

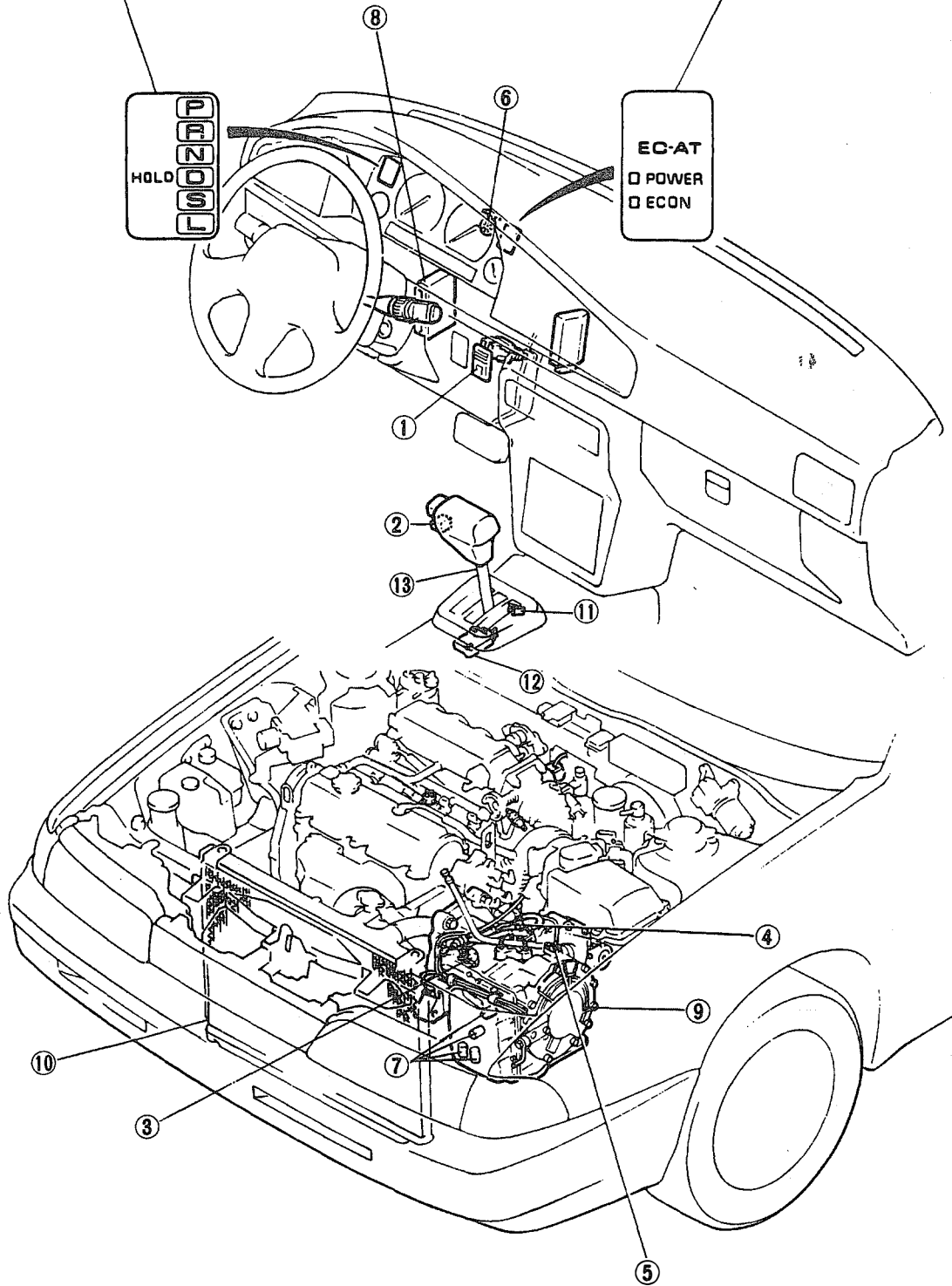
# AUTOMATIC TRANSAXLE (Electronically Controlled)

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06U0KX-003

**OUTLINE**

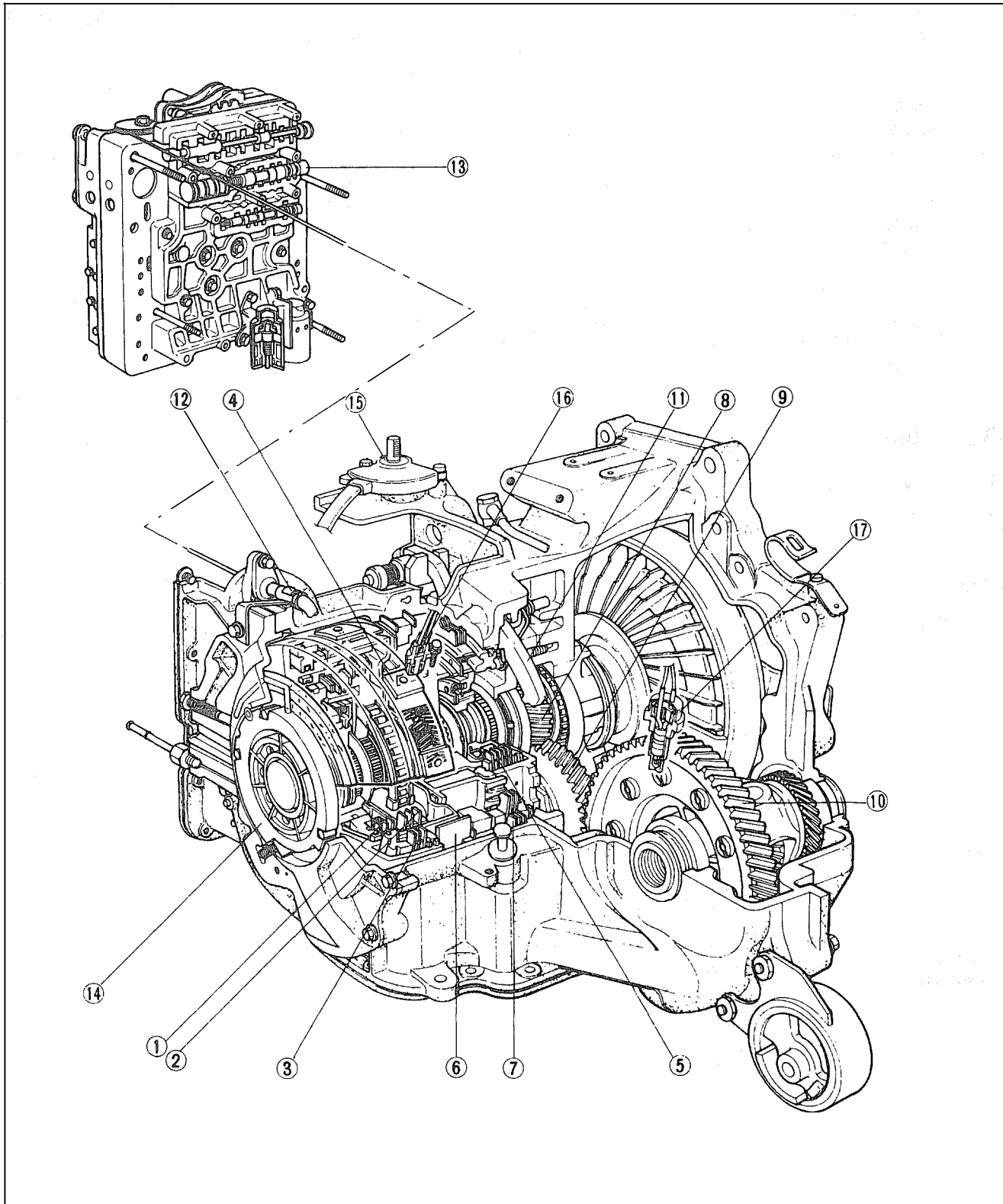
**SPECIFICATIONS**

Item		Model	EC-AT (G4A-EL)	
			Turbo	Non-Turbo
Torque converter stall torque ratio			1.600—1.800 : 1	1.700—1.900 : 1
Gear ratio	1st		2.800	
	2nd		1.540	
	3rd		1.000	
	4th (OD)		0.700	
	Reverse		2.333	
Final gear ratio			3.700	
Number of drive/ driven plates	Forward clutch		4/4	3/3
	Coasting clutch		2/2	
	3-4 clutch		5/5	
	Reverse clutch		2/2	
	Low and reverse brake		5/5	4/4
Servo diameter (Piston outer dia./retainer inner dia.) mm (in)			78/36 (3.07/1.42)	78/40 (3.07/1.57)
Speedometer gear ratio (Driven/Drive gear)	P185/70 R14		20 : 25	
	P195/60 HR15 P195/60 R15 87H		21 : 25	
Automatic transmission fluid	Type		DEXRON-II or M-III	
	Capacity liters (US qt, Imp qt)		6.8 (7.2, 6.0)	

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K

STRUCTURAL VIEW

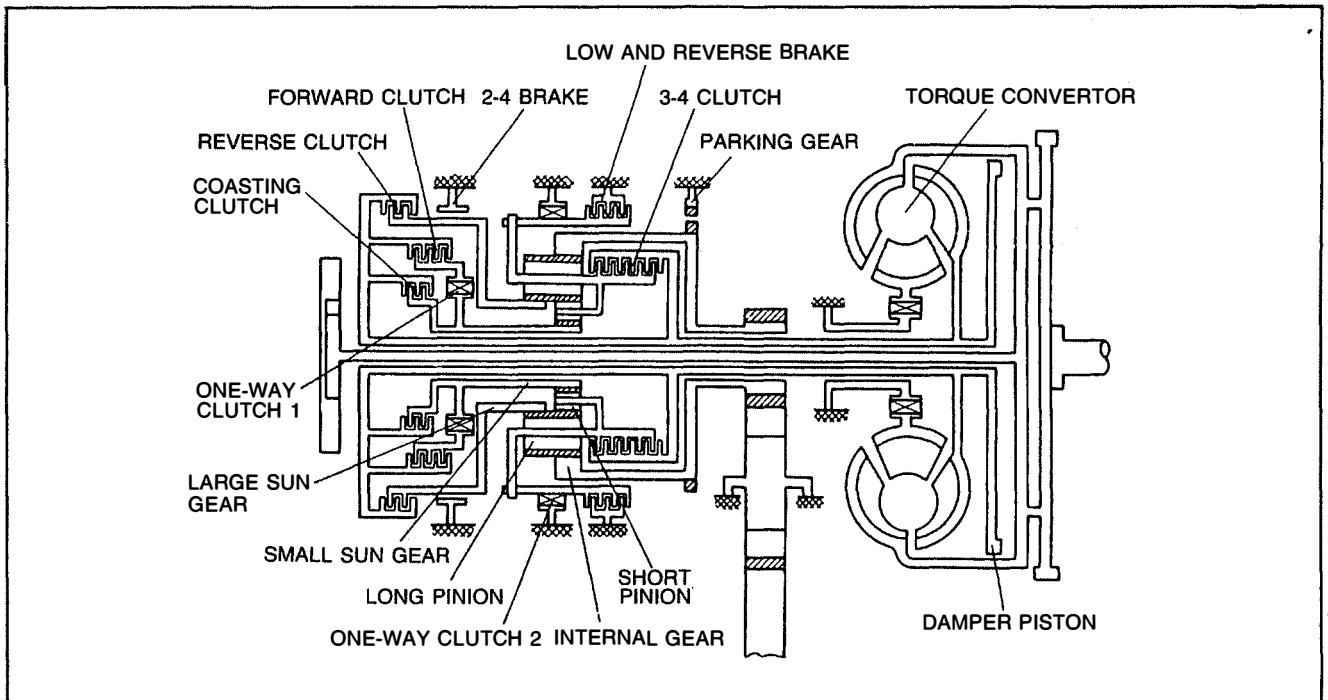


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- |                             |                          |                      |
|-----------------------------|--------------------------|----------------------|
| 1. Coasting clutch          | 7. Low and reverse brake | 13. Control body     |
| 2. Forward clutch           | 8. Output gear           | 14. Oil pump         |
| 3. Reverse clutch           | 9. Idler gear            | 15. Inhibitor switch |
| 4. Reverse and forward drum | 10. Differential         | 16. Pulse generator  |
| 5. 3-4 clutch               | 11. Parking pawl         | 17. ATF thermoswitch |
| 6. 2-4 brake band           | 12. Throttle cable       |                      |



POWERFLOW DIAGRAM



06U0KX-006

OPERATION OF COMPONENTS

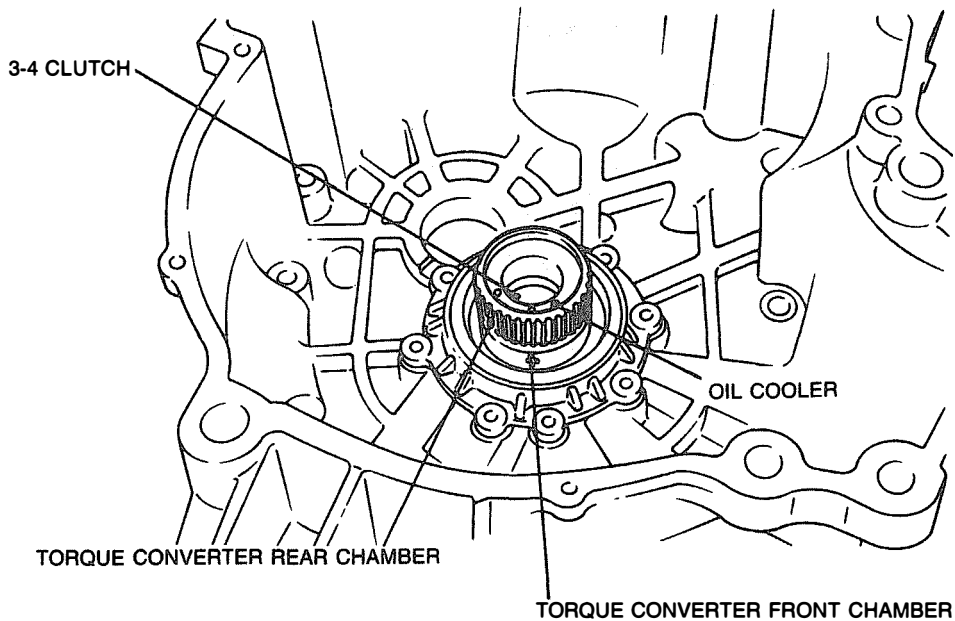
Range	Gear	Engine braking effect	Operation elements									
			Forward clutch	Coasting clutch	3-4 clutch	Reverse clutch	2-4 brake		Low & reverse brake	One-way clutch 1	One-way clutch 2	
							Applied	Released				
P	—	—										
R	Reverse	Yes				○			○			
N	—	—										
D	1st	No	○							○	○	
	2nd	No	○				○			○		
	3rd	Below approx. 40 km/h (25 mph)	Yes	○	○	○			○		○	
		Above approx. 40 km/h (25 mph)	Yes	○	○	○		⊗	○		○	
	OD	Yes	⊙		○		○					
S	1st	No	○							○	○	
	2nd	No	○				○			○		
	3rd	Below approx. 40 km/h (25 mph)	Yes	○	○	○			○		○	
		Above approx. 40 km/h (25 mph)	Yes	○	○	○		⊗	○		○	
L	1st	No	○						○	○	○	
	2nd	Yes	○	○			○			○		
HOLD	D	2nd	No	○				○			○	
		3rd	Below approx. 40 km/h (25 mph)	Yes	○	○	○			○		○
	Above approx. 40 km/h (25 mph)		Yes	○	○	○		⊗	○		○	
	S	2nd	Yes	○	○			○			○	
		3rd	Below approx. 40 km/h (25 mph)	Yes	○	○	○			○		○
	Above approx. 40 km/h (25 mph)		Yes	○	○	○		⊗	○		○	
L	1st	Yes	○	○					○	○	○	
	2nd	Yes	○	○			○			○		

⊗: Fluid pressure to servo but band not applied due to pressure difference in servo.  
 ⊙: Does not function to transmit power.

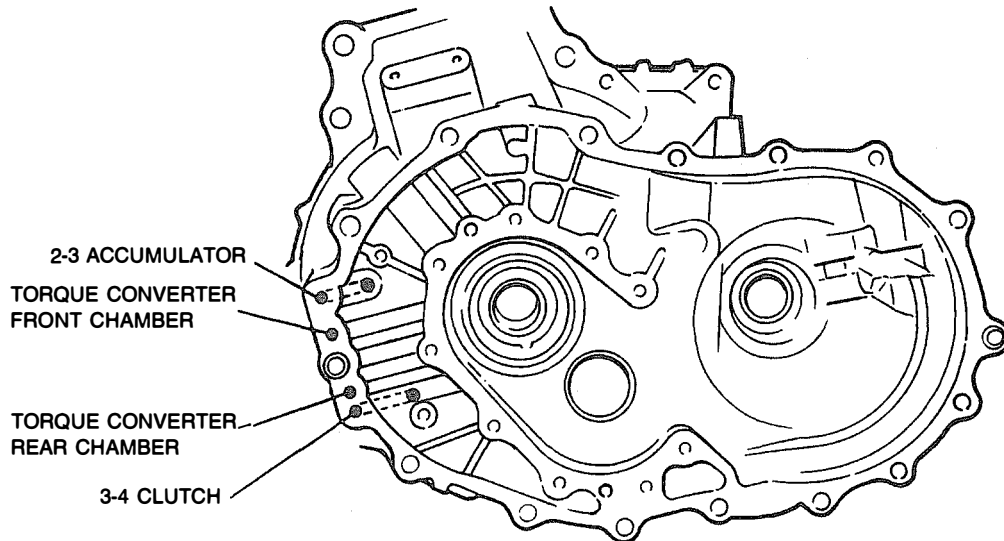
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**FLUID PASSAGE LOCATION**  
**Torque Converter Housing**

**OUTLET**

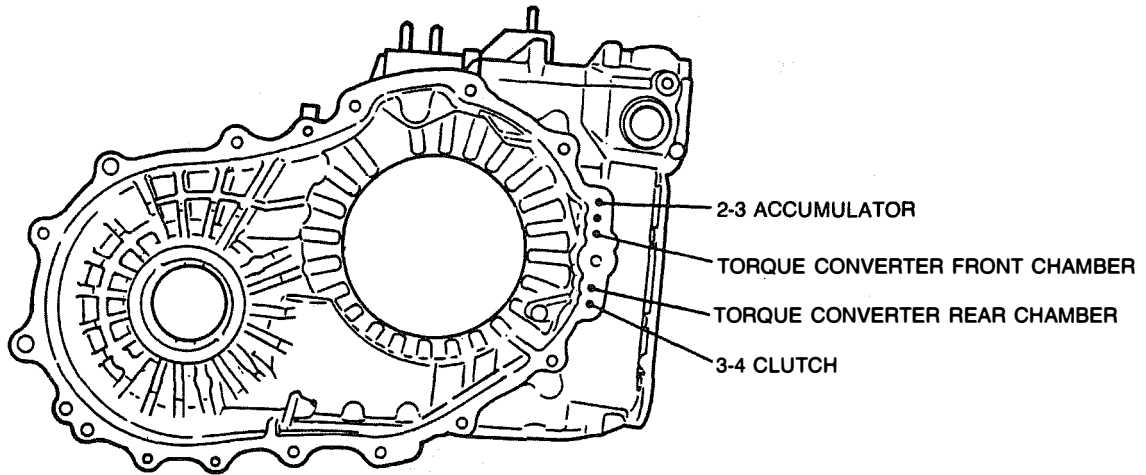


**INLET**

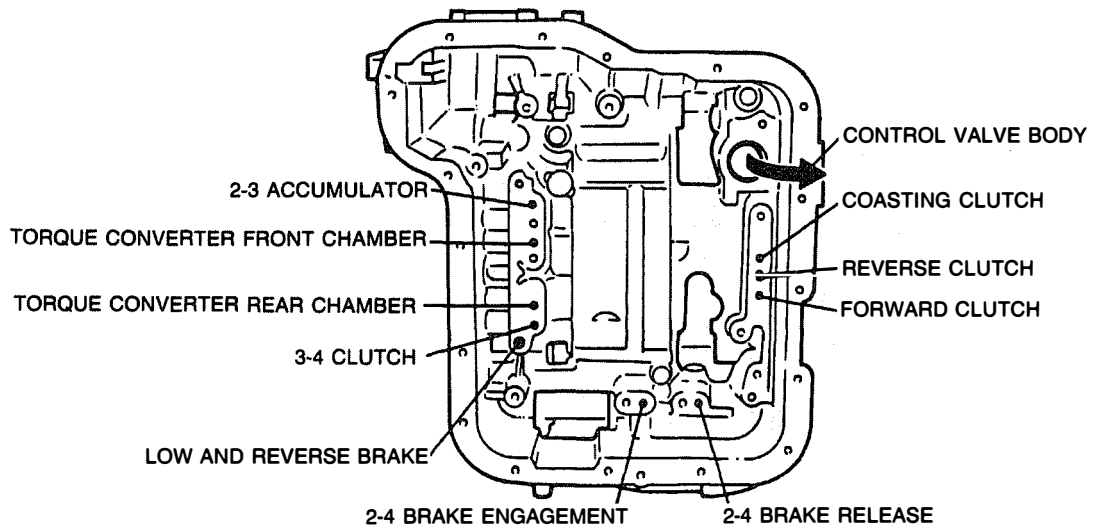


Transaxle Case

OUTLET



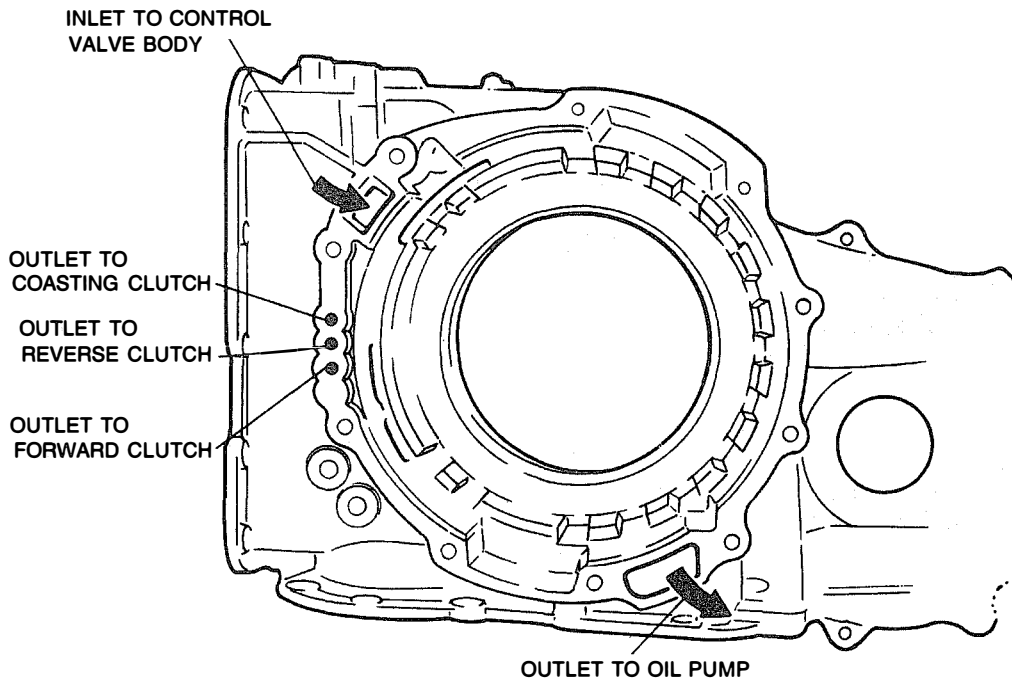
INLET



K

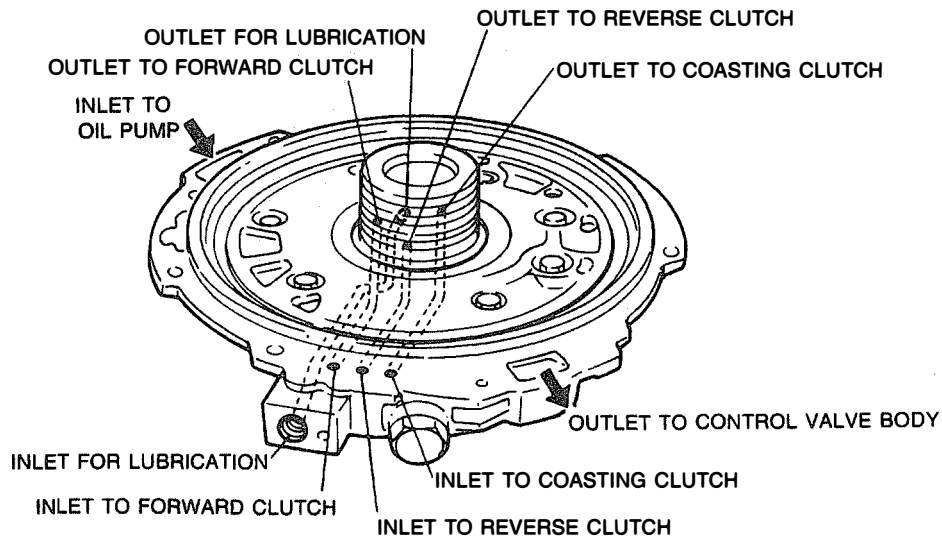
Transaxle Case

INLET AND OUTLET



Oil Pump

INLET AND OUTLET



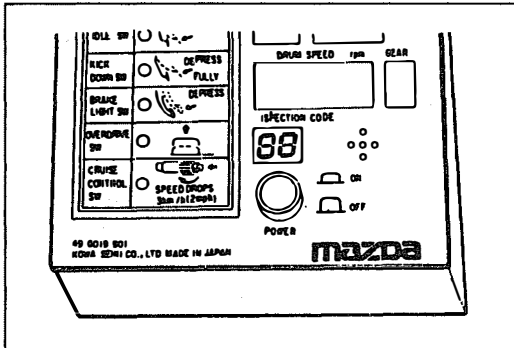
**TROUBLESHOOTING**

**GENERAL NOTES**

A problem with the EC-AT may be caused by the engine, the EC-AT powertrain, the hydraulic control system, or the electronic control system.

When troubleshooting, therefore, begin from these points, which can be inspected quickly and easily. The recommended troubleshooting sequence is described below.

9MU0K1-011



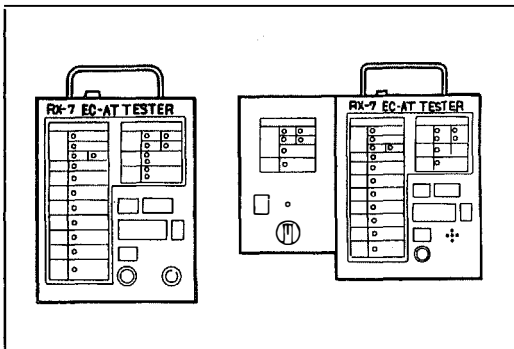
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**Step 1: Self-diagnostic System Inspection**

Check for malfunction code(s) memorized in the EC-AT control unit with the **EC-AT Tester**.

**Note**

- Malfunction code(s) can also be checked for by the flashing sequence of the HOLD indicator lamp (Turbo) or the MIL (Malfunction Indicator Lamp) (Non-Turbo).



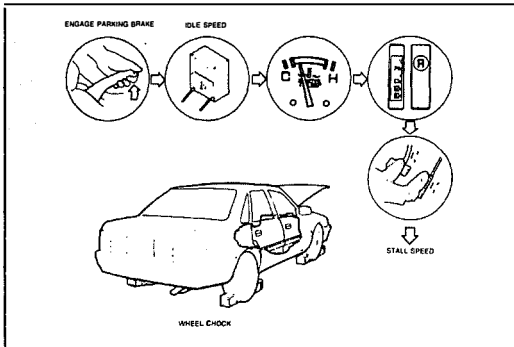
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**Step 2: Electric Signal Inspection**

Check the signals to/from the EC-AT control unit with the **EC-AT Tester**. (Refer to page K-12.)

**Note**

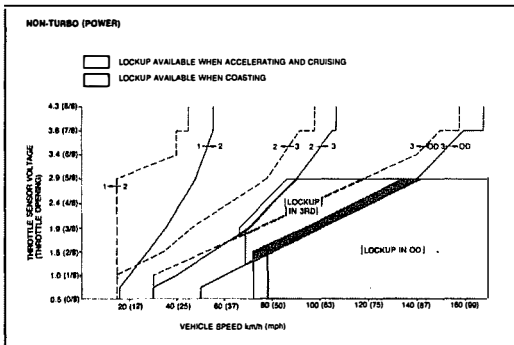
- Signals can also be checked by checking the EC-AT control unit terminal voltages with a voltmeter. (Refer to page K-42.)



06U0KX-013

**Step 3: Mechanical System Test**

Check the engine stall speed, time lag, line pressure, and throttle pressure. (Refer to page K-23.)



06U0KX-014

**Step 4: Road Test**

**Note**

- For correct testing, vehicle speed, engine speed, throttle opening (throttle sensor voltage), and gear position should be checked with the EC-AT Tester.

Check the shift point, shift schedule, and shift shock. (Refer to page K-30.)



Inspection point and reference page		ON VEHICLE										OFF VEHICLE																																																						
		Electronic control system										Preliminary	Hydraulic control system			Powertrain																																																		
		Section T		K-40		K-39		K-39		Section F1, F2		Section F1, F2		K-41		K-41		K-41		K-42		K-42		K-42		K-42		K-45		K-155		K-47		Section F1, F2			K-94		K-91, 98		K-70		K-153		K-69		K-74		K-74		K-74		K-87		K-92, 93		K-92		K-82		K-85		K-93		K-85	
Brake light switch		Inhibitor switch		Mode switch		Hold switch		Idle switch		Throttle sensor		Water thermostat		Vehicle speed sensor		Pulse generator		1-2 solenoid		2-3 solenoid		3-4 solenoid		Lock up solenoid		ATF level and condition		Selector lever		Throttle cable		Idle speed and Ignition timing			Control valves		Accumulators		Oil pump		Hydraulic circuit		Torque converter		Forward clutch		Coasting clutch		Reverse clutch		3-4 clutch		2-4 brake band and servo		Low and reverse brake		One-way clutch 1		One-way clutch 2		Parking gear		Planetary gear		Differential assembly	
Condition	Accelerating	Vehicle does not move in D, S, L, or R range																																																																
		Vehicle moves in N range																																																																
		Excessive creep																																																																
		No creep at all																																																																
	Shifting	No shift																																																																
		Abnormal shift sequence																																																																
		Frequent shifting																																																																
		Excessively high or low shift point																																																																
		No lockup																																																																
		No kickdown																																																																
	Slipping	Engine flare-up or slippage when accelerating vehicle																																																																
		Engine flare-up or slippage when upshifting or downshifting																																																																
	Shift shock	Excessive N to D or N to R shift shock																																																																
		Excessive shift shock when upshifting or downshifting																																																																
		Excessive shift shock when changing range																																																																
	Noise	Transmission noisy in N or P range																																																																
		Transmission noisy in D, S, L, or R range																																																																
	Others	No engine braking																																																																
		No mode change																																																																
		Transmission overheats																																																																
Vehicle moves in P Parking gear not disengaged when selector moved from P																																																																		
Hold indicator flashes																																																																		
Engine will not start																																																																		

06U0KX-017





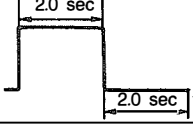

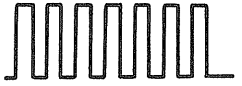







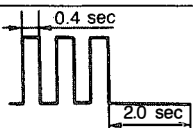
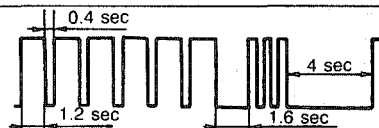
SELF-DIAGNOSTIC SYSTEM INSPECTION

SELF-DIAGNOSIS FUNCTION

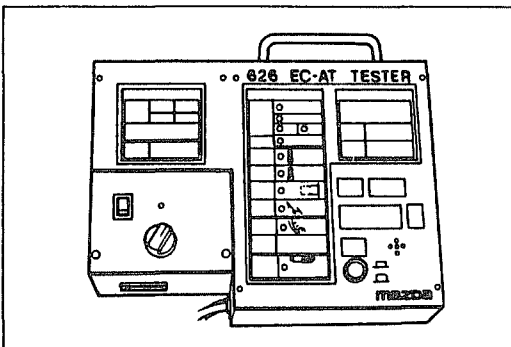
The self-diagnostic system, which is integrated in the EC-AT control unit, diagnoses malfunction of the main sensors (input), solenoid valves (output), and the EC-AT control unit.

Malfunctions which have happened or are continuing are memorized in the EC-AT control unit as specific codes. The **EC-AT Tester** is used to retrieve these malfunction codes. Each malfunction is indicated by a code number and buzzer as shown in the table below.

Malfunction Code Number

Code number	Location of malfunction	Buzzer	
		'87 EC-AT Tester 49 G019 901	'88 EC-AT Tester 49 G019 901A
06	Speed sensor		
12	Throttle sensor		
55	Pulse generator		
57	EC-AT CU (Turbo) (Shift signal)		
60	1-2 shift solenoid valve		
61	2-3 shift solenoid valve		
62	3-4 shift solenoid valve		
63	Lockup control solenoid valve		

06U0KX-018



06U0KX-019

EC-AT TESTER

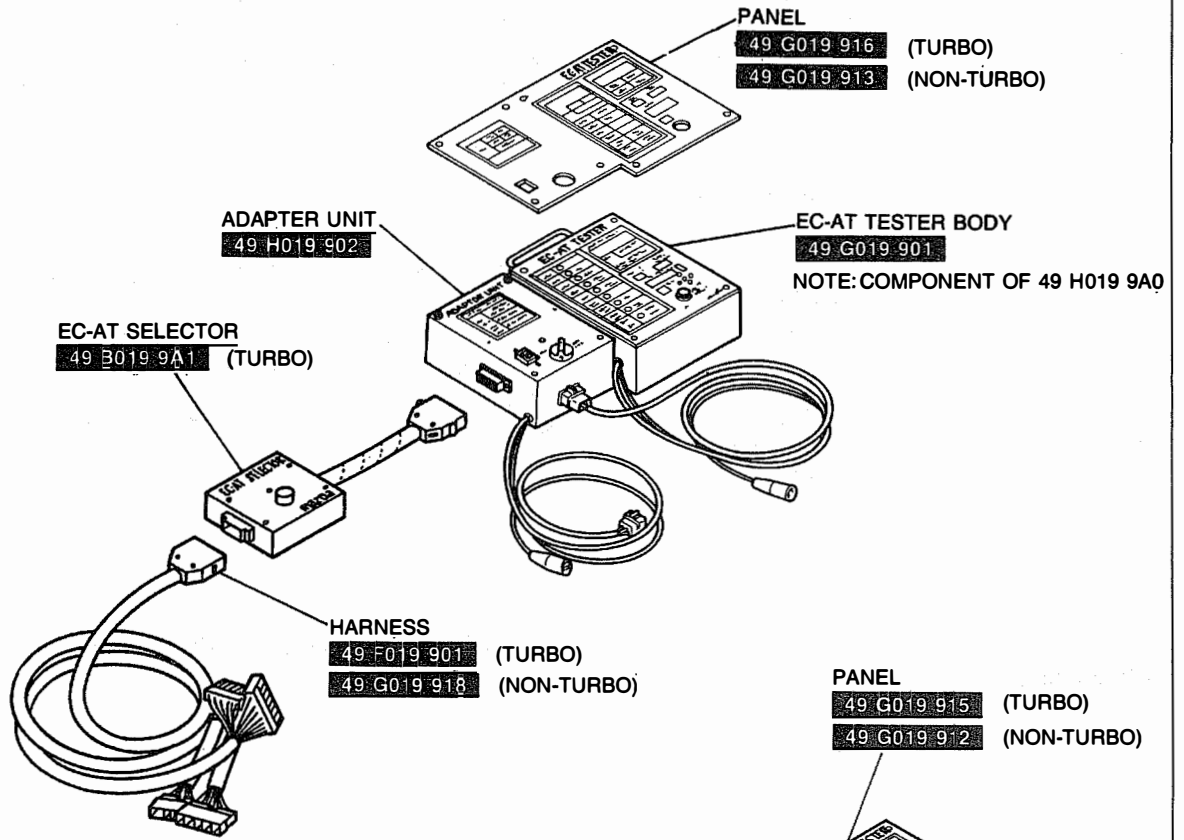
The previous **EC-AT Tester Body** (49 G019 901) and **Adapt-er Unit** (49 H019 902) can be used along with the **Panel** (49 G019 915 for Turbo; 49 G019 913 for Non-Turbo), **EC-AT Selector** (49 B019 9A1 for Turbo), and **Harness** (49 F019 901 for Turbo; 49 G019 918 for Non-Turbo).

Also the **EC-AT Tester Body** (49 G019 901A) can be used along with the **Panel** (49 G019 916 for Turbo; 49 G019 918 for Non-Turbo), **EC-AT Selector** (49 B019 9A1 for Turbo), and **Harness** (49 F019 901 for Turbo; 49 G019 918 for Non-Turbo).



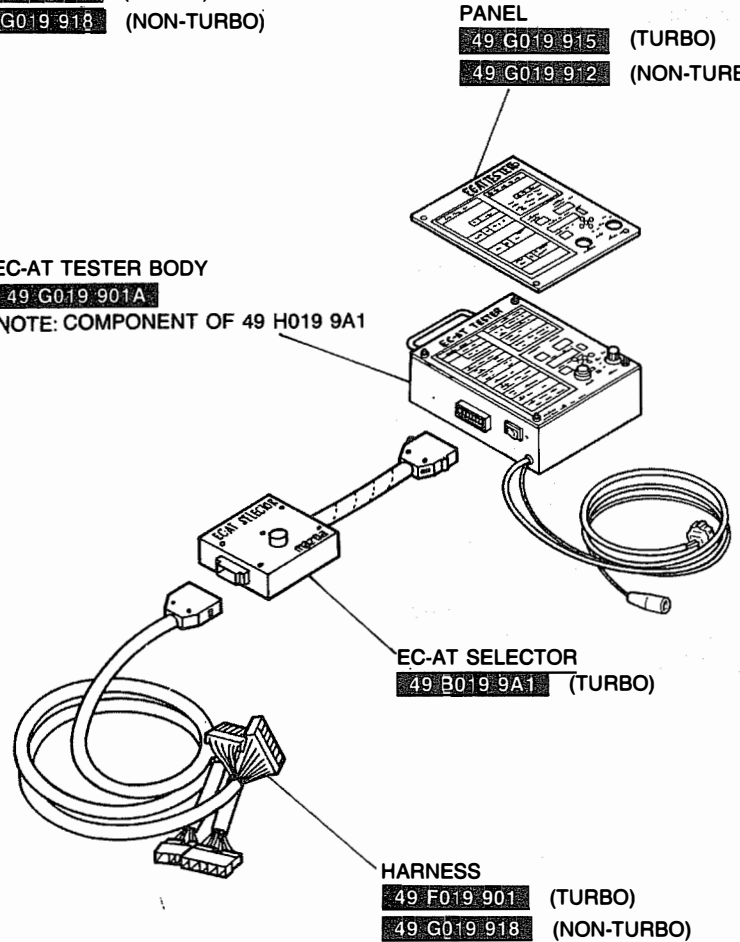
## Components

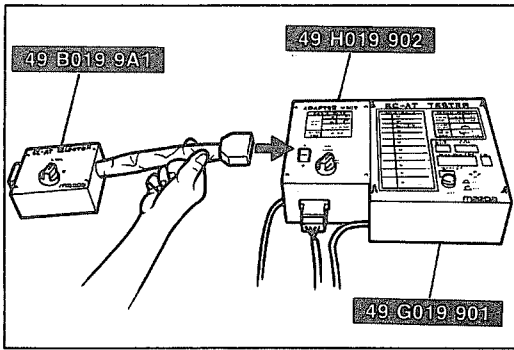
EC-AT TESTER BODY (49 G019 901) AND ADAPTER UNIT (49 H019 902)



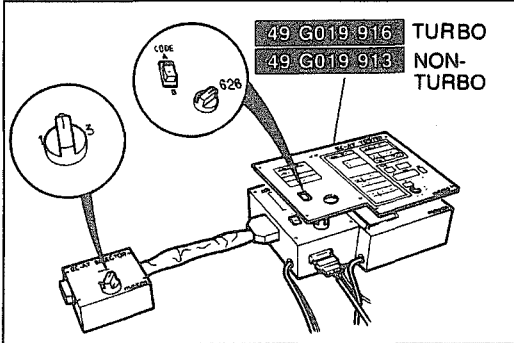
EC-AT TESTER BODY (49 G019 901A)

**EC-AT TESTER BODY**  
 49 G019 901A  
 NOTE: COMPONENT OF 49 H019 9A1

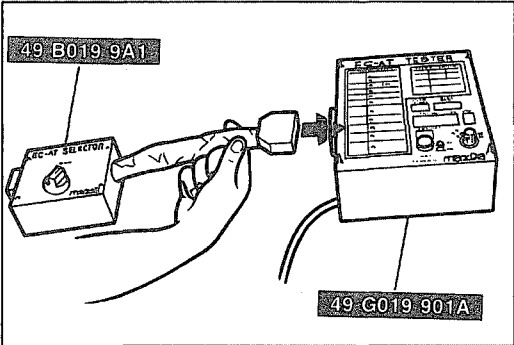




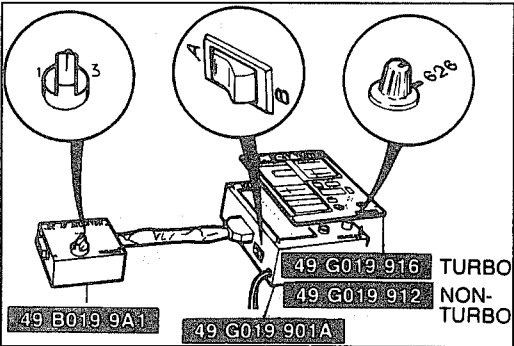
06U0KX-020



06U0KX-021



06U0KX-022



06U0KX-023

**Assembly of EC-AT Tester**

**For EC-AT Tester body (49 G019 901) and adapter unit (49 H019 902)**

1. Connect the **Adapter unit** (49 H019 902) to the **EC-AT Tester body** (49 G019 901), and connect the 6-pin connector to the **Adapter unit**.
2. Connect the **EC-AT Selector** (49 B019 9A1) to the assembled **EC-AT Tester body** (49 G019 901) and **Adapter unit** (49 H019 902). [Turbo]

3. Set the **Panel** (49 G019 916 for Turbo; 49 G019 913 for Non-Turbo) onto the assembled EC-AT Tester.

4. Set the code switch on the **Adapter unit** to position A.
5. Set the vehicle switch on the **Adapter unit** to the 626 position.
6. Set the vehicle switch on the **EC-AT Selector** to position 2. [Turbo]

**For EC-AT Tester body (49 G019 901A)**

1. Connect the **EC-AT Selector** (49 B019 9A1) to the **EC-AT Tester body** (49 G019 901A). [Turbo]

2. Set the **Panel** (49 G019 915 for Turbo; 49 G019 912 for Non-Turbo) onto the **EC-AT Tester body**.

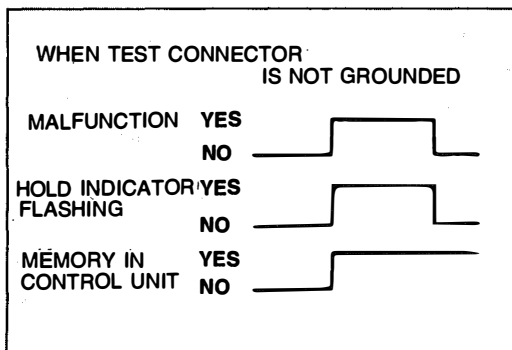
3. Set the code switch on the **EC-AT Tester body** to position A.
4. Set the vehicle switch on the **EC-AT Tester body** to the 626 position.
5. Set the vehicle switch on the **EC-AT Selector** to position 2. [Turbo]

**GENERAL NOTE**

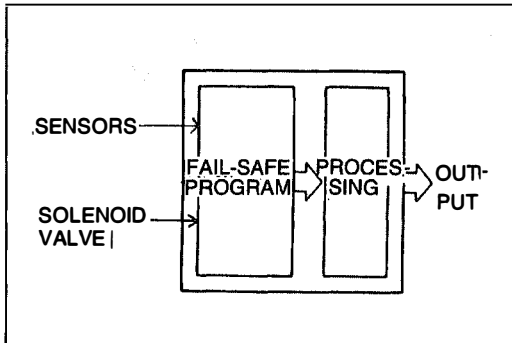
1. If there is more than one malfunction, the code numbers will be displayed in numerical order.

06 → 4 second period →  
 55 → 4 second period →  
 63 → 4 second period →  
 Repeats above

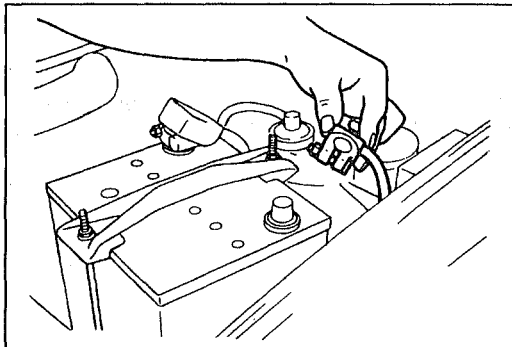
06U0KX-024



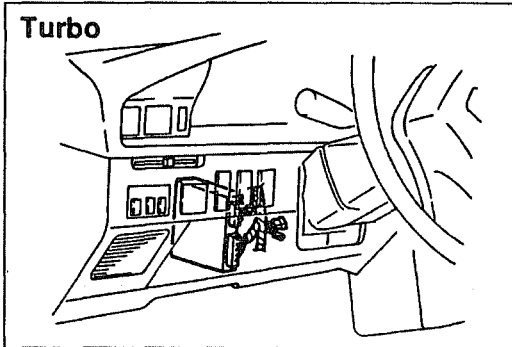
06U0KX-025



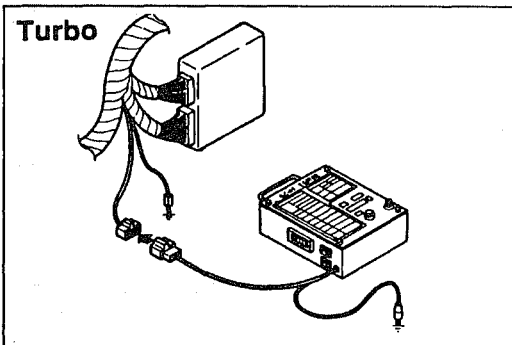
79G07C-062



06U0KX-026



06U0KX-027



06U0KX-028

2. The HOLD indicator (Turbo) or MIL (Non-Turbo) flashes to indicate the same pattern as the buzzer of the **EC-AT Tester** when the test connector (blue, 1-pin for Turbo; green, 1-pin for Non-Turbo) is grounded.

When the test connector is not grounded, the indicator flashes at a constant frequency unless the malfunction recovers. However, the malfunction code is memorized in the EC-AT control unit.

3. The EC-AT control unit has a built-in fail-safe function for the throttle sensor, the pulse generator, and the 1-2, 2-3, and 3-4 shift solenoid valves.

If a malfunction occurs, the EC-AT control unit will control operation of the remaining components according to a preset fail-safe program.

The vehicle may still be driven, although the driving performance will be slightly affected.

4. The memory of malfunction codes is canceled when the negative battery terminal is disconnected for approximately five seconds.

## RETRIEVAL PROCEDURES

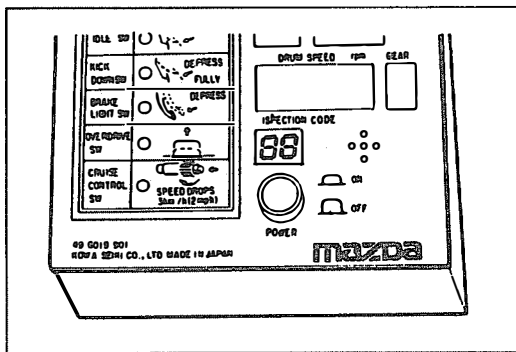
### Turbo

1. Locate the check connector (blue, 6-pin) and test connector (blue, 1-pin) under the dash, left of the steering column.

2. Connect the 6-pin connector of the **EC-AT Tester** to the check connector (blue, 6-pin).

3. Ground the ground connector of the **EC-AT Tester**.

4. Ground the test connector (blue, 1-pin).

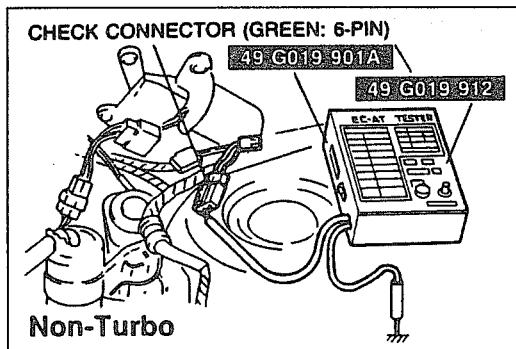


06U0KX-029

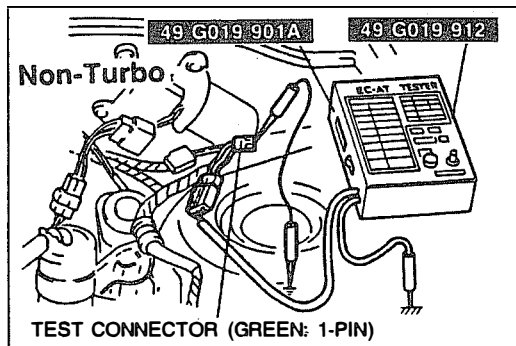
5. Turn the ignition switch ON.
6. Check that "88" flashes on the digital display and the buzzer sounds for three seconds.
7. If "88" does not flash, check the test connector wiring.
8. If "88" flashes and the buzzer sounds continuously for more than **20 seconds**, check wiring to 1C terminal of the EC-AT control unit for a short-circuit. If necessary, replace the EC-AT control unit and repeat Steps 2 to 5.
9. Note any code numbers and check for the causes by referring to the INSPECTION PROCEDURES shown on pages K-17 to K-18. Repair as necessary.

**Note**

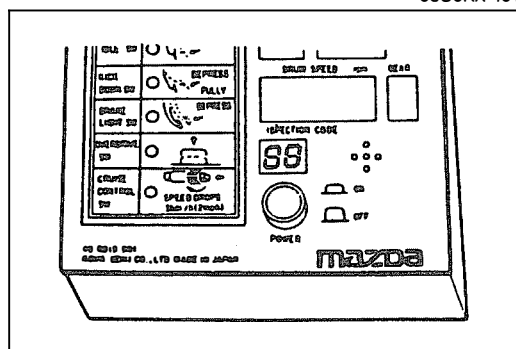
- After repairs are made, recheck for code numbers by performing the "AFTER-REPAIR PROCEDURES". (Refer to page K-19.)



16U0KX-002



06U0KX-401



06U0KX-402

**Non-Turbo****Caution**

- Do not connect two connectors of the EC-AT TESTER (AND EC-AT SELECTOR) to EC-AT control unit at the same time.

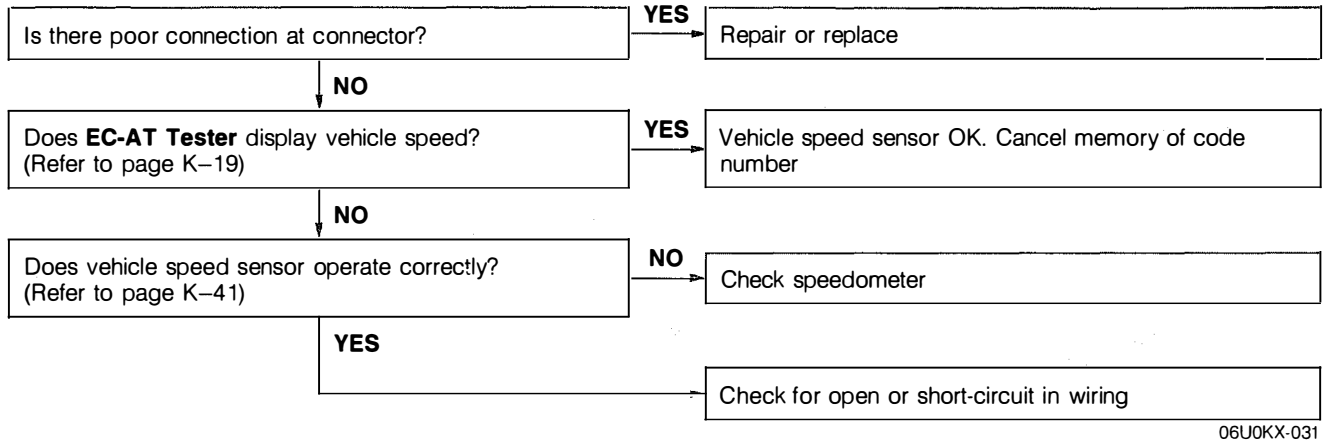
1. Locate the check connector (green, 6-pin) and test connector (green, 1-pin) in the engine compartment at the rear of the left side wheel housing.
2. Connect the 6-pin connector of the EC-AT Tester to the check connector (green, 6-pin).
3. Ground the ground connector of the EC-AT Tester.
4. Ground the test connector (green, 1-pin).
5. Turn the ignition switch ON.
6. Check that "88" flashes on the digital display and the buzzer sounds for three seconds.
7. If "88" does not flash, check the test connector wiring.
8. If "88" flashes and the buzzer sounds continuously for more than **20 seconds**, check wiring to 1F terminal of the engine control unit for a short-circuit. If necessary, replace the engine control unit and repeat Steps 2 to 5.
9. Note any code numbers and check for the causes by referring to the INSPECTION PROCEDURES shown on pages K-17 to K-18. Repair as necessary.

**Note**

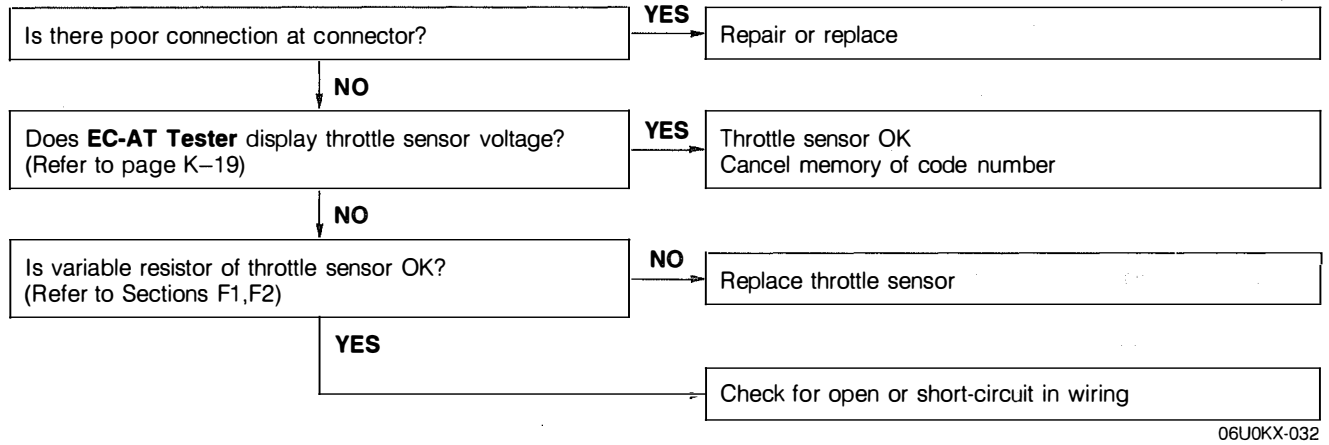
- After repairs are made, recheck for code numbers by performing the "AFTER-REPAIR PROCEDURES". (Refer to page K-19.)

**INSPECTION PROCEDURES**

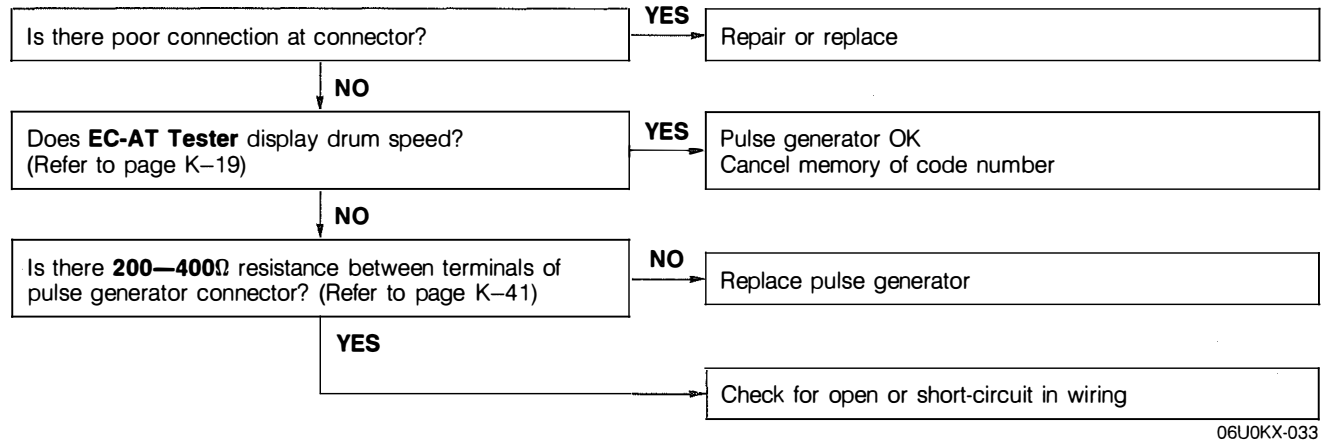
**No.06 Code Display (Vehicle Speed Sensor)**



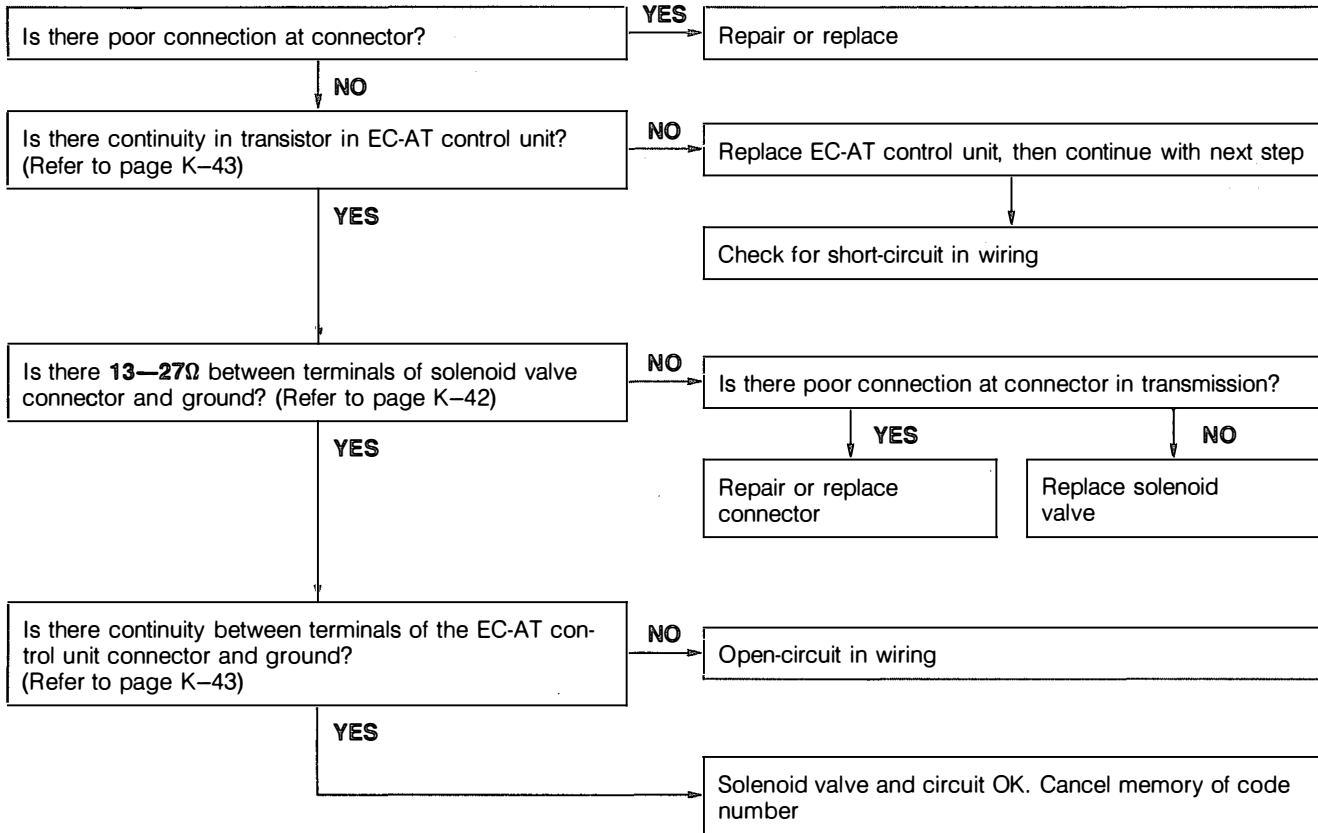
**No.12 Code Display (Throttle Sensor)**



**No.55 Code Display (Pulse Generator)**

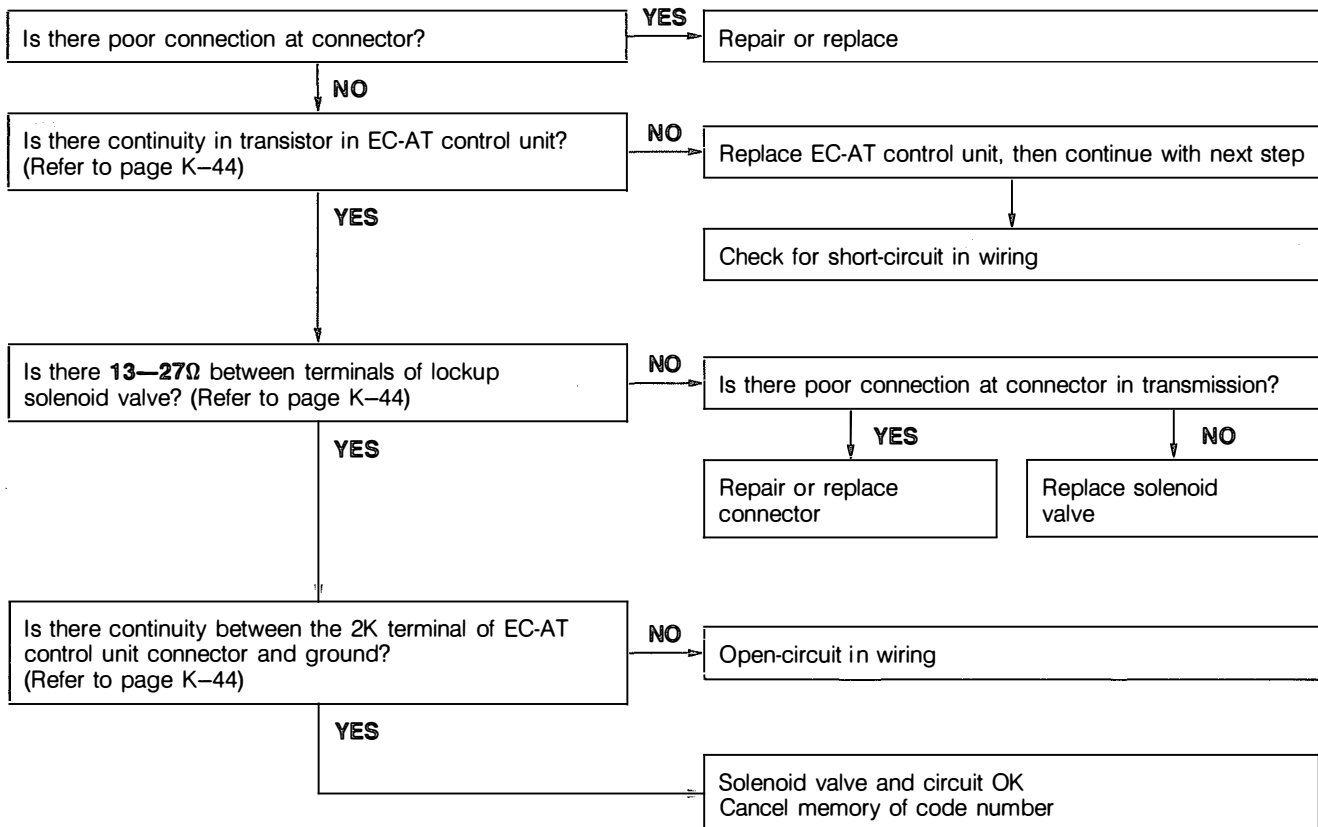


**No.60, 61, 62, or 64 Code Display (1-2 Shift, 2-3 Shift, or 3-4 Shift Solenoid Valve)**

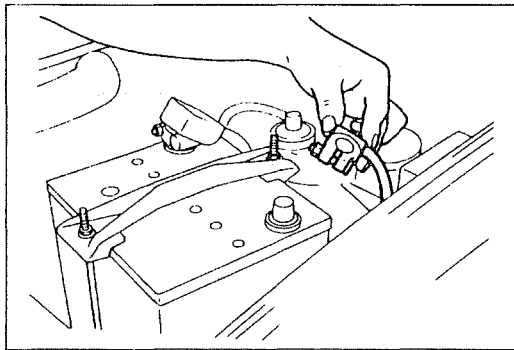


06U0KX-034

**No. 63 code display (Lockup Solenoid Valve)**



06U0KX-035



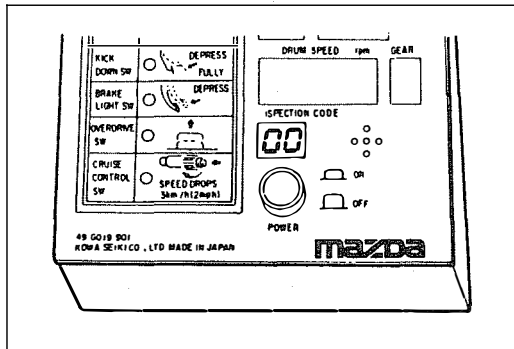
79G07C-068

**Drive at 50 km/h (31 mph)**

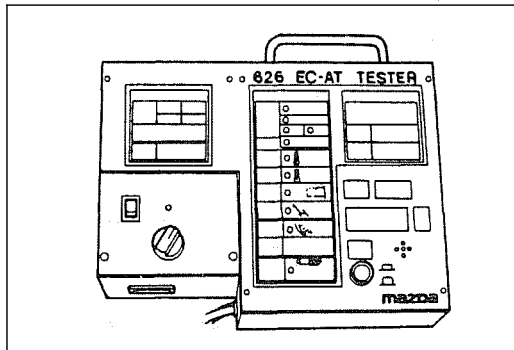
**Kickdown**

**Stop the vehicle**

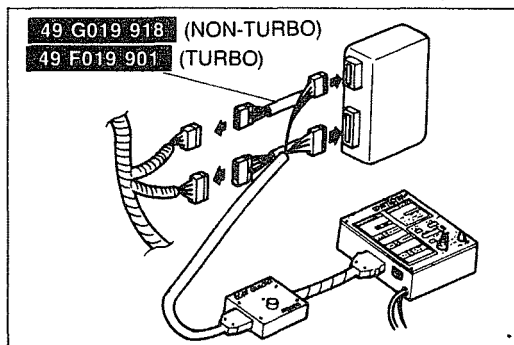
79G07C-069



06U0KX-036



06U0KX-037



06U0KX-038

## AFTER-REPAIR PROCEDURE

1. Cancel the memory of malfunctions by disconnecting the negative battery terminal for at least five seconds, then reconnect it.
2. Remove the **EC-AT Tester** if it is connected.
3. Drive the vehicle at 50 km/h (31 mph), then depress the accelerator pedal fully to activate kickdown. Stop the vehicle gradually.
4. Reconnect the **EC-AT Tester** to the check connector (blue, 6-pin for Turbo; green, 6-pin for Non-Turbo).
5. Ground the ground connector of the **EC-AT Tester**.
6. Ground the test connector (blue, 1-pin for Turbo; 1-pin for Non-Turbo).
7. Turn the ignition switch ON.
8. Verify that no code numbers are displayed.

## ELECTRIC SIGNAL INSPECTION

### Caution

- Do not connect two connectors of the **EC-AT TESTER (AND EC-AT SELECTOR)** to **EC-AT control unit** at the same time.

In this step, the input and output signals are checked with the **EC-AT Tester**.

The Tester checks for proper operation of the various switches and sensors in the EC-AT system. It also checks the control unit for output of the various control signals.

## INSPECTION PROCEDURE

1. Disconnect the connectors from the EC-AT control unit (Turbo) or engine control unit (Non-Turbo).
2. Connect the **Harness** between the control unit and the connectors.
3. Turn the ignition switch and main switch ON.
4. Check indication of the respective light or digital display in each condition, referring to the indication table on the next page.

Indication Table of Light and Digital Display

Item	Indication	Condition	Possible cause	
<b>Input (Light)</b>				
INHIBITOR SW	L	ON	L range	Inhibitor switch or wiring
		OFF	Other ranges	
	S	ON	S range	
		OFF	Other ranges	
	D	ON	D range	
		OFF	Other ranges	
	P, N	ON	P or N range	
		OFF	Other ranges	
HOLD SW	ON	Hold switch pressed	Hold switch or wiring	
	OFF	Hold switch released		
MODE SW	ON	Power mode	Mode switch or wiring	
	OFF	Economy mode		
IDLE SW	ON	Throttle valve fully closed	Idle switch or wiring	
	OFF	Throttle valve open		
BRAKE LIGHT SW	ON	Brake pedal depressed	Stoplight switch or wiring	
	OFF	Brake pedal released		
WATER THERMO SW	ON	Coolant temperature 72°C (162°F) or above	Water thermost switch or wiring	
	OFF	Coolant temperature lower than 65°C (149°F)		
ATF THERMO SW	ON	ATF temperature 150°C (302°F) or above	ATF thermost switch or wiring	
	OFF	ATF temperature lower than 143°C (289°F)		
CRUISE CONTROL SW	Not used	—	—	
<b>Input (Digital display)</b>				
THROTTLE SENSOR	EC-AT control unit terminal voltage	Constant	Throttle sensor, idle switch, or wiring	
VEHICLE SPEED*	Vehicle speed calculated from speed sensor signal	Constant	Vehicle speed sensor, speedometer cable, or wiring	
DRUM SPEED*	Drum speed	Constant	Pulse generator or wiring	



Item	Indication	Condition	Possible cause
<b>Output (Light)</b>			
1-2 SOLENOID VALVE*	ON	Refer to page K-22 solenoid valve operation table	Control unit, 1-2 shift sol., or wiring
	OFF		
2-3 SOLENOID VALVE*	ON		Control unit, 2-3 shift sol., or wiring
	OFF		
3-4 SOLENOID VALVE*	ON		Control unit, 3-4 shift sol., or wiring
	OFF		
LOCK-UP SOLENOID VALVE*	ON	Lockup condition	Control unit, lockup sol., or wiring
	OFF	Non-lockup condition	
HOLD INDICATOR	ON	Hold mode	Control unit, hold switch, or wiring
	OFF	Other modes	
MODE INDICATOR	ON	Power or economy mode	Control unit, hold switch, mode switch, or wiring
	OFF	Hold mode	
NO LOAD SIGNAL*	ON	N or P range	Control unit, pulse generator, inhibitor switch or wiring
	OFF	Other range	
SHIFT <sup>^</sup> [Turbo]	ON	3rd→2nd, 2nd→1st shift with throttle valve opening 5/8 or more	EC-AT control unit or wiring
	OFF	Others	

06U0KX-039

Item	Indication	Condition
<b>Output (Digital display)</b>		
GEAR*	1	1st gear position
	2	2nd gear position
	3	3rd gear position
	4	Overdrive (OD) gear position

16U0KX-005

**Note**

- \* Item must be checked with the engine running or while driving.
- ^ Item must be checked with the engine and transaxle thoroughly warm.

### Comprehensive Usage

The **EC-AT Tester** can be used to inspect slippage of friction elements, shift points, and shift sequence during the road test.

The inspection procedure is shown in ROAD TEST.

### Solenoid valve operation table

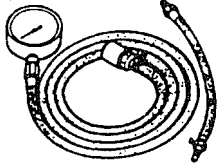
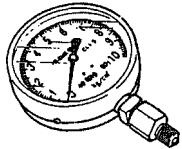
RANGE	GEAR		SOLENOID VALVE			
			1-2	2-3	3-4	Lockup
P	—				ON	
R	Reverse		ON			
N	—	Below approx. 4 km/h (2 mph)			ON	
		Above approx. 5 km/h (3 mph)	ON			
D	1st			ON	ON	
	2nd		ON	ON	ON	
	3rd	Below approx. 40 km/h (25 mph)				
		Above approx. 40 km/h (25 mph)	Lockup OFF	ON		
			Lockup ON	ON		ON
	OD	Lockup OFF		ON		ON
Lock-up ON		ON		ON	ON	
S	1st			ON	ON	
	2nd		ON	ON	ON	
	3rd	Below approx. 40 km/h (25 mph)				
		Above approx. 40 km/h (25 mph)		ON		
L	1st			ON	ON	
	2nd	Below approx. 110 km/h (68 mph)	ON	ON		
		Above approx. 110 km/h (68 mph)		ON		
HOLD	D	2nd		ON	ON	ON
		3rd	Below approx. 40 km/h (25 mph)			
	Above approx. 40 km/h (25 mph)		ON			
	S	2nd		ON	ON	
		3rd	Below approx. 40 km/h (25 mph)			
	Above approx. 40 km/h (25 mph)		ON			
	L	1st			ON	
		2nd	Below approx. 110 km/h (68 mph)	ON	ON	
	Above approx. 110 km/h (68 mph)		ON			

06U0KX-041

MECHANICAL SYSTEM TEST

PREPARATION

SST

<p>49 0378 400A</p> <p>Gauge set, oil pressure</p> 	<p>For measurement of oil pressure</p>	<p>49 B019 901</p> <p>Gauge</p> 	<p>For measurement of oil pressure</p>
--	--	---	--

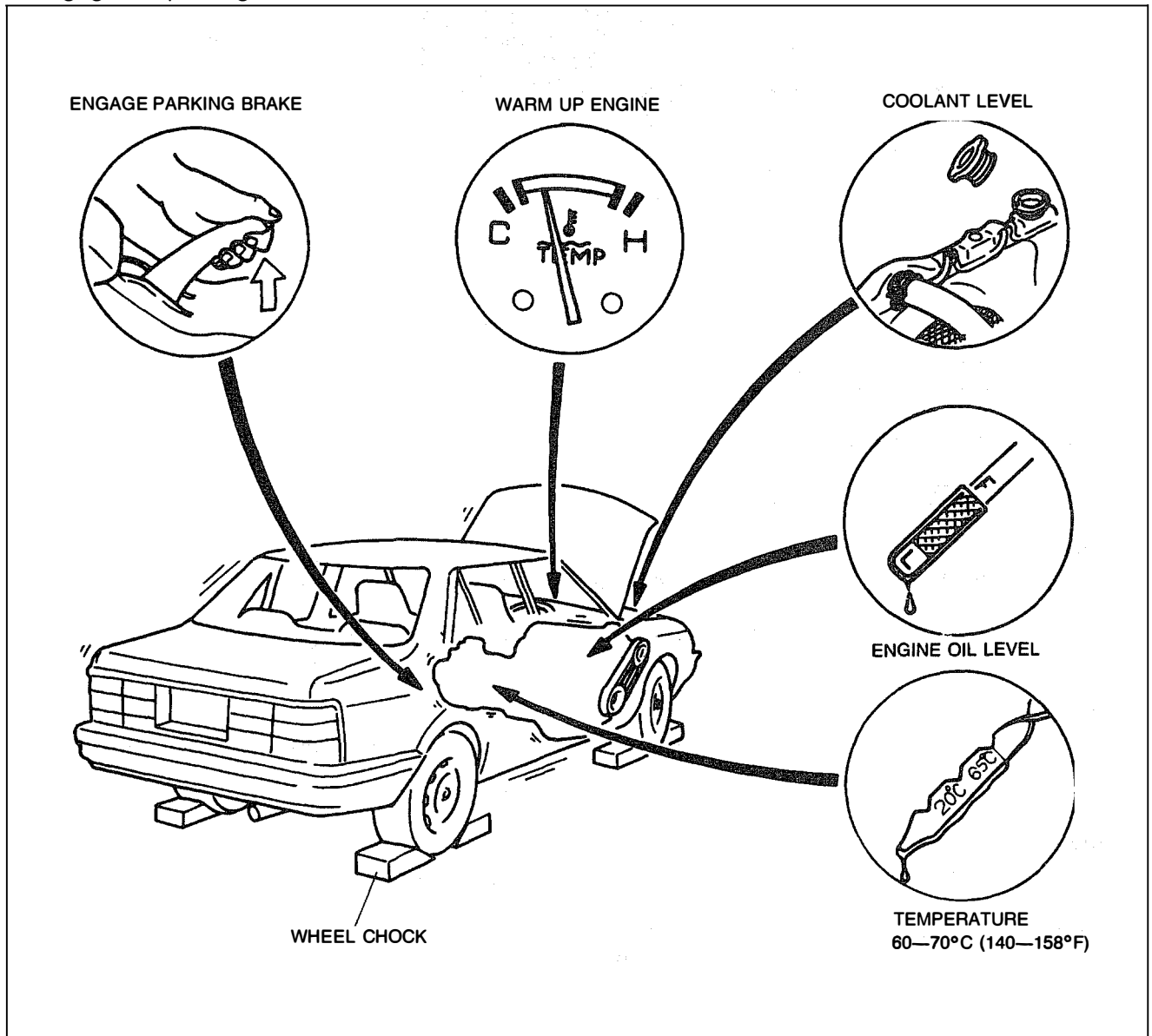
06U0KX-042

STALL TEST

This test is performed to determine if there is slippage of the friction elements or malfunction of the hydraulic components.

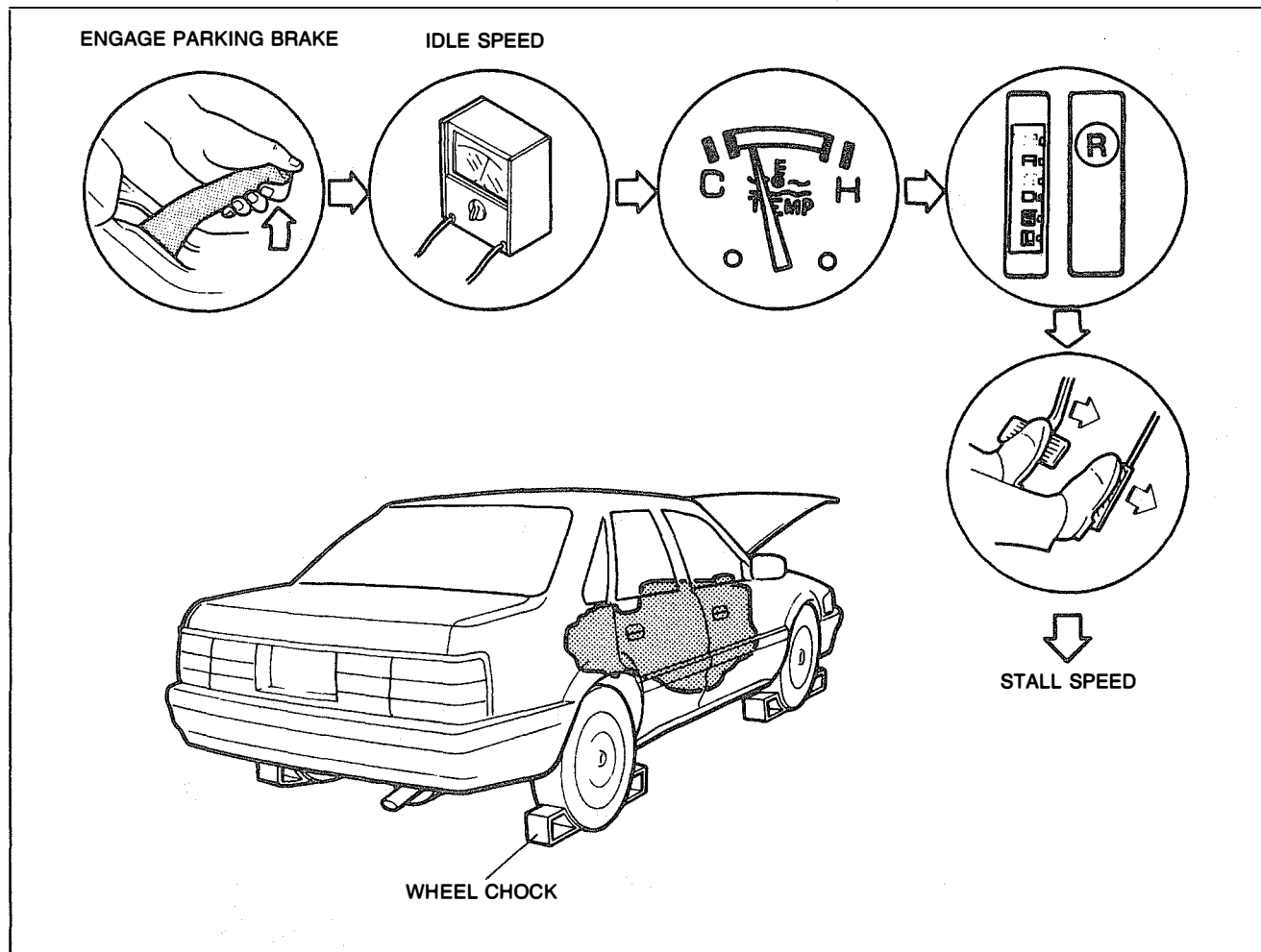
Preparation

1. Check the engine coolant, engine oil, and ATF levels before testing.
2. Warm the engine thoroughly to raise the ATF temperature to operating level (60–70°C, 140–158°F).
3. Engage the parking brake and use wheel chocks at the front and rear of the wheels.



06U0KX-043

## Procedure



16U0KX-006

1. Connect a tachometer to the engine.
2. Start the engine and check the idle speed in P range. (Refer to Sections F1, F2.)

**Idle speed: 750 ± 25 rpm**

3. Shift the selector lever to R range.

**Caution**

- Steps 4 and 5 must be performed within 5 seconds to prevent possible transaxle damage.

4. Firmly depress the foot brake with the left foot and gently depress the accelerator pedal with the right foot.
5. When the engine speed no longer increases, quickly note the speed and release the accelerator.

**Caution**

- Idling for at least one minute is to cool the ATF and to prevent deterioration of the fluid.

6. Move the selector lever to N range and let the engine idle for at least one minute.

**Caution**

- Be sure to allow sufficient cooling time between each stall test.

7. Perform the stall test for the following ranges in the same manner.

- |                    |                    |
|--------------------|--------------------|
| (1) D range        | (4) L range        |
| (2) D range (Hold) | (5) L range (Hold) |
| (3) S range (Hold) |                    |

**Engine stall speed: Non-Turbo**

**D.S.L range 2,120—2,420 rpm**

**R range 2,080—2,380 rpm**

**Turbo**

**D.S.L range 2,550—2,850 rpm**

**R range 2,500—2,800 rpm**

**Note**

- The stall test can be performed with the EC-AT Tester in place of a tachometer.

**Drum stall speed indication: 0 rpm**

06U0KX-045

**Evaluation**

<b>Condition</b>		<b>Possible cause</b>	
Above specification	In all ranges	Insufficient line pressure	Worn oil pump
			Oil leakage from oil pump, control valve, and/or transmission case
			Stuck pressure regulator valve
	In forward ranges	Forward clutch slipping One-way clutch 1 slipping	
	In D range	One-way clutch 2 slipping	
	In S (Hold) and L (Hold) ranges	Coasting clutch slipping	
	In D (Hold) and S (Hold) ranges	2-4 brake band slipping	
In R, L and L (Hold) ranges	Low and reverse brake slipping		
	In R range	Low and reverse brake slipping Reverse clutch slipping Perform road test to determine whether problem is low and reverse brake or reverse clutch a) Engine braking felt in 1st...Reverse clutch b) Engine braking not felt in 1st...Low and reverse brake	
Within specification		All shift control elements within transmission are functioning normally	
Below specification		Engine out of tune	
		One-way clutch slipping within torque converter	

06U0KX-046

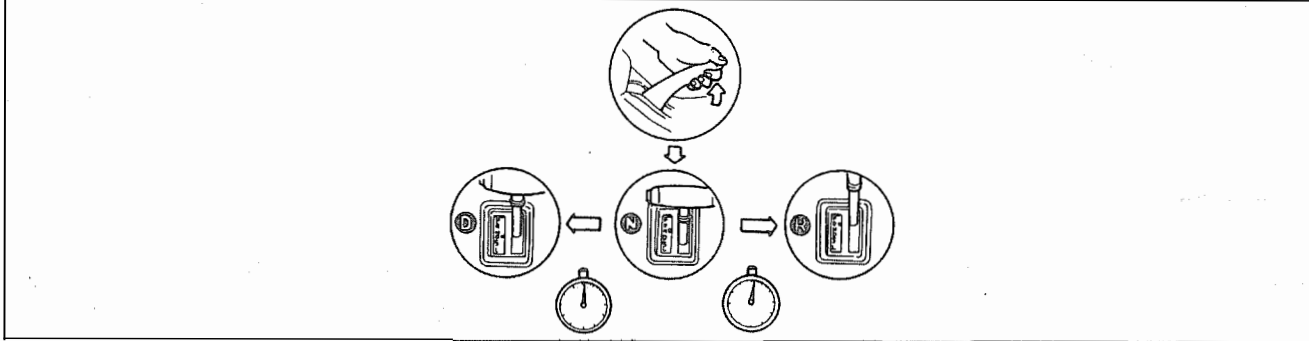
### TIME LAG TEST

If the selector lever is shifted while the engine is idling, there will be a certain time lapse, or time lag, before shock is felt. This step checks this time lag for checking condition of the 1-2, N-R, and N-D accumulators, forward, and one-way clutches, 2-4 brake band, and low-and-reverse brake.

