

AUTOMATIC TRANSAXLE

(Electronically Controlled and 4-Speed)

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7B OUTLINE

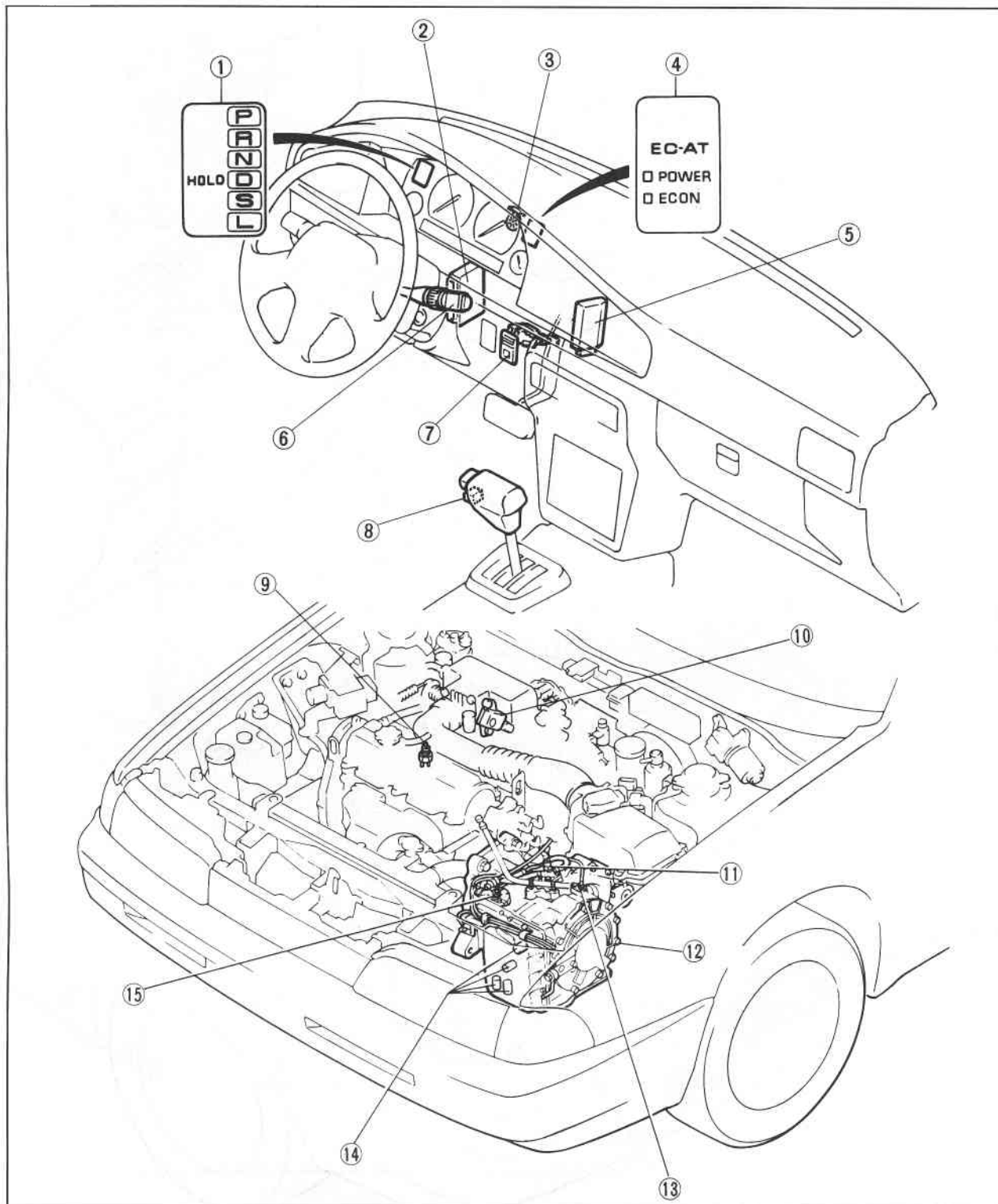
OUTLINE

SPECIFICATIONS

Model		G4A-EL (EC-AT)	G4A-HL (4-speed)	
			FE engine	F8 engine
Torque converter stall torque ratio		1.710—1.900 : 1	1.900—2.100 : 1	
Gear ratio	First	2.800		
	Second	1.540		
	Third	1.000		
	Fourth (OD)	0.700		
	Reverse	2.333		
Final gear ratio		3.700		
Number of drive plates/ driven plates	Forward clutch	3/3		
	Coasting clutch	2/2		
	3-4 clutch	5/5	4/4	
	Reverse clutch	2/2		
	Low and reverse brake	3/3	4/4	
Servo diameter (Piston outer dia./retainer inner dia.) mm (in)		78/53 (3.07/2.09)	78/49 (3.07/1.93)	78/56 (3.07/2.20)
Speedometer gear ratio (Driven/Drive gear)		20 : 25 or 21 : 25		
Automatic transmission fluid	Type	Dexron II or MIII		
	Capacity liters (US qt, Imp qt)	6.8 (7.2, 6.0)		

76G07B-002

COMPONENT LOCATION G4A-EL

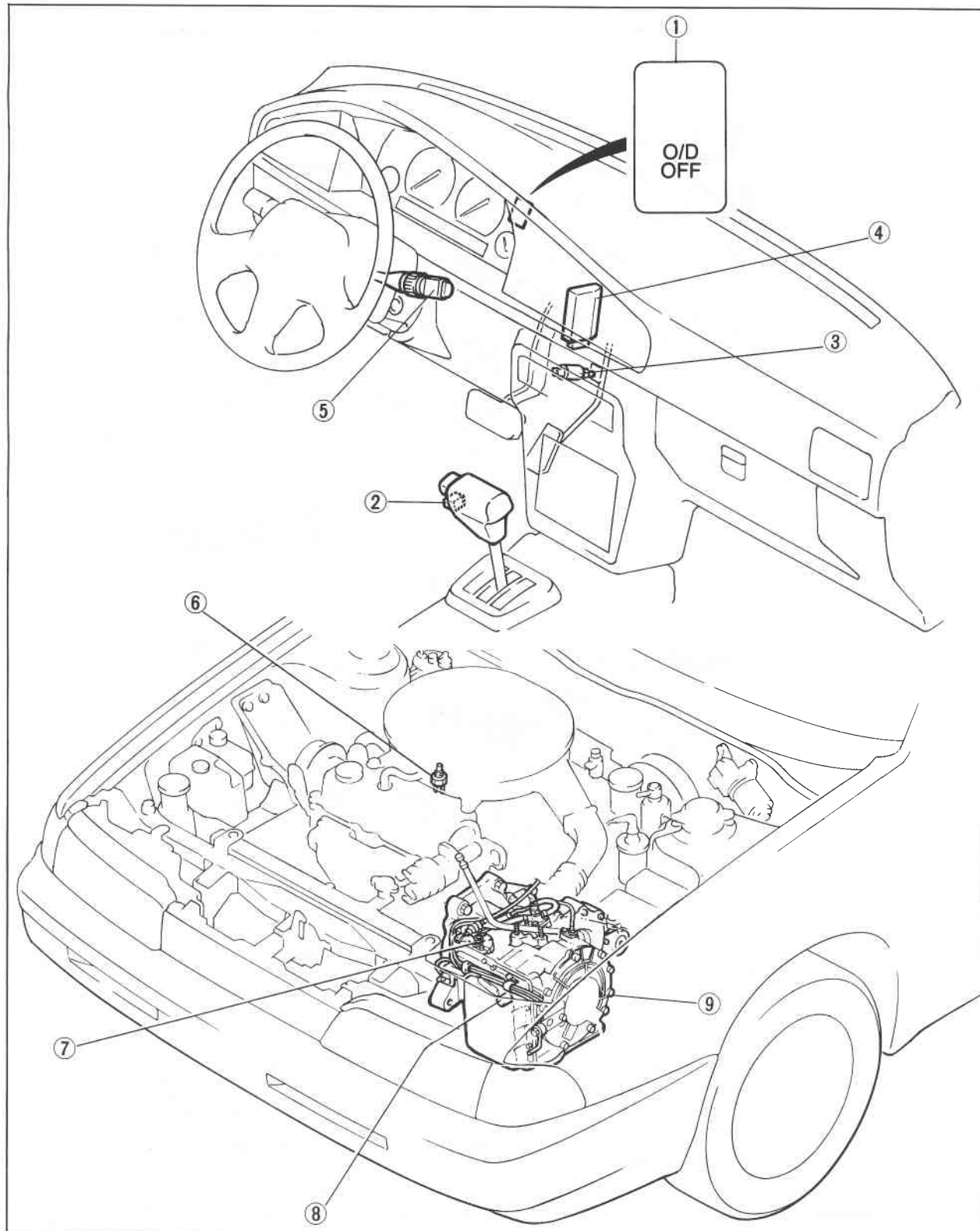


76G07B-003

- | | | |
|--------------------------|-------------------------------------|----------------------|
| 1. Hold indicator light | 7. Mode switch | 12. EC-AT |
| 2. EC-AT control unit | 8. Hold switch | 13. Pulse generator |
| 3. Vehicle speed sensor | 9. Water temperature switch | 14. Solenoid valves |
| 4. Mode indicator light | 10. Throttle sensor and idle switch | 15. Inhibitor switch |
| 5. Cruise control unit | 11. Fluid temperature switch | |
| 6. Cruise control switch | | |

7B OUTLINE

G4A-HL

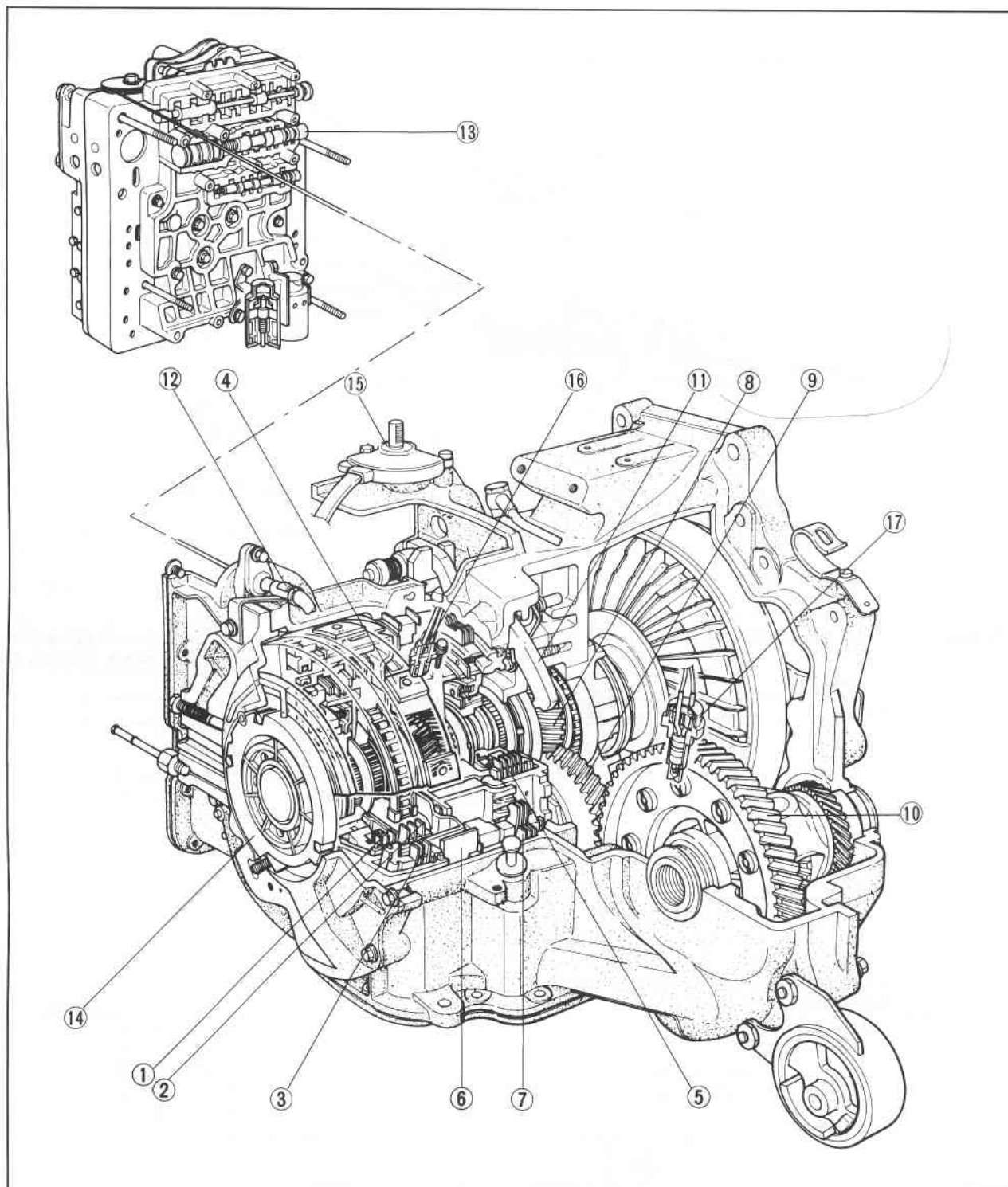


76G07B-004

- 1. OD OFF indicator light
- 2. OD OFF switch
- 3. Kick-down switch
- 4. Cruise control unit
- 5. Cruise control switch

- 6. Water temperature switch
- 7. Inhibitor switch
- 8. OD release solenoid valve
- 9. Automatic transaxle

STRUCTURAL VIEW

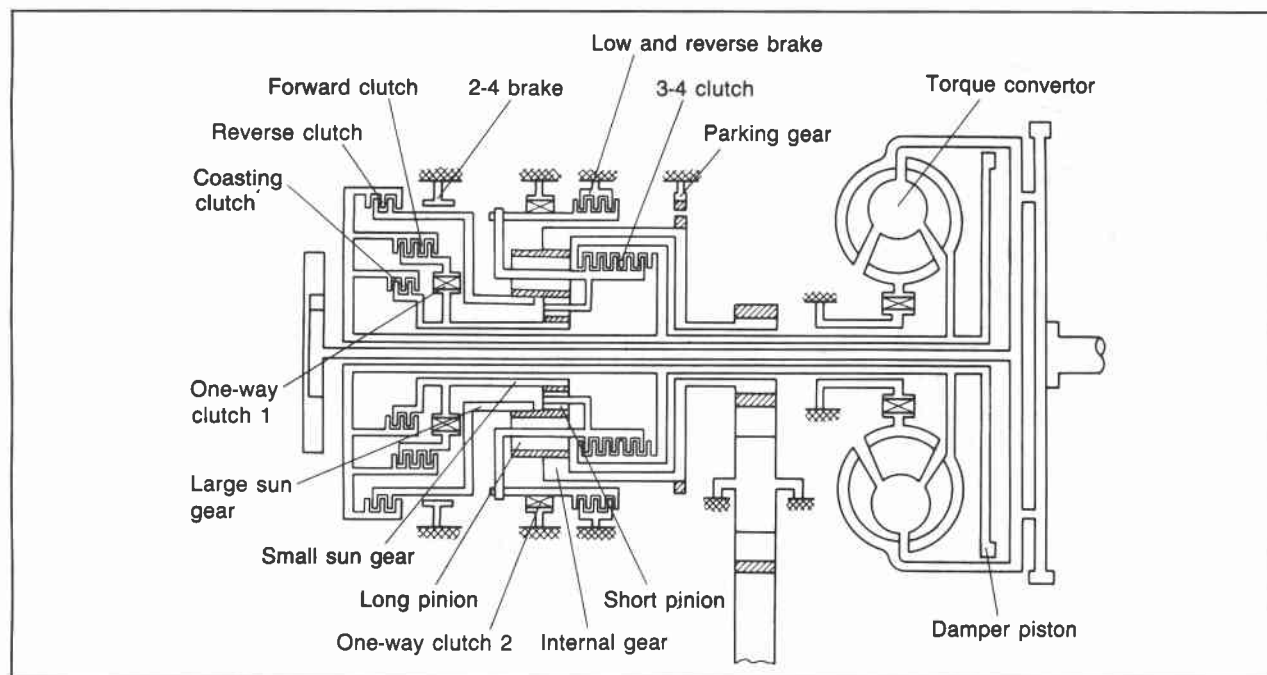


76G07B-005

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

7B OUTLINE

OPERATION OF COMPONENTS



76U07B-508

Operation Table (G4A-EL)

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

⊗ : Indicates fluid pressure to servo but band not applied due to pressure difference in servo.

◎ : Indicates that it does not function to transmission power.

76G07B-006

Operation Table (G4A-HL)

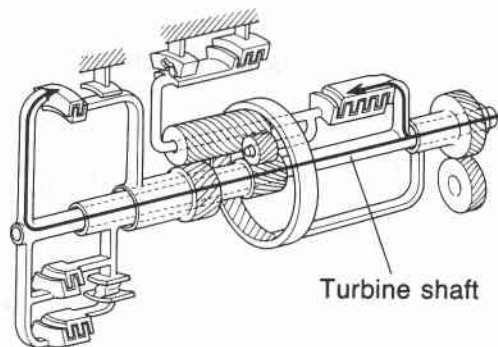
Range	Gear	Operation elements									
		Engine braking effect	Forward clutch	Coasting clutch	3-4 clutch	Reverse clutch	2-4 brake		Low & reverse brake	One-way clutch 1	One-way clutch 2
		Applied	Released								
P	—	—									
R	—	Yes				○			○		
N	—	—									
D	1st	No	○							○	○
	2nd	No	○				○			○	
	3rd	Yes	○	○	○		⊗	○		○	
	OD	Yes	◎		○		○				
2	2nd	Yes	○	○			○			○	
1	1st	Yes	○	○				○	○	○	
	2nd	Yes	○	○				○		○	

76G07B-007

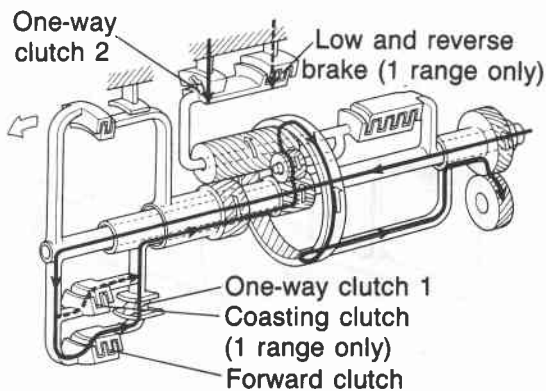
⊗ : Indicates fluid pressure to servo but band not applied due to pressure difference in servo.
 ◎ : Indicates that it does not function to transmit power.

