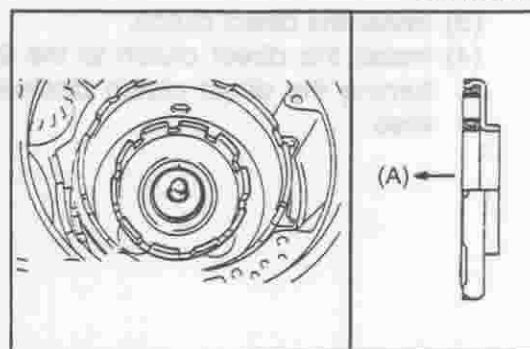
LAT00163-00149

11. Install the forward clutch hub to the intermediate shaft.

12. Coat the bearing with ATF and install the thrust bearing race and thrust needle roller bearing to the forward clutch hub.

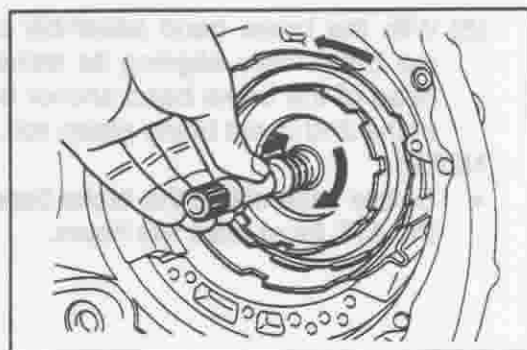
NOTE:

- Ensure that the (A) section of the thrust bearing race faces toward the forward clutch hub side.
- Reference Value:
Thrust needle roller bearing dimension:
Refer to page AT-28.



LAT00164-00150

13. Install the forward clutch subassembly.
14. While lightly pushing down the forward clutch, turn it clockwise and counterclockwise. Assemble the forward clutch, making sure that the pawl of the forward clutch disc, the groove of the forward clutch hub are aligned properly with each other.



LAT00185-00151

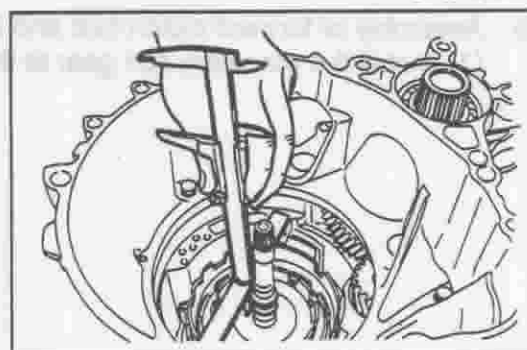
15. Measure the height of the forward clutch between the installation section of the oil pump and the thrust bearing race of the forward clutch, using the following SST.

SST: 09351-87208-000

Specified Value: Approx. 54 mm

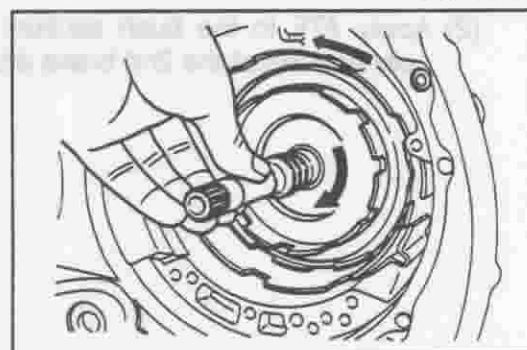
NOTE:

- If the actually measured value is less than the specified value, there is the possibility that the pawl section of the forward clutch disc is not fitted in the groove of the forward clutch hub. Be sure to perform the operation of the step 11 again and recheck the specified dimension.



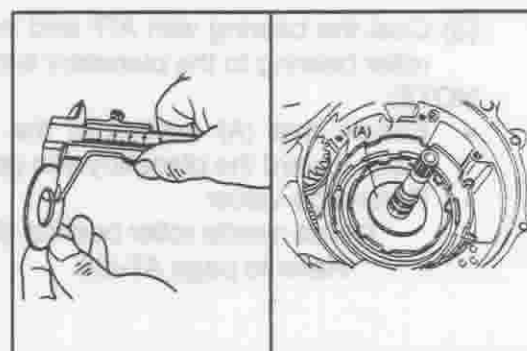
LAT00166-00152

16. 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.



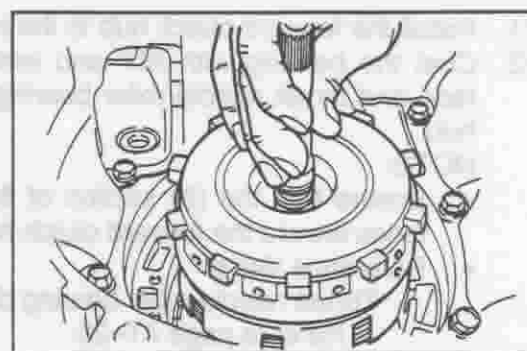
LAT00167-00153

17. Installation of direct clutch
 - (1) Measure and record the thickness of the thrust bearing race.
 - (2) Install the thrust bearing race (A).



LAT00168-00154

- (3) Install the direct clutch.
 - (4) Install the direct clutch to the 2nd brake drum while turning the direct clutch clockwise and counterclockwise.



LAT00169-00155

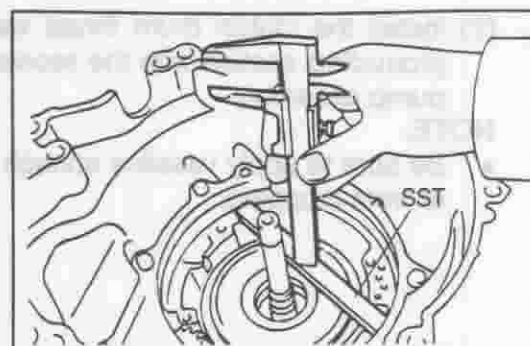
- (5) Confirm the height of the oil pump attaching surface from the direct clutch upper surface, using the following SST.

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.



LAT00170-00156

18. Inspection of stator shaft & oil pump assembly

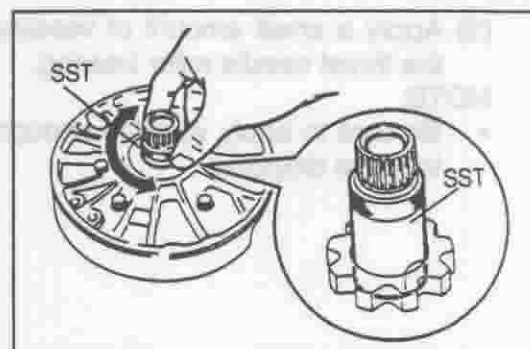
- (1) Inspection of oil pump operation

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.

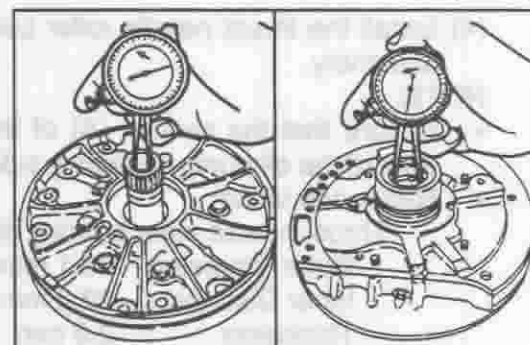


LAT00171-00157

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

Unit: mm

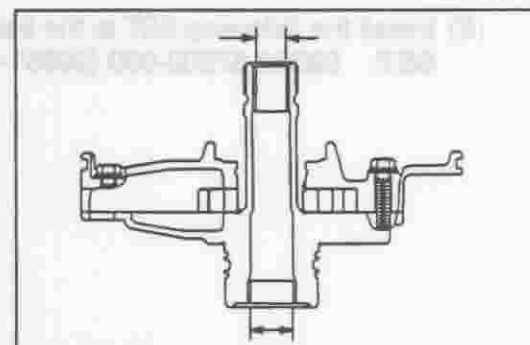
	Specified value	Allowable limit
Front side	15.50 - 15.52	15.57
Rear side	21.10 - 21.12	21.17



LAT00172-00158

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.



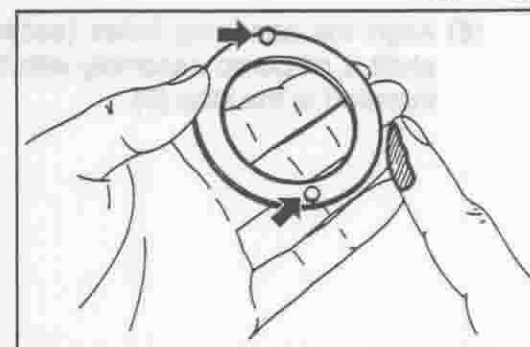
LAT00173-00159

19. 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.

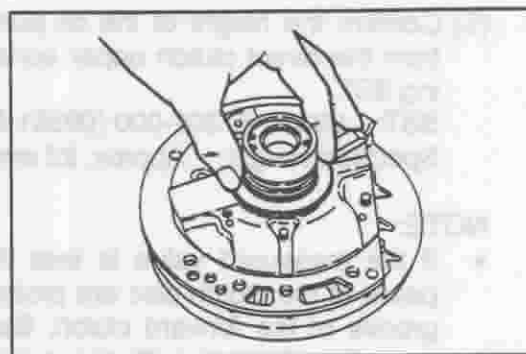


LAT00174-00160

- (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.

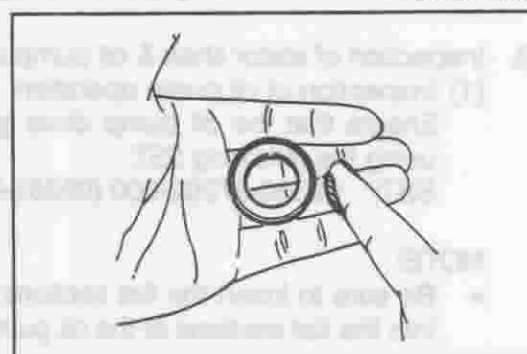


LAT00175-00161

- (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.



LAT00176-00162

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

NOTE:

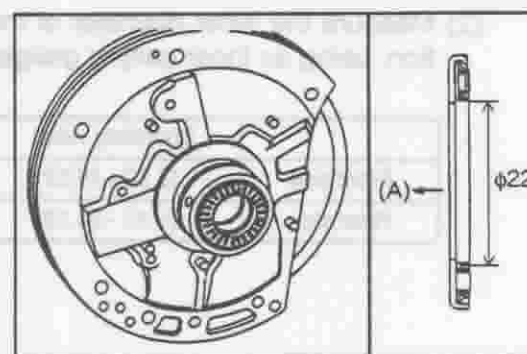
- Ensure that the section (A) of the bearing race faces toward the oil pump assembly side.
- Reference Value:

Thrust needle roller bearing dimensions:

Outer Diameter: 35.1 mm

Inner Diameter: 22.0 mm

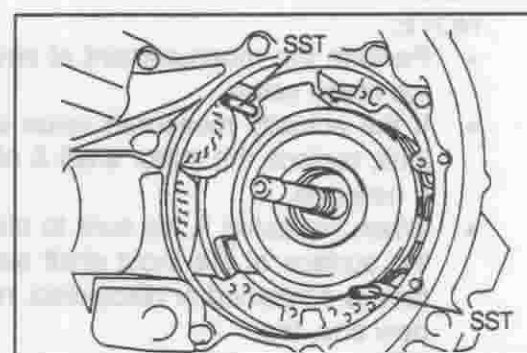
Thickness : 2.8 mm



LAT00177-00163

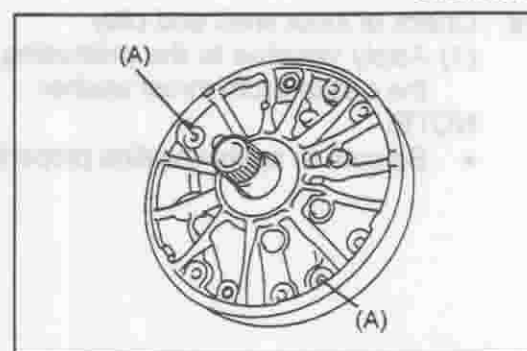
- (5) Install the following SST to the transaxle case.

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



LAT00178-00164

- (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).

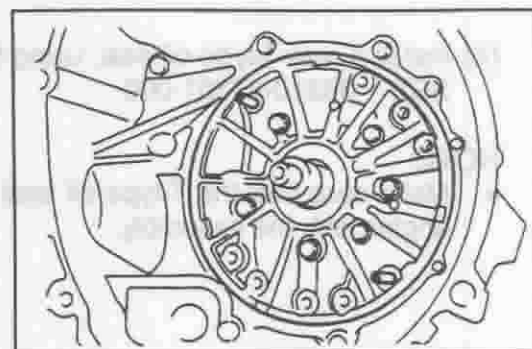


LAT00179-00165

- (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.



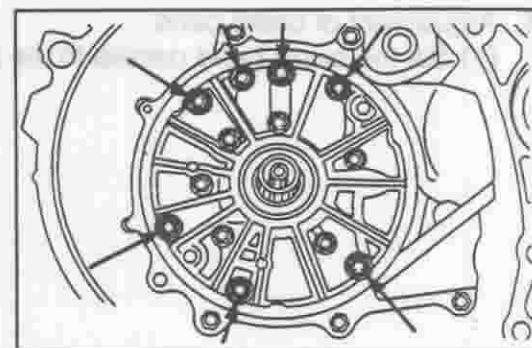
LAT00180-00166

- (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.