#### Preparation

Perform the preparation procedure shown in the STALL TEST. (Refer to page K-23.)

#### Procedure



06U0KX-047

1. Start the engine and check the idle speed in P range. (Refer to Sections F1, F2)

**Idle speed: 750 ± 25 rpm**

2. Shift from N range to D range.
3. Use a stopwatch to measure the time it takes from shifting until shock is felt.

#### Caution

- **Idling for at least one minute is to cool the ATF and prevent deterioration of the fluid.**

4. Shift the selector to N range and run the engine at idle speed for at least one minute.

#### Note

- **Make three measurements for each test and take the average value.**

5. Perform the test for the following shifts in the same manner.

- (1) N→D range (Hold mode)
- (2) N→R range

**Specified time lag:** N→D range..... 0.5—1.0 second  
 N→R range..... 0.5—1.0 second

#### Evaluation

Condition		Possible Cause
N → D (Economy) shifting	More than specification	Insufficient line pressure Forward clutch slipping One-way clutch 1 slipping One-way clutch 2 slipping
	Less than specification	N-D accumulator not operating properly Excessive line pressure
N → D (Hold) shifting	More than specification	Insufficient line pressure Forward clutch slipping 2-4 brake band slipping One-way clutch 1 slipping
	Less than specification	1-2 accumulator not operating properly Excessive line pressure
N → R shifting	More than specification	Insufficient line pressure Low and reverse brake slipping Reverse clutch slipping
	Less than specification	N-R accumulator not operating properly Excessive line pressure

86U07B-038

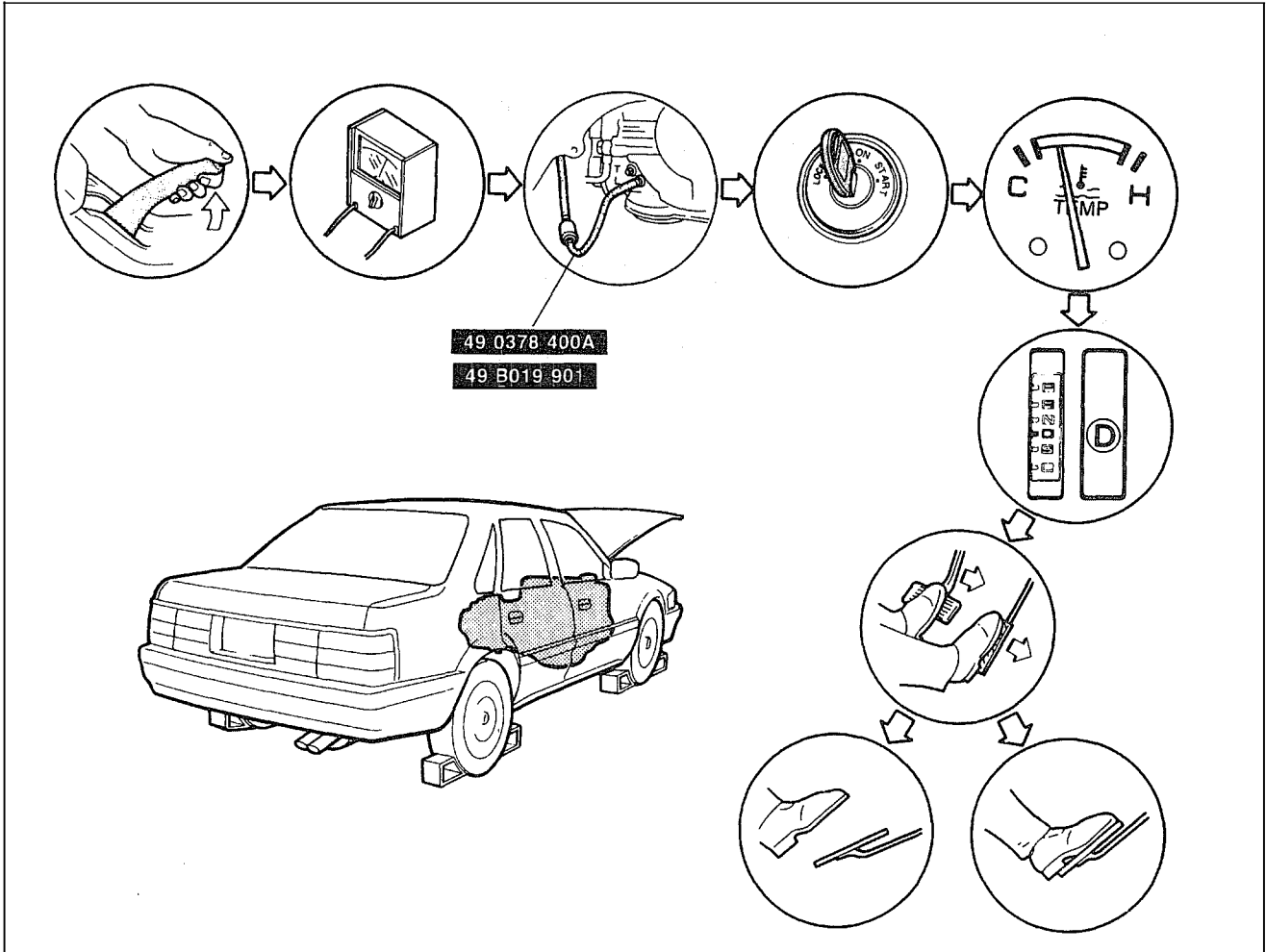
## LINE PRESSURE TEST

This test measures line pressures for checking the hydraulic components and inspecting for oil leakage.

### Preparation

1. Perform the preparation procedure shown in the STALL TEST. (Refer to page K-23.)
2. Connect a tachometer to the engine.
3. Connect the **SST** (49 B019 901) to the line pressure inspection port (square head plug "L").

### Procedure



16U0KX-007

1. Start the engine and check the idle speed in P range. (Refer to Sections F1, F2.)

**Idle speed: 750 ± 25 rpm**

2. Shift the selector lever to D range and read the line pressure at idle for each range.
3. Connect the **SST** (49 0378 400A) to the line pressure inspection port.

### Caution

- **Steps 4 and 5 must be performed within 5 seconds to prevent possible transaxle damage.**

4. Depress the brake pedal firmly with the left foot and gradually depress the accelerator pedal with the right foot.
5. Read the line pressure as soon as the engine speed becomes constant, then release the accelerator pedal.

### Caution

- **Idling for at least one minute is to cool the ATF and to prevent deterioration of the fluid.**

6. Shift the selector lever to N range and run the engine at idle for at least one minute.

## MECHANICAL SYSTEM TEST

Range	Line pressure kPa, (kg/cm <sup>2</sup> , psi)	
	D, S, L	R
At idle	353—432 (3.6—4.4, 51—63)	598—942 (6.1—9.6, 87—137)
At stall speed	873—1040 (8.9—10.6, 127—151)	1668—2011 (17.0—20.5, 242—292)

06U0KX-049

### Evaluation of line pressure test

Line pressure	Possible location of problem
Low pressure in all positions	Worn oil pump Fluid leaking from oil pump, control valve body, or transaxle case Pressure regulator valve stuck
Low pressure in D and S only	Fluid leaking from hydraulic circuit of forward clutch
Low pressure in R only	Fluid leaking from hydraulic circuit of low and reverse brake
Higher than specification	Throttle valve stuck Throttle modulator valve stuck Pressure regulator valve stuck

06U0KX-050



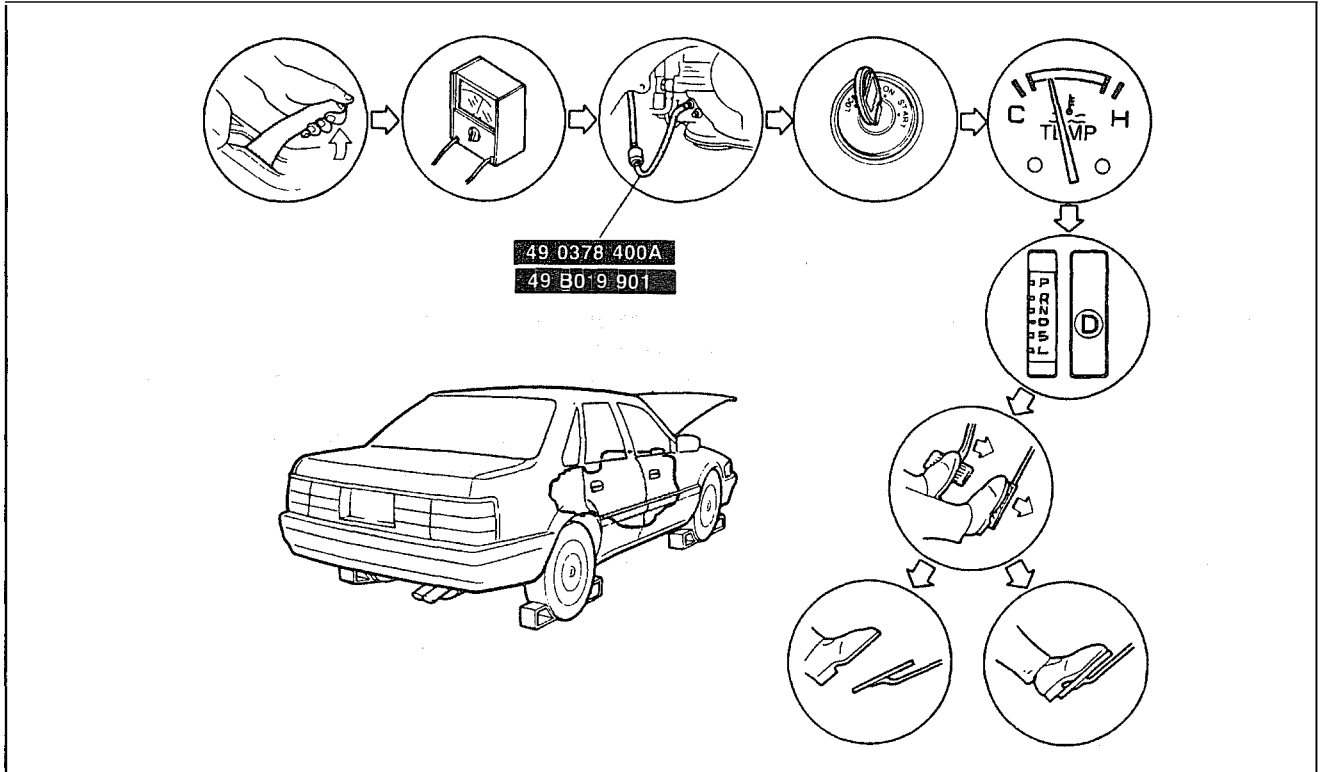
**Throttle Pressure Test**

This test measures throttle pressures for checking the hydraulic components and for improper adjustment of throttle cable.

**Preparation**

1. Perform the preparation procedure shown in STALL TEST. (Refer to page K-23.)
2. Connect a tachometer to the engine.
3. Connect the **SST** (49 B019 901) to the throttle pressure inspection hole (square head plug "T").

**Procedure**



16U0KX-008

1. Start the engine and check the idle speed in P range. (Refer to Sections F1, F2.)

**Idle speed: 750 ± 25 rpm**

2. Shift the selector lever to D range and read the throttle pressure at idle.

**Caution**

- **Steps 3 and 4 must be performed within 5 seconds to prevent possible transaxle damage.**

3. Depress the brake pedal firmly with the left foot and gradually depress the accelerator pedal with the right foot.
4. Read the throttle pressure as soon as the engine speed becomes constant, then release the accelerator pedal.

	Throttle pressure kPa (kg/cm <sup>2</sup> , psi)
At idle	39—88 (0.4—0.9, 6—13)
At stall speed	471—589 (4.8—6.0, 68—85)

**Evaluation of throttle pressure test**

Throttle pressure	Possible location of problem
Not within specification	Throttle valve stuck Pressure regulator valve stuck Improper adjustment of throttle cable

ROAD TEST

Caution

- Perform the test at normal ATF operating temperature (60—70°C, 140—158°F).

This step is performed to inspect for problems in the various ranges. If these tests show any problems, refer to the electronic system component or mechanical sections to adjust or replace.

D RANGE TEST

Shift Point, Shift Pattern, and Shift Shock

1. Shift the selector lever to D range and select the Power mode.

Note

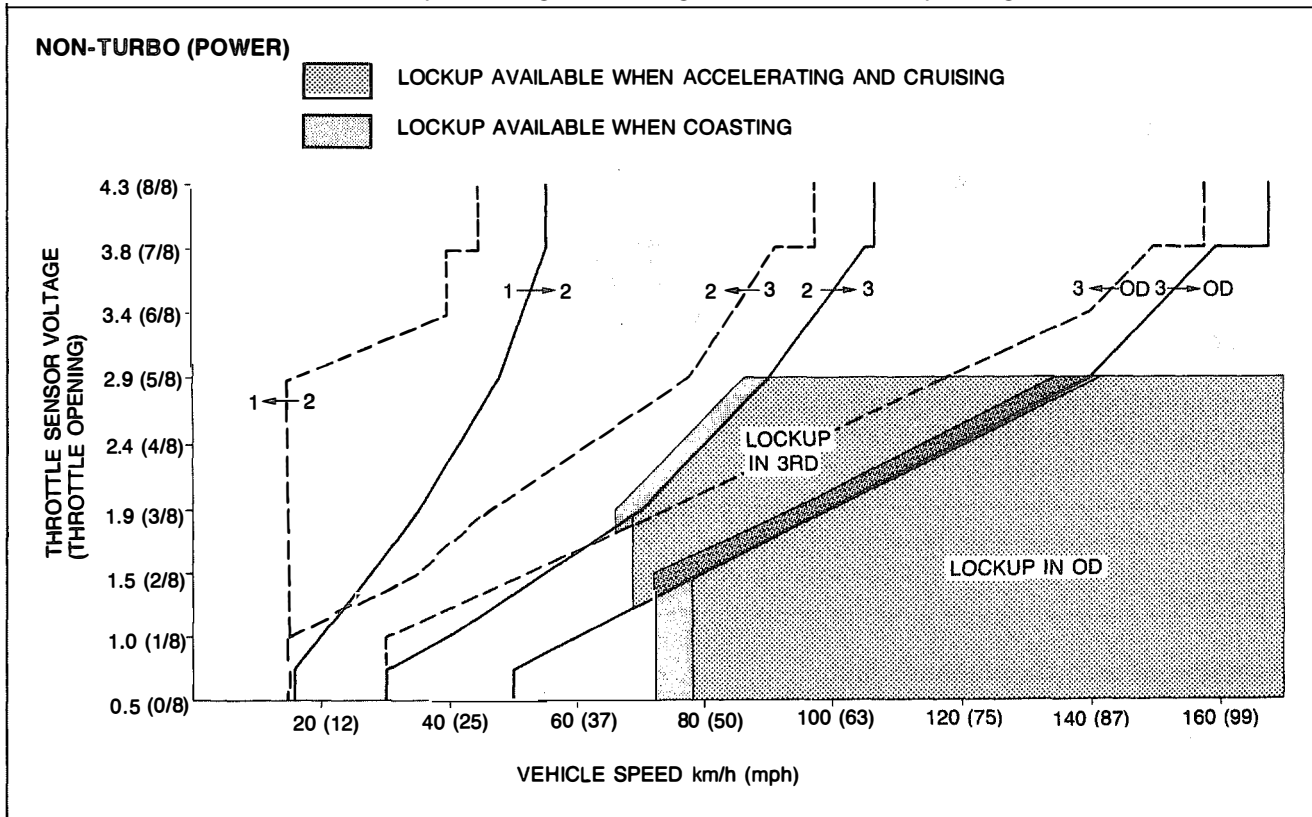
- Throttle sensor voltage of the EC-AT Tester represents the throttle valve opening.

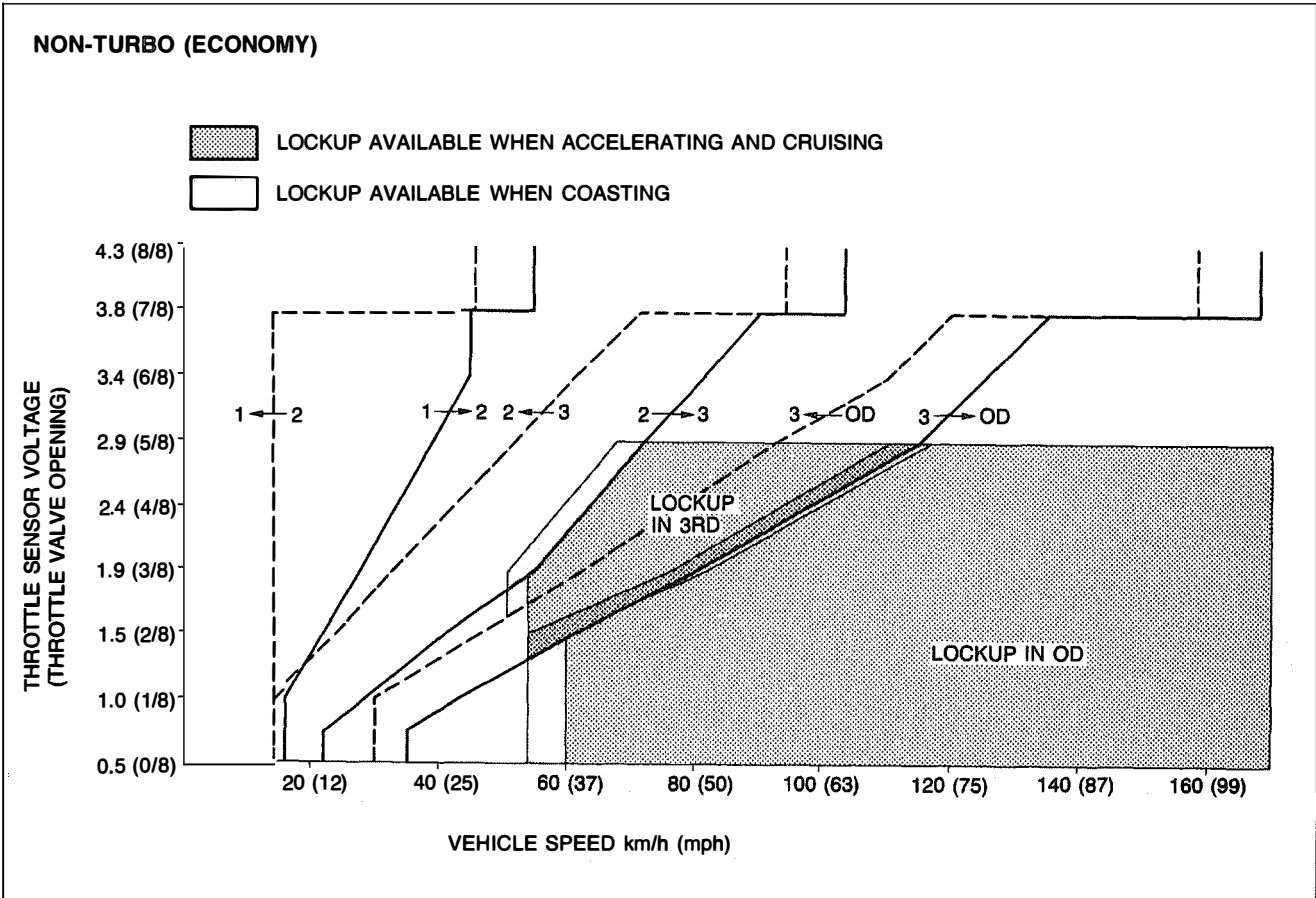
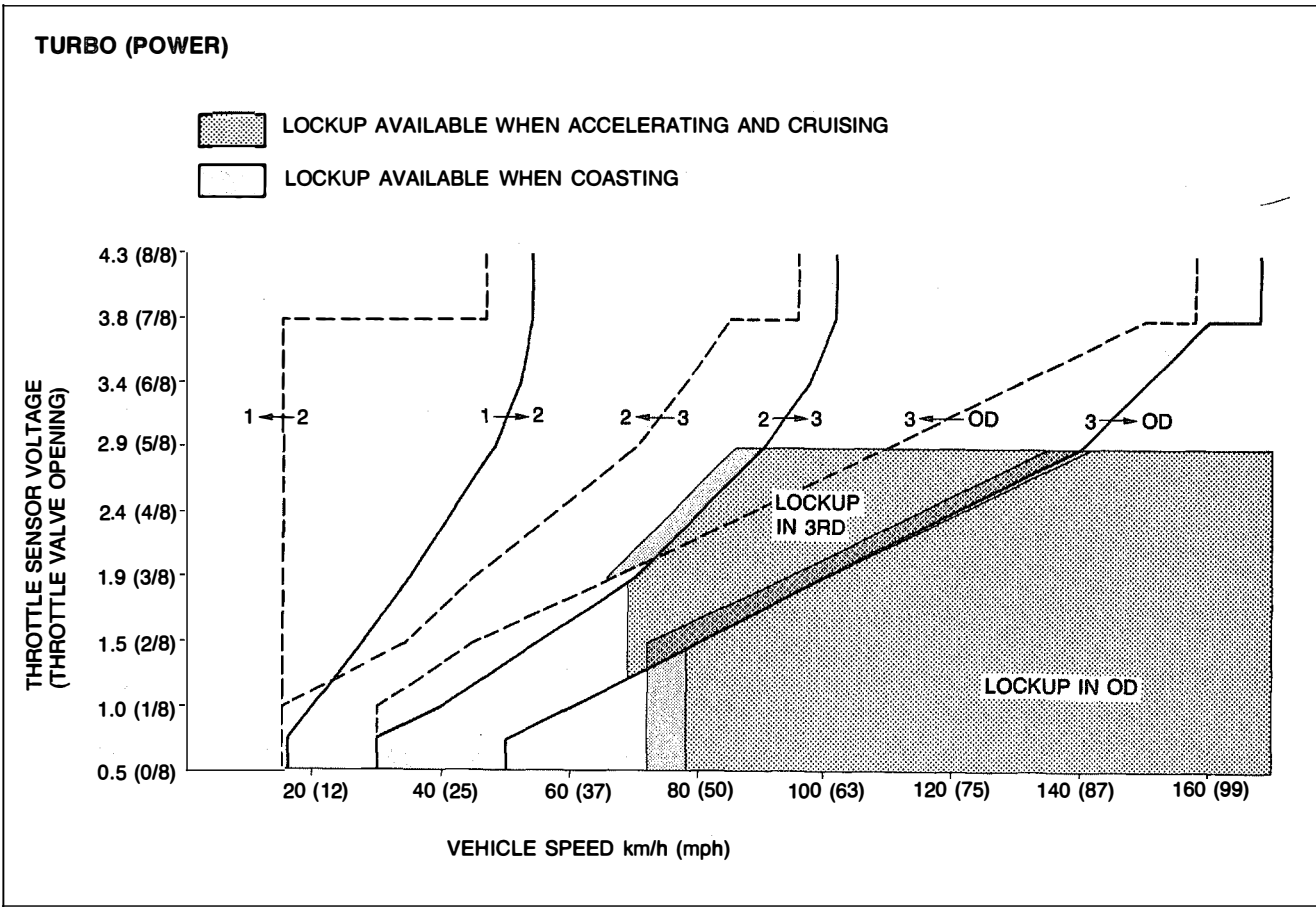
2. Accelerate the vehicle at half- and full-throttle.
3. Check that 1-2, 2-3 and 3-OD upshifts and downshifts and lockup are obtained. The shift points must be as shown in the D range (Power) shift diagram.

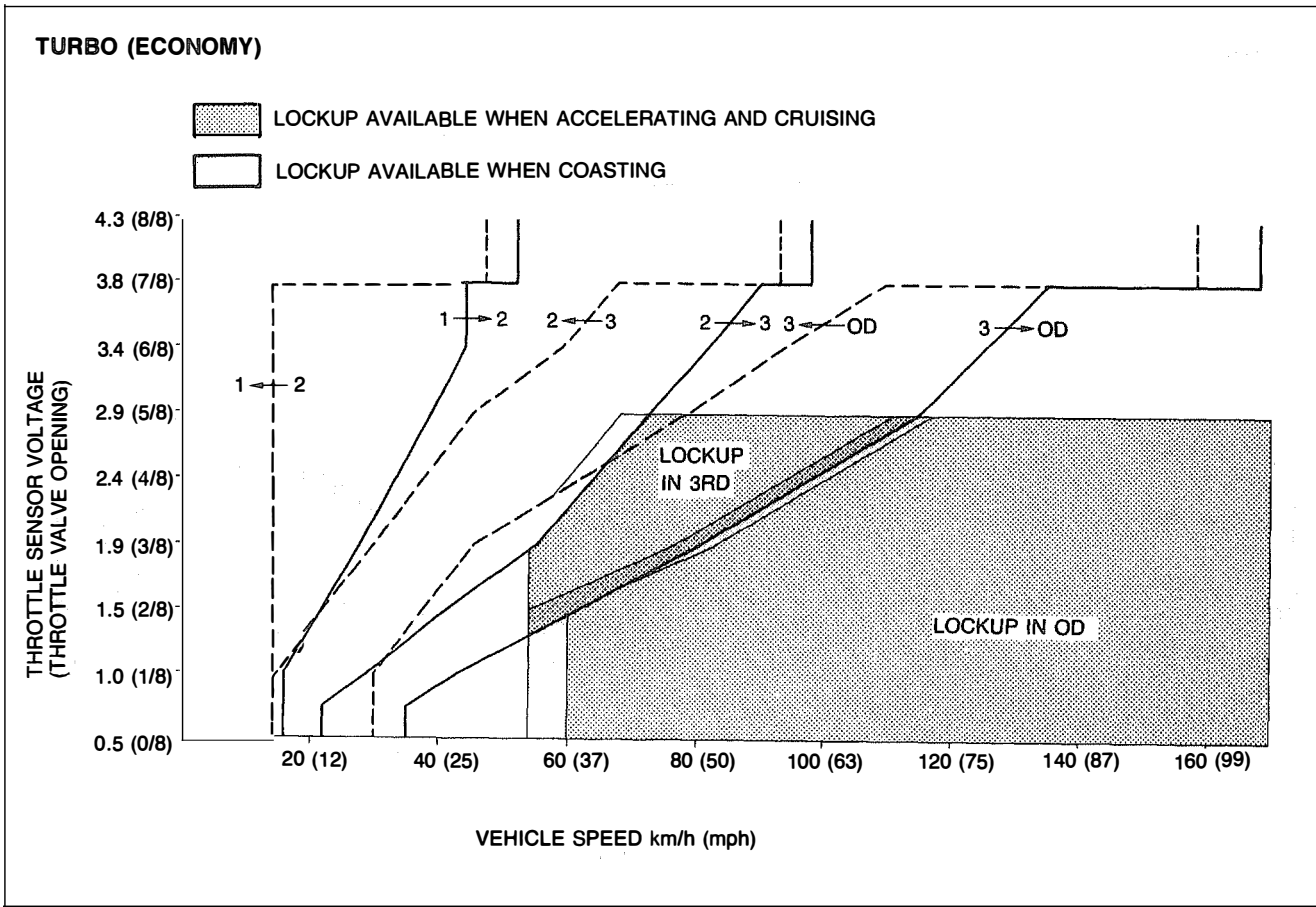
Note

- Drum speed (rpm) of the EC-AT Tester represents the shift point.
- Vehicle speed of the EC-AT Tester and speedometer and vehicle speed on a chassis roller may not meet the specified shift pattern because of tire size. Therefore, check the shift points with the drum speed.
- When the coolant temperature is below 72°C (162°F), the vehicle will operate in the POWER mode even when the ECONOMY mode is chosen (the control panel indication, however, will indicate ECON).
- There is no lockup when the coolant temperature is below 72°C (162°F).
- There is no lockup when the brake pedal is depressed.

4. Check the upshifts for shift shock or slippage in the same manner.
5. While driving in OD, shift the selector lever to S range and verify that OD—3 downshift immediately occurs, then decelerate and verify that engine braking effect is felt in only 3rd gear.

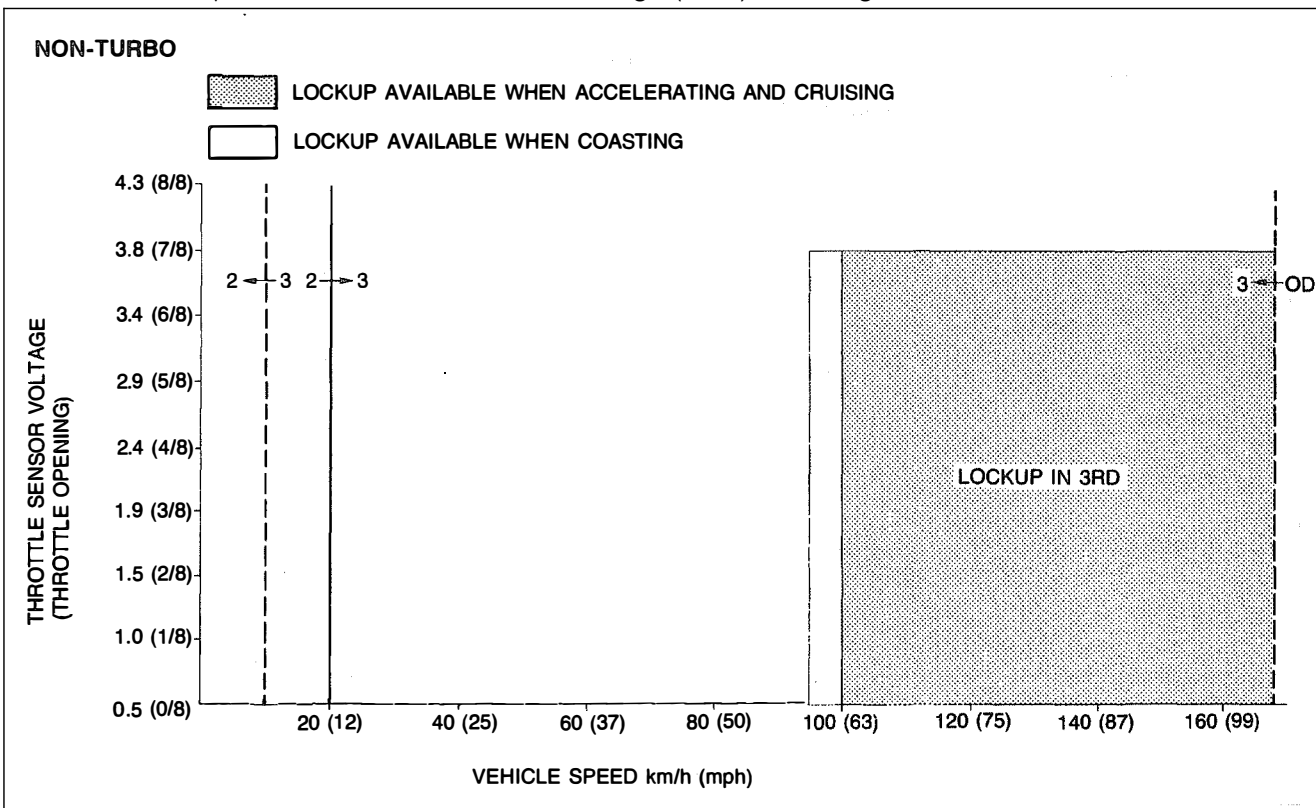


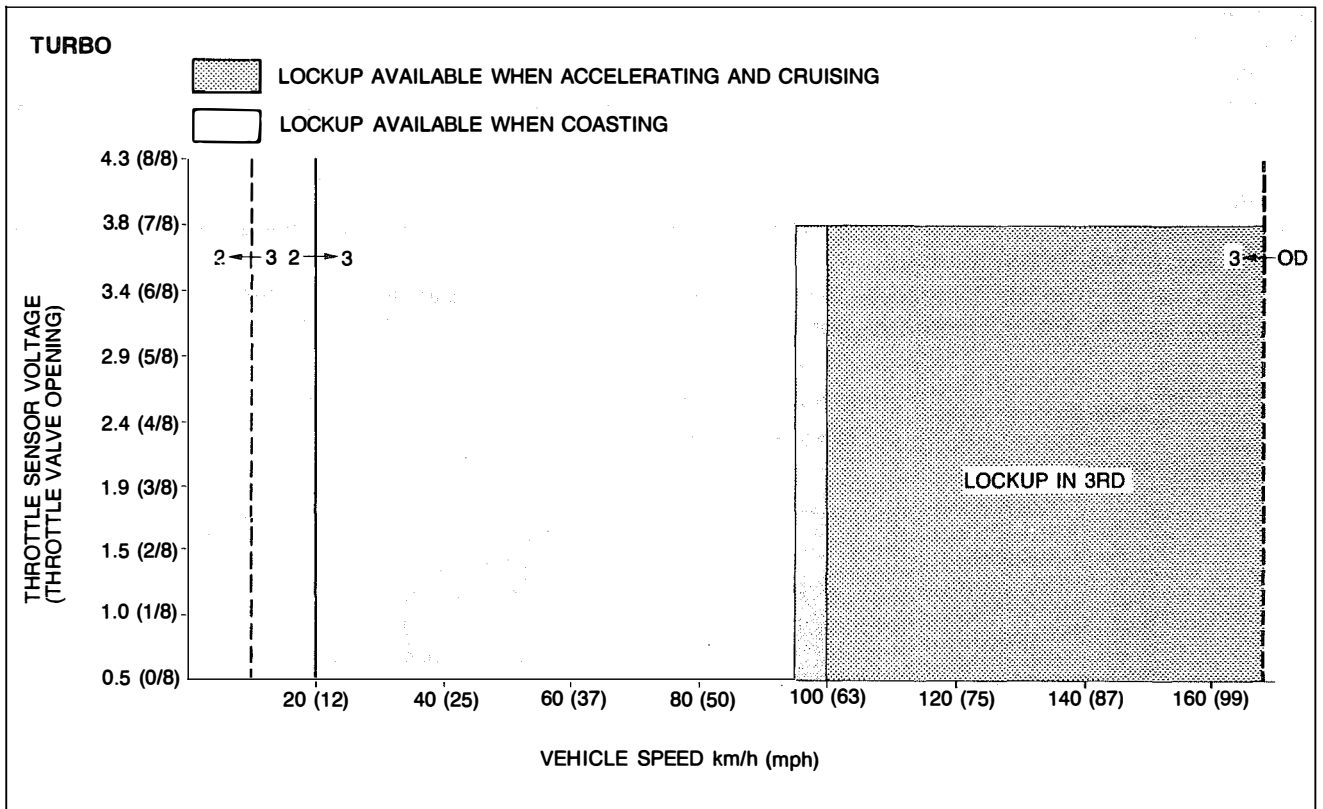




6. Select D range (Hold mode).

7. Accelerate the vehicle and check 2—3 upshift and downshift, no 1st and no OD is obtained, and that the 2—3 shift points are as shown in the D range (Hold) shift diagram.





**Evaluation**

Condition	Possible Cause
No 1—2 upshift or downshift	Stuck 1-2 shift solenoid valve Stuck 1-2 shift valve
No 2—3 upshift or downshift	Stuck 2-3 shift solenoid valve Stuck 2-3 shift valve
No 3—OD upshift or downshift	Stuck 3-4 shift solenoid valve Stuck 3-4 shift valve
No lockup shift	Stuck lockup control solenoid valve Stuck lockup control valve
Incorrect shift point	Misadjusted throttle sensor Stuck shift valve
Excessive shift shock or slippage	Excessive shift shock Stuck accumulator Stuck or no one-way check orifice Worn clutches, brakes, or one-way clutch
No engine braking effect	Worn clutches or brakes

16U0KX-009

**Noise and Vibration**

Drive the vehicle in OD (lockup), OD (no lockup), 3rd (Hold) and check for abnormal noise or vibration.

**Note**

- **Abnormal noise and vibration can also be caused by the torque converter, driveshaft, or differential. Therefore, determining the cause must be done with extreme care.**

**Kick-down**

Drive the vehicle in OD, 3rd and 2nd gears and check that kickdown occurs for OD→3, OD→2, OD→1, 3→2, 3→1, 2→1, and the shift points are as shown in the shift diagram.

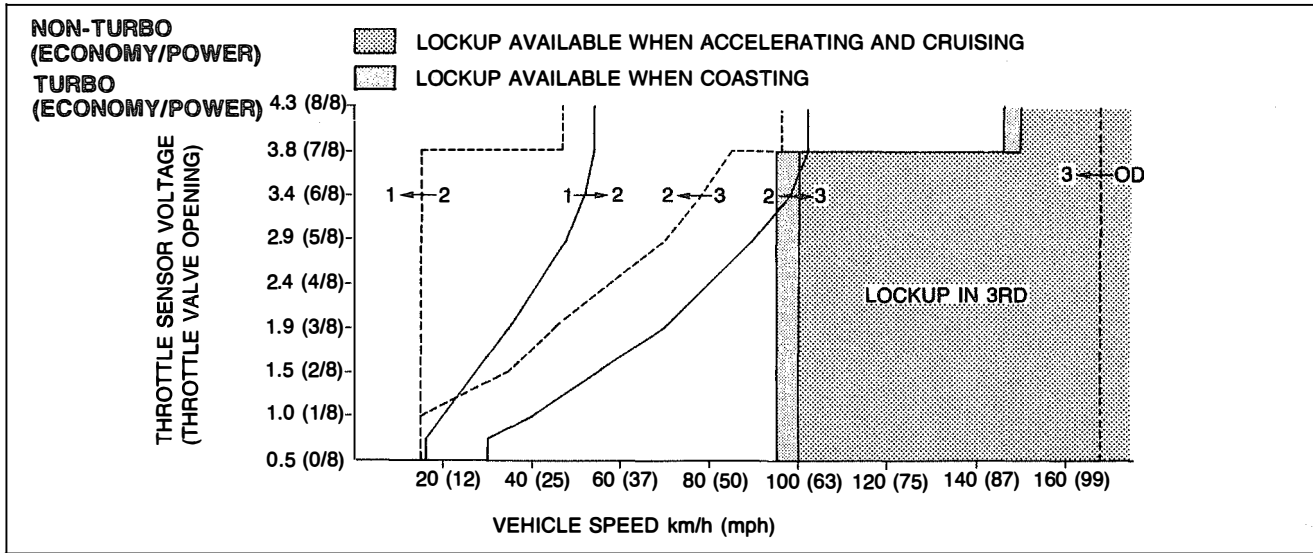
### S RANGE TEST

#### Shift Pattern

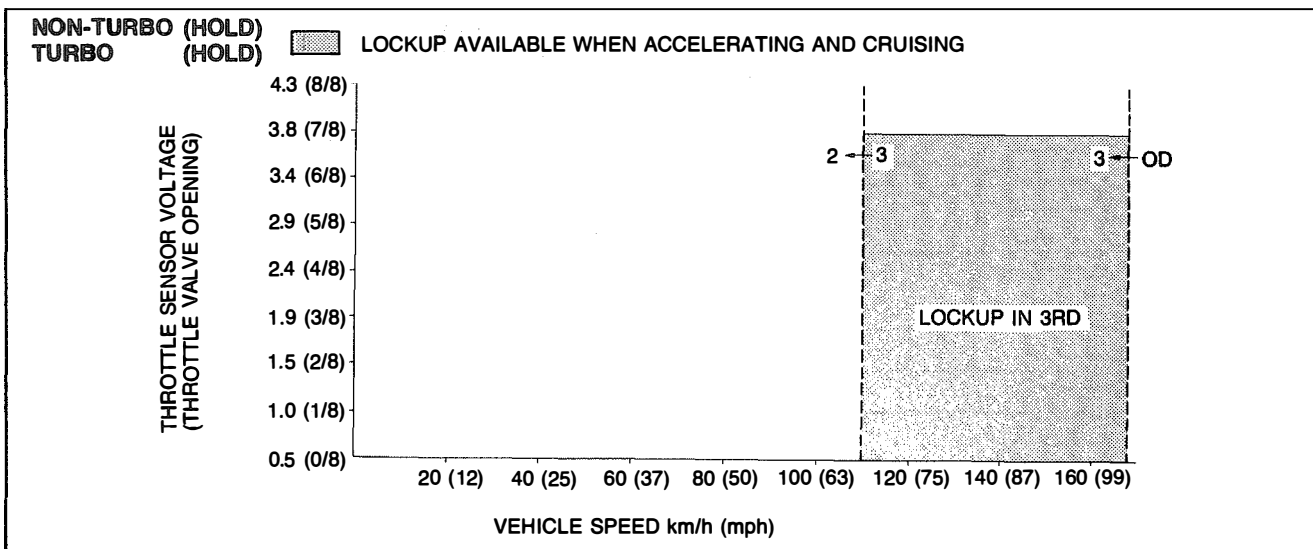
1. Shift the selector lever to S range and select the Economy mode or Power mode.
2. Accelerate the vehicle and verify that 1—2 and 2—3 upshifts and downshifts and lockup are obtained, and that overdrive is not engaged.

#### Note

- Inspections of shift shock and shift point are not necessary because these are the same as those of the D Range Test.
- In S range, the shift patterns for Economy and Power modes are the same.
- Shift points are the same as those of the D range (Power) shift diagram.



3. While driving in S range and 3rd gear, select the Hold mode and verify that 3rd gear is held until the 3—2 downshift point as shown in the S range (Hold) shift diagram is achieved.
4. Accelerate the vehicle in S range (Hold mode) and check that 2nd gear is held.



16U0KX-010

#### Noise and Vibration

Drive the vehicle in 2nd gear (Hold mode) and check for abnormal noise or vibration.

#### Note

- Abnormal noise and vibration can also be caused by the torque converter, driveshaft or differential. Therefore, determining the cause must be done with extreme care.

**L RANGE TEST****Shift Pattern**

1. Shift the selector lever to L range and select Economy or Power mode.
2. Accelerate the vehicle and verify that the 1—2 upshift and downshifting are obtained and that no 3rd gear, no OD, and no lockup are obtained.

**Note**

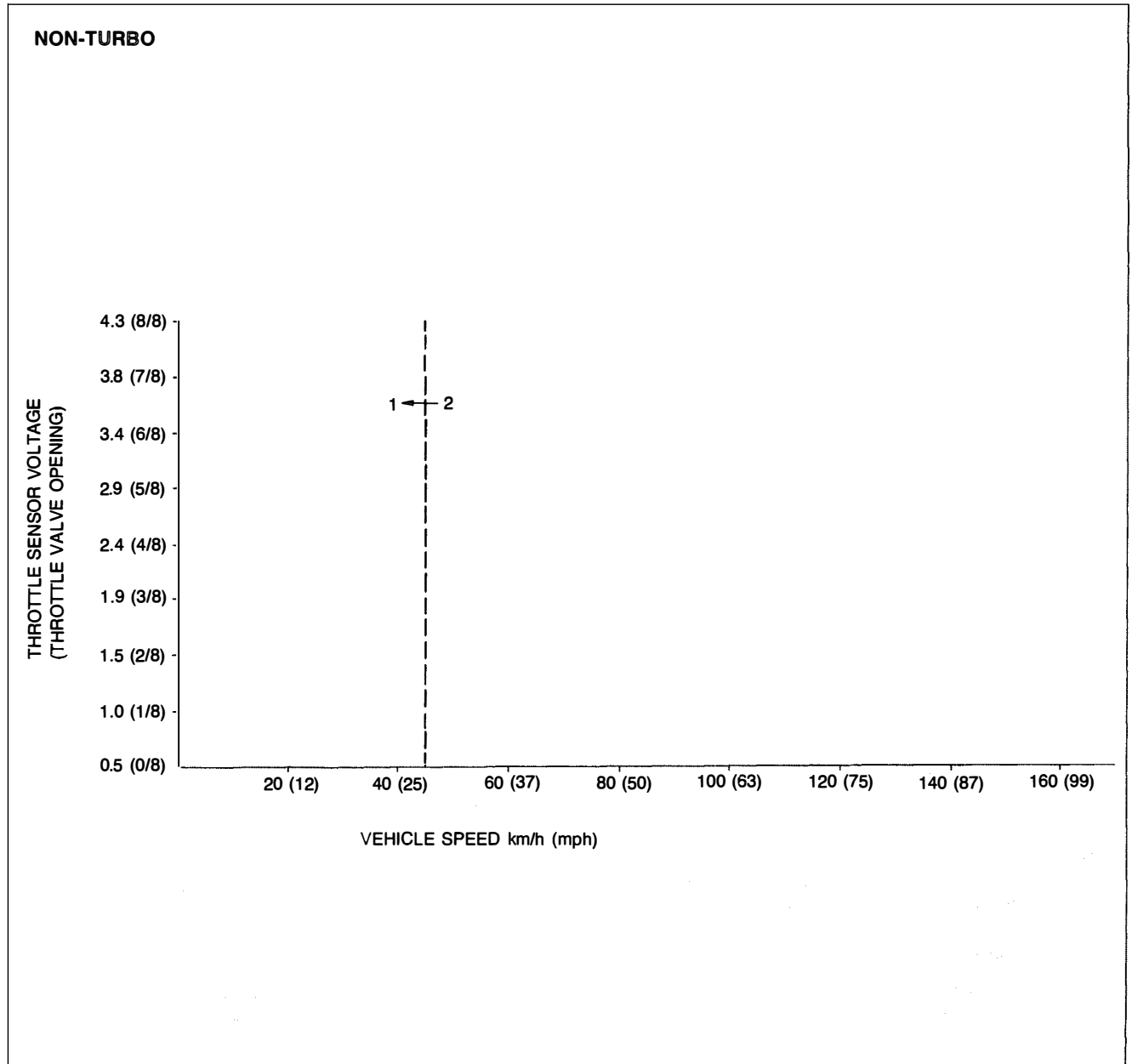
- Inspection of shift shock and shift point are not necessary because these are the same as those of the D Range Test.

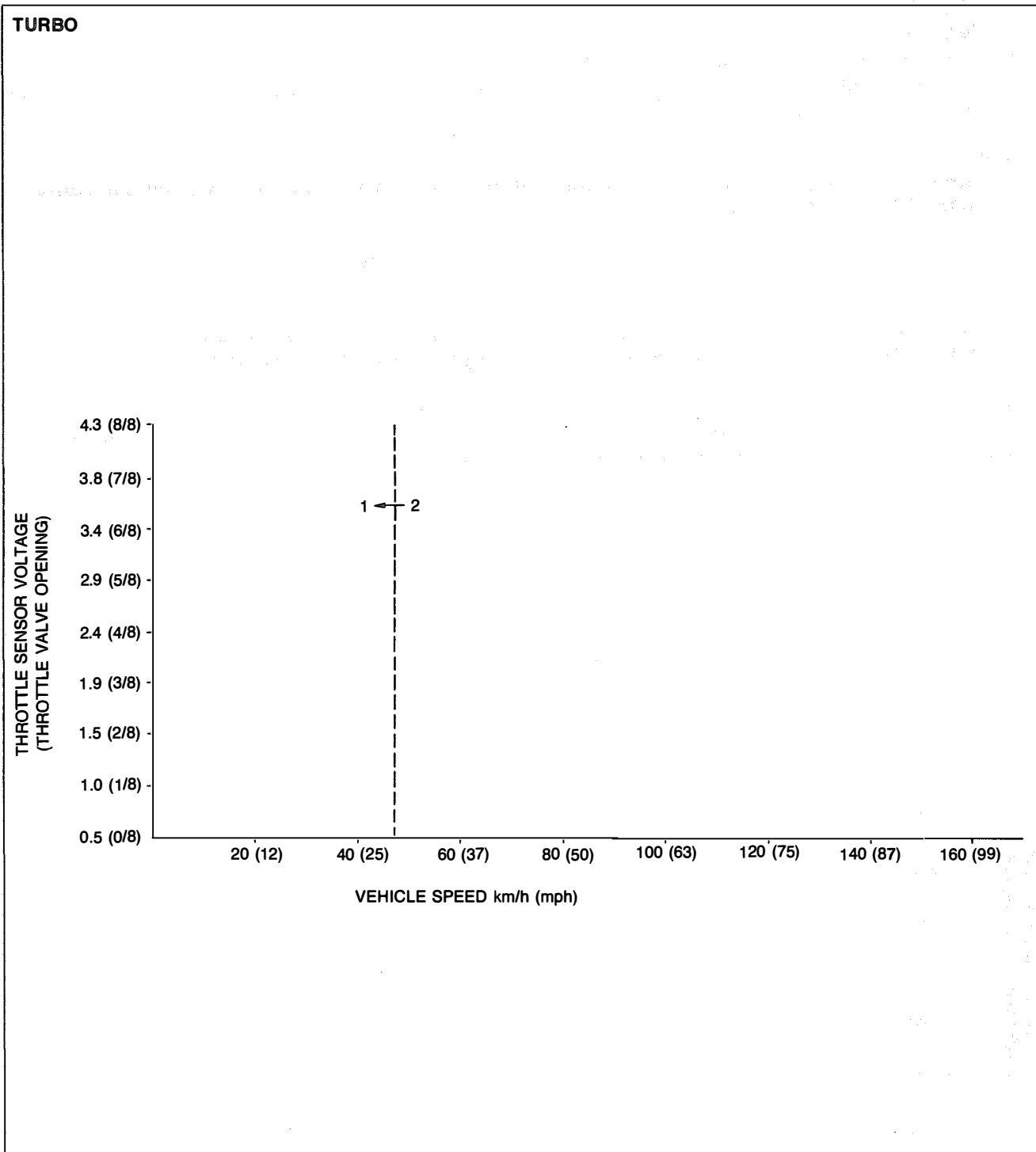
3. Drive in 1st gear then decelerate and verify that engine braking is felt.

**Note**

- In L range, the shift patterns for Economy and Power modes are the same.
- Shift points are the same as those of the D range (Power) shift diagram.

4. While driving in S range (Hold mode) and 2nd gear, shift the selector lever to L range and verify that 2nd gear is held until the 2—1 downshift point as shown in the L range (Hold) shift diagram is achieved.
5. Accelerate the vehicle in L range (Hold mode) and verify that 1st gear is held.





16U0KX-011

### Noise and Vibration

Drive the vehicle in 1st gear (Hold mode) and check for abnormal noise or vibration.

#### Note

- Abnormal noise and vibration can also be caused by the torque converter, driveshaft or differential. Therefore, determining the cause must be done with extreme care.

### P RANGE TEST

1. Shift into P range on a gentle slope, release the brake and verify that the vehicle does not roll.
2. Shift into P range while driving the vehicle at maximum of 4 km/h (2.5 mph) on a level surface, and verify that the vehicle stops.



Vehicle Speed at Shift Point Table

Range Mode	Throttle condition (Throttle sensor voltage)	Shift	Drum speed rpm		Vehicle speed km/h (mph)		
			Non-Turbo	Turbo	Non-Turbo	Turbo	
Power	Fully opened (4.3V)	D1 → D2	5,000—5,500	4,900—5,500	54—56 (33—35)	53—59 (33—37)	
		D2 → D3	5,300—5,700	5,100—5,500	105—113 (65—70)	100—108 (62—67)	
		D3 → OD	5,400—5,700	5,450—5,800	165—175 (102—109)		
	Half throttle (1.6—2.2V)	D1 → D2	3,500—4,050	3,550—4,150	38—44 (24—27)		
		D2 → D3	3,750—4,250	3,850—4,350	75—85 (47—53)		
		Lockup ON (D3)	2,350—2,700	2,400—2,750	73—83 (45—51)		
		D3 → OD	3,600—4,250	3,650—4,300	110—130 (68—81)		
		Lock-up ON (OD)	2,500—3,000	2,800—3,000	110—130 (68—81)		
		Lock-up OFF (OD)	2,400—2,850	2,400—2,900	104—124 (64—77)		
		OD → D3	1,950—2,450	1,800—2,300	85—107 (53—66)	77—99 (48—61)	
		Lockup OFF (D3)	2,300—2,600	2,350—2,700	71—81 (44—50)		
		D3 → D2	1,750—2,300	1,700—2,100	54—70 (33—43)	51—63 (32—39)	
	Kickdown	OD → D3	3,500—3,700	3,550—3,800	153—163 (95—101)		
		OD → D2	2,150—2,350	2,150—2,300	94—102 (58—63)	92—100 (57—62)	
		OD → D1	950—1,100	1,000—1,150	42—48 (26—30)	44—50 (27—31)	
		D3 → D2	3,050—3,350	3,050—3,300	94—102 (40—63)	92—100 (57—62)	
		D3 → D1	1,350—1,550	1,450—1,650	42—48 (26—30)	44—50 (27—31)	
		D2 → D1	2,200—2,400	2,250—2,550	42—48 (26—30)	44—50 (27—31)	
		D1 → D2	4,900—5,450	4,750—5,300	54—60 (33—37)	51—57 (32—35)	
	Economy	Fully opened (4.3V)	D2 → D3	5,100—5,500	4,900—5,300	102—110 (63—68)	96—104 (60—64)
			D3 → OD	5,400—5,700	5,450—5,800	165—175 (102—109)	
D1 → D2			2,800—3,350	3,200—3,850	31—37 (19—23)		
Half throttle (1.6—2.2V)		D2 → D3	3,000—3,400	3,450—3,900	60—68 (37—42)		
		Lockup ON (D3)	1,900—2,150	1,950—2,200	59—67 (36—41)		
		D3 → OD	2,900—3,450	3,350—4,000	89—107 (55—66)		
		Lock-up ON (OD)	2,050—2,500	2,400—2,850	91—109 (56—68)		
		Lock-up OFF (OD)	1,950—2,350	2,250—2,700	85—103 (53—64)		
		OD → D3	1,600—1,950	1,400—1,850	70—86 (43—53)	54—70 (33—43)	
		Lockup OFF (D3)	1,800—2,000	1,850—2,100	56—64 (35—40)		
		D3 → D2	1,200—1,550	1,250—1,550	38—48 (24—30)	34—42 (21—26)	
Kickdown		OD → D3	3,500—3,700	3,550—3,800	153—163 (95—101)		
		OD → D2	2,050—2,250		90—98 (56—61)	89—97 (55—60)	
		OD → D1	950—1,100	1,000—1,150	42—48 (26—30)	44—50 (27—31)	
		D3 → D2	2,950—3,200		90—98 (56—61)	89—97 (55—60)	
		D3 → D1	1,350—1,550	1,450—1,650	42—48 (26—30)	44—50 (27—31)	
		D2 → D1	2,100—2,400	2,250—2,550	42—48 (26—30)	44—50 (27—31)	
S		Fully opened (4.3V)	S1 → S2	5,000—5,500	4,900—5,500	54—60 (33—37)	53—59 (33—37)
			S2 → S3	5,300—5,700	5,100—5,500	105—113 (65—70)	100—108 (62—67)
			S4 → S3	3,750—4,000	3,850—4,050	165—175 (102—109)	
			S3 → S2	3,050—3,350	3,050—3,300	94—102 (40—63)	92—100 (57—62)
	S2 → S1		2,200—2,400	2,250—2,550	42—48 (26—30)	44—50 (27—31)	
	Half throttle (1.6—2.2V)	S1 → S2	3,500—4,050	3,350—4,150	38—44 (24—27)		
		S2 → S3	3,750—4,250	3,850—4,350	75—85 (47—53)		
		S4 → S3	3,750—4,000	4,350—4,600	165—175 (102—109)		
		S3 → S2	1,750—2,300	1,700—2,100	54—70 (33—43)	51—63 (32—39)	
L	Fully opened (4.3V)	L1 → L2	5,000—5,500	4,900—5,500	54—56 (33—35)	53—59 (33—37)	
		L2 → L1	2,200—2,400	2,250—2,550	42—48 (26—30)	44—50 (27—31)	
	Half throttle (1.6—2.2V)	L1 → L2	3,500—4,050	3,350—4,150	38—44 (24—27)		
Hold	D	—	850—1,150	1,000—1,350	17—23 (11—14)		
		D3 → D2	250—400	250—500	7—13 (4—8)		
		OD → D3	3,750—4,000	4,350—4,600	165—175 (102—109)		
	S	Fully closed (0.5V)	S3 → S2	3,600—3,850	4,100—4,400	110—118 (68—73)	108—116 (67—72)
			L2 → L1	2,150—2,300	2,200—2,500	43—46 (27—29)	43—49 (27—30)

06U0KX-058

**SLIPPAGE TEST**

This step is performed to inspect for slippage of the friction elements.

**Preparation**

1. Perform the preparation procedure shown in STALL TEST. (Refer to page K-23.)
2. Connect a tachometer to the engine and set it in the cabin.
3. Connect the **EC-AT Tester** between the EC-AT control unit and wire harness.

**Procedure**

Drive the vehicle in each of the gears indicated below and verify that the vehicle speed or engine speed is within specification as indicated by the drum speed.

Driving condition			Speed	Model	Drum speed (rpm)			
No.	Gears	Other condition			1,000	2,000	3,000	4,000
1	1st	L range, Hold mode	Vehicle speed km/h (mph)	Non-Turbo	11 (7)	22 (11)	33 (20)	44 (27)
				Turbo			32 (20)	43 (27)
2	1st	D range, Economy mode		Non-Turbo	11 (7)	22 (11)	33 (20)	44 (27)
				Turbo			32 (20)	43 (27)
3	2nd	S range, Hold mode		Non-Turbo	20 (12)	40 (25)	60 (37)	80 (50)
				Turbo			39 (24)	59 (37)
4	3rd	D range, Hold mode		Non-Turbo	31 (19)	61 (38)	92 (57)	123 (76)
				Turbo			30 (19)	60 (37)
5	OD	D range, Economy mode		Non-Turbo	44 (27)	88 (55)	131 (81)	175 (109)
				Turbo			43 (27)	86 (53)
6	OD	D range, Economy mode, Lockup	Engine speed (rpm)	1,000	2,000	3,000	4,000	

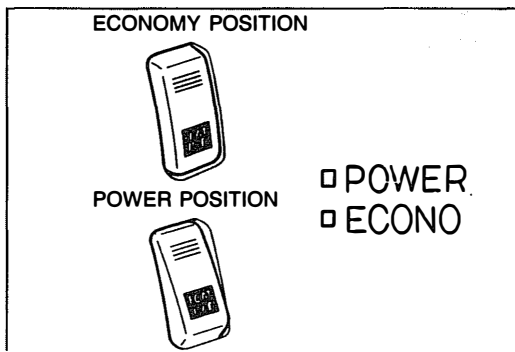
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**Evaluation**

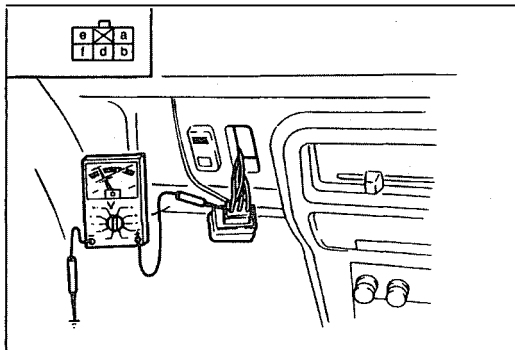
When there is no malfunction in the electrical system or hydraulic system, but the vehicle speed is too low or the engine speed is too high, the problem can be attributed to slippage of the friction elements.

Driving conditions below specification	Possible Cause
No.1 condition	Low and reverse brake
No.2 condition	One-way clutch
No.3 condition	2-4 brake band
No.4 condition	Coasting clutch
No.5 condition	3-4 clutch
No.1—No.5 conditions	Forward clutch
No.6 condition	Lookup piston (in torque converter)

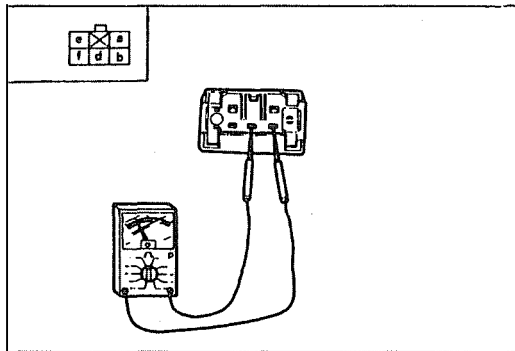
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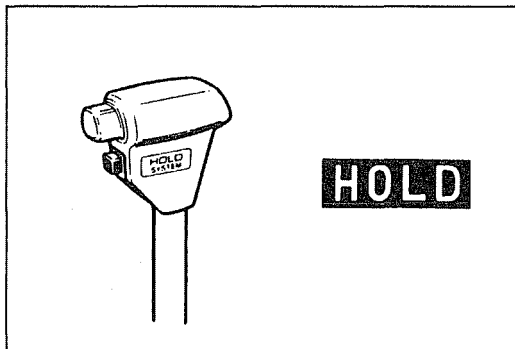
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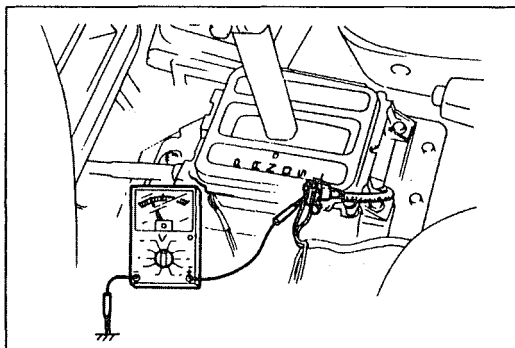
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06U0KX-065

**ELECTRICAL SYSTEM COMPONENTS**

**MODE SWITCH**

**Inspection of Operation**

1. Turn the ignition switch ON.
2. Check that the mode indicator illuminates in each mode.
3. If not as specified, measure terminal voltage of the mode switch.

**Inspection of Terminal Voltage**

1. Disconnect the mode switch.
2. Turn the ignition switch ON and verify that the light switch is OFF.
3. Measure the voltage between each terminal and a ground.

Mode	Voltage				
	a	b	d	e	f
Power	Approx. 12V	Below 1.5V	Below 1.5V	Approx. 12V	Below 1.5V
Economy	Approx. 12V	Below 1.5V	Below 1.5V	Below 1.5V	Approx. 12V

4. If not correct, check continuity between the terminals.

**Inspection of Continuity**

1. Disconnect the mode switch connector.
2. Check continuity between the terminals.

Mode	Terminal				
	a	f	d	e	b
Economy	○—○	○—○	○—○	○—○	○—○
Power	○—○	○—○	○—○	○—○	○—○

○—○: Indicates continuity

3. If not correct, replace the mode switch.

**HOLD SWITCH**

**Inspection of Operation**

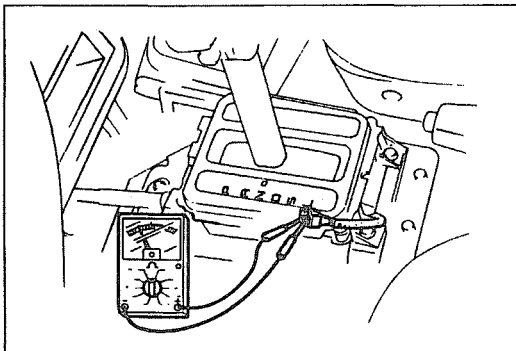
1. Turn the ignition switch ON.
2. Verify that the HOLD indicator illuminates while the switch is depressed. Release the switch and make sure the HOLD indicator is out.
3. If it is not working properly, check the terminal voltage of the hold switch.

**Inspection of Terminal Voltage**

1. Remove the console box.
2. Turn the ignition switch ON.
3. Measure the voltage between terminal and a ground while depressing the switch.

Terminal voltage	Switch
Approx. 12V	Depressed
Below 1.5V	Released

4. If not correct, check continuity between the terminals.



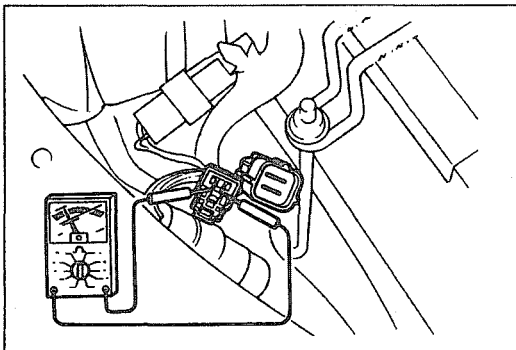
06U0KX-066

**Inspection of Continuity**

1. Disconnect the hold switch connector.
2. Check continuity between the terminals while depressing the switch.

Continuity	Switch
YES	Released
NO	Depressed

3. If not correct, replace the hold switch.

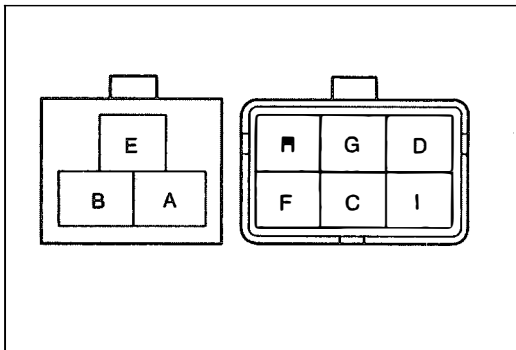


06U0KX-067

**INHIBITOR SWITCH**

**Inspection**

1. Verify that the starter turns with the ignition switch at START position and the selector in P and N ranges only.
2. Verify that the back-up lights illuminate when shifted to R range with the ignition switch in the ON position.
3. Inspect the inhibitor switch if not as specified.



06U0KX-068

**Inspection of continuity**

1. Disconnect the inhibitor switch connector.
2. Check continuity between the terminals.

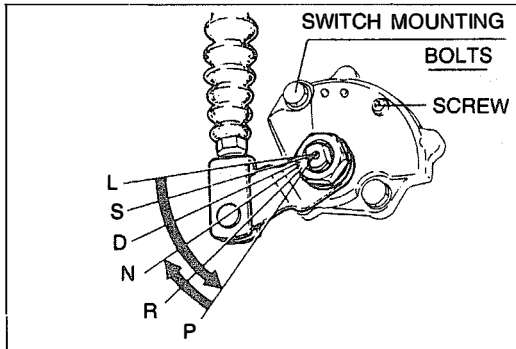
Position	Terminal								
	A	B	C	D	E	F	G	H	I
P	○—○		○—○						
R			○—○	○—○					
N	○—○		○—○			○—○			
D			○—○				○—○		
S			○—○					○—○	
L			○—○						○—○

○—○: Indicates continuity

3. If not correct, adjust the switch.

**Adjustment**

1. Set the manual shaft to N position.
2. Loosen the inhibitor switch mounting bolts.
3. Remove the screw and move the inhibitor switch so that the small hole is aligned with the screw hole.
4. Set the alignment by inserting a **2.0mm (0.079 in)** diameter pin through the holes.



06U0KX-069

5. Tighten the switch mounting bolts to specification.

**Tightening torque:**

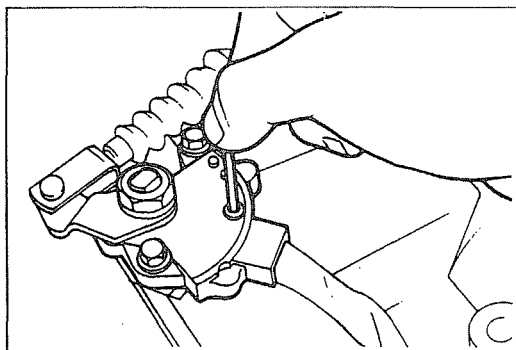
**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

6. Remove the pin, install and tighten the screw to specification.

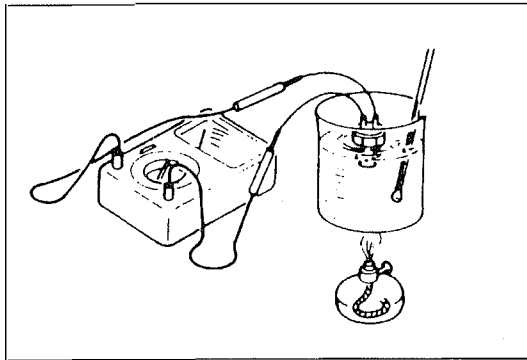
**Tightening torque:**

**0.4—0.7 N·m (4—7 cm·kg, 3.5—6.0 in·lb)**

7. Recheck the continuity of the individual terminals.
8. If not as specified, replace the switch.



06U0KX-070



96U07B-011

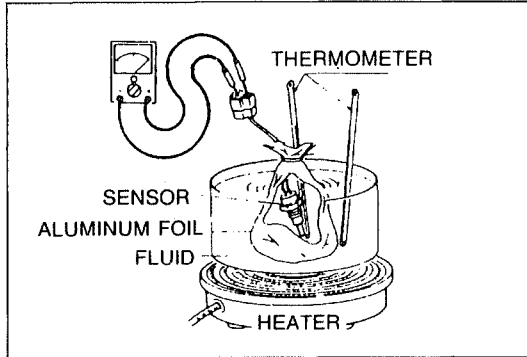
**WATER THERMOSWITCH**

**Inspection**

1. Remove the water thermostat.
2. Place the switch in water with a thermometer and heat up the water gradually.
3. Check the continuity of the terminals. If necessary, replace the switch.

**Connection guide**

Water temperature	Continuity
Below 65°C (149°F)	Yes
Above 72 ± 5°C (162 ± 41°F)	No



06U0KX-071

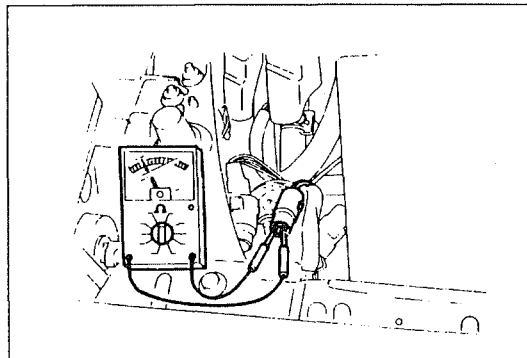
**ATF THERMOSWITCH**

**Inspection**

1. Remove the ATF thermostat.
2. Place the switch in oil with a thermometer as shown, and heat it up gradually.
3. Check the continuity of the terminals. If necessary replace the switch.

**Connection guide**

Fluid temperature	Continuity
Above 150 ± 3°C (302 ± 37°F)	Yes
Below 143°C (289°F)	No



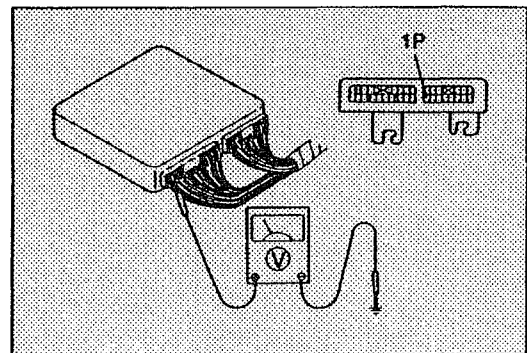
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**PULSE GENERATOR**

**Inspection**

1. Disconnect the pulse generator connector.
2. Measure the resistance between the terminals, if necessary replace the pulse generator.

**Resistance: 200—400Ω**

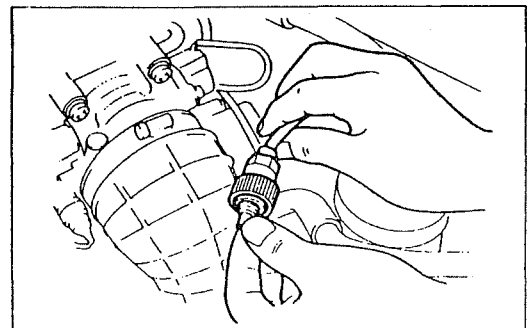


**VEHICLE SPEED SENSOR**

**Inspection of voltage**

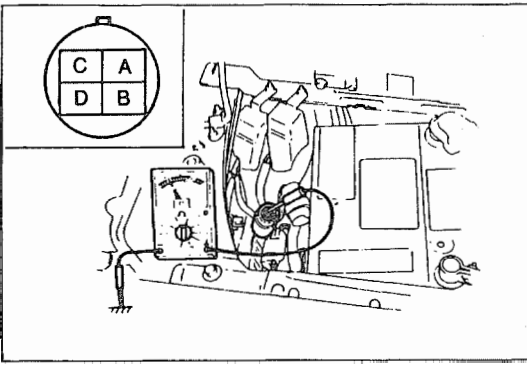
1. Connect a voltmeter between terminal 1P of the EC-AT control unit and a ground as shown. [Turbo]  
Connect a voltmeter between terminal 1M of the engine control unit and a ground. [Non-Turbo]

2. Turn the ignition switch ON.



06U0KX-073

3. Remove the speedometer cable from the transaxle.
4. Slowly turn the speedometer cable one full turn.
5. Verify that **approx. 4.5V** is shown 4 times.
6. If not correct, check the speedometer.



06U0KX-074

### SOLENOID VALVES

#### Inspection of Resistance

1. Disconnect the negative battery cable.
2. Disconnect the solenoid valve connector.
3. Measure the resistance of the terminals. If necessary, replace the solenoid valve.

**Resistance: 13—27Ω**

#### Note

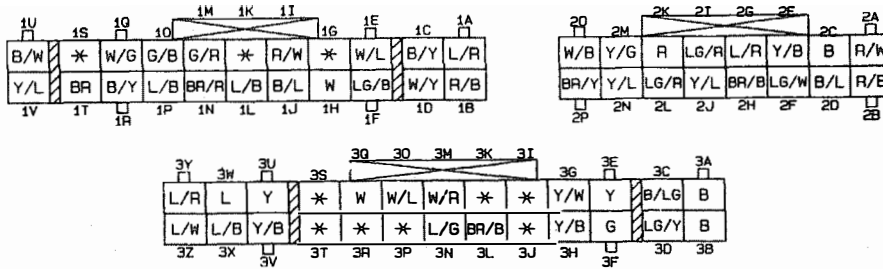
- 1-2 solenoid valve : A
- 2-3 solenoid valve : B
- 3-4 solenoid valve : C
- Lockup solenoid valve : D

### EC-AT CONTROL UNIT

#### Inspection

1. Turn the ignition switch ON, and check the EC-AT control unit terminal voltage, referring to the Terminal Voltage Chart.
2. If not correct, check or replace the component(s), wiring, and/or EC-AT control unit.

#### Non-Turbo EC-AT Control Unit Connectors



#### Turbo EC-AT Control Unit Connectors

2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	1O	1M	1K	1I	1G	1E	1C	1A
2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	1P	1N	1L	1J	1H	1F	1D	1B

9MU0K1-083

## Terminal Voltage Chart (Non-Turbo)

Terminal	Input	Output	Connected to	Voltage (After warming-up)		Remark
				IGN: ON	Idle	
1A	—	—	Battery	Battery voltage		For back-up
1C	○		Inhibitor switch (ATX)	Below 2.5V		While cranking: Battery voltage
1M	○		Vehicle speed sensor	Approx. 4.5V or below 1.5V		During driving: Approx: 4.5V
2H	○		Hold switch	<ul style="list-style-type: none"> <li>Switch depressed: Battery voltage</li> <li>Switch released: Below 1.5V</li> </ul>		—
2L	○		Mode switch (Power side)	<ul style="list-style-type: none"> <li>POWER mode: Below 1.5V</li> <li>ECONOMY mode or HOLD mode: Battery voltage</li> </ul>		
2M	○		Pulse generator	Below 1.5V	*Battery voltage	*P or N range
2N	—	—	Pulse generator	Below 1.5V		Ground
2P		○	Hold indicator	<ul style="list-style-type: none"> <li>Hold mode: Below 1.5V</li> <li>Other modes: Battery voltage</li> </ul>		—
3E	○		Inhibitor switch (D range)	<ul style="list-style-type: none"> <li>D range: Battery voltage</li> <li>Other range: Below 1.5V</li> </ul>		—
3G	○		Inhibitor switch (L range)	<ul style="list-style-type: none"> <li>L range: Battery to voltage</li> <li>Other range: Below 1.5V</li> </ul>		—
3H	○		Inhibitor switch (S range)	<ul style="list-style-type: none"> <li>S range: Battery voltage</li> <li>Other range: Below 1.5V</li> </ul>		—
3L		○	Mode indicator	<ul style="list-style-type: none"> <li>HOLD mode: Battery voltage</li> <li>POWER or ECONOMY mode: Below 1.5V</li> </ul>		
3N	○		Fluid thermoswitch	<ul style="list-style-type: none"> <li>Fluid temp. below 143°C (389°F): Approx. 10—12V</li> <li>Fluid temp. above 150°C (302°F): Below 1.5V</li> </ul>		—
3W		○	1—2 shift solenoid valve	<ul style="list-style-type: none"> <li>Solenoid valve ON: Battery voltage</li> <li>Solenoid valve OFF: Below 1.5V</li> </ul>		Refer to next page
3X		○	2—3 shift solenoid valve	<ul style="list-style-type: none"> <li>Solenoid valve ON: Battery voltage</li> <li>Solenoid valve OFF: Below 1.5V</li> </ul>		Refer to next page
3Y		○	3—4 shift solenoid valve	<ul style="list-style-type: none"> <li>Solenoid valve ON: Battery voltage</li> <li>Solenoid valve OFF: Below 1.5V</li> </ul>		Refer to next page
3Z		○	Lockup solenoid valve	<ul style="list-style-type: none"> <li>Lockup: Battery voltage</li> <li>No lockup: Below voltage</li> </ul>		Refer to next page

## Terminal Voltage Chart (Turbo)

Terminal	Connected to	Voltage	Condition
1A (Output)	Mode indicator	Approx. 12V	Hold mode
		Below 1.5V	Power or economy mode
1B (Output)	Hold indicator	Below 1.5V	Hold mode
		Approx. 12V	Other modes
1C (Output)	EC-AT Tester (Malfunction code)	Approx. 12V	Normal
		Below 1.5V	If malfunction present
		Code signal	Self-diagnosis check, connector grounded
1D (Output)	ECU (No load signal)	Approx. 12V	Drum speed below 80 rpm
		Below 1.5V	Drum speed above 640 rpm, and N or P range
1E (Input)	EC-AT test connector	Approx. 12V	—
1F (Input)	Stoplight switch	Approx. 12V	Brake pedal depressed
		Below 1.5V	Brake pedal released
1G	—	—	—
1H (Input)	Hold switch	Approx. 12V	Switch depressed
		Below 1.5V	Switch released

## Terminal Voltage Chart (Turbo Cont.)

Terminal	Connected to		Voltage	Condition
1I (Input)	Mode switch (Power side)		Below 1.5V	POWER mode
			Approx. 12V	ECONOMY mode, HOLD mode
1J (Ground)	Body ground		Below 1.5V	—
1K	—		—	—
1L	—		—	—
1M (Input)	ATF thermoswitch		Below 1.5V	Above 150°C (302°F)
			Approx. 10—12V	Below 143°C (289°F)
1N (Input)	Water thermoswitch		Approx. 12V	Above 72°C (162°F)
			Below 1.5V	Below 65°C (149°F)
1O (Input)	Idle switch		Below 1.5V	At idle
			Approx. 12V	Other speeds
1P (Input)	Vehicle speed sensor		Approx. 4.5V	During driving
			Approx. 4.5V or below 1.5V	Vehicle stopped
2A (Input)	Throttle sensor		Approx. 5V	Ignition switch ON
			Below 1.5V	Ignition switch OFF
2B (Input)	Inhibitor switch	N and P range	Below 1.5V	N or P range
			Approx. 12V	Other ranges
2C	—		—	—
2D (Input)	Inhibitor switch	D range	Approx. 12V	D range
			Below 1.5V	Other ranges
2E (Output)	1-2 shift solenoid valve		Approx. 12V	Refer to page K-22 of solenoid valve operation table
			Below 1.5V	
2F (Input)	Inhibitor switch	S range	Approx. 12V	S range
			Below 1.5V	Other ranges
2G (Output)	2-3 shift solenoid valve		Approx. 12V	Refer to page K-22 of solenoid valve operation table
			Below 1.5V	
2H (Input)	Inhibitor switch	L range	Approx. 12V	L range
			Below 1.5V	Other ranges
2I (Output)	3-4 shift solenoid valve		Approx. 12V	Refer to page K-22 of solenoid valve operation table
			Below 1.5V	
2J (Input)	Pulse generator*		Approx. 12V (AC)	Engine running
			Below 1.5V (AC)	Engine stopped
2K (Output)	Lockup solenoid valve		Approx. 12V	Lockup
			Below 1.5V	Other
2L (Ground)	Pulse generator		Below 1.5 V	—
2M (Output)	ECU <sup>△</sup>		Approx. 12V	3rd → 2nd, 2nd → 1st shift with throttle valve opening 5/8 or more
			Approx. 1V	Others
2N	—		—	—
2O (Memory power)	Battery		Approx. 12V	—
2P (Ground)	Body ground		Below 1.5V	—
2Q, 2S (Battery power)	Battery		Approx. 12V	Ignition switch ON
			Below 1.5V	Ignition switch OFF
2R (Ground)	Throttle sensor		Below 1.5V	—
2T (Input)			Approx. 0.5—4.3V	Throttle valve fully closed to fully open

\* Checked in AC range

<sup>△</sup> Checked with the engine and the transaxle warm throughly

06U0KX-076



**AUTOMATIC TRANSMISSION FLUID (ATF)**

**Inspection Level**

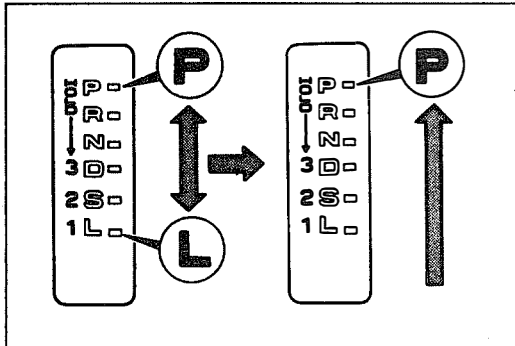
**Caution**

- Place the vehicle on a flat, level surface.

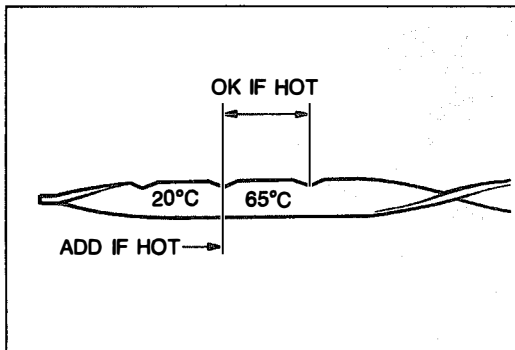
1. Apply the parking brake and position wheel chocks securely to prevent the vehicle from rolling.
2. Warm-up the engine until the ATF reaches **60—70°C (140—158°F)**.

06U0KX-077

3. While the engine is idling, shift the selector lever from P to L and back again.
4. Let the engine idle.
5. Shift the selector lever to P.



79G07C-126



06U0KX-078

**Note**

- Use the **COOL (20°C)** range as a rough reference only.

**Caution**

- Do not overfill.

6. Ensure that the ATF level is in the **HOT (65°C)** range. Add ATF to specification if necessary.

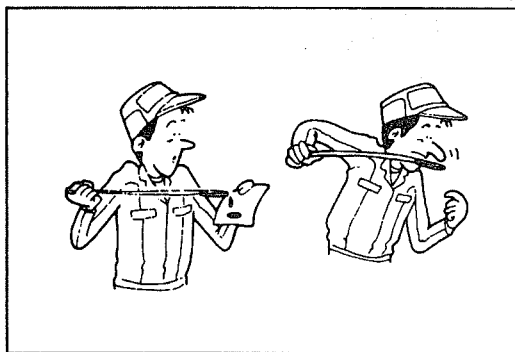
**ATF type: DEXRON-II or M-III**

**Condition**

1. Check the ATF for discoloration.
2. Check the ATF for any unusual smell.

**Note**

- Determine whether or not the automatic transmission should be disassembled by observing the condition of the ATF carefully. If the ATF is muddy and varnished, it indicates burned drive plates.

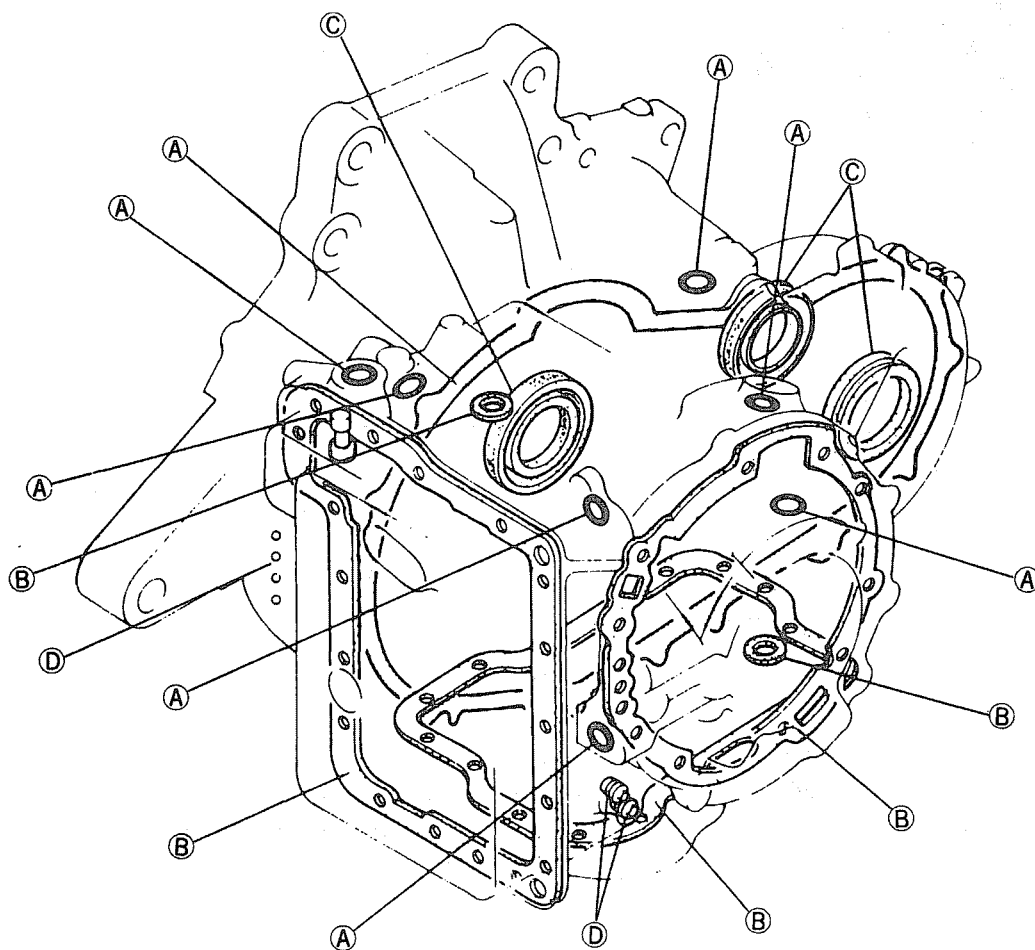


79G07C-128

**Fluid leaks**

Check for fluid leaks of the transmission as shown below, repair or replace if necessary.

