

1989 Mazda RX-7 Factory Service Manual

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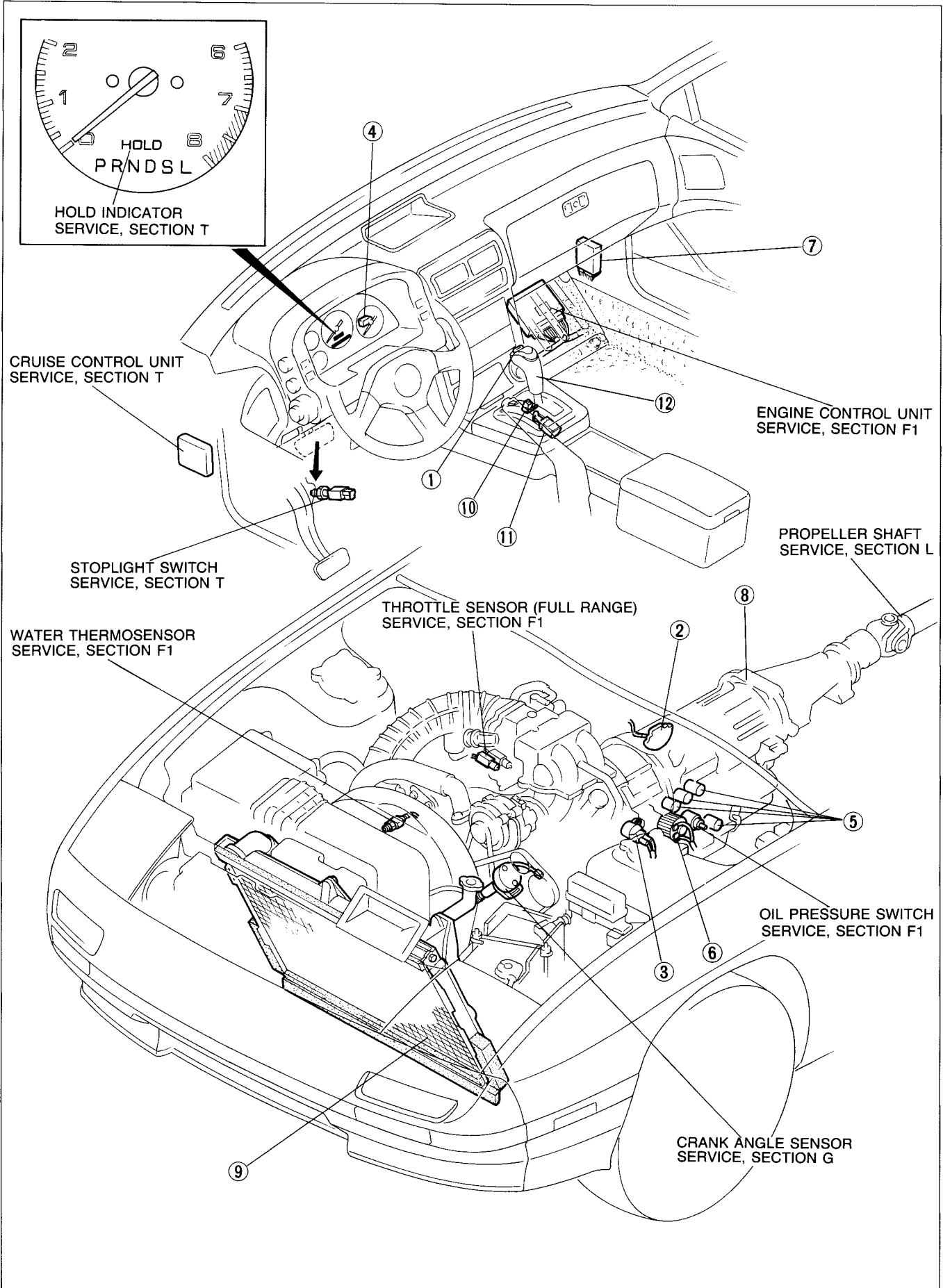
Some parts of the manual may be hard to read or see on the screen, but if you print the pages out it's perfect. Well except for the crookedness ☺.

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AUTOMATIC TRANSMISSION (Electronically-Controlled)

INDEX	K- 2	DIRECT CLUTCH	K- 69
OUTLINE	K- 3	OD BAND SERVO	K- 75
SPECIFICATIONS	K- 3	DRUM SUPPORT, ACCUMULATOR, AND OD CASE	K- 78
CROSS-SECTIONAL VIEW	K- 4	2ND BAND SERVO	K- 82
POWERFLOW DIAGRAM	K- 5	FRONT CLUTCH	K- 85
OPERATION OF COMPONENTS	K- 5	REAR CLUTCH	K- 90
FLUID PASSAGE LOCATION	K- 6	CONNECTING SHELL AND FRONT PLANETARY GEAR UNIT (REAR CLUTCH HUB, FRONT PLANETARY PINION CARRIER, REAR SUN GEAR)	K- 95
TROUBLESHOOTING	K- 8	REAR PLANETARY GEAR UNIT (CONNECTING DRUM, REAR PLANETARY PINION CARRIER, ONE-WAY CLUTCH)	K- 97
GENERAL NOTES	K- 8	LOW AND REVERSE BRAKE	K-101
QUICK DIAGNOSIS CHART	K- 9	EXTENSION HOUSING AND PARKING MECHANISM	K-106
SELF-DIAGNOSTIC SYSTEM		OIL SEAL	K-111
INSPECTION	K- 11	CONTROL VALVE BODY (DISASSEMBLY AND INSPECTION)	K-112
SELF-DIAGNOSTIC FUNCTION	K- 11	UPPER AND LOWER VALVE BODY	K-116
EC-AT TESTER	K- 11	CONTROL VALVE BODY (ASSEMBLY)	K-126
GENERAL NOTES	K- 14	VACUUM DIAPHRAGM	K-132
RETRIEVAL PROCEDURES	K- 14	TRANSMISSION UNIT (ASSEMBLY)	K-134
INSPECTION PROCEDURES	K- 15	TRANSMISSION UNIT (INSTALLATION)	K-149
AFTER-REPAIR PROCEDURES	K- 17	OIL COOLER	K-154
ELECTRIC SIGNAL INSPECTION	K- 18	SHIFT MECHANISM	
INSPECTION PROCEDURES	K- 18	(WITH SHIFT-LOCK SYSTEM)	K-155
MECHANICAL SYSTEM TEST	K- 21	SHIFT-LOCK SYSTEM	
PREPARATION	K- 21	COMPONENTS	K-155
STALL TEST	K- 21	TROUBLESHOOTING	K-155
TIME LAG TEST	K- 24	P RANG SWITCH	K-157
LINE PRESSURE TEST	K- 25	SHIFT-LOCK ACTUATOR	K-157
ROAD TEST	K- 28	SELECTOR LEVER	K-158
D-RANGE TEST	K- 28	HYDRAULIC CIRCUIT	K-167
S-RANGE TEST	K- 32	P RANGE	K-167
L-RANGE TEST	K- 34	R RANGE	K-168
P-RANGE TEST	K- 35	N RANGE; BELOW 15 km/h (9 mph)	K-169
ELECTRONIC SYSTEM		N RANGE; ABOVE 17 km/h (11 mph)	K-170
COMPONENTS	K- 39	D RANGE; 1ST GEAR	K-171
HOLD SWITCH	K- 39	D RANGE; 2ND GEAR	K-172
INHIBITOR SWITCH	K- 39	D RANGE; 3RD GEAR	K-173
TURBINE SENSOR	K- 40	D RANGE; OD, LOCK-UP ON	K-174
SPEED SENSOR	K- 41	S RANGE; 1ST GEAR	K-175
SOLENOID VALVE (1-2 SHIFT, 2-3 SHIFT, 3-4 SHIFT, 3-2 CONTROL)	K- 41	S RANGE; 2ND GEAR	K-176
SOLENOID VALVE (LOCKUP CONTROL)	K- 41	S RANGE; 3RD GEAR	K-177
EC-AT CONTROL UNIT	K- 42	L RANGE; 1ST GEAR	K-178
AUTOMATIC TRANSMISSION		L RANGE; 2ND GEAR	K-179
FLUID (ATF)	K- 45		
TRANSMISSION	K- 47		
TRANSMISSION UNIT (REMOVAL)	K- 47		
TRANSMISSION UNIT (DISASSEMBLY)	K- 50		
TORQUE CONVERTER	K- 61		
OIL PUMP	K- 62		
OD CONNECTING SHELL AND OD PLANETARY GEAR UNIT (OD SUN GEAR, OD PLANETARY PINION CARRIER, OD CLUTCH HUB)	K- 67		

INDEX



<p>1. Hold switch Inspection page K- 39</p> <p>2. Inhibitor switch Inspection page K- 39 Adjustment page K- 40</p> <p>3. Turbine sensor Inspection page K- 40</p> <p>4. Speed sensor Inspection page K- 41</p> <p>5. Solenoid valves Inspection page K- 41</p> <p>6. Lockup control solenoid valve Inspection page K- 41</p> <p>7. EC-AT control unit Inspection page K- 42</p> <p>8. Automatic transmission Removal page K- 47 Disassembly page K- 50 Assembly page K-134 Installation page K-149</p>	<p>9. Oil cooler Removal, Inspection, and Installation page K-154</p> <p>10. P range switch Inspection page K-157</p> <p>11. Shift-lock actuator Inspection page K-157</p> <p>12. Selector lever Inspection page K-158 Adjustment page K-159 Removal, Inspection, and Installation page K-161 Overhaul page K-165</p>
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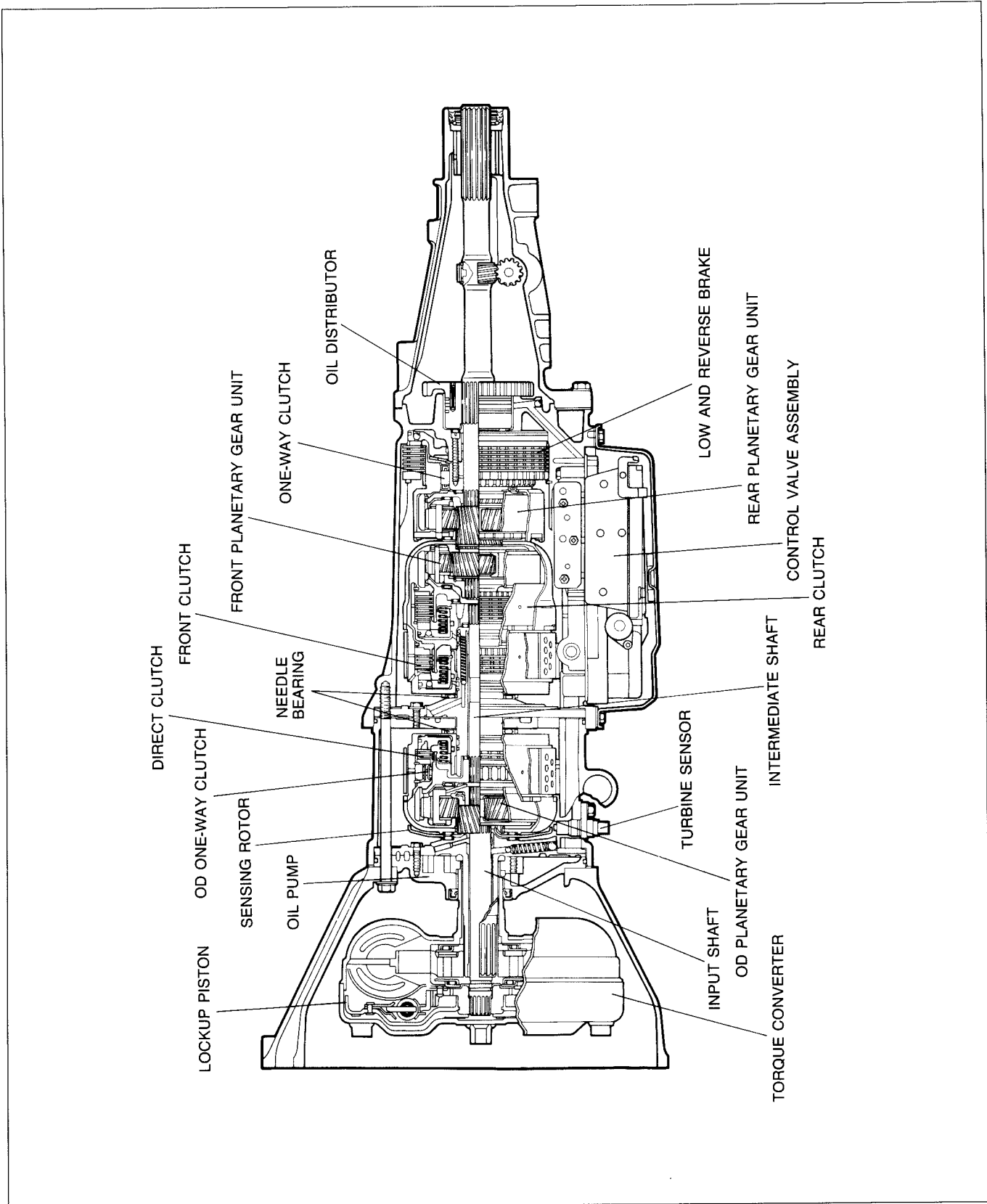
OUTLINE

SPECIFICATIONS

Item	Model	N4A-EL	
Torque converter stall torque ratio		1.900 : 1	
Gear ratio	1st	2.841	
	2nd	1.541	
	3rd	1.000	
	OD (4th)	0.720	
	Reverse	2.400	
Number of drive/driven plates	Direct clutch	2/2	
	Front clutch	4/5	
	Rear clutch	6/6	
	Low and reverse brake	5/5	
Servo diameter (Piston outer diameter/retainer inner diameter) mm (in)	OD band servo	60/40 (2.362/1.575)	
	2nd band servo	80/56 (3.150/2.205)	
Automatic transmission fluid (ATF)	Type		
	Capacity liters (US qt, Imp qt)	Total	7.3 (7.7, 6.4)
		Oil pan	4.0 (4.2, 3.5)

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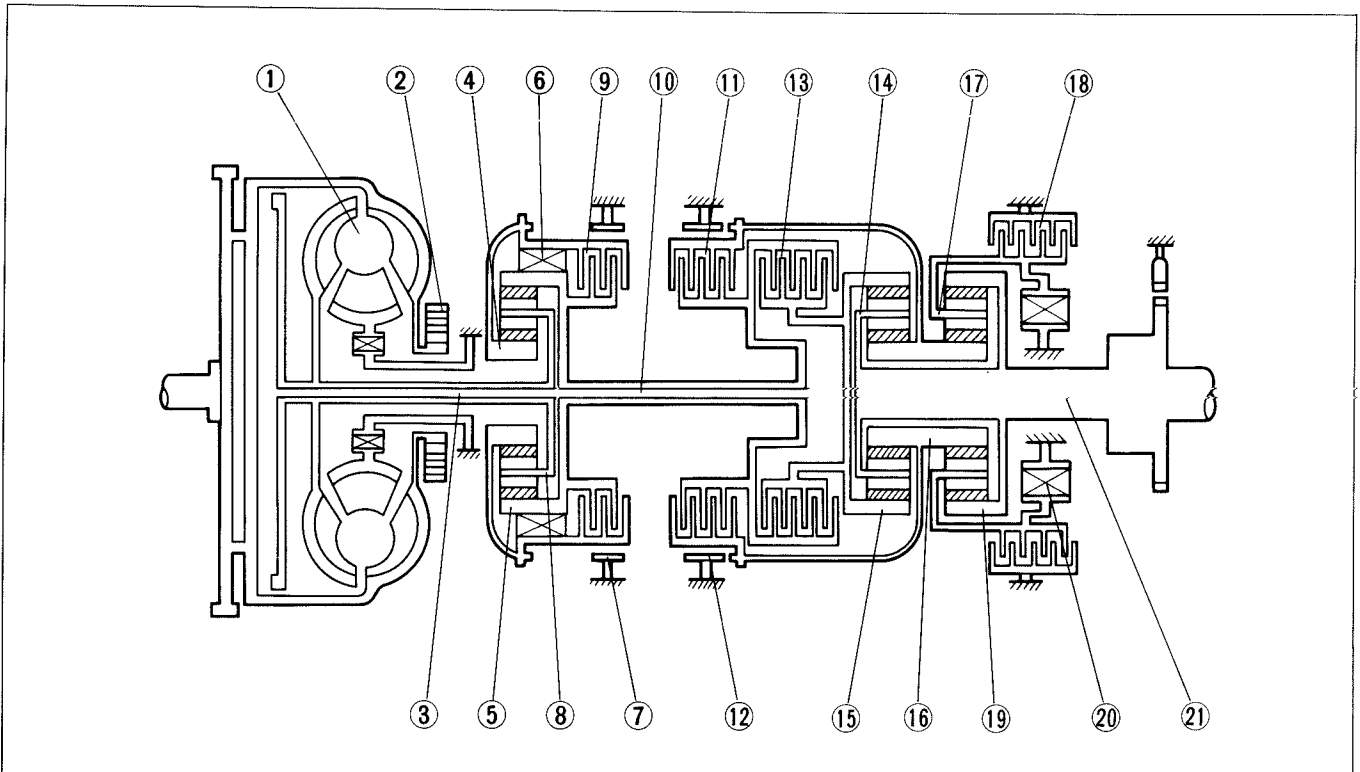
CROSS-SECTIONAL VIEW Powertrain



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The powertrain provides, 1st, 2nd, 3rd, 3rd lockup (lockup:ON), overdrive, overdrive lockup (lockup: ON), neutral, and reverse gears according to the line pressure flow from the control valve. It consists of the torque converter, oil pump, three clutches, three brakes, two one-way clutches, two planetary gears, sensing rotor, and turbine sensor.

POWERFLOW DIAGRAM



97U0KX-006

- | | | |
|--------------------------------|------------------------------------|--------------------------------------|
| 1. Torque converter | 9. Direct clutch (D/C) | 16. Sun gear |
| 2. Oil pump | 10. Intermediate shaft | 17. Rear planetary pinion carrier |
| 3. Input shaft | 11. Front clutch (F/C) | 18. Low and reverse brake (L&R Brk.) |
| 4. OD sun gear | 12. 2nd brake band (2nd Brk.) | 19. Internal gear |
| 5. Internal gear | 13. Rear clutch (R/C) | 20. One-way clutch (OWC) |
| 6. OD one-way clutch (OD OWC) | 14. Front planetary pinion carrier | 21. Output shaft |
| 7. OD brake band (OD Brk.) | 15. Internal gear | |
| 8. OD planetary pinion carrier | | |

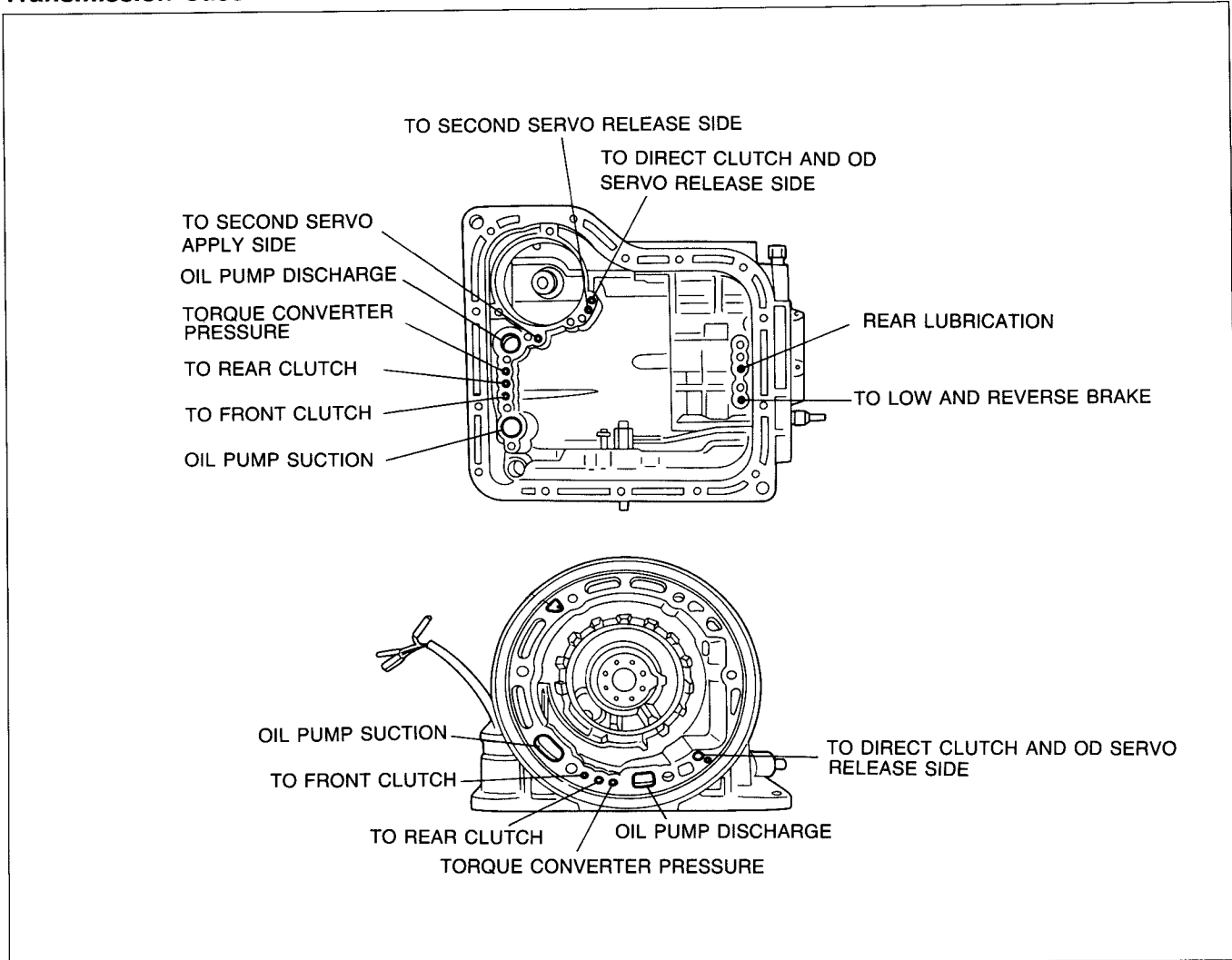
OPERATION OF COMPONENTS

Range	Gear position	D/C	OD Brk.		OD OWC	R/C	F/C	2nd Brk.		L & R Brk.	OWC	Solenoid valve		
			Apl.	Rel.				Apl.	Rel.			1-2	2-3	3-4
P	—	○	⊗	○						○		○	○	○
R	—	○	⊗	○	○		○			○				○
N	Below 15 km/h	○	⊗	○								○	○	○
	Above 17 km/h	○	⊗	○										○
D	1st	○	⊗	○	○	○					○	○	○	○
	2nd	○	⊗	○	○	○		○					○	○
	3rd	○	⊗	○	○	○	○	⊗	○					○
	OD	○	○	○	○	○	○	⊗	○					
S	1st	○	⊗	○	○	○					○	○	○	○
	2nd	○	⊗	○	○	○		○					○	○
	3rd	○	⊗	○	○	○	○	⊗	○					○
L	1st	○	⊗	○	○	○				○		○	○	○
	2nd	○	⊗	○	○	○		○					○	○

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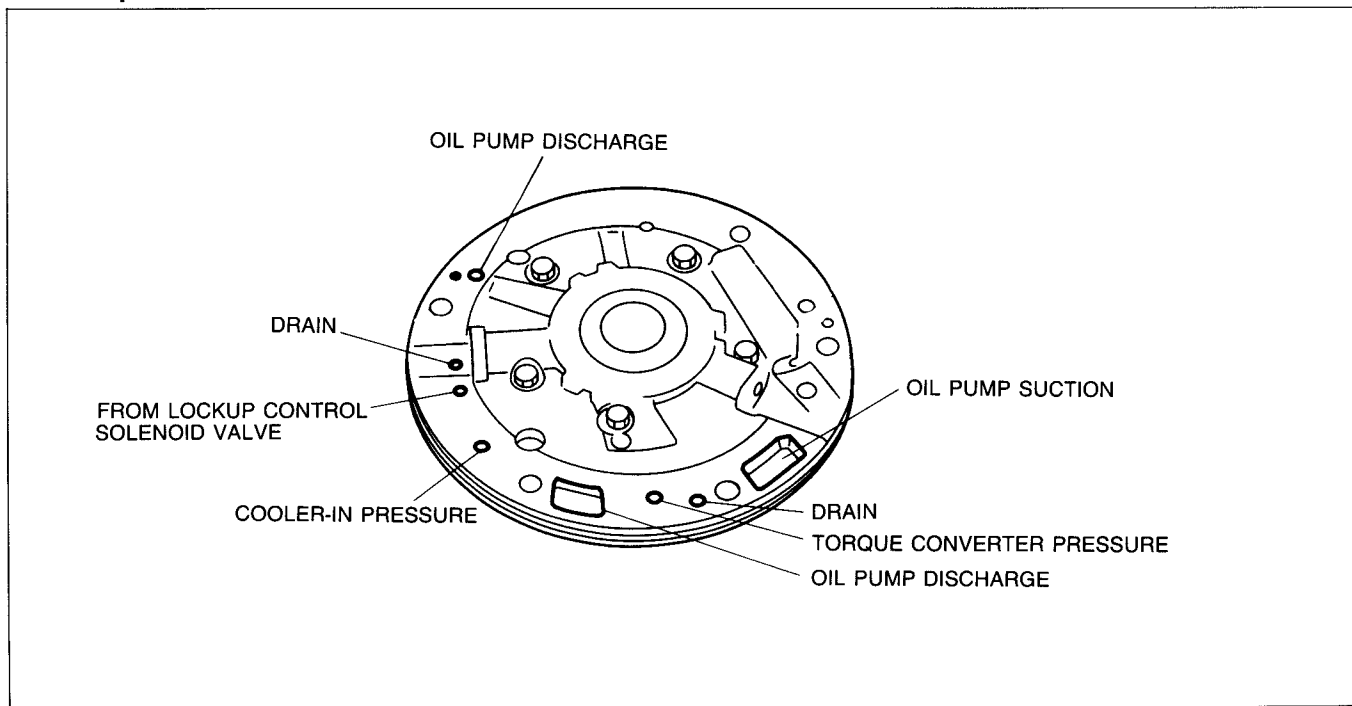
⊗ indicates operation although the band servo remains deactivated due to the large area of the release pressure side.
 The lockup control solenoid valve operates only during lockup.
 The 3-2 control solenoid valve operates momentarily during 3-2 downshift.
 The OD one-way clutch operates momentarily during OD-3 downshift.

FLUID PASSAGE LOCATION Transmission Case



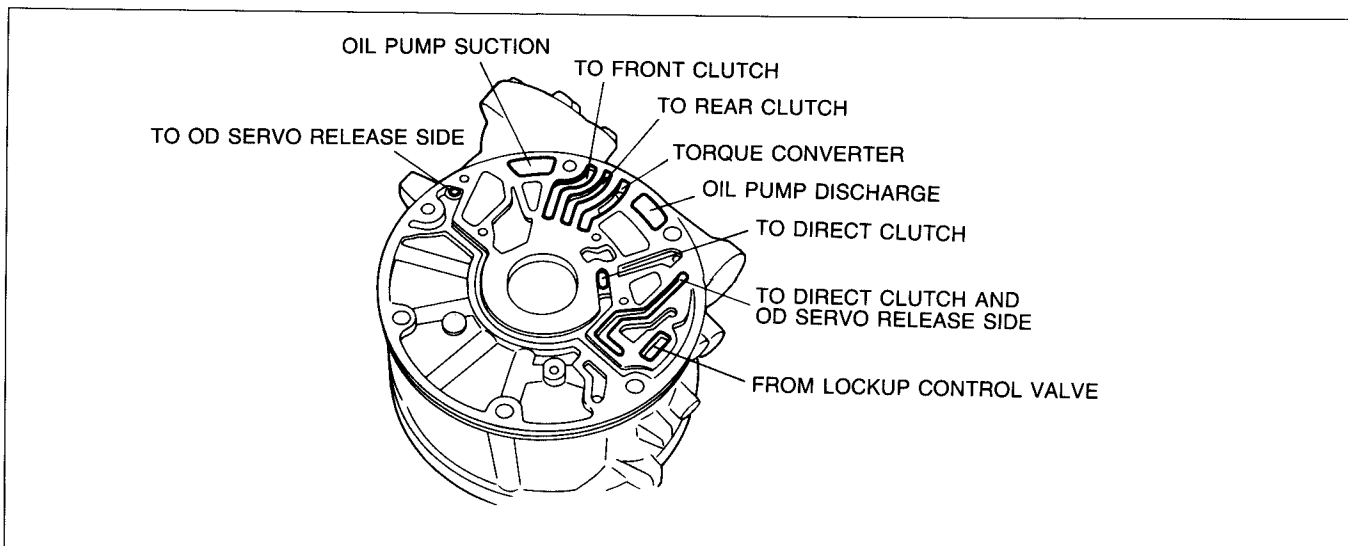
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Oil Pump



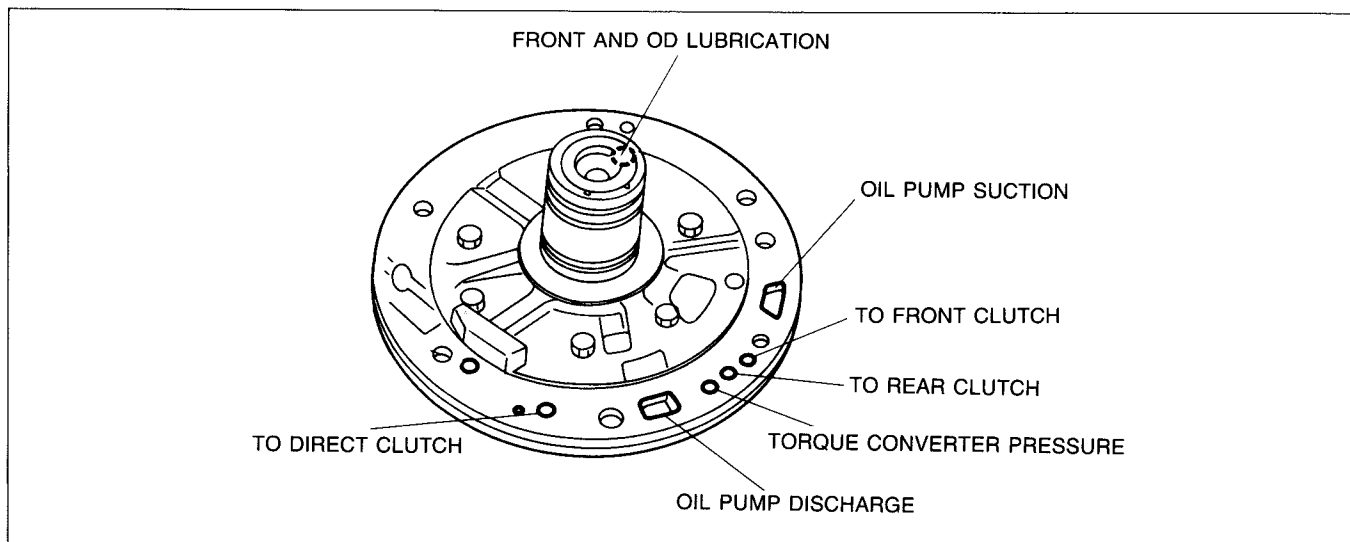
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OD Case



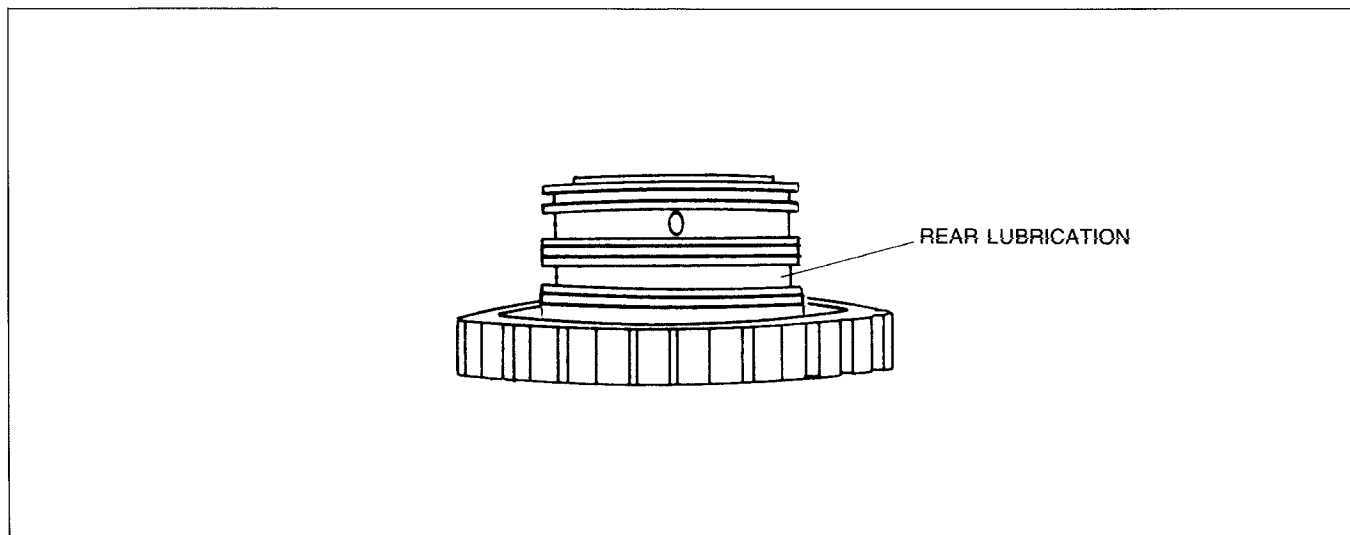
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Drum Support



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Oil Distributor



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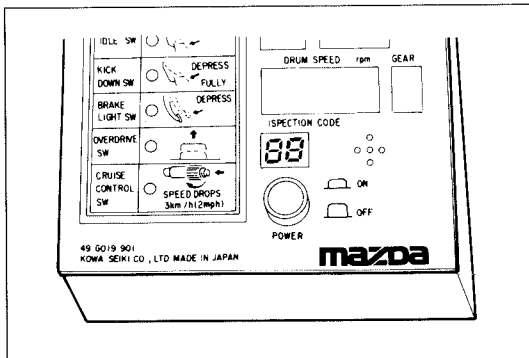
TROUBLESHOOTING

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.

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97U0KX-014

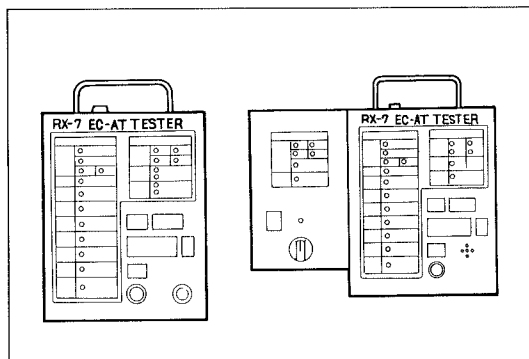
Step 1: Self-diagnostic System Inspection

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

(Refer to page K-11.)

Note

Malfunction code(s) can also be checked for by the flashing sequence of the HOLD indicator lamp. (Refer to page K-11.)



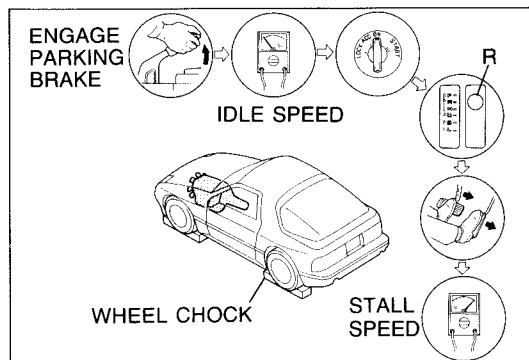
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Step 2: Electric Signal Inspection

Check the signals to/from the EC-AT control unit with the **EC-AT Tester**. (Refer to page K-18.)

Note

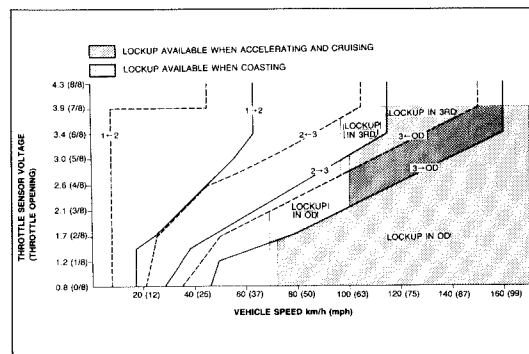
Signals can also be checked by checking the EC-AT control unit terminal voltages with a voltmeter. (Refer to page K-42.)



97U0KX-016

Step 3: Mechanical System Test

Check the engine stall speed, time lag, and line pressure. (Refer to page K-21.)



97U0KX-017

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-28.)

If the 4 steps on page K–8 are followed, the cause of the problem should be located. Another guide to faster location of the causes of problems, the QUICK DIAGNOSIS CHART, is on page K–10.

In this chart, numbers are used to indicate the components that may be the cause of 22 possible problems. It is necessary to check only those components indicated by numbers during each step of the troubleshooting process to locate the cause of the problem quickly.

QUICK DIAGNOSIS CHART

The QUICK DIAGNOSIS CHART shows different problems and the relationship of components that might be the cause.

1. Components indicated in the “Adjustment” column indicate the possibility that the problem may result from an incorrect adjustment.

Check the adjustment of each component, and readjust if necessary.

2. Components indicated in the “Self-diagnosis” column are diagnosed by the EC-AT control unit self-diagnostic function.

The **EC-AT Tester** can be used for easy retrieval of these signals.

3. Input and output signals of the EC-AT control unit for components indicated in the “EC-AT Tester” column can be easily checked with the **EC-AT Tester**.

4. Components indicated in the “Mechanical System Test” column can be checked for malfunction by the results of the oil pressure test.

5. Components indicated in the “Road Test” column can be checked for malfunction by the results of the road test.

6. The numbers in the chart indicate the order of inspection for detecting malfunctions.

7. Circled numbers indicate that the transmission must be removed from the vehicle.

8. The checking, adjusting, repair, and replacement procedures for components are described in the page(s) shown in the “Reference page” column.

97U0KX-018

K TROUBLESHOOTING

Problem	Possible Cause	Electronic control system							Preliminary	Hydraulic control system			Powertrain														
		Inhibitor switch	Hold switch	Cruise control switch	Speed sensor	Throttle sensor (Full range)	Shift sol. and 3-2 control sol.	Turbine sensor	Lockup control sol.	ATF level and condition	Selector lever	Idle speed & ignition timing	Vacuum diaphragm and rod	Control valve body	Accumulators	Oil pump	Torque converter	Direct clutch	OD brake band	OD one-way clutch	Front clutch	2nd brake band	Rear clutch	Low and reverse brake	One-way clutch	OD band servo	2nd band servo
Problem	Self-diag.																										
	Adjustment	○																									
	EC-AT TESTER	○	○	○	○	○	○	○																			
	Stall Test																										
	Time Lag Test																										
	Oil Pressure Test												○	○													
	Road Test										○		○	○													
	Reference page	K-39	K-39	Section T	K-41	Section F1	K-41	K-40	K-41	K-45	K-158	Section F1	K-132	K-112	K-78	K-62	K-61	K-69	K-75	K-69	K-85	K-82	K-90	K-101	K-97	K-75	K-82
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 runaway or slip when starting vehicle	○							○			○	○	○	○	○	○				○	○	○	○	○	○	
	Engine runaway or slip when up- 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					○			○	○			○	○	○	○	○				○	○	○	○	○	○	
	Transmission overheats								○	○			○	○	○												
	White smoke discharged from exhaust								○			○	○														
	Hold indicator flashes				○	○	○	○																			
	Engine will not start	○									○																

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SELF-DIAGNOSTIC SYSTEM INSPECTION





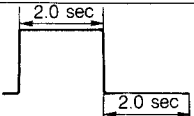







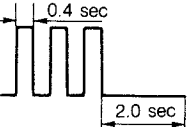
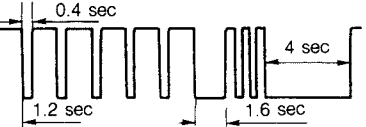


SELF-DIAGNOSTIC FUNCTION

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

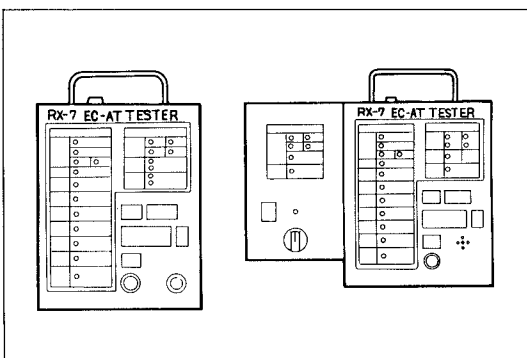
Malfunctions or intermittent malfunctions are stored in the EC-AT control unit to later be output as malfunction codes.

The **EC-AT Tester** is used to retrieve these malfunction codes. Each malfunction is indicated by a code number and the buzzer as shown in the table below.

Malfunction Code Number

CODE NO.	LOCATION OF MALFUNCTION	BUZZER	
		49 G019 901 TESTER BODY	49 G019 901A TESTER BODY
06	Speed sensor or circuit		
12	Throttle sensor or circuit		
55	Turbine sensor or circuit		
60	1-2 shift solenoid valve or circuit		
61	2-3 shift solenoid valve or circuit		
62	3-4 shift solenoid valve or circuit		
63	Lockup control solenoid valve or circuit		
64	3-2 control solenoid valve or circuit		

97U0KX-020



97U0KX-021

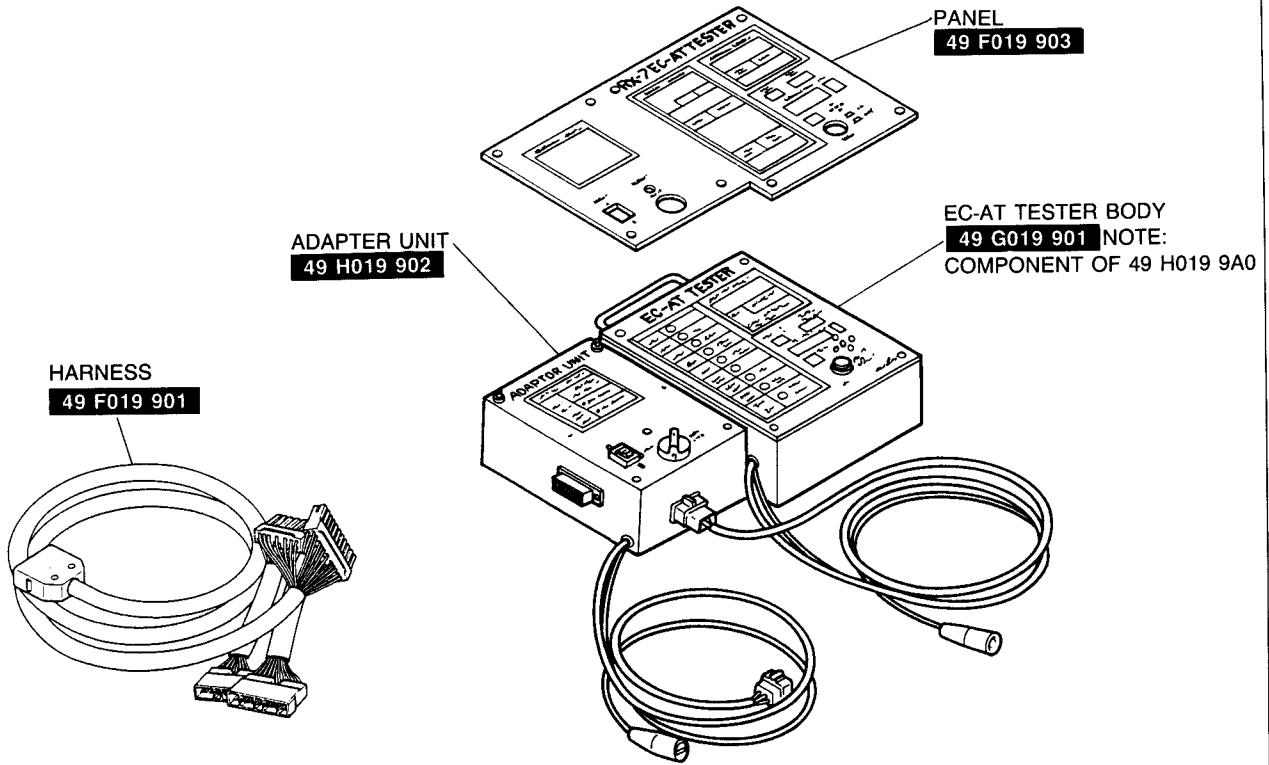
EC-AT TESTER

The previous **EC-AT Tester** can be used along with the **panel** (49 F019 902 or 49 F019 903) and **harness** (49 F019 901) for RX-7.

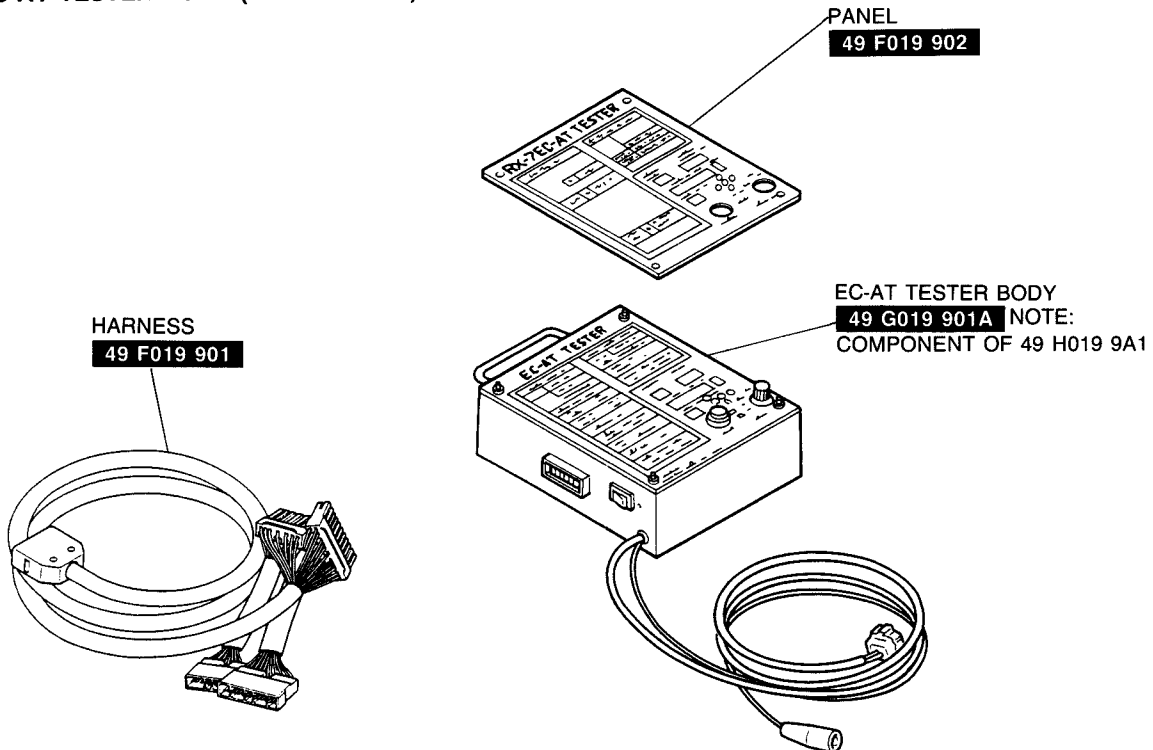
K SELF-DIAGNOSTIC SYSTEM INSPECTION

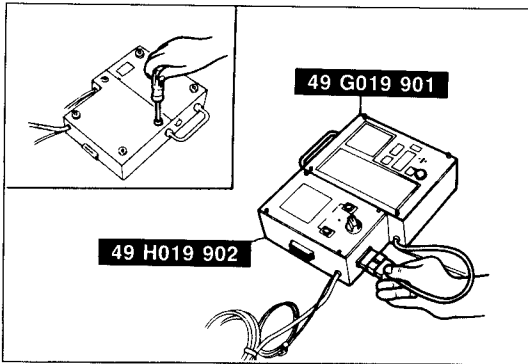
Components

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

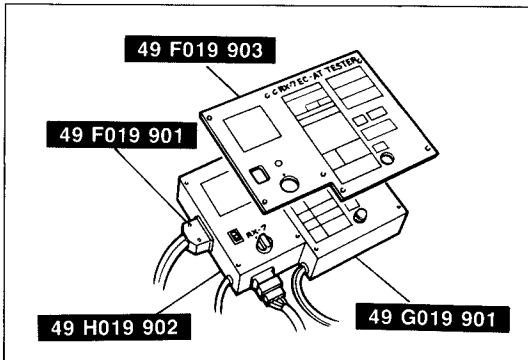


EC-AT TESTER BODY (49 G019 901A)

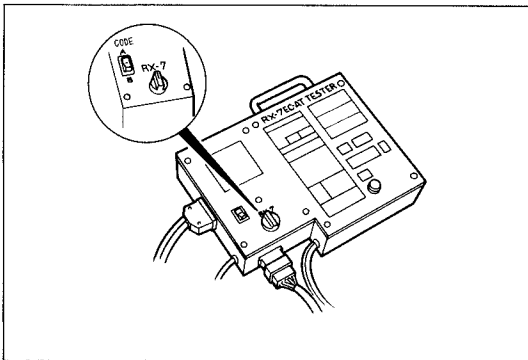




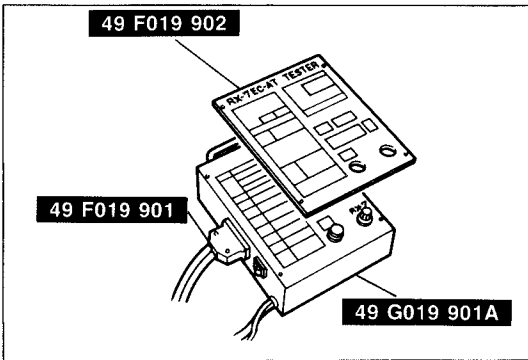
97U0KX-022



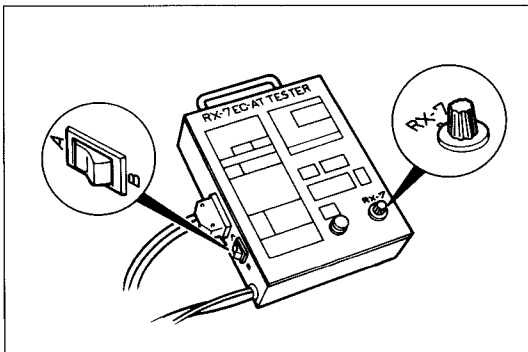
97U0KX-023



97U0KX-024



97U0KX-025



97U0KX-026

Assembly of EC-AT Tester

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

1. Install the **adapter unit** (49 H019 902) to the **EC-AT tester body** (49 G019 901).
2. Connect the 6 pin connector to the adapter unit.

3. Set the **panel** (49 F019 903) onto the EC-AT tester body.
4. Connect the **harness** (49 F019 901) to the adapter unit.

5. Set the code selector switch to position A.

Note

Position B is used only for the 1987 626.

6. Select the select switch to the RX-7 position.

For EC-AT tester body (49 G019 901A)

1. Set the **panel** (49 F019 902) onto the EC-AT tester body.
2. Connect the **harness** (49 F019 901) to the EC-AT tester body.

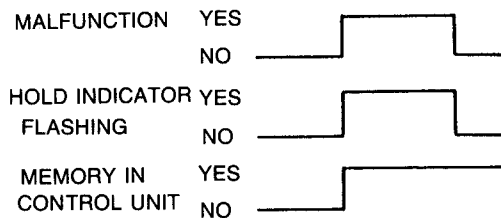
3. Perform steps 5 to 6 above.

K SELF-DIAGNOSTIC SYSTEM INSPECTION

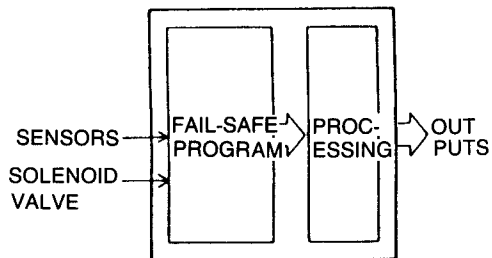
06 → 4 SEC PERIOD →
62 → 4 SEC PERIOD →
64 → 4 SEC PERIOD →
REPEATS ABOVE

9MU0K1-025

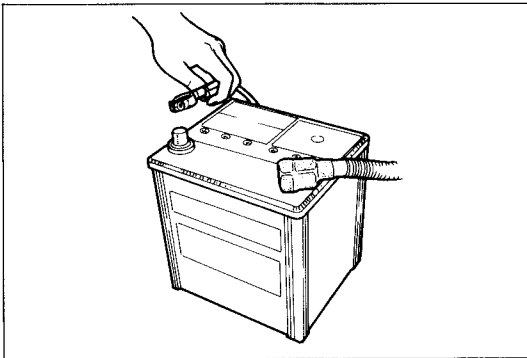
CHECK CONNECTOR NOT GROUNDED



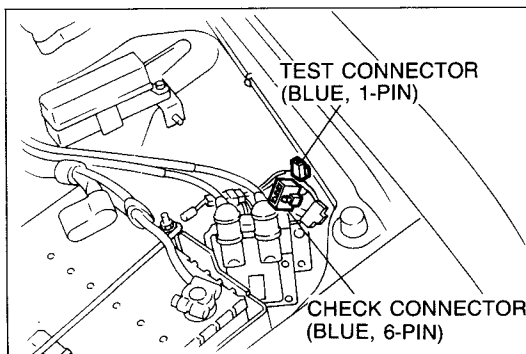
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79G07C-062



9MU0K1-028



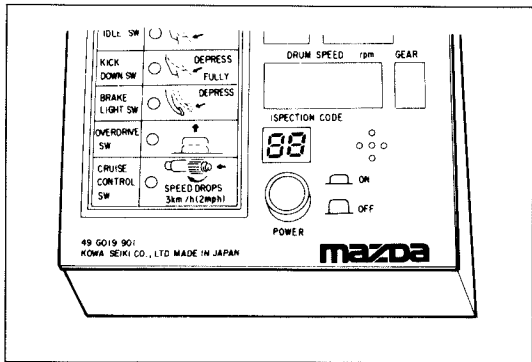
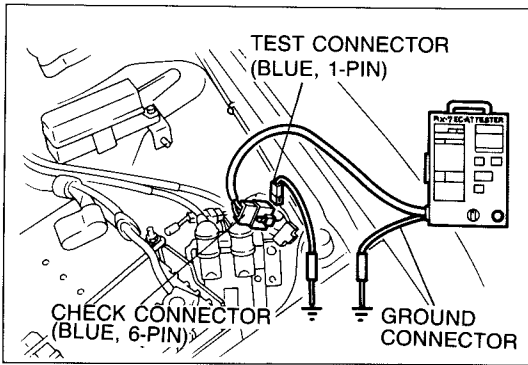
9MU0K1-029

GENERAL NOTES

1. If there is more than one malfunction, the code numbers will be displayed on the tester one by one in numerical order. In the case of malfunctions 62, 06, and 64, the code numbers are displayed in order of 06, 62, then 64. The display is shown.
2. The HOLD indicator flashes to indicate the same pattern as the buzzer of the **EC-AT Tester** (49 G019 901A) when the check connector (blue, 1-pin) is grounded. When the check connector is not grounded, the indicator flashes at a constant frequency 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 turbine sensor, 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 and the brake pedal is depressed.

RETRIEVAL PROCEDURES

1. Locate the check connector, and test connector.



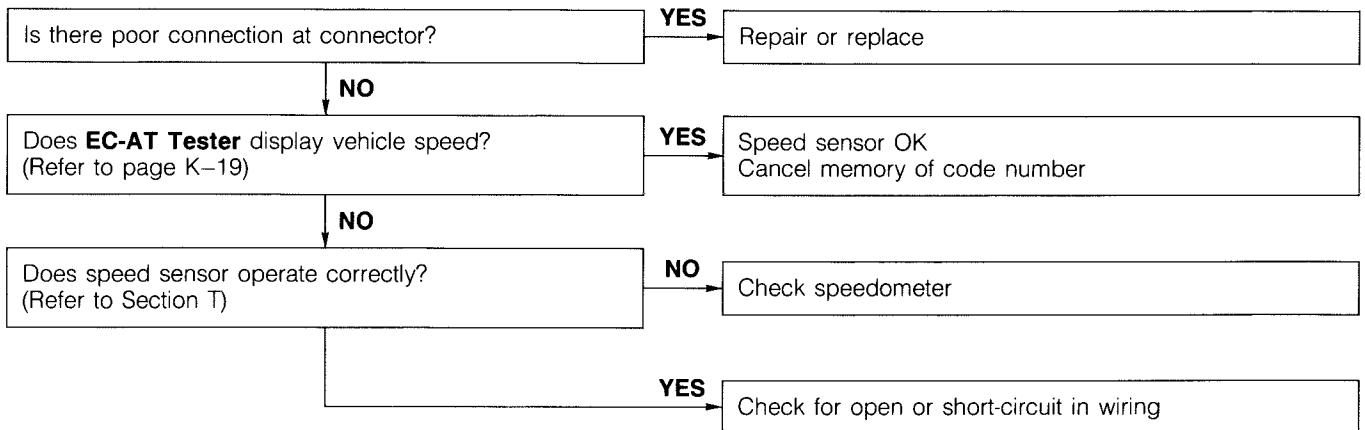
2. Connect the 6-pin connector of the **EC-AT Tester** to the check connector (blue, 6-pin).
3. Ground the ground connector of the **EC-AT Tester**.
4. Ground the test connector (blue, 1-pin).
5. Turn the ignition switch ON.
6. Check that **"88"** flashes on the digital display and that the buzzer sounds 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 the 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 the code numbers and check for the causes by referring to the INSPECTION PROCEDURES shown on pages K-15 to 17. Repair as necessary.

Note

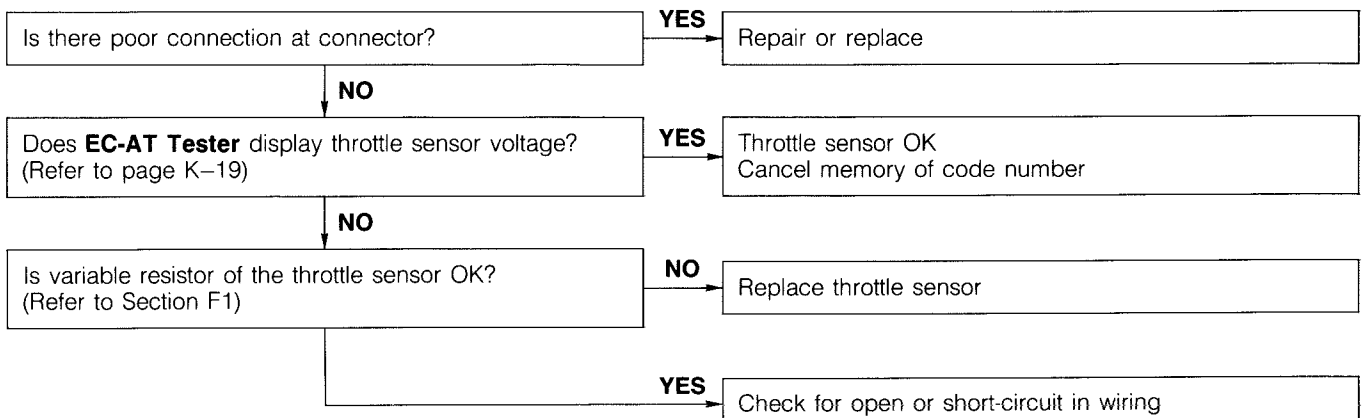
After repairs are made, recheck for code numbers by performing the **"AFTER-REPAIR PROCEDURES"**. (Refer to page K-17.)

INSPECTION PROCEDURES

No.06 Code Display (Speed Sensor)

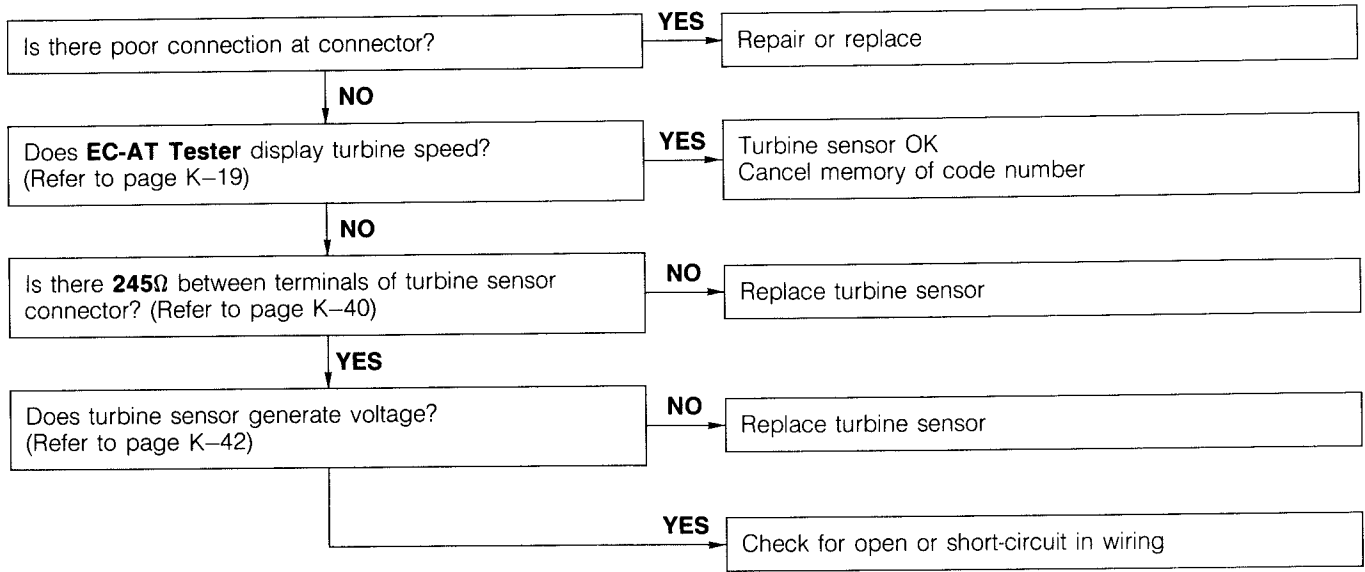


No.12 Code Display (Throttle Sensor)



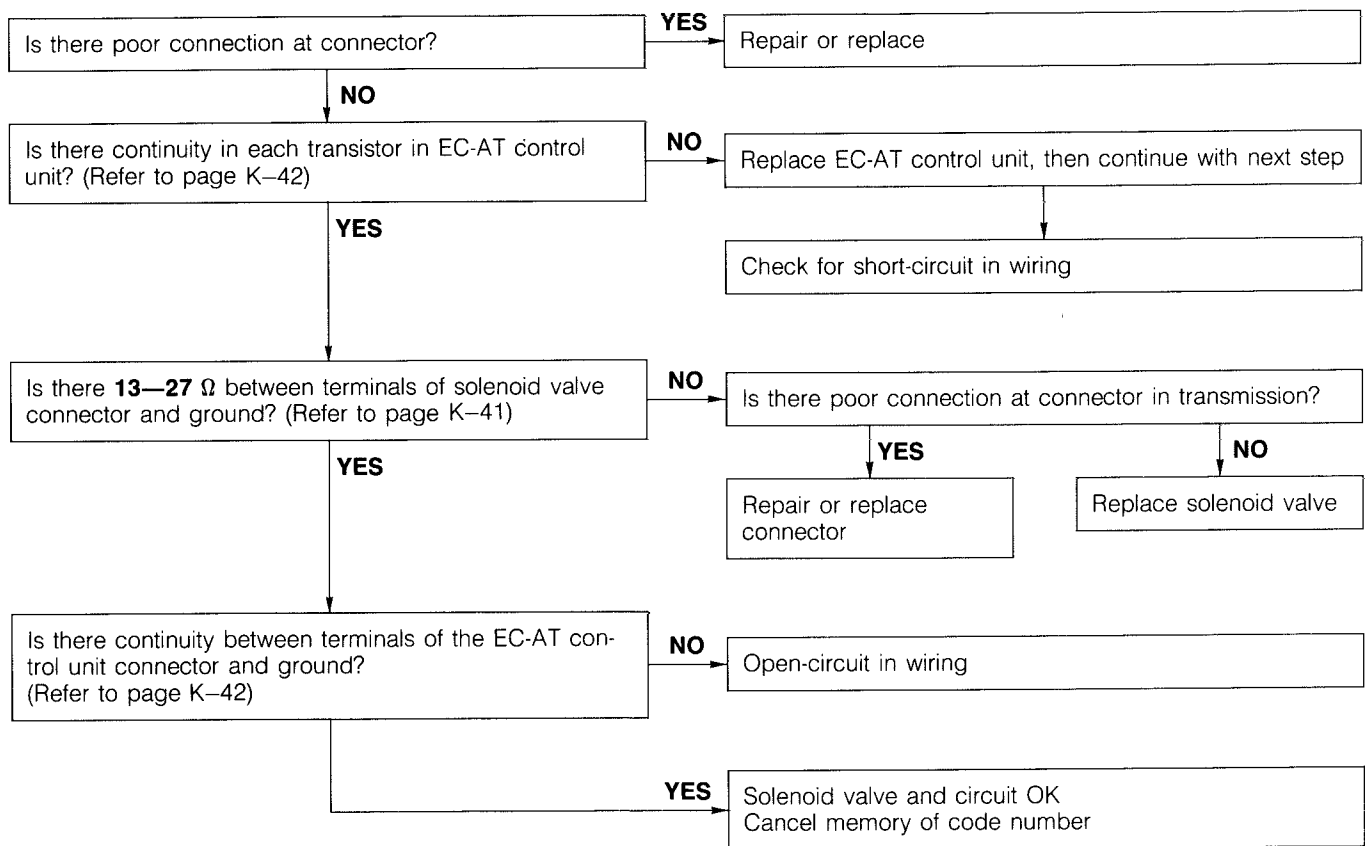
K SELF-DIAGNOSTIC SYSTEM INSPECTION

No.55 Code Display (Turbine Sensor)



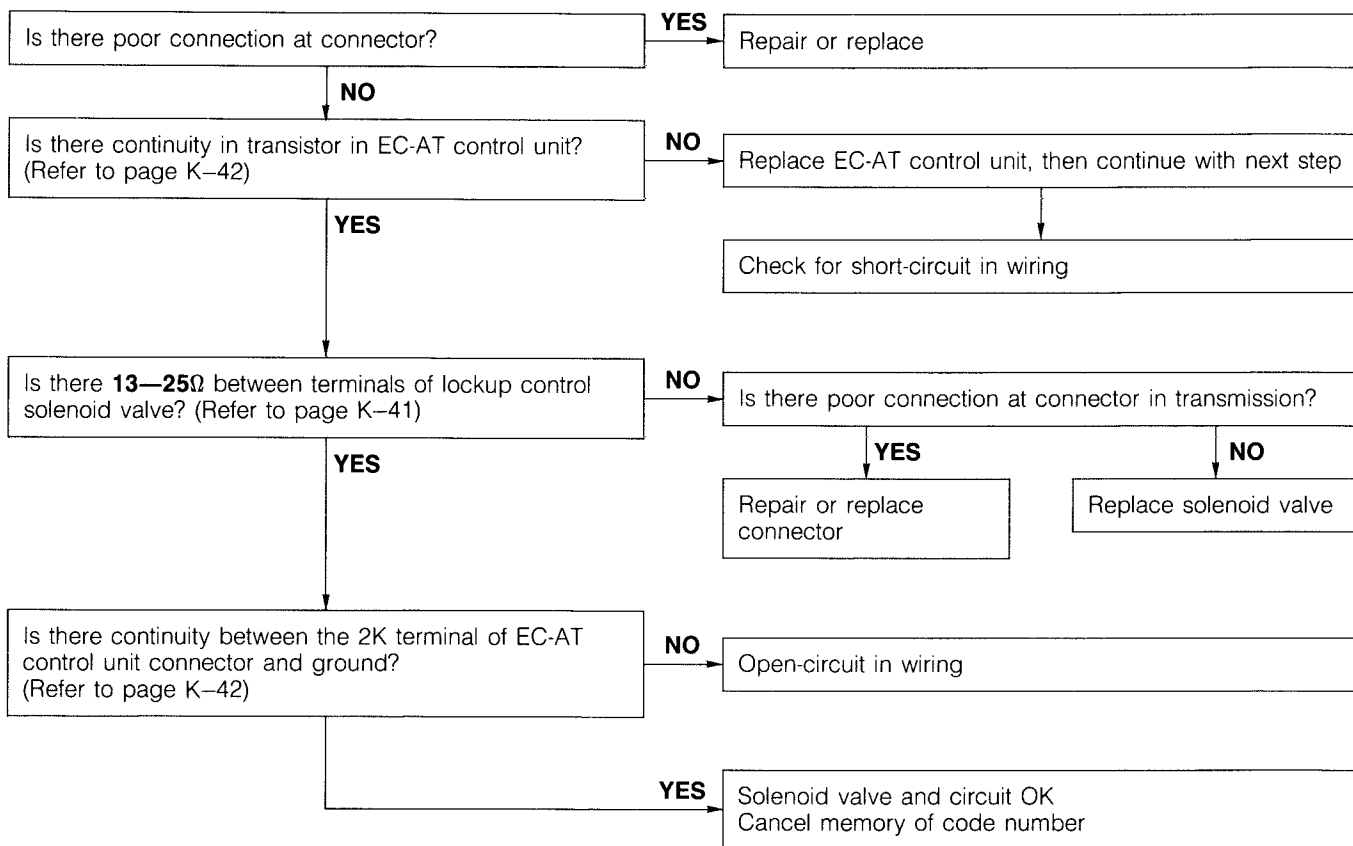
97U0KX-030

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

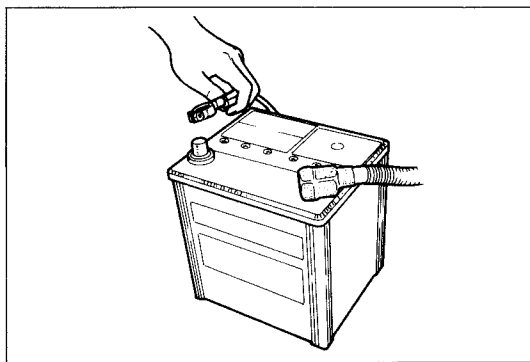


97U0KX-031

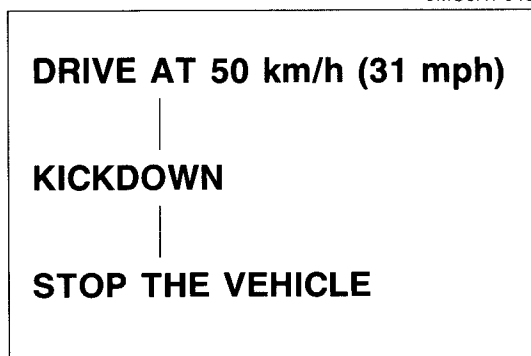
No.63 Code Display (Lockup Control Solenoid Valve)



97U0KX-032



9MU0K1-040



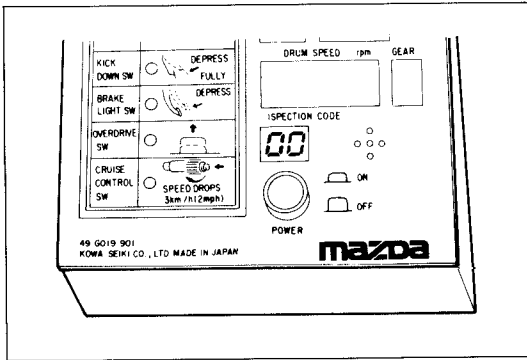
79G07C-069

AFTER-REPAIR PROCEDURES

1. Cancel the memory of malfunctions by disconnecting the negative battery terminal for at least five seconds and the brake pedal is depressed; 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.

K SELF-DIAGNOSTIC SYSTEM INSPECTION, ELECTRIC SIGNAL INSPECTION



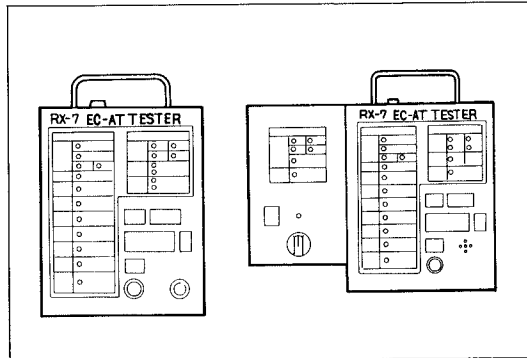
9MU0K1-484

4. Reconnect the **EC-AT Tester** to the test connector (blue, 6-pin).
5. Ground the ground connector of the **EC-AT Tester**.
6. Ground the check connector (blue, 1-pin).
7. Turn the ignition switch ON.
8. Check that no code numbers are displayed.

ELECTRIC SIGNAL INSPECTION

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

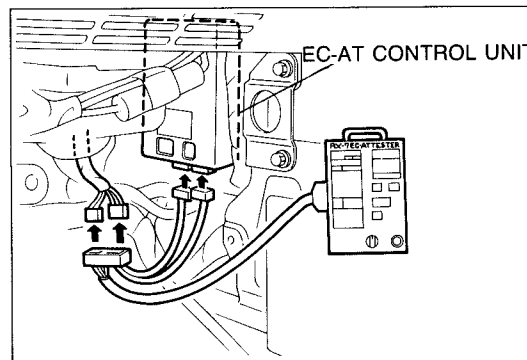
The tester checks for proper operation of the various switches and sensors in the EC-AT system. It also checks the control unit for output of the various control signals.



9MU0K1-041

INSPECTION PROCEDURES

1. Assemble the **EC-AT tester**. (Refer to page K-13.)
2. Disconnect the connectors from the EC-AT control unit.
3. Connect the **Adapter harness** between the control unit and the connectors.
4. Turn the ignition switch and main switch of the **EC-AT Tester** ON.
5. Check indication of the respective light or digital display in each condition, referring to the indication table below.



97U0KX-033

Indication Table of Light and Digital Display

Item	Indication	Condition	Possible cause	
Input (Light)				
INHIBITOR SW	P,N	ON	P or N range	Inhibitor switch or wiring
		OFF	Other ranges	
	D	ON	D range	
		OFF	Other ranges	
	S	ON	S range	
		OFF	Other ranges	
L	ON	L range		
	OFF	Other ranges		
HOLD SW	ON	Hold switch pushed	Hold switch or wiring	
	OFF	Hold switch released		

Indication Table of Light and Digital Display

Item	Indication	Condition	Possible cause
WATER TEMPERATURE SW AND IDLE SW	ON	When water temperature above 70°C (158°F) and throttle valve open	Engine control unit or wiring
	OFF	Other conditions	
CRUISE CONTROL SW*	ON	SET or RESUME switch ON or vehicle speed 8 km/h (5 mph) lower than pre-set speed (Driving vehicle; cruise control ON)	Cruise control unit or wiring
	OFF	SET and RESUME switch OFF and vehicle speed kept at pre-set speed	
Input (Digital display)			
THROTTLE SENSOR	EC-AT control unit terminal voltage	All the time	Throttle sensor, or wiring
VEHICLE SPEED*	Vehicle speed calculated from speed sensor signal	All the time	Speed sensor, speedometer cable, or wiring
TURBINE SPEED*	Turbine speed	All the time	Turbine sensor or wiring
Output (Light)			
1-2 SOLENOID VALVE*	ON	1st gear position	Control unit, 1-2 shift sol., or wiring
	OFF	2nd, 3rd, and OD gear position	
2-3 SOLENOID VALVE*	ON	1st and 2nd gear position	Control unit, 2-3 shift sol., or wiring
	OFF	3rd and OD gear position	
3-4 SOLENOID VALVE*	ON	1st, 2nd, and 3rd gear position	Control unit, 3-4 shift sol., or wiring
	OFF	In OD gear position and backup conditions	
LOCKUP SOLENOID VALVE*	ON	Lockup condition	Control unit, 2-3 shift sol., or wiring
	OFF	Non-lockup condition	
3-2 CONTROL SOLENOID VALVE*	OFF	3-2 or 4-2 downshift	Control unit, 3-2 control sol., or wiring
	ON	Other conditions	
HOLD INDICATOR	ON	Hold mode	Control unit, hold switch, or wiring
	OFF	Other modes	
NO LOAD SIGNAL *	ON	N or P range	Control unit, turbine sensor, inhibitor switch, or wiring
	OFF	Other range	

Note

* : Items should be checked with engine running or while driving.

K ELECTRIC SIGNAL INSPECTION

Item	Indication	Condition	Possible cause
OUTPUT (Digital display)			
GEAR*	1	1st gear position	—
	2	2nd gear position	
	3	3rd gear position	
	4	Overdrive (O/D) gear position	
	No indication	R range, N, P range, gear position between 1st and 2nd gear, and gear position between 2nd and 3rd gear	

97U0KX-034

Note

a) Backup condition is as follows:

S range, hold mode, and accelerator pedal depressed fully.

b) The * marked items should be checked with the engine running or while driving.

Comprehensive Usage

The **EC-AT Tester Set** 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. (Refer to page K-28.)