LAT00181-00167

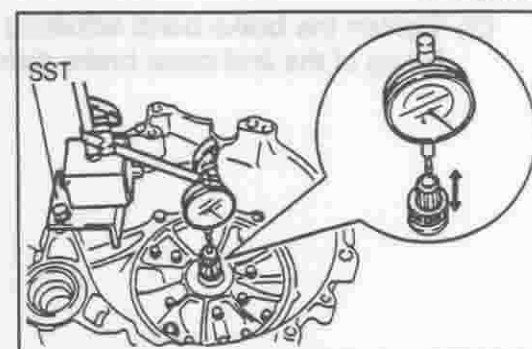
- (9) Measure the input shaft end play with a dial gauge and the following SST.

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 15-(1) to 17-(9).



LAT00182-00168

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

LAT00183-00000

20. Assembly of stator shaft & oil pump assembly

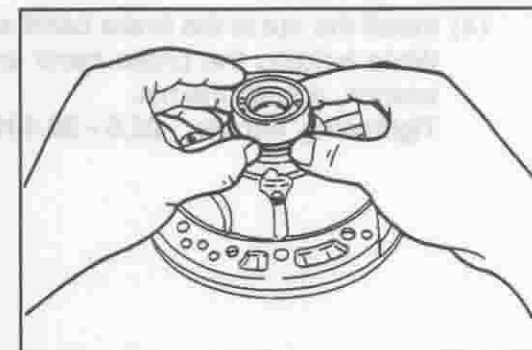
- (1) Coat two new clutch drum oil seal rings with the ATF and install them to the stator shaft & oil pump assembly.

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 19-(1) through 19-(8).

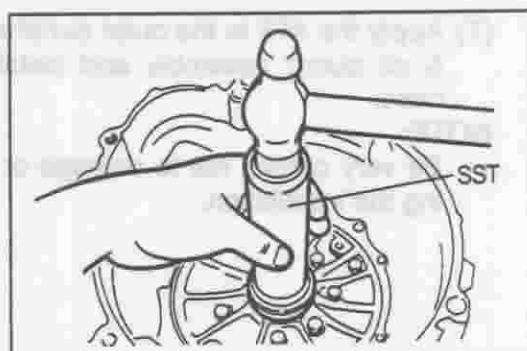


LAT00184-00169

- (4) Install a new T-type oil seal, using the following SST.
SST: 09310-87301-000

NOTE:

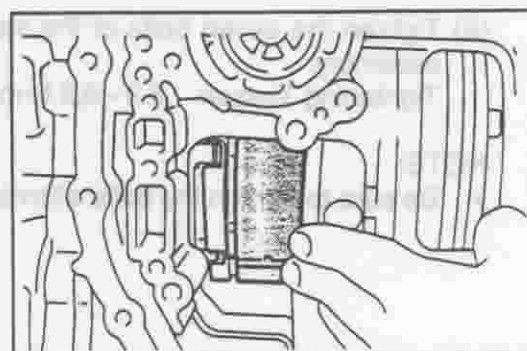
- Make sure that the T-type oil seal is in contact at right angles with the assembly.



LAT00185-00170

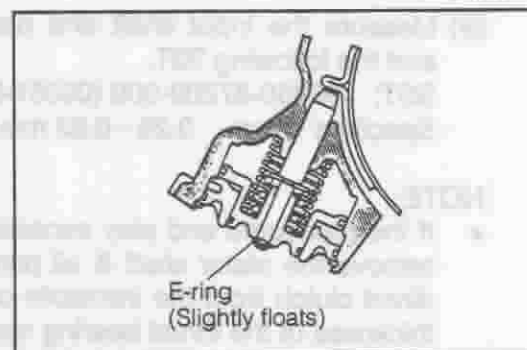
21. Adjustment of brake band

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



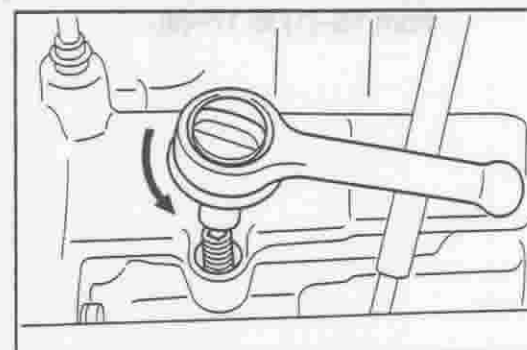
LAT00186-00171

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



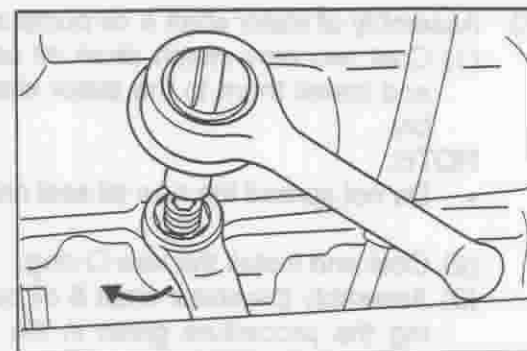
LAT00187-00172

- (3) Under the condition of the step (2) above, loosen the brake band anchor bolt 3.2 turns counterclockwise.



LAT00188-00173

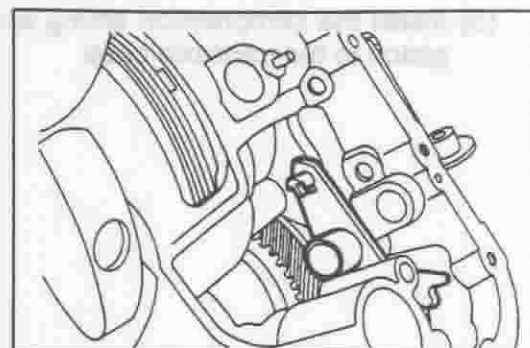
- (4) Install the nut to the brake band anchor bolt. While holding the brake band anchor bolt with a torx wrench, tighten the nut.
Tightening Torque: 22.5 - 30.4 N·m



LAT00189-00174

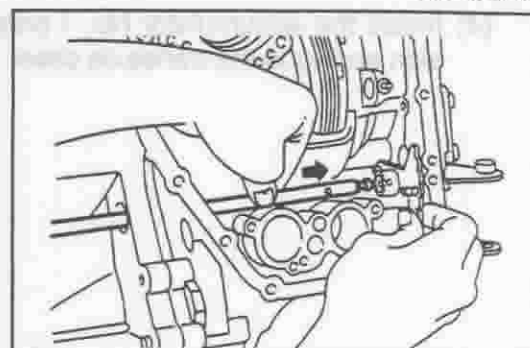
22. Installation of manual valve lever shaft assembly

- (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.



LAT00190-00175

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

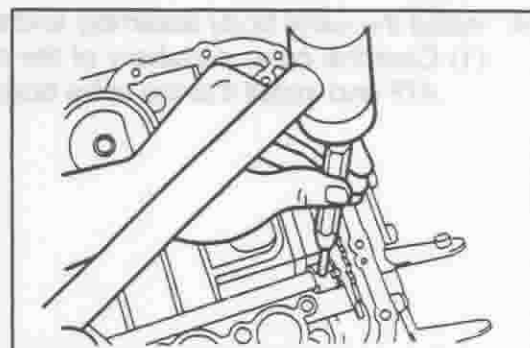


LAT00191-00176

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

NOTE:

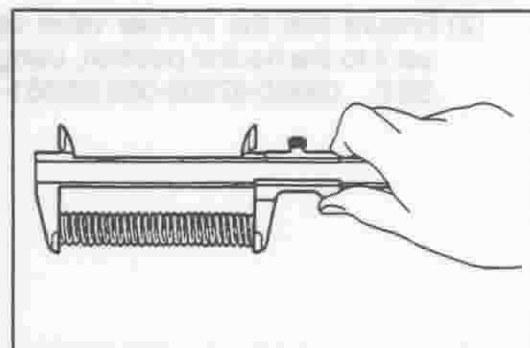
- Be sure to install the pin, until it reaches the edge surface of the manual valve lever.



LAT00192-00177

23. Install the accumulators

- (1) Measure the free length and outer diameter of the accumulator compression springs.
(Refer to the figure in the step 23-(2).)



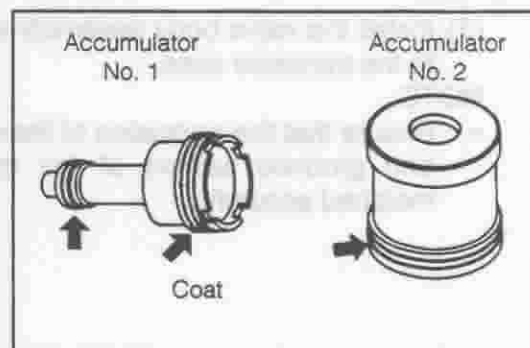
LAT00193-00178

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

NOTE:

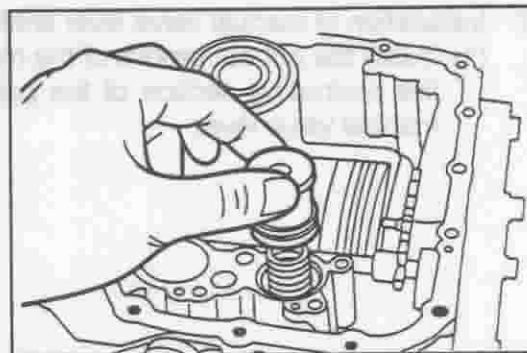
- Do not spread the seal ring end excessively.

		Accumulator compression spring (approx.)	
		B ₁	C ₂
Free length	(mm)	53	117.2
Outer diameter	(mm)	14.5 and 20	18



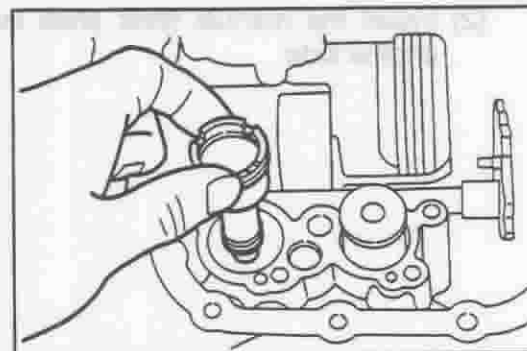
LAT00194-00179

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



LAT00195-00180

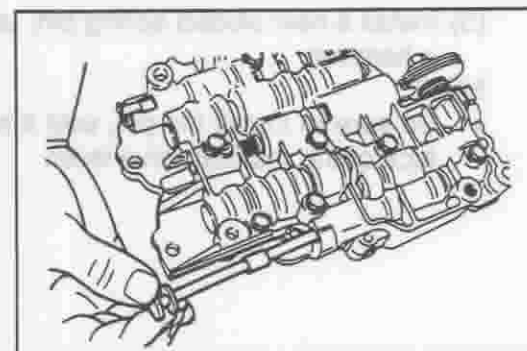
- (4) Install the accumulator No. 1 piston and the compression spring to the transaxle case.



LAT00196-00181

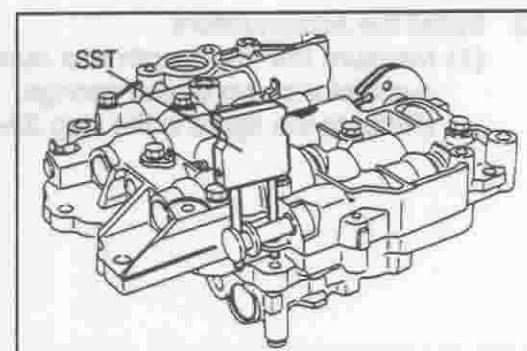
24. Install the valve body assembly and the throttle cable.

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



LAT00197-00182

- (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)

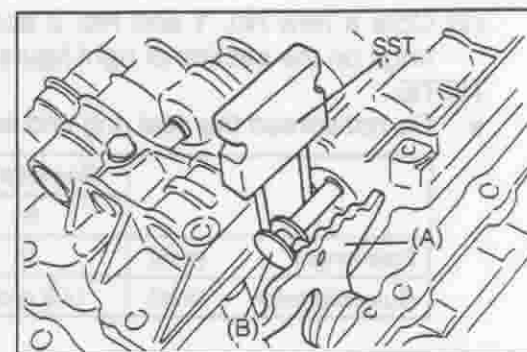


LAT00198-00183

- (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.

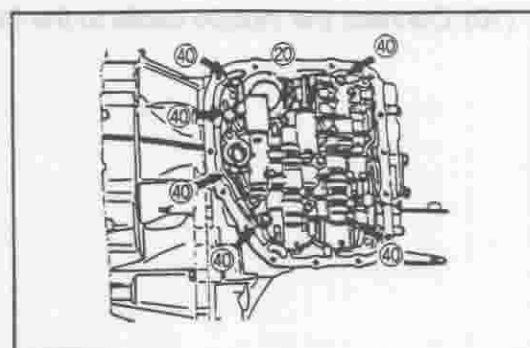


LAT00199-00184

- (4) Temporarily tighten the seven bolts of the valve body assembly.
- (5) Tighten the bolts.
Tightening Torque: 4.9 - 6.9 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.