1. Gaskets, O-rings, and plugs.
2. Oil hoses, oil pipes, and connections.
3. Oil cooler.

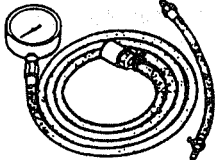



- (A) ..... O-RING
- (B) ..... GASKET
- (C) ..... OIL SEAL
- (D) ..... PLUG

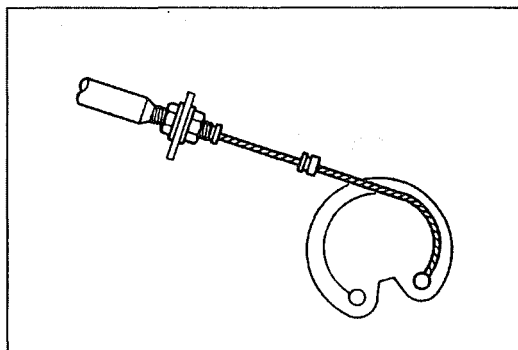
## THROTTLE CABLE

### PREPARATION

#### SST

<p>49 0378 400A</p> <p>Gauge set, oil pressure</p> 	<p>For adjustment of line pressure</p>	<p>49 B019 901</p> <p>Gauge</p> 	<p>For adjustment of line pressure</p>
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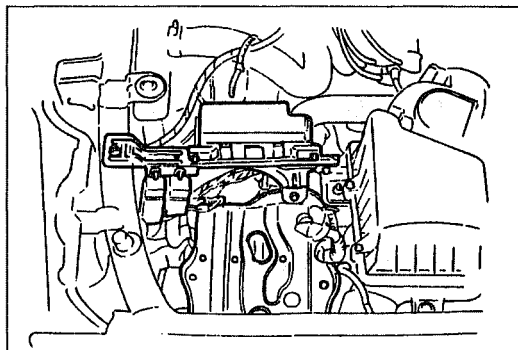


86U07B-066

### THROTTLE CABLE

#### Inspection

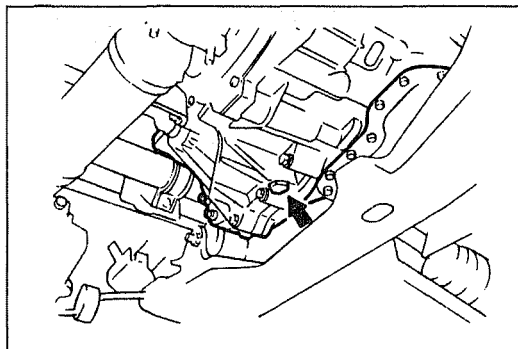
1. Check the inner and outer cable for damage.
2. Make sure that the accelerator operates smoothly.



86U07B-071

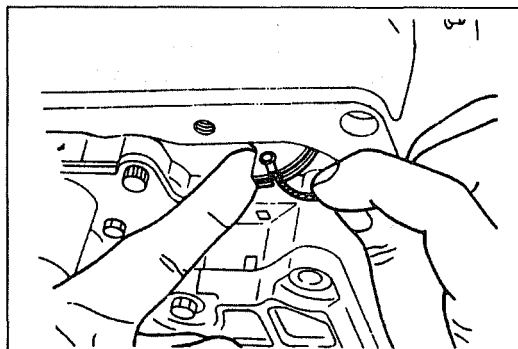
#### Removal

1. Remove the battery and battery carrier.
2. Remove the main fuse block.
3. Remove the intercooler hoses.
  - (1) Intercooler to air funnel
  - (2) Intercooler to intercooler pipe



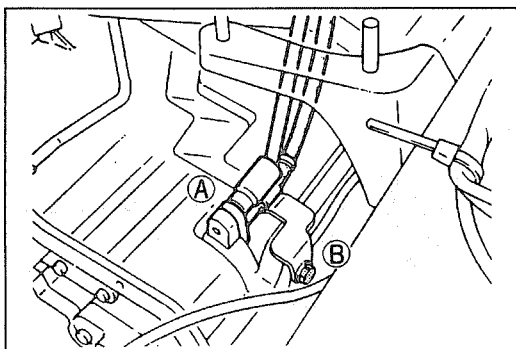
86U07B-073

4. Separate the EC-AT harness from the clip.
5. Jack up the vehicle and support it with safety stands, then drain the ATF.



96U07B-017

6. Remove the throttle cable from the throttle lever (throttle body).
7. Remove the control valve body cover and gasket.
8. Remove the throttle cable from the throttle lever (control valve body).
9. Remove the mounting bolt and throttle cable from the transaxle.
10. Remove the O-ring.



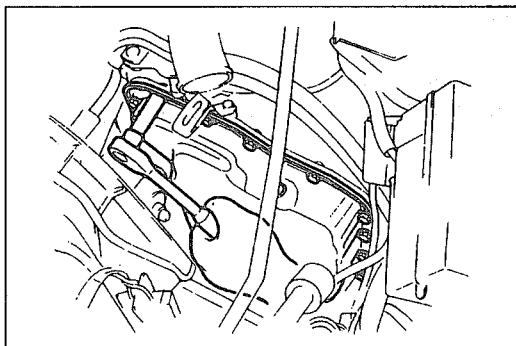
06U0KX-081

**Installation**

1. Install the throttle cable and a new O-ring into the transaxle case.

**Tightening torque:**

- Ⓐ : 8—11 N·m (80—110 cm·kg, 69—95 in·lb)
- Ⓑ : 19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

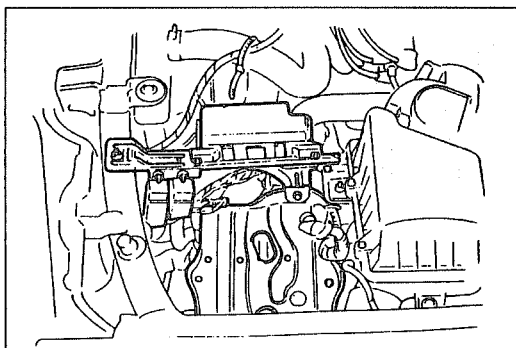


06U0KX-082

2. Install the control valve body cover together with a new gasket.

**Tightening torque:**

- 8—11 N·m (85—110 cm·kg, 74—95 in·lb)



06U0KX-083

3. Install the main fuse block.

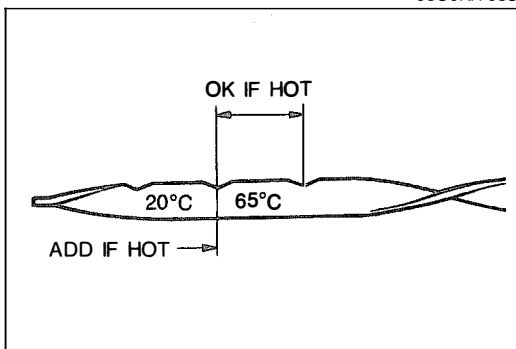
**Tightening torque:**

- 8—11 N·m (80—110 cm·kg, 69—95 in·lb)

4. Install the battery carrier.

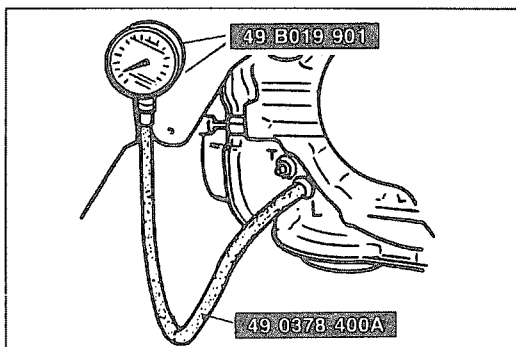
**Tightening torque:**

- 31—40 N·m (3.2—4.1 m·kg, 23—30 ft·lb)



16U0KX-012

5. After installation, add ATF, and with the engine idling, check the fluid level and check for leaks. (Refer to page K-45.)

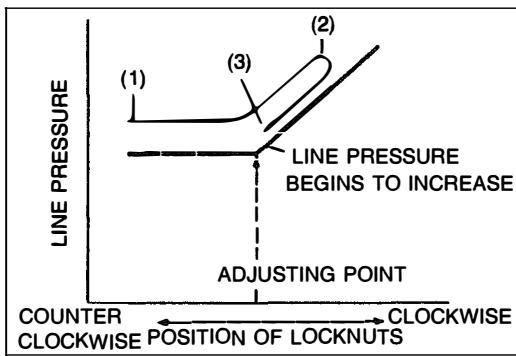


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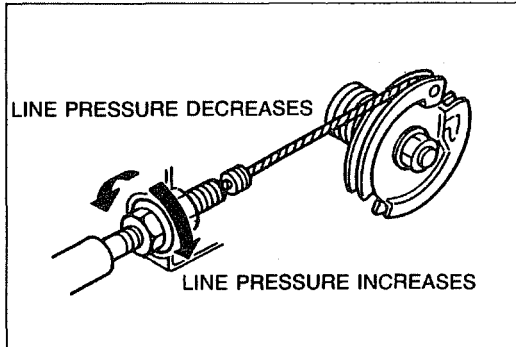
**Adjustment**

1. Remove the splash shield next to the left front tire.
2. Remove the square head plug L and install the **SST**.
3. Shift into P range and start the engine. Warm-up the engine to normal operating temperature, and adjust the idle speed if necessary.

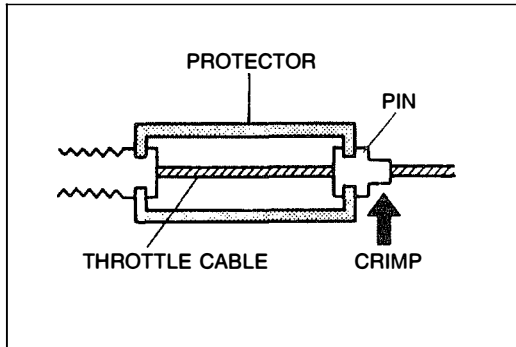
**Idle speed: 750 ± 25 rpm**



06U0KX-086



06U0KX-087



86U07B-080

4. Adjust the locknuts as follows:

**Note**

- **Transmission in P range.**

When the locknuts are moved, line pressure is increased or decreased as shown. Adjust the locknuts to the correct position using the following procedure.

- (1) Initially install the locknuts fully away from the throttle cam. (Loosen the cable fully)
- (2) Adjust the locknuts in a clockwise direction as viewed from the passenger side of the vehicle until the line pressure begins to increase above the specification shown below.
- (3) Adjust the locknuts in a counterclockwise direction until the line pressure decreases to the specification.

**Adjustment pressure:**

**441 kPa (4.5 kg/cm<sup>2</sup>, 64 psi)**

- (4) Tighten the locknuts and verify that the line pressure is as specified.

**Specified pressure:**

**432—451 kPa (4.4—4.6 kg/cm<sup>2</sup>, 63—65 psi)**

5. Turn off the engine.
6. Reinstall the square head plug.

**Tightening torque:**

**5—10 N·m (50—100 cm·kg, 43—87 in·lb)**

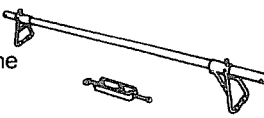
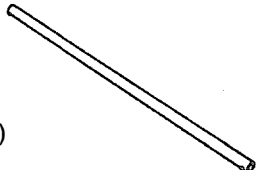
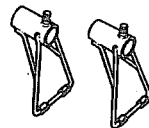
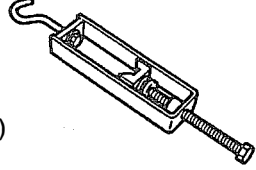
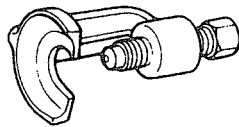
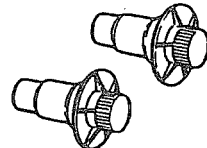
7. Fully open the throttle valve; then crimp the pin with the protector installed as shown.
8. Remove the protector.

TRANSAXLE

TRANSAXLE UNIT (REMOVAL)

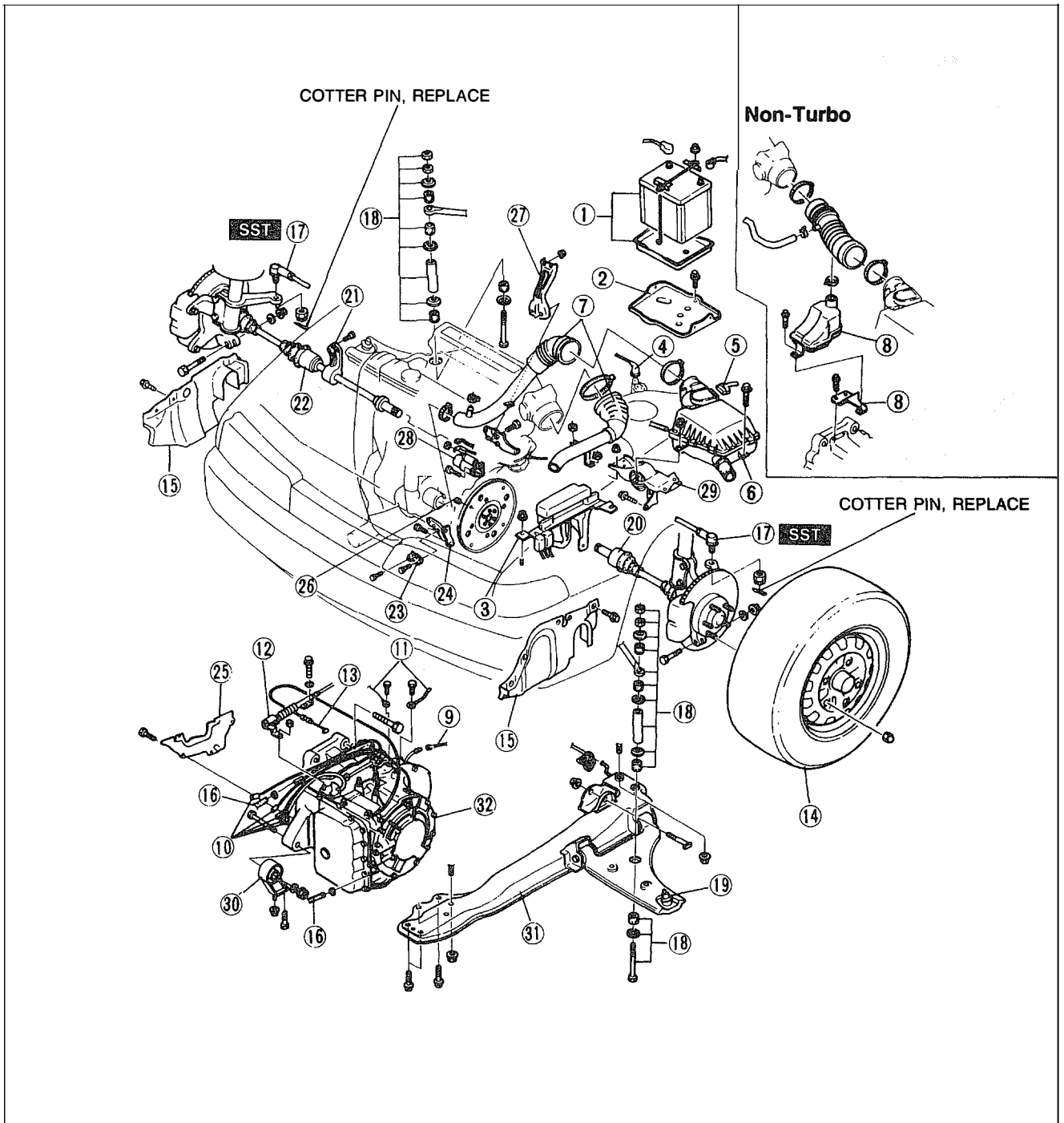
Preparation

SST

<p>49 G017 5A0 Support, engine</p> 	<p>For support of engine</p>	<p>49 G017 501 Bar (Part of 49 G017 5A0)</p> 	<p>For support of engine</p>
<p>49 G017 502 Support (Part of 49 G017 5A0)</p> 	<p>For support of engine</p>	<p>49 G017 503 Hook (Part of 49 G017 5A0)</p> 	<p>For support of engine</p>
<p>49 0118 850C Puller, ball joint</p> 	<p>For disconnecting tie-rod end</p>	<p>49 G030 455 Holder, diff. side gear</p> 	<p>For holding differential side gear</p>

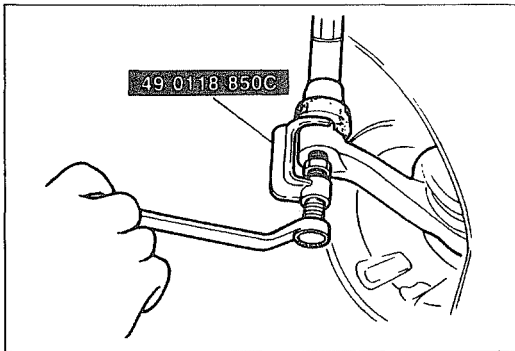
06U0KX-088

1. Disconnect the negative battery cable.
2. Jack up the vehicle and support it with safety stands.
3. Drain the ATF into a suitable container.
4. Remove in the order shown in the figure, referring to **Removal Note**.

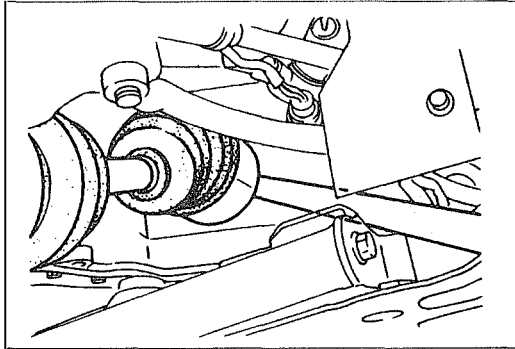


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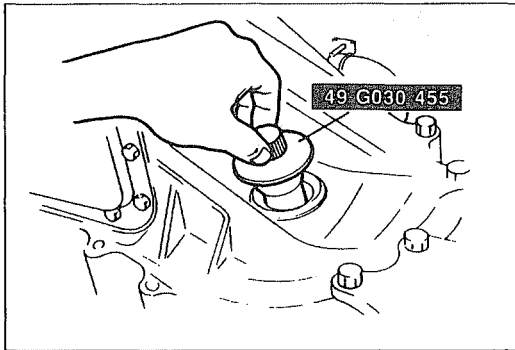
- |  |                                       |   |
|--|---------------------------------------|---|
| 1. Battery                                   | 13. Throttle cable                    | 23. Exhaust pipe bracket                |
| 2. Battery carrier                           | 14. Front wheels                      | 24. Gusset plates                       |
| 3. Main fuse block                           | 15. Splash shields                    | Removal..... page K-52                  |
| 4. Distributor lead                          | 16. Oil cooler outlet and inlet hoses | 25. Undercover                          |
| 5. Airflow meter connector                   | 17. Tie-rod ends                      | 26. Torque converter nuts               |
| 6. Air cleaner assembly                      | Removal..... page K-52                | 27. Manifold bracket                    |
| 7. Intercooler hoses (Turbo)                 | 18. Stabilizer bar control links      | 28. Starter                             |
| 8. Resonance chamber and bracket (Non-Turbo) | 19. Lower arm ball joints             | 29. Engine mount No.4                   |
| 9. Speedometer cable                         | 20. Driveshaft                        | 30. Engine mount No.2                   |
| 10. EC-AT connectors                         | Removal..... page K-52                | 31. Crossmember and left side lower arm |
| 11. Grounds                                  | 21. Joint shaft bracket               | 32. Transaxle                           |
| 12. Selector cable                           | 22. Joint shaft and driveshaft        | Removal..... page K-52                  |



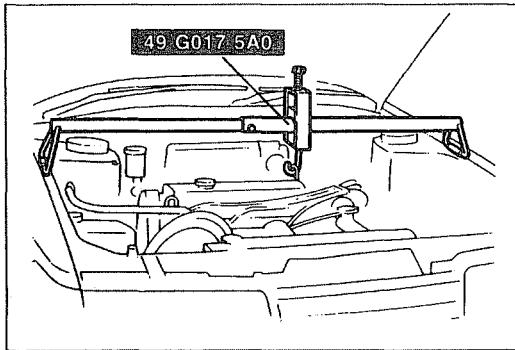
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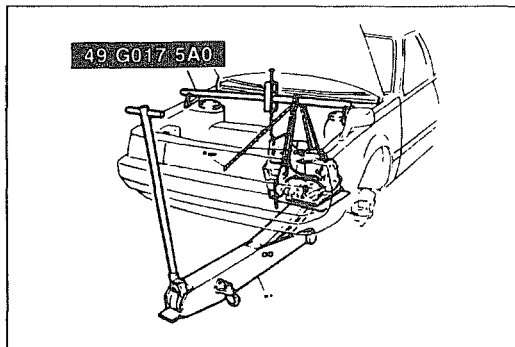
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06U0KX-092



06U0KX-093



06U0KX-094

**Removal Note****Tie-rod ends**

Disconnect the tie-rod ends with the **SST**.

**Driveshaft****Caution**

- Do not separate the driveshaft by pulling the disc plate.
- Do not damage the oil seal.

1. Separate the left driveshaft from the transaxle by prying with a bar inserted between the shaft and the case.
2. Remove the joint shaft bracket.
3. Separate the right driveshaft together with the joint shaft in the same manner.

**Caution**

- Failure to install the **SST** may allow the differential side gears to become misaligned.

4. Install the **SST** into the differential side gears.

**Gusset plates**

1. Suspend the engine with the **SST**.
2. Remove the gusset plates.

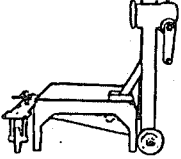
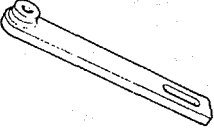

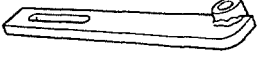
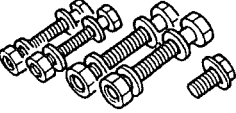
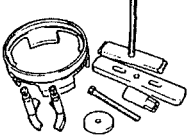

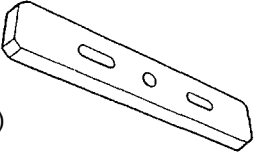
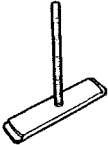

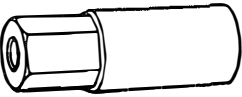
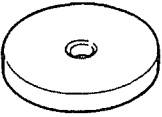
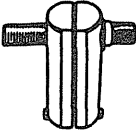
**Transaxle**

1. Lean the engine toward the transaxle by loosening the engine support hook bolt.
2. Support the transaxle with a jack.
3. Remove the transaxle mounting bolts.
4. Remove the transaxle.



**TRANSAXLE UNIT (DISASSEMBLY)**

**Preparation  
SST**

<p>49 0107 680A Engine stand</p> 	<p>For disassembly of transaxle</p>	<p>49 G019 0A0 Hanger, transaxle</p> 	<p>For disassembly of transaxle</p>
<p>49 G019 001 Body (Part of 49 G019 0A0)</p> 	<p>For disassembly of transaxle</p>	<p>49 G019 002 Stay (Part of 49 G019 0A0)</p> 	<p>For disassembly of transaxle</p>
<p>49 G019 003 Bolt set (Part of 49 G019 0A0)</p> 	<p>For disassembly of transaxle)</p>	<p>49 G019 0A7A Compressor set, return spring</p> 	<p>For disassembly of low and reverse brake piston</p>
<p>49 G019 024 Body A (Part of 49 G019 0A7A)</p> 	<p>For disassembly of low and reverse brake piston</p>	<p>49 G019 026 Plate (Part of 49 G019 0A7A)</p> 	<p>For disassembly of low and reverse brake piston</p>
<p>49 G019 027 Attachment A (Part of 49 G019 0A7A)</p> 	<p>For disassembly of low and reverse brake piston</p>	<p>49 G019 028 Bolt (Part of 49 G019 0A7A)</p> 	<p>For disassembly of low and reverse brake piston</p>
<p>49 G019 029 Nut (Part of 49 G019 0A7A)</p> 	<p>For disassembly of low and reverse brake piston</p>	<p>49 G019 030 Plate (Plate of 49 G019 0A7A)</p> 	<p>For disassembly of servo</p>
<p>49 FT01 361 Remover, bearing</p> 	<p>For removal of bearing outer race</p>	<p style="text-align: right;">06U0KX-095</p>	

**Precaution****General notes:**

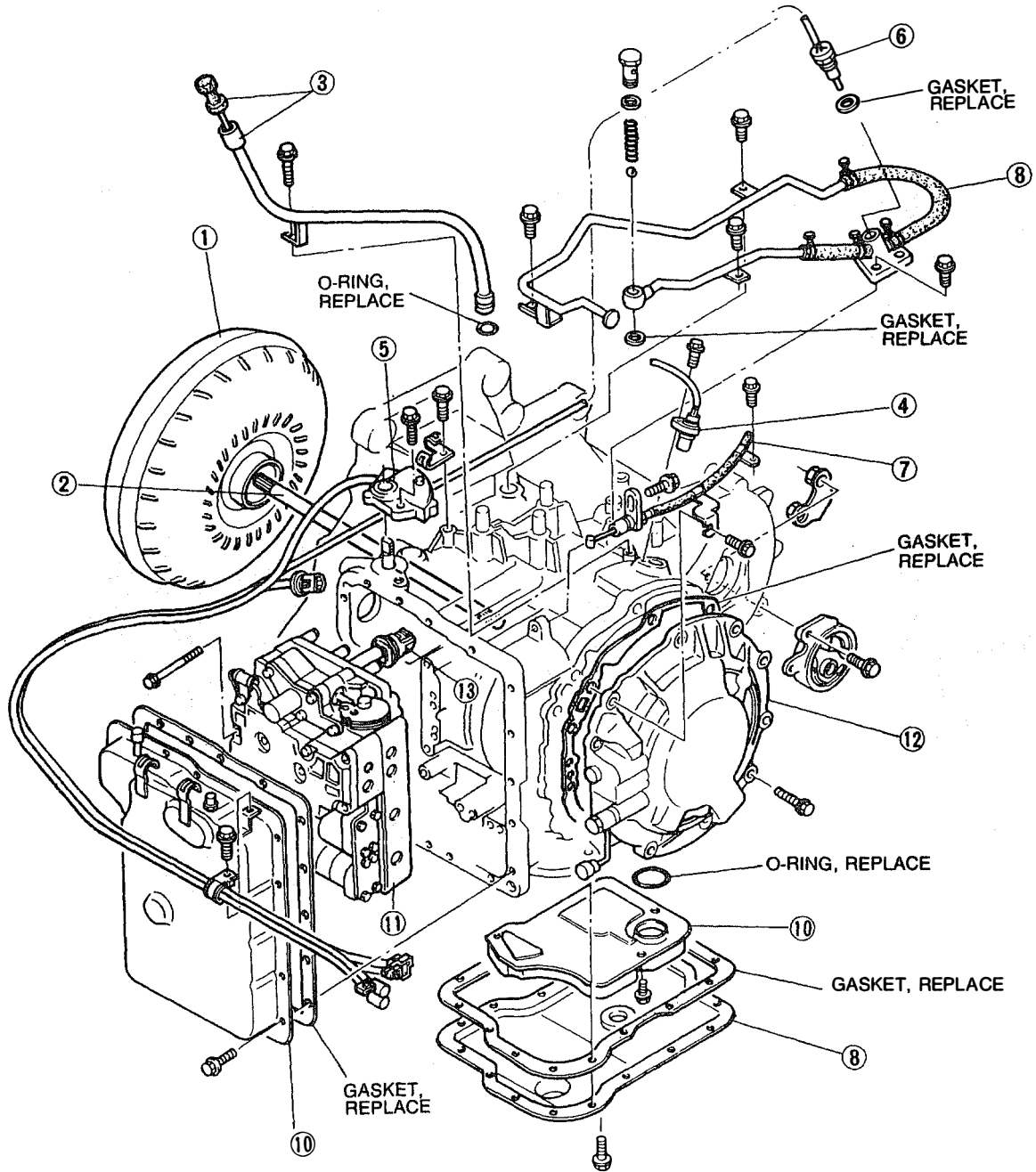
1. Disassemble the transmission in a clean area (dustproof work space) to prevent entry of dust into the mechanisms.
2. Inspect the individual transmission components in accordance with the QUICK DIAGNOSIS CHART during disassembly. (Refer to page K-10.)
3. Use only plastic hammers when applying force to separate the light alloy case joints.
4. Never use rags during disassembly; they may leave particles that can clog fluid passages.
5. Several parts resemble one another; organize them so they do not get mixed up.
6. Disassemble the control valve assembly and thoroughly clean it when a clutch or brake band is burned or when the ATF has degenerated.

**Cleaning notes:**

1. Clean the transmission exterior thoroughly with a steam cleaner or cleaning solvents before disassembly.
2. Clean the removed parts with cleaning solvent, and dry with compressed air. Clean out all holes and passages with compressed air, and check that there are no obstructions.
3. Wear eye protection when using compressed air to clean components.

06UOKX-096

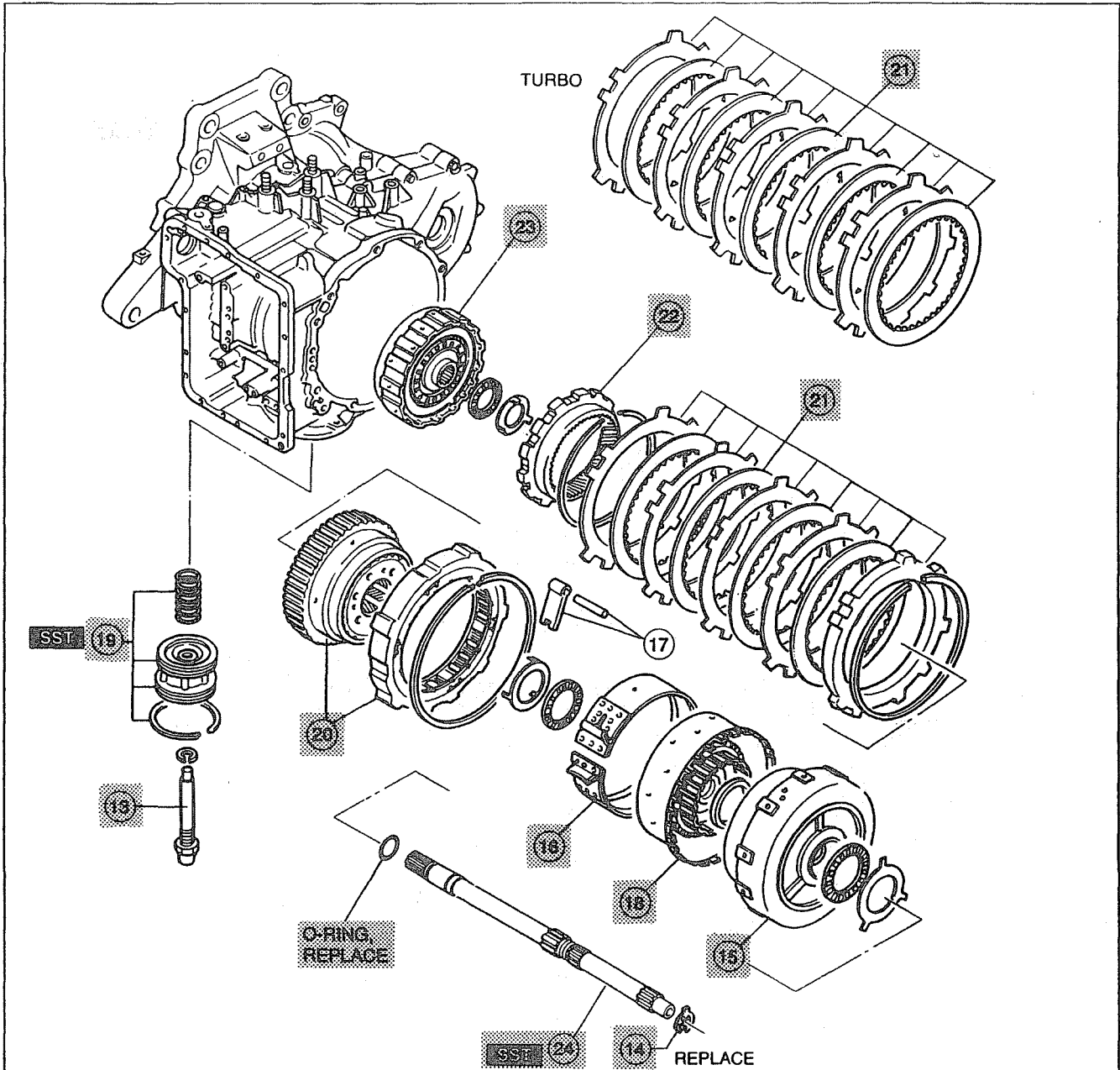
Components



16U0KX-016

- |  |  |   |
|--|--|---|
| 1. Torque converter<br>Inspection ..... page K- 69                               | 6. ATF thermoswitch<br>Inspection ..... page K- 41                             | 11. Control valve body<br>Disassembly... page K- 94<br>Assembly ..... page K-106<br>On-vehicle<br>Replacement<br>..... page K-110 |
| 2. Oil pump shaft<br>Inspection ..... page K- 93                                 | 7. Throttle cable<br>Inspection ..... page K- 47<br>Adjustment..... page K- 48 | 12. Oil pump<br>Disassembly... page K- 70<br>Assembly ..... page K- 72  |
| 3. Oil level gauge and oil filler<br>tube  | 8. Oil pan<br>Inspection ..... page K- 93                                      |   |
| 4. Pulse generator<br>Inspection ..... page K- 41                                | 9. Oil strainer<br>Inspection ..... page K- 93                                 |   |
| 5. Inhibitor switch<br>Inspection ..... page K- 40<br>Adjustment..... page K- 40 | 10. Control valve body cover<br>Inspection ..... page K- 93                    |   |

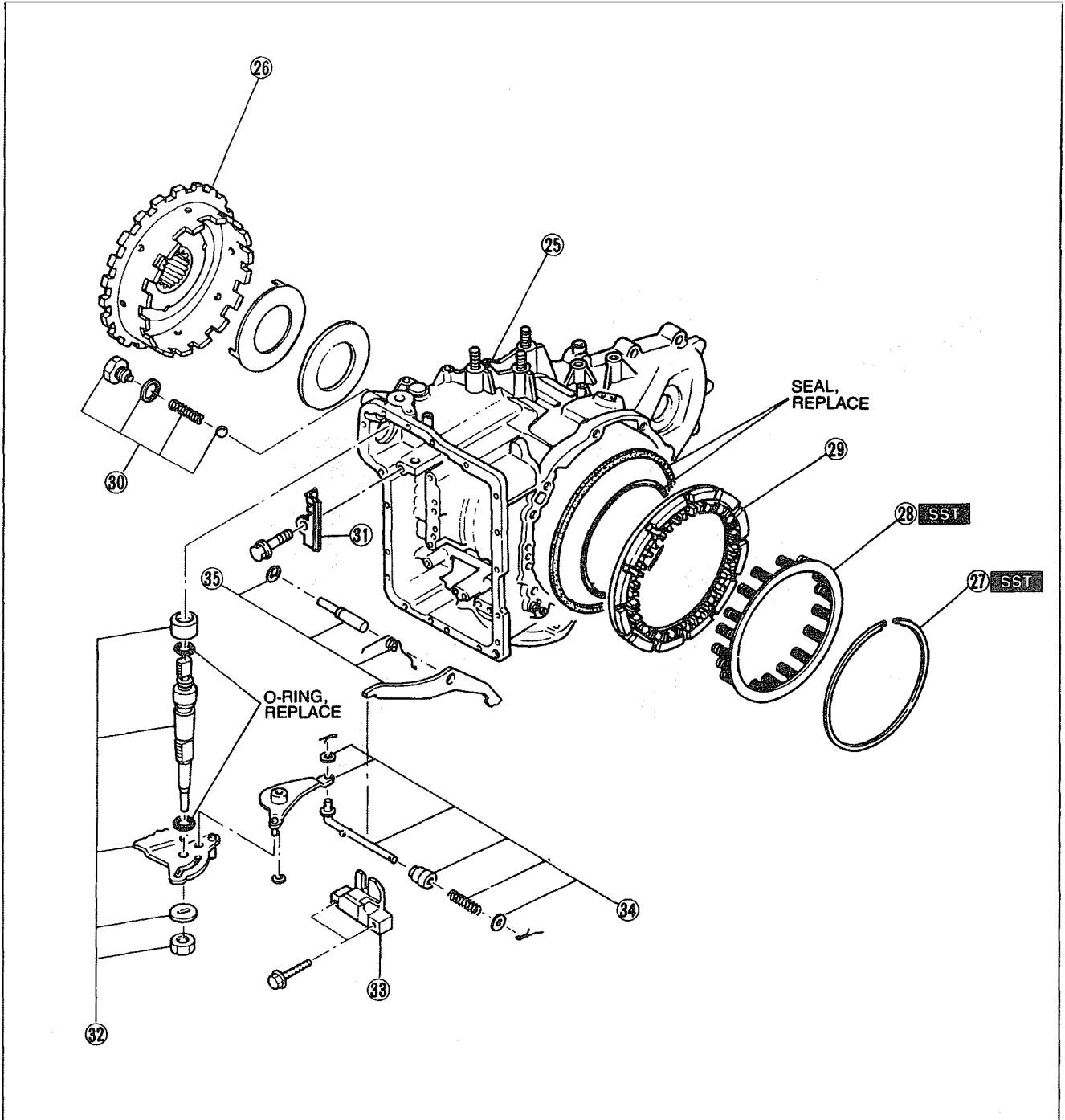
Components (Cont'd)



06U0KX-098

- |   |  |   |
|---|--|---|
| <p>13. Piston stem</p> <p>14. Snap ring</p> <p>15. Clutch assembly<br/>Disassembly /<br/>Inspection .... page K- 74<br/>Assembly ..... page K- 77</p> <p>16. 2-4 brake band<br/>Inspection ..... page K- 92</p> <p>17. Anchor strut and shaft<br/>Inspection ..... page K- 93</p> <p>18. Small sun gear and one-way<br/>clutch<br/>Disassembly /<br/>Inspection .... page K- 82<br/>Assembly ..... page K- 84</p> | <p>19. Servo<br/>Disassembly... page K- 63<br/>Inspection ..... page K- 92<br/>Assembly ..... page K-139<br/>On-vehicle<br/>Adjustment... page K- 93</p> <p>20. One-way clutch and carrier<br/>hub assembly<br/>Disassembly /<br/>Inspection .... page K- 85</p> <p>21. <b>Low and reverse brake drive and driven plates</b><br/>Disassembly... page K- 64<br/>Inspection ..... page K- 92<br/>Assembly ..... page K-135</p> | <p>22. Internal gear<br/>Inspection ..... page K- 93</p> <p>23. 3-4 clutch assembly<br/>Disassembly /<br/>Inspection .... page K- 88<br/>Assembly ..... page K- 89</p> <p>24. Turbine shaft<br/>Inspection ..... page K- 93</p> |
|---|--|---|

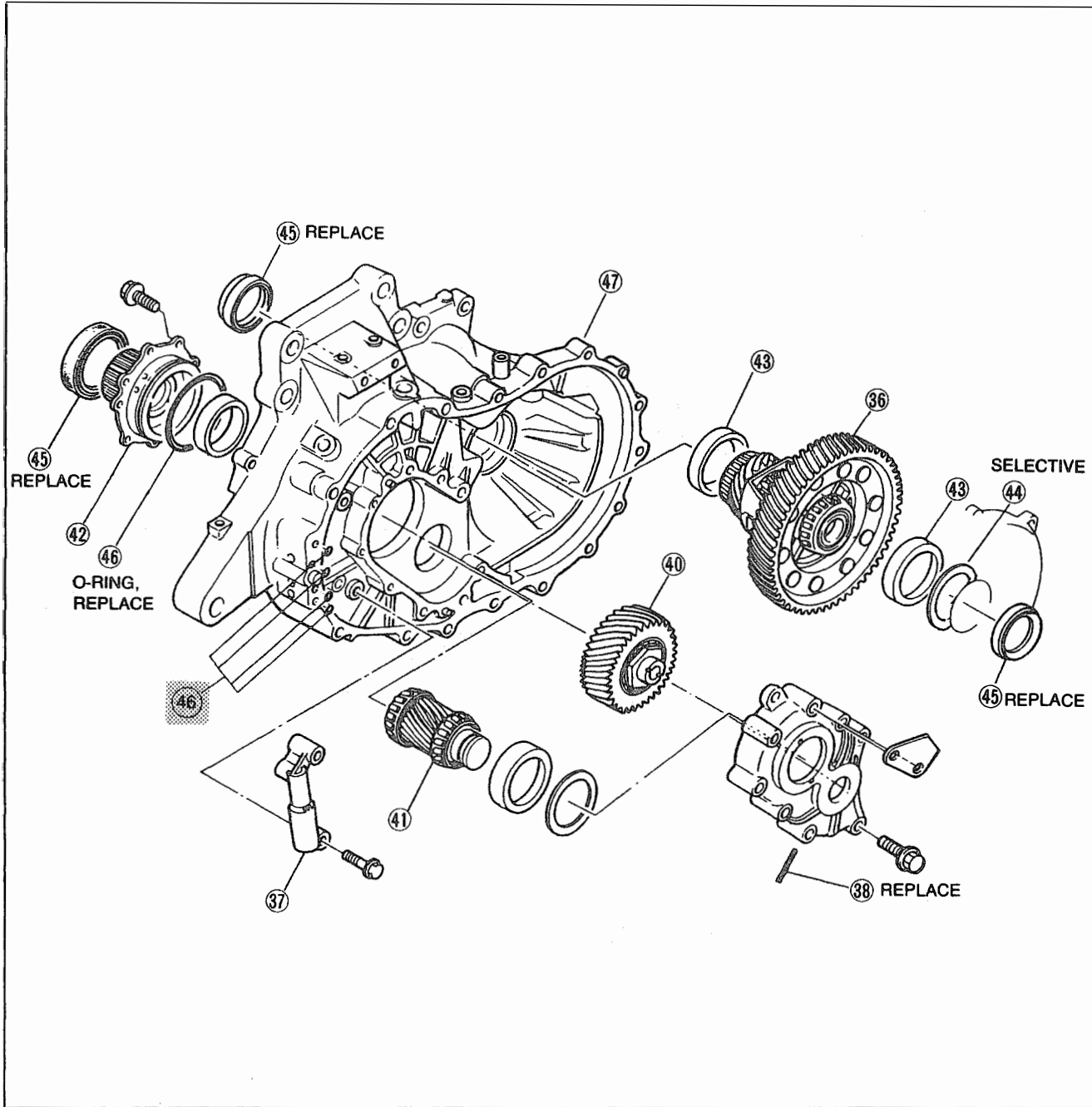
Components (Cont'd)



06U0KX-099

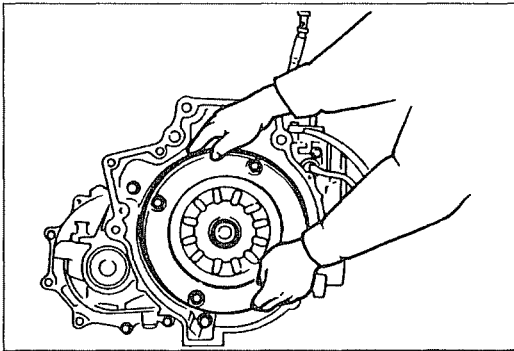
- |                                  |   |
|----------------------------------|---|
| 25. Transaxle case               | 30. Plug, washer, spring, and detent ball |
| 26. Output shell                 | 31. Bracket                               |
| Inspection..... page K- 93       | 32. Manual shaft and manual plate         |
| 27. Snap ring                    | Disassembly ..... page K- 66              |
| 28. Spring and retainer assembly | Assembly..... page K-134                  |
| Disassembly ..... page K- 66     | 33. Actuator support                      |
| Inspection..... page K- 92       | 34. Parking assist lever                  |
| Assembly..... page K-135         | Disassembly ..... page K- 67              |
| 29. Low and reverse brake piston | Assembly..... page K-134                  |
| Disassembly ..... page K- 66     | 35. Parking pawl                          |
| Inspection..... page K- 92       |   |
| Assembly..... page K-135         |   |

### Components (Cont'd)



06U0KX-100

- |   |   |
|---|---|
| 36. Differential assembly                 | 41. Output gear assembly                  |
| Disassembly / Inspection ..... page K-112 | Disassembly / Inspection ..... page K-115 |
| Assembly ..... page K-114                 | Assembly ..... page K-116                 |
| 37. 2-3 accumulator piston assembly       | 42. Bearing cover assembly                |
| Disassembly ..... page K- 91              | Disassembly / Inspection ..... page K-120 |
| Inspection ..... page K- 91               | Assembly ..... page K-121                 |
| Assembly ..... page K- 92                 | 43. Bearing outer races                   |
| 38. Roll pin                              | Disassembly ..... page K- 69              |
| 39. Bearing housing                       | Assembly ..... page K-133                 |
| Disassembly / Inspection ..... page K-121 | 44. Adjustment shim                       |
| Assembly ..... page K-130                 | 45. Oil seals                             |
| 40. Idler gear assembly                   | On-vehicle replacement..... page K- 69    |
| Disassembly / Inspection ..... page K-117 | 46. O-rings                               |
| Assembly ..... page K-118                 | 47. Converter housing                     |



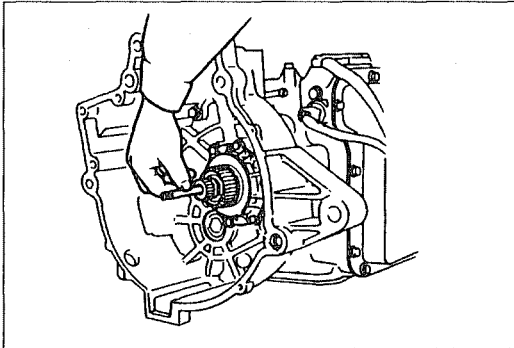
06U0KX-101

### Procedure

1. Remove the torque converter from the converter housing.

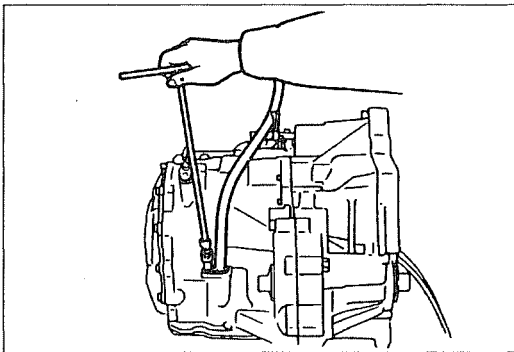
### Note

- Do not allow the ATF to spill when removing the torque converter.



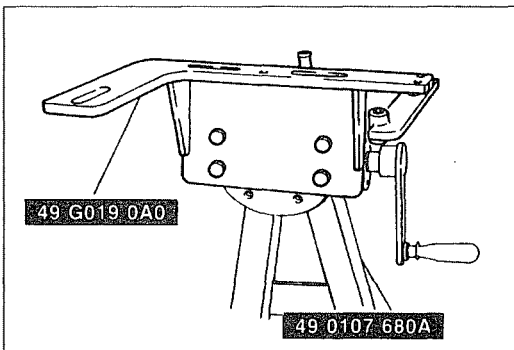
86U07B-119

2. Pull out the oil pump shaft by hand.



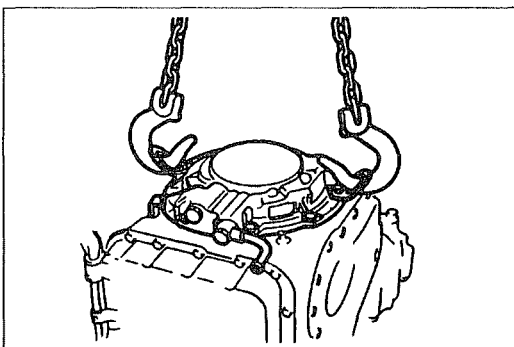
86U07B-120

3. Remove the oil level gauge and oil filler tube.



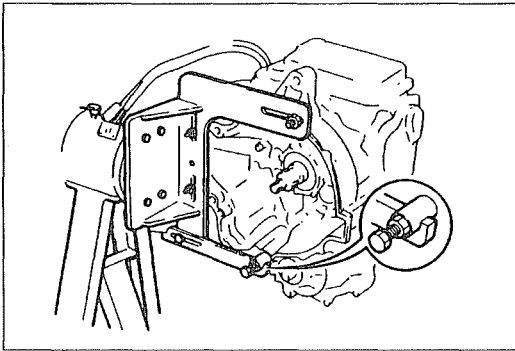
86U07B-121

4. Assemble the **SST**.

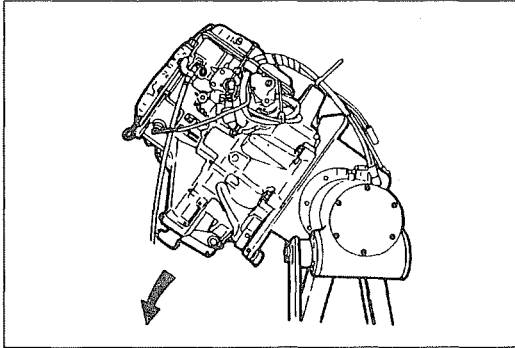


06U0KX-102

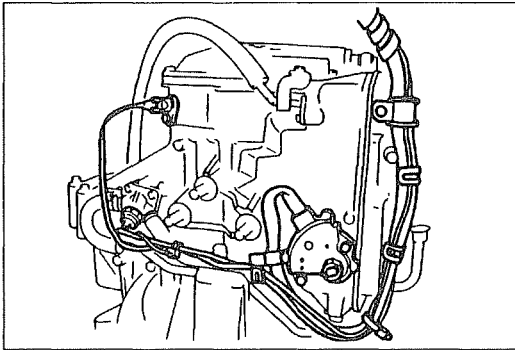
5. Attach suitable hangers to the oil pump as shown.



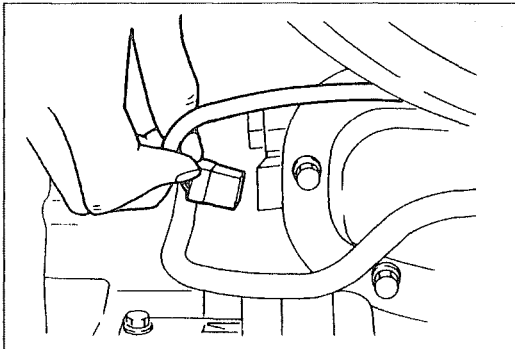
76G07B-709



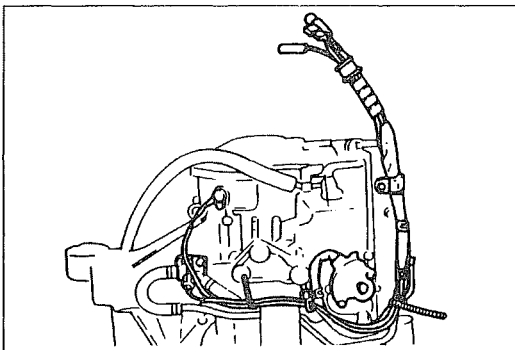
76U07B-453



06U0KX-103



76G07B-711



76G07B-712

6. Lift the transaxle and mount it on the **SST**.

**Warning**

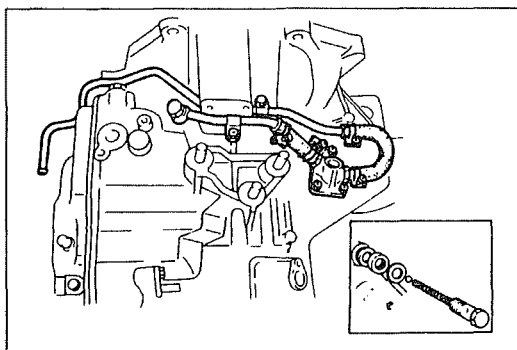
- Avoid leaning the transaxle to one side during disassembly, it may turn quickly and cause injury.

7. Remove the pulse generator, ATF thermoswitch, and inhibitor switch.

8. Disconnect the solenoid connector.

9. Remove the harnesses.



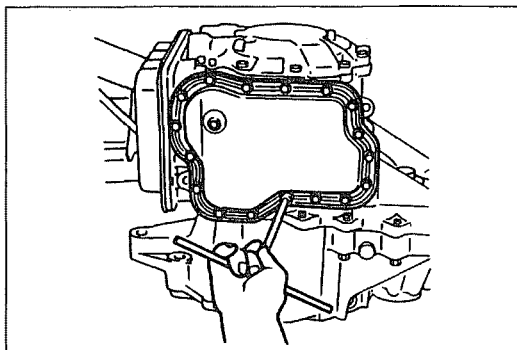


76G07B-713

10. Remove the harness clip, then remove the oil pipes, oil hoses and switch box as an assembly.

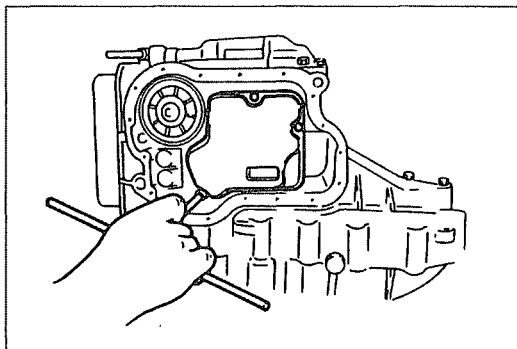
**Note**

- Remove the ball from the case.



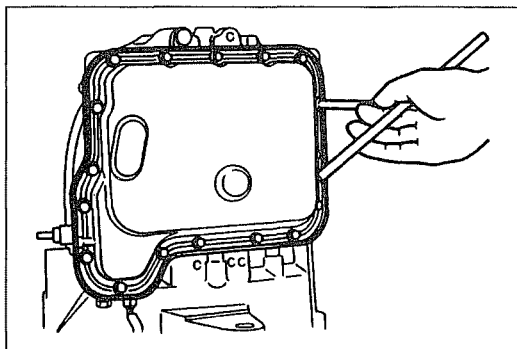
76G07B-714

11. Remove the oil pan and gasket.



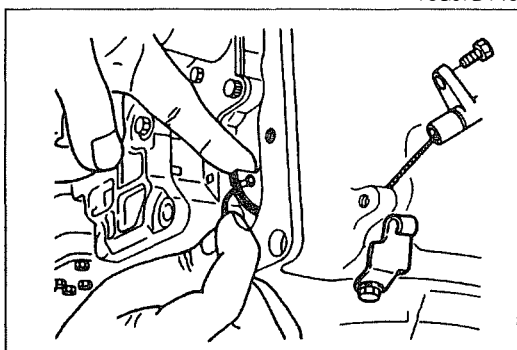
76G07B-715

12. Remove the oil strainer and O-ring.



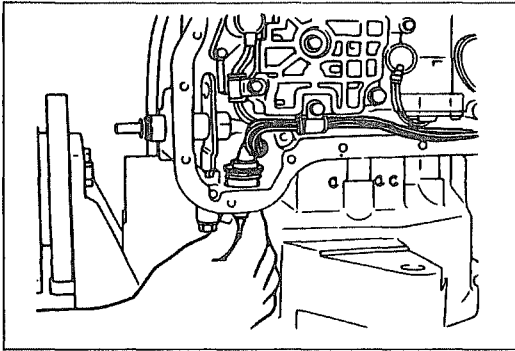
76G07B-716

13. Remove the control valve body cover and gasket.



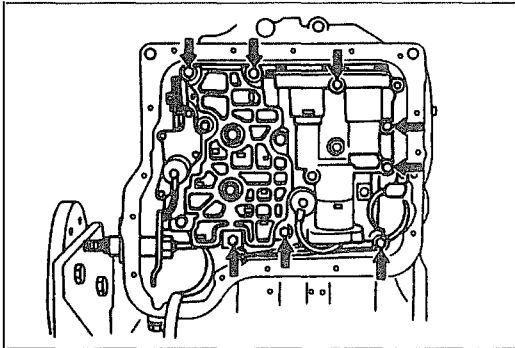
96U07B-025

14. Remove the throttle cable.  
 (1) Remove the throttle cable attaching bolt and bracket.  
 (2) Remove the cable from the throttle lever of the valve body.



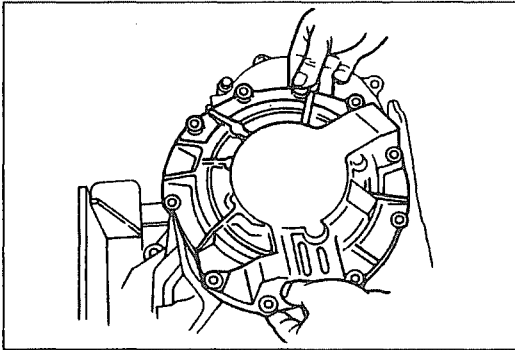
76G07B-718

15. Pinch the tangs of the solenoid connector and remove it by pushing inward.



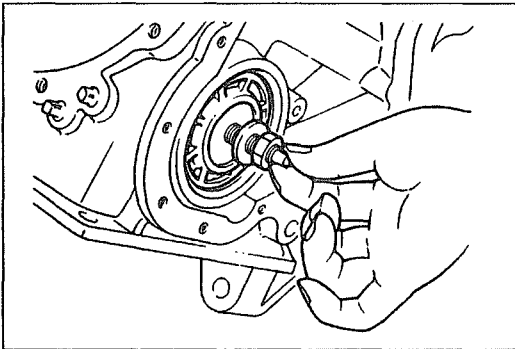
76G07B-719

16. Remove the control valve body as an assembly.



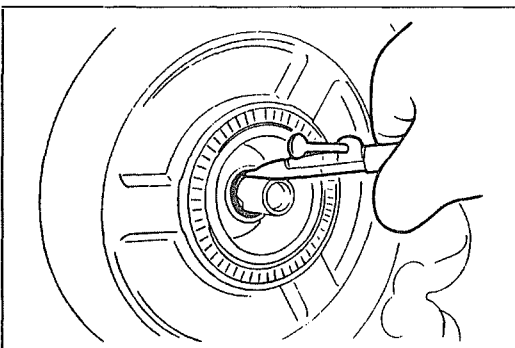
76G07B-720

17. Remove the oil pump as an assembly.



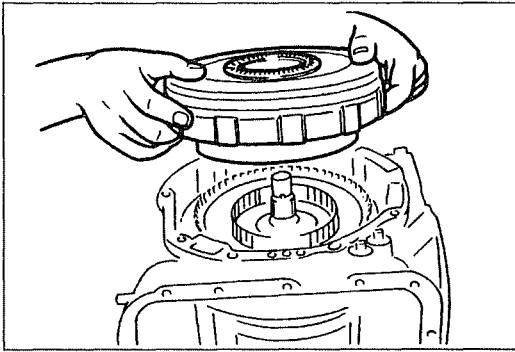
06U0KX-104

18. Remove the piston stem from the servo.



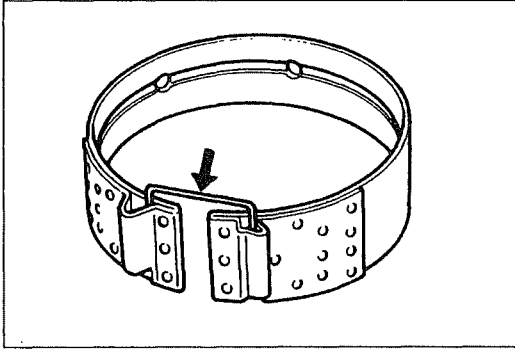
06U0KX-105

19. Remove the clutch assembly.  
(1) Remove the turbine shaft snap ring.



86U07B-138

- (2) Pull the reverse and forward drum and remove the clutch assembly.

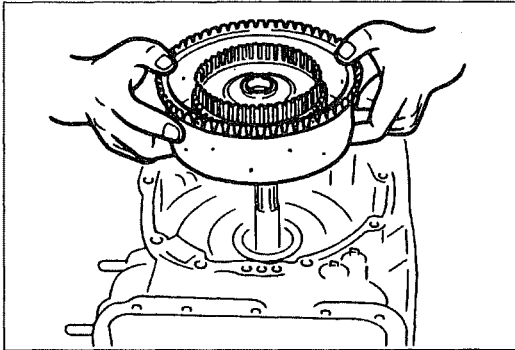


06U0KX-106

20. Remove the 2-4 brake band.

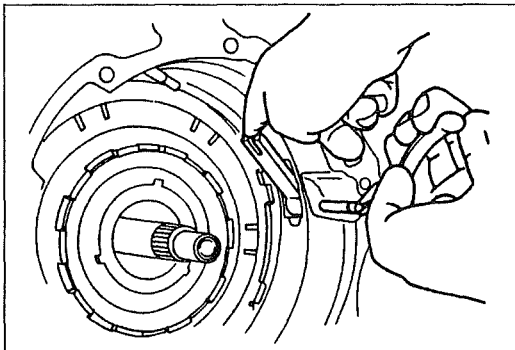
**Note**

- Use a piece of wire to secure the brake band so that it is not damaged by being stretched.



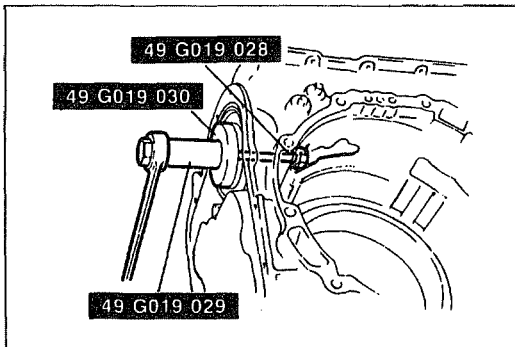
06U0KX-107

21. Remove the small sun gear and one-way clutch.



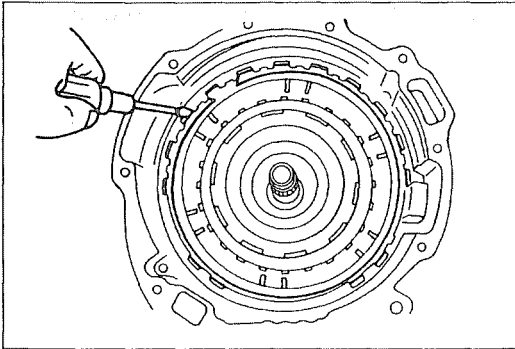
06U0KX-108

22. Pull the anchor shaft while holding the strut, then remove the strut.



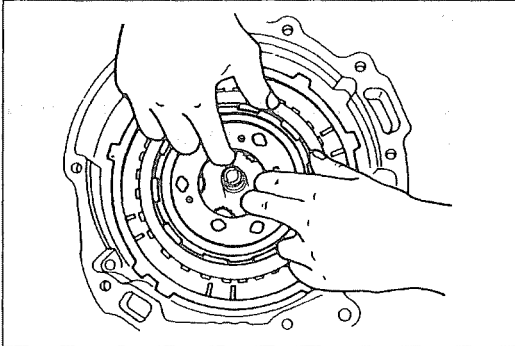
06U0KX-109

23. Remove the servo.  
 (1) Remove the snap ring with the **SST**.  
 (2) Remove the servo and spring.



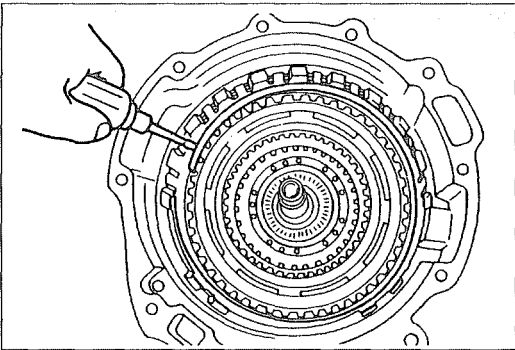
06U0KX-110

24. Remove the one-way clutch and carrier hub assembly.  
 (1) Remove the snap ring.



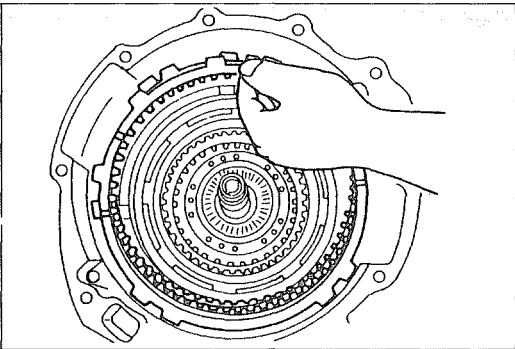
86U07B-144

- (2) Remove the one-way clutch together with the carrier hub assembly.



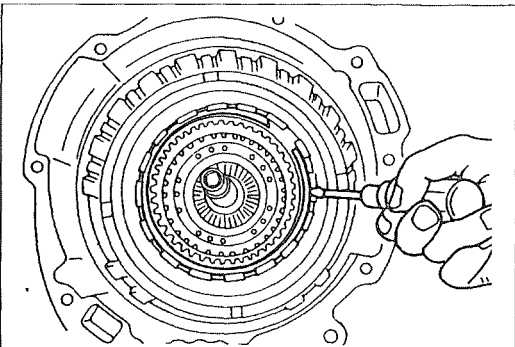
06U0KX-111

25. Remove the low and reverse brake assembly.  
 (1) Remove the snap ring.



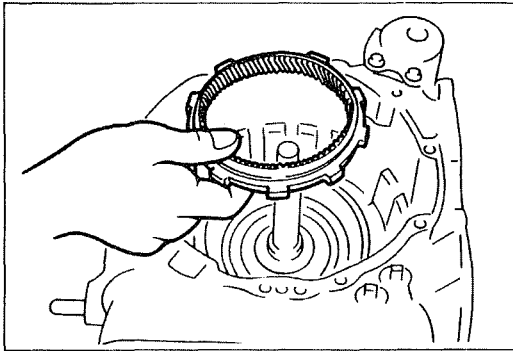
86U07B-146

- (2) Remove the retaining plate and the drive and driven plates.



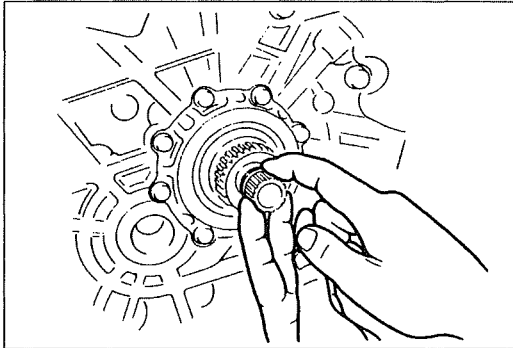
06U0KX-112

26. Remove the internal gear.  
 (1) Remove the snap ring.



86U07B-148

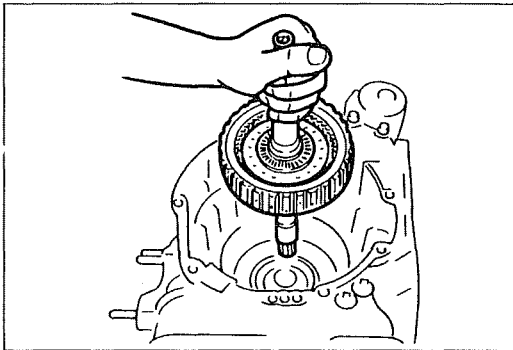
(2) Remove the internal gear from the 3-4 clutch drum.



06U0KX-113

27. Remove the 3-4 clutch assembly.

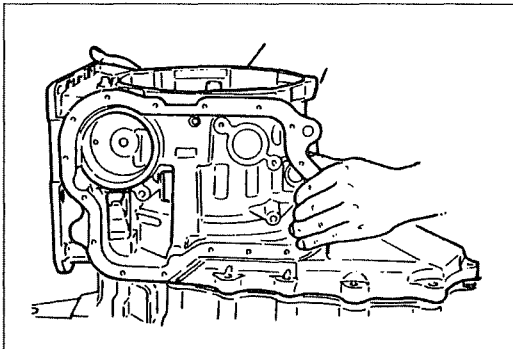
(1) Remove the O-ring from the turbine shaft at the converter housing side.



86U07B-150

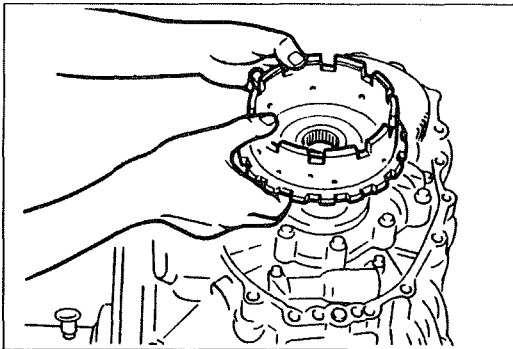
(2) Pull out the turbine shaft to remove the 3-4 clutch assembly.

(3) Remove the 3-4 clutch assembly.



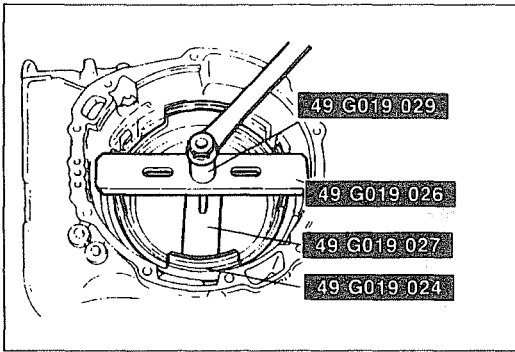
06U0KX-115

28. Remove the bolts, and remove the transaxle case by tapping lightly with a plastic hammer.



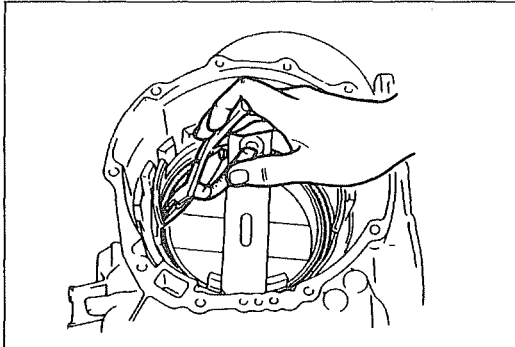
06U0KX-116

29. Remove the output shell from the output gear.



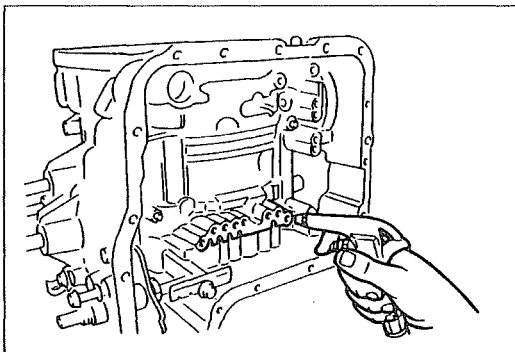
06U0KX-117

30. Remove the low and reverse brake piston
- (1) Install the **SST**.
  - (2) Compress the spring and retainer assembly.



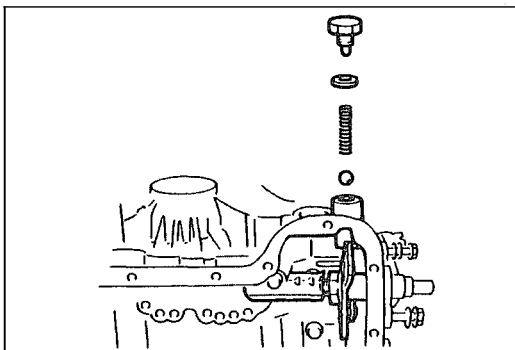
06U0KX-118

- (3) Remove the snap ring with snap-ring pliers, and remove the spring and retainer assembly.



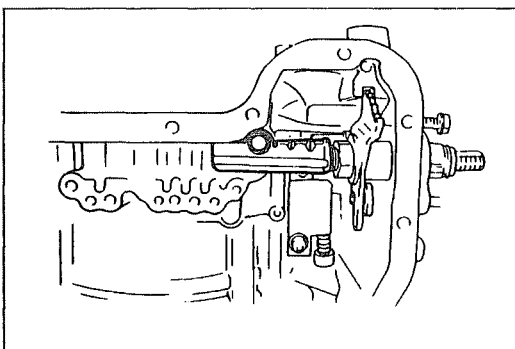
86U07B-156

- (4) Remove the low and reverse brake piston by applying compressed air through the fluid passage.



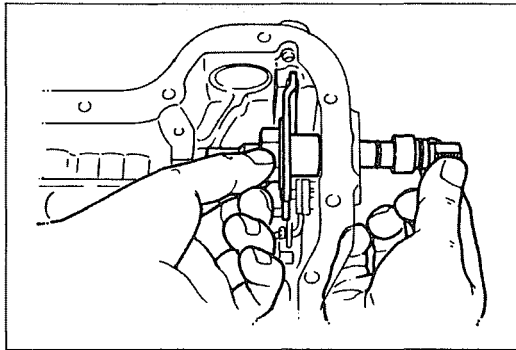
06U0KX-119

31. Remove the manual shaft and manual plate.
- (1) Remove the plug, washer, spring, and detent ball.



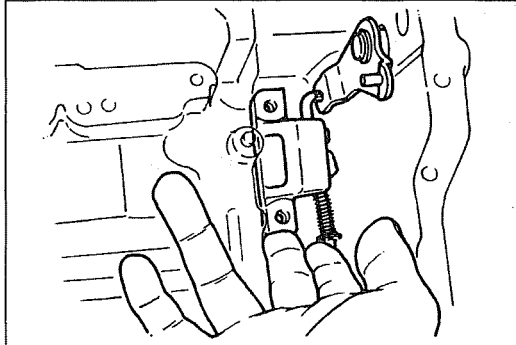
86U07B-158

- (2) Remove the bracket.



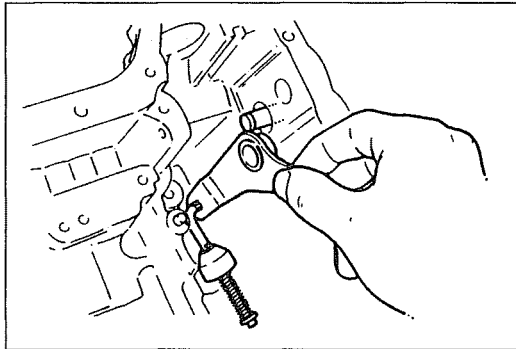
86U07B-159

- (3) Loosen the nut and pull the manual shaft out.
- (4) Remove the nut, washer, spacer, and manual plate.



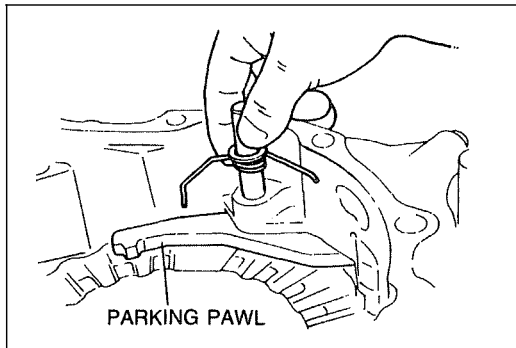
06U0KX-120

32. Remove the actuator support.



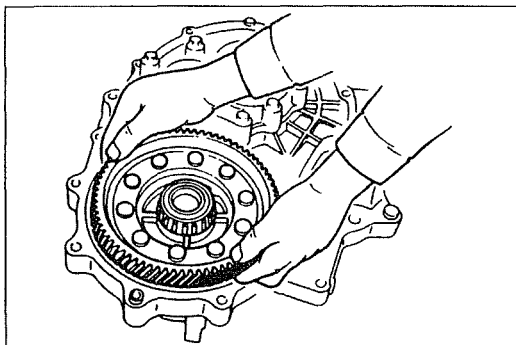
06U0KX-121

33. Remove the snap ring, and remove the parking assist lever.



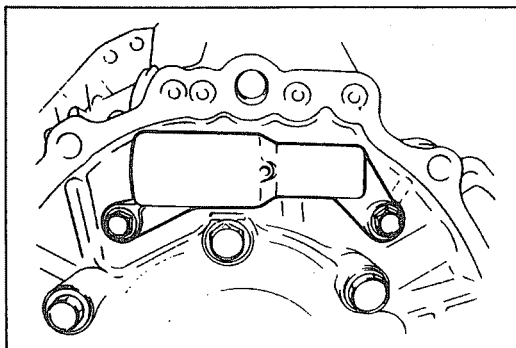
06U0KX-122

- 34. Remove the parking pawl.
  - (1) Remove the snap ring.
  - (2) Pull the parking shaft, and remove the spring and parking pawl.



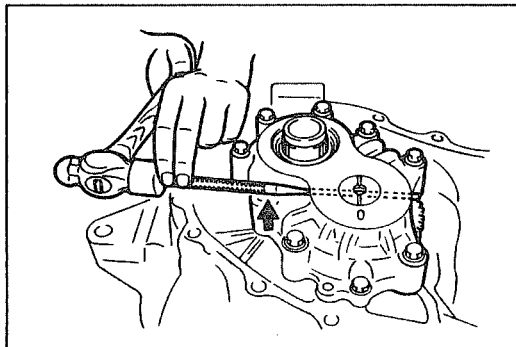
06U0KX-124

35. Remove the differential assembly.



06U0KX-125

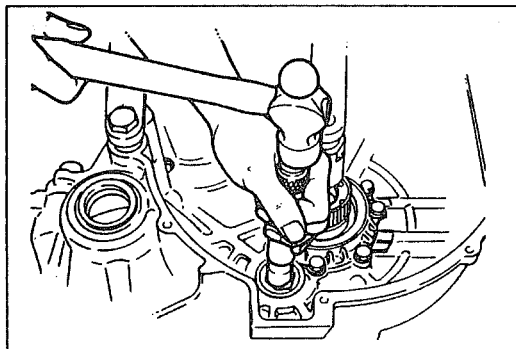
36. Remove the 2-3 accumulator piston assembly.



16U0KX-004

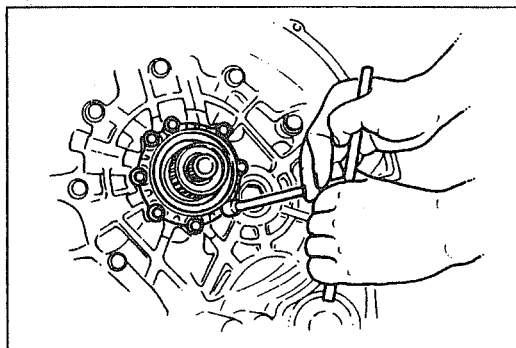
37. Remove the bearing housing.

- (1) Remove the bolt indicated in the figure for access to the roll pin.
- (2) Remove the roll pin with a pin punch.
- (3) Remove the baffle plate.
- (4) Remove the bearing housing by tapping lightly with a plastic hammer.



06U0KX-127

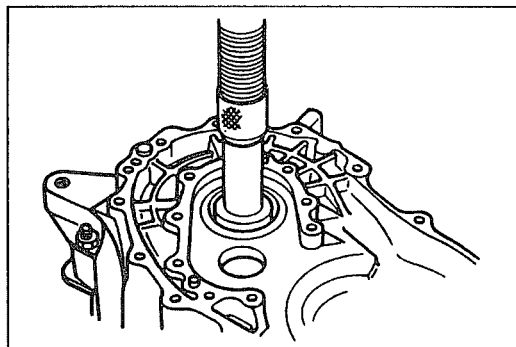
38. Remove the idler gear assembly and output gear assembly by tapping out away from the torque converter side.



06U0KX-128

39. Remove the bearing cover.

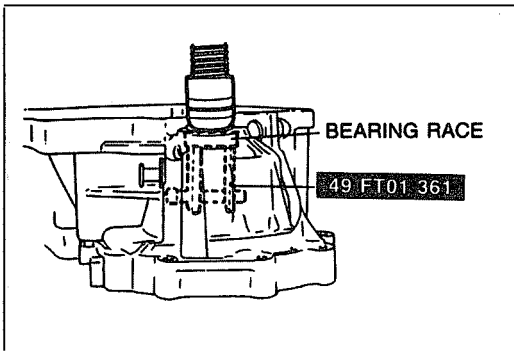
- (1) Remove the converter housing from the transaxle hanger.
- (2) Remove the bearing cover bolts.



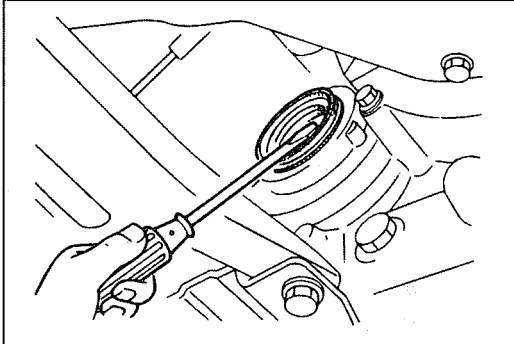
86U07B-169

- (3) Press the bearing cover assembly out of the converter housing.

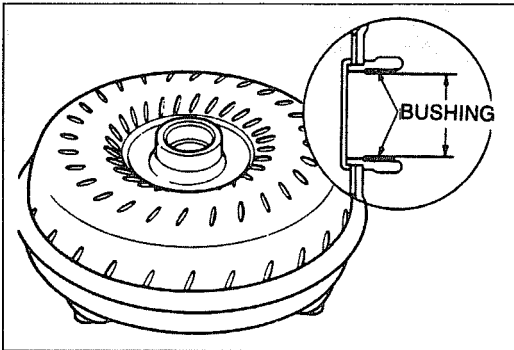




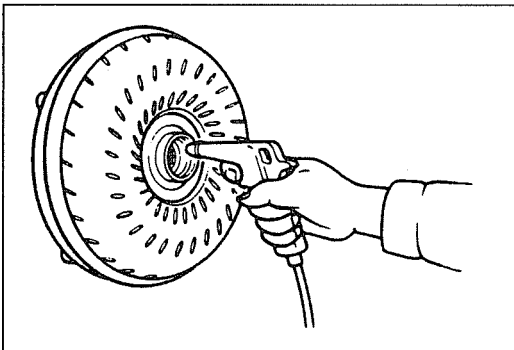
06U0KX-129



06U0KX-130



86U07B-172



06U0KX-131

40. Remove the bearing outer race.
  - (1) Press out the bearing outer races with the **SST**.

**Note**

- **Install the bearing outer race during reassembly to adjust the preload.**

41. Check the oil seals for damage, replace if necessary.
42. Check the O-rings for damage, replace if necessary.

**On-vehicle Replacement**

**Oil seal**

Replace the oil seal in the same manner as for the manual transaxle. (Refer to pages J1-16 or J2-16.)

**TORQUE CONVERTER**

The torque converter is welded together and cannot be disassembled.

**Inspection**

1. Check the outer part of the converter for damage or cracks, and replace it if necessary.
2. Check whether there is any rust on the pilot hub of the converter or on the boss. If there is any, remove it completely.
3. Measure the bushing of the converter boss. Replace the converter assembly if the bushing is worn.