97U0KX-035

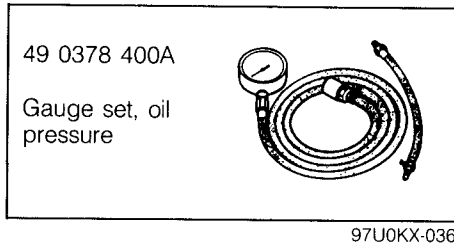
Solenoid valve operation table

RANGE	GEAR		SOLENOID VALVES			
			1-2	2-3	3-4	Lockup
P	None		ON	ON	ON	—
R	Reverse		—	—	ON	—
N	Neutral	Below 15 km/h (9 mph)	ON	ON	ON	—
		Above 17 km/h (11 mph)	—	—	ON	—
D	1st		ON	ON	ON	—
	2nd		—	ON	ON	—
	3rd	Lockup OFF	—	—	ON	—
		Lockup ON	—	—	ON	ON
	Overdrive (OD)	Lockup OFF	—	—	—	—
		Lockup ON	—	—	—	ON
S	1st		ON	ON	ON	—
	2nd	Normal	—	ON	ON	—
		Backup	—	ON	—	—
	3rd	Lockup OFF	—	—	ON	—
		Lockup ON	—	—	ON	ON
	L	1st		ON	ON	ON
2nd		Normal	—	ON	ON	—
		Backup	—	ON	—	—

99U07B-027

MECHANICAL SYSTEM TEST

PREPARATION SST

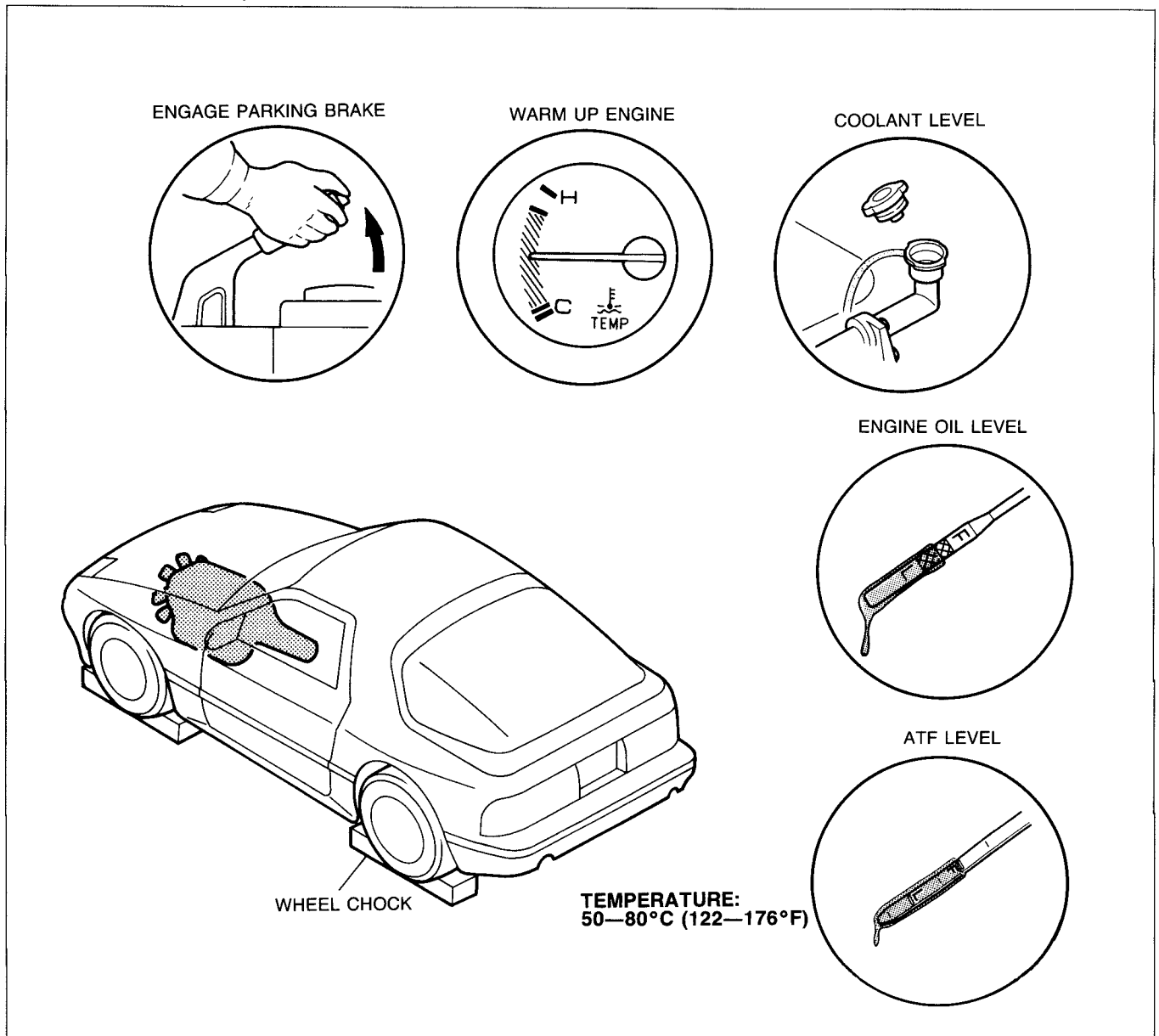


STALL TEST

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

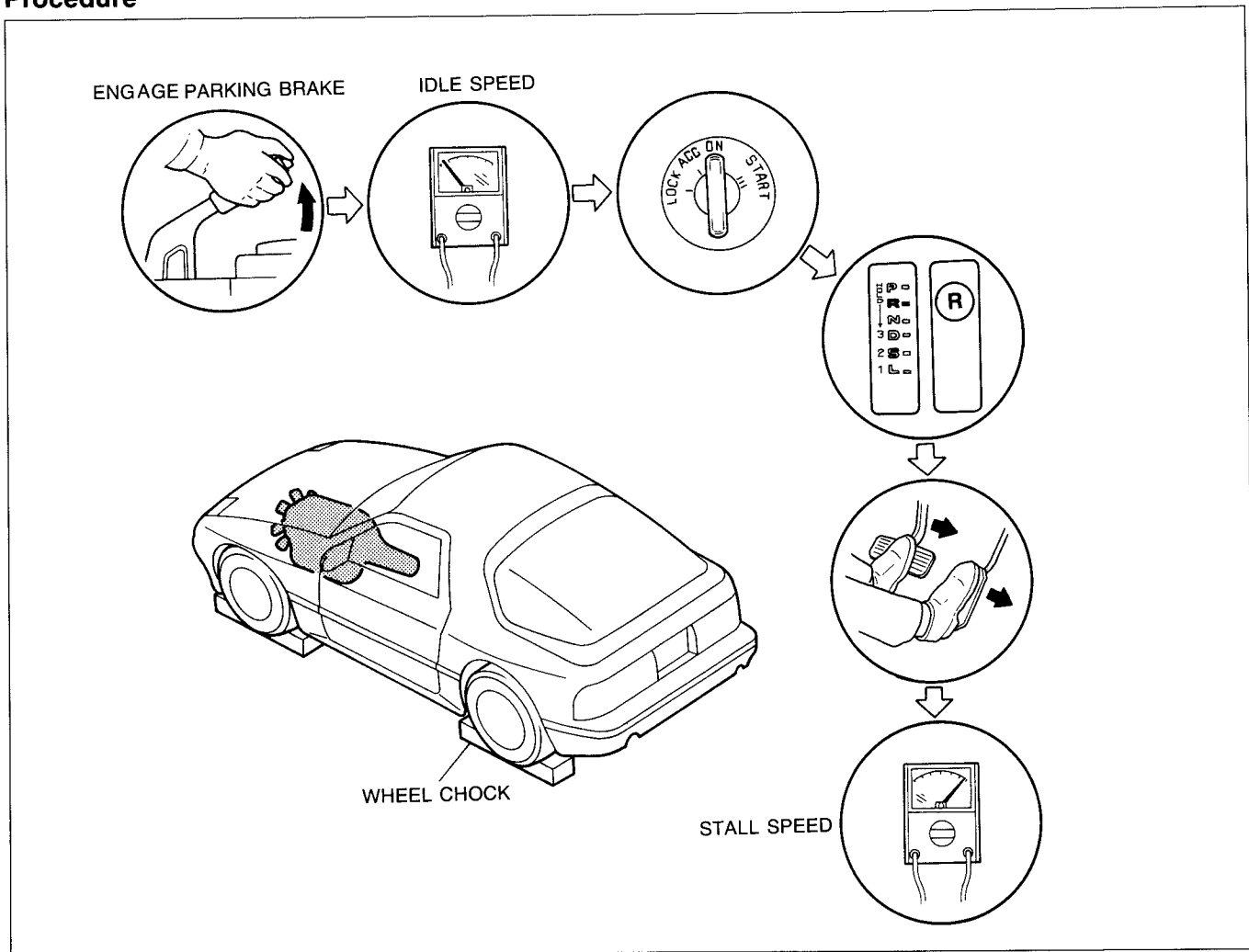
Preparation

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 (**50—80°C, 122—176°F**).
3. Engage the parking brake and use wheel chocks at the front and rear of the wheels.



K MECHANICAL SYSTEM TEST

Procedure



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

Idle speed: 750 ± 25 rpm

3. Shift the selector lever to R range.

Caution

Step 4 must be performed within 5 seconds to prevent possible transmission damage.

4. Firmly depress the foot brake with the left foot, and gently depress the accelerator pedal with the right.

Caution

Step 5 must be performed within 5 seconds to prevent possible transmission damage.

5. When the engine speed no longer increases, quickly read the engine 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
 - (2) S range
 - (3) L range

Engine stall speed: 1,900—2,100 rpm

Evaluation of Stall Test

Condition		Possible cause	
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
			Direct clutch and overdrive one-way clutch slipping
	In D (Normal), and L ranges	Rear clutch slipping	
In D (Normal) range only	One-way clutch slipping		
In R range only	Low and reverse brake slipping		
	Front clutch slipping		
	Perform road test to determine if this is caused by low-and-reverse brake or front clutch as follows: a) Effective engine braking in L range..... Front clutch b) No engine braking in L range..... 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	

97U0KX-038

K MECHANICAL SYSTEM TEST

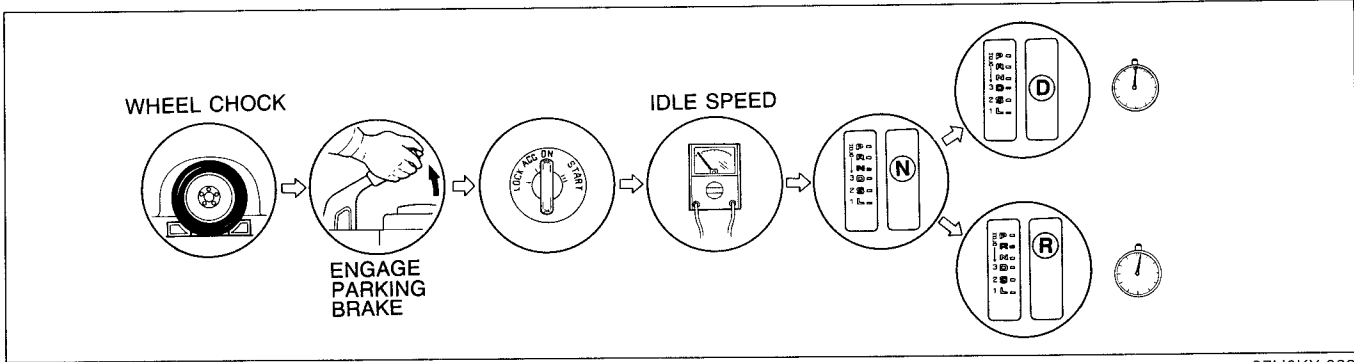
TIME LAG TEST

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/2-3 and N-D accumulators, front, rear and one-way clutches, 2nd brake band, and low-and-reverse brake.

Preparation

Perform the preparation procedure shown in the STALL TEST. (Refer to page K-21.)

Procedure



97U0KX-039

1. Start the engine and check the idle speed on P range. (Refer to Section F1.)

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 (Normal mode)
- (2) N→D range (Hold mode)
- (3) N→R range

Specified time lag: N→D range 0.5—0.6 second
 N→R range 0.75—0.85 second

Evaluation of Time Lag Test

Condition		Possible Cause
N → D (Normal) shifting	More than specification	Insufficient line pressure Rear clutch slipping One-way clutch slipping
	Less than specification	N-D accumulator not operating properly Excessive line pressure
N → D (Hold) shifting	More than specification	Insufficient line pressure Rear clutch slipping 2nd brake band slipping
	Less than specification	1-2 accumulator not operating properly Excessive line pressure
N → R shifting	More than specification	Insufficient line pressure Low & reverse brake slipping Front clutch slipping
	Less than specification	N-R/2-3 accumulator not operating properly Excessive line pressure

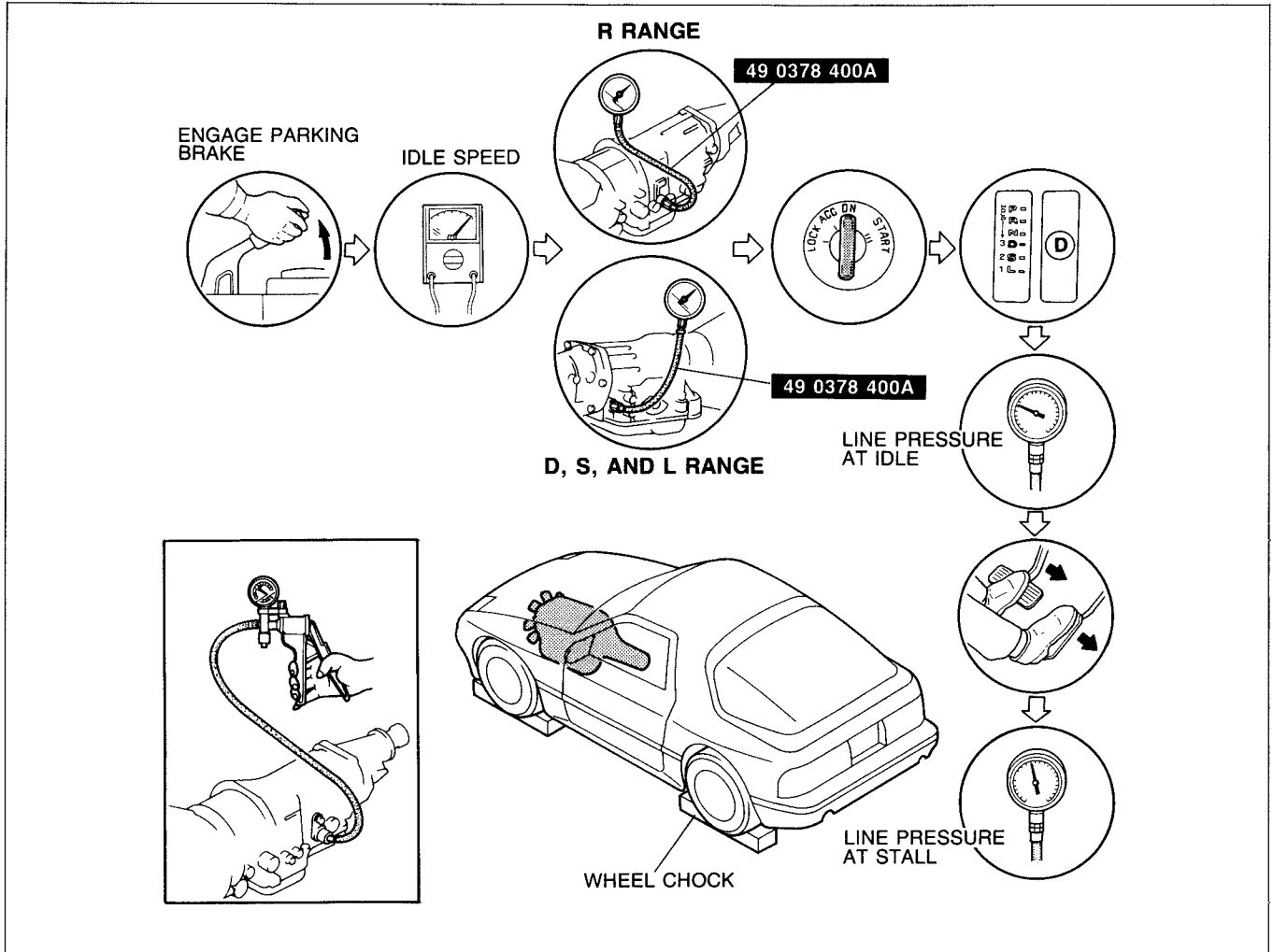
97U0KX-040

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-21.)
2. Connect a tachometer to the engine.
3. Connect the **SST** to the line pressure inspection hole(s).

Procedure

97U0KX-041

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

Idle speed: 750 ± 25 rpm

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

Caution

Step 3 must be performed within 5 seconds to prevent possible transmission damage.

3. Depress the brake pedal firmly with the left foot and gradually depress the accelerator pedal with the right foot.

Caution

Step 4 must be performed within 5 seconds to prevent possible transmission damage.

4. 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.

5. Shift the selector lever to N range and run the engine at idle for at least one minute.
6. Read the line pressure at idle and at the engine stall speed for each range in the same manner.

K MECHANICAL SYSTEM TEST

Specified line pressure:

Range		Pressure kPa (kg/cm ² , psi)	
		Idle	Stall
D range	Normal mode	294—392 (3.0—4.0, 43—57)	883—1,079 (9.0—11.0, 128—156)
S range	Normal mode	294—392 (3.0—4.0, 43—57)	883—1,079 (9.0—11.0, 128—156)
	Hold mode	294—392 (3.0—4.0, 43—57)	638—834 (6.5—8.5, 92—121)
L range		294—392 (3.0—4.0, 43—57)	883—1,079 (9.0—11.0, 128—156)
R range		638—736 (6.5—7.5, 92—107)	1,864—2,060 (19.0—21.0, 270—299)

97U0KX-042

7. Cool the transmission and reconnect the **SST** to the line pressure inspection hole.
8. Connect a vacuum pump to the vacuum diaphragm and place the pump inside the vehicle.
9. Shift the selector lever to R range.
10. Read the line pressure at idle as described below.

Specified line pressure:

Vacuum	Line pressure kPa (kg/cm ² , psi)
Atmospheric pressure	883—1,079 (9.0—11.0, 128—156)
200 mmHg (7.87 inHg)	687—785 (7.0—8.0, 100—114)
400 mmHg (15.7 inHg)	392—491 (4.0—5.0, 57—71)

97U0KX-043

Evaluation of Line Pressure Test

Condition		Possible Cause
Below specification	In all ranges	Worn oil pump Fluid leakage from the oil pump, control valve body, and/or transmission case Stuck pressure regulator valve Fluid leakage from the direct clutch and/or OD band servo release side hydraulic circuit
	In D (Normal), S (Normal), and L ranges	Fluid leakage from the rear clutch hydraulic circuit Stuck pressure modifier valve
	In S (Normal & Hold) and L ranges	Fluid leakage from the throttle backup valve hydraulic circuit
	In L and R ranges	Fluid leakage from the low-and-reverse hydraulic circuit
	In R range only	Fluid leakage from the front clutch and/or 2nd band servo release side hydraulic circuit
	In S range (Hold)	Stuck throttle backup valve Stuck backup control valve Backup control function (electronic) not operating properly
Excessive line pressure		Stuck pressure modifier valve Stuck backup control valve

Condition		Possible Cause
Below specification		Same as Line Pressure Test
Excessive pressure	In all ranges	Leaking or disconnected vacuum hose Leaking vacuum diaphragm Over length diaphragm rod Stuck vacuum throttle valve Stuck pressure regulator valve
	In S range (Hold)	Stuck pressure modifier valve
Incorrect line pressure with specified vacuum at vacuum diaphragm	No variation	Missing diaphragm rod
	Incorrect variation (Above or below specification)	Incorrect diaphragm rod length Stuck vacuum throttle valve Stuck pressure regulator valve Stuck pressure regulator plug

97U0KX-044

ROAD TEST

Caution

Perform the test at normal ATF operating temperature (50—80°C, 122—176°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

- Shift the selector lever to D range and select the Normal mode.

Note

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

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

Note

a) Vehicle speed of the EC-AT Tester and the speedometer and vehicle speed on a chassis roller may not meet the specified shift pattern because of incorrect tire size. Therefore, check the shift points with the VEHICLE SPEED of the EC-AT Tester.

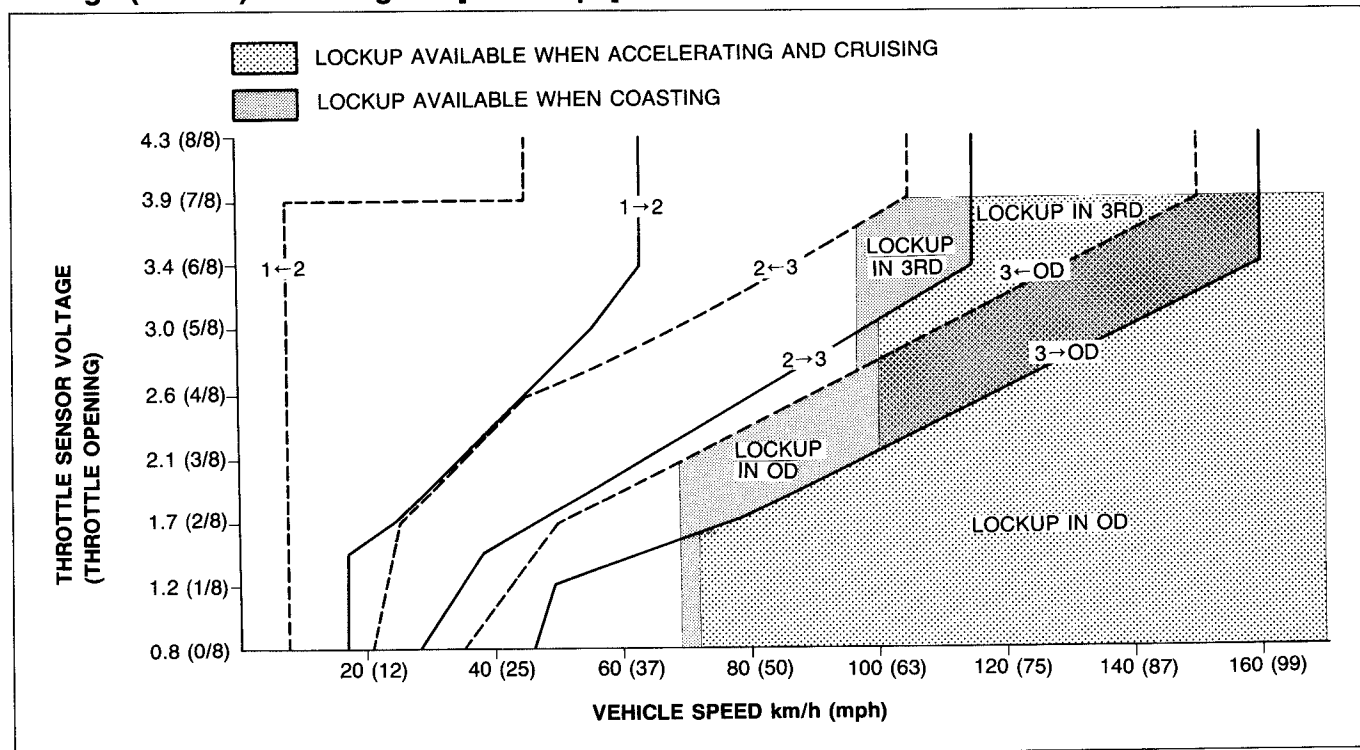
b) Vehicle speed of the EC-AT Tester and the speedometer and vehicle speed on a chassis roller may not meet the specified shift pattern because of incorrect tire size. Therefore, check the shift points with the TURBINE SPEED.

c) There is no overdrive when the cruise control is operating and there is an 8 km/h (5 mph) difference between the preset cruise speed and vehicle speed, or SET or RESUME switch is ON.

d) There is no lockup when water temperature is below 50°C (122°F) or accelerator pedal is fully closed.

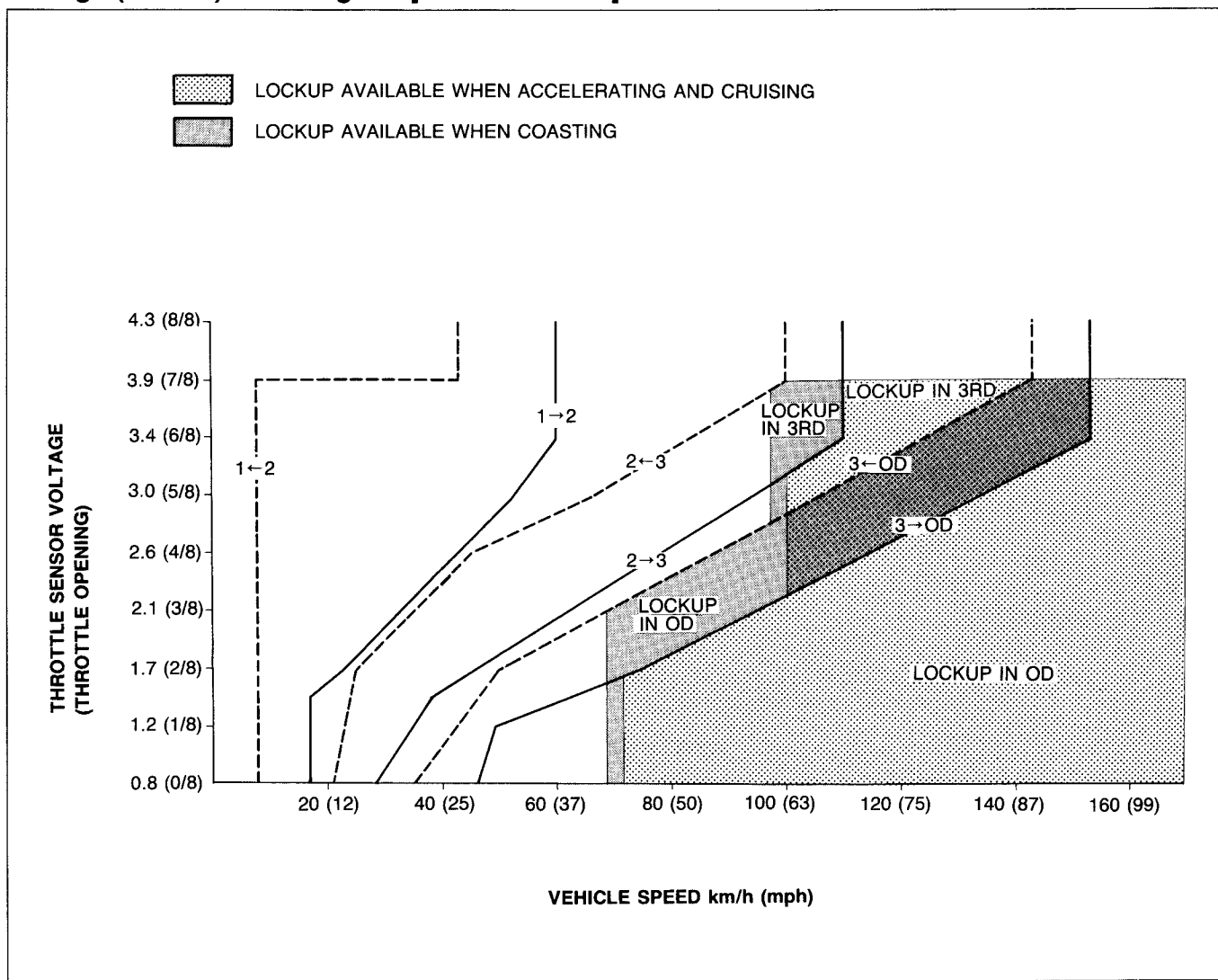
- Check the upshifts for shift shock or slippage in the same manner.
- While driving in overdrive, shift the selector lever to S range and check that OD-3 downshift immediately occurs, then decelerate and check that engine braking effect is felt in only 3rd and 2nd gears.

D-range (Normal) shift diagram [For coupe]



97U0KX-045

D-range (Normal) shift diagram [For convertible]

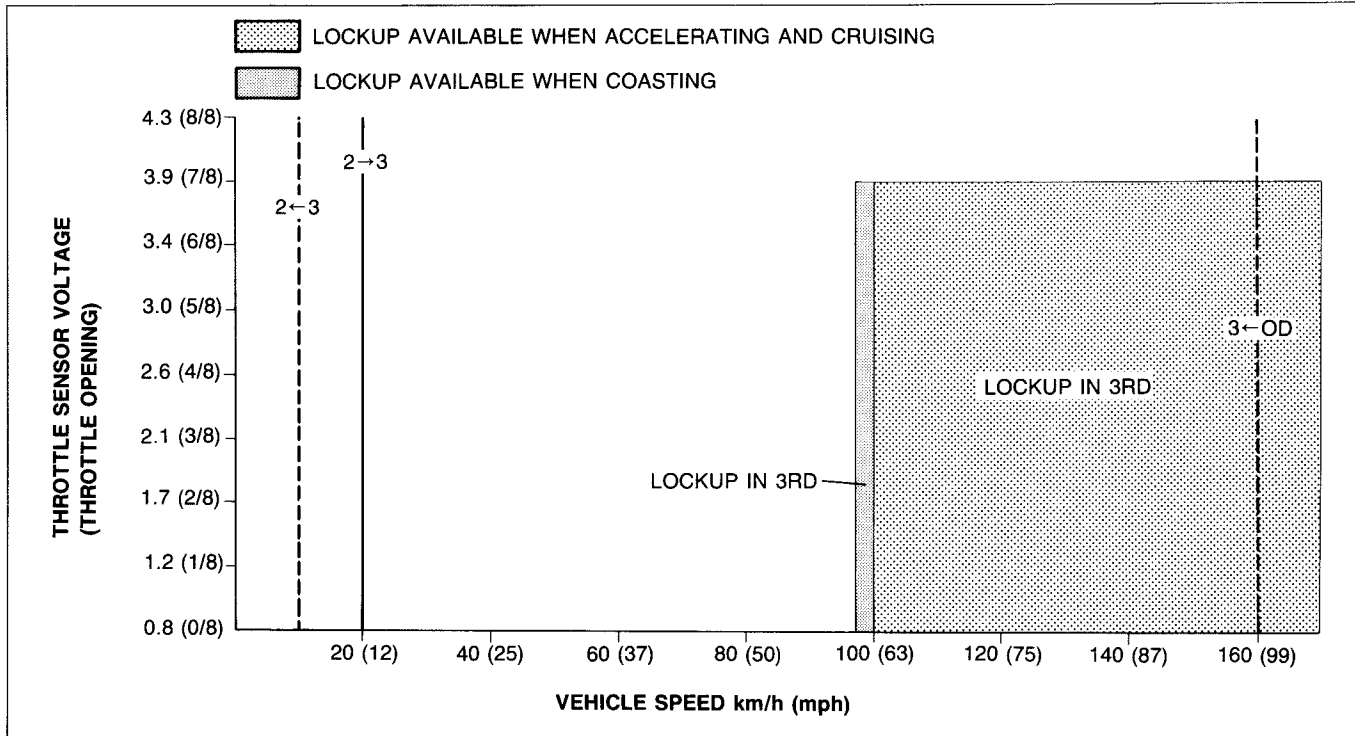


97U0KX-332

K ROAD TEST

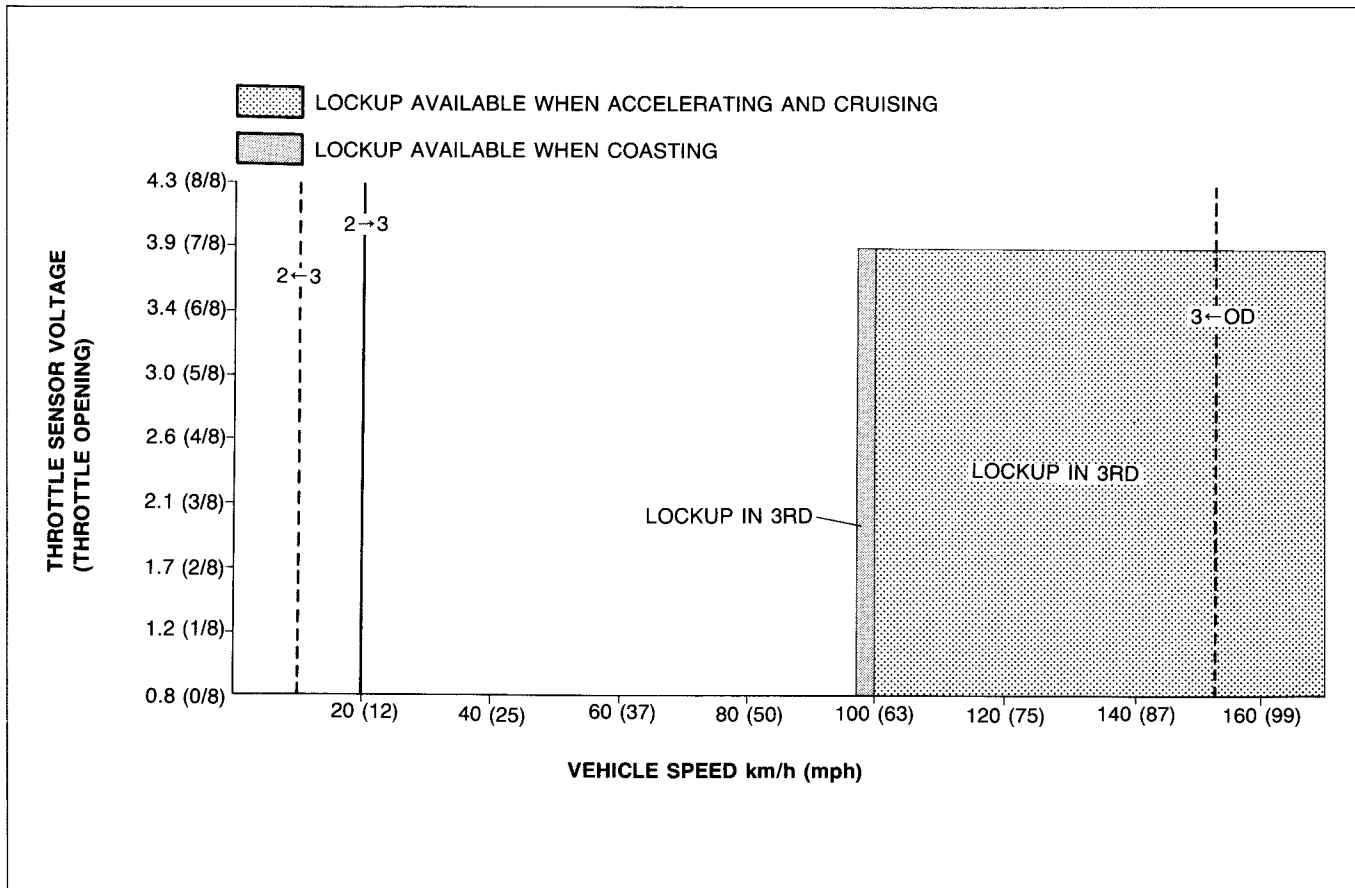
6. Select the Hold mode.
7. Accelerate the vehicle and check 2-3 up- and downshifts, that no 1st and no overdrive is obtained, and that the 2-3 shift points are as shown in the D range (Hold) shift diagram.

D-range (Hold) shift diagram [For coupe]



97U0KX-046

D-range (Hold) shift diagram [For convertible]



97U0KX-333

Evaluation

Condition	Possible Cause
No 1-2 up- or downshift	Stuck 1-2 shift solenoid valve Stuck 1-2 shift valve
No 2-3 up- or downshift	Stuck 2-3 shift solenoid valve Stuck 2-3 shift valve
No 3-OD up- 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 Sticking shift valves
Excessive shift shock or slippage	Stuck accumulators Stuck or no one-way check orifice Stuck 3-2 control solenoid valve Stuck 3-2 control valve Worn clutches, brakes, or one-way clutch
No engine braking effect	Worn clutches or brakes

79G07C-095

Noise and Vibration

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

Note

Abnormal noise and vibration can also be caused by the torque converter, propeller shaft, or differential. Therefore, check for the cause with extreme care.

Kickdown

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 that the shift points are as shown in the shift diagram. (Refer to page K-28, 29.)

97U0KX-047

S-RANGE TEST

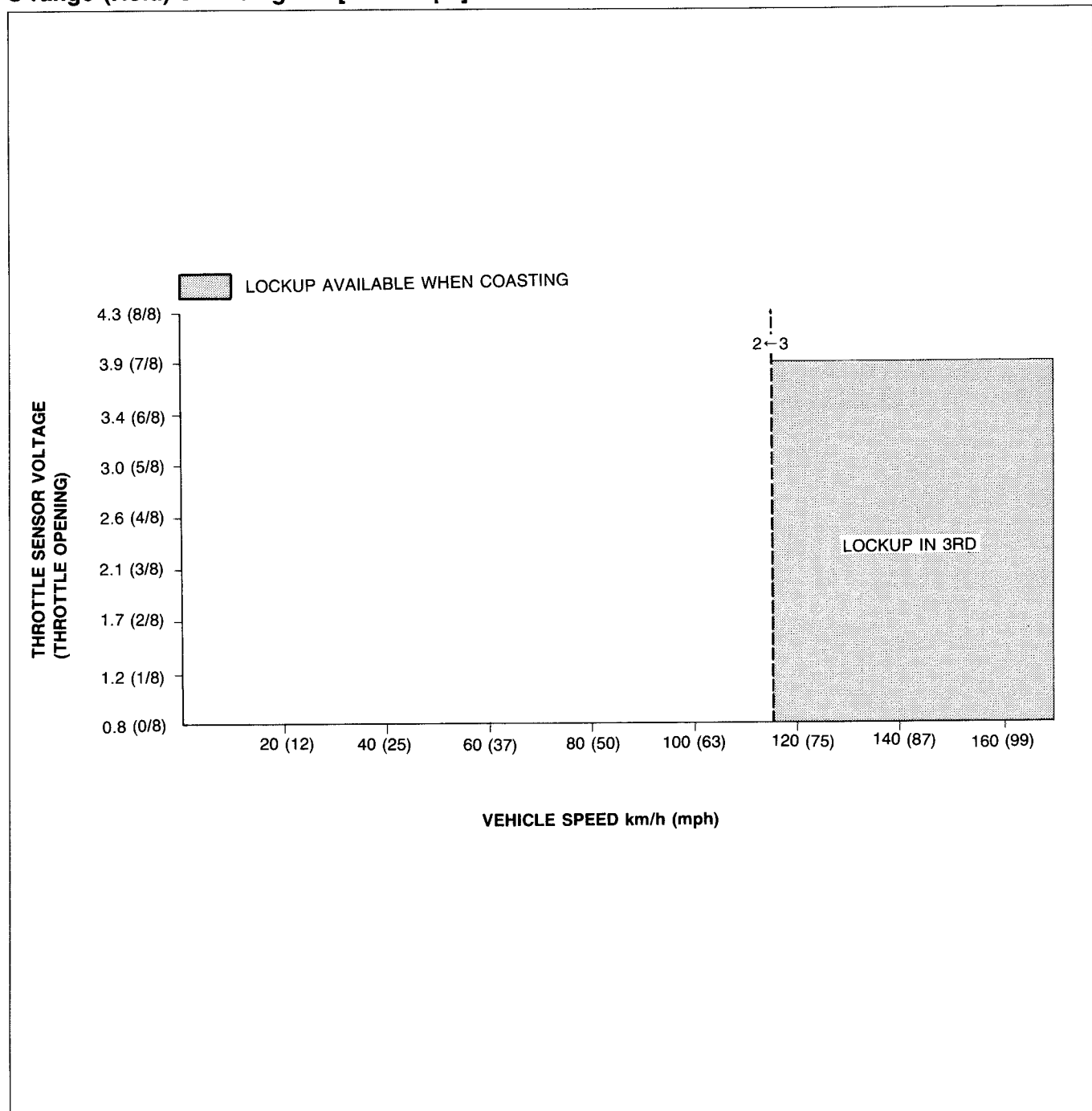
Shift Pattern

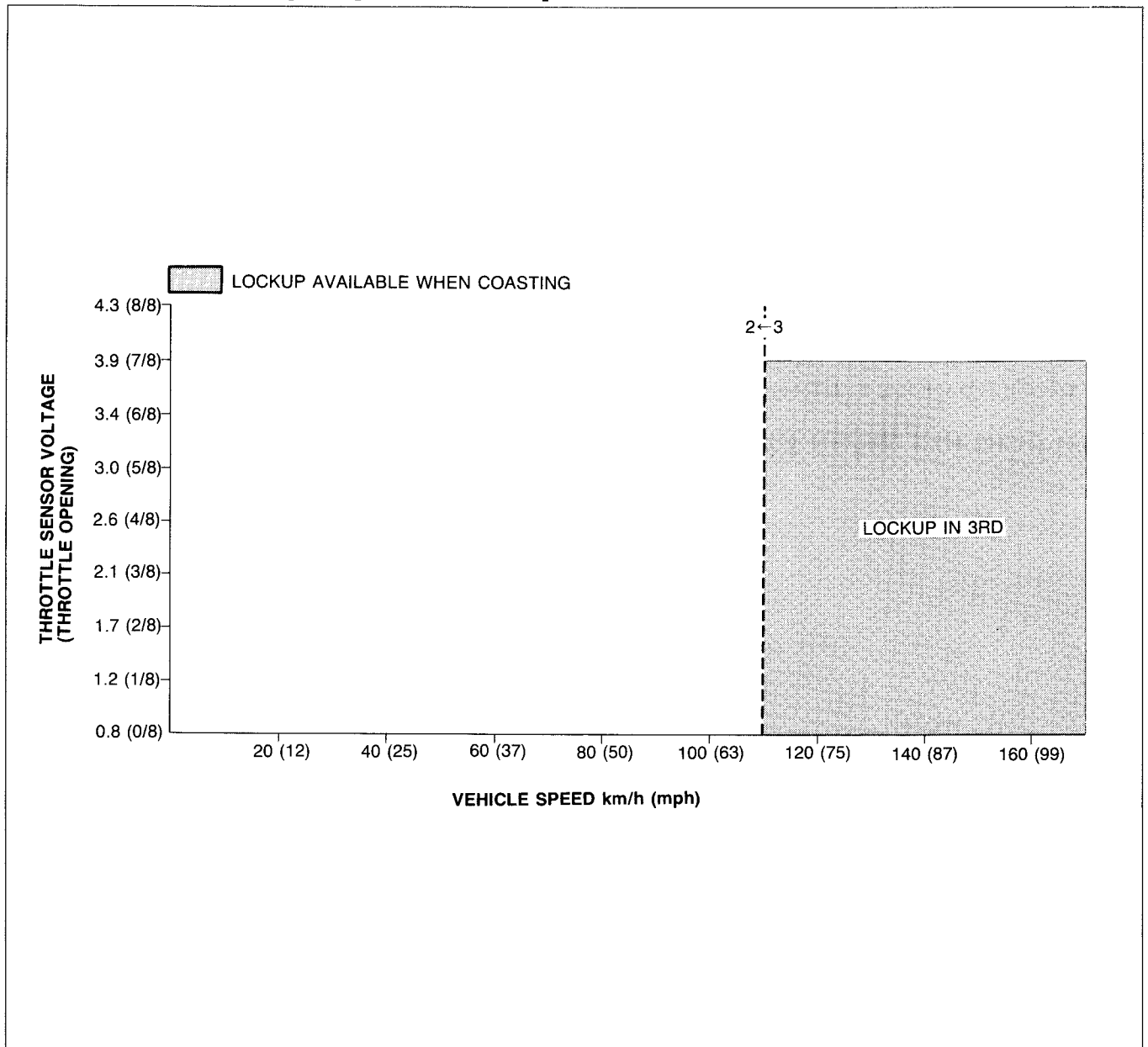
1. Shift the selector lever to S range and select the Normal mode.
2. Accelerate the vehicle and check that 1-2 and 2-3 up- and downshifts are obtained, and that no OD and no lockup (below approx. 100 km/h (63 mph)) are obtained.

Note

- a) Inspections of shift shock and shift points are not necessary because these are the same as those of the D-range test.
 - b) Shift points are the same as those of the D-range (Normal) shift diagram.
3. While driving in S range (Normal mode) and 3rd gear, select the Hold mode and check 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 with S range (Hold mode) and check that 2nd gear is held.

S-range (Hold) shift diagram [For coupe]



S-range (Hold) shift diagram [For convertible]

97U0KX-334

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, propeller shaft, or differential. Therefore, check for the cause with extreme care.

K ROAD TEST

L-RANGE TEST

Shift Pattern

1. Shift the selector lever to L-range and select the Normal mode.
2. Accelerate the vehicle and check that the 1-2 up- and downshifts are obtained and that no 3rd gear, no overdrive gear, and no lockup are obtained.

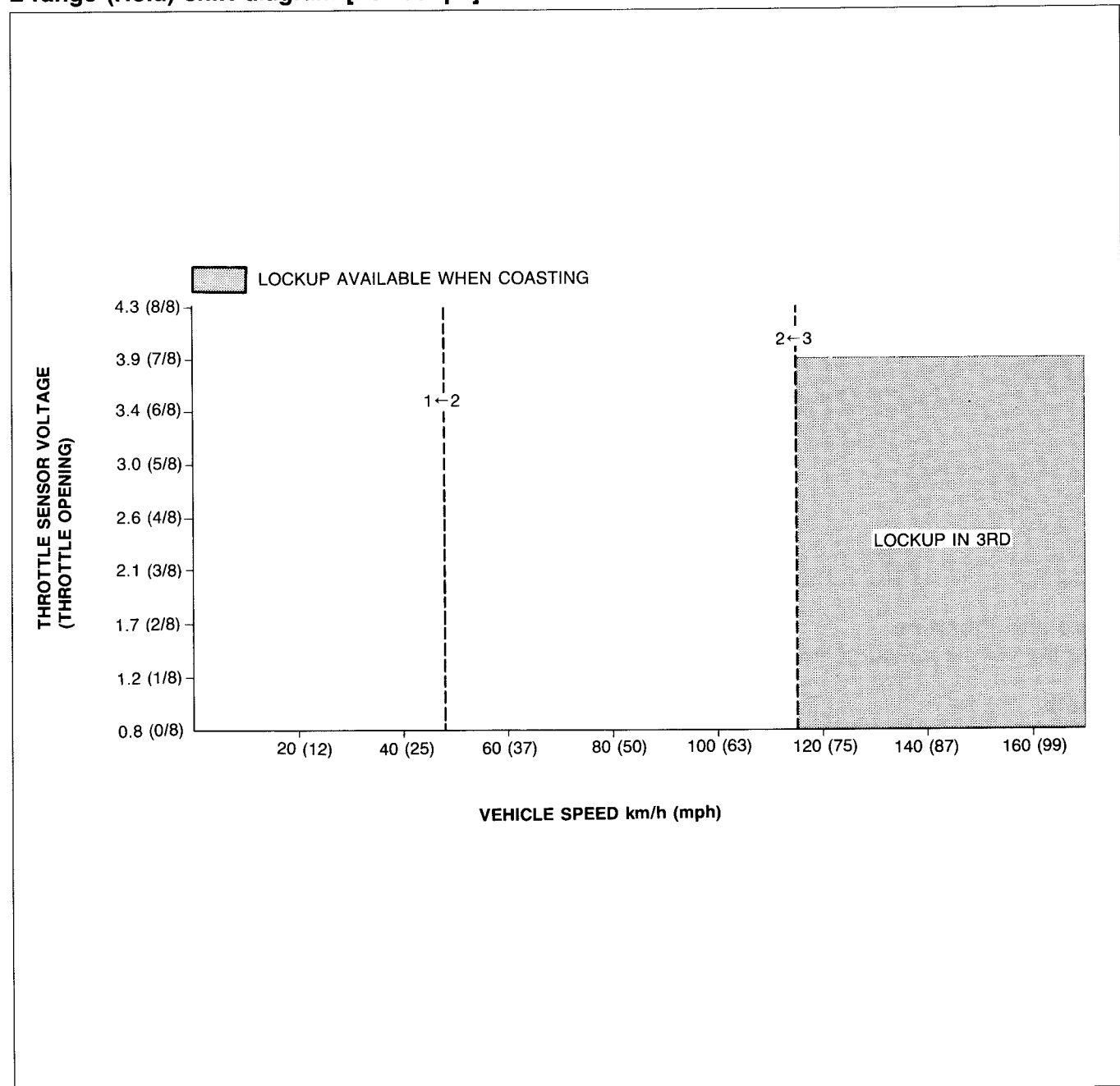
Note

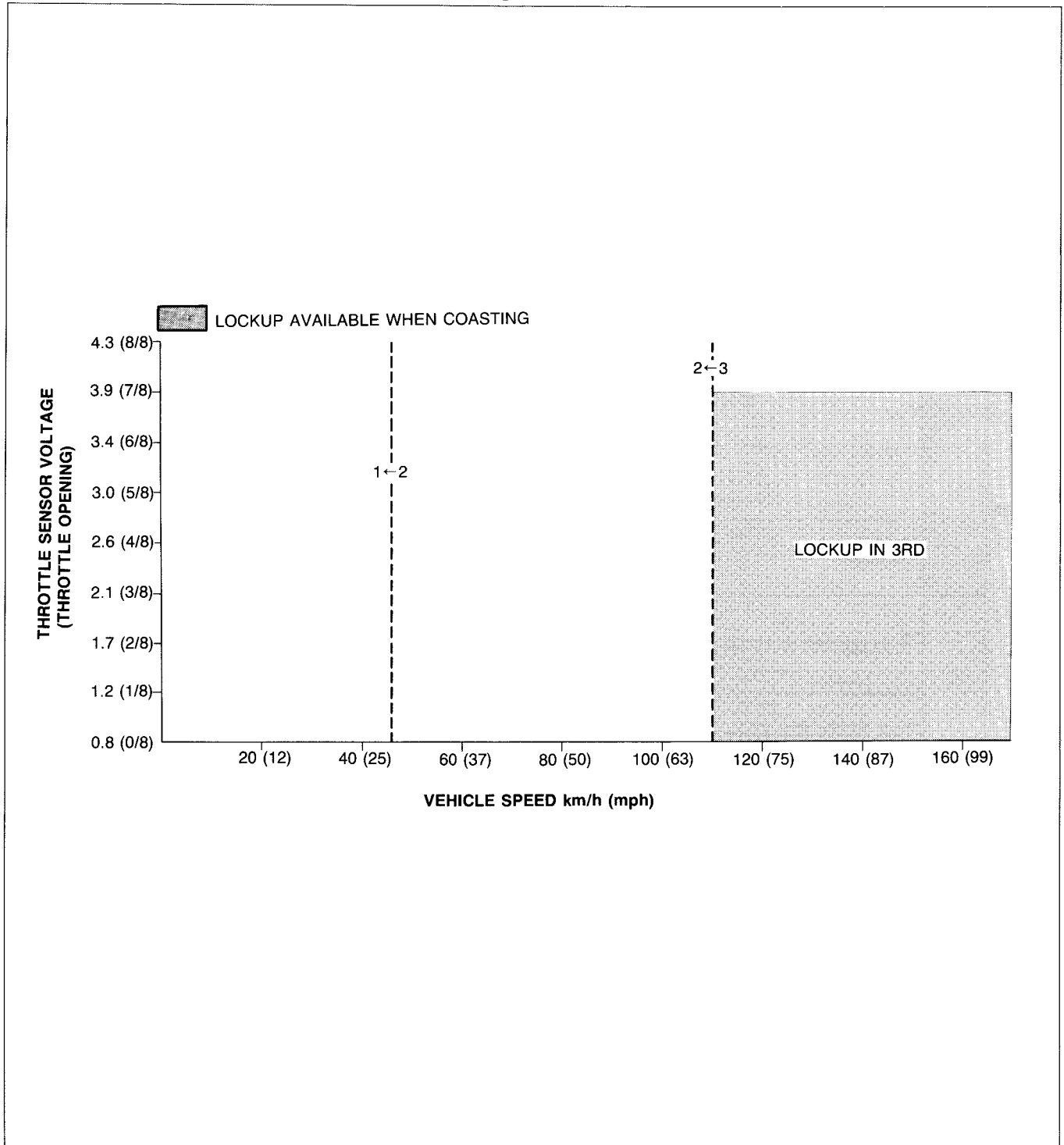
a) Inspection of shift shock and shift point is not necessary because these are the same as those of the D-range Test.

b) Shift points are the same as those of the D-range (Normal) shift diagram.

3. Drive in 1st gear, then decelerate and check that engine braking effect is felt.
4. While driving in D-range (Hold mode) and 3rd gear, shift the selector lever to L-range and check that 3rd gear is held until the 3-2 downshift point is achieved, as shown in the L-range (Hold) shift diagram, and that 2nd gear is held until 2-1 downshift point is achieved.
5. Accelerate the vehicle in L-range (Hold mode) and check that 1st gear is held.

L-range (Hold) shift diagram [For coupe]



L-range (Hold) shift diagram [For convertible]

97U0KX-335

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, propeller shaft or differential. Therefore, check for the cause with extreme care.

P-RANGE TEST

1. Shift into P range on a gentle slope, release the brake, and check 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 check that the vehicle stop.

9MU0K1-060

K-35

Vehicle Speed at Shiftpoint Table [For coupe]

Note

Vehicle speed when shift is felt is 5—6 km/h (3—4 mph) higher than the specified vehicle speed at full-throttle because of mechanical time lag.

Mode	Range	Throttle condition (Throttle sensor voltage)	Shift	Turbine speed (rpm)	Vehicle speed km/h (mph)
Normal	D	Fully opened (4.3 volt)	D1→D2	5,780—6,350	60—66 (37—41)
			D2→D3	5,800—6,210	111—119 (69—74)
			D3→OD	5,250—5,590	155—165 (96—102)
		Half throttle (2.6 volt)	D1→D2	3,950—4,520	41—47 (25—29)
			D2→D3	3,970—4,390	76—84 (47—52)
			Lockup ON (D3)	3,290—3,490	97—103 (60—64)
			D3→OD	3,860—4,130	114—122 (71—76)
			Lockup ON (OD)	3,860—4,130	114—122 (71—76)
			Lockup OFF (OD)	2,100—2,290	86—94 (53—58)
			OD→D3	2,100—2,290	86—94 (53—58)
		Kickdown	D3→D2	1,390—1,660	41—49 (25—30)
			OD→D3	3,540—3,780	145—155 (90—96)
	D3→D2		3,420—3,690	101—109 (63—68)	
	S	Fully opened (4.3 volt)	D2→D1	2,190—2,510	42—48 (26—30)
			S1→S2	5,780—6,350	60—66 (37—41)
			S2→S3	5,800—6,210	111—119 (69—74)
			S3→S2	3,460—3,660	102—108 (63—67)
		Half throttle (2.6 volt)	S2→S1	2,190—2,510	42—48 (26—30)
			S1→S2	3,950—4,520	41—47 (25—29)
			S2→S3	3,970—4,390	76—84 (47—52)
			S3→S2	1,420—1,630	42—48 (26—30)
L1→L2			5,780—6,350	60—66 (37—41)	
L	Fully opened (4.3 volt)	L2→L1	2,190—2,510	42—48 (26—30)	
	Half throttle (2.6 volt)	L1→L2	4,040—4,620	42—48 (26—30)	
Hold	D	—	D2→D3	890—1,200	17—23 (11—14)
			D3→D2	200—470	6—14 (4—9)
			OD→D3	3,830—3,980	157—163 (97—101)
	S	Fully closed (0.8 volt)	S3→S2	3,800—4,000	112—118 (69—73)
			L	L2→L1	2,350—2,660

97U0KX-050

Vehicle Speed at Shiftpoint Table [For convertible]**Note**

Vehicle speed when shift is felt is 5—6 km/h (3—4 mph) higher than the specified vehicle speed at full-throttle because of mechanical time lag.

Mode	Range	Throttle condition (Throttle sensor voltage)	Shift	Turbine speed (rpm)	Vehicle speed km/h (mph)
Normal	D	Fully opened (4.3 volt)	D1→D2	5,960—6,560	59—65 (37—40)
			D2→D3	5,910—6,350	108—116 (67—72)
			D3→OD	5,330—5,690	150—160 (93—99)
		Half throttle (2.6 volt)	D1→D2	4,040—4,640	40—46 (25—29)
			D2→D3	4,050—4,490	74—82 (46—51)
			Lockup ON (D3)	3,450—3,660	97—103 (60—64)
			D3→OD	3,910—4,190	110—118 (68—73)
			Lockup ON (OD)	2,810—3,020	110—118 (68—73)
			Lockup OFF (OD)	2,120—2,330	83—91 (51—56)
			OD→D3	2,120—2,330	83—91 (51—56)
		Kickdown	D3→D2	1,460—1,740	41—49 (25—30)
			OD→D3	3,530—3,790	138—148 (86—92)
	D3→D2		3,410—3,700	96—104 (60—64)	
	S	Fully opened (4.3 volt)	D2→D1	2,190—2,520	40—46 (25—29)
			S1→S2	5,960—6,560	59—65 (37—40)
			S2→S3	5,910—6,350	108—116 (67—72)
			S3→S2	3,450—3,660	97—103 (60—64)
		Half throttle (2.6 volt)	S2→S1	2,190—2,520	40—46 (25—29)
			S1→S2	4,040—4,640	40—46 (25—29)
			S2→S3	4,110—4,440	75—81 (47—50)
			S3→S2	1,460—1,740	41—49 (25—30)
L1→L2			5,960—6,560	59—65 (37—40)	
L	Fully opened (4.3 volt)	L2→L1	2,190—2,520	40—46 (25—29)	
	Half throttle (2.6 volt)	L1→L2	4,040—4,640	40—46 (25—29)	
Hold	D	—	D2→D3	930—1,260	17—23 (11—14)
			D3→D2	210—500	6—14 (4—9)
			OD→D3	3,840—3,990	150—156 (93—97)
	S	Fully closed (0.8 volt)	S3→S2	3,800—4,020	107—113 (66—70)
	L	L2→L1	2,350—2,680	43—49 (27—30)	

97U0KX-336

K ROAD TEST

Slippage Test

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

Preparation

1. Perform the preparation procedure shown in STALL TEST. (Refer to page K-21.)
2. Connect a tachometer to the engine and set it in the cabin.
3. Connect the **EC-AT Tester Set** between the EC-AT control unit and wiring harness.

Procedure

Drive the vehicle in each of the gears indicated below and check whether the vehicle speed or engine speed is above or below specification as shown by the turbine speed.

[For coupe]

Driving condition			Speed	Turbine 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)	10 (6)	21 (13)	31 (19)	42 (26)
2	1st	D range, Normal mode		10 (6)	21 (13)	31 (19)	42 (26)
3	2nd	S range, Hold mode		19 (12)	38 (24)	57 (35)	76 (47)
4	3rd	D range, Hold mode		30 (19)	59 (37)	89 (55)	118 (73)
5	OD	D range, Normal mode		41 (25)	82 (51)	123 (76)	164 (102)
6	OD	D range, Normal mode, Lockup	Engine speed (rpm)	1,000	2,000	3,000	4,000

97U0KX-051

[For convertible]

Driving condition			Speed	Turbine 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)	10 (6)	20 (12)	30 (19)	40 (25)
2	1st	D range, Normal mode		10 (6)	20 (12)	30 (19)	40 (25)
3	2nd	S range, Hold mode		18 (11)	37 (23)	55 (34)	73 (45)
4	3rd	D range, Hold mode		28 (17)	56 (35)	84 (52)	113 (70)
5	OD	D range, Normal mode		39 (24)	78 (48)	117 (73)	156 (97)
6	OD	D range, Normal mode, Lockup	Engine speed (rpm)	1,000	2,000	3,000	4,000

97U0KX-037

Evaluation

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

Results below specification	Possible Cause
No.1 condition only	Low and reverse brake
No.2 condition only	One-way clutch
No.3 condition only	2nd brake band
No.4 condition only	Front clutch
No.5 condition only	Overdrive brake band
No.1, 2, 3, and 4 conditions	Direct clutch
No.6 condition only	Lockup piston
All conditions	Rear clutch

99U07B-036

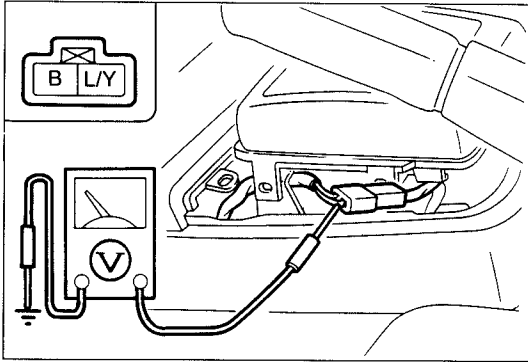
ELECTRONIC SYSTEM COMPONENTS

HOLD SWITCH

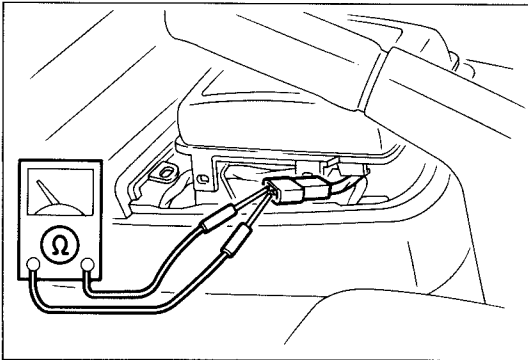
Inspection

Terminal voltage

1. Pry off the upper panel and lift up the selector knob, selector sleeve, and indicator panel.
2. Turn the ignition switch ON.
3. Check the voltage between terminal-wire (L/Y), and a ground.



97U0KX-052



97U0KX-053

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

4. If not correct, go to the next step.

Continuity

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

Continuity	Switch
YES	Released
NO	Depressed

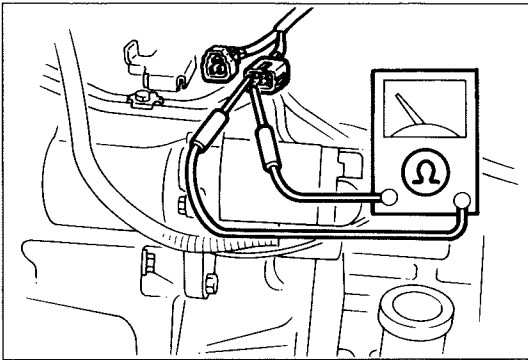
3. If not correct, replace the hold switch.

INHIBITOR SWITCH

Inspection

Operation

1. Check that the starter operates with the ignition switch at START position and the selector lever in P and N range only and that it does not operate in any other position.
2. Check that the back-up lights illuminate when shifted to the R range with the ignition switch in the ON position.
3. Check the inhibitor switch if it is not as specified.



9MU0K1-067

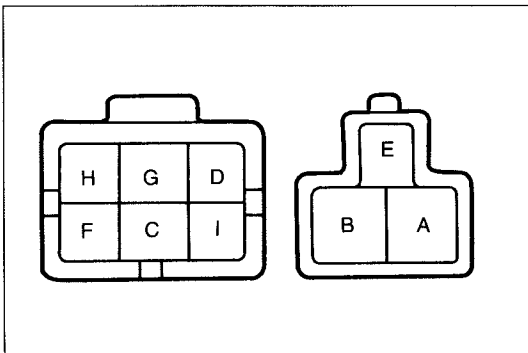
Continuity

1. Jack up the vehicle and support it with safety stands.
2. Disconnect the select lever from the manual shaft.
3. Disconnect the inhibitor switch connector.
4. Check continuity of the terminals.

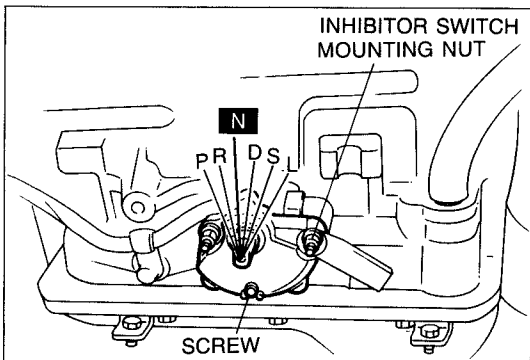
Position	Connector terminal								
	A	B	C	D	E	F	G	H	I
P	○—○		○—○						
R			○—○		○				
N	○—○		○—○			○			
D			○—○				○		
S			○—○					○	
L			○—○						○

○—○: Indicates continuity

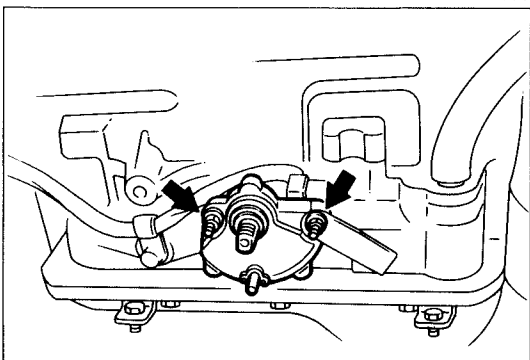
5. If not correct, adjust the inhibitor switch.
6. If correct, check or adjust the selector lever.
(Refer to page K-158.)



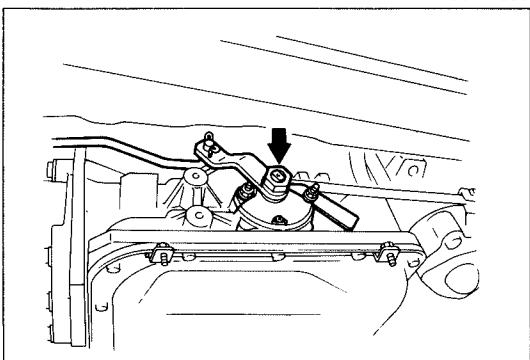
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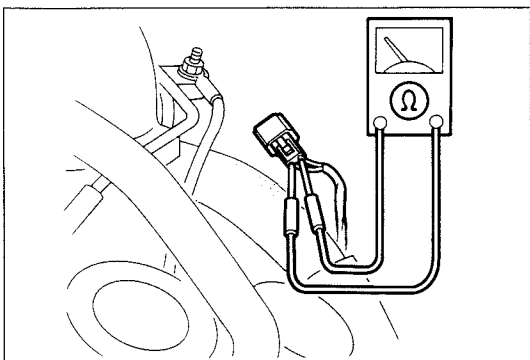
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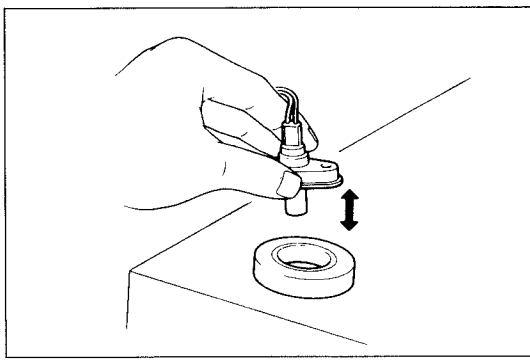
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97U0KX-057



97U0KX-058



97U0KX-059

Adjustment

1. Move the manual shaft to N position.
2. Loosen the inhibitor switch mounting Nuts.
3. Remove the screw on the switch body and move the inhibitor switch so that the screw hole is aligned with the small hole inside the switch. Check their alignment by inserting an **approx. 2.0mm (0.079 in)** diameter pin through the holes.

4. Tighten the mounting Nuts and remove the pin.

Tightening torque:

4.9—6.9 N·m (50—70 cm·kg, 43—61 in·lb)

5. Install and tighten the screw in the switch body.
6. Check the continuity of the inhibitor switch.
7. If not correct, replace the inhibitor switch.

8. Connect the select lever.

Tightening torque:

44—64 N·m (4.5—6.5 m·kg, 33—47 ft·lb)

TURBINE SENSOR

Inspection

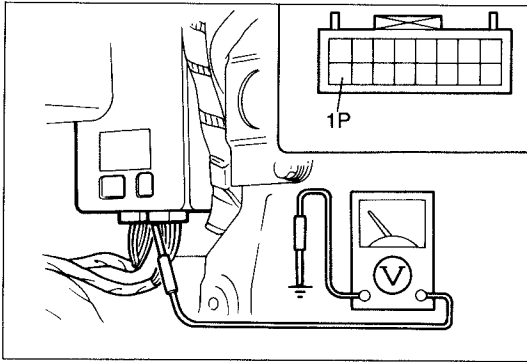
1. Disconnect the turbine sensor connector.
2. Measure the resistance between the terminals.

Resistance: Approx. 245Ω

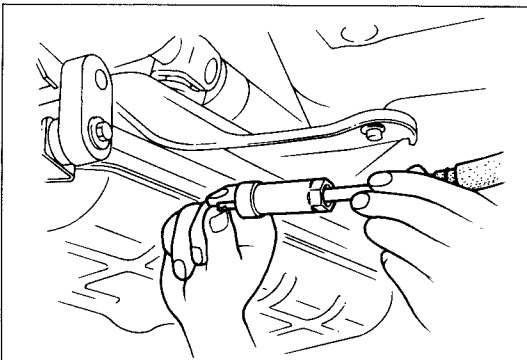
3. If not correct, go to next step.

Continuity

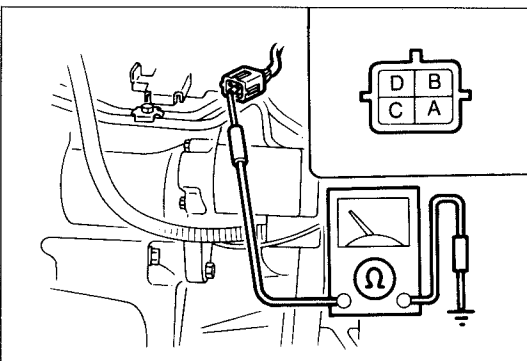
1. Jack up the vehicle and support it with safety stands.
2. Remove the turbine sensor.
3. Connect a voltmeter (0.1 volt range) to the terminals. Wave the tip of turbine sensor approx. 5mm (0.197 in) away from a magnet and check that the sensor generates voltage.
4. If not correct, replace the turbine sensor.



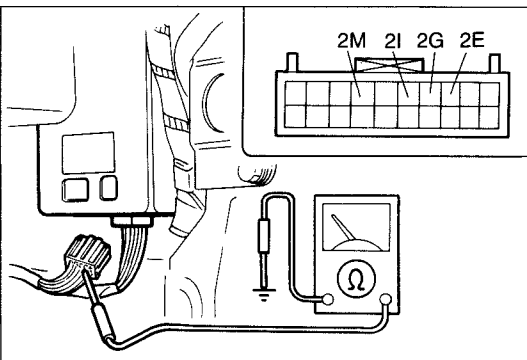
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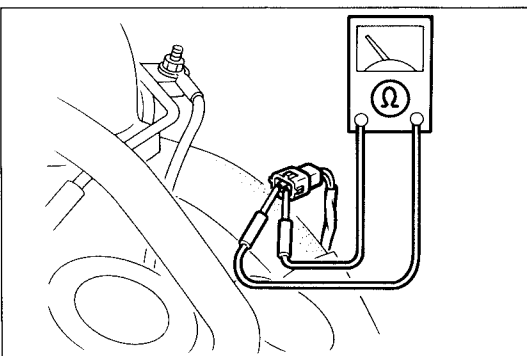
97U0KX-061



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97U0KX-063



97U0KX-064

SPEED SENSOR

Inspection

1. Connect a voltmeter between the 1P terminal and ground as shown.
2. Turn the ignition switch ON.

3. Jack up the vehicle and support it with safety stands.
4. Remove the speedometer cable from the transmission.
5. Slowly turn the speedometer cable one turn.
6. Check that approx. 7V is shown 4 times.
7. If not correct, check the speedometer.

SOLENOID VALVE (1-2 SHIFT, 2-3 SHIFT, 3-4 SHIFT, 3-2 CONTROL)

Inspection

1. Jack up the vehicle and support it with safety stands.
2. Disconnect the solenoid valve connector.
3. Measure the resistance between each terminal and ground.

Resistance: 13—27 Ω

Note

- 1-2 shift solenoid valve: A**
- 2-3 shift solenoid valve: B**
- 3-4 shift solenoid valve: C**
- 3-2 control solenoid valve: D**

4. If not correct, check the wiring harness for an open or short-circuit. Replace the solenoid valve, if necessary.

Continuity

1. Disconnect the 20-pin connector from the EC-AT control unit.
2. Check continuity between terminals 2E, 2G, 2I, and 2M, and ground.
3. If not correct, check the wiring harness for an open-circuit.

SOLENOID VALVE (LOCKUP CONTROL)

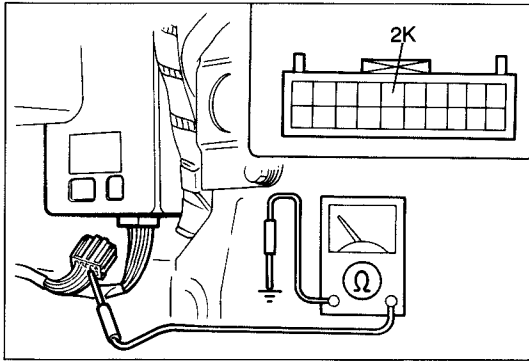
Inspection

1. Disconnect the solenoid valve connector.
2. Measure the resistance between the terminals.

Resistance: 13—25 Ω

3. If not correct, replace the solenoid valve.

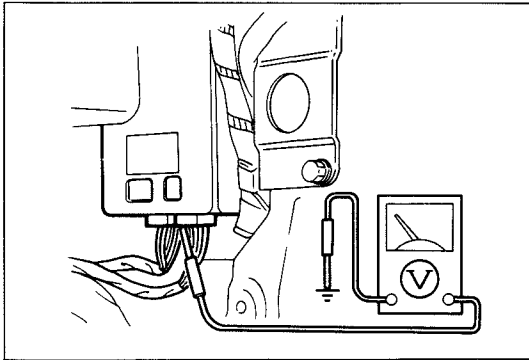
K ELECTRONIC SYSTEM COMPONENTS



97U0KX-065

Continuity

1. Disconnect the 20-pin connector from the EC-AT control unit.
2. Check continuity between the terminal 2K and ground.
3. If not correct, check the wiring harness for an open-circuit.



9MU0K1-082

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.

Terminal Voltage Chart

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	Connected to	Voltmeter		Voltage	Condition
		+ terminal	- terminal		
1A	—	—	—	—	—
1B (Output)	Hold indicator	1B	Ground	Approx. 12V	No hold mode
				Below 1.5V	Hold mode
1C (Output)	EC-AT tester (malfunction code)	1C	Ground	Approx. 12V	Normal (with EC-AT tester)
				Below 1.5V or Approx. 12V (fluctuating)	If malfunction present (with EC-AT tester)
				Code Signal	EC-AT check connector grounded (with EC-AT tester)
1D (Output)	Engine control unit (R terminal)	1D	Ground	Below 2.5V	N or P range
				Approx. 12V	Other ranges
1E (Input)	EC-AT check connector	1E	Ground	Approx. 12V	—
1F	—	—	—	—	—
1G	—	—	—	—	—
1H (Input)	Hold switch	1H	Ground	Approx. 12V	Switch depressed
				Below 1.5V	Switch released
1I	—	—	—	—	—
1J (Output)	—	1J	Ground	Below 1.5V	—
1K	—	—	—	—	—
1L	—	—	—	—	—
1M (Input)	Cruise control unit	1M	Ground	Approx. 12V	Normal conditions
				Below 1.5V	Set or Resume switch ON or vehicle speed 8 km/h (5 mph) lower than preset speed (Driving vehicle cruise control operation)
1N (Input)	Engine control unit (3M terminal)	1N	Ground	Below 1.5V	Water temperature below 40°C (104°F) to 50°C (122°F), or water temperature above 70°C (158°F) and throttle valve fully closed
				Approx. 12V	Other conditions
1O (Input)	—	1O	Ground	Approx. 12V	Coupe model
				Below 1.5V	Convertible model
1P (Input)	Speed sensor	1P	Ground	Approx. 4V	While driving
				Approx. 7–9V or Below 1.5V	Vehicle stopped
2A (Input)	Throttle sensor	2A	Ground	Approx. 4.4–5.5V	Ignition switch ON
				Below 1.5V	Ignition switch OFF
2B (Input)	Inhibitor switch (N and P ranges)	2B	Ground	Below 1.5V	N or P range
				Approx. 12V	Other ranges
2C	—	—	—	—	—
2D (Input)	Inhibitor switch (D range)	2D	Ground	Approx. 12V	D range
				Below 1.5V	Other ranges
2E (Output)	1-2 shift solenoid valve	2E	Ground	Approx. 12V	Solenoid ON in following condition: • 1st gear position
				Below 1.5V	Solenoid OFF in following condition: • 2nd, 3rd, and OD gear positions
2F (Input)	Inhibitor switch (S range)	2F	Ground	Approx. 12V	S range
				Below 1.5V	Other ranges
2G (Output)	2-3 shift solenoid valve	2G	Ground	Approx. 12V	Solenoid ON in following condition: • 1st and 2nd gear positions
				Below 1.5V	Solenoid OFF in following condition: • 3rd and OD gear positions
2H (Input)	Inhibitor switch (L range)	2H	Ground	Approx. 12V	L range
				Below 1.5V	Other ranges
2I (Output)	3-4 shift solenoid valve	2I	Ground	Approx. 12V	Solenoid ON in following condition: • 1st, 2nd, and 3rd gear positions
				Below 1.5V	Solenoid OFF in following condition: • OD gear position

K ELECTRONIC SYSTEM COMPONENTS

Terminal	Connected to	Voltmeter		Voltage	Condition
		+ terminal	- terminal		
2J (Input)	Turbine sensor*	2J	Ground	0.05—0.1V (AC)	Engine running
				Approx. 0.05V (AC)	Engine stopped
2K (Output)	Lockup control solenoid valve	2K		Approx. 12V	Solenoid ON, Lockup
				Below 1.5V	Solenoid OFF, Non-lockup
2L (Ground)	Turbine sensor	2L		Blow 1.5V	—
2M (Output)	3-2 control solenoid valve	2M		Approx. 12V	3-2 or OD-2 downshift
				Blow 1.5V	Other conditions
2N (Output)	Engine control unit (U terminal)	2N		Blow 1.5V	Always ground
2O (Memory power)	Battery	2O		Approx. 12V	Constant
2P (Ground)	—	2P		Blow 1.5V	—
2Q (Battery power)	Battery	2Q		Approx. 12V	Ignition switch ON
				Below 1.5V	Ignition switch OFF
2R	—	—	—	—	—
2S (Battery power)	Battery	2S	Ground	Approx. 12V	Ignition switch ON
				Below 1.5V	Ignition switch OFF
2T (Input)	Throttle sensor	2T		Approx. 0.8—4.3	Throttle valve fully closed to fully open

* Checked with AC range

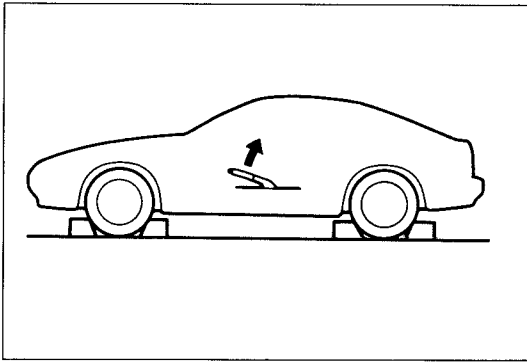
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AUTOMATIC TRANSMISSION FLUID (ATF)

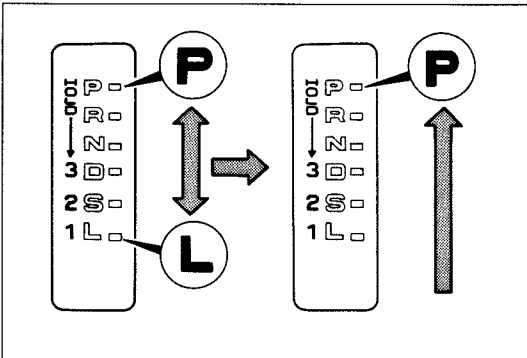
Inspection Level

Caution

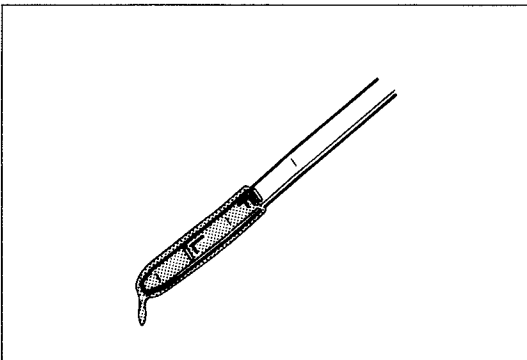
Place the vehicle on a flat, level surface.



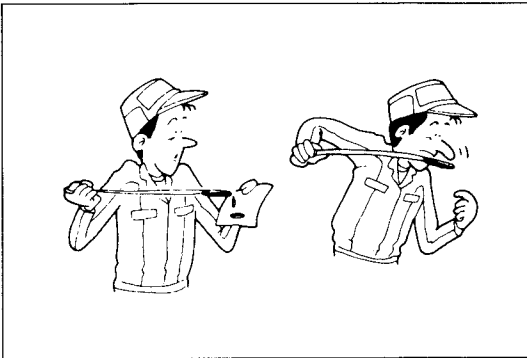
9MU0K1-085



79G07C-126



79G07C-127



79G07C-128

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 **50—80°C (122—176°F)**.

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.

6. Ensure that the ATF level is between the F and L marks on the transmission level gauge. Add ATF to specification if necessary.

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.

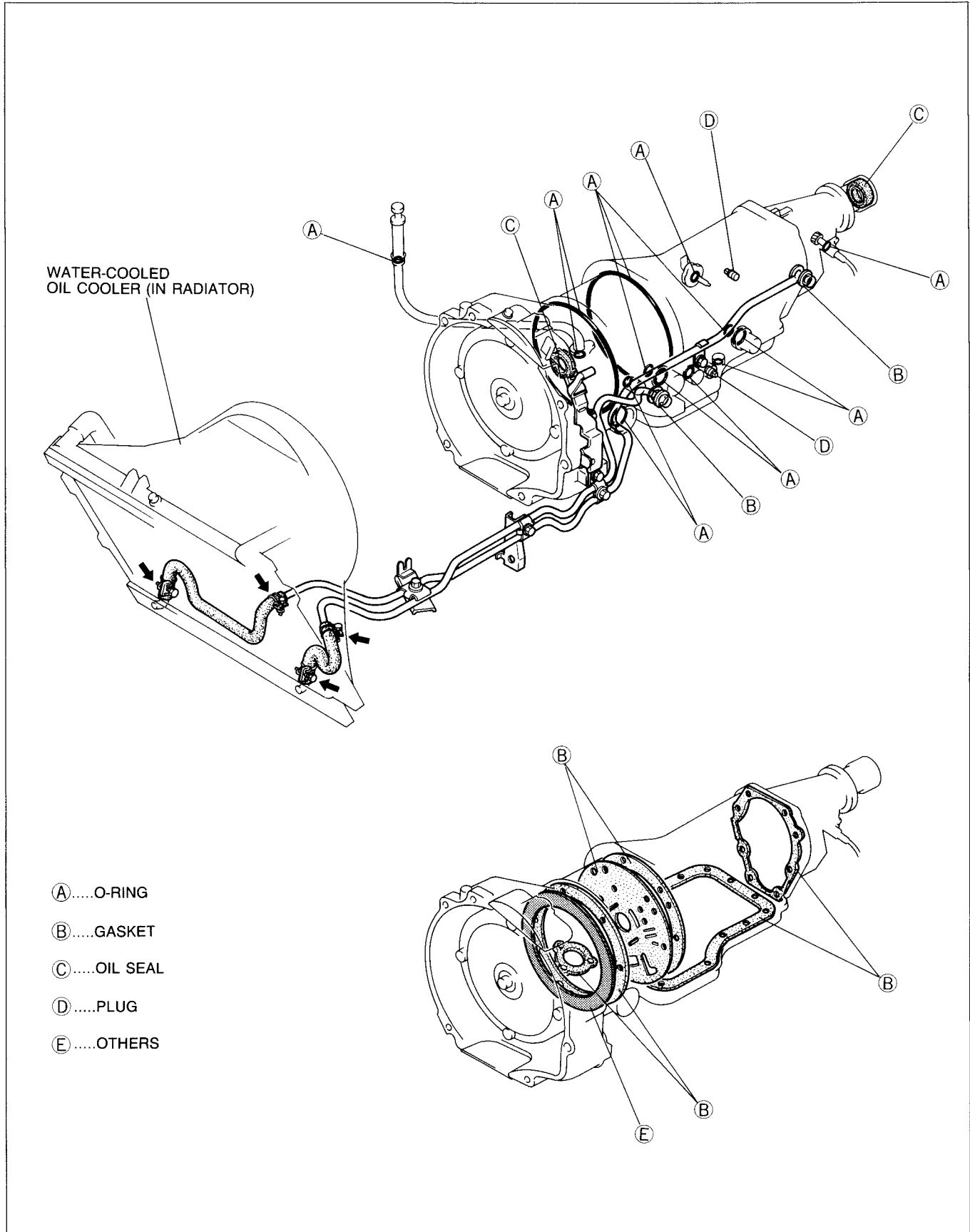
If the ATF is muddy and varnished, it indicates burned drive plates.