POWER FLOW DIAGRAM

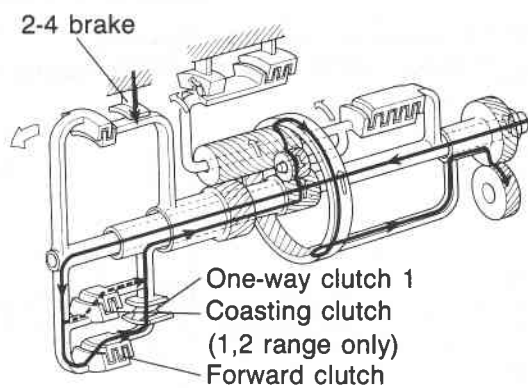
Neutral



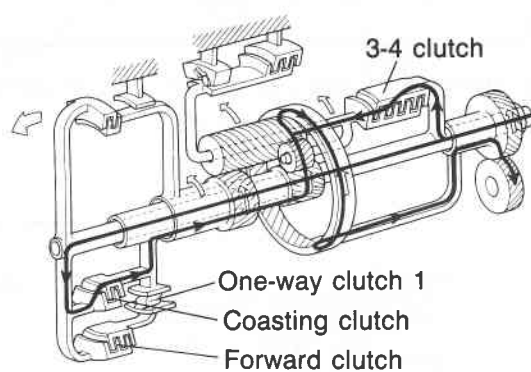
1st gear



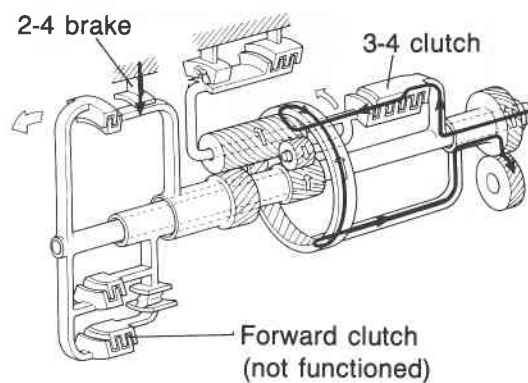
2nd gear



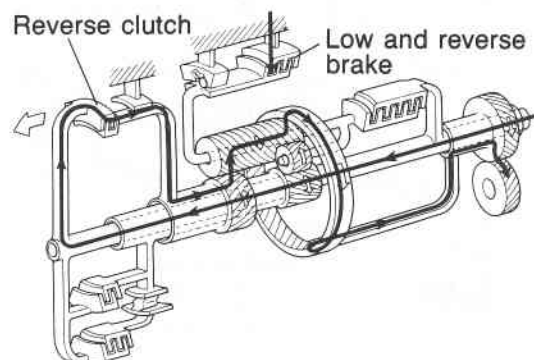
3rd gear



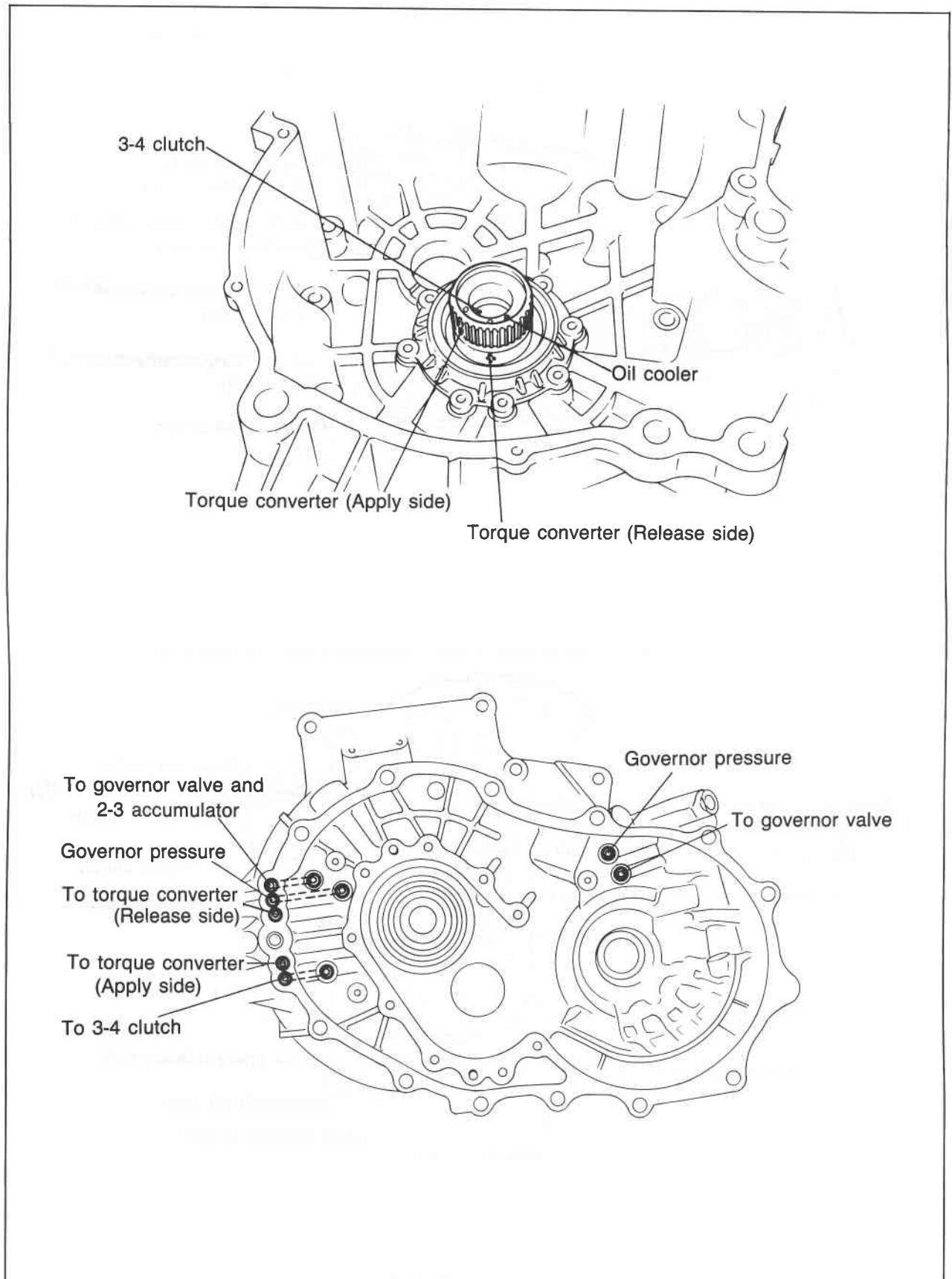
Overdrive gear



Reverse gear

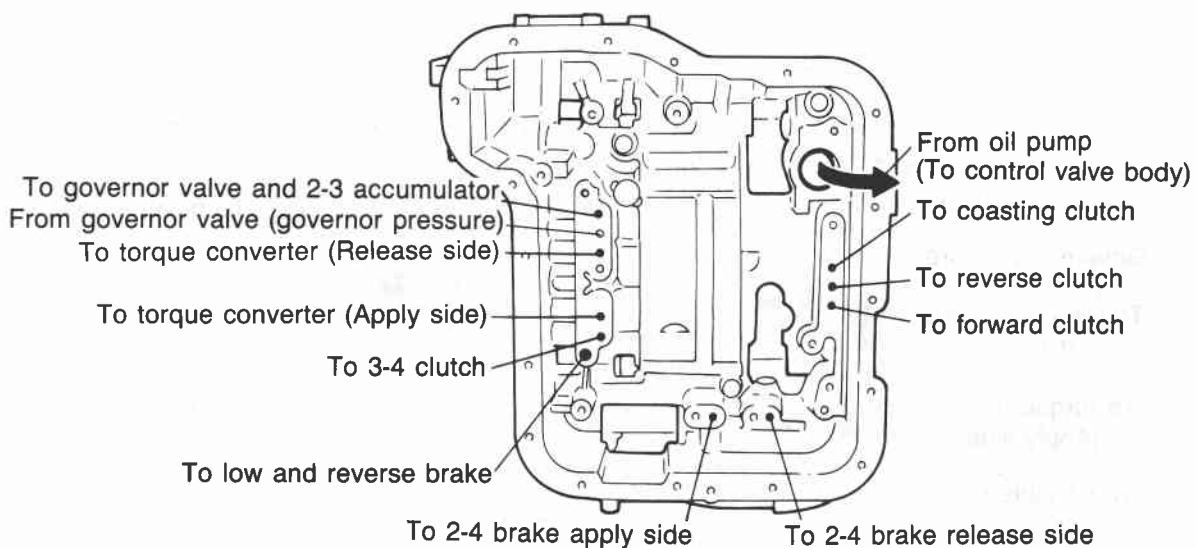
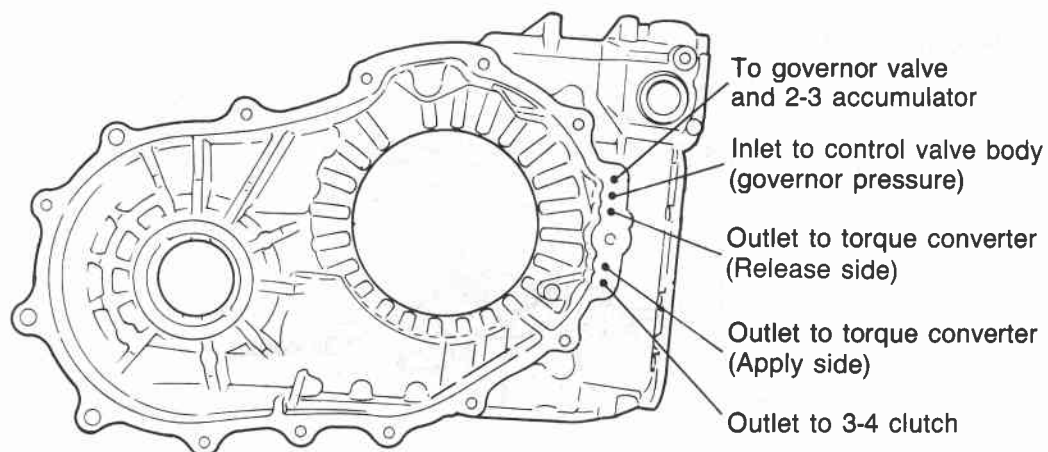


FLUID PASSAGE LOCATION Converter Housing

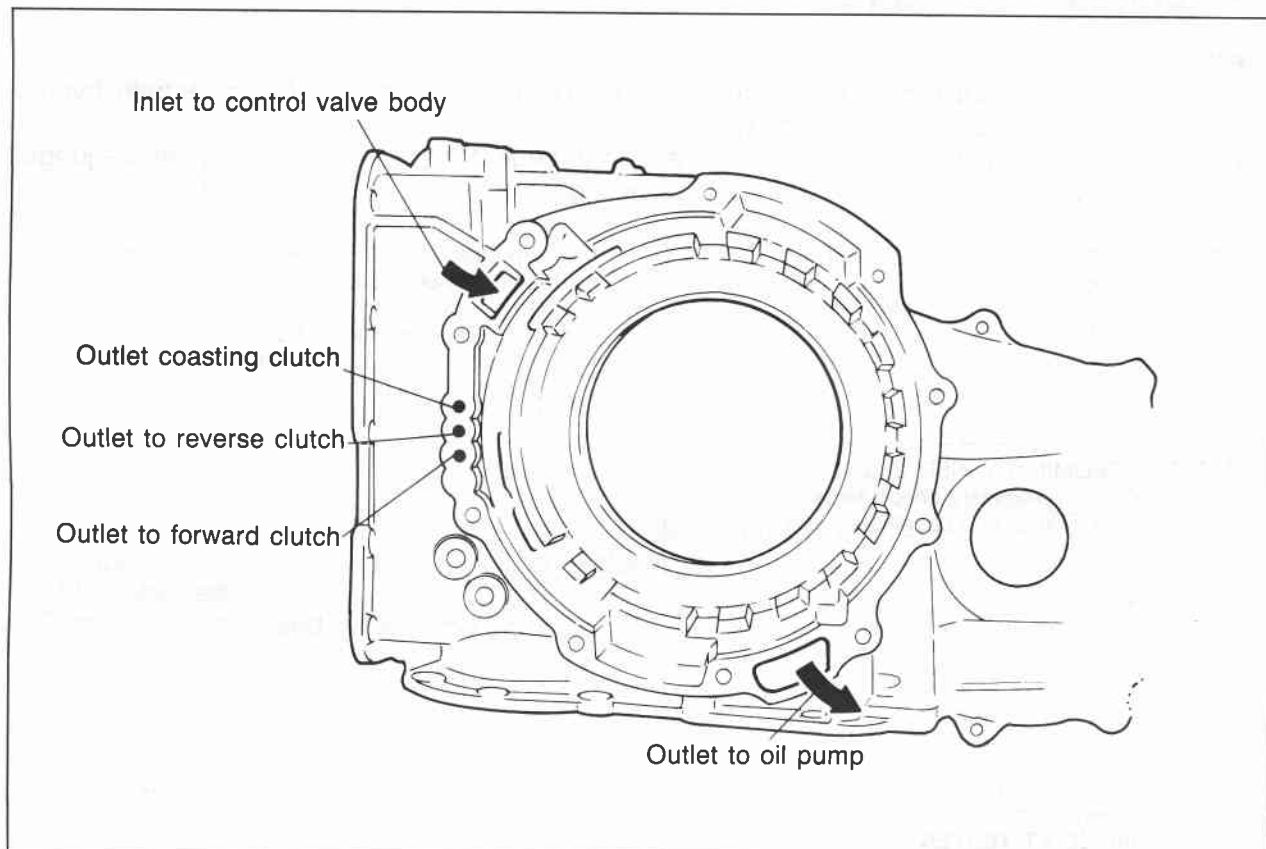


7B OUTLINE

Transaxle Case

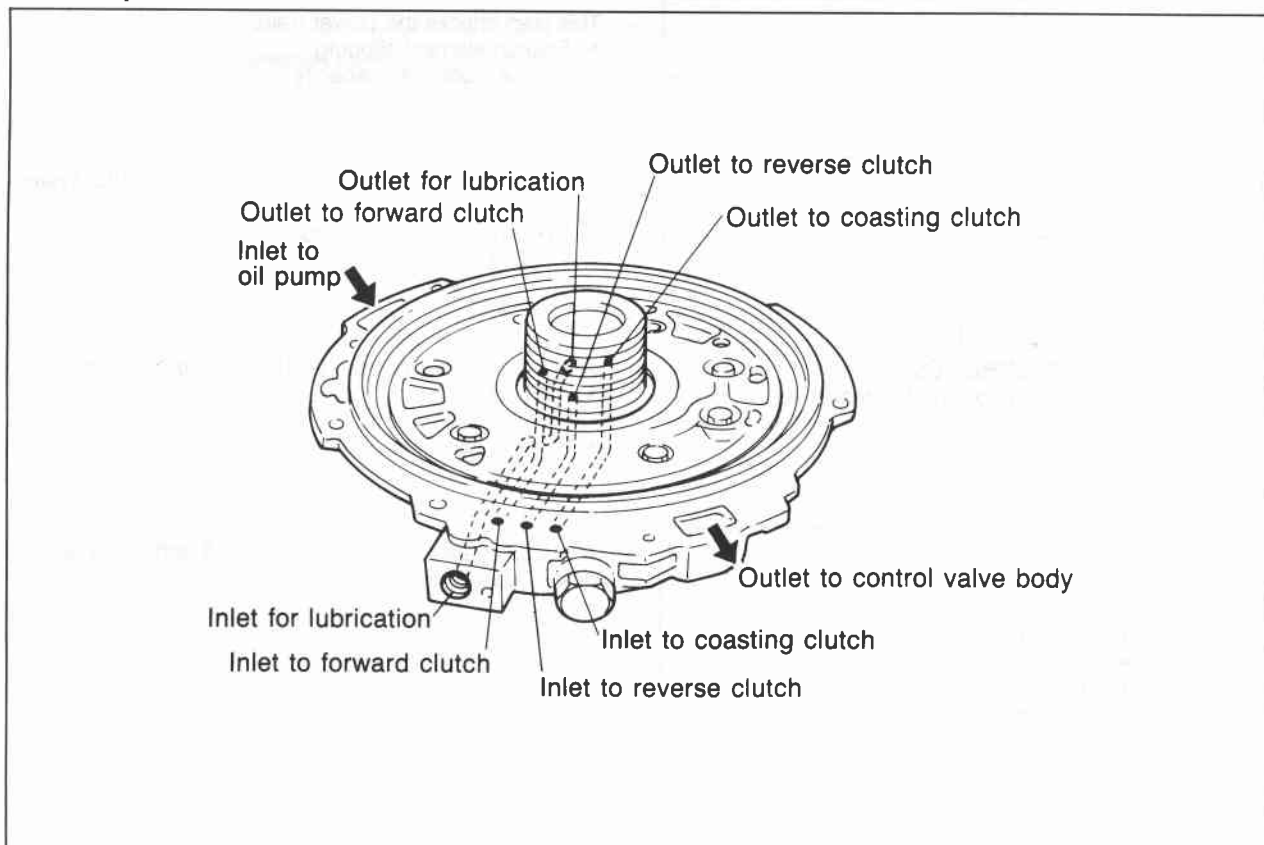


Transaxle Case



76G07B-010

Oil Pump



76G07B-011

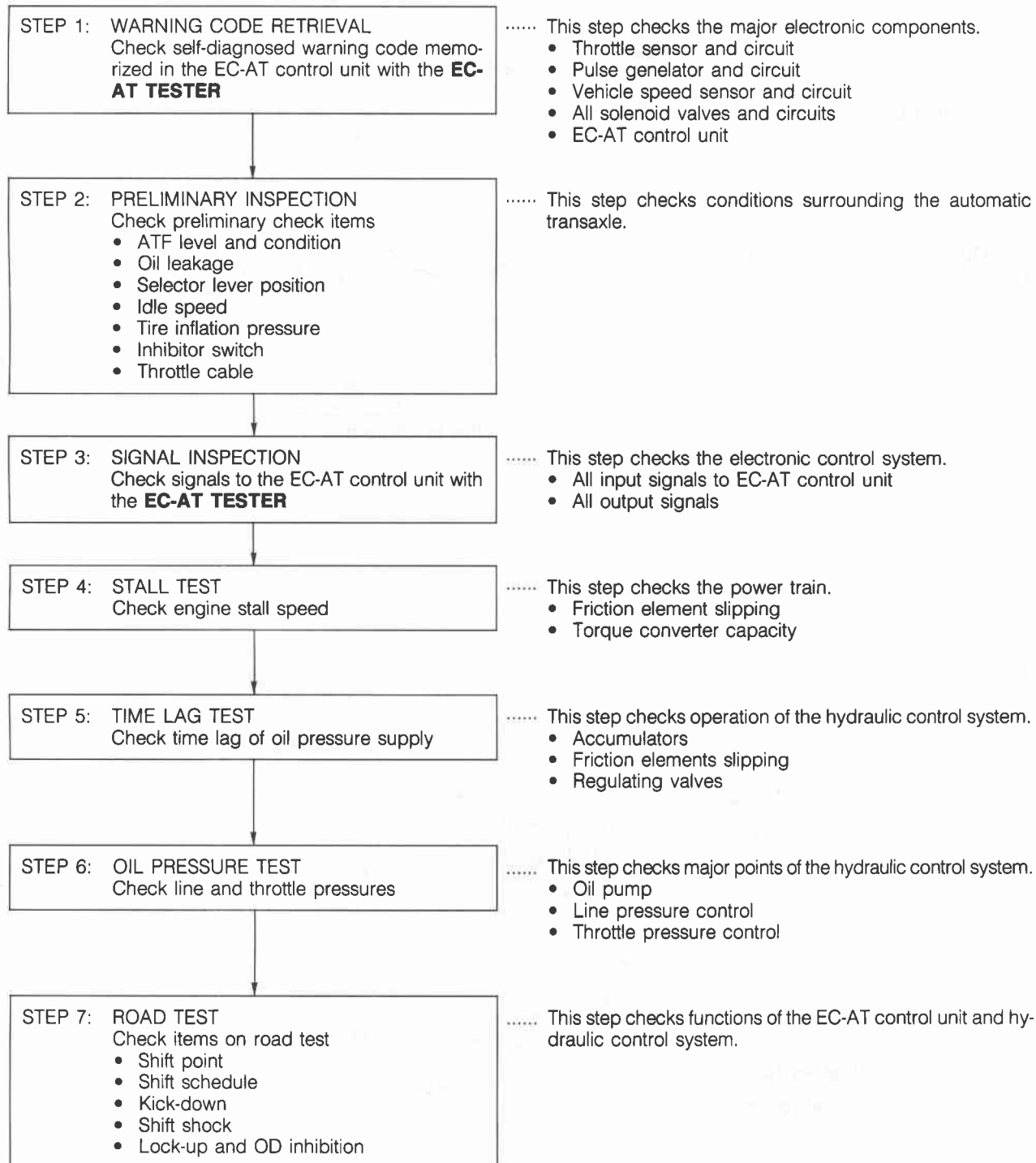
7B TROUBLESHOOTING (G4A-EL)

TROUBLESHOOTING (G4A-EL)

GENERAL NOTE

In the event of a problem with the EC-AT, the cause may be in the engine, EC-AT power train, hydraulic control system, or electronic control system.

When troubleshooting, therefore, it is recommended to begin from those points that can be judged quickly and easily. The recommended troubleshooting sequence is described below.



76G07B-012

By following the above seven steps, the cause of the problem should be located. As another guide to faster location of the causes of problems, the Quick Diagnosis Chart is included at pages 7B—13, 14.

In this chart, a circle is used to indicate the components that might be the cause of trouble for 23 types of problems. It is only necessary to check those components indicated by circles, at each step of the troubleshooting process, in order to quickly locate the cause of the problem.

Quick Diagnosis Chart

The Quick Diagnosis Chart shows various problems and the relationship of various components that might be the cause of the problem.

1. Components indicated in the "Self-Diag." column are diagnosed by the EC-AT control unit self-diagnosis function.

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

2. Components indicated in the "Adjustment" column indicate that there is a possibility that the problem may be the result of an incorrect adjustment.

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

3. Input and output signals of the EC-AT control unit for the components indicated in the "EC-AT TESTER" column can be easily checked by using of the **EC-AT Tester**.

4. Components indicated in the "Stall Test" column can be checked for malfunction by the results of the stall test.

5. Components indicated in the "Time Lag Test" column can be checked for malfunction by the results of the time lag test.

6. Components indicated in the "Oil Pressure Test" column can be checked for malfunction by the results of the oil pressure test.

7. Components indicated in the "Road Test" column can be checked for malfunction by the results of the road test.

8. The checking, adjusting, repair or replacement procedures for each component is described in the page(s) noted in the "Reference Page" column.

Item	Inspection point	Electronic control system												Preliminary	Hydraulic control system	Power train																		
		Brake light switch	Inhibitor switch	Mode switch	Hold switch	Idle switch	Throttle sensor	Water temp. switch	Vehicle speed sensor	Pulse generator	1-2 solenoid	2-3 solenoid	3-4 solenoid	Lock-up solenoid	ATF level and condition	Selector lever	Throttle cable	Idle speed and Ignition timing	Control valves	Accumulators	Oil pump	Hydraulic circuit	Torque converter	Forward clutch	Coasting clutch	Reverse clutch	3-4 clutch	2-4 brake band and servo	Low and reverse brake	One-way clutch 1	One-way clutch 2	Parking gear	Planetary gear	Differential assembly
Self-diag.						○																												
Adjustment			○				○	○			○	○			○	○	○											○						
EC-AT TESTER		○	○	○	○	○	○	○	○	○	○	○	○	○																				
Stall Test																		○		○		○	○			○		○						
Time Lag Test																			○				○					○						
Oil Pressure Test																	○			○	○													
Road Test																							○	○	○	○	○	○	○	○				

76G07B-013

7B TROUBLESHOOTING (G4A-EL)

Inspection point and reference page		ON VEHICLE										OFF VEHICLE																							
		Electronic control system										Preliminary	Hydraulic control system		Power train																				
		7B-66	7B-65	7B-63	7B-63	Section 4B	Section 4B	7B-66	7B-68	7B-68	7B-69	7B-69	7B-69	7B-69	7B-71	7B-72	7B-73	Section 4B	7B-77, 137	7B-132, 141	7B-108	7B-231	7B-107	7B-113	7B-113	7B-113	7B-128	7B-135	7B-134	7B-122	7B-126	7B-135	7B-126	7B-177	
Condition		Brake light switch	Inhibitor switch	Mode switch	Hold switch	Idle switch	Throttle sensor	Water temp. switch	Vehicle speed sensor	Pulse generator	1-2 solenoid	2-3 solenoid	3-4 solenoid	Lock-up solenoid	ATF level and condition	Selector lever	Throttle cable	Idle speed and Ignition timing	Control valves	Accumulators	Oil pump	Hydraulic circuit	Torque converter	Forward clutch	Coasting clutch	Reverse clutch	3-4 clutch	2-4 brake band and servo	Low and reverse brake	One-way clutch 1	One-way clutch 2	Parking gear	Planetary gear	Differential assembly	
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 lock-up	○					○	○		○	○	○	○			○							○												
	No kick-down		○		○		○										○																		
Slipping	Engine run away or slip when starting vehicle		○											○					○		○			○							○				
	Engine run away or slip when up- or down-shifting		○											○					○		○			○		○	○	○		○					
Shift shock	Excessive N to D or N to R shift shock													○				○	○	○				○		○									
	Excessive shift shock when up-shifting or downshifting													○		○			○	○					○		○	○							
	Excessive shift shock when changing range		○														○								○			○							
Noise	Transaxle noisy in N or P range														○						○		○											○	
	Transaxle noisy in D, S, L, or R range														○									○						○			○		
Others	No engine braking											○	○						○			○			○				○						
	No mode change		○	○	○		○	○	○	○	○	○	○	○																					
	Transaxle overheats														○	○				○		○													
	Vehicle moves in "P", or parking gear not disengaged when "P" is disengaged																○															○			
	Hold indicator flashes						○		○	○	○	○	○	○																					
	Engine will not start		○														○																		

76G07B-014

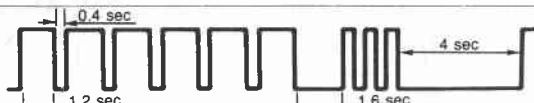
STEP 1 (WARNING CODE RETRIEVAL)**Self-diagnosis Function**

The self-diagnosis 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.

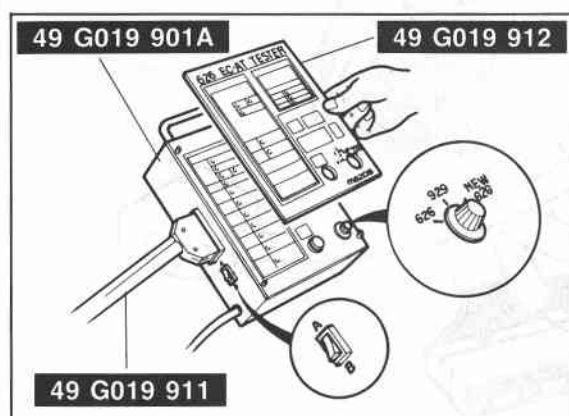
Malfunctions which have happened or are continuing are memorized in the EC-AT control unit as specific codes.

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

Code Number

Code number	Location of malfunction	Buzzer
06	Vehicle speed sensor or circuit	
12	Throttle sensor or circuit	
55	Pulse genelator 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	Lock-up solenoid valve or circuit	

76G07B-213



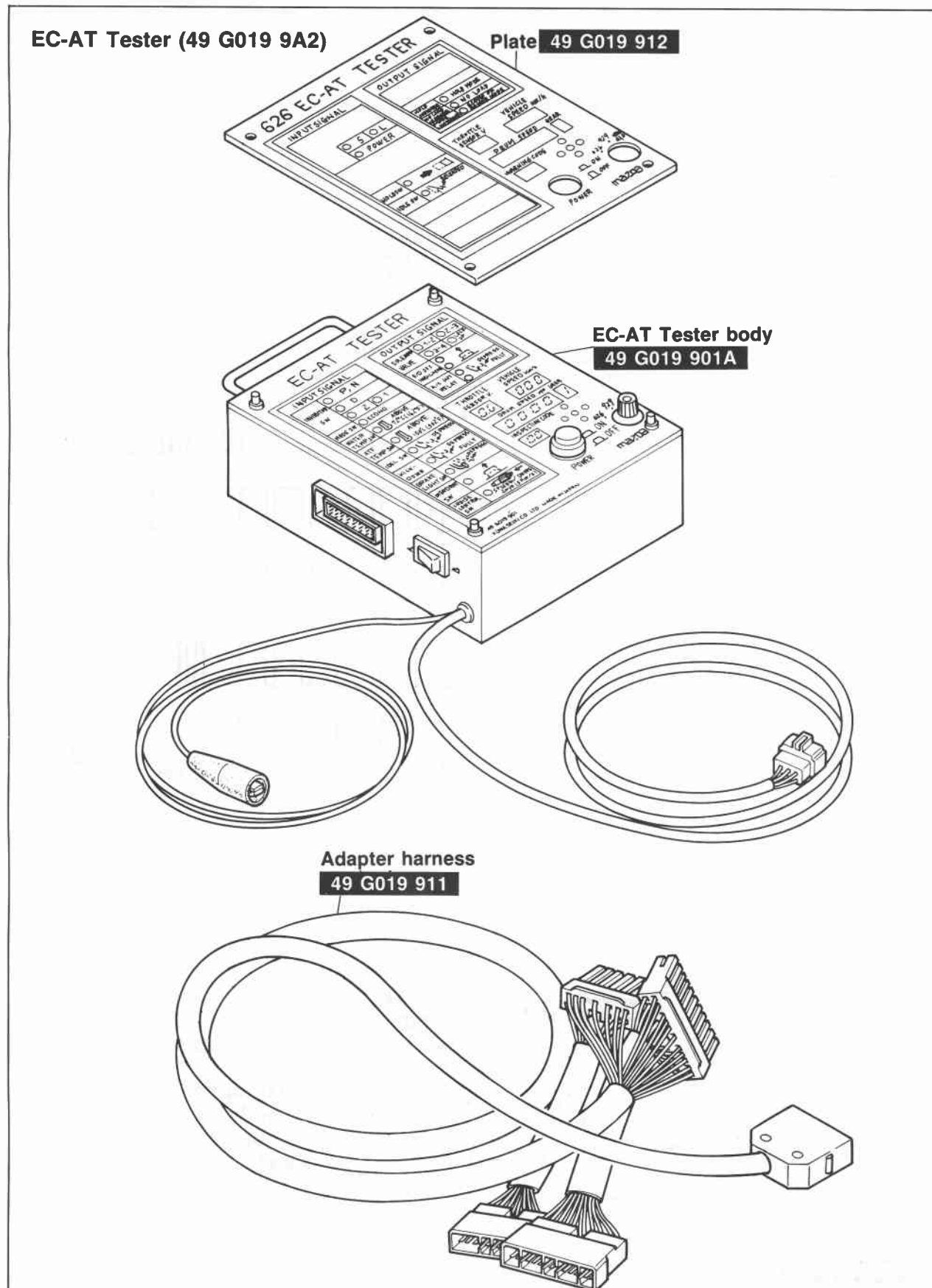
76G07B-603

EC-AT Tester**Assembly of EC-AT tester**

1. Set the **plate** (49 G019 912) onto the **EC-AT tester body** (49 G019 901A).
2. Connect the **adapter harness** (49 G019 911) to the **EC-AT tester body**.
3. Select the code select switch to A position.
4. Select the select switch to NEW 626 position.