**Bushing inner diameter**

**Standard: 53.030mm (2.088 in)**

**Maximum: 53.076mm (2.090 in)**

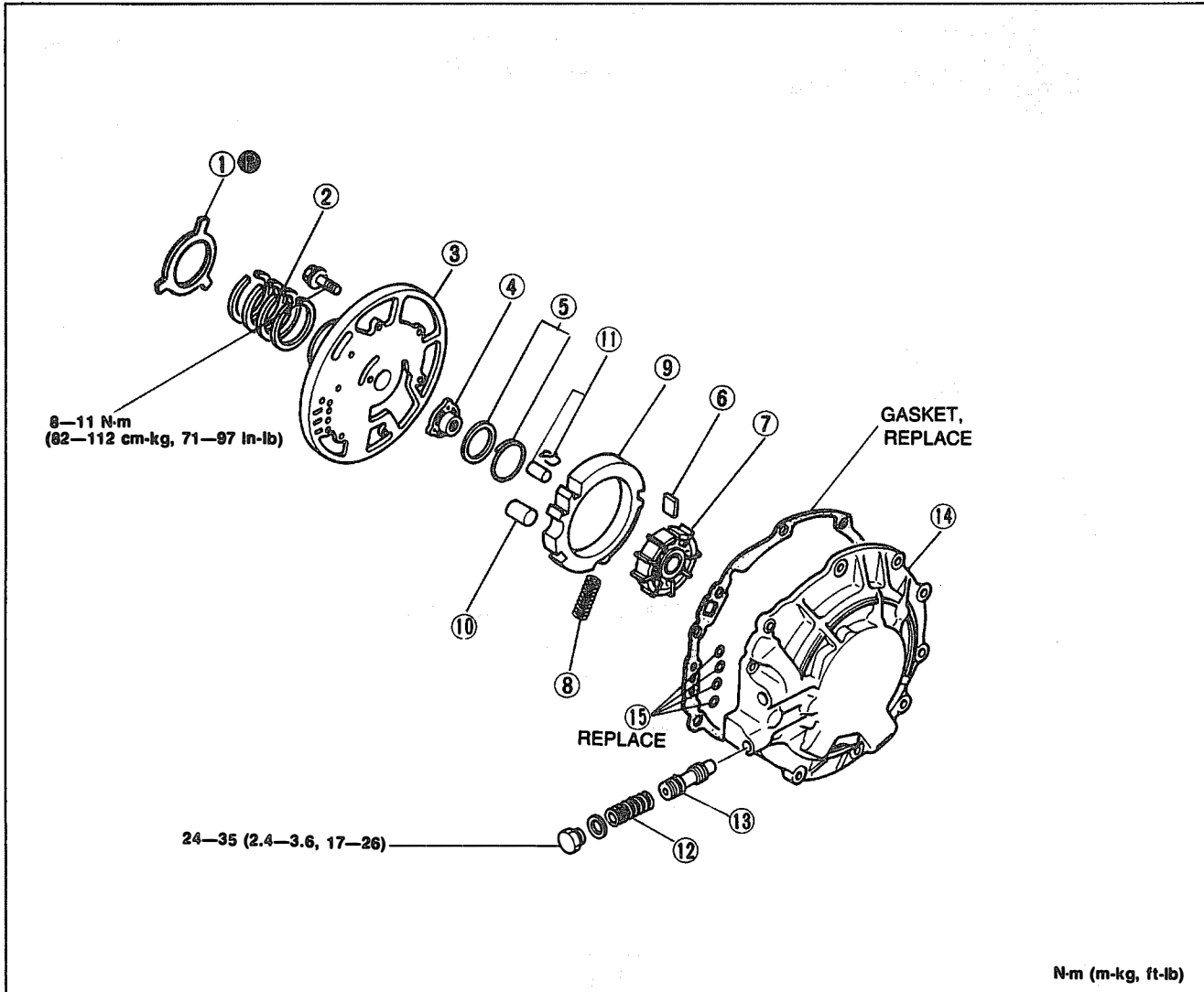
**Washing Inside of Converter**

1. Drain any ATF remaining in the converter.
2. Pour in solvent [**approx. 0.5 liter (0.53 US qt, 0.44 Imp qt)**].
3. Shake the converter to clean the inside. Pour out the solvent.
4. Clean the inside of the converter with compressed air so that the inside is perfectly empty.
5. Pour in ATF.
6. Shake the converter to clean the inside. Pour out the ATF.

### OIL PUMP

#### Disassembly

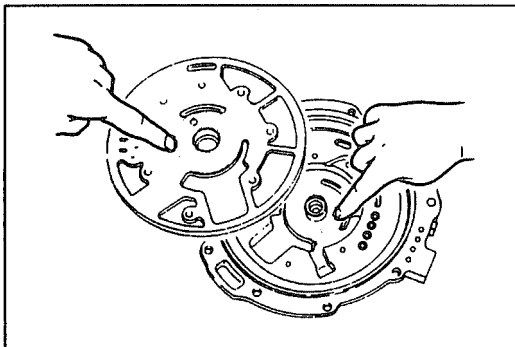
Disassemble in the order shown in the figure.



N-m (m-kg, ft-lb)

06U0KX-132

- |                                |                         |
|--------------------------------|-------------------------|
| 1. Bearing race                | 9. Cam ring             |
| 2. Seal rings                  | 10. Pivot roller        |
| 3. Oil pump cover              | 11. Seal pin and spring |
| 4. Pump flange                 | 12. Spring (Valve)      |
| 5. Guide ring and guide spring | 13. Valve               |
| 6. Vane                        | 14. Oil pump body       |
| 7. Rotor                       | 15. O-ring              |
| 8. Spring (Cam ring)           |                         |



06U0KX-133

#### Inspection

Check the following and replace any faulty parts.

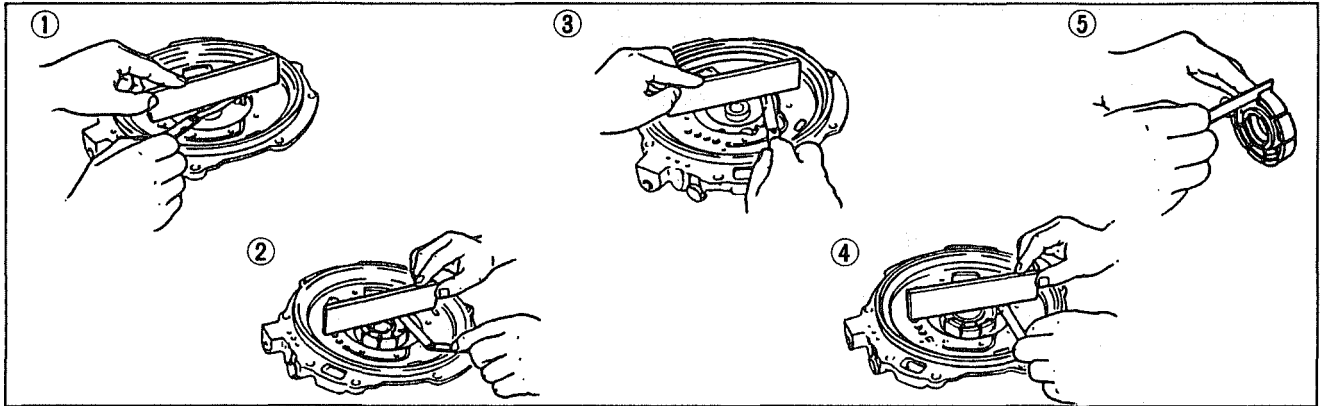
1. Sliding surfaces of the oil pump cover and oil pump body for damage or wear.
2. Broken or worn seal ring.
3. Weakened spring.

#### Free length of springs

- (1): For cam ring 41.6mm (1.64 in)  
 (2): For valve 35.0mm (1.38 in)

4. Clearance.

Measure the clearances below; if not within specification, replace the oil pump.



86U07B-176

1. Seal pin—Oil pump cover

Standard:  
0.005—0.020mm  
(0.0002—0.0008 in)  
Maximum:  
0.060mm (0.002 in)

3. Cam ring—Oil pump cover

Standard:  
0.005—0.020mm  
(0.0002—0.0008 in)  
Maximum:  
0.080mm (0.003 in)

5. Vane—Rotor groove

Standard:  
0.010—0.045mm  
(0.0004—0.0018 in)  
Maximum:  
0.065mm (0.0026 in)

2. Rotor—Oil pump cover

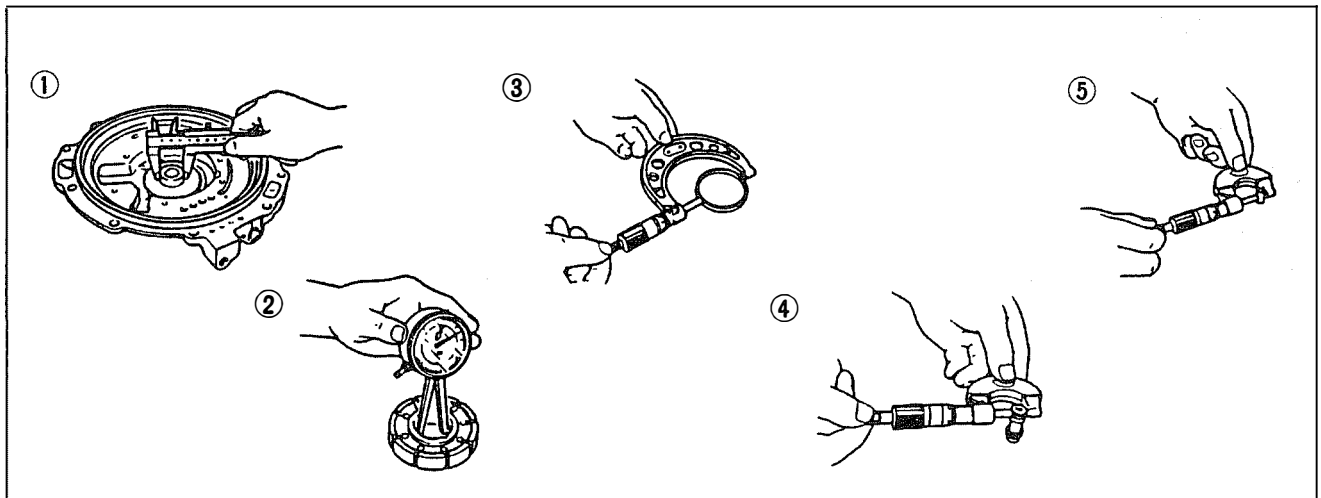
Standard:  
0.005—0.020mm  
(0.0002—0.0008 in)  
Maximum:  
0.030mm (0.0012 in)

4. Vane—Oil pump cover

Standard:  
0.015—0.050mm  
(0.0006—0.0020 in)  
Maximum:  
0.080 mm (0.003 in)

5. Wear.

Check each part for wear; if not within specification, replace the oil pump.



06U0KX-134

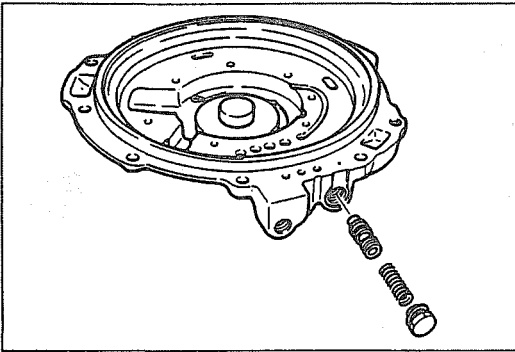
1. Oil pump body sleeve ..... outer diameter  
Standard: 28.00mm (1.102 in)

4. Valve ..... outer diameter  
Standard: 12.00mm (0.472 in)  
Minimum: 11.86mm (0.467 in)

2. Rotor bushing ..... inner diameter  
Standard: 28.00mm (1.102 in)  
Maximum: 28.05mm (1.104 in)

5. Seal pin ..... outer diameter  
Standard: 5.00mm (0.197 in)  
Minimum: 4.90mm (0.193 in)

3. Guide ring ..... outer diameter  
Standard: 57.85mm (2.278 in)  
Minimum: 57.70mm (2.272 in)



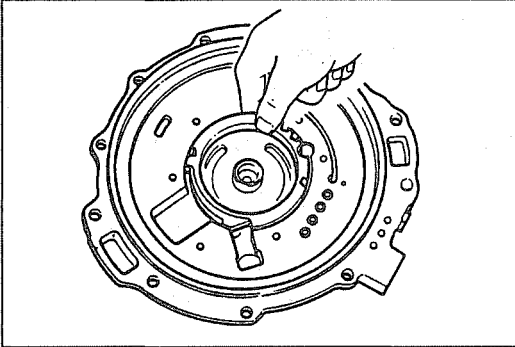
86U07B-178

**Assembly**

1. Install the valve and spring into the oil pump body, and check that the valve moves smoothly.
2. Install the plug.

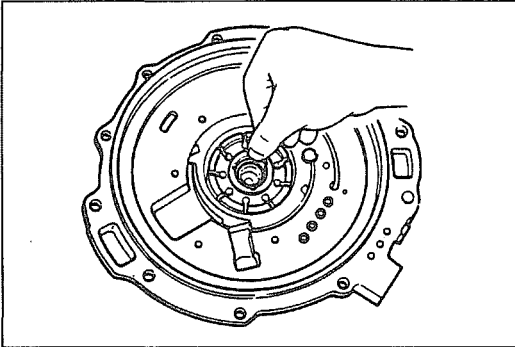
**Tightening torque:**

**24—35 N·m (2.4—3.6 m·kg, 17—26 ft·lb)**



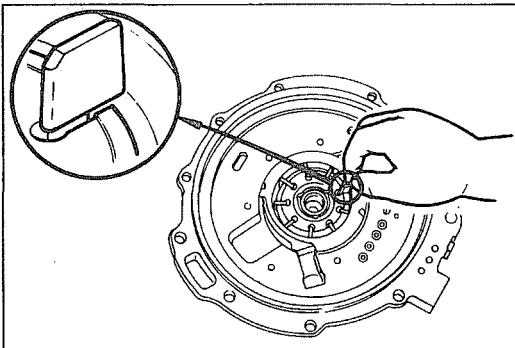
86U07B-179

3. Install the cam ring and pivot roller onto the oil pump body.



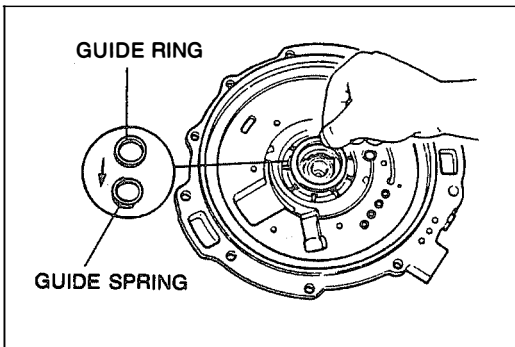
06U0KX-135

4. Install the rotor into the oil pump body.



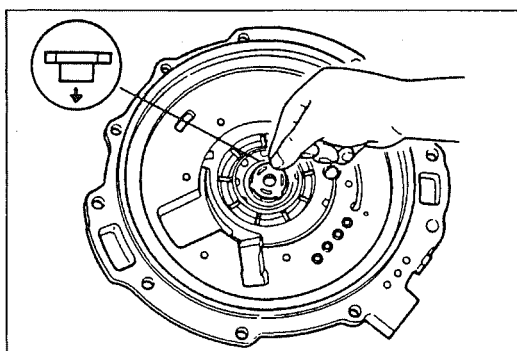
86U07B-181

5. Install the vanes into the rotor as shown.

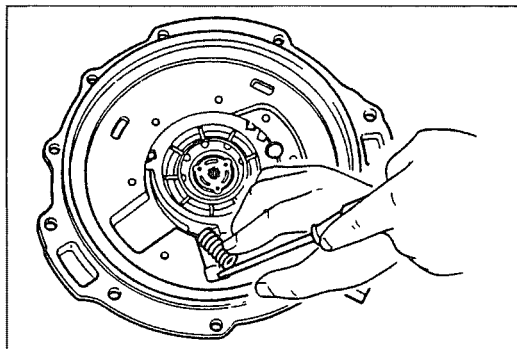


06U0KX-136

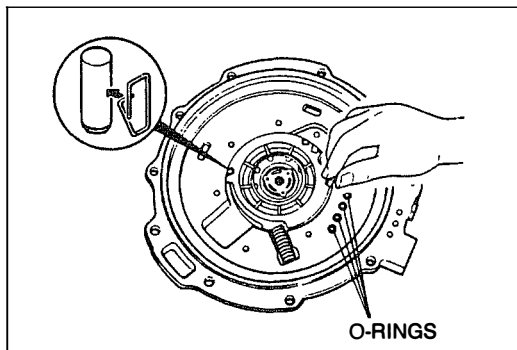
6. Install the guide spring and guide ring while pushing the vanes toward the cam ring.



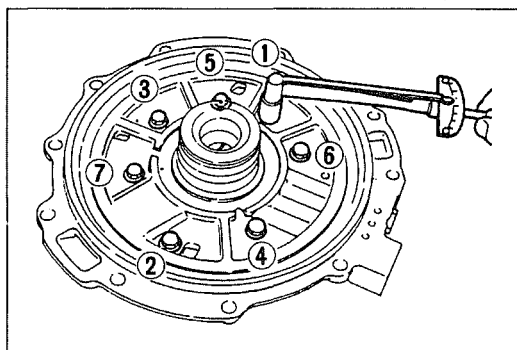
86U07B-183



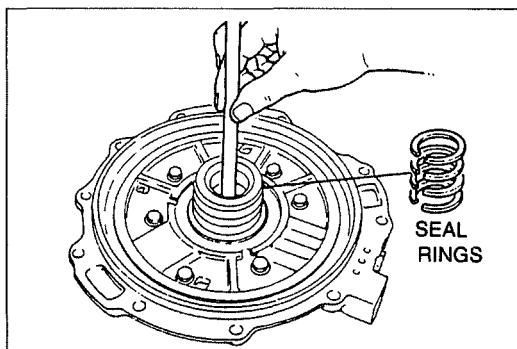
86U07B-184



86U07B-185



86U07B-186



86U07B-187

7. Install the pump flange onto the rotor.

8. Install the spring between the cam ring and oil pump body.

9. Install the seal pins and springs with the pins facing toward the oil pump body.

**Note**

- Install the seal pins round end first.

10. Install the O-rings.

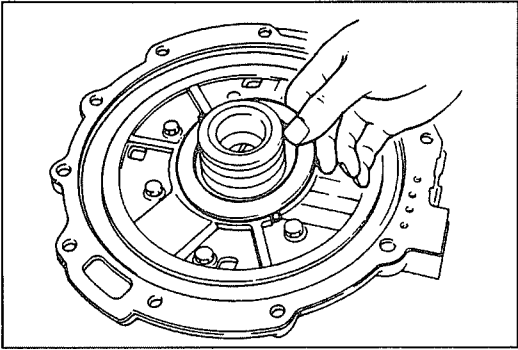
11. Install the oil pump cover to the oil pump body. Tighten the bolts in sequence.

**Tightening torque:**

**8—11 N·m (82—112 cm·kg, 71—97 in·lb)**

12. Install the oil pump shaft and check for smooth oil pump operation.

13. Install the seal rings.



86U07B-188

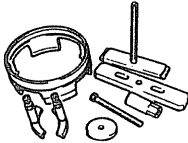

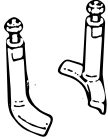
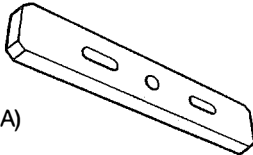
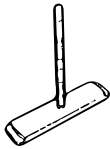
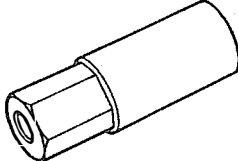
14. Apply petroleum jelly to the bearing race to secure it to the oil pump cover; then install it on the oil pump cover.

**Bearing race outer diameter: 88.0mm (3.46 in)**

**CLUTCH ASSEMBLY**

**Preparation**

**SST**

<p>49 G019 0A07A Compressor set, return spring</p> 	<p>For disassembly and assembly of coasting clutch and reverse clutch</p>	<p>49 G019 024 Body A (Part of 49 G019 0A07A)</p> 	<p>For disassembly and assembly of reverse clutch</p>
<p>49 G019 025 Body B (Part of 49 G019 0A07A)</p> 	<p>For disassembly and assembly of coasting clutch</p>	<p>49 G019 026 Plate (Part of 49 G019 0A07A)</p> 	<p>For disassembly and assembly of coasting clutch and reverse clutch</p>
<p>49 G019 027 Attachment A (Part of 49 G019 0A07A)</p> 	<p>For disassembly and assembly of coasting clutch and reverse clutch</p>	<p>49 G019 029 Nut (Part of 49 G019 0A07A)</p> 	<p>For disassembly and assembly of coasting clutch and reverse clutch</p>

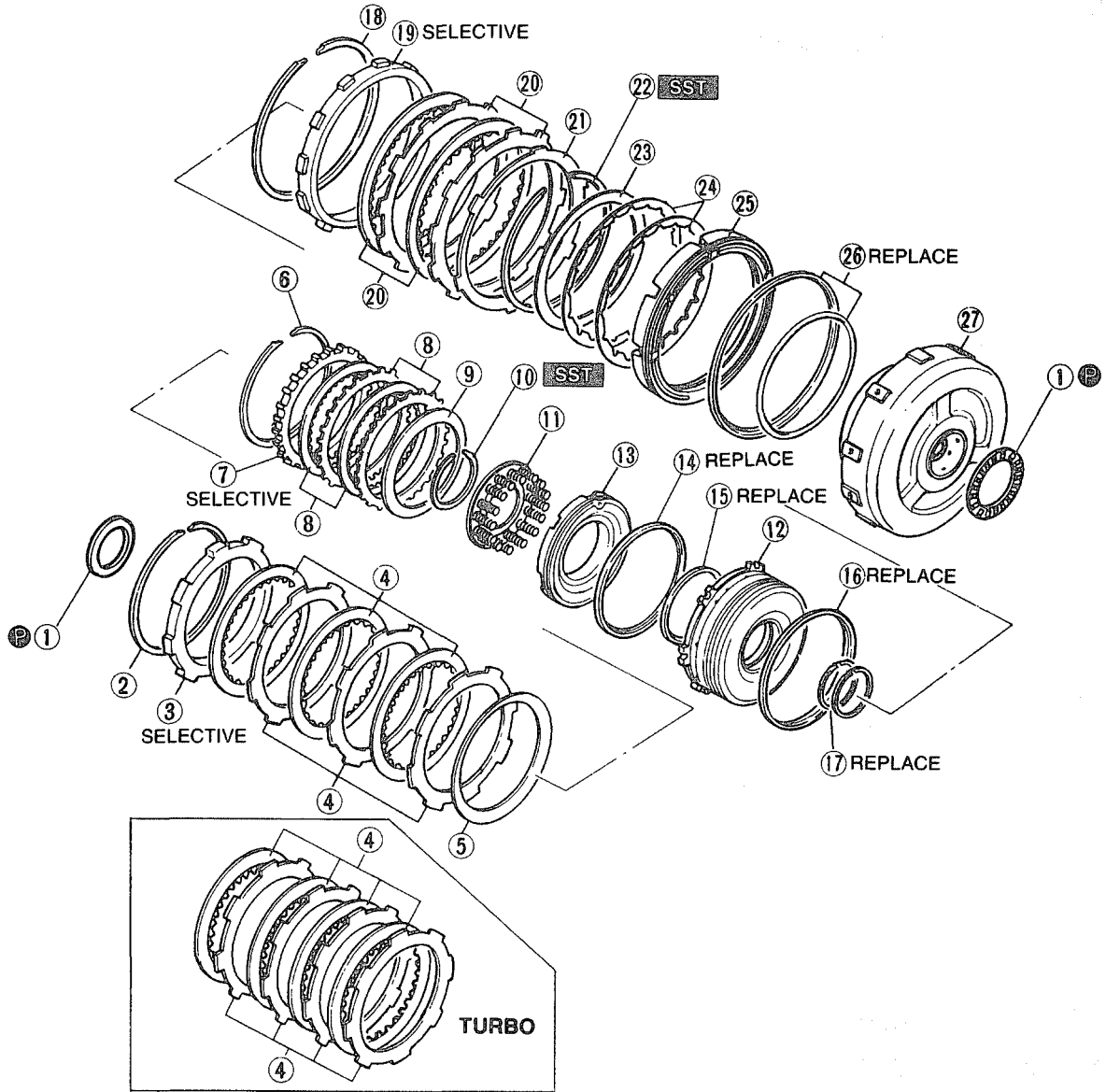
06U0KX-137

**Disassembly**

Disassemble in the order shown in the figure, referring to **Disassembly Note**.



APPLY SPECIFIED ATF TO INDIVIDUAL PARTS



06U0KX-138

**—Forward clutch—**

- 1. Thrust bearings
- 2. Snap ring
- 3. Retaining plate
- 4. Drive and driven plates
- 5. Dished plate

**—Coasting clutch—**

- 6. Snap ring
- 7. Retaining plate
- 8. Drive and driven plates
- 9. Dished plate
- 10. Snap ring

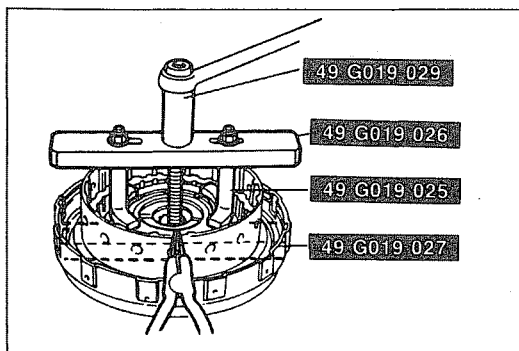
Removal..... page K-76

- 11. Spring and retainer assembly
- 12. Coasting clutch drum  
Removal..... page K-76
- 13. Coasting piston  
Removal..... page K-76
- 14. Outer seal
- 15. Inner seal
- 16. Outer seal
- 17. Seal rings

**—Reverse clutch—**

- 18. Snap ring
- 19. Retaining plate

- 20. Drive and driven plates
- 21. Dished plate
- 22. Snap ring  
Removal..... page K-76
- 23. Return spring stop
- 24. Piston return spring
- 25. Reverse piston  
Removal..... page K-77
- 26. Seal rings (inner and outer)
- 27. Reverse and forward drum

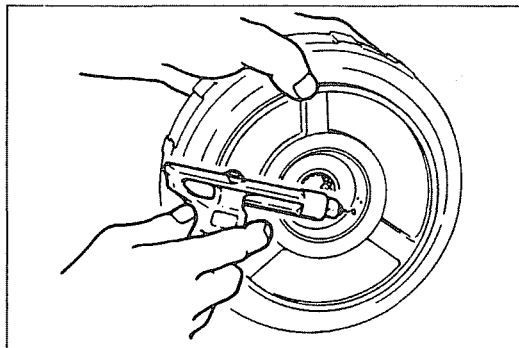


06U0KX-139

**Disassembly note**

**Snap ring**

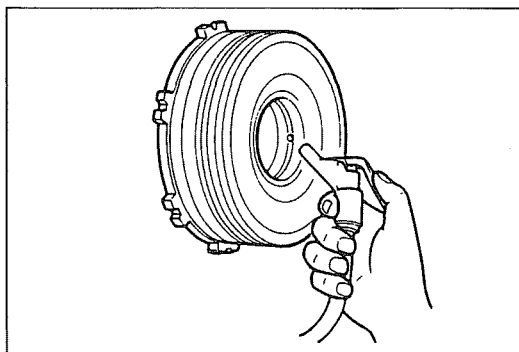
1. Install the **SST** in the coasting clutch drum as shown.
2. Compress the spring and retainer assembly.
3. Remove the snap ring.
4. Remove the **SST**, and remove the spring and retainer assembly.



06U0KX-140

**Coasting clutch drum**

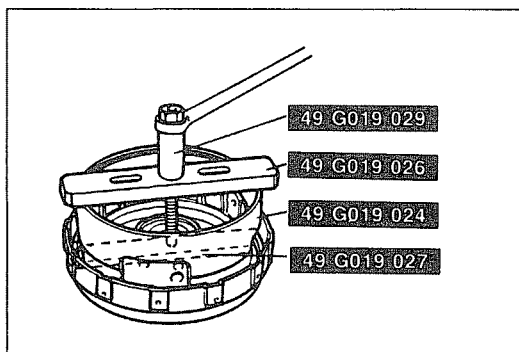
1. Remove the coasting clutch drum from the reverse and forward drum by applying compressed air through the fluid passage.



96U07B-026

**Coasting piston**

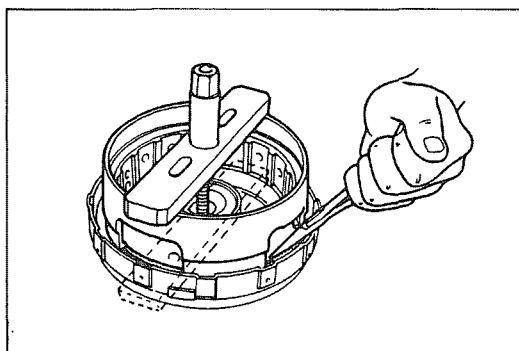
1. Remove the coasting clutch piston from the coasting clutch drum by applying compressed air through the fluid passage.



06U0KX-141

**Snap ring**

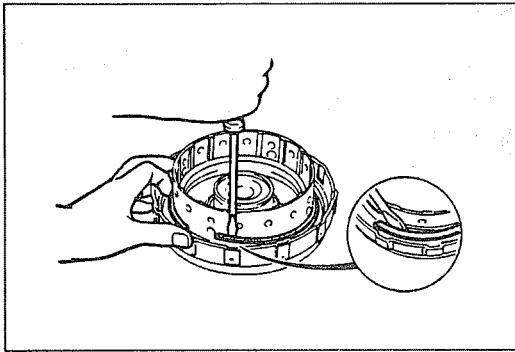
1. Install the **SST** in the reverse and forward drum as shown.
2. Compress the piston return spring.



86U07B-194

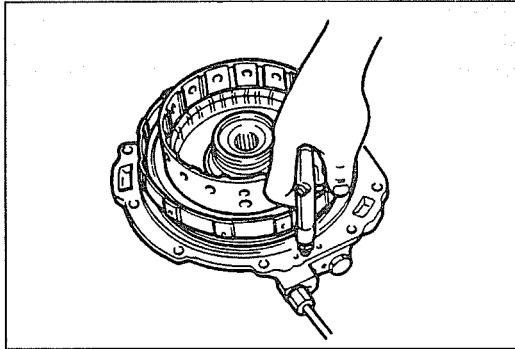
3. Remove one end of the snap ring from the groove with snap ring pliers.





06U0KX-142

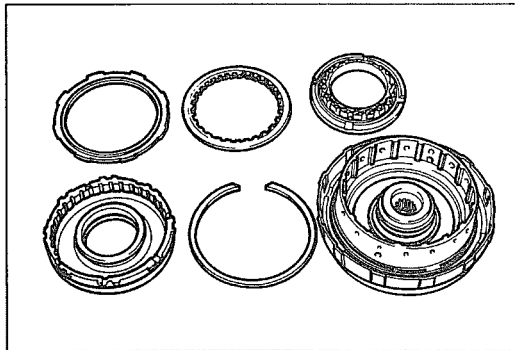
4. Remove the **SST** from the reverse and forward drum.
5. Remove the snap ring with a screwdriver.



06U0KX-143

**Reverse piston**

1. Place the reverse and forward drum on the oil pump.
2. Remove the reverse piston by applying compressed air through the fluid passage.



86U07B-197

**Inspection**

Check the following and repair or replace any faulty parts.

1. Drive and driven plates for damage or wear

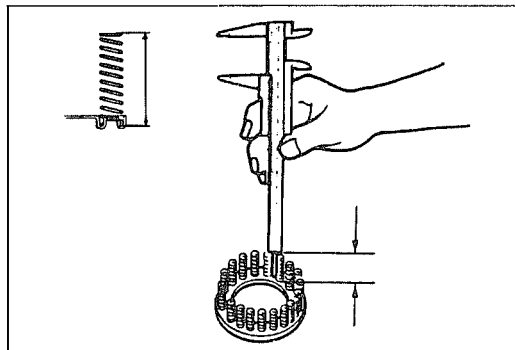
**Drive plate thickness**

**Standard: 1.6mm (0.063 in)**

**Minimum: 1.4mm (0.055 in)**

2. Clutch piston for damage or cracks.
3. Clutch drum for damage or deformation.
4. Seal contact area for damage.
5. Check ball for leaking and sticking.
6. Broken or worn snap ring.
7. Broken or weakened spring.
8. Spring and retainer assembly for separation or deformation.

**Free length of spring: 29.8mm (1.173 in)**

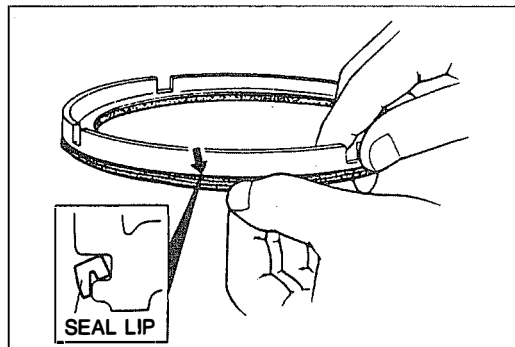


86U07B-198

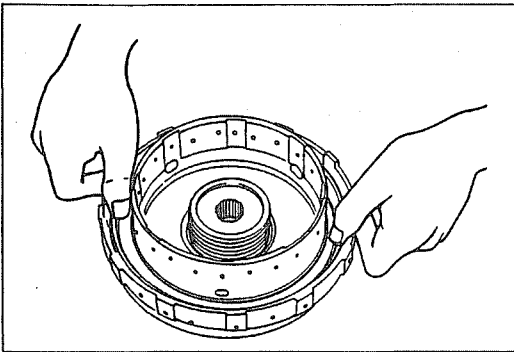
**Assembly**

**Reverse clutch**

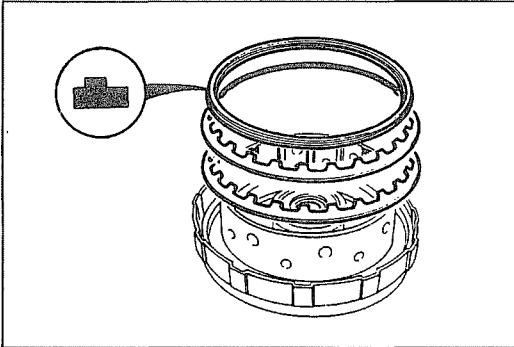
1. Install the reverse piston.
  - (1) Apply ATF to inner and outer faces of the seals, and install them to the reverse piston.
  - (2) Face the outer seal lip toward the inside by gently rolling it down around the circumference for easier installation into the reverse clutch drum.



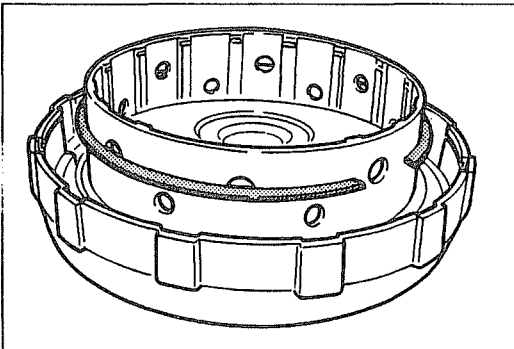
86U07B-199



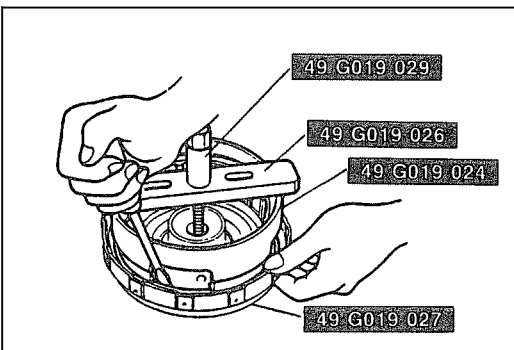
86U07B-200



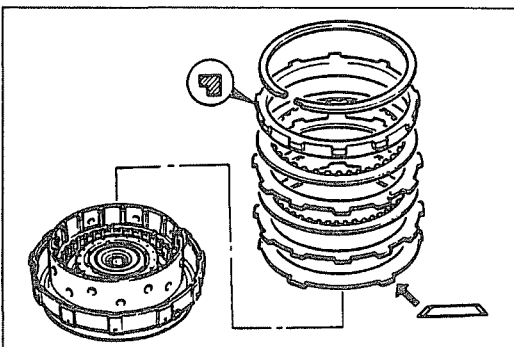
86U07B-201



86U07B-202



86U07B-203



86U07B-204

- (3) Install the reverse piston by pushing evenly around the circumference, being careful not to damage the seal rings.

2. Install the piston return spring with the tabs facing away from the reverse piston.

3. Install the return spring stopper with the step facing upward.

4. Install the snap ring half-way down the reverse forward drum as shown.

5. Install the **SST** on the reverse and forward drum.

6. Compress the spring and retainer assembly.

7. Install the snap ring with a screwdriver.

8. Remove the **SST**.

9. Install the dished plate with the dished side facing the piston as shown.

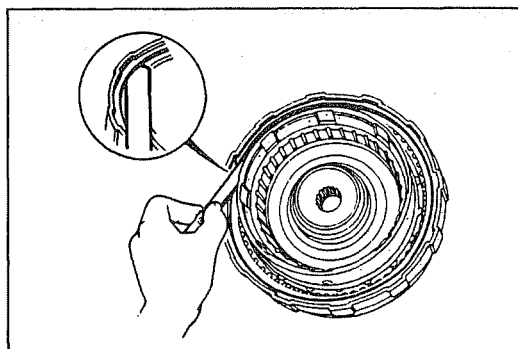
10. Install the drive and driven plates.

**Note**

- **Installation order: Driven-Drive-Driven-Drive**

11. Install the retaining plate with the step facing downward.

12. Install the snap ring.



16U0KX-017

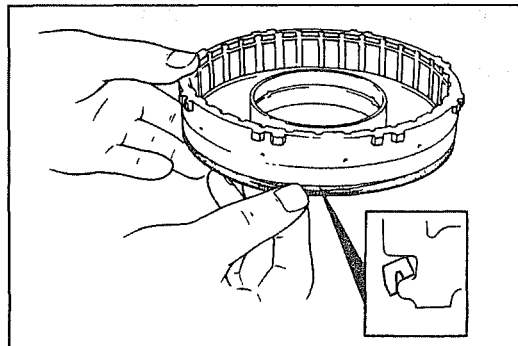
13. Check the reverse clutch clearance.
- (1) Measure the clearance between the snap ring and the retaining plate of the reverse clutch.
  - (2) If the clearance is not within specification, adjust it by selecting a proper retaining plate.

**Reverse clutch clearance:**  
**1.5—1.8mm (0.059—0.071 in)**

**Retaining plate sizes**

mm (in)

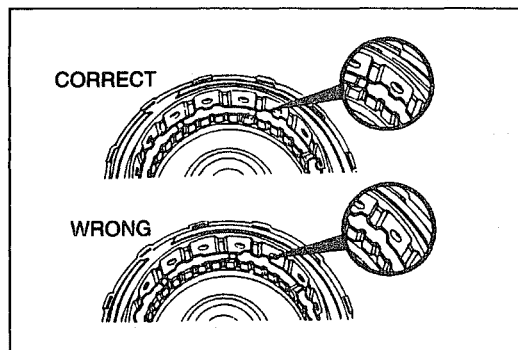
6.6 (0.260)	6.8 (0.268)	7.0 (0.276)
7.2 (0.283)	8.4 (0.331)	



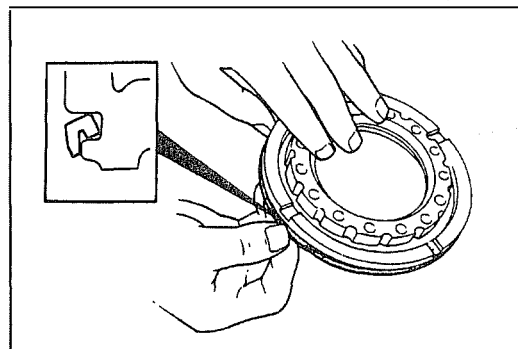
86U07B-206

**Coasting clutch**

1. Install the coasting clutch drum.
  - (1) Apply ATF to inner and outer faces of the seal, and install it onto the coasting clutch drum.
  - (2) Face the outer seal lip toward the inside by gently rolling it down around the circumference for easier installation into the drum.
- (3) Install the coasting clutch drum in the correct position in the reverse and forward drum.
- (4) Push evenly around the circumference, being careful not to damage the outer seal.

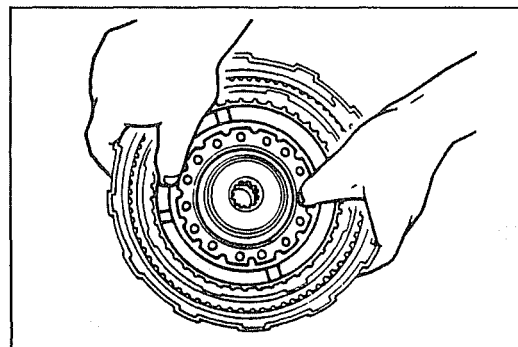


86U07B-207



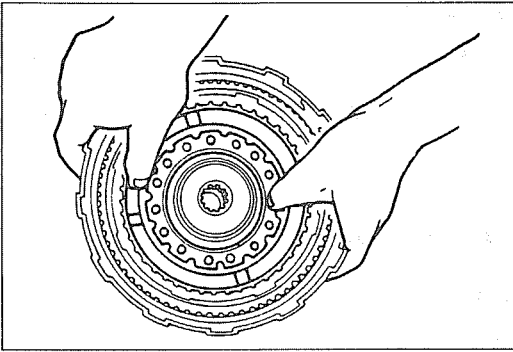
86U07B-208

2. Install the coasting piston.
  - (1) Apply ATF to inner and outer faces of the seals and install them onto the coasting piston.
  - (2) Face the outer seal lip toward the inside by gently rolling it down around the circumference for easier installation into the drum.

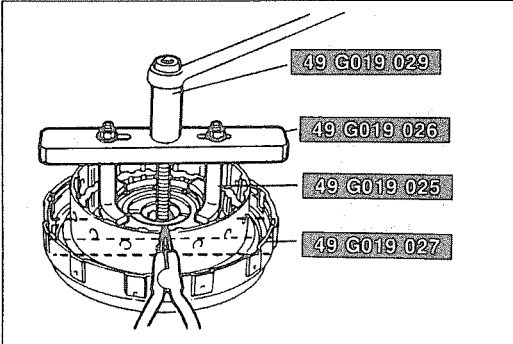


86U07B-209

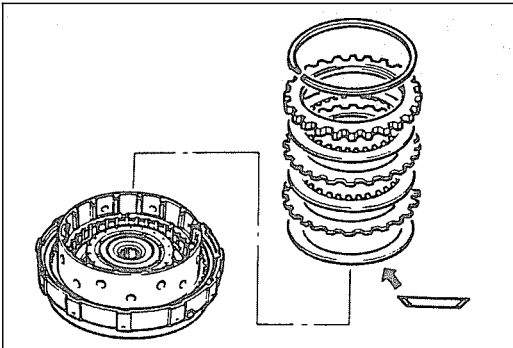
- (3) Install the coasting piston by pushing evenly around the circumference, being careful not to damage the outer seal.



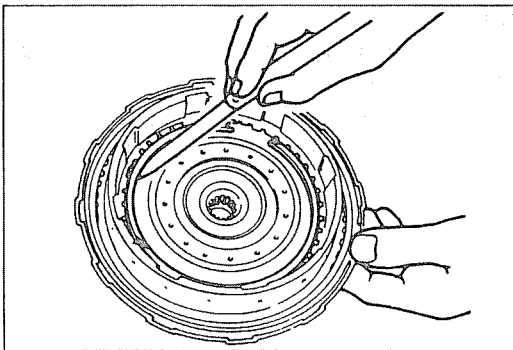
86U07B-210



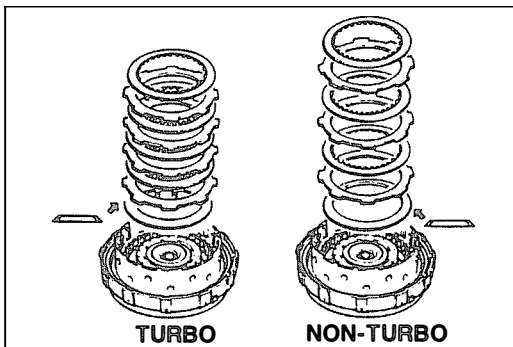
86U07B-211



86U07B-212



06U0KX-144



86U07B-214

3. Install the spring and retainer assembly.

4. Install the **SST** in the coasting clutch as shown.
5. Compress the spring and retainer assembly.
6. Install the snap ring.
7. Remove the **SST**.

8. Install the dished plate with the dished side upward.
9. Install the drive and driven plates.

**Note**

- **Installation order: Driven-Drive-Driven-Drive**

10. Install the retaining plate.
11. Install the snap ring.
12. Check the coasting clutch clearance.
  - (1) Measure the clearance between the snap ring and the retaining plate of the coasting clutch.
  - (2) If the clearance is not within specification, adjust it by selecting a proper retaining plate.

**Coasting clutch clearance:**

**1.0—1.2 mm (0.040—0.047 in)**

**Retaining plate sizes**

mm (in)

4.6 (0.181)	4.8 (0.189)	5.0 (0.197)
5.2 (0.205)	5.4 (0.213)	5.6 (0.220)

**Caution**

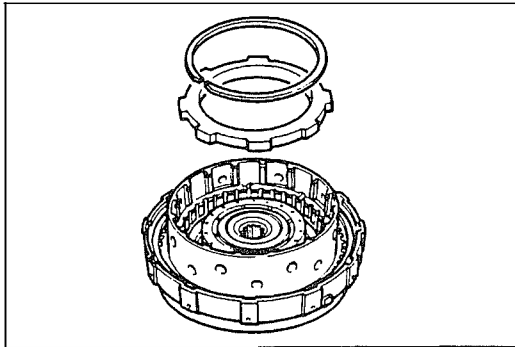
- **The 5.6mm (0.220 in) retaining plate is used only for Non-Turbo.**

**Forward clutch**

1. Install the dished plate with the dished side downward.
2. Install the drive and driven plates.

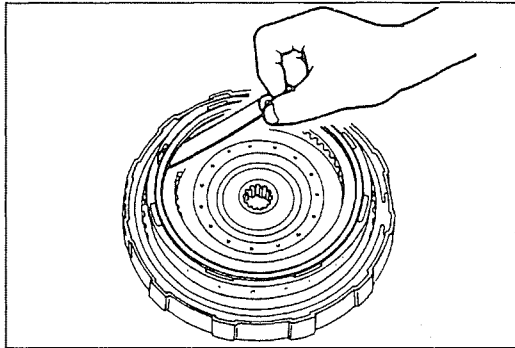
**Note**

- **Installation order:**
  - Non-Turbo model**
  - Driven-Drive-Driven-Drive-Driven-Drive**
  - Turbo model**
  - Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive**



86U07B-215

3. Install the retaining plate.
4. Install the snap ring.



86U07B-216

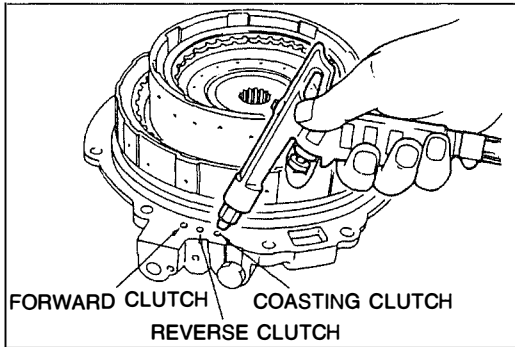
5. Check the forward clutch clearance.
  - (1) Measure the clearance between the snap ring and the retaining plate of the forward clutch.
  - (2) If the clearance is not within specification, adjust it by selecting a proper retaining plate.

**Forward clutch clearance:**  
**1.0—1.2mm (0.040—0.047 in)**

**Retaining plate sizes**

mm (in)

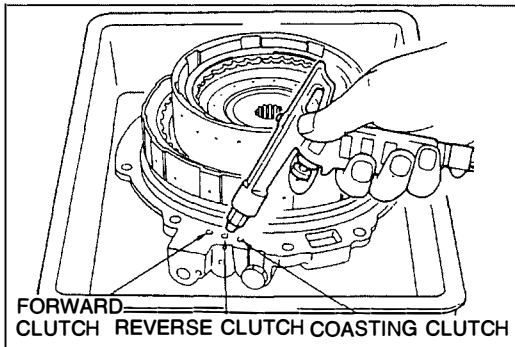
5.9 (0.232)	6.1 (0.240)	6.3 (0.248)
6.5 (0.256)	6.7 (0.264)	8.9 (0.350)



06U0KX-145

6. Check for clutch operation as follows.
  - (1) Set the clutch assembly onto the oil pump.
  - (2) Check clutch operation by applying compressed air through the fluid passages as shown.

**Applied air pressure: 392 kPa (4.0 kg/cm<sup>2</sup>, 57 psi)**

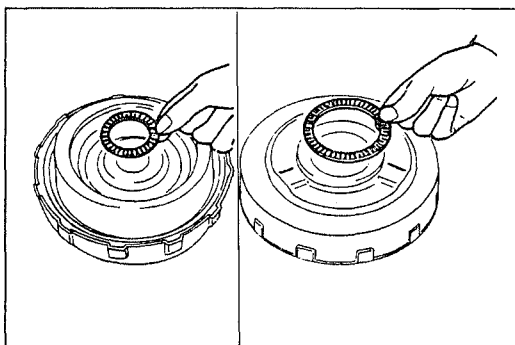


86U07B-219

- (3) Check that no bubbles come from between the piston and drum seal when applying compressed air through the fluid passages as shown.

**Caution**

- The compressed air must be under 392 kPa (4.0 kg/cm<sup>2</sup>, 57 psi), and should not applied for over 3 seconds.



06U0KX-146

7. Apply petroleum jelly to the thrust bearings, and install one on each side of the reverse and forward drum.

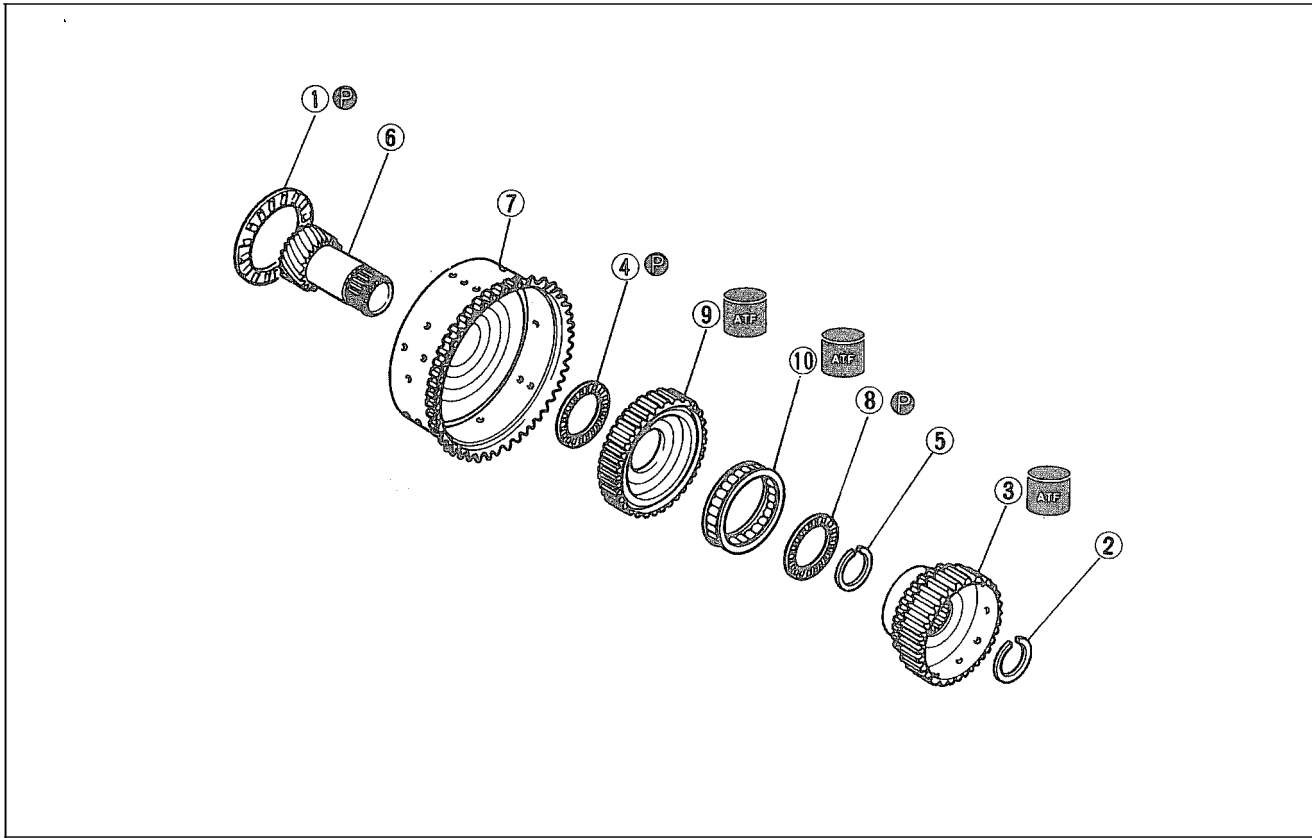
**Thrust bearing outer diameter**  
**Oil pump side: 86.0mm (3.39 in)**

**Small sun gear and one-way clutch side:**  
**56.1mm (2.21 in)**

**SMALL SUN GEAR AND ONE-WAY CLUTCH**

**Disassembly**

Disassemble in the order shown in the figure.



06U0KX-147

1. Thrust bearing

2. Snap ring

3. One-way clutch inner race

4. Thrust bearing

5. Snap ring

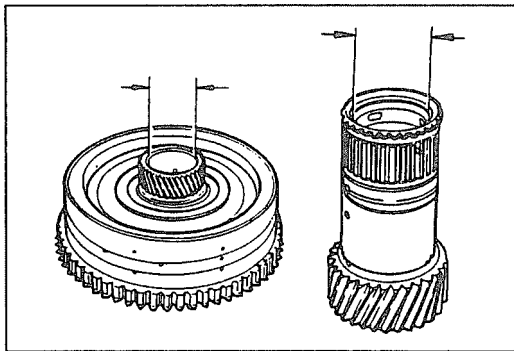
6. Small sun gear

7. Sun gear drum

8. Thrust bearing

9. One-way clutch outer race

10. One-way clutch



86U07B-222

**Inspection**

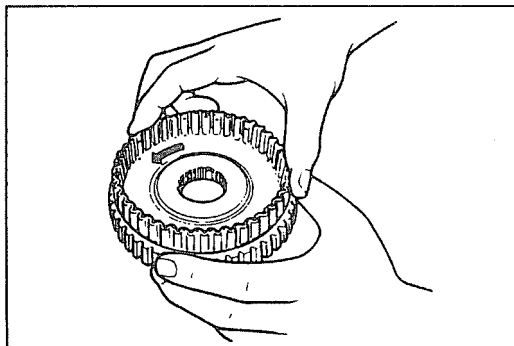
Check the following and replace any faulty parts.

1. Sun gear drum and small sun gear for damage or wear
2. Bushing for damage or wear

**Specification**

**Sun gear drum: 33.425mm (1.316 in) max.**

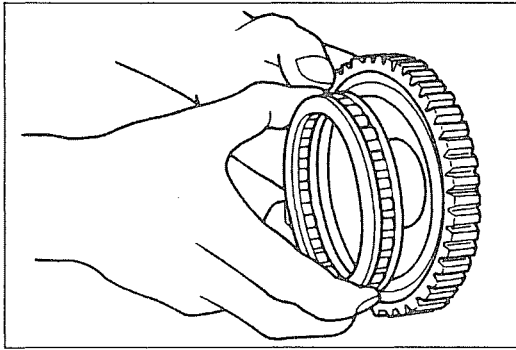
**Small sun gear: 24.021mm (0.946 in) max.**



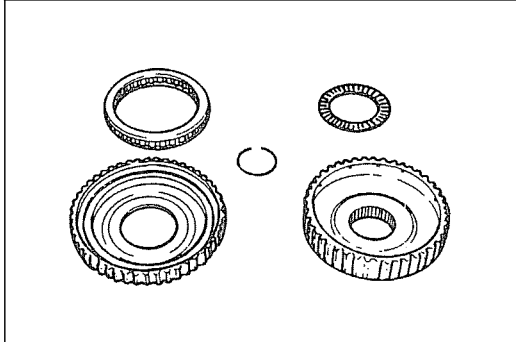
86U07B-223

3. Inner and outer race for damage or wear.
4. Damaged or worn clutch hub.
5. Damaged or worn gear.
6. Damaged or worn thrust bearing.
7. Broken or worn snap ring.
8. One-way clutch operation.

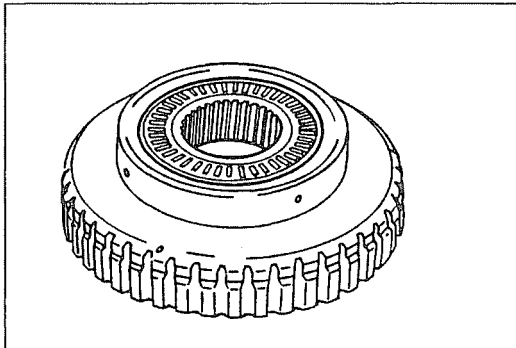
Hold the one-way clutch outer race. Check that the inner race turns only counterclockwise.



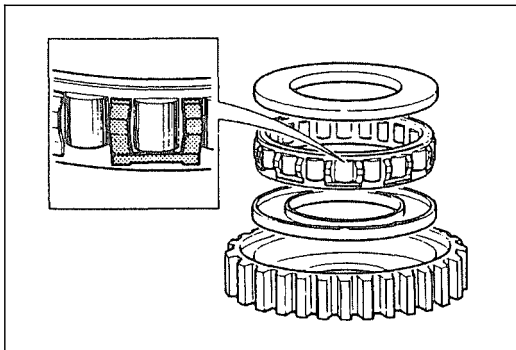
86U07B-224



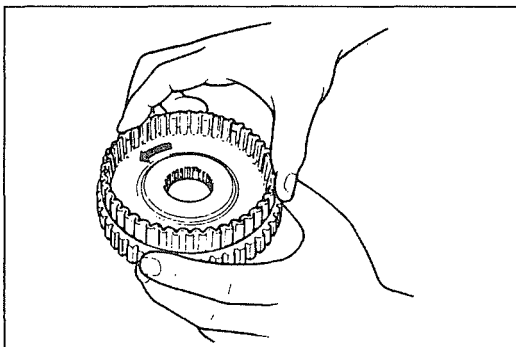
86U07B-225



86U07B-226



86U07B-227



86U07B-228

**Replacement of one-way clutch**

1. Remove the one-way clutch inner race.
2. Remove the one-way clutch.
3. Remove the thrust bearing.

4. Inspect the one-way clutch inner and outer races, and replace if necessary.

5. Apply petroleum jelly to the thrust bearing to secure it; then install it to the one-way clutch inner race.

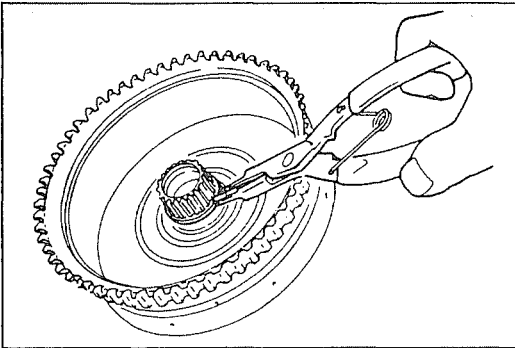
**Thrust bearing outer diameter: 62.1mm (2.44 in)**

6. Install the one-way clutch into the one-way clutch outer race.

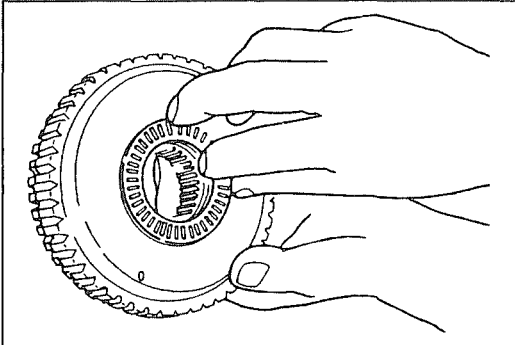
**Caution**

- Check that the spring cage of the one-way clutch faces toward the outer race.

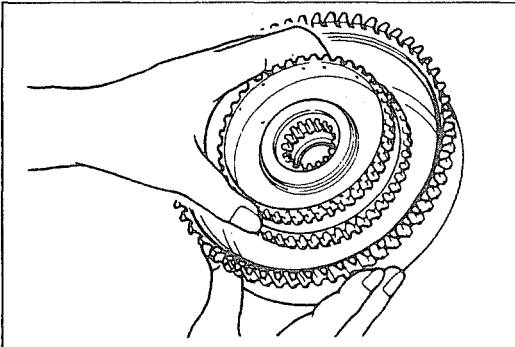
7. Install the one-way clutch inner race into the one-way clutch outer race by turning inner race counterclockwise.
8. Hold the one-way clutch outer race. Check that the inner race turns only counterclockwise.



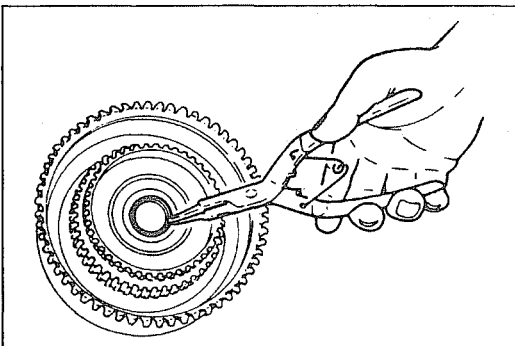
86U07B-229



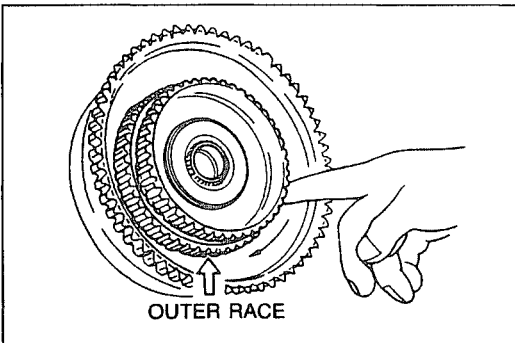
86U07B-230



86U07B-231



86U07B-232



86U07B-233

**Assembly**

1. Install the small sun gear into the sun gear drum.
2. Install the snap ring.

3. Apply petroleum jelly to the thrust bearing to secure it; then install it to the one-way clutch inner race.

**Thrust bearing outer diameter: 62.1mm (2.44 in)**

4. Install the one-way clutch inner and outer race to the sun gear drum.

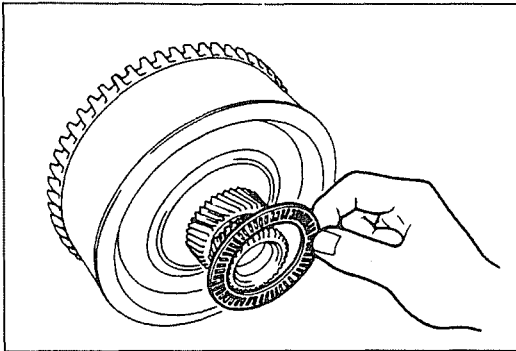
**Note**

- Align the splines of the one-way clutch inner race and small sun gear clutch hub.

5. Install the snap ring.

6. Check that when the small sun gear is held, the one-way clutch outer race turns smoothly and only clockwise.





86U07B-234

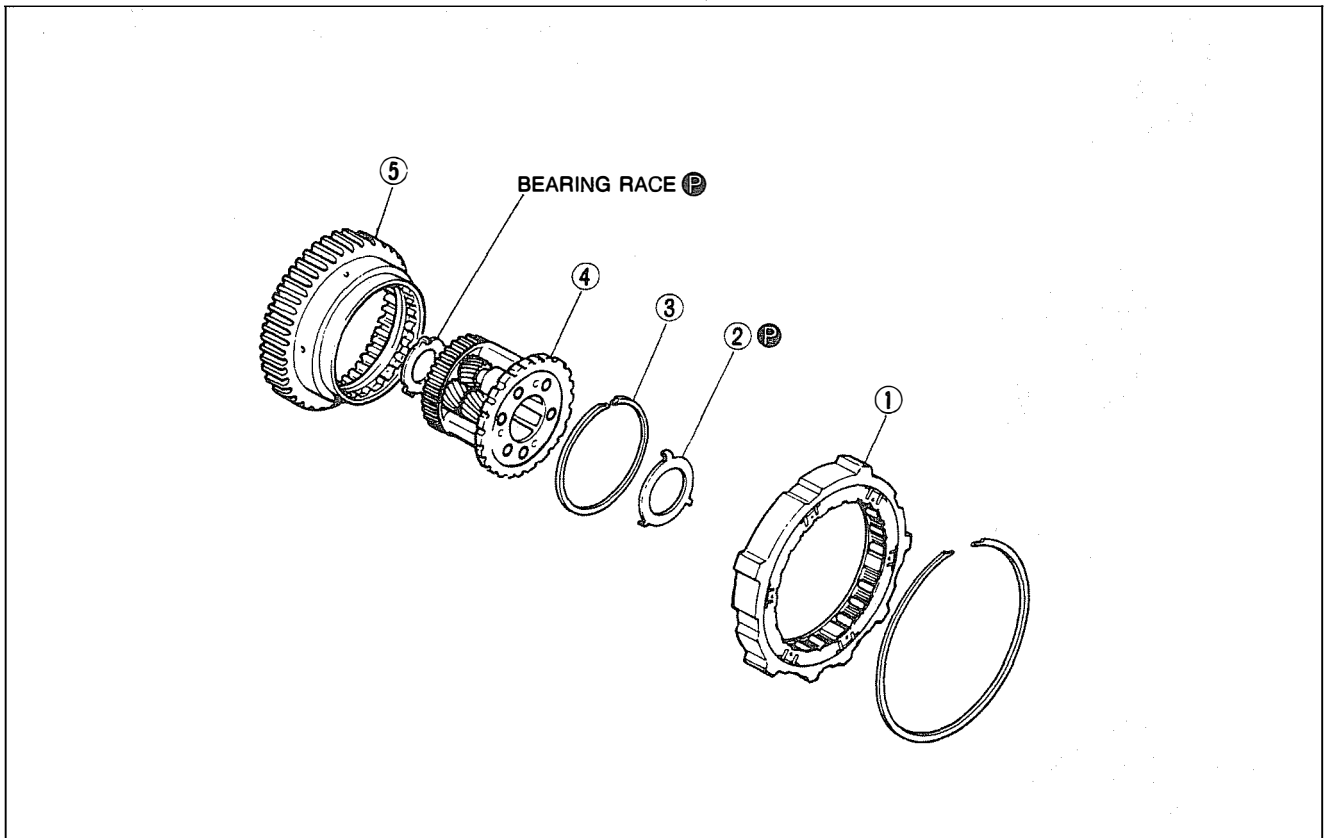
7. Apply petroleum jelly to the thrust bearing to secure it; then install it to the sun gear drum.

**Thrust bearing outer diameter: 72.0mm (2.83 in)**

**ONE-WAY CLUTCH AND CARRIER HUB ASSEMBLY**

**Disassembly**

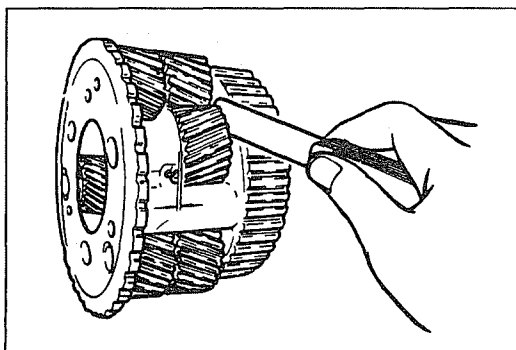
Disassemble in the order shown in the figure.



06U0KX-148

- 1. One-way clutch
- 2. Bearing races
- 3. Snap ring

- 4. Carrier hub assembly
- 5. Inner race (Low and reverse hub)



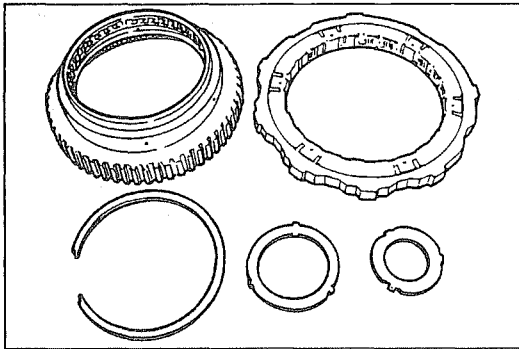
86U07B-236

**Inspection**

Check the following and replace any faulty parts.

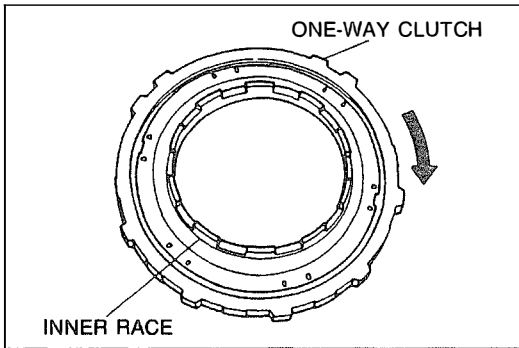
- 1. Damaged or worn gear and operation.
- 2. Clearance between pinion washer and planetary carrier.

**Clearance: 0.2—0.7mm (0.008—0.028 in)**



86U07B-237

- 3. Damaged or worn inner race.
- 4. Broken or worn snap ring.
- 5. Damaged or worn bearing race.

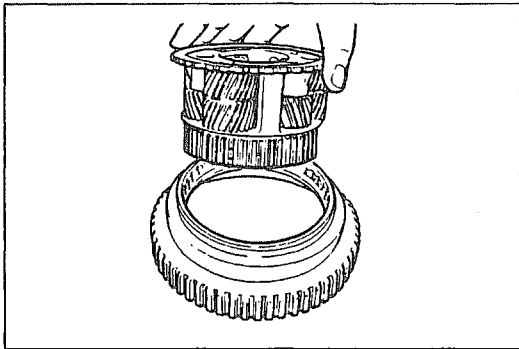


86U07B-238

- 6. Damaged or worn one-way clutch and operation.
- 7. Detached roller.

**Note**

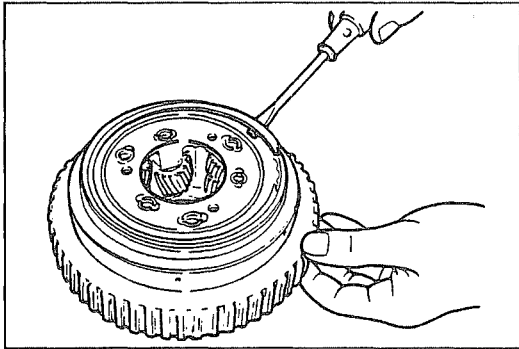
- Assemble the one-way clutch and the inner race, then confirm that the one-way clutch rotates only clockwise and smoothly.



86U07B-239

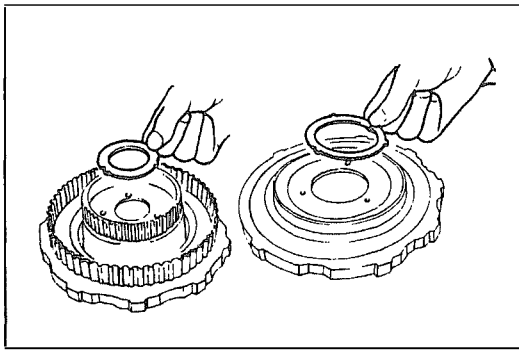
**Assembly**

- 1. Assemble the carrier hub assembly to the inner race.



86U07B-240

- 2. Install the snap ring.



86U07B-241

- 3. Apply petroleum jelly to the bearing races to secure them; then install them to both sides of the one-way clutch and carrier hub assembly.

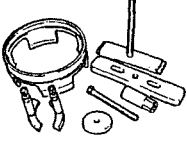
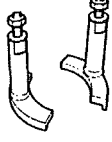
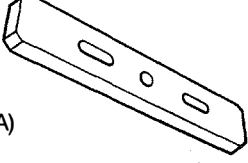
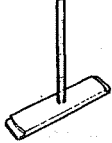
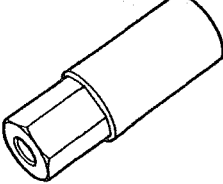
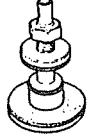
**Bearing race outer diameter**

- Sun gear drum side: 72.0mm (2.83 in)
- 3-4 clutch side: 57.0mm (2.21 in)

**Note**

- Install the tabs of the bearing race into the alignment holes.

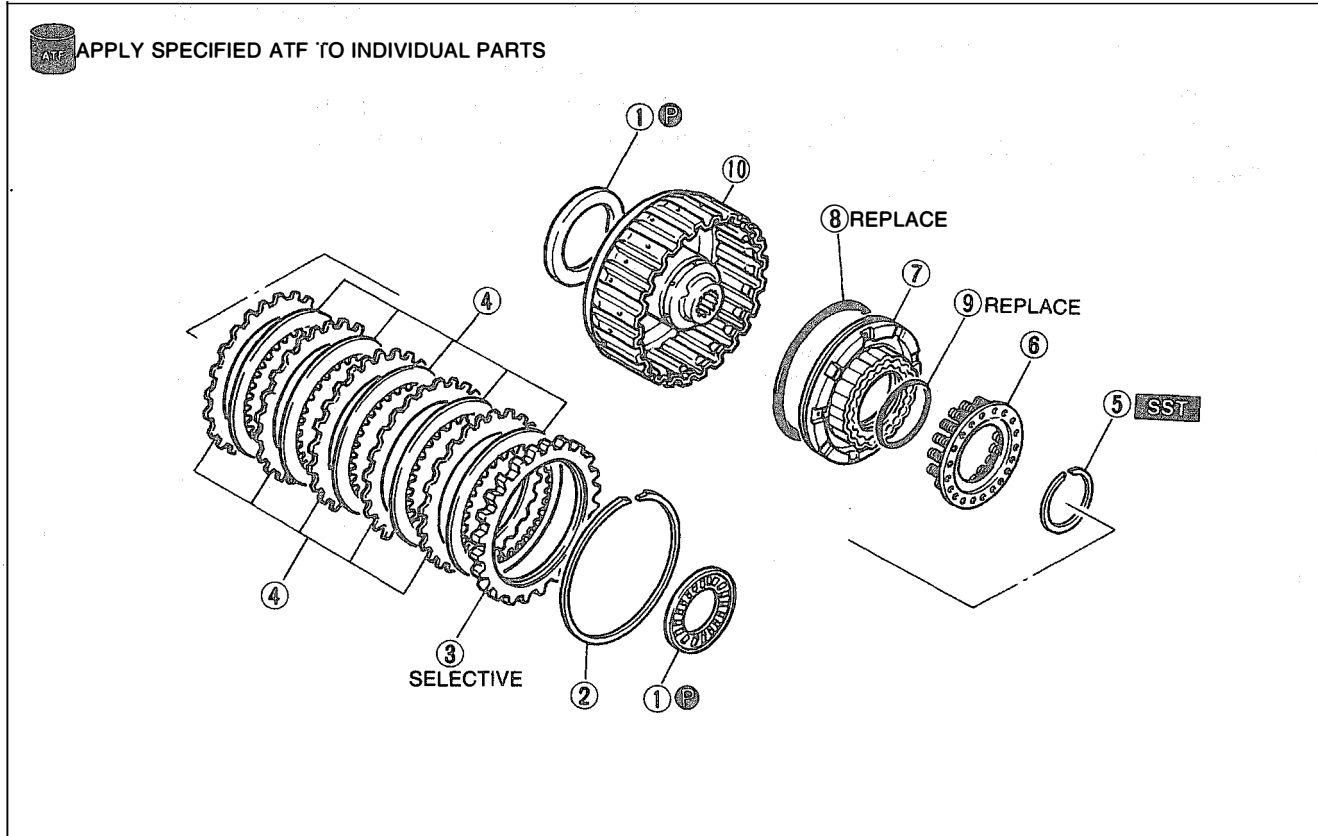
**3-4 CLUTCH  
Preparation  
SST**

<p>49 G019 0A07A Compressor set, return spring</p> 	<p>For disassembly and assembly of 3-4 clutch</p>	<p>49 G019 025 Body B (Part of 49 G019 0A07A)</p> 	<p>For disassembly and assembly of 3-4 clutch</p>
<p>49 G019 026 Plate (Part of 49 G019 0A07A)</p> 	<p>For disassembly and assembly of 3-4 clutch</p>	<p>49 G019 027 Attachment A (Part of 49 G019 0A07A)</p> 	<p>For disassembly and assembly of 3-4 clutch</p>
<p>49 G019 029 Nut (Part of 49 G019 0A07A)</p> 	<p>For disassembly and assembly of 3-4 clutch</p>	<p>49 G019 012 Leak checker</p> 	<p>For clutch operation inspection</p>

06U0KX-149

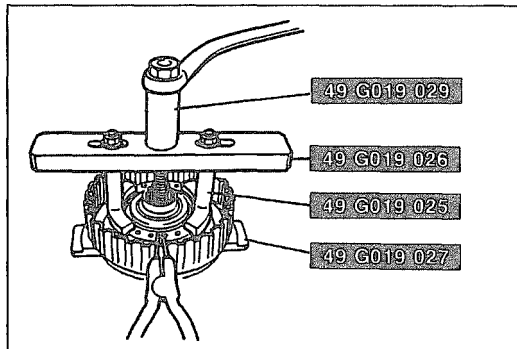
### Disassembly

Disassemble in the order shown in the figure, referring to **Disassembly Note**.



06U0KX-151

- |                            |                                 |                     |
|----------------------------|---------------------------------|---------------------|
| 1. Thrust bearings         | 5. Snap ring                    | 8. Outer seal       |
| 2. Snap ring               | Removal..... page K-88          | 9. Inner seal       |
| 3. Retaining plate         | 6. Spring and retainer assembly | 10. 3-4 clutch drum |
| 4. Drive and driven plates | 7. 3-4 clutch piston            |                     |
|                            | Removal..... page K-89          |                     |

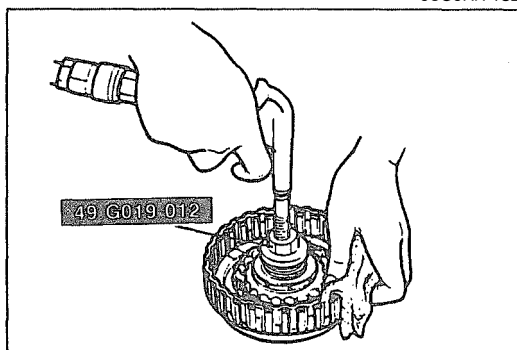


06U0KX-152

### Disassembly note

#### Snap ring

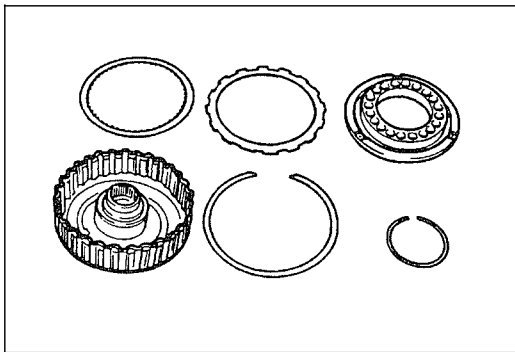
1. Install the **SST** to the 3-4 clutch as shown.
2. Compress the spring and retainer assembly.
3. Remove the snap ring.
4. Remove the **SST** then remove the spring and retainer assembly.



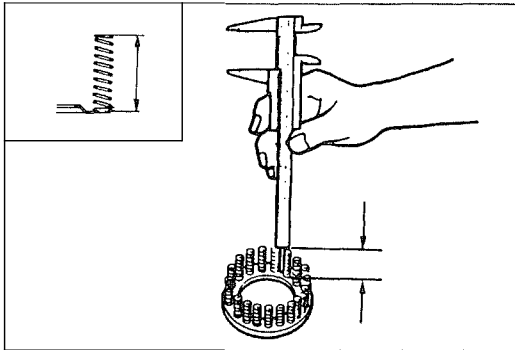
06U0KX-153

#### 3-4 clutch piston

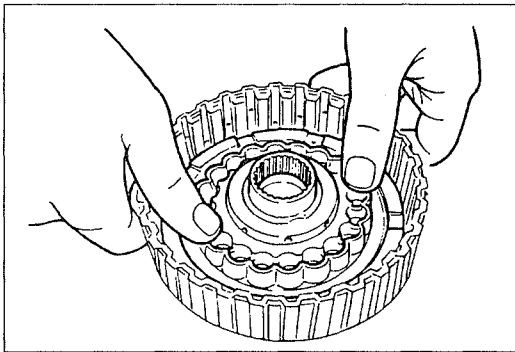
1. Remove the 3-4 clutch piston with the **SST** and compressed air.



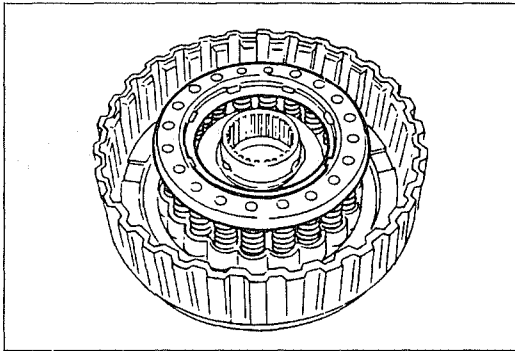
86U07B-245



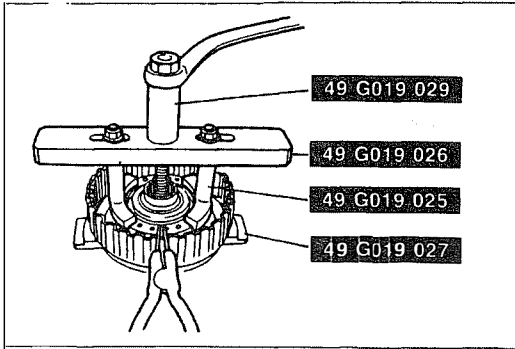
86U07B-246



86U07B-247



86U07B-248



86U07B-249

**Inspection**

Check the following and repair or replace any faulty parts.  
 1. Drive and driven plates for damage or wear

**Drive plate thickness**

**Standard: 1.6mm (0.063 in)**

**Minimum: 1.4mm (0.055 in)**

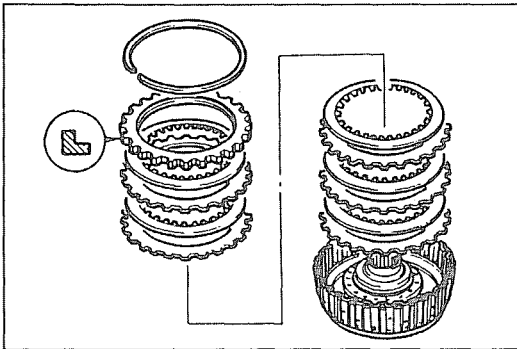
2. Clutch piston for damage or cracks.
3. Clutch drum for damage or deformation.
4. Seal contact areas for damage.
5. Check ball for leaking and sticking.
6. Spring and retainer assembly for separation or deformation.
7. Broken or worn snap ring.
8. Broken or weakened spring.

**Free length of spring: 33.2mm (1.307 in)**

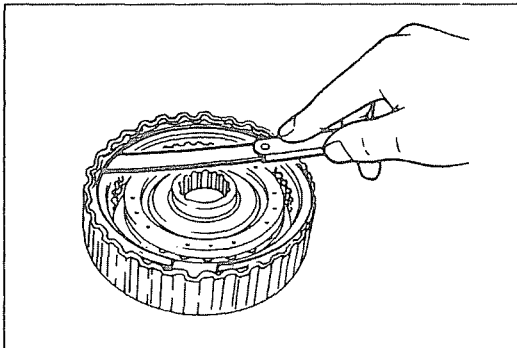
**Assembly**

1. Install the 3-4 clutch piston.
  - (1) Apply ATF to the inner and outer seals, and install them onto the 3-4 clutch piston.
  - (2) Install the piston by pushing evenly around the circumference, being careful not to damage the seal rings.
2. Install the spring and retainer assembly.

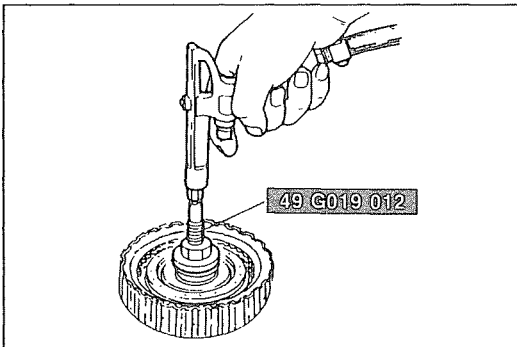
3. Install the **SST** to the 3-4 clutch as shown.
4. Compress the spring and retainer assembly.
5. Install the snap ring.
6. Remove the **SST**.



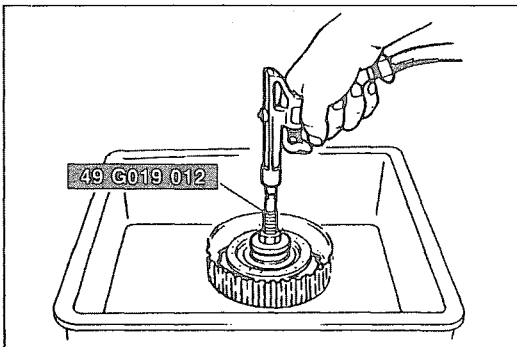
86U07B-250



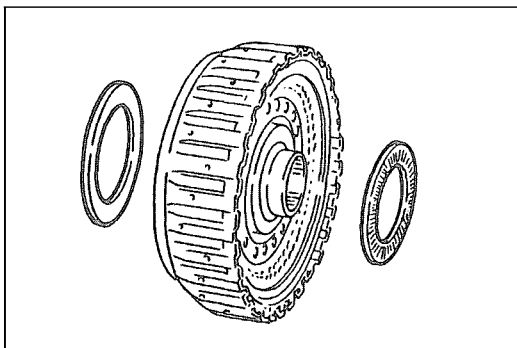
86U07B-251



86U07B-252



06U0KX-304



86U07B-254

7. Install the drive and driven plates.

**Note**

- **Installation order:**  
**Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive**

8. Install the retaining plate with the step facing upward.

9. Install the snap ring.

10. Check the 3-4 clutch clearance.

- (1) Measure the clearance between the snap ring and the retaining plate of the 3-4 clutch.
- (2) If the clearance is not within specification, adjust it by selecting a proper retaining plate.

**3-4 clutch clearance: 1.3—1.5mm (0.051—0.059 in)**

**Retaining plate sizes**

mm (in)

3.8 (0.150)	4.0 (0.157)	4.2 (0.165)
4.4 (0.173)	4.6 (0.181)	4.8 (0.189)

11. Check clutch operation as follows:

- (1) Install the **SST** as shown, and check clutch operation by applying compressed air.

**Air pressure: 392 kPa (4.0 kg/cm<sup>2</sup>, 57 psi)**

- (2) Check that no bubbles come from the 3-4 clutch piston seal while applying compressed air.