K AUTOMATIC TRANSMISSION FLUID (ATF)

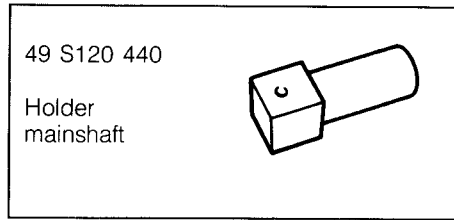
Fluid leaks

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

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



97U0KX-067

TRANSMISSION**TRANSMISSION UNIT (REMOVAL)****Preparation****SST**

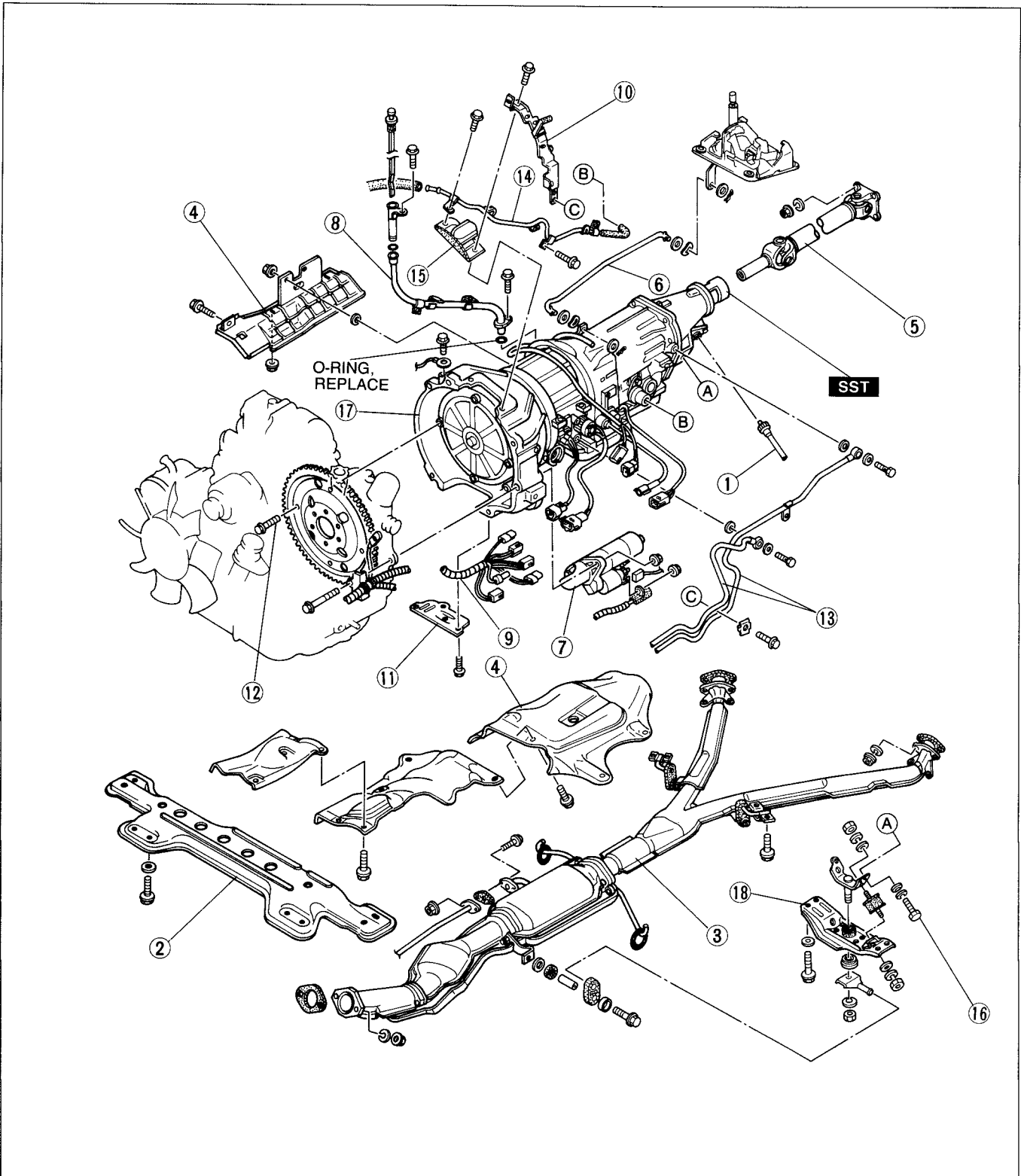
97U0KX-068

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

Caution

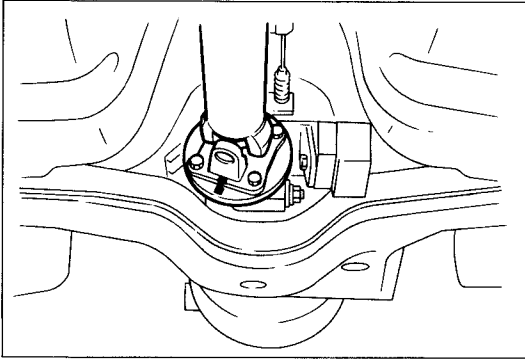
Do not turn the transmission over before removing the oil pan.

6. After removal, remove the oil pan to check condition of the transmission.

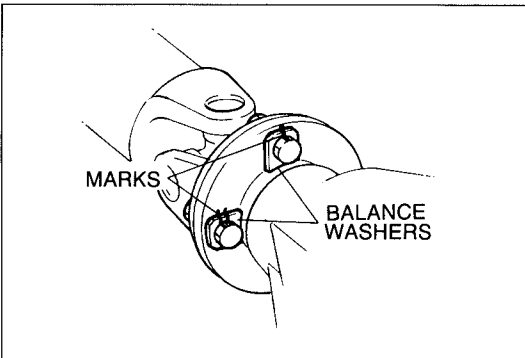


97U0KX-069

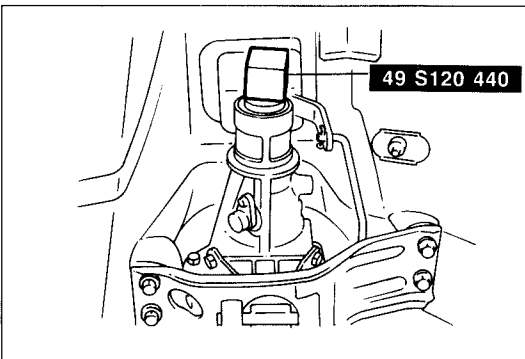
- | | | |
|---|--|--|
| 1. Speedometer cable | 8. Filler tube | 14. Vacuum pipe |
| 2. Crossmember
(Convertible model only) | 9. Connectors | Removal..... page K- 49 |
| 3. Exhaust pipe | 10. Coupler bracket | 15. Top cover |
| 4. Heat insulator | 11. Undercover | 16. Transmission mounting bolts |
| 5. Propeller shaft
Removal..... page K- 49 | 12. Torque converter mounting bolts | 17. Transmission
Disassembly... page K- 50
Assembly page K-134 |
| 6. Shift rod | 13. Oil pipes
Removal..... page K- 49 | 18. Transmission mount |
| 7. Starter | | |



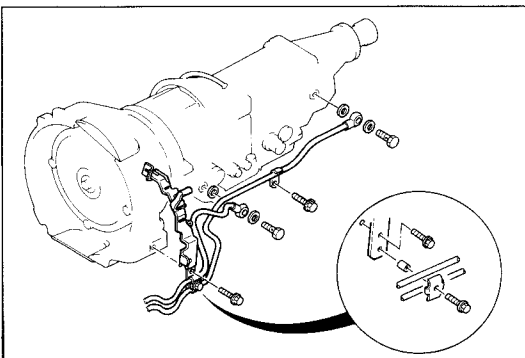
9MU0K1-091



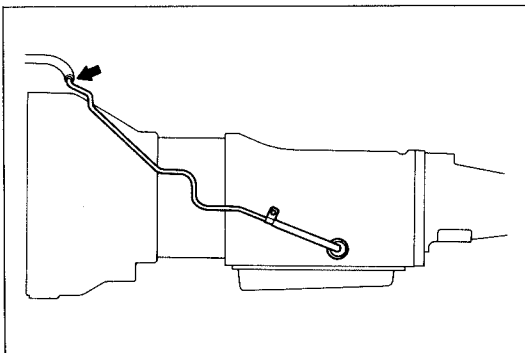
97U0KX-070



9MU0K1-093



97U0KX-071



97U0KX-072

Removal note Propeller shaft

1. Before removing the propeller shaft, mark the flanges for correct reassembly.

2. Mark the balance washers for correct reassembly.

3. When the propeller shaft is removed from the extension housing, install the **SST** into the extension housing.

Oil pipe

Caution

Be sure the transmission is securely supported by the transmission jack.

1. Remove the oil pipe mount bolts.
2. Disconnect the oil pipes.
3. Support the transmission with a transmission jack.
4. Remove the transmission mount bolts.
5. Support the transmission and lower it.

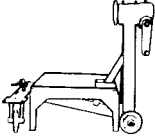
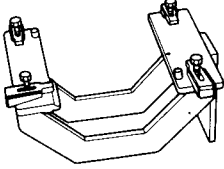
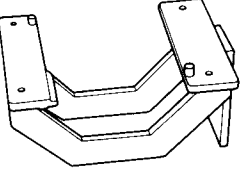
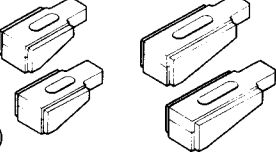
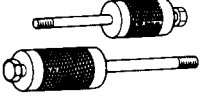
Vacuum pipe

Disconnect the vacuum pipe.

K TRANSMISSION

TRANSMISSION UNIT (DISASSEMBLY)

Preparation SST

<p>49 0107 680A</p> <p>Engine stand</p> 	<p>49 U019 0A0</p> <p>Transmission hanger</p> 	<p>49 H075 495A</p> <p>Body (Part of 49 U019 0A0)</p> 
<p>49 U019 003</p> <p>Holder (Part of 49 U019 0A0)</p> 	<p>49 0378 390</p> <p>Puller, oil pump</p> 	<p>9MU0K2-082</p>

Precaution

General notes:

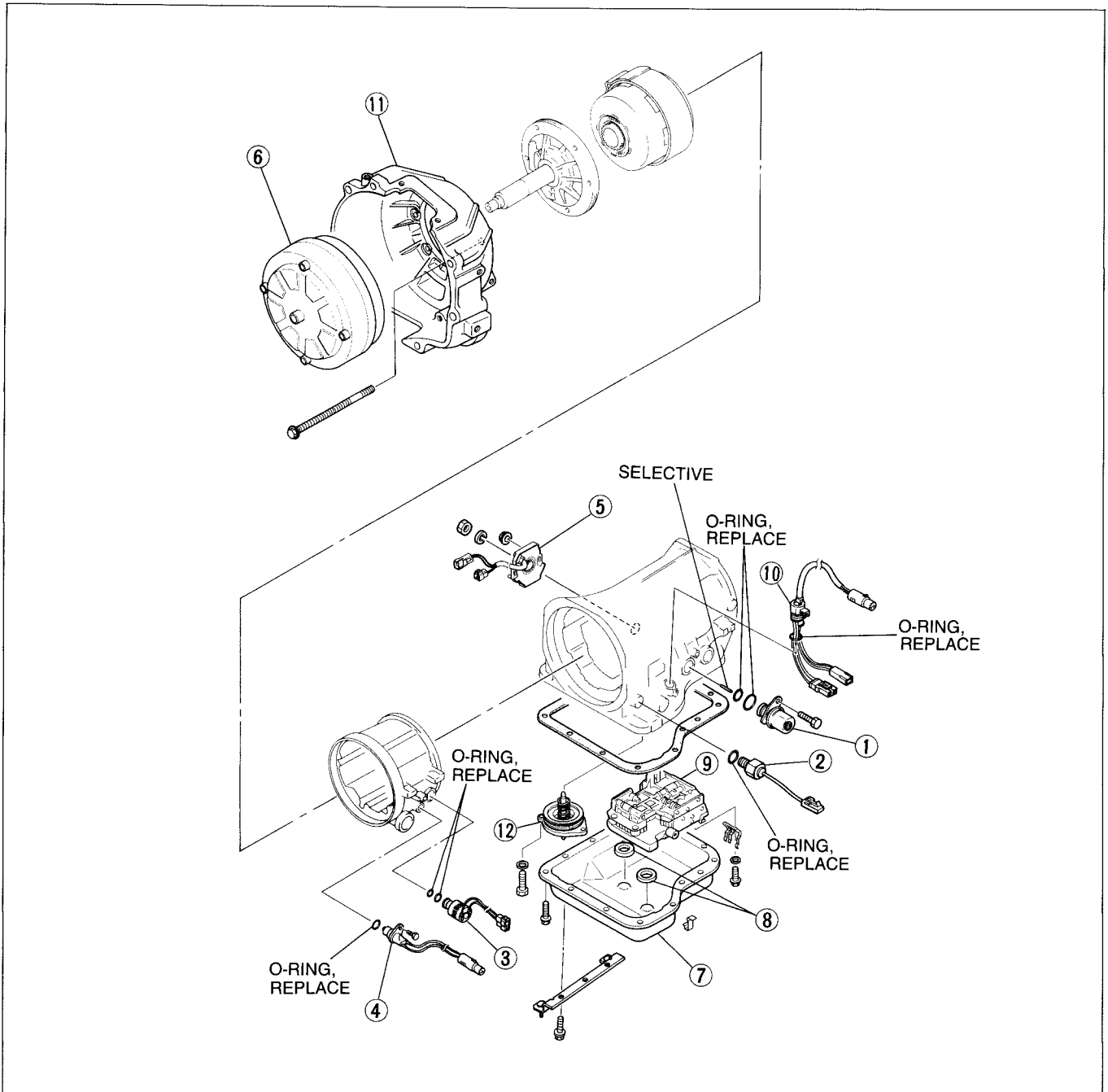
1. Disassemble transmission in a clean area (dustproof work space) to prevent entry of dust into the mechanisms.
2. Inspect the individual transmission components in accordance with the QUICK DIAGNOSIS CHART during disassembly.
3. Use only plastic hammers when applying force to separate the light alloy 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 steam or cleaning solvents, or both, 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.

9MU0K2-083

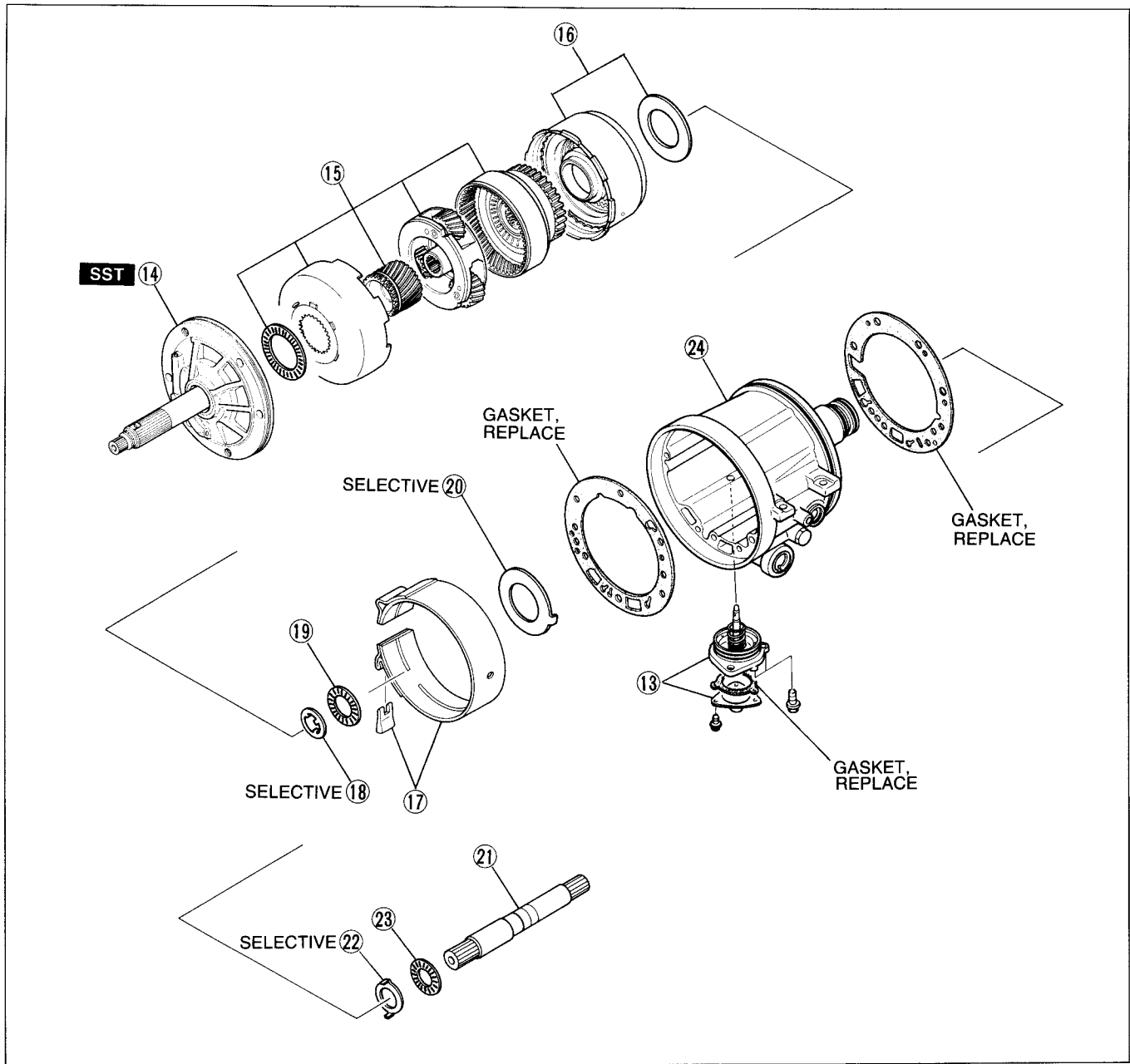
Components



97U0KX-073

- | | | |
|--|---|--|
| 1. Vacuum diaphragm
On-vehicle
Removal page K-132
Inspection page K-132 | 5. Inhibitor switch
Inspection page K- 39
Adjustment page K- 40 | 10. Solenoid valve connector |
| On-vehicle
Installation page K-133 | 6. Torque converter
Inspection page K- 61 | 11. Converter housing |
| On-vehicle
Adjustment ... page K-133 | 7. Oil pan | 12. 2nd band servo
Disassembly, and
Inspection page K- 82 |
| 2. Oil pressure switch
Inspection Section F1 | 8. Magnet | Assembly page K- 83 |
| 3. Lockup control solenoid
Inspection page K- 41 | 9. Control valve body
Disassembly, and
Inspection page K-112 | On-vehicle
Adjustment ... page K- 84 |
| 4. Turbine sensor
Inspection page K- 40 | Assembly page K-126 | |
| | On-vehicle
Removal page K-129 | |
| | On-vehicle
Installation page K-130 | |

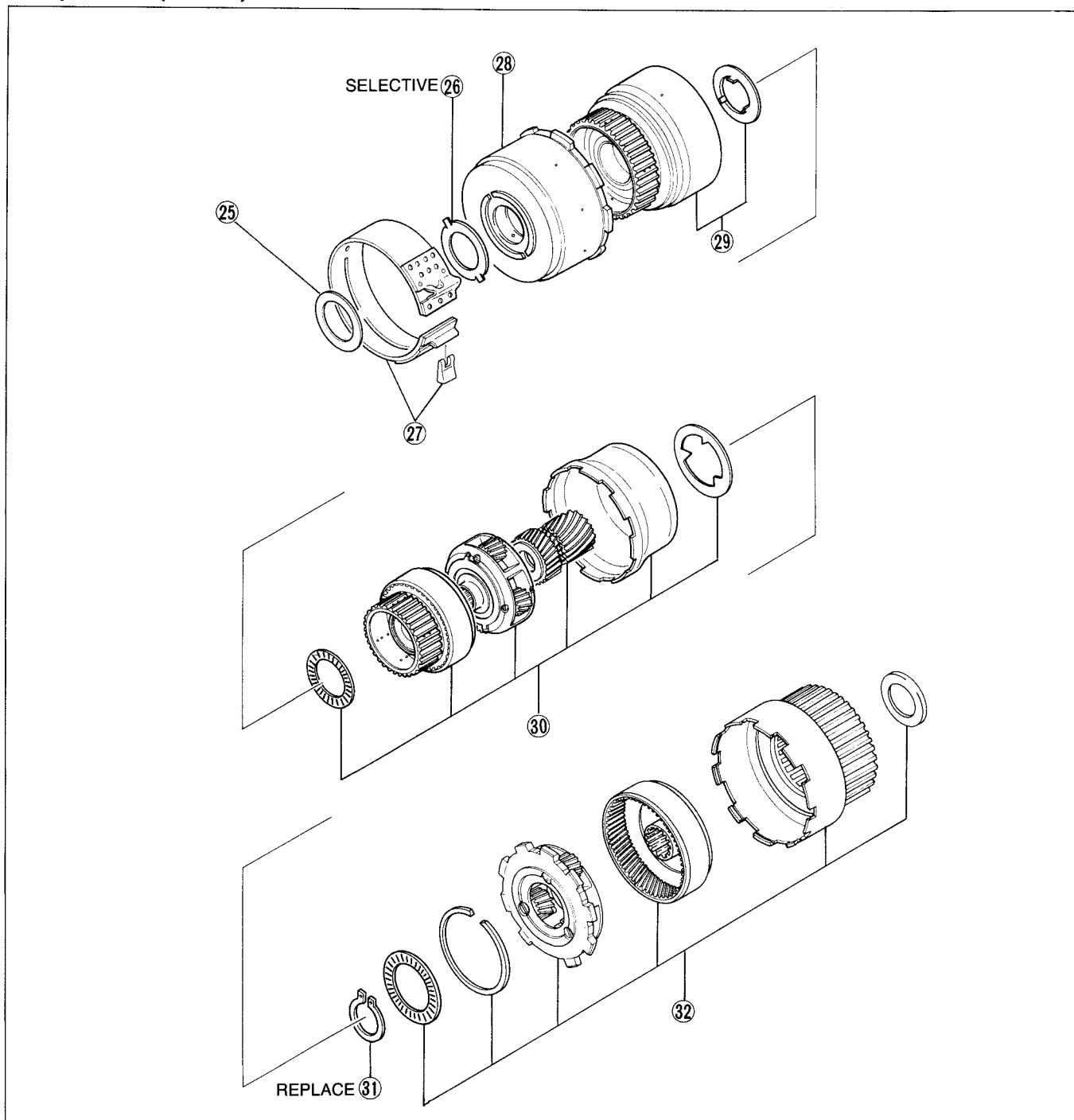
Components (Cont'd)



97U0KX-074

- | | | |
|---|---|---|
| 13. OD band servo and cover
Disassembly, and
Inspection page K-75
Assembly page K-76
On-vehicle
Adjustment page K-77 | 16. Direct clutch
Disassembly, and
Inspection page K-70
Assembly page K-72 | 21. Intermediate shaft |
| 14. Oil pump
Disassembly, and
Inspection page K-63
Assembly page K-65 | 17. OD brake band and band
strut | 22. Bearing race
Inspection page K-59 |
| 15. OD connecting shell and OD
planetary gear unit
(OD sun gear, OD planetary
pinion carrier, OD clutch hub)
Disassembly, and
Inspection page K-67
Assembly page K-68 | 18. Bearing
Inspection page K-59 | 23. Bearing
Inspection page K-59 |
| | 19. Bearing race
Inspection page K-59 | 24. Drum support, accumulator,
and OD case
Disassembly, and
Inspection page K-78
Assembly page K-79 |
| | 20. Bearing race
Inspection page K-59 | |

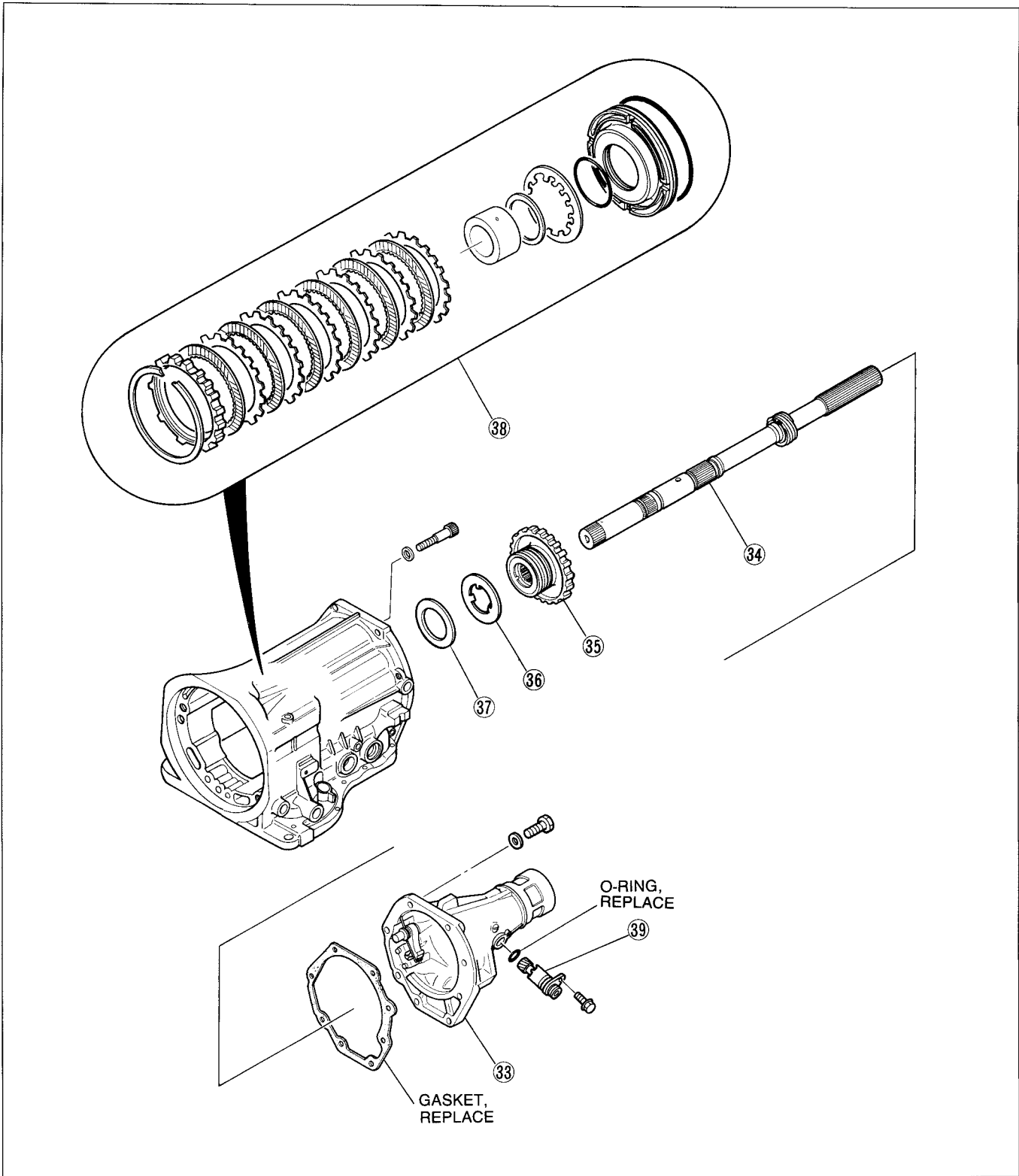
Components (Cont'd)



97U0KX-075

- | | | |
|--|--|---|
| <p>25. Bearing
Inspection page K-59</p> <p>26. Bearing race
Inspection page K-59</p> <p>27. 2nd brake band and band
strut</p> <p>28. Front clutch
Disassembly, and
Inspection page K-86
Assembly page K-88</p> <p>29. Rear clutch
Disassembly, and
Inspection page K-91
Assembly page K-93</p> | <p>30. Connecting shell and front
planetary gear unit
(rear clutch hub, front plane-
tary pinion carrier, rear sun
gear)
Disassembly, and
Inspection page K-95
Assembly page K-96</p> <p>31. Snap ring
REPLACE</p> | <p>32. Rear planetary gear unit
(connecting drum, rear plane-
tary pinion carrier, one-way
clutch)
Disassembly, and
Inspection page K-98
Assembly page K-99</p> |
|--|--|---|

Components (Cont'd)

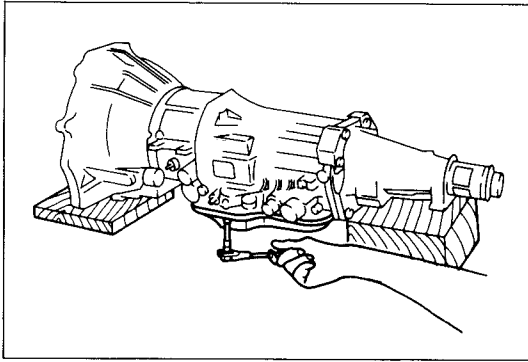


97U0KX-076

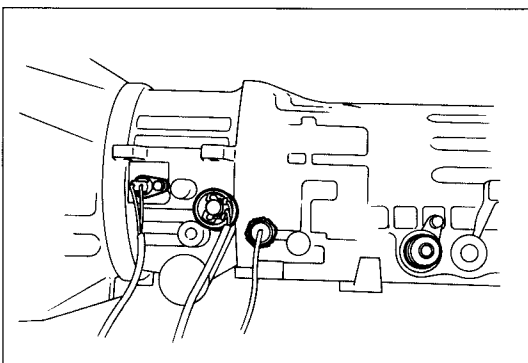
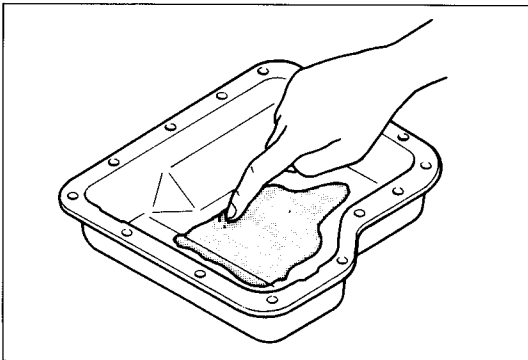
33. Extension housing
 Disassembly, and
 Inspection page K-106
 Assembly page K-107
 On-vehicle
 Removal..... page K-109
 On-vehicle
 Installation page K-109

34. Output shaft
 35. Oil distributor
 36. Bearing race
 Inspection page K- 61
 37. Bearing
 Inspection page K- 61

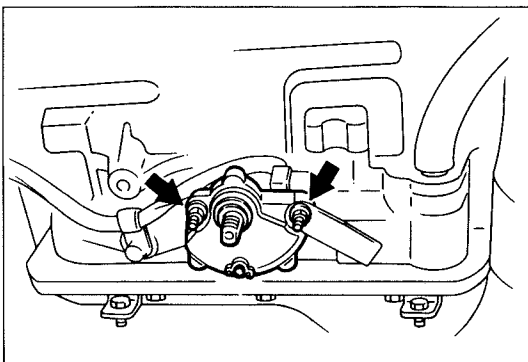
38. Low and reverse brake
 Disassembly, and
 Inspection page K-102
 Assembly page K-104
 39. Speedometer driven gear
 Inspection page K- 55



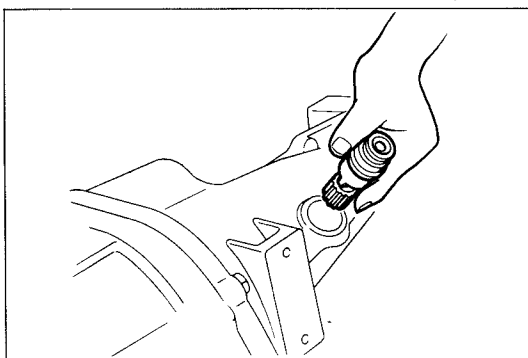
97U0KX-077



97U0KX-078



9MU0K2-090



97U0KX-079

Procedure

Caution

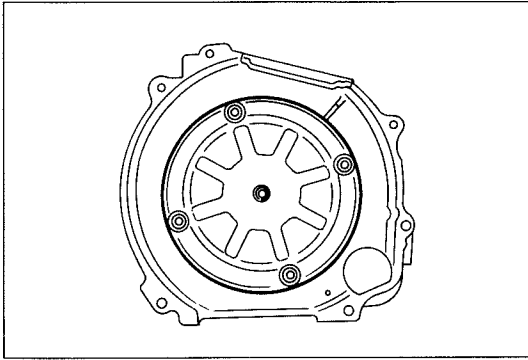
Keep the transmission oil pan-down so that any foreign material will remain in the pan.

1. Place the transmission on wooden blocks under the converter housing and the extension housing.
2. Remove the oil pan and gasket.
Examine any material found in the pan or on the magnet to determine the condition of the transmission.
Clutch facing material..... Drive plate and brake band wear
Steel (magnetic)..... Bearing, gear, and driven plate wear
Aluminum (nonmagnetic).... Bushings or cast aluminum parts wear
If large amounts of material are found, replace the torque converter and carefully check the transmission for the cause.
3. Install the oil pan and gasket with a few bolts to protect the valve body.

Caution

Do not leave the vacuum rod in the tip of the vacuum diaphragm after removal.

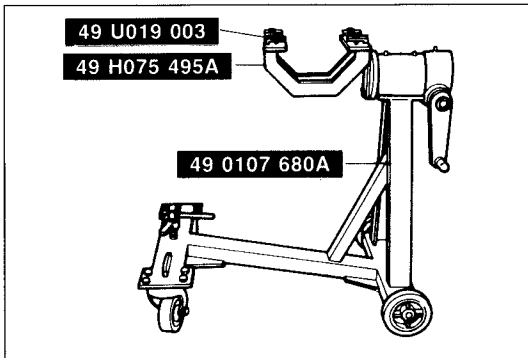
4. Remove the vacuum diaphragm, oil pressure switch, lock-up control solenoid, turbine sensor, and O-rings.
5. Remove the inhibitor switch.
6. Remove the speedometer driven gear from the extension housing.
Inspect the following parts repair or replace as necessary.
Speedometer driven gear
Inspect for wear or damage
7. Remove the O-ring from the speedometer driven gear.



9MU0K2-092

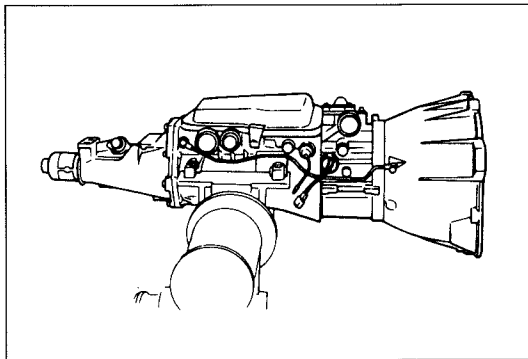
Caution
Be careful not to spill the ATF when removing the torque converter.

8. Remove the torque converter.



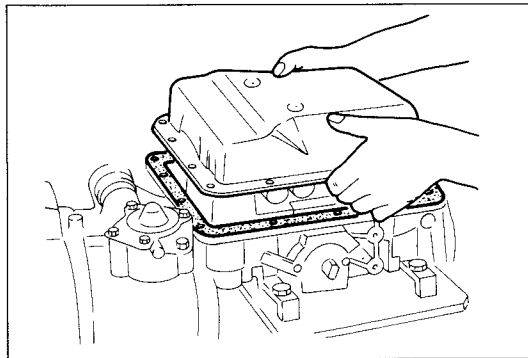
9MU0K2-088

9. Assemble the **SST** as shown.



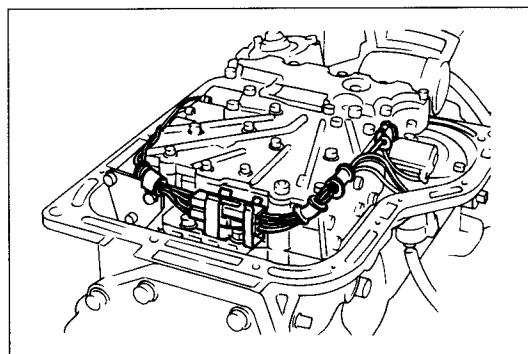
97U0KX-080

10. Mount the transmission onto the **SST**.



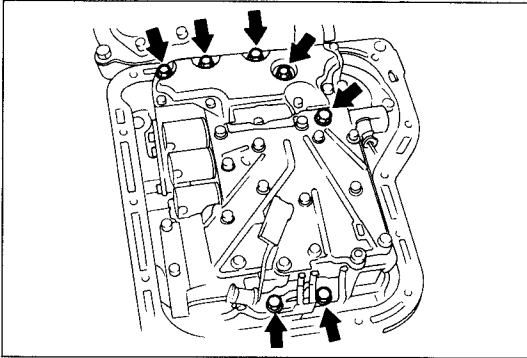
97U0KX-086

11. Remove the oil pan and gasket.
12. Remove the magnets.



97U0KX-081

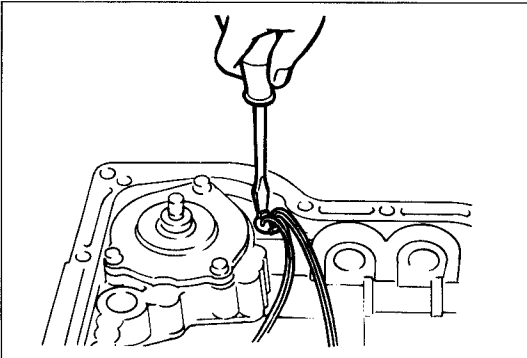
13. Disconnect the solenoid valve connectors.
14. Remove the harnesses from the bracket.



97U0KX-082

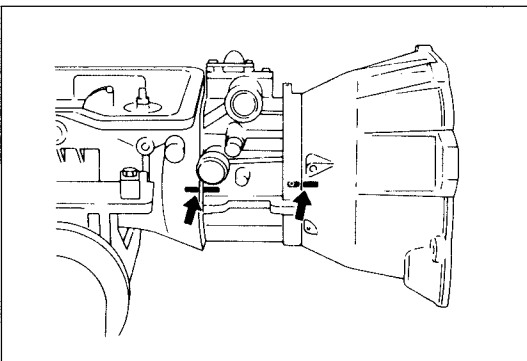
Note
Neatly arrange bolts of different lengths for proper reassembly.

15. Remove the control valve body as shown in the figure.



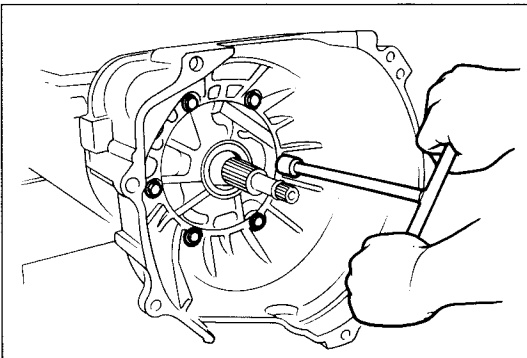
97U0KX-083

16. Remove the solenoid valve connector from the transmission case.



97U0KX-084

17. Mark the converter housing, OD case, and transmission case for proper reassembly.

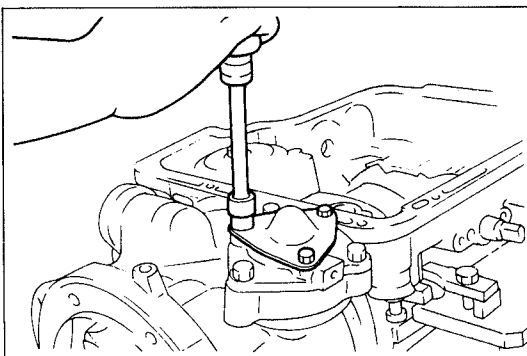


97U0KX-085

18. Remove the converter housing from the OD case.

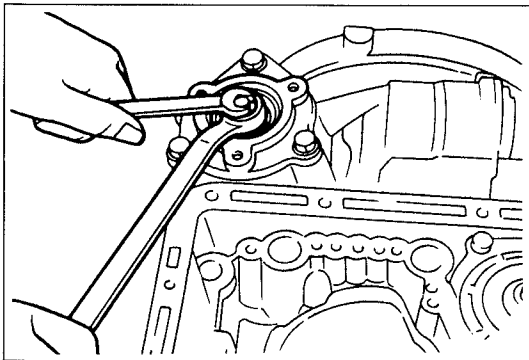
Caution
Do not damage the converter housing.

19. Clean the sealing compound from the converter housing.



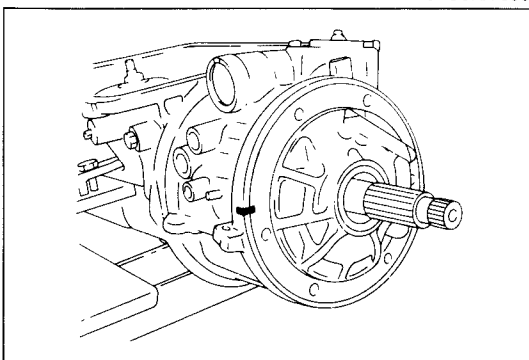
97U0KX-087

20. Remove the OD band servo cover and gasket.



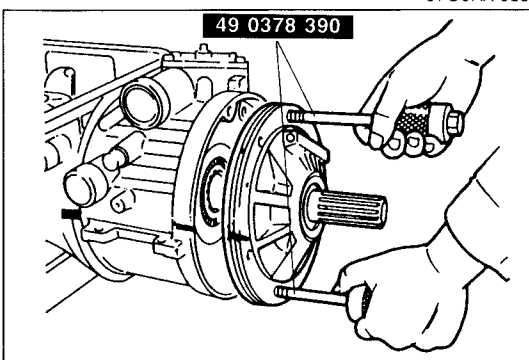
97U0KX-088

21. Loosen the OD band servo locknut and tighten the piston stem.



97U0KX-089

22. Mark the OD case and oil pump for proper reassembly.

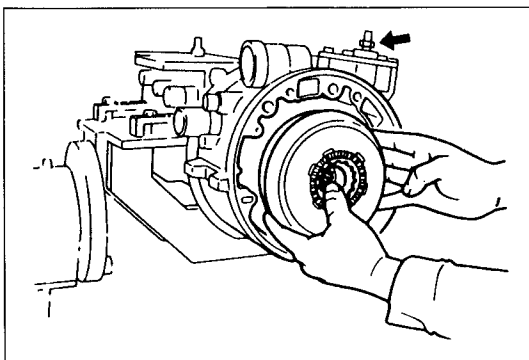


97U0KX-090

23. Install the **SST** to the oil pump assembly.

Caution
Carefully remove the oil pump to prevent the OD connection shell, sun gear, and planetary pinion carrier from falling out.

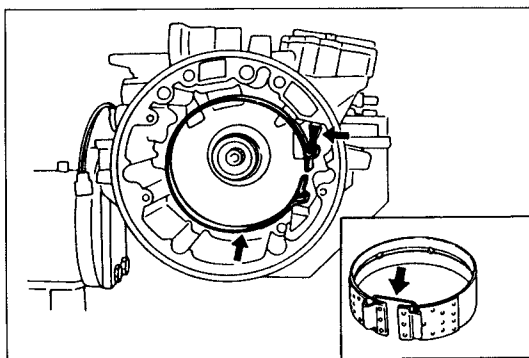
24. Remove the oil pump assembly from the OD case by sliding weights of the **SST** evenly then remove the **SST** from the oil pump. Remove the gasket.



97U0KX-091

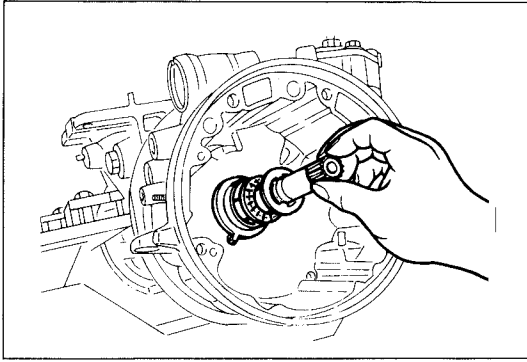
25. Loosen the piston stem of the OD band servo. Remove the OD connecting shell and OD planetary gear unit (OD sun gear, OD planetary pinion carrier, OD clutch hub), and direct clutch.

Caution
To prevent the brake lining from cracking or peeling, do not stretch the OD brake band. Secure it with a wire clip.



97U0KX-092

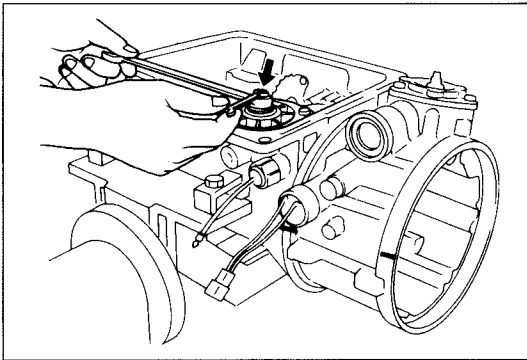
26. Remove the OD brake band and band strut.



97U0KX-093

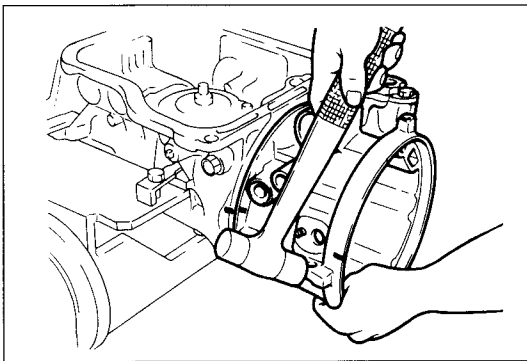
27. Remove the bearing races and bearing. Inspect the following parts and repair or replace as necessary. Remove the intermediate shaft.

- 1) Bearing
Inspect for damage or rough rotation
- 2) Bearing race
Inspect bearing surface for scoring or scratches



97U0KX-094

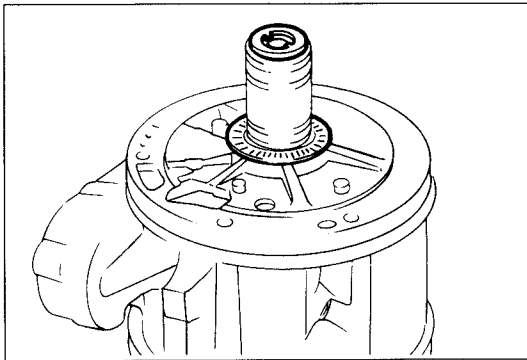
28. Loosen the 2nd band servo locknut and tighten the piston stem.



97U0KX-095

Caution
Do not lose the bearing race.

29. Separate the drum support, accumulator and OD case from the transmission case by tapping it lightly with a plastic hammer. Remove the gasket.

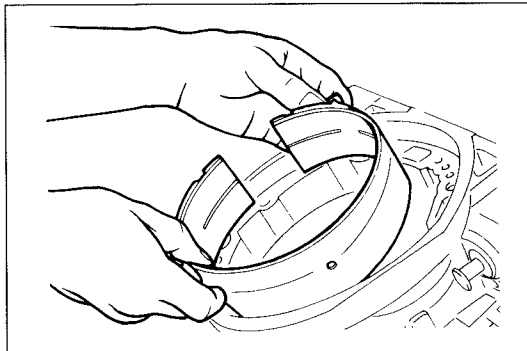


97U0KX-096

30. Remove the bearing race and bearing from the drum support, accumulator and OD case. Remove the bearing from the front clutch hole. Inspect the following parts and repair or replace as necessary.

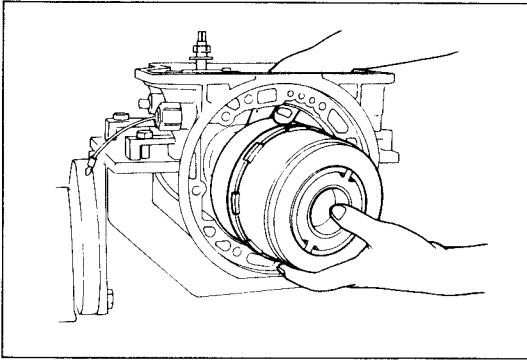
- 1) Bearing
Inspect for damage or rough rotation
- 2) Bearing race
Inspect bearing surface for scoring or scratches

Caution
To prevent the brake lining from cracking or peeling, do not stretch the 2nd band brake. Secure it with a wire clip.



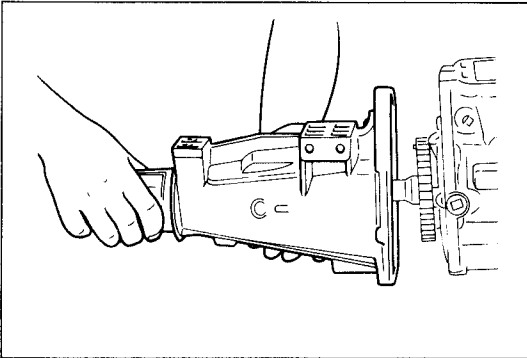
97U0KX-097

31. Loosen the piston stem of the 2nd band servo. Remove the 2nd brake band and band strut.



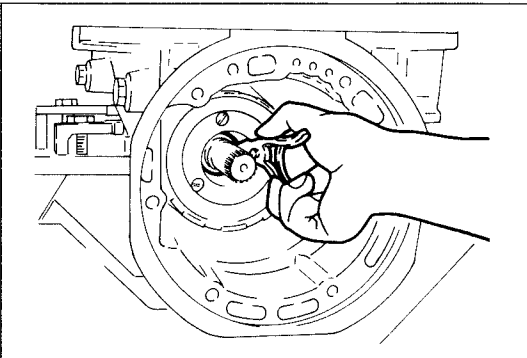
97U0KX-098

32. Remove the bearing race, front clutch, rear clutch, connecting shell, and front planetary gear unit (rear clutch hub, front planetary pinion carrier, rear sun gear) as a unit. Inspect the following parts and repair or replace as necessary.
- Bearing race
 - Inspect bearing surface for scoring or scratches



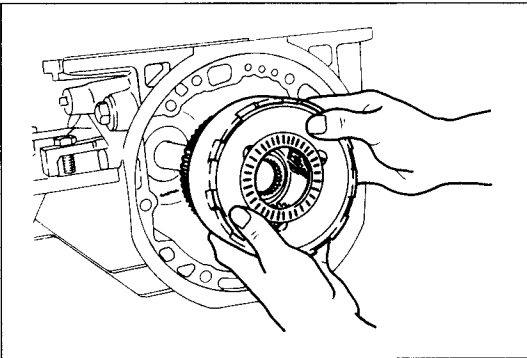
97U0KX-099

33. Remove the extension housing and gasket.



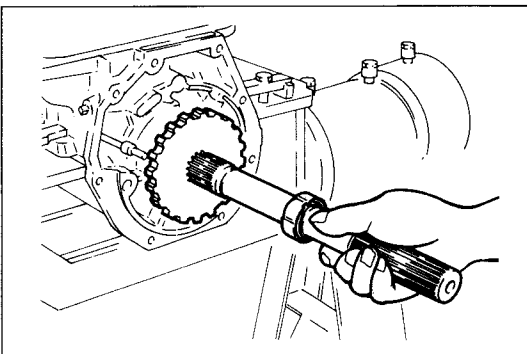
97U0KX-100

34. Remove the snap ring from the output shaft with snap ring pliers.



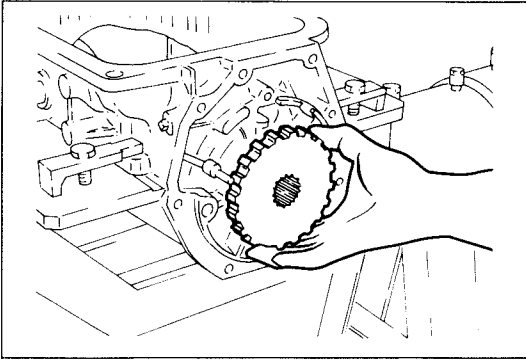
97U0KX-101

35. Remove the rear planetary gear unit (connecting drum, rear planetary pinion carrier, one-way clutch).



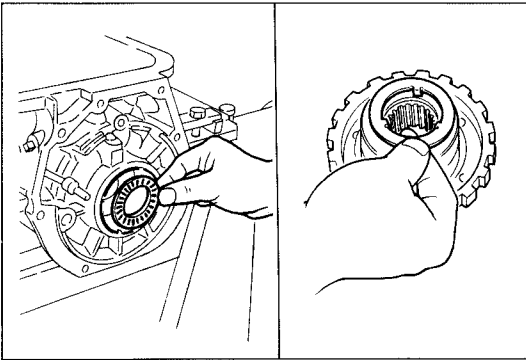
97U0KX-102

36. Pull out the output shaft.



97U0KX-103

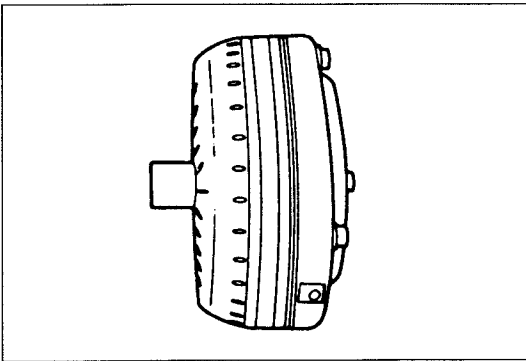
37. Remove the oil distributor.



97U0KX-104

38. Remove the bearing race and bearing.
Inspect the following parts and repair or replace as necessary.

- 1) Bearing
Inspect for damage or rough rotation
- 2) Bearing race
Inspect bearing surface for scoring or scratches

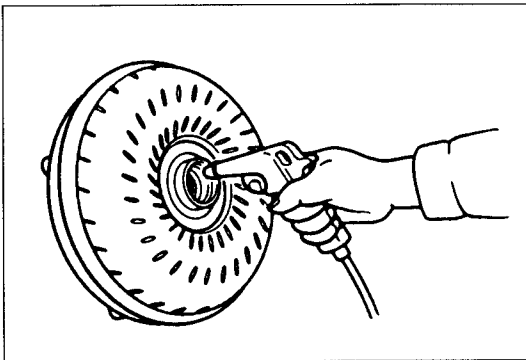


9MU0K2-119

TORQUE CONVERTER

Inspection

1. Check the outside of the converter for damage and cracks, and replace the torque converter if there is any problem.
2. Check for rust on the pilot hub or on the boss, and remove it completely if there is any.



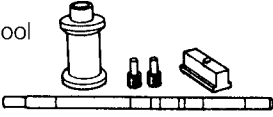
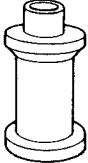
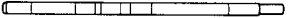
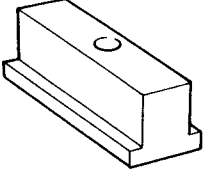
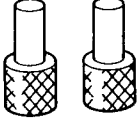



9MU0K2-120

Washing inside the converter

1. Drain any ATF remaining in the converter.
2. Pour in solvent (**0.5 liter, 0.5 US qt, 0.4 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 completely empty.
5. Pour in ATF.
6. Shake the converter to clean the inside. Pour out the ATF.

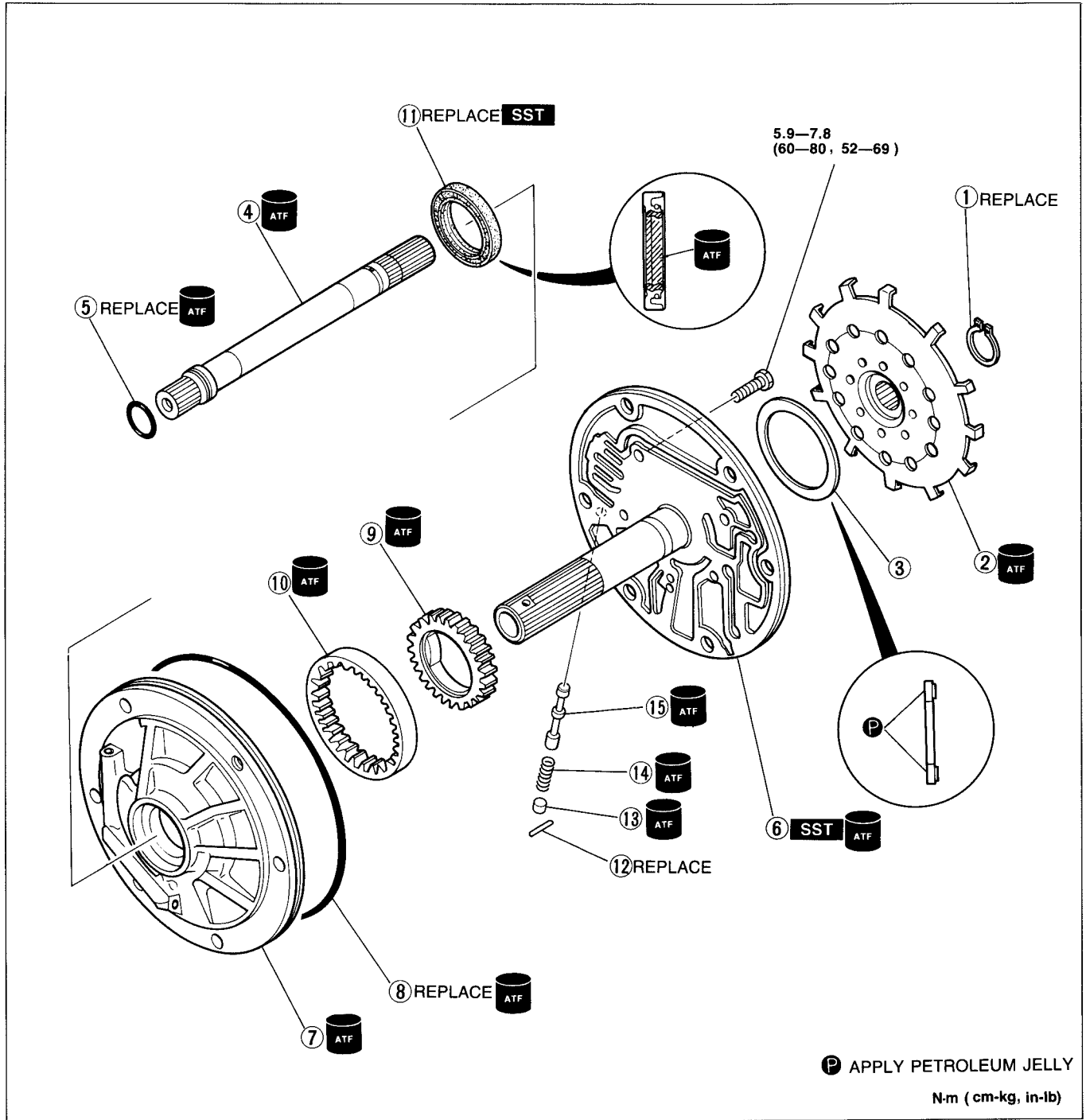
K TRANSMISSION

OIL PUMP Preparation SST

<p>49 S019 0A0</p> <p>Set centering tool</p> 	<p>49 S019 001</p> <p>Holder (Part of 49 S019 0A0)</p> 	<p>49 S019 002</p> <p>Shaft (Part of 49 S019 0A0)</p> 
<p>49 S019 003</p> <p>Stand (Part of 49 S019 0A0)</p> 	<p>49 S019 004</p> <p>Pin (Part of 49 S019 0A0)</p> 	<p>49 G030 795</p> <p>Installer, Oil seal</p> 
<p>49 G030 796</p> <p>Body (Part of 49 G030 795)</p> 	<p>49 G030 797</p> <p>Handle (Part of 49 G030 795)</p> 	<p>9MU0K2-121</p>

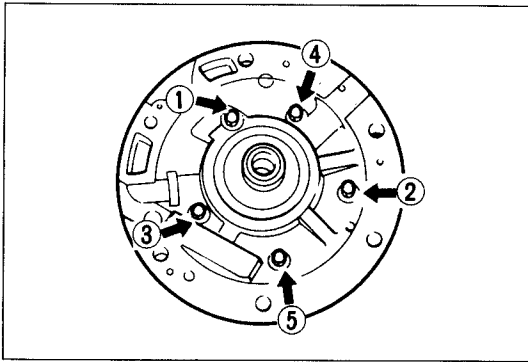
Disassembly and Inspection

Disassemble in the order shown in the figure, referring to **Disassembly Note**.
Inspect all parts, and repair or replace as necessary.



97U0KX-105

- | | | |
|--------------------------------------|----------------------------|---|
| 1. Snap ring | 7. Oil pump housing | 11. Oil seal |
| 2. Sensing rotor | Inspection page K-64 | Inspect for damage of oil seal lip. |
| 3. Bearing | 8. O-ring | If necessary replace it. |
| Inspect for damage or rough rotation | 9. Inner gear | |
| 4. Input shaft | Removal page K-64 | 12. Roll pin |
| 5. O-ring | Inspection page K-64 | 13. Plug |
| 6. Oil pump cover | | 14. Spring |
| Removal page K-64 | | Inspection page K-65 |
| Inspection page K-64 | 10. Outer gear | 15. Lockup control valve |
| | Removal page K-64 | Inspect for sticking, scoring, or scratches |
| | Inspection page K-64 | |

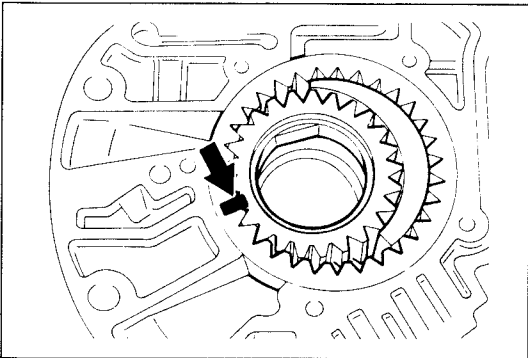


9MU0K2-123

Disassembly note

Oil pump cover

Loosen the mounting bolts evenly in the pattern shown, and remove the oil pump cover from the oil pump housing.



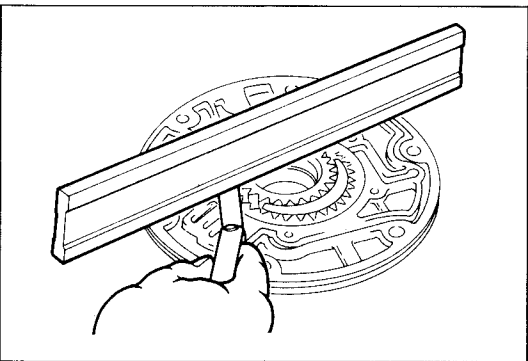
9MU0K2-124

Inner gear and outer gear

Caution

Do not use a punch to mark the gears.

Mark the inner and outer gear positions, and remove the gears from the housing.



9MU0K2-126

Inspection

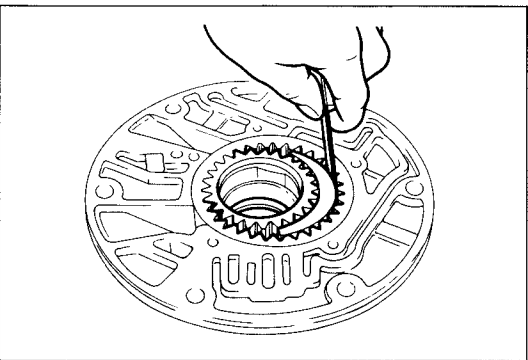
Clearance

1. Measure the clearance between the gears and the pump cover.

Standard clearance:

0.02—0.04mm (0.0008—0.0016 in)

Maximum clearance: 0.08mm (0.0031 in)



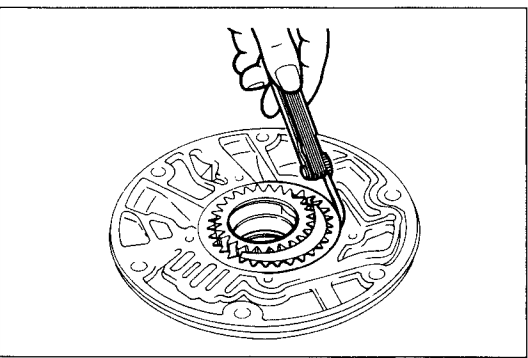
9MU0K2-127

2. Measure the clearance between the outer gear teeth tip and the crescent.

Standard clearance:

0.14—0.21mm (0.0055—0.0083 in)

Maximum clearance: 0.25mm (0.0098 in)



97U0KX-106

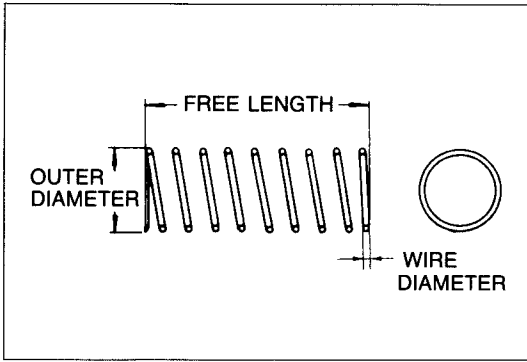
3. Measure the side clearance between the outer gear and the housing.

Standard clearance:

0.05—0.20mm (0.0020—0.0079 in)

Maximum clearance: 0.25mm (0.0098 in)

4. If not within specification, replace the oil pump assembly.



97U0KX-107

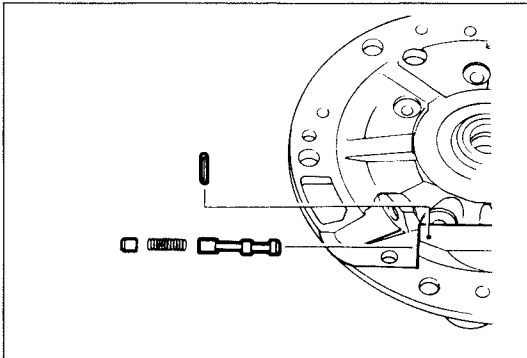
Spring

1. Measure the spring specifications.

Specifications

Outer dia. mm (in)	Free length mm (in)	No. of coils	Wire dia. mm (in)
5.45 (0.215)	25.7 (1.012)	16.5	0.65 (0.026)

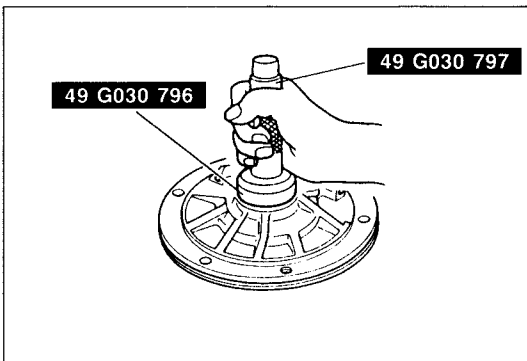
2. If not within specification, replace the spring.



9MU0K2-130

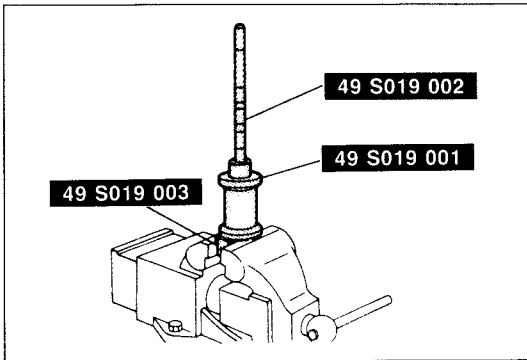
Assembly

1. Apply ATF to the lockup control valve, spring, and plug, and install them into the oil pump housing.
2. Tap in the new roll pin.



9MU0K2-131

3. Apply ATF to a new oil seal, and install it with the **SST**.

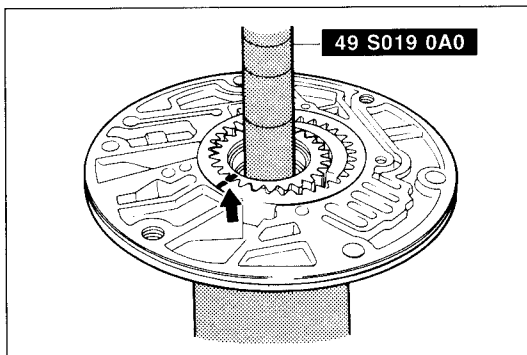


9MU0K2-132

Note

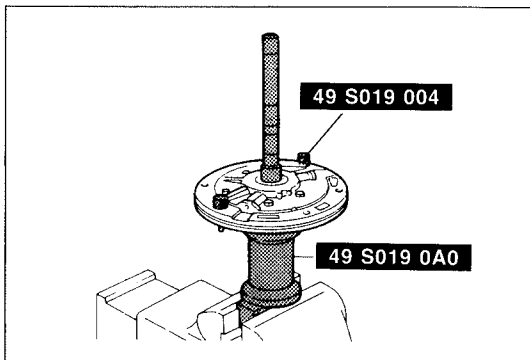
Use protective plates to prevent damaging the SST.

4. Assemble the **SST** and secure it in a vise.

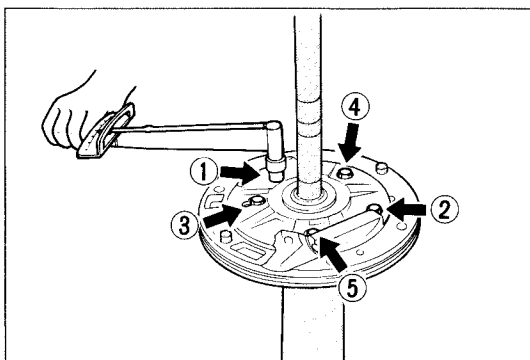


9MU0K2-133

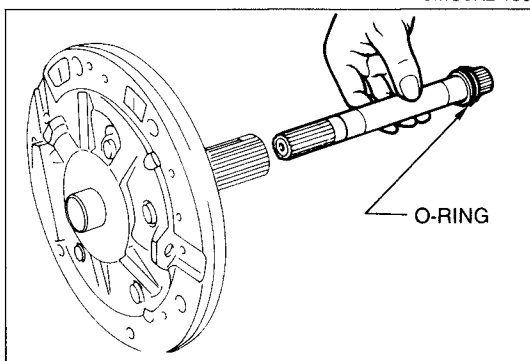
5. Apply ATF to the new O-ring, and place it on the pump cover.
6. Set the pump housing on the **SST**.
7. Apply ATF to the inner and outer gears, and install them in the pump housing with their matching marks toward the pump cover.



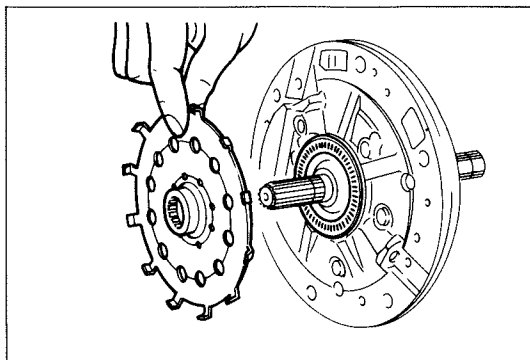
9MU0K2-134



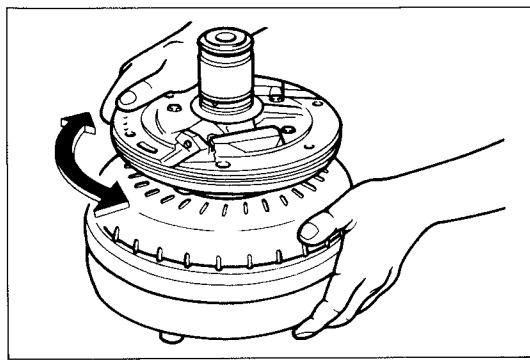
9MU0K2-135



9MU0K2-136



97U0KX-108



97U0KX-109

8. Set the pump cover on the **SST**.

Caution

Do not damage the oil seal with the splines of the oil pump cover.

9. Install the **SST** (pins) for alignment.

10. Tighten the bolts evenly and gradually in the order shown.

Tightening torque:

5.9—7.8 N·m (60—80 cm·kg, 52—69 in·lb)

11. Apply ATF to a new O-ring, and install it onto the input shaft.

12. Apply ATF to the input shaft, and install it into the oil pump.

13. Apply petroleum jelly to the bearing, and install it onto the oil pump.

Bearing race outer diameter: 70.0mm (2.756 in)

14. Apply ATF to the sensing rotor splines, and install them onto the input shaft.

15. Install the snap ring on the input shaft with snap ring pliers.

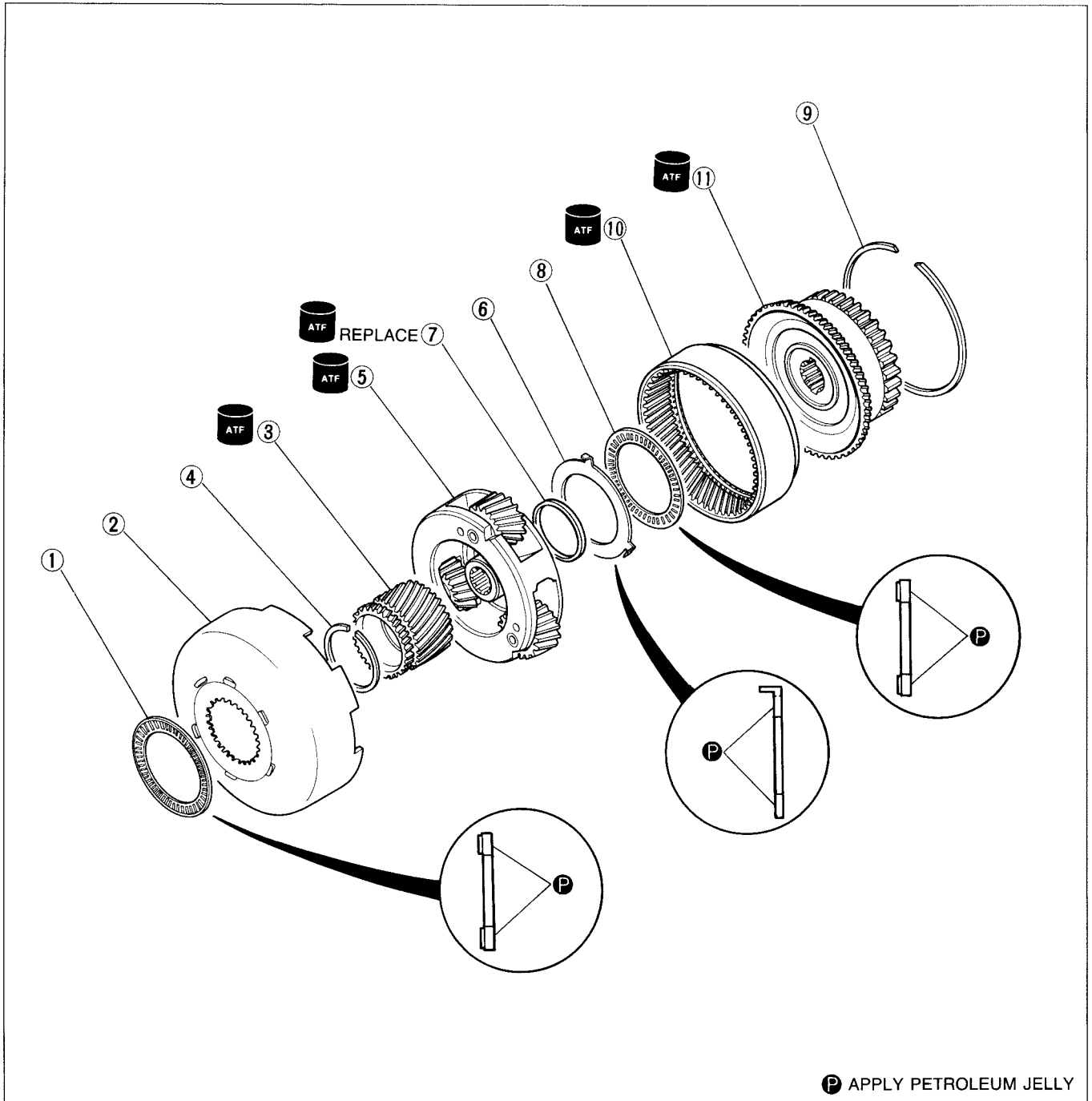
16. Set the oil pump on the torque converter, and verify that the pump turns smoothly.

OD CONNECTING SHELL AND OD PLANETARY GEAR UNIT (OD SUN GEAR, OD PLANETARY PINION CARRIER, OD CLUTCH HUB)

Disassembly and Inspection

Disassemble in the order shown in the figure.

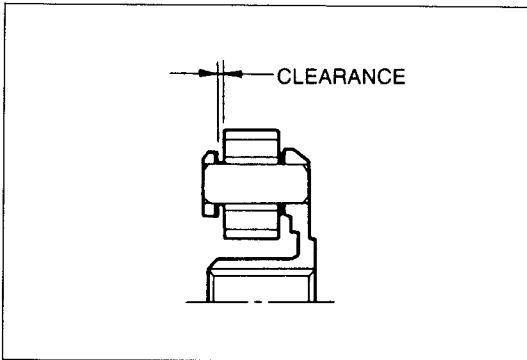
Inspect all parts, and repair or replace as necessary.



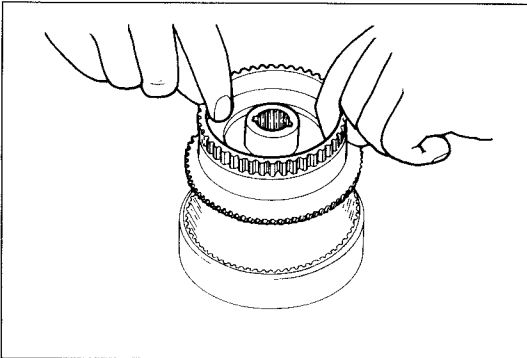
P APPLY PETROLEUM JELLY

97U0KX-110

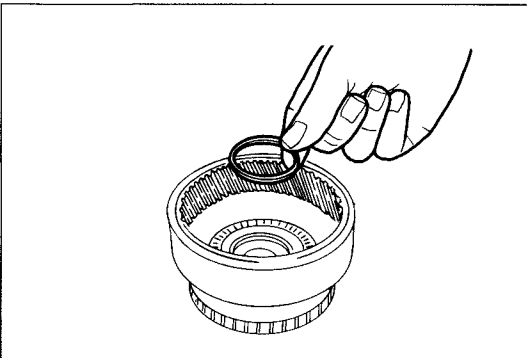
- | | | |
|---|--|--|
| <p>1. Bearing
Inspect for damage or rough rotation</p> <p>2. OD connecting shell</p> <p>3. Sun gear
Inspect individual gear teeth for damage, wear, or cracks</p> <p>4. Snap ring</p> | <p>5. OD planetary pinion carrier
Inspect individual gear teeth for damage, wear, or cracks, and rotation of pinion gears
Inspection page K-68</p> <p>6. Bearing race
Inspect for bearing surface scoring or scratches</p> | <p>7. Seal sleeve</p> <p>8. Bearing
Inspect for damage or rough rotation</p> <p>9. Snap ring</p> <p>10. Internal gear
Inspect individual gear teeth for damage, wear, or cracks</p> <p>11. OD clutch hub</p> |
|---|--|--|



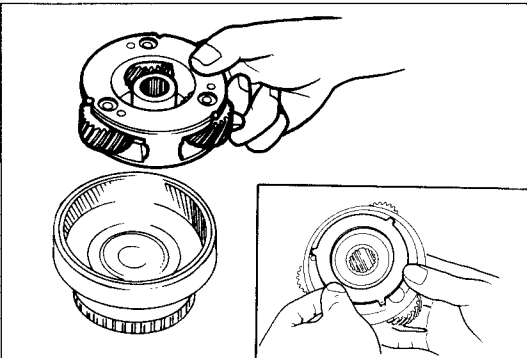
9MU0K2-248



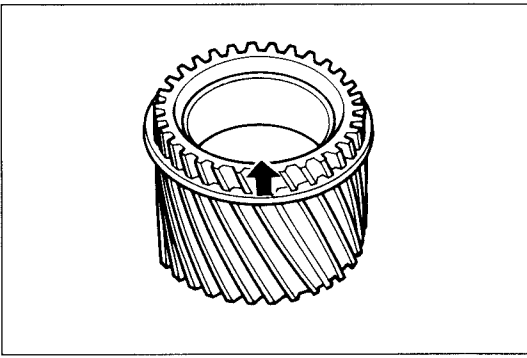
9MU0K2-249



97U0KX-111



97U0KX-112



97U0KX-113

Inspection

OD planetary pinion carrier

1. Measure the clearance between the pinion washer and the planetary pinion carrier.

Clearance

Standard: 0.2—0.7mm (0.008—0.028 in)

Maximum: 0.8mm (0.031 in)

2. If not within specification, replace the planetary pinion carrier.

Assembly

1. Apply ATF to the OD clutch hub and internal gear, and assemble them with the snap ring.

2. Apply petroleum jelly to the bearing, and install it onto the OD clutch hub.

Bearing outer diameter: 70.0mm (2.756 in)

3. Apply ATF to the new seal sleeve, and install it into the OD clutch hub.

4. Apply petroleum jelly to the bearing race, and install it onto the OD planetary pinion carrier.

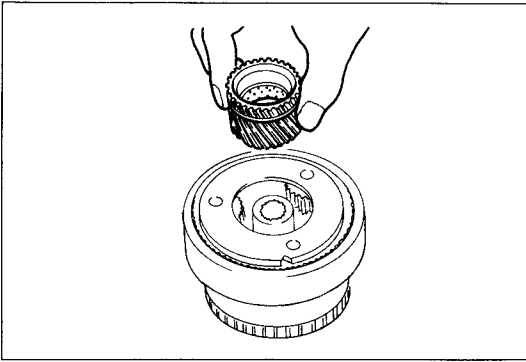
Bearing race outer diameter: 70.0mm (2.756 in)

5. Apply ATF to the OD planetary pinion carrier, and install it into the internal gear.

Note

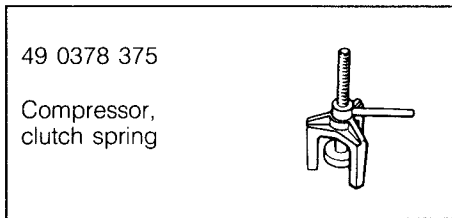
Pay close attention to the front and rear directions of the sun gear. The grooved side (arrow) is the front.