7B TROUBLESHOOTING (G4A-EL)

Components

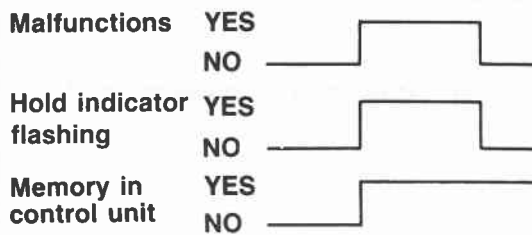


86U07B-013

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

86U07B-018

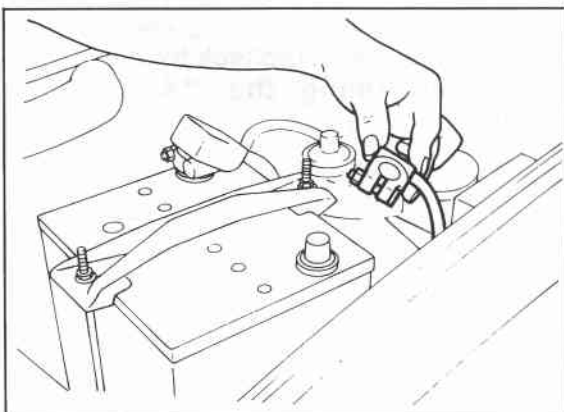
**When the service connector
is not grounded**



76G07B-015



79G07C-062

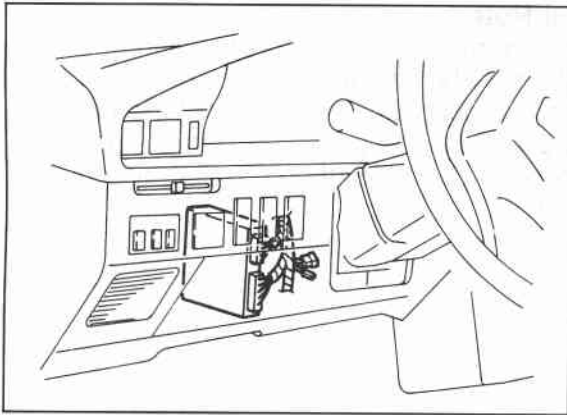


79G07C-063

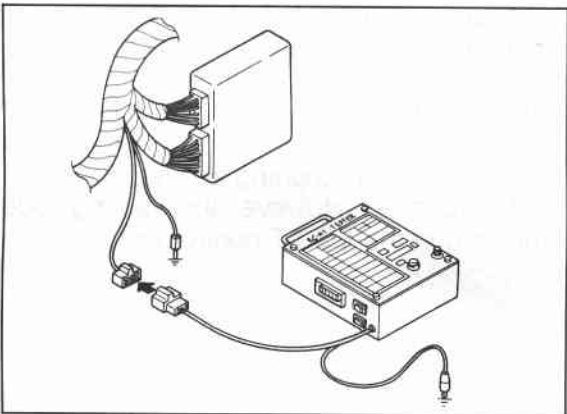
General Note

1. If there is more than one malfunction, the code numbers will be displayed on the tester one by one in a numerical order. In the case of malfunctions, 55, 06, and 63, the code numbers are displayed in an order of 06, 55, then 63. The display is as shown.
2. The hold indicator flashes to indicate the same pattern as the buzzer of the EC-AT Tester when the EC-AT service connector is grounded. When the EC-AT service connector is not grounded, the indicator flashes in a constant frequency while a malfunction is occurring and goes out if the malfunction recovers. However, the warning code is memorized in the EC-AT control unit.
3. The EC-AT control unit has a built-in fail-safe function for the throttle sensor, the pulse generator, and the 1-2, 2-3, and 3-4 shift solenoid valves. If a malfunction occurs, the EC-AT control unit will control operation of the remaining components according to a preset fail-safe program. The vehicle may still be driven, although the driving performance will be slightly affected.
4. The memory of warning codes is canceled by disconnecting the negative battery terminal for approx. five seconds.

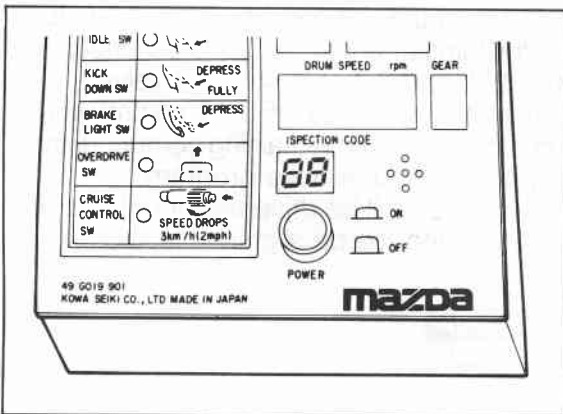
7B TROUBLESHOOTING (G4A-EL)



86U07B-019



76G07B-214



76G07B-016

Retrieval Procedure

1. Locate the service connector.

2. Ground the ground connector of the **EC-AT Tester**.
3. Connect the 6-pin connector of the **EC-AT Tester** to the service connector.

Note

The service connector is blue-colored connector.

4. Ground the 1 pin service connector.

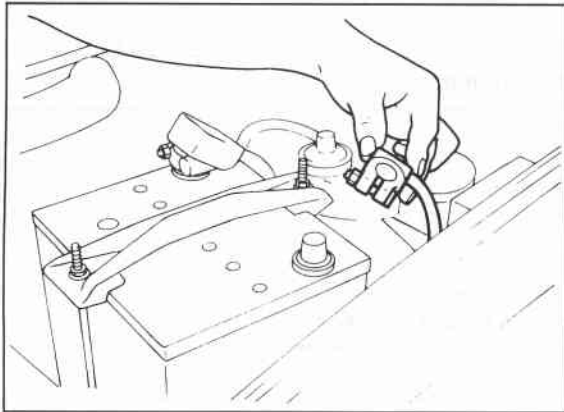
Note

The service connector is blue-colored connector.

5. Turn the ignition switch ON.
6. Check that "**88**" flashes on the digital display and the buzzer sounds for three seconds after turning the ignition switch ON.
7. If "**88**" does not flash, check the service connector wiring.
8. If "**88**" flashes and the buzzer sounds continuously for more than **20 seconds**, check wiring to 2M terminal of the EC-AT control unit for short-circuit then replace the EC-AT control unit and repeat steps 3 and 4.
9. Note the code numbers and check for the causes by referring to the Inspection Procedure shown on pages 7B—19 to 7B—21, repair as necessary.

Note

After repairs are made, recheck for code numbers by performing the "After-repair procedure."



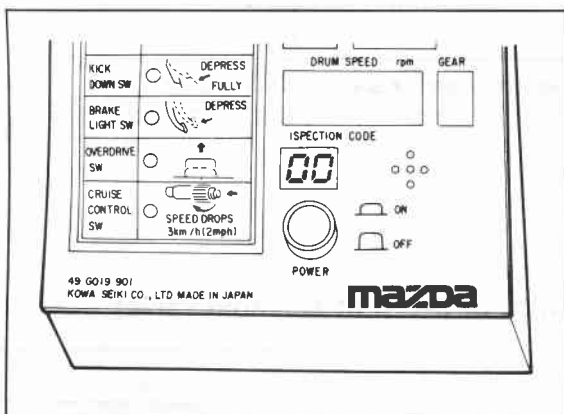
79G07C-068

Drive at 50 km/h (31 mph)

Kick-down

Stop the vehicle

79G07C-069



79G07C-070

After-repair Procedure

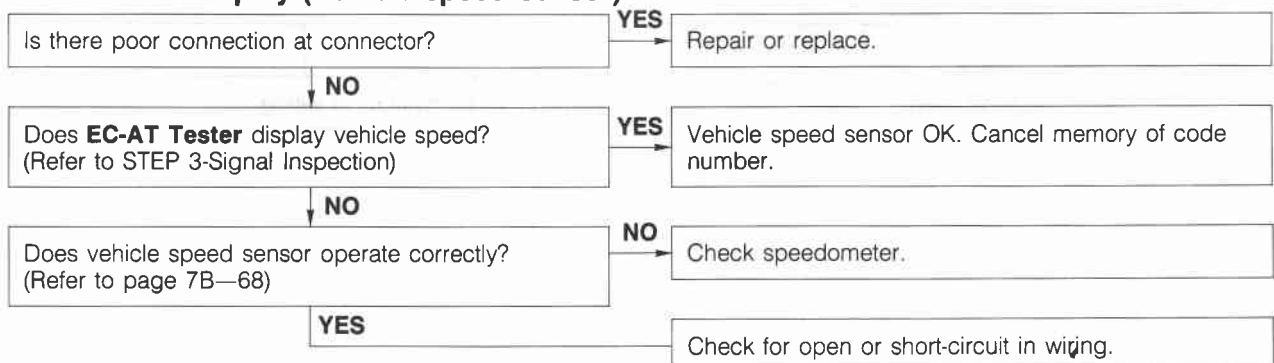
1. Cancel the memory of malfunctions by disconnecting the negative battery terminal for at least five seconds, then reconnect it.
2. Remove the EC-AT tester if it is connected.

3. Drive the vehicle at 50 km/h (31 mph), then depress the accelerator pedal fully to activate kick-down. Stop the vehicle gradually.

4. Reconnect the **EC-AT tester** to the 6-pin service connector.
5. Ground the 1-pin service connector with a jumper wire.
6. Turn the ignition switch ON.
7. Check that no code numbers are displayed.

Inspection Procedure

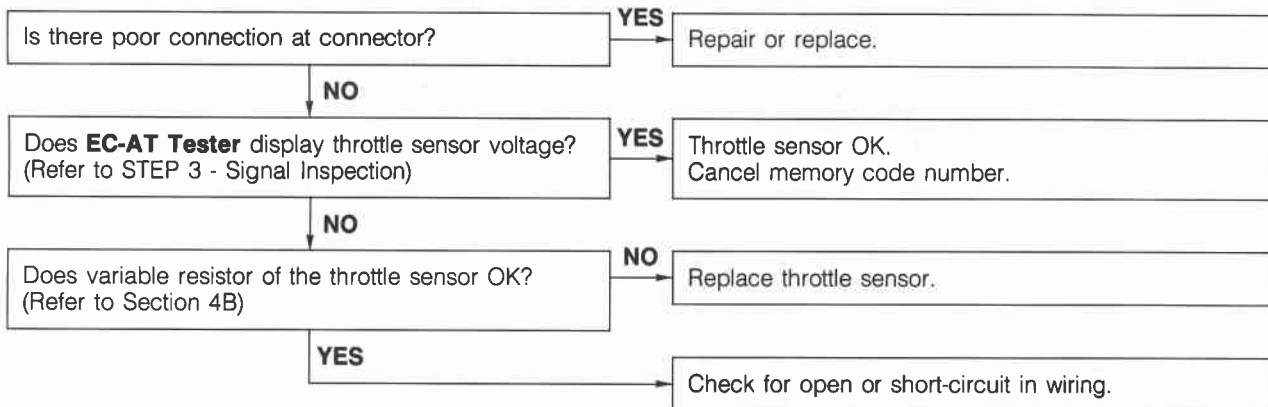
No. 06 code display (Vehicle speed sensor)



76G07B-017

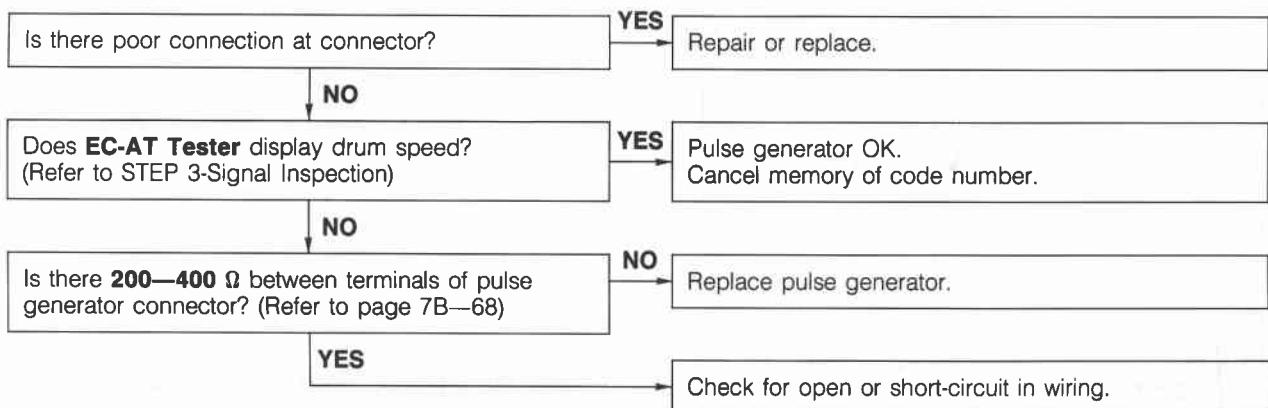
7B TROUBLESHOOTING (G4A-EL)

No. 12 code display (Throttle sensor)



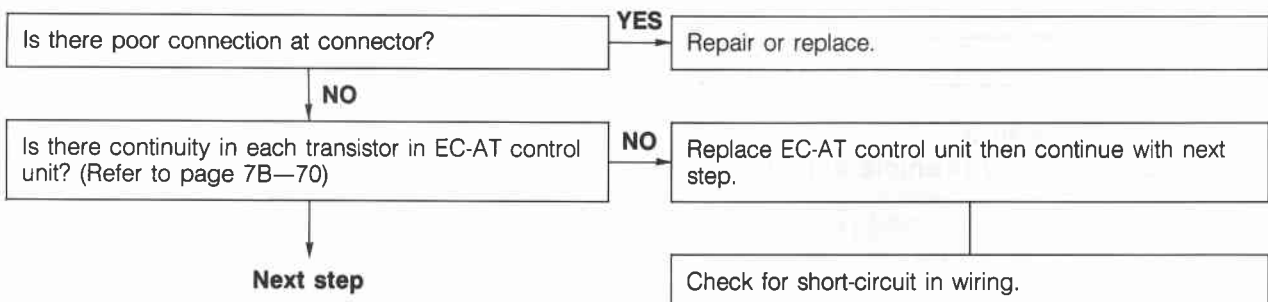
76G07B-018

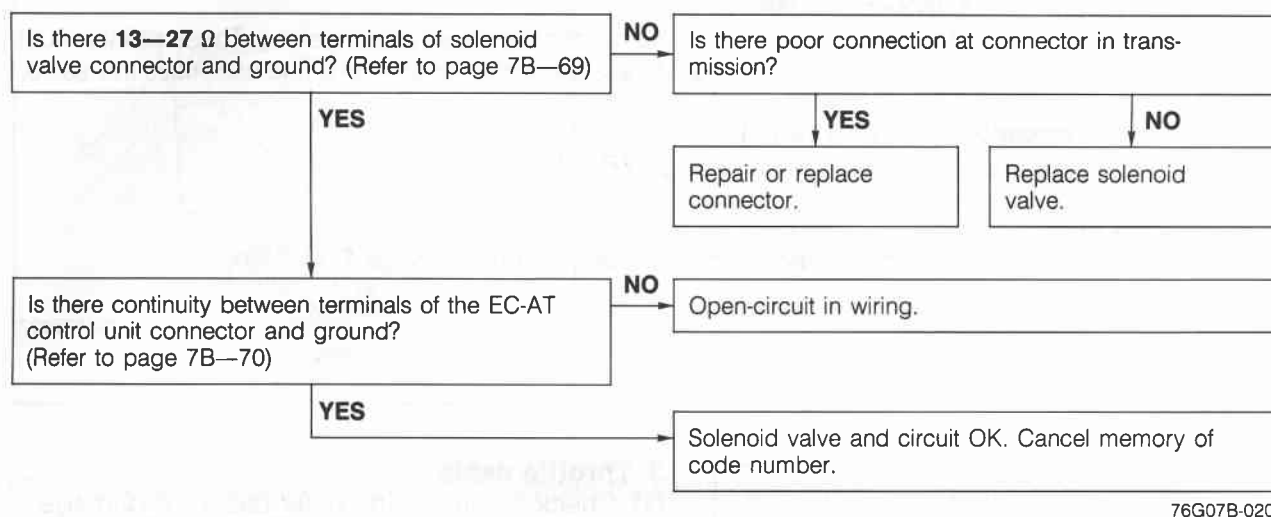
No. 55 code display (Pulse generator)



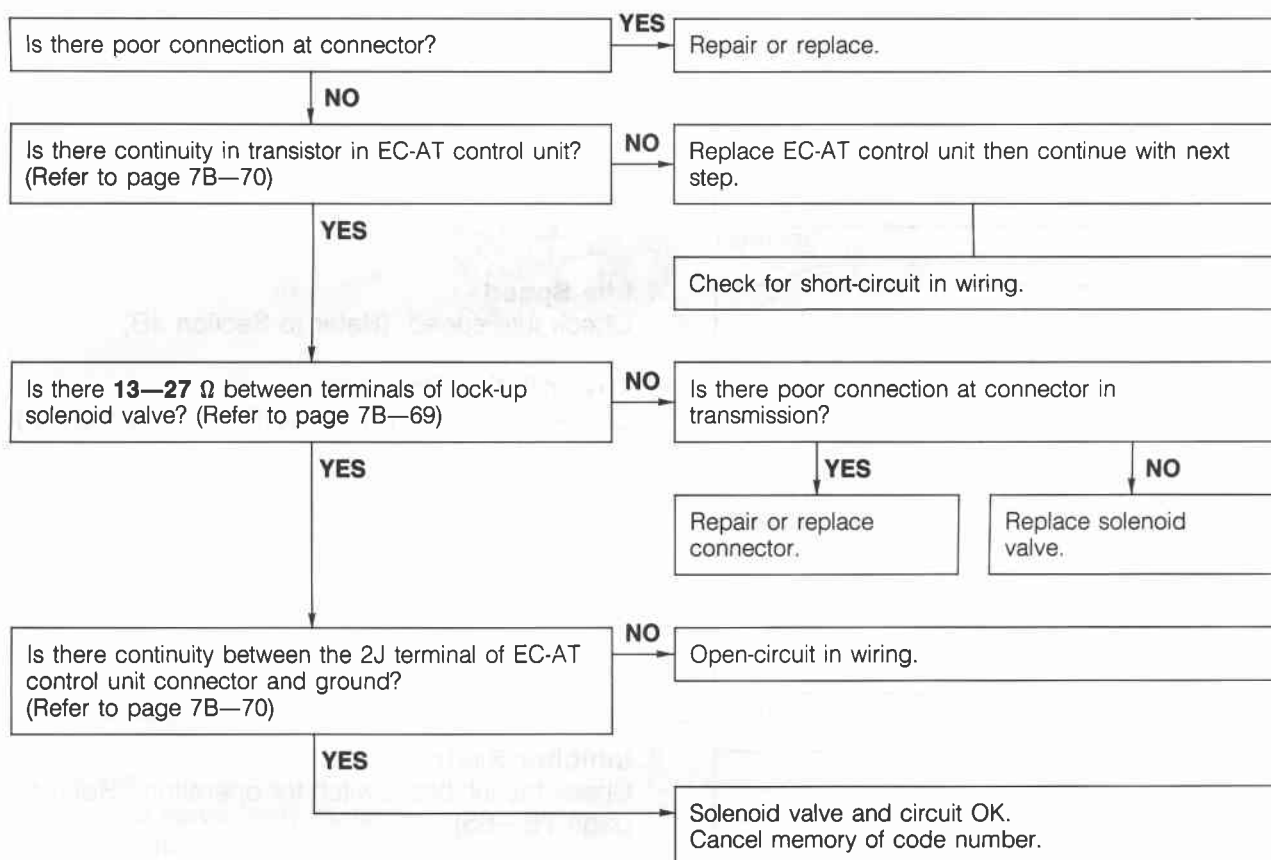
76G07B-019

No. 60, 61, 62, or 64 code display (1-2 shift, 2-3 shift, or 3-4 shift solenoid valve)





No. 63 code display (Lock-up solenoid valve)



7B TROUBLESHOOTING (G4A-EL)

STEP 2 (PRELIMINARY INSPECTION)

In this step, the fundamental points related to the automatic transaxle are checked. These points must be kept in the correct condition at all times in order to assure proper operation of the automatic transaxle.