**Caution**

- **The compressed air must be under 392 kPa (4.0 kg/cm<sup>2</sup>, 57 psi) and not applied for over 3 seconds.**

12. Apply petroleum jelly to the thrust bearings and secure them to both sides of the 3-4 clutch drum.

**Thrust bearing outer diameter**

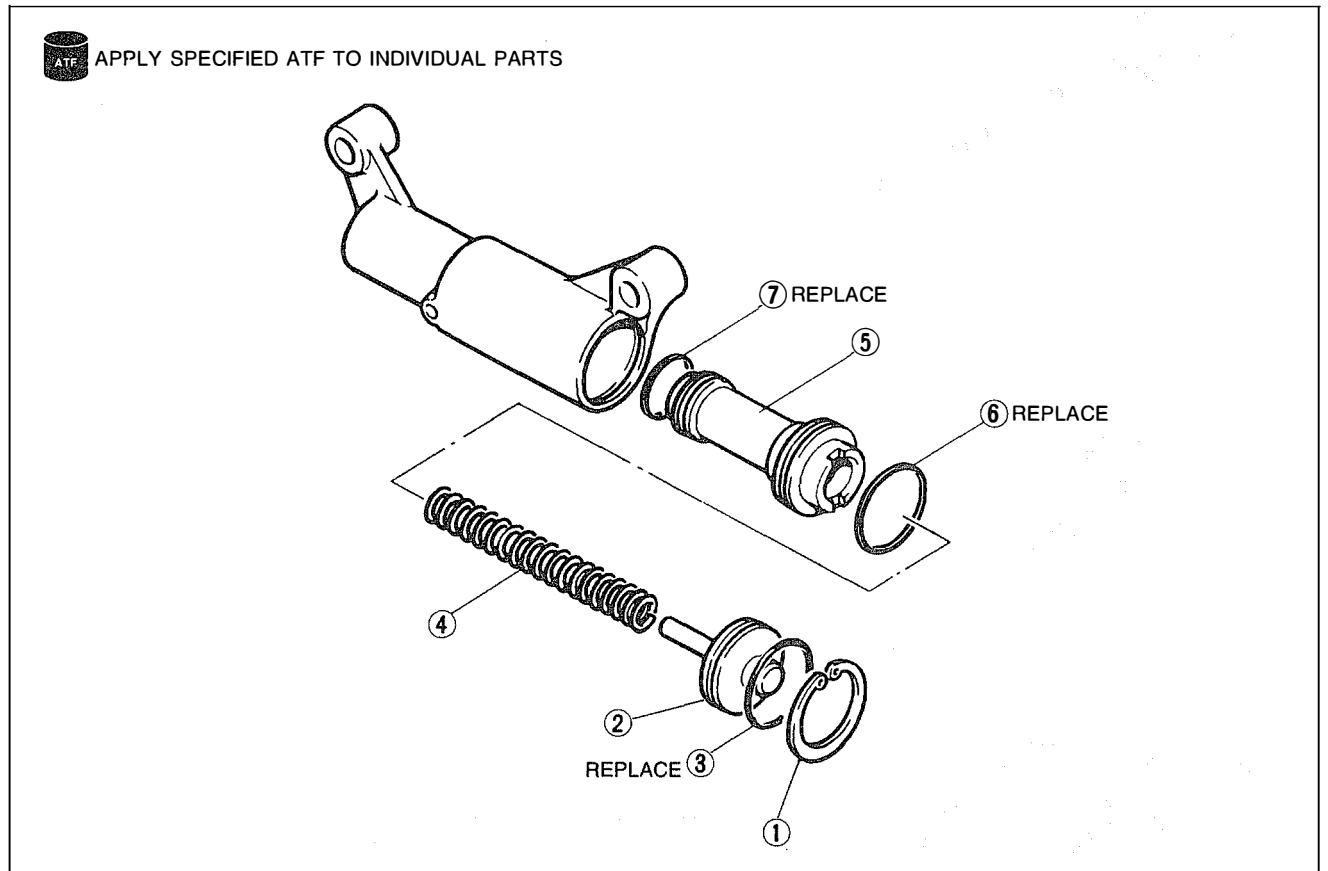
**Carrier hub side: 56.1mm (2.21 in)**

**Output shell side: 72.1mm (2.84 in)**

**2-3 ACCUMULATOR**

**Disassembly**

Disassemble in the order shown in the figure.

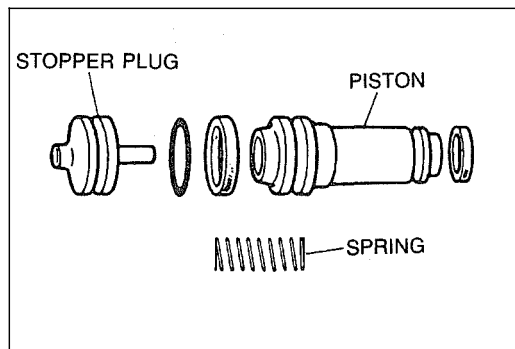


06U0KX-154

- 1. Snap ring
- 2. Stopper plug
- 3. O-ring

- 4. 2-3 accumulator spring
- 5. 2-3 accumulator piston

- 6. Large seal ring
- 7. Small seal ring



06U0KX-155

**Inspection**

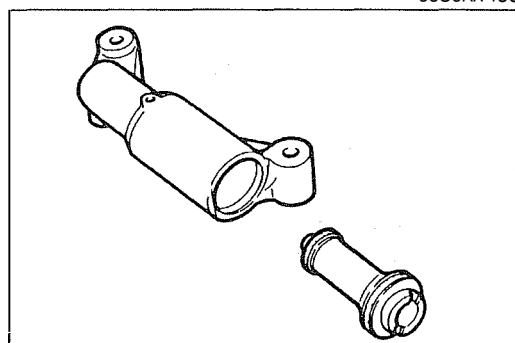
Check the following and replace any faulty parts.

- 1. Damaged or worn piston.
- 2. Damaged or worn stopper plug.
- 3. Broken or weakened spring.

**Free length of spring**

**Non-Turbo: 85.0mm (3.346 in)**

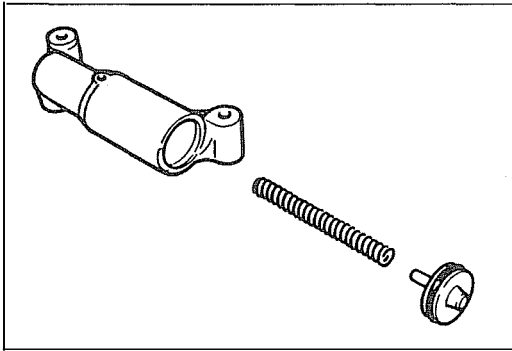
**Turbo : 85.0mm (3.346 in)**



86U07B-257

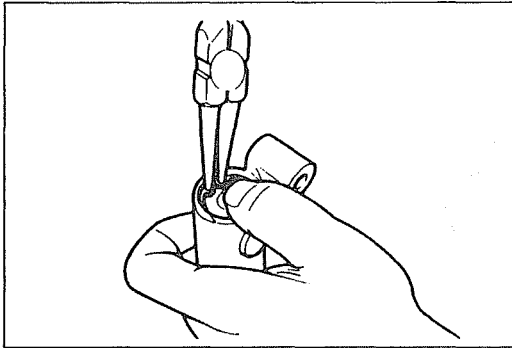
**Assembly**

- 1. Install the 2-3 accumulator.
  - (1) Apply ATF to large and small seal rings; then install them to the accumulator piston.
  - (2) Insert the 2-3 accumulator.



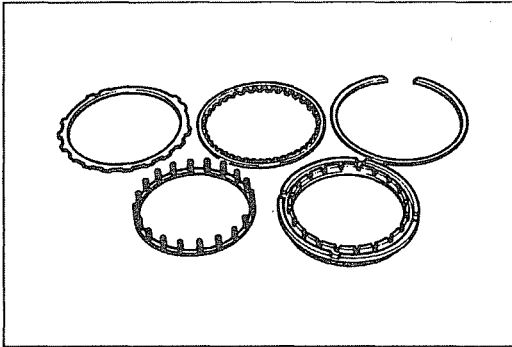
86U07B-258

2. Install the spring to the piston.
3. Install the stopper plug.
  - (1) Apply ATF to O-ring, and install it onto the stopper plug.
  - (2) Install the stopper plug.



86U07B-259

4. Install the snap ring while holding in the stopper plug.



86U07B-260

**LOW AND REVERSE BRAKE**

**Inspection**

Check the following and replace any faulty parts.

1. Damaged or worn drive and driven plates.

**Drive plate thickness**

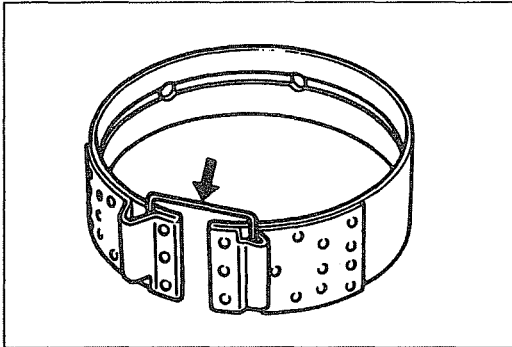
**Standard: 1.6mm (0.063 in)**

**Minimum: 1.4mm (0.055 in)**

2. Broken or worn snap ring.
3. Deformed or detached spring and retainer assembly.
4. Broken or weakened spring.

**Free length of spring: 20.5 mm (0.807 in)**

5. Damaged or worn piston.
6. Damaged seal contact area of transaxle case.



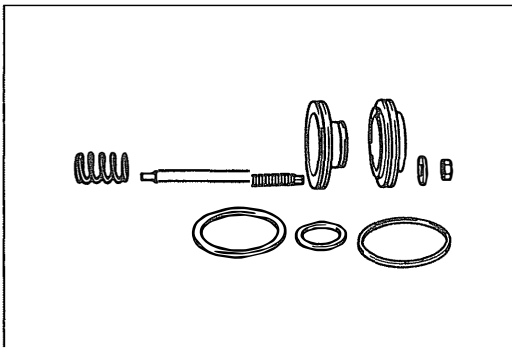
86U07B-261

**2-4 BRAKE BAND**

**Inspection**

Check the following and replace if necessary.

1. Damaged or worn 2-4 brake band.



86U07B-262

**BAND SERVO**

**Inspection**

Check the following and replace any faulty parts.

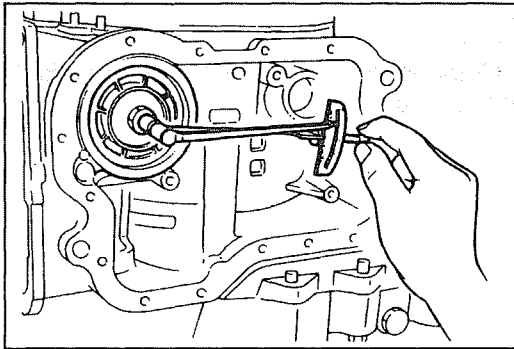
1. Damaged or worn piston.
2. Weakened return spring.

**Free length of spring**

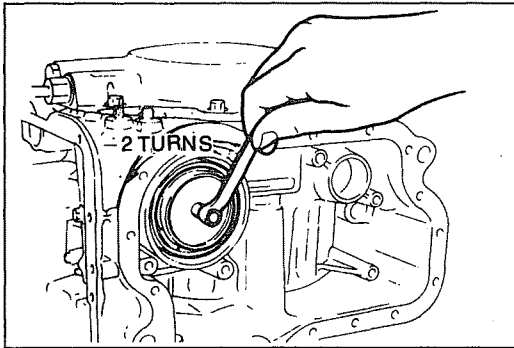
**Non-Turbo: 43.25mm (1.703 in)**

**Turbo : 42.0mm (1.654 in)**

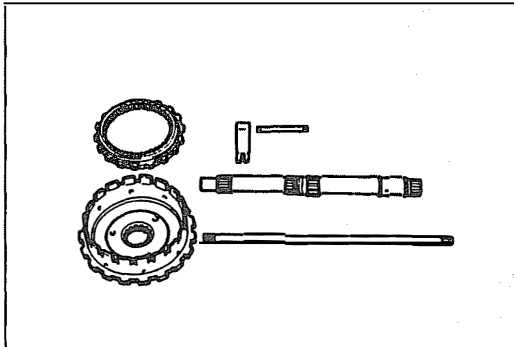




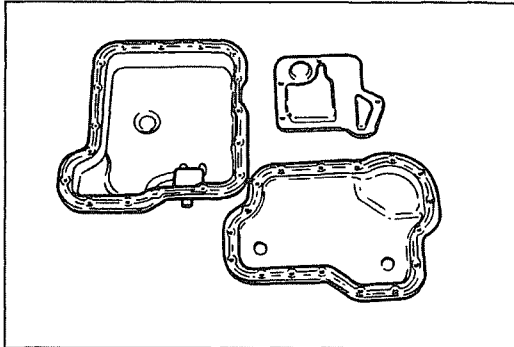
06U0KX-156



16U0KX-013



86U07B-263



86U07B-264

## On-vehicle Adjustment

1. Remove the oil pan.
2. Loosen the locknut and tighten the piston stem to the specified torque.

### Tightening torque:

**9—11 N·m (9.0—11.0 cm·kg, 78—95 in·lb)**

3. Loosen the piston stem 2 turns.
4. Hold the piston stem and tighten the locknut to the specified torque.

### Tightening torque:

**25—39 N·m (2.5—4.0 m·kg, 18—29 ft·lb)**

5. Install the oil pan.

## OTHER INSPECTION

Check the following and replace any faulty parts.

1. Damaged or worn output shell.
2. Damaged or worn internal gear.
3. Damaged or worn turbine shaft.
4. Damaged or worn oil pump shaft.
5. Damaged or worn anchor strut and shaft.

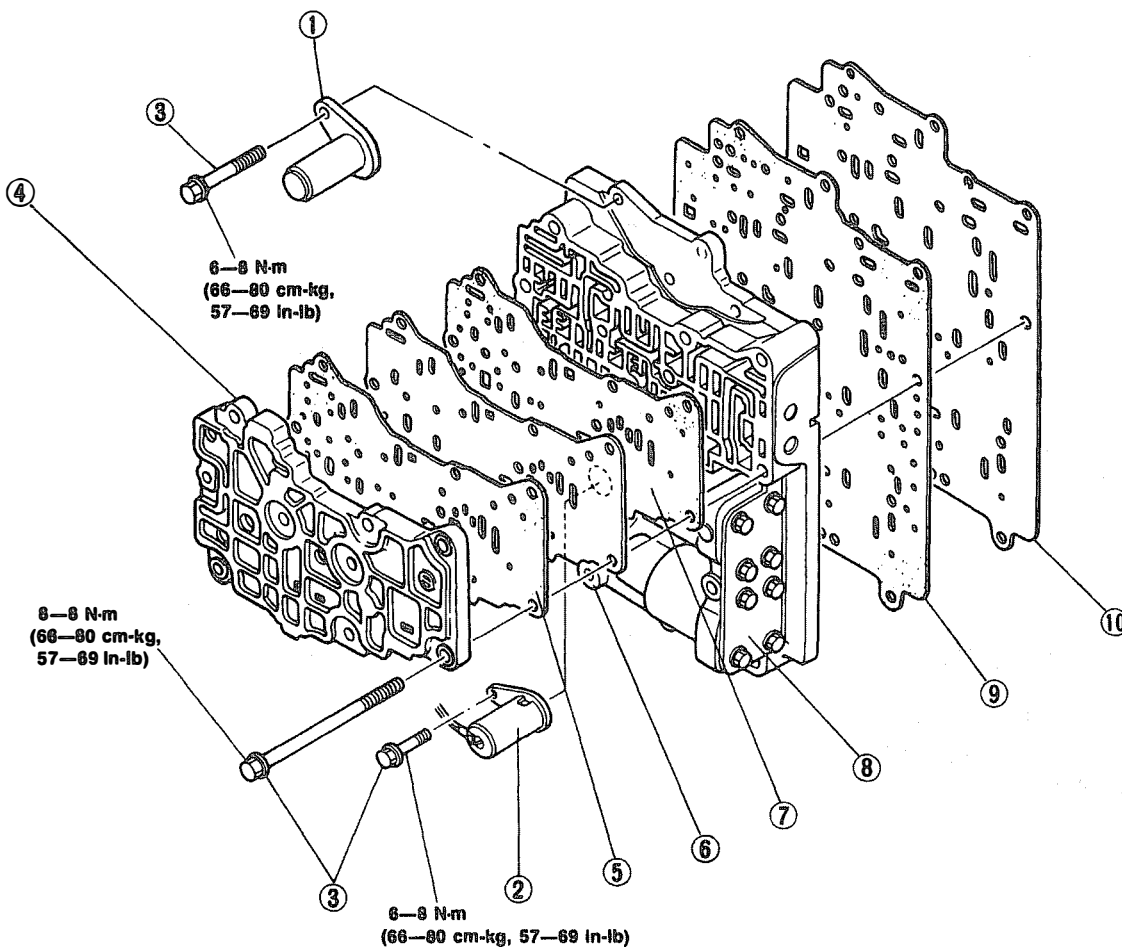
6. Damaged or cracked valve body cover
7. Damaged or cracked oil pan
8. Damaged or clogged oil strainer

**CONTROL VALVE BODY****Precaution**

- (1) Pay close attention when handling the control valve because it consists of the most precise and delicate parts of the transaxle.
- (2) Neatly arrange the removed parts in order to avoid mixing up similar parts.
- (3) Disassemble the control valve assembly and thoroughly clean it when the clutch and/or brake bands are burned, and/or when the automatic transmission fluid is degenerated.

**Disassembly****FRONT AND PREMAIN CONTROL BODY**

APPLY SPECIFIED ATF TO INDIVIDUAL PARTS



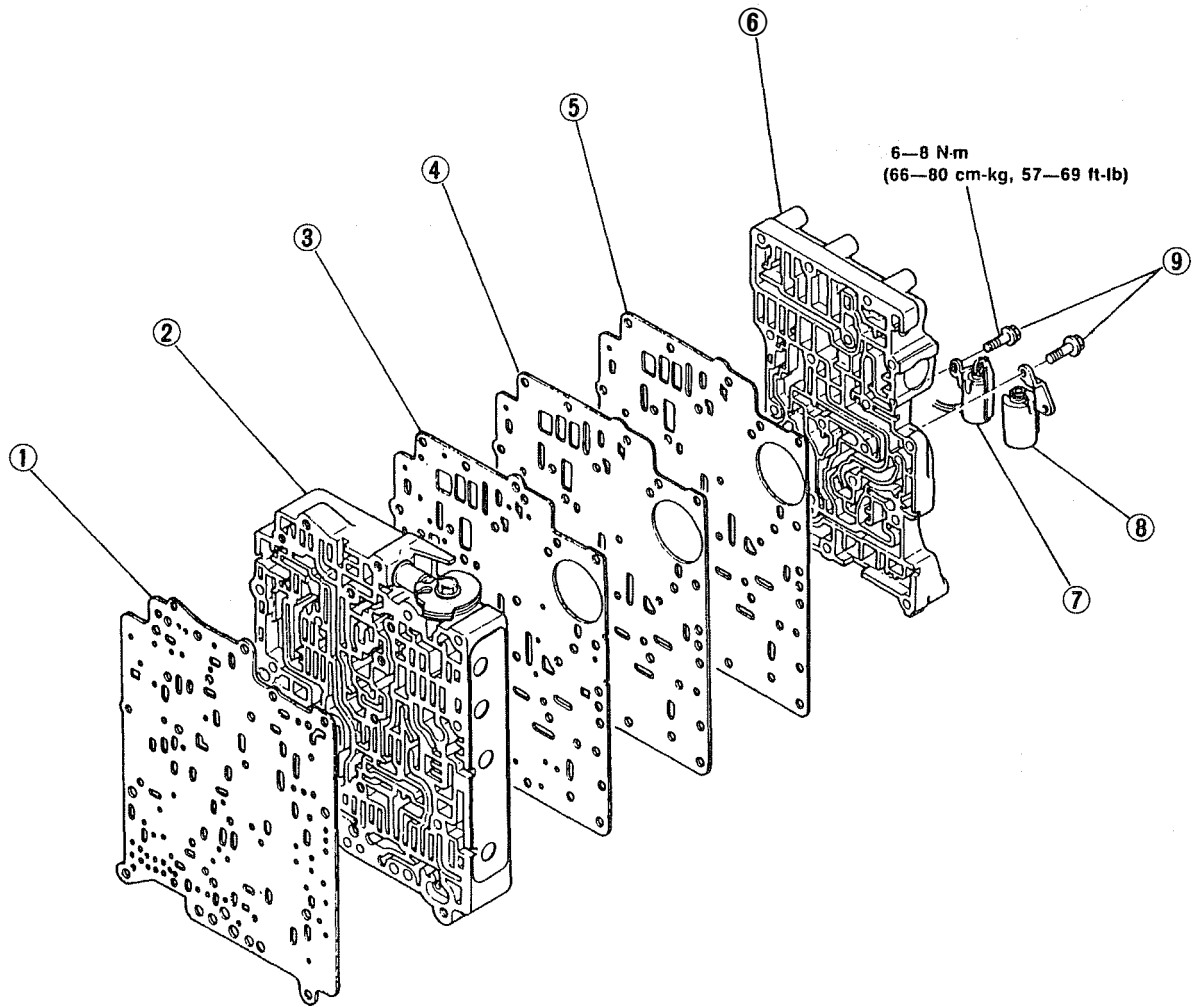
06U0KX-158

- |                               |                              |
|-------------------------------|------------------------------|
| 1. 1-2 Solenoid valve         | 6. Premain separator         |
| 2. 2-3 Solenoid valve         | 7. Front/premain rear gasket |
| 3. Bolts                      | 8. Premain control body      |
| 4. Front control body         | 9. Premain/main front gasket |
| 5. Front/premain front gasket | 10. Main separator           |

MAIN AND REAR CONTROL BODY



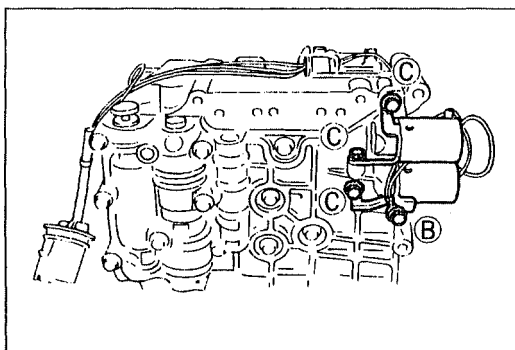
APPLY SPECIFIED ATF TO INDIVIDUAL PARTS



06U0KX-159

- 1. Premain/main rear gasket
- 2. Main control body
- 3. Main/rear front gasket
- 4. Rear separator
- 5. Main/rear rear gasket

- 6. Rear control body
- 7. 3-4 solenoid valve
- 8. Lockup solenoid valve
- 9. Bolts

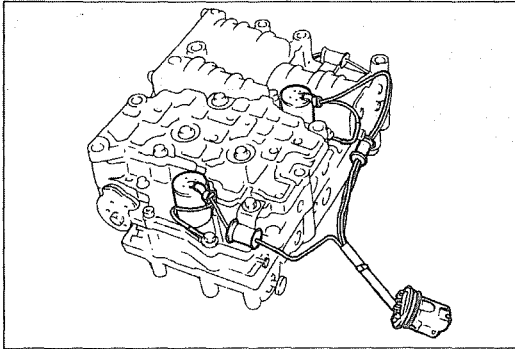


06U0KX-160

**Procedure**

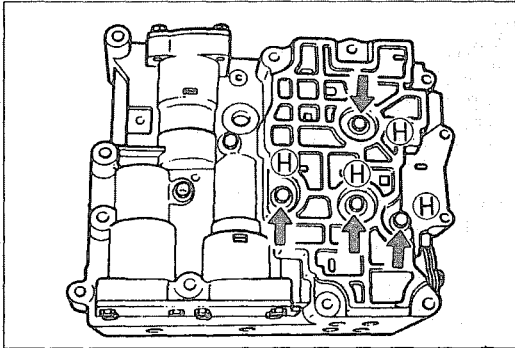
- 1. Remove the 3-4 solenoid valve and lockup solenoid valve.
- 2. Remove the O-rings and oil strainers.

TRANSAXLE



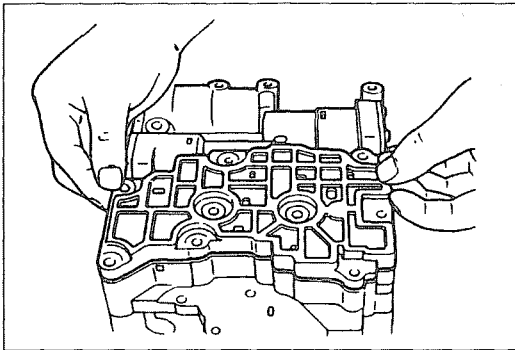
86U07B-268

3. Remove the 1-2 solenoid valve and 2-3 solenoid valve and wire harness.
4. Remove the O-rings and oil strainers.



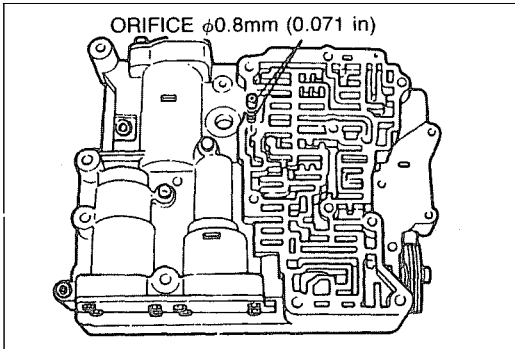
06U0KX-161

5. Remove the indicated bolts and pull out the front control body with premain separator as a unit.



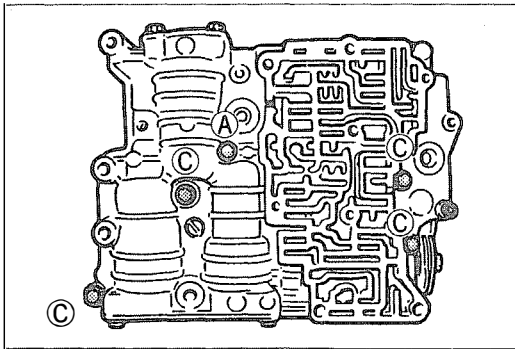
86U07B-270

6. Remove the front/premain gaskets and separator from the front control body.



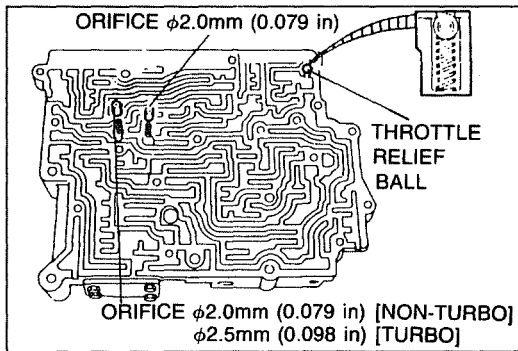
86U07B-271

7. Remove the orifice check valve ( $\phi 0.8\text{mm}$ , 0.071 in) and spring from the premain control body.

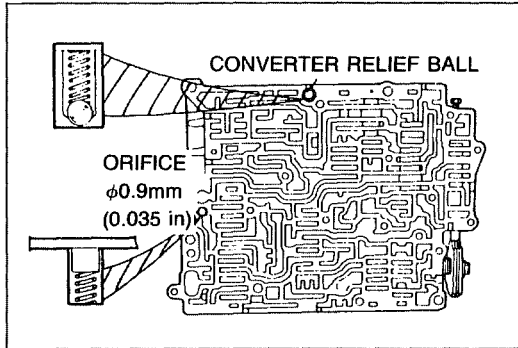


06U0KX-162

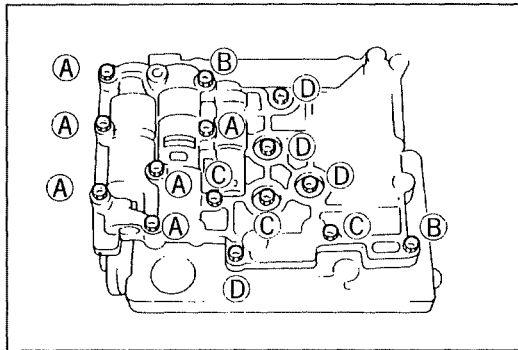
8. Remove the bolts and the Allen head bolt and remove the premain control body and the main separator as a unit.



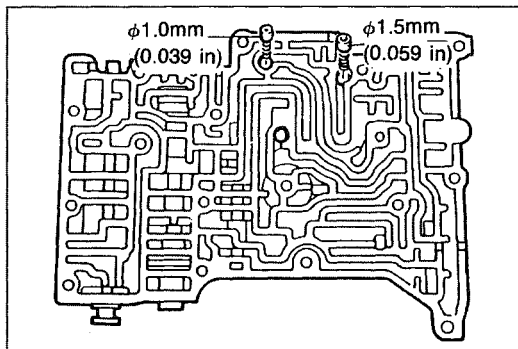
9. Remove the premain/main gaskets and separator from the premain control body.
10. Remove the orifice check valves ( $\phi 2.0\text{mm}$ , 0.079 in;  $\phi 2.5\text{mm}$ , 0.098 in) and springs, and the throttle relief ball and spring from the premain control body.



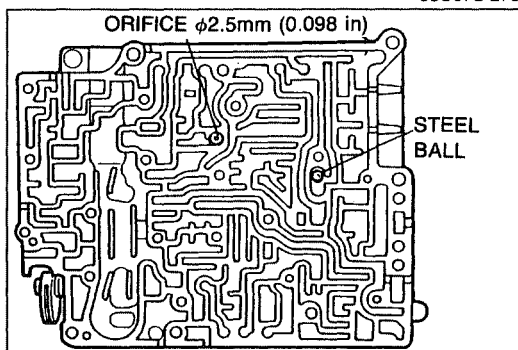
11. Remove the converter relief ball and spring, and the orifice check valve ( $\phi 0.9\text{mm}$ , 0.035 in) and spring from the main control body.



12. Turn the assembly over and remove the bolts shown in the figure. Remove the rear separator as a unit.



13. Remove the main/rear gaskets and separator from the rear control body.
14. Remove the orifice check valves ( $\phi 1.5\text{mm}$ , 0.059 in;  $\phi 1.0\text{mm}$ , 0.039 in) and spring from the rear control body.



15. Remove the orifice check valve ( $\phi 2.5\text{mm}$ , 0.098 in) and spring and the steel ball from the main control body.

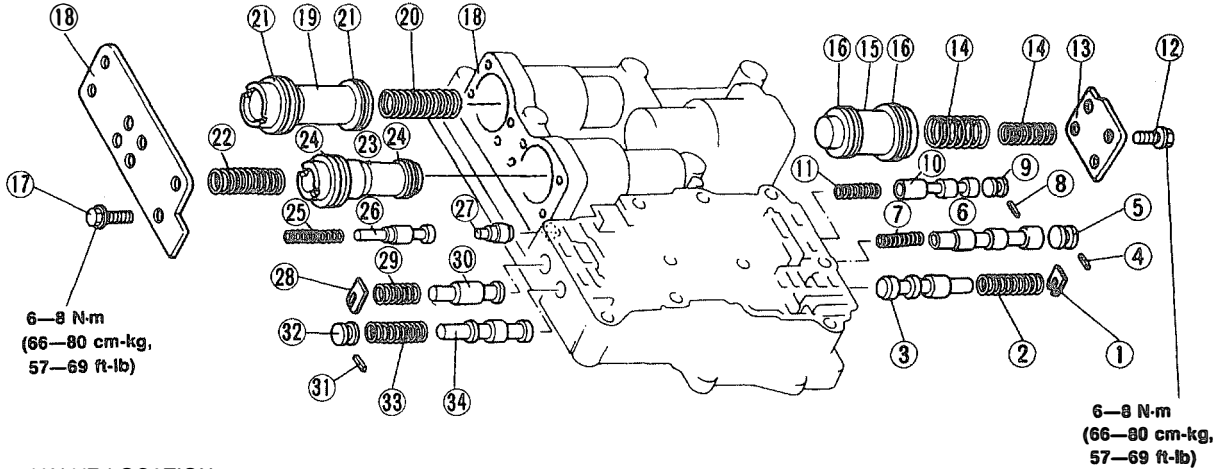
PREMAIN CONTROL BODY

Disassembly

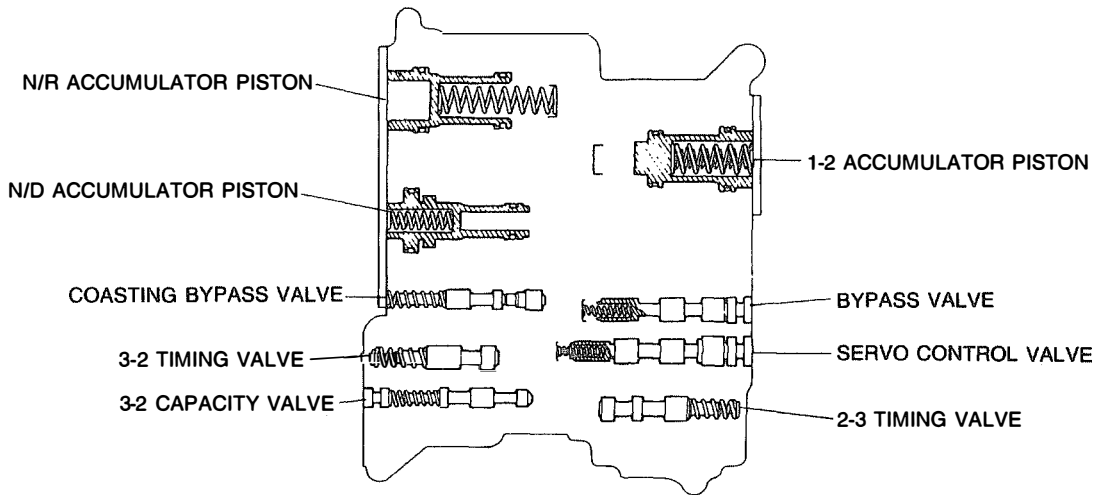
Disassemble in the order shown in the figure.



APPLY SPECIFIED ATF TO INDIVIDUAL PARTS



VALVE LOCATION



06U0KX-163

- |                         |                                      |                                |
|-------------------------|--------------------------------------|--------------------------------|
| 1. Retainer             | 13. 1-2 accumulator plate and gasket | 23. N-D accumulator piston     |
| 2. 2-3 timing spring    | 14. 1-2 accumulator spring           | 24. N-D accumulator seal rings |
| 3. 2-3 timing valve     | 15. 1-2 accumulator piston           | 25. Coasting bypass spring     |
| 4. Stopper pin          | 16. 1-2 accumulator seal rings       | 26. Coasting bypass valve      |
| 5. Stopper plug         | 17. Bolt                             | 27. Coasting bypass plug       |
| 6. Servo control valve  | 18. N-R accumulator plate and gasket | 28. Retainer                   |
| 7. Servo control spring | 19. N-R accumulator piston           | 29. 3-2 timing spring          |
| 8. Stopper pin          | 20. N-R accumulator rear spring      | 30. 3-2 timing valve           |
| 9. Stopper plug         | 21. N-R accumulator seal rings       | 31. Stopper pin                |
| 10. Bypass valve        | 22. N-D accumulator front spring     | 32. Stopper plug               |
| 11. Bypass spring       |                                      | 33. 3-2 capacity spring        |
| 12. Bolt                |                                      | 34. 3-2 capacity valve         |

**Inspection**

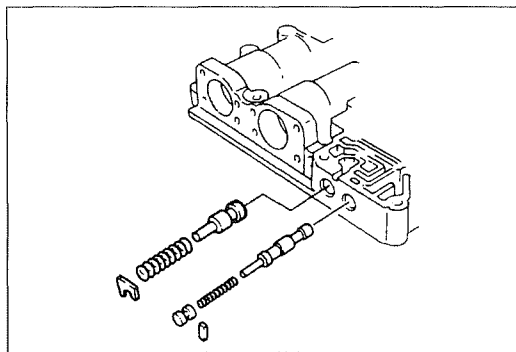
Check the following and replace any faulty parts.

1. Damaged or worn valves.
2. Damaged oil passage.
3. Cracked or damaged valve body.
4. Operation of each valve.
5. Weakened spring.

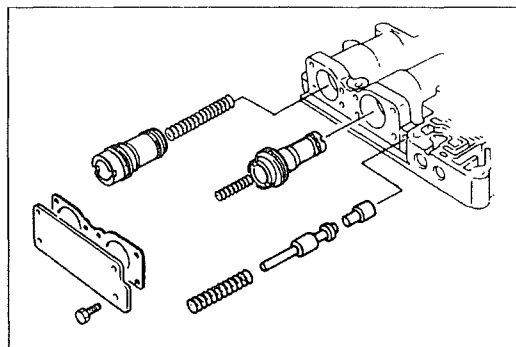
**Spring**

Spring name		Outer dia. mm (in)	Free length mm (in)	Wire dia. mm (in)	Spring color
1-2 accumulator small spring	Non-Turbo	14.4 (0.567)	86.0 (3.386)	1.8 (0.071)	—
	Turbo	14.4 (0.567)	73.8 (2.906)	2.0 (0.079)	Gray
1-2 accumulator large spring		20 (0.787)	97.1 (3.823)	2.3 (0.091)	Gray
Bypass, Servo control spring		4.9 (0.193)	27.6 (1.087)	0.55 (0.022)	Yellow
2-3 timing spring		8.3 (0.327)	26.5 (1.043)	0.8 (0.031)	—
N-R accumulator rear spring		11.1 (0.437)	62.0 (2.441)	1.2 (0.047)	Light green
N-D accumulator front spring		9.8 (0.386)	68.0 (2.677)	1.1 (0.043)	Orange
Coasting bypass spring		5.8 (0.228)	37.7 (1.484)	0.6 (0.024)	Dark blue
3-2 timing spring		8.2 (0.323)	28.6 (1.126)	0.8 (0.031)	Red
3-2 capacity spring		5.4 (0.213)	30.6 (1.205)	0.5 (0.020)	White
Throttle relief ball spring		6.6 (0.260)	21.6 (0.850)	0.8 (0.031)	—

06U0KX-164



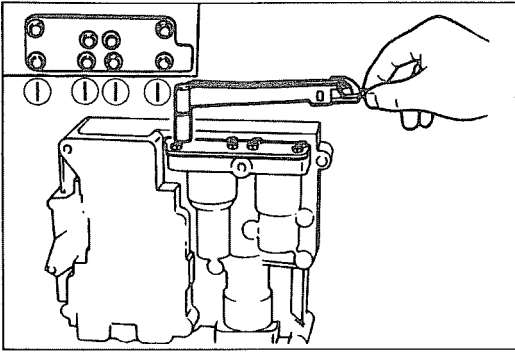
86U07B-280



86U07B-281

**Assembly**

1. Install the 3-2 capacity valve, 3-2 capacity spring, and stopper plug; then install the stopper pin.
2. Install the 3-2 timing valve, the 3-2 timing spring, and retainer.
3. Install the coasting bypass plug, coasting bypass valve and coasting bypass spring.
4. Apply ATF to the O-rings, and install them to the piston; then insert the N-R accumulator rear spring and N-R accumulator piston.
5. Apply ATF to the O-rings, and install them to the piston; then insert the N-D accumulator piston and N-D accumulator front spring.

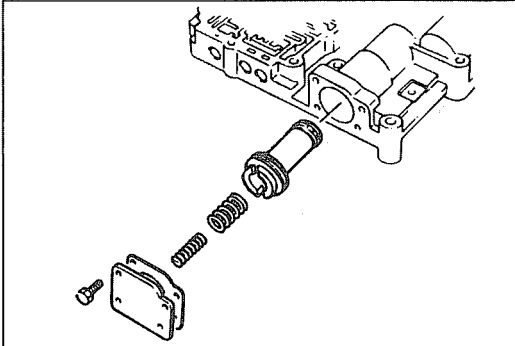


86U07B-282

6. Install the N-R accumulator gasket and plate; then tighten the plate.

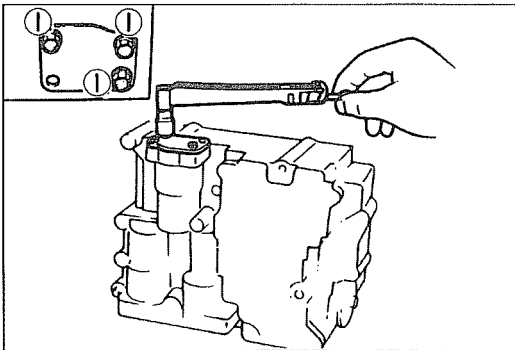
**Tightening torque:**

**6—8 N·m (66—80 cm·kg, 57—69 in·lb)**



86U07B-283

7. Apply ATF to the O-rings, and install them onto the piston; then install the 1-2 accumulator piston and 1-2 accumulator springs.

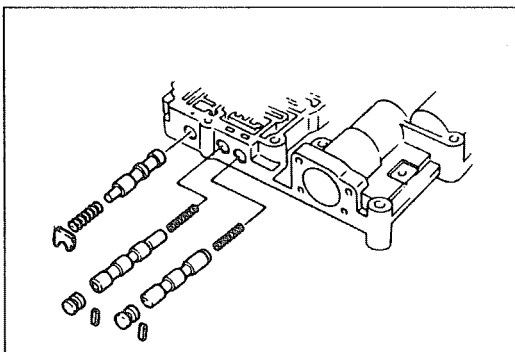


86U07B-284

8. Install the 1-2 accumulator gasket and plate; then tighten the plate.

**Tightening torque:**

**6—8 N·m (66—80 cm·kg, 57—69 in·lb)**



86U07B-285

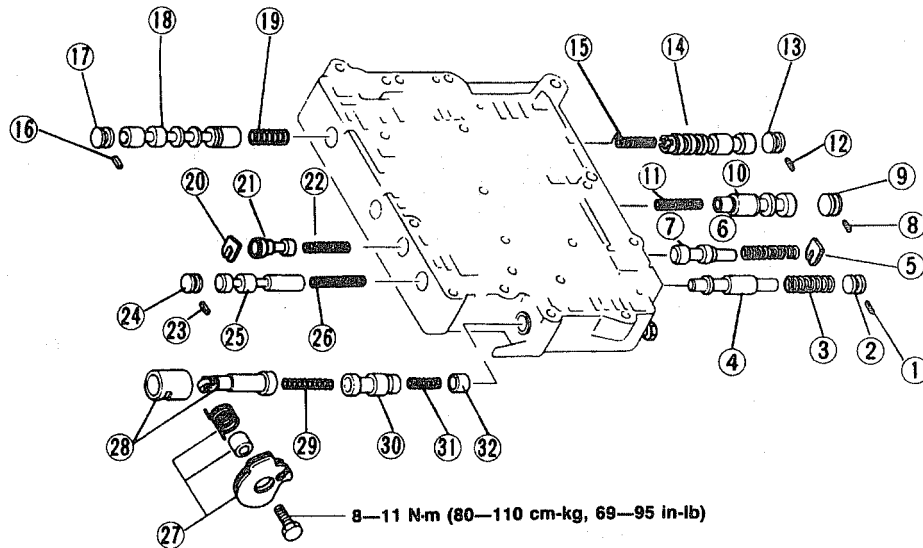
9. Install the bypass spring, bypass valve, stopper plug, and stopper pin.  
 10. Install the servo control spring, servo control valve, stopper plug, and stopper pin.  
 11. Install the 2-3 timing valve, 2-3 timing spring, and retainer.



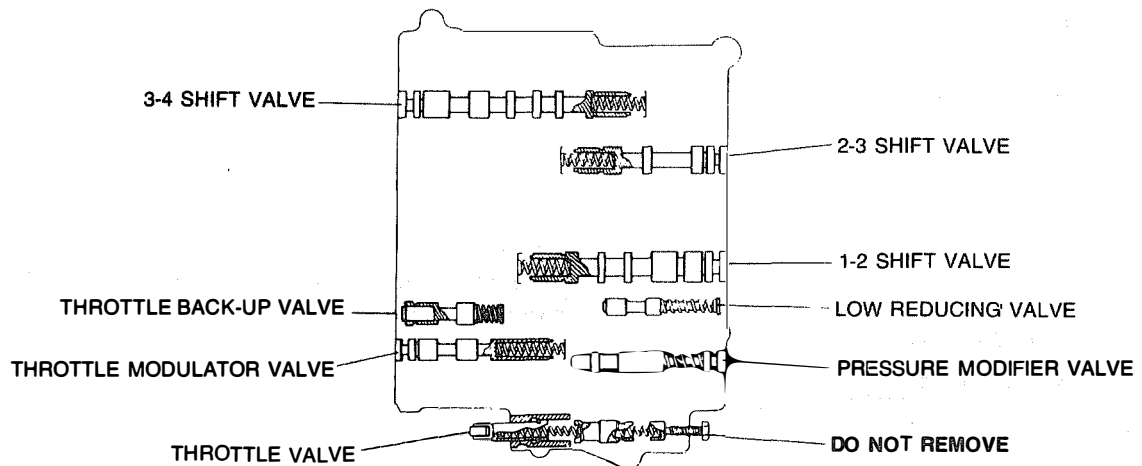
## MAIN CONTROL BODY

### Disassembly

Disassemble in the order shown in the figure.



### VALVE LAYOUT



06U0KX-165

1. Stopper pin
2. Stopper plug
3. Pressure modifier spring
4. Pressure modifier valve
5. Retainer
6. Low reducing spring
7. Low reducing valve
8. Stopper pin
9. Stopper plug
10. 1-2 shift valve
11. 1-2 shift spring

12. Stopper pin
13. Stopper plug
14. 2-3 shift valve
15. 2-3 shift spring
16. Stopper pin
17. Stopper plug
18. 3-4 shift valve
19. 3-4 shift spring
20. Retainer
21. Throttle backup valve
22. Throttle backup spring

23. Stopper pin
24. Stopper plug
25. Throttle modulator valve
26. Throttle modulator spring
27. Throttle lever assembly
28. Throttle plug assembly
29. Throttle spring
30. Throttle valve
31. Throttle assist spring
32. Throttle adjust plug

**Inspection**

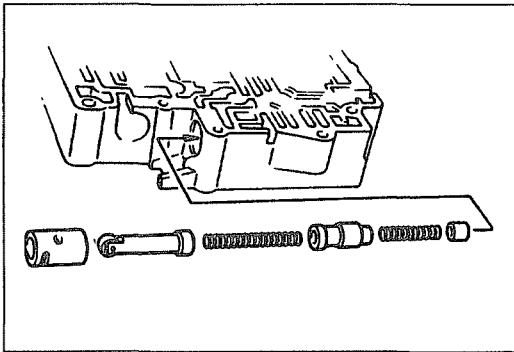
Check the following and replace any faulty parts.

1. Damaged or worn valves.
2. Damaged oil passage.
3. Cracked or damaged valve body.
4. Operation of each valve.
5. Weakened spring.

**Spring**

Spring name	Outer dia. mm (in)	Free length mm (in)	Wire dia. mm (in)	Spring color
Pressure modifier spring	8.3 (0.327)	26.5 (1.043)	0.8 (0.031)	—
Low reducing spring	8.7 (0.343)	38.3 (1.508)	0.9 (0.035)	Black
1-2 shift spring	8.7 (0.343)	41.3 (1.626)	1.0 (0.039)	Yellow
2-3, 3-4 shift spring	7.4 (0.291)	36.6 (1.441)	0.8 (0.031)	Gray
Throttle backup spring	9.65 (0.380)	26.9 (1.059)	0.55 (0.022)	Red
Throttle modulator spring	6.3 (0.248)	47.9 (1.886)	0.8 (0.031)	—
Throttle assist spring	5.15 (0.203)	32.3 (1.272)	0.55 (0.022)	Dark green
Throttle spring	5.4 (0.213)	47.2 (1.858)	0.8 (0.031)	Pink
Converter relief ball spring	6.9 (0.272)	24.1 (0.949)	0.9 (0.035)	Maroon
Orifice check valve spring	5.0 (0.197)	12.5 (0.492)	0.23 (0.009)	—

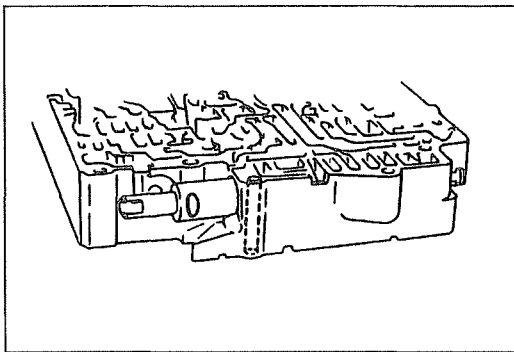
96U07B-029



86U07B-288

**Assembly**

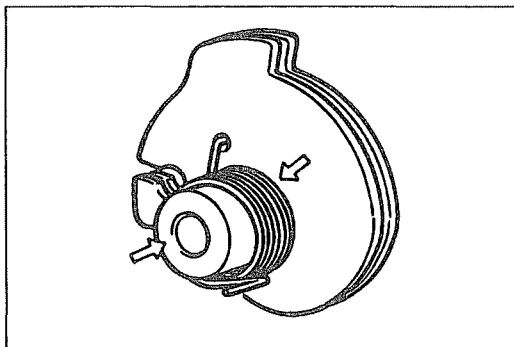
1. Install the throttle adjust plug, throttle assist spring, throttle valve, and throttle plug assembly.



86U07B-289

**Caution**

- Install the throttle plug assembly with the groove aligned with the bolt hole.

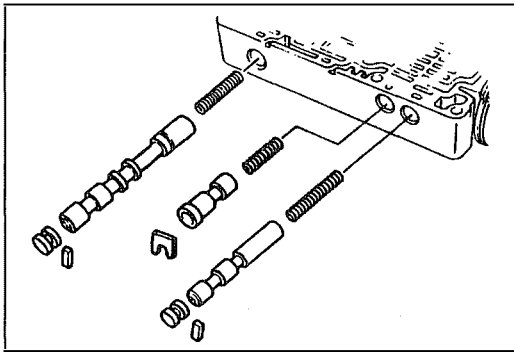


96U07B-052

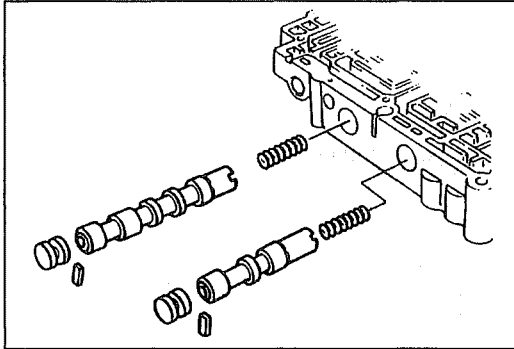
2. Install the throttle return spring as shown.
3. Install the throttle lever assembly to the main control body.

**Tightening torque:**

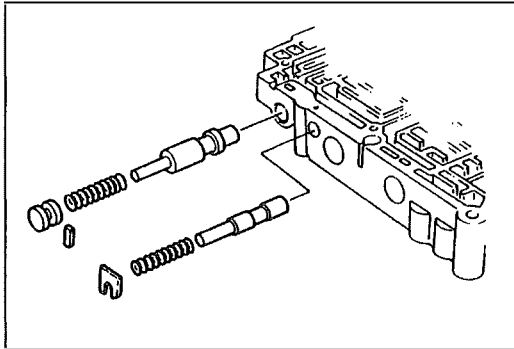
8—11 N·m (80—110 cm·kg, 69—95 in·lb)



06U0KX-166



86U07B-292



86U07B-293

4. Install the throttle modulator spring, throttle modulator valve, stopper plug, and stopper pin.
5. Install the throttle backup spring, throttle backup valve, and retainer.
6. Install the 3-4 shift spring, 3-4 shift valve, stopper plug, and stopper pin.

7. Install the 2-3 shift spring, 2-3 shift valve, stopper plug, and stopper pin.
8. Install the 1-2 shift spring, 1-2 shift valve, stopper plug, and stopper pin.

9. Install the low reducing valve, low reducing spring, and retainer.
10. Install the pressure modifier valve, pressure modifier spring, stopper plug, and stopper pin.

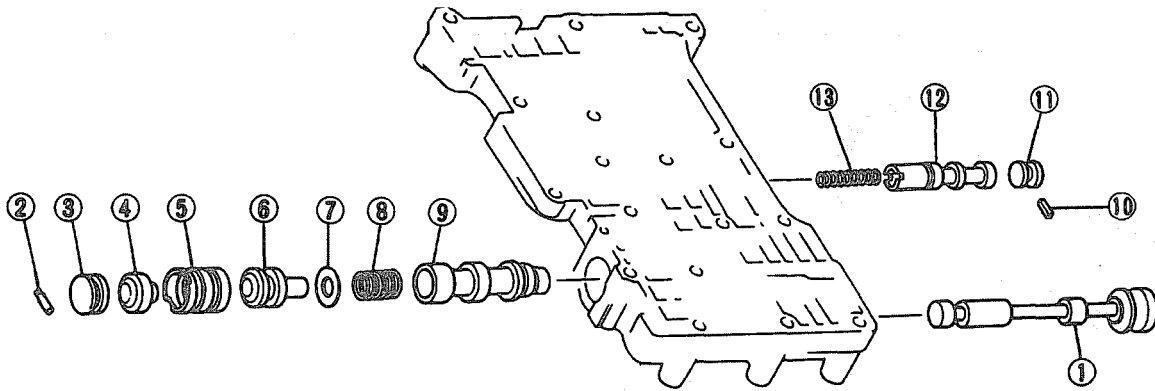
### REAR CONTROL BODY

#### Disassembly

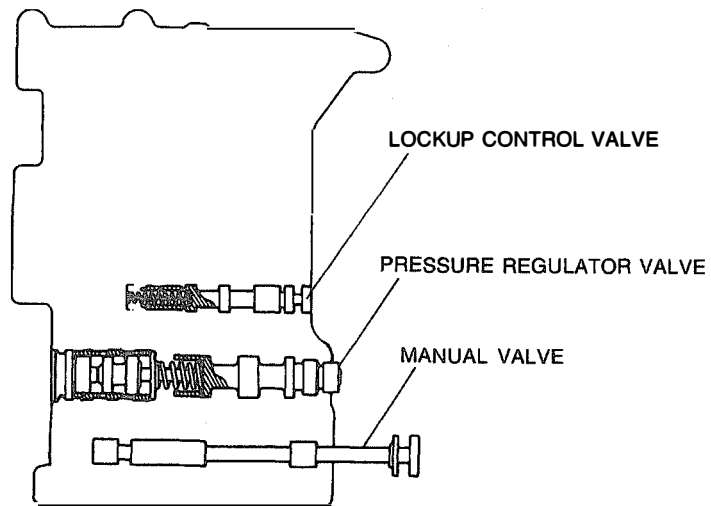
Disassemble in the order shown in the figure.



APPLY SPECIFIED ATF TO INDIVIDUAL PARTS



VALVE LOCATION



06U0KX-167

- |                                   |                              |
|-----------------------------------|------------------------------|
| 1. Manual valve                   | 8. Pressure regulator spring |
| 2. Stopper pin                    | 9. Pressure regulator valve  |
| 3. Stopper plug                   | 10. Stopper pin              |
| 4. Pressure regulator backup plug | 11. Stopper plug             |
| 5. Pressure regulator plug sleeve | 12. Lock-up control valve    |
| 6. Pressure regulator plug        | 13. Lock-up control spring   |
| 7. Pressure regulator spring seat |                              |

**Inspection**

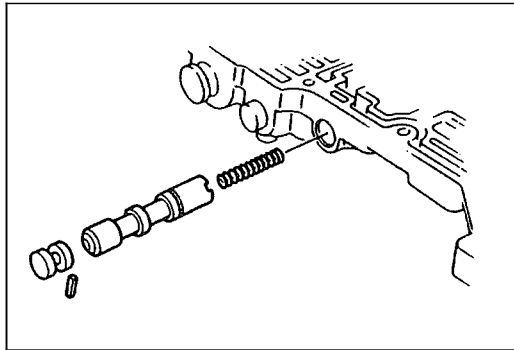
Check the following and replace any faulty parts.

1. Damaged or worn valves.
2. Damaged oil passage.
3. Cracked or damaged valve body.
4. Operation of each valve.
5. Weakened spring.

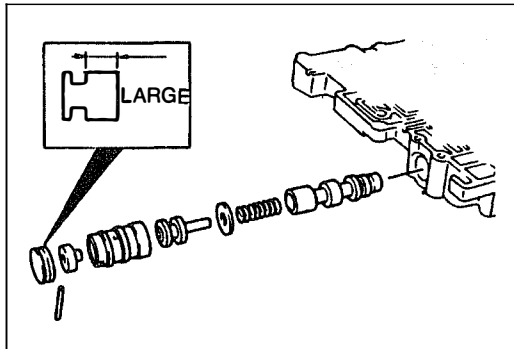
**Spring**

Spring name	Outer dia. mm (in)	Free length mm (in)	Wire dia. mm (in)	Spring color
Pressure regulator spring	11.5 (0.453)	26.5 (1.043)	1.0 (0.039)	Maroon
Lockup control spring	5.0 (0.197)	35.2 (1.386)	0.6 (0.024)	Purple

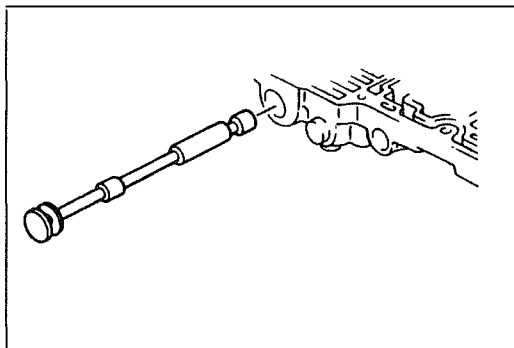
86U07B-295



86U07B-296



86U07B-297



86U07B-298

**Assembly**

1. Install the lockup control spring, lockup control valve, stopper plug, and stopper pin.

2. Install the pressure regulator valve, pressure regulator spring, pressure regulator spring seat, pressure regulator plug, pressure regulator plug sleeve, pressure regulator backup plug, stopper plug, and stopper pin.

**Note**

- Install the stopper plug larger end first.

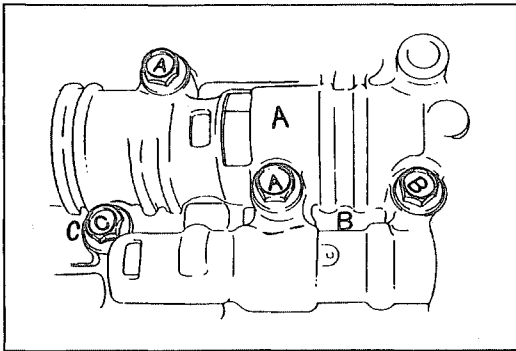
3. Install the manual valve.

**CONTROL VALVE BODY**

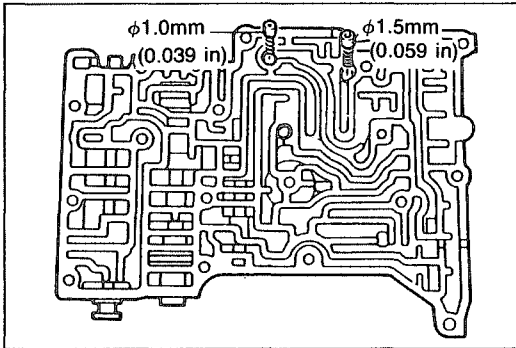
**Assembly Procedure**

**Note**

- Do not mix-up the front and rear gaskets during assembly.
- Match the bolt head letter and the control valve body letter.

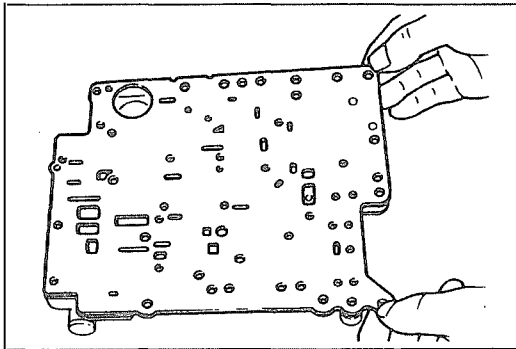


06U0KX-168



86U07B-300

1. Install the orifice check valves ( $\phi 1.5\text{mm}$ , 0.059 in;  $\phi 1.0\text{mm}$ , 0.039 in) and springs in the rear control body as shown.

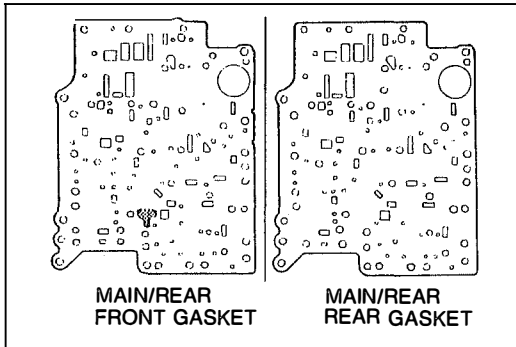


86U07B-301

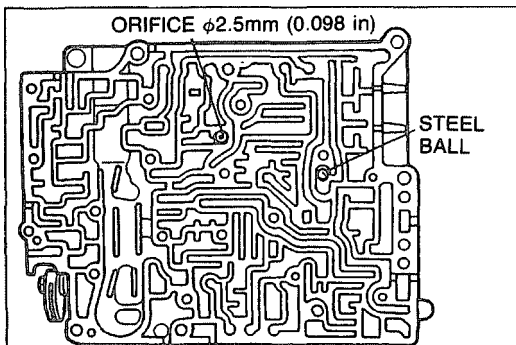
2. Install the gaskets on both sides of the rear separator; then install it onto the rear control body.

**Note**

- The main/rear rear gasket and main/rear front gasket are not interchangeable.

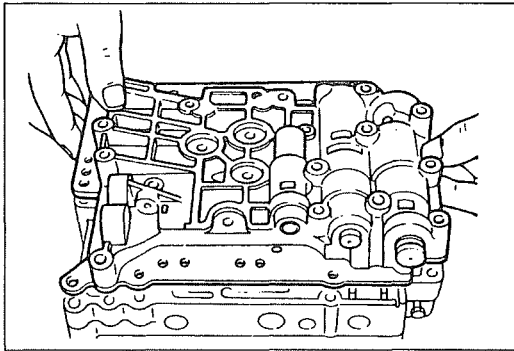


86U07B-302



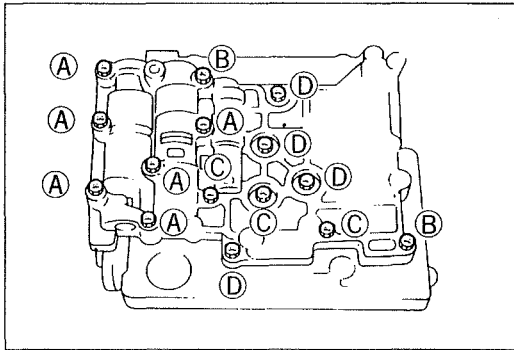
06U0KX-299

3. Install the orifice check valve ( $\phi 2.5\text{mm}$ , 0.098 in) and spring, and the steel ball in the main control body as shown.



86U07B-304

4. Install the rear control body to the main control body.

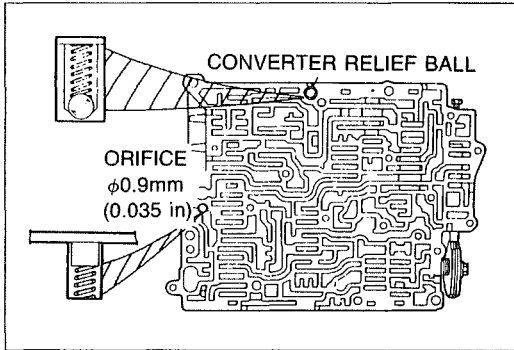


06U0KX-169

5. Install and loosely tighten the bolts.

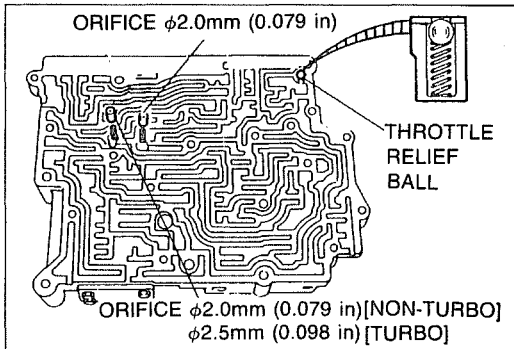
**Note**

- Match the bolt head letter as shown.



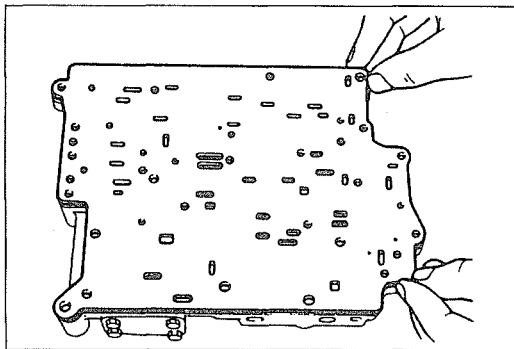
06U0KX-300

6. Turn the assembly over and install the orifice check valve ( $\phi 0.9\text{mm}$ , 0.035 in) and spring, and the converter relief ball and spring in the main control body as shown.



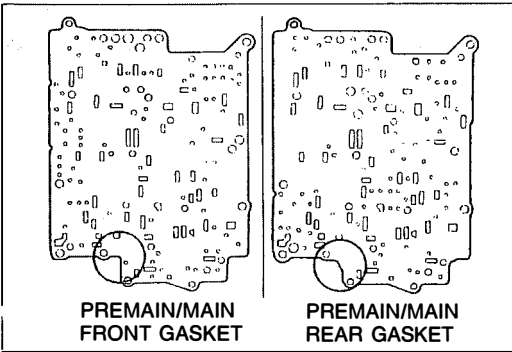
86U07B-307

7. Install the orifice check valves ( $\phi 2.0\text{mm}$ , 0.079 in;  $\phi 2.5\text{mm}$ , 0.098 in) and springs, and the throttle relief ball and spring in the premain control body as shown.



86U07B-308

8. Install the gaskets on both sides of the main separator; then install it onto the premain control body.

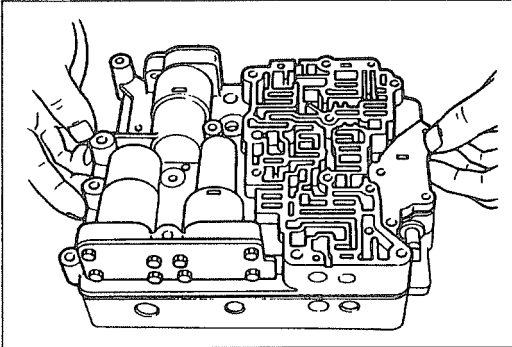


86U07B-309

**Note**

- The premain/main rear gasket and premain/main front gasket are not interchangeable.

9. Set the premain control body onto the main control body.

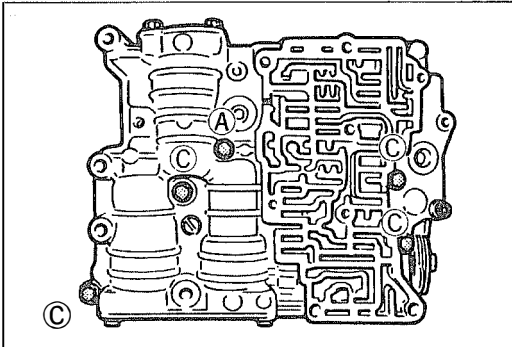


86U07B-310

10. Install and loosely tighten the bolts.

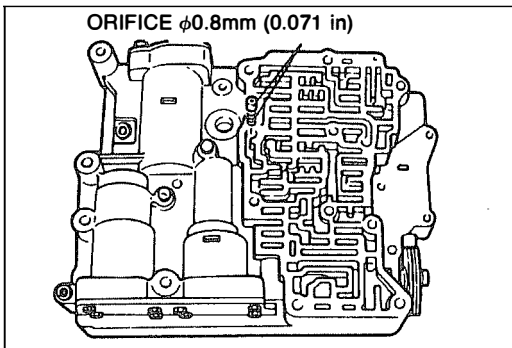
**Note**

- Match the bolt head letter as shown.



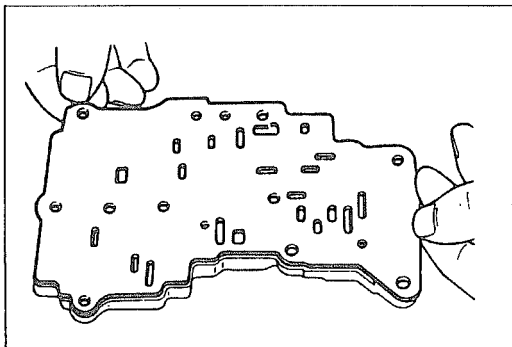
06U0KX-170

11. Install the orifice check valve ( $\phi 0.8\text{mm}$ , 0.071 in) and spring in the premain control body as shown.



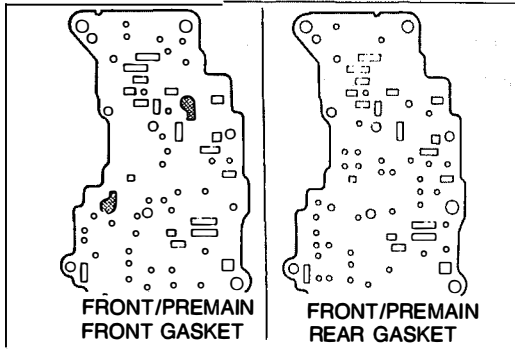
86U07B-312

12. Install the gaskets on both sides of the premain separator; then install it onto the front control body.



86U07B-313

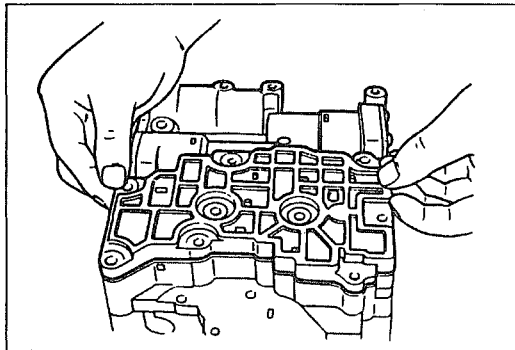




86U07B-314

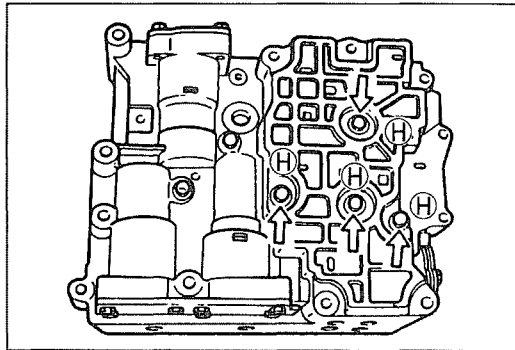
**Note**

- The front/premain front gasket and front/premain rear gasket are not interchangeable.



86U07B-315

13. Install the front control body on the premain control body.

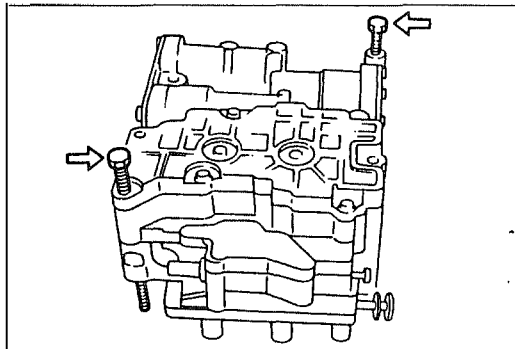


06U0KX-171

14. Install and loosely tighten the bolts.

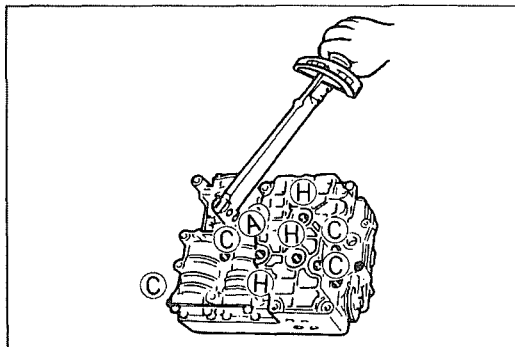
**Note**

- Match the bolt head letter as shown.



86U07B-317

15. Install the control valve body mounting bolts as shown for alignment.

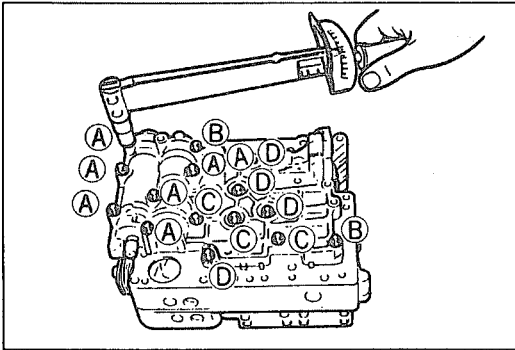


86U07B-318

16. Tighten the mounting bolts.  
 (1) Tighten the front control body.

**Tightening torque:**

6—8 N·m (66—80 cm·kg, 57—69 in·lb)

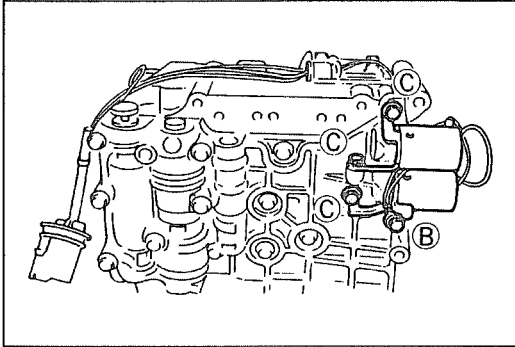


86U07B-319

(2) Tighten the rear control body.

**Tightening torque:**

6—8 N·m (66—80 cm·kg, 57—69 in·lb)

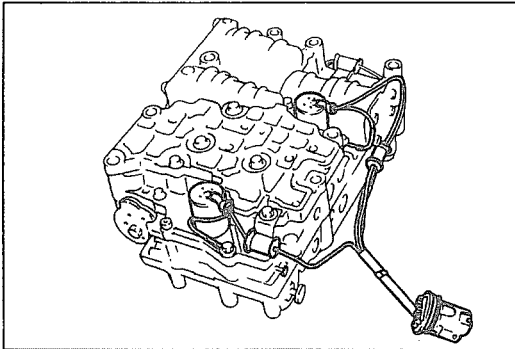


86U07B-320

17. Install the 3-4 solenoid valve and lockup solenoid valve along with new O-rings and oil strainers.

**Tightening torque:**

6—8 N·m (66—80 cm·kg, 57—69 in·lb)

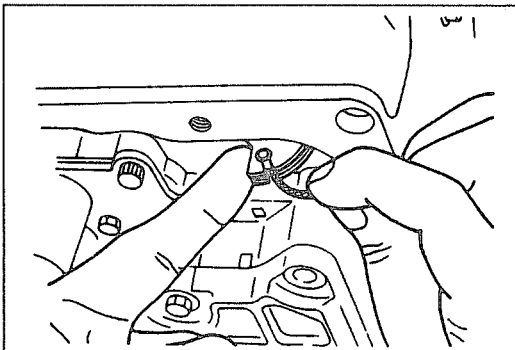


86U07B-321

18. Install the 1-2 solenoid valve and 2-3 solenoid valve along with new O-rings and oil strainers.

**Tightening torque:**

6—8 N·m (66—80 cm·kg, 57—69 in·lb)



06U0KX-172

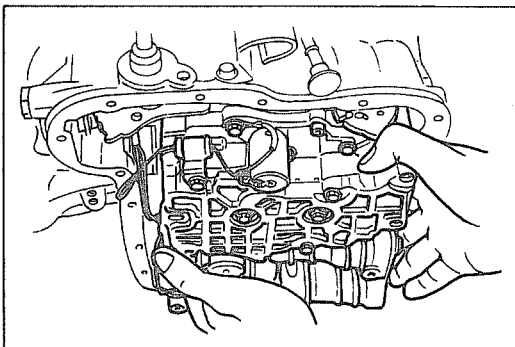
**On-vehicle Replacement**

**Note**

- Remove the control valve body only if troubleshooting indicates a probable failure.

**Precaution**

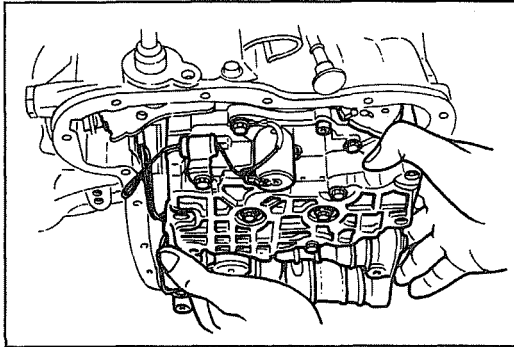
- (1) Remove the control valve body in a clean area (dustproof workspace) to prevent dust entry into the mechanisms.
- (2) Clean the control valve body cover and around it thoroughly with steam and/or cleaning solvents prior to removal.



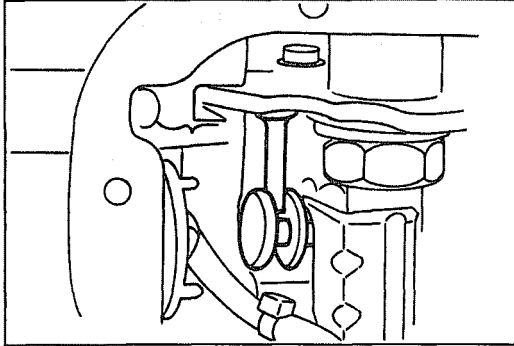
06U0KX-173

**Removal**

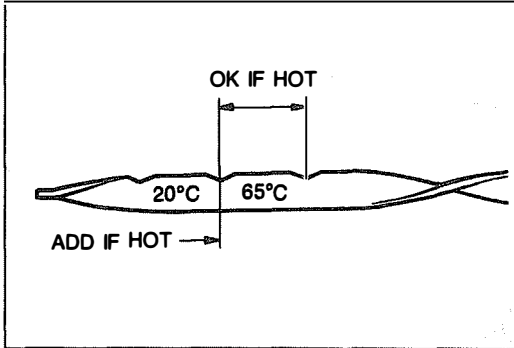
1. Remove the throttle cable. (Refer to page K-47.)
2. Disconnect the solenoid connector.
3. Remove the control valve body.



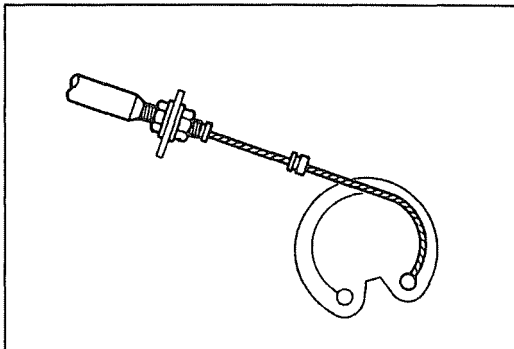
06U0KX-174



86U07B-084



16U0KX-014



06U0KX-176

**Installation**

1. Install the control valve body.

**Tightening torque:**

11—15 N·m (110—150 cm·kg, 95—130 in·lb)

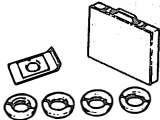
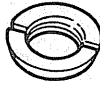
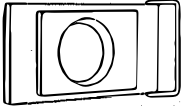
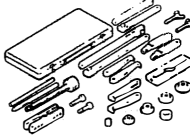

**Note**

- To place the manual plate in the correct position of the manual valve, shift into R before installation.
- Verify that the manual plate and manual valve are assembled correctly by using a mirror, then tighten the mounting bolts.

2. After installation, add ATF, and with the engine idling, check the fluid level and check for leaks. (Refer to page K-45.)

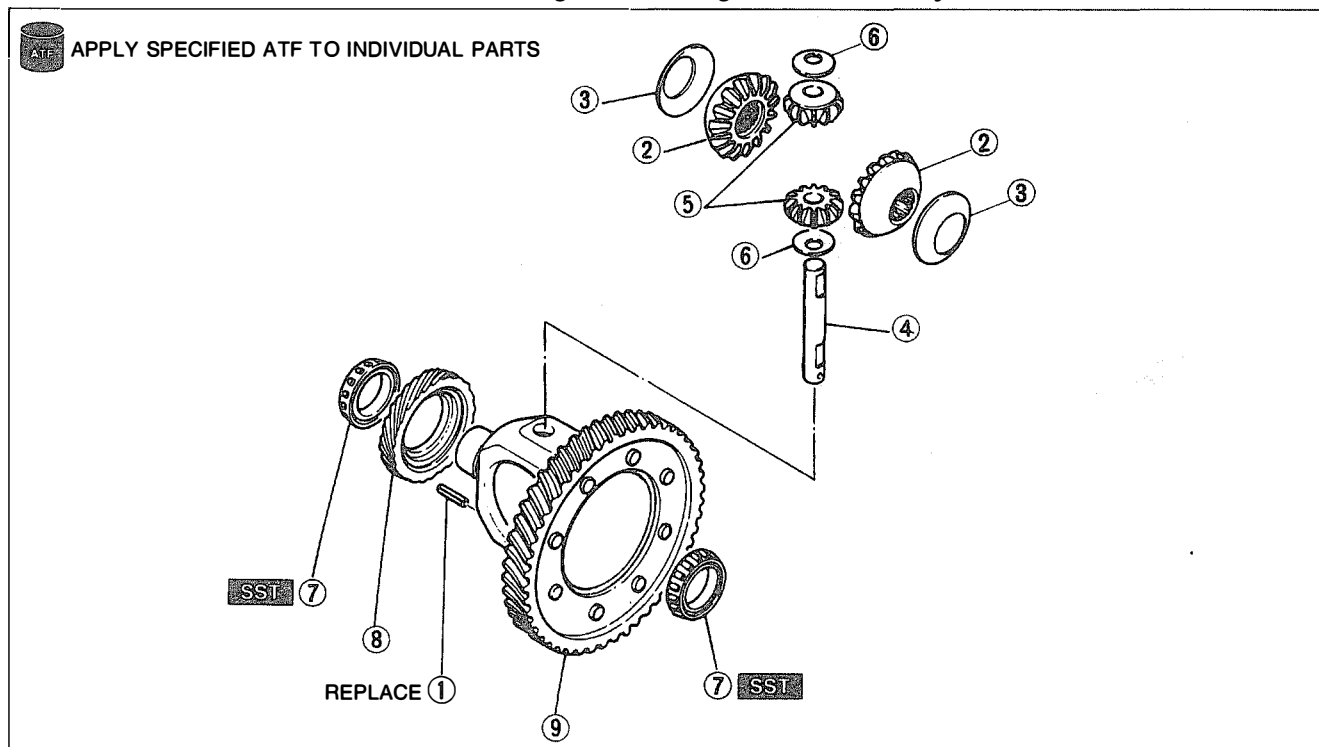
3. Adjust the throttle cable using the oil pressure test. (Refer to page K-48.)

### DIFFERENTIAL Preparation SST

<p>49 G017 1A0</p> <p>Remover set, bearing</p> 	<p>For removal of bearing inner race</p>	<p>49 B092 375</p> <p>Attachment J (Part of 49 G017 1A0)</p> 	<p>For removal of bearing inner race</p>
<p>49 F401 366A</p> <p>Plate (Part of 49 G017 1A0)</p> 	<p>For removal of bearing inner race</p>	<p>49 0839 425C</p> <p>Puller set, bearing</p> 	<p>For removal of bearing inner race</p>
<p>49 G030 338</p> <p>Attachment E</p> 	<p>For installation of bearing inner race</p>	06U0KX-177	

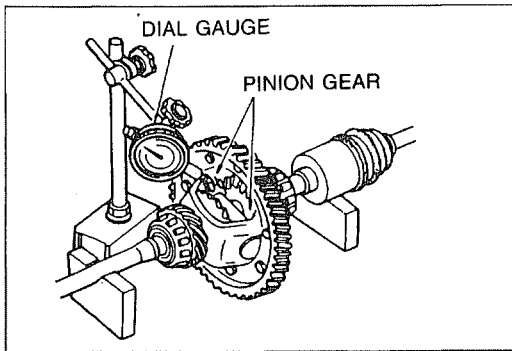
### Disassembly

1. Inspect the backlash of the side gears and pinion gears, referring to **Preinspection**.
2. Disassemble in the order shown in the figure, referring to **Disassembly Note**.



06U0KX-178

- |  |  |
|--|--|
| <p>1. Roll pin<br/>Removal ..... page K-113</p> <p>2. Side gear</p> <p>3. Side gear thrust washer</p> <p>4. Pinion shaft</p> <p>5. Pinion gear</p> | <p>6. Pinion gear thrust washer</p> <p>7. Side bearing inner race<br/>Removal ..... page K-113</p> <p>8. Speedometer drive gear</p> <p>9. Ring gear and gear case assembly</p> |
|--|--|



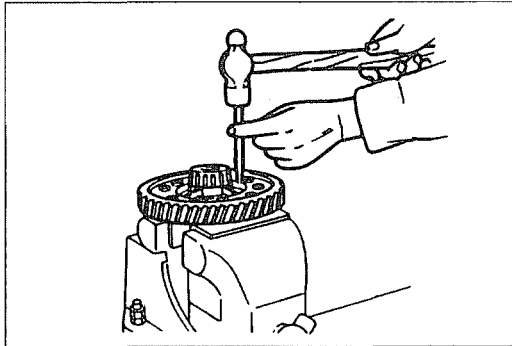
06U0KX-179

**Preinspection**

Measure the backlash of the side gears and pinion gears. If not within specification, replace the differential assembly.