6. Install the snap ring onto the sun gear.

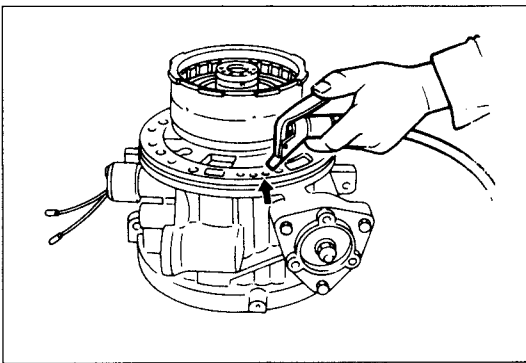


97U0KX-114

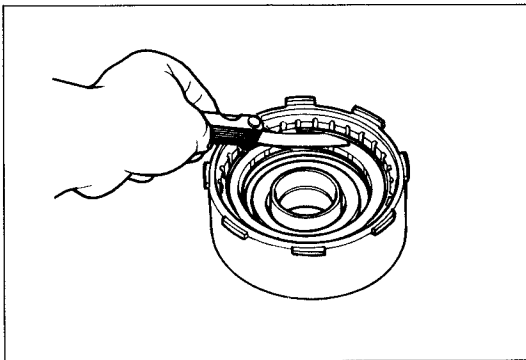
DIRECT CLUTCH Preparation SST



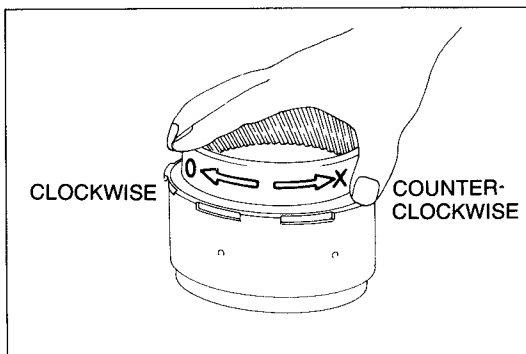
9MU0K2-138



97U0KX-115



97U0KX-116



97U0KX-117

7. Apply ATF to the sun gear, and install it into the OD planetary pinion carrier.
8. Apply petroleum jelly to the bearing, and install it onto the OD connecting shell.

Bearing outer diameter: 70mm (2.756 in)

Preinspection

Direct clutch operation

1. Install the direct clutch onto the drum support along with the seal rings.
Apply compressed air through the oil passage as shown.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

2. Verify that the side plate moves toward the snap ring. If not, the seal ring or O-ring may be damaged or fluid may be leaking at the piston check ball. Inspect them, and replace as necessary when assembling.

Clearance between side plate and snap ring

Measure the clearance between the side plate and the snap ring.

Clearance:

Maximum: 0.2mm (0.008 in)

Select and install the correct side plate when assembling.

One-way clutch operation

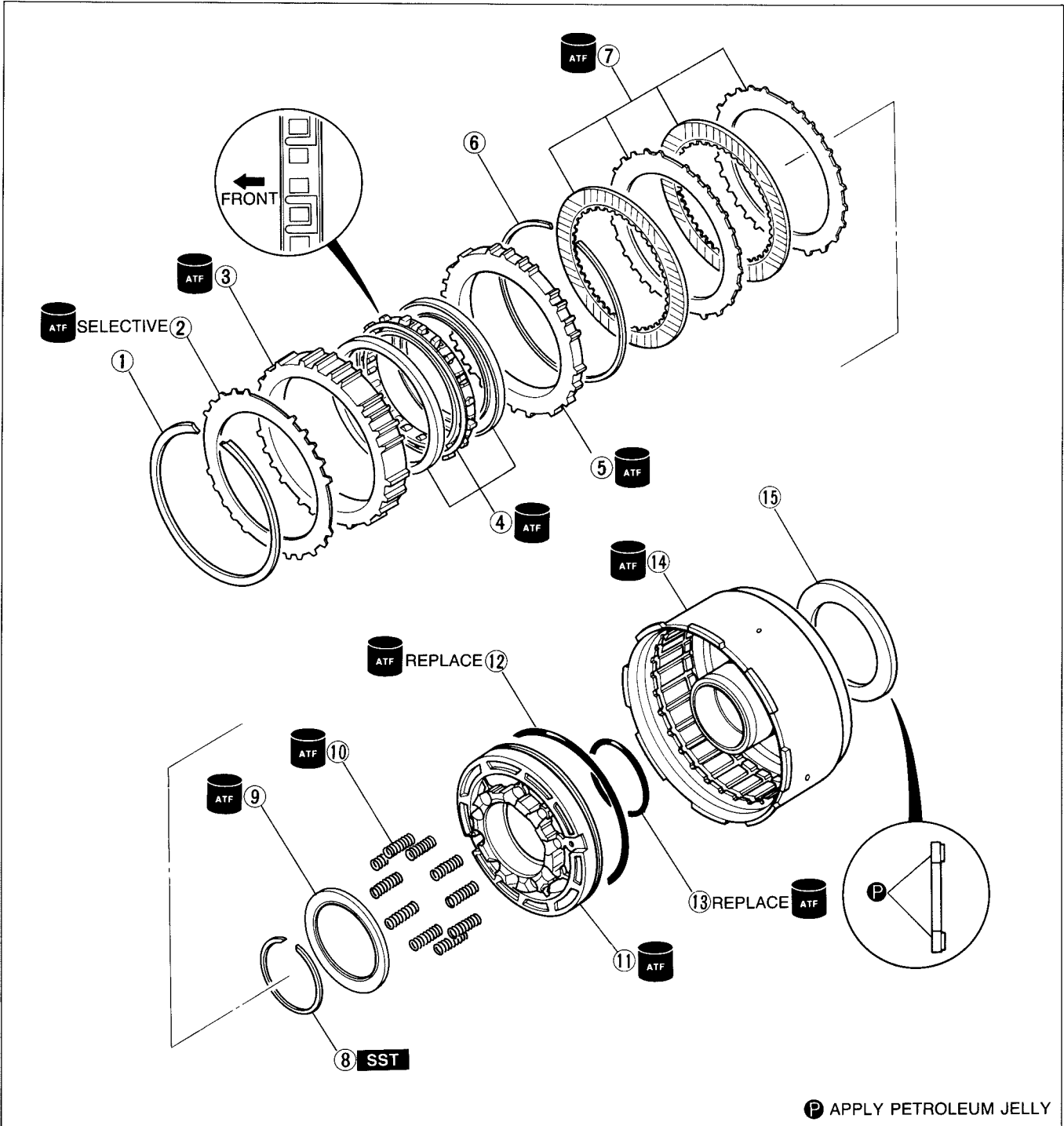
Insert the OD clutch hub on the top of the direct clutch, check that the OD clutch hub rotates smoothly when turned clockwise and lock when turned counterclockwise.

If not, replace the one-way clutch.

K TRANSMISSION

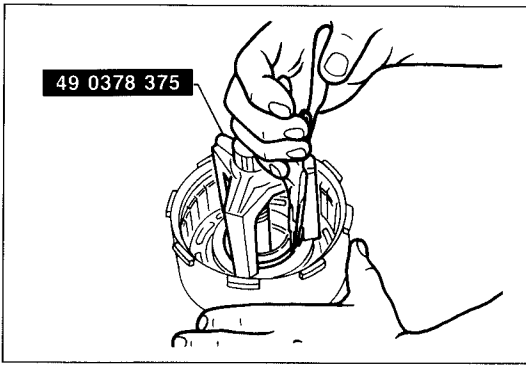
Disassembly and Inspection

Disassemble in the order shown in the figure, referring to **Disassembly Note**.
Inspect all parts, and repair or replace as necessary.



97U0KX-118

- | | | |
|-----------------------------------|-------------------------------|------------------------|
| 1. Snap ring | 8. Snap ring | 12. Seal ring |
| 2. Side plate | Removal..... page K-71 | 13. O-ring |
| 3. Outer race | 9. Spring retainer | 14. Direct clutch drum |
| 4. One-way clutch | Inspection page K-71 | 15. Bearing |
| Inspection page K-69 | 10. Return spring | Inspect for damage or |
| 5. Retaining plate | Inspection page K-71 | rough rotation |
| 6. Snap ring | 11. Clutch piston | |
| 7. Drive plates and driven plates | Inspect balls for sticking by | |
| Inspect for wear or burning | shaking piston | |
| Inspection page K-71 | Removal..... page K-71 | |
| | Inspection page K-71 | |

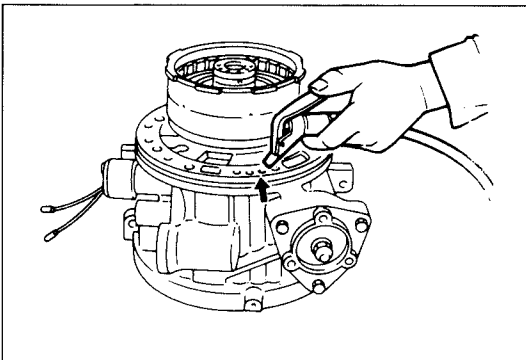


9MU0K2-142

Disassembly note Snap ring

Caution
Do not damage the snap ring.

1. Compress the spring with the **SST**, then remove the snap ring with snap ring pliers.
2. Remove the spring retainer and spring.

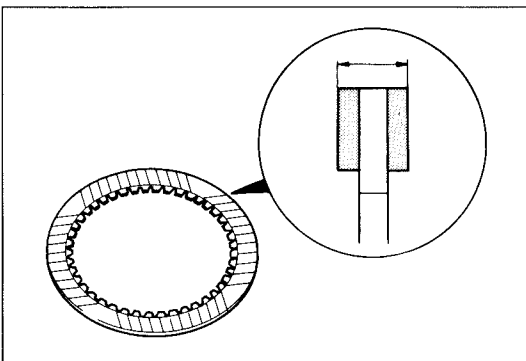


9MU0K2-143

Clutch piston

1. Install the direct clutch drum onto the drum support along with the seal rings.
2. Remove the piston by applying compressed air through the oil passage.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.



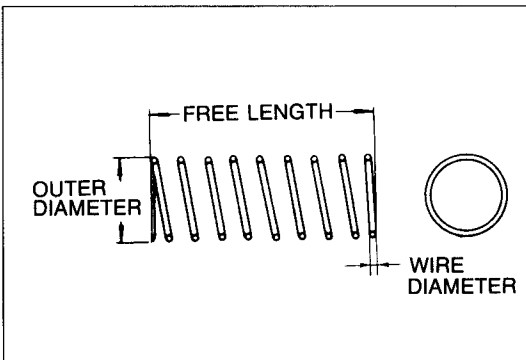
9MU0K2-144

Inspection Drive plate

1. Measure the facing thickness in three places, and determine the average of the three readings.

Standard thickness: 1.6mm (0.063 in)
Minimum thickness: 1.4mm (0.055 in)

2. If not within specification, replace the drive plates.



9MU0K2-145

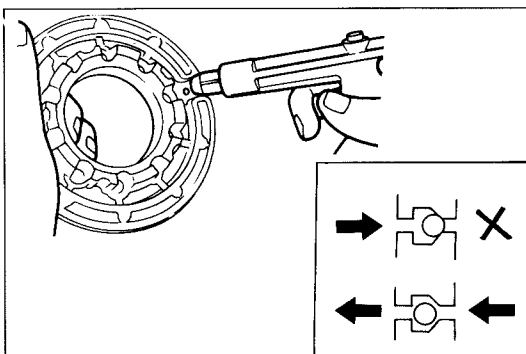
Return spring

1. Measure the spring specifications.

Specifications

Outer dia. mm (in)	Free length mm (in)	No. of coils	Wire dia. mm (in)
8.0 (0.315)	30.5 (1.201)	14.5	1.3 (0.051)

2. If not within specification, replace the return spring.



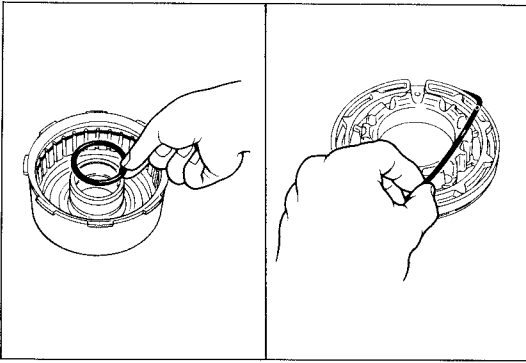
9MU0K2-146

Clutch piston

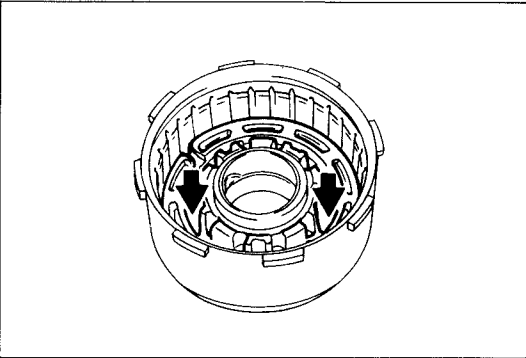
1. Verify that there is no air leakage when applying compressed air through the oil hole opposite the return spring.
2. Verify that there is airflow when applying compressed air through the oil hole on the return spring side.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

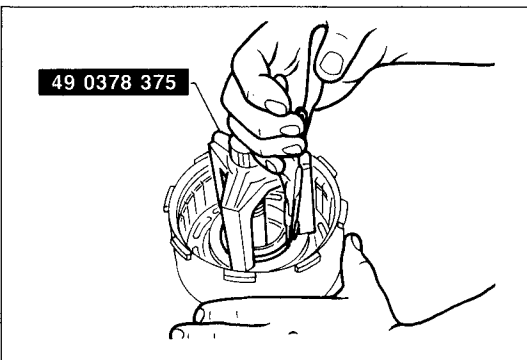
3. If not correct, replace the clutch piston.



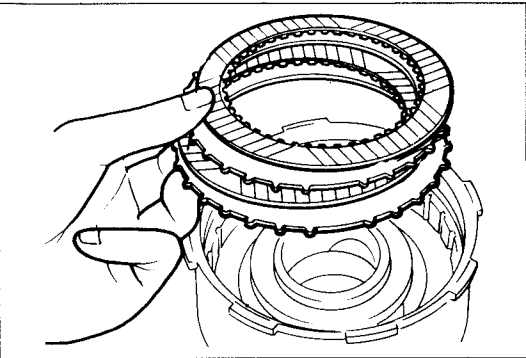
97U0KX-119



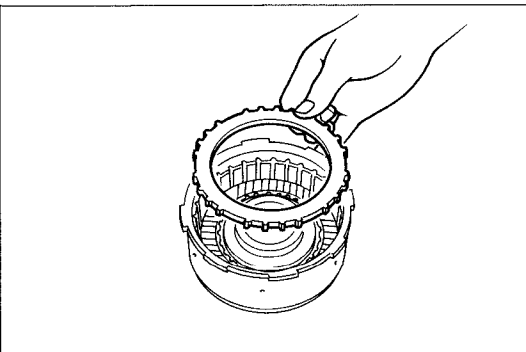
9MU0K2-148



9MU0K2-149



97U0KX-120



97U0KX-121

Assembly

1. Apply ATF to a new O-ring, and install it onto the direct clutch drum.
2. Apply ATF to a new seal ring, and install it onto the piston.

3. Apply ATF to the inside of the direct clutch drum.

Caution

Apply even pressure to the outer edge of the piston to avoid damaging the seal rings when installing.

4. Install the piston in the direct clutch drum.

Caution

- a) Do not overexpand the snap ring when installing.
- b) Do not align the snap ring end-gap with the spring retainer stop.

5. Install the springs and spring retainer and compress them with the **SST**.
6. Install the snap ring.

Caution

Align the flats of the drive plates with the lubrication hole of the clutch drum, then set them into the drum.

Note

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

7. Apply ATF to the drive plates and driven plates, and install them into the direct clutch drum.

Caution

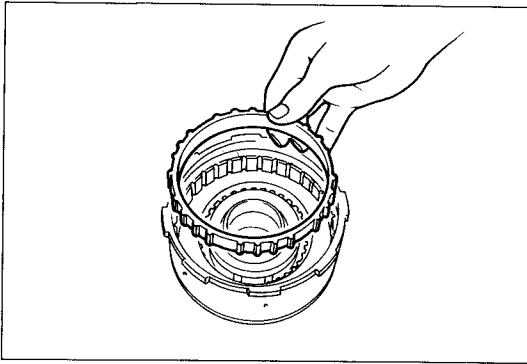
Do not deform the snap ring.

8. Install the snap ring.

Caution

Align the flats of the retaining plate with the lubrication hole of the clutch drum, then set it into the drum.

9. Apply ATF to the retaining plate, and install it into the direct clutch drum.

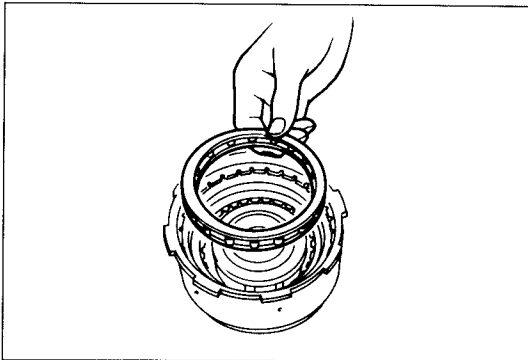


97U0KX-122

Caution

Align the flats of the outer race with the lubrication hole of the clutch drum, then set it into the drum.

10. Apply ATF to the outer race, and install it into the direct clutch drum.

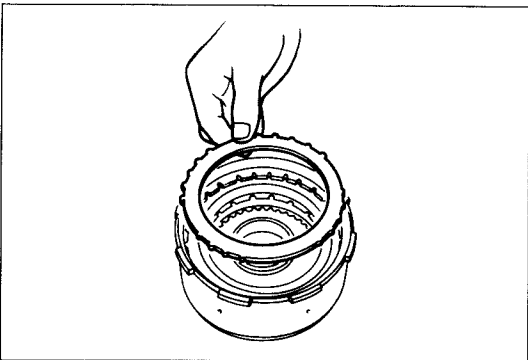


97U0KX-123

Caution

Check that the spring cage of the one-way clutch faces toward the direct clutch drum.

11. Apply ATF to the one-way clutch, and install it into the outer race.



97U0KX-124

Caution

Align the flats of the side plate with the lubrication hole of the clutch drum, then set it into the drum.

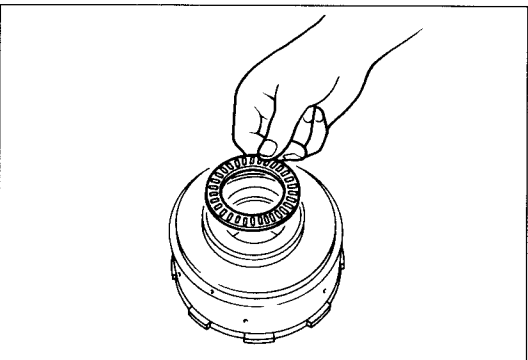
12. Apply ATF to the side plate, and install it into the direct clutch drum.

Caution

Do not deform the snap ring.

13. Install the snap ring.
14. Apply petroleum jelly to the bearing, and install it onto the direct clutch drum.

Bearing outer diameter: 70.0mm (2.756 in)



97U0KX-125

15. Measure the clearance between the side plate and the snap ring with a feeler gauge. If not within specification, adjust the clearance by installing the correct side plate.

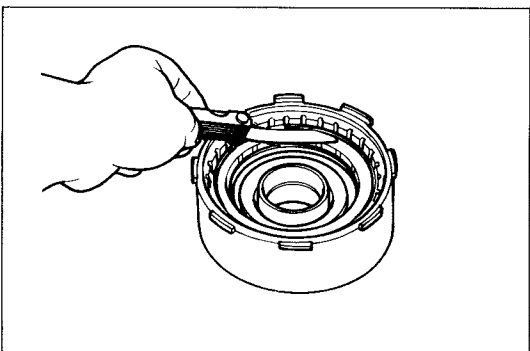
Clearance:

Maximum: 0.2mm (0.008 in)

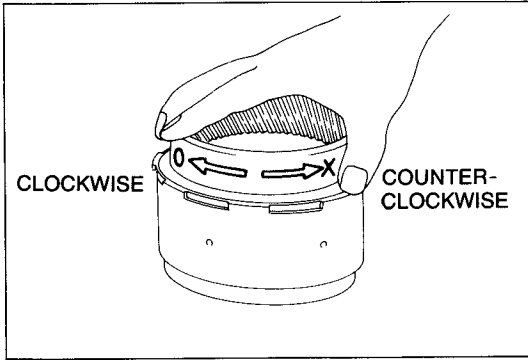
Side plate sizes

mm (in)

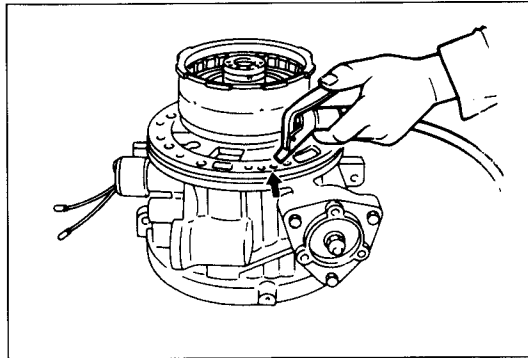
0.4 (0.016)	0.6 (0.024)	0.8 (0.031)
1.0 (0.039)	1.2 (0.047)	



97U0KX-126



97U0KX-127



97U0KX-128

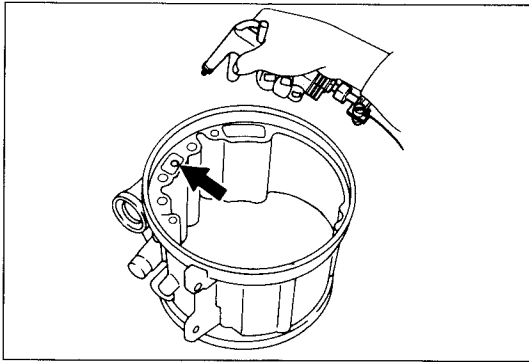
Note
If it turns counterclockwise, the one-way clutch is installed upside down.

16. Insert the OD clutch hub on the top of the direct clutch, check the one-way clutch operation by turning right and left. It should turn clockwise only, and locked counterclockwise.

Caution
Apply air for no more than three(3) seconds.

17. Install the direct clutch onto the drum support along with the seal rings. Apply compressed air to the oil passage and check the clutch operation.

Air pressure: 392 kPa (4.0 kg/cm², 67 psi) max.



9MU0K2-432

OD BAND SERVO

Preinspection

OD band servo operation

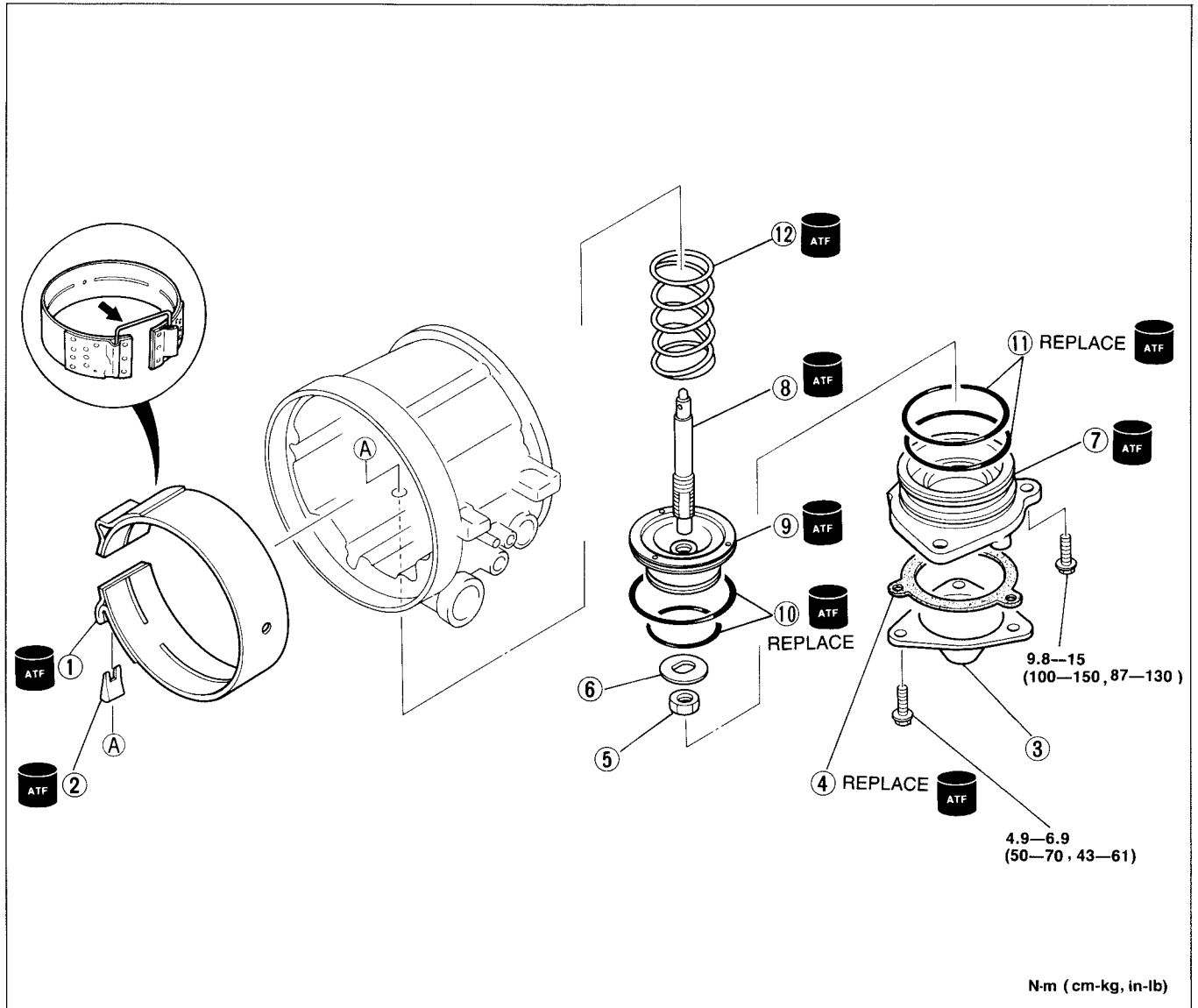
1. Apply compressed air through the oil passage as shown.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

2. Verify that the piston stem moves to the brake band.
If not, the seal rings or the oil seal may be damage or the piston assembly may be sticking.
Inspect them, and replace as necessary when assembling.

Disassembly and Inspection

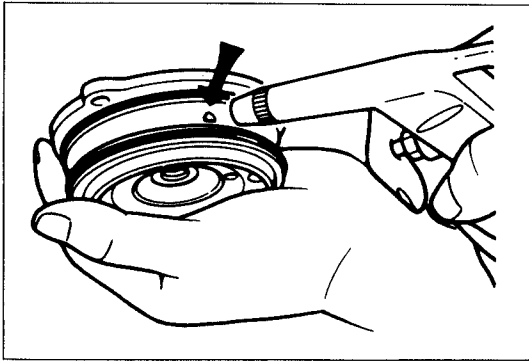
Disassemble in the order shown in the figure, referring to **Disassembly Note**.
Inspect all parts, and repair or replace as necessary.



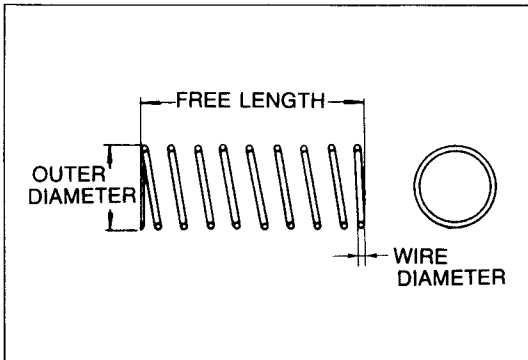
N-m (cm-kg, in-lb)

97U0KX-129

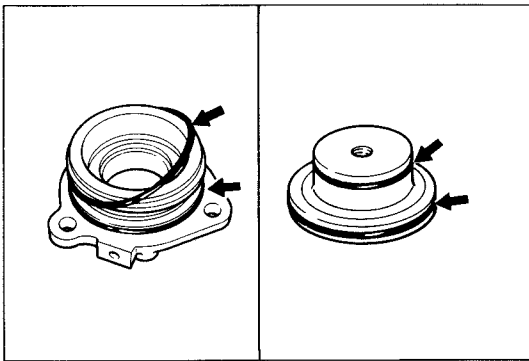
- | | | |
|--|--|----------------------------|
| 1. Brake band
Inspect for wear or burning | 6. Washer | 11. O-rings |
| 2. Band strut | 7. Body | 12. Return spring |
| 3. OD band servo cover | 8. Piston stem | Inspection page K-76 |
| 4. Gasket | 9. Piston assembly
Removal..... page K-76 | |
| 5. Nut | 10. Seal rings | |



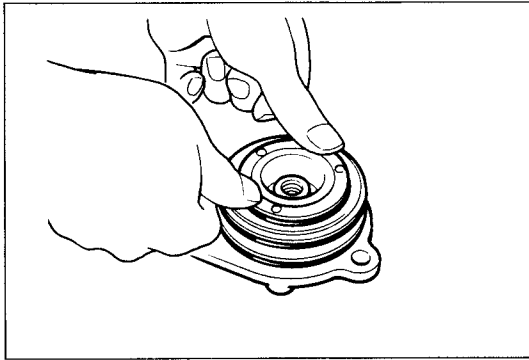
9MU0K2-192



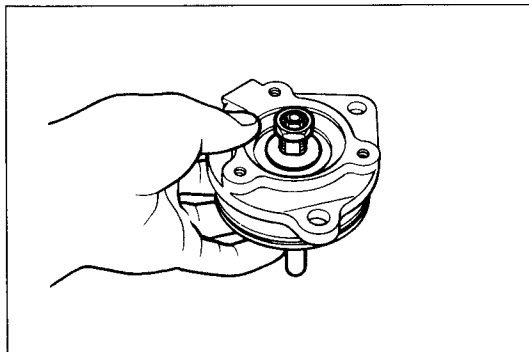
97U0KX-130



9MU0K2-194



9MU0K2-195



9MU0K2-196

Disassembly note

Piston assembly

Remove the piston assembly from the body by applying compressed air through the oil passage hole.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

Inspection

Return spring

1. Measure the spring specifications.

Specifications

Outer dia. mm (in)	Free length mm (in)	Wire dia. mm (in)
28.0 (1.102)	48.0 (1.890)	3.5 (0.138)

2. If not within specification, replace the return spring.

Assembly

1. Apply ATF to the new seal rings, and install them onto the body.
2. Apply ATF to the new O-rings, and install them onto the piston assembly.

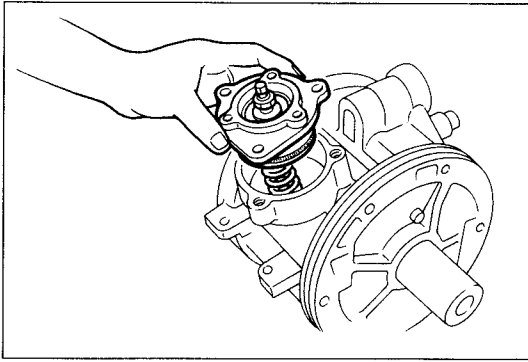
3. Apply ATF to the piston assembly and body.

Caution

Apply even pressure to the outside edge of the piston to avoid damaging the seal rings when installing.

4. Press the piston assembly in the body.

5. Apply ATF to the piston stem and washer, and install them into the body.
6. Loosely tighten the nut.



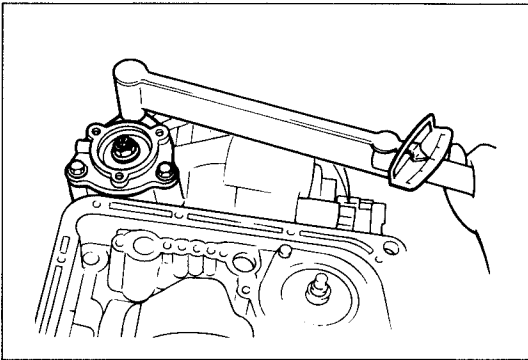
97U0KX-131

7. Apply ATF to the return spring, and install it into the transmission case.

Caution

Apply even pressure to the outside edge of the body to avoid damaging the O-ring when installing.

8. Install the piston assembly.

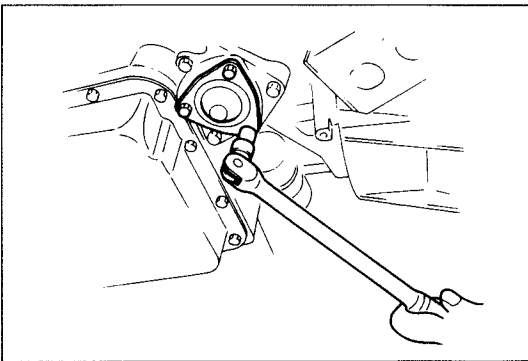


97U0KX-132

9. Install and tighten the bolts.

Tightening torque:

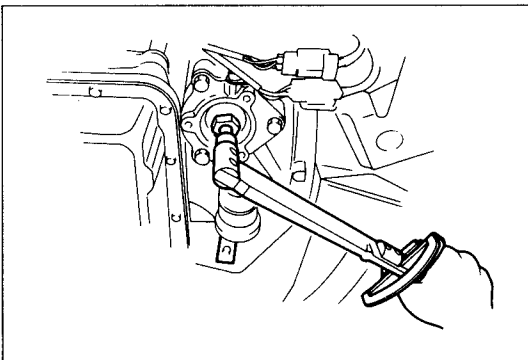
9.8—15 N·m (100—150 cm·kg, 87—130 in·lb)



97U0KX-133

On-vehicle Adjustment

1. Remove the crossmember (Convertible), exhaust pipe, and heat insulator. (Refer to page K-48.)
2. Remove the OD band servo cover and gasket.



97U0KX-134

3. Loosen the locknut and tighten the piston stem.

Tightening torque:

12—15 N·m (120—150 cm·kg, 104—130 in·lb)

4. Loosen the stem the number of turns shown below.

Stem: 2 turns

5. Hold the piston stem and tighten the locknut.

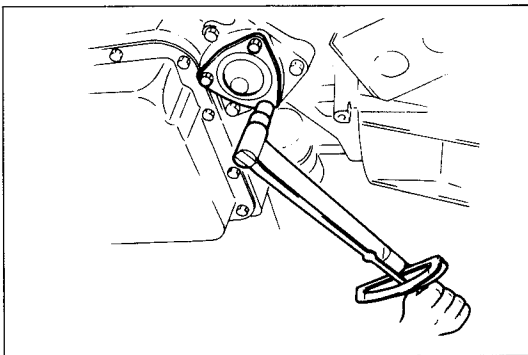
Tightening torque:

15—39 N·m (1.5—4.0 m·kg, 11—29 ft·lb)

6. Install a new gasket and the OD band servo cover.

Tightening torque:

4.9—6.9 N·m (50—70 cm·kg, 43—61 in·lb)



97U0KX-135

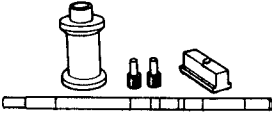
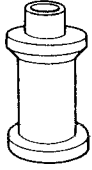

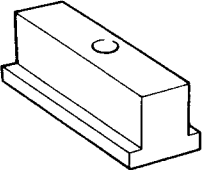
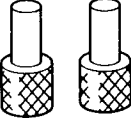
7. Install the heat insulator, exhaust pipe, and crossmember (Convertible). (Refer to page K-149.)

K TRANSMISSION

DRUM SUPPORT, ACCUMULATOR, AND OD CASE

Preparation

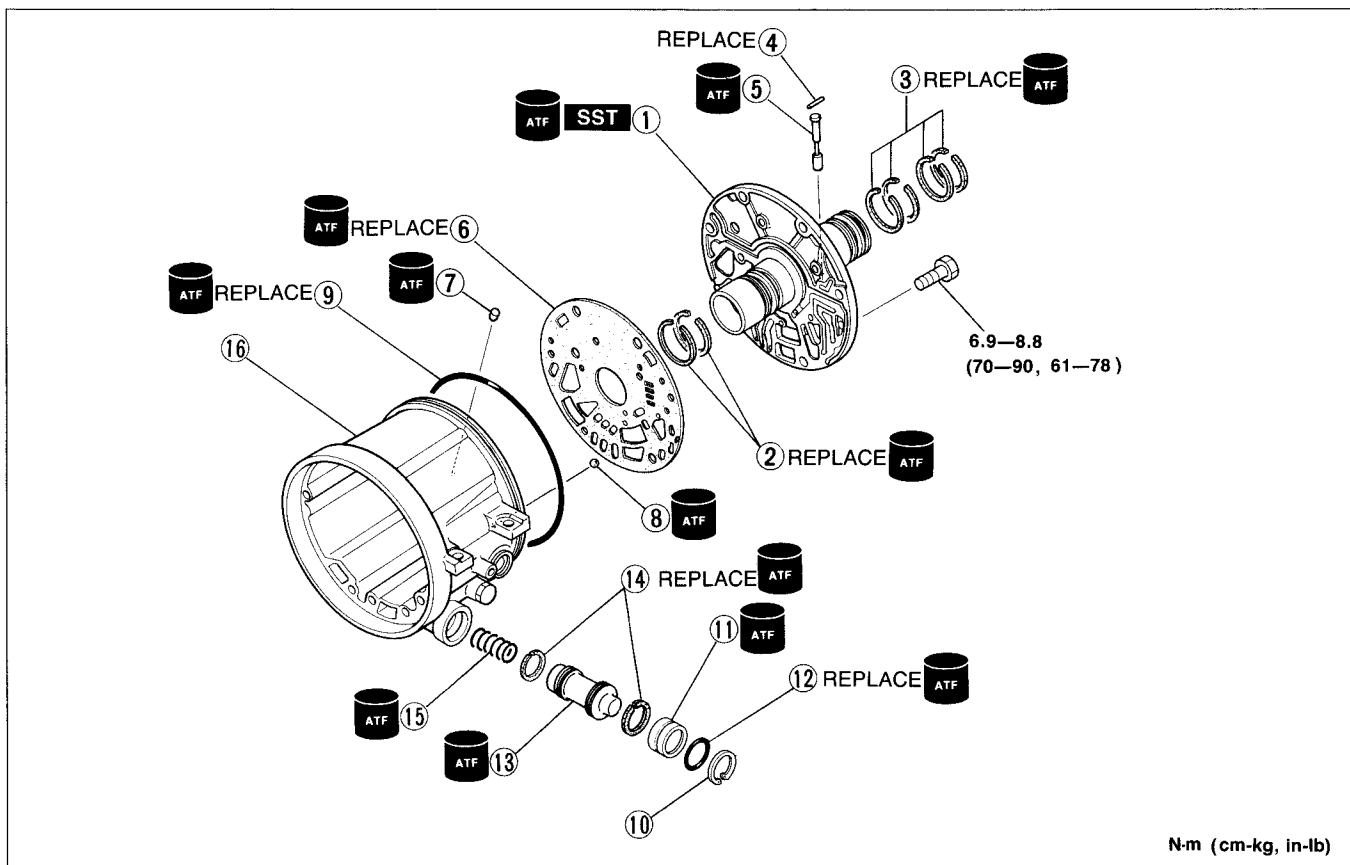
SST

<p>49 S019 0A0</p> <p>Set, centering tool</p> 	<p>49 S019 001</p> <p>Holder (Part of 49 S019 0A0)</p> 	<p>49 S019 002</p> <p>Shaft (Part of 49 S019 0A0)</p> 
<p>49 S019 003</p> <p>Stand (Part of 49 S019 0A0)</p> 	<p>49 S019 004</p> <p>Pin (Part of 49 S019 0A0)</p> 	<p>9MU0K2-232</p>

Disassembly and Inspection

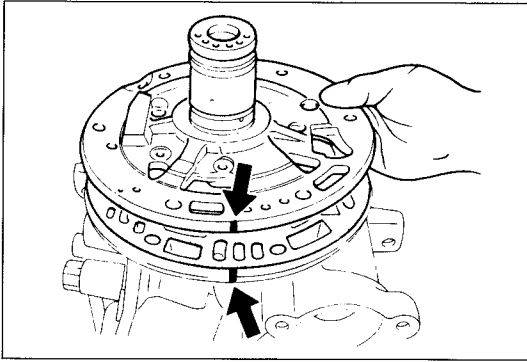
Disassemble in the order shown in the figure, referring to **Disassembly Note**.

Inspect all parts, and repair or replace as necessary.



97U0KX-136

- | | | |
|---|--|--|
| 1. Drum support
Removal..... page K-79
Inspection page K-79 | 6. Gasket | 14. Seal rings |
| 2. Seal rings | 7. One-way valve | 15. Spring
Inspection page K-79 |
| 3. Seal rings | 8. Steel ball | 16. OD case |
| 4. Roll pin | 9. Seal ring | |
| 5. Plug
Inspect for sticking, scoring, or scratches | 10. Snap ring | |
| | 11. Accumulator plug
Removal..... page K-79 | |
| | 12. O-ring | |
| | 13. Accumulator piston | |

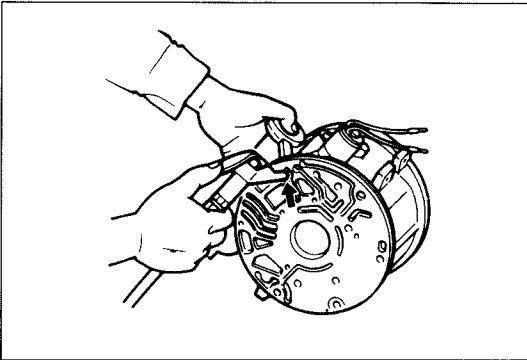


9MU0K2-234

Disassembly note

Drum support

Mark the OD case and drum support for proper reassembly, then remove the drum support.

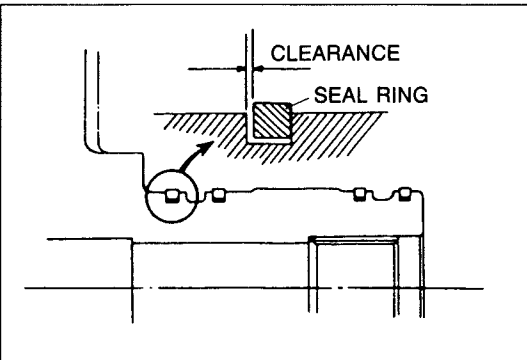


9MU0K2-235

Accumulator plug

Remove the accumulator plug, piston, and spring by applying compressed air through the oil passage.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.



9MU0K2-236

Inspection

Drum support

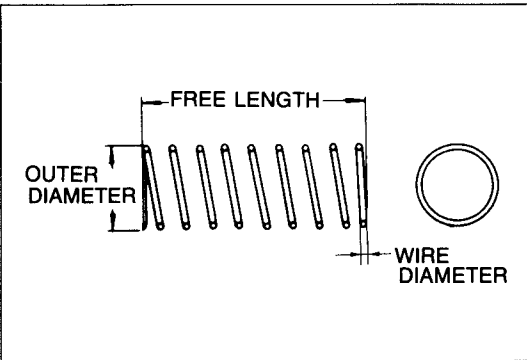
1. Apply ATF to the new seal rings and install them into the seal ring grooves of the drum support.
2. Measure the clearance between the seal rings and the seal ring grooves.

Clearance

Standard: 0.04—0.16mm (0.0016—0.0063 in)

Maximum: 0.40mm (0.016 in)

3. If not within specification, replace the drum support.



97U0KX-137

Spring

1. Measure the spring specifications.

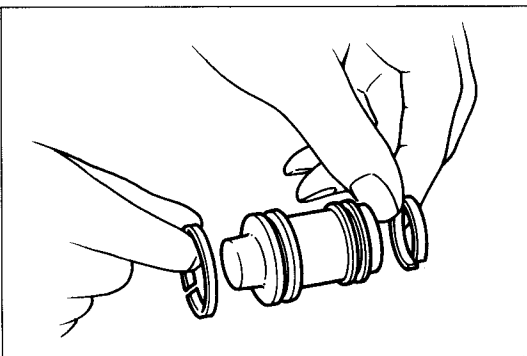
Specifications

Outer dia. mm (in)	Free length mm (in)	No. of coils	Wire dia. mm (in)
16.0 (0.630)	40.4 (1.590)	9.8	2.6 (0.102)

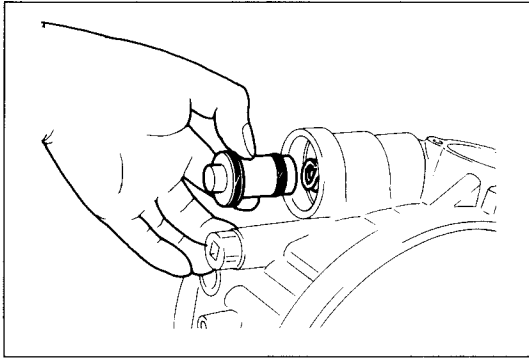
2. If not within specification, replace the spring.

Assembly

1. Apply ATF to the new seal rings, and install them onto the accumulator piston.



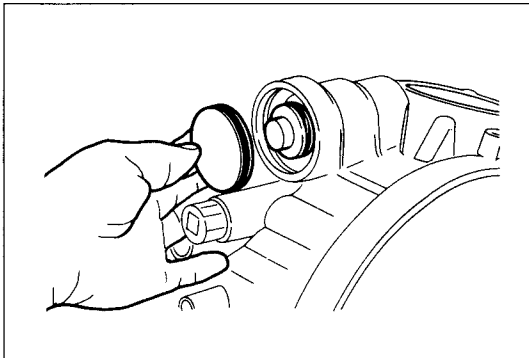
9MU0K2-238



Caution

Apply even pressure to the outside edge of the piston to avoid damaging the seal rings when installing.

2. Apply ATF to the spring and accumulator piston, and install them into the OD case.



3. Apply ATF to a new O-ring, and install it on the accumulator plug.

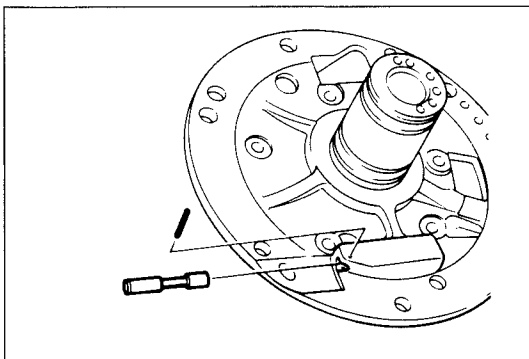
4. Install the accumulator plug and snap ring.

Caution

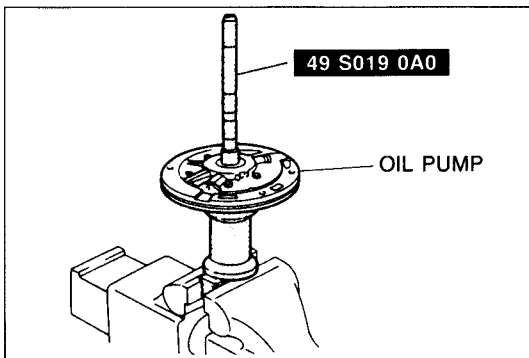
Apply air for no more than three(3) seconds.

5. Check the accumulator operation by applying compressed air through the oil passage.

Air pressure: 392 kPa (4.0kg/cm², 57 psi) max.



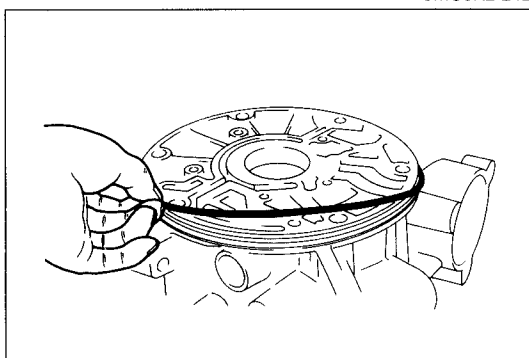
6. Apply ATF to the plug, and install it into the drum support.
7. Tap in a new roll pin.



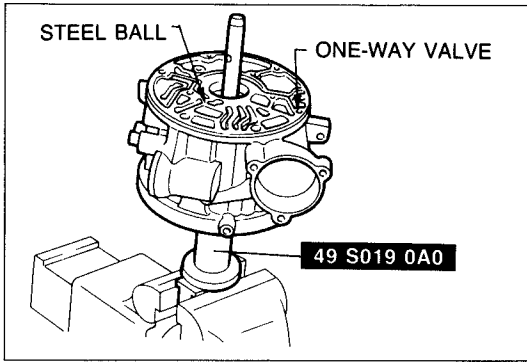
Note

Use protective plates to prevent damaging the SST.

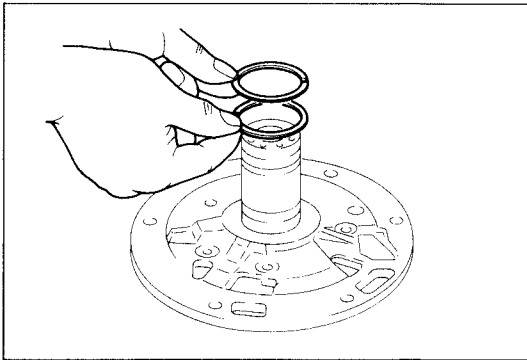
8. Set the oil pump onto the **SST**.



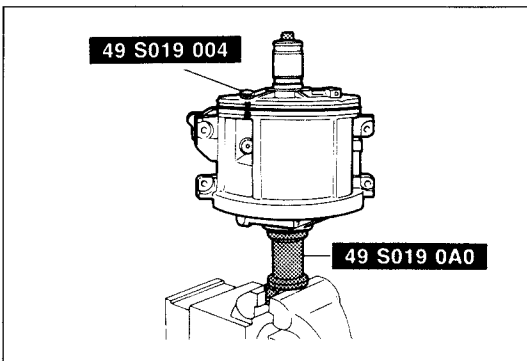
9. Apply ATF to a new seal ring, and install it onto the drum support.



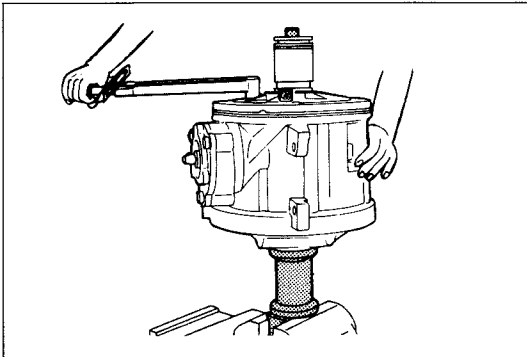
9MU0K2-244



9MU0K2-245



9MU0K2-246



79G07C-284

10. Apply ATF to the OD case, and mount it onto the oil pump.

11. Install the steel ball and the one-way valve.

12. Apply ATF to the new seal rings, and install them onto the drum support.

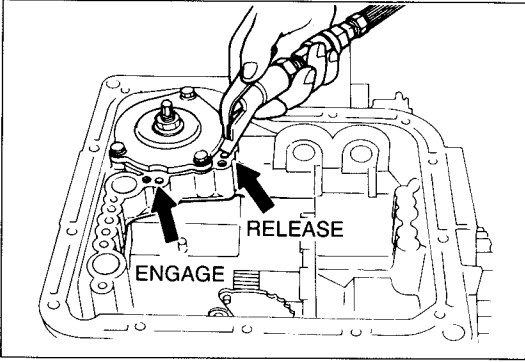
13. Apply ATF to the drum support, and install the support and a new gasket onto the OD case, aligning the marks.

14. Install the **SST** (pins).

15. Tighten the drum support mounting bolts.

Tightening torque:

6.9—8.8 N·m (70—90 cm·kg, 61—78 in·lb)



2ND BAND SERVO

Preinspection

2ND band servo operation

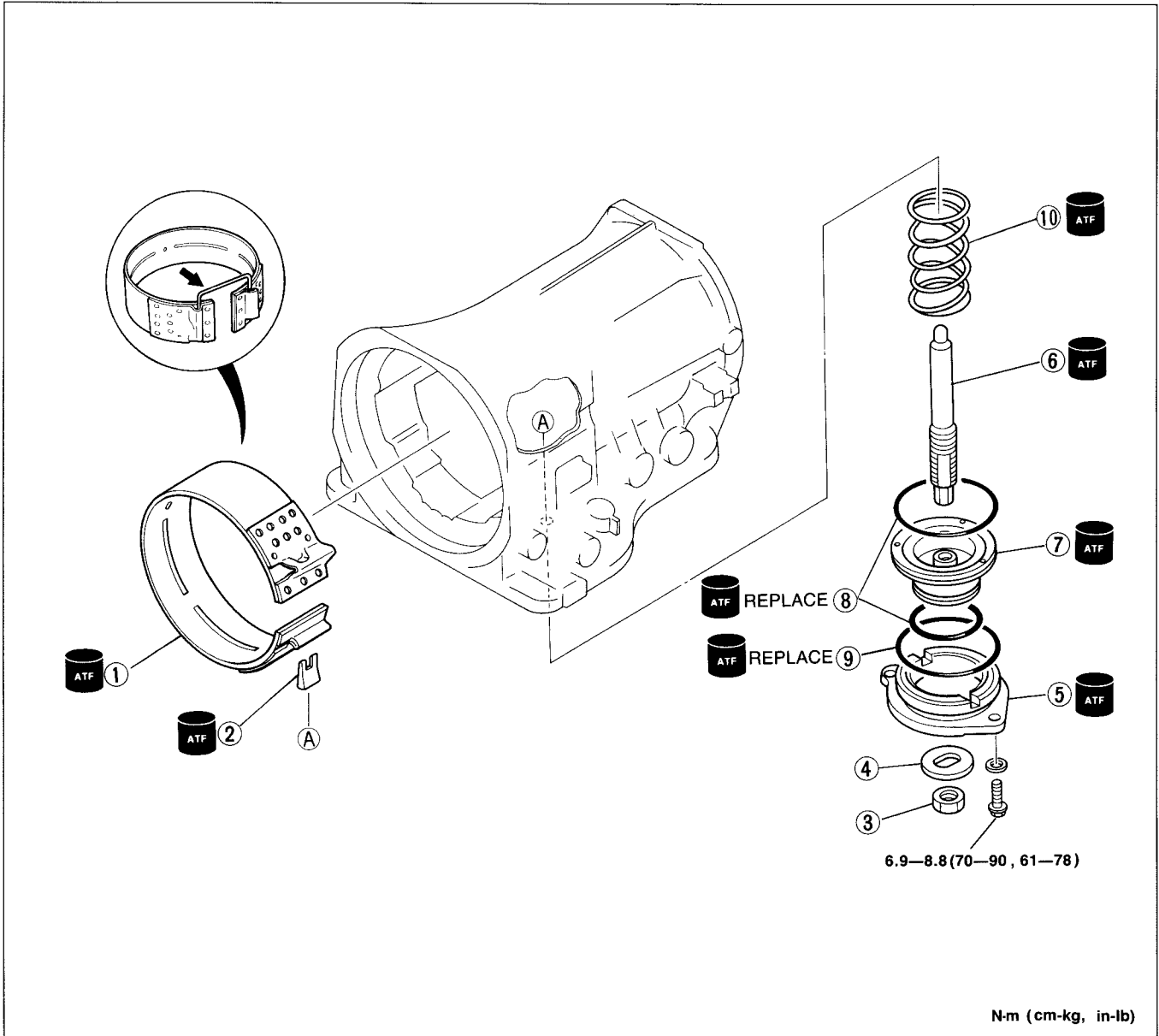
1. Apply compressed air through the oil passage as shown.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

2. Verify that the piston stem moves to the brake band.
If not, the seal rings or the oil seal may be damage or the piston assembly may be sticking.
Inspect them, and replace as necessary when assembling.

Disassembly and Inspection

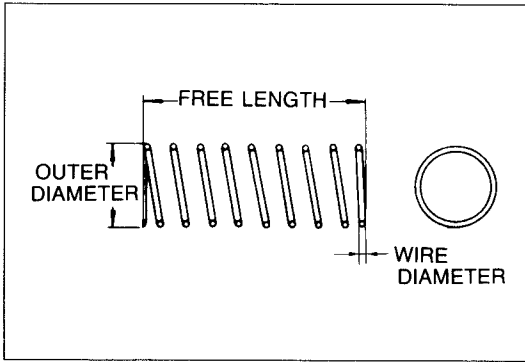
Disassemble in the order shown in the figure.
Inspect all parts, and repair or replace as necessary.



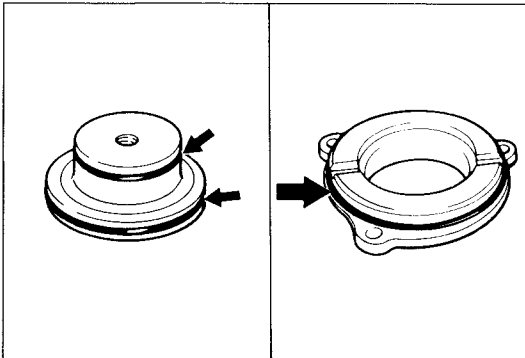
- 1. Brake band
Inspect for wear or burning
- 2. Band strut
- 3. Nut

- 4. Washer
- 5. Body
- 6. Piston stem
- 7. Piston assembly

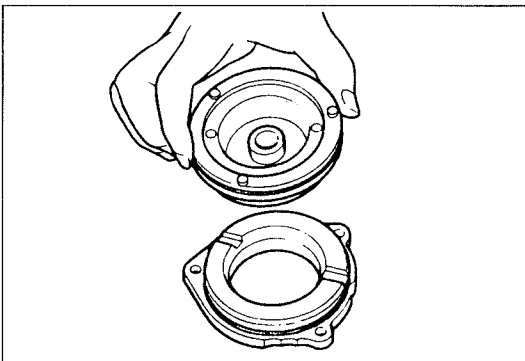
- 8. Seal rings
 - 9. O-ring
 - 10. Return spring
- Inspection page K-83



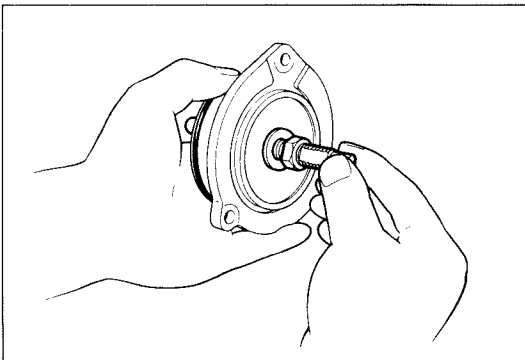
97U0KX-140



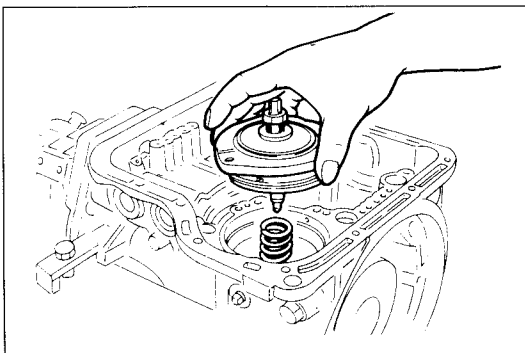
97U0KX-141



9MU0K2-205



9MU0K2-206



9MU0K2-207

Inspection Return spring

1. Measure the spring specifications.

Specifications

Outer dia. mm (in)	Free length mm (in)	Wire dia. mm (in)
28.25 (1.112)	35.0 (1.378)	3.5 (0.138)

2. If not within specification, replace the return spring.

Assembly

1. Apply ATF to the new seal rings, and install them onto the piston assembly.
2. Apply ATF to a new O-rings, and install it onto the piston assembly.

3. Apply ATF to the piston assembly and body.

Caution

Apply even pressure to the outside edge of the piston to avoid damaging the seal rings when installing.

4. Press the piston assembly into the body.

5. Apply ATF to the piston stem and washer, and install them into the body.

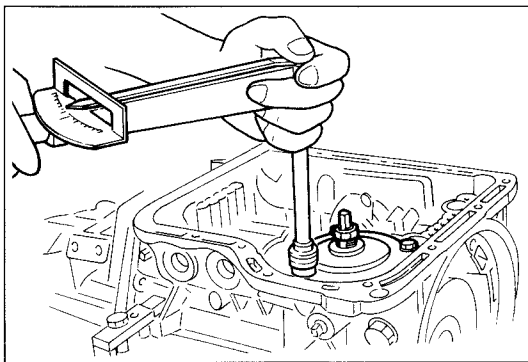
6. Loosely tighten the nut.

7. Apply ATF to the return spring, and install it into the transmission case.

Caution

Apply even pressure to the outside edge of the body to avoid damaging the O-ring when installing.

8. Install the piston assembly.

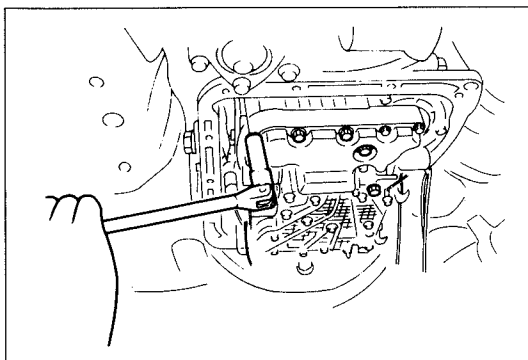


9MU0K2-208

9. Install and tighten the bolts.

Tightening torque:

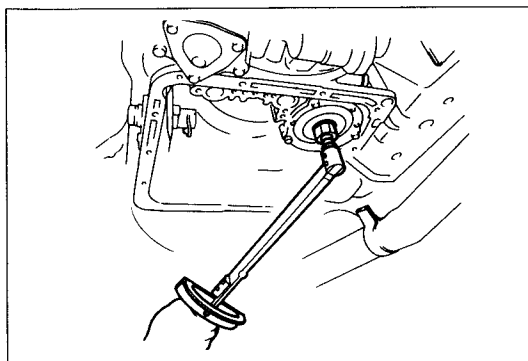
6.9—8.8 N·m (70—90 cm·kg, 61—78 in·lb)



97U0KX-142

On-vehicle Adjustment

1. Remove the crossmember (Convertible), exhaust pipe, and heat insulator. (Refer to page K-48.)
2. Remove the valve body assembly. (Refer to page K-129.)



97U0KX-143

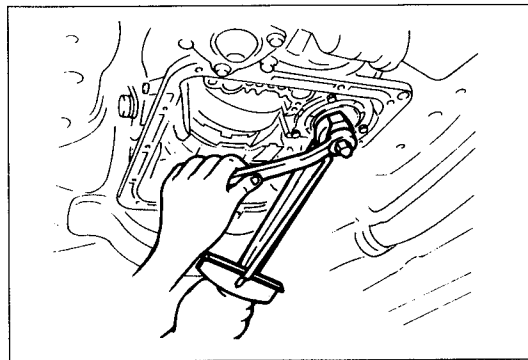
3. Loosen the locknut and tighten the piston stem.

Tightening torque:

12—14 N·m (125—145 cm·kg, 109—126 in·lb)

4. Loosen the stem the number of turns shown below.

Stem: 2 1/2 turns

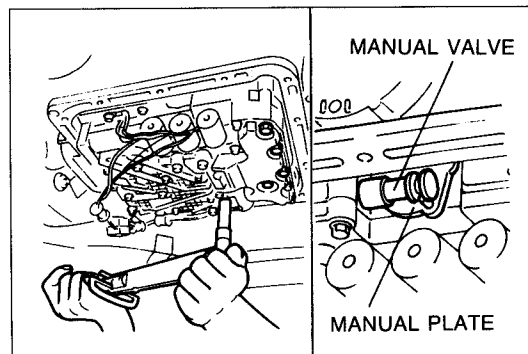


97U0KX-144

5. Hold the piston stem and tighten the locknut.

Tightening torque:

15—39 N·m (1.5—4.0 m·kg, 11—29 ft·lb)



97U0KX-145

6. Install the valve body assembly. (Refer to page K-130.)
7. Install the heat insulator, exhaust pipe, and crossmember (Convertible). (Refer to page K-149.)

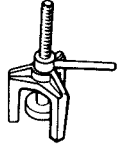
FRONT CLUTCH

Preparation

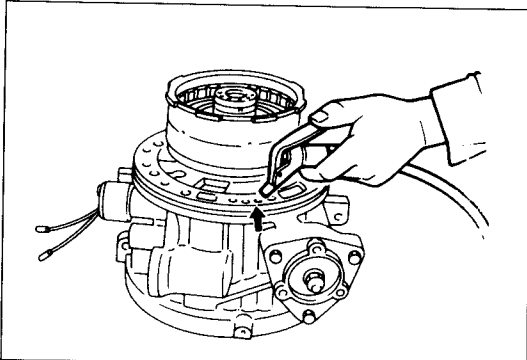
SST

49 0378 375

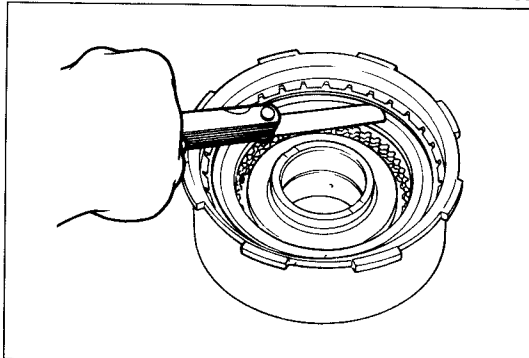
Compressor,
clutch spring



9MU0K2-155



9MU0K2-156



97U0KX-146

Preinspection

Front clutch operation

1. Install the front clutch onto the drum support along with the seal rings.
Apply compressed air through the oil passage as shown.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

2. Verify that the retaining plate moves toward the snap ring.
If not, the seal ring or O-ring may be damaged or fluid may be leaking at the piston check ball. Inspect them, and replace when assembling.

Clearance between retaining plate and snap ring

Measure the clearance between the retaining plate and the snap ring.

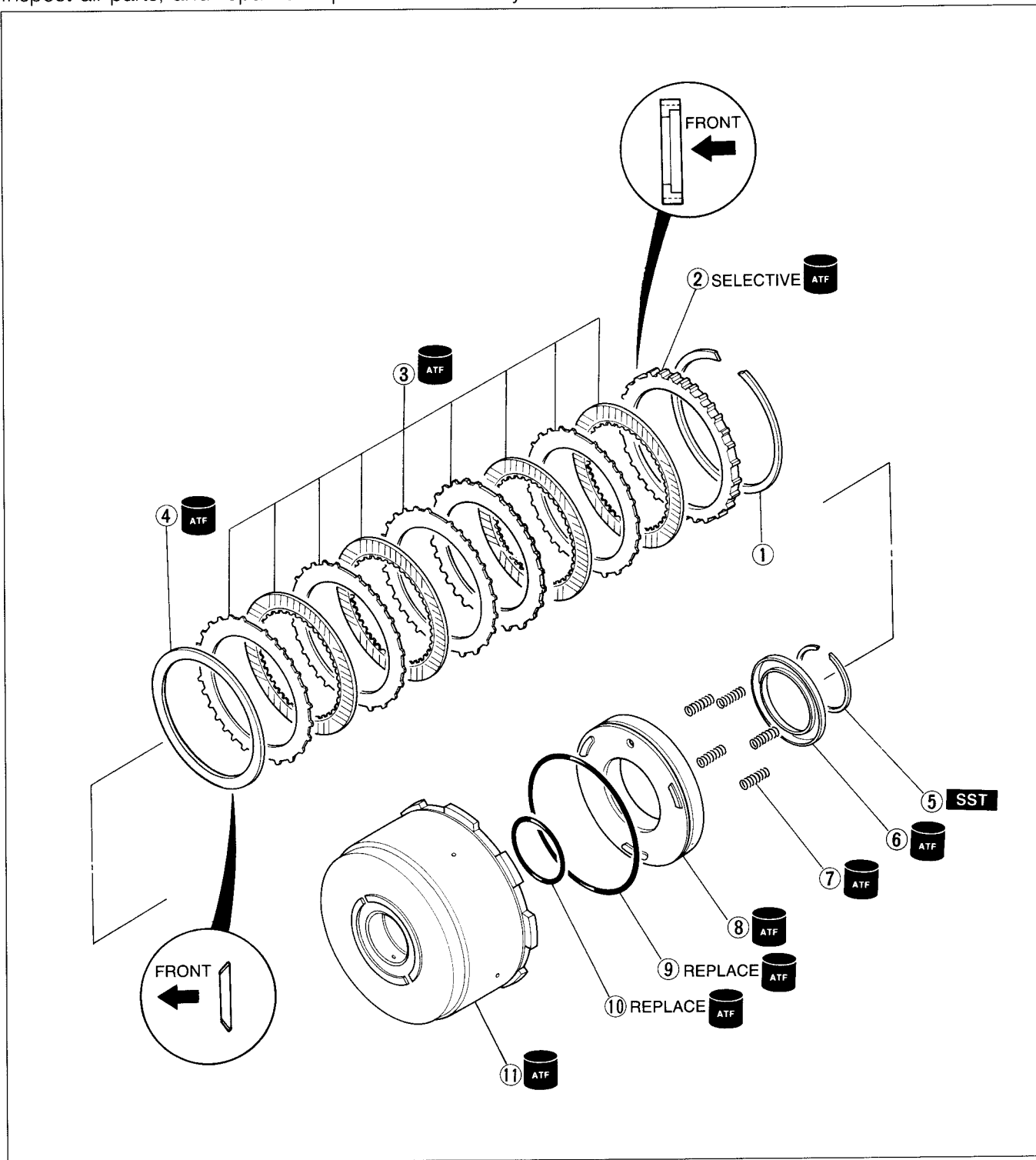
Clearance: 0.9—1.1mm (0.035—0.043 in)

Select and install the correct retaining plate when assembling.

K TRANSMISSION

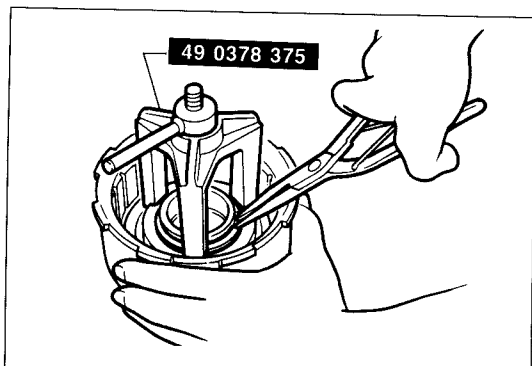
Disassembly and Inspection

Disassemble in the order shown in the figure, referring to **Disassembly Note**.
Inspect all parts, and repair or replace as necessary.



97U0KX-147

- | | | |
|-----------------------------------|-------------------------------|-----------------------|
| 1. Snap ring | 6. Spring retainer | 9. Seal ring |
| 2. Retaining plate | 7. Return spring | 10. O-ring |
| 3. Drive plates and driven plates | Inspection page K-87 | 11. Front clutch drum |
| Inspect for wear or burning | | |
| Inspection page K-87 | | |
| 4. Dished plate | 8. Clutch piston | |
| 5. Snap ring | Inspect balls for sticking by | |
| Removal page K-87 | shaking piston | |
| | Removal page K-87 | |
| | Inspection page K-87 | |



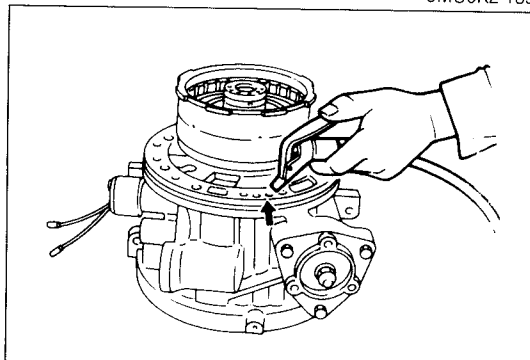
9MU0K2-159

Disassembly note Snap ring

Caution

Do not damage the snap ring.

1. Compress the spring with the **SST**, then remove the snap ring with snap ring pliers.
2. Remove the spring retainer and spring.

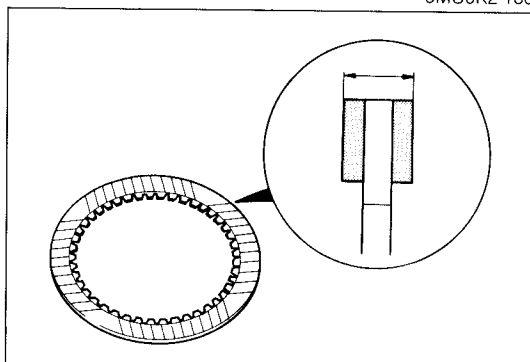


9MU0K2-160

Clutch piston

1. Install the front clutch drum onto the drum support along with seal rings.
2. Remove the piston by applying compressed air through the oil passage.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.



9MU0K2-161

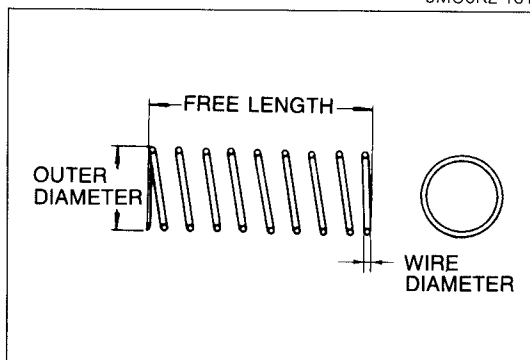
Inspection Drive plate

1. Measure the facing thickness in three places, and determine the average of the three readings.

Standard thickness: 1.6mm (0.063 in)

Minimum thickness: 1.4mm (0.055 in)

2. If not within specification, replace the drive plates.



9MU0K2-162

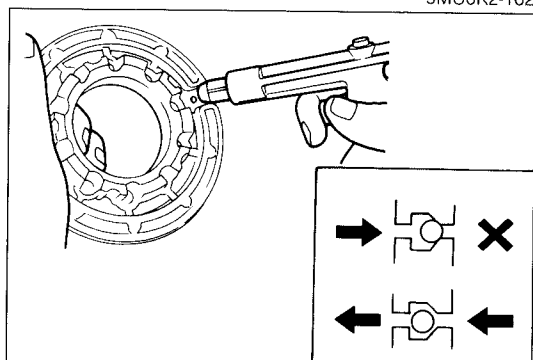
Return spring

1. Measure the spring specifications.

Specifications

Outer dia. mm (in)	Free length mm (in)	No. of coils	Wire dia. mm (in)
8.0 (0.315)	30.5 (1.201)	14.5	1.3 (0.051)

2. If not within specification, replace the return spring.



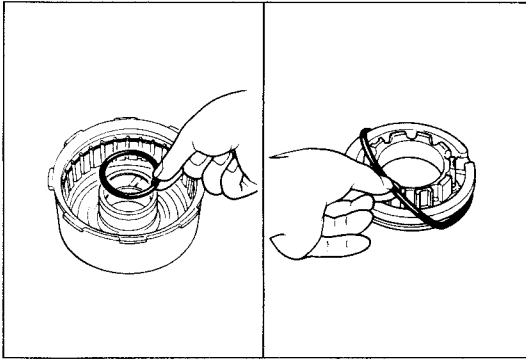
9MU0K2-163

Clutch piston

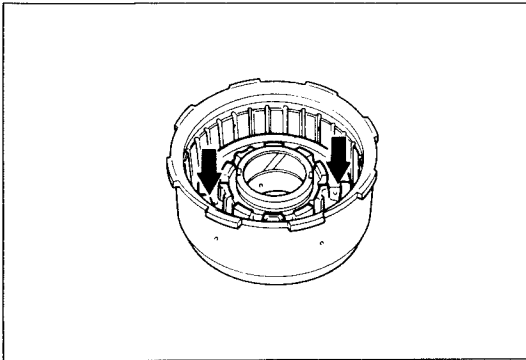
1. Verify that there is no air leakage when applying compressed air through the oil hole opposite the return spring.
2. Verify that there is airflow when applying compressed air through the oil hole on the return spring side.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

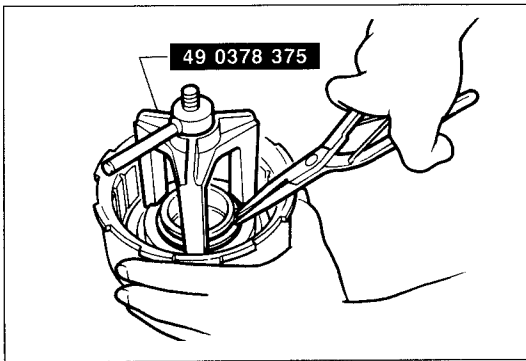
3. If not correct, replace the clutch piston.



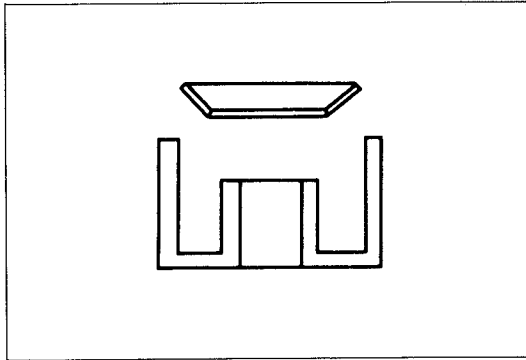
9MU0K2-164



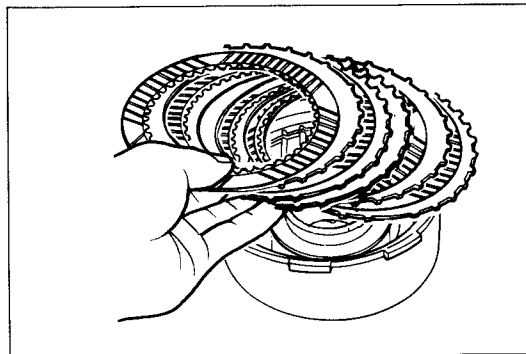
9MU0K2-165



9MU0K2-166



97U0KX-148



9MU0K2-168

Assembly

1. Apply ATF to a new O-ring and install it onto the front clutch drum.
2. Apply ATF to a new seal ring and install it onto the piston.

Caution

Apply even pressure to the outside edge of the piston to avoid damaging the seal rings when installing.

3. Apply ATF to the inside of the front clutch drum.
4. Install the piston in the front clutch drum.

Caution

**a) Do not overexpand the snap ring when installing.
b) Do not align the snap ring end-gap with the spring retainer stop.**

5. Install the springs and spring retainer, then compress them with the **SST**.
6. Install the snap ring.

7. Install the dished plate as shown.

Caution

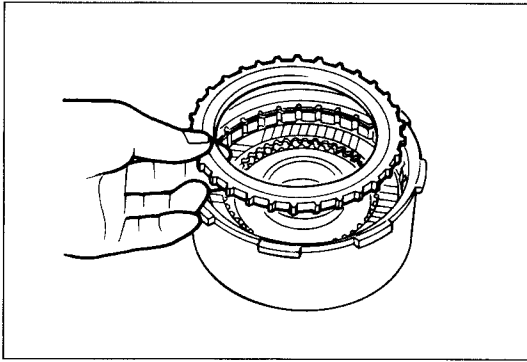
Align the flats of the drive plates with the lubrication hole of the clutch drum, then set them into the drum.