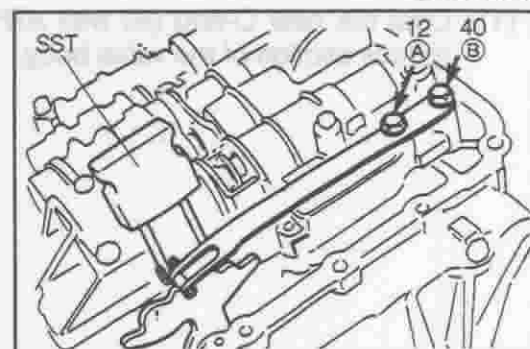


LAT00200-00185

- (6) Tighten the (A) bolt firstly. Then, proceed to tighten the (B) 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.

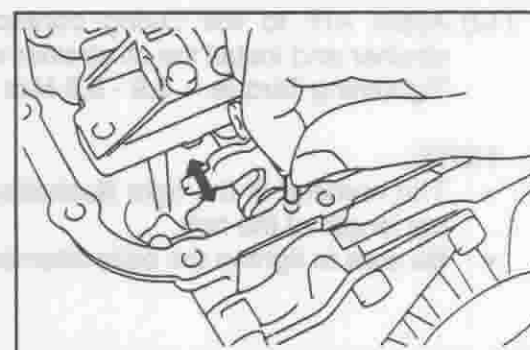


LAT00201-00186

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

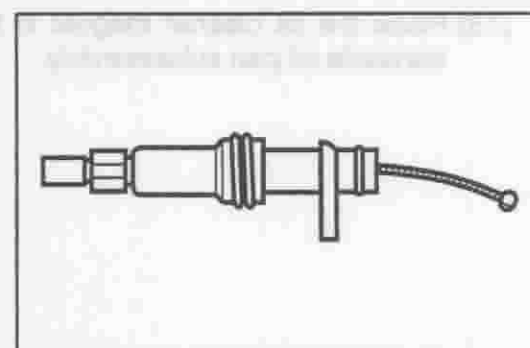
NOTE:

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



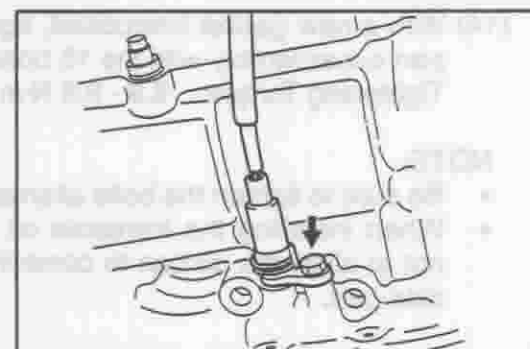
LAT00202-00187

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



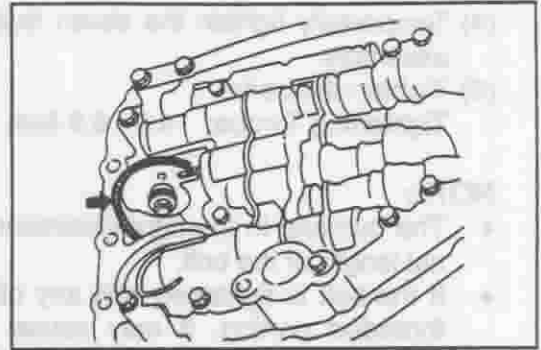
LAT00203-00188

- (9) Insert the throttle cable to the transaxle case and tighten it with a bolt.
Tightening Torque: 6.9 - 9.8 N·m



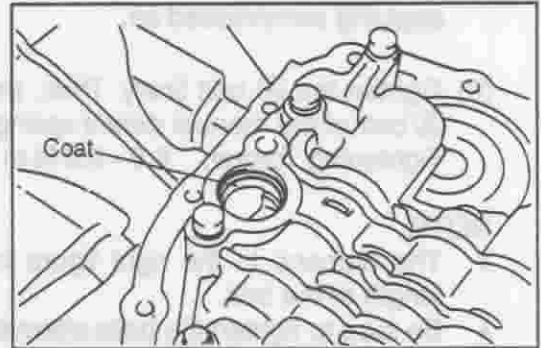
LAT00204-00189

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



LAT00205-00190

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

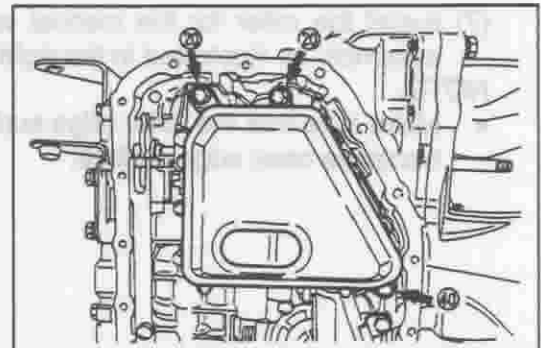


LAT00206-00191

(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

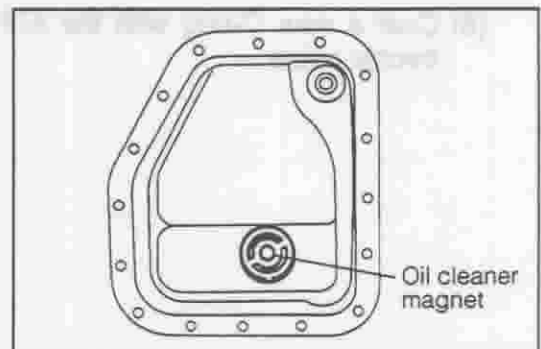
NOTE:

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



LAT00207-00192

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

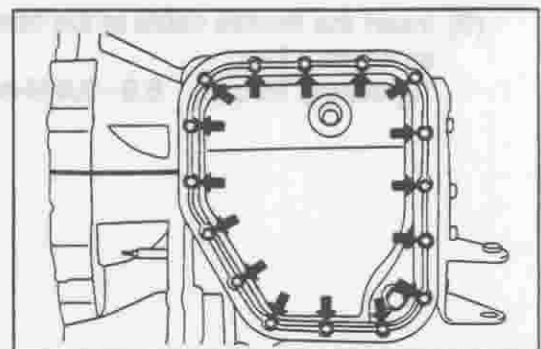


LAT00208-00193

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

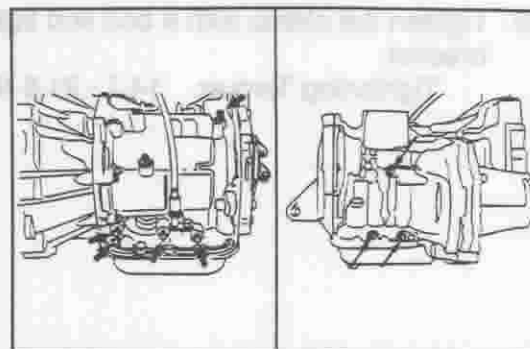
NOTE:

- 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.



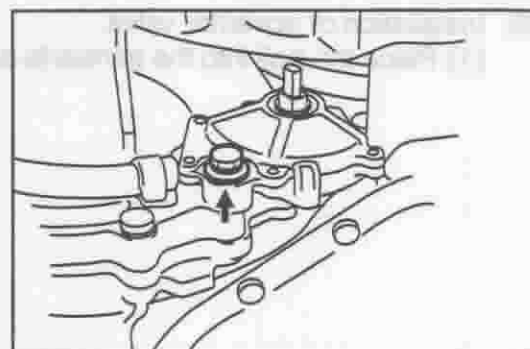
LAT00209-00194

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



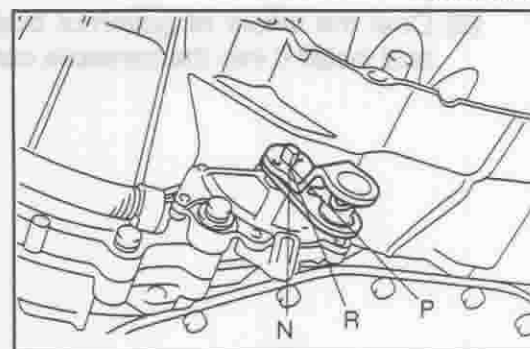
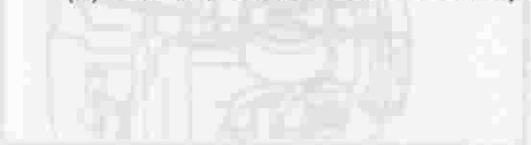
LAT00210-00195

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



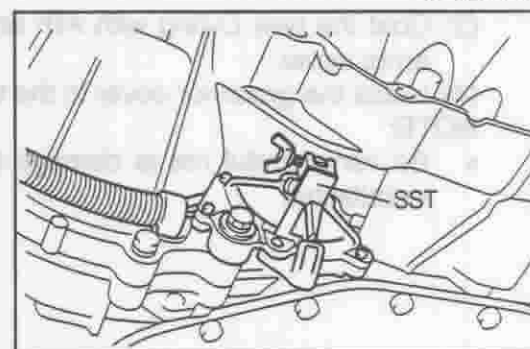
LAT00211-00197

- (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.



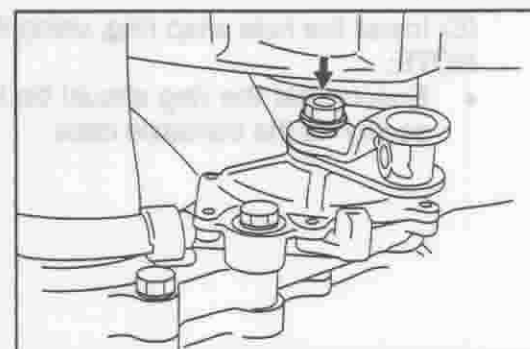
LAT00212-00197

- (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



LAT00213-00198

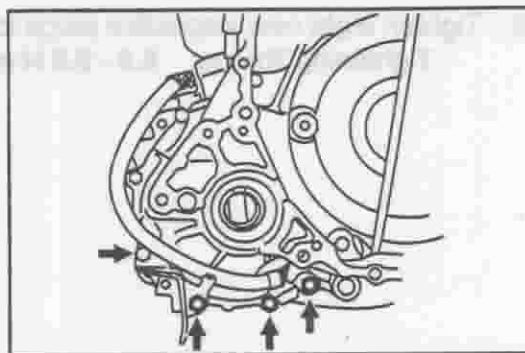
27. Tighten the lever subassembly with a nut.
Tightening Torque: 9.8 - 15.7 N·m



LAT00214-00199

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

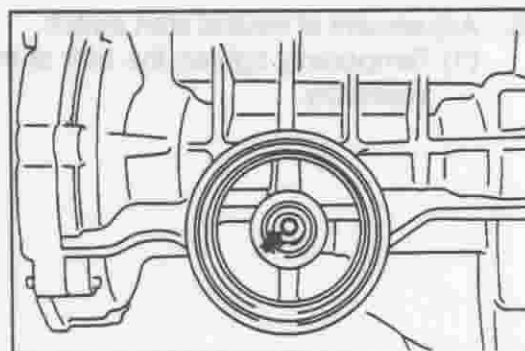
Tightening Torque: 14.7 - 21.6 N·m



LAT00215-00200

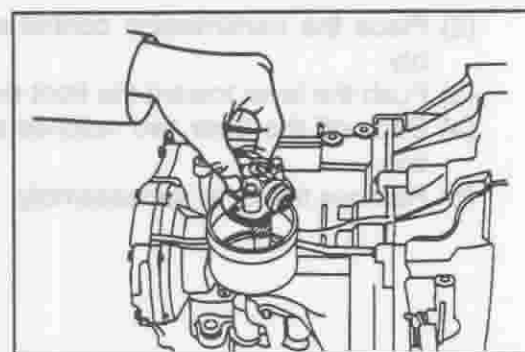
29. Installation of governor valve.

- (1) Place the ball into the transaxle case.



LAT00216-00201

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



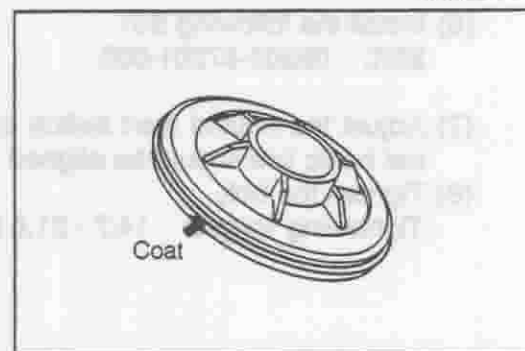
LAT00217-00202

- (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.

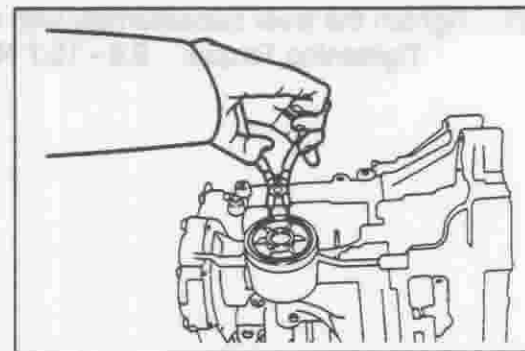


LAT00218-00203

- (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.