**Backlash**

**Standard: 0.025—0.1mm (0.001—0.004 in)**  
**Maximum: 0.5mm (0.020 in)**



06U0KX-180

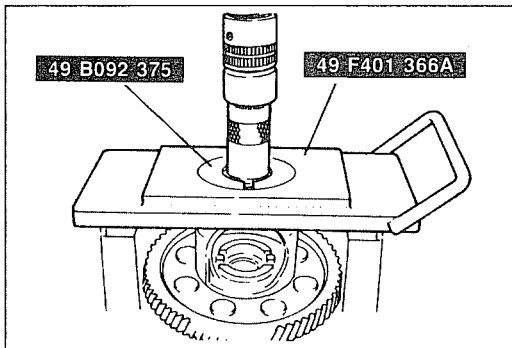
**Disassembly note**

**Roll pin**

For removing the roll pin from the pinion shaft, place the gear case on a vise and knock the pin out with a suitable pin punch ( $\phi 2.0\text{mm}$  (0.079 in)) and hammer.

**Note**

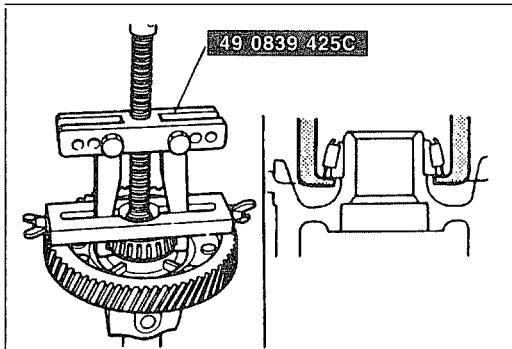
- Use protective plates to prevent damage to the differential.
- Insert the punch into the spring pin hole from the ring gear side.



86U07B-325

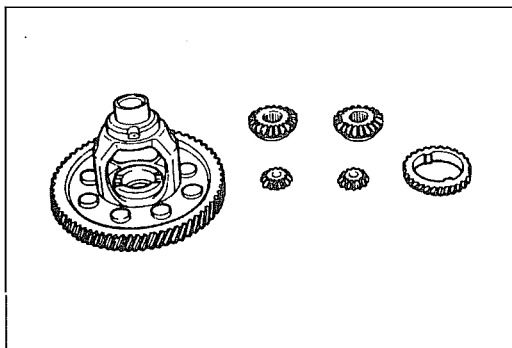
**Side bearing inner race**

1. Remove the side bearing inner race (side opposite the ring gear) from the gear case with the **SST**.



86U07B-326

2. Remove the side bearing inner race (ring gear side) with a combination of parts from the **SST**.

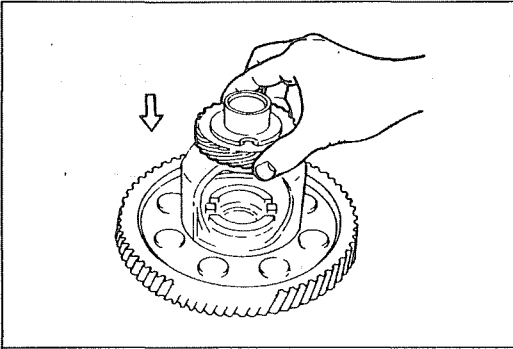


06U0KX-181

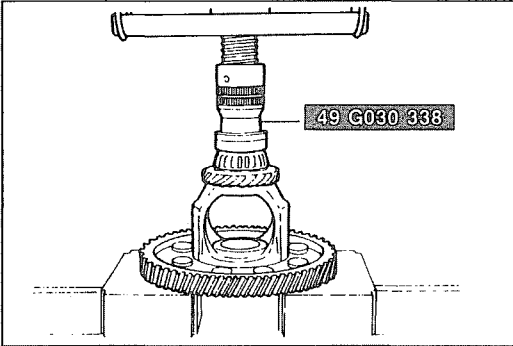
**Inspection**

Check the following and replace any faulty parts.

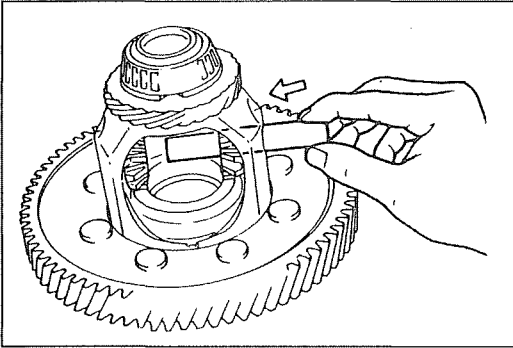
1. Damaged or worn gears.
2. Cracked or damaged gear case.



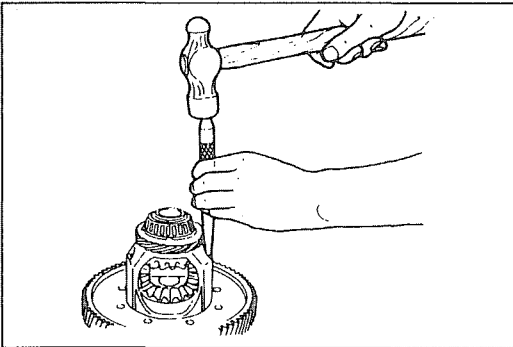
86U07B-328



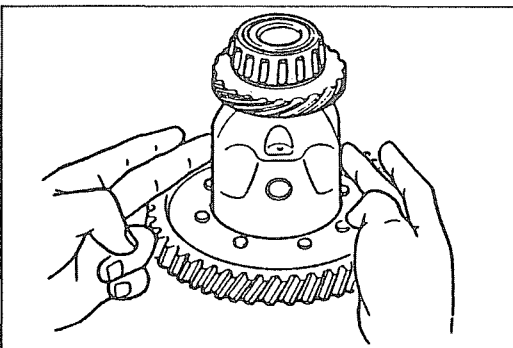
06U0KX-182



06U0KX-183



06U0KX-184



06U0KX-185

**Assembly**

1. Set the speedometer drive gear onto the ring gear and case assembly.

2. Install the side bearing inner races.

**Caution**

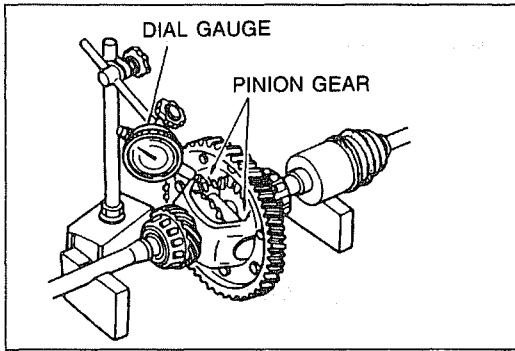
- Do not reuse the bearings if they were removed.

- (1) Press the side bearing inner race (side opposite ring gear) onto the ring gear and case assembly with the **SST**.
- (2) Press on the other side bearing inner race (ring gear side) in the same manner.

3. Install the pinion gears and thrust washers into the case.
4. Install the pinion shaft.

5. Install the roll pin, and make a crimp so that it will not come out of the gear case.

6. Install the thrust washers and side gears into the gear case at the same time, then turn them back on the pinion gear and align them with the pinion shaft hole.



06U0KX-186

7. Check the backlash of the side gears and pinion gears as follows:
  - (1) Install the left and right driveshafts in the differential assembly.
  - (2) Support the driveshafts on V-blocks.
  - (3) Measure the backlash of both pinion gears.

**Backlash**

**Standard: 0.025—0.1mm (0.001—0.004 in)**

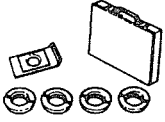
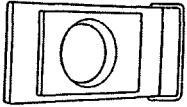
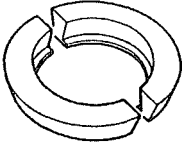
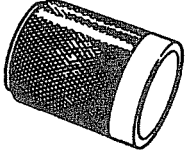
**Maximum: 0.5mm (0.020 in)**

8. If the backlash is not within specification, replace the differential assembly.

**OUTPUT GEAR**

**Preparation**

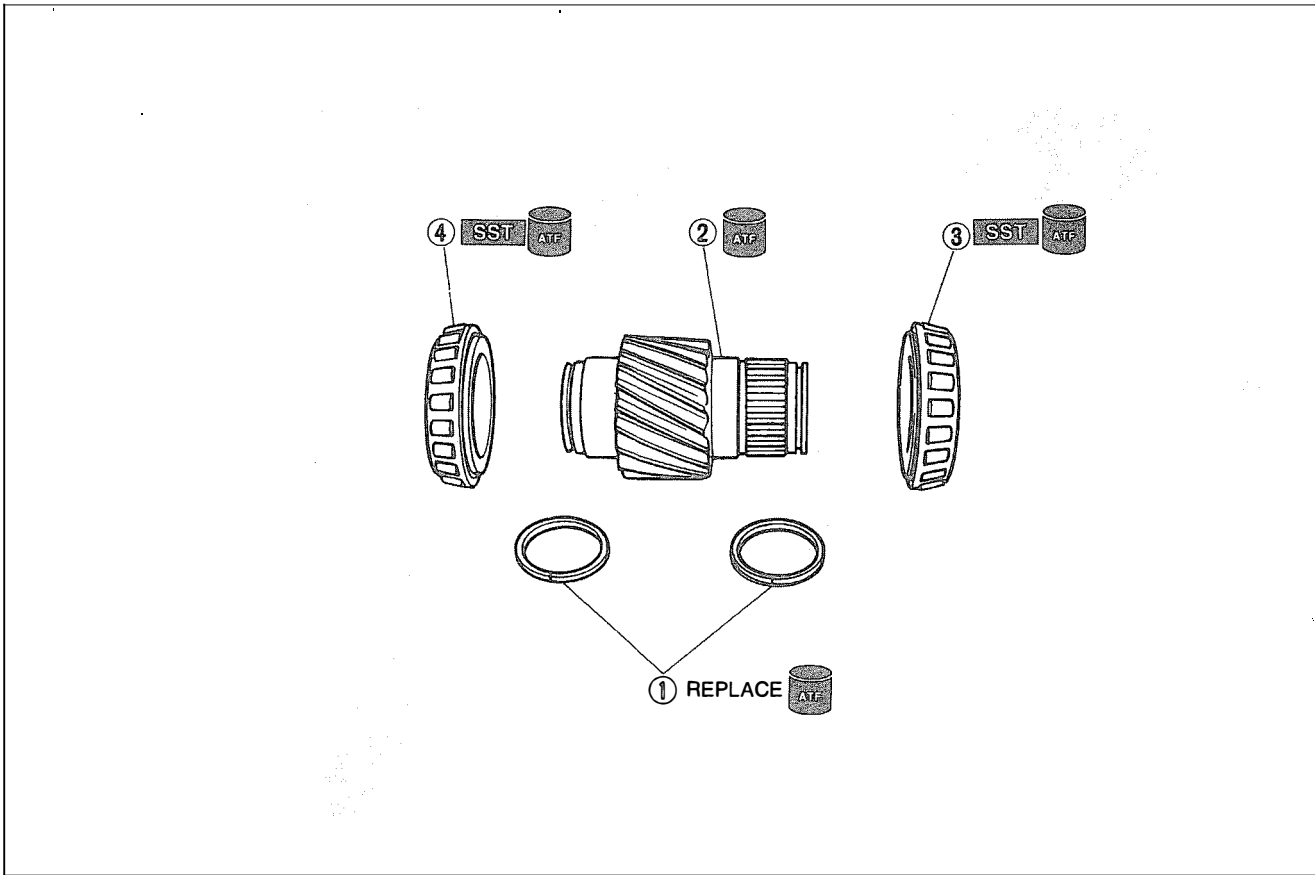
**SST**

<p>49 G017 1A0</p> <p>Remover set, bearing</p> 	<p>For removal of bearing inner race</p>	<p>49 F401 366A</p> <p>Plate (Part of 49 G017 1A0)</p> 	<p>For removal of bearing inner race</p>
<p>49 G019 022</p> <p>Attachment K</p> 	<p>For removal of bearing inner race</p>	<p>49 G019 011</p> <p>Installer, bearing</p> 	<p>For installation of bearing inner race</p>

06U0KX-187

**Disassembly**

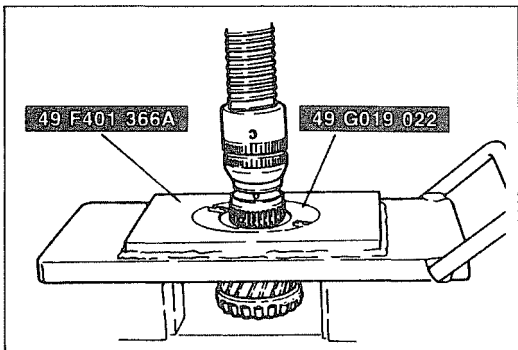
Disassemble in the order shown in the figure referring to **Disassembly Note**.



06U0KX-188

- 1. Seal ring
- 2. Output gear

- 3. Output gear bearing  
Removal ..... page K-116
- 4. Output gear bearing  
Removal ..... page K-116



86U07B-335

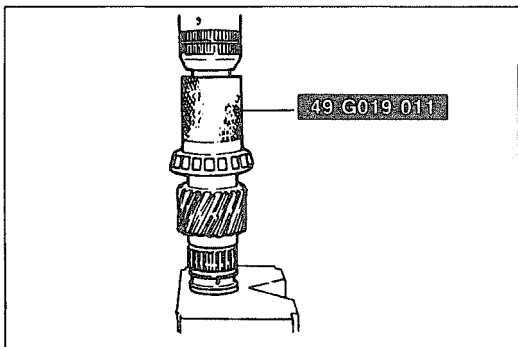
**Disassembly note**  
**Output gear bearings**

Remove the output gear bearings from the output gear with the **SST**.

**Inspection**

Check the following and replace any faulty parts.

- 1. Damaged or worn output gear.
- 2. Damaged bearing.



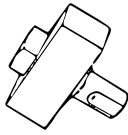
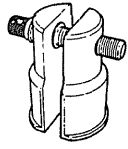


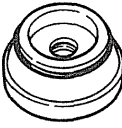
86U07B-336

**Assembly**

- 1. Press the output gear bearings onto the output gear with the **SST**.

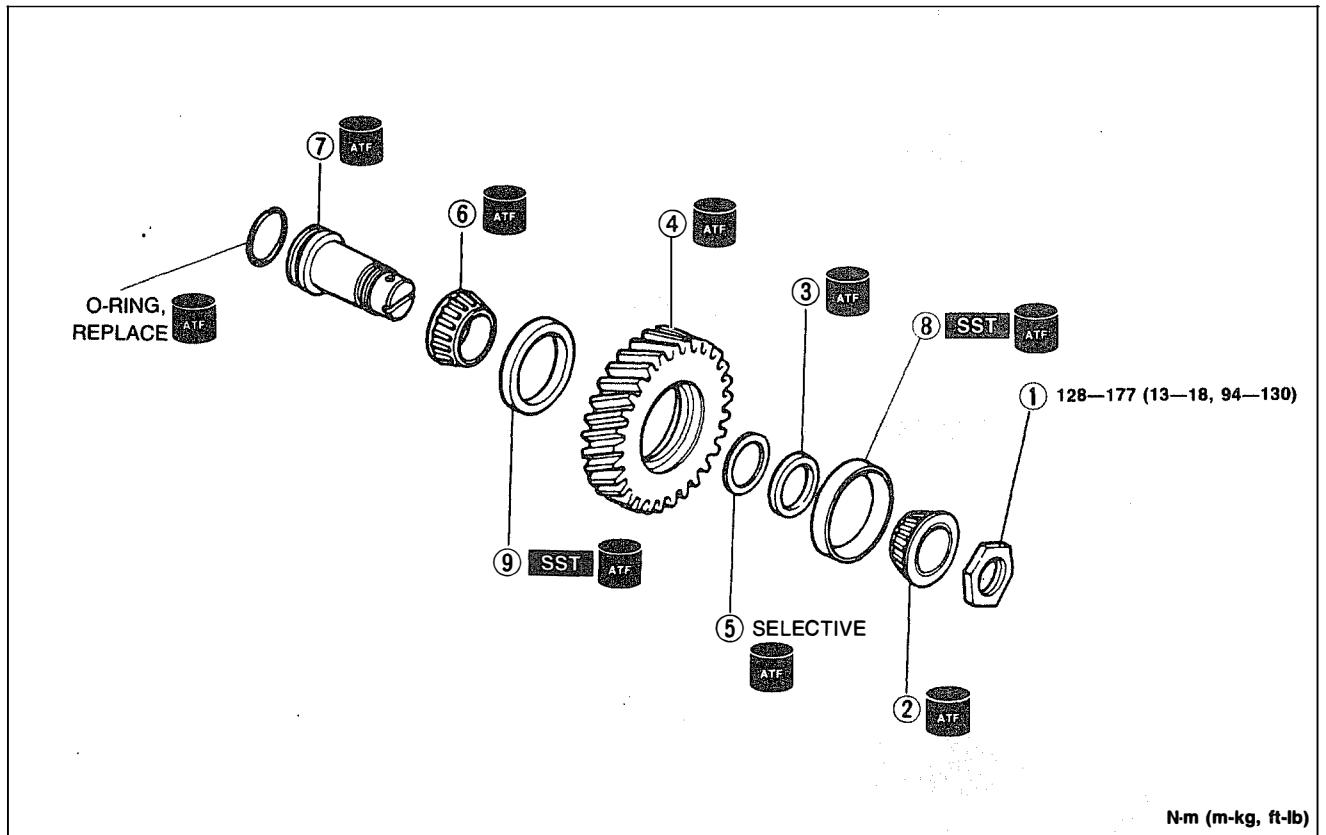


**IDLER GEAR  
Preparation  
SST**

<p>49 FT01 439 Holder, idle gear shaft</p> 	<p>For removal and installation of locknut</p>	<p>49 G019 013 Remover, bearing</p> 	<p>For removal of bearing outer race</p>
<p>49 F027 0A1 Installer set, bearing</p> 	<p>For installation of bearing outer race</p>	<p>49 0180 510B Attachment, steering worm bearing preload measuring</p> 	<p>For adjustment of bearing preload</p>
<p>49 F027 007 Attachment 72 (Part of 49 F027 0A1)</p> 	<p>For installation of bearing outer race</p>	<p>06U0KX-189</p>	

**Disassembly**

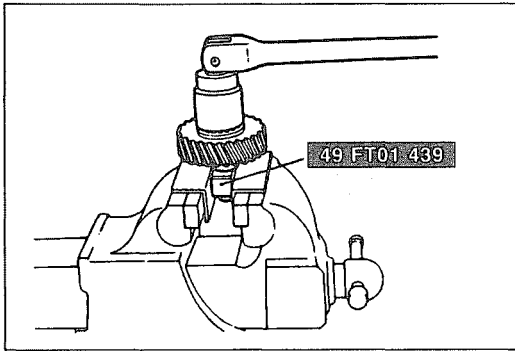
Disassemble in the order shown in the figure, referring to **Disassembly Note**.



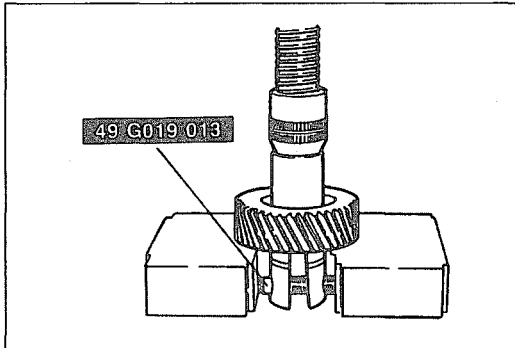
N-m (m-kg, ft-lb)

06U0KX-190

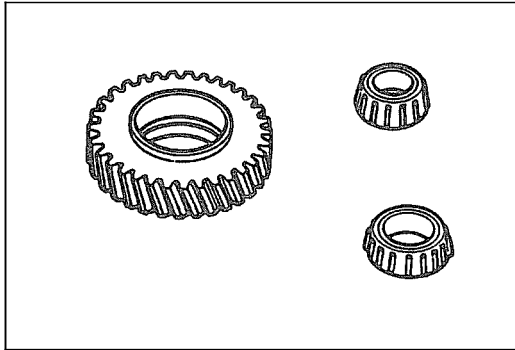
- |   |   |   |
|---|---|---|
| <p>1. Locknut<br/>Removal..... page K-118</p> <p>2. Idler gear bearing</p> <p>3. Spacer</p> | <p>4. Idler gear</p> <p>5. Adjustment shim</p> <p>6. Idler gear bearing</p> <p>7. Idler shaft</p> | <p>8. Bearing outer race<br/>Removal..... page K-118</p> <p>9. Bearing outer race<br/>Removal..... page K-118</p> |
|---|---|---|



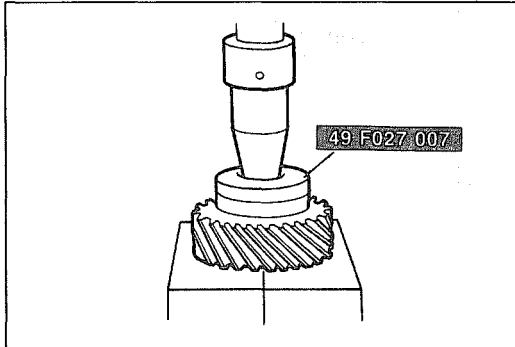
06U0KX-191



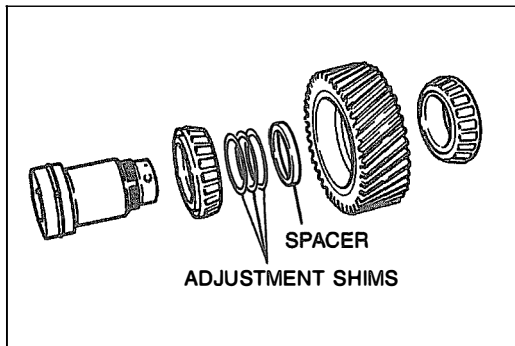
06U0KX-192



06U0KX-193



86U07B-341



06U0KX-194

**Disassembly note****Locknut**

Secure the idler shaft in a vise with the **SST**; then remove the locknut.

**Note**

- Use protective plates to prevent damage to the **SST**.

**Bearing outer race**

Remove the bearing outer race from the idler gear with the **SST**.

**Inspection**

Check the following and replace any faulty parts.

1. Damaged or worn idler gear.
2. Damaged or worn bearing.

**Assembly**

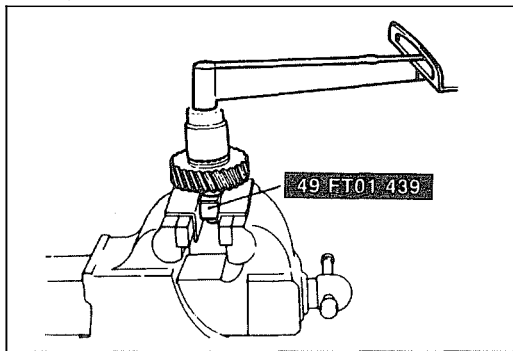
1. Press the bearing outer races in with the **SST**.

2. Install the idler gear bearing onto the idler shaft, then install the idler gear, adjustment shim, spacer, and bearing.
3. Secure the idler shaft in a vise with the **SST**; then tighten the locknut to the lower limit of the tightening torque.

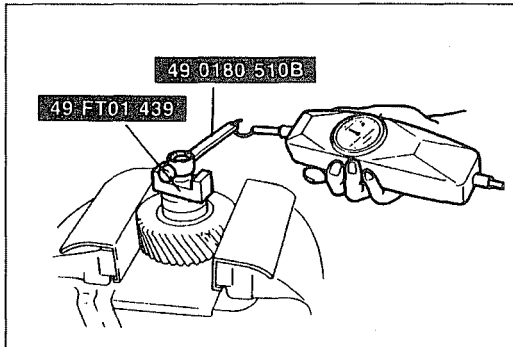
**Tightening torque: 128 N·m (13 m·kg, 94 ft·lb)**

**Note**

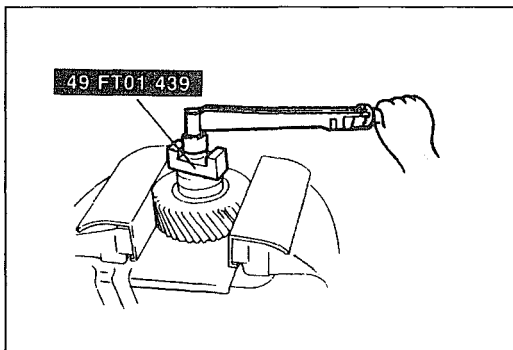
- Use protective plates to prevent damage to the **SST**.



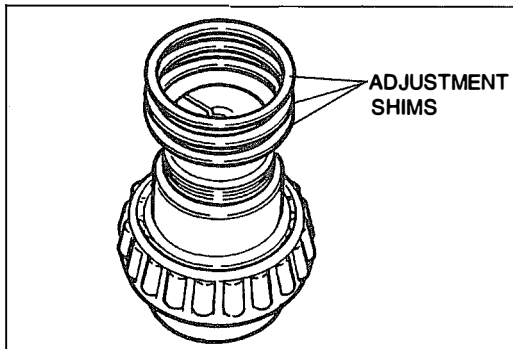
06U0KX-195



06U0KX-196



86U07B-345



06U0KX-197

4. Check and adjust the idle gear bearing preload.
  - (1) Turn the idler gear assembly and **SST** over, and secure the gear in the vice.

**Note**

- Use protective plates to prevent damage to the idle gear.

- (2) Attach the **SST** and spring scale or torque wrench, and measure the preload while tightening the locknut.

**Tightening torque:**

**128—177 N·m (13—18 m·kg, 94—130 ft·lb)**

**Preload:**

**0.03—0.9 N·m (0.3—9.0 cm·kg, 0.26—7.8 in·lb)**

**Value indicated on pull scale:**

**0.3—9 N (0.03—0.9 kg, 0.066—1.98 lb)**

**Note**

- Read the preload when the idler shaft starts to turn.

5. If the specified preload cannot be obtained within the specified tightening torque, adjust by selecting the proper adjustment shims.

Thickness of shim	
0.10mm (0.004 in)	0.16mm (0.0063 in)
0.12mm (0.005 in)	0.18mm (0.007 in)
0.14mm (0.006 in)	0.20mm (0.008 in)

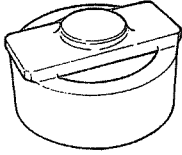
**Note**

- The maximum allowable number of shims is 7.
- Preload is reduced by increasing the thickness of the shims, or increased by reducing the thickness of the shims.

**BEARING COVER ASSEMBLY**

**Preparation**

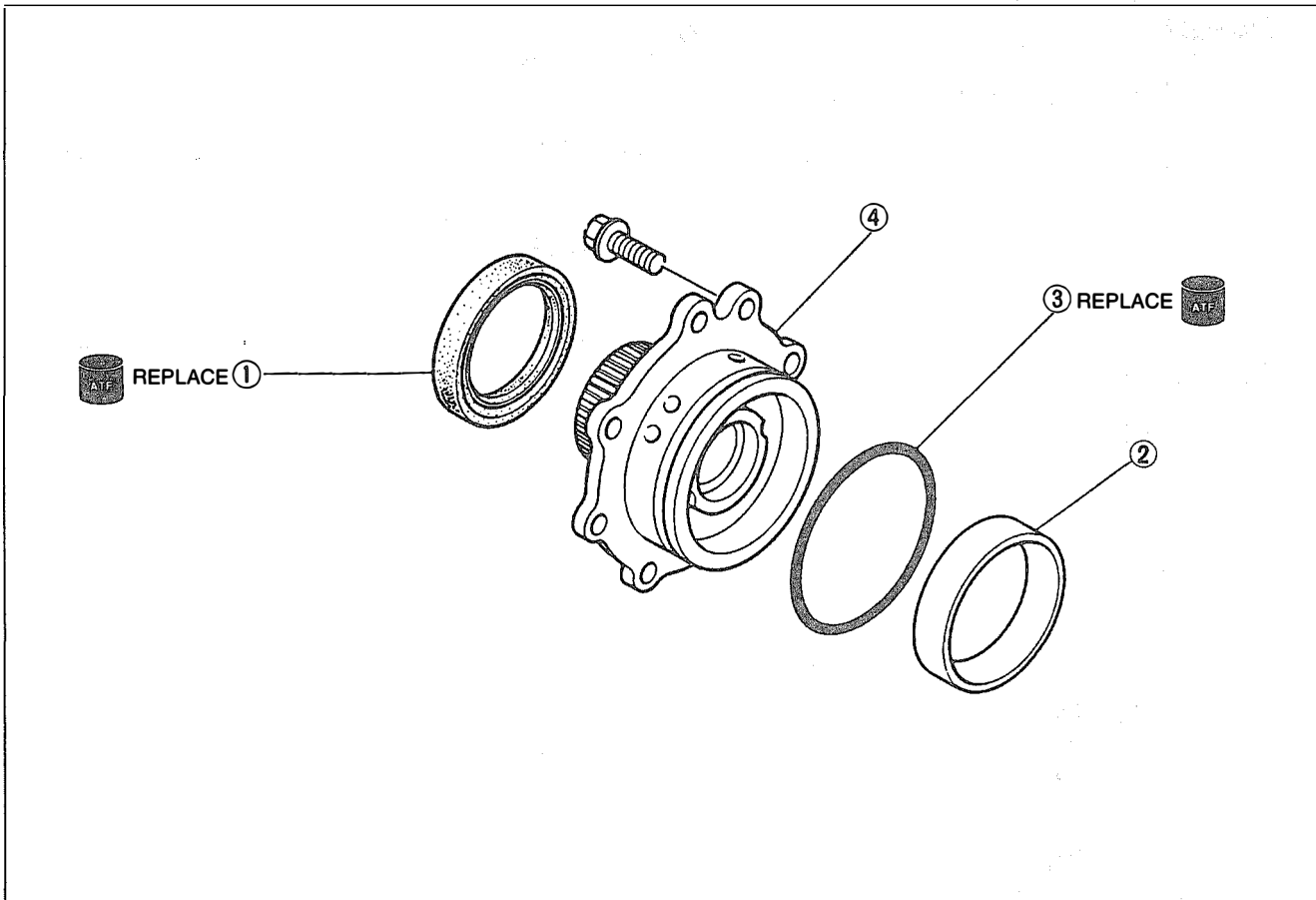
**SST**

<p>49 G019 017 Installer, oil seal</p>		<p>For installation of oil seal</p>
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06U0KX-198

**Disassembly**

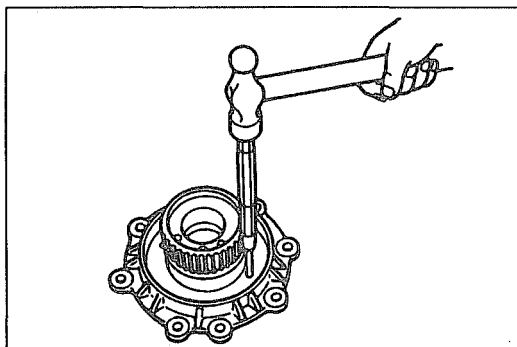
Disassemble in the order shown in the figure, referring to **Disassembly Note**.



06U0KX-199

- 1. Oil seal
- 2. Bearing outer race
- 3. O-ring
- 4. Bearing cover

Removal ..... page K-121



86U07B-348

**Disassembly note**

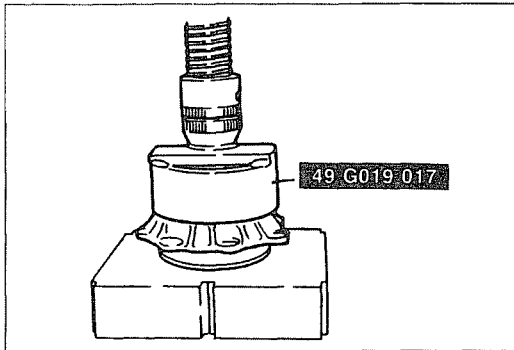
**Bearing outer race**

Remove the bearing outer race with a pin punch and hammer as shown.

**Inspection**

Check the following and replace any faulty parts.

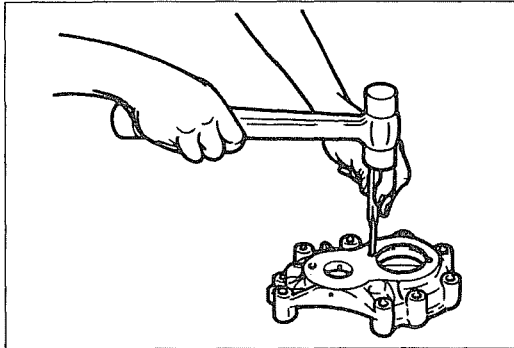
- 1. Damaged bearing cover.
- 2. Damaged or worn bushing.



86U07B-349

### Assembly

1. Press the bearing outer race into the cover.
2. Press the oil seal into the cover with the **SST**.



86U07B-350

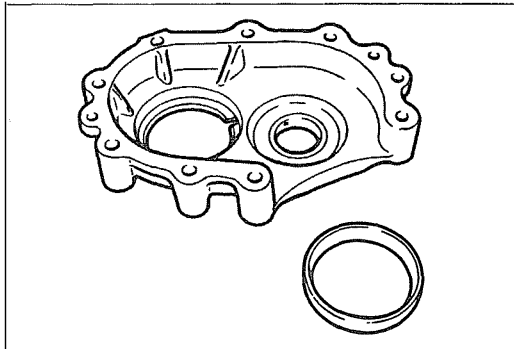
### BEARING HOUSING

#### Disassembly

Remove the bearing outer race with a pin punch and hammer.

#### Note

- Install the bearing outer race during reassembly of transaxle to adjust the preload.



86U07B-351

#### Inspection

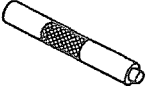
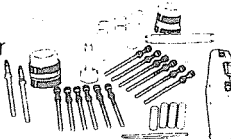



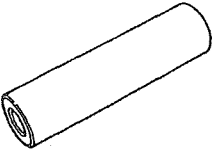






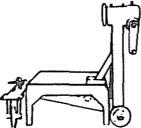
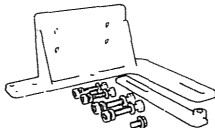
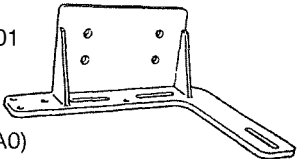
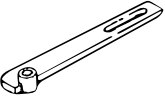
Check the following and replace any faulty parts.

1. Damaged bearing housing.
2. Damaged bearing outer race.

### TRANSAXLE UNIT (ASSEMBLY)

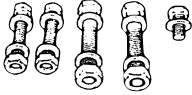
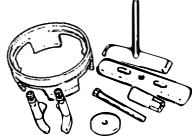

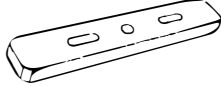

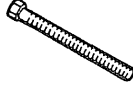
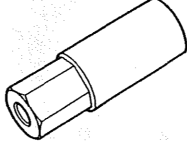
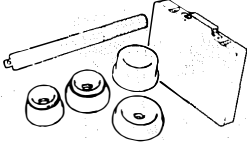
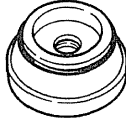
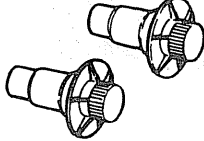
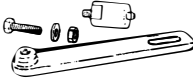

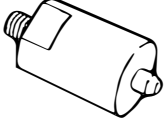
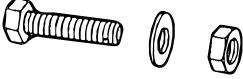
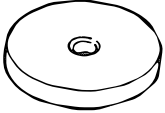
#### Preparation

#### SST

<p>49 G019 017 Installer, oil seal</p> 	<p>For assembly of bearing cover</p>	<p>49 G019 0A5A Set, shim selector</p> 	<p>For selecting adjustment shim</p>
<p>49 G019 018 Selector for <math>\phi 72</math> (Part of 49 G019 0A5A)</p> 	<p>For selecting adjustment shim</p>	<p>49 G030 381 Selector for <math>\phi 68</math> (Part of 49 G019 0A5A)</p> 	<p>For selecting adjustment shim</p>
<p>49 FT01 384 Collar (Part of 49 G019 0A5A)</p> 	<p>For selecting adjustment shim</p>	<p>49 F401 384 Collar (Part of 49 G019 0A5A)</p> 	<p>For selecting adjustment shim</p>
<p>49 F401 385 Bar (Part of 49 G019 0A5A)</p> 	<p>For selecting adjustment shim</p>	<p>49 G019 019 Bolt set (Part of 49 G019 0A5A)</p> 	<p>For selecting adjustment shim</p>
<p>49 G019 021 Bolt set (Part of 49 G019 0A5A)</p> 	<p>For selecting adjustment shim</p>	<p>49 FT01 515A Adaptor, preload (Part of 49 G019 0A5A)</p> 	<p>For selecting adjustment shim</p>
<p>49 D019 001 Bolt (Part of 49 G019 0A5A)</p> 	<p>For selecting adjustment shim</p>	<p>49 0180 510B Attachment, steering worm bearing preload measuring</p> 	<p>For selecting adjustment shim</p>
<p>49 0107 680A Engine stand</p> 	<p>For assembly of transaxle</p>	<p>49 G019 0A0 Hanger, transaxle</p> 	<p>For assembly of transaxle</p>
<p>49 G019 001 Body (Part of 49 G019 0A0)</p> 	<p>For assembly of transaxle</p>	<p>49 G019 002 Stay (Part of 49 G019 0A0)</p> 	<p>For assembly of transaxle</p>

# TRANSAXLE

# K

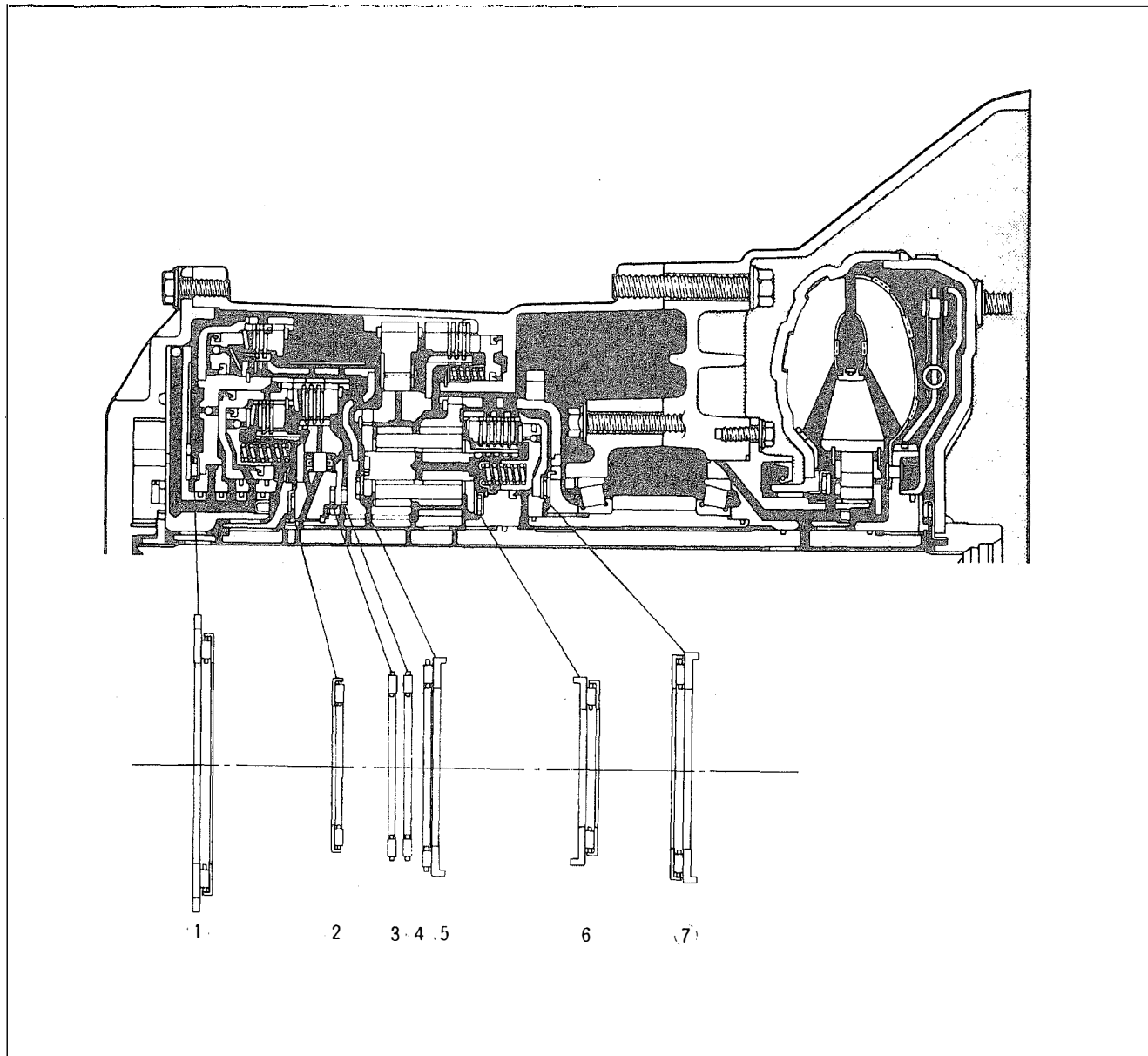
<p>49 G019 003</p> <p>Bolt set (Part of 49 G019 0A0)</p> 	<p>For assembly of transaxle</p>	<p>49 G019 0A7A</p> <p>Compressor set, return spring</p> 	<p>For assembly of low and reverse brake piston</p>
<p>49 G019 024</p> <p>Body A (Part of 49 G019 0A7A)</p> 	<p>For assembly of low and reverse brake piston</p>	<p>49 G019 026</p> <p>Plate (Part of 49 G019 0A7A)</p> 	<p>For assembly of low and reverse brake piston</p>
<p>49 G019 027</p> <p>Attachment A (Part of 49 G019 0A7A)</p> 	<p>For assembly of low and reverse brake piston</p>	<p>49 G019 028</p> <p>Bolt (Part of 49 G019 0A7A)</p> 	<p>For assembly of servo piston</p>
<p>49 G019 029</p> <p>Nut (Part of 49 G019 0A7A)</p> 	<p>For assembly of low and reverse brake piston</p>	<p>49 F027 0A1</p> <p>Installer set, bearing</p> 	<p>For assembly of bearing</p>
<p>49 F027 007</p> <p>Attachment 72 (Part of 49 F027 0A1)</p> 	<p>For assembly of bearing outer race</p>	<p>49 G030 455</p> <p>Holder, diff. side gear</p> 	<p>For holding diff. side gear</p>
<p>49 G019 0A2</p> <p>Holder, turbine shaft</p> 	<p>For holding turbine shaft</p>	<p>49 G019 014</p> <p>Stay (Part of 49 G019 0A2)</p> 	<p>For holding turbine shaft</p>
<p>49 G019 015</p> <p>Adaptor (Part of 49 G019 0A2)</p> 	<p>For holding turbine shaft</p>	<p>49 G019 016</p> <p>Bolt (Part of 49 G019 0A2)</p> 	<p>For holding turbine shaft</p>
<p>49 G019 030</p> <p>Plate (Part of 49 G019 0A7A)</p> 	<p>For assembly of servo</p>	<p>06U0KX-200</p>	

### Precaution

1. If the drive plates or brake bands are replaced with new ones, soak them in ATF for at least two hours before installation.
2. Before assembly, apply ATF to all seal rings, rotating parts, O-rings, and sliding parts.
3. All O-rings, seals, and gaskets must be replaced with the new ones provided in the overhaul kit.
4. Use petroleum jelly, not grease, during reassembly.
5. When it is necessary to replace a bushing, replace the subassembly that includes that bushing.
6. Assemble the housing within 10 minutes after applying sealant, and allow it to cure at least 30 minutes after assembly before filling the transmission with ATF.

06U0KX-201

### Thrust Washer, Bearing, and Race Locations



86U07B-380

### Outer diameter of bearing and race

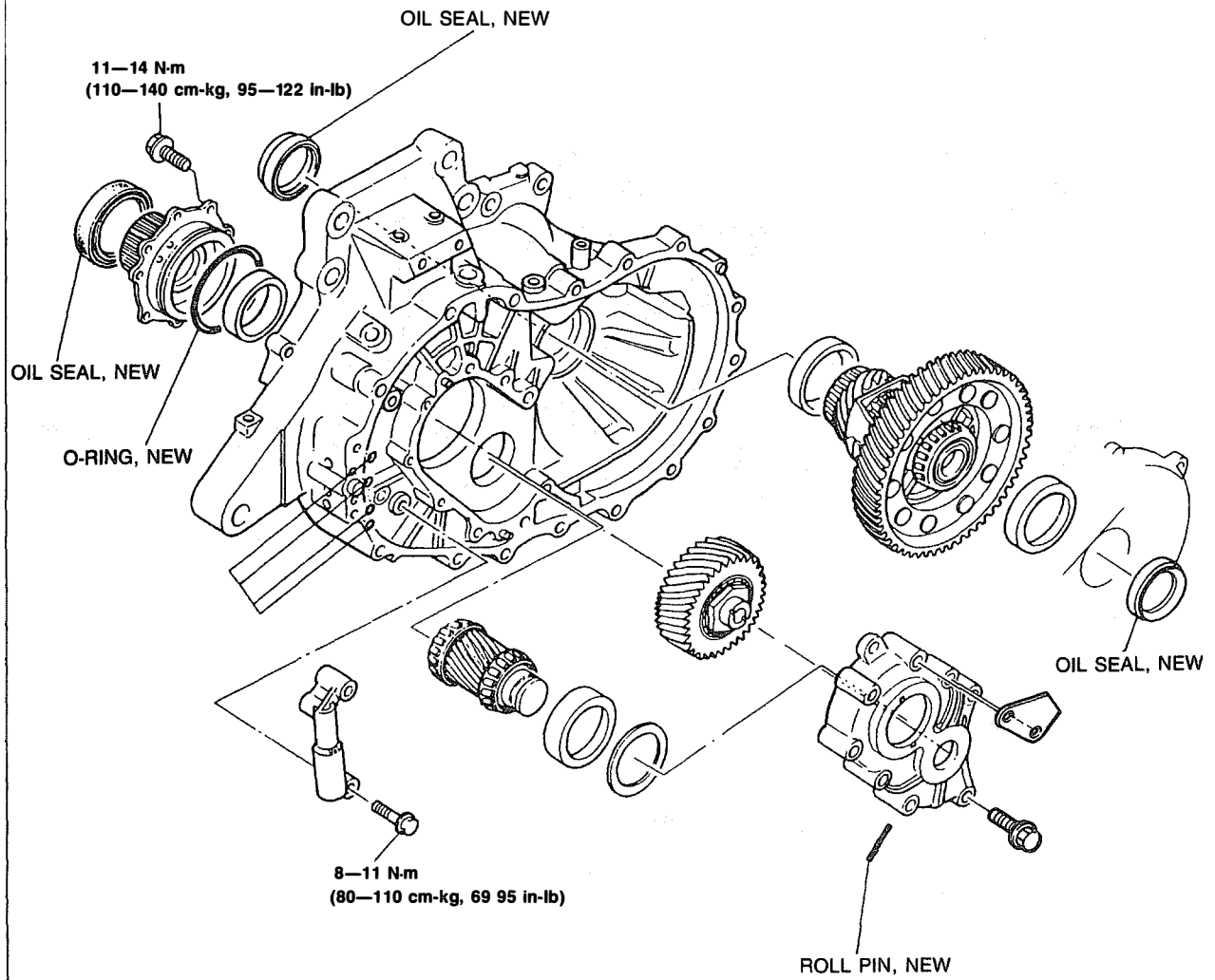
mm (in)

	1	2	3	4	5	6	7
Bearing	86.0 (3.39)	56.1 (2.21)	62.1 (2.44)	62.1 (2.44)	72.0 (2.83)	56.1 (2.21)	72.1 (2.84)
Race	88.0 (3.46)	—	—	—	72.0 (2.83)	57.0 (2.21)	72.0 (2.83)

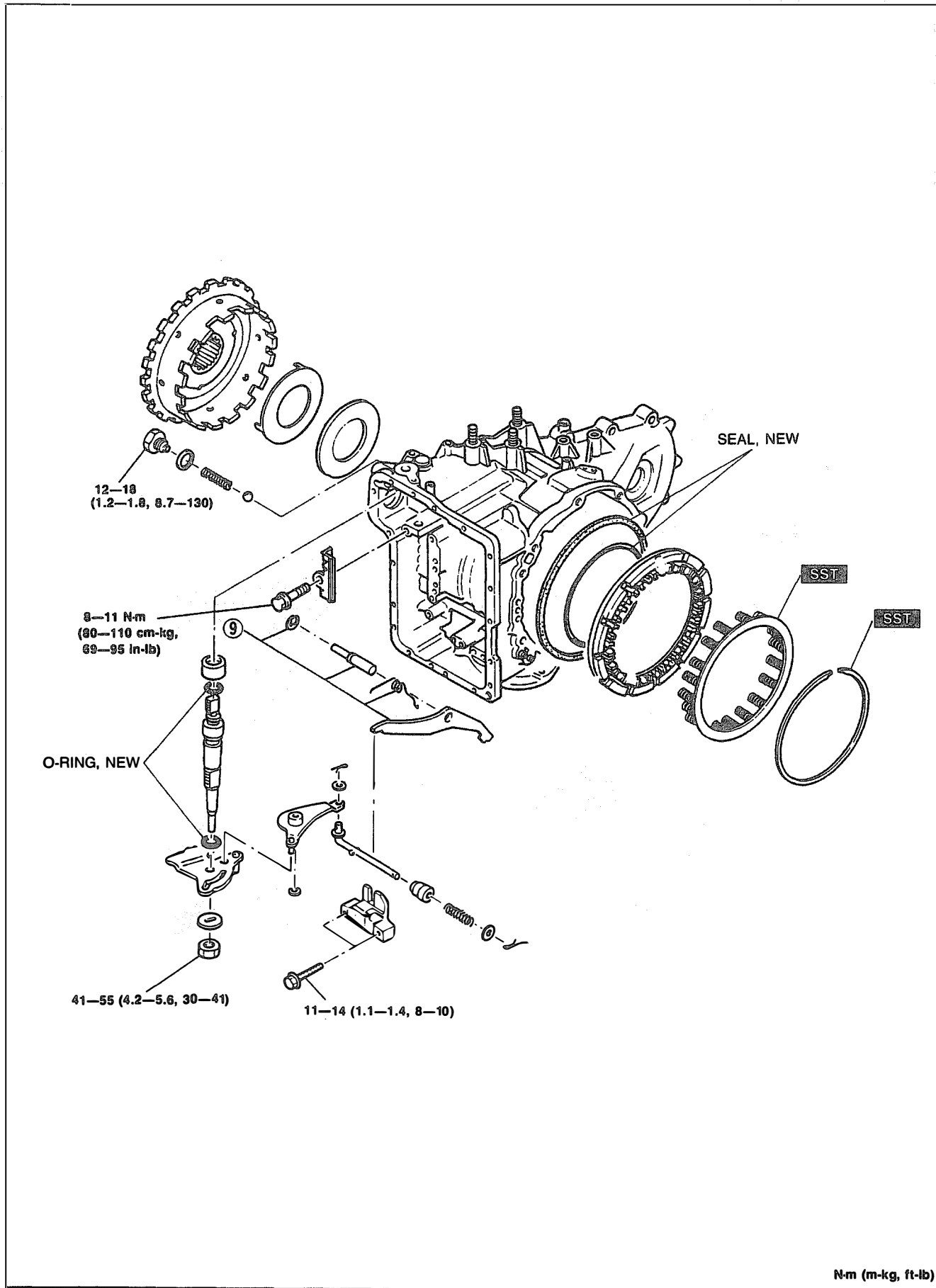
**Note:** Install with petroleum jelly to prevent the thrust bearing or bearing race from falling out.



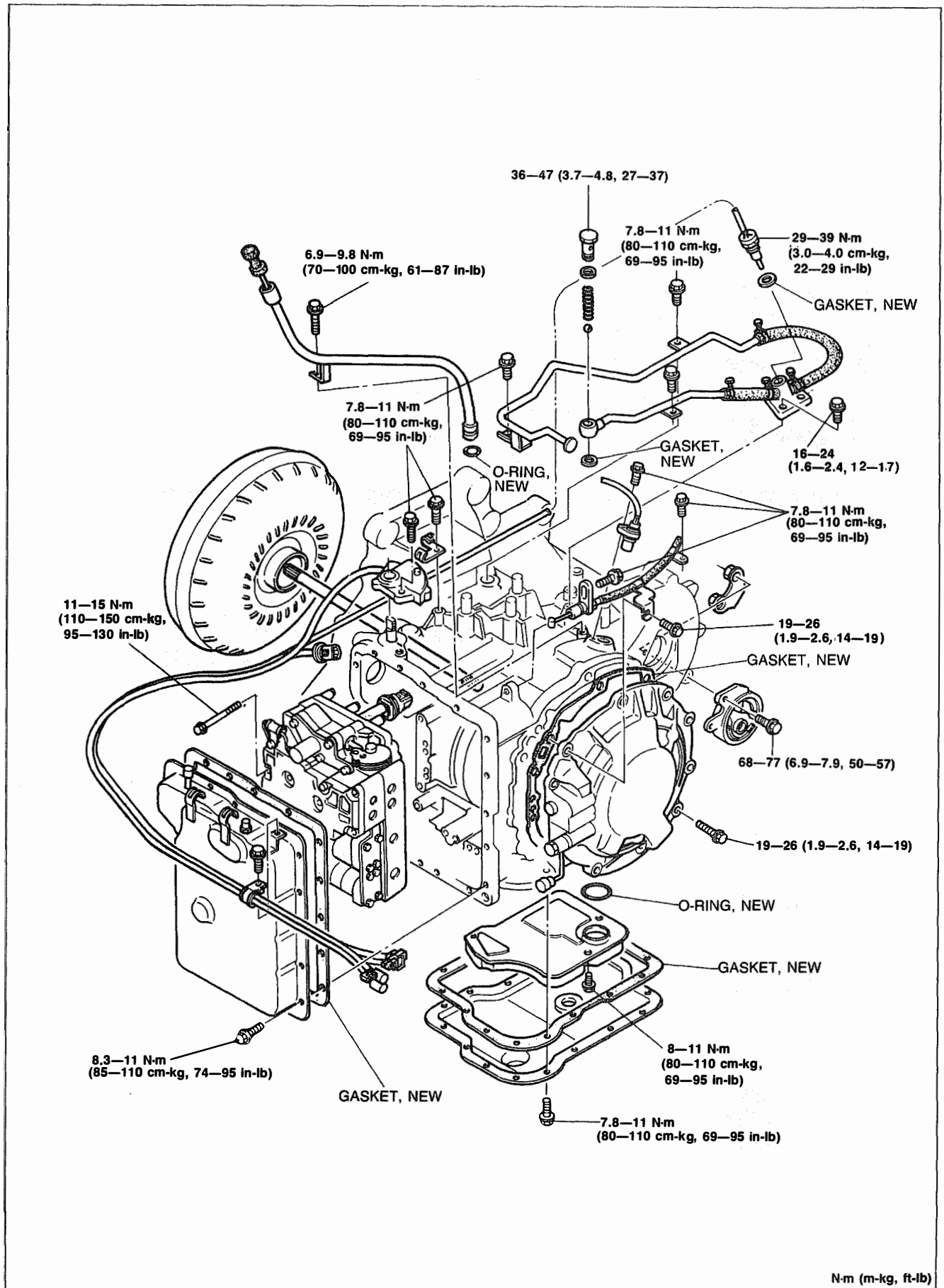
Torque specifications



Torque specifications (Cont'd)



## Torque specifications (Cont'd)

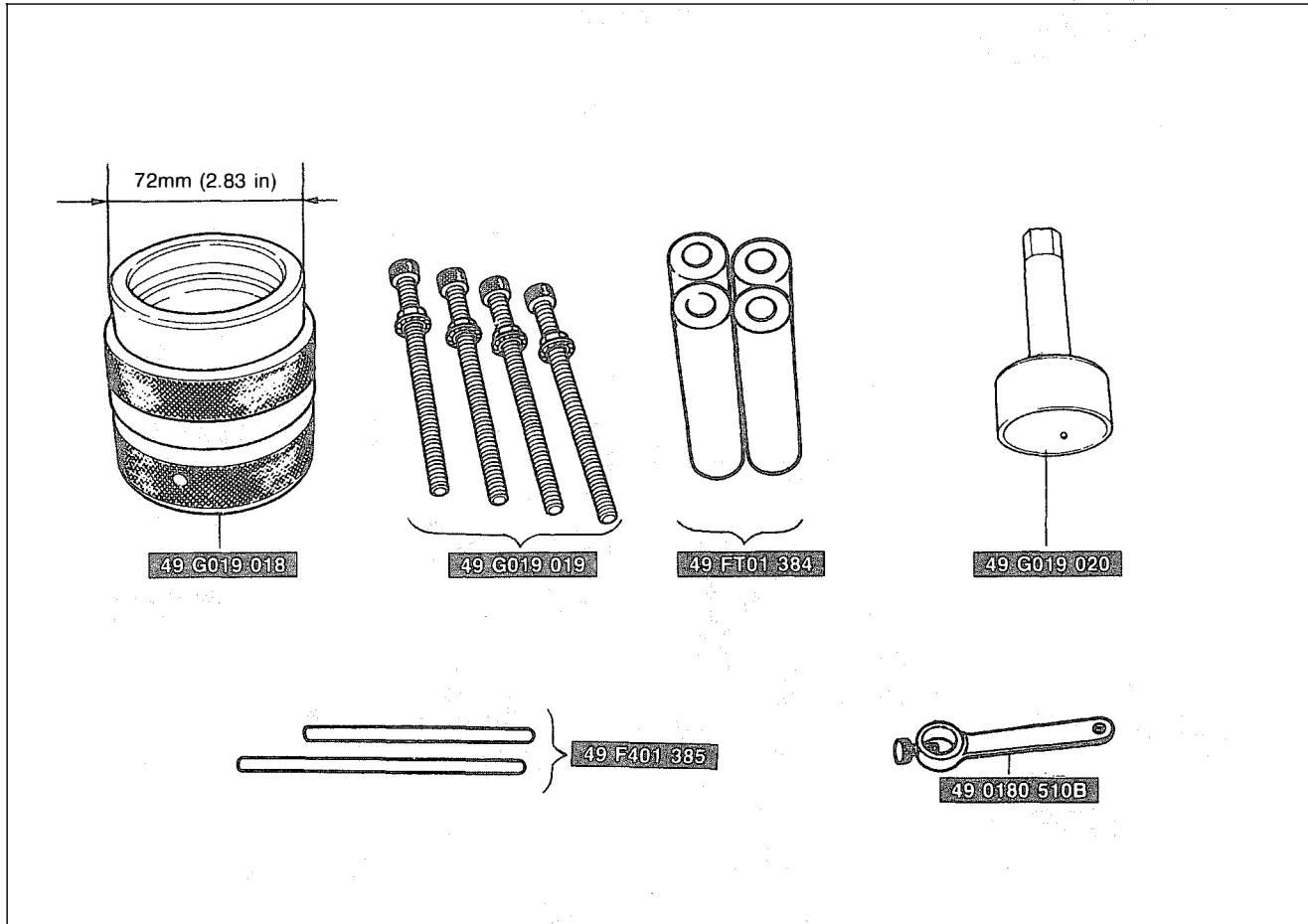


**Procedure**

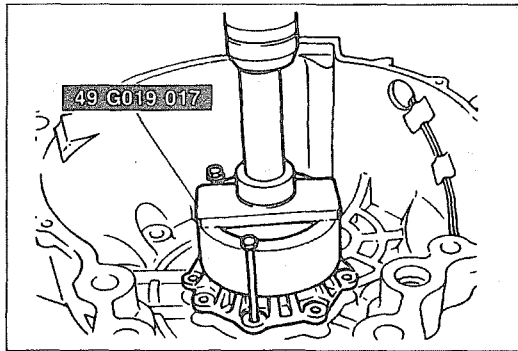
1. Adjust the preload at the output gear bearing and select the adjust shim(s) as described below.

**Note**

- To adjust the preload, use the SST shown below.



86U07B-353

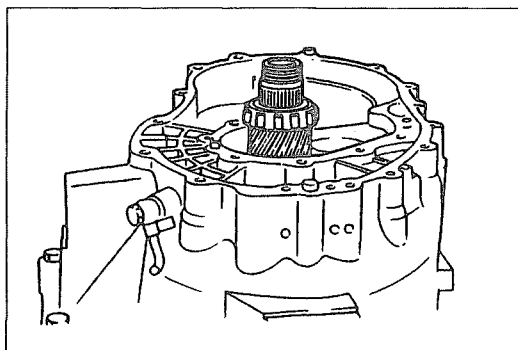


86U07B-354

- (1) Press the bearing cover in after aligning it with guide bolts as shown.

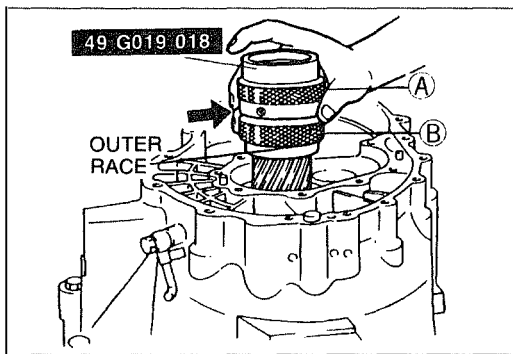
**Tightening torque:**

11–14 N·m (110–140 cm·kg, 95–122 in·lb)

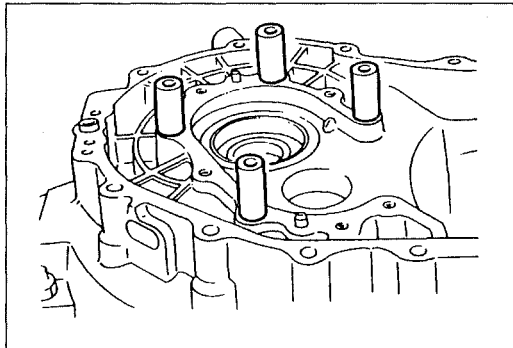


06U0KX-205

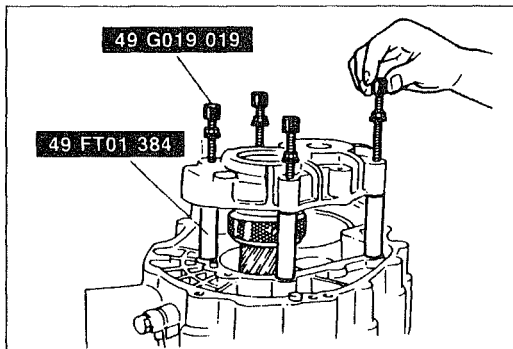
- (2) Install the converter housing onto the transaxle hanger.
- (3) Remove the bearing outer race and adjustment shims from the bearing housing. (Refer to page K-121.)
- (4) Set the output gear assembly into the converter housing.



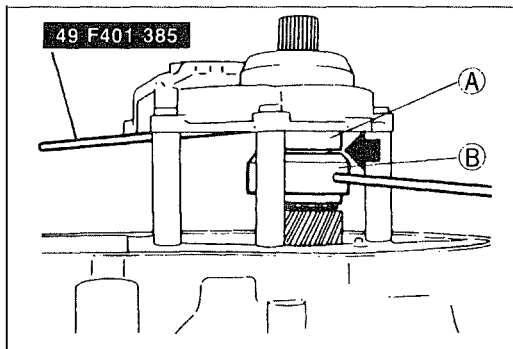
06U0KX-206



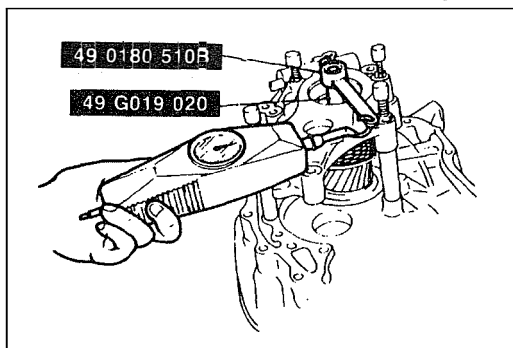
76G07B-723



06U0KX-207



76G07B-725



06U0KX-208

(5) Install the outer race removed in Step (3) to the **SST**; then mount them on the output gear assembly.

**Caution**

- Eliminate the gap (arrow) by turning **A** or **B** of the selector.

(6) Set the four **SST** on the converter housing in the positions shown.

(7) Set the bearing housing on the **SST** (selector) and install the four **SST** (bolts); then tighten them to the specified torque.

**Tightening torque:**

19—26 N·m (1.9—2.6 m·kg, 14—18 ft·lb)

(8) Turn the **SST** (selector) to increase the clearance indicated by the arrow with the **SST** (bars) until it no longer turns.

**Note**

- This is to seat the bearing.

(9) Turn the selector in the opposite direction until the preload is eliminated (gap is reduced).

(10) Mount the **SST** and pull scale or torque wrench on the output gear.

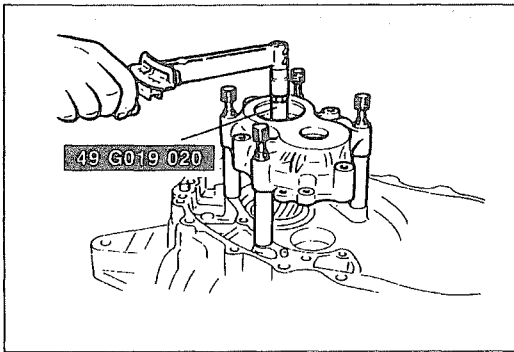
(11) Increase the clearance between **A** and **B** to obtain the specified preload/pull scale reading.

**Preload:**

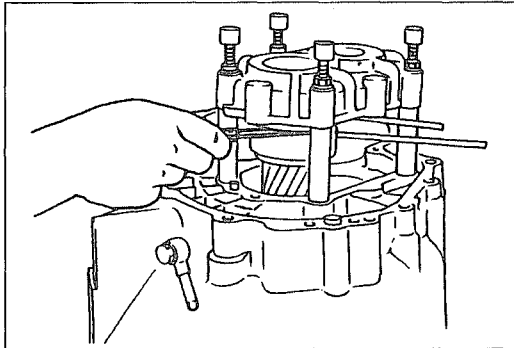
0.5—0.9 N·m (5.0—9.0 cm·kg, 4.5—7 in·lb)

**Reading on pull scale:**

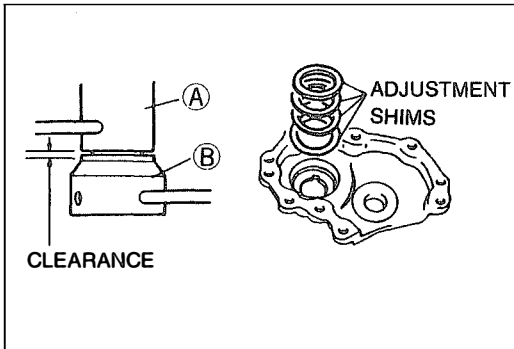
5—9 N (0.5—0.9 kg, 1.1—1.98 lb)



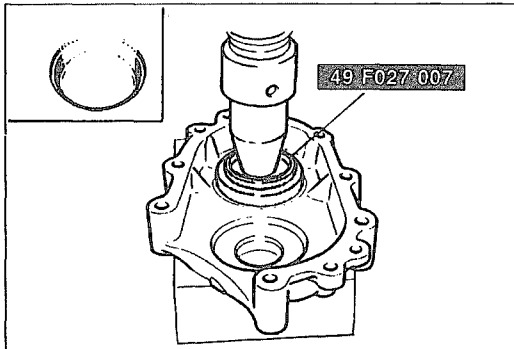
86U07B-361



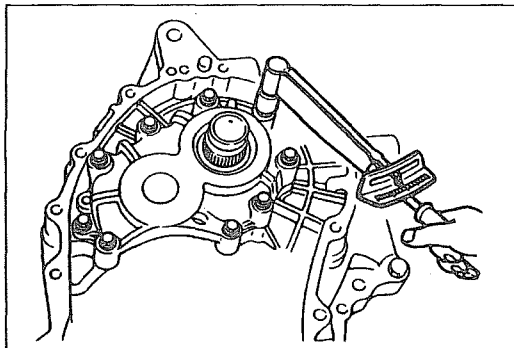
06U0KX-209



06U0KX-210



76G07B-728



06U0KX-211

**Note**

- Read the preload when the output gear starts to turn.

- (12) Measure the clearance. Select adjustment shim(s) equivalent to the measured clearance.

**Caution**

- Measure the clearance around the entire circumference, and select shims equivalent to the maximum clearance.
- The maximum allowable number of shims is 7.

Thickness of shim	
0.10mm (0.004 in)	0.18mm (0.007 in)
0.12mm (0.005 in)	0.20mm (0.008 in)
0.14mm (0.006 in)	0.50mm (0.020 in)
0.16mm (0.0063 in)	

- (13) Remove the bearing housing and **SST**.  
 (14) Install the required shim(s) and press the bearing race into the bearing housing with the **SST**.

- (15) Install the bearing housing.

**Tightening torque:**

**19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

- (16) Check that the preload/pull scale reading is within specification. If not within specification return to Step (3).

**Preload:**

**0.03—0.9 N·m (0.3—9.0 cm·kg, 0.26—7.81 in·lb)**

**Reading on pull scale:**

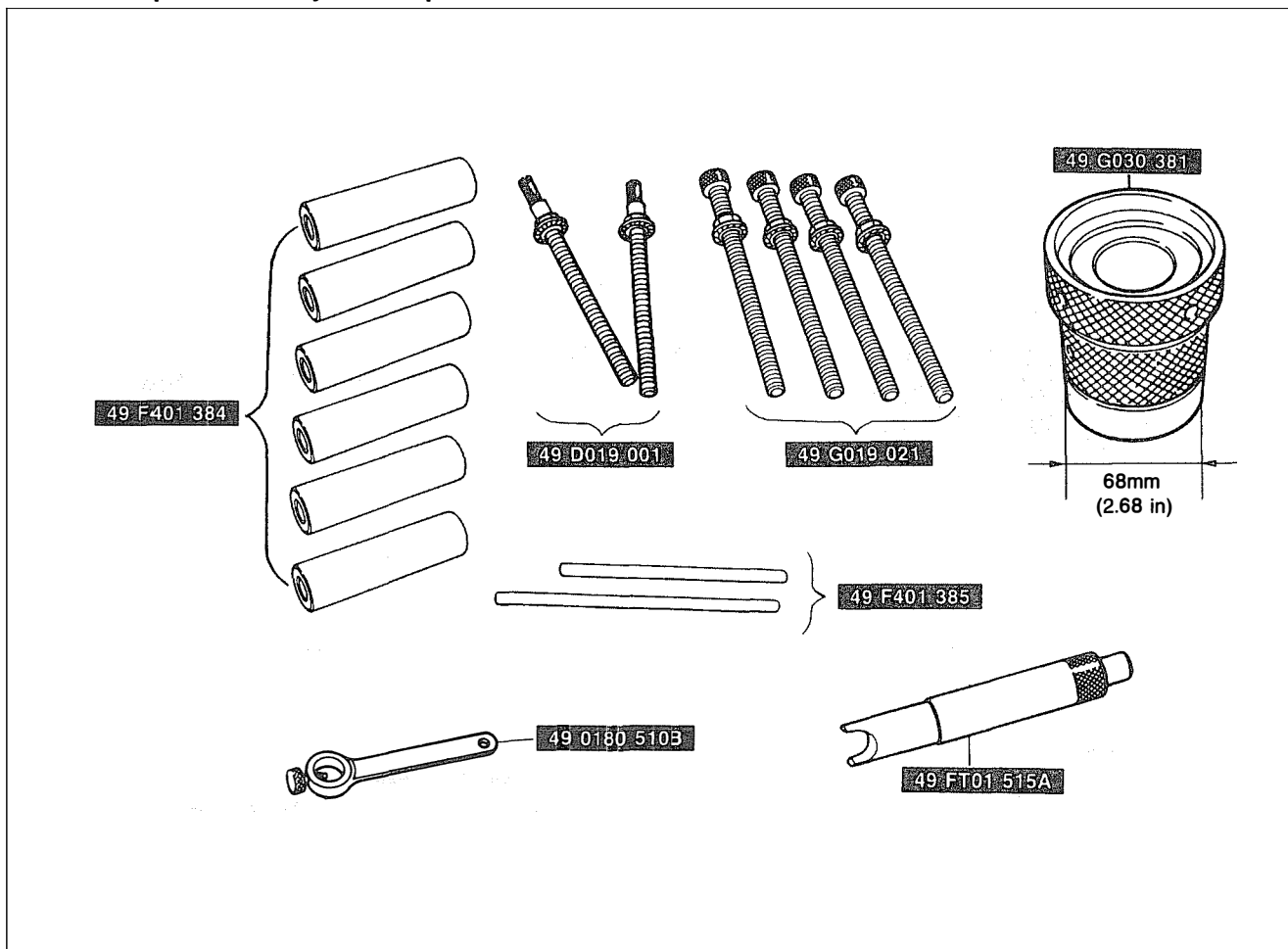
**0.3—9 N (0.03—0.9 kg, 0.066—1.98 lb)**

- (17) Remove the bearing housing and output gear assembly.

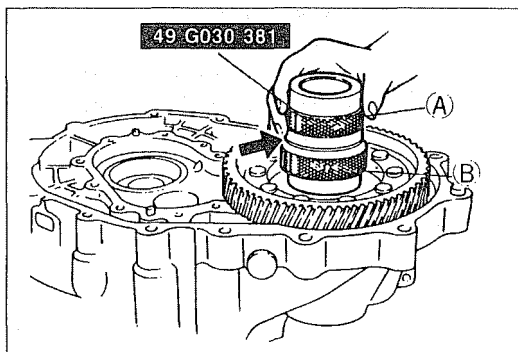
2. Adjust the differential side bearing preload and select the adjustment shim(s) as described below.

**Note**

- To inspect and adjust the preload, use the SST shown below.



06U0KX-212

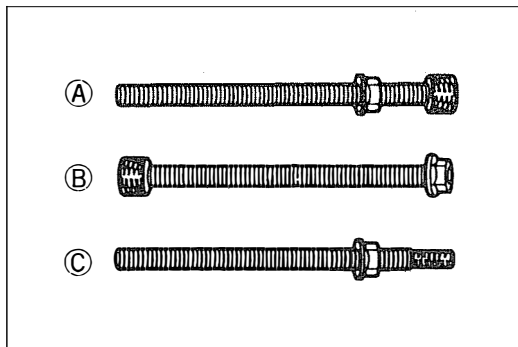


06U0KX-213

- (1) Remove the bearing outer race and adjustment shims from the transaxle case. (Refer to page K-69.)
- (2) Set the differential assembly into the converter housing.
- (3) Install the outer race removed in Step (1) into the SST; then set them on the differential assembly.

**Caution**

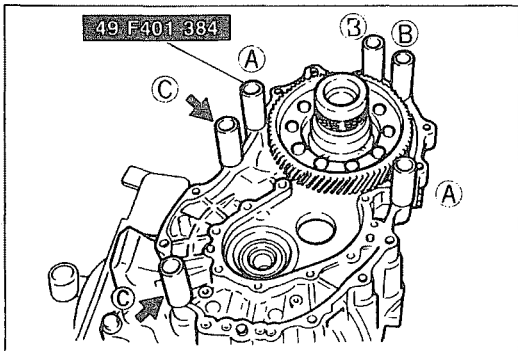
- Eliminate the gap by turning either A or B of the selector.



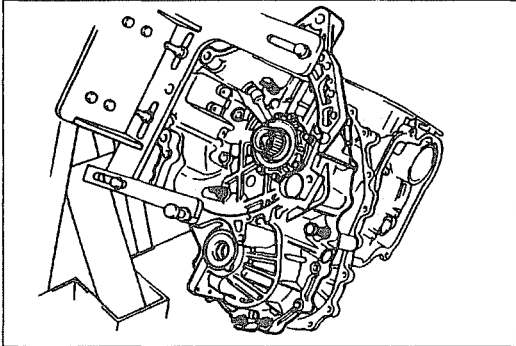
06U0KX-214

**Note**

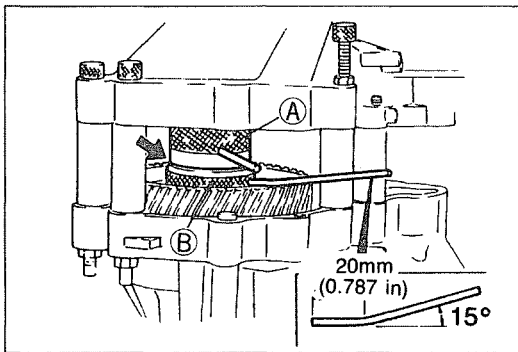
- Install the bolts in the positions shown in the illustration on the next page.



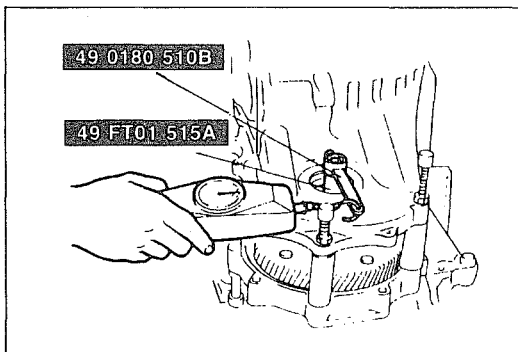
86U07B-368



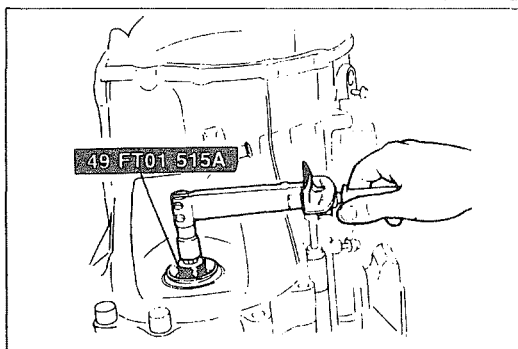
86U07B-370



86U07B-371



86U07B-372



86U07B-373

(4) Set the six **SST** in the positions shown.

(5) Set the transaxle case on the selectors.  
 (6) Tighten the **SST** (bolts) to the specified torque.

**Tightening torque:**

**36—52 N·m (3.7—5.3 m·kg, 27—38 ft·lb)**

(7) Turn the **SST** (selector) to increase the clearance indicated by the arrow with the **SST** (bars), until it no longer turns.

**Note**

- This is to seat the bearings.
- To turn the **SST** (B), bend the bar as shown.

(8) Turn the selector in the opposite direction until the preload is eliminated (gap is reduced).

(9) Insert the **SST** through the oil seal hole of the transaxle case and attach it to the pinion shaft.

(10) Mount the **SST** and pull scale or torque wrench.

(11) Widen the clearance between A and B to obtain the specified preload/pull scale reading.

**Preload: 0.5 N·m (5 cm·kg, 4.3 in·lb)**

**Reading on pull scale: 5 N (0.5 kg, 1.1 lb)**

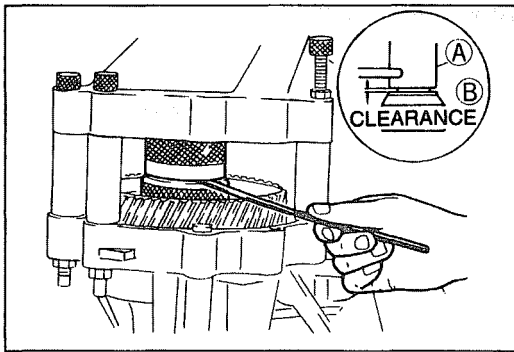
**Note**

- Read the preload when the differential starts to turn.

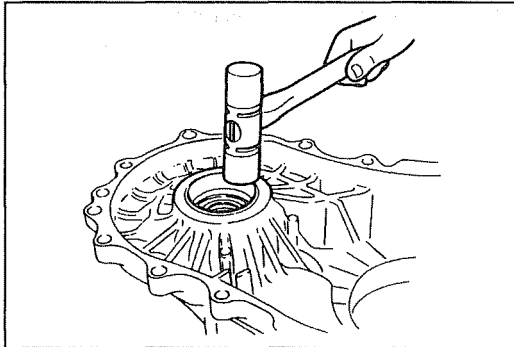
(12) Measure the clearance between A and B.

(13) Add **0.3mm (0.0118 in)** to the measured clearance, and select the shim(s) closest in value to that measurement.

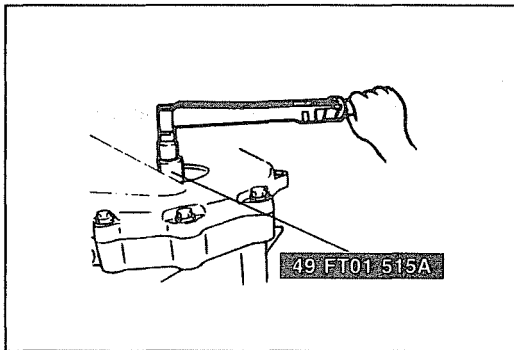




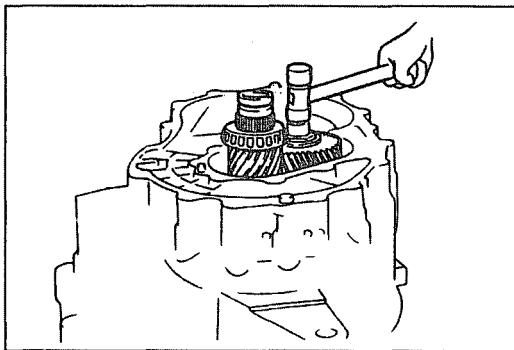
06U0KX-215



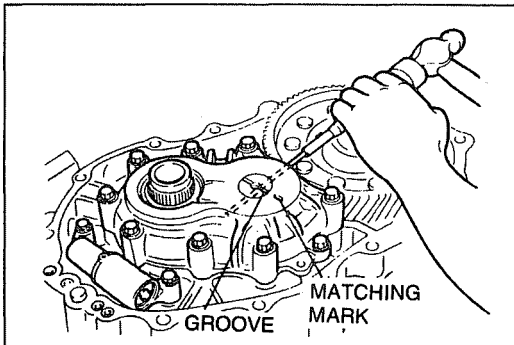
06U0KX-216



06U0KX-217



06U0KX-218



16U0KX-005

**Caution**

- Measure the clearance around the entire circumference, and select shims equivalent to the maximum clearance.
- The maximum allowable number of shims is 3.

Thickness of shim	
0.10mm (0.004 in)	0.20mm (0.008 in)
0.12mm (0.005 in)	0.50mm (0.020 in)
0.14mm (0.006 in)	0.70mm (0.028 in)
0.16mm (0.0063 in)	1.00mm (0.039 in)
0.18mm (0.007 in)	

- (14) Remove the transaxle case and selector.
- (15) Install the required shim(s) and tap the bearing race into the transaxle case.

- (16) Install the transaxle case.

**Tightening torque:**

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**

- (17) Check that the preload is within specification. If not, return to Step (1).

**Preload:**

**2.9—3.9 N·m (30—40 cm·kg, 26—35 in·lb)**

**Reading on pull scale:**

**29—39 N (3.0—4.0 kg, 6.6—8.8 lb)**

- (18) Remove the transaxle case.

3. Install the idler gear and output gear as an assembly by tapping in with a plastic hammer.

4. Install the bearing housing.

- (1) Install the bearing housing and baffle plate.

**Tightening torque:**

**19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**

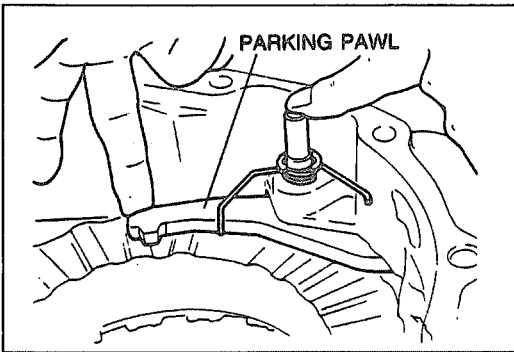
- (2) Align the groove on the idle shaft with the matching mark on the bearing housing.

- (3) Tap the roll pin in with a pin punch and hammer.

5. Apply ATF to the O-rings and install them into the 2-3 accumulator. Then install the 2-3 accumulator piston assembly.

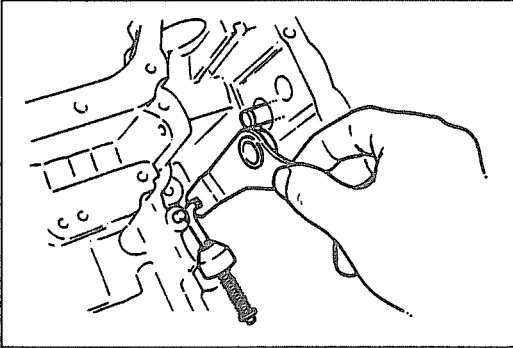
**Tightening torque:**

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**



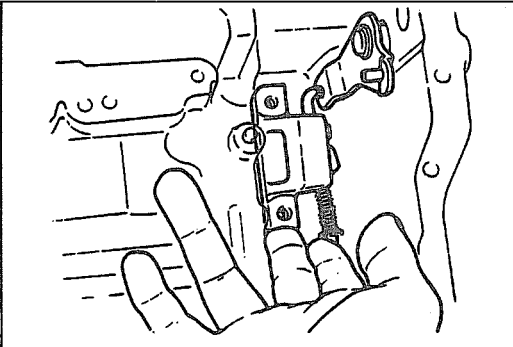
06U0KX-219

6. Install the parking pawl.
  - (1) Install the parking pawl and shaft.
  - (2) Install the spring and snap ring.
  - (3) Move the manual shaft and check that the parking pawl operates.