Note

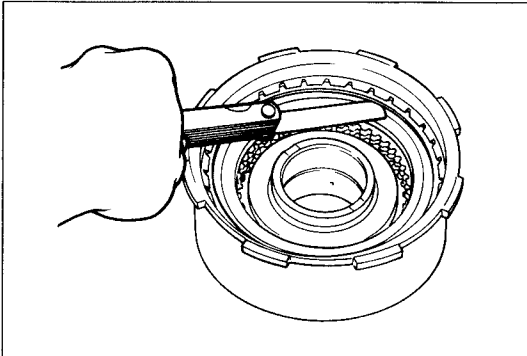
Installation order:

Driven-Drive-Driven-Drive-Driven-Driven-Drive-Driven-Drive

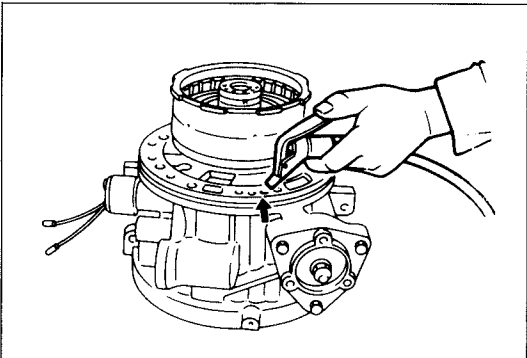
8. Apply ATF to the drive plates and driven plates, and install them into the front clutch drum.



9MU0K2-169



97U0KX-149



9MU0K2-171

Caution

Align the flats of the retaining plate with the lubrication hole of the clutch drum, then set it into the drum.

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

Caution

Do not deform the snap ring.

10. Install the snap ring.
11. Measure the clearance between the retaining plate and snap ring with a feeler gauge. If not within specification, adjust the clearance by installing the correct retaining plate.

Clearance: 0.9—1.1mm (0.035—0.043 in)

Retaining plate sizes

mm (in)

5.0 (0.197)	5.2 (0.205)	5.4 (0.213)
5.6 (0.220)	5.8 (0.228)	6.0 (0.236)
6.2 (0.244)		

Caution

Apply air for no more than three(3) seconds.

12. Install the front clutch onto the drum support along with the seal rings. Apply compressed air through the oil passage and check the clutch operation.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

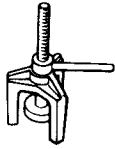
REAR CLUTCH

Preparation

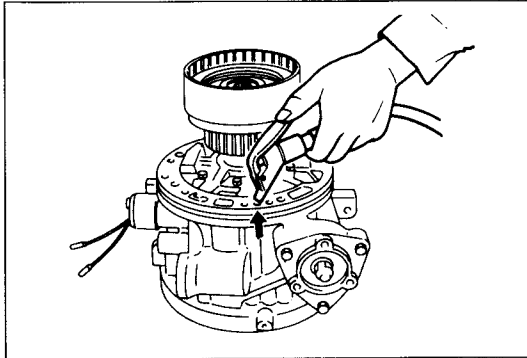
SST

49 0378 375

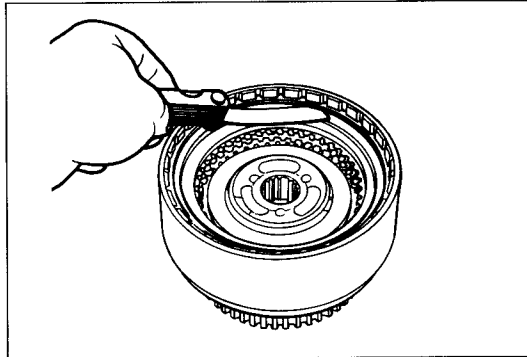
Compressor,
clutch spring



9MU0K2-172



9MU0K2-173



97U0KX-150

Preinspection

Rear clutch operation

1. Install the rear clutch onto the drum support along with the seal rings. Apply compressed air through the oil passage as shown.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

2. Verify that the retaining plate moves toward the snap ring. If not, the seal ring or O-ring may be damaged or fluid may be leaking at the piston check ball. Inspect them, and replace when assembling.

Clearance between retaining plate and snap ring

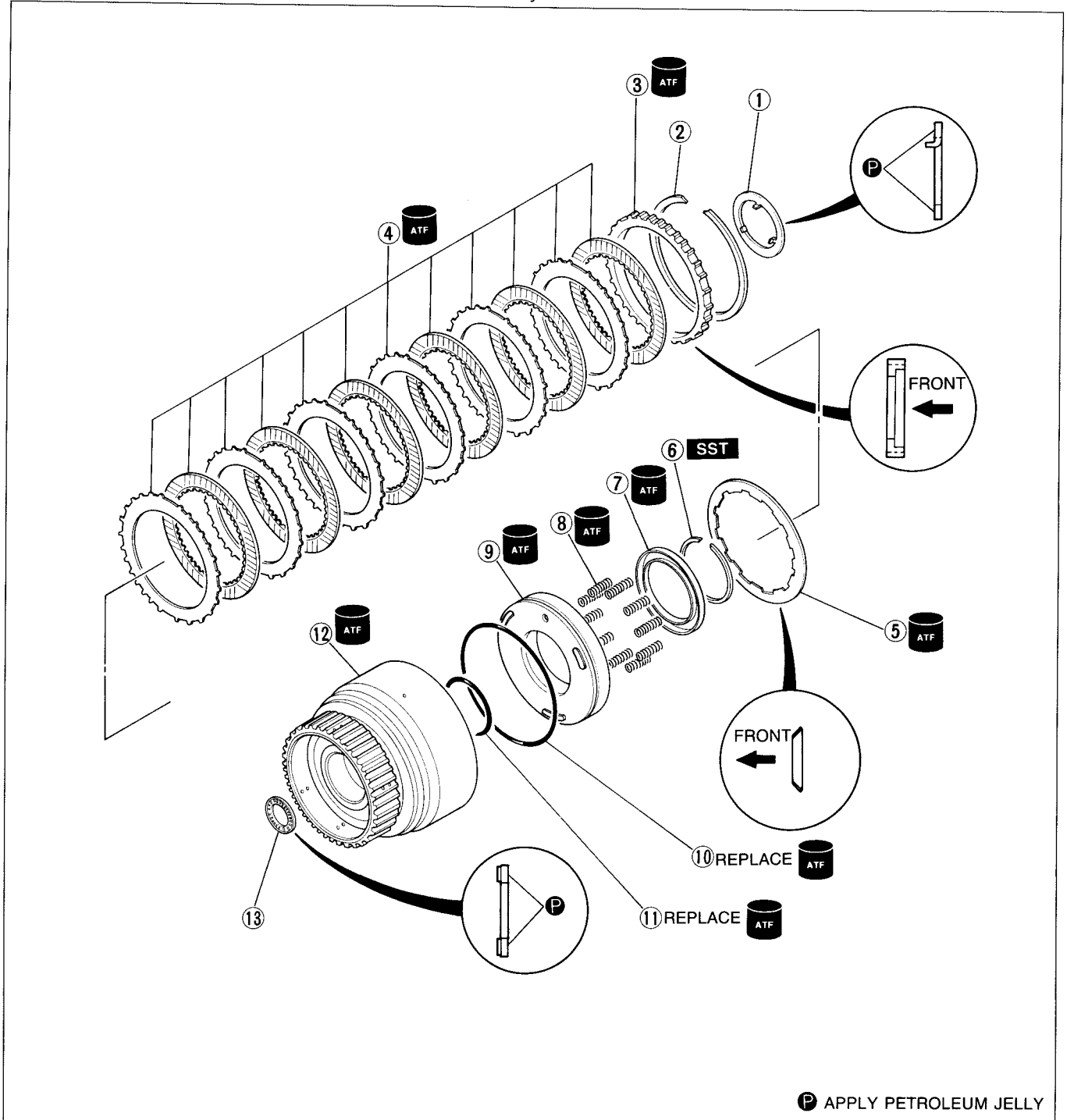
Measure the clearance between the retaining plate and the snap ring.

Clearance: 0.8—1.0mm (0.031—0.039 in)

If not within specification, replace the dished plate, drive plates, driven plates, and retaining plate when assembling.

Disassembly and Inspection

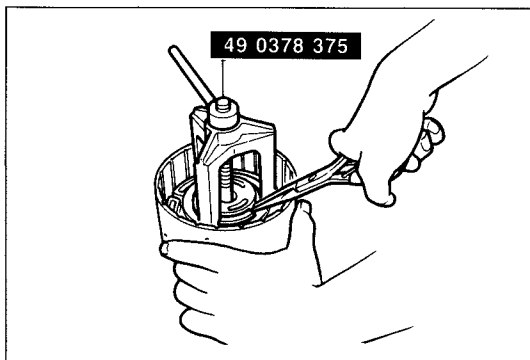
Disassemble in the order shown in the figure, referring to **Disassembly Note**.
Inspect all parts, and repair or replace as necessary.



P APPLY PETROLEUM JELLY

97U0KX-151

- | | | |
|---|---|--|
| <p>1. Bearing race
Inspect for bearing surface scoring or scratches</p> <p>2. Snap ring</p> <p>3. Retaining ring</p> <p>4. Drive plates and driven plates
Inspect for wear or burning
Inspection page K-92</p> <p>5. Dishes plate</p> | <p>6. Snap ring
Removal page K-92</p> <p>7. Spring retainer</p> <p>8. Return spring</p> <p>9. Clutch piston
Inspection page K-92
Inspect balls for sticking by shaking, piston
Removal page K-92
Inspection page K-92</p> | <p>10. Seal ring</p> <p>11. O-ring</p> <p>12. Rear clutch drum</p> <p>13. Bearing
Inspect for damage or rough rotation</p> |
|---|---|--|



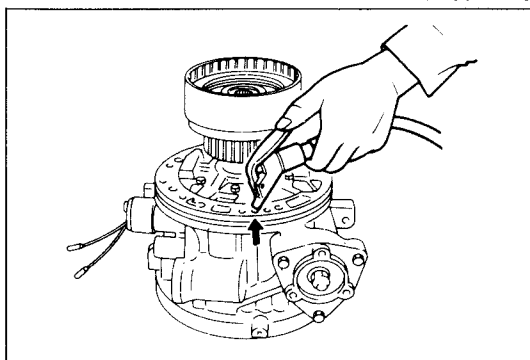
9MU0K2-176

Disassembly note Snap ring

Caution

Do not damage the snap ring.

1. Compress the spring with the **SST**, then remove the snap ring with snap ring pliers.
2. Remove the spring retainer and spring.

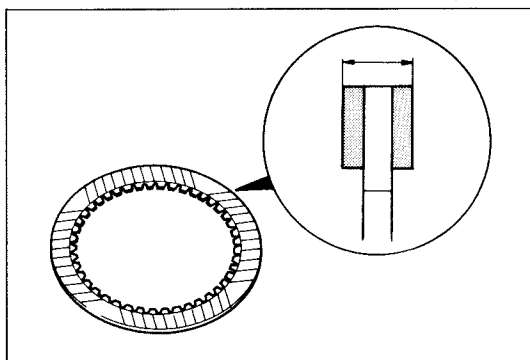


9MU0K2-177

Clutch piston

1. Install the rear clutch drum onto the drum support along with the seal rings.
2. Remove the piston by applying compressed air through the oil passage.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.



9MU0K2-178

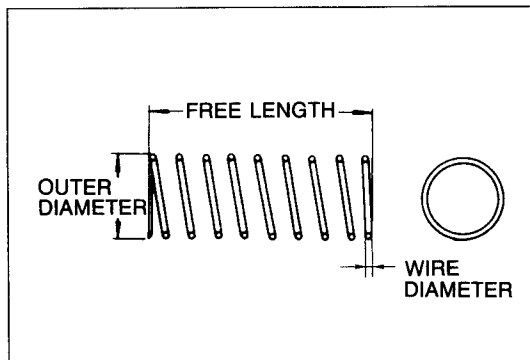
Inspection

Drive plate

1. Measure the facing thickness in three places and determine the average of the three readings.

Standard thickness: 1.6mm (0.063 in)
Minimum thickness: 1.4mm (0.055 in)

2. If not within specification, replace the drive plates.



9MU0K2-179

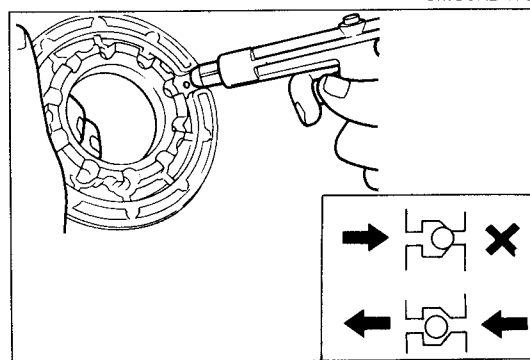
Return spring

1. Measure the spring specifications.

Specifications

Outer dia. mm (in)	Free length mm (in)	No. of coils	wire dia. mm (in)
8.0 (0.315)	30.5 (1.201)	14.5	1.3 (0.051)

2. If not within specification, replace the return spring.



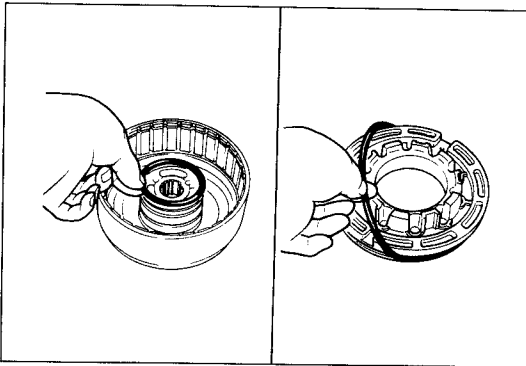
9MU0K2-180

Clutch piston

1. Verify that there is no air leakage when applying compressed air through the oil hole opposite the return spring.
2. Verify that there is airflow when applying compressed air through the oil hole on the return spring side.

Air pressure: 392 kPa (4.0 kg/cm², 57psi) max.

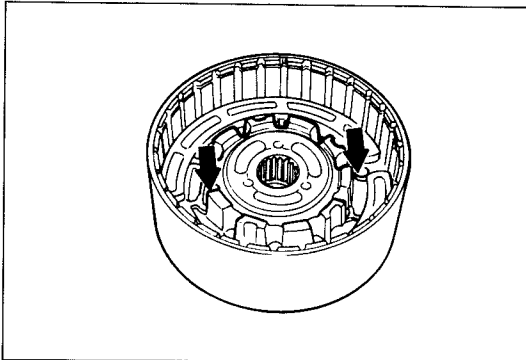
3. If not correct, replace the clutch piston.



9MU0K2-181

Assembly

1. Apply ATF to a new O-ring and install it onto the rear clutch drum.
2. Apply ATF to a new seal ring and install it onto the piston.



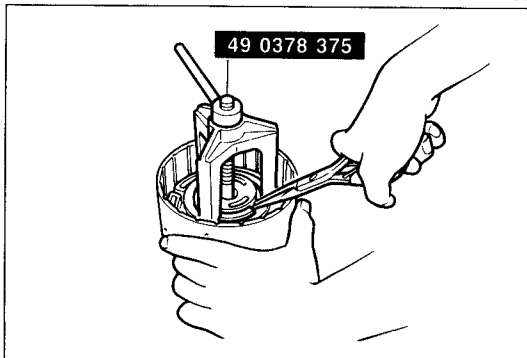
9MU0K2-182

3. Apply ATF to the inside of the rear clutch drum.

Caution

Apply even pressure to the outside edge of the piston to avoid damaging the seal rings when installing.

4. Install the piston in the rear clutch drum.

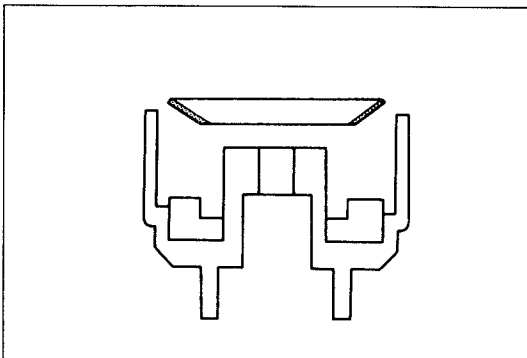


9MU0K2-183

Caution

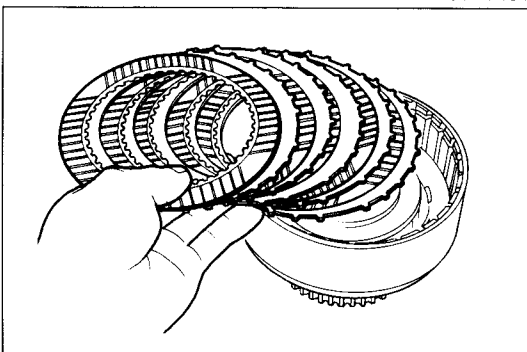
- a) Do not overexpand the snap ring when installing.
- b) Do not align the snap ring end-gap with the spring retainer stop.

5. Install the springs and spring retainer and compress them with the **SST**.
6. Install the snap ring.



9MU0K2-184

7. Install the dished plate as shown.



97U0KX-152

Caution

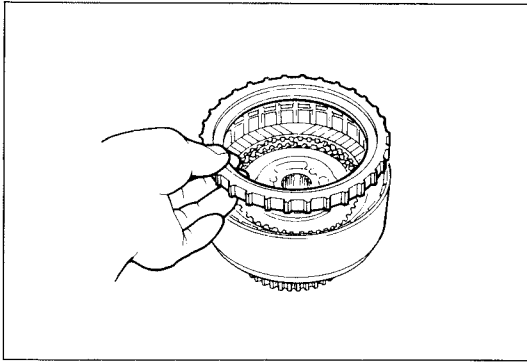
Align the flats of the drive plates with the lubrication hole of the clutch drum, then set them into the drum.

Note

Installation order:

Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive

8. Apply ATF to the drive plates and driven plates, and install them into the rear clutch drum.



9MU0K2-186

Caution

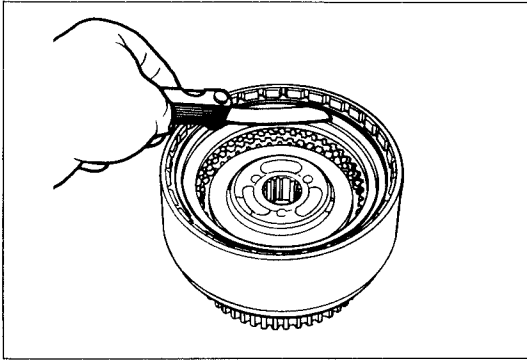
Align the flats of the retaining plate with the lubrication hole of the clutch drum, then set it into the drum.

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

Caution

Do not deform the snap ring.

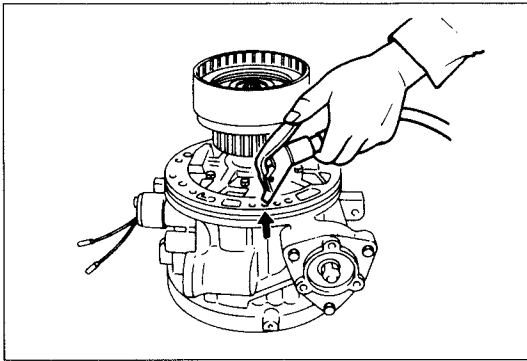
10. Install the snap ring.



97U0KX-153

11. Measure the clearance between the retaining plate and snap ring with a feeler gauge. If not within specification, replace the dished plate, drive plates, driven plates and retaining plate.

Clearance: 0.8—1.0mm (0.031—0.039 in)



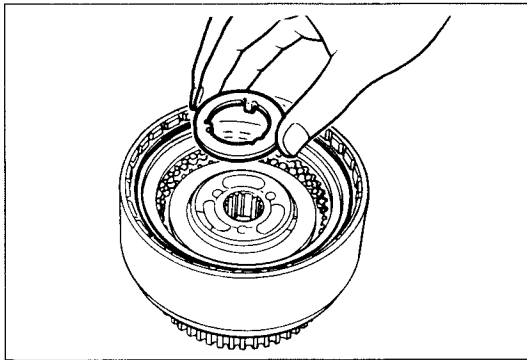
9MU0K2-188

Caution

Apply air for no more than three(3) seconds.

12. Install the rear clutch onto the drum support along with the seal rings.
Apply compressed air to the oil passage and check the clutch operation.

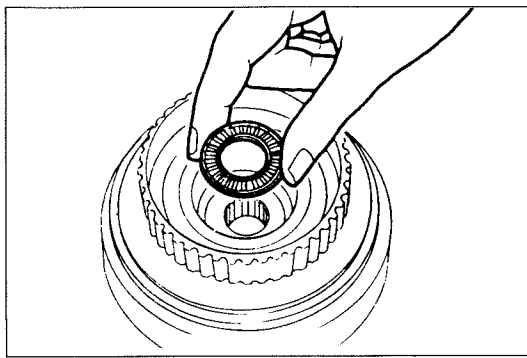
Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.



97U0KX-154

13. Apply petroleum jelly to the bearing race, and install it onto the rear clutch drum.

Bearing outer diameter: 35.0mm (1.378 in)



97U0KX-155

14. Apply petroleum jelly to the bearing, and install it onto the rear clutch drum.

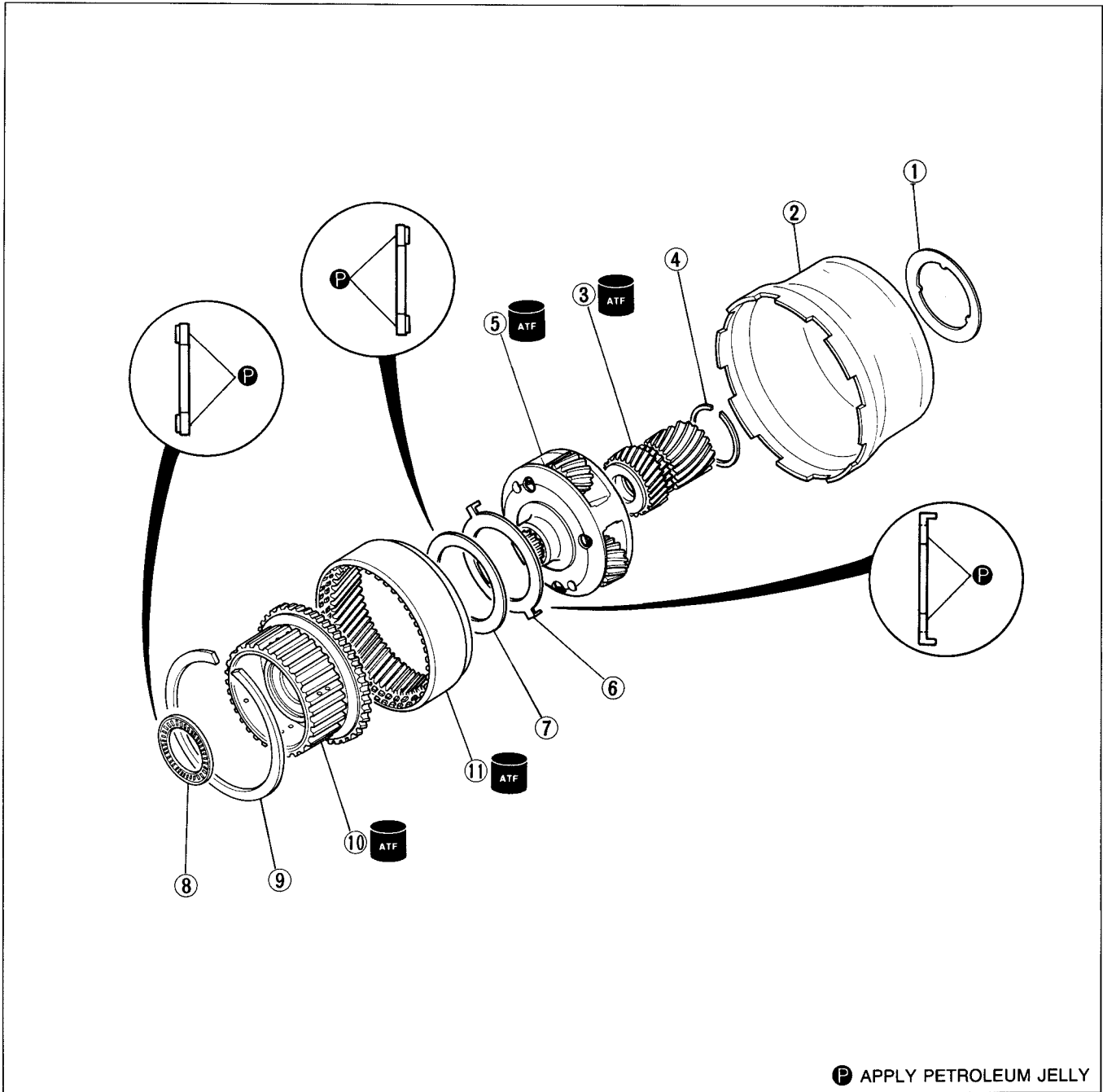
Bearing race outer diameter: 51.5mm (2.028 in)

CONNECTING SHELL AND FRONT PLANETARY GEAR UNIT (REAR CLUTCH HUB, FRONT PLANETARY PINION CARRIER, REAR SUN GEAR)

Disassembly and Inspection

Disassemble in the order shown in the figure.

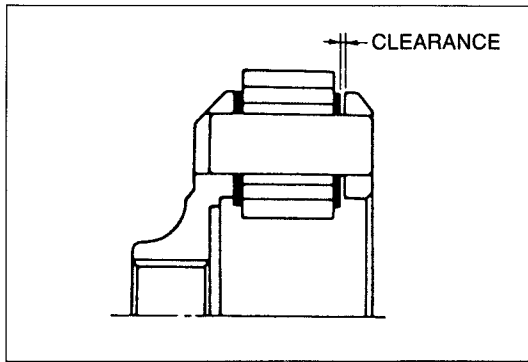
Inspect all parts, and repair or replace as necessary.



P APPLY PETROLEUM JELLY

97U0KX-156

- | | | |
|---|--|--|
| <p>1. Bearing race
Inspect for bearing surface scoring or scratches</p> <p>2. Connecting shell</p> <p>3. Front sun gear
Inspect individual gear teeth for damage, wear, or cracks</p> <p>4. Snap ring</p> | <p>5. Front planetary pinion carrier
Inspect individual gear teeth for damage, wear, or cracks, and rotation of pinion gears Inspection page K-96</p> <p>6. Bearing race
Inspect for bearing surface scoring or scratches</p> <p>7. Bearing
Inspect for damage or rough rotation</p> | <p>8. Bearing
Inspect for damage or rough rotation</p> <p>9. Snap ring</p> <p>10. Rear clutch hub</p> <p>11. Internal gear
Inspect individual gear teeth for damage, wear, or cracks</p> |
|---|--|--|



9MU0K2-257

Inspection

Front planetary pinion carrier

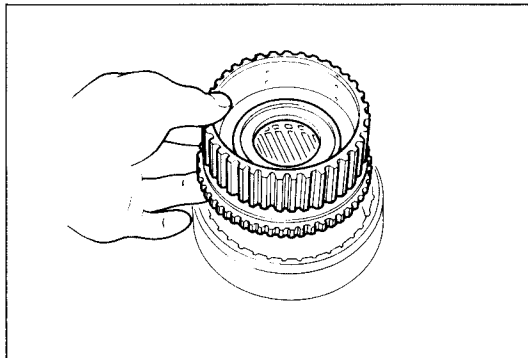
1. Measure the clearance between the pinion washer and the planetary pinion carrier.

Clearance

Standard : 0.2—0.7mm (0.008—0.028 in)

Maximum: 0.8mm (0.031 in)

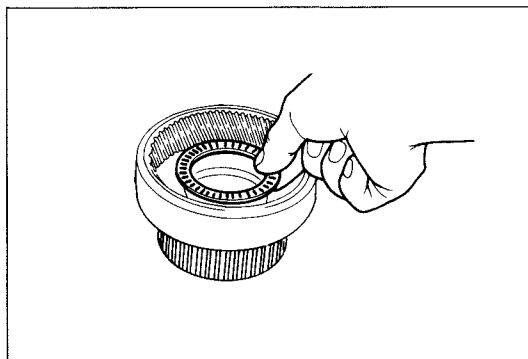
2. If not within specification, replace the planetary pinion carrier.



97U0KX-157

Assembly

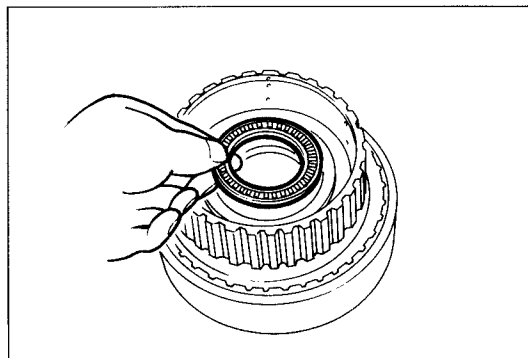
1. Apply ATF to the rear clutch hub and internal gear, and assemble them with the snap ring.



97U0KX-158

2. Apply petroleum jelly to the bearing, and install it onto the rear clutch hub.

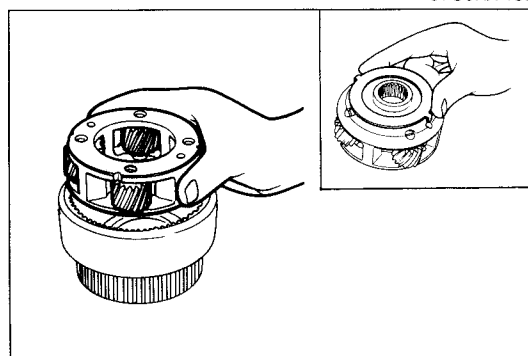
Bearing outer diameter: 70.0mm (2.756 in)



97U0KX-159

3. Apply petroleum jelly to the bearing, and install it onto the rear clutch hub.

Bearing outer diameter: 53.0mm (2.087 in)

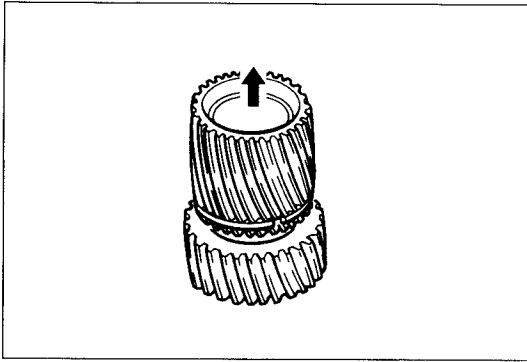


97U0KX-160

4. Apply petroleum jelly to the bearing race and, install it onto the front planetary pinion carrier.

Bearing race outer diameter: 70.0mm (2.756 in)

5. Apply ATF to the front planetary pinion carrier, and install it into the internal gear.

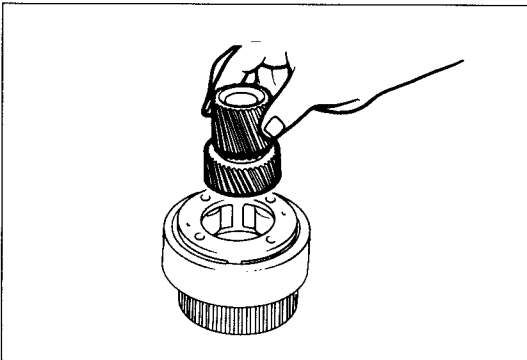


97U0KX-161

Note

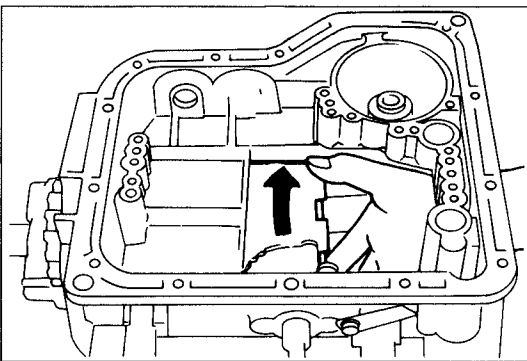
Pay close attention to the front and rear directions of the sun gear. The grooved side (arrow) is the front.

6. Install the snap ring onto the sun gear.



97U0KX-162

7. Apply ATF to the sun gear, and install it into the front planetary pinion carrier.



9MU0K2-263

**REAR PLANETARY GEAR UNIT
(CONNECTING DRUM, REAR PLANETARY PINION
CARRIER, ONE-WAY CLUTCH)**

Preinspection

One-way clutch operation

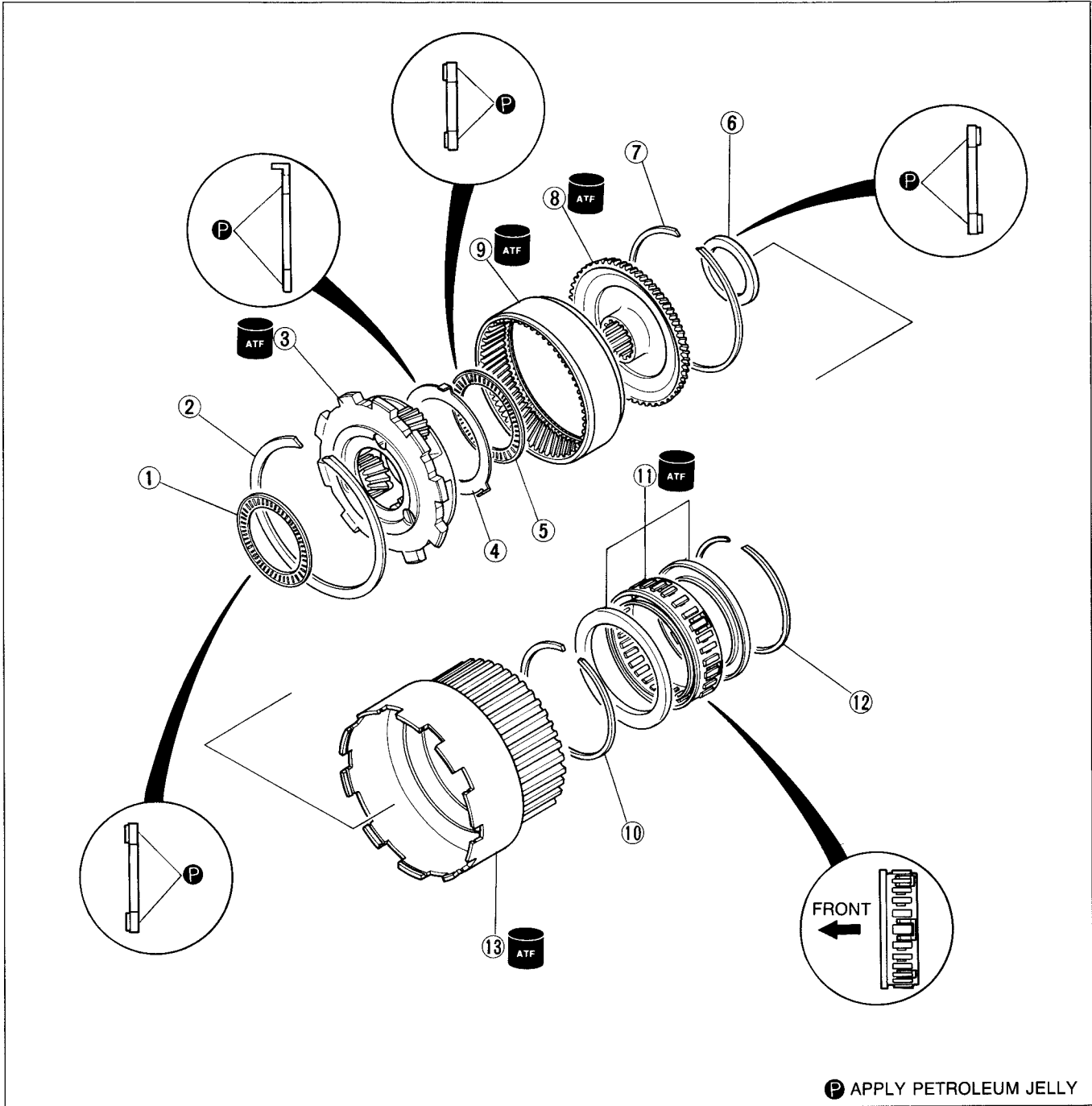
Install the rear planetary gear unit and check that the rear planetary gear unit rotate smoothly when turned clockwise and locked when turned counterclockwise.

If not, replace the one-way clutch.

K TRANSMISSION

Disassembly and Inspection

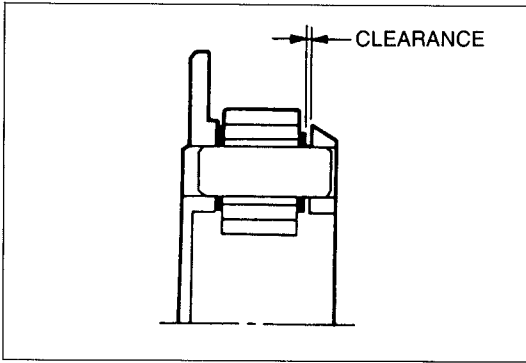
Disassemble in the order shown in the figure.
Inspect all parts, and repair or replace as necessary.



P APPLY PETROLEUM JELLY

97U0KX-163

- | | | |
|--|--|--|
| <p>1. Bearing
Inspect for damage or rough rotation</p> <p>2. Snap ring</p> <p>3. Rear planetary pinion carrier
Inspect individual gears teeth for damage, wear, or cracks, and rotation of pinion gears Inspection page K-99</p> <p>4. Bearing race
Inspect for bearing surface scoring or scratches</p> | <p>5. Bearing
Inspect for damage or rough rotation.</p> <p>6. Bearing
Inspect for damage or rough rotation</p> <p>7. Snap ring</p> <p>8. Drive flange
Inspect individual gears teeth for damage, wear, or cracks</p> | <p>9. Internal gear
Inspect individual gears teeth for damage, wear, or cracks</p> <p>10. Snap ring</p> <p>11. One-way clutch
Inspection page K-97</p> <p>12. Snap ring</p> <p>13. Connecting drum</p> |
|--|--|--|



9MU0K2-266

Inspection

Rear planetary pinion carrier

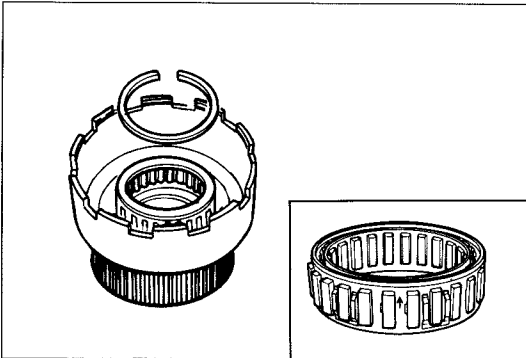
1. Measure the clearance between the pinion washer and the planetary pinion carrier.

Clearance

Standard: 0.2—0.7mm (0.008—0.028 in)

Maximum: 0.8mm (0.031 in)

2. If not within specification, replace the planetary pinion carrier.



97U0KX-164

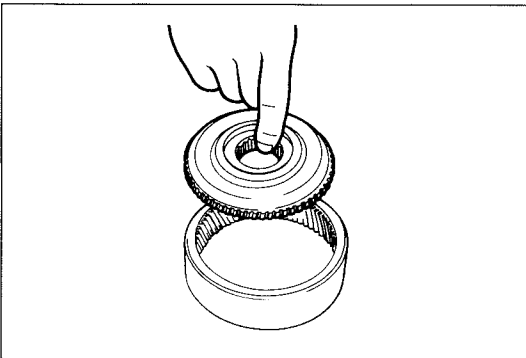
Assembly

Caution

a) Do not deform the snap ring.

b) Install the side indicated by an arrow in the figure toward the front when inserting the one-way clutch into the connecting drum.

1. Install the snap ring into the connecting drum.
2. Apply ATF to the one-way clutch. Install it in the connecting drum and the snap ring.



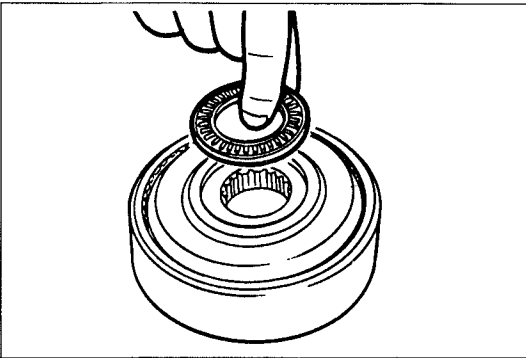
97U0KX-165

3. Apply ATF to the drive flange and internal gear, and install it into the internal gear.

Caution

Do not deform the snap ring.

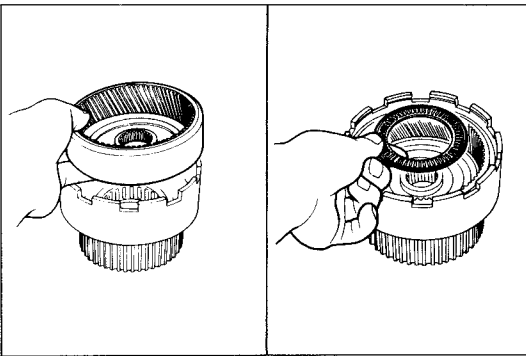
4. Install the snap ring.



97U0KX-166

5. Apply petroleum jelly to the bearing, and install it onto the drive flange.

Bearing outer diameter: 47.0mm (1.850 in)

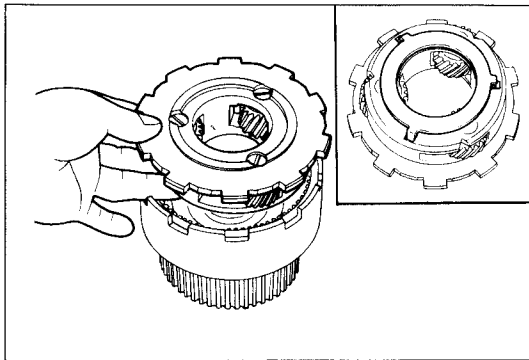


97U0KX-167

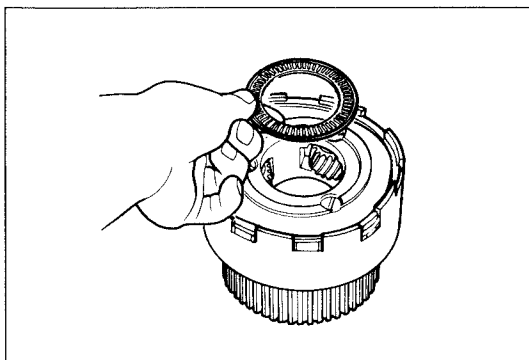
6. Install the internal gear and the drive flange into the connecting drum.

7. Apply petroleum jelly to the bearing, and install it onto the drive flange.

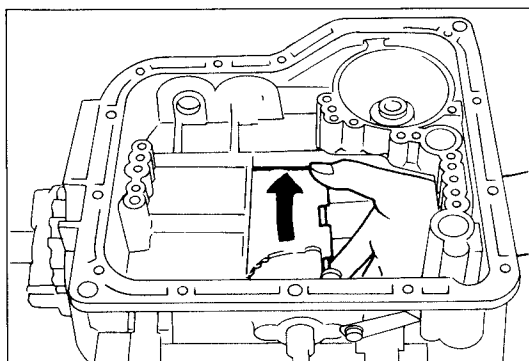
Bearing outer diameter: 70.0mm (2.756 in)



97U0KX-168



97U0KX-169



97U0KX-170

8. Apply petroleum jelly to the bearing race, and install it onto the rear planetary pinion carrier.

Bearing race outer diameter: 70.0mm (2.756 in)

9. Apply ATF to the rear planetary pinion carrier, and install it into the connecting drum.

Caution

Do not deform the snap ring.

10. Install the snap ring.

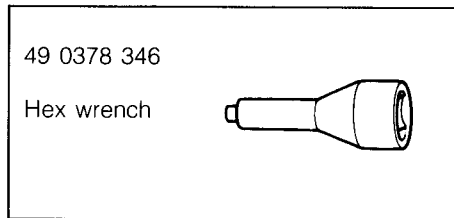
11. Apply petroleum jelly to the bearing, and install it onto the bearing race.

Bearing race outer diameter: 70.0mm (2.756 in)

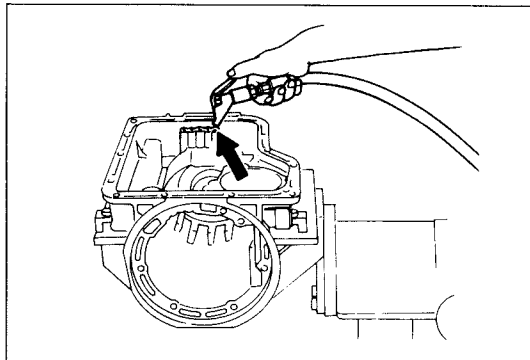
Note

If it turns counterclockwise, the one-way clutch is installed upside down.

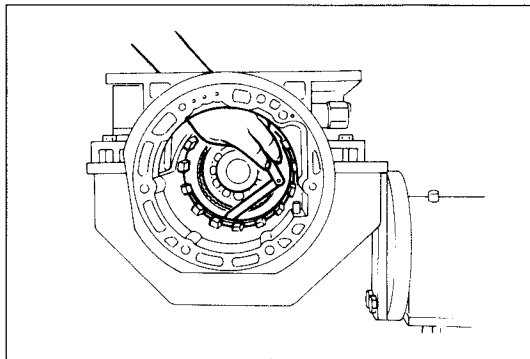
12. Install the rear planetary gear unit and check the one-way clutch operation by turning right and left. It should turn clockwise only, and locked counterclockwise.

LOW AND REVERSE BRAKE**Preparation****SST**

9MU0K2-213



9MU0K2-214



9MU0K2-215

Preinspection**Low and reverse brake operation**

1. Apply compressed air through the oil passage as shown.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

2. Verify that the retaining plate moves toward the snap ring. If not, the seal ring or O-ring may be damaged or fluid may be leaking at the piston check ball. Inspect them, and replace as necessary when assembling.

Clearance between retaining plate and snap ring

Measure the clearance between the retaining plate and the snap ring.

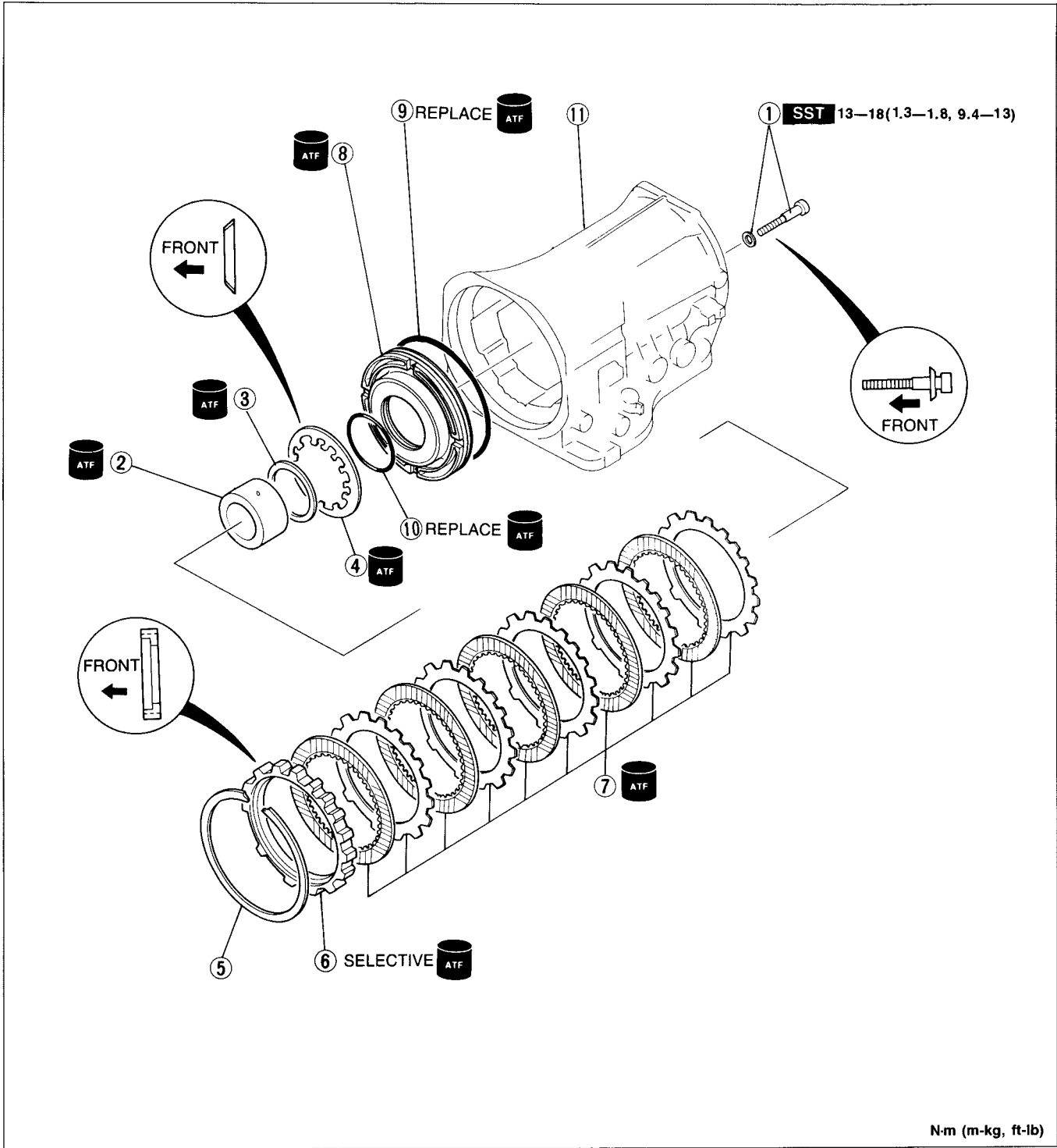
Clearance: 0.8—1.05mm (0.031—0.041 in)

Select and install the correct retaining plate when assembling.

K TRANSMISSION

Disassembly and Inspection

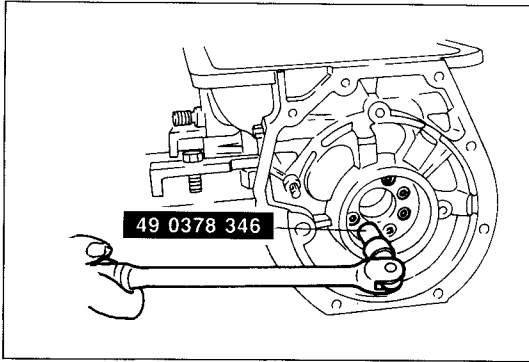
Disassemble in the order shown in the figure, referring to **Disassembly Note**.
Inspect all parts, and repair or replace as necessary.



N·m (m·kg, ft·lb)

97U0KX-171

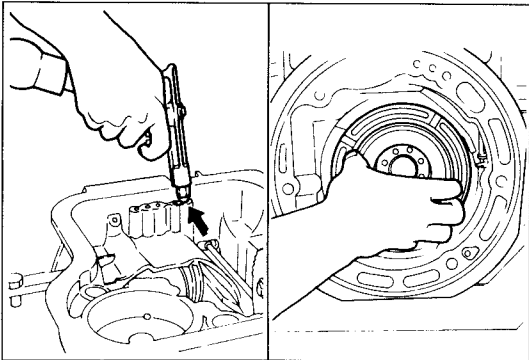
- | | | |
|---|--|-----------------------|
| 1. Allen head bolts and dished washers | 7. Drive plates and driven plates
Inspect for wear or burning | 9. Seal ring |
| 2. One-way clutch inner race
Removal..... page K-103 | 8. Low and reverse brake piston
Inspect balls for sticking by shaking piston
Removal..... page K-103 | 10. O-ring |
| 3. Thrust washer | | 11. Transmission case |
| 4. Return spring
Inspection page K-103 | | |
| 5. Snap ring | | |
| 6. Retaining plate | | |



9MU0K2-217

Disassembly note
One-way clutch inner race

1. Remove the allen head bolts from the rear of the transmission case with the **SST**.
2. Remove the one-way clutch inner race, thrust washer, and piston return spring.

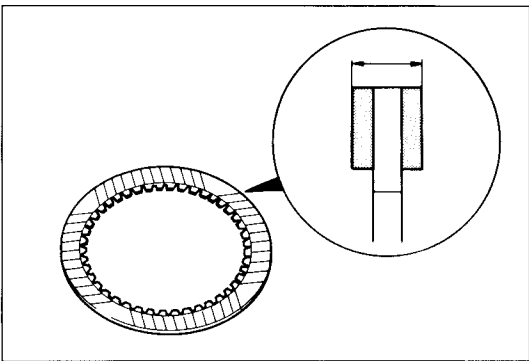


9MU0K2-218

Low and reverse brake piston

Remove the piston by applying compressed air through the oil passage.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.



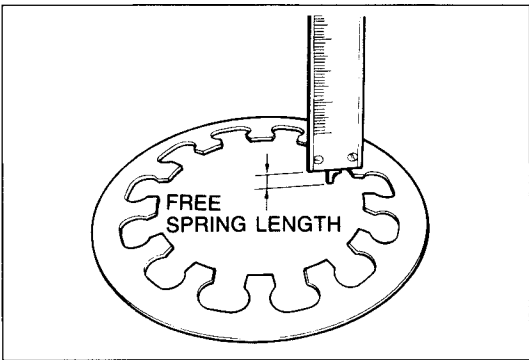
9MU0K2-219

Inspection
Drive plate

1. Measure the facing thickness in three places, and determine the average of the three readings.

Standard thickness: 1.6mm (0.063 in)
Minimum thickness: 1.4mm (0.055 in)

2. If not within specification, replace the drive plates.



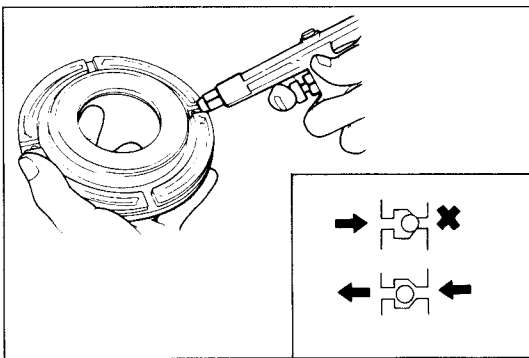
9MU0K2-220

Return spring

1. Measure the return spring free length.

Spring free length: 5.3—6.2mm (0.209—0.244 in)

2. If not within specification, replace the return spring.



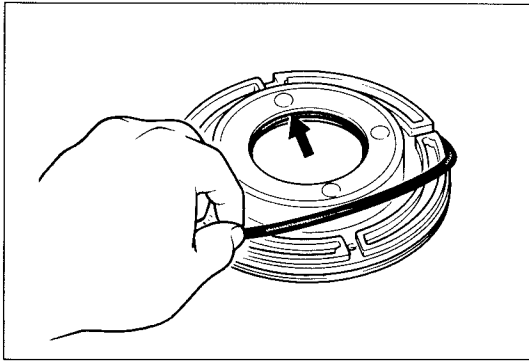
9MU0K2-221

Clutch piston

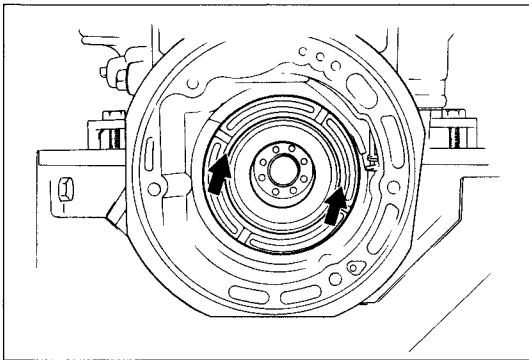
1. Verify that there is no air leakage when applying compressed air through the oil hole opposite the return spring.
2. Verify that there is airflow when applying compressed air through the oil hole on the return spring side.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

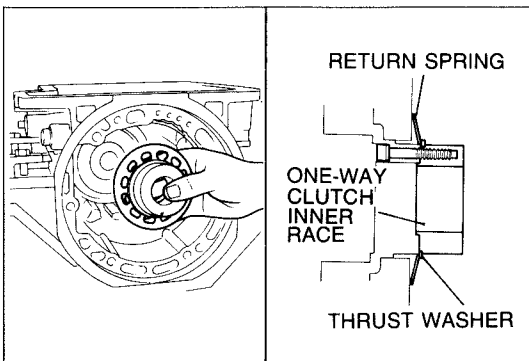
3. If not correct, replace the clutch piston.



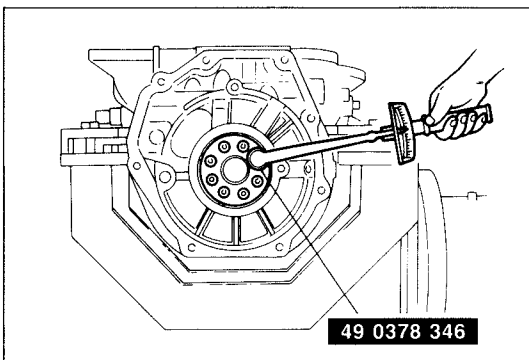
9MU0K2-222



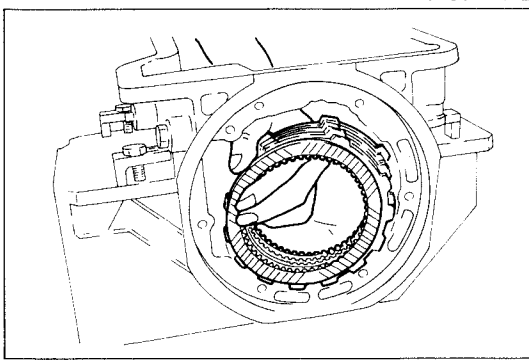
9MU0K2-223



9MU0K2-224



97U0KX-172



9MU0K2-226

Assembly

1. Apply ATF to a new O-ring and install it onto the piston.
2. Apply ATF to a new seal ring and install it onto the piston.

Caution

Apply even pressure to the outside edge of the piston to avoid damaging the seal ring and O-ring when installing.

3. Install the low and reverse brake piston.

4. Apply ATF to the one-way clutch inner race, thrust washer, and return spring.
5. Assemble the one-way clutch inner race, thrust washer, and return spring, and install them in the transmission case.
6. Check that the return spring, thrust washer, and rings are properly positioned before securing the bolts.

7. Tighten the allen head bolts with the **SST**.

Tightening torque:

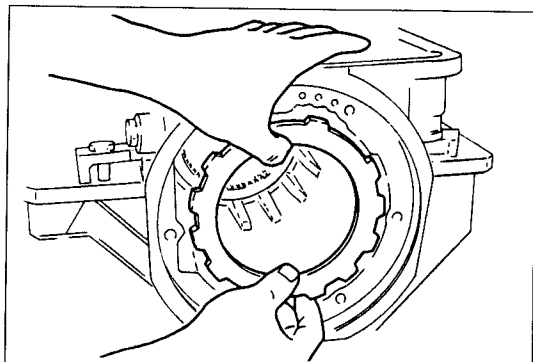
13—18 N·m (1.3—1.8 m·kg, 9.4—13 ft·lb)

Note

Installation order:

Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive-Driven-Drive

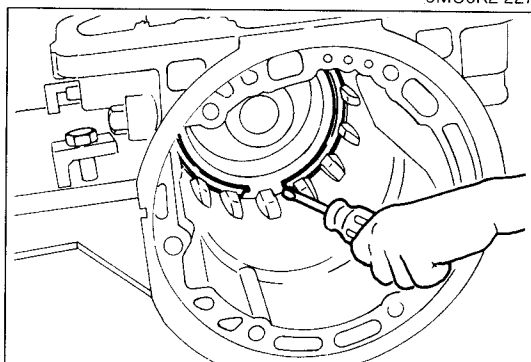
8. Apply ATF to the driven plates and driven plates, and install them into the transmission case.



9MU0K2-227

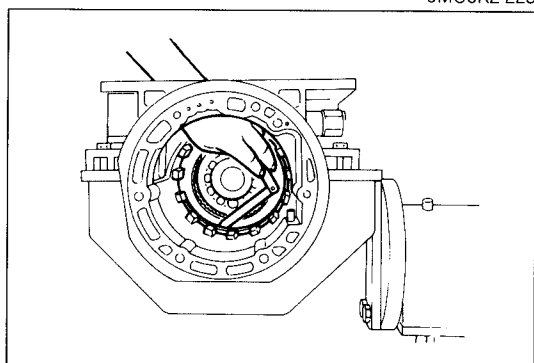
9. Install the retaining plate.

Caution
Do not deform the snap ring.



9MU0K2-228

10. Install the snap ring with a screwdriver.



97U0KX-173

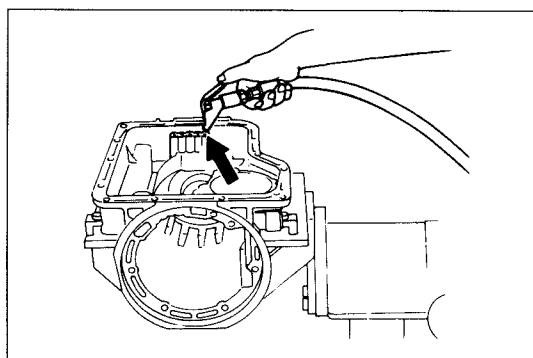
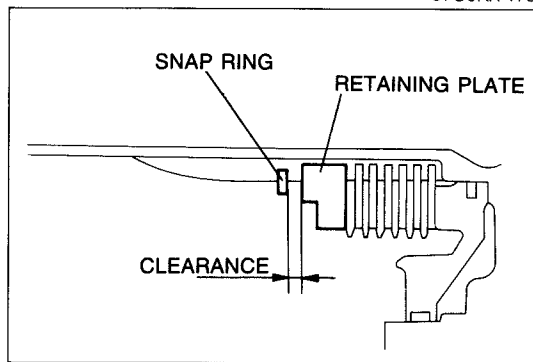
11. Measure the clearance between the snap ring and the retaining plate with a feeler gauge. If not within specification, adjust the clearance by installing the proper retaining plate.

Clearance: 0.8—1.05mm (0.031—0.041 in)

Retaining plate sizes

mm (in)

11.8 (0.465)	12.0 (0.472)	12.2 (0.480)
12.4 (0.488)	12.6 (0.496)	12.8 (0.504)



9MU0K2-231

Caution
Apply air for no more than three(3) seconds.

12. Check operation of the piston by applying compressed air through the oil passage of the low and reverse brake.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

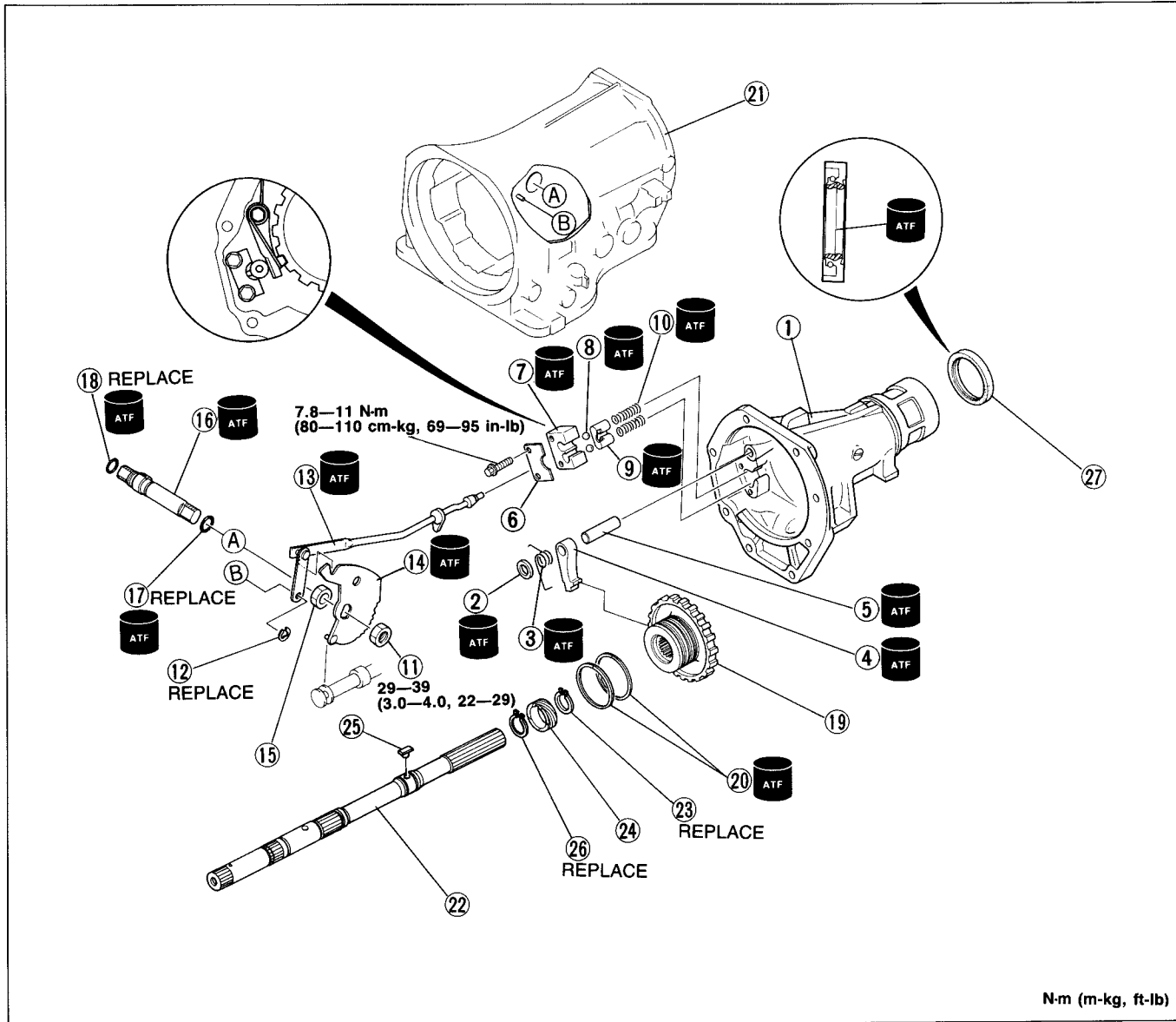
K TRANSMISSION

EXTENTION HOUSING AND PARKING MECHANISM Disassembly and Inspection

Caution

Do not remove the oil seal if not necessary for repairs.

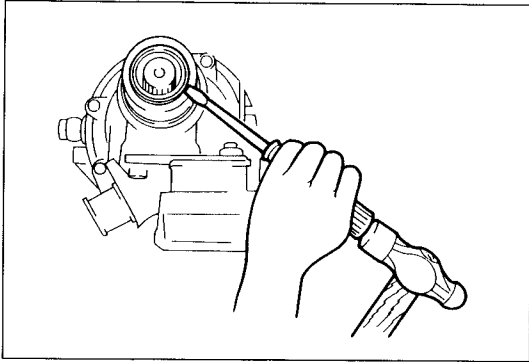
Disassemble in the order shown in the figure referring to **Disassembly Note**.
Inspect all parts, and repair or replace if necessary.



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

97U0KX-174

- | | | |
|----------------------|--|------------------------------------|
| 1. Extension housing | 13. Parking rod | 22. Output shaft |
| 2. Dowel spacer | Inspect individual gear teeth for damage or wear | Inspect splines for damage or wear |
| 3. Return spring | and condition of spring | 23. Snap ring |
| 4. Parking pawl | 14. Manual plate | 24. Speedometer drive gear |
| 5. Pawl shaft | 15. Spacer | Inspect for wear or damage |
| 6. Retainer plate | 16. Manual shaft | 25. Key |
| 7. Actuator support | 17. O-ring | 26. Snap ring |
| 8. Steel ball | 18. O-ring | 27. Oil seal |
| 9. Retainer | 19. Oil distributor | Inspect for damage or crack |
| 10. Spring | Inspection page K-107 | Removal..... page K-107 |
| 11. Nut | 20. Seal rings | |
| 12. Retaining ring | 21. Transmission case | |



9MU0K2-276

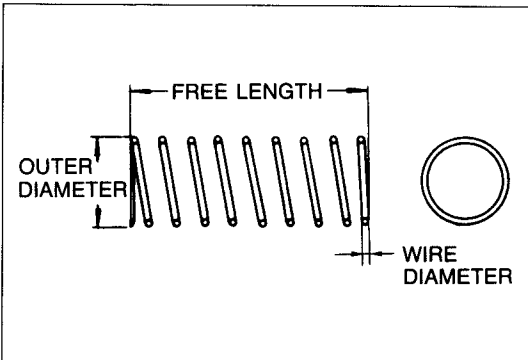
Disassembly note

Oil seal

Caution

Do not remove the seal unless necessary.

Remove the oil seal with a screwdriver.



9MU0K2-277

Inspection

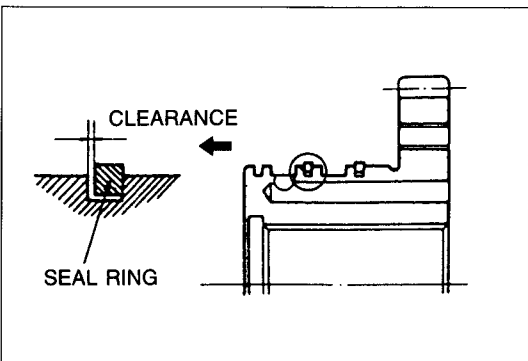
Spring

1. Measure the spring specifications.

Specifications

Outer dia. mm (in)	Free length mm (in)	No. of coils	Wire dia. mm (in)
7.2 (0.283)	32.0 (1.260)	14.0	0.7 (0.028)

2. If not within specification, replace the spring.



97U0KX-175

Oil distributor

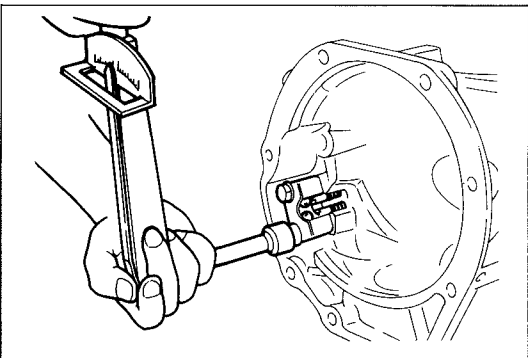
1. Measure the clearance between the seal rings and the grooves.

Clearance:

Standard: 0.04—0.16mm (0.002—0.006 in)

Maximum: 0.40mm (0.016 in)

2. If not within specification, replace the oil distributor.



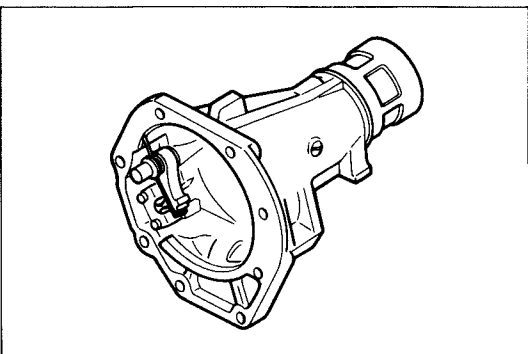
9MU0K2-279

Assembly

1. Apply ATF to a new oil seal, and install it into the extension housing.
2. Apply ATF to the springs and retainer and install them into the extension housing.
3. Apply ATF to the steel balls and actuator support and install them into the extension housing.
4. Apply ATF to the retainer plate, and install it into the extension housing.

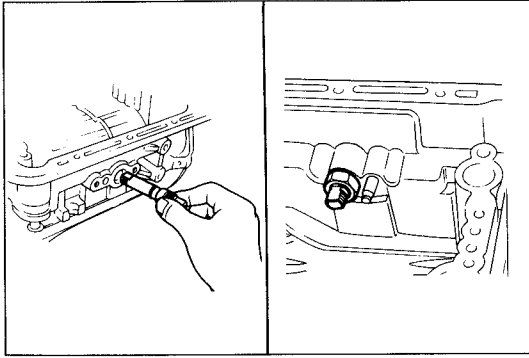
Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

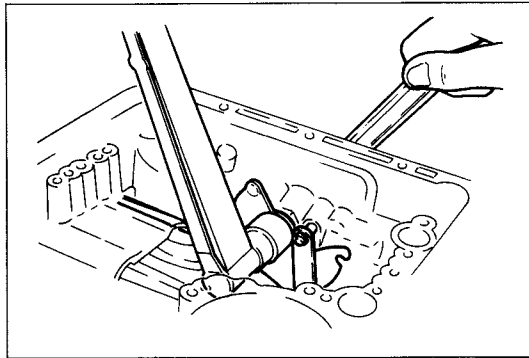


9MU0K2-280

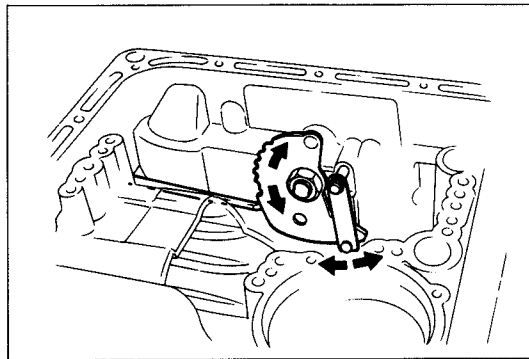
5. Apply ATF to the pawl shaft, and install it into the extension housing.
6. Apply ATF to the parking pawl and return spring, and install them into the extension housing.
7. Apply ATF to the dowel spacer, and install it into the extension housing.



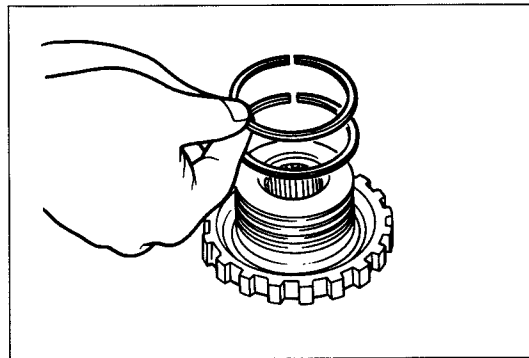
9MU0K2-281



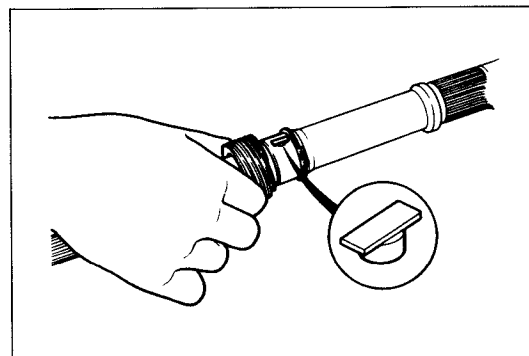
9MU0K2-282



9MU0K2-283



97U0KX-176



97U0KX-177

8. Apply ATF to the new O-rings, and install them onto the manual shaft.
9. Apply ATF to the manual shaft and spacer, and install them into the transmission case.
10. Install the parking rod and retaining ring.
11. Apply ATF to the manual plate, and install it onto the manual shaft.
12. Loosely tighten the locknut.

13. Tighten the locknut.

Tightening torque:

29—39 N·m (3.0—4.0 m·kg, 22—29 ft·lb)

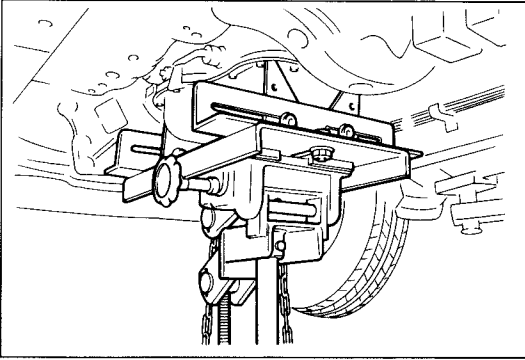
14. Check the parking mechanism operation.

15. Apply ATF to the new seal rings, and install them onto the oil distributor.

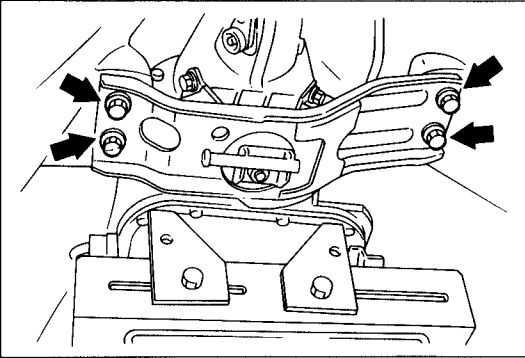
Caution

Do not deform the snap ring.

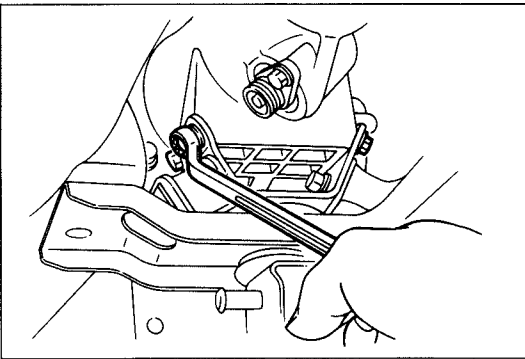
16. Install the snap ring, key, and speedometer drive gear onto the output shaft.
17. Secure the speedometer drive gear with the snap ring.



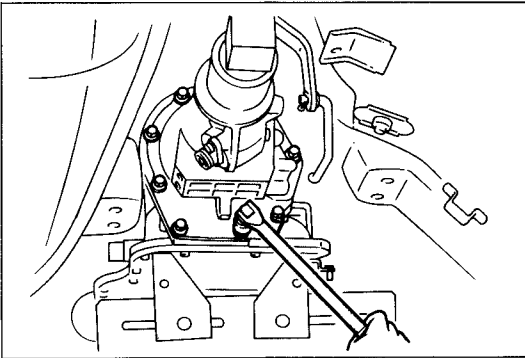
97U0KX-178



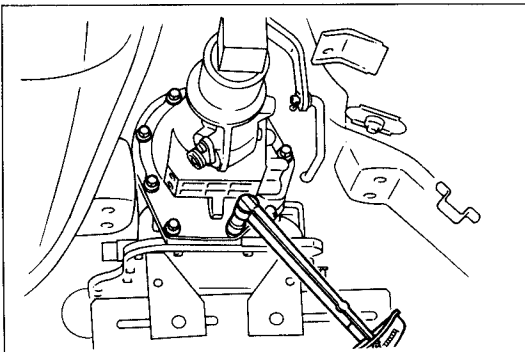
97U0KX-179



97U0KX-180



97U0KX-181



9MU0K2-289

On-vehicle Removal

1. Disconnect the negative battery cable.
2. Jack up the vehicle and support it with safety stands.
3. Remove the crossmember (Convertible), exhaust pipe, and heat insulator. (Refer to page K-48.)
4. Remove the propeller shaft. (Refer to Section L.)
5. Disconnect the speedometer cable.
6. Support the transmission with a transmission jack.

7. Remove the transmission mount from the body.

8. Remove the transmission mount from the extension housing.

Note

Prepare a suitable container to drain the ATF into.

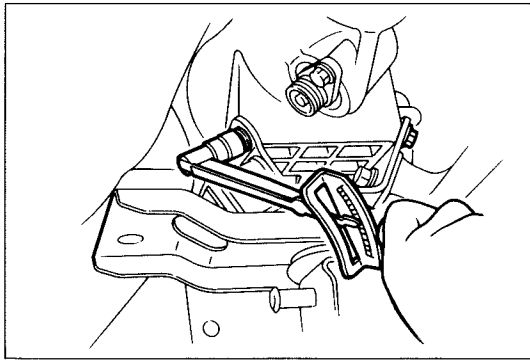
9. Remove the extension housing and gasket.