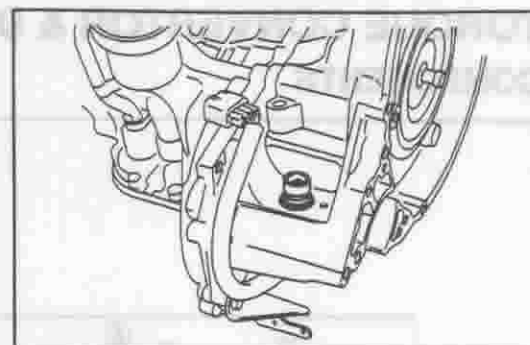


LAT00219-00204

30. 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:

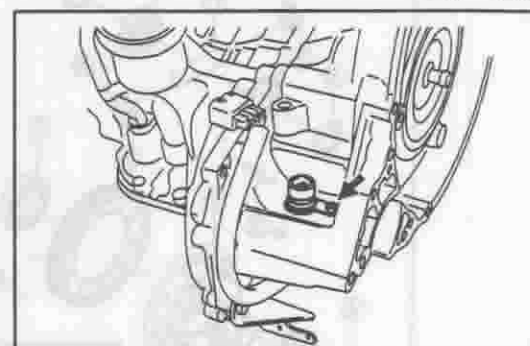
- It is recommended to hold the speedometer shaft sleeve during the installation of the speedometer driven gear subassembly.



LAT00220-00205

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

Tightening Torque: 6.9 - 9.8 N·m



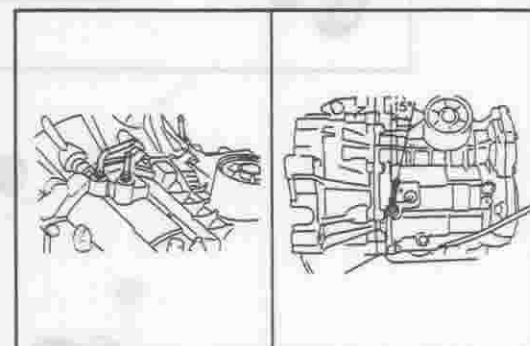
LAT00221-00206

32. 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.



LAT00222-00207

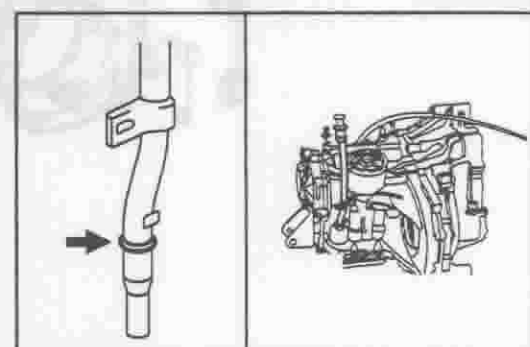
33. Tighten the breather union and install the cap of the union.

Tightening Torque: 3.9 - 5.9 N·m

34. 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.



LAT00223-00208

35. 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

36. Install the transaxle case assembly to the vehicle.

37. Adjust the throttle cable.

38. Operation check of shift lever position.

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

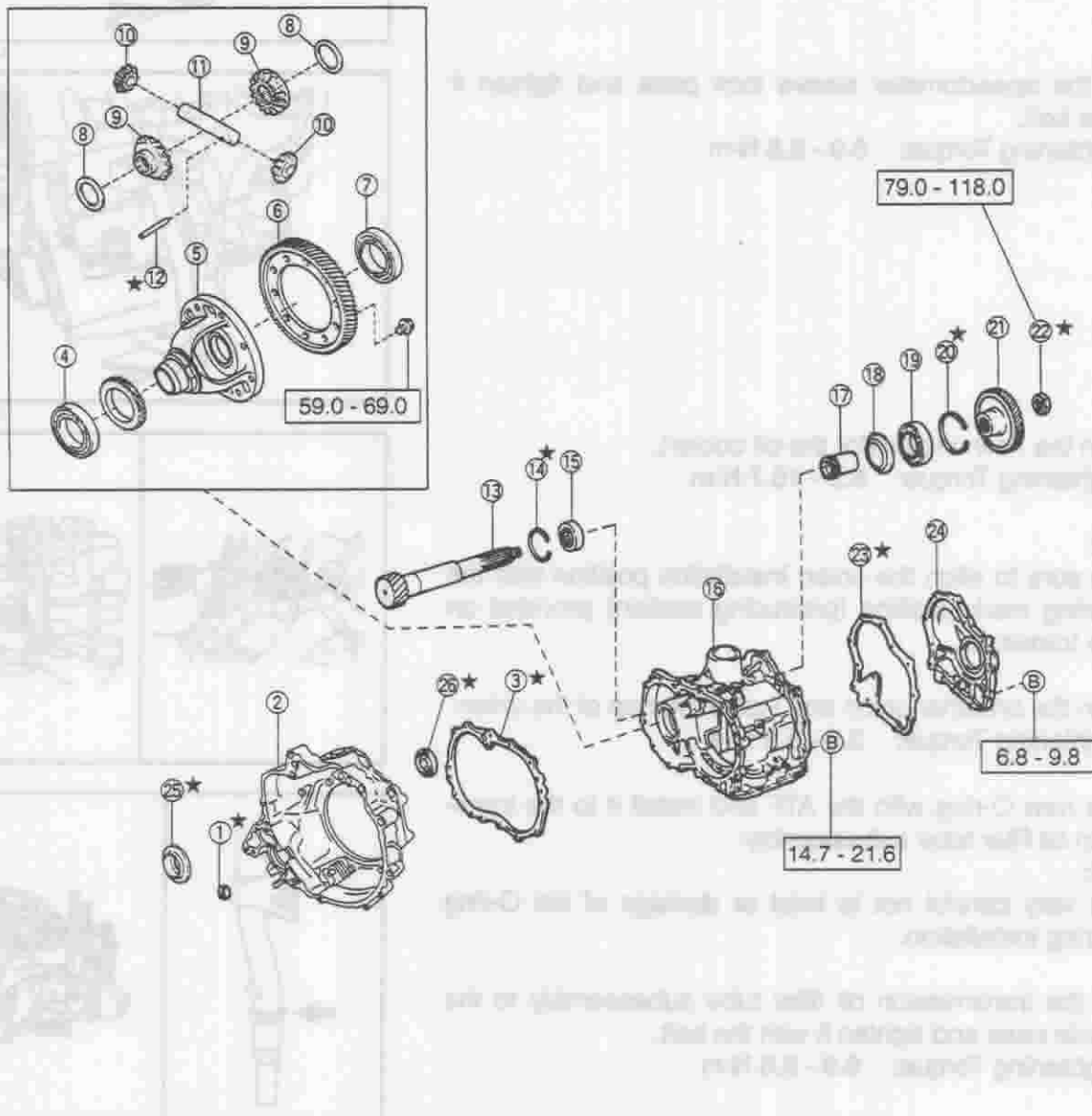
CAUTION:

- Never overfill the new fluid.

LAT00224-00000

TORQUE CONVERTOR & DIFFERENTIAL CASE COMPONENTS

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



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

- ⑭, ⑮ Hole snap ring
- ⑯ Cylindrical roller bearing
- ⑰ Transaxle case
- ⑱ Governor drive gear assembly
- ⑲ Oil reserve plate
- ⑳ Primary reduction driven gear
- ㉑ Lock nut
- ㉒ Transaxle case rear cover gasket
- ㉓ Rear transmission case cover subassembly
- ㉔ T-type oil seal (for RH drive shaft)
- ㉕ T-type oil seal (for LH drive shaft)

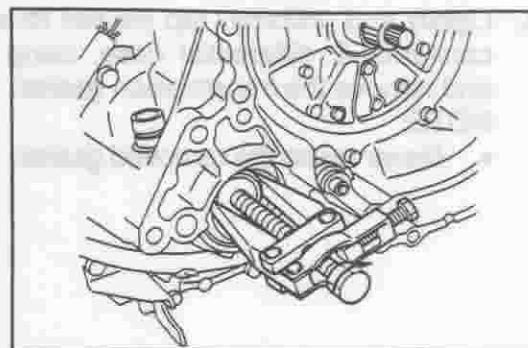
DISASSEMBLY

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

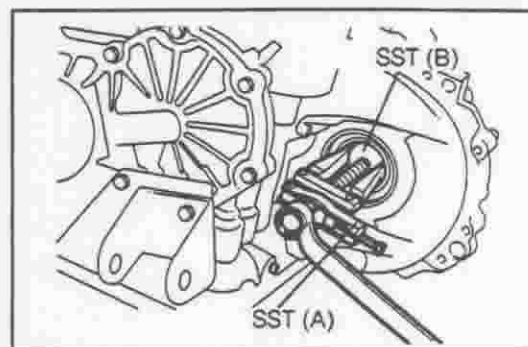
SST: 09308-10010-000 ... (A)
09950-20017-000 ("E" part only) ... (B)

NOTE:

- Never reuse the removed oil seal.



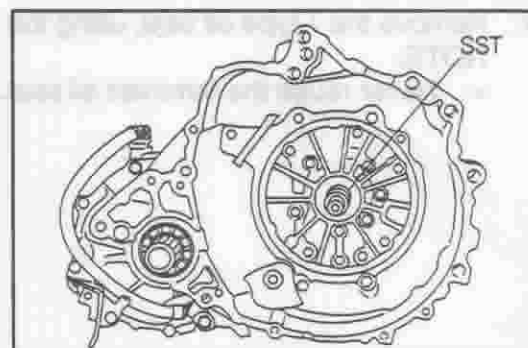
LAT00226-00210



LAT00000-00211

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

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

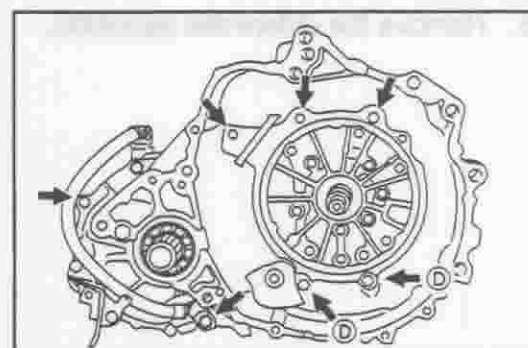


LAT00227-00212

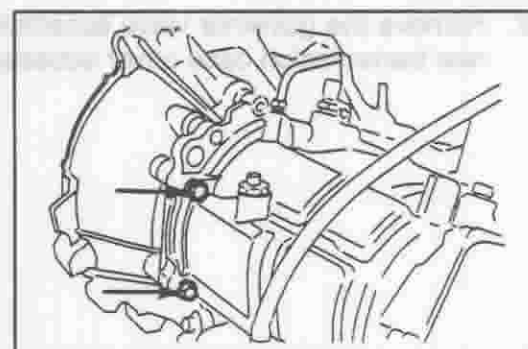
5. Remove the nine bolts.

NOTE:

- Never reuse the removed bolt ④ as illustration in the right figure.



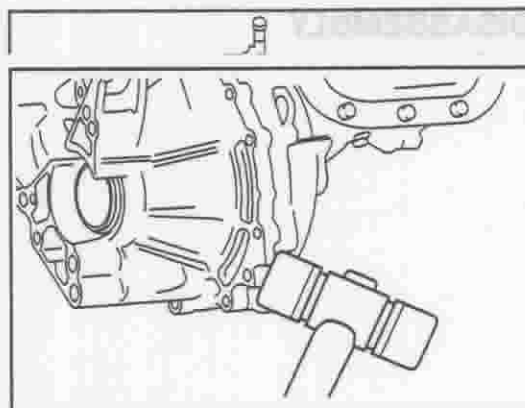
LAT00228-00213



LAT00000-00214

AT-66

6. Lightly and uniformly tap the two lib sections of the torque converter differential case using the plastic hammer.

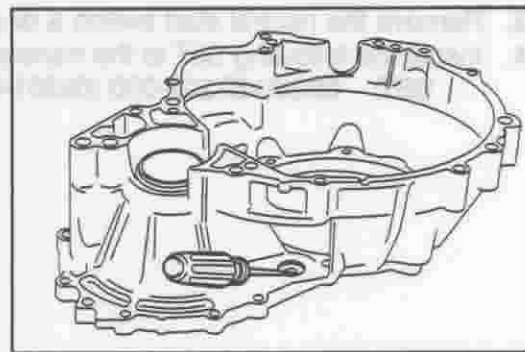


LAT00000-00216

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

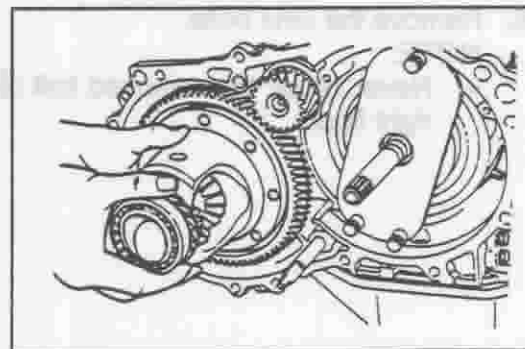
NOTE:

- Never reuse the removed oil seal.



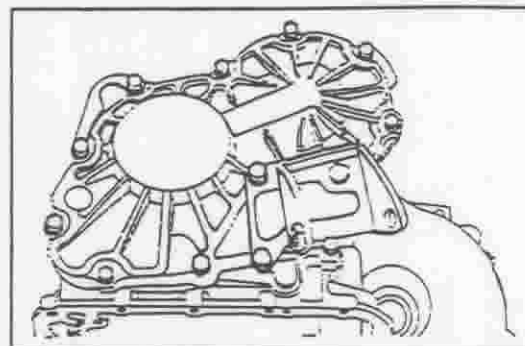
LAT00230-00217

8. Remove the differential assembly.



LAT00231-00218

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

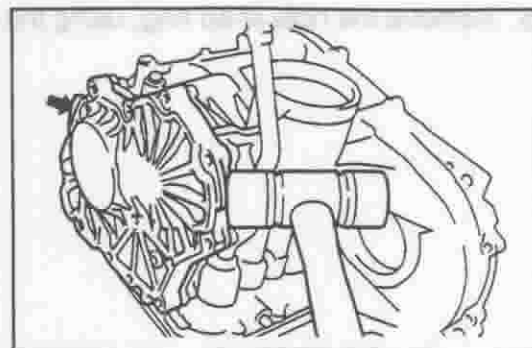


LAT00232-00219

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.