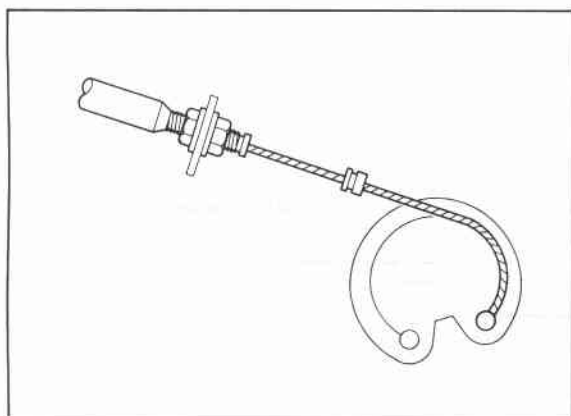
1. Automatic Transmission Fluid (ATF)

Check ATF level and condition. (Refer to page 7B—71)

2. Selector Lever

Check selector lever position and adjust if necessary. (Refer to page 7B—72)

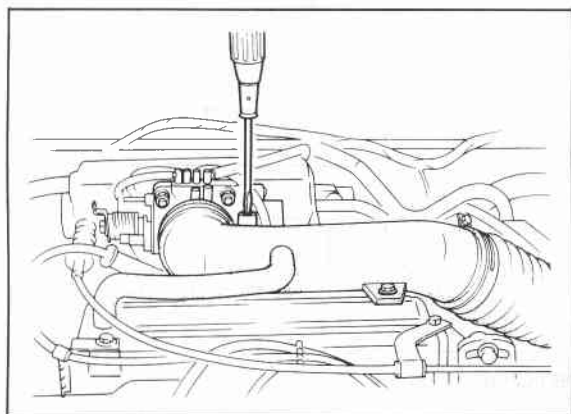
76G07B-022



76G07B-023

3. Throttle cable

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



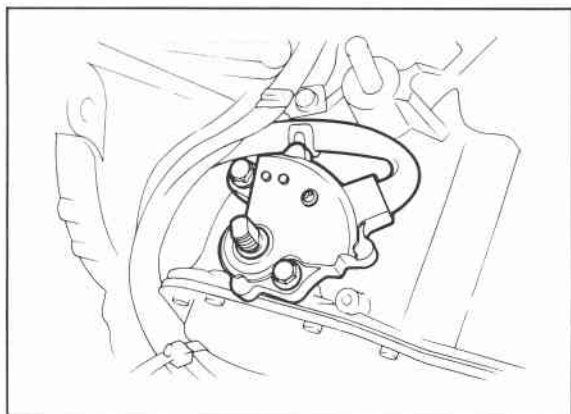
76G07B-024

4. Idle Speed

Check idle speed. (Refer to Section 4B)

5. Tire Inflation Pressure

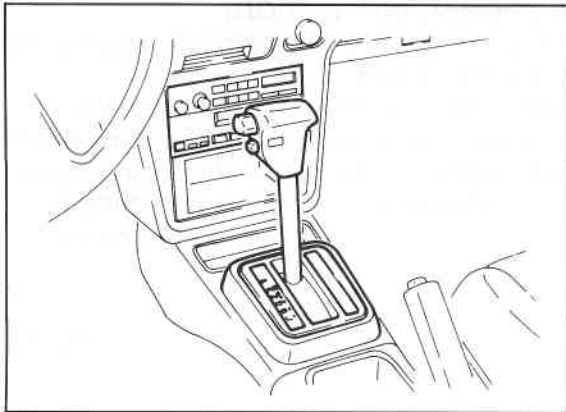
Check tire inflation pressure. (Refer to Section 12)



76G07B-025

6. Inhibitor Switch

Check the inhibitor switch for operation. (Refer to page 7B—65)



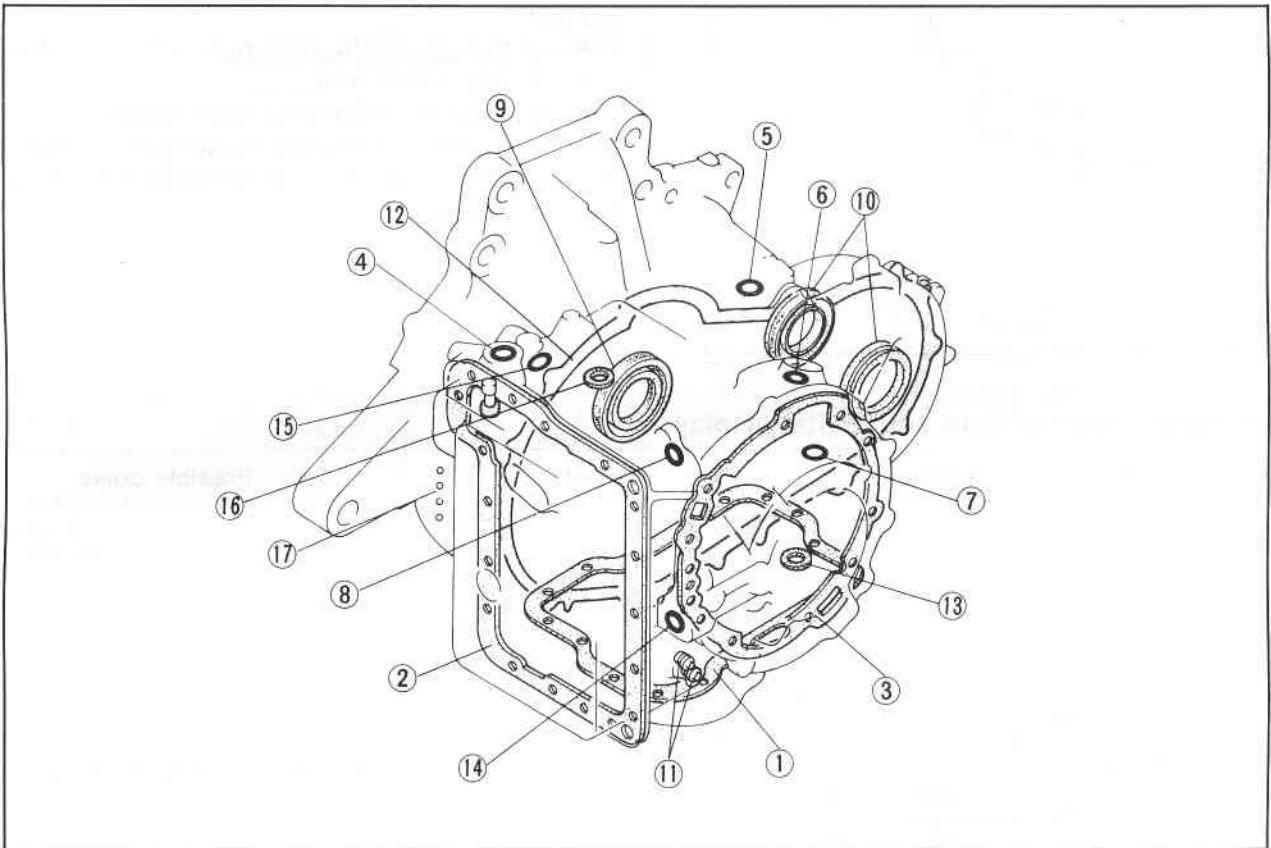
76G07B-026

7. Oil Leakage

Check for oil leakage.

- (1) Warm up the ATF.
- (2) Apply the parking brake and block the wheels to prevent the vehicle from rolling.
- (3) Shift the selector lever to R range.
- (4) Check if oil leaks from the following oil seals or gaskets.
- (5) If oil leaks, replace the oil seal or gasket.

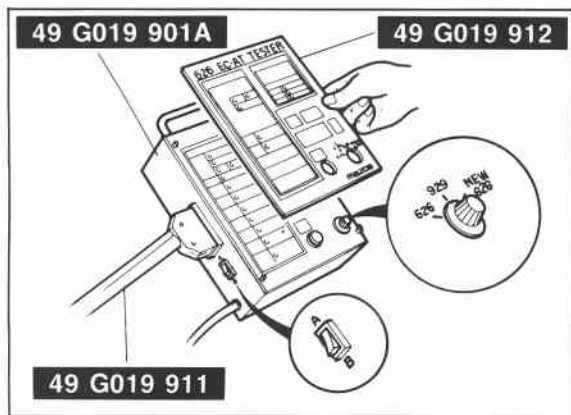
Check for fluid leaks; the following figure shows the locations where fluid leakage may possibly occur.



76G07B-027

- | | |
|-----------------------------|------------------------------|
| 1. Oil pan | 10. Driveshaft |
| 2. Control valve body cover | 11. Square head plug |
| 3. Oil pump | 12. Transaxle case |
| 4. Inhibitor switch | 13. Drain plug |
| 5. Speedometer driven gear | 14. Oil cooler return pipe |
| 6. Pulse generator | 15. Oil cooler outlet pipe |
| 7. Oil filler tube | 16. Fluid temperature switch |
| 8. Throttle cable | 17. Blind plugs |
| 9. Bearing cover | |

7B TROUBLESHOOTING (G4A-EL)

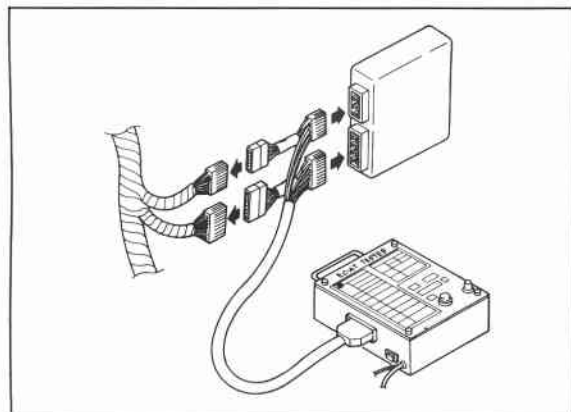


86U07B-030

STEP 3 (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. Powertrain slippage is also checked.



86U07B-031

Inspection Procedure

1. Disconnect the connectors from the EC-AT control unit.
2. Connect the adaptor harness between the control unit and the connectors.
3. Turn the ignition switch and main switch ON.
4. Check indication of the respective light or digital display in each condition, referring to the indication table below.

Indication table of light and digital display

Item	Indication		Condition	Possible cause
Input (Light)				
INHIBITOR SW	L	ON	L range	Inhibitor switch or wiring
		OFF	Other ranges	
	S	ON	S range	
		OFF	Other ranges	
	D	ON	D range	
		OFF	Other ranges	
	P,N	ON	P or N range	
		OFF	Other ranges	
HOLD SW		ON	Hold switch pushed	Hold switch or wiring
		OFF	Hold switch released	
MODE SW		ON	Power mode	Mode switch or wiring
		OFF	Economy mode	
IDLE SW		ON	Throttle valve fully closed	Idle switch or wiring
		OFF	Throttle valve open	

Item	Indication	Condition	Possible cause
BRAKE LIGHT SW	ON	Brake pedal depressed	Brake light switch or wiring
	OFF	Brake pedal released	
WATER TEMP SW	ON	Coolant temperature 72°C (162°F) or above	Water temp switch or wiring
	OFF	Coolant temperature lower than 65°C (149°F)	
ATF TEMP SW	ON	ATF temperature 150°C (302°F) or above	Fluid temperature switch or wiring
	OFF	ATF temperature lower than 143°C (289°F)	
CRUISE CONTROL SW	Not used	—	—
Input (Digital display)			
THROTTLE SENSOR	EC-AT control unit terminal voltage	All the time	Throttle sensor, idle switch or wirings
VEHICLE SPEED*	Vehicle speed calculated from speed sensor signal	All the time	Vehicle speed sensor, speedometer cable, or wiring
DRUM SPEED*	Drum speed	All the time	Pulse generator or wirings
Output (Light)			
1-2 SOLENOID VALVE*	ON	Refer to page 7B—26 solenoid valve operation table	Control unit, 1-2 shift sol., or wiring
	OFF		
2-3 SOLENOID VALVE*	ON		Control unit, 2-3 shift sol., or wiring
	OFF		
3-4 SOLENOID VALVE*	ON		Control unit, 3-4 shift sol., or wiring
	OFF		
LOCK-UP SOLENOID VALVE*	ON	Lock-up condition	Control unit, lock-up sol., or wiring
	OFF	Non-lock-up condition	
HOLD INDICATOR	ON	Hold mode	Control unit, Hold switch, or wiring
	OFF	Other modes	
MODE INDICATOR	ON	Power or economy mode	Control unit, hold switch, mode switch, or wiring
	OFF	Hold mode	
NO LOAD SIGNAL	Not used	—	—

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7B TROUBLESHOOTING (G4A-EL)

Item	Indication	Condition
OUTPUT (Digital display)		
GEAR*	1	1st gear position
	2	2nd gear position
	3	3rd gear position
	4	Overdrive (OD) gear position

86U07B-033

Note

a) The back-up condition is as following condition

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

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

Comprehensive Usage

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

The inspection procedure is shown in STEP 7 (ROAD TEST).

Solenoid valve operation table

RANGE		GEAR		SOLENOID VALVES			
				1-2	2-3	3-4	Lock-up
P		Non				ON	
R		Reverse		ON			
N	—	Below approx. 18 km/h (11 mph)				ON	
		Above approx. 18 km/h (11 mph)		ON			
D	3rd	1st			ON	ON	
		2nd		ON	ON	ON	
		Below approx. 40 km/h (25 mph)					
		Above approx. 40 km/h (25 mph)		ON			
	OD	Lock-up OFF		ON		ON	
		Lock-up ON		ON		ON	ON
S	3rd	1st			ON	ON	
		2nd		ON	ON	ON	
		Below approx. 40 km/h (25 mph)					
		Above approx. 40 km/h (25 mph)		ON			
L	2nd	1st			ON	ON	
		Below approx. 110 km/h (68 mph)		ON	ON		
		Above approx. 110 km/h (68 mph)		ON			
		2nd		ON	ON	ON	
HOLD	D	3rd	Below approx. 40 km/h (25 mph)				
			Above approx. 40 km/h (25 mph)	ON			
		2nd		ON	ON	ON	
		3rd					
	S	3rd	Below approx. 40 km/h (25 mph)				
			Above approx. 40 km/h (25 mph)	ON			
		2nd		ON	ON		
		3rd					
	L	1st			ON		
		2nd	Below approx. 110 km/h (68 mph)	ON	ON		
			Above approx. 110 km/h (68 mph)	ON			

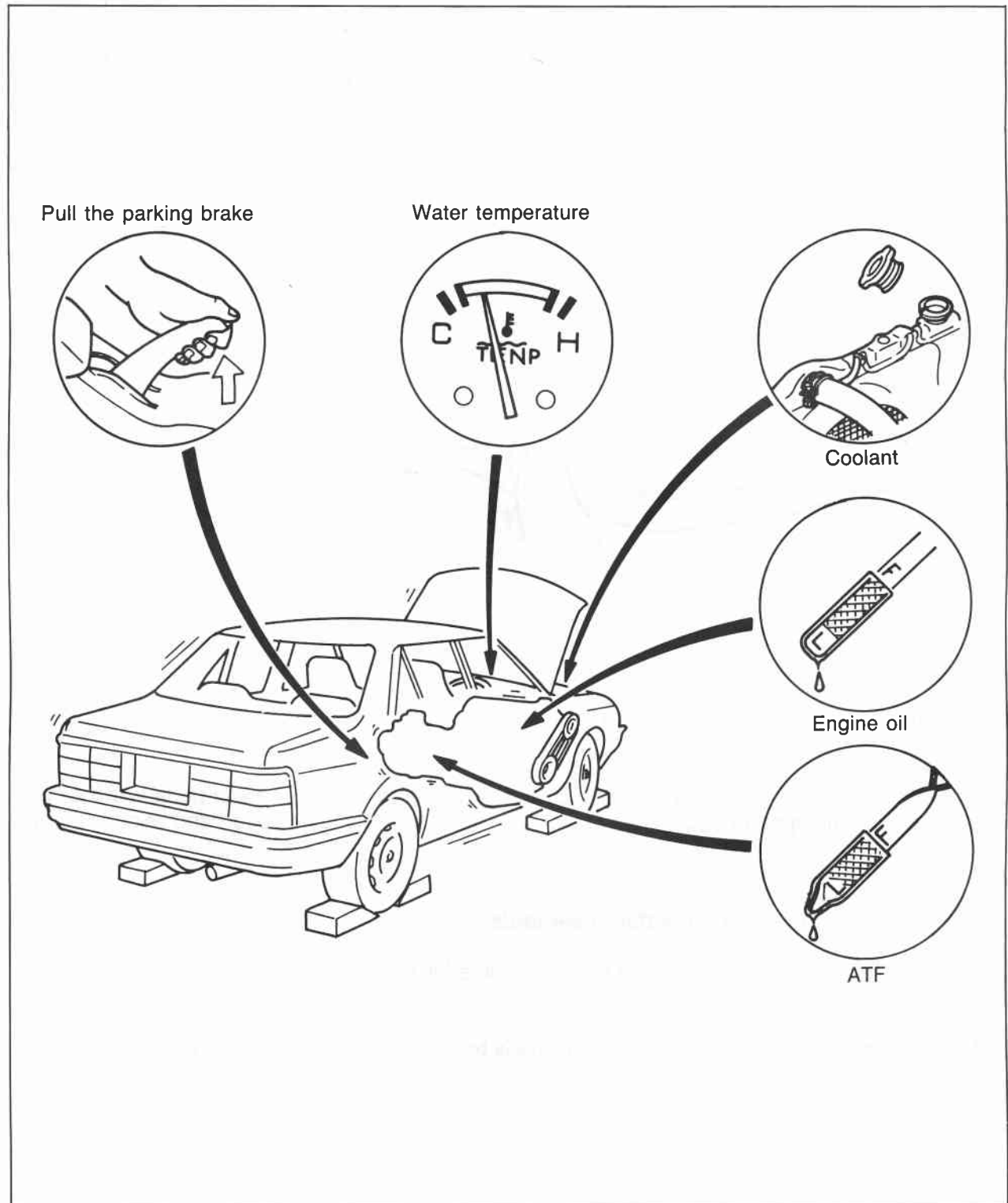
STEP 4 (STALL TEST)

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

Preparation

Check the following items prior to testing:

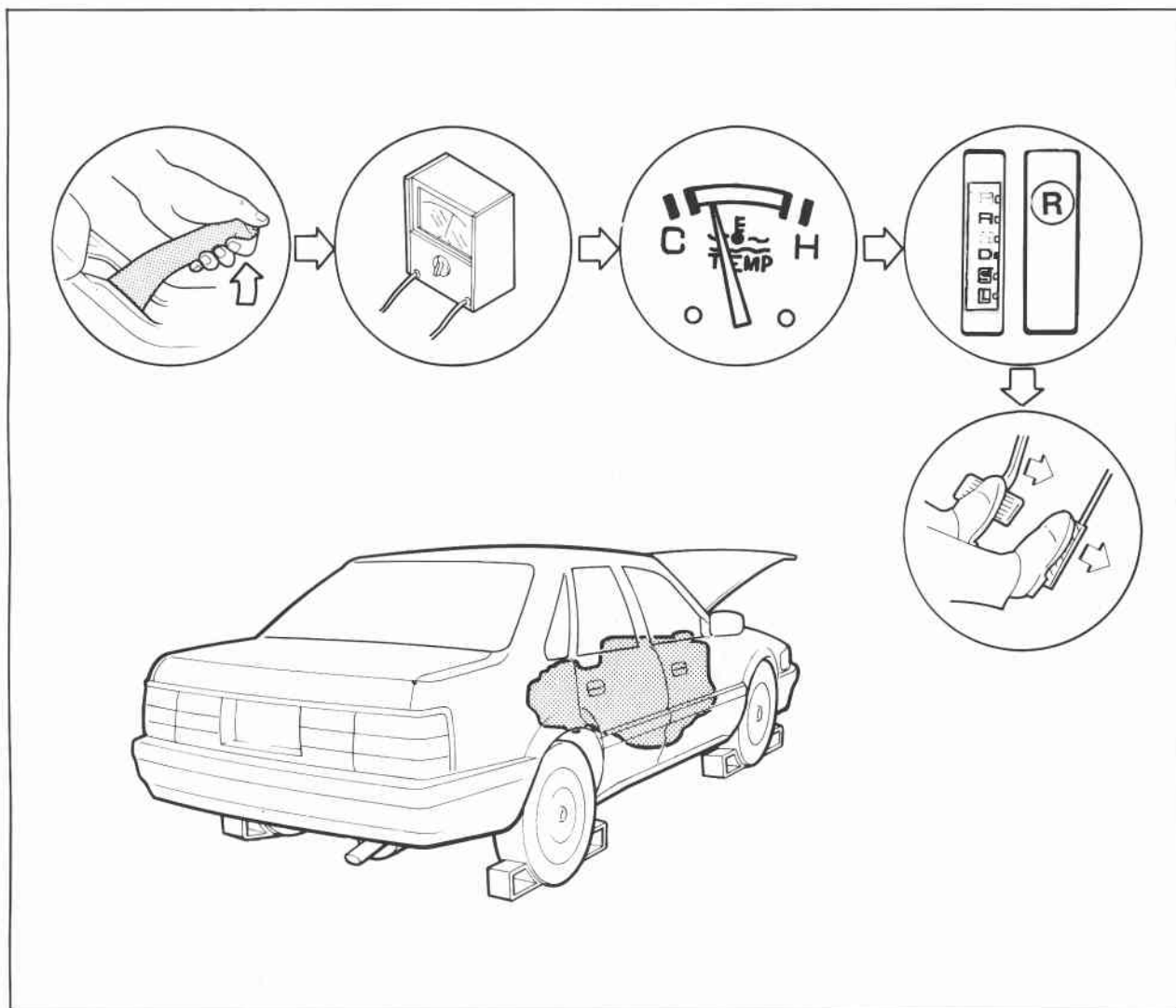
1. Engine coolant, engine oil and ATF levels.
2. Warm the engine thoroughly to raise the ATF temperature to operating level (50—80°C, 122—176°F).
3. Engage the parking brake and use wheel chocks at the front and rear wheels.



79G07C-084

7B TROUBLESHOOTING (G4A-EL)

Procedure



86U07B-034

1. Block the wheels and apply the parking brake.
2. Connect a tachometer to the engine.
3. Shift the selector lever to R.
4. Firmly depress the foot brake with the left foot, and gently depress the accelerator pedal with the right.
5. When the engine speed no longer increases, quickly read the engine speed and release the accelerator.

Caution

Steps 4 → 5 must be done within 5 seconds.

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

Caution

The reason for idling for at least one minute is to cool the ATF and to prevent deterioration of the fluid.

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

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

Caution

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

Engine stall speed: D.S.L range 2170—2270 rpm
R range 2130—2230 rpm

Note

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

Drum stall speed indication: 0 rpm

76G07B-029

Evaluation

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
	In forward ranges	Forward clutch slipping One-way clutch 1 slipping	
	In D range	One-way clutch 2 slipping	
	In S (Hold) and L (Hold) ranges	Coasting clutch slipping	
	In D (Hold) and S (Hold) ranges	2-4 brake band slipping	
Within specification	In R, L and L (Hold) ranges	Low and reverse brake slipping	
	In R range	Low and reverse brake slipping Reverse clutch slipping Perform road test to determine whether problem is low and reverse brake or reverse clutch a) Engine brake applied in 1st ...Reverse clutch b) Engine brake not applied in 1st ...Low and reverse brake	
		All shift control elements within transmission are functioning normally.	
Below specification		Engine out of tune	
		One-way clutch slipping within torque converter	

86U07B-036

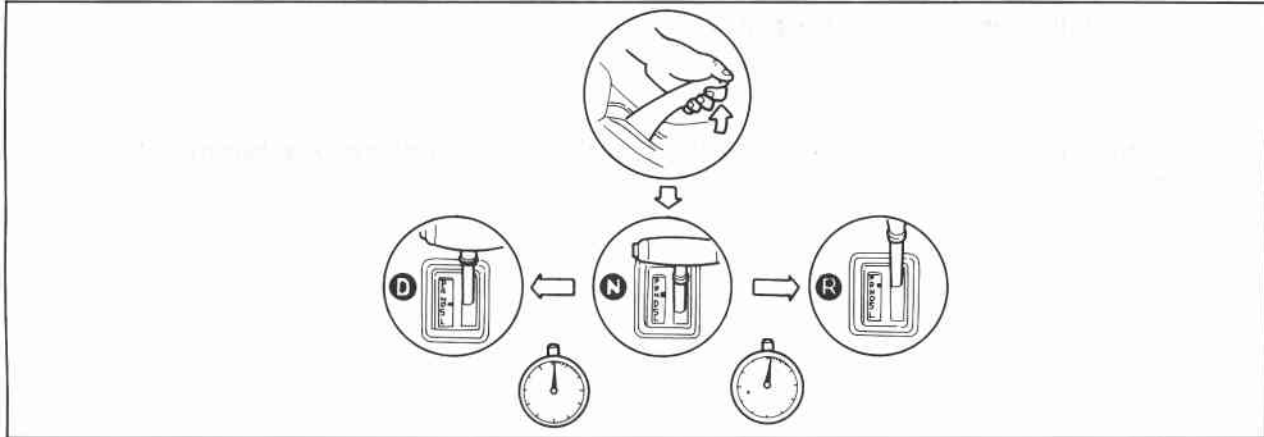
7B TROUBLESHOOTING (G4A-EL)

STEP 5 (TIME LAG TEST)

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

Preparation

Perform the preparation procedure shown in the STEP 4 (STALL TEST).



76G07B-030

Procedure

1. Start the engine and check the idle speed in P range.

Idle speed: 900 ± 50 rpm

2. Shift from N range to D range
3. Measure the time it takes from shifting until shock is felt, with a stop watch.
4. Shift the selector to N range and run the engine at idle speed for at least one minute.
5. Perform the test for the following shifts in the same manner.
 - (1) N → D range (Hold mode)
 - (2) N → R range

Note

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

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

Evaluation

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

86U07B-038

STEP 6 (OIL PRESSURE TEST)

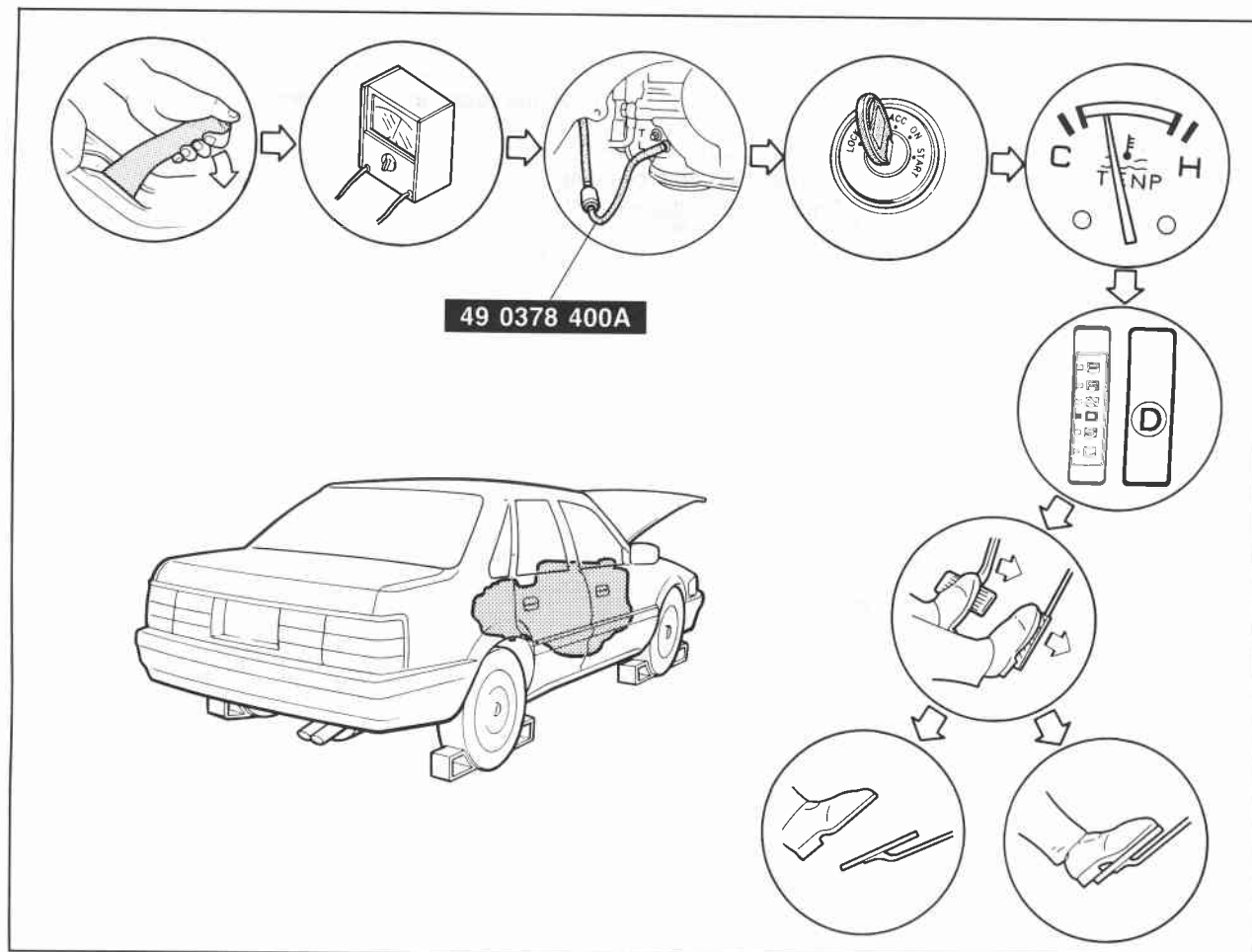
This step checks line pressures for checking the hydraulic components and for oil leakage.