On-vehicle Installation

1. Install a new gasket on the transmission case.
2. Install the extension housing.

Tightening torque:

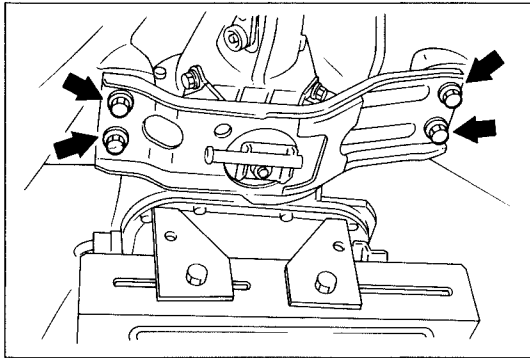
20—25 N·m (2.0—2.5 m·kg, 14—18 ft·lb)



97U0KX-182

3. Install the transmission mount under the extension housing.

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

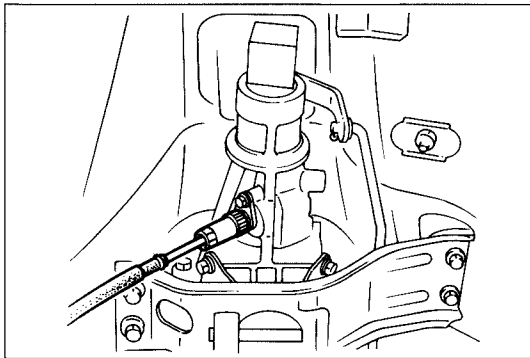


97U0KX-183

4. Install the transmission mount.

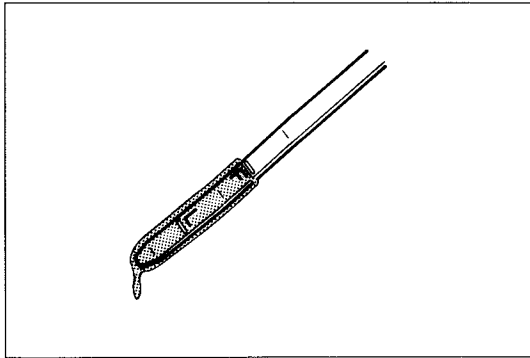
Tightening torque:
31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

5. Remove the transmission jack.



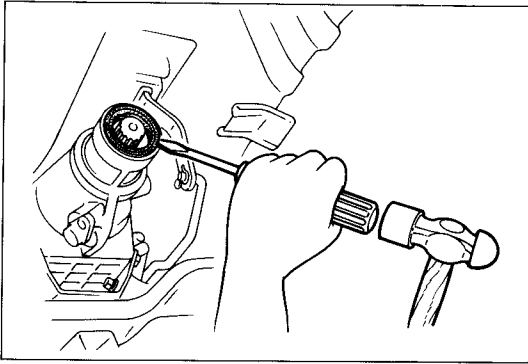
9MU0K2-293

6. Connect the speedometer cable.

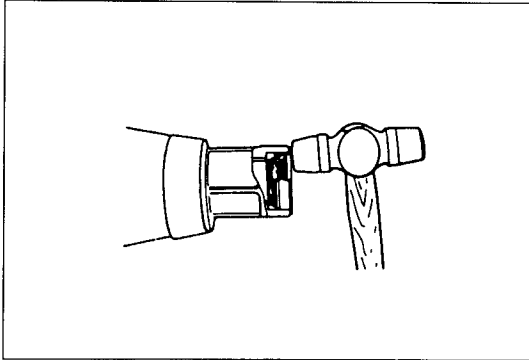


97U0KX-184

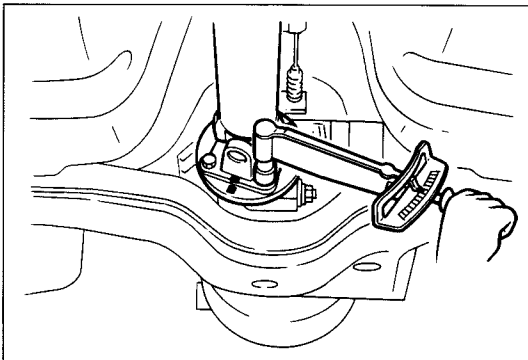
7. Install the propeller shaft. (Refer to Section L.)
8. Install the heat insulator, exhaust pipe, and crossmember (Convertible). (Refer to page K-149.)
9. Add ATF, and check the ATF level. (Refer to page K-45.)



97U0KX-185



97U0KX-186



97U0KX-187

OIL SEAL Inspection

Check for damage, wear, or oil leaking of oil seal. Replace if necessary.

On-vehicle Replacement

1. Remove the crossmember (Convertible), exhaust pipe, and heat insulator. (Refer to page K-48.)
2. Remove the propeller shaft. (Refer to Section L.)
3. Remove the oil seal from the extension housing with a screwdriver.
4. Coat the oil seal lip with ATF.
5. Install the oil seal squarely into the extension housing with a plastic hammer.
6. Install the propeller shaft. (Refer to Section L.)
7. Install the heat insulator, exhaust pipe, and crossmember (Convertible). (Refer to page K-149.)

K TRANSMISSION

CONTROL VALVE BODY Disassembly and Inspection

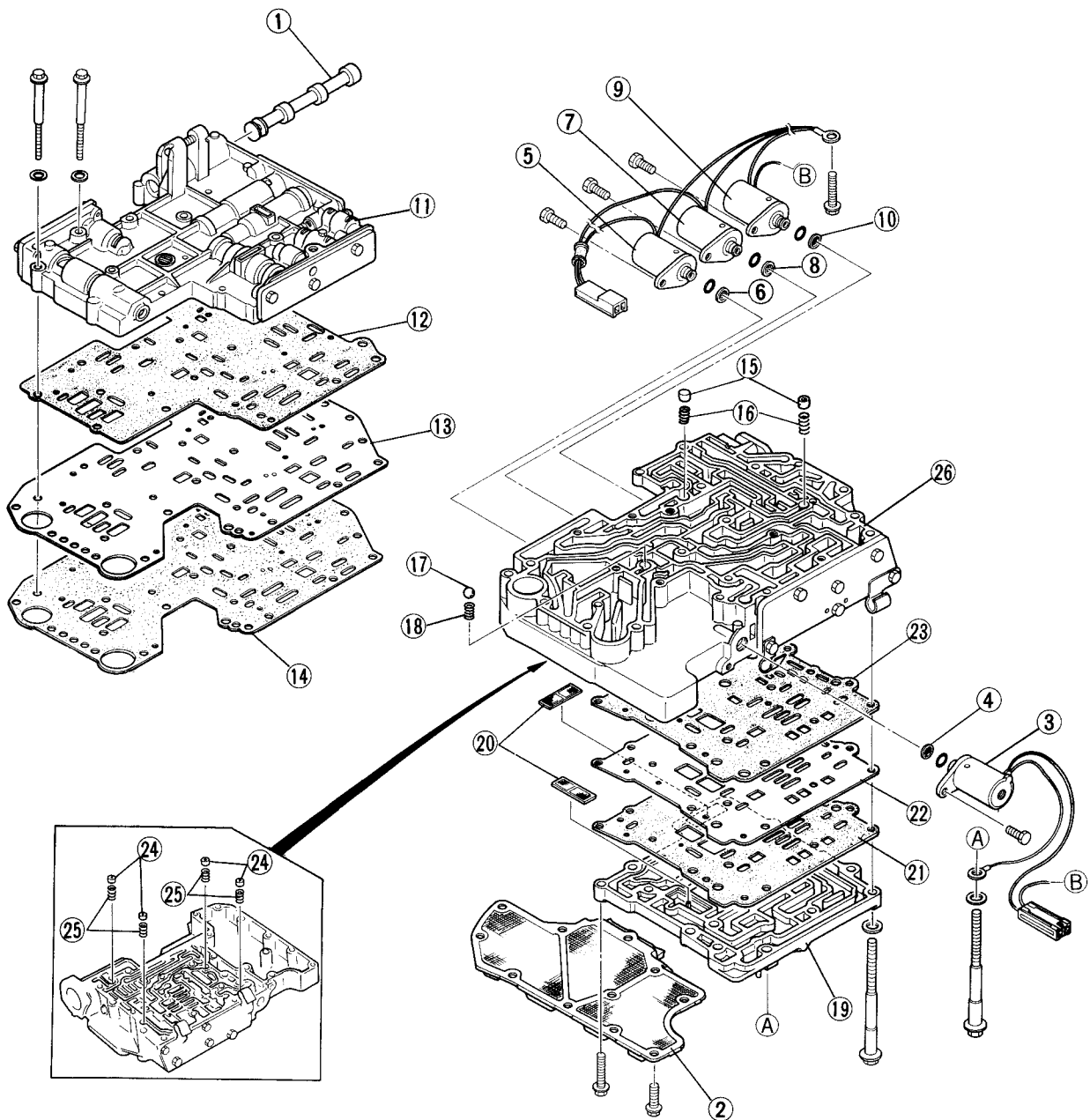
Caution

- a) Be especially careful when handling the control valve because it consists of the most precise and delicate parts of the transmission.
- b) Neatly arrange the removed parts to avoid confusing them with similar parts.
- c) Clean the removed parts with cleaning solvent and dry them with compressed air.
Clean out all holes and passages with compressed air.

Disassemble in the order shown in the figure, referring to **Disassembly Note**.
Inspect all parts and repair or replace as necessary.

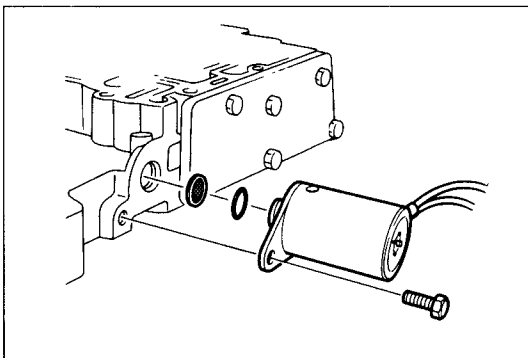


APPLY SPECIFIED ATF TO INDIVIDUAL PARTS



- | | | |
|---|--|--|
| 1. Manual valve
Inspect for sticking, scoring, or scratches | 9. 3-4 shift solenoid valve
Removal..... page K-114
Inspection page K- 41 | 18. Throttle relief spring
Removal..... page K-115
Inspection page K-115 |
| 2. Oil strainer
Inspect for clogging or damage | 10. Oil strainer
Inspect for clogging or damage | 19. Valve body cover
Inspect for damage or scoring |
| 3. 3-2 control solenoid valve
Removal..... page K-113
Inspection page K- 41 | 11. Upper valve body
Removal..... page K-114
Disassembly and
Inspection page K-116 | 20. Inner strainer
Inspect for clogging or damage |
| 4. Oil strainer
Inspect for clogging or damage | 12. Upper gasket
Assembly page K-121 | 21. Cover gasket |
| 5. 1-2 shift solenoid valve
Removal..... page K-113
Inspection page K- 41 | 13. Separate plate
Inspect fluid passage for clogging or damage
Removal..... page K-114 | 22. Separate plate
Inspect fluid passage for clogging or damage
Removal..... page K-115 |
| 6. Oil strainer
Inspect for clogging or damage | 14. Lower gasket | 23. Lower gasket |
| 7. 2-3 shift solenoid valve
Removal..... page K-114
Inspection page K- 41 | 15. Orifice check valve
Removal..... page K-115 | 24. Orifice check valve
Removal..... page K-115 |
| 8. Oil strainer
Inspect for clogging or damage | 16. Orifice check spring
Removal..... page K-115
Inspection page K-115 | 25. Orifice check spring
Removal..... page K-115
Inspection page K-115 |
| | 17. Throttle relief ball
Removal..... page K-115 | 26. Lower valve body
Disassembly and
Inspection page K-116
Assembly page K-121 |

97U0KX-189



97U0KX-190

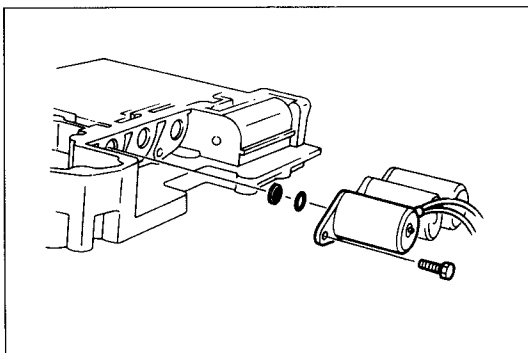
Disassembly note
3-2 control solenoid valve

1. Remove the 3-2 control solenoid valve.

Note

Be careful not to lose the oil strainer.

2. Remove the oil strainer and O-ring.



97U0KX-191

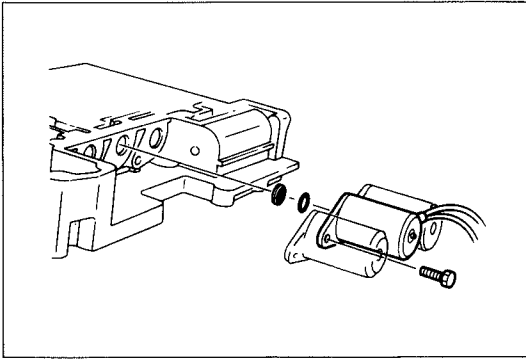
1-2 shift solenoid valve

1. Remove the 1-2 shift solenoid valve.

Note

Be careful not to lose the oil strainer.

2. Remove the oil strainer and O-ring.



97U0KX-192

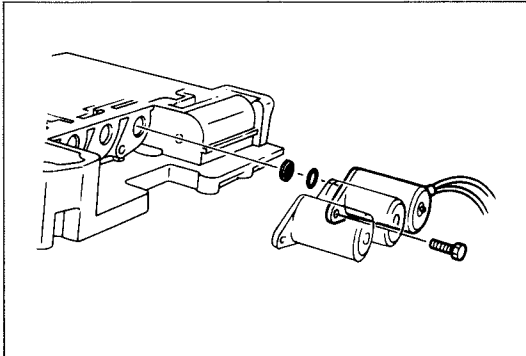
2-3 shift solenoid valve

1. Remove the 2-3 shift solenoid valve.

Note

Be careful not to lose the oil strainer.

2. Remove the oil strainer and O-ring.



97U0KX-193

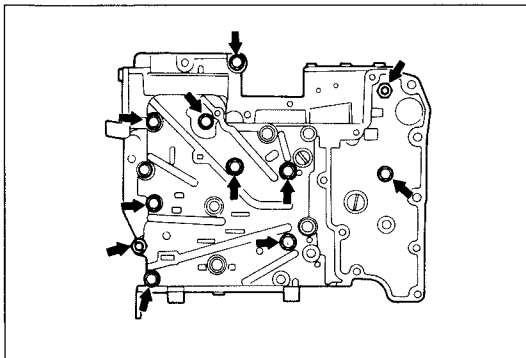
3-4 shift solenoid valve

1. Remove the 3-4 shift solenoid valve.

Note

Be careful not to lose the oil strainer.

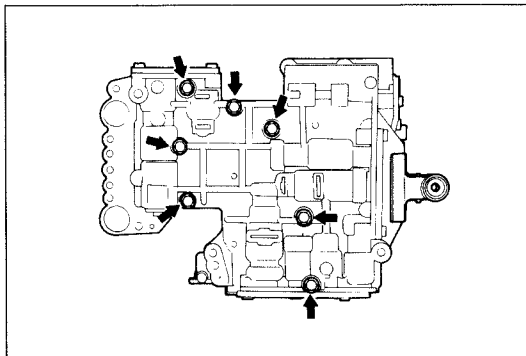
2. Remove the oil strainer and O-ring.



89U07B-092

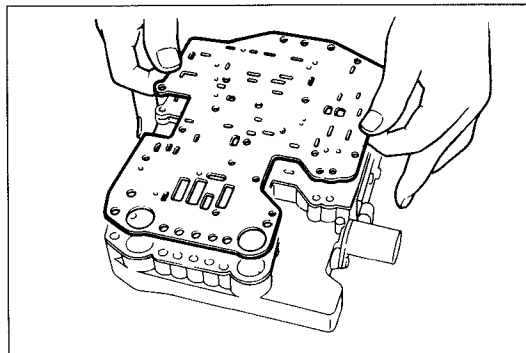
Upper valve body

1. Remove the bolts and nuts shown in the figure.



89U07B-093

2. Hold the lower valve body and separate plate together with a large clip.
3. Remove the upper valve body.



97U0KX-194

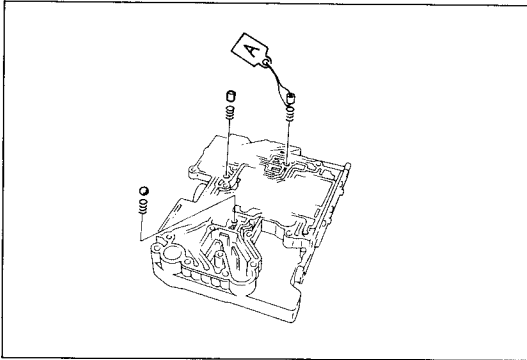
Separate plate

1. Remove the clip.

Caution

Remove the separate plate and lower gasket gently to avoid losing the orifice check valves and springs and the throttle relief ball and spring in the valve body.

2. Remove the separate plate and lower gasket.



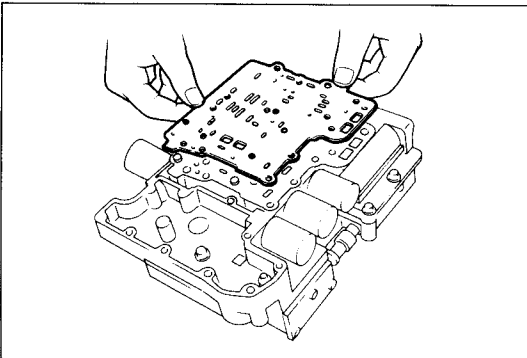
97U0KX-195

Orifice check valve, Throttle relief ball, Spring

Note

Tag the orifice check valve as shown for proper reassembly.

Remove the orifice check valves, throttle relief ball, and springs.



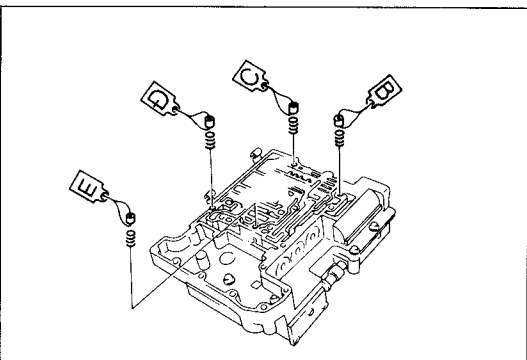
97U0KX-196

Separate plate

Caution

Remove the separate plate and lower gasket gently to avoid losing the orifice check valves and springs in the valve body.

Remove the separate plate and lower gasket.



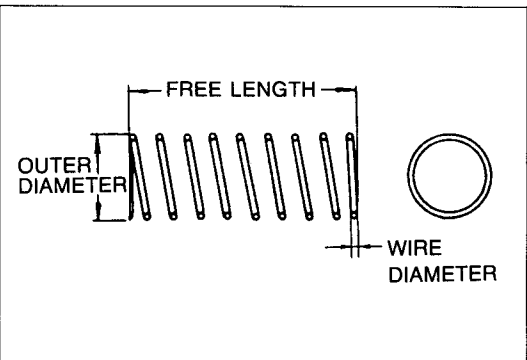
97U0KX-197

Orifice check valve, Spring

Note

Tag the orifice check valves as shown for proper reassembly.

Remove the orifice check valves and springs.



97U0KX-198

Inspection

1. Measure the spring specifications.
2. If not within specification, replace the spring(s).

Spring	Item	Outer dia. mm (in)	Free length mm (in)	No. of coils	Wire dia. mm (in)
Orifice check		5.0 (0.197)	15.5 (0.610)	12.0	0.23 (0.009)
Throttle relief		6.5 (0.256)	26.8 (1.055)	16.0	0.9 (0.035)

97U0KX-199

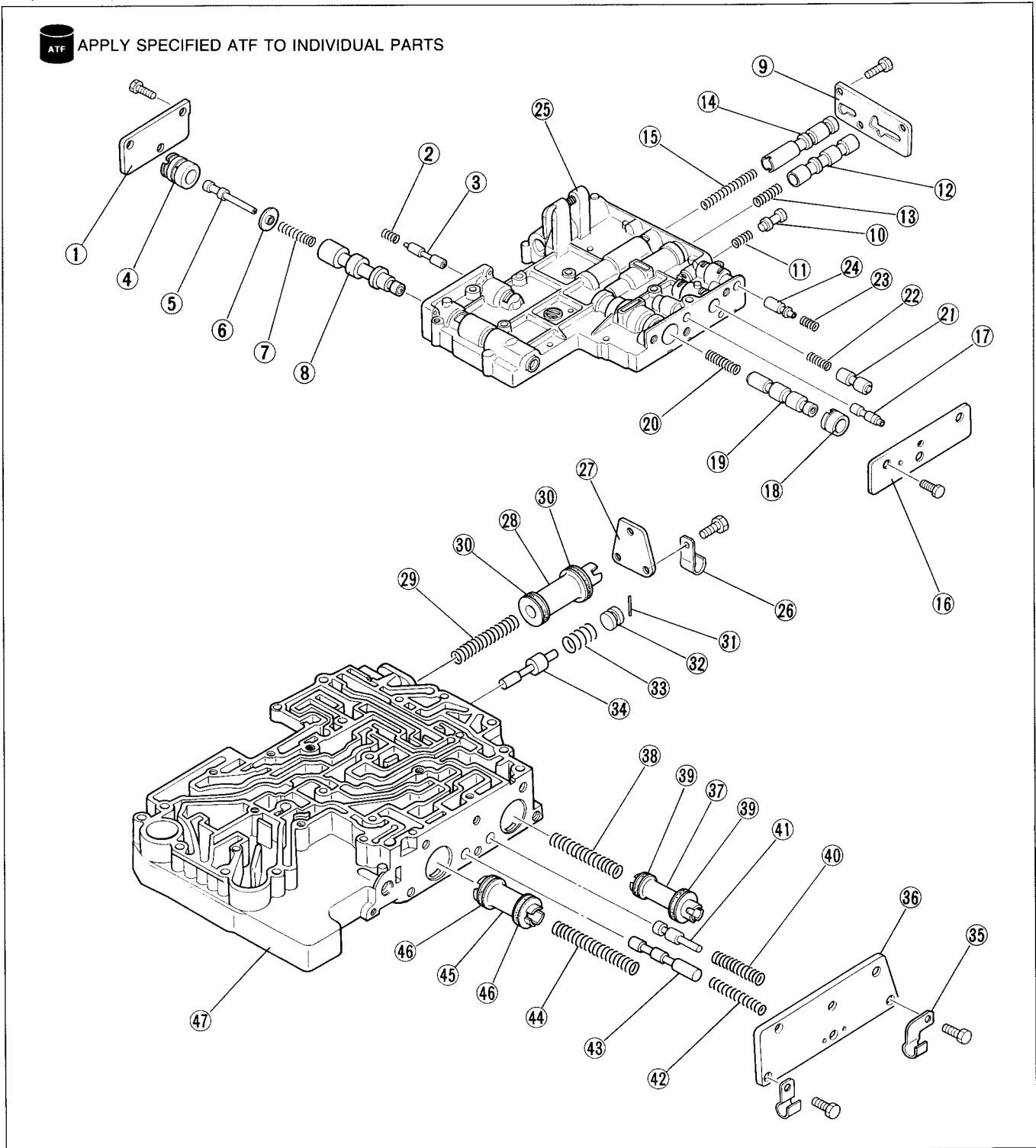
K TRANSMISSION

UPPER AND LOWER VALVE BODY Disassembly and Inspection

Caution

- Each valve should slide out by its own weight.
- When a valve will not slide out by its own weight, depending on the valve, push it out with a wire or place the valve body open-side down and lightly tap it with a soft hammer. Never scratch or otherwise damage the valve surface or bore.
- Do not drop or lose the valves or internal parts.

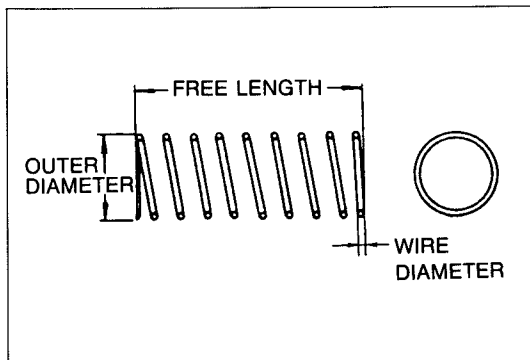
Disassemble in the order shown in the figure.
Inspect all parts, repair or replace as necessary.



- | | | |
|---|--|---|
| <ul style="list-style-type: none"> 1. Side plate 2. N-R reducing spring
Inspection page K-118 3. N-R reducing valve
Inspect for sticking,
scoring, or scratches 4. Pressure regulator sleeve
Inspect for sticking,
scoring, or scratches 5. Pressure regulator plug
Inspect for sticking,
scoring, or scratches 6. Spring seat
Inspect for sticking,
scoring, or scratches 7. Pressure regulator spring
Inspection page K-118 8. Pressure regulator valve
Inspect for sticking,
scoring, or scratches 9. Side plate 10. Pressure modifier valve
Inspect for sticking,
scoring, or scratches 11. Pressure modifier spring
Inspection page K-118 12. 1-2 shift valve
Inspect for sticking,
scoring, or scratches 13. 1-2 shift spring
Inspection page K-118 14. 2-3 shift valve
Inspect for sticking,
scoring, or scratches 15. 2-3 shift spring
Inspection page K-118 16. Side plate | <ul style="list-style-type: none"> 17. Vacuum throttle valve
Inspect for sticking,
scoring, or scratches 18. 3-4 shift sleeve
Inspect for sticking,
scoring, or scratches 19. 3-4 shift valve
Inspect for sticking,
scoring, or scratches 20. 3-4 shift spring
Inspection page K-118 21. Backup control valve
Inspect for sticking,
scoring, or scratches 22. Backup control spring
Inspection..... pae K-118 23. Throttle backup spring
Inspection page K-118 24. Throttle backup valve
Inspect for sticking,
scoring, or scratches 25. Upper valve body
Inspect for damage or
scoring 26. Clip 27. Side plate 28. N-D accumulator piston
Inspect for sticking,
scoring, or scratches 29. N-D accumulator spring
Inspection page K-118 30. Seal ring 31. Pin 32. Stopper plug
Inspect for sticking,
scoring, or scratches | <ul style="list-style-type: none"> 33. 1-2 reducing spring
Inspection page K-118 34. 1-2 reducing valve
Inspect for sticking,
scoring, or scratches 35. Clip 36. Side plate 37. N-R/2-3 accumulator piston
Inspect for sticking,
scoring, or scratches 38. N-R/2-3 accumulator spring
Inspection page K-118 39. Seal ring 40. Throttle relief spring
Inspection page K-118 41. Throttle relief valve
Inspect for sticking,
scoring, or scratches 42. 3-2 control spring
Inspection page K-118 43. 3-2 control valve
Inspect for sticking,
scoring, or scratches 44. 1-2 accumulator spring
Inspection page K-118 45. 1-2 accumulator piston
Inspect for sticking,
scoring, or scratches 46. Seal ring 47. Lower valve body
Inspect for damage or
scoring |
|---|--|---|

97U0KX-201

K TRANSMISSION



9MU0K1-315

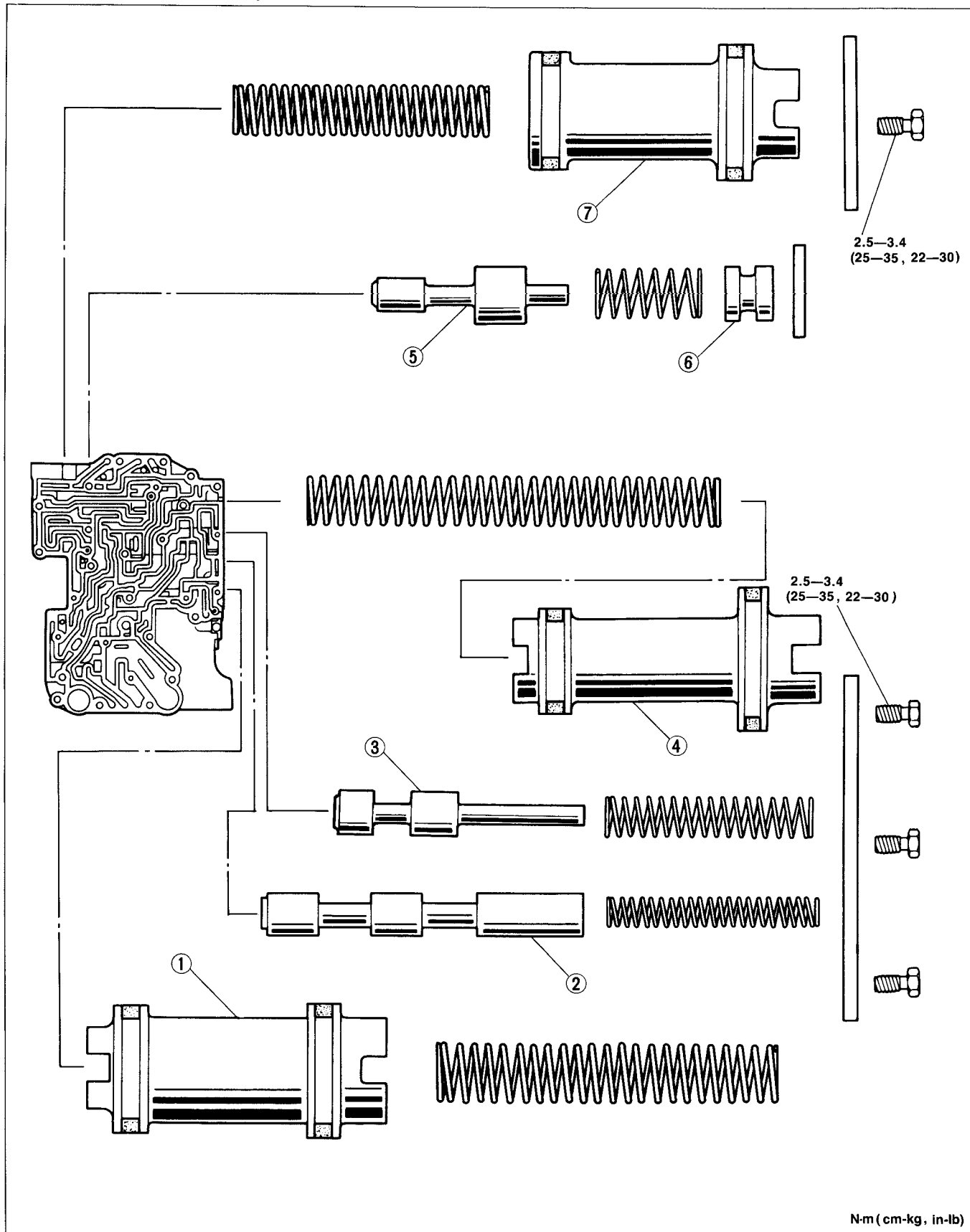
Inspection

1. Measure the spring specifications.
2. If not within specification, replace the spring(s).

Spring	Item	Outer dia. mm (in)	Free length mm (in)	No. of coils	Wire dia. mm (in)
Pressure regulator		11.7 (0.461)	43.0 (1.693)	15.0	1.2 (0.047)
1-2 shift		7.4 (0.291)	26.4 (1.039)	11.6	0.7 (0.028)
2-3 shift		7.4 (0.291)	57.6 (2.268)	26.0	0.9 (0.035)
3-4 shift		7.5 (0.295)	40.2 (1.583)	17.0	0.8 (0.031)
Pressure modifier		9.2 (0.362)	19.8 (0.780)	7.3	0.7 (0.028)
Throttle backup		8.3 (0.327)	18.3 (0.720)	7.5	0.8 (0.031)
N-R reducing		7.4 (0.291)	14.5 (0.571)	7.0	0.6 (0.024)
Backup control		8.5 (0.335)	21.3 (0.839)	9.25	0.9 (0.035)
N-R/2-3 accumulator		8.7 (0.343)	75.8 (2.984)	30.0	1.1 (0.043)
N-D accumulator		9.3 (0.366)	43.4 (1.709)	24.0	1.4 (0.055)
1-2 reducing		9.5 (0.374)	19.5 (0.768)	7.6	0.9 (0.035)
Throttle relief		7.4 (0.291)	38.2 (1.504)	17.0	1.1 (0.043)
3-2 control		5.5 (0.217)	39.5 (1.555)	24.4	0.65 (0.026)
1-2 accumulator		10.3 (0.406)	62.6 (2.465)	24.0	1.4 (0.055)

97U0KX-202

Components (actual size)



N-m (cm-kg, in-lb)

99U07B-091

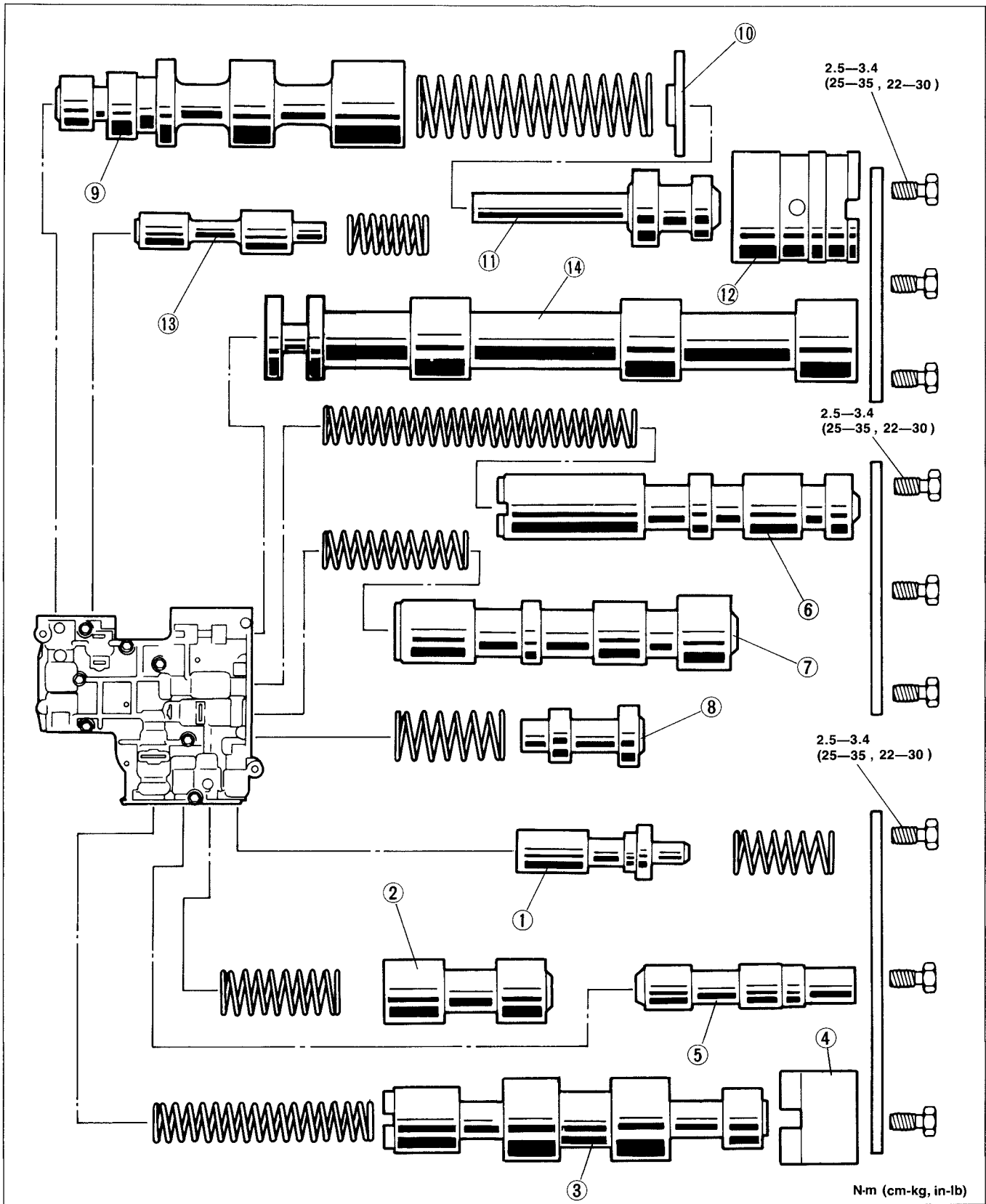
1. 1-2 accumulator piston
2. 3-2 control valve
3. Throttle relief valve

4. N-R/2-3 accumulator piston
5. 1-2 reducing valve
6. Stopper plug

7. N-D accumulator piston

K TRANSMISSION

Components (actual size)



N-m (cm-kg, in-lb)

99U07B-092

- 1. Throttle backup valve
- 2. Backup control valve
- 3. 3-4 shift valve
- 4. 3-4 shift sleeve
- 5. Vacuum throttle valve

- 6. 2-3 shift valve
- 7. 1-2 shift valve
- 8. Pressure modifier valve
- 9. Pressure regulator valve
- 10. Spring seat

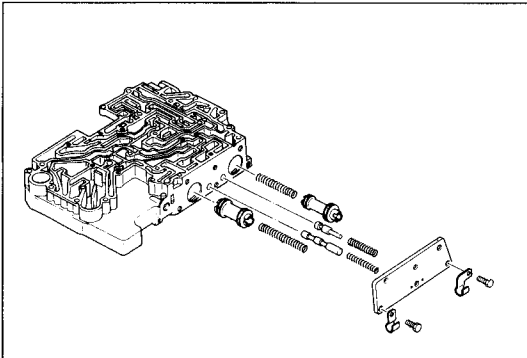
- 11. Pressure regulator plug
- 12. Pressure regulator sleeve
- 13. N-R reducing valve
- 14. Manual valve

Assembly

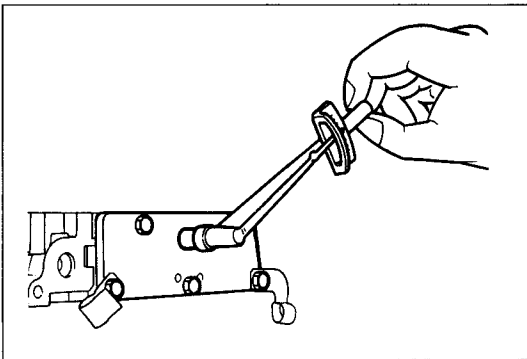
Caution

- a) Before assembly, make sure all parts are thoroughly clean.
- b) Apply ATF to all parts and bores.
- c) Note the proper direction of the valve and internal parts.
- d) Do not reuse any parts that have been dropped.
- e) Do not scratch the valve or valve body.

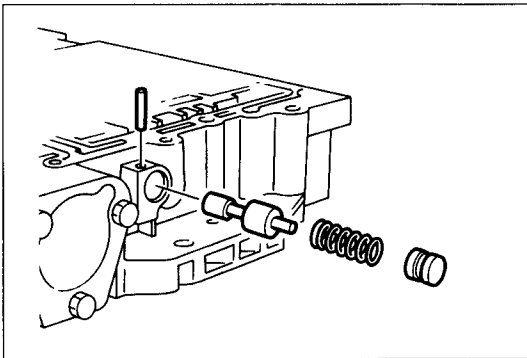
97U0KX-203



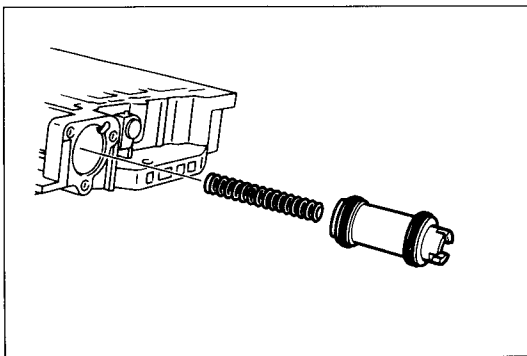
97U0KX-204



97U0KX-205



79G07C-371



79G07C-372

Procedure

1. Apply ATF to the seal rings and install them onto the 1-2 accumulator piston.
2. Insert the 1-2 accumulator piston and spring.
3. Insert the 3-2 control valve and spring.
4. Insert the throttle relief valve and spring.
5. Apply ATF to the seal rings and install them onto the N-R/2-3 accumulator piston.
6. Insert the N-R/2-3 accumulator spring and valve.
7. Install the side plate.

Note

Install the valves by consecutively blocking them with the side plate held with a bolt at the end.

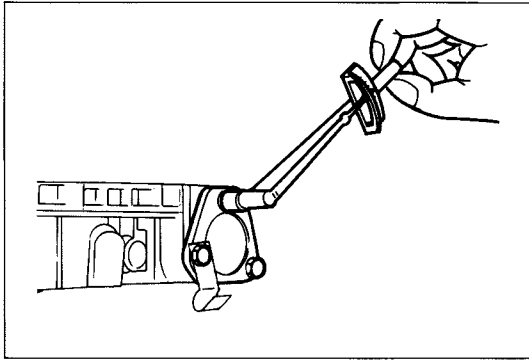
8. Install the clip and bolts.

Tightening torque:

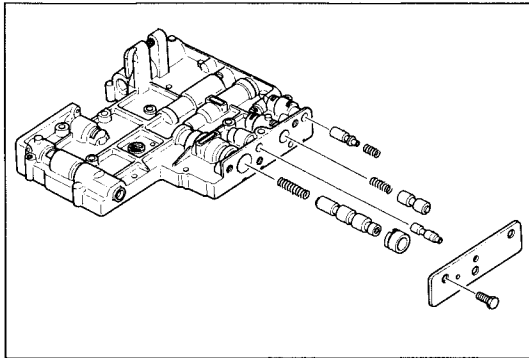
2.5—3.4 N·m (25—35 cm·kg, 22—30 in·lb)

9. Insert the 1-2 reducing valve, spring, and stopper plug.
10. Tap in the roll pin.

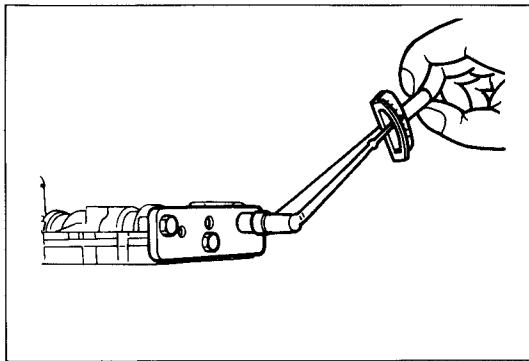
11. Apply ATF to the seal rings and install them onto the N-D accumulator piston.
12. Insert the N-D accumulator spring and piston.



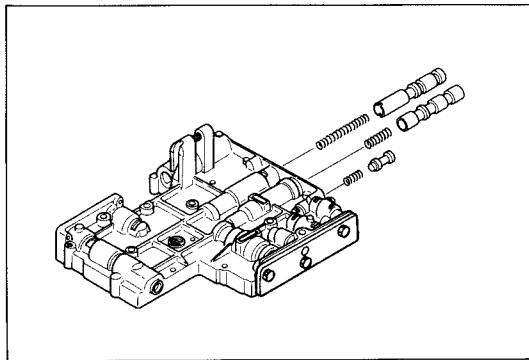
79G07C-373



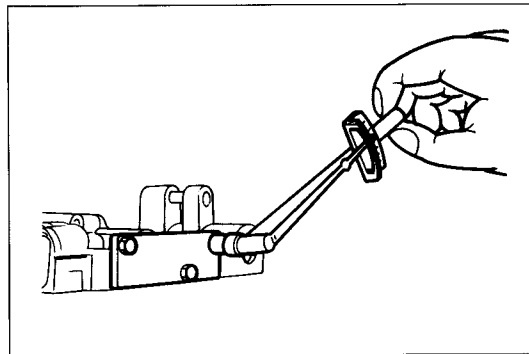
79G07C-374



79G07C-375



79G07C-376



97U0KX-206

13. Install the clip and bolts.

Tightening torque:
2.5—3.4 N·m (25—35 cm·kg, 22—30 in·lb)

14. Insert the throttle backup valve and spring.
15. Insert the backup control spring and valve.
16. Insert the 3-4 shift spring, valve, and sleeve.
17. Insert the vacuum throttle valve.
18. Install the side plate so that it does not contact the vacuum throttle valve.

19. Tighten the installation bolts.

Tightening torque:
2.5—3.4 N·m (25—35 cm·kg, 22—30 in·lb)

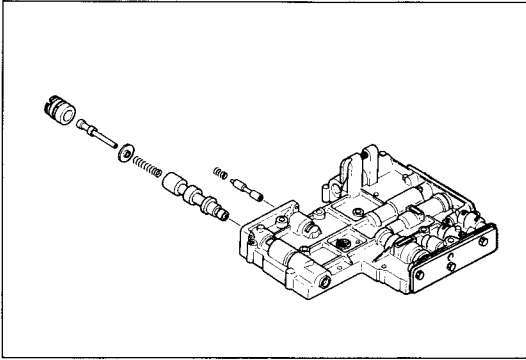
20. Insert the 2-3 shift spring and valve.
21. Insert the 1-2 shift spring and valve.
22. Insert the pressure modifier spring and valve.

23. Install the side plate.

Note
Install the valves by consecutively blocking them with the side plate held with a bolt at the end.

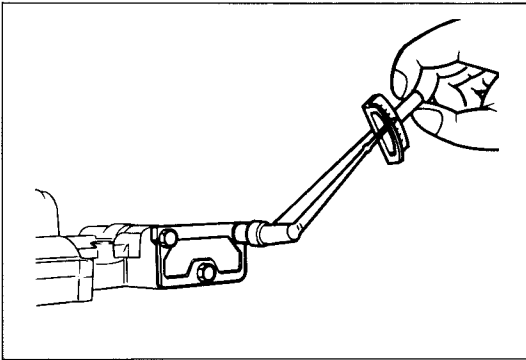
24. Tighten the installation bolts.

Tightening torque:
2.5—3.4 N·m (25—35 cm·kg, 22—30 in·lb)



79G07C-378

25. Insert the pressure regulator valve, spring, spring seat, plug, and sleeve.
26. Insert the N-R reducing valve and spring.



99U07B-097

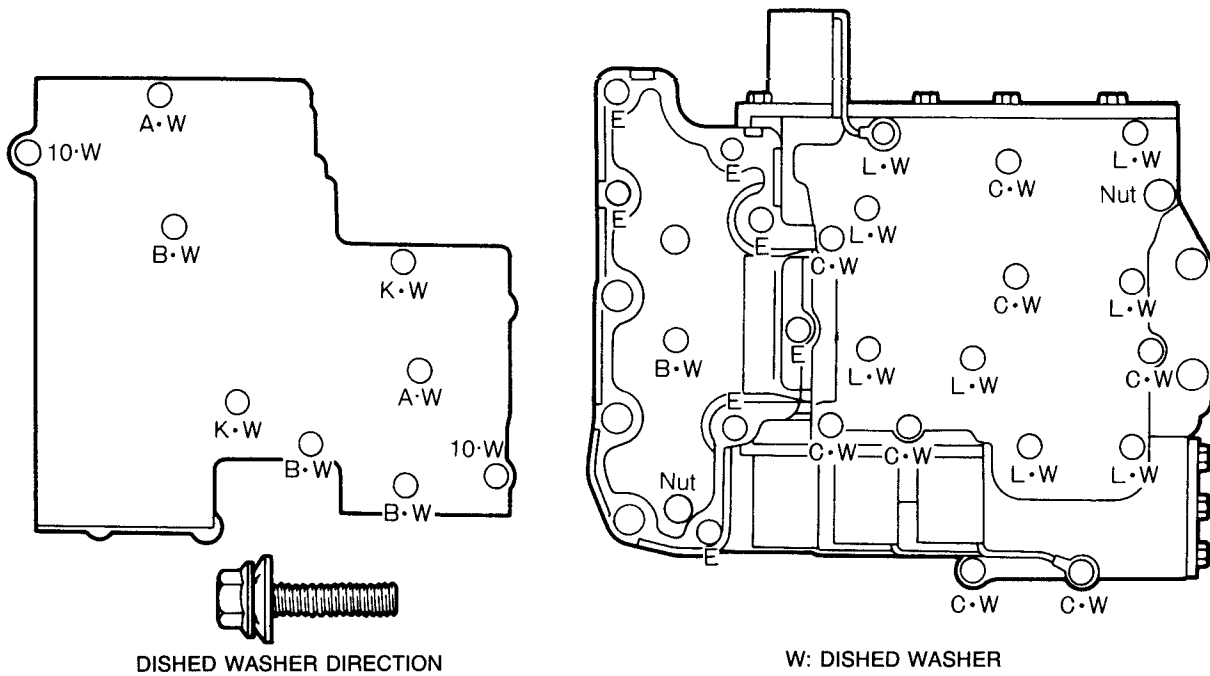
27. Install the side plate.
28. Tighten the installation bolts.

Tightening torque:

2.5—3.4 N·m (25—35 cm·kg, 22—30 in·lb)

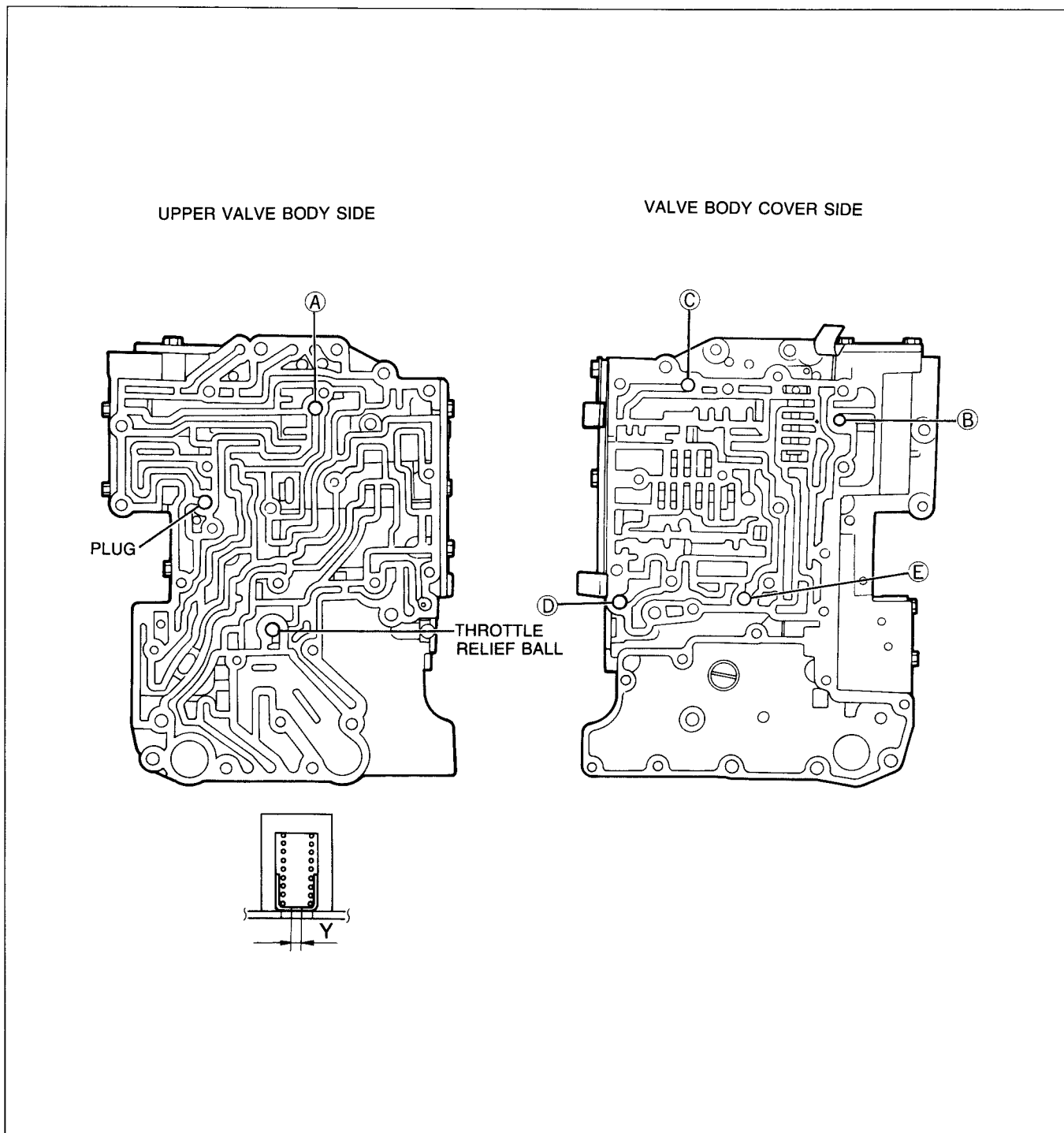
K TRANSMISSION

Bolt locations



Indentification letter	Bolts	Torque specification
L		6.5—7.8 N·m (66—80 cm·kg, 57—69 in·lb)
A		
B		
K		
C		
E		
10		11—15 N·m (1.1—1.5 m·kg, 8.0—11 ft·lb)
10		

Orifice check valve location



97U0KX-207

Orifice check valve specification

		Y diameter	
Upper valve body side	mm (in)	(A)	$\phi 1.8$ (0.071)
Valve body cover side	mm (in)	(B)	$\phi 1.8$ (0.071)
		(C)	$\phi 1.5$ (0.059)
		(D)	$\phi 1.0$ (0.039)
		(E)	$\phi 1.0$ (0.039)

CONTROL VALVE BODY Assembly

Caution

- a) Before assembly, make sure all parts are perfectly clean.
- b) Apply ATF to all parts.

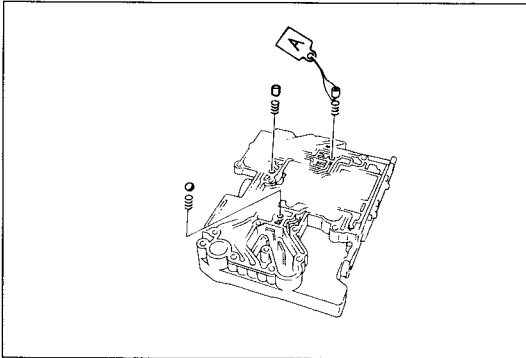
97U0KX-331

Procedure

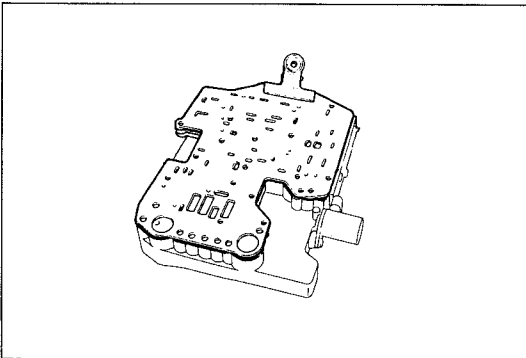
Note

Check that the orifice check valve and check ball are properly inserted. (Refer to page K-125.)

1. Insert the orifice check valve, plug and springs, and the check ball and spring in the lower valve body.

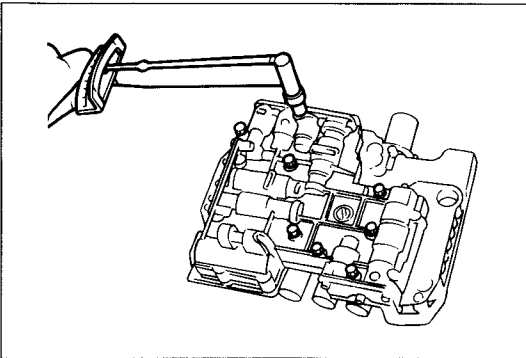


97U0KX-208



97U0KX-209

2. Position the separate plate and lower gasket on the lower valve body. Align the plate and valve body and hold them together with large clips.



97U0KX-210

3. Install the upper gasket and upper valve body on the separate plate.

Note

Check that the installation bolts are installed in the correct position. (Refer to page K-124.)

4. Tighten the installation bolts.

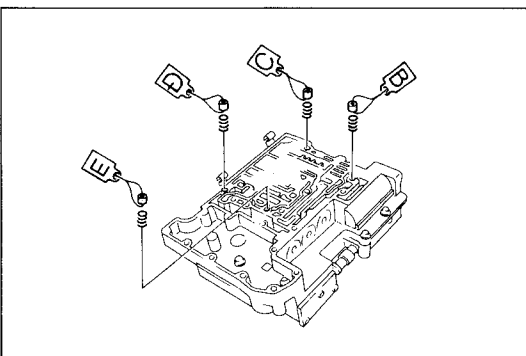
Tightening torque:

6.5—7.8 N·m (66—80 cm·kg, 57—69 in·lb)

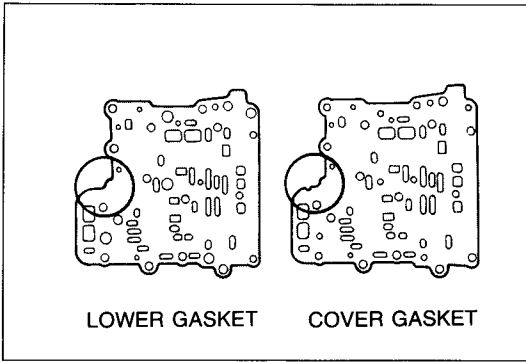
Note

Check that the orifice check valves are properly inserted. (Refer to page K-125.)

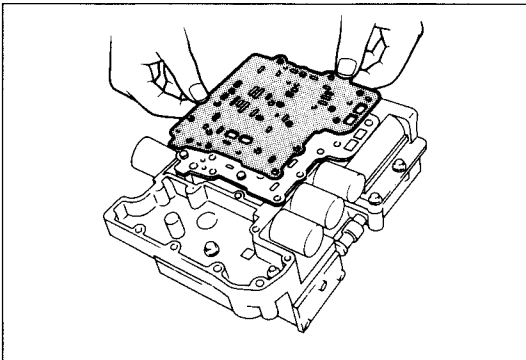
5. Turn over the valve body assembly and insert the orifice check valves and springs in the lower valve body.



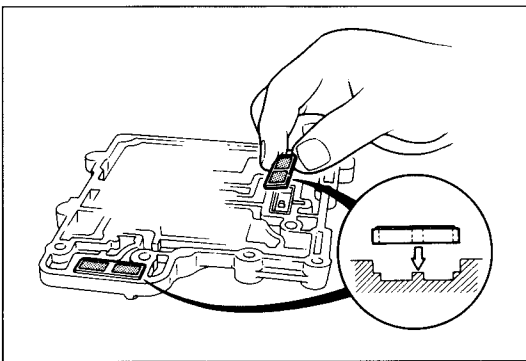
97U0KX-211



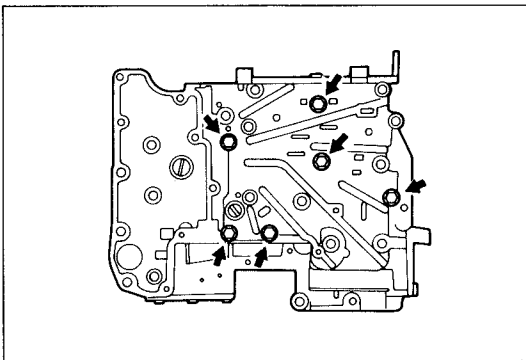
97U0KX-212



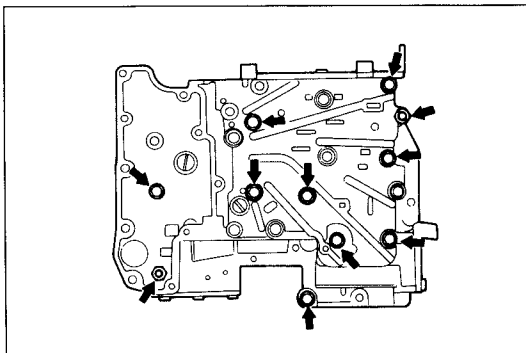
97U0KX-213



97U0KX-214



97U0KX-215



97U0KX-216

Note

The lower gasket is identified as shown.

6. Install the lower gasket on the lower valve body.

7. Install the lower gasket, separate plate, and cover gasket.

8. Install the inner strainer in the valve body cover.

Note

Check that the installation bolts are installed in the correct position. (Refer to page K-124.)

9. Install the valve body cover on the cover gasket.

Tightening torque:

6.5—7.8 N·m (66—80 cm·kg, 57—69 in·lb)

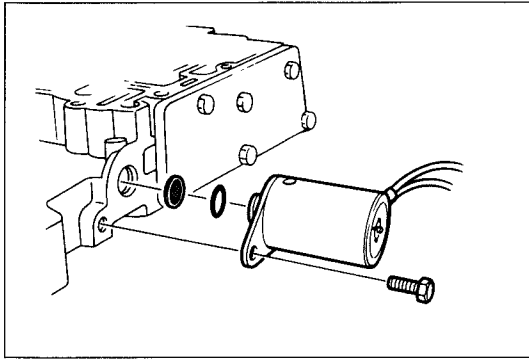
Note

Check that the installation bolts are installed in the correct position. (Refer to page K-124.)

10. Tighten the installation bolts and nuts.

Tightening torque:

Bolt: 6.5—7.8 N·m (66—80 cm·kg, 57—69 in·lb)
Nut: 11—15 N·m (1.1—1.5 m·kg, 8.0—15 ft·lb)

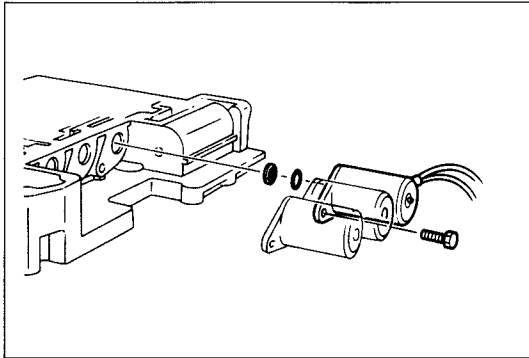


97U0KX-217

11. Install the O-rings onto the each solenoid valve.
12. Install the oil strainer in the lower valve body.
13. Install the 3-2 control solenoid valve.
14. Tighten the installation bolt.

Tightening torque:

2.5—3.4 N·m (25—35 cm·kg, 22—30 in·lb)

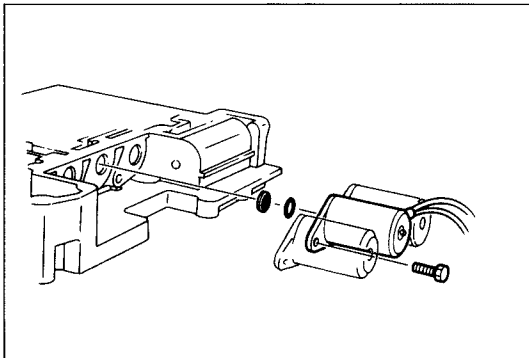


97U0KX-218

15. Install the oil strainer in the lower valve body.
16. Install the 3-4 shift solenoid valve.
17. Tighten the installation bolt.

Tightening torque:

2.5—3.4 N·m (25—35 cm·kg, 22—30 in·lb)

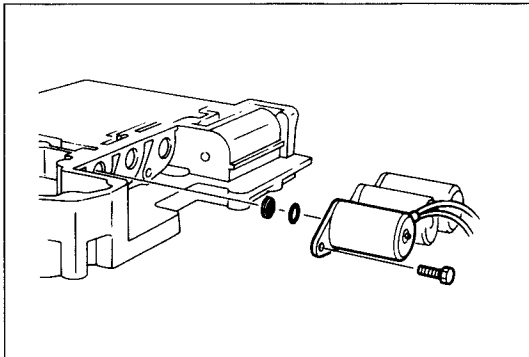


97U0KX-219

18. Install the oil strainer in the lower valve body.
19. Install the 2-3 shift solenoid valve.
20. Tighten the installation bolt.

Tightening torque:

2.5—3.4 N·m (25—35 cm·kg, 22—30 in·lb)

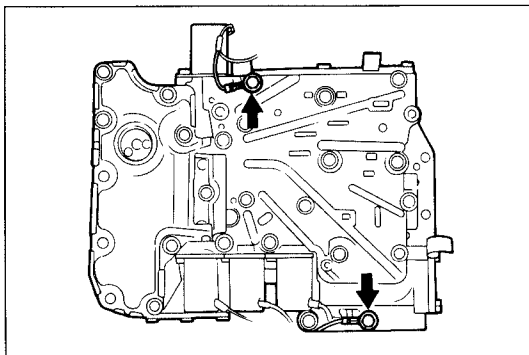


97U0KX-220

21. Install the oil strainer in the lower valve body.
22. Install the 1-2 shift solenoid valve.
23. Tighten the installation bolt.

Tightening torque:

2.5—3.4 N·m (25—35 cm·kg, 22—30 in·lb)



97U0KX-221

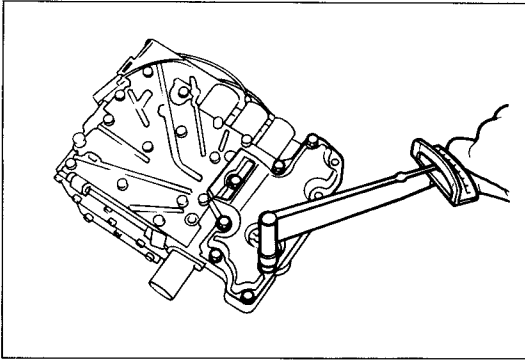
Note

Check that the installation bolts are installed in the correct position. (Refer to page K-124.)

24. Connect the ground terminals and tighten the bolts.

Tightening torque:

6.5—7.8 N·m (66—80 cm·kg, 57—69 in·lb)



97U0KX-222

25. Mount the oil strainer.

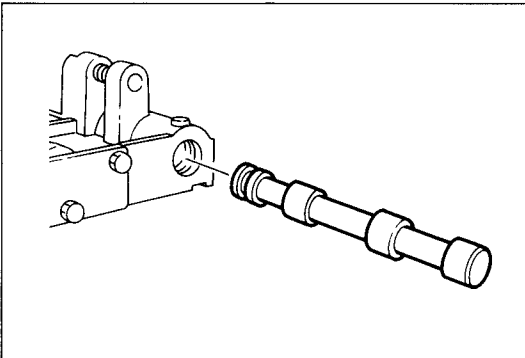
Note

Check that the installation bolts are installed in the correct position. (Refer to page K-124.)

26. Tighten the installation bolts.

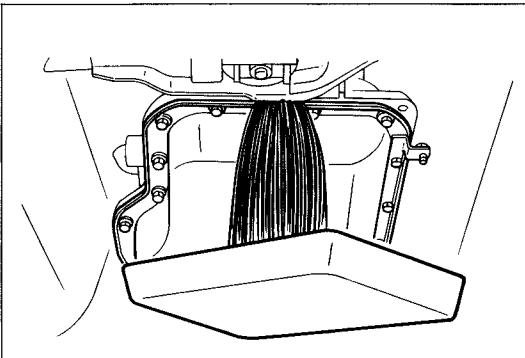
Tightening torque:

6.5—7.8 N·m (66—80 cm·kg, 57—69 in·lb)



97U0KX-223

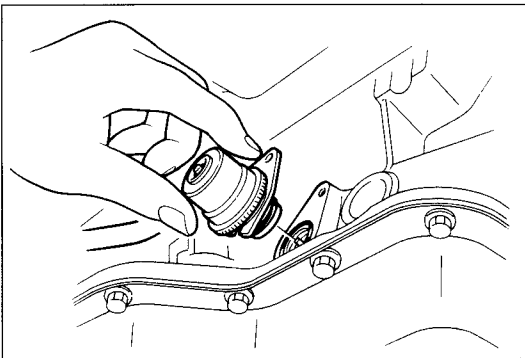
27. Install the manual valve.



97U0KX-224

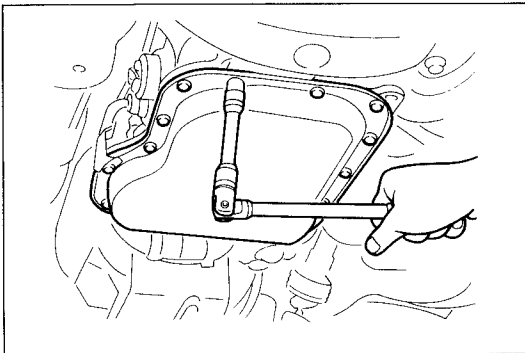
On-vehicle Removal

1. Disconnect the negative battery cable.
2. Jack up the vehicle and support it with safety stands.
3. Remove the crossmember (Convertible), exhaust pipe, and heat insulator. (Refer to page K-48.)
4. Loosen the oil pan installation bolts, and drain the ATF into a container.



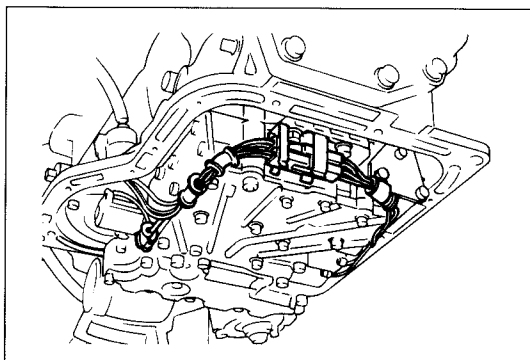
97U0KX-225

5. Disconnect the vacuum hose.
6. Remove the vacuum diaphragm, O-rings, and vacuum diaphragm rod.

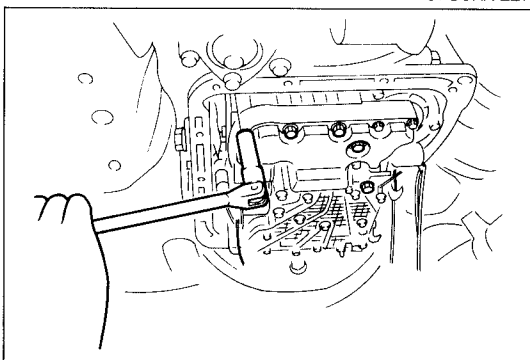


97U0KX-226

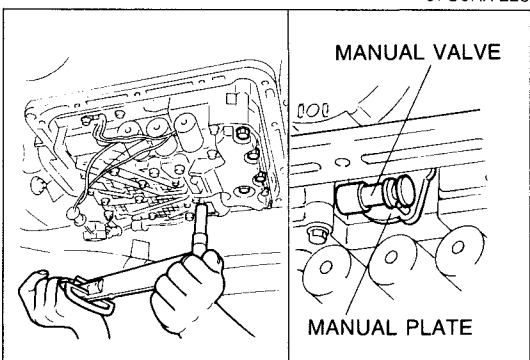
7. Remove the bracket, oil pan, and the gasket.



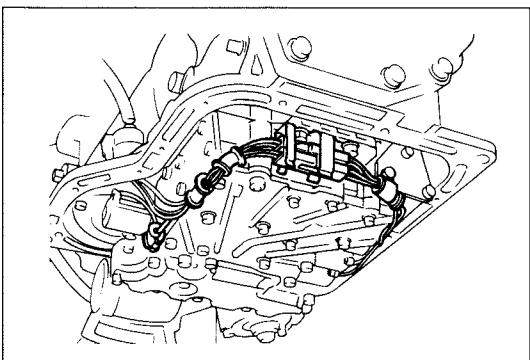
97U0KX-227



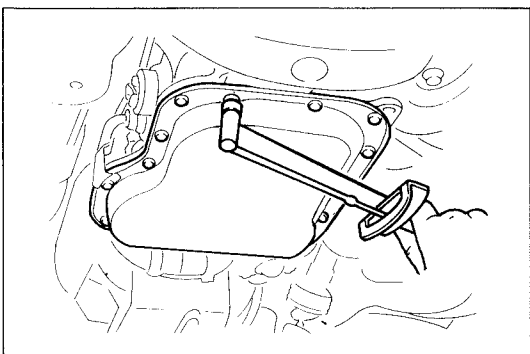
97U0KX-228



97U0KX-229



97U0KX-230



97U0KX-231

8. Disconnect the solenoid valve connector.
9. Remove the harness from the bracket.

10. Remove the control valve body assembly.

On-vehicle Installation

Note

Be sure to align the manual plate and the manual valve.

1. Install the control valve body assembly.

Tightening torque:

11—15 N·m (1.1—1.5 m·kg, 8.0—11 ft·lb)

2. Connect the solenoid valve connector.
3. Install the harness.

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

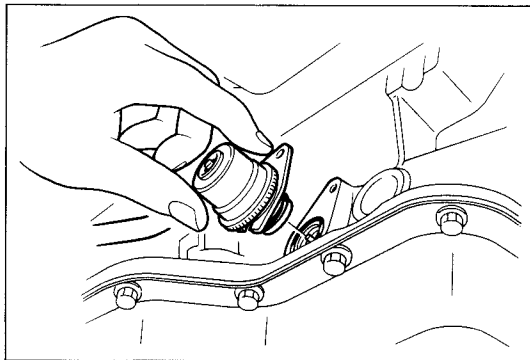
Tightening torque:

5.9—7.8 N·m (60—80 cm·kg, 52—69 in·lb)

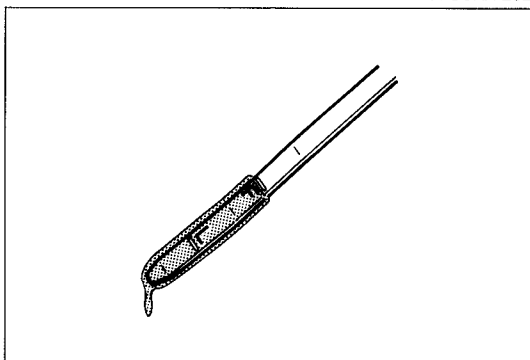
5. Install the bracket and bolts.

Tightening torque:

5.9—7.8 N·m (60—80 cm·kg, 52—69 in·lb)



97U0KX-232



97U0KX-233

6. Apply ATF to a new O-ring and install it onto the vacuum diaphragm.
7. Apply ATF to a new O-ring and install it into the transmission case.
8. Apply ATF to the vacuum diaphragm rod and vacuum diaphragm, and install them into the transmission case.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

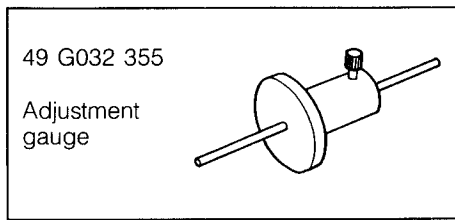
9. Connect the vacuum hose.
10. Install the heat insulator, exhaust pipe, and crossmember (Convertible). (Refer to page K-149.)
11. Add **approx. 1.0 liter (1.1 US qt, 0.9 Imp qt)** ATF, and check the ATF level. (Refer to page K-45.)

K TRANSMISSION

VACUUM DIAPHRAGM

Preparation

SST

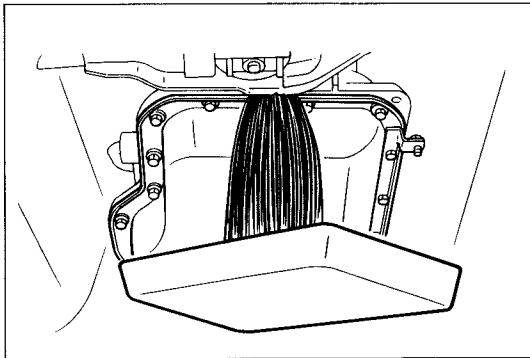


9MU0K2-345

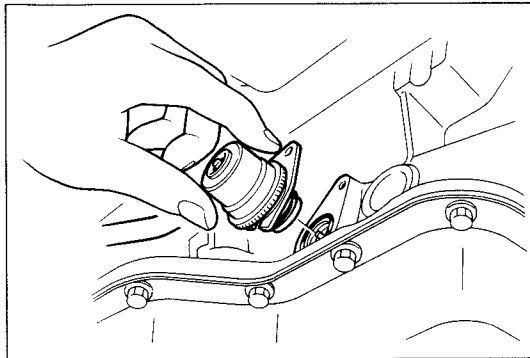
General note

Excessive shift shock and improper shifting often indicate a vacuum diaphragm malfunction.

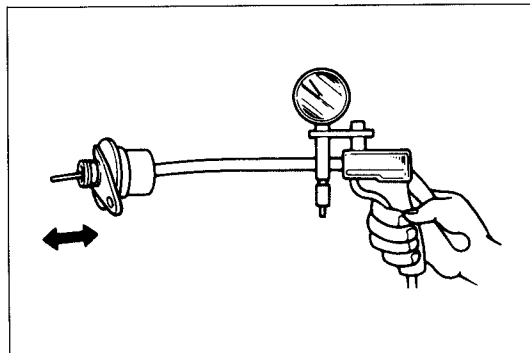
9MU0K2-346



97U0KX-234



97U0KX-235



9MU0K2-349

On-vehicle Removal

1. Jack up the vehicle and support it with safety stands.
2. Remove the crossmember (Convertible), exhaust pipe, and heat insulator. (Refer to page K-48.)
3. Loosen the oil pan mounting bolts, and drain **approx. 1.0 liter (1.1 US qt, 0.9 Imp qt)** of ATF.

4. Disconnect the vacuum hose.

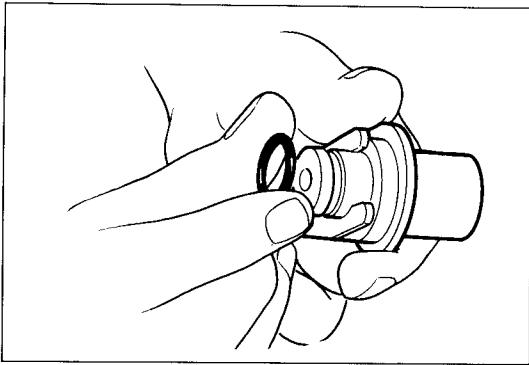
Caution

When removing the vacuum diaphragm, do not drop the vacuum diaphragm rod into the oil pan.

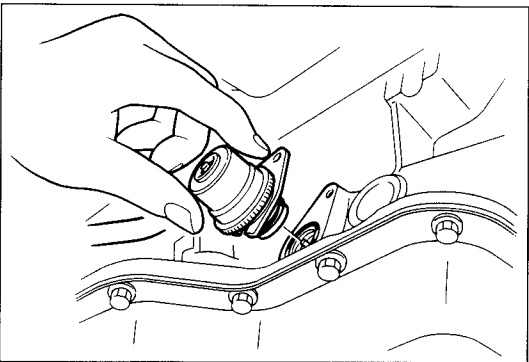
5. Remove the vacuum diaphragm, O-rings, and vacuum diaphragm rod.

Inspection

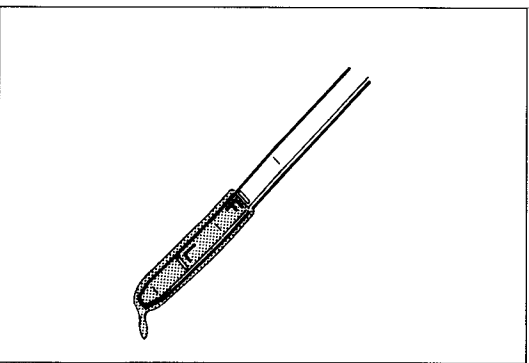
1. Check that the vacuum diaphragm rod moves when vacuum is applied to the vacuum diaphragm.
2. If not correct, replace the vacuum diaphragm.



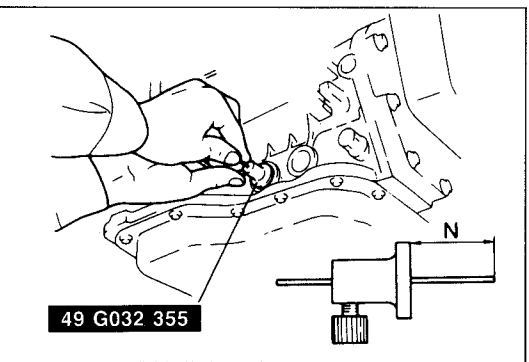
97U0KX-236



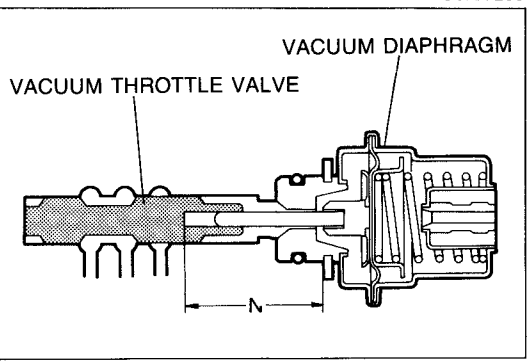
97U0KX-237



97U0KX-238



97U0KX-239



97U0KX-240

On-vehicle Installation

1. Apply ATF to a new O-ring, and install it onto the vacuum diaphragm.
2. Apply ATF to a new O-ring, and install it into the transmission case.

3. Apply ATF to the vacuum diaphragm rod and vacuum diaphragm, and install them into the transmission case.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

4. Connect the vacuum hose.
5. Install the heat insulator, exhaust pipe, and crossmember (Convertible). (Refer to page K-149.)

6. Add **approx. 1.0 liter (1.1 US qt, 0.9 Imp qt)** of ATF and check the oil level. (Refer to page K-45.)

7. Warm up the ATF to normal operating temperature (**50—80°C, 122—176°F**), then check for following:

- (1) Fluid leakage
- (2) Vacuum leakage

On-vehicle Adjustment

1. Remove the vacuum diaphragm, vacuum diaphragm rod, and O-rings from the transmission case. (Refer to On-vehicle Removal, page K-132.)

2. Measure dimension N indicated in the figure with the **SST** and a scale.

3. Select the proper diaphragm rod from the table.

Dimension N	Applicable diaphragm rod
Below 27.30mm (1.0748 in)	29.0mm (1.14 in)
27.30—27.80mm (1.0748—1.0945 in)	29.5mm (1.16 in)
27.80—28.30mm (1.0945—1.1142 in)	30.0mm (1.18 in)
28.30—28.80mm (1.1142—1.1339 in)	30.5mm (1.20 in)
28.80mm (1.1339 in) or over	31.0 mm (1.22 in)

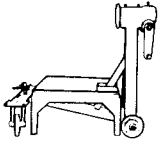
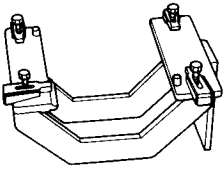
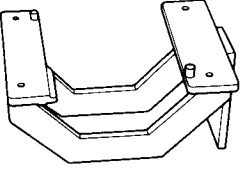
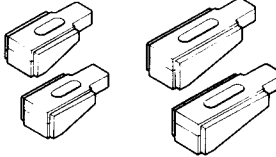
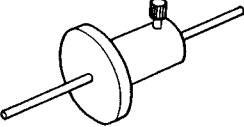
4. Install the correct vacuum diaphragm rod, O-rings, and vacuum diaphragm. (Refer to On-vehicle Installation, page K-133.)