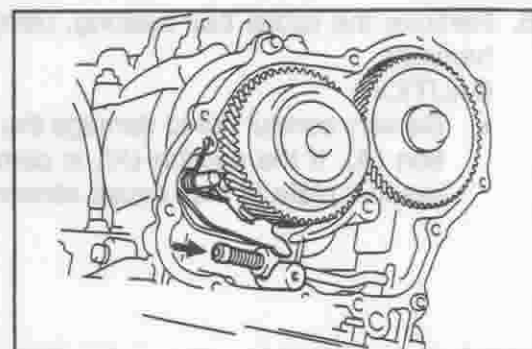


LAT00233-00220

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).

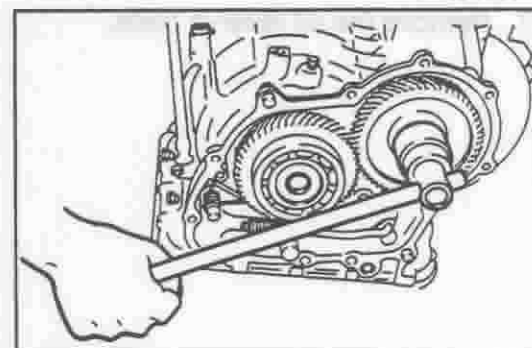


LAT00234-00221

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

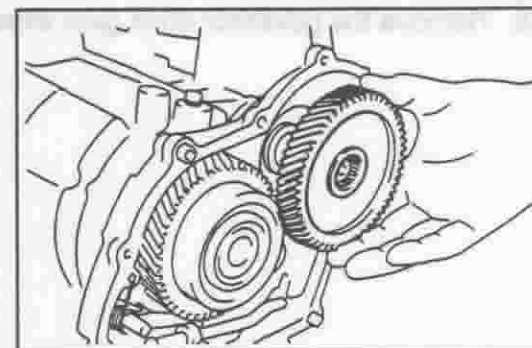
NOTE:

- Never reuse the removed lock nut.



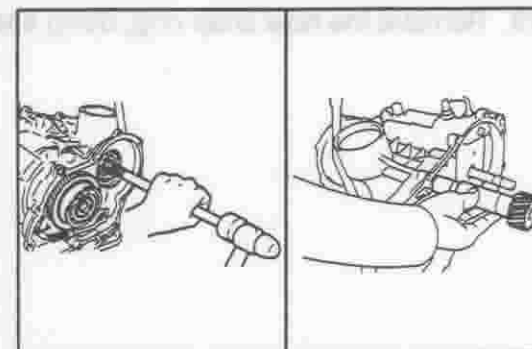
LAT00235-00222

13. Remove the primary reduction driven gear.



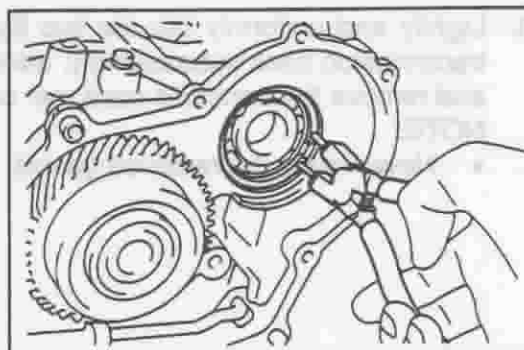
LAT00236-00223

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.



LAT00237-00224

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

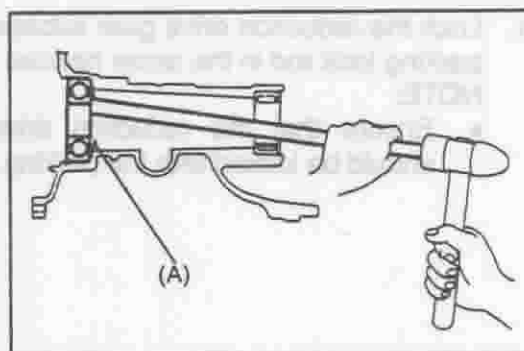
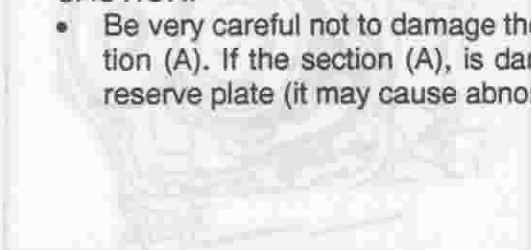


LAT00238-00225

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

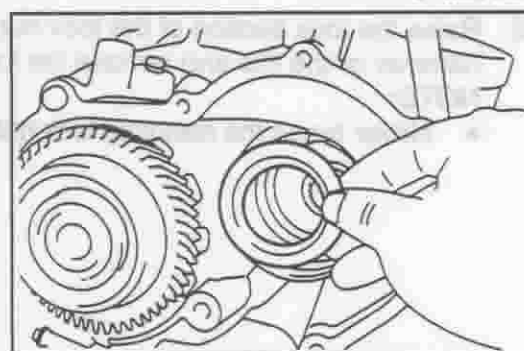
CAUTION:

- 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).



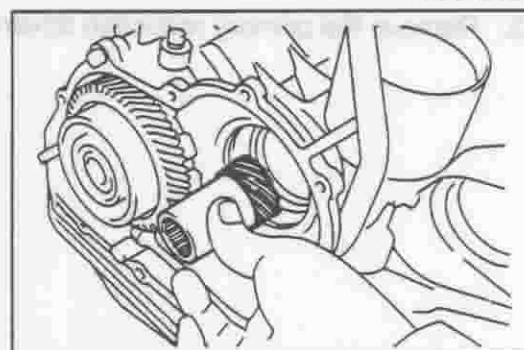
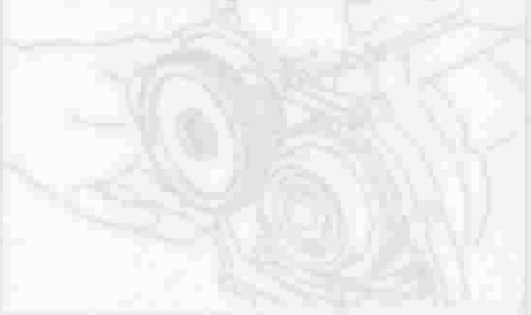
LAT00239-00226

17. Remove the oil reserve plate.



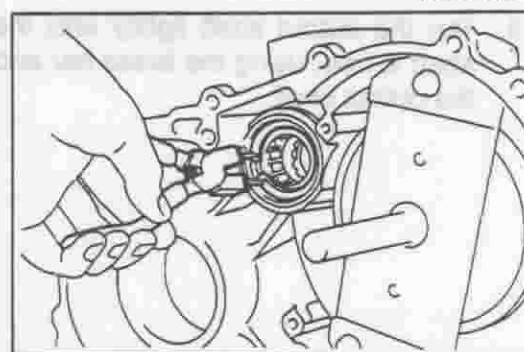
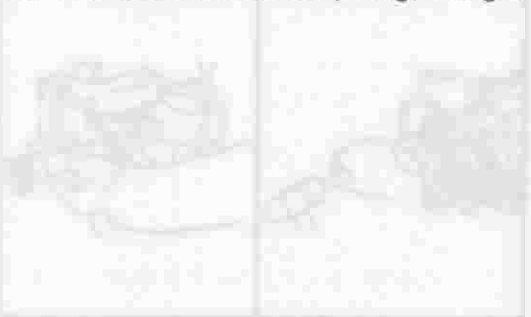
LAT00240-00227

18. Remove the governor drive gear assembly.



LAT00241-00228

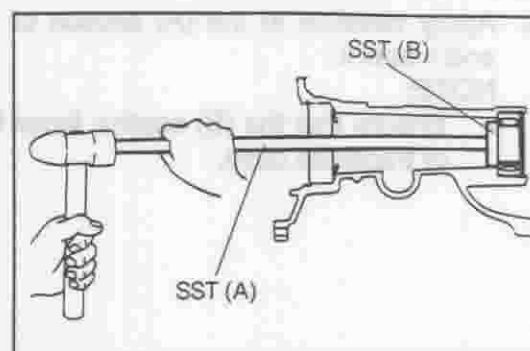
19. Remove the hole snap ring, using snap ring pliers.



LAT00242-00229

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

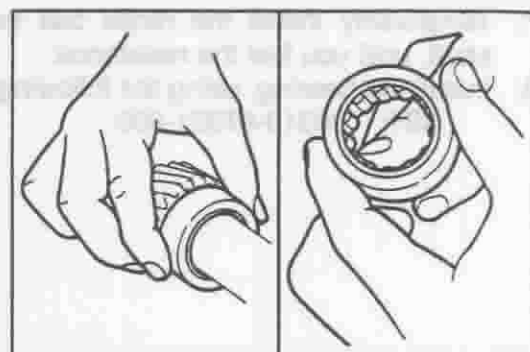
SSTs: 09631-12020-000 ... (A)
09630-24013-000 (09620-24030-000) ... (B)



LAT00243-00230

INSTALLATION

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



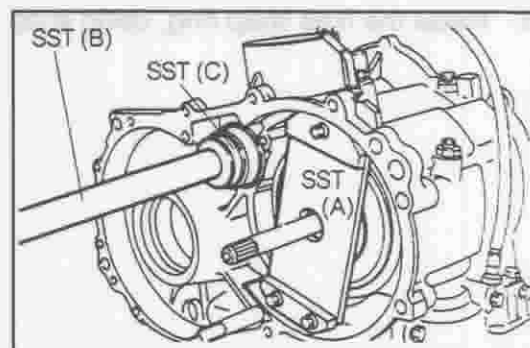
LAT00244-00231

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)

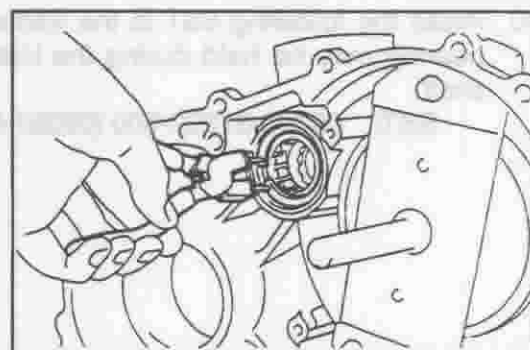


LAT00245-00232

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

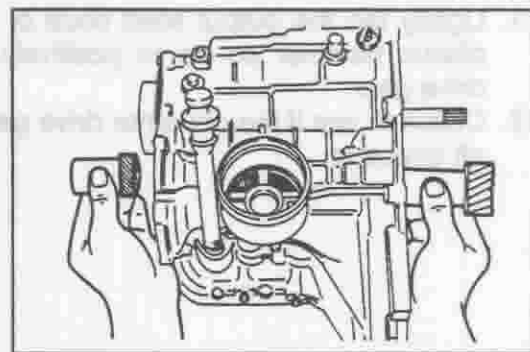
NOTE:

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



LAT00246-00233

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

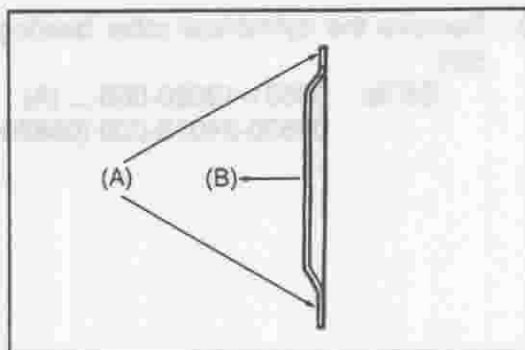


LAT00247-00234

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.

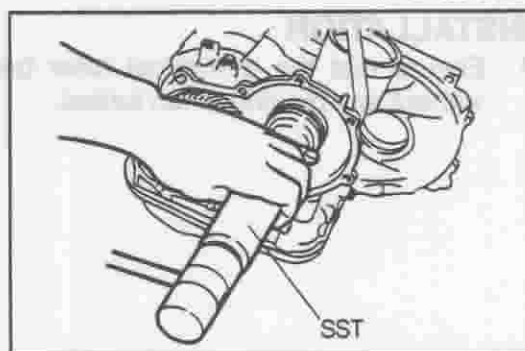


LAT00248-00235

7. Temporarily install the radial ball bearing to the output shaft, until you feel the resistance.

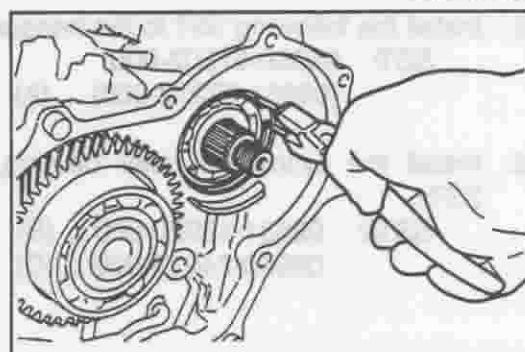
8. Install the bearing, using the following SST.