06U0KX-220

7. Install the parking assist lever and snap ring.

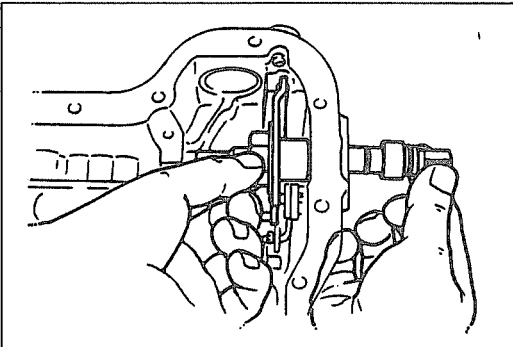


06U0KX-221

8. Install the actuator support.

**Tightening torque:**

**11—14 N·m (110—140 cm·kg, 96—120 in·lb)**

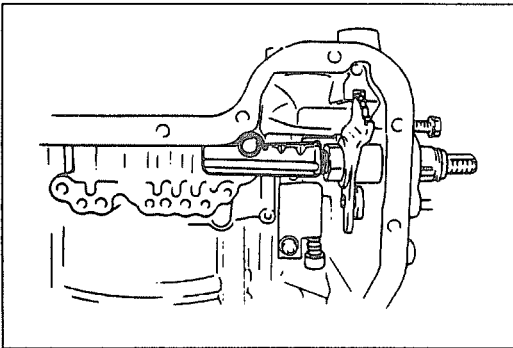


06U0KX-222

9. Install the manual shaft and manual plate.
  - (1) Install the manual plate, spacer, washer, and nut.
  - (2) Tighten the nut to specified torque.

**Tightening torque:**

**41—55 N·m (4.2—5.6 m·kg, 30—41 ft·lb)**

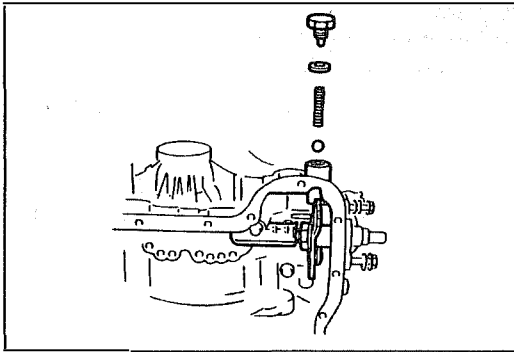


86U07B-385

- (3) Install the bracket.

**Tightening torque:**

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

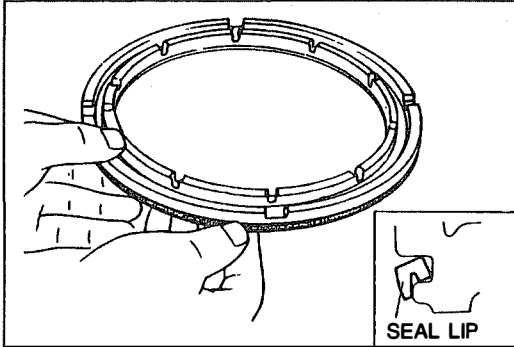


86U07B-386

- (4) Install the detent ball, spring, washer and plug; then tighten the plug.

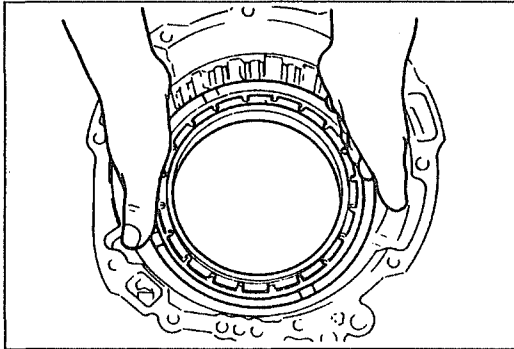
**Tightening torque:**

**12—18 N·m (1.2—1.8 m·kg, 8.7—13 ft·lb)**



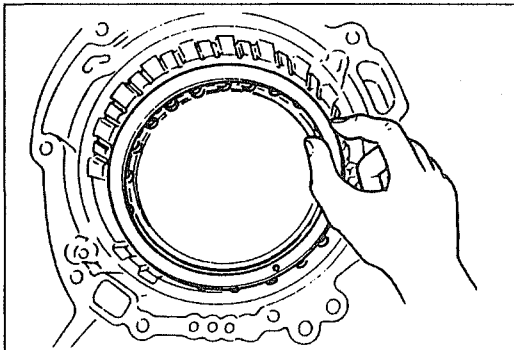
06U0KX-223

- 10. Install the low and reverse brake piston.
  - (1) Apply ATF to the inner and outer seals, and install them to the low and reverse brake piston.
  - (2) Face the outer seal lip toward the inside by gently rolling it down around the circumference for easier installation into the case.



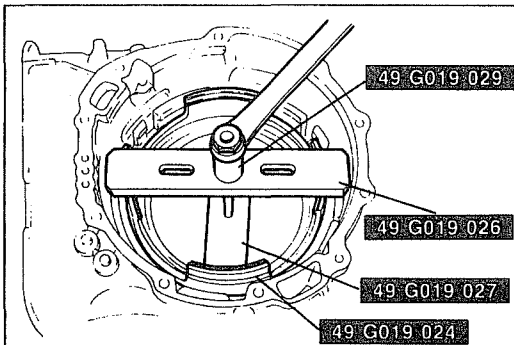
86U07B-388

- (3) Install the low and reverse brake piston by pushing evenly around the circumference, being careful not to damage the outer seal.



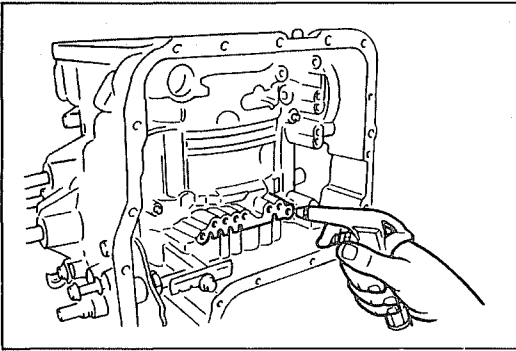
86U07B-389

- (4) Install the spring and retainer assembly.



86U07B-390

- (5) Install the **SST** in the case.
- (6) Compress the spring and retainer assembly.
- (7) Install the snap ring with snap-ring pliers.
- (8) Remove the **SST**.

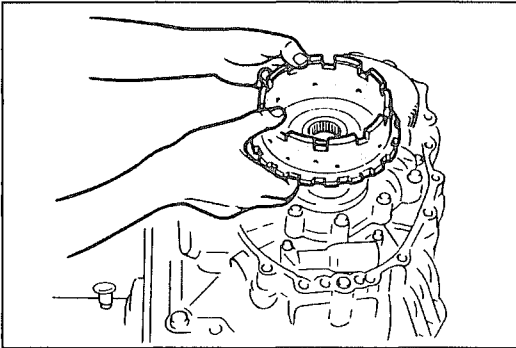


06U0KX-224

11. Check the low and reverse brake piston operation.
  - (1) Check that no bubbles come from between the piston and seals when applying compressed air through the fluid passage.

**Caution**

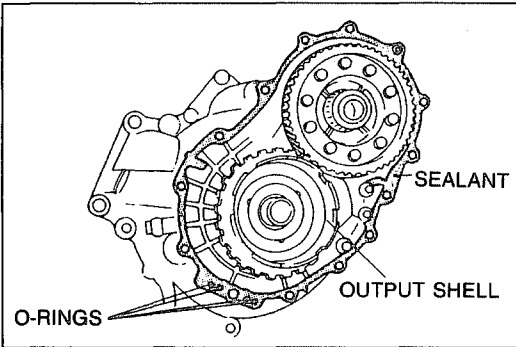
- The compressed air must be under 392 kPa (4.0 kg/cm<sup>2</sup>, 57 psi) and not applied for over 3 seconds.



06U0KX-225

12. Install the output shell to the output gear, and install the bearing race onto the output shell.

**Bearing race outer diameter: 72.0mm (2.83 in)**

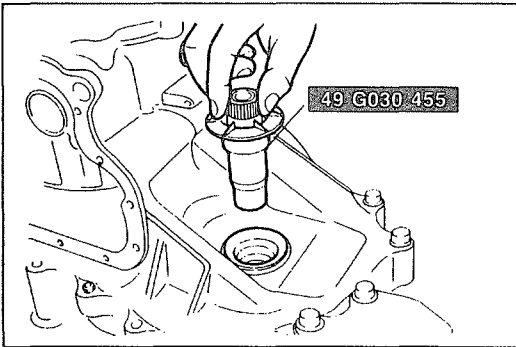


06U0KX-226

13. Apply a thin coat of silicone sealant to the contact surfaces of the converter housing and transaxle case.
14. Install the O-rings.
15. Install the transaxle case to the converter housing.

**Tightening torque:**

**37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)**

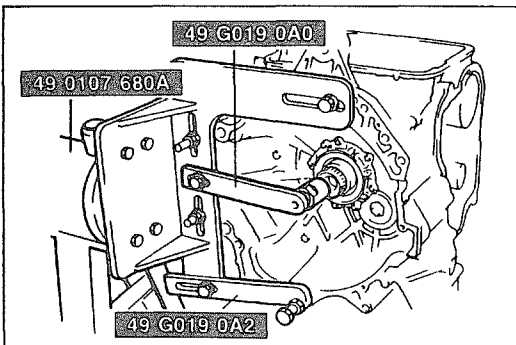


06U0KX-227

16. Install the **SST** to the differential side gear.

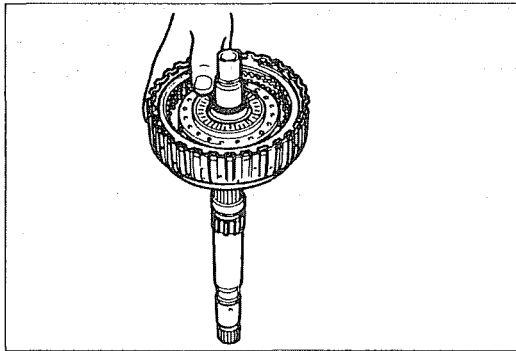
**Caution**

- Failure to install the **SST** may allow the differential side gears to become mispositioned.



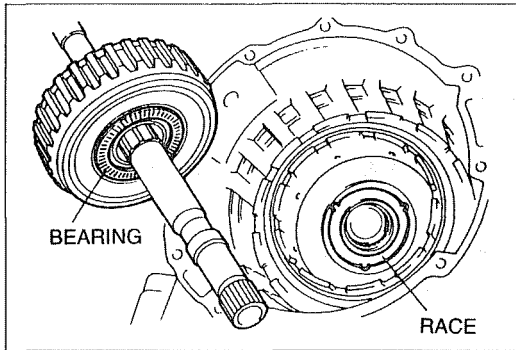
06U0KX-228

17. Temporarily install the **SST** to hold the turbine shaft.



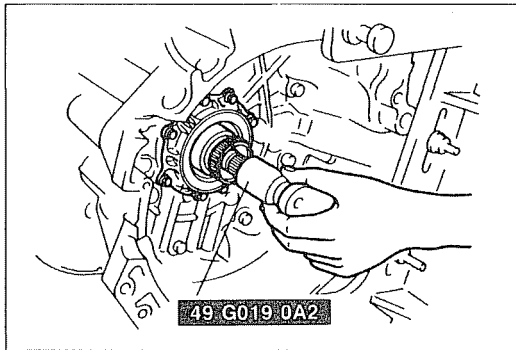
06U0KX-229

18. Install the turbine shaft and 3-4 clutch assembly.  
 (1) Assemble the turbine shaft and 3-4 clutch assembly.



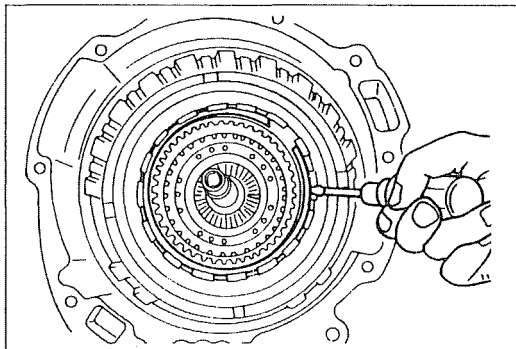
86U07B-397

- (2) Check that the thrust bearing and bearing race are installed in the correct position.  
 (3) Install the turbine shaft and 3-4 clutch assembly into the transaxle case.



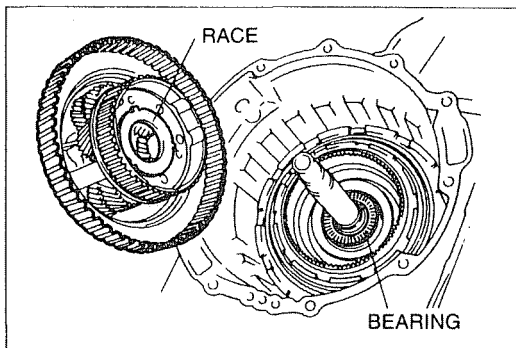
06U0KX-230

19. Adjust the **SST** position so that it contacts and holds the turbine shaft.



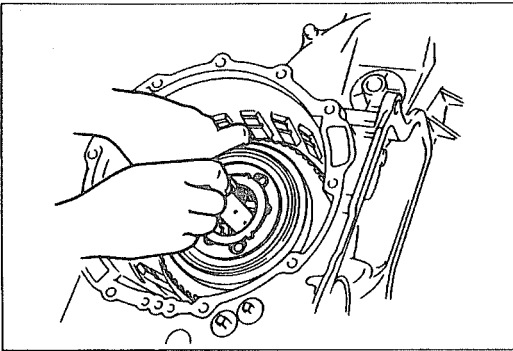
06U0KX-231

20. Install the internal gear.  
 (1) Install the internal gear to the 3-4 clutch drum.  
 (2) Install the snap ring.



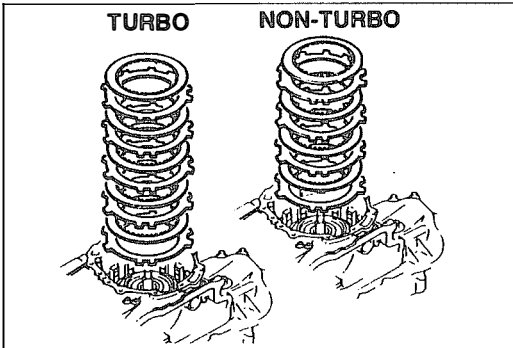
06U0KX-232

21. Install the carrier hub assembly.  
 (1) Check that the thrust bearing and bearing race are installed in the correct position.



86U07B-401

- (2) Hold the turbine shaft with one hand to prevent it from rotating.
- (3) Install the carrier hub assembly into the 3-4 clutch drum by rotating it.

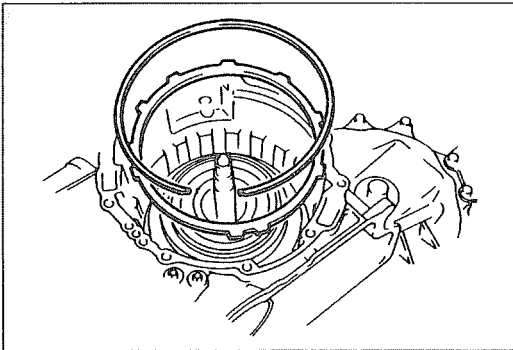


06U0KX-233

22. Install the drive and driven plates.

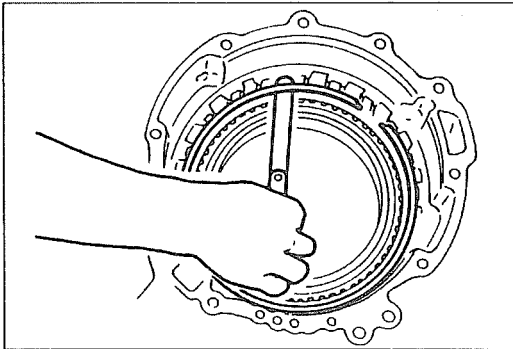
**Note**

- **Installation order:**
  - Non-Turbo**  
Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive
  - Turbo**  
Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive



06U0KX-234

23. Install the retaining plate.
24. Install the snap ring.



06U0KX-235

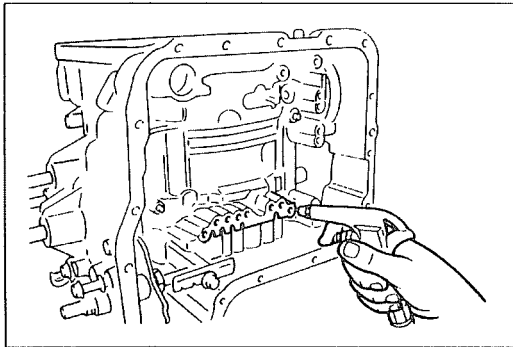
25. Check the low and reverse brake clearance.
  - (1) Measure the clearance between the snap ring and the low and reverse brake retaining plate.
  - (2) If the clearance is not within specification, adjust it by selecting a proper retaining plate.

**Low and reverse brake clearance:**  
2.1—2.4mm (0.083—0.094 in)

**Retaining plate sizes**

mm (in)

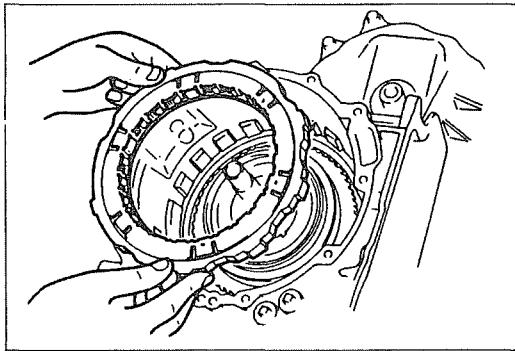
6.8 (0.268)	7.0 (0.276)	7.2 (0.283)
7.4 (0.291)	7.6 (0.299)	7.8 (0.307)



06U0KX-236

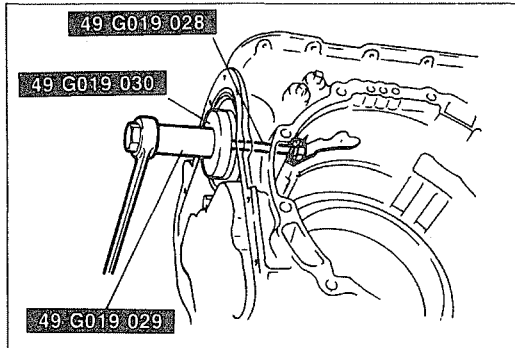
26. Check the low and reverse brake operation by applying compressed air through the fluid passage as shown in the figure.

**Air pressure: 392 kPa (4.0 kg/cm<sup>2</sup>, 57 psi)**



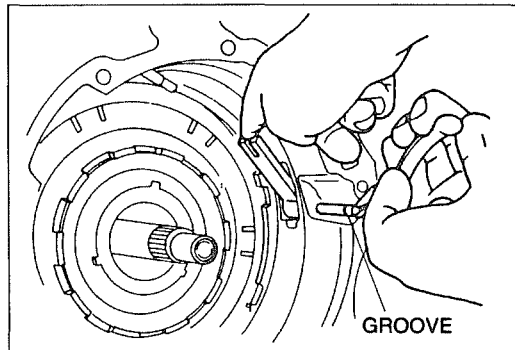
06U0KX-237

27. Install the one-way clutch.
  - (1) Hold the one-way clutch horizontally.
  - (2) Install it by turning the carrier hub assembly counter-clockwise.
  - (3) Install the snap ring.



06U0KX-238

28. Install the servo to the transaxle case.
  - (1) Install the servo spring and servo.
  - (2) Compress the servo with the **SST**.
  - (3) Install the snap ring.
  - (4) Remove the **SST**.
  - (5) Install the piston stem.

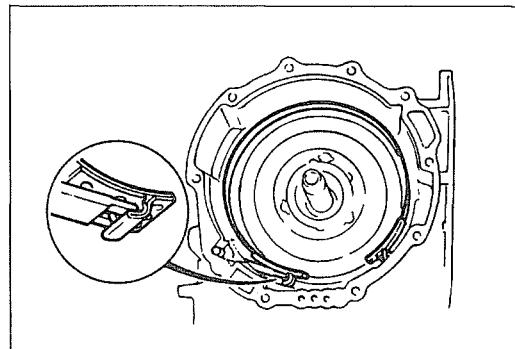


06U0KX-239

29. Install the anchor strut.

**Note**

- Face the groove upward.

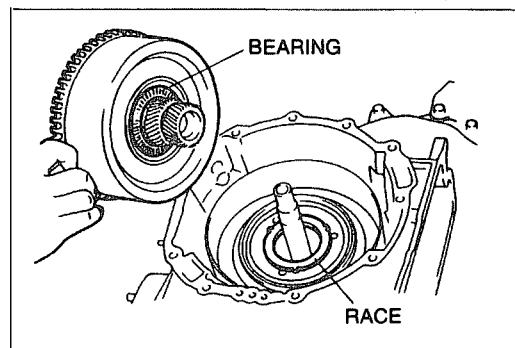


06U0KX-240

30. Install the 2-4 brake band in the transaxle case so that it is expanded fully.

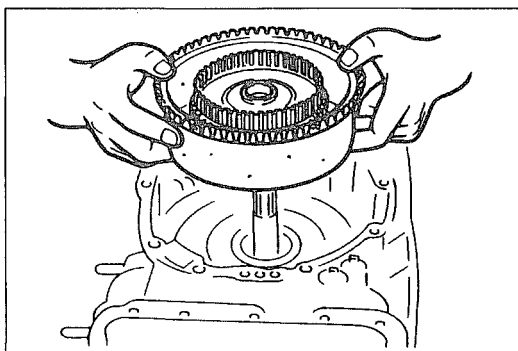
**Note**

- Interlock the 2-4 brake band and anchor strut as shown.



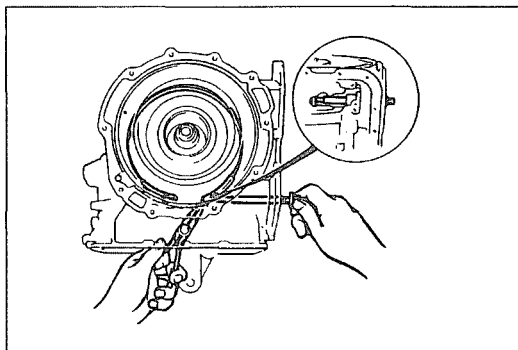
06U0KX-241

31. Install the small sun gear and one-way clutch.
  - (1) Check that the thrust bearing and bearing race are installed in the correct position.



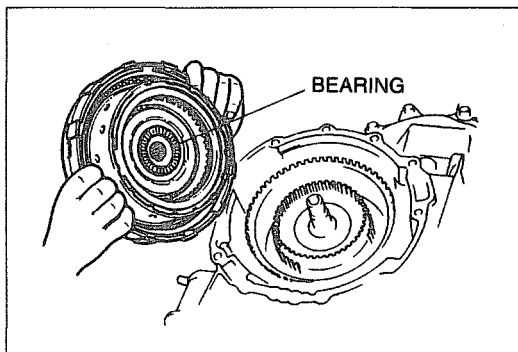
86U07B-411

- (2) Install the small sun gear and one-way clutch by rotating it.



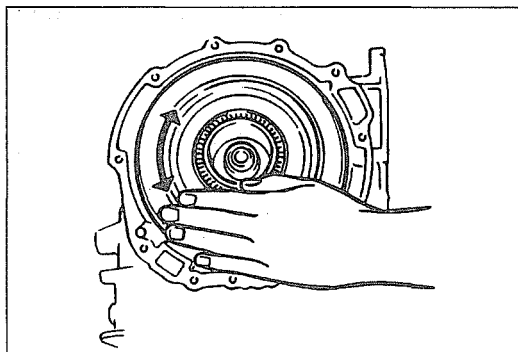
06U0KX-242

32. Install the piston stem in the position while pulling out the 2-4 brake band with a pliers; then loosely tighten the piston stem by hand.



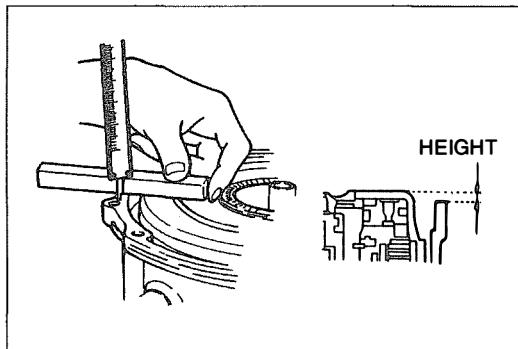
06U0KX-243

33. Install the clutch assembly.  
(1) Check that the thrust bearing is installed in the correct position.



86U07B-414

- (2) Install the clutch assembly by rotating it.

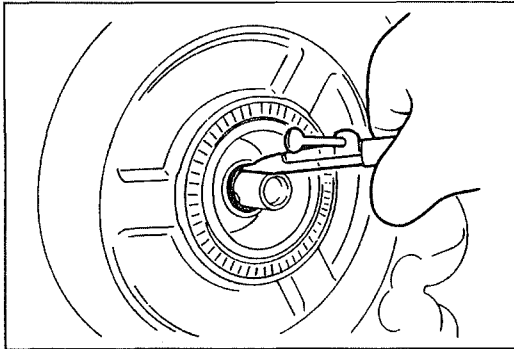


86U07B-415

#### Note

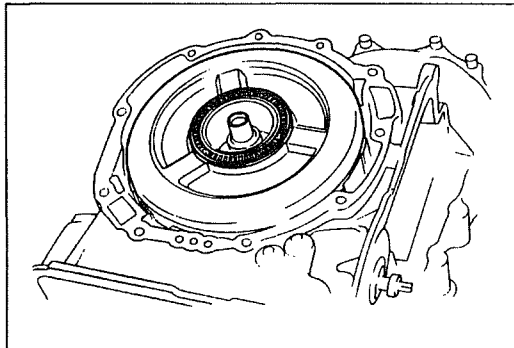
- Measure the height difference between the reverse and forward drum and transaxle case.  
Non-Turbo: 0.8mm (0.032 in)  
Turbo : 3.8mm (0.151 in)





06U0KX-244

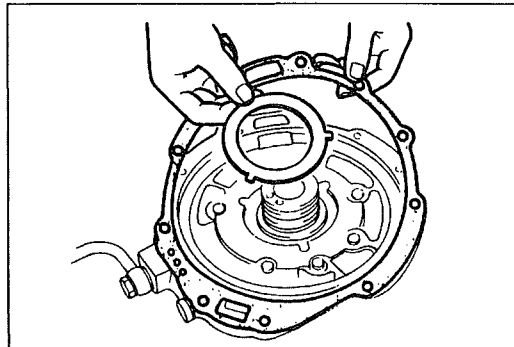
34. Install the snap ring into the bottom ring groove of the turbine shaft.



06U0KX-245

35. Use the following procedure to adjust the total end play and select a suitable bearing race.

(1) Set the thrust bearing onto the clutch assembly.

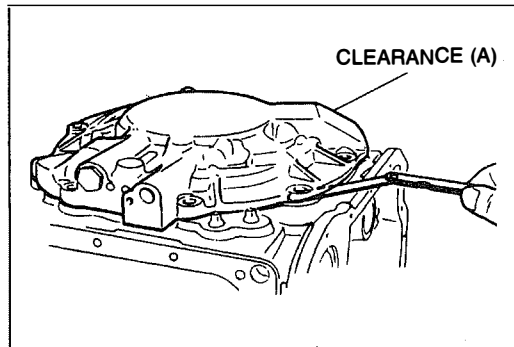


86U07B-419

(2) Remove the previous race and gasket.

(3) Set the thickest bearing race (**2.2mm [0.087 in]**) onto the oil pump.

(4) Set the oil pump onto the clutch assembly.



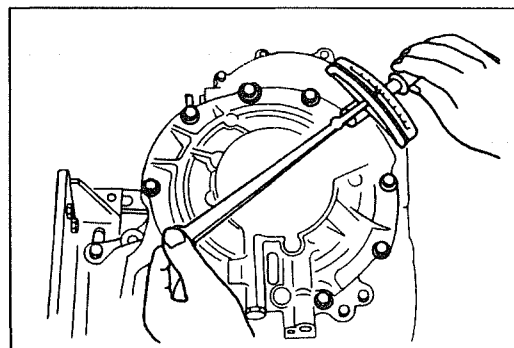
CLEARANCE (A)

86U07B-420

(5) Measure clearance A between the transaxle case and oil pump.

(6) Select a suitable bearing race from the chart below.

Clearance A	mm (in)	Select this bearing race	mm (in)
0.91—1.10	(0.036—0.043)	1.2	(0.047)
0.71—0.90	(0.028—0.035)	1.4	(0.055)
0.51—0.70	(0.020—0.027)	1.6	(0.063)
0.31—0.50	(0.012—0.019)	1.8	(0.071)
0.11—0.30	(0.004—0.011)	2.0	(0.078)
0—0.10	(0—0.003)	2.2	(0.087)



86U07B-421

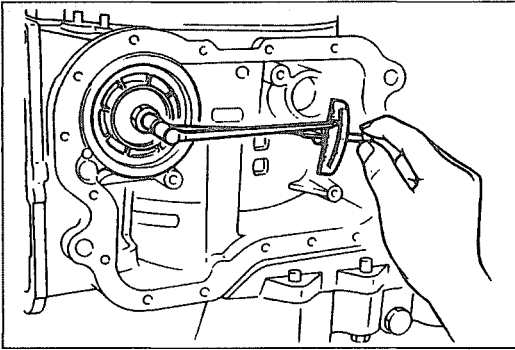
(7) Remove the oil pump.

(8) Place the selected bearing race and a new gasket onto the oil pump.

(9) Install the oil pump onto the clutch assembly.

**Tightening torque:**

**19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)**



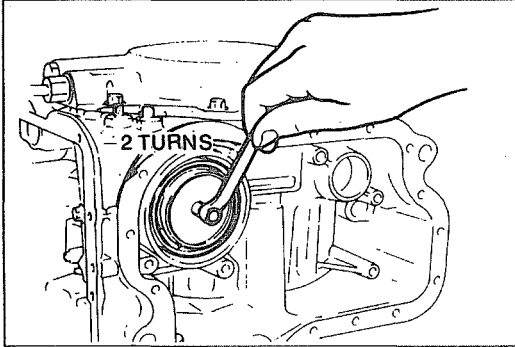
06U0KX-246

36. Adjust the 2-4 brake band.

- (1) Loosen the locknut and tighten the piston stem to the specified torque.

**Tightening torque:**

**9—11 N·m (90—110 cm·kg, 78—95 in·lb)**



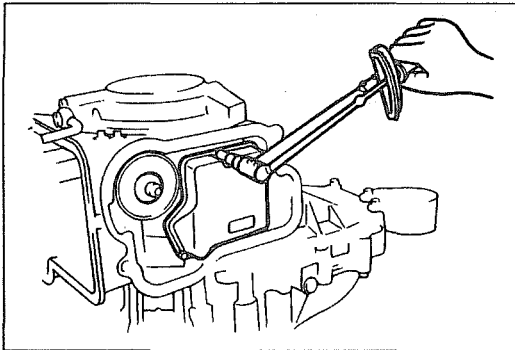
96U07B-054

- (2) Loosen the piston stem 2 turns.

- (3) Hold the piston stem and tighten the locknut to the specified torque.

**Tightening torque:**

**25—39 N·m (2.5—4.0 m·kg, 18—29 ft·lb)**

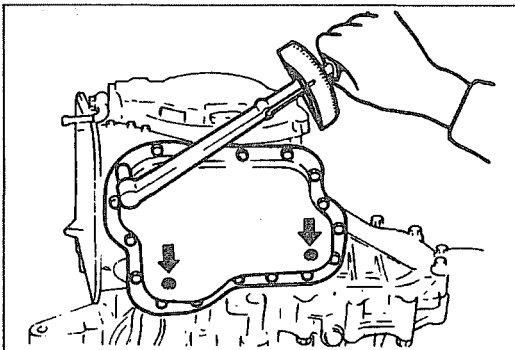


06U0KX-247

37. Install the oil strainer along with a new O-ring to the transaxle.

**Tightening torque:**

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**



06U0KX-248

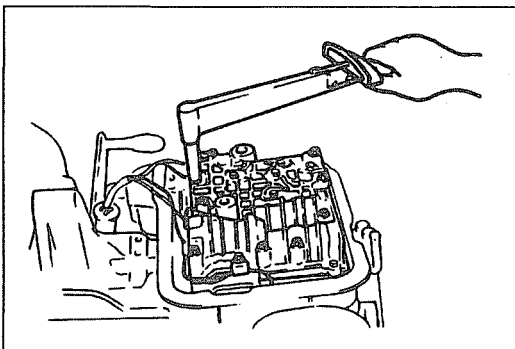
38. Install the oil pan along with a new gasket.

**Tightening torque:**

**8—11 N·m (85—110 cm·kg, 74—95 in·lb)**

**Note**

- Attach the magnets inside the pan in the positions shown in the illustration.

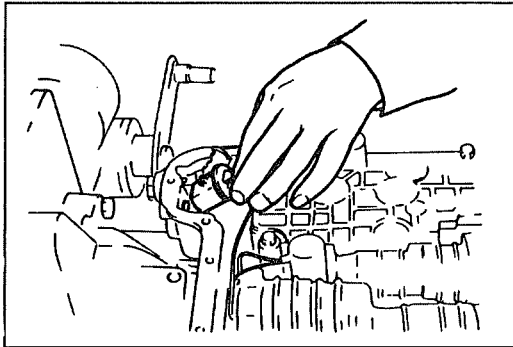


06U0KX-249

39. Align the manual valve with the pin on the manual plate, and install the control valve body into the transaxle case.

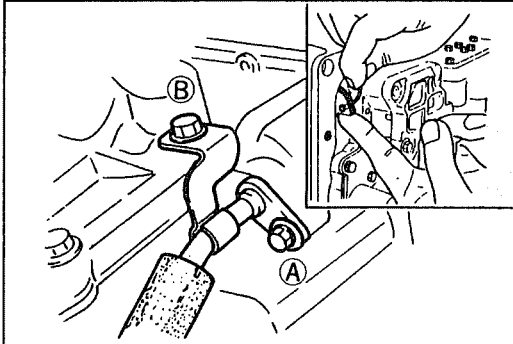
**Tightening torque:**

**11—15 N·m (110—150 cm·kg, 95—130 in·lb)**



06U0KX-250

40. Install the solenoid connector and a new O-ring in the transaxle case.

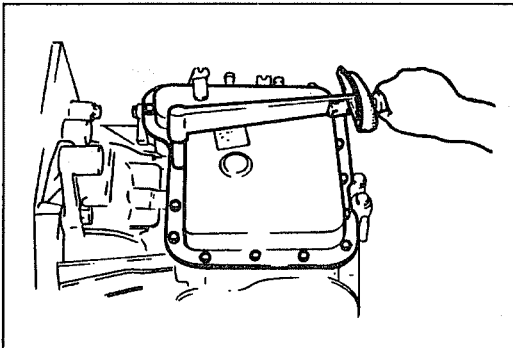


06U0KX-251

41. Install a new O-ring on the bracket; then feed the throttle cable through the transaxle case and connect it to the throttle lever.  
42. Install the throttle cable attaching bolts and bracket.

**Tightening torque**

- Ⓐ : 8—11 N·m (80—110 cm·kg, 69—95 in·lb)
- Ⓑ : 19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

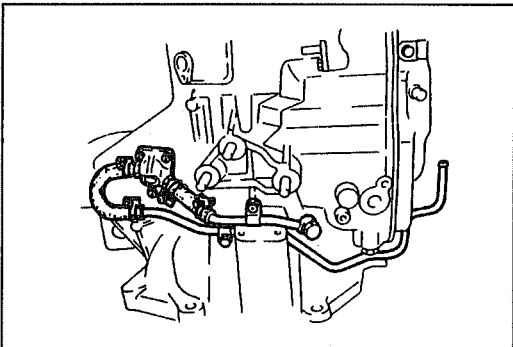


06U0KX-252

43. Install the control valve body cover along with a new gasket.

**Tightening torque:**

- 8—11 N·m (85—110 cm·kg, 74—95 in·lb)

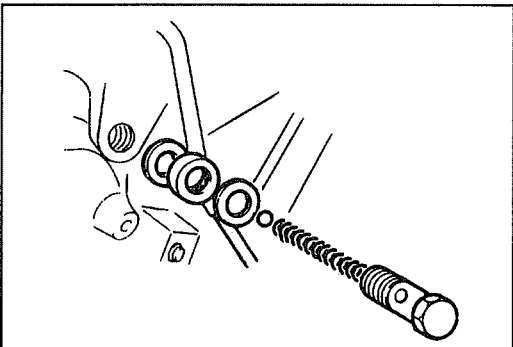


06U0KX-253

44. Install the oil pipes, oil hoses, and switch box as an assembly; then install the harness clips.

**Tightening torque**

- Switch box:**  
16—24 N·m (1.6—2.4 m·kg, 12—17 ft·lb)
- Harness clip:**  
8—11 N·m (80—110 cm·kg, 69—95 in·lb)

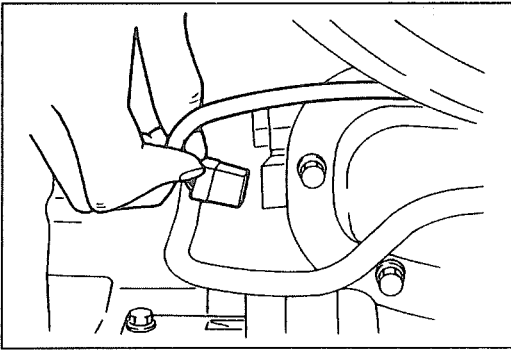


06U0KX-254

45. Install the ball, spring, gasket, and a plug.

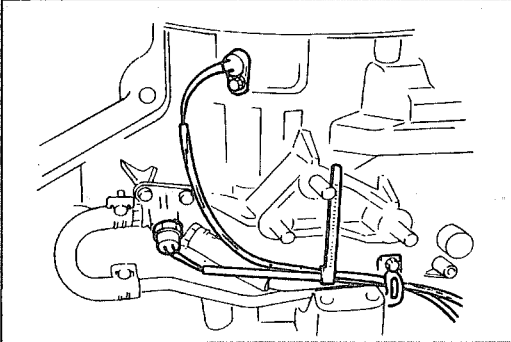
**Tightening torque:**

- 31—47 N·m (3.2—4.8 m·kg, 23—35 ft·lb)



06U0KX-255

46. Install the solenoid connector.



06U0KX-256

47. Install the pulse generator and ATF thermoswitch.

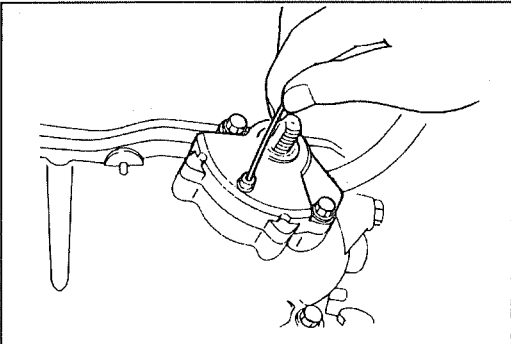
**Tightening torque**

**Pulse generator:**

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

**ATF thermoswitch:**

**29—39 N·m (3.0—4.0 m·kg, 22—29 in·lb)**



06U0KX-257

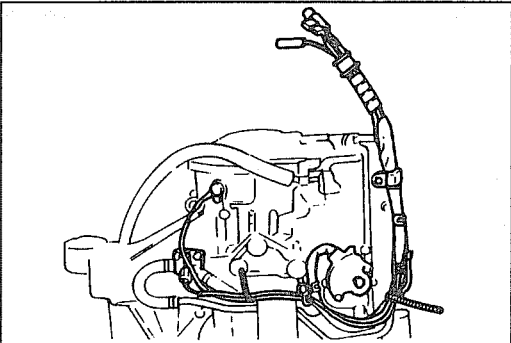
48. Install the inhibitor switch.

- (1) Turn the manual shaft to N position.
- (2) Install the inhibitor switch and loosely tighten the bolts.
- (3) Remove the screw and move the inhibitor switch so that the small alignment hole is aligned with the screw hole.
- (4) Set the alignment by inserting a **2.0mm (0.079 in)** diameter pin through the holes.
- (5) Tighten the bolts to the specified torque.

**Tightening torque:**

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

- (6) Remove the pin, install and tighten the screw to specification.



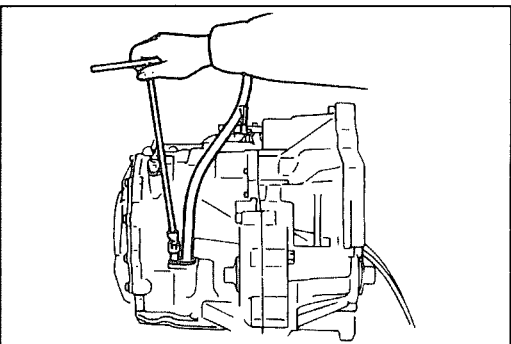
06U0KX-258

49. Install the harness with the remaining clip.

**Tightening torque:**

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

50. Remove the transaxle from the SST.

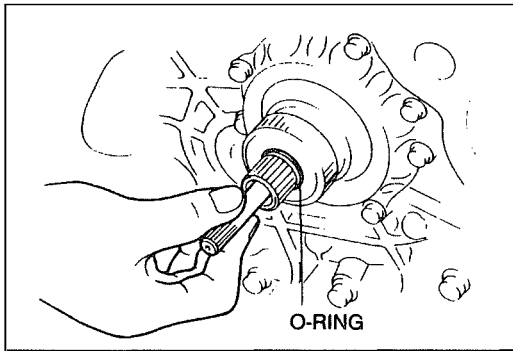


06U0KX-259

51. Install the oil level gauge and tube along with a new O-ring to the transaxle case.

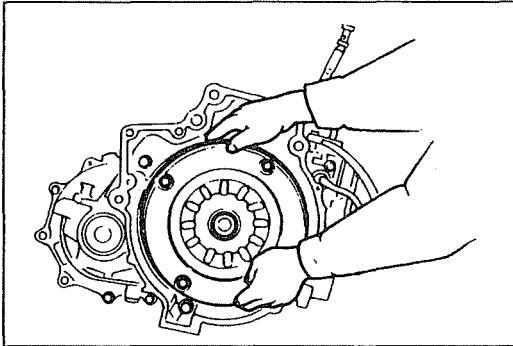
**Tightening torque:**

**7—10 N·m (70—100 cm·kg, 61—87 in·lb)**



06U0KX-260

52. Install the oil pump shaft.
53. Install a new O-ring onto the turbine shaft.



06U0KX-261

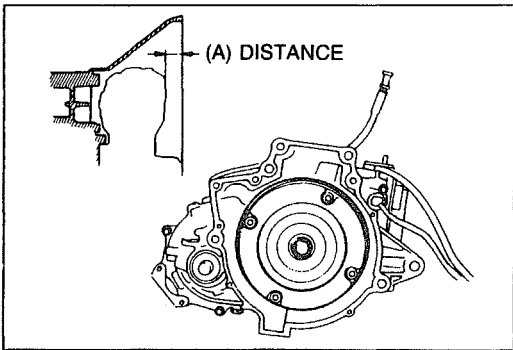
54. Fill the torque converter with ATF if it has been drained and washed.

**ATF type: DEXRON-II or M-III**

55. Install the torque converter in the converter housing while rotating it to align the splines.

**Caution**

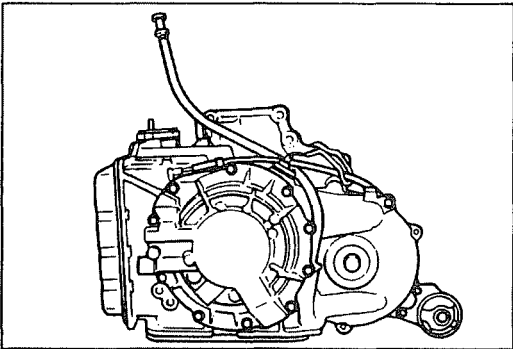
- Hold the torque converter in an erect position when filling it with ATF, do not allow the fluid to overflow.
- If the converter does not fit in easily, do not try to force it; install carefully.



06U0KX-262

56. To ensure that the torque converter is installed accurately, measure distance A between the end of the torque converter and the end of the converter housing.

**(A): 20.6mm (0.81 in)**



06U0KX-263

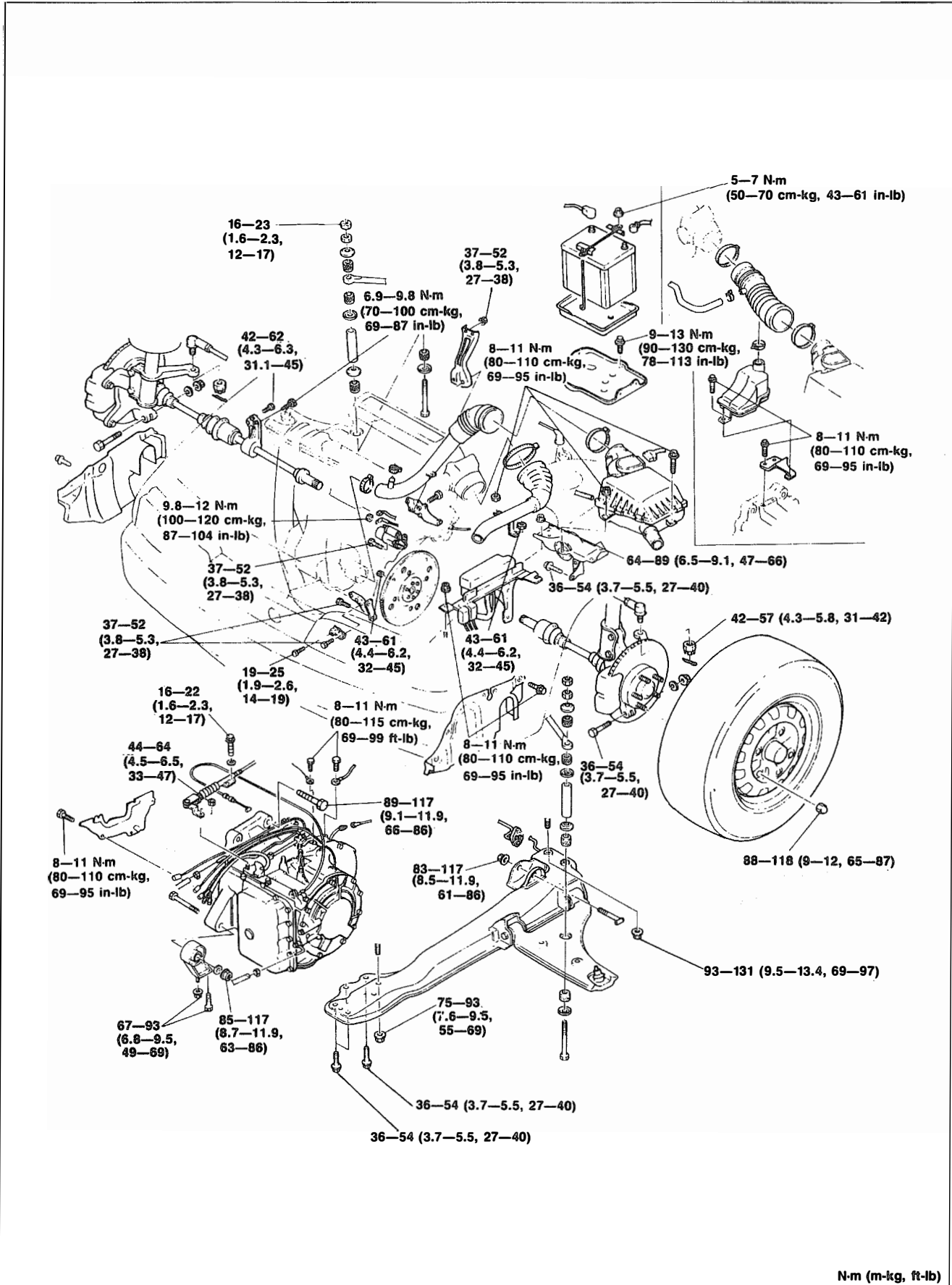
57. Install engine mount No.1

**Tightening torque:**

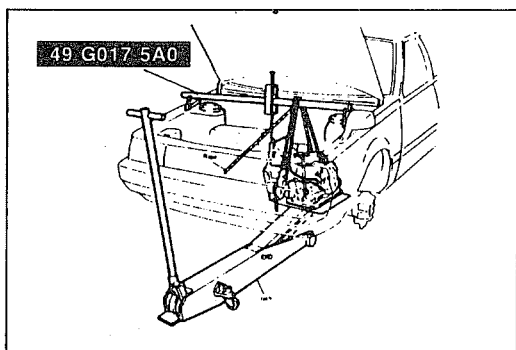
**68—77 N·m (6.9—7.9 m·kg, 50—57 ft·lb)**

TRANSAXLE UNIT (INSTALLATION)

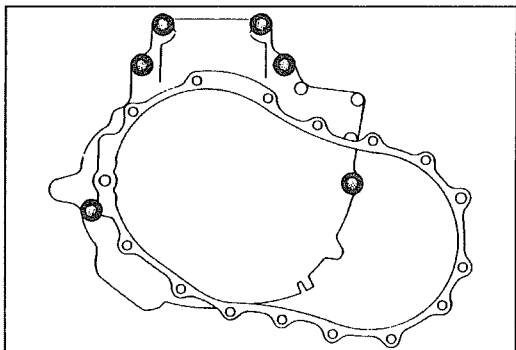
Torque specifications



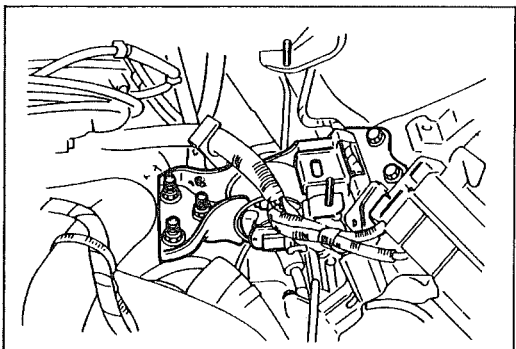
N-m (m-kg, ft-lb)



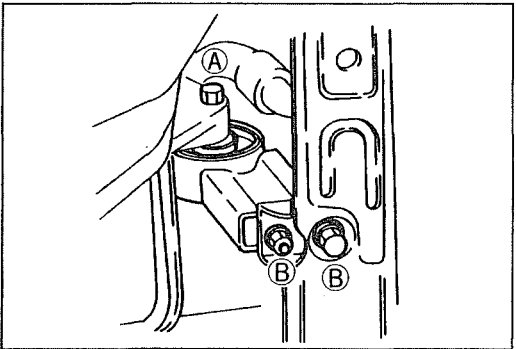
06U0KX-265



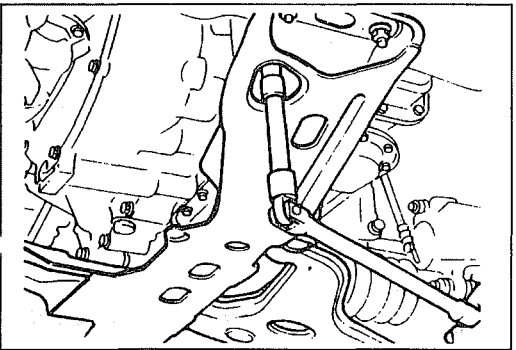
86U07B-442



86U07B-443



86U07B-444



06U0KX-266

1. Attach a rope at 2 places on the transaxle. Place a flat board on a jack and set the transaxle on it.

**Caution**

- The transaxle is not well balanced; be careful when positioning it on the jack.

2. Move the transaxle into place and attach the rope to the SST.

3. Mount the transaxle to the engine.

**Tightening torque:**

89—117 N·m (9.1—11.9 m·kg, 66—86 ft·lb)

**Note**

- Lift the transaxle with the jack while pulling the rope.
- Align the torque converter bolts and drive plate holes.

4. Install engine mount No.4 and bracket.

**Tightening torque:**

**Bolt:** 36—54 N·m (3.7—5.5 m·kg, 27—40 ft·lb)

**Nut:** 64—89 N·m (6.5—9.1 m·kg, 47—66 ft·lb)

5. Install engine mount No.2.

**Tightening torque:**

**(A):** 85—117 N·m (8.7—11.9 m·kg, 63—86 ft·lb)

**(B):** 67—93 N·m (6.8—9.5 m·kg, 49—69 ft·lb)

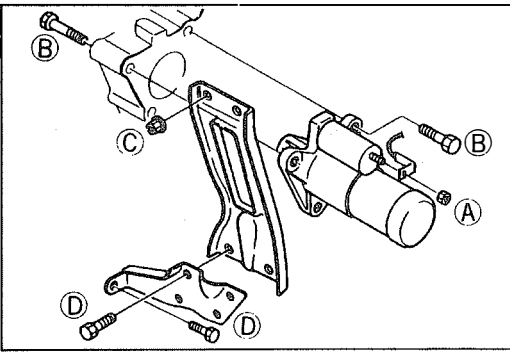
6. Install the crossmember and the left side lower arm as an assembly.

**Tightening torque:**

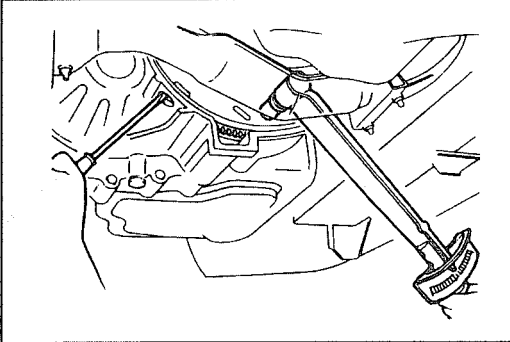
**Bolt:** 36—54 N·m (3.7—5.5 m·kg, 27—40 ft·lb)

**Nut:** 75—93 N·m (7.6—9.5 m·kg, 55—69 ft·lb)

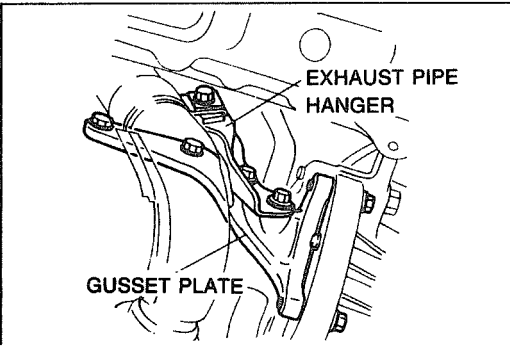
7. Remove the jack and the rope.
8. Remove the SST.



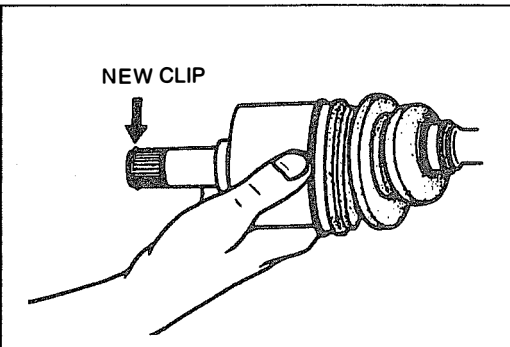
06U0KX-301



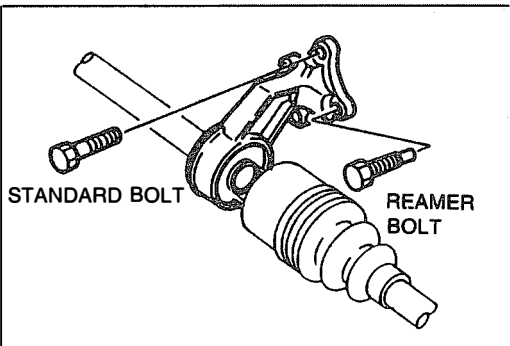
86U07B-447



86U07B-448



06U0KX-267



86U07B-450

9. Install the starter and harnesses.

**Tightening torque**

- Ⓐ : 9.8—12 N·m (100—120 cm·kg, 87—104 in·lb)
- Ⓑ : 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

10. Install the manifold bracket.

**Tightening torque**

- Ⓒ : 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)
- Ⓓ : 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

11. Install the torque converter nuts.

**Tightening torque:**

- 43—61 N·m (4.4—6.2 m·kg, 32—45 ft·lb)

12. Install the end plate.

**Tightening torque:**

- 8—11 N·m (80—110 cm·kg, 69—95 in·lb)

13. Install the gusset plates and exhaust pipe hanger.

**Tightening torque**

**Gusset plate:**

- 37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

**Exhaust pipe hanger:**

- 19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

14. Replace the clips at the end of the driveshaft and joint shaft with new ones.

15. Install the joint shaft and right driveshaft as follows:

- (1) Remove the **SST (holder)** and insert the joint shaft into the transaxle.
- (2) Mount the joint shaft bracket onto the engine.
- (3) Install and tighten the reamer bolts; then install and tighten the standard bolts.

**Tightening torque**

**Reamer bolts:**

- 6.9—9.8 N·m (70—100 cm·kg, 61—87 in·lb)

**Standard bolts:**

- 42—62 N·m (4.3—6.3 m·kg, 31.1—45.6 ft·lb)

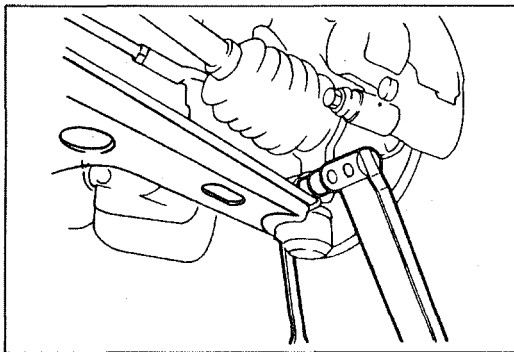
(4) Pull the front hub outward to connect the driveshaft to the joint shaft.

(5) Push the joint from the differential side to securely connect the driveshaft to the joint shaft.

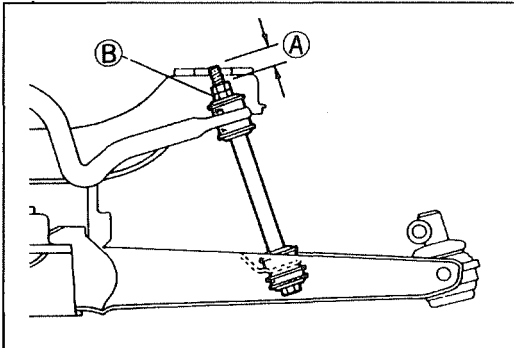
**Caution**

- Do not damage the oil seal.
- After installation, pull the front hub outward to verify that the driveshaft does not come.

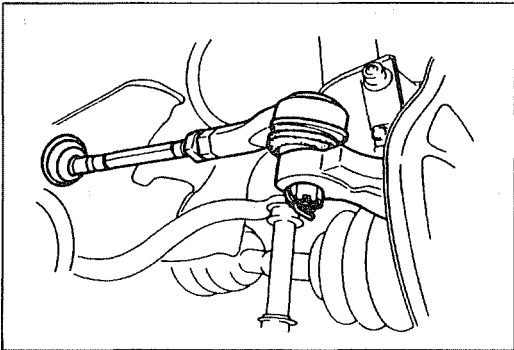




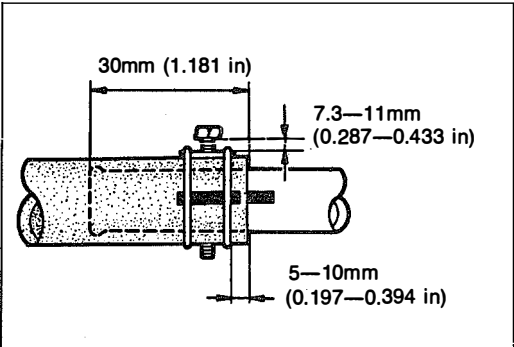
06U0KX-302



06U0KX-268



06U0KX-269



06U0KX-270

16. Install the left driveshaft as follows:
- (1) Pull the front hub outward to insert the driveshaft into the transaxle.
  - (2) Push the joint from the differential side to connect the driveshaft to the differential side gear.

**Caution**

- Do not damage the oil seal.
- After installation, pull the front hub outward to verify that the driveshaft does not come out.

17. Install the lower arm ball joints to the knuckles and tighten the bolts and nuts.

**Tightening torque:**

**36—54 N·m (3.7—5.5 m·kg, 27—40 ft·lb)**

18. Install the undercover.

19. Install the stabilizer bar control link as follows:

- (1) Install the stabilizer bar control link.
- (2) Adjust protrusion A to **20.1 ± 2mm (0.79 ± 0.08 in)**.
- (3) Tighten nuts B to the specified torque.

**Tightening torque:**

**16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)**

20. Install the tie-rod ends and new cotter pins.

**Tightening torque:**

**42—57 N·m (4.3—5.8 m·kg, 31—42 ft·lb)**

21. Connect the oil cooler outlet and inlet hoses as follows:

- (1) Align the marks, and slide the oil cooler hoses onto the oil cooler pipes **at least 30mm (1.181 in)**.
- (2) Install the hose clamps as shown and tighten them as specified.
- (3) Verify that the hose clamps do not interfere with any other parts.

22. Install the splash shields.

**Tightening torque:**

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

23. Install the front wheels.

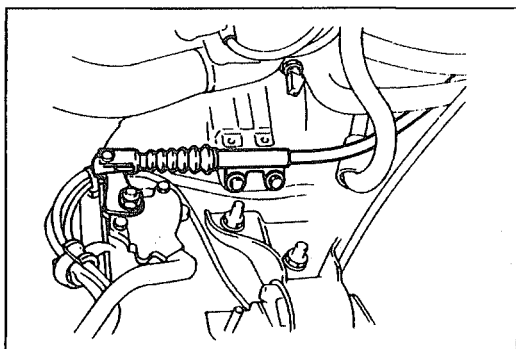
**Tightening torque:**

**88—118 N·m (9—12 m·kg, 65—87 ft·lb)**

24. Connect the throttle cable.

**Note**

- Adjust the throttle cable with the oil pressure test. (Refer to page K-48.)

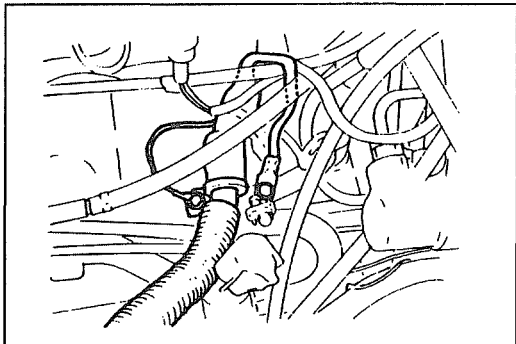


06U0KX-271

25. Connect the selector cable as follows:
- (1) Disconnect the selector cable from the selector lever.
  - (2) Tighten the bolts and the nut.

**Tightening torque****Bolts: 16—22 N·m (1.6—2.3 m·kg, 12—17 ft·lb)****Nut: 44—64 N·m (4.5—6.5 m·kg, 33—47 ft·lb)**

- (3) Connect the selector cable to the selector lever, and adjust the selector lever. (Refer to page K-155.)



86U07B-456

26. Connect the ground wires to the transaxle case.

**Tightening torque:****8—11 N·m (80—115 cm·kg, 69—99 in·lb)**

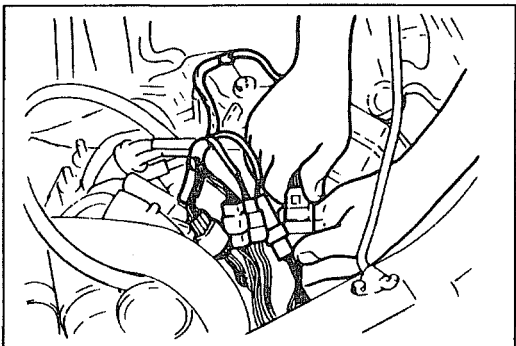
27. Connect the EC-AT connectors as follows:

- (1) Inhibitor switch
- (2) Solenoid valve
- (3) Pulse generator
- (4) ATF thermoswitch

28. Connect the speedometer cable.

29. Install the intercooler hoses as follows: (Turbo)

- (1) Air cleaner to turbocharger
- (2) Intercooler to throttle body.

**Tightening torque****(A) : 8—11 N·m (80—110 cm·kg, 69—95 in·lb)****(B) : 64—89 N·m (6.5—9.1 m·kg, 47—66 ft·lb)**

06U0KX-272

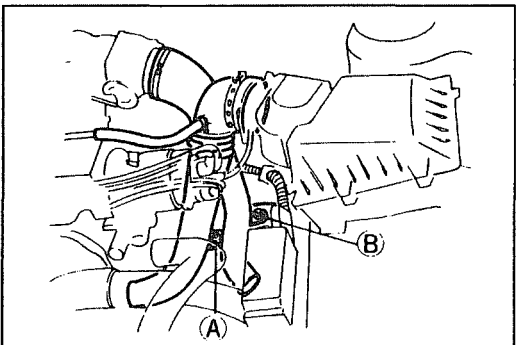
30. Install the resonance chamber bracket.

**Tightening torque:****8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

31. Install the resonance chamber and air cleaner hose.

**Tightening torque:****8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

32. Install the air cleaner assembly; then connect the airflow meter connector and inlet hose.

**Tightening torque****Bolt: 31—40 N·m (3.2—4.1 m·kg, 23—30 in·lb)****Nut: 8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

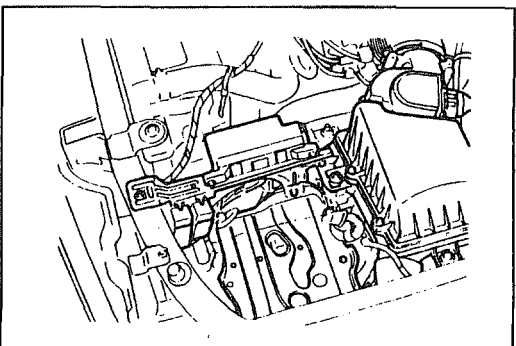
86U07B-458

33. Connect the distributor lead.

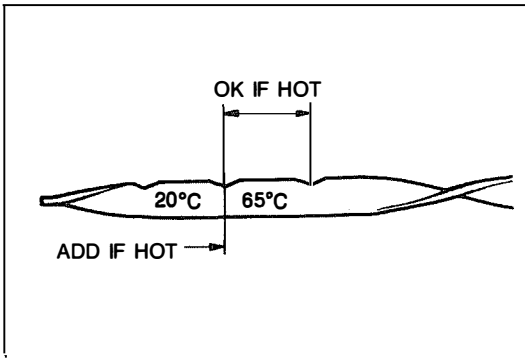
34. Connect the main fuse block.

**Tightening torque:****8—11 N·m (80—110 cm·kg, 69—95 in·lb)**

35. Install the battery carrier and battery.

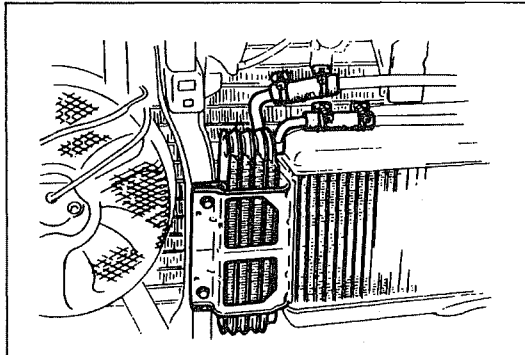
**Tightening torque:****9—13 N·m (90—130 cm·kg, 78—113 in·lb)**

16U0KX-015



06U0KX-273

36. Pour in ATF and check the following:
- (1) With the engine idling, check that the fluid level is in the HOT (65°C) range on the dipstick. (Refer to page K-45.)
  - (2) Check the manual linkage, and adjust if necessary. (Refer to page K-155.)
  - (3) Check the inhibitor switch operation. (Refer to page K-40.)
  - (4) Conduct a road test. (Refer to page K-30.)
  - (5) Check that there is no fluid leakage from the transaxle. (Refer to page K-46.)

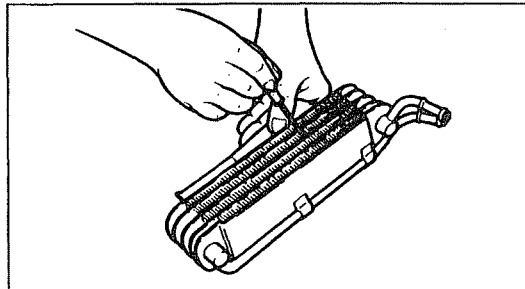


96U07B-020

**OIL COOLER**

**Removal**

1. Remove the front grille.
2. Disconnect the oil cooler hoses.
3. Remove the oil cooler.

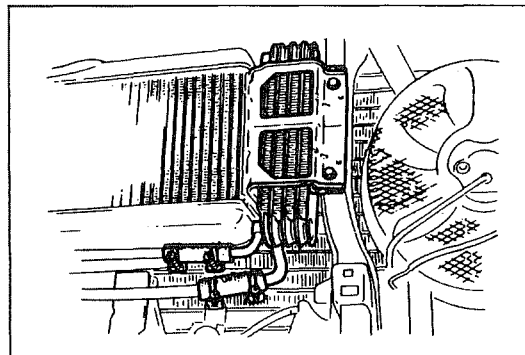


86U07B-097

**Inspection**

Check the following and repair or replace any faulty parts.

1. Cracks, damage, or oil leakage.
2. Bent fins (repair with a screwdriver).



06U0KX-274

**Installation**

Install the oil cooler and connect the oil cooler hoses, referring to the Installation note.

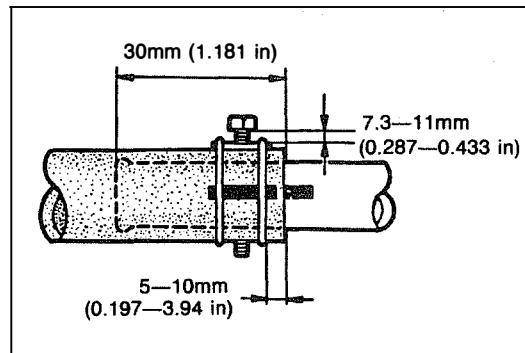
**Installation note**

**Oil cooler**

Install the oil cooler.

**Tightening torque:**

**8—11 N·m (80—110 cm·kg, 69—95 in·lb)**



06U0KX-275

**Oil hoses**

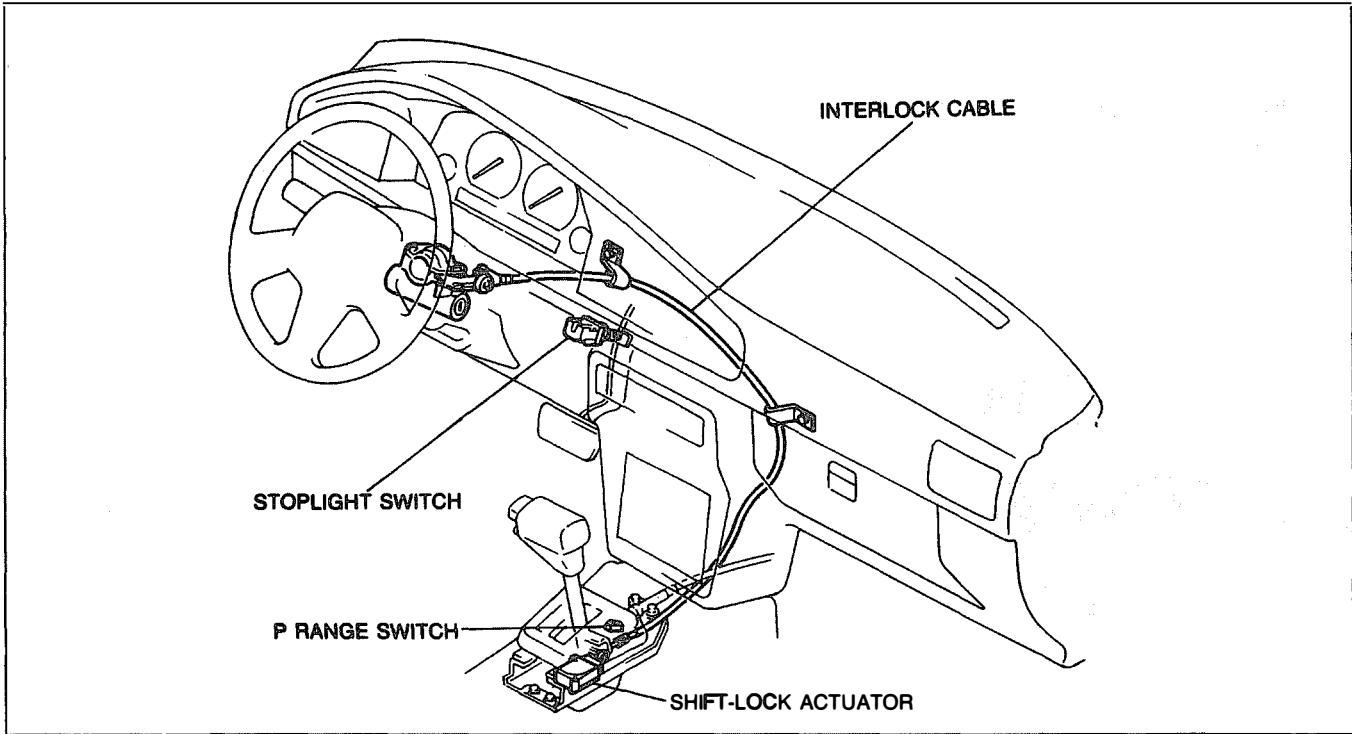
1. Align the marks, and slide the oil cooler hoses onto the oil cooler pipes **at least 30mm (1.2 in)**.
2. Install the hose clamps as shown and tighten them as specified.
3. Verify that the hose clamps do not interfere with any other parts.

# K

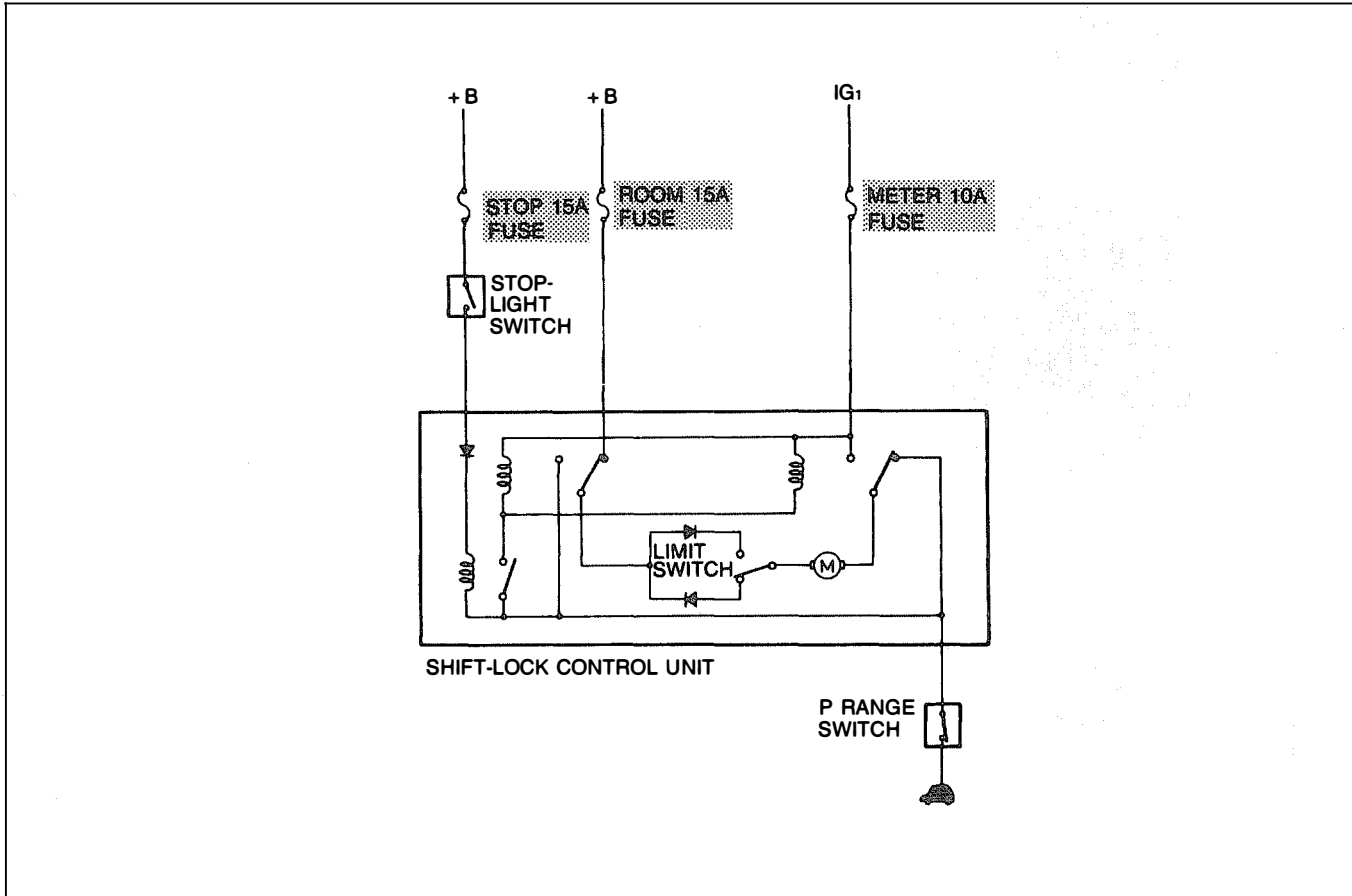
## SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)

### SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)

#### SHIFT-LOCK SYSTEM COMPONENTS



#### TROUBLESHOOTING Circuit Diagram

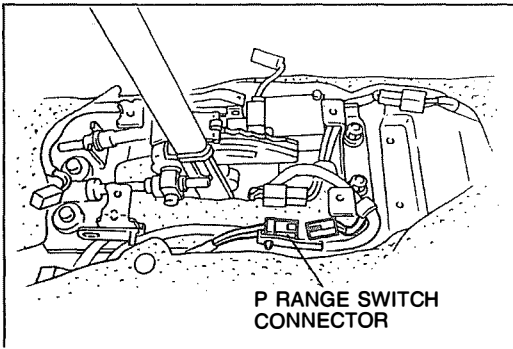


## Diagnosis chart

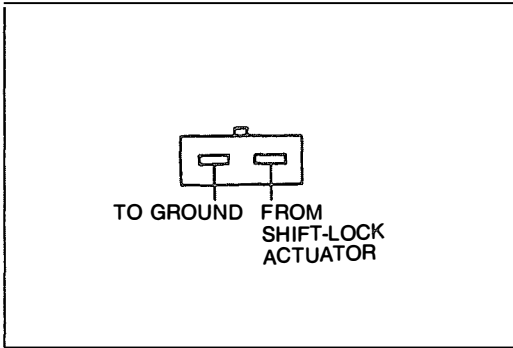
Problem	Possible Cause	Action
<b>Selector lever cannot be moved from P range with brake pedal depressed and ignition switch ON</b>	ROOM 15A fuse burned	Install or replace
	IG1 system malfunction <ul style="list-style-type: none"> <li>• Wire harness broken</li> <li>• Poor connection</li> <li>• METER 10A fuse burned</li> </ul>	Repair or replace Connect firmly Replace
	Ignition switch malfunction	Inspect and replace
	Stoplight switch remains OFF	Inspect and replace
	Stoplight system malfunction <ul style="list-style-type: none"> <li>• Wire harness broken</li> <li>• Poor connection</li> <li>• STOP 15A fuse burned</li> </ul>	Repair or replace Connect firmly Replace
	P range switch remains OFF	Inspect and replace
	P range switch system malfunction <ul style="list-style-type: none"> <li>• Wire harness broken (Poor ground)</li> <li>• Poor connection</li> </ul>	Repair or replace Connect firmly
	Shift-lock actuator malfunction <ul style="list-style-type: none"> <li>• Wire harness broken</li> <li>• Poor connection</li> </ul>	Inspect and replace Repair wiring harness Connect firmly
	Misadjustment of selector lever or improper assembly of shift-lock actuator	Adjust or repair
<b>Selector lever can be moved from P range with ignition switch ON, but without brake pedal depressed</b>	ROOM 15A fuse burned	Replace
	Stoplight switch remains ON	Inspect and replace
	Shift-lock actuator malfunction	Inspect and replace
	Misadjustment of selector lever or improper assembly of shift-lock actuator	Adjust or repair
<b>Selector lever can be moved from P range with ignition switch OFF and brake pedal depressed</b>	ROOM 15A fuse burned	Replace
	Ignition switch malfunction	Inspect and repair
	Shift-lock actuator malfunction	Inspect and replace
	Misadjustment of selector lever or improper assembly of shift-lock actuator	Adjust and repair
<b>Shift-lock actuator operation heard when brake pedal depressed with ignition switch ON in other than P range</b>	P range switch remains ON	Inspect and replace
<b>Selector remains locked with emergency override button operated</b>	Emergency override button not slid fully back	Slide fully back and hold emergency override button, move selector lever
	Broken emergency override button	Replace
	Misadjustment of indicator panel	Adjust
<b>Ignition key can be turned to LOCK position with selector lever in ranges other than P range</b>	Interlock cable <ul style="list-style-type: none"> <li>• Disconnected</li> <li>• Kinked</li> <li>• Stuck</li> <li>• Spring damaged</li> </ul>	Inspect and replace
	Key cylinder malfunction	Replace
<b>Ignition key cannot be turned to LOCK position with selector lever in P range</b>	Interlock cable <ul style="list-style-type: none"> <li>• Disconnected</li> <li>• Kinked</li> <li>• Stuck</li> <li>• Spring damaged</li> </ul>	Inspect and replace
	Key cylinder malfunction	Replace

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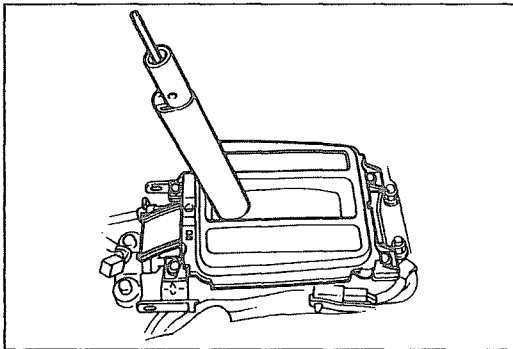
**SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)**



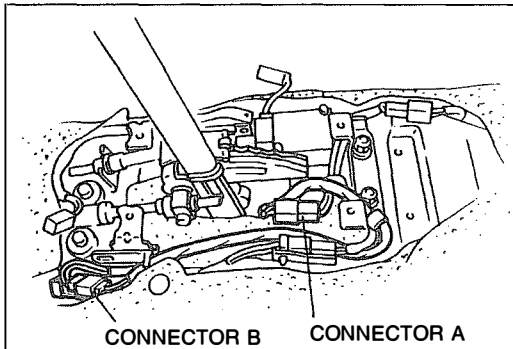
06U0KX-277



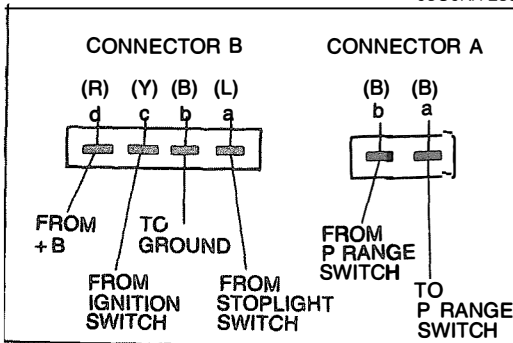
06U0KX-278



06U0KX-279



06U0KX-280



06U0KX-281

**P RANGE SWITCH**

**Inspection**

**Continuity**

1. Disconnect the negative battery cable.
2. Remove the screws and remove the selector lever knob.
3. Remove the front console. (Refer to Section T.)
4. Remove the indicator panel.
5. Disconnect the P range switch connector.

6. Check continuity between the terminals.

Range	Push rod	Continuity
P	Released	Yes
	Depressed	No
R, D, S, L	—	No

7. If not as specified, replace the P range switch. (Refer to page K-160.)

8. Adjust the indicator panel. (Refer to page K-156.)  
Install the screws in the order shown in the figure.
9. Install the front console.
10. Install the selector lever knob and tighten the screws.

**Tightening torque:**

**1.5—2.9 N·m (15—30 cm·kg, 13—26 in·lb)**

11. Connect the negative battery cable.
12. Check for correct operation of the shift-lock system.

**SHIFT-LOCK ACTUATOR**

**Inspection**

**Terminal voltage and continuity**

1. Remove the screws and remove the selector lever knob.
2. Remove the front console. (Refer to Section T.)

**Caution**

- Disconnect connector B to check continuity between terminal b (harness side) and a ground.

3. Turn the ignition switch ON, and check terminal voltages and continuity, referring to the chart next.
4. If not as specified, repair the wire harness and/or shift-lock actuator.

Connector	Terminal	⊖ terminal connected to	Condition	Measurement value
A	a	B—b	P range, selector lever release button not depressed	0Ω
A	b	B—b	Constant	0Ω
B	a	B—b	Brake pedal released → depressed	Below 1.5V → Approx. 12V
B	b (harness side)	Body	Constant	0Ω
B	c	B—b	Ignition switch ON	Approx. 12V
B	d	B—b	Ignition switch OFF	Approx. 12V

06U0KX-282

5. Install the front console.
6. Install the selector lever knob and tighten the screws.

### Tightening torque:

**1.5—2.9 N·m (15—30 cm·kg, 13—26 in·lb)**

7. Check for correct operation of the shift-lock system.

06U0KX-283

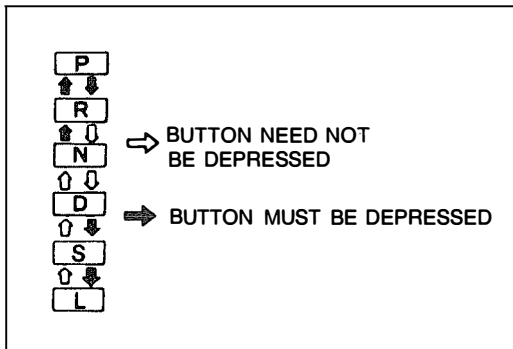
## SELECTOR LEVER

### Inspection

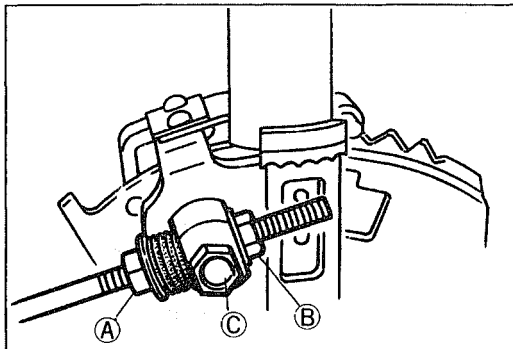
#### Caution

- **Shift the selector lever from P range to other ranges with ignition switch ON and brake pedal depressed.**

1. Check that the selector lever can only be shifted as shown in the figure.
2. Make sure there is a click at each range when shifted from P ↔ L range.
3. Check that the position of the selector lever and the indicator are exact.
4. Check that the button returns smoothly when used to shift the selector.