K TRANSMISSION

TRANSMISSION (ASSEMBLY)

Preparation

SST

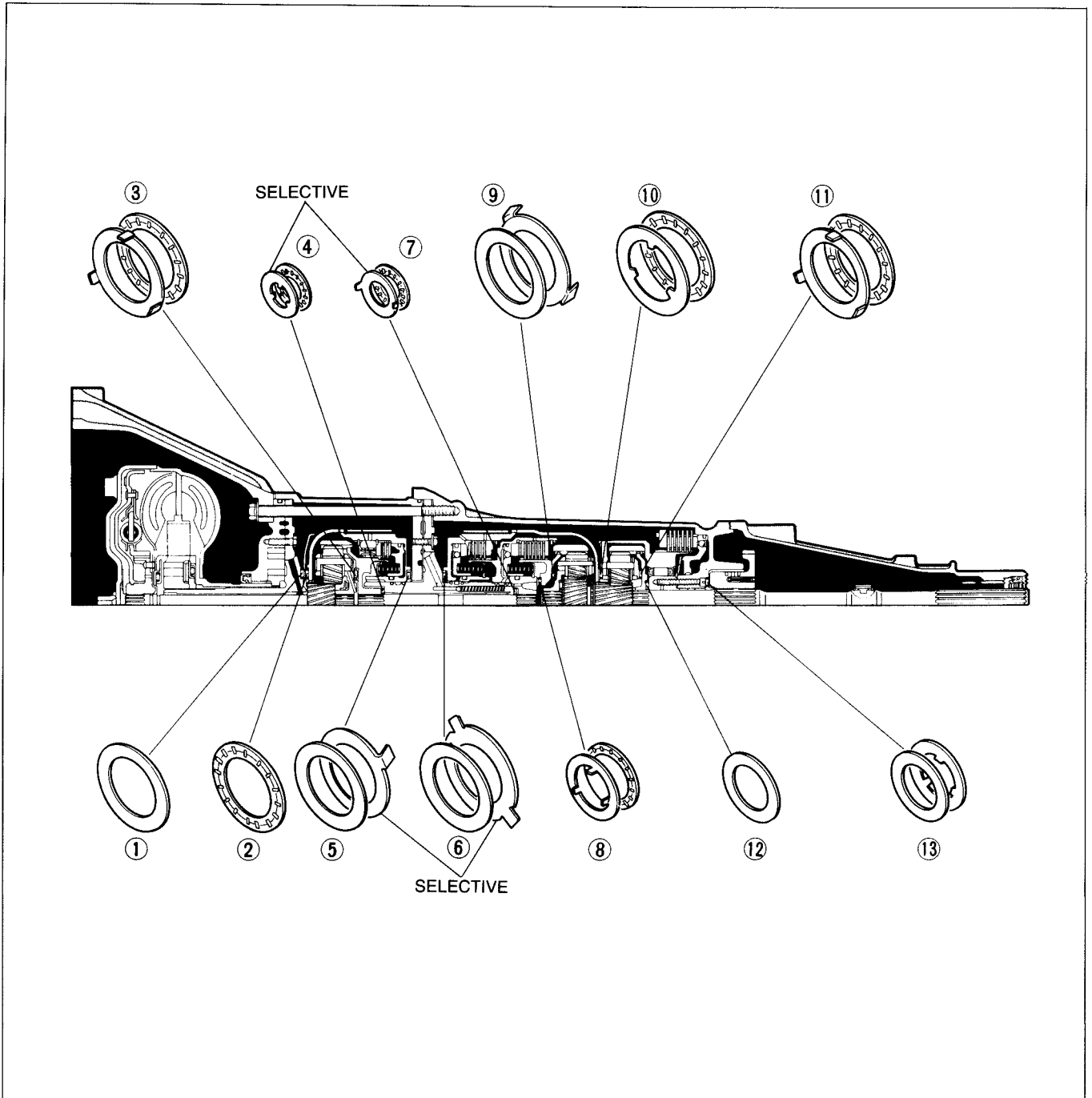
<p>49 0107 680 A</p> <p>Engine stand</p> 	<p>49 U019 0A0</p> <p>Transmission hanger</p> 	<p>49 H075 495A</p> <p>Body (Part of 49 U019 0A0)</p> 
<p>49 U019 003</p> <p>Holder (Part of 49 U019 0A0)</p> 	<p>49 G032 355</p> <p>Adjustment gauge</p> 	<p>9MU0K2-355</p>

Precaution

1. If the drive plates or brake bands are replaced with new ones, soak the new ones 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 included 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.

97U0KX-339

Thrust Washer, Bearing, and Race Location



97U0KX-241

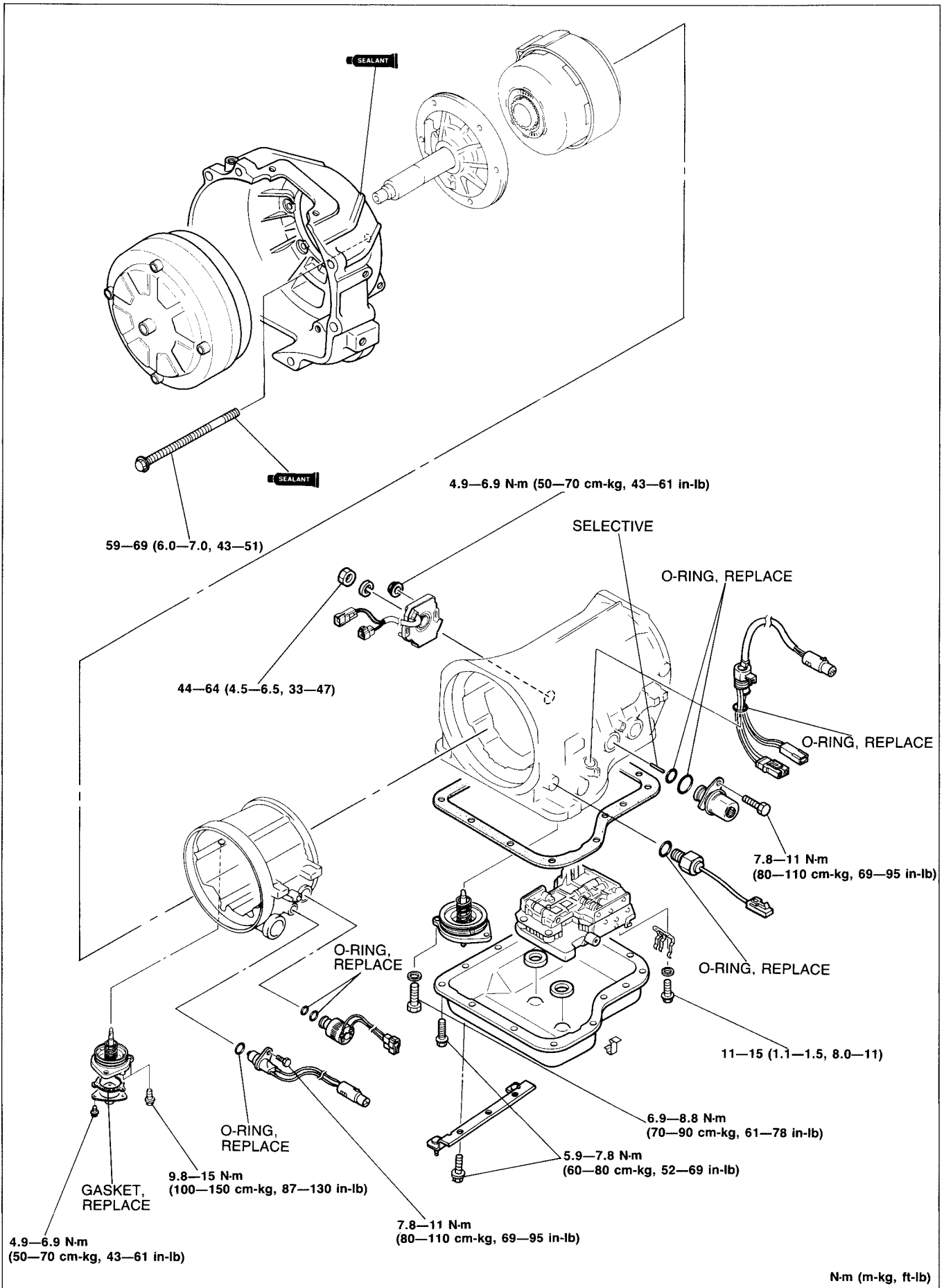
Outer diameter of bearing and race

		1	2	3	4	5	6	7
Bearing	mm (in)	70.0 (2.756)	70.0 (2.756)	70.0 (2.756)	35.0 (1.378)	70.0 (2.756)	70.0 (2.756)	35.0 (1.378)
Race	mm (in)	—	—	70.0 (2.756)	33.0 (1.299)	70.0 (2.756)	76.0 (2.992)	33.0 (1.299)

		8	9	10	11	12	13
Bearing	mm (in)	53.0 (2.087)	70.0 (2.756)	70.0 (2.756)	70.0 (2.756)	47.0 (1.850)	53.0 (2.087)
Race	mm (in)	51.5 (2.028)	70.0 (2.756)	70.0 (2.756)	70.0 (2.756)	—	51.5 (2.028)

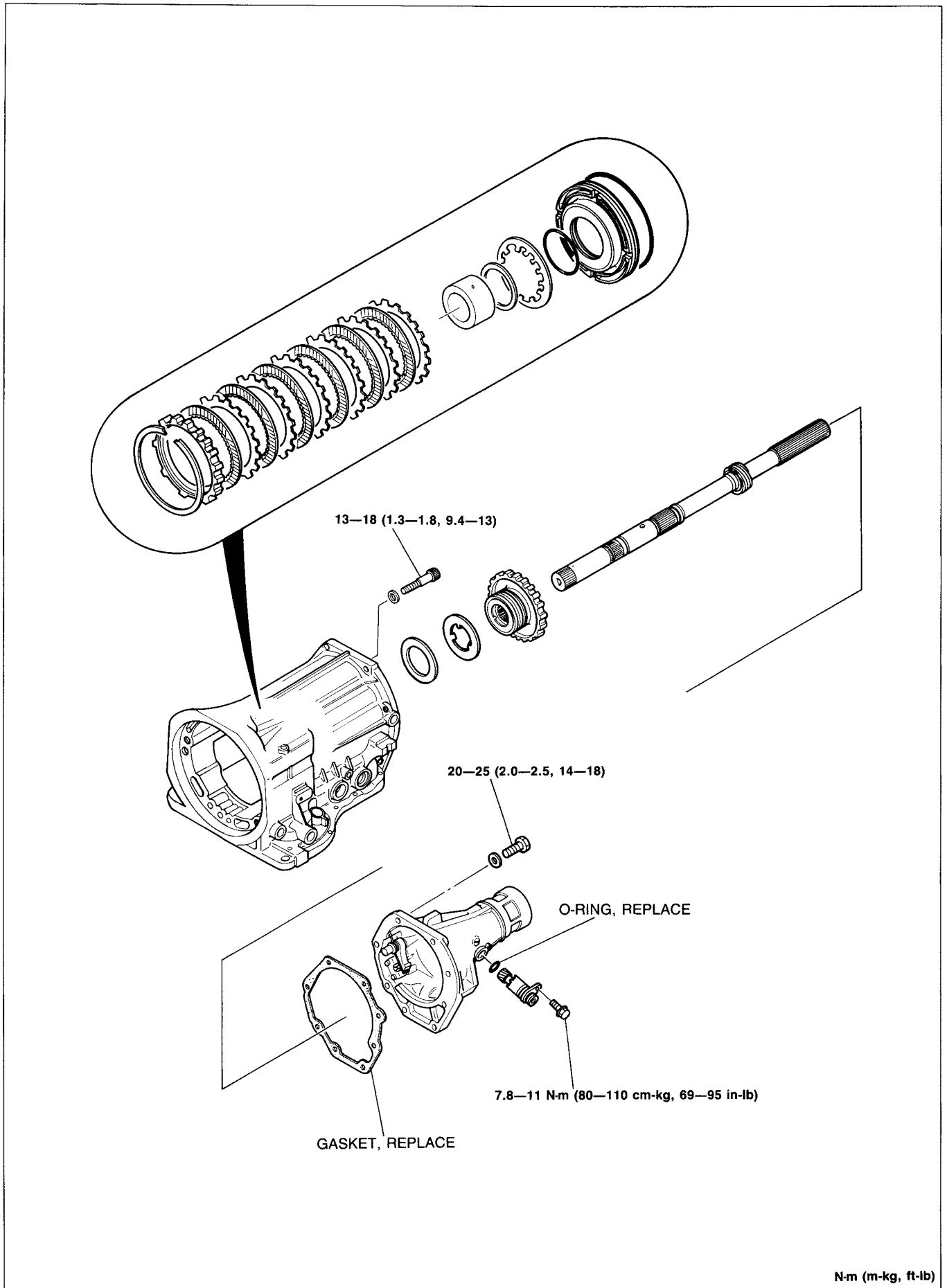
K TRANSMISSION

Torque specifications



9MUOK2-359

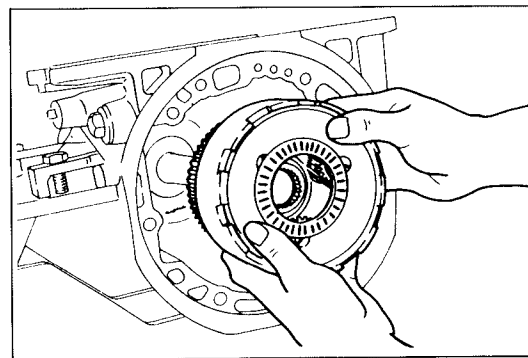
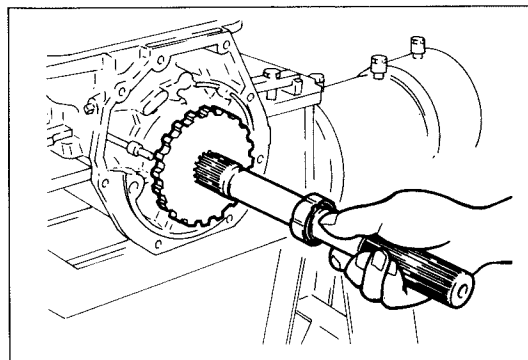
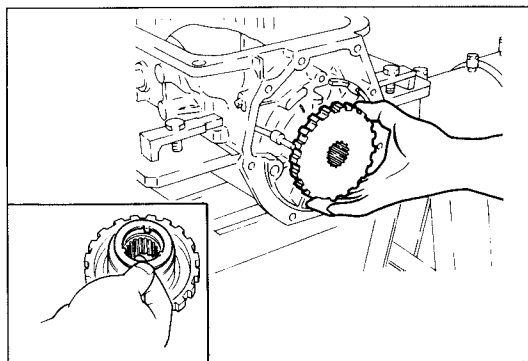
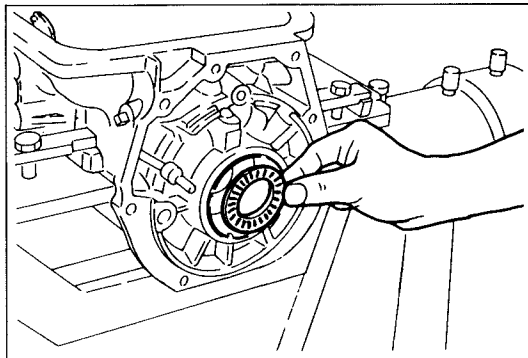
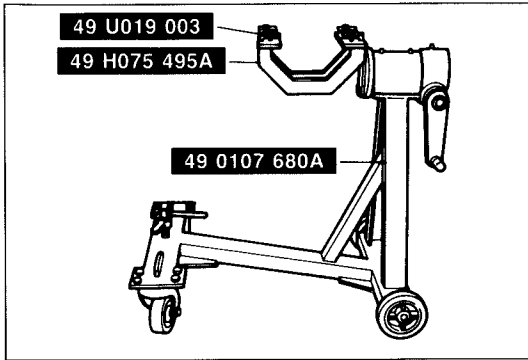
Torque specifications (cont'd)



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

9MU0K2-435

K-137



Procedure

1. Assemble the **SST** as shown.
2. Mount the transmission case onto the **SST**.
3. Apply petroleum jelly to the bearing, and install it into the rear of the transmission case.

Bearing outer diameter: 53.0mm (2.087 in)

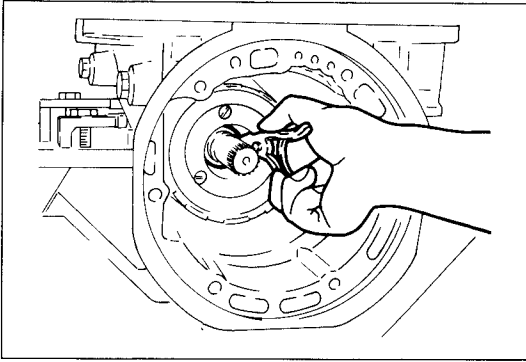
4. Apply petroleum jelly to the bearing race, and install it onto the oil distributor.

Bearing race outer diameter: 51.5mm (2.028 in)

5. Install the oil distributor in the transmission case.

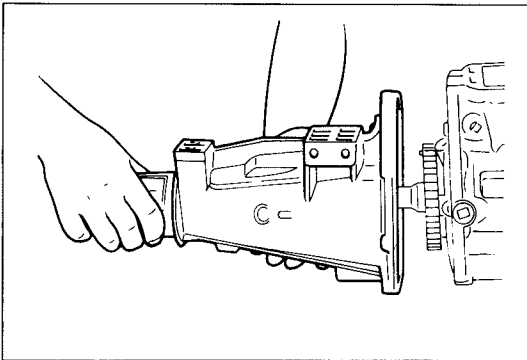
6. Insert the output shaft.

7. Install the rear planetary gear unit (connecting drum, rear planetary pinion carrier and one-way clutch) in the low and reverse brake side.



9MU0K2-365

8. Install a new snap ring onto the front of the output shaft.



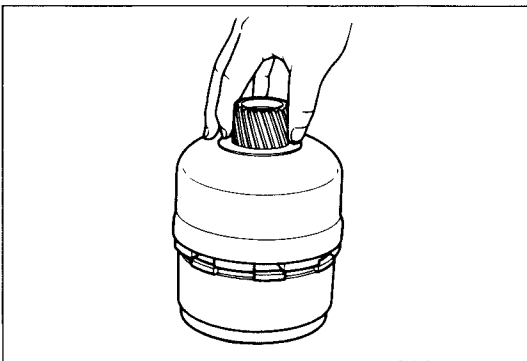
97U0KX-243

9. Install the extension housing along with a new gasket.

Tightening torque:

20—25 N·m (2.0—2.5 m·kg, 14—18 ft·lb)

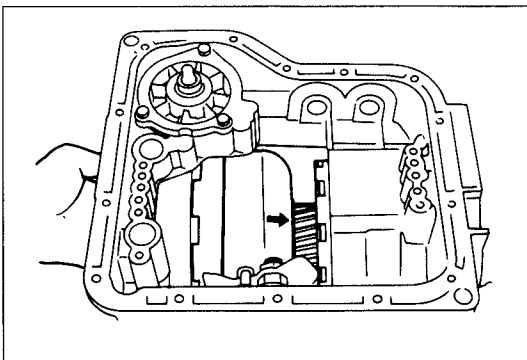
10. Check that the output shaft is locked with the manual lever in P range.



97U0KX-244

11. Set the rear clutch assembly on the top of the front clutch assembly.

12. Install the connecting shell and front planetary gear unit (rear clutch hub, front planetary pinion carrier, rear sun gear) onto the rear clutch assembly.

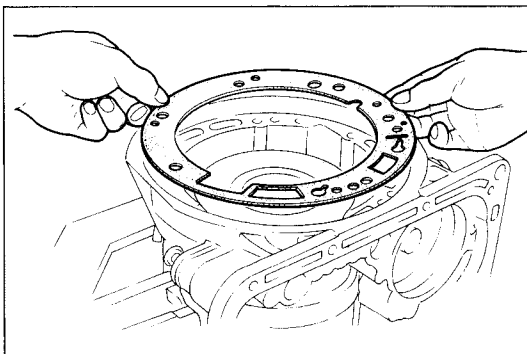


97U0KX-245

Caution

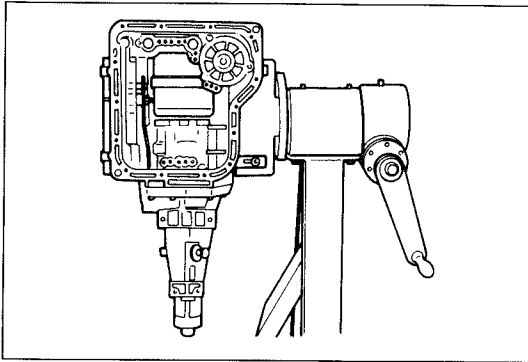
Be very careful to avoid incorrect assembly of the many similar bearings and races. (Refer to page K-135.)

13. Install the front clutch, rear clutch, rear clutch hub, front planetary pinion carrier, connecting shell, internal gear, sun gear, bearing, and bearing races as a unit into the transmission case.

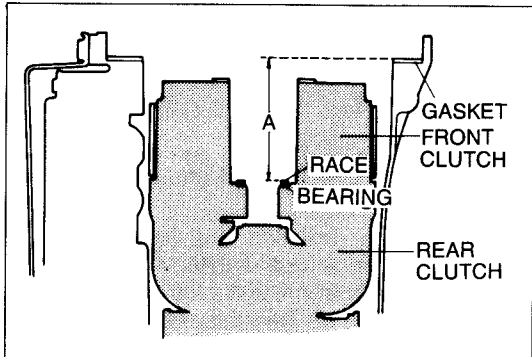


9MU0K2-369

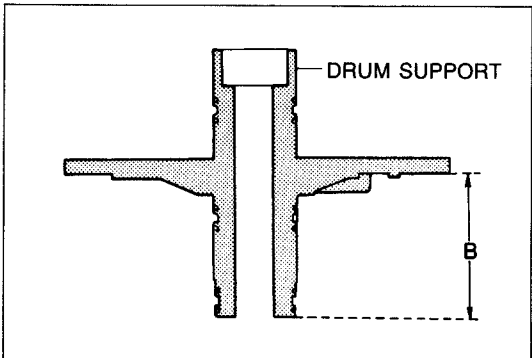
14. Set a new gasket into the front of the case.



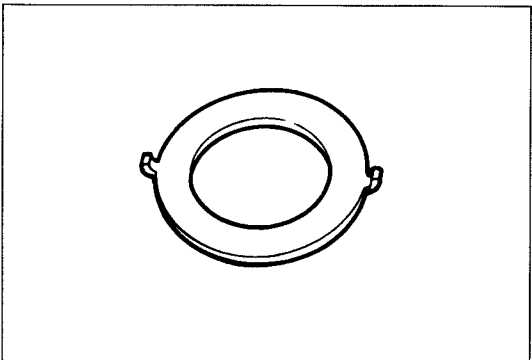
97U0KX-246



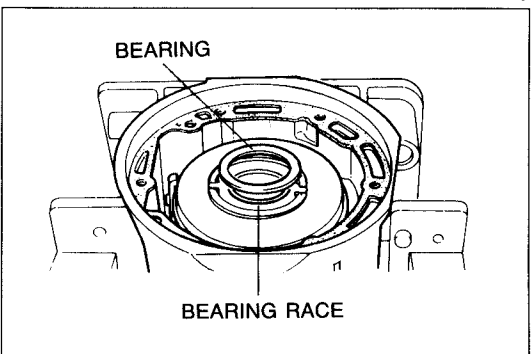
97U0KX-247



97U0KX-248



97U0KX-249



97U0KX-250

15. Check and adjust the rear clutch total end play.
- (1) Position the front of the transmission case upward.
 - (2) Set the drum support bearing and race on the rear clutch.

- (3) Measure distances A and B with a straight edge and vernier calipers.
- (4) Calculate the total end play by using the formula below.

Formula: $T = A - B - 0.1\text{mm}$ (0.0039 in)

- T: Total end play
 A: The distance between the drum support mounting surface (including the drum support gasket) and the drum support bearing race surface on the rear clutch assembly.
 B: The distance between the drum support bearing race contact surface and the drum support gasket contact surface.
 0.1: The compression amount of a new gasket.

Total end play: 0.25—0.50mm (0.010—0.020 in)

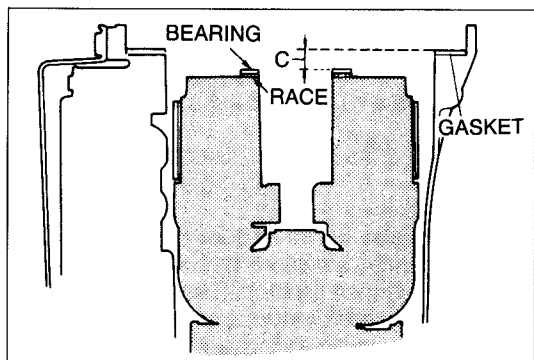
- (5) Adjust the total end play by selecting the proper bearing race.

Bearing race sizes

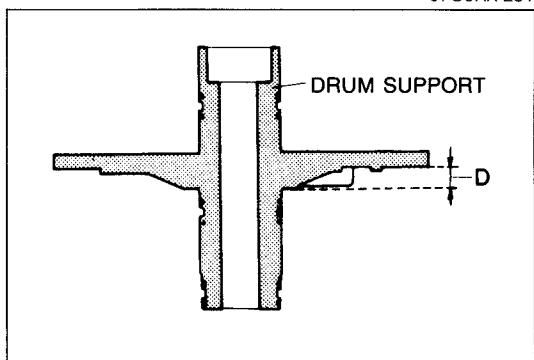
mm (in)

1.2 (0.047)	1.4 (0.055)	1.6 (0.063)
1.8 (0.071)	2.0 (0.079)	2.2 (0.087)

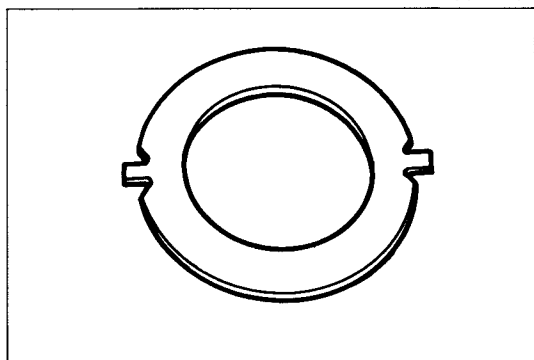
16. Check and adjust the front clutch end play.
- (1) Set the bearing race and bearing in position.



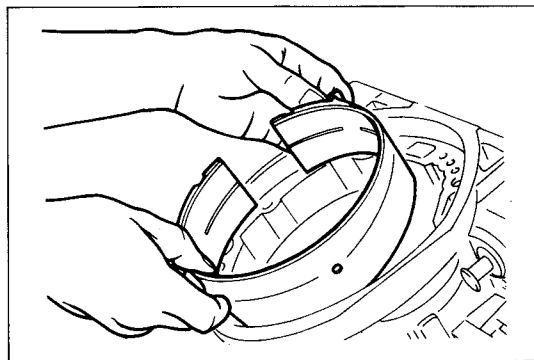
97U0KX-251



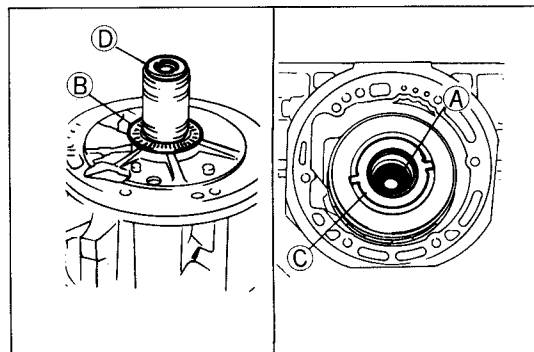
97U0KX-252



79G07C-421



97U0KX-253



97U0KX-254

- (2) Measure distances C and D with a straight edge and vernier calipers.
- (3) Calculate the front clutch end play by using the formula below.

Formula: $T = C - D - 0.1\text{mm (0.0039 in)}$

- T: Front clutch end play
 C: The distance between the drum support mounting surface (including the drum support gasket) of the transmission case and the bearing surface on the front clutch assembly.
 D: The distance between the sliding surface of the bearing and the drum support gasket contact surface.
 0.1: The compression amount of a new gasket.

Front clutch end play: 0.5—0.8mm (0.020—0.031 in)

- (4) Adjust the front clutch end play by selecting the proper bearing race.

Bearing race sizes

mm (in)

0.8 (0.031)	1.0 (0.039)	1.2 (0.047)
1.4 (0.055)	1.6 (0.063)	1.8 (0.071)
2.0 (0.079)	2.2 (0.087)	

17. Set the 2nd brake band and strut in position.
18. Tighten the piston stem lightly.

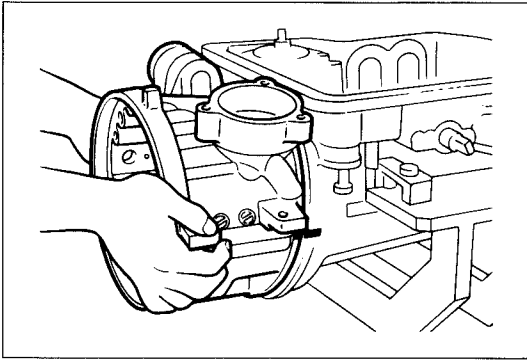
19. Apply petroleum jelly to the bearings and bearing races, and install them as shown.

Bearing outer diameter

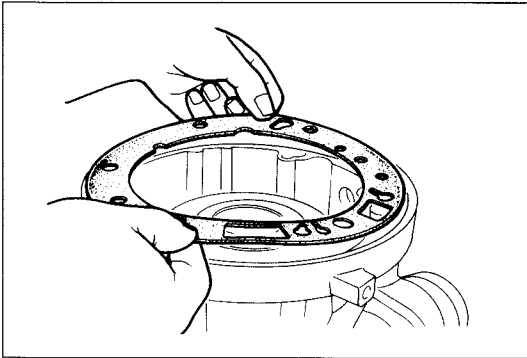
- (A): 34.9mm (1.37 in)**
- (B): 69.9mm (2.75 in)**

Bearing race outer diameter

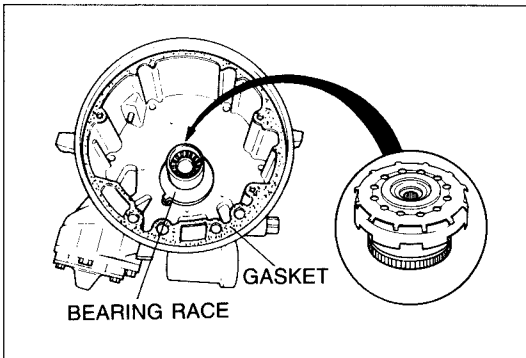
- (C): 76.0mm (2.99 in)**
- (D): 33.0mm (1.30 in)**



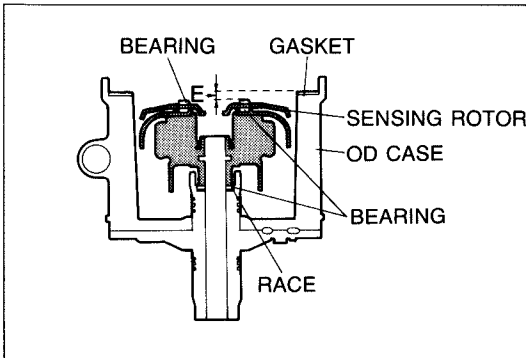
9MU0K2-376



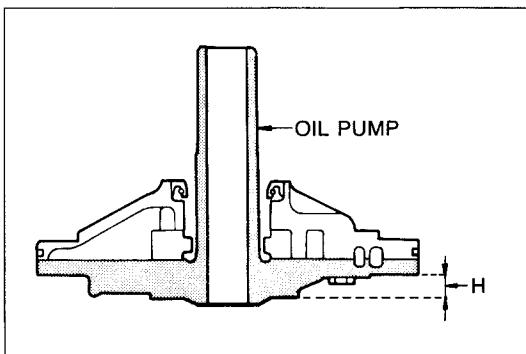
9MU0K2-377



97U0KX-255



97U0KX-256



Note

- a) Align the marks of the transmission case and OD case. Tap lightly with a plastic hammer to avoid damaging the seal rings when installing.
- b) Install two bolts for alignment.

20. Check that the bearing race is at the top of the front clutch and that the bearing is on the bottom of the front clutch hole, then mount the OD case.

21. Set a new gasket in place.

Note

- a) Do not install the direct clutch drum at this time.
- b) The sensing rotor and bearing are part of the oil pump assembly.

22. Check and adjust the OD planetary gear unit total end play.

- (1) Position the OD case upright.
- (2) Install the bearing and race on the OD case.
- (3) Install the planetary carrier, sun gear, connecting shell, and bearing as a unit in the OD case.
- (4) Install the sensing rotor and bearing on the connecting shell.
- (5) Measure distances E and H with a straight edge and vernier calipers.
- (6) Calculate the OD gear train total end play by using the formula below.

Formula: $T = E - H - 0.1\text{mm (0.0039 in)}$

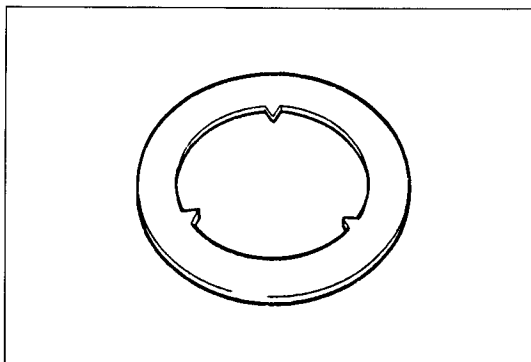
T: Total end play

E: The distance between the oil pump mounting surface (including the oil pump gasket) and the sensing rotor bearing surface.

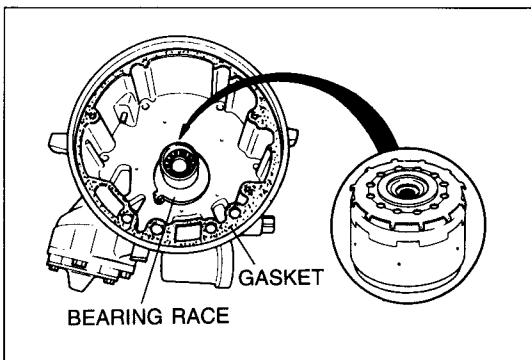
H: The distance between the oil pump side sensing rotor bearing contact surface and the oil pump gasket contact surface.

0.1: The compression amount of a new gasket.

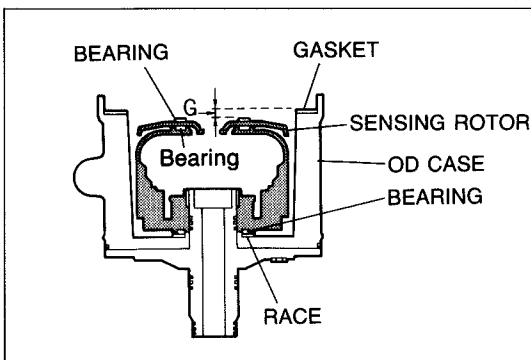
Total end play: 0.25—0.50mm (0.010—0.020 in)



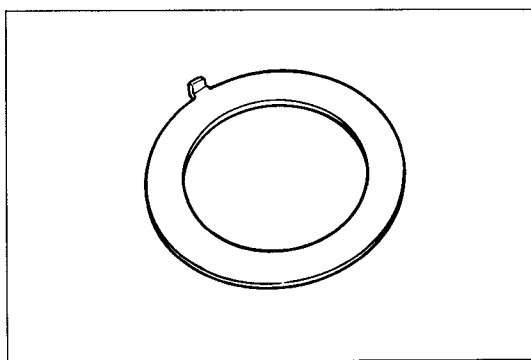
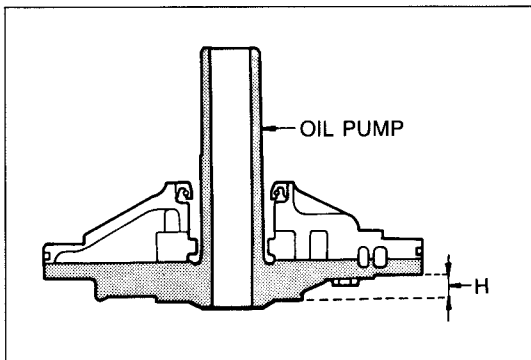
97U0KX-257



97U0KX-258



97U0KX-259



79G07C-430

(7) Adjust the total end play by selecting the proper bearing race.

Bearing race sizes

mm (in)

1.2 (0.047)	1.4 (0.055)	1.6 (0.063)
1.8 (0.071)	2.0 (0.079)	2.2 (0.087)

Note

a) Do not install the planetary pinion carrier at this time.

b) The sensing rotor and bearing are part of the oil pump assembly.

23. Check and adjust the direct clutch end play.

(1) Install the bearing race in the OD case.

(2) Install the direct clutch, sun gear, connecting shell, and bearings in the OD case.

(3) Install the sensing rotor and bearing on the connecting shell.

(4) Measure distances G and H with a straight edge and vernier calipers.

(5) Calculate the direct clutch end play by using the formula below.

Formula: $T = G - H - 0.1\text{mm (0.0039 in)}$

T: Total end play

G: The distance between the oil pump mounting surface (including the oil pump gasket) and the sensing rotor bearing surface.

H: The distance between the oil pump side sensing rotor bearing contact surface and the oil pump gasket contact surface.

0.1: The compression amount of a new gasket.

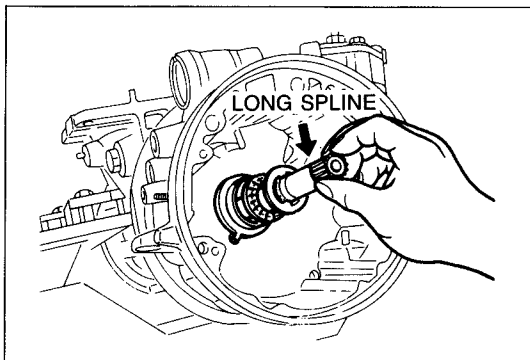
Total end play: 0.5—0.8mm (0.020—0.031 in)

(6) Adjust the direct clutch end play by selecting the proper bearing race.

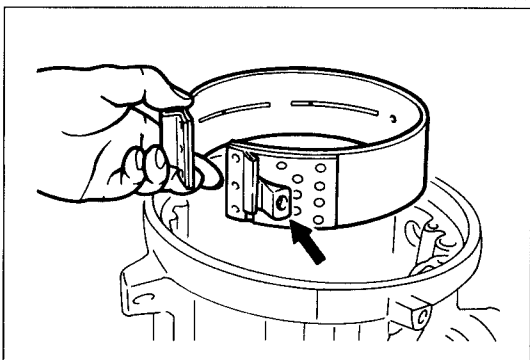
Bearing race sizes

mm (in)

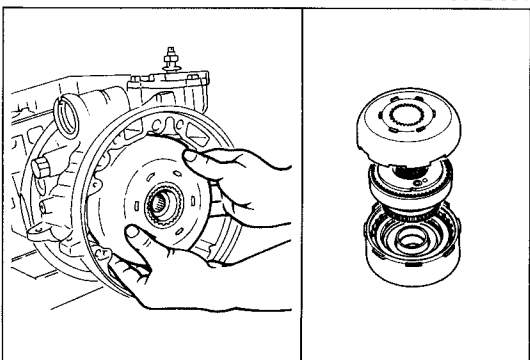
0.8 (0.031)	1.0 (0.039)	1.2 (0.047)
1.4 (0.055)	1.6 (0.063)	1.8 (0.071)
2.0 (0.079)	2.2 (0.087)	



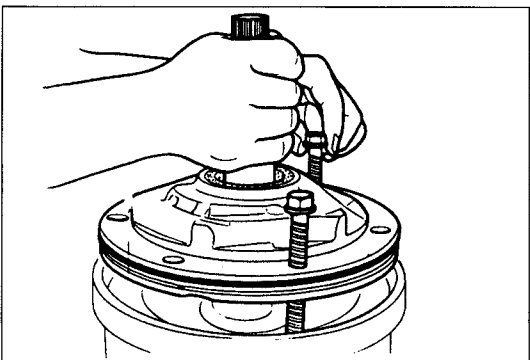
97U0KX-260



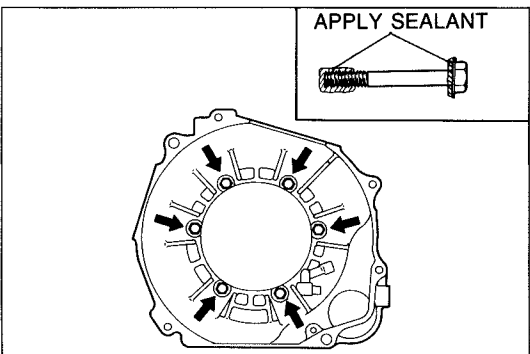
9MU0K2-384



97U0KX-261



97U0KX-262



97U0KX-263

Caution

The end with the long spline is the front.

Long spline: 23.0mm (0.906 in)

Short spline: 18.6mm (0.772 in)

24. Insert the intermediate shaft.
25. Apply petroleum jelly to the large bearing race and install it into the OD case.

Bearing race outer diameter: 70mm (2.756 in)

26. Apply petroleum jelly to the small bearing and small bearing race, and install them as shown.

Bearing outer diameter: 35.0mm (1.378 in)

Bearing race outer diameter: 33.0mm (1.299 in)

27. Install the OD brake band and band strut.

28. Install the OD connecting shell and OD planetary gear unit (OD sun gear, OD planetary pinion carrier, OD clutch hub) onto the direct clutch.

29. Install the direct clutch assembly into the OD case.

Caution

a) Do not damage the O-ring.

b) Do not use a hammer, plastic or otherwise, to install the oil pump.

30. Install the oil pump assembly into the transmission case using two converter housing bolts as guide.

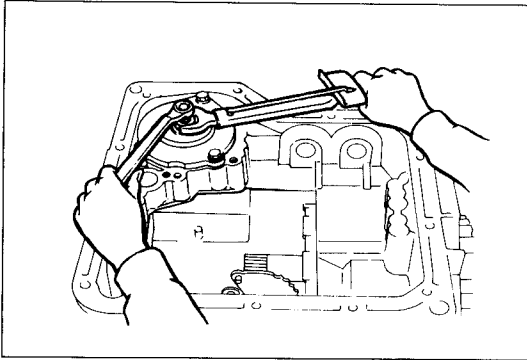
31. Remove the converter housing bolts used as guide. Apply sealant to the bolts.

32. Apply sealant to the contact surfaces of the converter housing and oil pump.

33. Install the converter housing onto the oil pump, and tighten bolts evenly in a crisscross pattern.

Tightening torque:

59—69 N·m (6.0—7.0 m·kg, 43—51 ft·lb)



97U0KX-264

34. Apply ATF to the piston stem.
35. Adjust the 2nd brake band.
 - (1) Loosen the locknut and tighten the piston stem.

Tightening torque:

12—14 N·m (1.25—1.45 m·kg, 9.0—10.5 ft·lb)

- (2) Loosen the stem the number of turns shown below.

Stem: 2 1/2 turns

- (3) Hold the stem and tighten the locknut.

Tightening torque:

15—39 N·m (1.5—4.0 m·kg, 11—29 ft·lb)

Caution

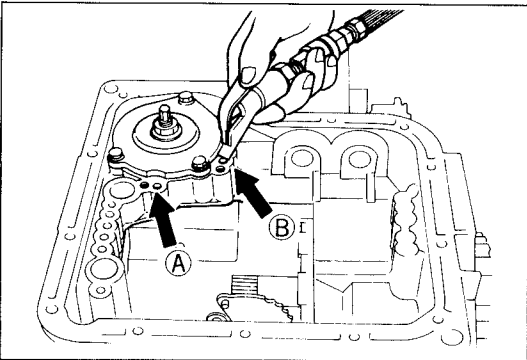
Apply air for no more than three(3) seconds.

36. Check the servo piston operation by applying compressed air through the oil passages of the 2nd band servo.

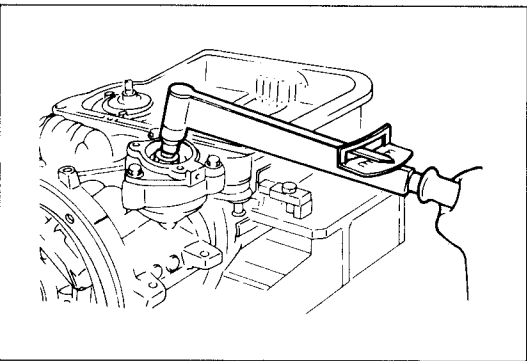
(A) : Engage

(B) : Release

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.



97U0KX-265



97U0KX-266

37. Apply ATF to the piston stem. Adjust the OD brake band.
 - (1) Loosen the locknut and tighten the piston stem.

Tightening torque:

12—15 N·m (1.2—1.5 m·kg, 8.7—11 ft·lb)

- (2) Loosen the stem the number of turns shown below.

Stem: 2 turns

- (3) Hold the stem and tighten the locknut.

Tightening torque:

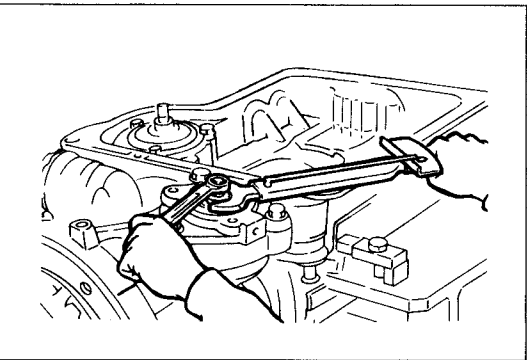
15—39 N·m (1.5—4.0 m·kg, 11—29 ft·lb)

Caution

Apply air for no more than three(3) seconds.

38. Check the servo piston operation by applying compressed air through the oil passage of the OD band servo.

Air pressure: 392 kPa (4.0 kg/cm², 57 psi) max.

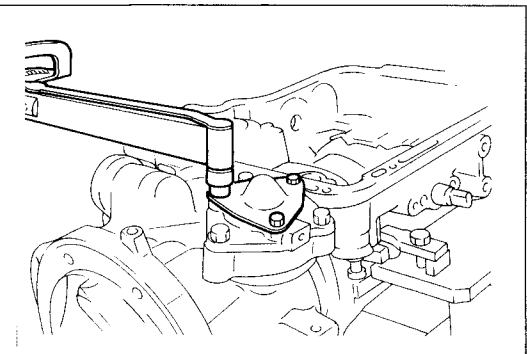


97U0KX-267

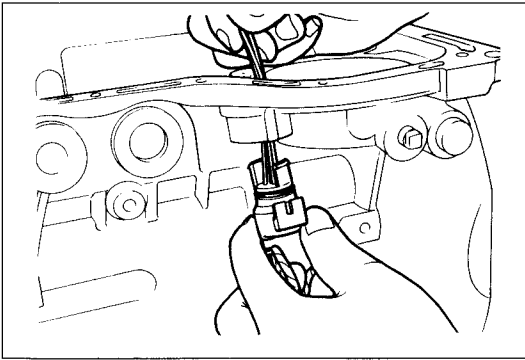
39. Set a new gasket on the OD band servo. Install the OD band servo cover.

Tightening torque:

4.9—6.9 N·m (50—70 cm·kg, 43—61 in·lb)

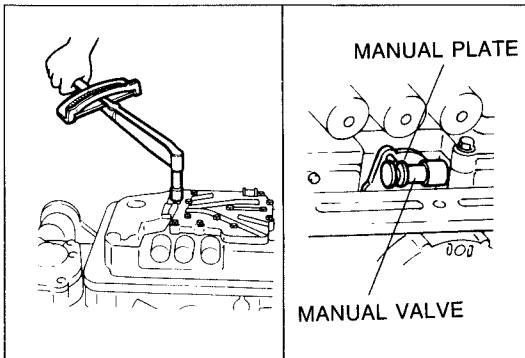


97U0KX-268



97U0KX-269

40. Apply ATF to a new O-ring and install it onto the solenoid valve connector.
41. Install the solenoid valve connector in the transmission case.



97U0KX-270

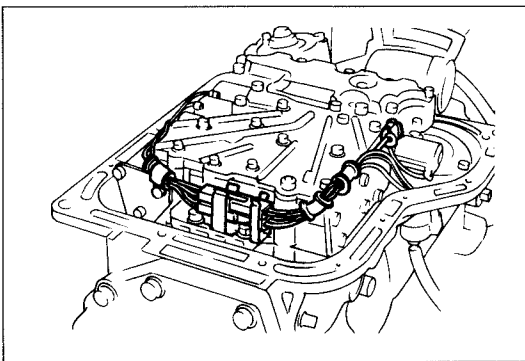
Note

Be sure to align the manual plate and the manual valve.

42. Install the control valve body assembly.
43. Install the bolts.

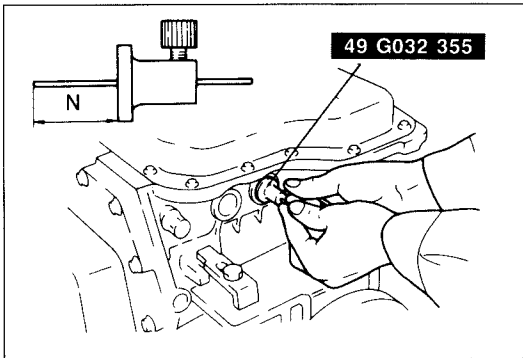
Tightening torque:

11—15 N·m (1.1—1.5 m·kg, 8.0—11 ft·lb)



97U0KX-271

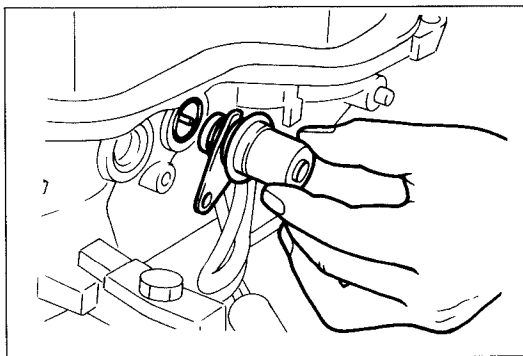
44. Connect the solenoid valve connectors.
45. Install the harnesses.



97U0KX-272

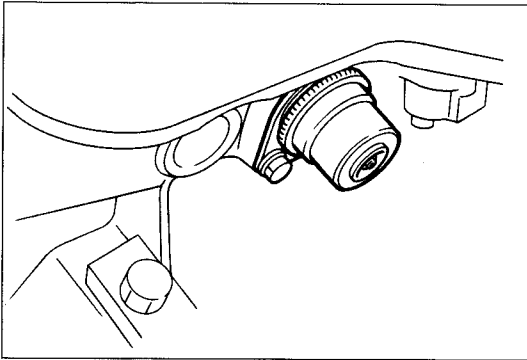
46. Apply ATF to a new O-ring, and install it onto the vacuum diaphragm.
47. Select the diaphragm rod.
 - (1) Measure dimension N with the **SST** and a scale.
 - (2) Select the proper diaphragm rod in accordance with the table below.

Dimension N	Applicable diaphragm rod
Below 27.30mm (1.0748 in)	29.0mm (1.14 in)
27.30—27.80mm (1.0748—1.0945 in)	29.5mm (1.16 in)
27.80—28.30mm (1.0945—1.1142 in)	30.0mm (1.18 in)
28.30—28.80mm (1.1142—1.1339 in)	30.5mm (1.20 in)
28.80mm (1.1339 in) or over	31.0mm (1.22 in)



97U0KX-273

48. Apply ATF to a new O-ring, and install it into the transmission case.

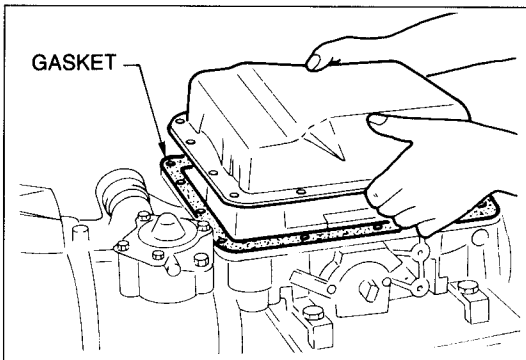


97U0KX-274

49. Install the vacuum diaphragm to the transmission case.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



97U0KX-275

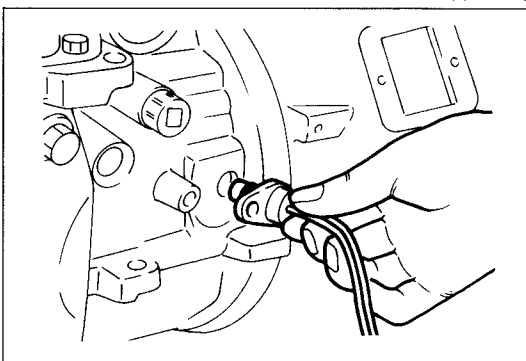
50. Set the magnets in the oil pan.

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

52. Install the bracket and the pan mounting bolts.

Tightening torque:

5.9—7.8 N·m (60—80 cm·kg, 52—69 in·lb)



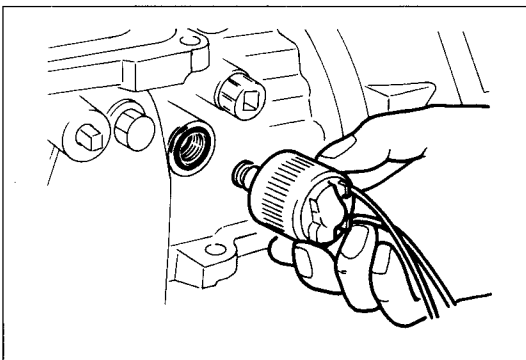
97U0KX-276

53. Apply ATF to a new O-ring and install it onto the turbine sensor.

54. Apply locking compound to the mounting bolt threads, then install the turbine sensor.

Tightening torque:

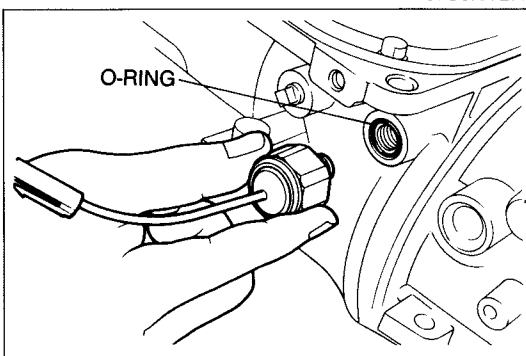
7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



97U0KX-277

55. Apply ATF to the new O-rings and install them into the transmission case.

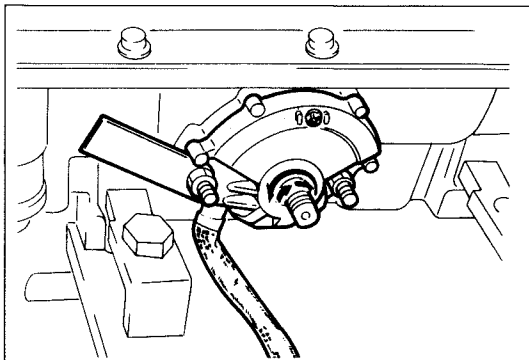
56. Install the lockup control solenoid.



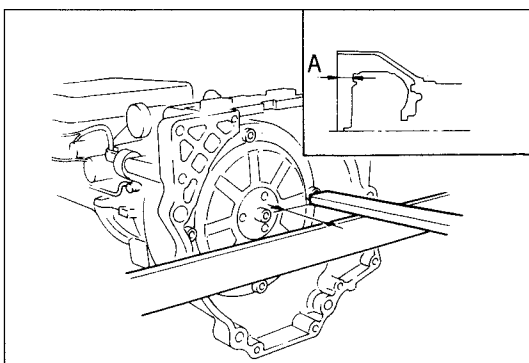
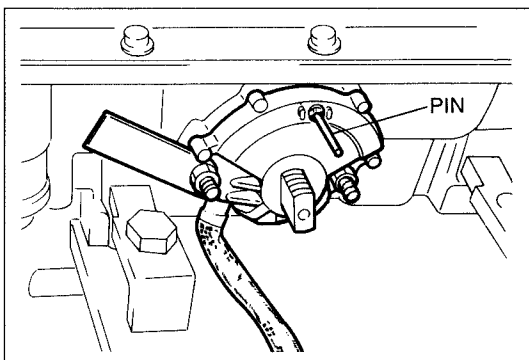
97U0KX-278

57. Apply ATF to a new O-ring and install it into the transmission case.

58. Install the pressure switch.



97U0KX-279



97U0KX-280

59. Rotate the manual shaft fully reward, then return it two (2) notches to the N position.
60. Loosely tighten the inhibitor switch nuts.
61. Remove the screw on the switch body and move the inhibitor switch so that the screw hole on the switch body is aligned with the small hole inside the switch. Check their alignment by inserting a **2.0mm (0.0079 in)** diameter pin into the holes.
62. Tighten the switch attaching nuts.
63. Remove the pin, and tighten the screw into the hole.

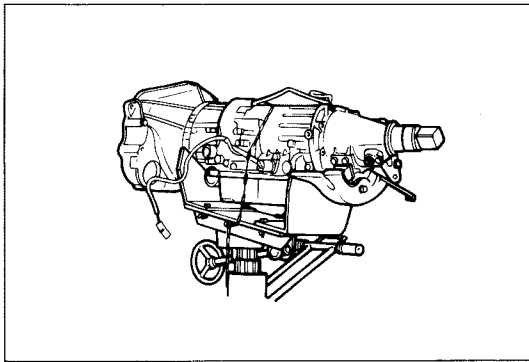
Tightening torque:

4.9—6.9 N·m (50—70 cm·kg, 43—61 in·lb)

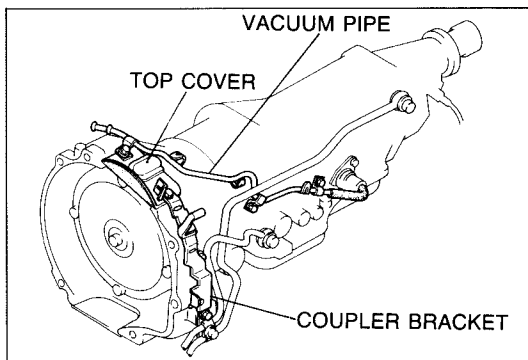
64. Ensure that the torque converter is installed correctly by measuring the distance (A) between the end of the torque converter and the end of the converter housing.

“A”: **32mm (1.26 in) min.**

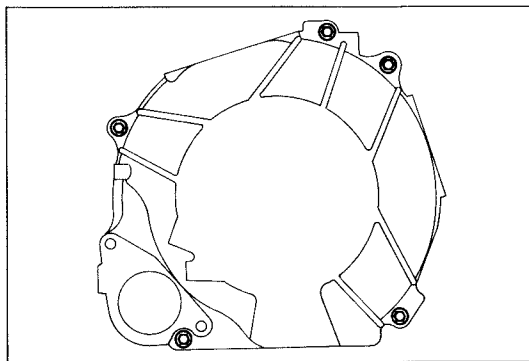
65. Remove the transmission from the engine stand.



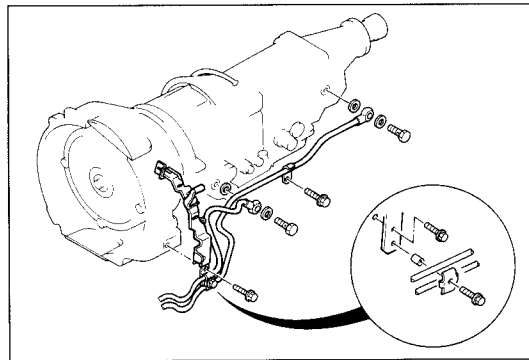
9MU0K2-408



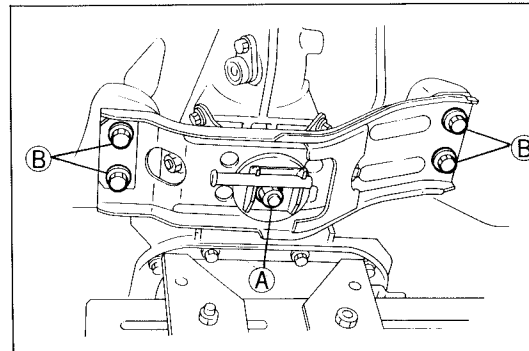
97U0KX-282



97U0KX-283



97U0KX-284



97U0KX-285

Caution

Do not allow the transmission to lean toward the torque converter side.

3. Set the transmission on a transmission jack.

4. Install the top cover, coupler bracket, and vacuum pipe.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

5. Raise the transmission into place, and install and tighten the installation bolts.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

6. Connect the oil pipes.

Tightening torque:

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

Ⓑ : 7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

7. Tighten the bolts Ⓑ.

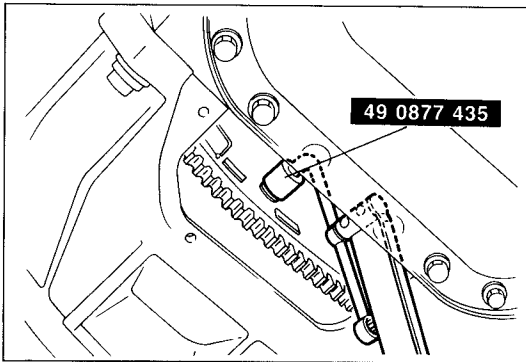
Tightening torque:

31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

8. Tighten the nut Ⓐ.

Tightening torque:

55—80 N·m (5.6—8.2 m·kg, 41—59 ft·lb)



97U0KX-286

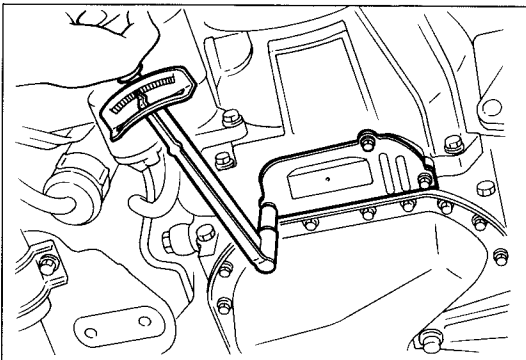
Caution

When tightening the bolts with the SST, tighten them to the minimum specified tightening torque.

9. Loosely and equally tighten the torque converter bolts, then further tighten them to the specified tightening torque.

Tightening torque:

34—49 N·m (3.5—5.0 m·kg, 25—36 ft·lb)

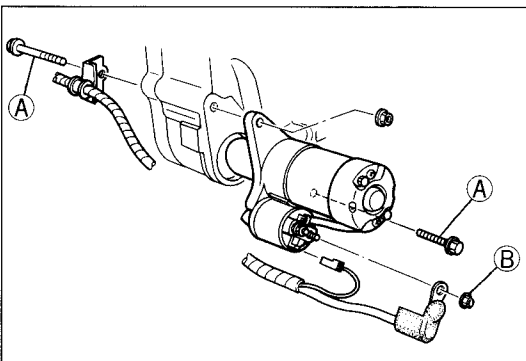


97U0KX-287

10. Install the undercover.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)



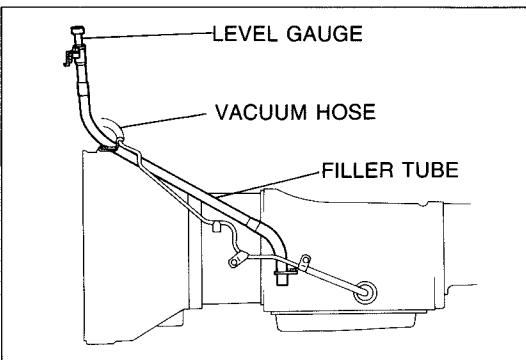
97U0KX-288

11. Install and tighten the starter and bracket to the specified torque.

Tightening torque:

A : 31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

B : 9.8—12 N·m (100—120 cm·kg, 87—104 in·lb)



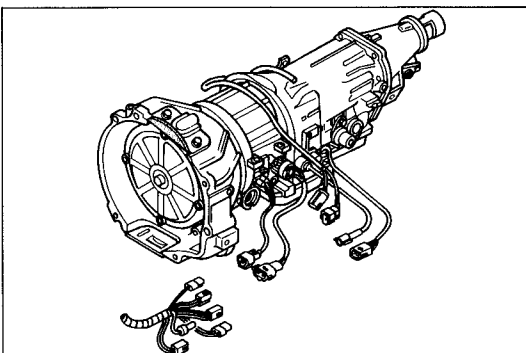
97U0KX-289

12. Install the filler tube.

Tightening torque:

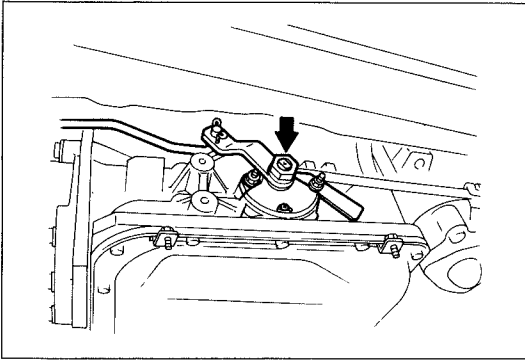
7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

13. Insert the level gauge.
14. Connect the vacuum hose.



97U0KX-290

15. Connect the inhibitor switch, oil pressure switch, lockup control solenoid, and turbine sensor connectors.



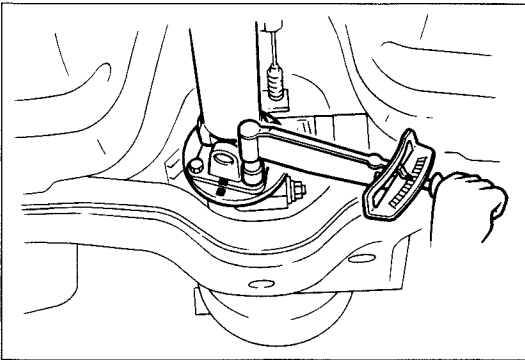
97U0KX-291

16. Install the select lever and nut.

Tightening torque:

44—64 N·m (4.5—6.5 m·kg, 33—47 ft·lb)

17. Install the shift rod and a new snap ring.



97U0KX-292

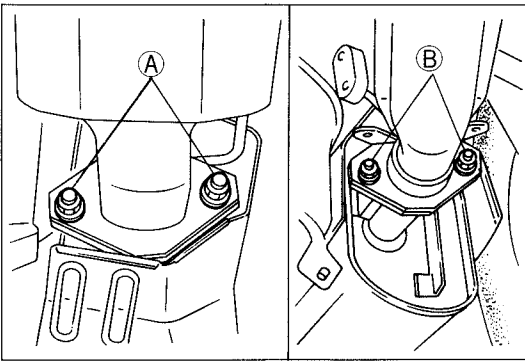
Note

Align the matching marks and install the propeller shaft.

18. Install the propeller shaft. (Refer to section L.)

Tightening torque:

49—59 N·m (5.0—6.0 m·kg, 36—43 ft·lb)



97U0KX-293

19. Install the insulator and exhaust pipe.

Tightening torque:

Heat insulator:

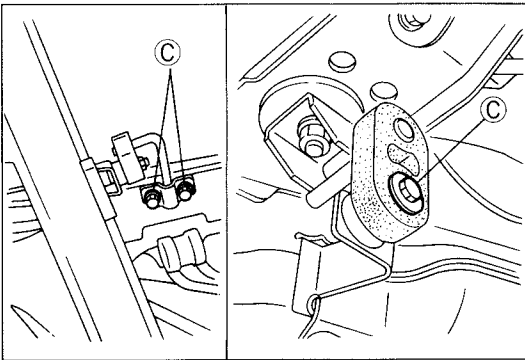
7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Exhaust pipes:

(A) : 59—80 N·m (6.0—8.2 m·kg, 43—59 ft·lb)

(B) : 31—46 N·m (3.2—4.7 m·kg, 23—34 ft·lb)

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



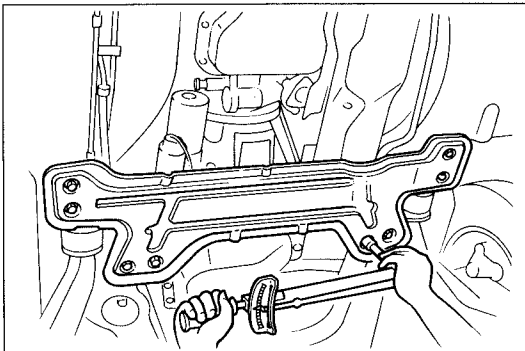
97U0KX-294

20. Install the speedometer cable.

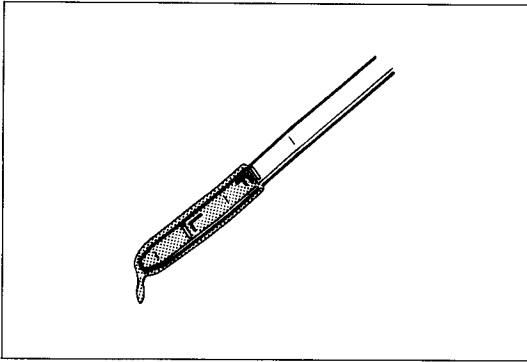
21. Install the crossmember. (Convertible)

Tightening torque:

36—54 N·m (3.7—5.5 m·kg, 27—40 ft·lb)

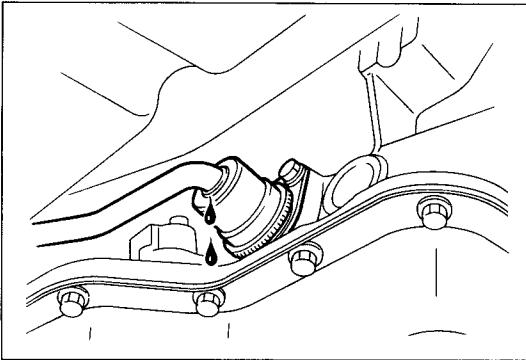


97U0KX-295



97U0KX-338

22. Connect the negative battery cable.
23. Fill with the specified amount and type of ATF until the fluid level is between the F and L on the level gauge.



9MU0K2-423

24. Warm up the engine and ATF to normal operating temperature, then check the following items.
 - 1) Fluid leakage
 - 2) Vacuum leakage
 - 3) ATF level

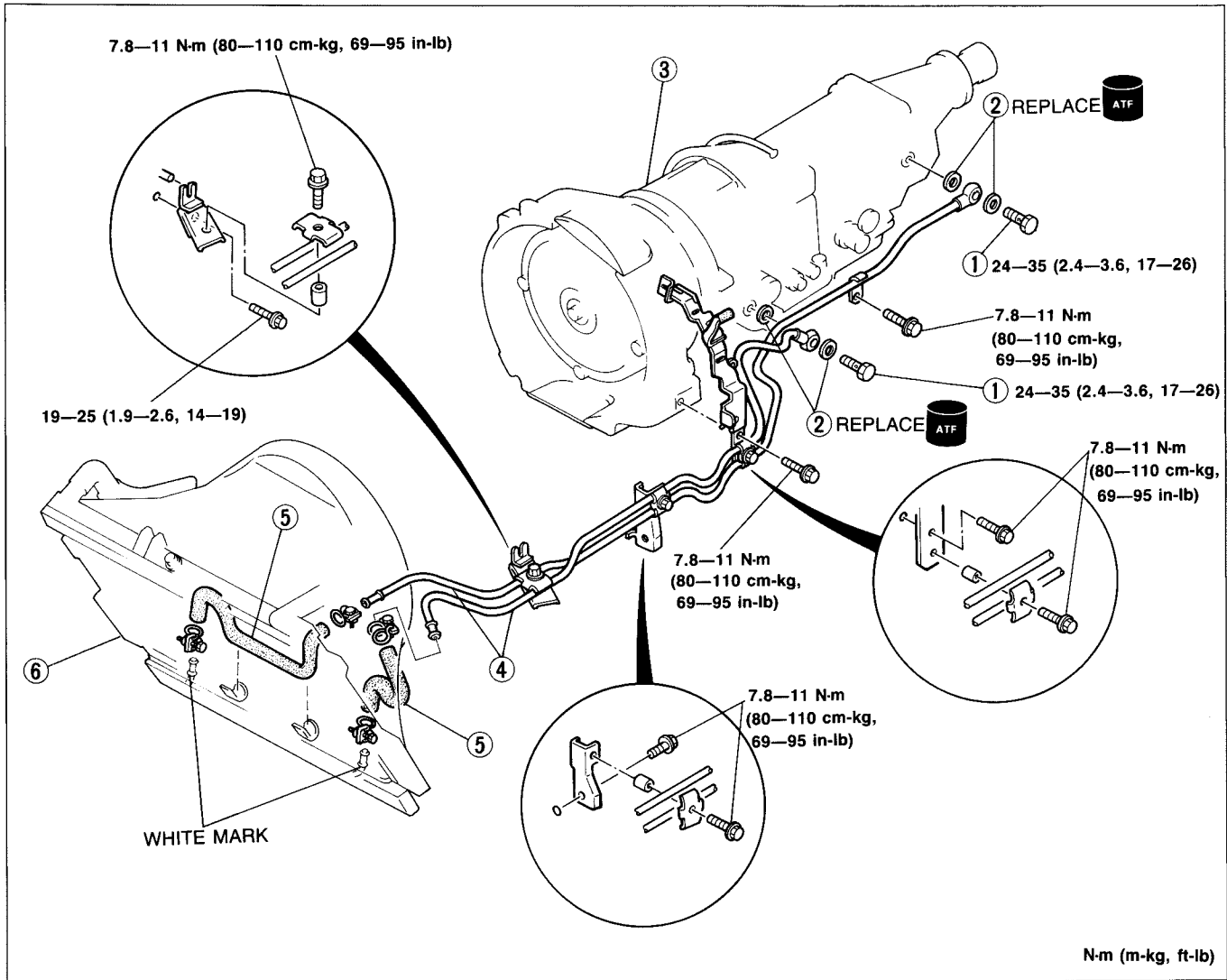
OIL COOLER

Removal, Inspection, and Installation

Remove in the order shown in the figure.

Inspect all parts and repair or replace as necessary.

Install in the reverse order of removal, referring to **Installation Note**.



97U0KX-296

1. Connector bolts
Inspect for clogging

2. Packing

3. Transmission

Removal page K- 47

Installation..... page K-149

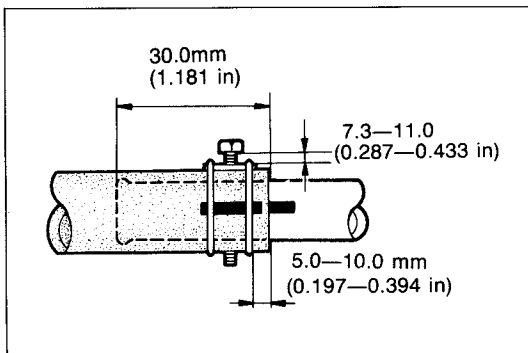
4. Oil pipe
Inspect for damage or cracks

5. Oil hose

Inspect for damage or cracks

6. Radiator

Refer to Section E



97U0KX-297

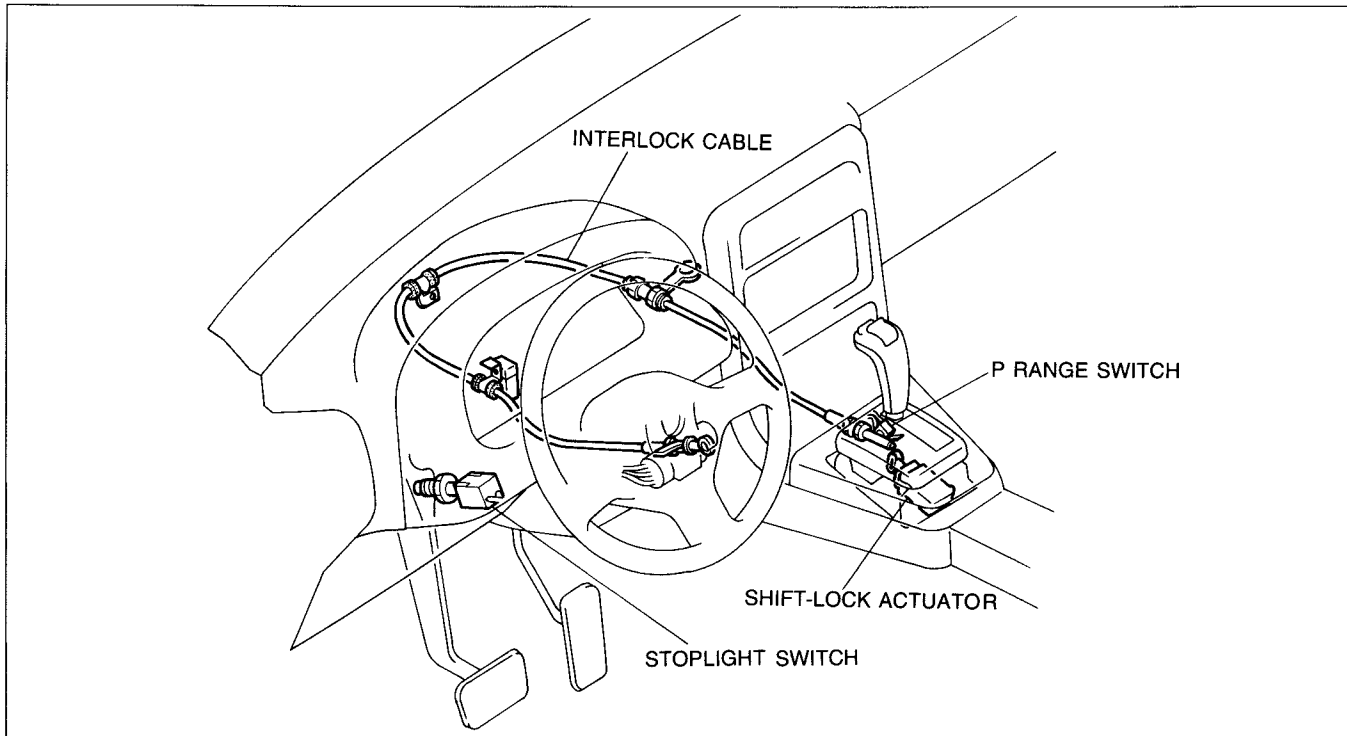
Installation note

Oil pipe

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 other parts.