SST: 09310-87301-000



LAT00249-00236

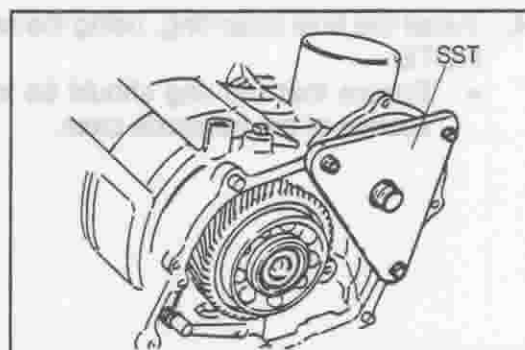
9. Install the hole snap ring, using snap ring pliers.



LAT00250-00237

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

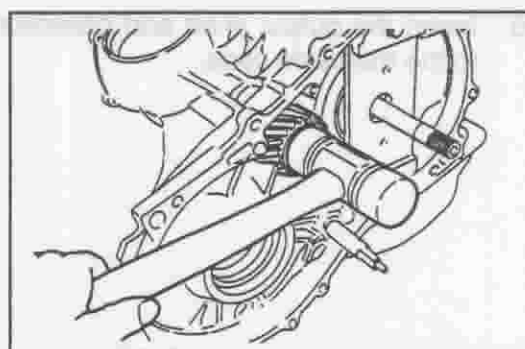
SST: 09350-87202-000 (09351-87214-000)



LAT00251-00238

11. Lightly tap the output shaft once or twice by means of a plastic hammer so as to positively install the governor drive gear.

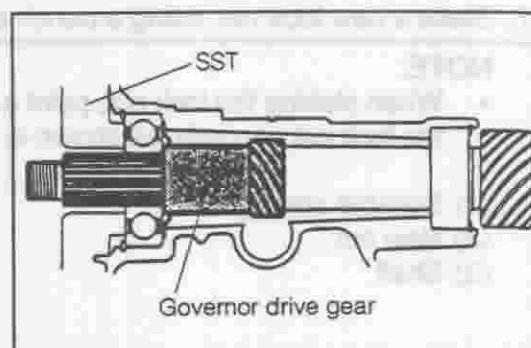
12. Check to see if the governor drive gear moved in a fore-&-aft direction.



LAT00252-00239

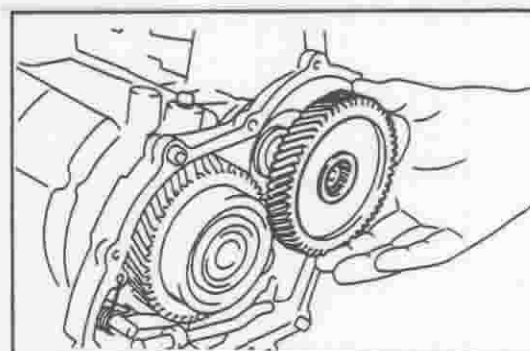
13. If the gear moved in a fore-&-aft direction, repeat operations of the steps 11 and 12 above, until the governor drive gear no longer moves in a fore-&-aft direction.

Latent: Lock the gear with the governor drive gear.



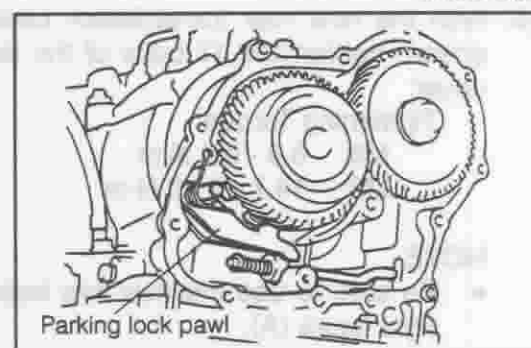
LAT00253-00240

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



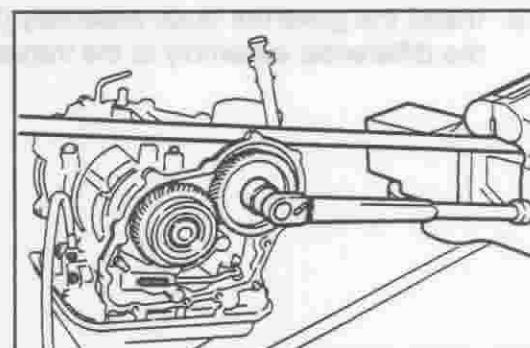
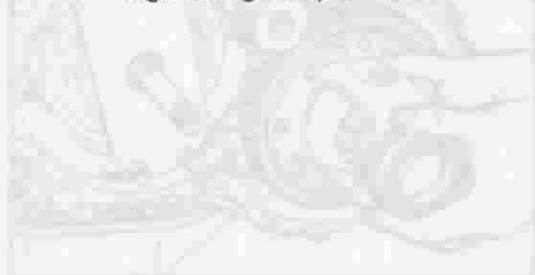
LAT00254-00241

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



LAT00255-00242

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



LAT00256-00243

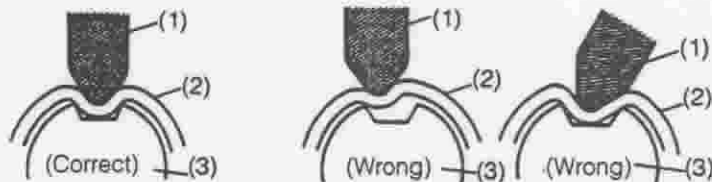


17. Stake a new lock nut, using a punch and a hammer.

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



LAT00257-00244

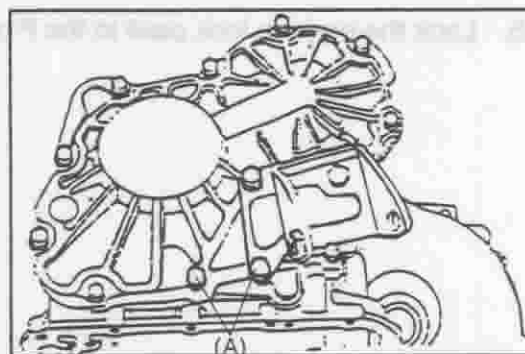
18. With the new rear transmission case cover gasket interposed, tighten the 13 bolts of the rear transmission case cover.

Tightening Torque:

- M6: 6.9 - 9.8 N·m
M8: 14.7 - 21.6 N·m

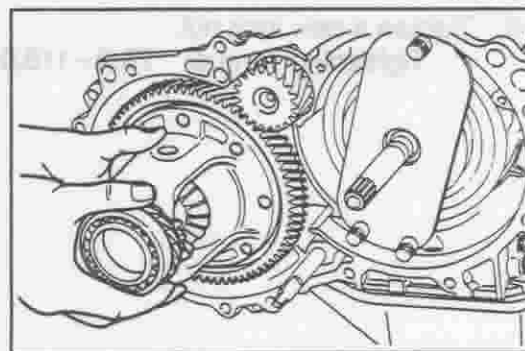
NOTE:

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



LAT00258-00245

19. Install the governor body assembly (See page AT-62) and the differential assembly to the transaxle case.



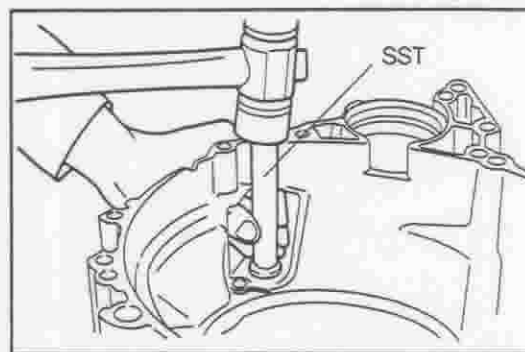
LAT00259-00246

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.

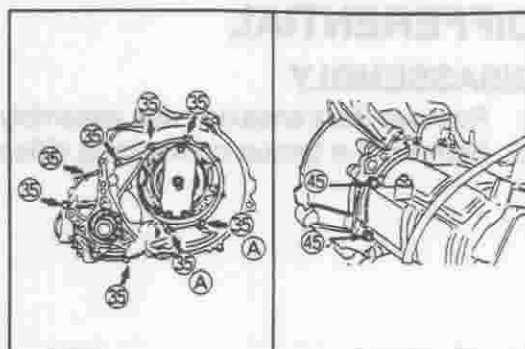


LAT00260-00247

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

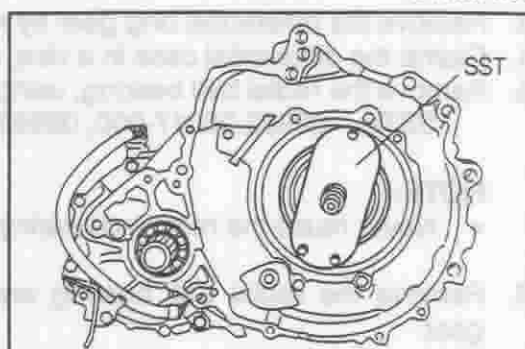
NOTE:

- 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.



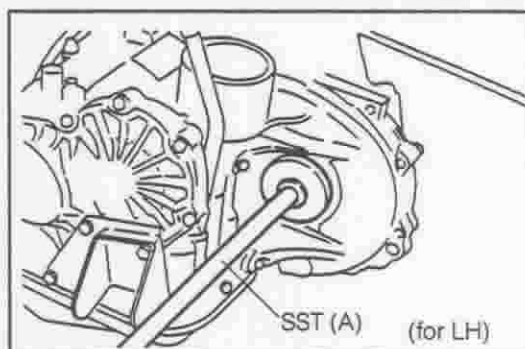
LAT00261-00248

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

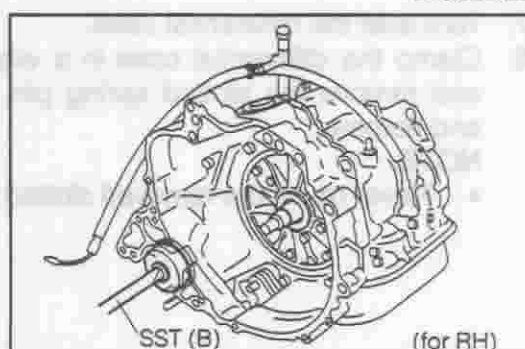


LAT00262-00249

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)



LAT00263-00250



LAT00000-00251

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.

LAT00264-00000

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.

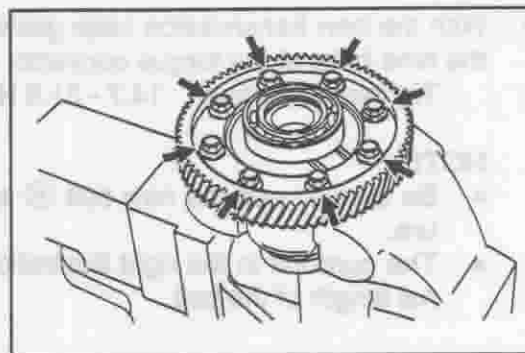
6. Remove the radial ball bearing and speedometer drive gear.

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.

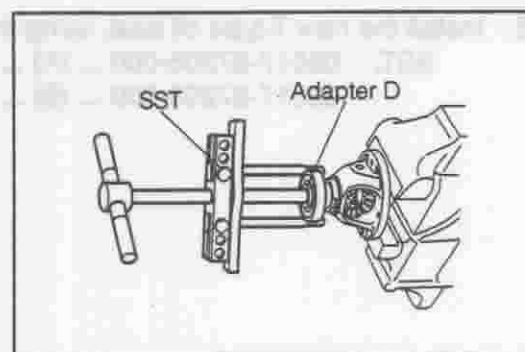
9. Remove the differential pinion shaft from the differential case.



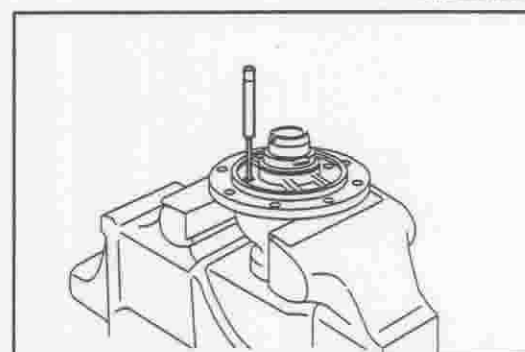
LAT00265-00252



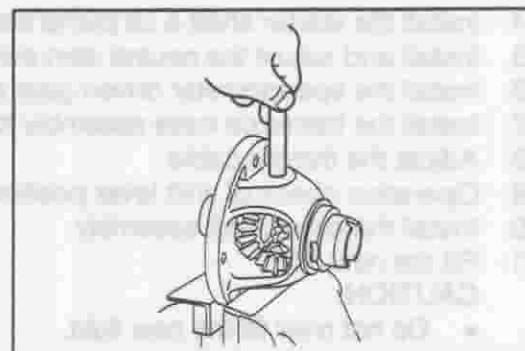
LAT00266-00253



LAT00000-00254



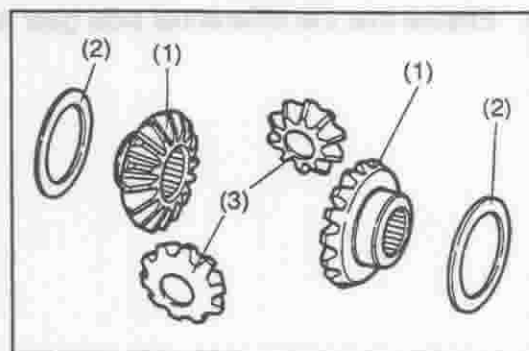
LAT00267-00255



LAT00268-00256

10. Remove the following parts.

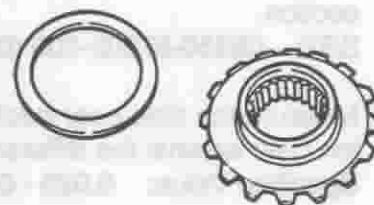
- (1) Differential side gear 2 pcs
- (2) Differential side gear thrust washer 2 pcs
- (3) Differential pinion gear 2 pcs



LAT00269-00257

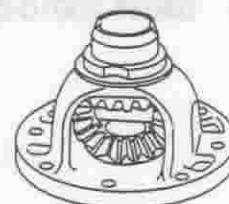
ASSEMBLY

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



LAT00270-00258

2. Install the aforesaid parts to the differential case.

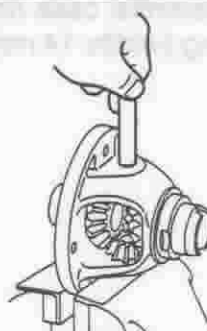
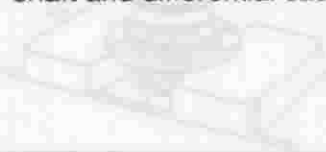


LAT00271-00259

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.