Line Pressure Test

Preparation

1. Perform the preparation procedure shown in STEP 4 (STALL TEST).
2. Connect a tachometer to the engine.
3. Connect the **SST** to the line pressure inspection hole (square head plug L)

Procedure



76G07B-031

1. Start the engine and check the idle speed in P range

Idle speed: 900 ± 50 rpm

2. Shift the selector lever to D range and read the line pressure at idle.
3. Depress the brake pedal firmly with the left foot and gradually depress the accelerator pedal with the right foot.
4. Read the line pressure as soon as the engine speed becomes constant, then release the accelerator pedal.

Caution

Steps 3 to 4 must be performed within 5 seconds.

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 engine stall speeds for each range in the same manner.

7B TROUBLESHOOTING (G4A-EL)

Specified line pressure:

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

76G07B-032

Evaluation

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

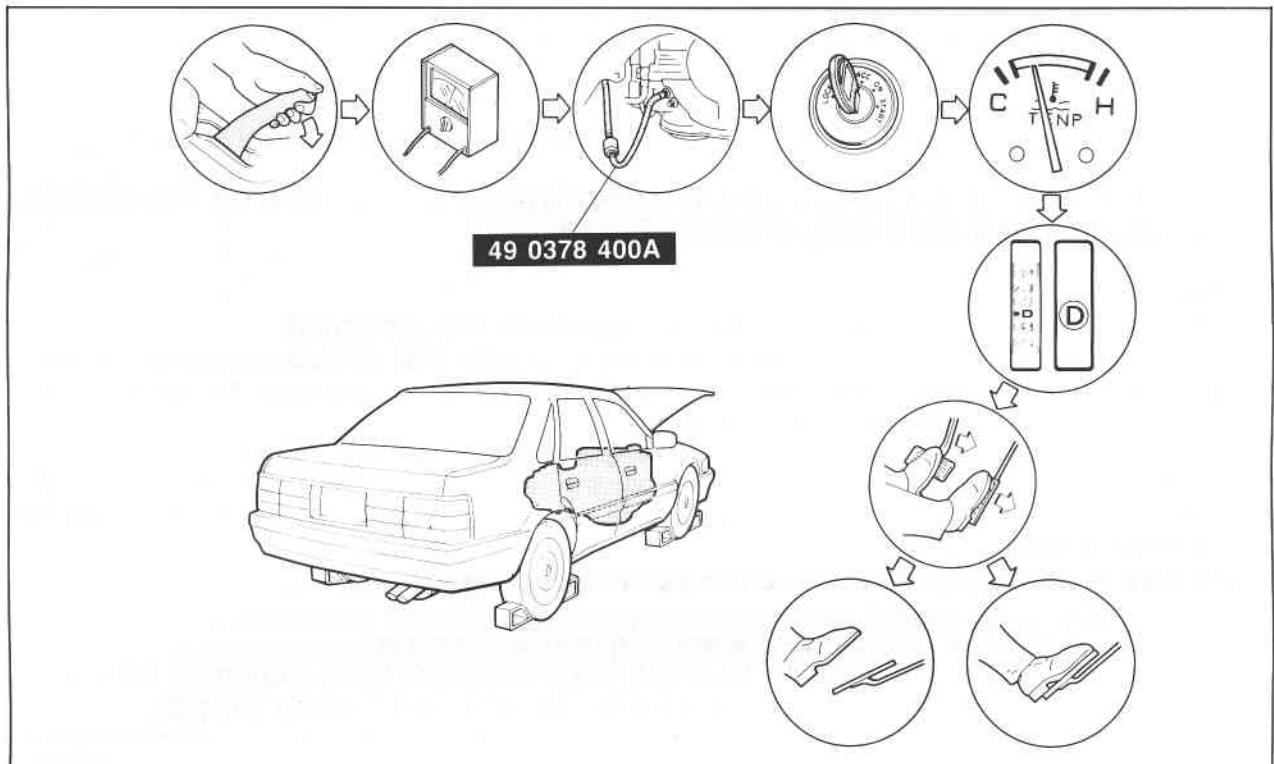
76G07B-033

Throttle Pressure Test

This step checks line pressure for checking the hydraulic components and for improper adjustment of throttle cable.

Preparation

1. Perform the preparation procedure shown in STEP 4 (STALL TEST).
2. Connect a tachometer to the engine.
3. Connect the **SST** to the throttle pressure inspection hole (square head plug T).

Procedure

76G07B-034

1. Start the engine and check the idle speed in P range.

Idle speed: 900 ± 50 rpm

2. Shift the selector lever to D range and read the throttle pressure at idle.
3. Depress the brake pedal firmly with the left foot and gradually depress the accelerator pedal with the right foot.
4. Read the throttle pressure as soon as the engine speed becomes constant, then release the accelerator pedal.

Caution

Steps 3 to 4 must be performed within 5 seconds.

Specified throttle pressure:

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

Evaluation

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

7B TROUBLESHOOTING (G4A-EL)

STEP 7 (ROAD TEST)

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

Caution

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

D Range Test

Shift point, shift pattern, and shift shock

1. Shift the selector lever to D range and select the Power mode.
2. Accelerate the vehicle with half and full throttle valve opening.

Note

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

3. Check that 1-2, 2-3 and 3-OD up-shifts and downshifts and lock-up are obtained. The shift points must be as shown in the D range (Power) shift diagram.

Note

a) Drum speed (rpm) of the EC-AT Tester represents the shift point.

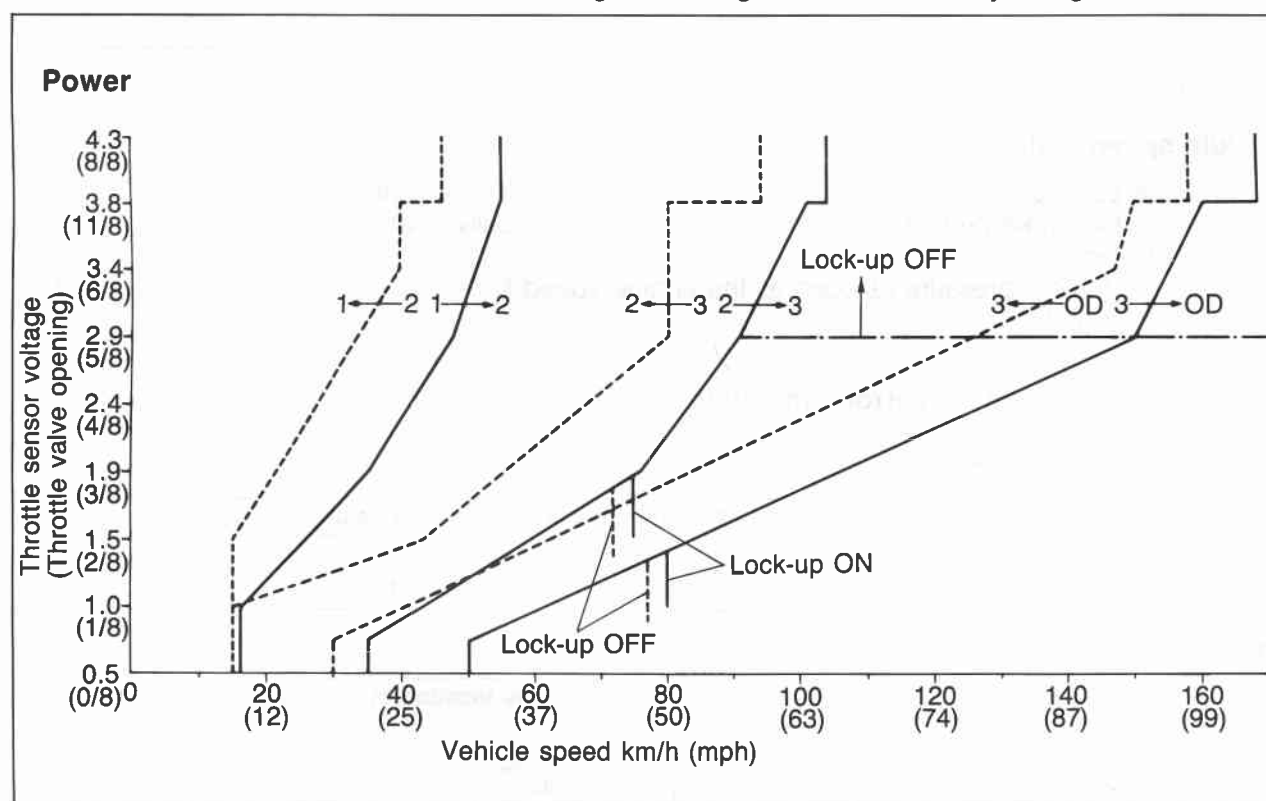
b) Vehicle speed of the EC-AT Tester and speedometer and vehicle speed on a chassis roller may not meet the specified shift pattern because of tire size. Therefore, check the shift points with the Drum speed.

c) There is no lock-up when the coolant temperature is below 72°C (162°F).

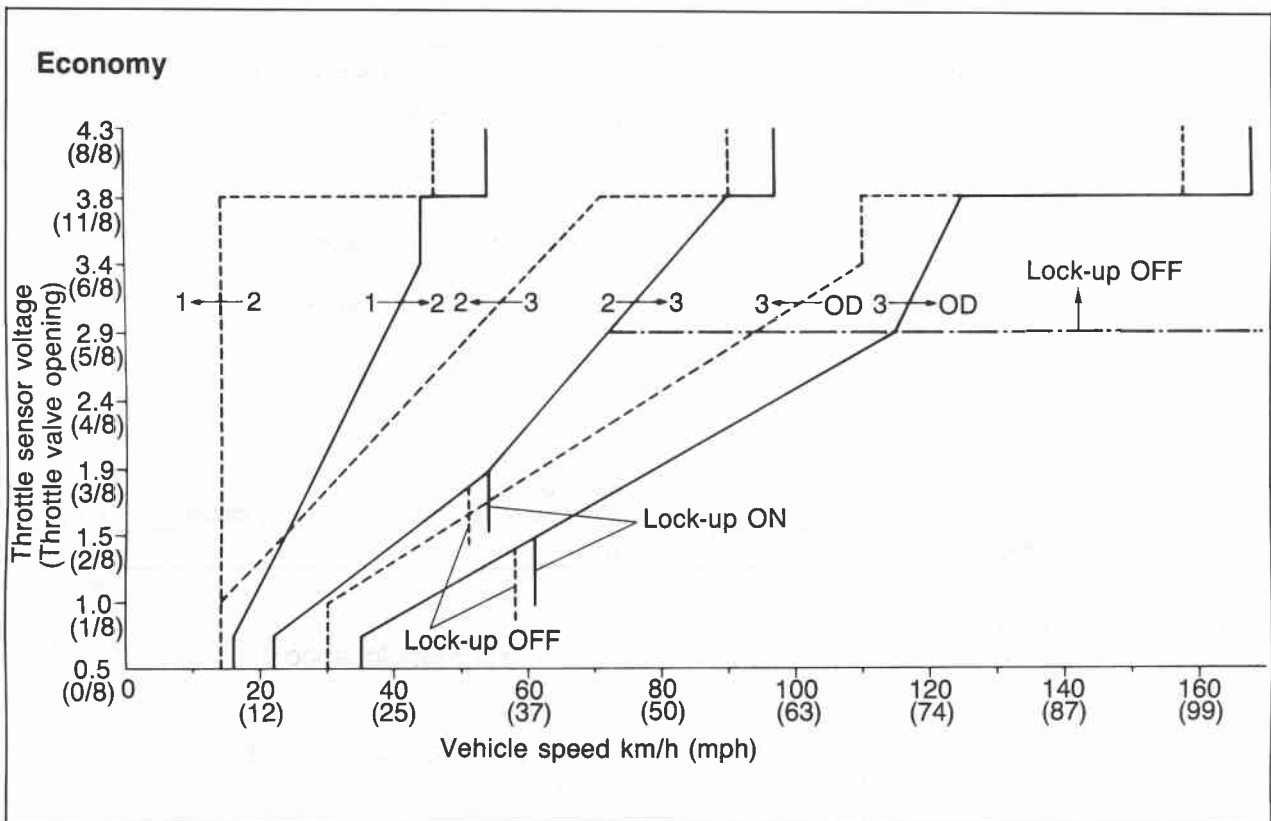
d) There is no overdrive when the cruise control is operating and there is a 3 km/h (1.9 mph) difference between the pre-set cruise speed and vehicle speed, or set or resume switch is ON.

e) There is no lock-up when the brake pedal is depressed.

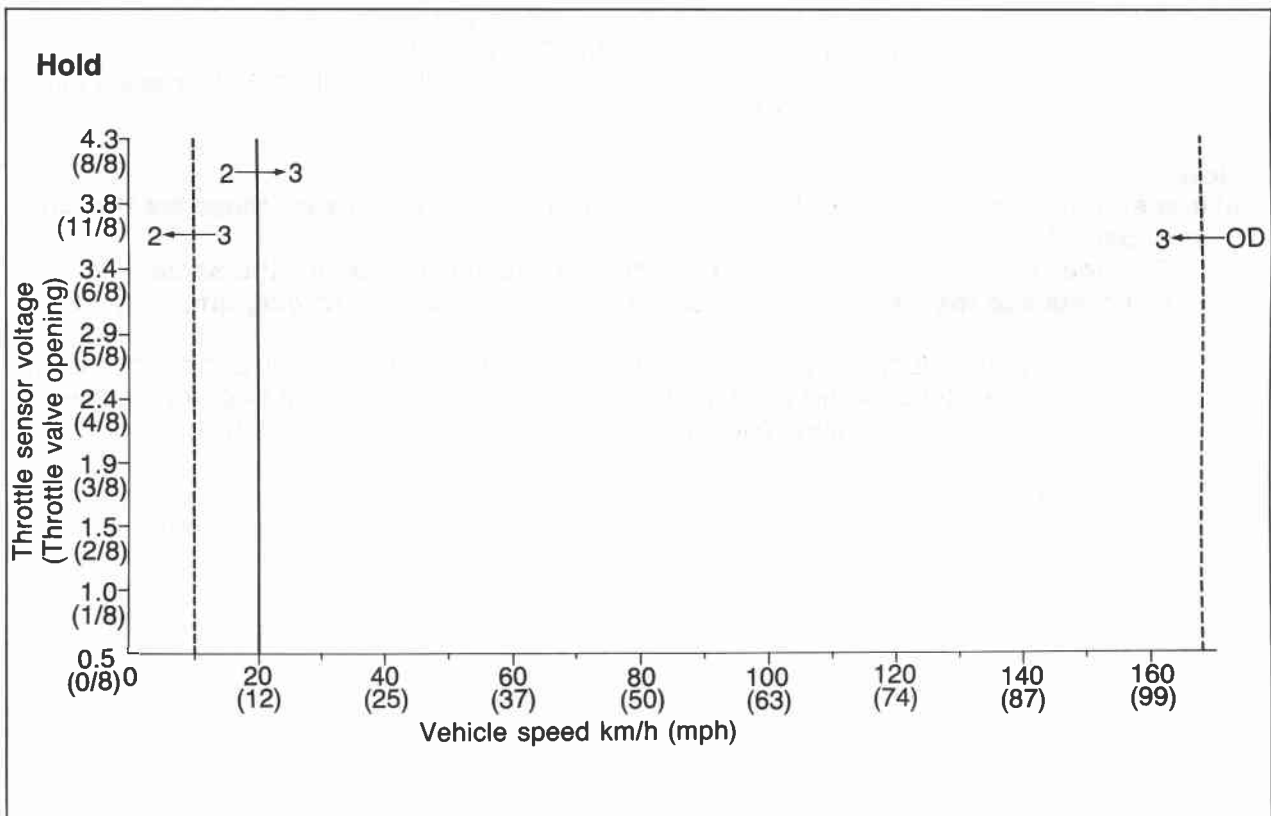
4. Check the up-shifts for shift shock or slippage in the same manner.
5. While driving in OD, shift the selector lever to S range and check that 4-3 downshift immediately occurs, then decelerate and check that engine braking effect is felt in only 3rd gear.



79G07C-093



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



7B TROUBLESHOOTING (G4A-EL)

Evaluation

Condition	Possible Cause
No 1-2 up- or down-shift	Stuck 1-2 shift solenoid valve Stuck 1-2 shift valve
No 2-3 up- or down-shift	Stuck 2-3 shift solenoid valve Stuck 2-3 shift valve
No 3-OD up- or down-shift	Stuck 3-4 shift solenoid valve Stuck 3-4 shift valve
No lock-up shift	Stuck lock-up control solenoid valve Stuck lock-up control valve
Incorrect shift point	Mis-adjusted throttle sensor Sticking shift valves
Excessive shift shock or slippage	Excessive shift shock Stuck accumulators Stuck or no one-way check orifice Worn clutches, brakes, or one-way clutch
No engine braking effect	Worn clutches or brakes

76G07B-035

Noise and vibration

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

Note

Abnormal noise and vibration can also be caused by the torque converter, drive shaft, or differential. Therefore, checking of cause must be made with extreme care.

Kick-down

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

S Range Test

Shift pattern

1. Shift the selector lever to S range and select the Economy mode.
2. Accelerate the vehicle and check that 1-2 and 2-3 up-shifts and down-shifts are obtained, and that no overdrive and no lock-up are obtained.

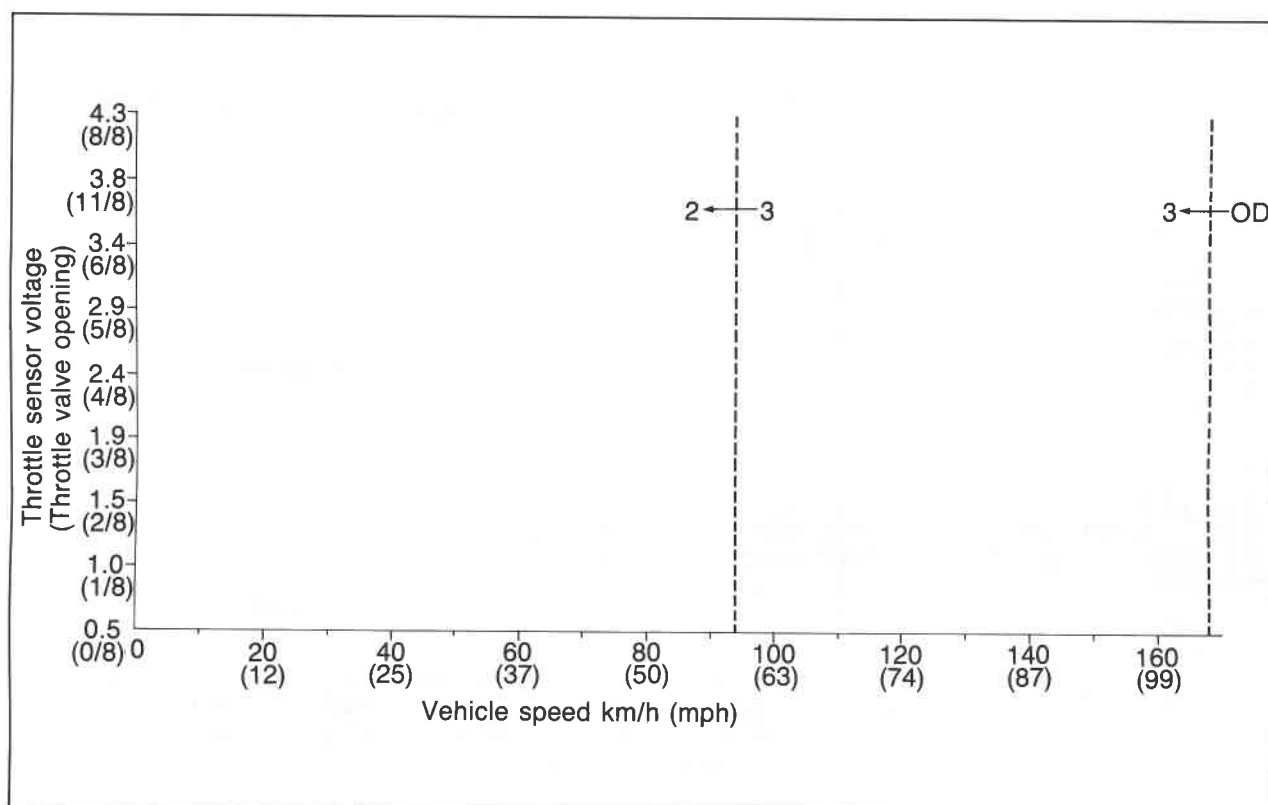
Note

a) Inspections of shift shock and shift point are not necessary because these are the same as those of the D Range Test.

b) In S range, the shift patterns for Economy and Power modes are the same.

c) Shift points are the same as those of the D range (Power) shift diagram.

3. While driving in S range (Economy mode) and 3rd gear, select the Hold mode and check that 3rd gear is held until the 3-2 down-shift 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.



76G07B-036

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, drive shaft or differential. Therefore, checking of cause must be made with extreme care.

L Range Test**Shift pattern**

1. Shift the selector lever to L range and select the mode.
2. Accelerate the vehicle and check that the 1-2 up- and down-shiftings are obtained and that no 3rd gear, no OD, and no lock-up are obtained.

Note

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

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

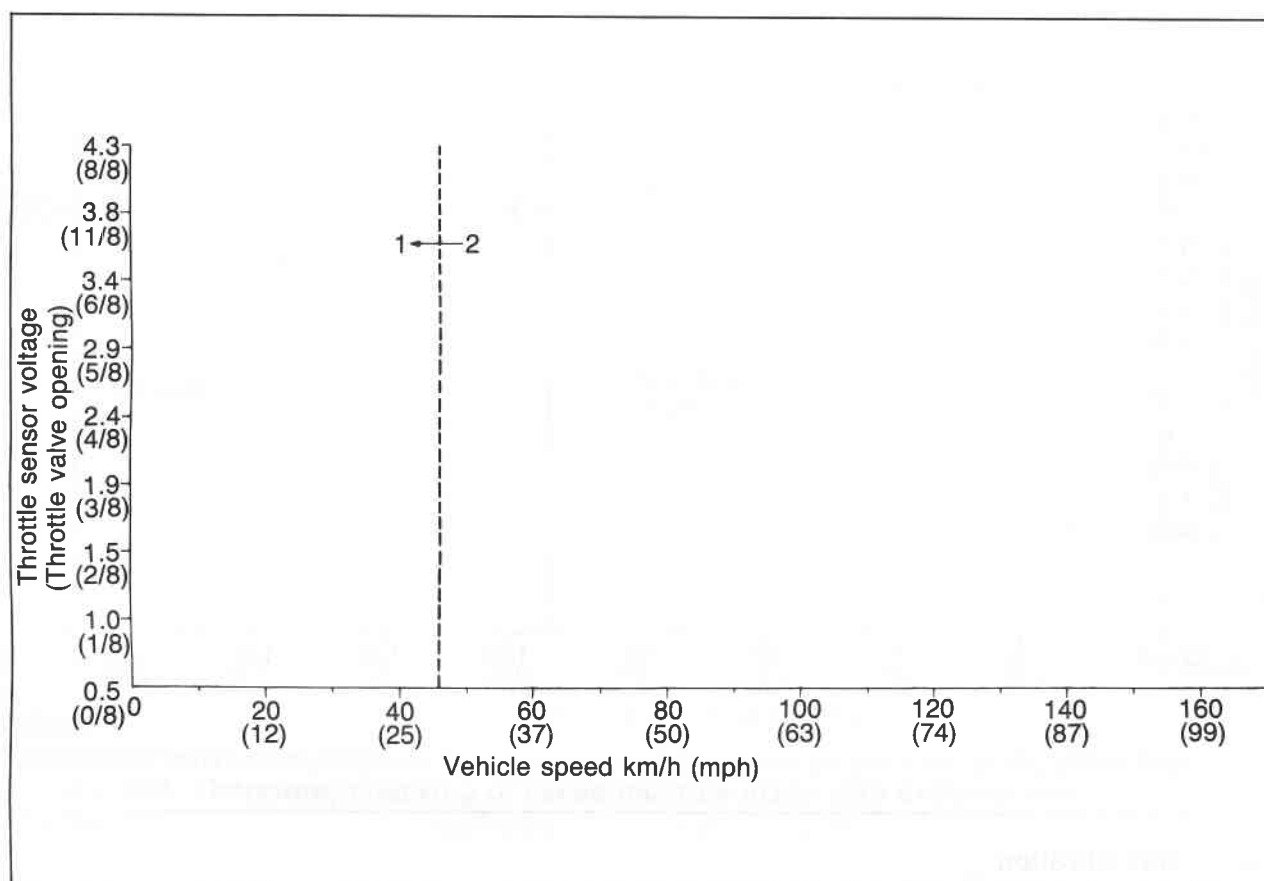
Note

a) In L range, the shift patterns for Economy and Power modes are the same.