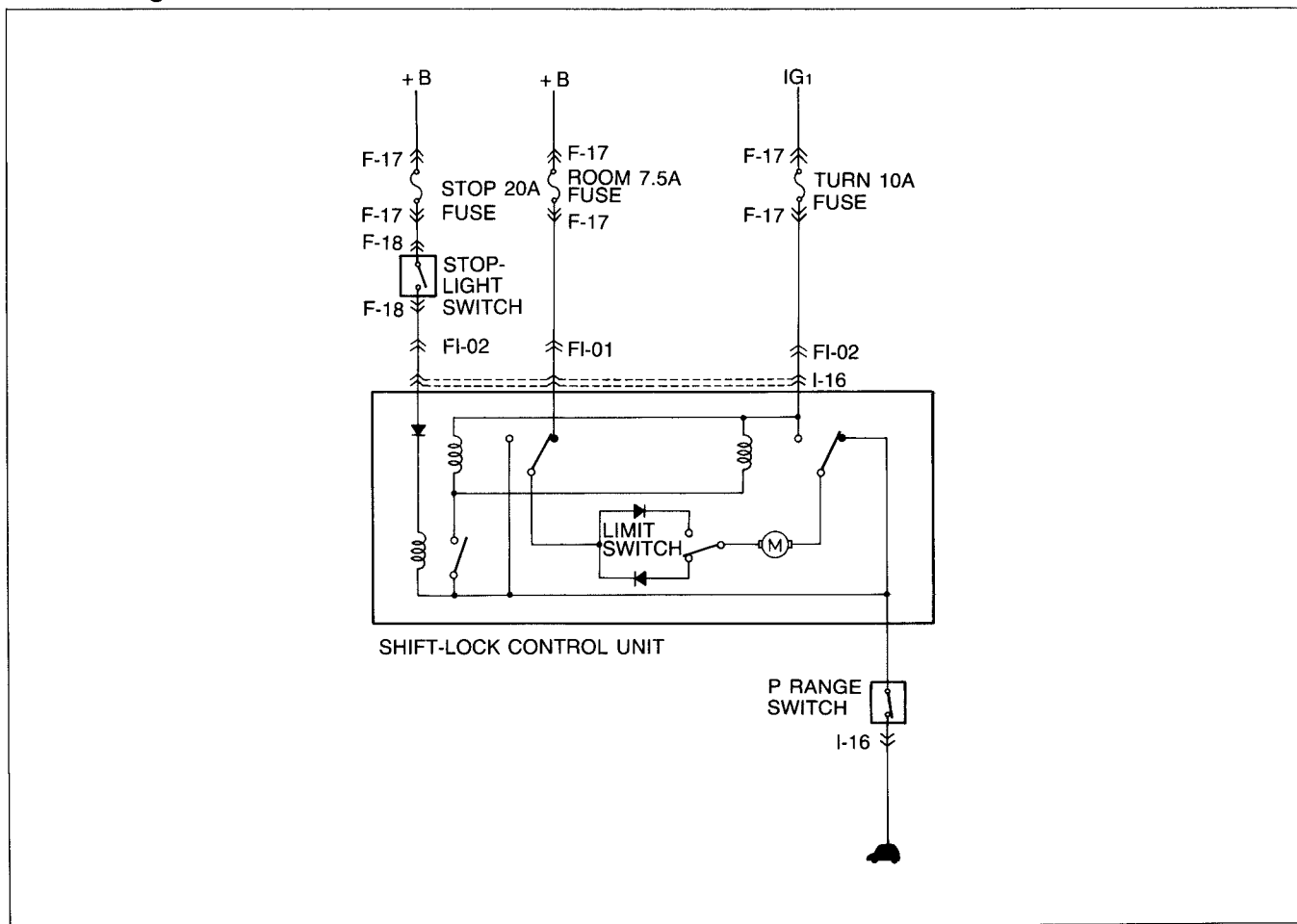
SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)

SHIFT-LOCK SYSTEM COMPONENTS



TROUBLESHOOTING

Circuit Diagram

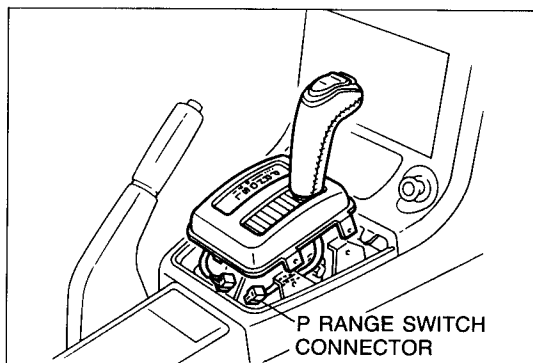


K SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)

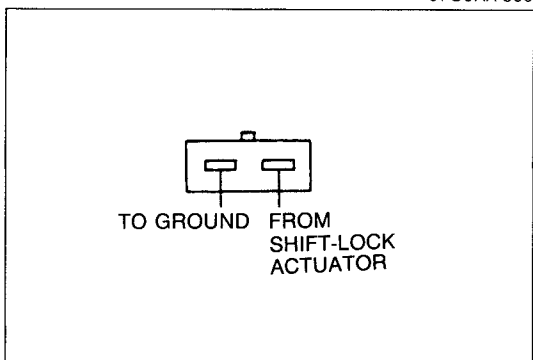
Diagnosis chart

Problem	Possible Cause	Action	Page
Selector lever cannot be moved from P range with brake pedal depressed and ignition switch ON	ROOM 7.5A fuse not installed or burned	Install or replace	K-155
	IG1 system malfunction <ul style="list-style-type: none"> • Wire harness broken • Poor connection • TURN 10A fuse burned 	Repair or replace Connect firmly Replace	K-155 K-155 K-155
	Ignition switch malfunction	Inspect and replace	Section T
	Stoplight switch remains OFF	Inspect and replace	Section T
	Stoplight system malfunction <ul style="list-style-type: none"> • Wire harness broken • Poor connection • STOP 20A fuse burned 	Repair or replace Connec firmly Replace	K-155 K-155 K-155
	P range switch remains OFF	Inspect and replace	K-157, 165
	P range switch system malfunction <ul style="list-style-type: none"> • Wire harness broken (Poor ground) • Poor connection 	Repair or replace Connect firmly	K-155 K-155
	Shift-lock actuator malfunction <ul style="list-style-type: none"> • Wire harness broken • Poor connection 	Inspect and replace Repair wiring harness Connect firmly	K-157, 165 K-155 K-155
	Misadjustment of selector lever or improper assembly of shift-lock actuator	Adjust or repair	K-159, 165
Selector lever can be moved from P range with ignition switch ON, but without brake pedal depressed	ROOM 7.5A fuse burned	Replace	K-155
	Stoplight switch remains ON	Inspect and replace	Section T
	Shift-lock actuator malfunction	Inspect and replace	K-157, 165
	Misadjustment of selector lever or improper assembly of shift-lock actuator	Adjust or repair	K-159, 165
Selector lever can be moved from P range with ignition switch OFF and brake pedal depressed	ROOM 7.5A fuse burned	Replace	K-155
	Ignition switch malfunction	Inspect and repair	Section T
	Shift-lock actuator malfunction	Inspect and replace	K-157, 165
	Misadjustment of selector lever or improper assembly of shift-lock actuator	Adjust and repair	K-159, 165
Shift-lock actuator operation heard when brake pedal depressed with ignition switch ON in other than P range	P range switch remains ON	Inspect and replace	K-157, 165
Selector remains locked with emergency override button operated	Emergency override button not slide fully back	Slide fully back and hold emergency override button, move selector lever	—
	Broken emergency override button	Replace	K-161
	Misadjustment of indicator panel	Adjust	K-164
Ignition key can be turned to LOCK position with selector lever in ranges other than P range	Interlock cable <ul style="list-style-type: none"> • Disconnected • Kinked • Stuck • Spring damaged 	Inspect and replace	K-160, 161
	Key cylinder malfunction	Replace	Section N
Ignition key cannot be turned to LOCK position with selector lever in P range	Interlock cable <ul style="list-style-type: none"> • Disconnected • Kinked • Stuck • Spring damaged 	Inspect and replace	K-160, 161
	Key cylinder malfunction	Replace	Section N

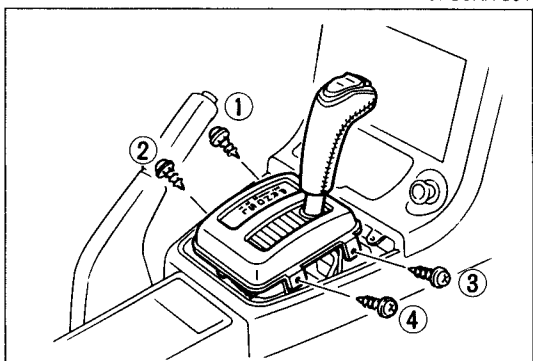
97U0KX-299



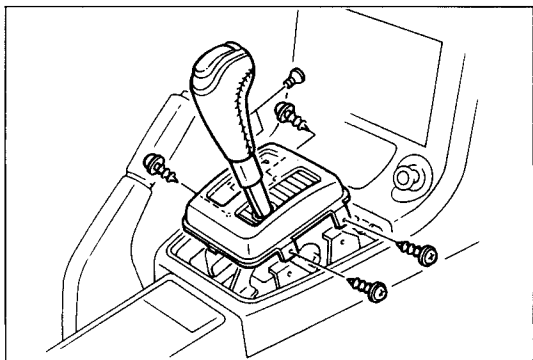
97U0KX-300



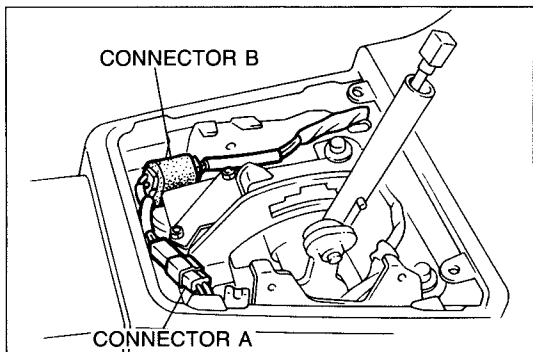
97U0KX-301



97U0KX-302



97U0KX-303



97U0KX-304

P RANGE SWITCH

Inspection

Continuity

1. Disconnect the negative battery cable.
2. Pry off the upper panel.
3. Remove the indicator screws and lift up the indicator panel.
4. Disconnect the P range switch connector.

5. Check continuity of the terminals.

Range	Selector lever release button	Continuity
P	Released	Yes
	Depressed	No
R, D, S, L	—	No

6. If not as specified, replace the P range switch.
(Refer to page K-165.)

7. Adjust the indicator panel. (Refer to page K-159.)
Install the screws in the order shown in the figure.
8. Install the upper panel.
9. Connect the negative battery cable.
10. Check for correct operation of the shift-lock system.

SHIFT-LOCK ACTUATOR

Inspection

Terminal voltage and continuity

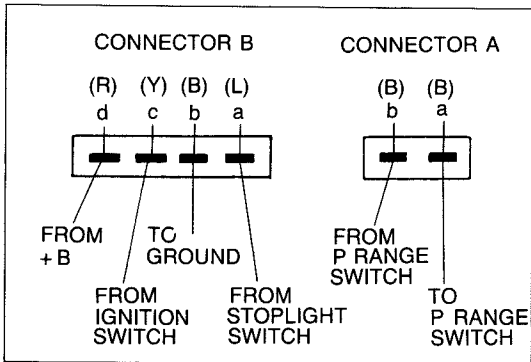
1. Pry off the upper panel.
2. Shift the selector lever to L range.
3. Remove the selector knob and indicator panel screws.

Caution

Do not pull the selector knob up too far to prevent damaging the wire harness.

4. Lift up the selector knob, selector sleeve, and indicator panel.
5. Disconnect the hold switch connector.
6. Shift the selector lever to P range.

K SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)



97U0KX-305

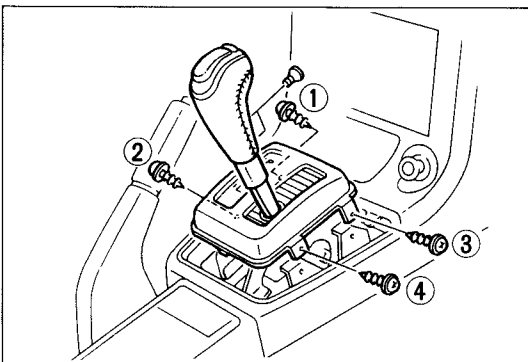
Caution

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

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

Connector	Terminal	⊖ terminal connected to	Condition	Measurement valve
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	Ignition switch ON	Approx. 12V
B	c	B—b	Ignition switch OFF	Approx. 12V
B	d	B—b	Constant	0Ω

97U0KX-306



97U0KX-307

- Grasp the hold switch wire harness and pull it while pushing the selector knob down fully on the selector lever.
- Connect the hold switch connector.
- Adjust the indicator panel. (Refer to page K-159.) Install the screws in the order shown in the figure.
- Clean and apply locking compound to the selector knob screws threads. Tighten the screws.

Tightening torque:

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

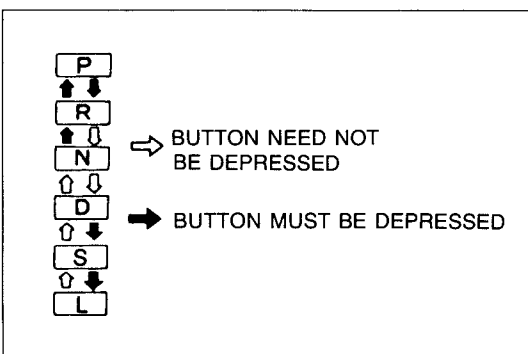
- Install the upper panel.
- Connect the negative battery cable.
- Check for correct operation of the shift-lock system.

SELECTOR LEVER Inspection

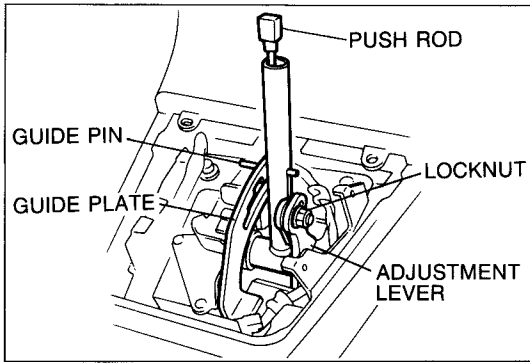
Caution

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

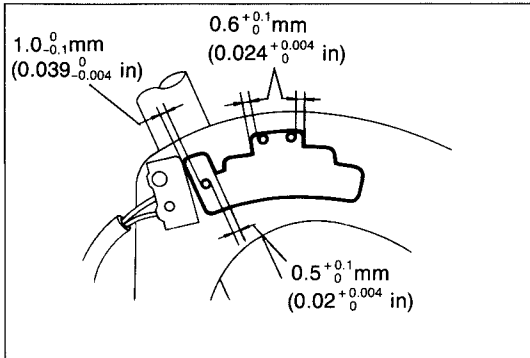
- Check that the selector lever can only be shifted as shown in the figure.
- Make sure there is a click at each range when shifted from P → L range.
- Check that the positions of the selector lever and the indicator are aligned.
- Check that the button returns smoothly when pushed to shift.



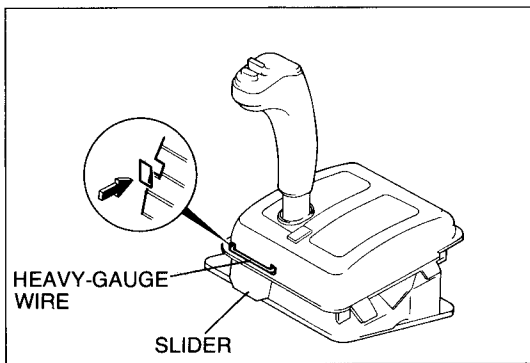
97U0KX-308



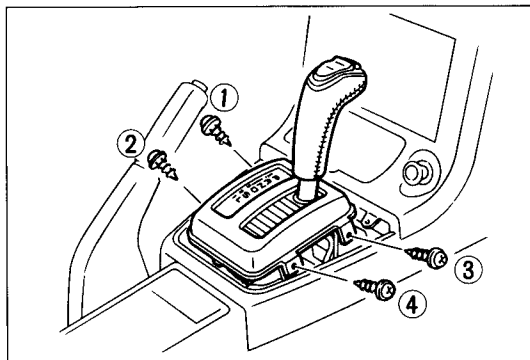
97U0KX-309



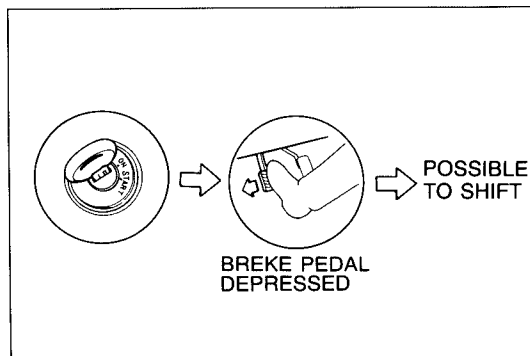
97U0KX-310



97U0KX-311



97U0KX-312



97U0KX-313

Adjustment Lever position

1. Disconnect the negative battery cable to deactivate the shift-lock.
2. Remove the upper panel, selector knob, selector sleeve, and indicator panel. (Refer to shift-lock actuator inspection; page K-157, Steps 1—7.)
3. Loosen the locknut.
4. Shift the transmission to P range by pushing the adjustment lever forward.
5. Adjust the lever so that the clearance between the guide plate and the guide pin in P range with the push rod lightly depressed is as shown.
6. Tighten the locknut.

Tightening torque:

20—28 N·m (2.0—2.9 m·kg, 14—21 ft·lb)

7. Move the selector lever to N and D ranges and verify that there is the same clearance between the guide plate and the guide pin.
8. If not as specified, readjust the lever.
9. Install the indicator panel, selector sleeve, selector knob, and upper panel in the reverse order of removal.
10. Check the selector lever operation. (Refer to Inspection above.)

Indicator panel

1. Remove the upper panel.
2. Shift the selector lever to P range.
3. Loosen the indicator screws.
4. Align the alignment grooves in the slider with the holes in the indicator panel. Install suitable heavy-gauge wire to hold the slider.
5. Tighten the indicator screws in the order shown in the figure.
6. Remove the wire.
7. Verify that the selector lever properly aligns with the indicator in each range.

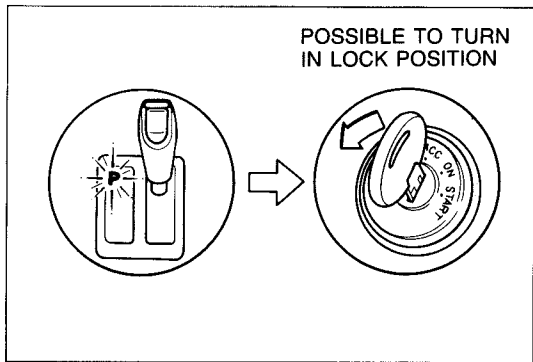
Shift-lock System Operation Inspection

Caution
Service with engine OFF.

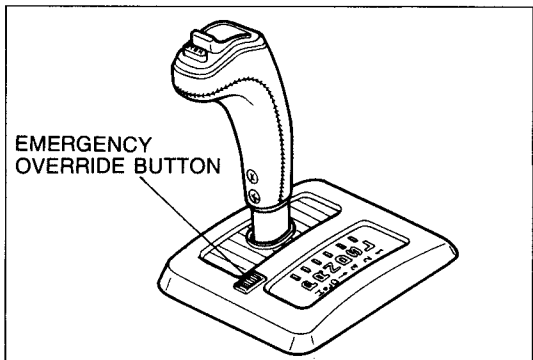
Shift-lock system

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.

K SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)



97U0KX-314



97U0KX-315

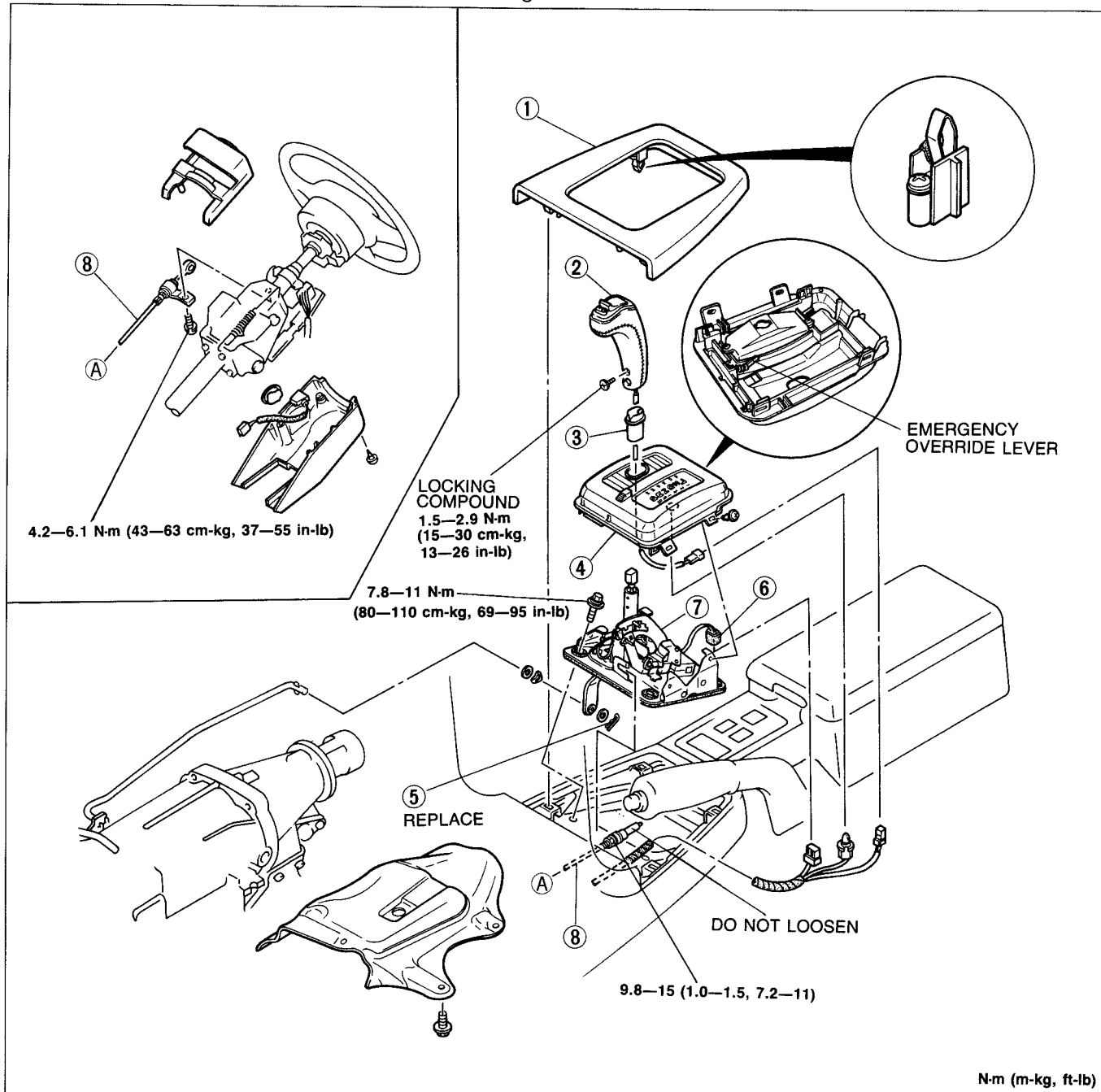
5. Shift the selector lever to R range.
6. Verify that the ignition key cannot be turned to LOCK position.
7. Shift the selector lever to P range.
8. Verify that the ignition key can be turned to LOCK position.
9. If not as specified, inspect and repair as necessary, referring to Troubleshooting.

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.

Removal, Inspection, and 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 in the reverse order of removal, referring to **Installation Note**.

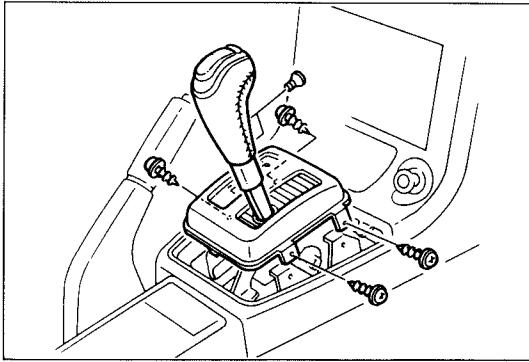


N-m (m-kg, ft-lb)

97U0KX-316

1. Upper panel	
2. Selector knob	
Removal	page K-162
Installation	page K-164
3. Selector sleeve	
4. Indicator panel	
Inspect emergency override lever for wear or damage	
Inspect emergency override button operation	
Installation	page K-164
5. Spring clip	
Removal	page K-162
Installation	page K-163
6. Shift-lock actuator connector	
7. Selector lever	
Removal	page K-162
Overhaul	page K-165
Installation	page K-163
8. Interlock cable	
Removal	page K-162
Installation	page K-163

K SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)



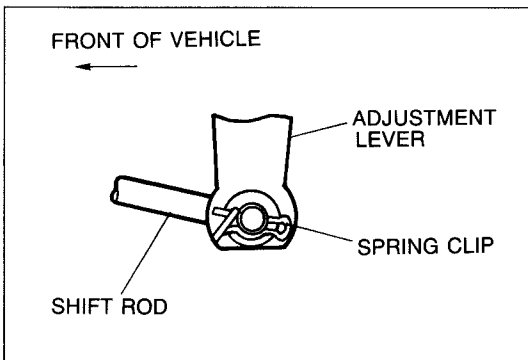
97U0KX-317

Removal note Selector knob

Caution

Do not pull the selector knob up too far to prevent damaging the wire harness.

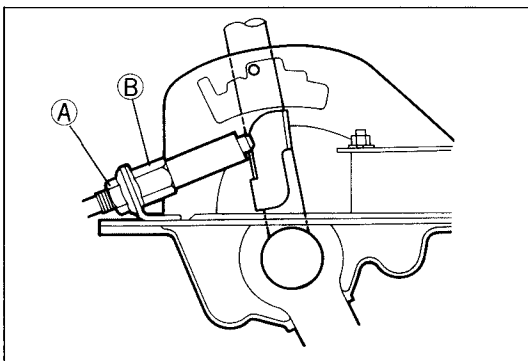
Refer to shift-lock actuator inspection; page K-157, Steps 2-6.



97U0KX-318

Spring clip

1. Jack up the vehicle and support it with safety stands.
2. Remove the mounting bolts and slide back the heat insulator to expose the spring clip.
3. Remove the spring clip.



97U0KX-319

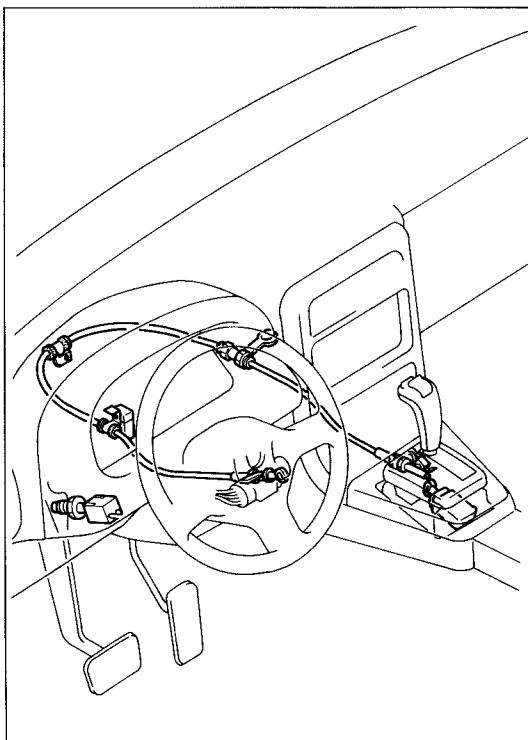
Selector lever

1. Shift the selector lever to N range.

Caution

- a) **Do not loosen locknut (B), it is factory preset for proper shift-lock system operation.**
- b) **Do not kink the cable.**

2. Loosen the locknut (A).
3. Separate the cable from the selector lever.



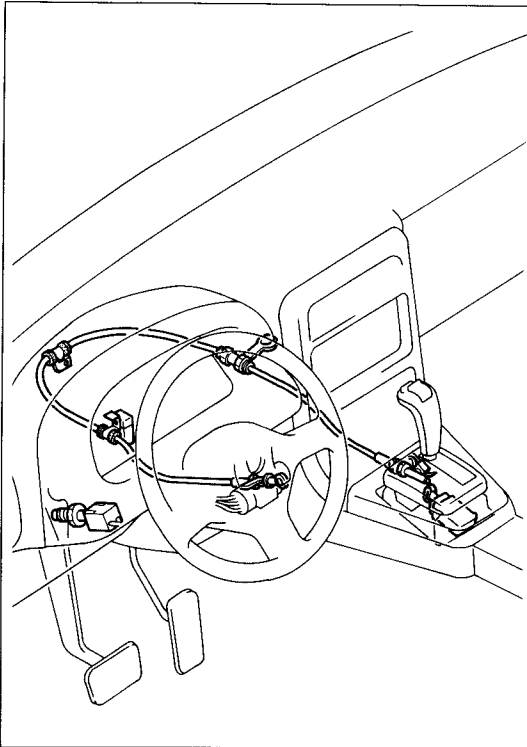
97U0KX-320

Interlock cable

Note

Do not remove the interlock cable if not necessary.

1. Remove the instrument panel. (Refer to Section S.)
2. Remove the interlock cable.

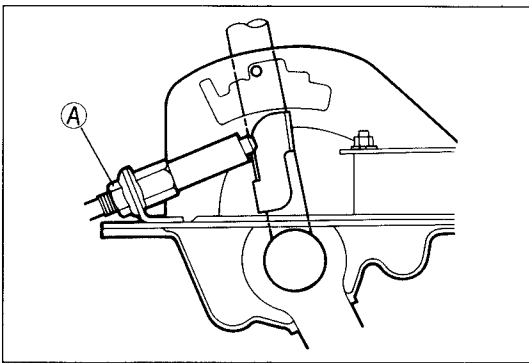


97U0KX-321

Installation note

Interlock cable

1. Install the interlock cable.
2. Install the instrument panel. (Refer to Section S.)



97U0KX-322

Selector lever

1. Shift the selector lever to N range.
2. Install the selector lever.

Tightening torque:

7.8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Caution

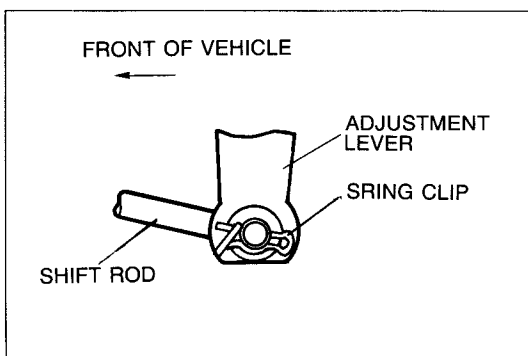
Do not kink the cable.

3. Install the cable and tighten locknut (A).

Tightening torque:

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

4. Check shift-lock system operation.
(Refer to page K-159, Steps 5 to 8.)

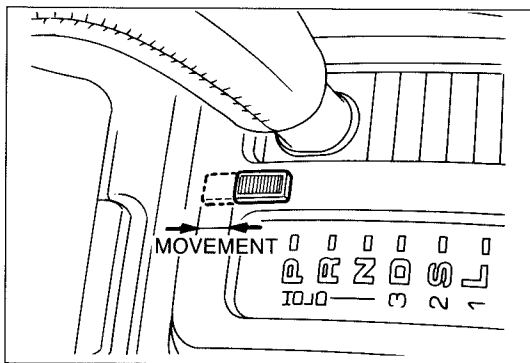


97U0KX-323

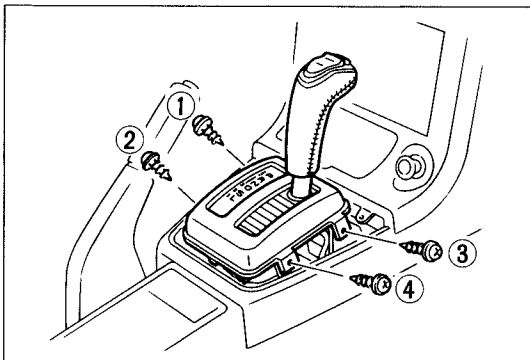
Spring clip

1. Jack up the vehicle and support it with safety stands.
2. Install a new spring clip forward as shown in the figure.
3. Install the heat insulator.
4. Adjust the selector lever position. (Refer to page K-159.)

K SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)



97U0KX-324



97U0KX-330

Indicator panel

1. Set the selector knob and selector sleeve on the indicator panel.
2. Grasp the hold switch wire harness and pull it while pushing the selector knob down fully on the selector lever.
3. Connect the hold switch connector.
4. Shift the selector lever to P range.
5. Align the alignment grooves in the slider with the holes in the indicator panel. Install suitable heavy-gauge wire to hold the slider.
6. Temporarily install the indicator panel.
7. Slide back the emergency override button lightly until contact is felt and measure the movement amount. If not as specified, adjust the movement amount by sliding the indicator panel forward or backward.

Movement: 0.3—4.0mm (0.012—0.157 in)

8. Tighten the indicator screws in the order shown in the figure.

Selector knob

1. Clean and apply locking compound to the selector knob screws. Tighten the screws.

Tightening torque:

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

2. Check the selector lever and shift-lock system operation. (Refer to page K-158, 159.)

97U0KX-325

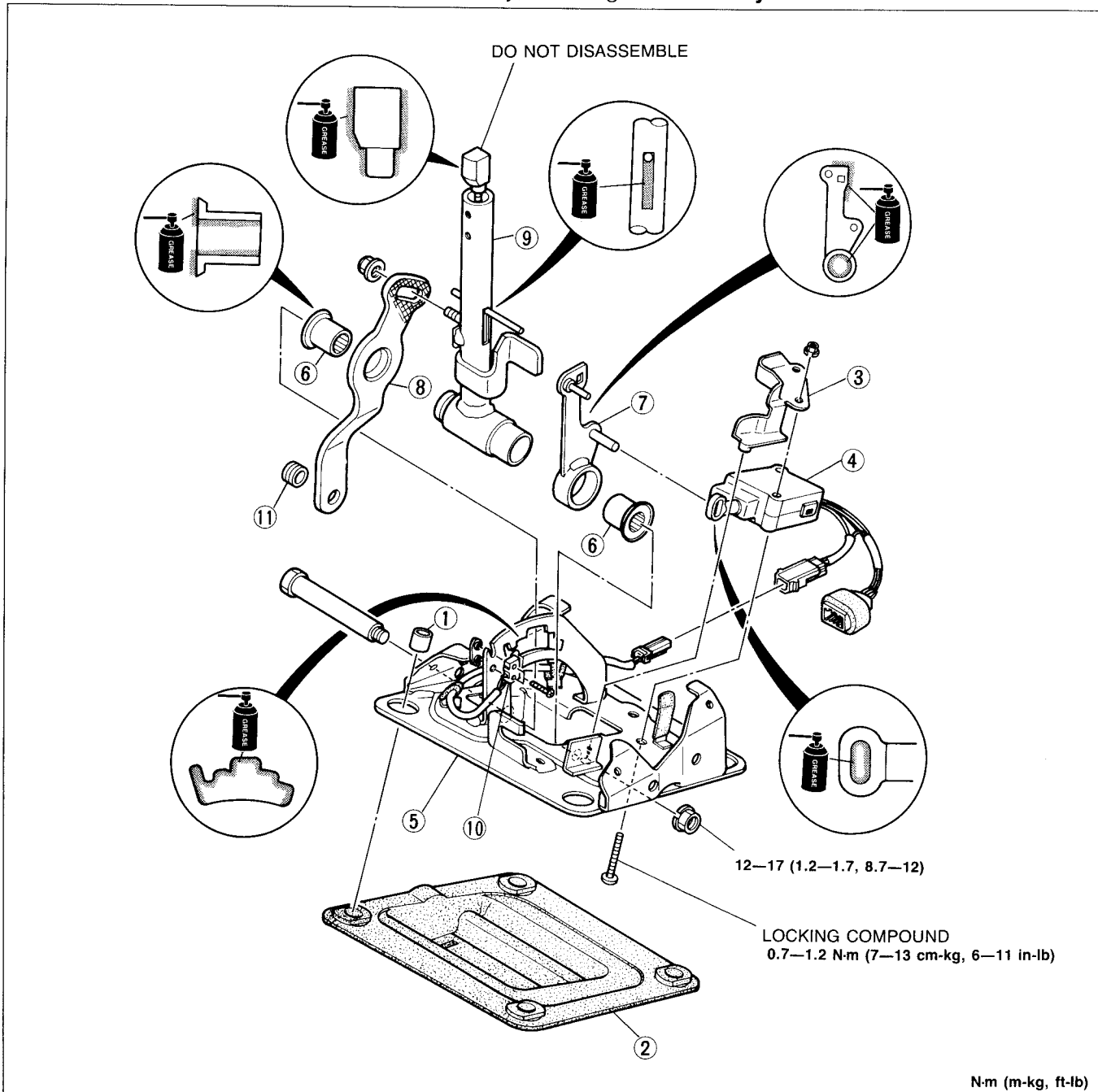
SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM) **K**

Overhaul

Note

Do not remove the bushing or P range switch if not necessary.

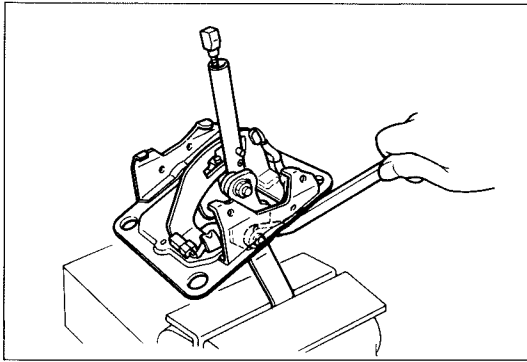
1. Disassemble in the order shown in the figure, referring to **Disassembly Note**.
2. Inspect all parts and repair or replace as necessary.
3. Assemble in the reverse order of disassembly, referring to **Assembly Note**.



97U0KX-326

- | | | |
|--|--|---|
| <p>1. Spacer</p> <p>2. Boot</p> <p>3. Actuator bracket
Installation page K-166</p> <p>4. Shift-lock actuator</p> <p>5. Selector lever bracket
Removal page K-166
Installation page K-166</p> | <p>6. Bushings
Inspect for damage or wear</p> <p>7. Lock lever
Inspect for damage</p> <p>8. Adjustment lever</p> | <p>9. Push rod assembly
Inspect for smooth operation
Inspect guide pin for damage or wear</p> <p>10. P range switch</p> <p>11. Bushing
Inspect for damage or wear</p> |
|--|--|---|

K SHIFT MECHANISM (WITH SHIFT-LOCK SYSTEM)



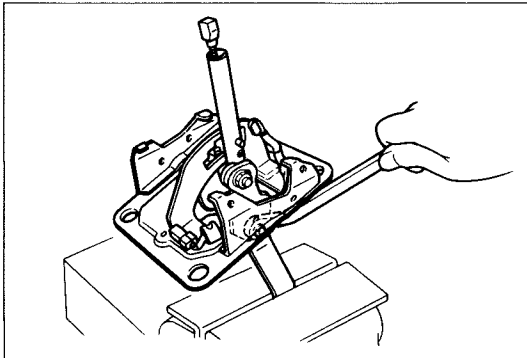
97U0KX-327

Disassembly note Selector lever bracket

Caution

Use pads in the vise to prevent damaging the adjustment lever.

1. Place the selector lever in a vise.
2. Remove the selector lever bracket.



97U0KX-328

Assembly note Selector lever bracket

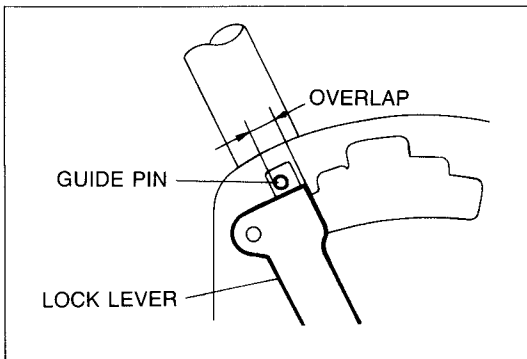
Caution

Use pads in the vise to prevent damaging the adjustment lever.

1. Place the selector lever in a vise.
2. Tighten the bolt.

Tightening torque:

12—17 N·m (1.2—1.7 m·kg, 8.7—12 ft·lb)



97U0KX-329

Actuator bracket

1. Clean the bolt threads.
2. Apply small amount of locking compound to the bolt threads.
3. Install the actuator bracket.

Tightening torque:

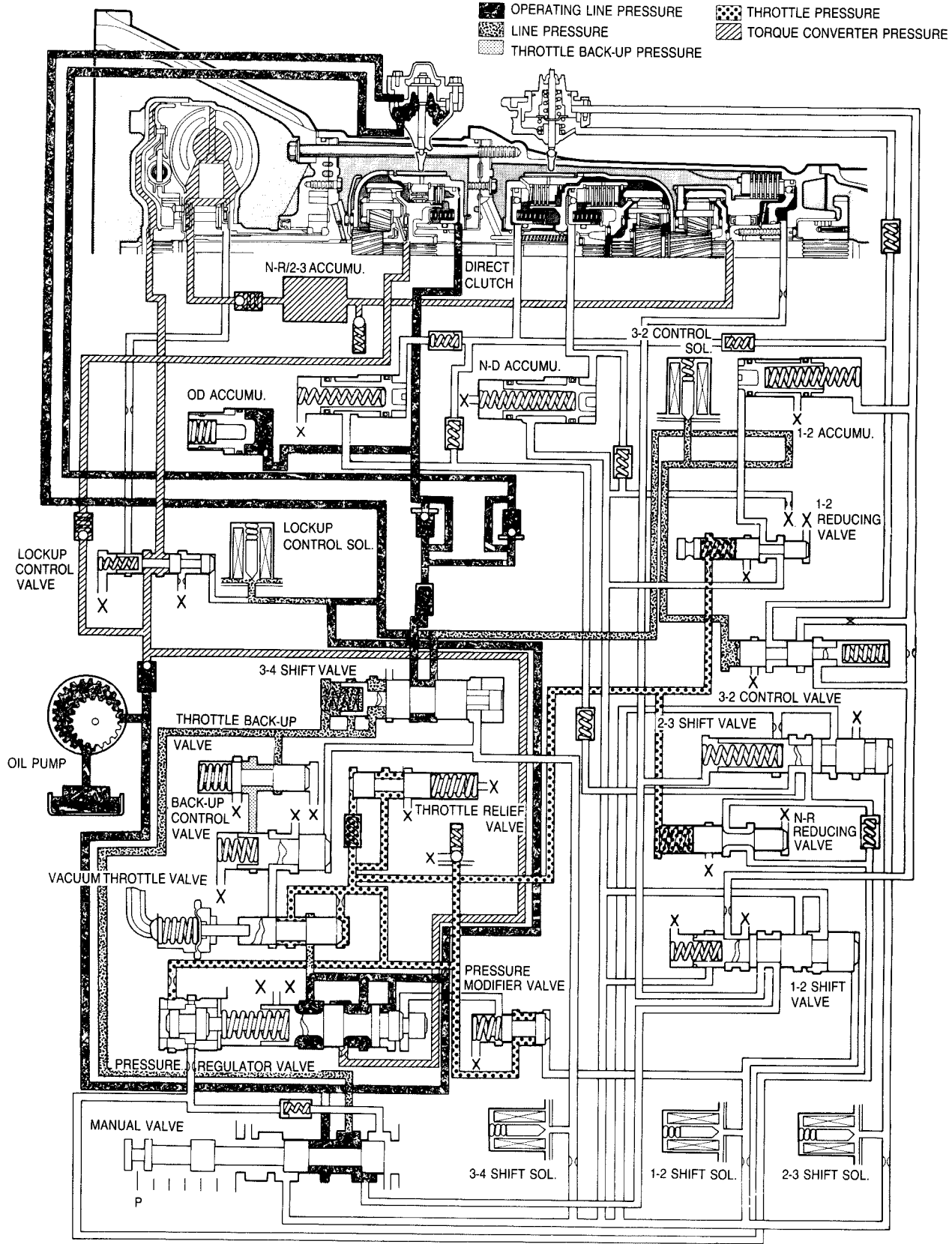
0.7—1.2 N·m (7—13 cm·kg, 6—11 in·lb)

4. Verify that the overlap between the guide pin and the lock lever is within specification with the selector lever pushed forward.

Specification: 6—8mm (0.237—0.315 in)

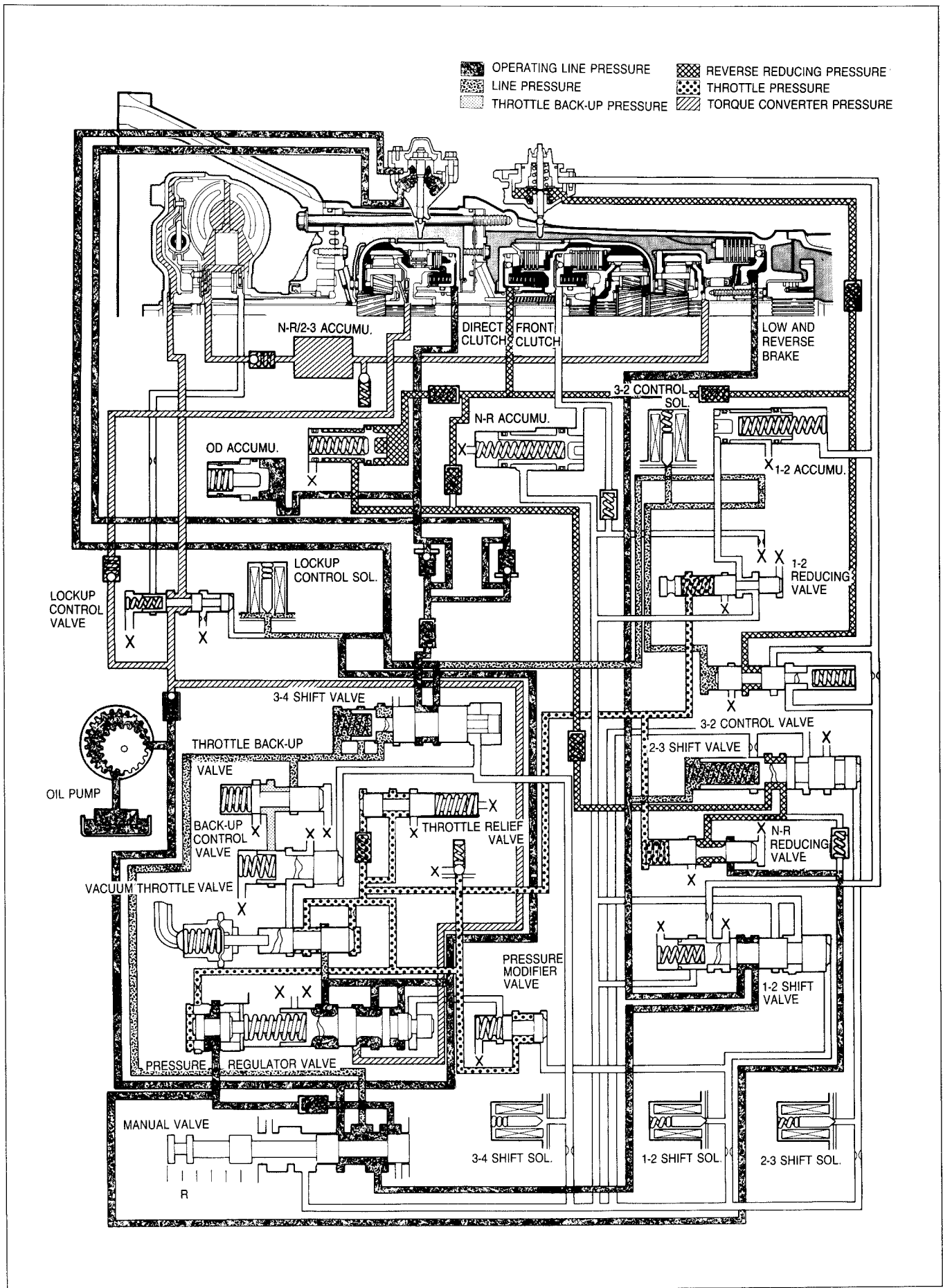
HYDRAULIC CIRCUIT

P RANGE

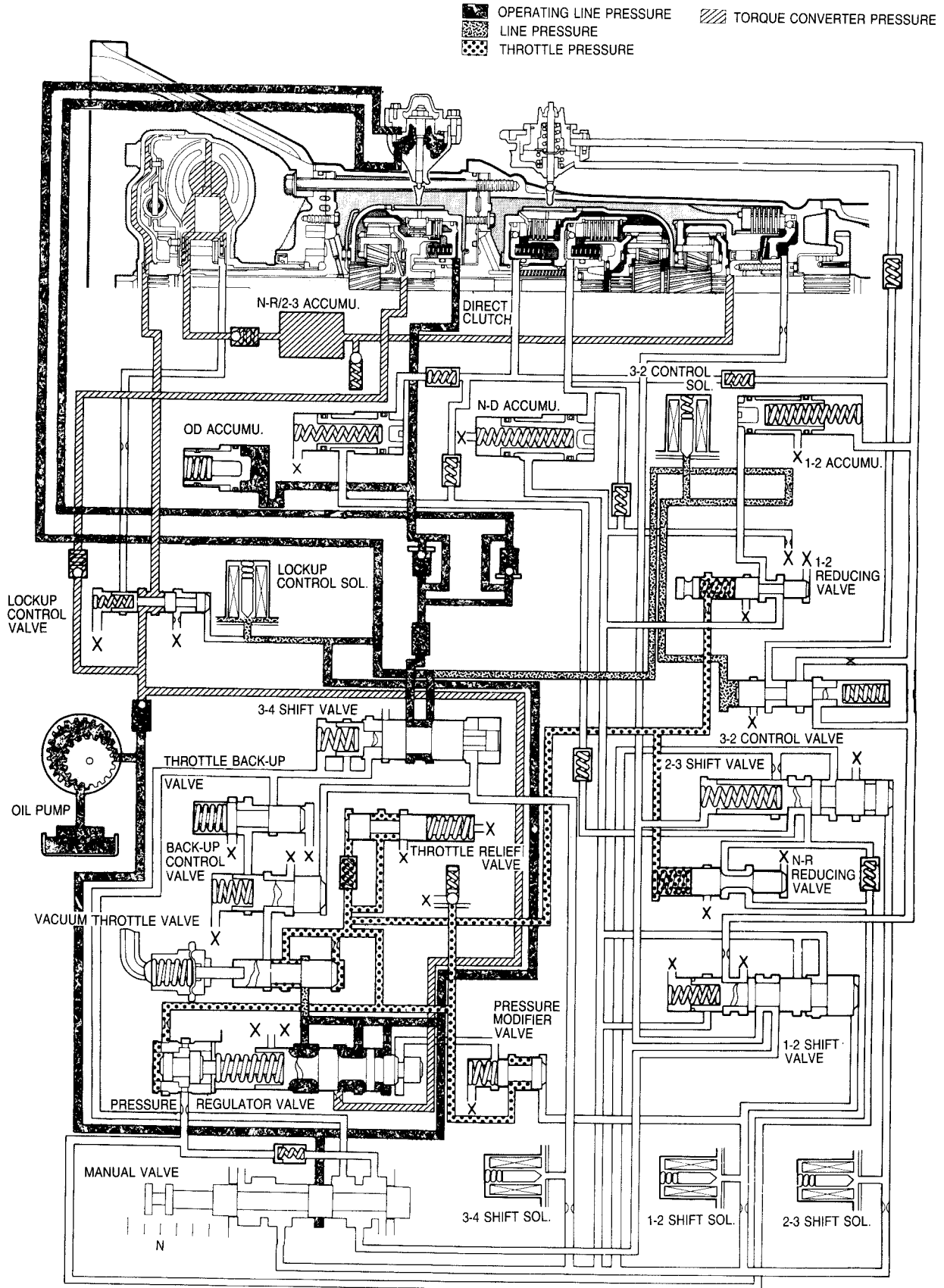


K HYDRAULIC CIRCUIT

R RANGE

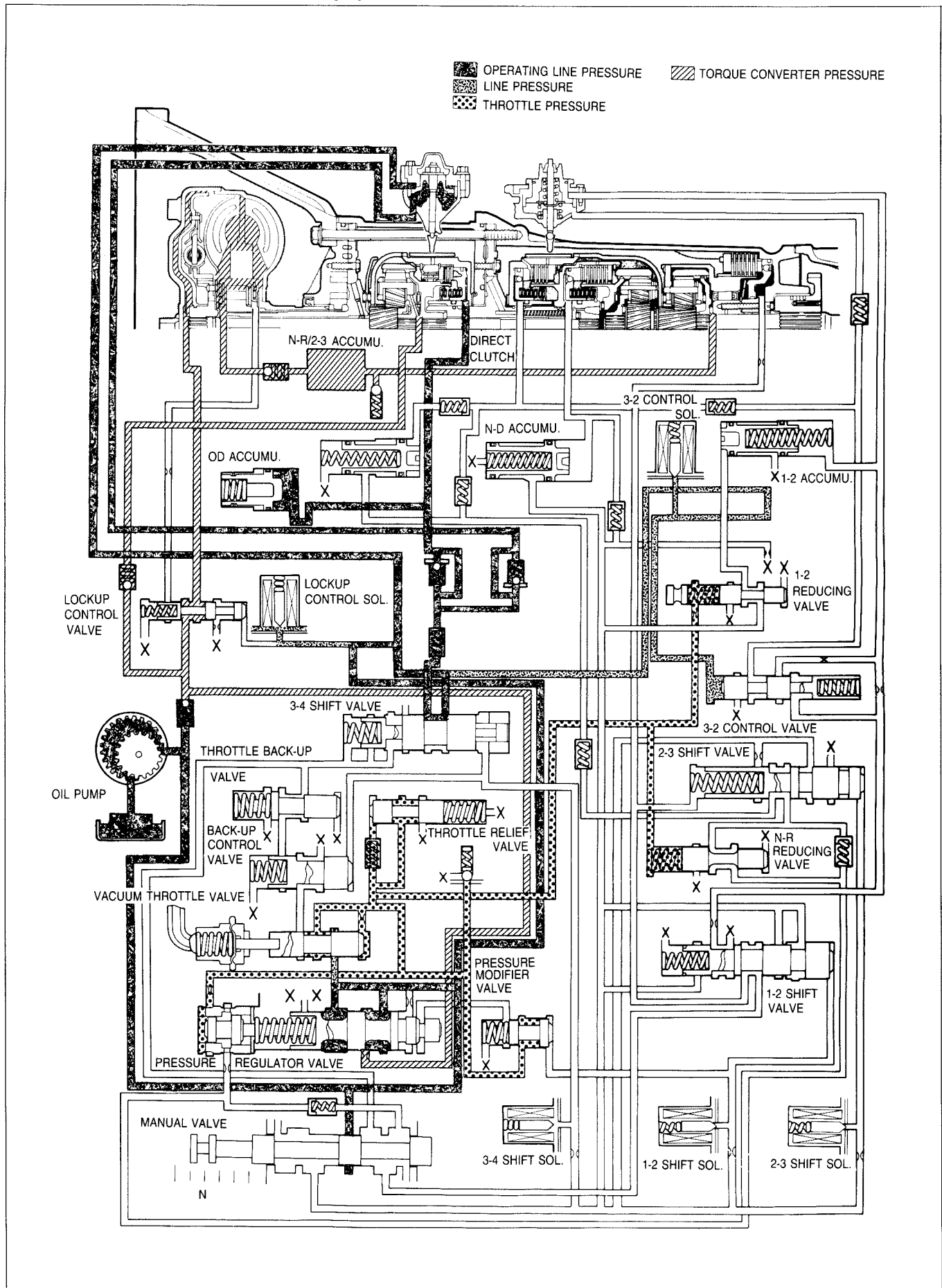


N RANGE; BELOW 15 km/h (9 mph)

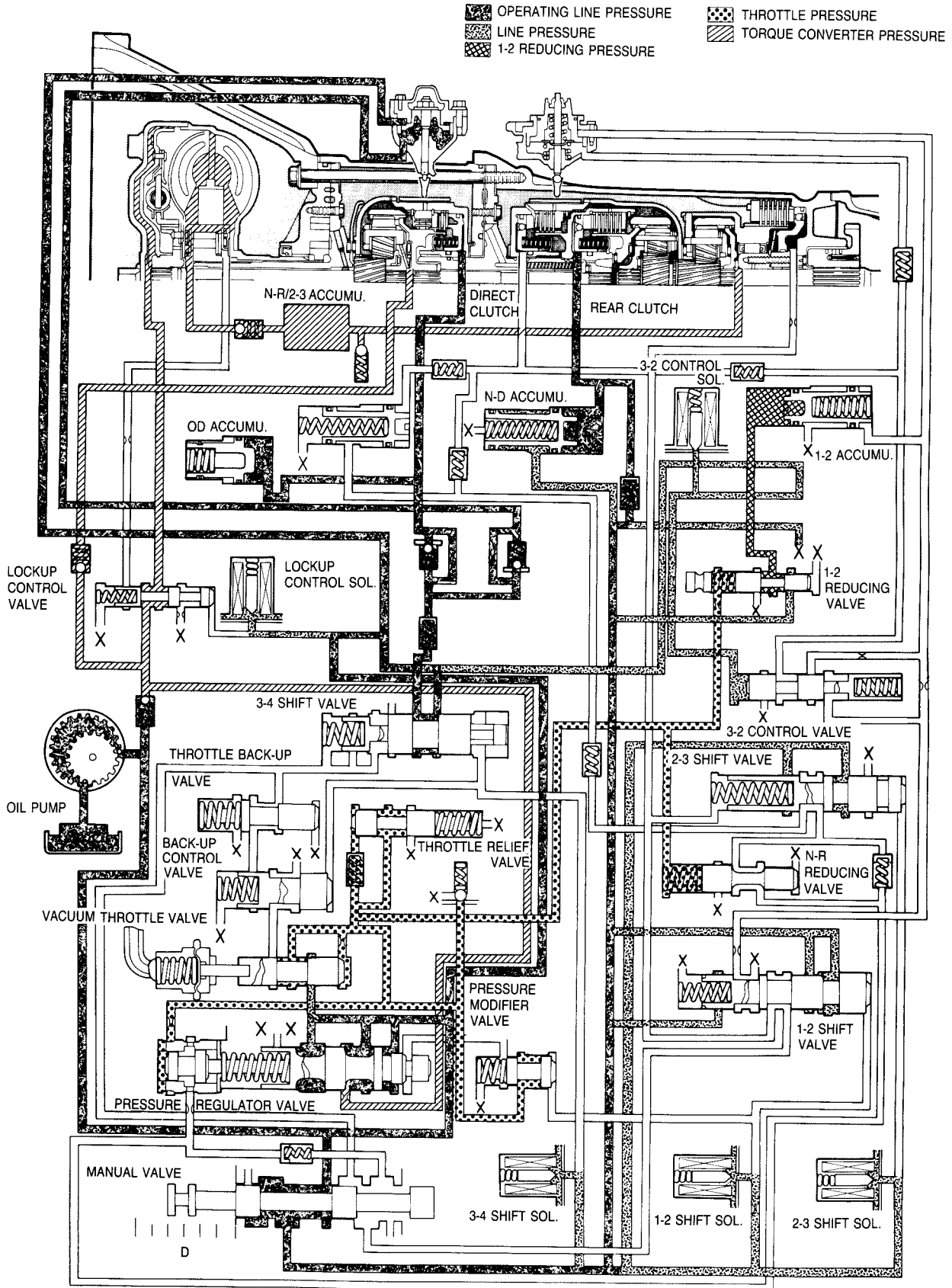


K HYDRAULIC CIRCUIT

N RANGE; ABOVE 17 km/h (11 mph)

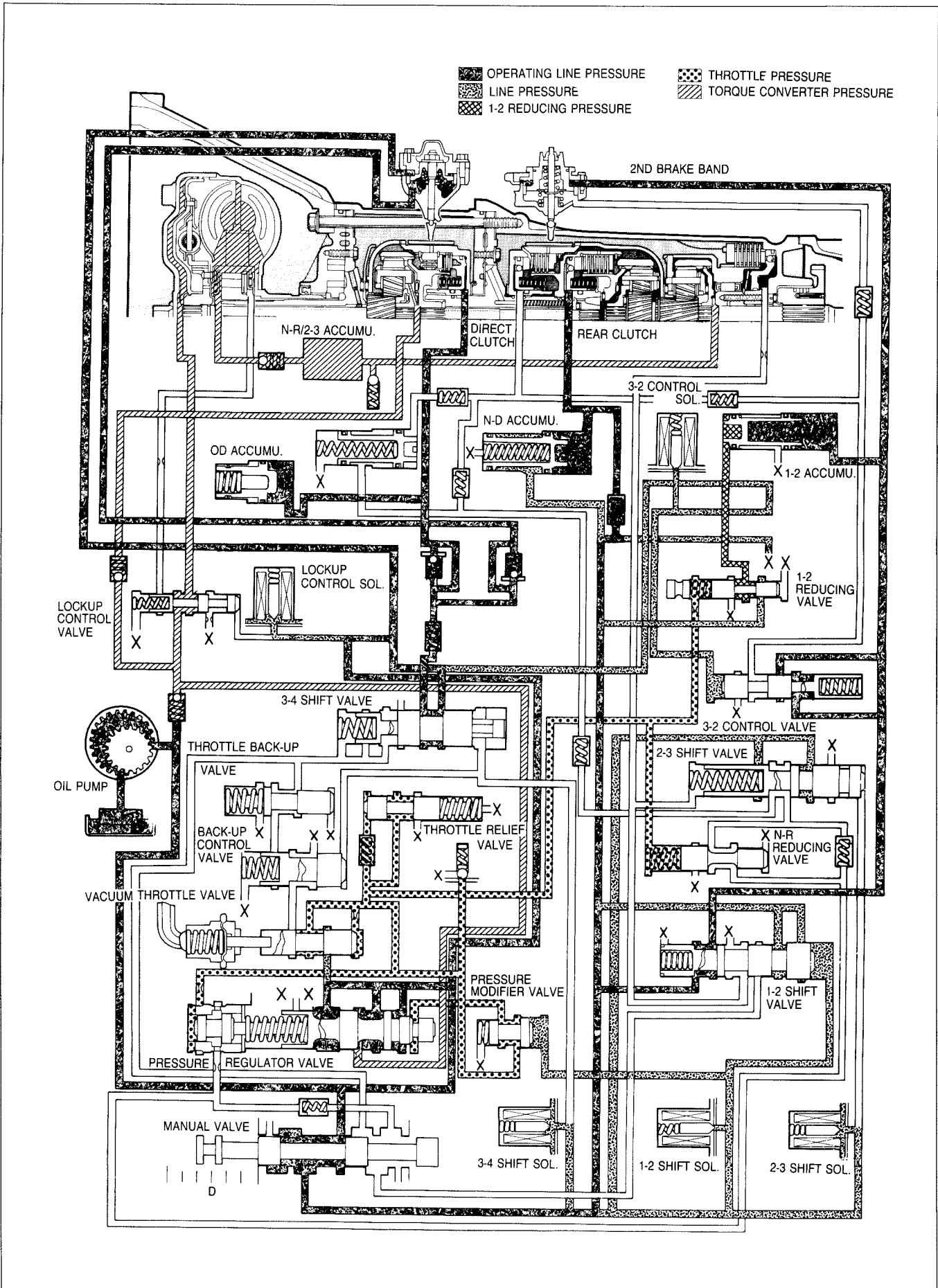


D RANGE; 1ST GEAR

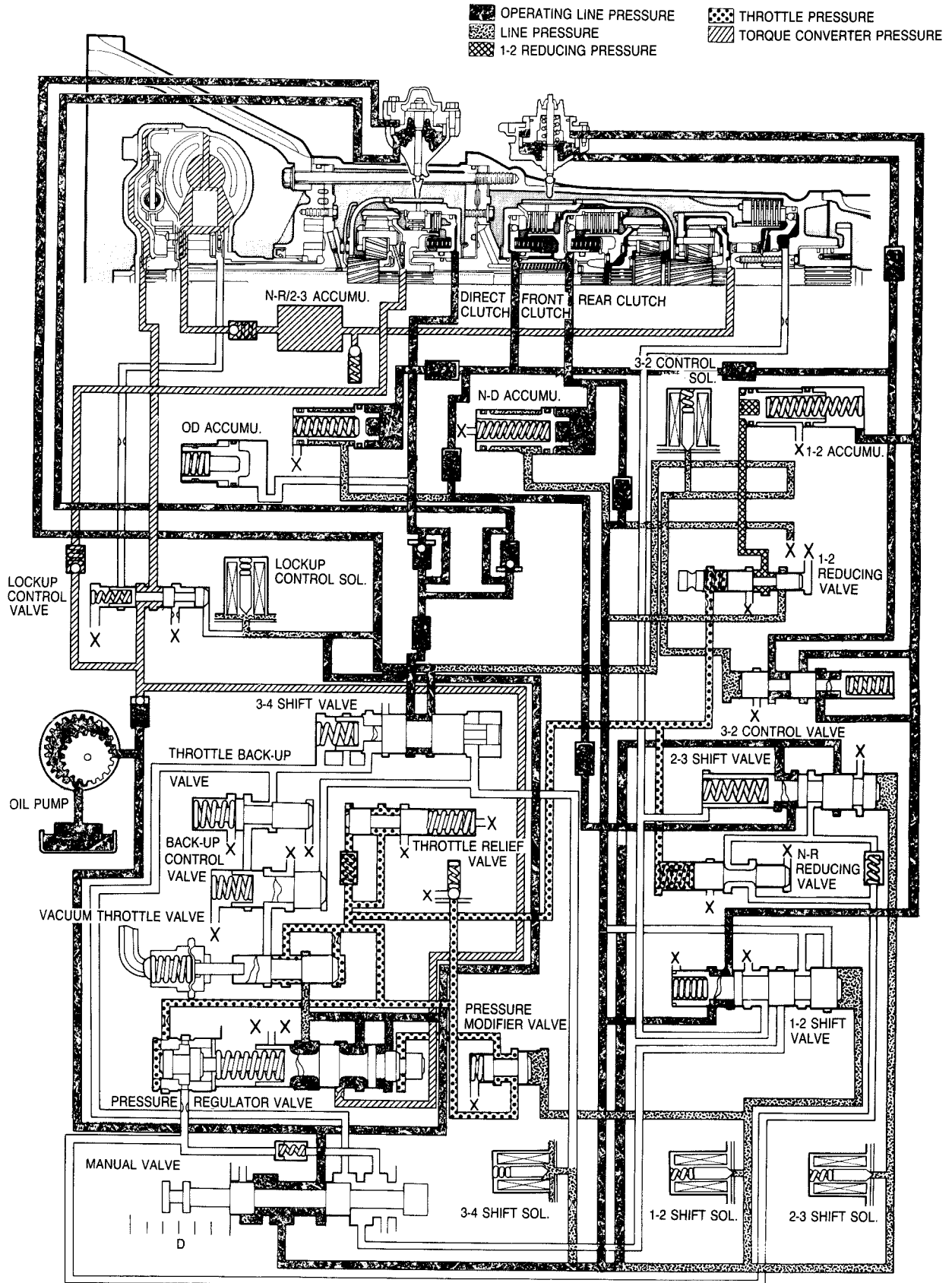


K HYDRAULIC CIRCUIT

D RANGE; 2ND GEAR

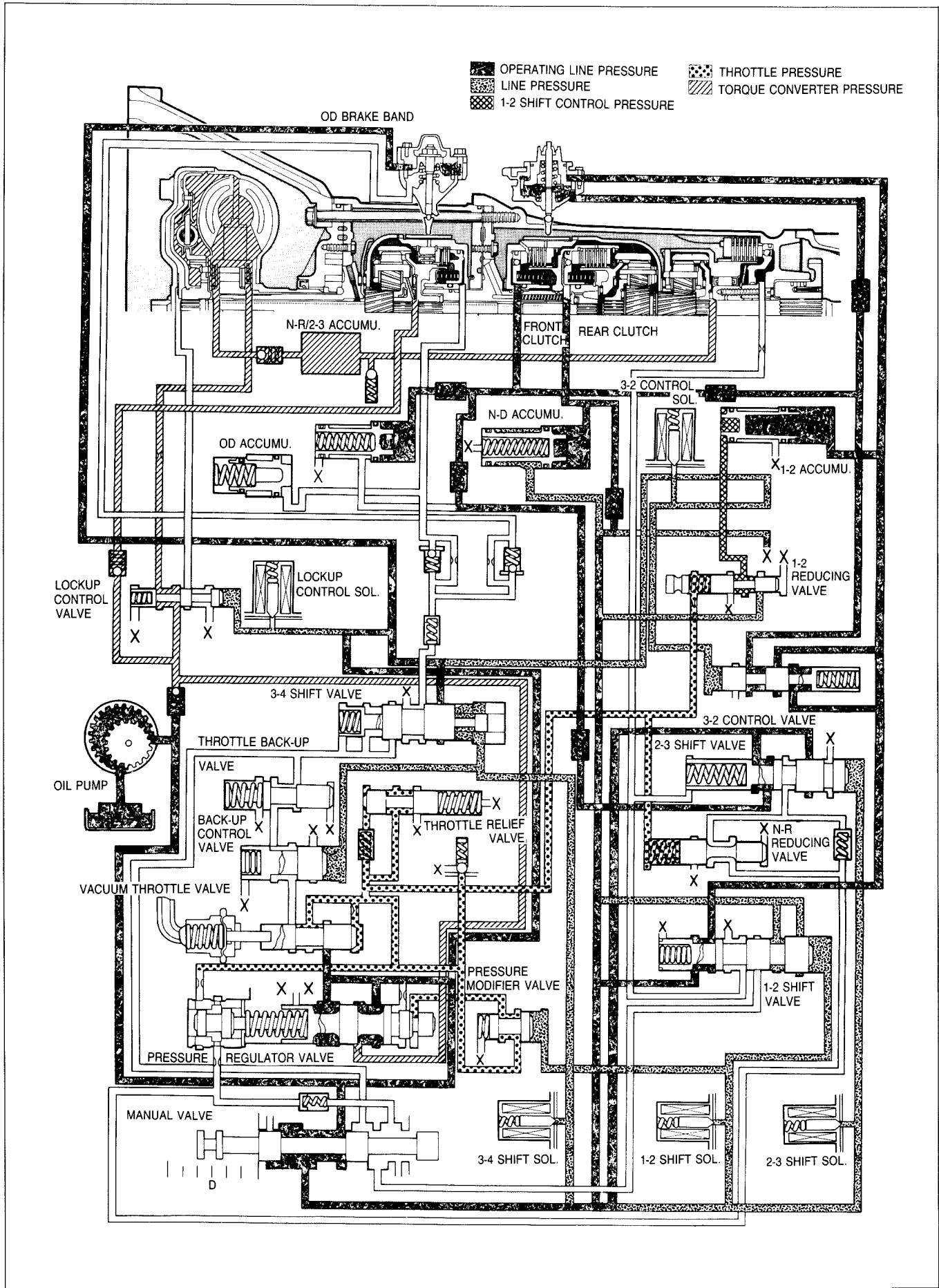


D RANGE; 3RD GEAR



K HYDRAULIC CIRCUIT

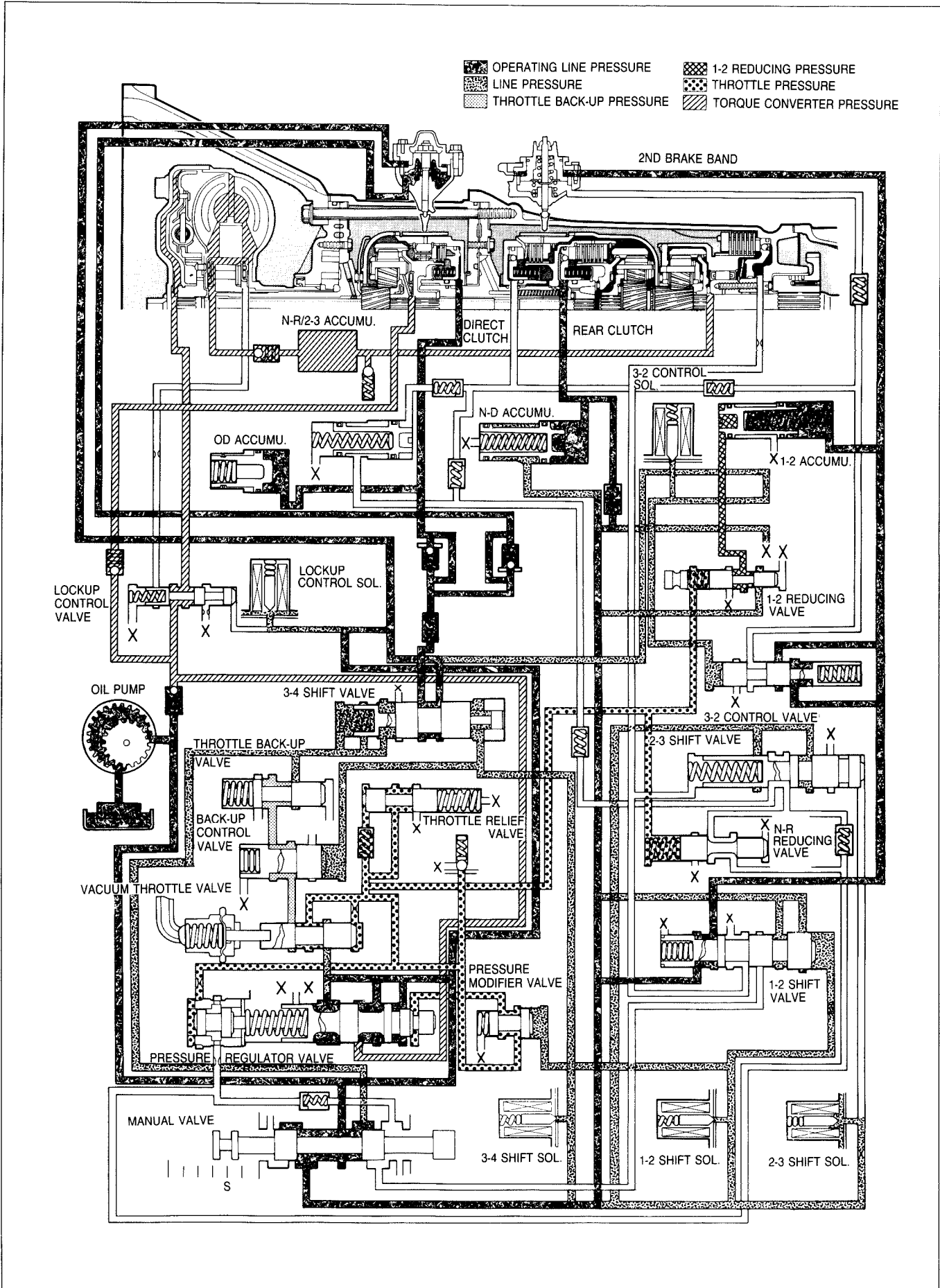
D RANGE; OD, LOCK-UP ON



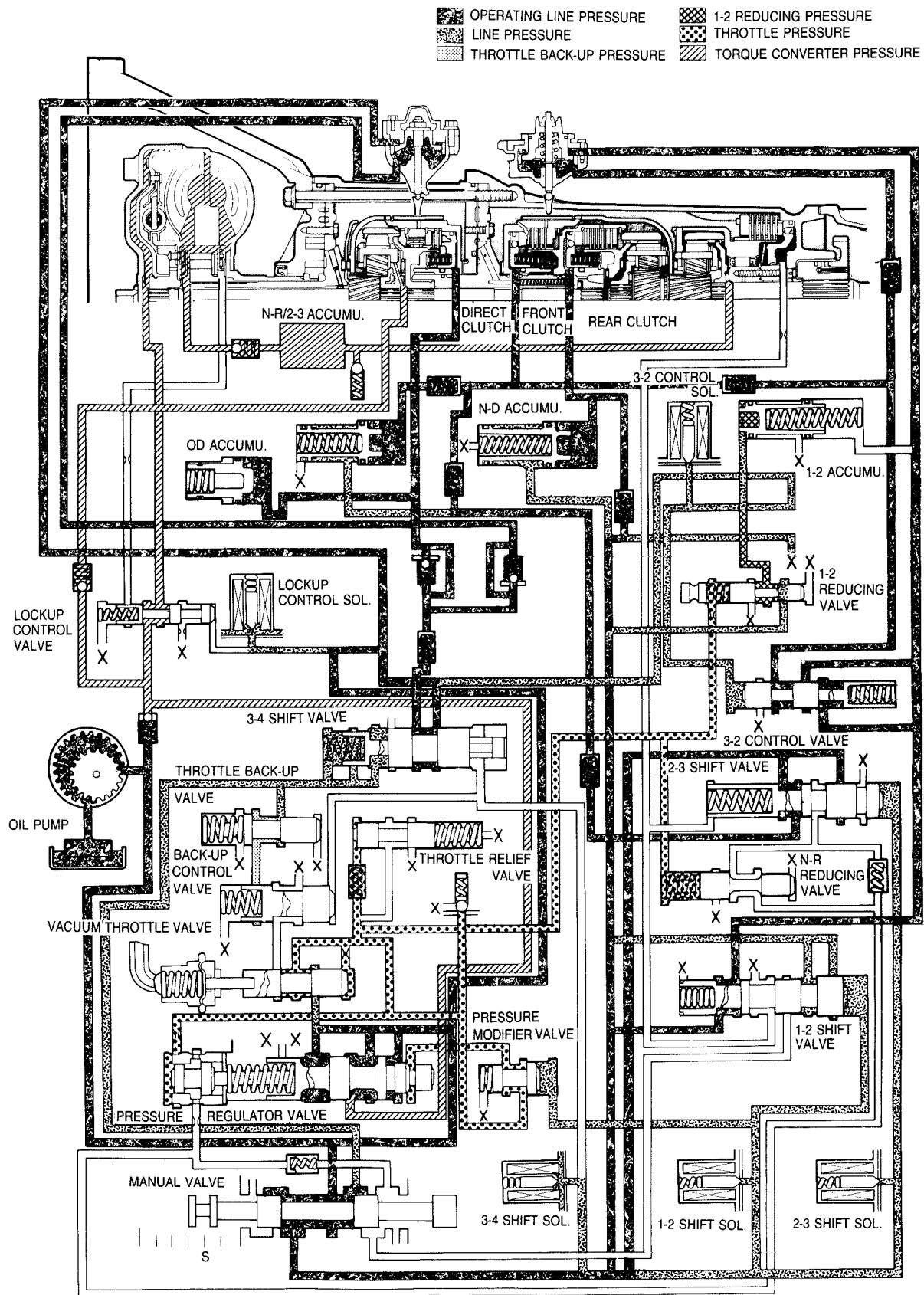
89U07B-110

K HYDRAULIC CIRCUIT

S RANGE; 2ND GEAR

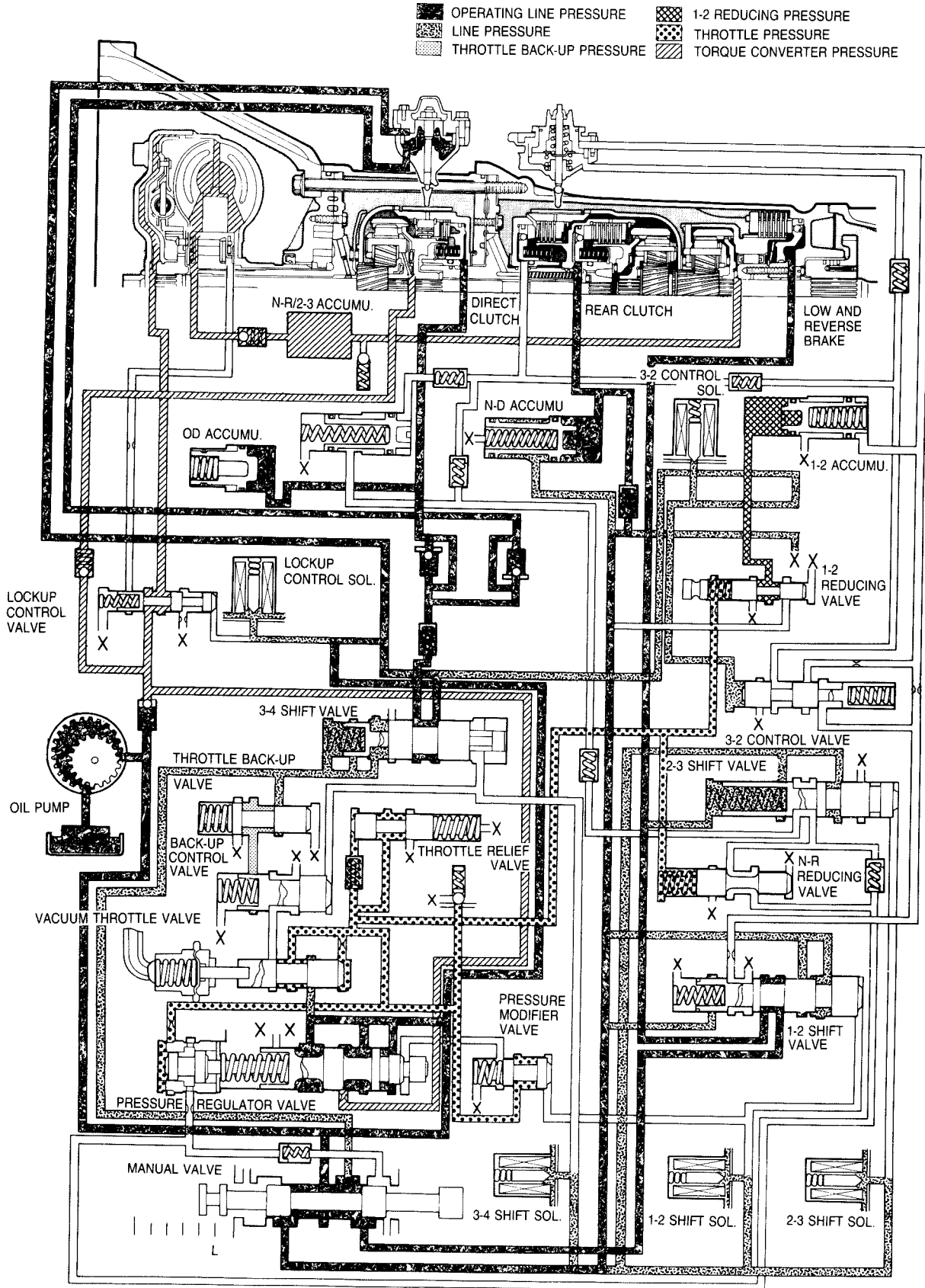


S RANGE; 3RD GEAR



K HYDRAULIC CIRCUIT

L RANGE; 1ST GEAR



L RANGE; 2ND GEAR