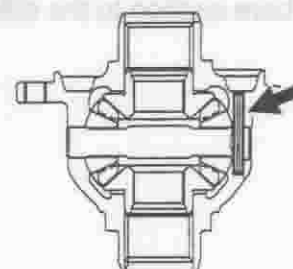
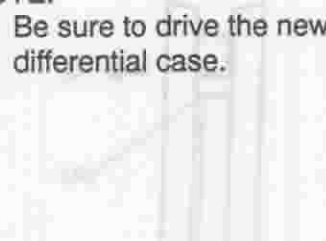


LAT00272-00260

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

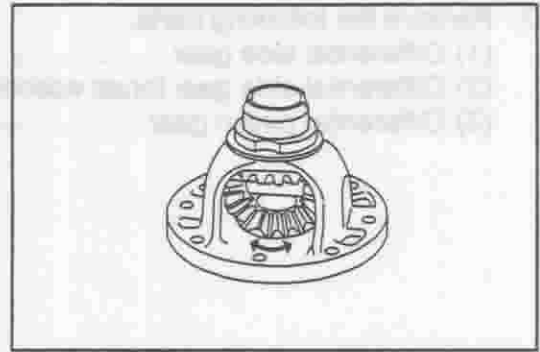
NOTE:

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



LAT00273-00261

5. Ensure that the differential side gear turns smoothly.



LAT00274-00262

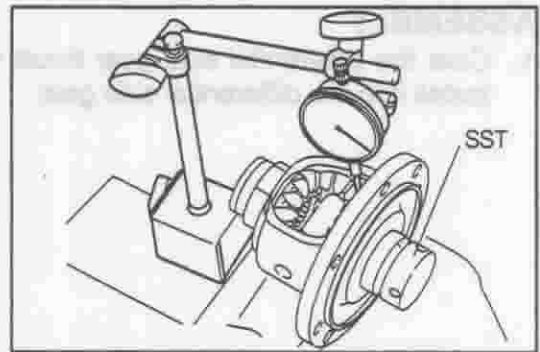
6. Backlash inspection

- (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.

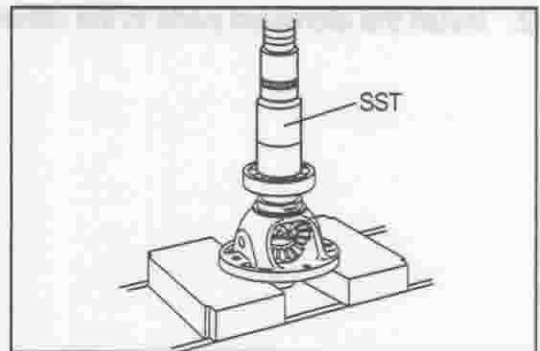
Specified Value: 0.025 - 0.10 mm



LAT00275-00263

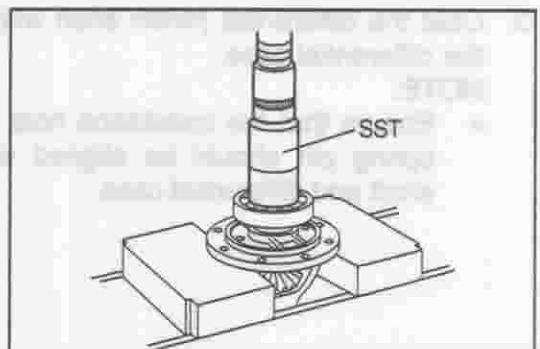
7. Install the speedometer drive gear and press a new radial ball bearing (width: 15 mm), using the following SST.

SST: 09636-20010-000



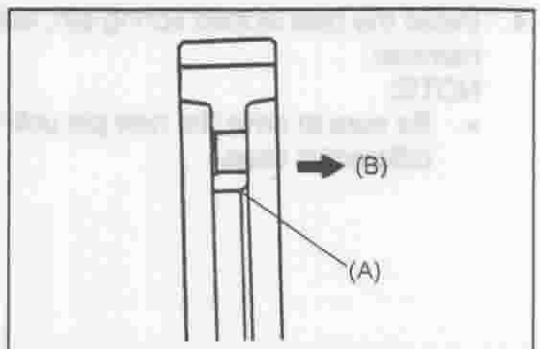
LAT00276-00264

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



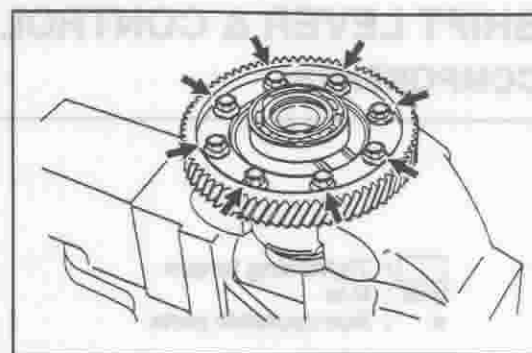
LAT00277-00265

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

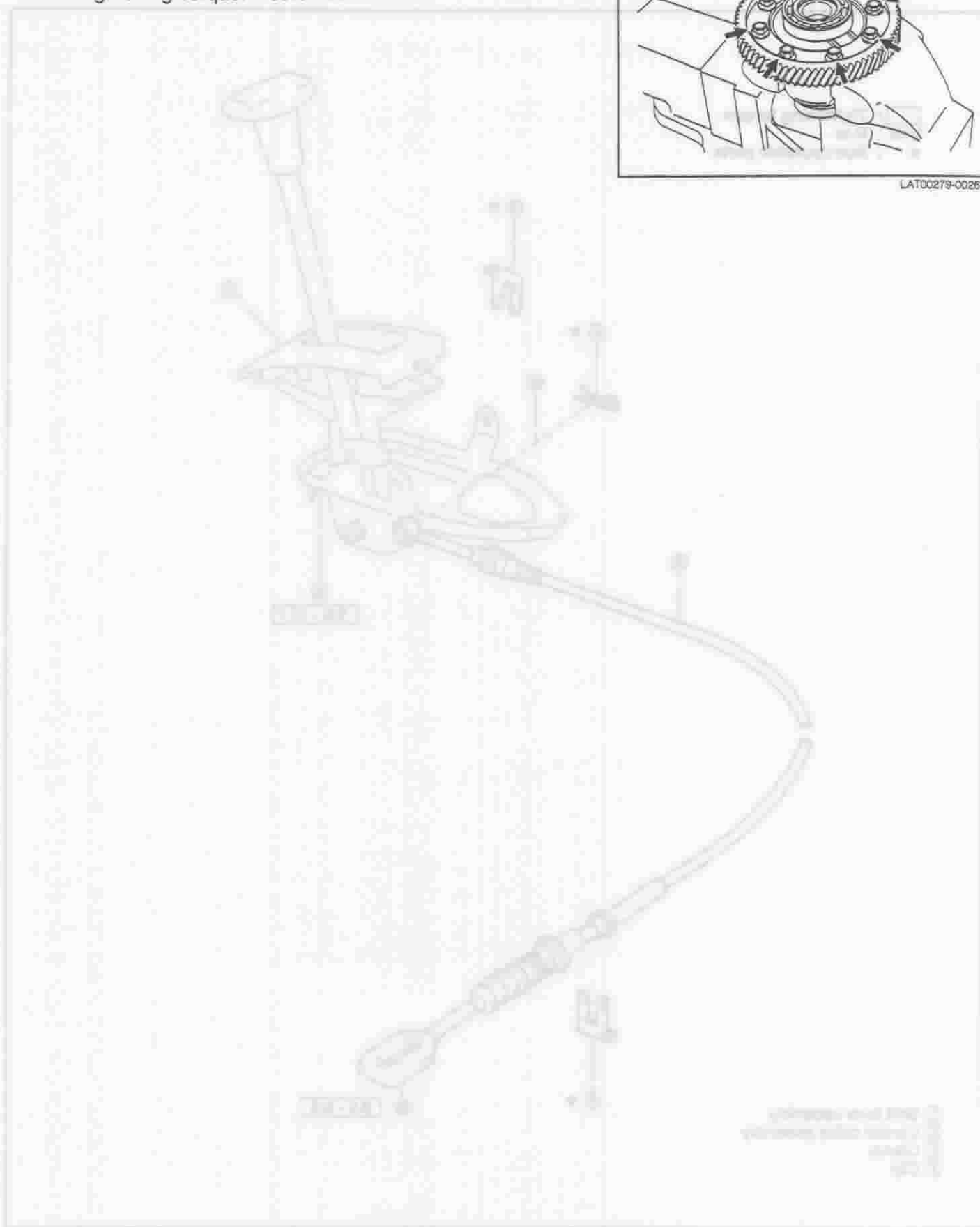


LAT00278-00266

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

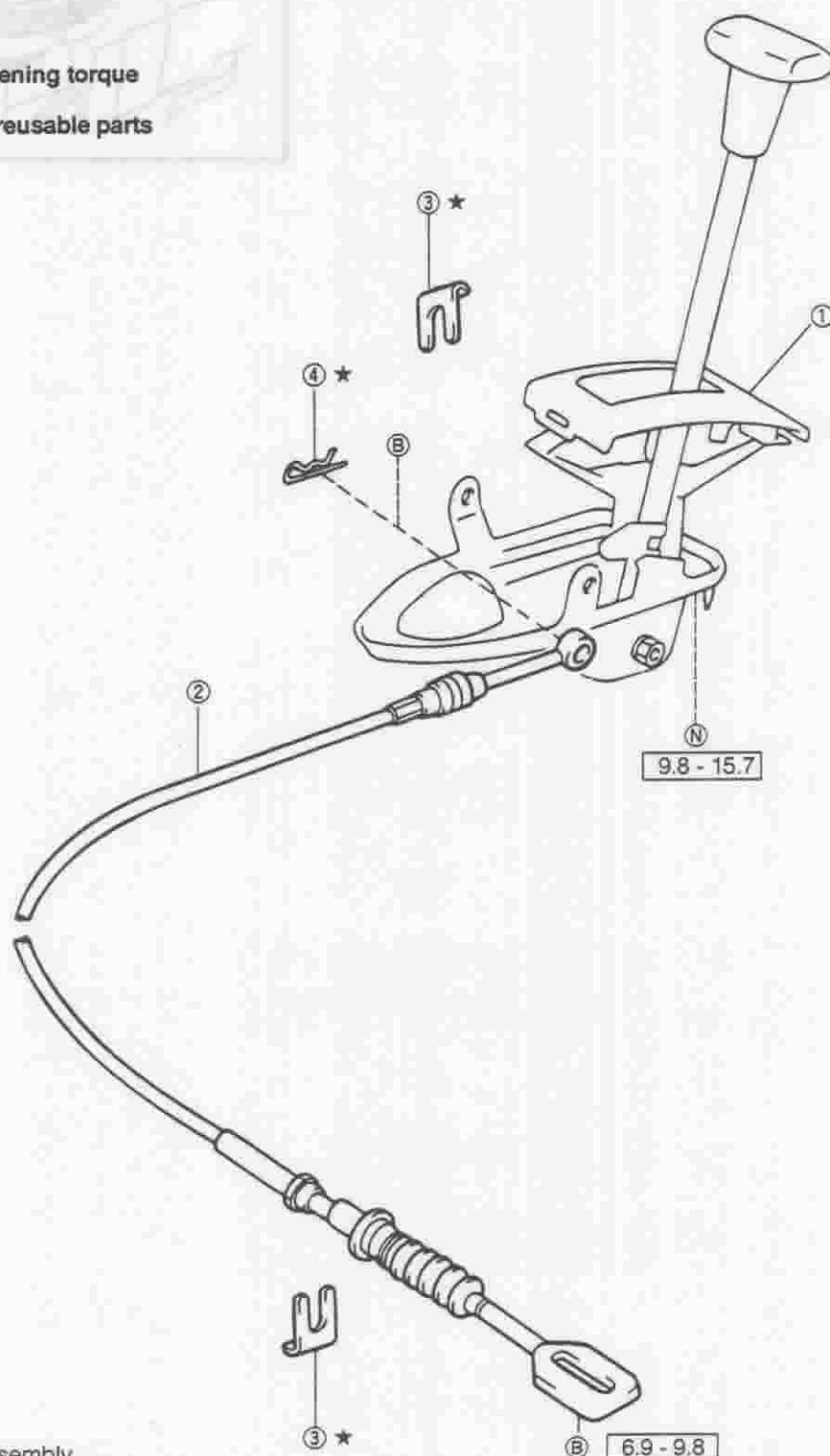


LAT00279-00257



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

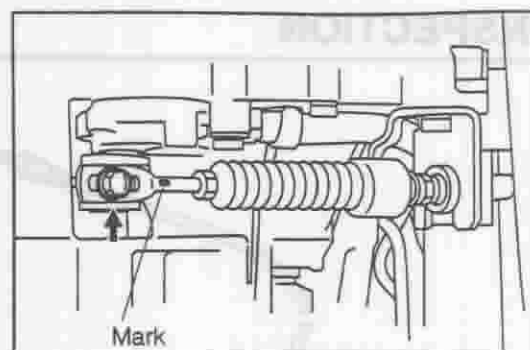
REMOVAL

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.