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

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

7B TROUBLESHOOTING (G4A-EL)



86U07B-044

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, drive shaft or differential. Therefore, checking of cause must be made 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 stops.

Vehicle Speed at Gearshift Table

Mode Range		Throttle condition (Throttle sensor voltage)	Shifting	Drum speed rpm	Vehicle speed km/h (mph)
Power	D	Fully opened (4.3 volt)	D1 → D2	4930—5480	54—60 (33—37)
			D2 → D3	5120—5520	102—110 (63—68)
			D3 → OD	5380—5710	165—175 (102—109)
		Half throttle (1.6—2.2 volt)	D1 → D2	3470—4180	38—45 (24—28)
			D2 → D3	4020—4420	80—88 (50—55)
			D3 → OD	3820—4530	117—139 (73—86)
			Lock-up ON (OD)	2670—3170	117—139 (73—86)
			Lock-up OFF (OD)	2510—2970	110—130 (68—81)
			OD → D3	2150—2630	94—115 (58—71)
			D3 → D2	2020—2410	62—74 (38—46)
		Kick-down	OD → D3	3490—3720	153—163 (95—101)
			OD → D2	2050—2240	90—98 (56—61)
			OD → D1	980—1120	43—49 (27—30)
			D3 → D2	2940—3200	90—98 (56—61)
			D3 → D1	1400—1500	43—46 (27—29)
			D2 → D1	2160—2300	43—46 (27—29)
	Economy	Fully opened (4.3 volt)	D1 → D2	4470—5020	49—55 (30—34)
			D2 → D3	4770—5170	95—103 (59—64)
			D3 → OD	5380—5710	165—175 (102—109)
		Half throttle (1.6—2.2 volt)	D1 → D2	2830—3380	31—37 (19—23)
			D2 → D3	2960—3120	59—68 (37—42)
			D3 → OD	2870—3460	88—106 (55—66)
			Lock-up ON (OD)	2010—2420	88—106 (55—66)
			Lock-up OFF (OD)	1940—2310	85—101 (53—63)
			OD → D3	1600—1960	70—86 (43—53)
			D3 → D2	1240—1570	38—48 (24—30)
		Kick-down	OD → D3	3490—3720	153—163 (95—101)
			OD → D2	1960—2150	86—94 (53—58)
			OD → D1	980—1120	43—49 (27—30)
			D3 → D2	2800—3070	86—94 (53—58)
			D3 → D1	1400—1600	43—49 (27—30)
			D2 → D1	2160—2460	43—46 (27—30)
S		Fully opened (4.3 volt)	S1 → S2	4930—5480	54—60 (33—37)
			S2 → S3	5120—5520	102—110 (63—68)
			S4 → S3	3720—3950	163—173 (101—107)
			S3 → S2	2940—3200	90—98 (56—61)
			S2 → S1	2160—2310	43—46 (27—29)
		Half throttle (1.6—2.2 volt)	S1 → S2	3470—4180	38—45 (24—28)
			S2 → S3	4020—4420	80—88 (50—55)
			S4 → S3	3720—3950	163—173 (101—107)
			S3 → S2	2020—2410	62—74 (38—46)
			S2 → S1	2160—2310	43—46 (27—29)
L		Fully opened (4.3 volt)	L1 → L2	4930—5480	54—60 (33—37)
			L2 → L1	2160—2310	43—46 (27—29)
		Half throttle (1.6—2.2 volt)	L1 → L2	3470—4180	38—45 (24—28)
			L2 → L1	2160—2310	43—46 (27—29)
HOLD	D	—	D2 → D3	850—1160	17—23 (11—14)
			D3 → D2	230—420	7—13 (4—8)
			OD → D3	3720—3950	163—173 (101—107)
	S	Fully closed (0.5 volt)	S3 → S2	2940—3200	90—98 (56—61)
	L		L2 → L1	2160—2310	43—49 (27—30)

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7B TROUBLESHOOTING (G4A-EL)

Slippage Test

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

Preparation

1. Perform the preparation procedure shown in STEP 4 (STALL TEST).
2. Connect a tachometer to the engine and set it in the cabin.
3. Connect the **EC-AT Tester** and the **adaptor harness** 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 excessively as shown by the drum speed.

Driving condition			Speed	Drum speed (rpm)			
No.	Gears	Other condition		1,000	2,000	3,000	4,000
1	1st	L range, Hold mode	Vehicle speed km/h (mph)	11 (7)	22 (14)	33 (20)	44 (27)
2	1st	D range, Economy mode		11 (7)	22 (14)	33 (20)	44 (27)
3	2nd	S range, Hold mode		20 (12)	40 (25)	60 (37)	80 (50)
4	3rd	D range, Hold mode		31 (19)	61 (38)	92 (57)	123 (76)
5	OD	D range, Economy mode		44 (27)	88 (55)	131 (81)	173 (107)
6	OD	D range, Economy mode, Lock-up	Engine speed (rpm)	1,000	2,000	3,000	4,000

76G07B-038

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.

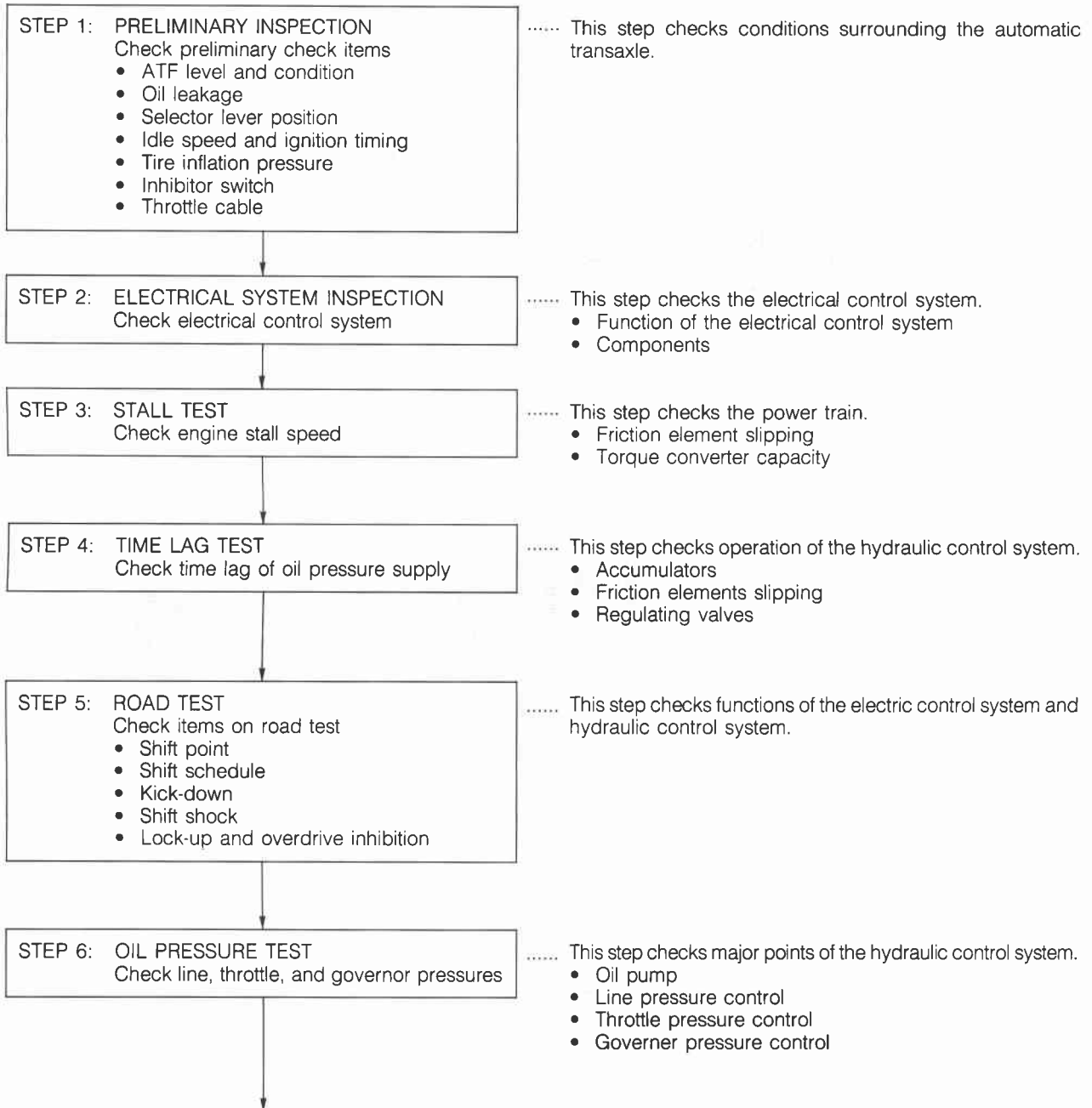
Driving conditions below specification	Possible Cause
No.1 condition only	Low and reverse brake
No.2 condition only	One-way clutch
No.3 condition only	2-4 brake band
No.4 condition only	Coasting clutch
No.5 condition only	3-4 clutch
No.1-No.5 conditions	Forward clutch
No.6 condition only	Lock-up piston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

76G07B-039

TROUBLESHOOTING (G4A-HL)**GENERAL NOTE**

In the event of a problem with the automatic transaxle, the cause may be in the engine, power train, hydraulic control system, or electrical control system.

When troubleshooting, therefore, it is recommended to begin from those points that can be judged quickly and easily. The recommended troubleshooting sequence is described below.



By following the above 6 steps, the cause of the problem should be located.

As another guide to faster location of the causes of problems, the Quick Diagnosis Chart is included at pages 7B—42, 43.

In this chart, a circle is used to indicate the components that might be the cause of trouble for 20 types of problems. It is only necessary to check those components indicated by circles, at each step of the troubleshooting process, in order to quickly locate the cause of the problem.

7B TROUBLESHOOTING (G4A-HL)

Quick Diagnosis Chart

The Quick Diagnosis Chart shows various problems and the relationship of various components that might be the cause of the problem.

The following is an explanation of the symbols used in this chart.

1. Components indicated in the "Adjustment" column indicate that there is a possibility that the problem may be the result of an incorrect adjustment.
Check the adjustment of each component, and readjust if necessary.
2. The components indicated in the "Electrical System Inspection" column can be checked for malfunction by the results of the checking procedure.
3. Components indicated in the "Stall Test" column can be checked for malfunction by the results of the stall test.
4. Components indicated in the "Time Lag Test" column can be checked for malfunction by the results of the time lag test.
5. Components indicated in the "Road Test" column can be checked for malfunction by the results of the road test.
6. Components indicated in the "Oil Pressure Test" column can be checked for malfunction by the results of the oil pressure test.
7. The checking, adjusting, repair or replacement procedures for each component is described in the page(s) noted in the "Reference Page" column.

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Item	Inspection point	Electrical control system				Preliminary		Hydraulic control system		Power train																	
		Inhibitor switch	OD OFF switch	Water temperature switch	Kick-down switch	OD release solenoid valve	ATF level and condition	Selector lever	Throttle cable	Idle speed and ignition timing	Control valves	Accumulators	Oil pump	Governor valve	Hydraulic circuit	Torque converter	Forward clutch	Coasting clutch	Reverse clutch	3-4 clutch	2-4 brake and servo	Low and reverse brake	One-way clutch 1	One-way clutch 2	Parking gear	Planetary gear	Differential assembly
Adjustment		○					○	○	○	○																	
Electrical System Inspection			○		○	○																					
Stall Test											○		○			○			○		○				○		
Time Lag Test											○	○			○		○		○			○	○	○			
Oil Pressure Test								○			○	○	○	○	○		○	○	○		○	○					
Road Test					○					○			○	○													

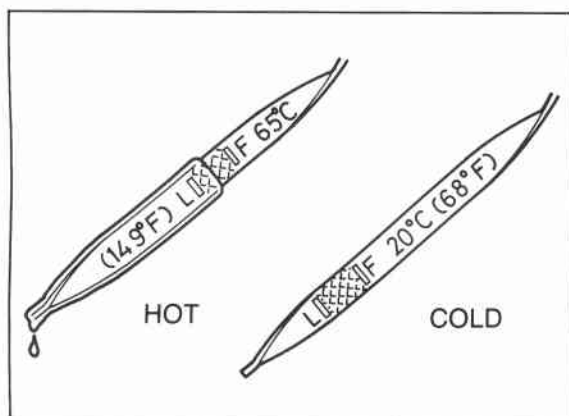
Inspection point and reference page		ON VEHICLE										OFF VEHICLE															
		Electrical control system					Preliminary	Hydraulic control system				Power train															
		Inhibitor switch	OD OFF switch	Water temperature switch	Kick-down switch	OD release solenoid valve	ATF level and condition	Selector lever	Throttle cable	Idle speed and ignition timing	Control valves	Accumulators	Oil pump	Governor valve	Hydraulic circuit	Torque converter	Forward clutch	Coasting clutch	Reverse clutch	3-4 clutch	2-4 brake and servo	Low and reverse brake	One-way clutch 1	One-way clutch 2	Parking gear	Planetary gear	Differential assembly
Condition		7B-65	7B-64	7B-66	7B-67	7B-68	7B-71	7B-72	7B-73	SECTION 4A	7B-77, 155	7B-132, 155	7B-108	7B-82, 133	7B-249	7B-107	7B-108	7B-108	7B-108	7B-128	7B-134	7B-134	7B-122	7B-126	7B-135	7B-126	7B-177
Accelerating	Vehicle does not move in D, 2, 1, or R range						○	○				○		○		○	○	○		○		○	○	○	○		
	Vehicle moves in N range							○				○			○												
	Excessive creep								○	○	○					○											
	No creep at all						○	○	○	○	○		○		○	○	○	○		○		○	○	○			
Shifting	No shift						○				○		○	○	○							○	○	○			
	Abnormal shift sequence		○	○		○	○	○	○		○			○	○		○	○		○	○		○	○			
	Frequent shifting		○	○	○	○					○			○													
	Excessive high or low shift point				○	○	○	○	○		○		○	○	○	○											
	No lock-up		○	○	○	○		○			○			○	○	○											
	No kick-down				○			○			○			○	○												
Slipping	Engine run away or slip when starting vehicle						○		○		○		○		○		○		○			○	○	○			
	Engine run away or slip when up- or down-shifting						○		○		○		○		○		○	○		○	○		○	○			
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	Transaxle noisy in N or P range						○				○		○	○		○											
	Transaxle noisy in D, 2, 1, or R range						○				○		○	○		○									○	○	
Others	No engine braking						○			○	○				○	○		○			○	○					
	Transaxle overheats						○				○		○		○	○											
	Engine will not start	○						○																			

7B TROUBLESHOOTING (G4A-HL)

STEP 1 (PRELIMINARY INSPECTION)

In this step, the fundamental points related to the automatic transaxle are checked. These points must be kept in the correct condition at all times in order to assure proper operation of the automatic transaxle.

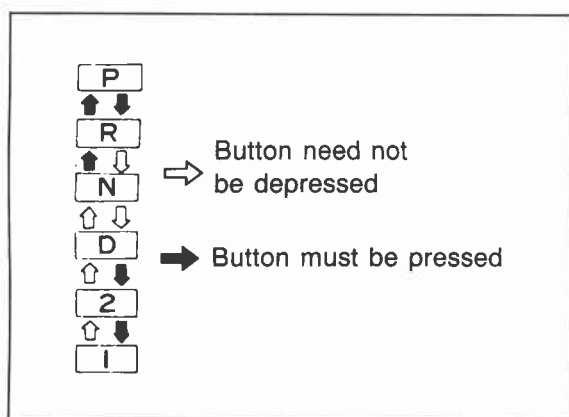
83U07B-025



76G07B-043

1. Automatic Transaxle Fluid (ATF)

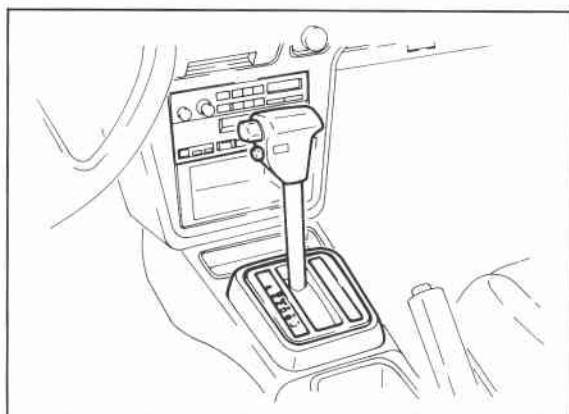
Check ATF level and condition. (Refer to page 7B—71)



76G07B-044

2. Selector Lever

Check selector lever position and adjust if necessary. (Refer to page 7B—72)



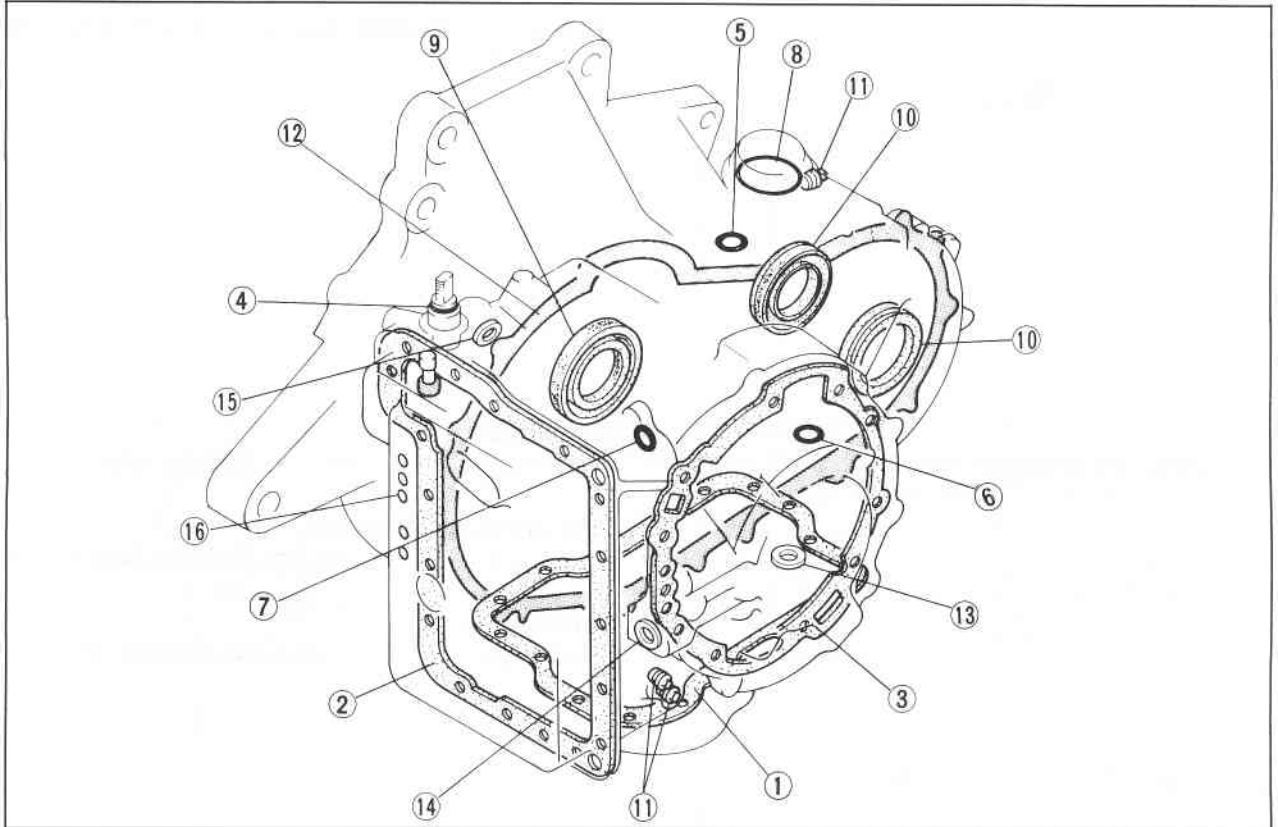
76G07B-215

3. Oil Leakage

Check for oil leakage.

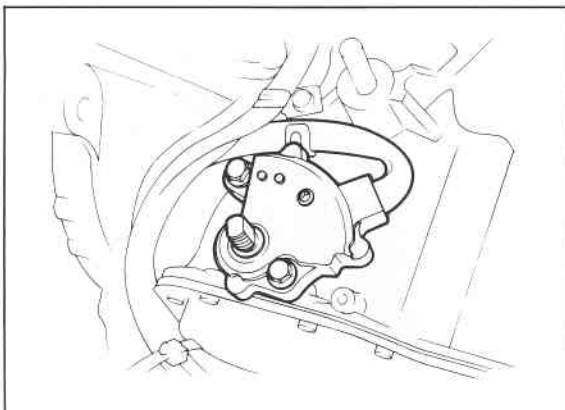
- (1) Warm up the ATF.
- (2) Apply the parking brake and block the wheels to prevent the vehicle from rolling.
- (3) Shift the selector lever to R range.
- (4) Check if oil leaks from the following oil seals or gaskets.
- (5) If oil leaks, replace the oil seal or gasket.

The following figure shows the locations where fluid leakage may possibly occur.



83U07B-028

- | | |
|-----------------------------|----------------------------|
| 1. Oil pan | 10. Driveshaft |
| 2. Control valve body cover | 11. Square head plug |
| 3. Oil pump | 12. Transaxle case |
| 4. Inhibitor switch | 13. Drain plug |
| 5. Speedometer driven gear | 14. Oil cooler return pipe |
| 6. Oil filler tube | 15. Oil cooler outlet pipe |
| 7. Throttle cable | 16. Blind plugs |
| 8. Governor cover | |
| 9. Bearing cover | |

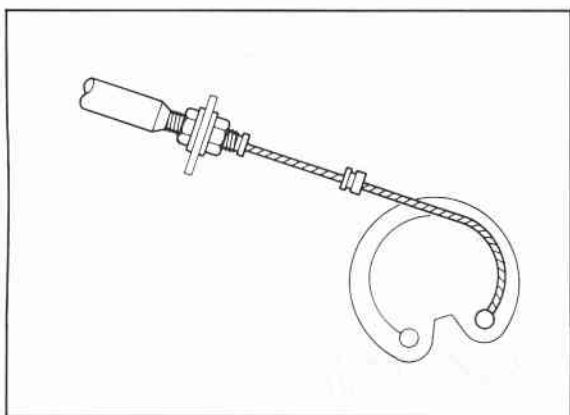


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4. Inhibitor Switch

Check the inhibitor switch for operation. (Refer to page 7B—65)

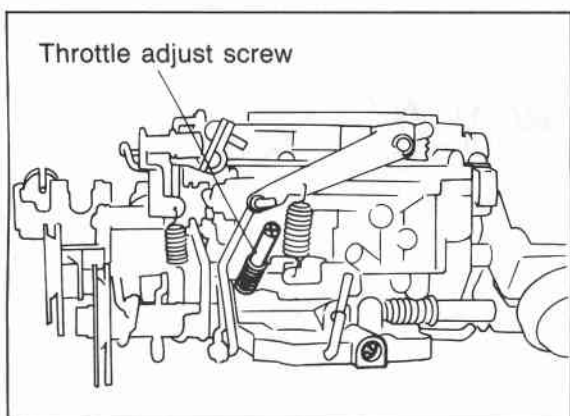
7B TROUBLESHOOTING (G4A-HL)



76G07B-046

5. Throttle Cable

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



76G07B-047

6. Idle Speed

Check idle speed. (Refer to Section 4A)

7. Tire Inflation Pressure

Check tire inflation pressure. (Refer to Section 12)

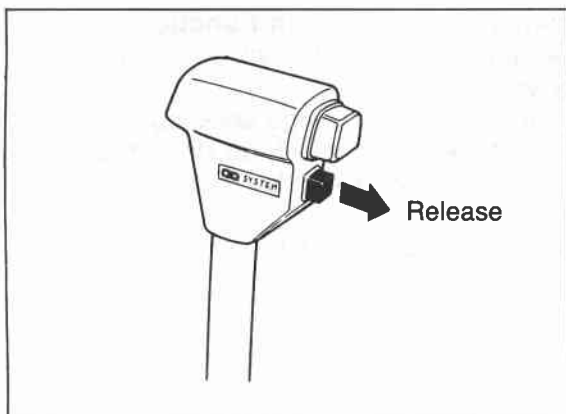
8. Ignition Timing

Check ignition timing. (Refer to Section 5)

STEP 2 (ELECTRICAL SYSTEM INSPECTION)

In this step, the function of the electrical control system (Inhibition of OD and lock-up) is checked. The electrical control system components should be checked to determine if it functions correctly.