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### Adjustment

#### Lever position

1. Loosen locknuts A and B and lock bolt C.
2. Shift the selector lever to P range.
3. Shift the transaxle to P range by moving the manual shaft of the transaxle.
4. While holding the selector lever forward in P range, tighten lock bolt C to the specified torque.

### Tightening torque:

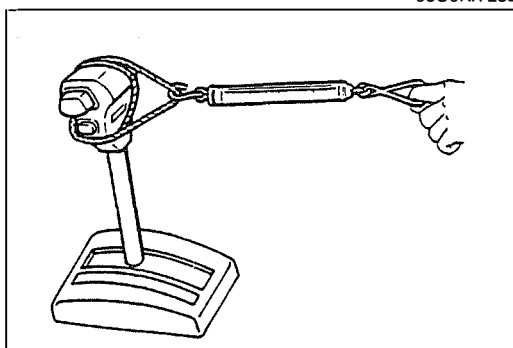
**8—11 N·m (80—110 cm·kg, 67—95 in·lb)**

5. Turn locknut A by hand until it just touches the spacer.
6. Tighten locknut B to the specified torque.

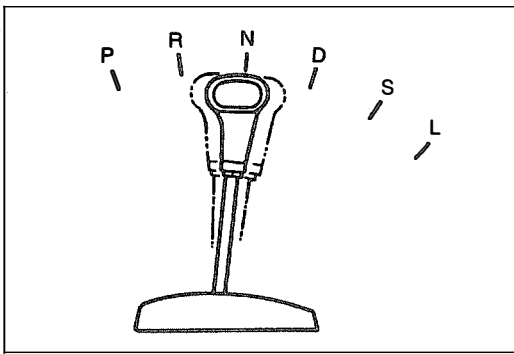
### Tightening torque:

**8—11 N·m (80—110 cm·kg, 67—96 in·lb)**

7. Shift the selector lever to N range.
8. With the button on the selector lever knob pressed, push the selector forward with a force of **20 N (2 kg, 4.4 lb)** and check the amount of movement (a) at the selector lever knob.



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06U0KX-287

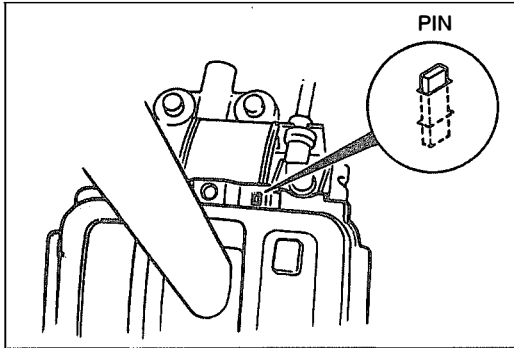
9. Pull the selector lever back with the same force and check the amount of movement (b).
10. Verify that the stroke difference of (a) and (b) is within specification.

**Stroke difference: 8mm (0.315 in) max.**

**Note**

- If not within specification, return to Step 1.

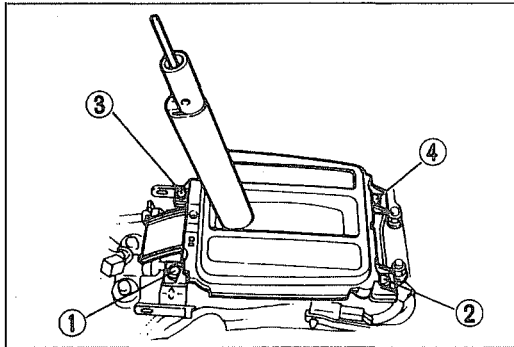
11. Check the selector lever operation.  
(Refer to Inspection Section.)



06U0KX-288

**Indicator panel**

1. Remove the selector lever knob and the front console.
2. Shift the selector lever to P range.
3. Loosen the indicator screws.
4. Align the alignment hole in the slider with the hole in the indicator panel. Install a suitable pin to hold the slider.



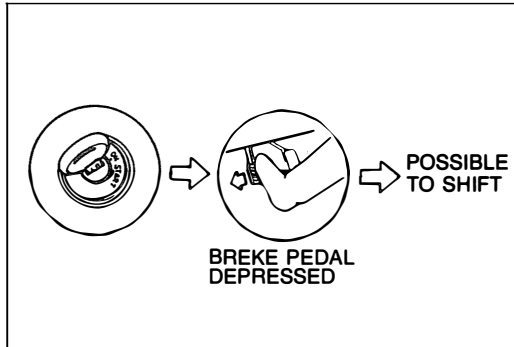
06U0KX-289

5. Tighten the indicator screws in the order shown in the figure.
6. Remove the pin.
7. Verify that the selector lever properly aligns with the indicator in each range.
8. Install the front console and the selector lever knob.

**Shift-lock System Operation Inspection**

**Caution**

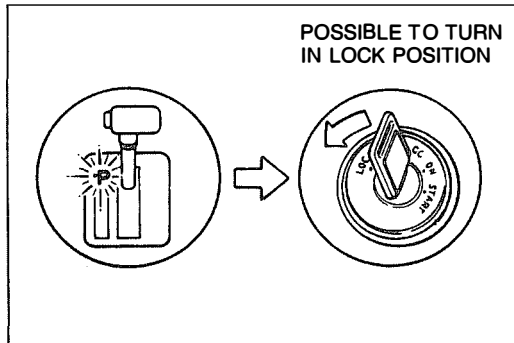
- Service with engine OFF.



97U0KX-313

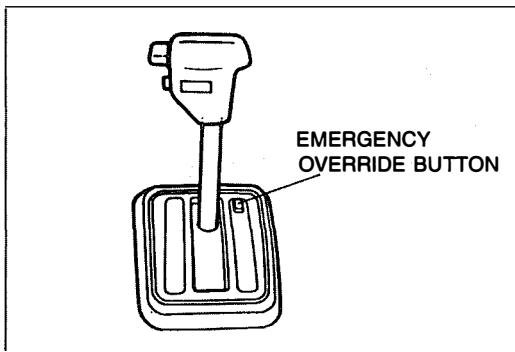
**Shift-lock system**

1. Turn the ignition switch ON.
2. Verify that the selector lever is in P range.
3. Without the brake pedal depressed, verify that the selector lever cannot be shifted from P range.
4. Depress the brake pedal. Verify that the selector lever can be shifted from P range.
5. Shift the selector lever to R range.
6. Verify that the ignition key cannot be turned to LOCK position.
7. Shift the selector lever to P range.
8. Verify that the ignition key can be turned to LOCK position.
9. If not as specified, inspect and repair as necessary, referring to Troubleshooting.



97U0KX-314





97UOKX-315

### Emergency override button

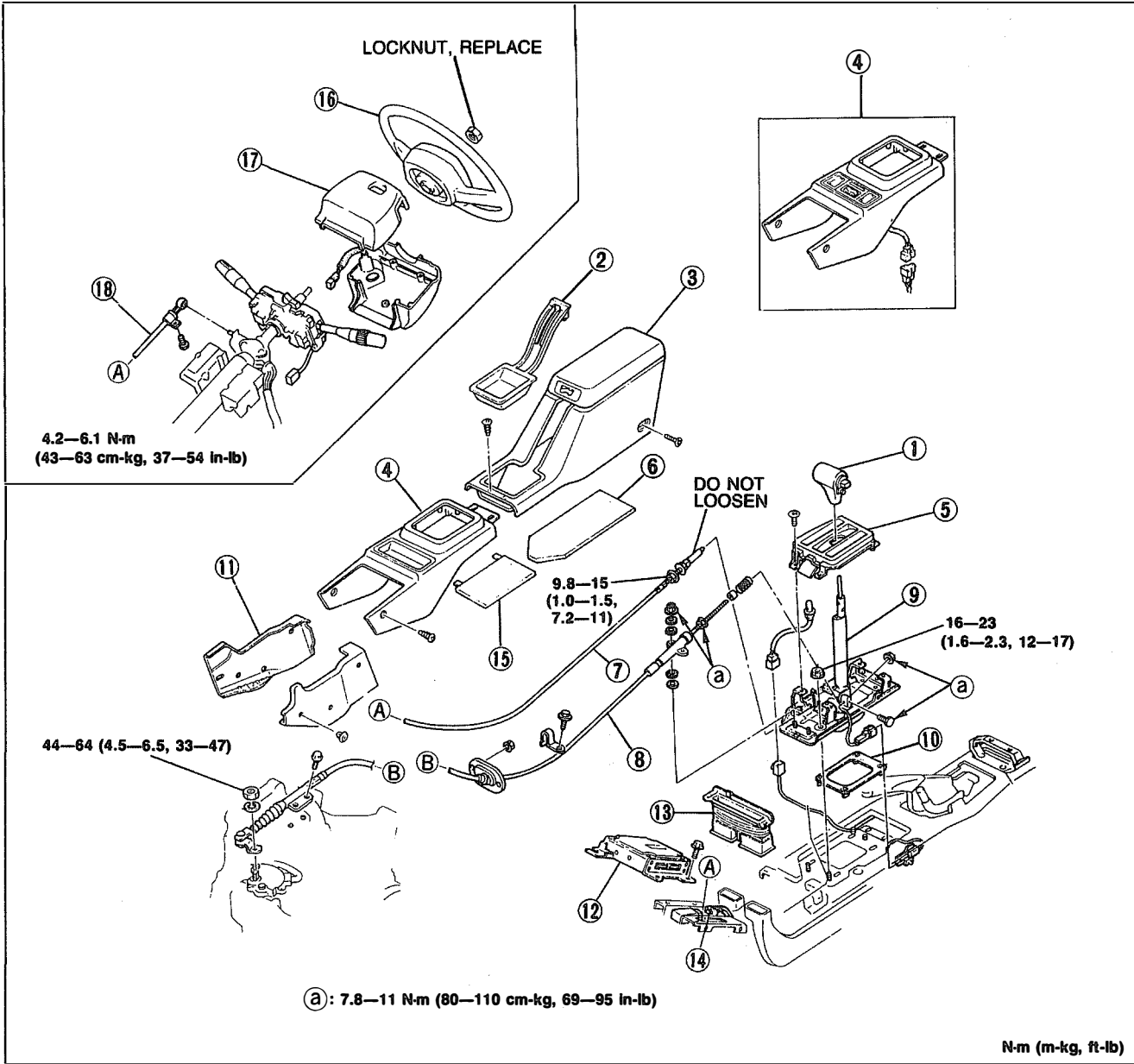
1. Verify that the selector lever is locked in P range.
2. Sliding back and hold the emergency override button.  
Verify that the selector lever can be shifted from P range.
3. If not as specified, inspect and repair as necessary, referring to Troubleshooting.

# K

## SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)

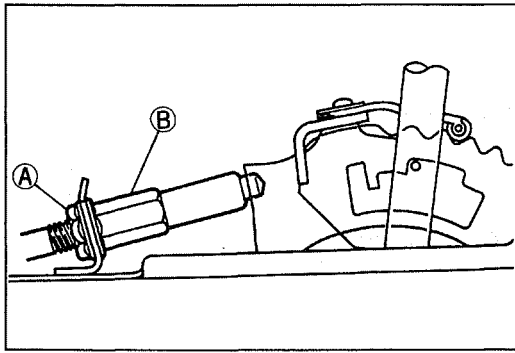
### Removal / Inspection / Installation

1. Disconnect the negative battery cable.
2. Remove in the order shown in the figure, referring to **Removal Note**.
3. Inspect all parts and repair or replace as necessary.
4. Install the reverse order of removal, referring to **Installation Note**.
5. Connect the negative battery cable and check the selector lever operation and shift-lock system operation. (Refer to pages K-155, 156)



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- |                                 |   |
|---------------------------------|---|
| 1. Selector lever knob          | 9. Selector lever assembly                |
| 2. Upper plate                  | 10. Rubber                                |
| 3. Rear console                 | 11. Side cover                            |
| 4. Front console                | 12. Engine control unit                   |
| 5. Indicator panel              | 13. Front duct                            |
| Installation..... page K-159    | 14. Control relay connector               |
| 6. Cable insulator No.2         | 15. Cable insulator No.1                  |
| 7. Interlock cable (lever side) | 16. Steering wheel                        |
| Removal ..... page K-159        | 17. Column cover                          |
| Installation..... page K-159    | 18. Interlock cable (steering wheel side) |
| 8. Selector cable (lever side)  | Removal ..... page K-159                  |



06U0KX-291

### Removal note

#### Interlock cable (lever side)

1. Shift the selector lever to N range.

#### Caution

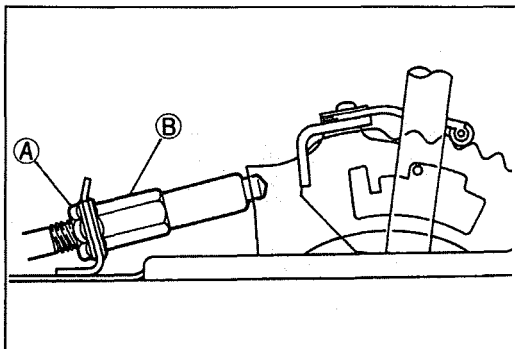
- Do not loosen locknut B, it is factory preset for proper shift-lock system operation.

2. Loosen locknut A.

#### Interlock cable (steering wheel side)

1. Remove the lower panel and instrument panel.  
(Refer to Section T.)

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### Installation note

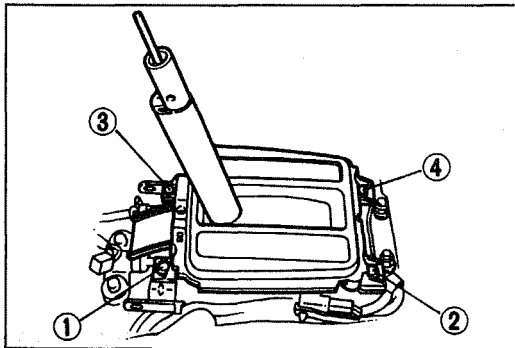
#### Interlock cable (lever side)

1. Shift the selector lever to N range.
2. Tighten the locknut A.

#### Tightening torque:

**9.8--15 N·m (1.0--1.5 m·kg, 7.2--11 ft·lb)**

3. Check shift-lock system operation.  
(Refer to page K-156, Steps 5 to 8.)
4. Adjust the selector lever position.  
(Refer to page K-155.)



06U0KX-294

#### Indicator panel

1. Shift the selector lever to P range.
2. Align the alignment hole in the slider with the hole in the indicator panel. Install a suitable pin to hold the slider.
3. Install the indicator panel.
4. Tighten the indicator screws in the order shown in the figure.
5. Removal the pin.

# K

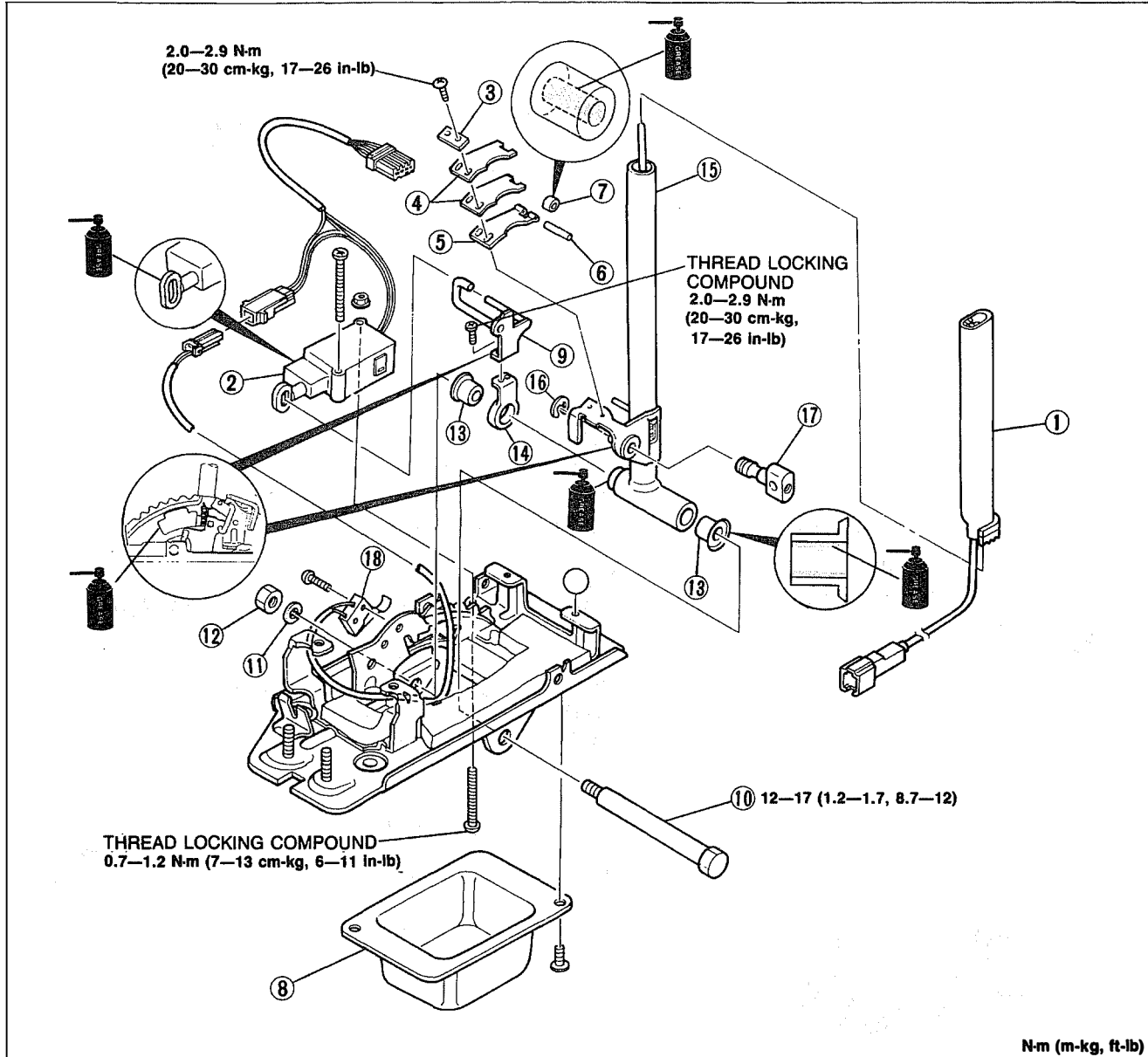
## SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)

### Overhaul

#### Note

- Do not remove the bushing or P range switch if not necessary.

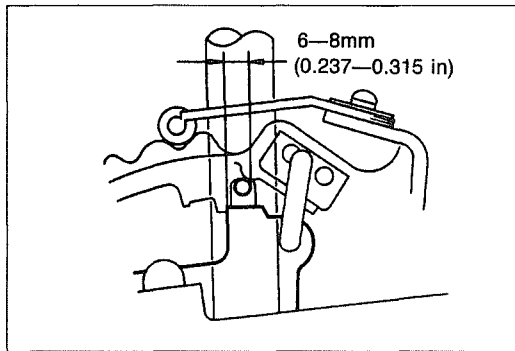
1. Disassemble in the order shown in the figure.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



N-m (m-kg, ft-lb)

06UOKX-295

- |  |  |
|--|--|
| 1. Cover   | 10. Spindle                                      |
| 2. Shift-lock actuator<br>Installation..... page K-161 | 11. Lock washer                                  |
| 3. Assist plate  | 12. Nut  |
| 4. Spring plates                                       | 13. Bushing<br>Inspect for damage and wear       |
| 5. Spring  | 14. Lower lock lever                             |
| 6. Pin   | 15. Select lever<br>Inspect for smooth operation |
| 7. Spacer  | 16. Clip   |
| 8. Seal plate  | 17. T-joint                                      |
| 9. Upper lock lever<br>Inspect for damage              | 18. P range switch                               |

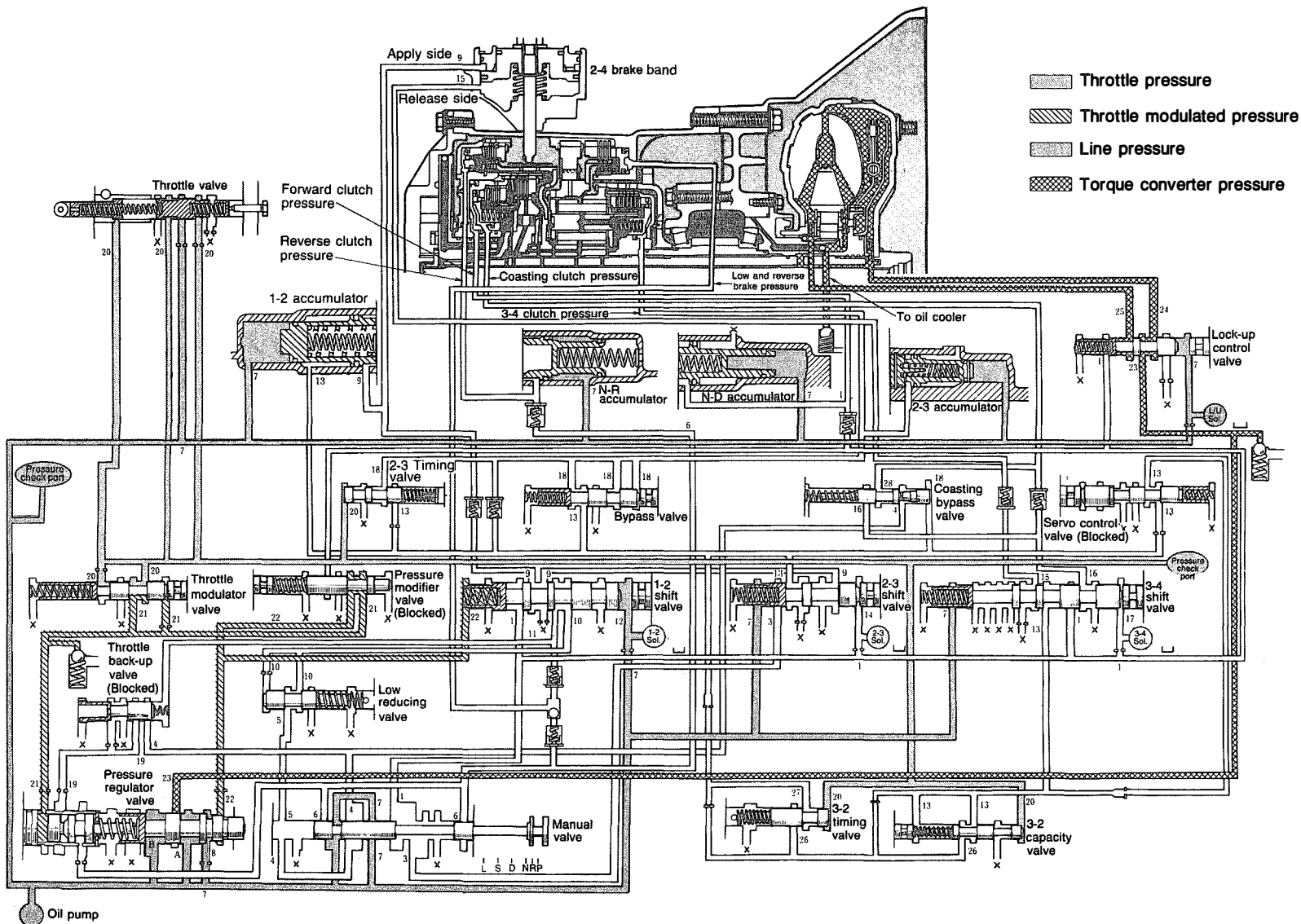


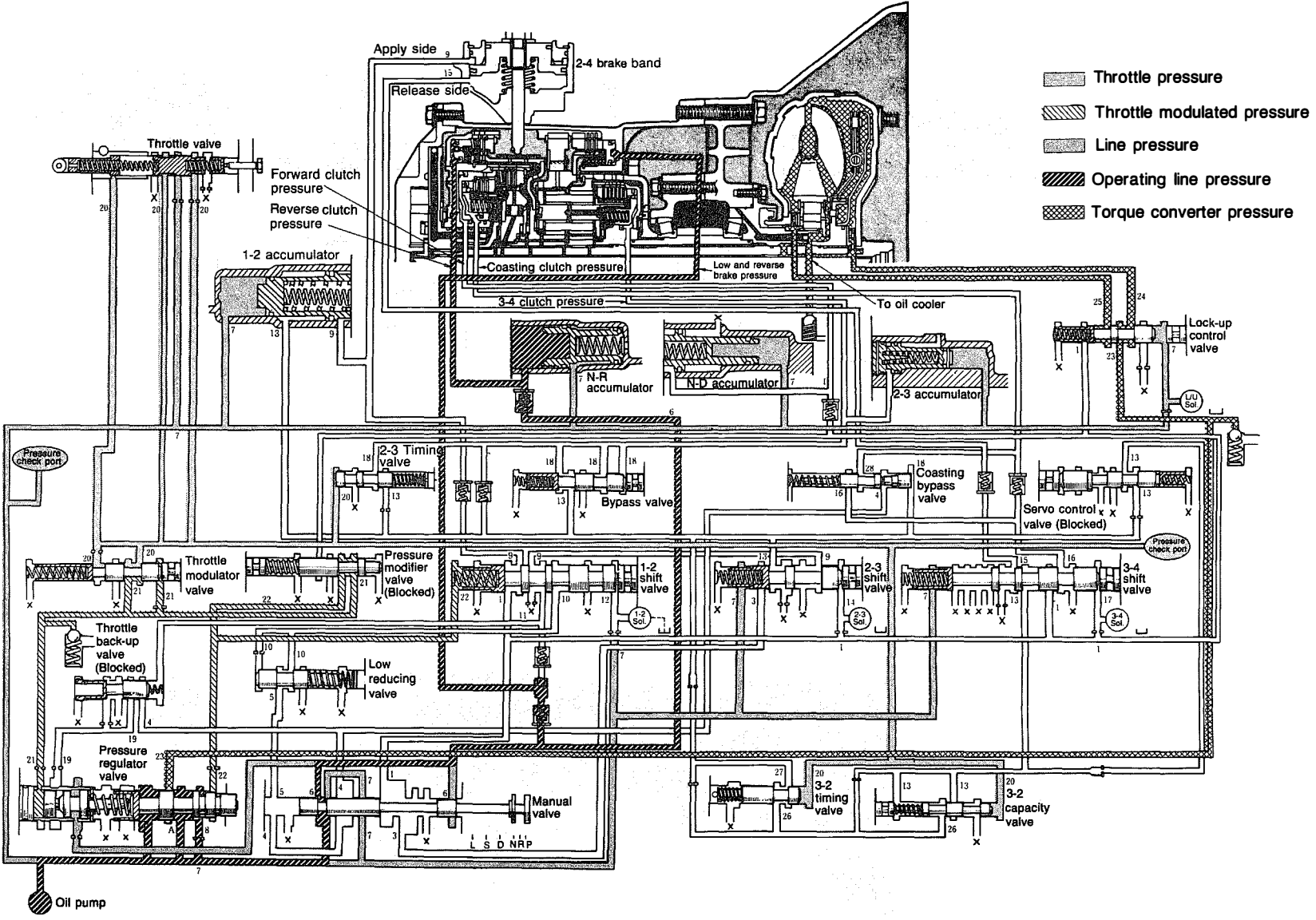
06U0KX-296

## Assembly note Shift-lock actuator

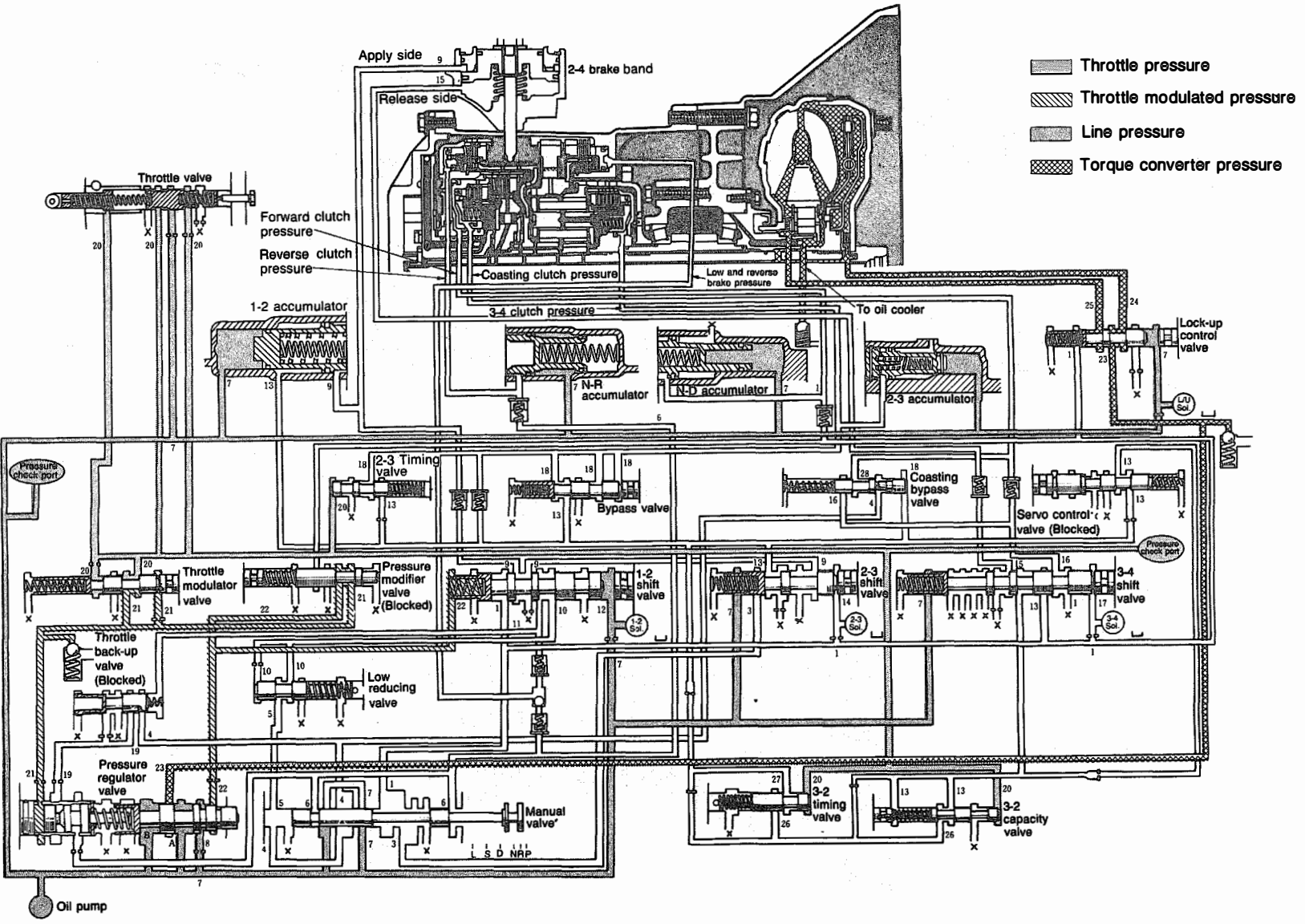
1. Verify that the overlap between the guide pin and the lock lever is within specification with the selector lever pushed.

**Specification: 6—8mm (0.237—0.315 in)**





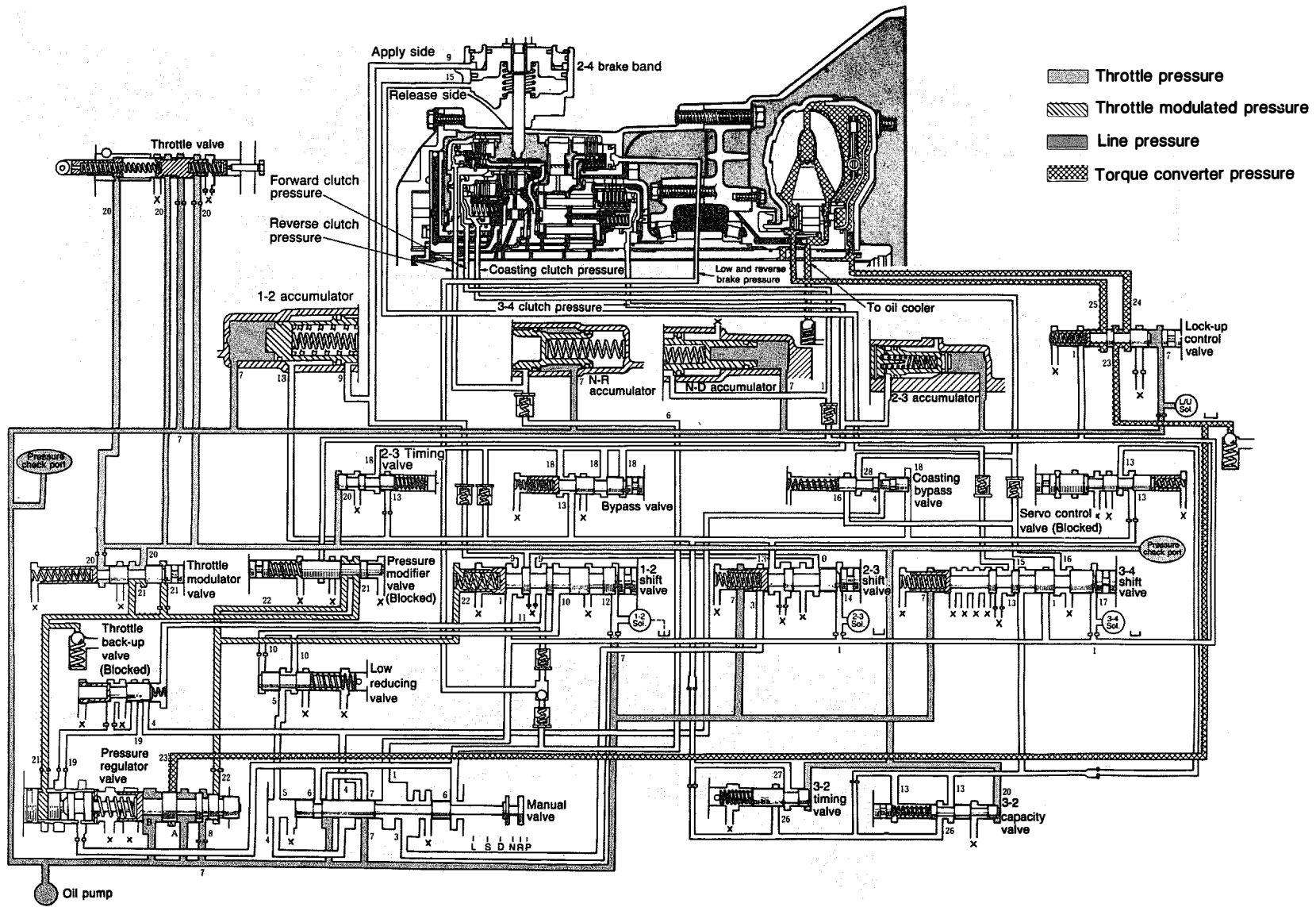
N RANGE; BELOW APPROX. 4 km/h (2 mph)

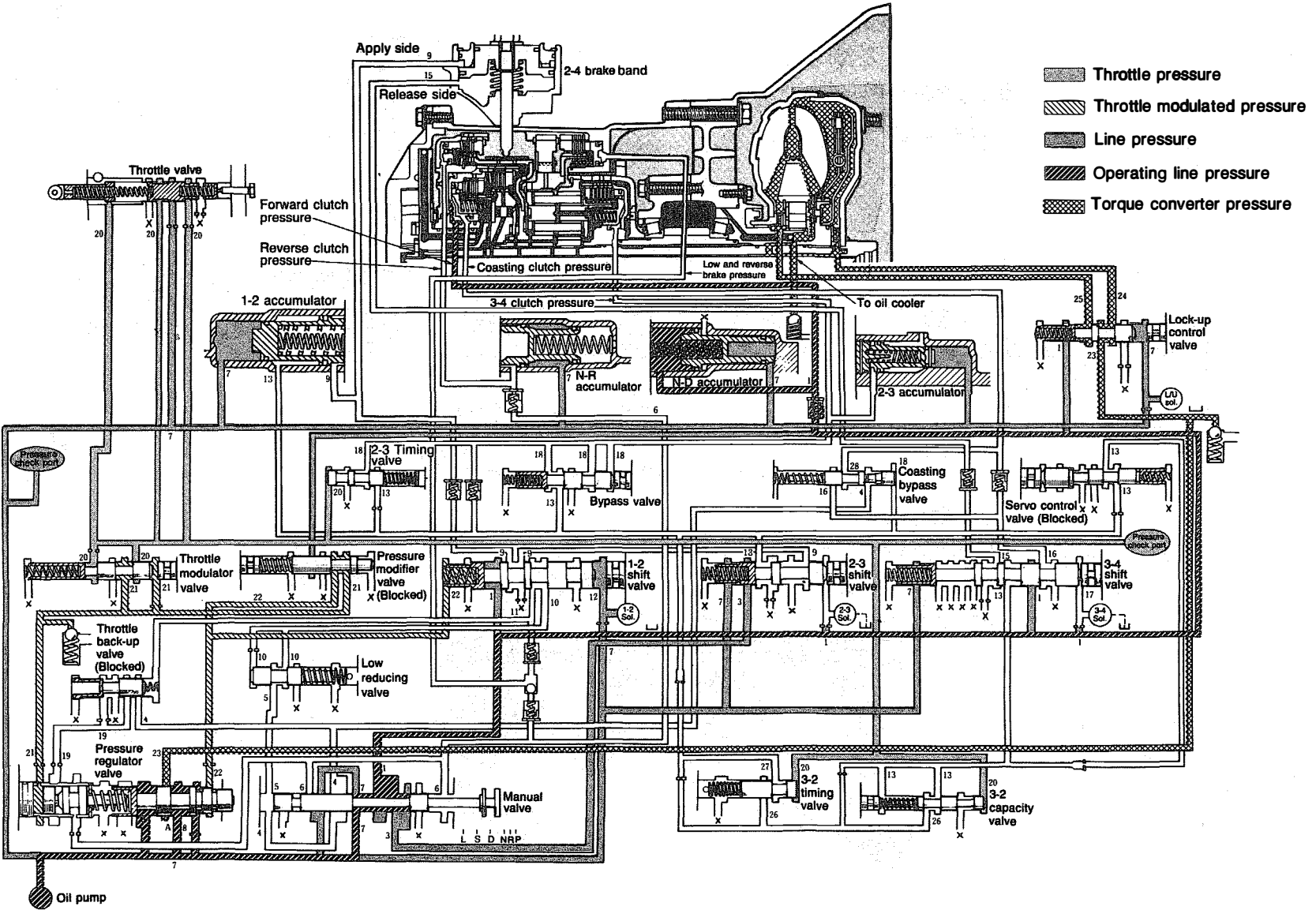


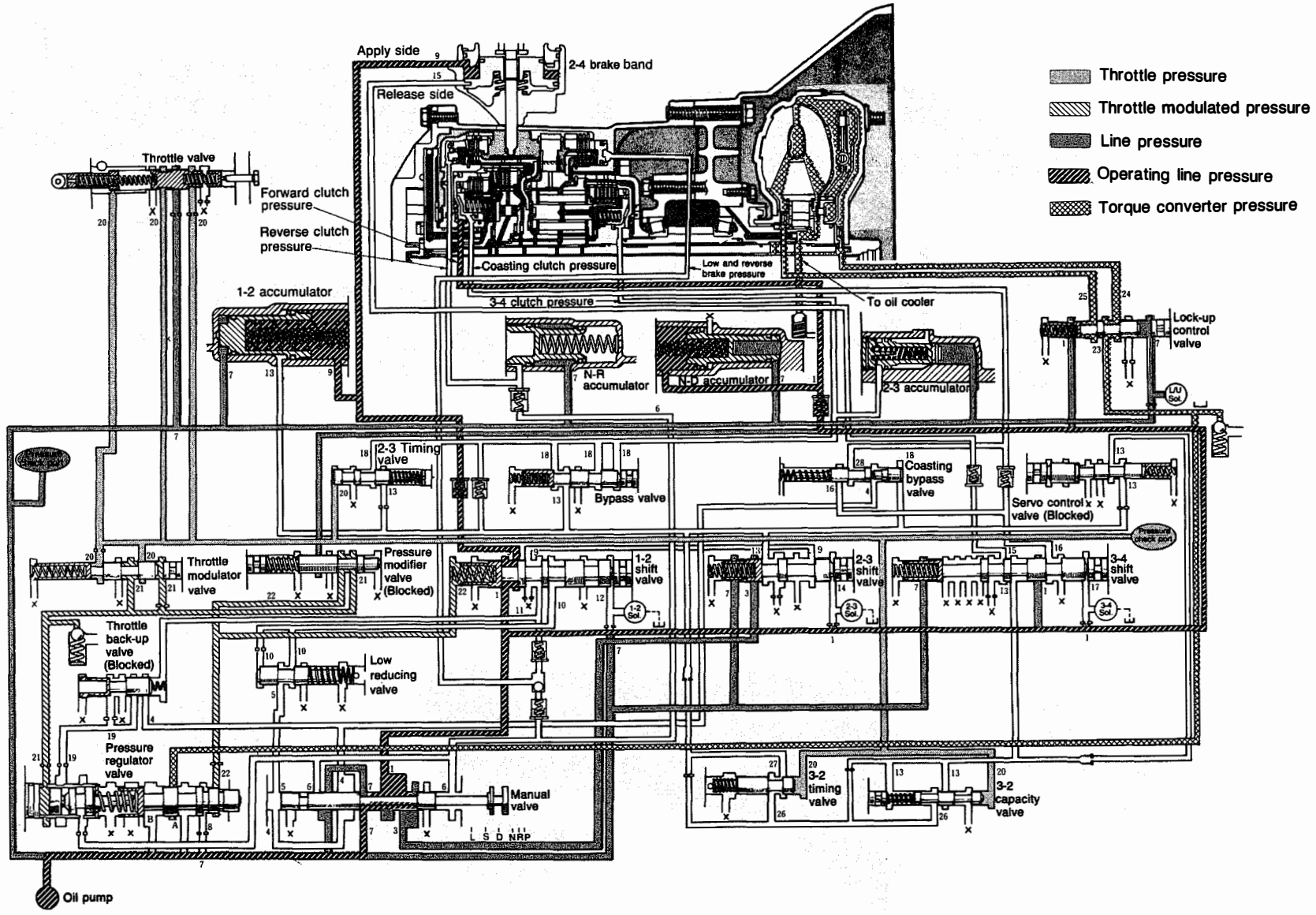


# HYDRAULIC CIRCUIT

N RANGE; ABOVE APPROX. 5 km/h (3 mph)

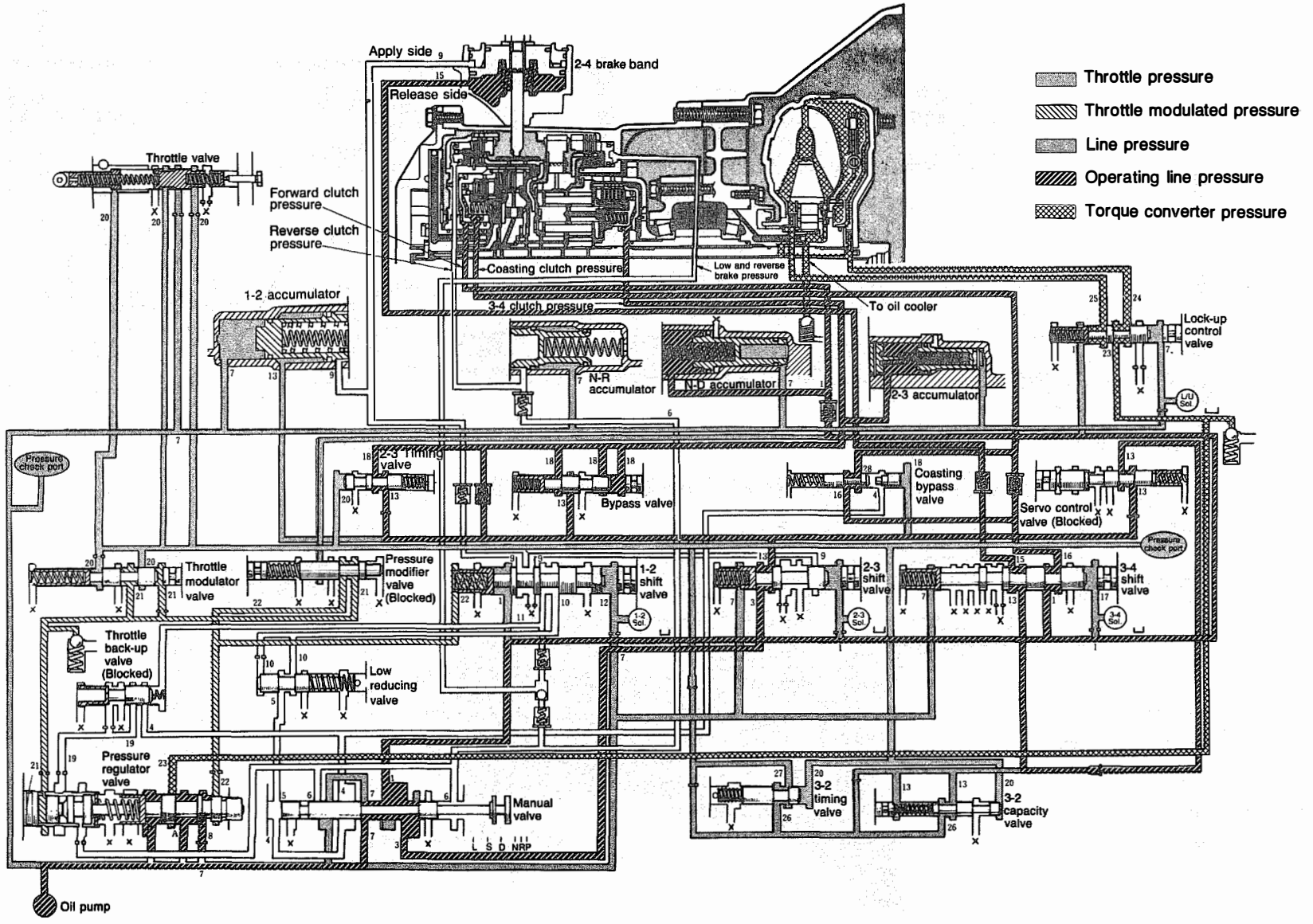






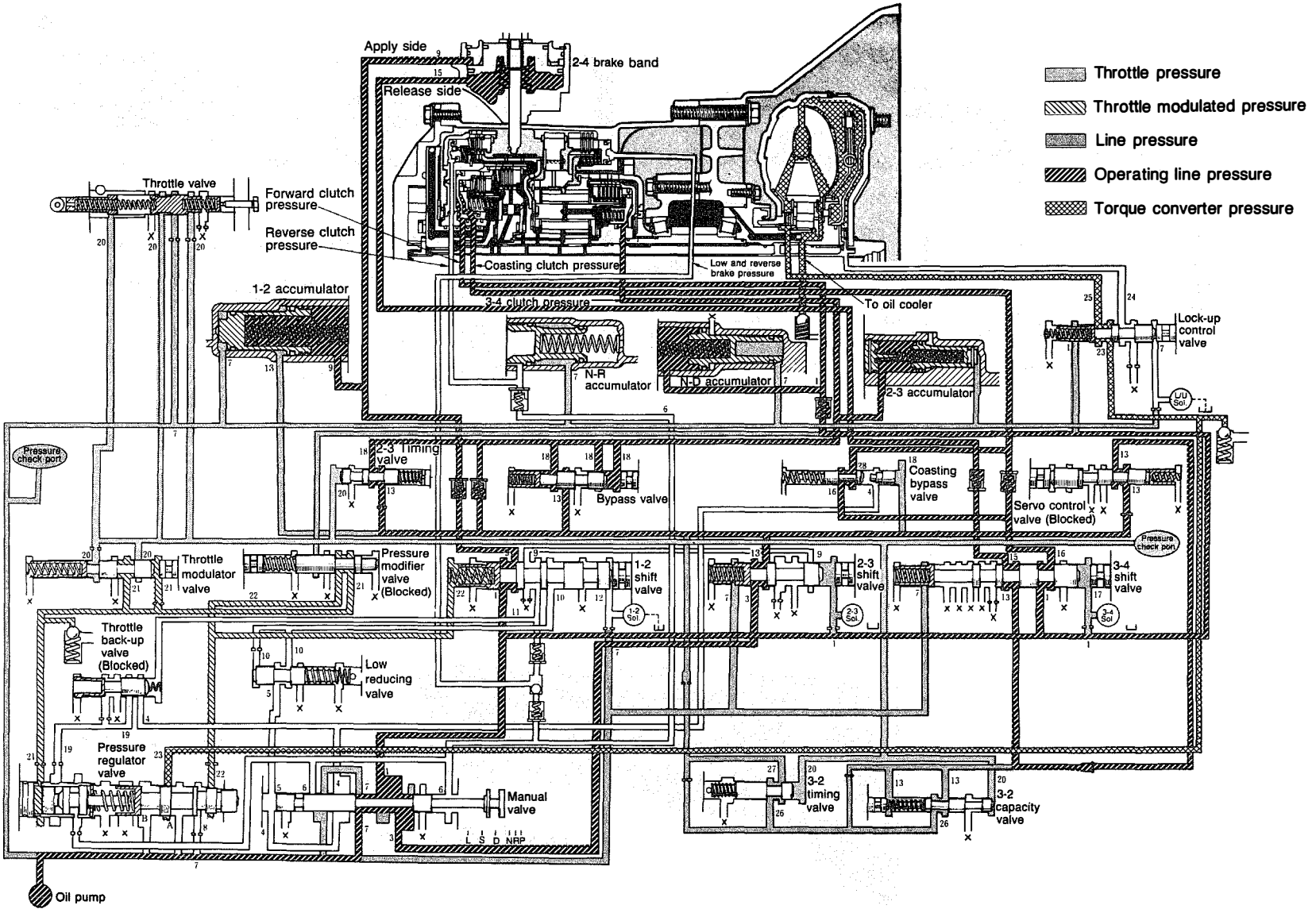
- Throttle pressure
- Throttle modulated pressure
- Line pressure
- Operating line pressure
- Torque converter pressure

D RANGE; 3RD GEAR, BELOW APPROX. 40 km/h (25 mph)

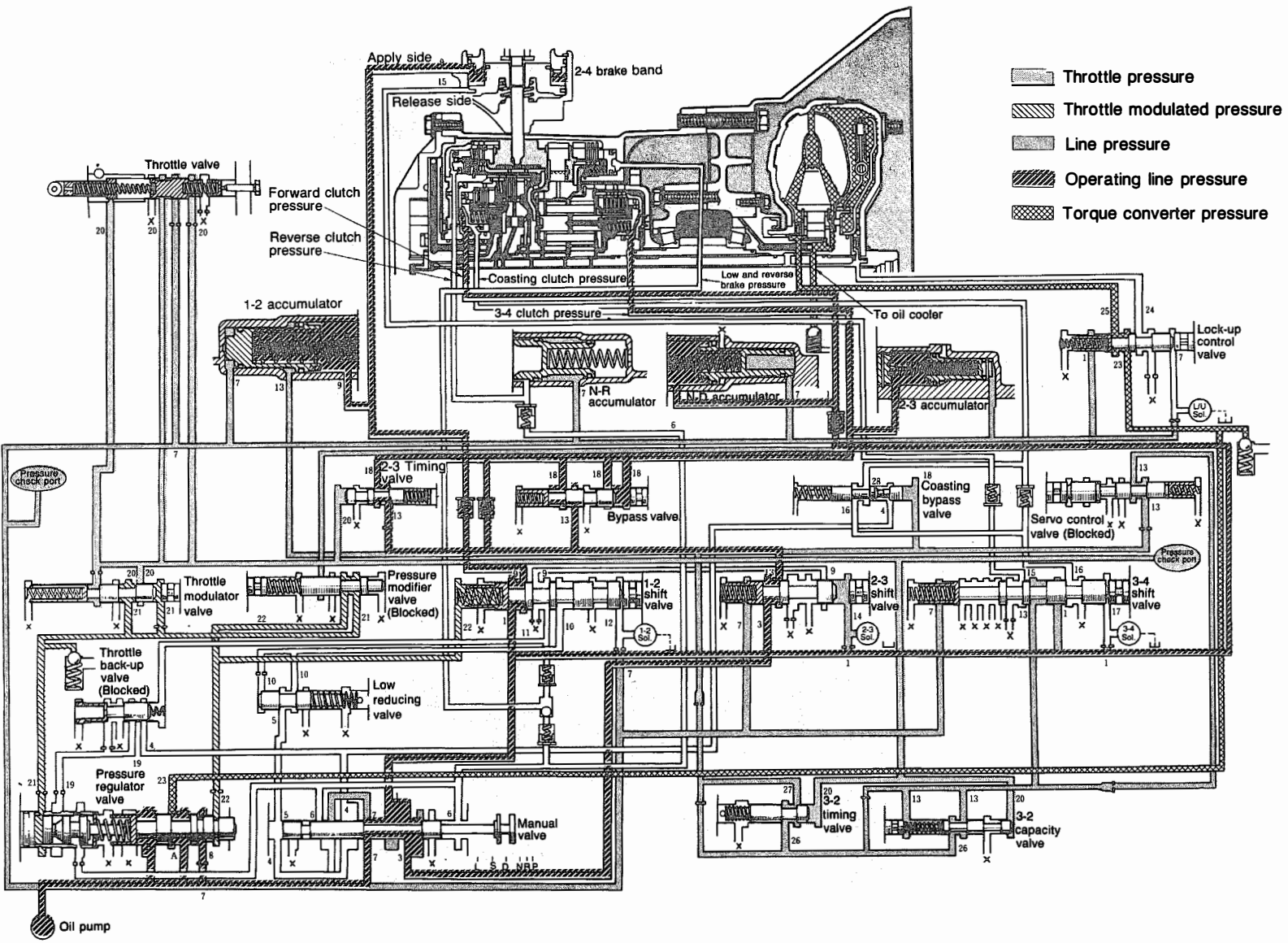







# HYDRAULIC CIRCUIT

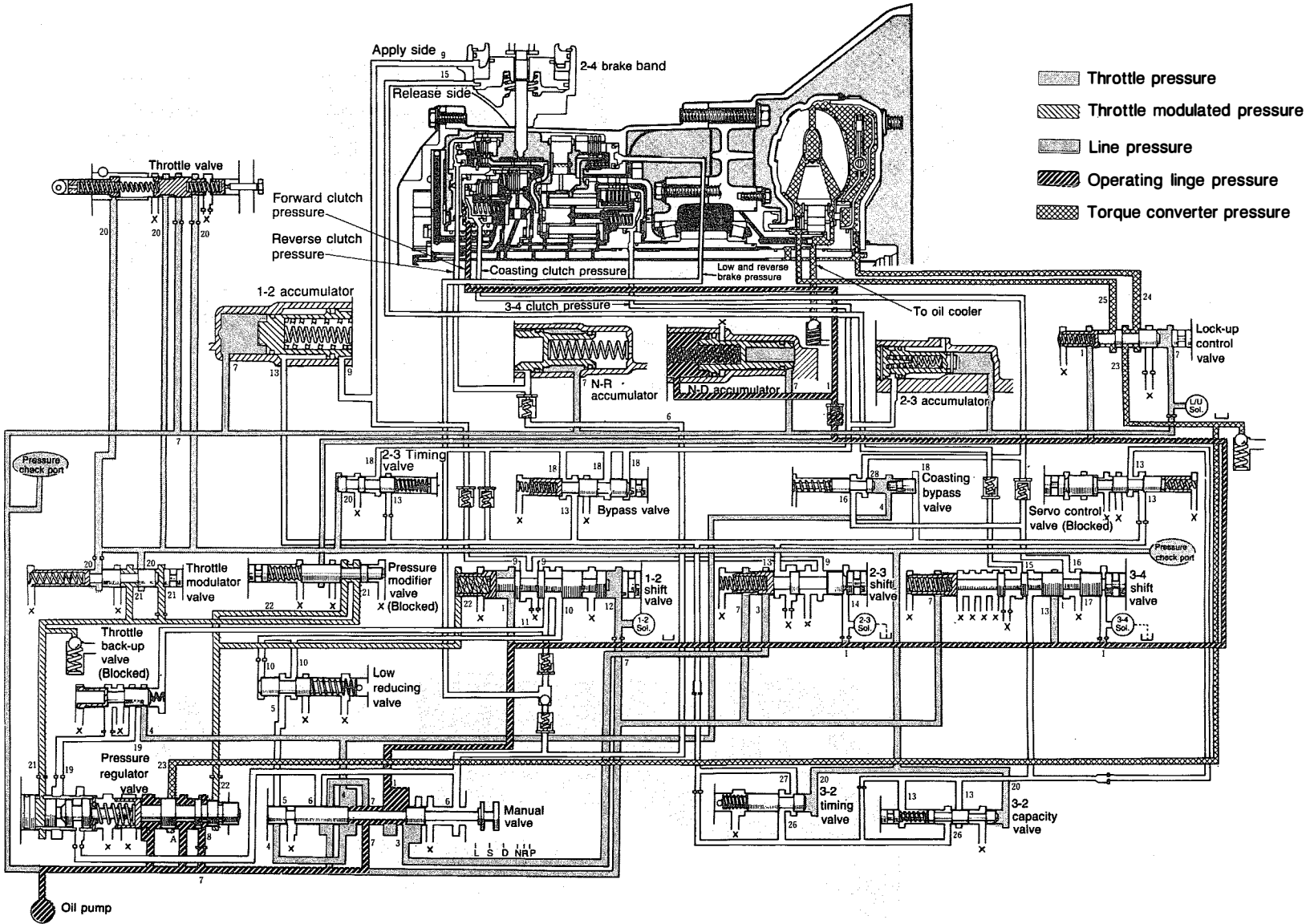
D RANGE: 3RD GEAR, ABOVE APPROX. 40 km/h (25 mph) LOCKUP ON



- Throttle pressure
- Throttle modulated pressure
- Line pressure
- Operating line pressure
- Torque converter pressure

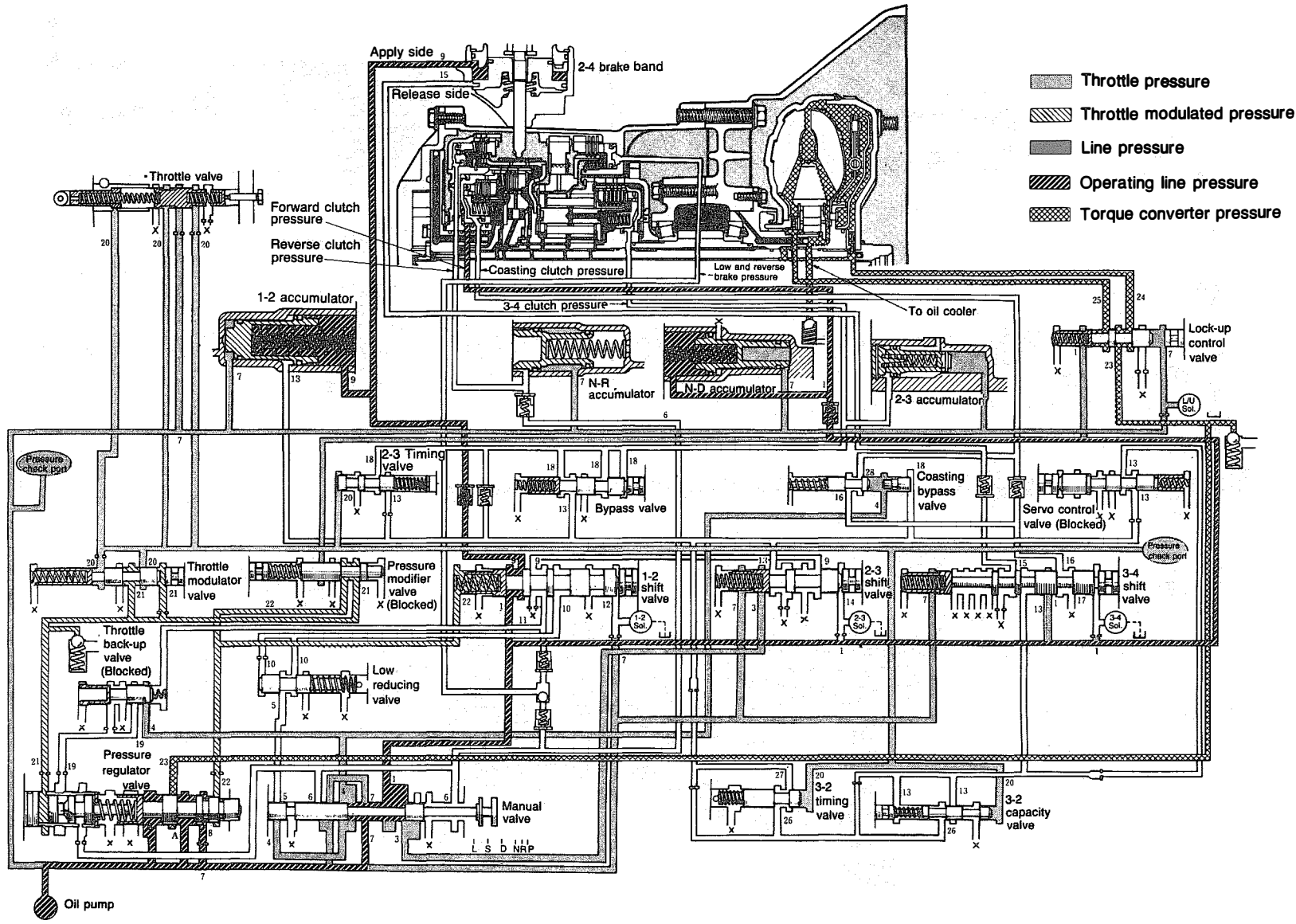







-  Throttle pressure
-  Throttle modulated pressure
-  Line pressure
-  Operating line pressure
-  Torque converter pressure



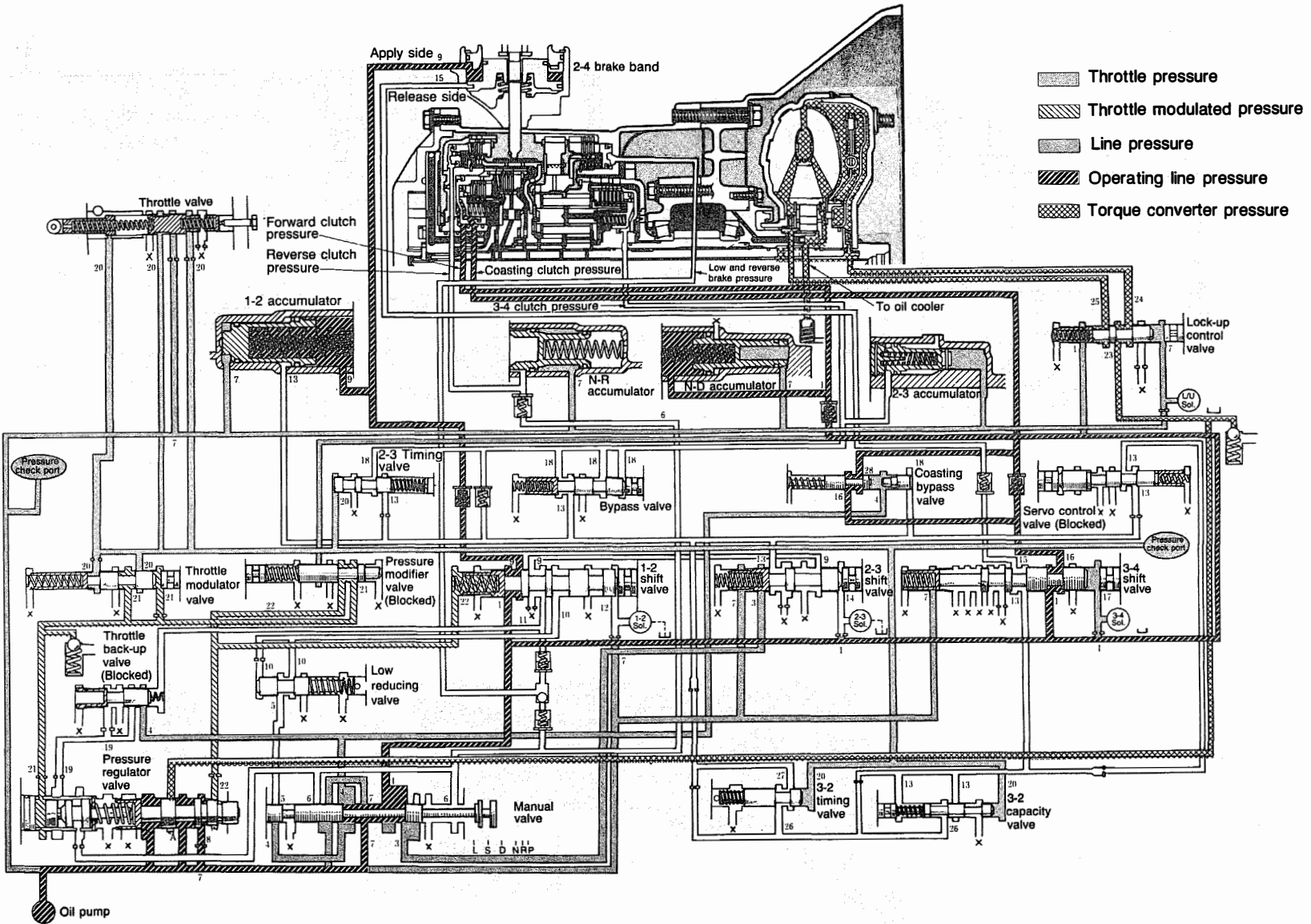
- Throttle pressure
- Throttle modulated pressure
- Line pressure
- Operating linge pressure
- Torque converter pressure



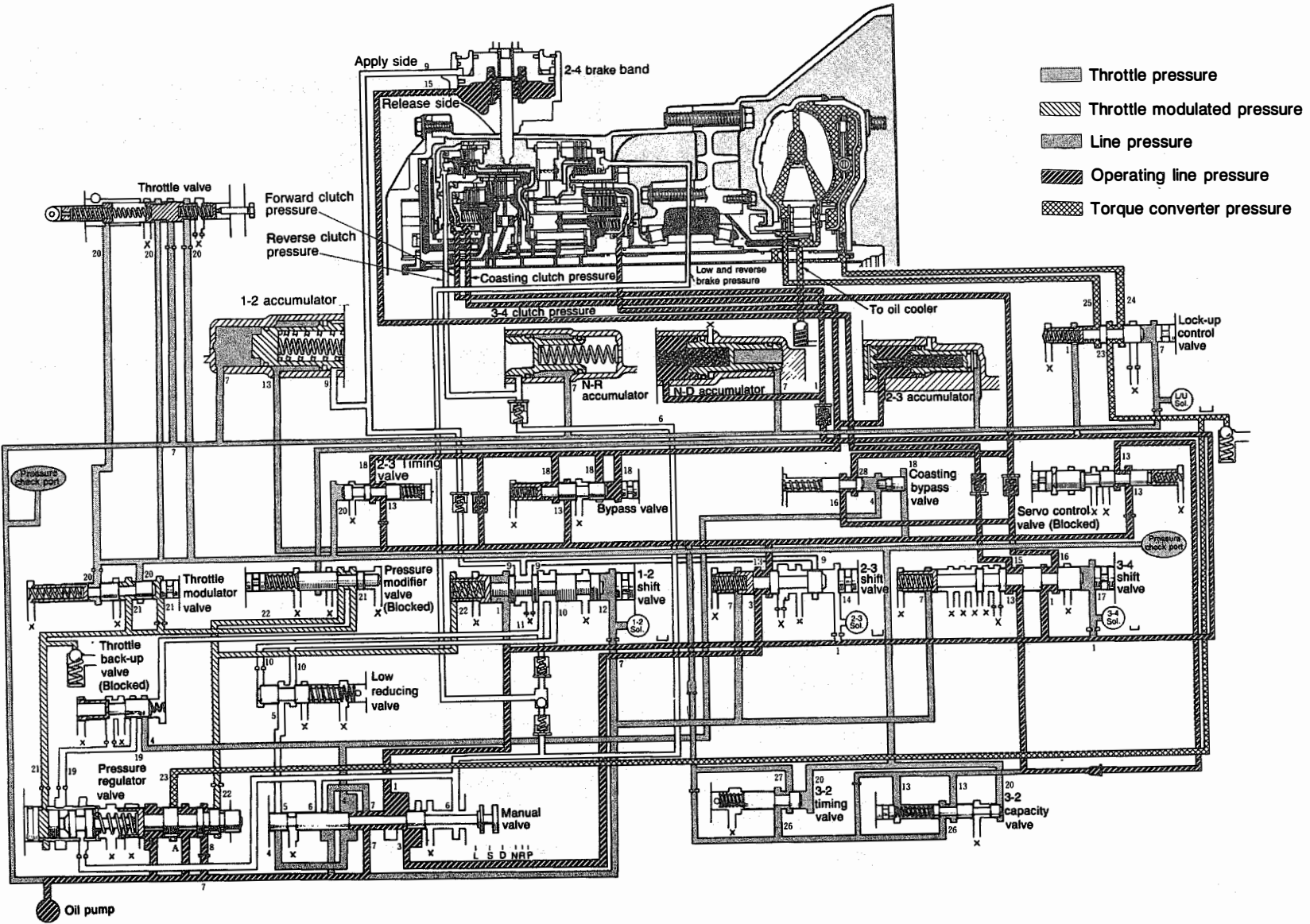


-  Throttle pressure
-  Throttle modulated pressure
-  Line pressure
-  Operating line pressure
-  Torque converter pressure



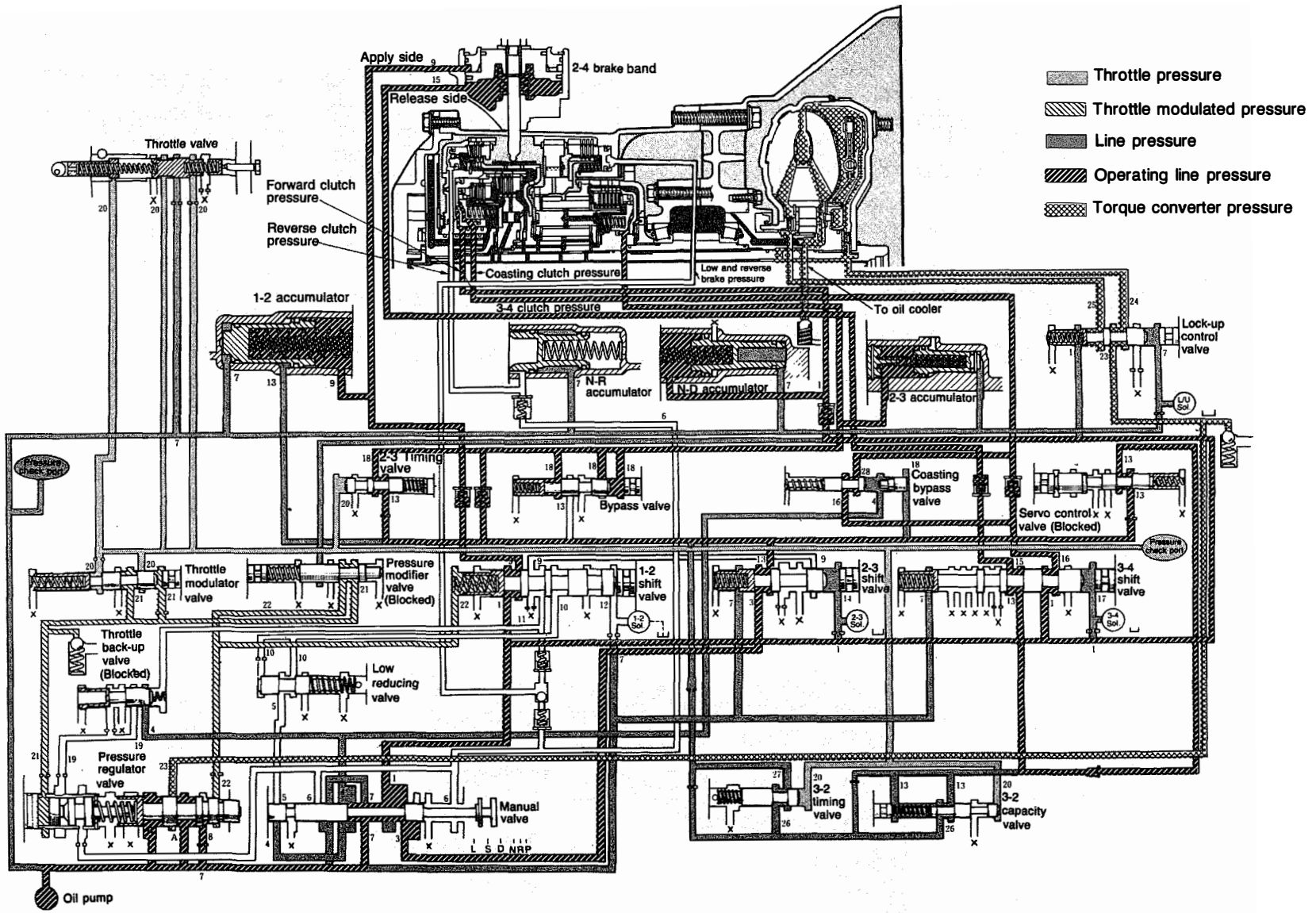


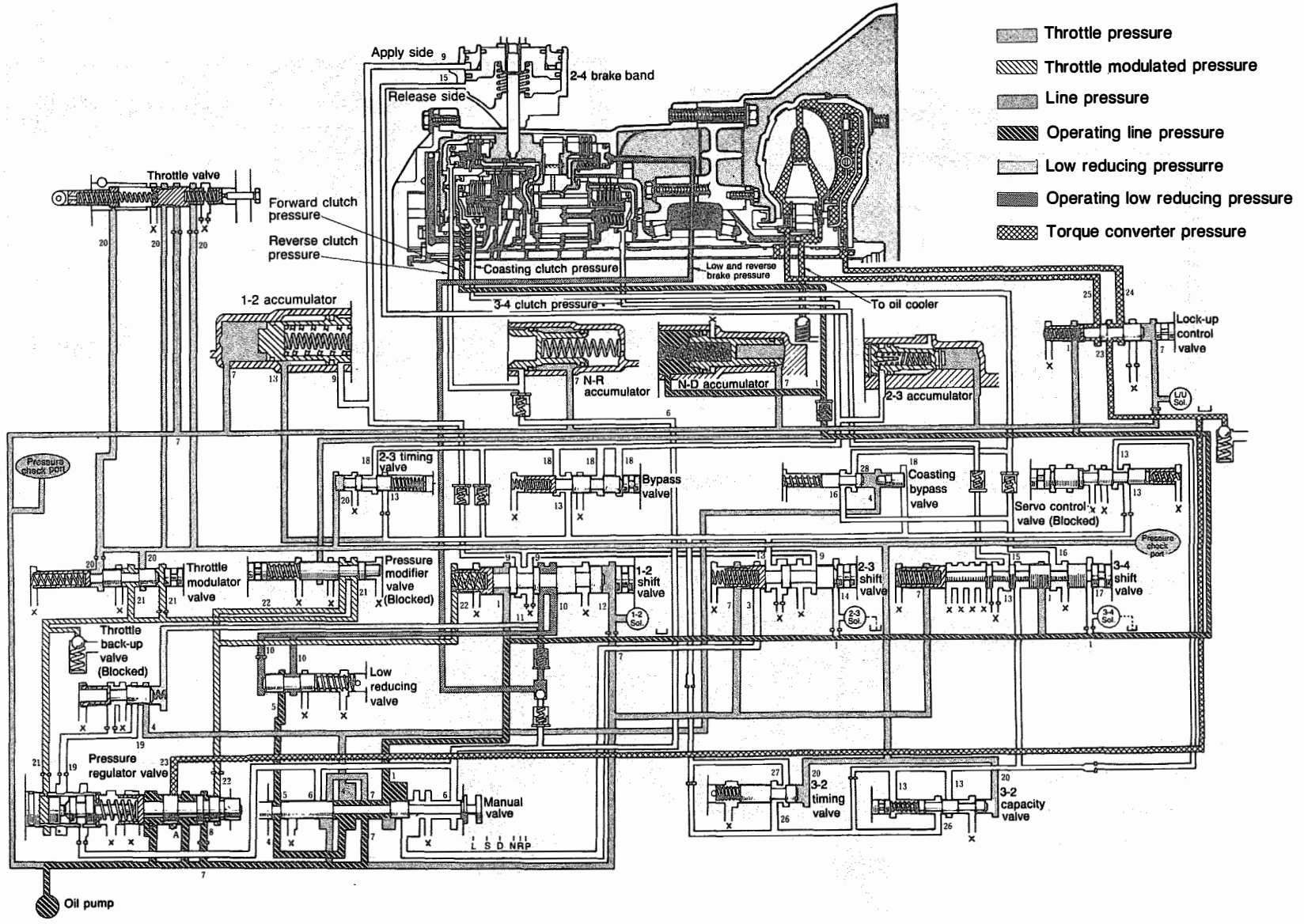
S RANGE: 3RD GEAR, BELOW APPROX. 40 km/h (25 mph)



# HYDRAULIC CIRCUIT

S RANGE; 3RD GEAR, ABOVE APPROX. 40 km/h (25 mph)

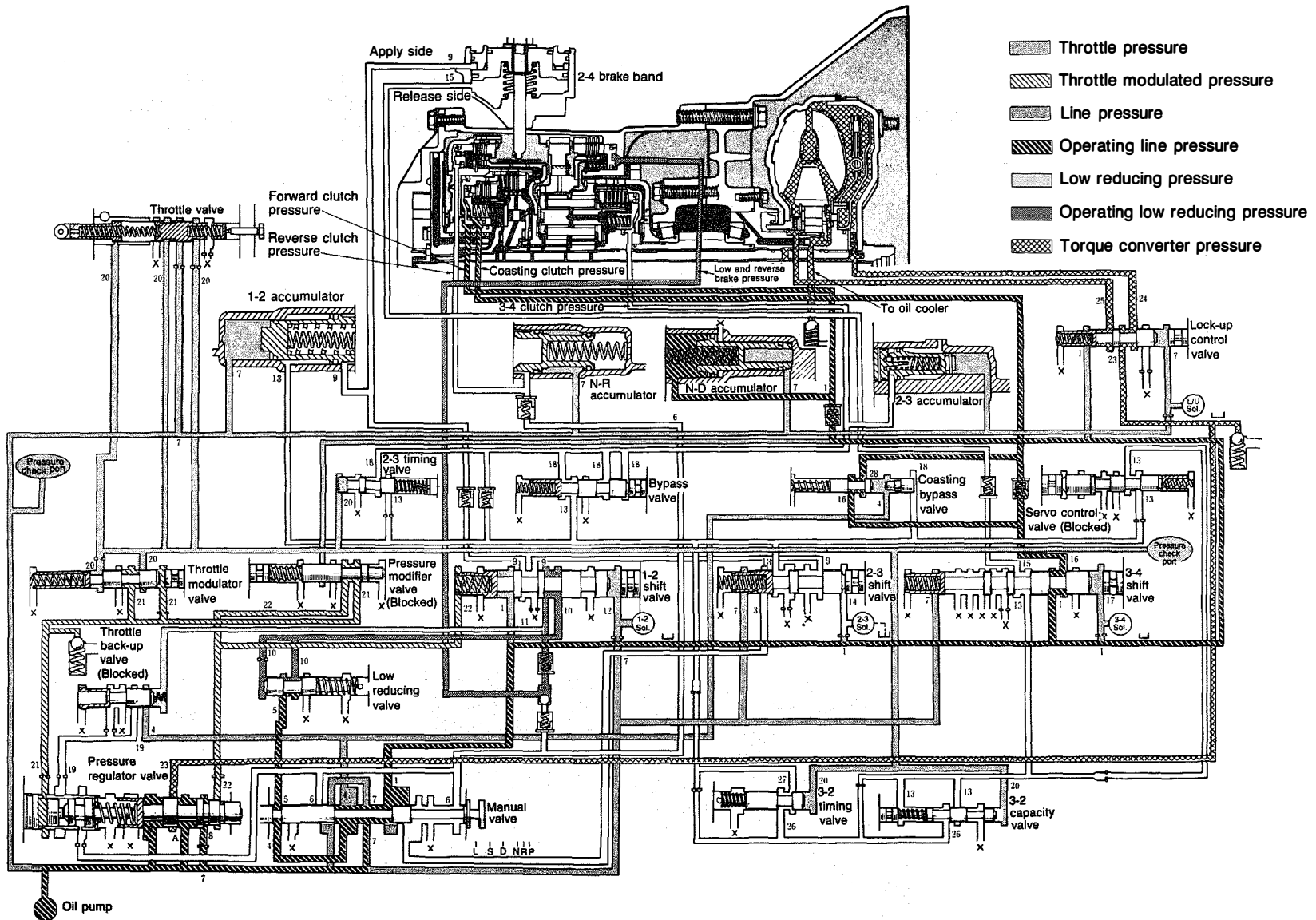




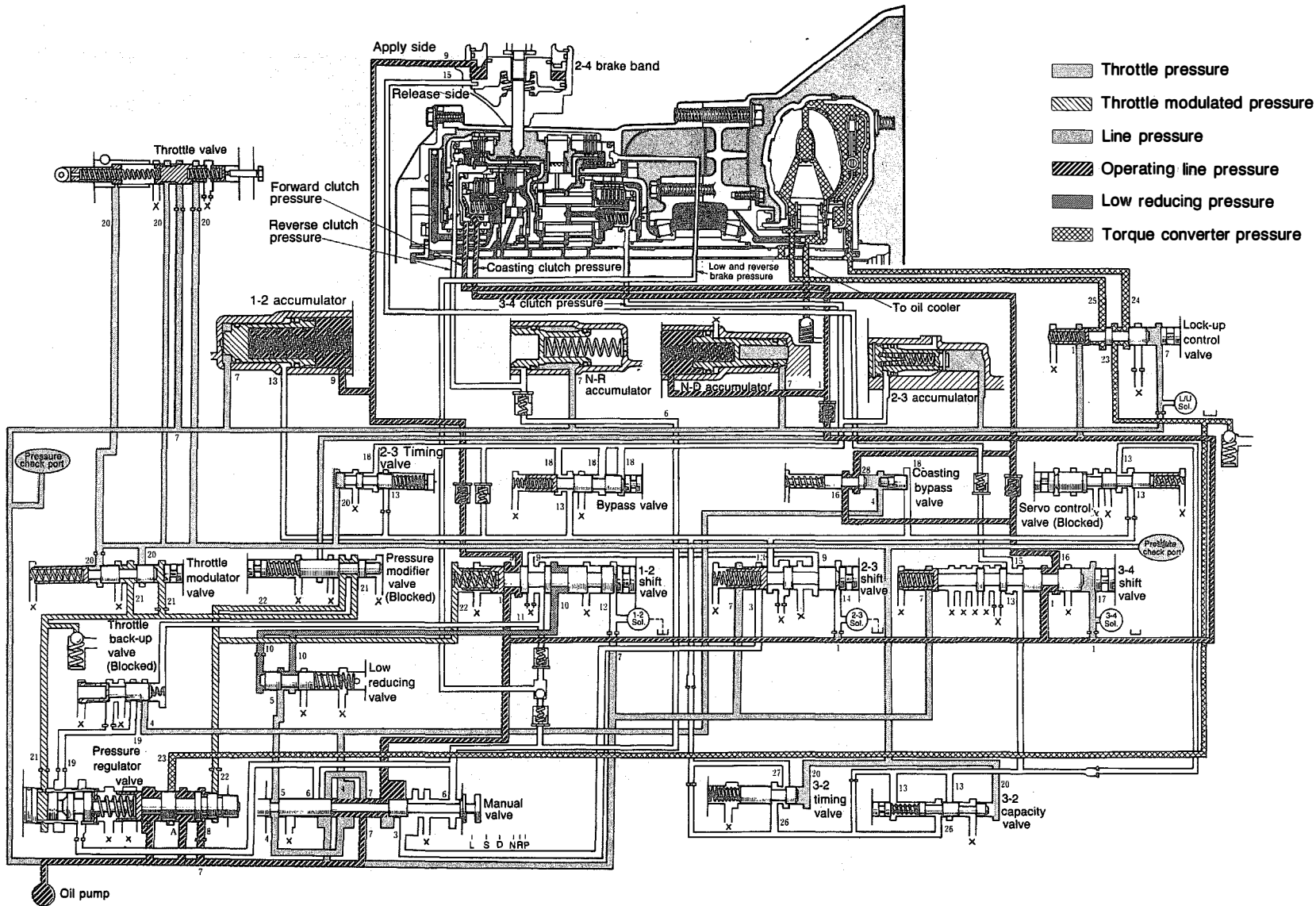
L RANGE: 1ST GEAR, HOLD

HYDRAULIC CIRCUIT

K



86U07B-476  
K-177





L RANGE; 2ND GEAR, ABOVE APPROX. 110 km/h (68 mph)

HYDRAULIC CIRCUIT

K