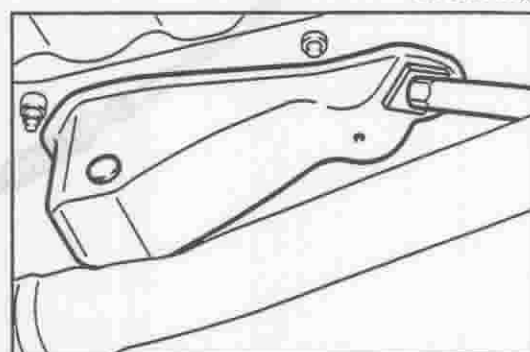
NOTE:

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

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

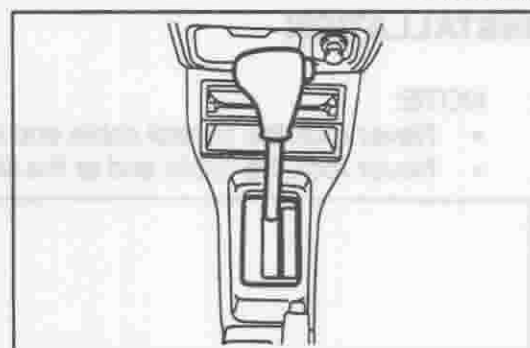


LAT00281-00269



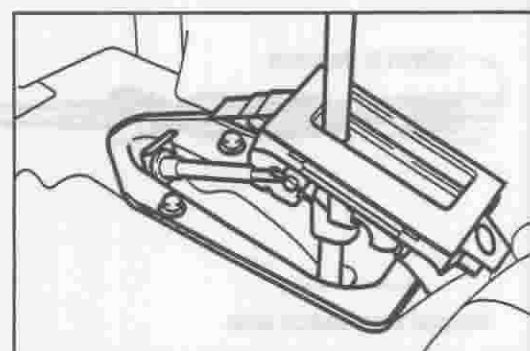
LAT00282-00270

6. Remove the console box.



LAT00283-00271

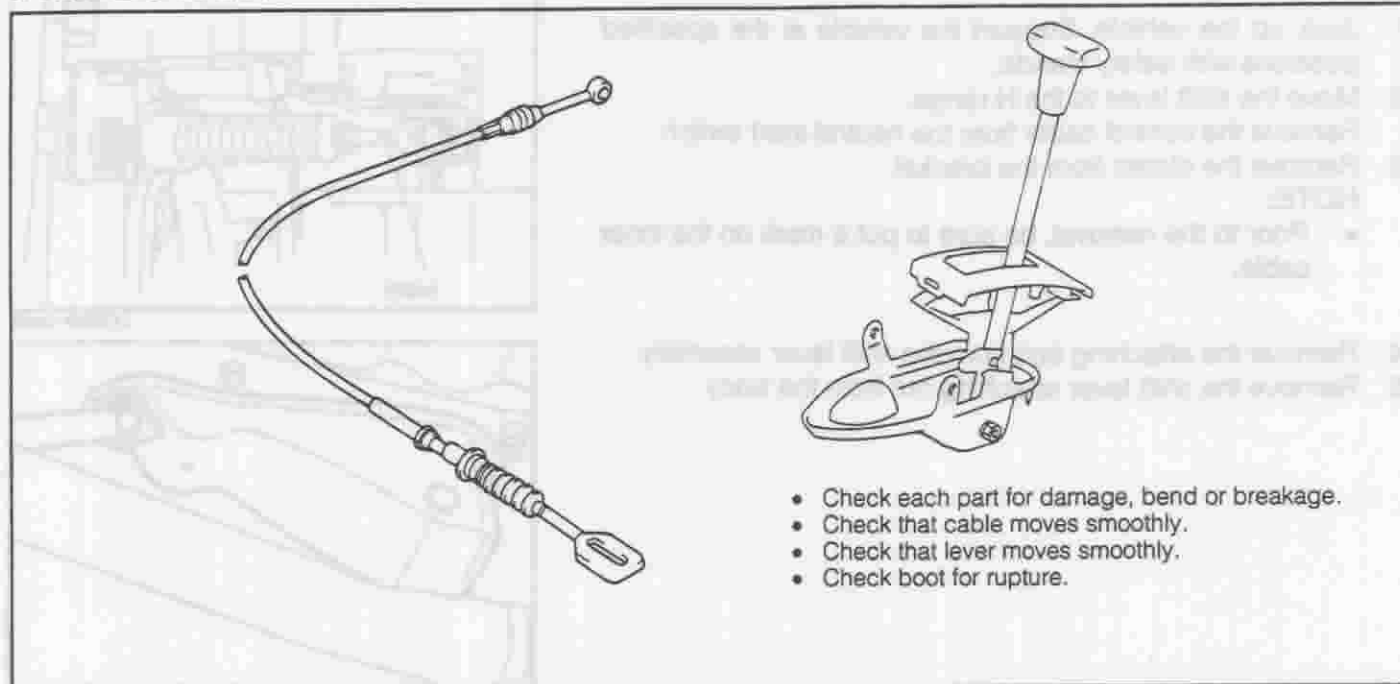
7. Remove the clip.
Disconnect the control cable from the shift lever assembly.
8. Remove the shift lever attaching bolt from the floor.
Disconnect the connector of the shift lever indicator lamp.
9. Take out the shift lever assembly from the vehicle.



LAT00284-00272



INSPECTION

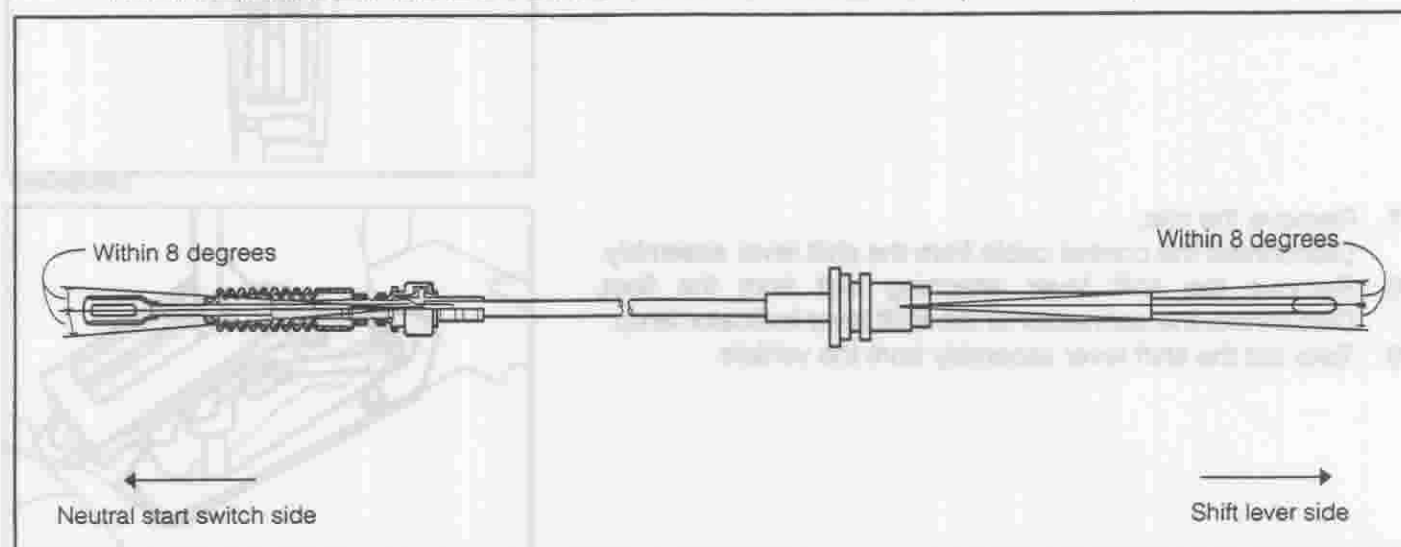


LAT00285-00273

INSTALLATION

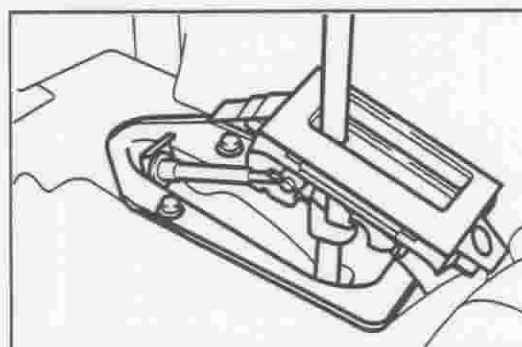
NOTE:

- 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.



LAT00286-00274

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.



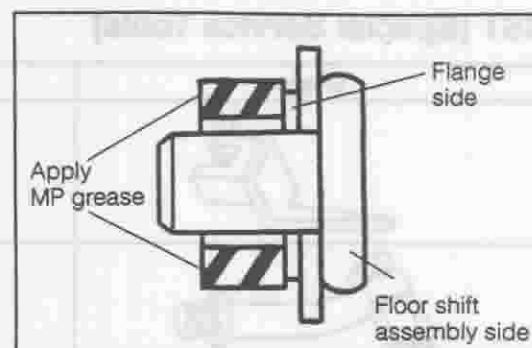
LAT00287-00275

- 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.

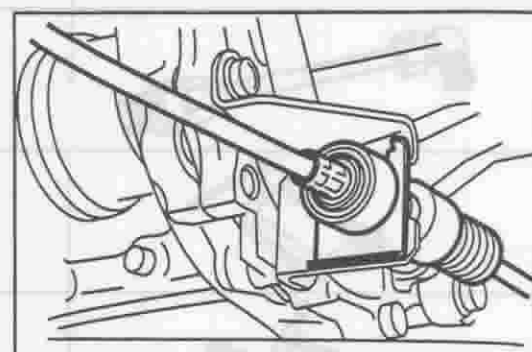
- Install the console box.



LAT00288-00276

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

Tightening Torque: 14.7 - 21.6 N·m



LAT00289-00277

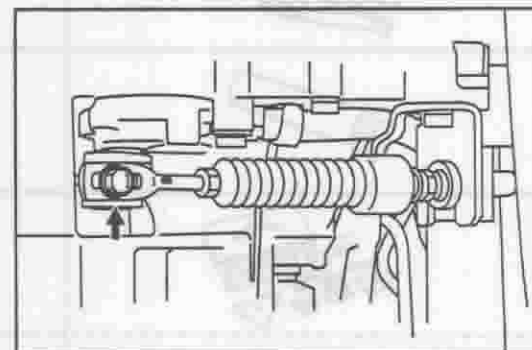
- Install the control cable to the bracket with the new clamp.

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.

- Install the control cable to the neutral start switch.

Tightening Torque: 6.9 - 9.8 N·m



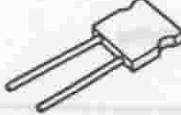
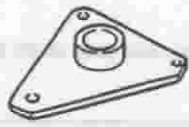
LAT00290-00278



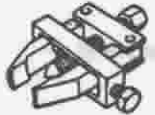
SST (Special Service Tools)

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
	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
	09351-87205-000	Holder reduction drive gear holding

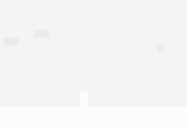
*It should be noted that 09350-87202 contains SSTs other than those posted in this section.

Shape	Part No.	Part name
	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
 	09517-87203-000	Replacer, oil seal No. 1
	09517-87205-000	Replacer, oil seal No. 2

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

Shape	Part No.	Part name
	09608-30012-000	Tool set front hub & drive pinion bearing
	09630-24014-000	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	Remover, bearing
	09306-87302-000	Puller, counter gear front bearing
	09527-87301-000	Remover, rear axle shaft bearing

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	09608-30012-000
	09630-24014-000
	09631-12020-000
	09636-20010-000
	09820-00021-000
	09950-20017-000
	09950-87701-000
	09306-87302-000
	09527-87301-000

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		4.9 - 6.9	5.0 - 7.0
Manual detent spring × Transmission case		6.9 - 9.8	0.7 - 1.0
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 case × T/M 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
Attachment of oil pump		6.9 - 9.8	0.7 - 1.0

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