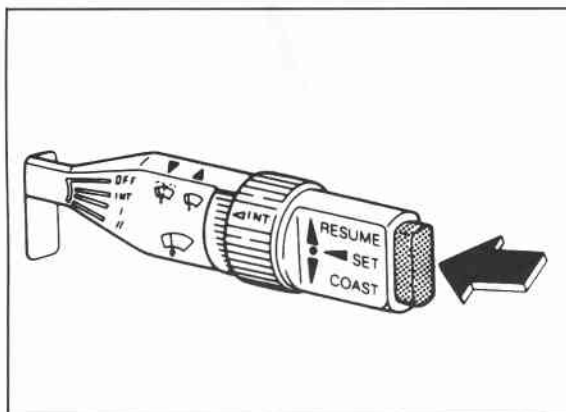
76G07B-048



76G07B-049

O/D OFF Switch Inhibition Function

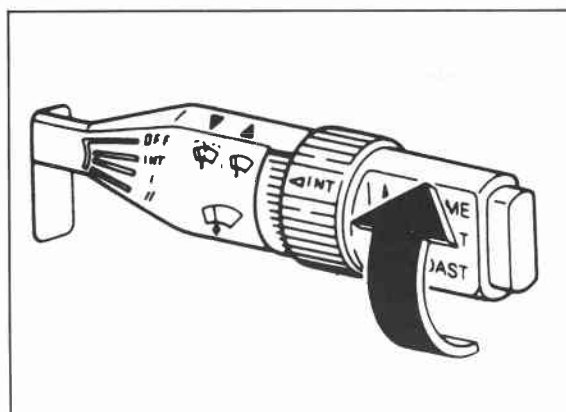
1. Warm up the engine and ATF.
2. Check that the D range, OD, and lock-up is provided.
3. When driving the vehicle with D range, OD, and lock-up selected, depress the O/D OFF switch and check that OD and lock-up is cancelled.
4. If not cancelled, check the O/D OFF switch.
5. Release the O/D OFF switch after completion.



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Cruise Control Switch Inhibition Function

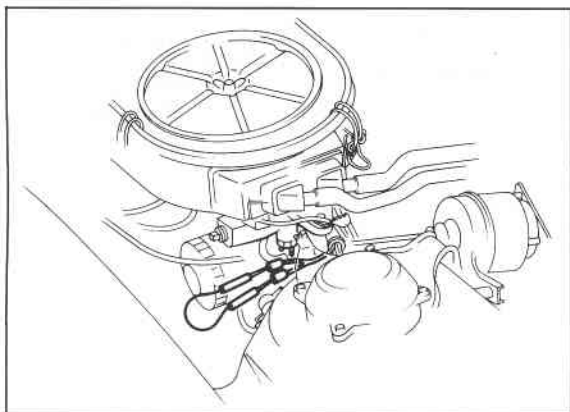
1. Drive the vehicle in D range, OD, and lock-up selected again.
2. Depress the Set switch of the cruise control and check that OD and lock-up is cancelled.
3. If not cancelled, check the cruise control system.



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4. Again drive the vehicle in D range, OD, and lock-up.
5. Turn the Resume switch of the cruise control and check that OD and lock-up is cancelled.
6. If not cancelled, check the cruise control system.

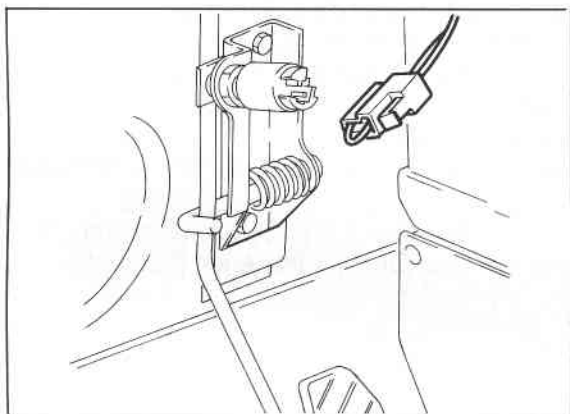
7B TROUBLESHOOTING (G4A-HL)



76G07B-052

Water Temperature Switch Inhibition Function

1. Stop the vehicle.
2. Disconnect the water temperature switch connector.
3. Drive the vehicle in D range selected.
4. Check that OD and lock-up does not operate.
5. If not cancelled, check the wiring harness of the water temperature switch.
6. Stop the vehicle and reconnect the water temperature switch connector.



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Kick-down Switch Inhibition Function

1. Connect the terminals of the kick-down switch connector with a jumper wire.
2. Drive the vehicle in D range selected.
3. Check that the OD and lock-up do not achieve.
4. If not correct, check wiring harness of kick-down switch.
5. Stop the vehicle and reconnect the connector to the switch.

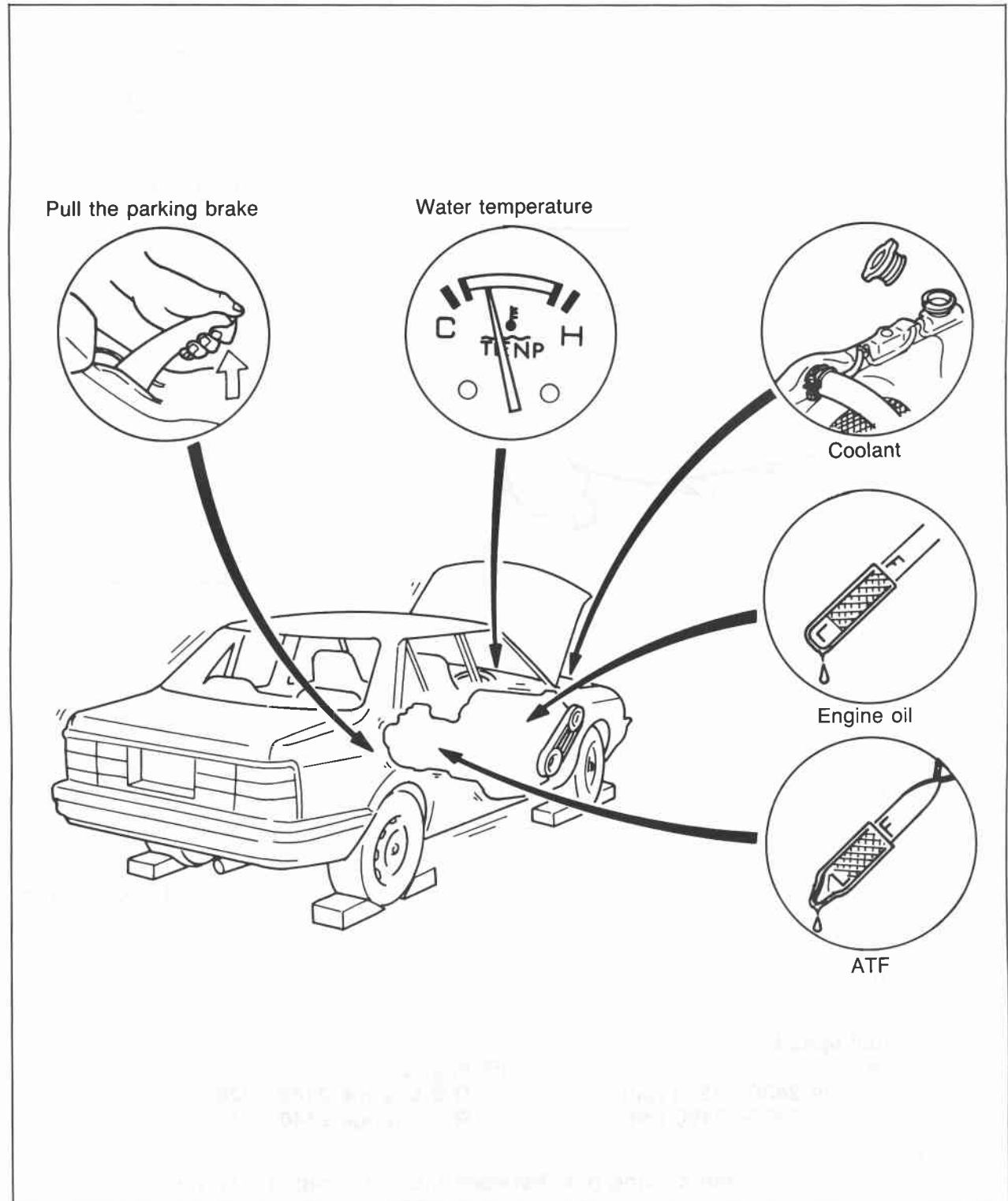
STEP 3 (STALL TEST)

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

Preparation

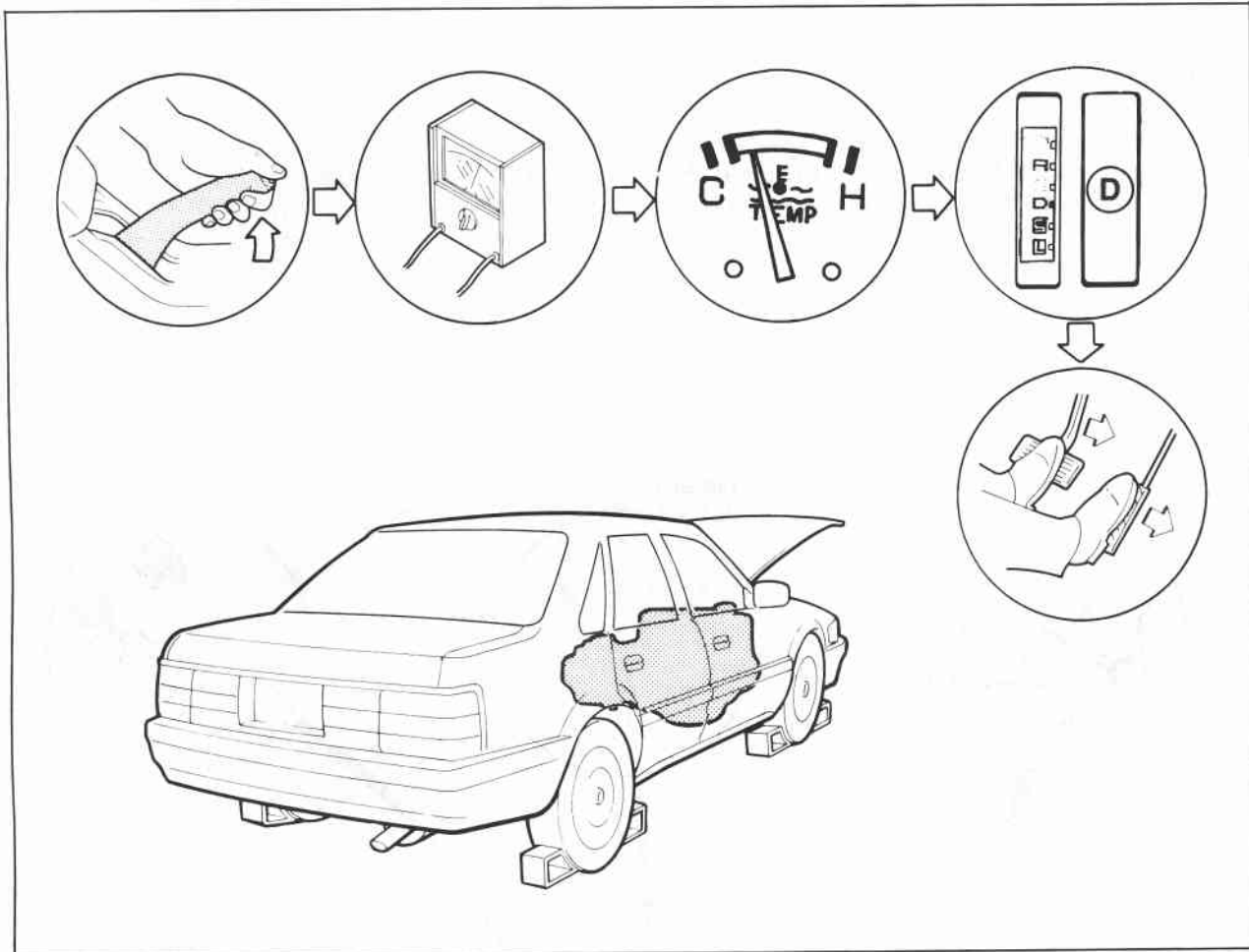
Check the following items prior to testing:

1. Engine coolant, engine oil and ATF levels.
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 wheels.



7B TROUBLESHOOTING (G4A-HL)

Procedure



76G07B-054

1. Connect a tachometer to the engine.
2. Shift the selector lever to D range.
3. Depress the brake pedal firmly with the left foot and gradually depress the accelerator pedal with the right foot.
4. Read and note the engine speed as soon as it becomes constant, then release the accelerator pedal.

Caution

Steps 3 to 4 must be performed within 5 seconds.

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

Note

This one minute idle period is performed to cool the ATF and prevent oil degradation.

6. Perform stall tests for the following ranges in the same manner.
 - (1) 2 range
 - (2) 1 range
 - (3) R range

Standard stall speed:

FE engine

D.S.L range 2430—2530 rpm
R range 2390—2490 rpm

F8 engine

D.S.L range 2180—2280 rpm
R range 2140—2240 rpm

Caution

Always provide adequate cooling time between individual range stall tests.

Evaluation

Condition		Possible cause	
Above specification	In all ranges	Insufficient line pressure	Worn oil pump
			Oil leakage from oil pump, control valve, and/or transaxle case
			Stuck pressure regulator valve
	In D 2, and 1	One-way clutch 1 slipping	
	In D range only	One-way clutch 2 slipping	
	In 2 range only	2-4 brake slipping	
	In R range only	Low and reverse brake slipping	
		Reverse clutch slipping	
Perform a road test, to determine if this is caused by the low and reverse brake or the reverse clutch, as follows: a) Effective engine braking in 1 range.....Front clutch b) No engine braking in 1 range.....Low and reverse brake			
Within specification		All shift control elements within transaxle are functioning normally.	
Below specification	Engine out of tune		
	One-way clutch slipping within torque converter		

76G07B-055

7B TROUBLESHOOTING (G4A-HL)

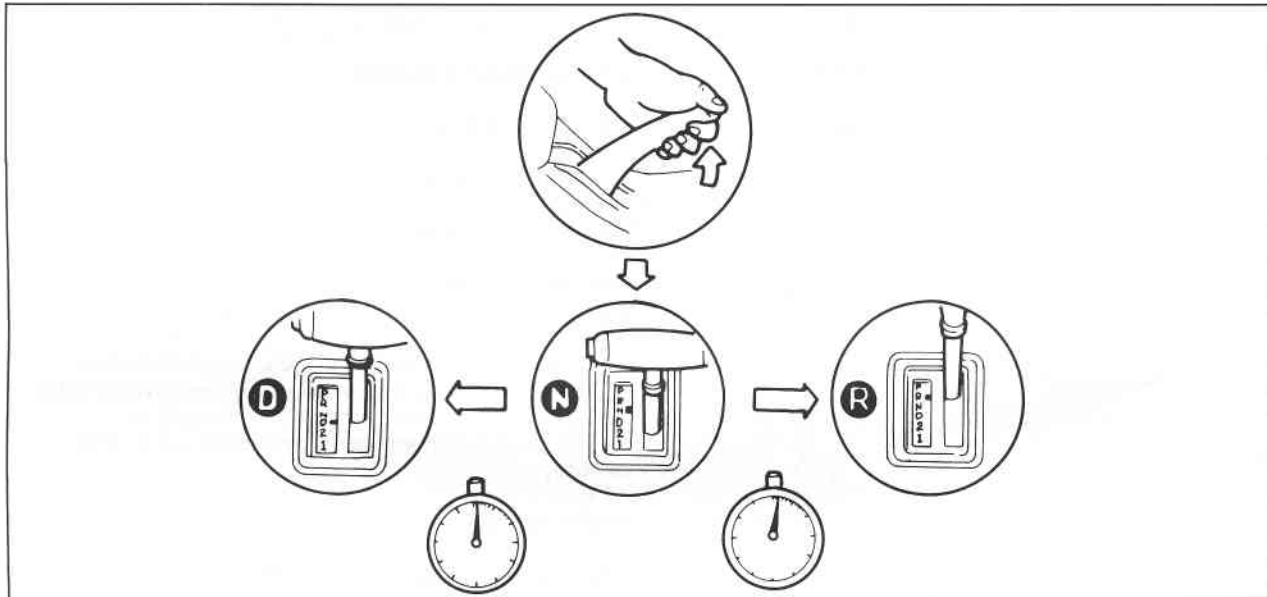
STEP 4 (TIME LAG TEST)

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 the condition of the N-D and N-R accumulators, forward, reverse and one-way clutches, and low and reverse brake.

Preparation

Perform the preparation procedure shown in the STEP 3 (STALL TEST).

Procedure



1. Start the engine and check that the idle speed is $900 \pm 5\%$ rpm.
2. Shift from N range to D range
3. Measure the time it takes from shifting until shock is felt using a stop watch.
4. Shift the selector to N range and run the engine at idle speed for at least one minute.
5. Perform the test for the shift from N range to R range in the same manner.

Note

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

Specified time lag: N → D range 0.4—1.2 second
N → R range 0.4—1.5 second

Evaluation

Condition		Possible Cause
N → D shift	More than specification	Insufficient line pressure
		Forward clutch slipping
		One-way clutch 1 slipping
		One-way clutch 2 slipping
	Less than specification	N-D accumulator not operating properly
N → R shift	More than specification	Excessive line pressure
		Insufficient line pressure
		Low & reverse brake slipping
		Reverse clutch slipping
	Less than specification	N-R accumulator not operating properly
		Excessive line pressure

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STEP 5 (ROAD TEST)

This step is performed to inspect for problems at the various ranges. If these tests show any problems, adjust or replace by referring to the mechanical sections.

Caution

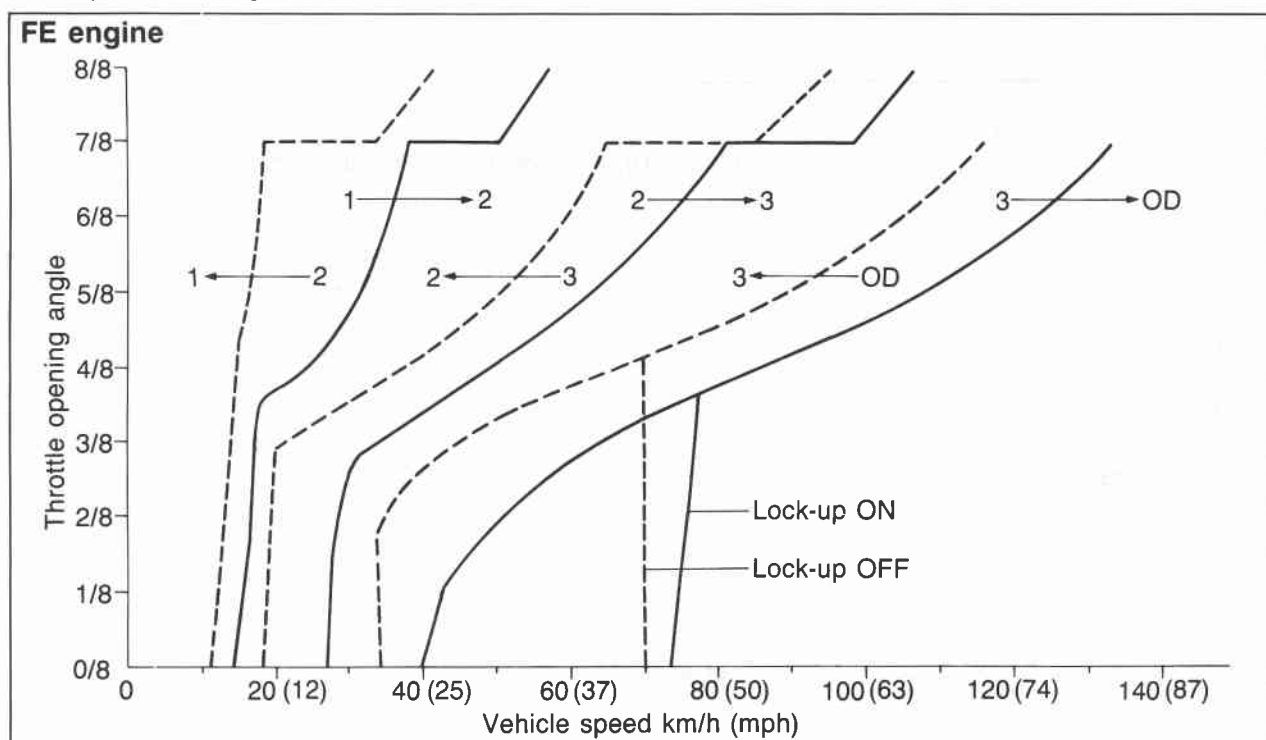
Perform the test at normal ATF operating temperature (50—80°C, 122—176°F).

D Range Test**Shift point, shift pattern, and shift shock**

1. Shift the selector lever to D range and depress the OD OFF switch.
2. Accelerate the vehicle with half (4/8) and full (8/8) throttle valve opening.
3. Check that 1-2, 2-3 and 3-OD up-shifts and downshifts and lock-up are obtained. The shift points must be as shown in the D range shift diagram.

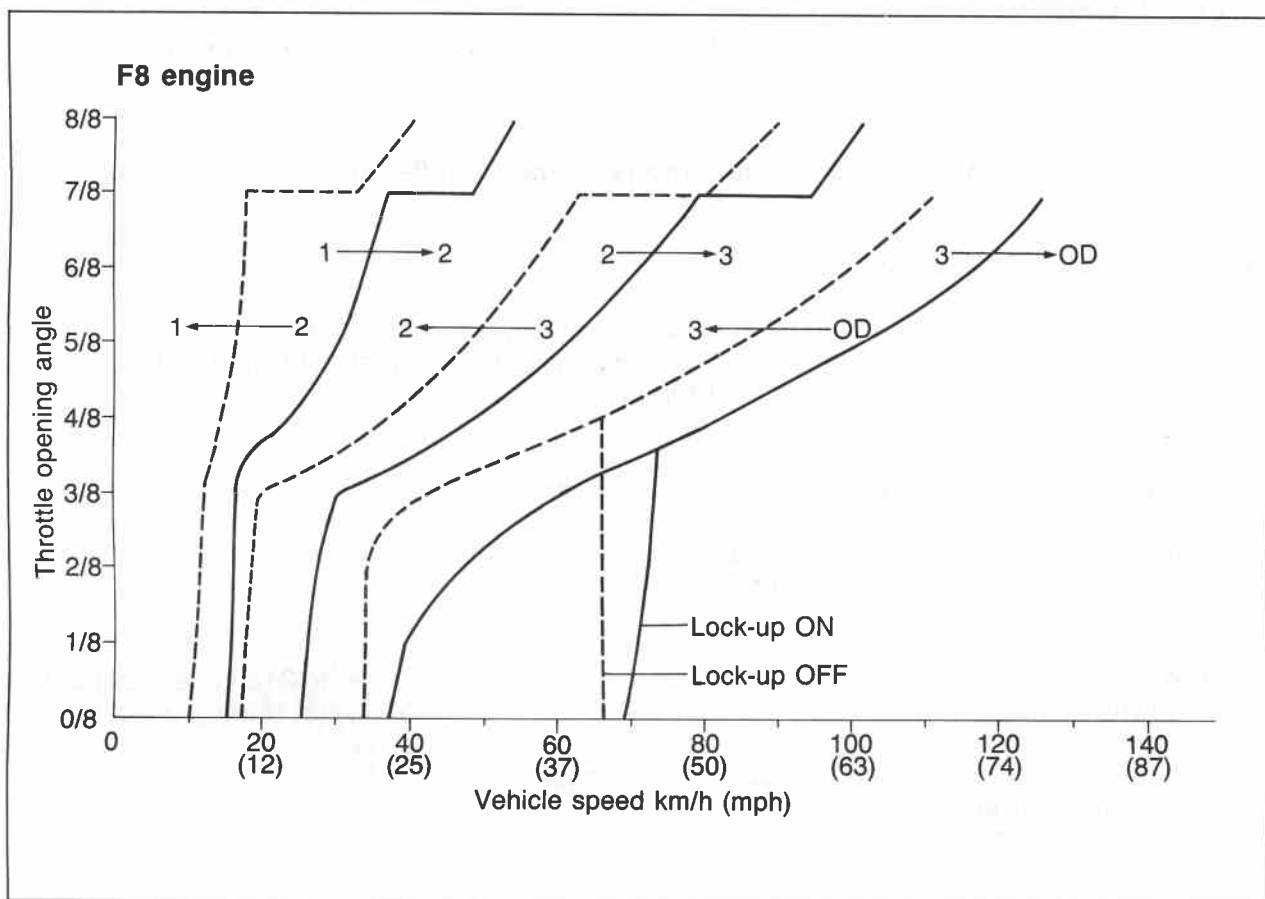
Note

- a) Vehicle speed on a chassis roller may not meet the specified shift diagram because of tire size.
 - b) There is no lock-up or OD when the coolant temperature is below 72°C (162°F), and when the OD OFF switch is depressed.
4. Check the up and down shifts for shift shock or slippage.
 5. While driving in 3rd (50—60 km/h, 31—37 mph) shift the selector lever to 2 range and check that 3-2 downshift immediately occurs, then decelerate and check that engine braking effect is felt in 2nd gear.

D range shift diagram

76G07B-057

7B TROUBLESHOOTING (G4A-HL)



76G07B-058

Noise and vibration

Drive the vehicle in OD (lock-up), OD (no lock-up), 3rd and check for abnormal noise or vibration.

Note

Abnormal noise and vibration can also be caused by the torque converter, drive shaft, or differential. Therefore, checking of cause must be made with extreme care.

Kick-down

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

2 Range Test

Shift pattern

1. Shift the selector lever to 2 range.
2. Accelerate the vehicle in 2 range and check that 2nd gear is held.

Noise and vibration

Drive the vehicle in 2nd gear and check for abnormal noise or vibration.

Note

Abnormal noise and vibration can also be caused by the torque converter, drive shaft or differential. Therefore, checking of cause must be made with extreme care.

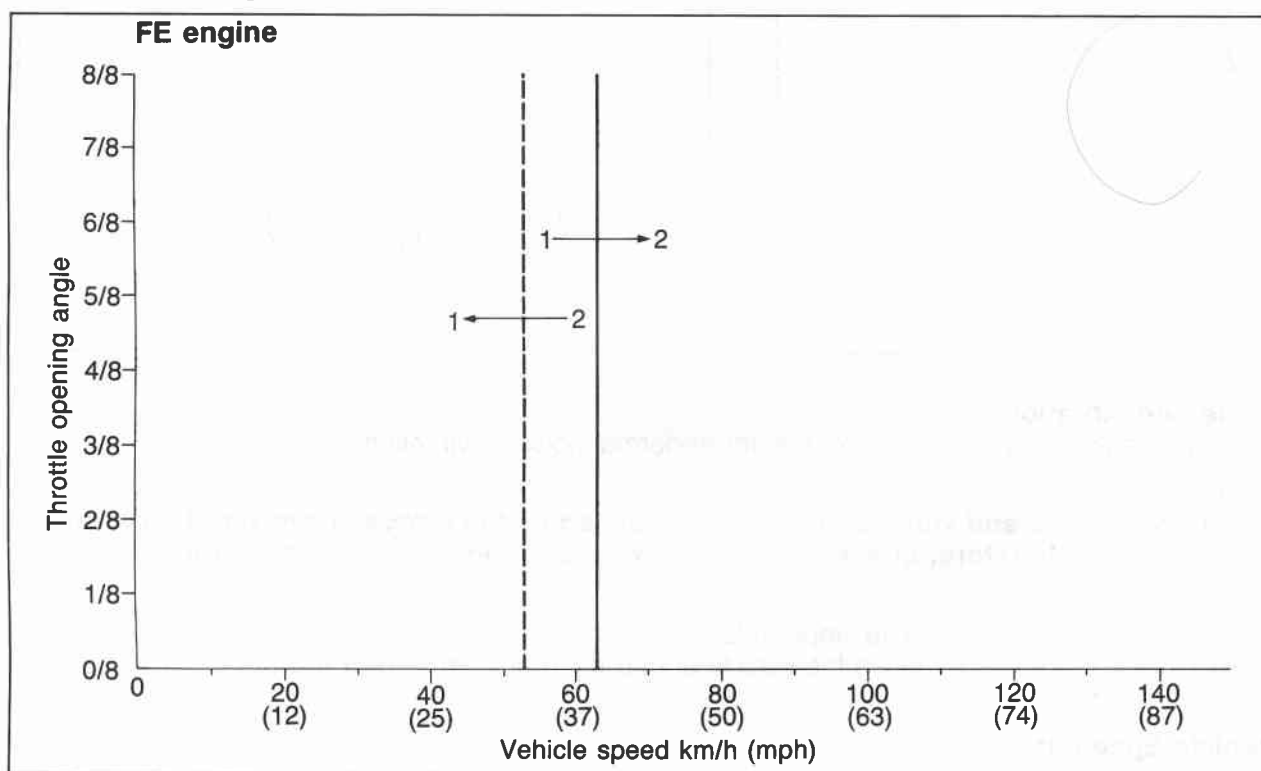
1 Range Test**Shift pattern**

1. Shift the selector lever to 1 range.
2. Accelerate the vehicle with half (4/8) and full (8/8) throttle valve opening.
3. Check that the 1-2 up- and down-shifts are obtained and that no 3rd gear, no OD, and no lock-up are obtained. The shift points must be as shown in the 1 range shift diagram.

Note

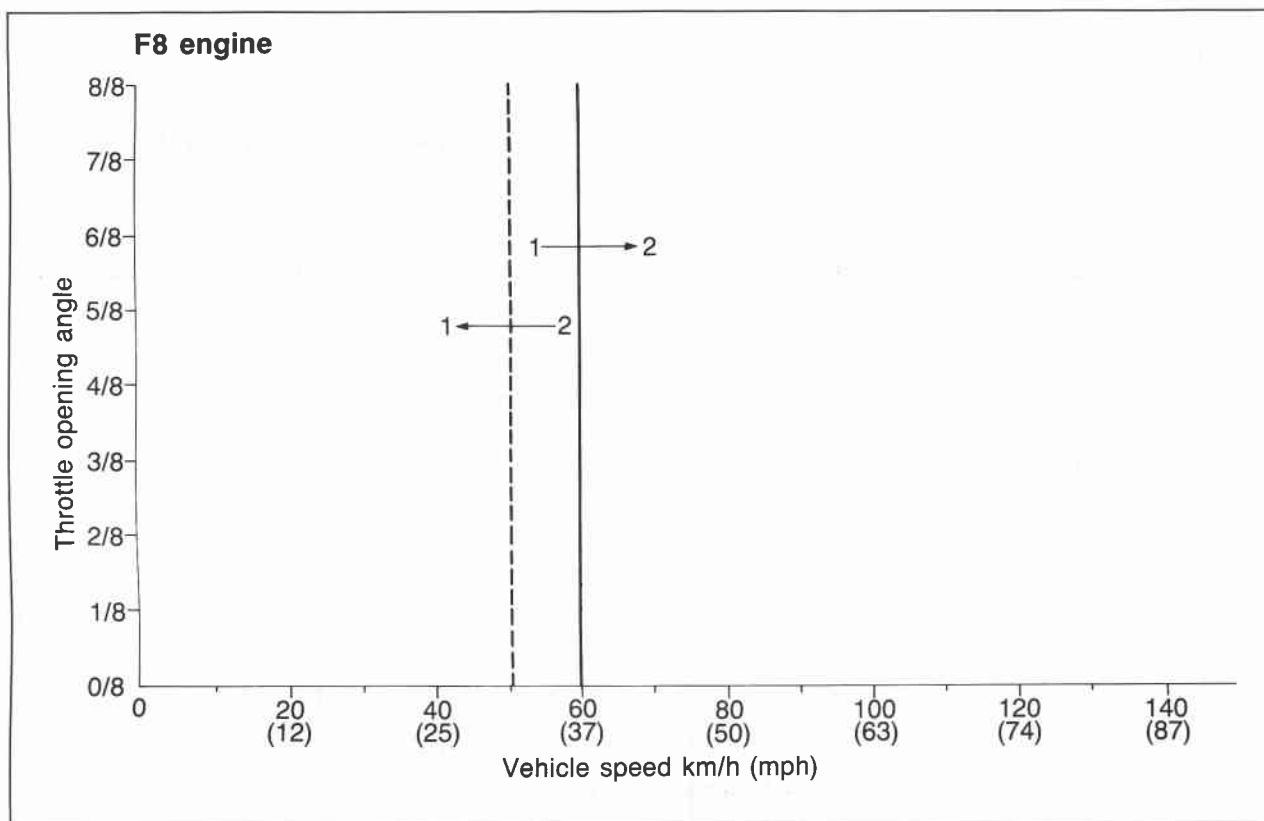
Vehicle speed on a chassis roller may not meet the specified shift diagram because of tire size.

4. Check the up and down-shifts for shift shock or slippage.
5. Drive in 1st gear then decelerate and check that engine braking effect is felt.

1 range shift diagram

76G07B-059

7B TROUBLESHOOTING (G4A-HL)



76G07B-060

Noise and vibration

Drive the vehicle in 1st gear and check for abnormal noise or vibration.

Note

Abnormal noise and vibration can also be caused by the torque converter, drive shaft or differential. Therefore, checking of cause must be made with extreme care.

P Range Test

- Shift into P range on a gentle slope, release the brake and check that the vehicle does not roll.
- 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 stops.

Vehicle Speed at Gearshift Table

Range	Throttle condition	Shifting	Vehicle speed km/h (mph)	
			FE engine	F8 engine
D	Fully opened	1st → 2nd	50—65 (31—40)	47—62 (29—38)
		2nd → 3rd	100—115 (62—71)	94—109 (58—68)
	Half throttle (1/2)	1st → 2nd	17—32 (11—20)	16—31 (10—19)
		2nd → 3rd	42—57 (26—35)	
		3rd → OD	79—94 (49—58)	74—89 (46—55)
		Lock-up	74—89 (46—55)	
	Kick-down	OD → 3rd	More than 88 (55)	More than 82 (51)
		OD → 2nd	34—103 (21—64)	33—97 (20—60)
		OD → 1st	27—49 (17—30)	26—48 (16—30)
		3rd → 2nd	34—103 (21—64)	33—97 (20—60)
		3rd → 1st	11—49 (7—30)	10—48 (6—30)
		2nd → 1st	4—49 (2—30)	3—48 (2—30)
1	Fully opened	1st → 2nd	56—71 (35—44)	52—67 (32—42)
	Half throttle (1/2)	1st → 2nd	56—71 (35—44)	52—67 (32—42)
	Kick-down	2nd → 1st	46—61 (29—38)	43—58 (27—36)
D	Fully opened	3rd lock-up	106—121 (66—75)	100—115 (62—71)

Evaluation

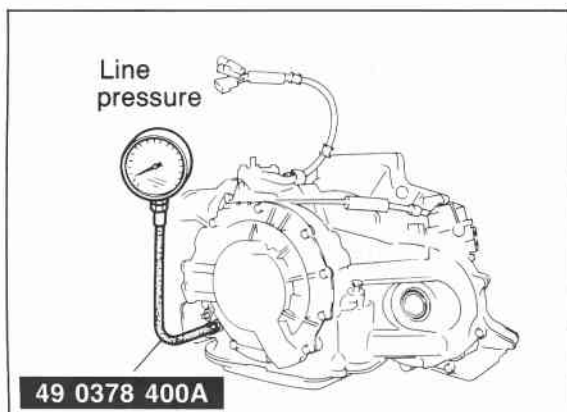
Condition		Possible Cause
No 1-2 shift		Insufficient governor pressure
		Stuck 1 range control valve
		Stuck 1-2 shift control valve
		Stuck 1-2 shift valve
		No check ball (rubber ball)
No 2-3 shift		Insufficient governor pressure
		Stuck 2 range control valve
		Stuck servo control valve
		Stuck 2-3 shift valve
		No check ball (rubber ball)
No 3-OD shift		Insufficient governor pressure
		Excessive throttle pressure
		Stuck OD release valve
		Stuck needle valve of the OD release solenoid valve
		Stuck 3-4 shift valve
		No check ball (rubber ball)
No. Lock-up (Electric circuit is OK)		Insufficient governor pressure
		Stuck OD release valve
		Stuck needle valve of the OD release solenoid valve
		Stuck OD lock-up valve
		Stuck lock-up control valve
Shift occurred in 2 range		Stuck 1-2 control valve
		Stuck 2 range control valve
No kick-down		Stuck throttle valve
		Stuck kick-down valve
Incorrect shift point	In D and 1 range	Excessive or insufficient governor pressure
		Excessive or insufficient throttle pressure
		Excessive or insufficient line pressure
	In 1 range	Stuck 1 range control valve
No engine braking effect		Stuck coasting bypass valve
		Fluid leakage from 2-3 accumulator seal rings
		No check ball (rubber ball)
Shift shock or slippage	In 1-2 and/or 3-OD shift	Fluid leakage from 1-2 accumulator seal rings
		No check ball (rubber ball) or leakage
		No one-way check orifice or leakage
	In 2-3 shift	Fluid leakage from 2-3 accumulator seal ring
		Stuck bypass valve
		Stuck 2-3 timing valve
		Stuck coast bypass valve
		Stuck servo control valve
		No one-way check orifice or leakage
		No check ball (rubber ball) or leakage
		In 3-2 shift
	No check ball (rubber ball) or leakage	
	Stuck 3-2 timing valve	

7B TROUBLESHOOTING (G4A-HL)

STEP 6 (OIL PRESSURE TEST)

This step checks line, throttle, and governor pressures to check the operation of hydraulic components and for oil leakage.

83U07B-047



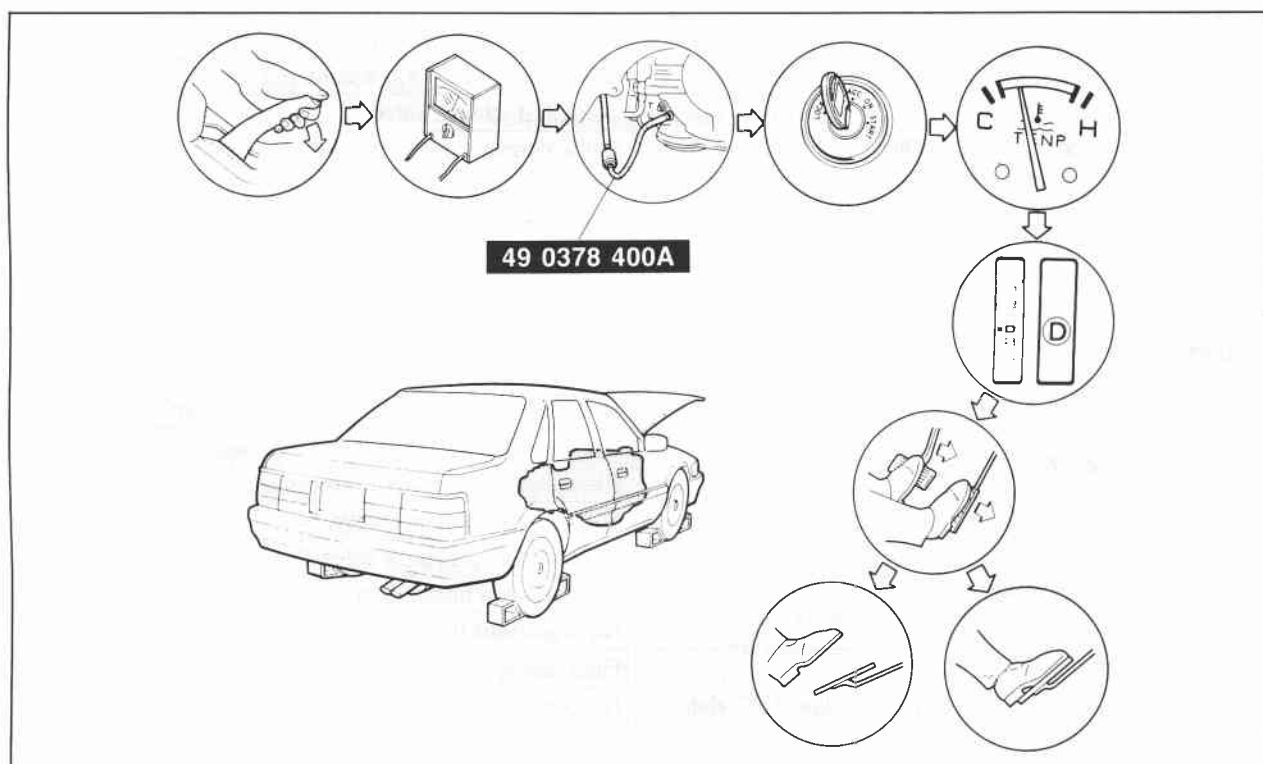
76G07B-061

Line Pressure Test

Preparation

1. Connect the **SST** to the line pressure output point (square head plug L).
2. Connect a tachometer to the engine.
3. Perform the preparation procedure shown in STEP 3 (STALL TEST).

Procedure



76G07B-062

1. Start the engine and check that the idle speed is 900 ± 50 rpm.
2. Shift the selector lever to D range.
3. Read the line pressure at idle.
4. Depress the brake pedal firmly with the left foot and gradually depress the accelerator pedal with the right foot.
5. Read the line pressure as soon as the engine speed becomes constant, then release the accelerator pedal.

Caution

Steps 4 to 5 must be performed within 5 seconds.

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 engine stall speeds for each range in the same manner.

Specified Line pressure:

Condition	Line pressure kPa (kg/cm ² , psi)	
	D S L	R
When idling	350—490 (3.6—5.0, 51—71)	600—830 (6.1—8.5, 87—121)
At stall speed	980—1230 (10.0—12.5, 142—178)	1470—1960 (15.0—20.0, 213—284)

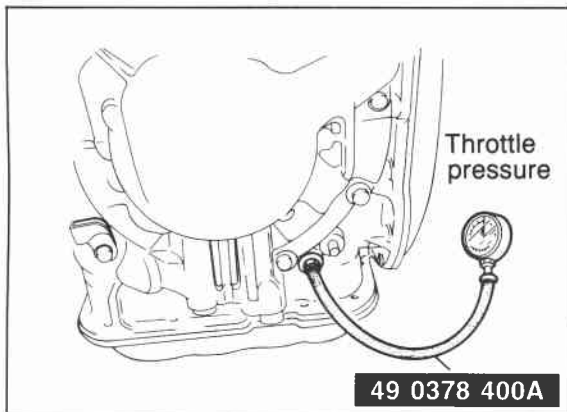
76G07B-063

Evaluation

Condition		Possible Cause
Below specification	In all ranges	Worn oil pump
		Fluid leakage from the oil pump, control valve body and/or transaxle case
		Stuck pressure regulator valve
		Stuck throttle valve
		Stuck pressure modulator valve
	In D, 2 and 1 range	Fluid leakage from the forward clutch hydraulic circuit
		Fluid leakage from the governor valve hydraulic circuit
		Fluid leakage from the N-R accumulator seal rings
	In D and 1 range	Fluid leakage from the 2-3 accumulator seal rings
		Fluid leakage from the 1-2 accumulator seal rings
	In D and R range	Fluid leakage from the N-D accumulator seal rings
	In 2 and 1 range	Fluid leakage from the coasting clutch hydraulic circuit
		Stuck throttle backup valve
Excessive line pressure	In R and 1 range	Fluid leakage from the low and reverse brake hydraulic circuit
	In 2 range only	Fluid leakage from 2-4 brake servo hydraulic circuit
	In 1 range only	Stuck low reducing valve
	In R range only	Fluid leakage from reverse clutch hydraulic circuit
		Stuck throttle valve
		Stuck throttle modulator valve
		Stuck pressure regulator valve
		Stuck throttle backup valve

76G07B-216

7B TROUBLESHOOTING (G4A-HL)



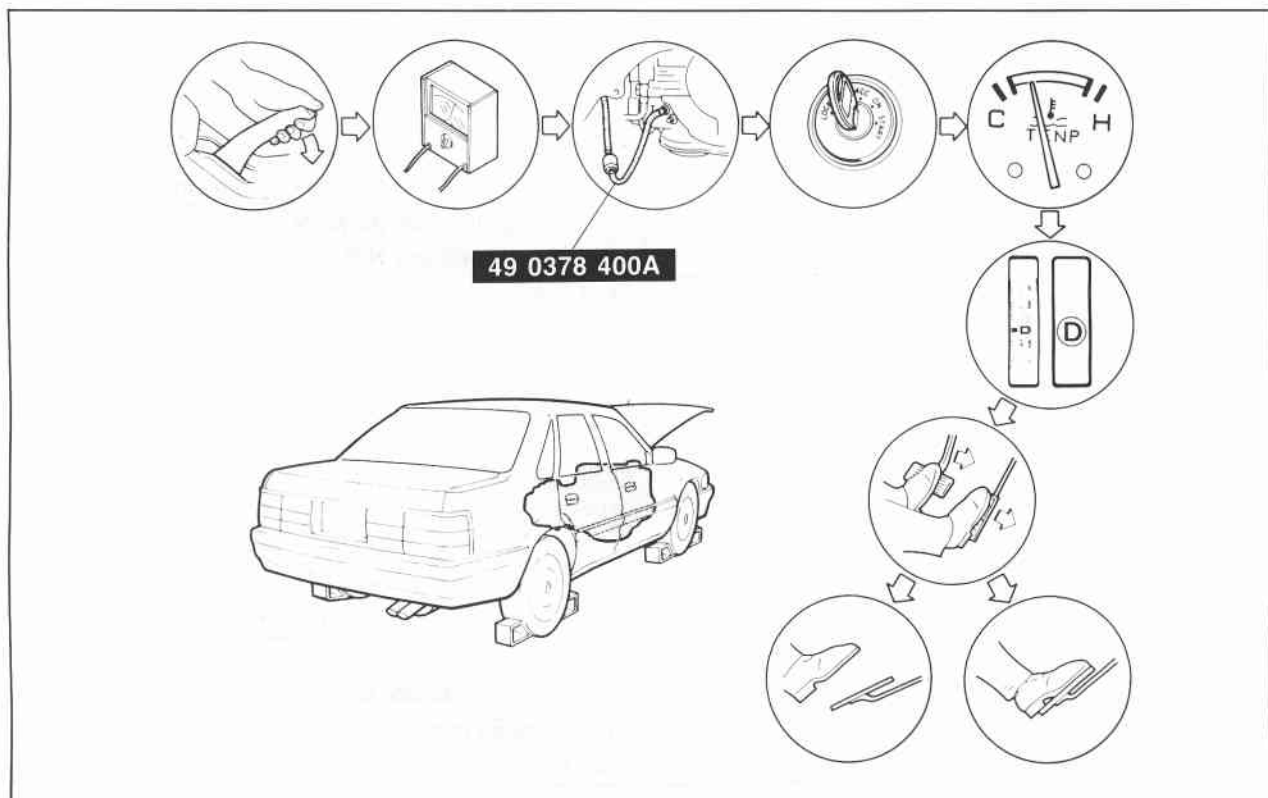
83U07B-052

Throttle Pressure Test

Preparation

1. Connect the **SST** to the throttle pressure output point (Square head plug T).
2. Connect a tachometer to the engine.
3. Perform the preparation procedure shown in STEP 3 (STALL TEST).

Procedure



76G07B-064

1. Start the engine and check that the idle speed is $900 \pm 5\%$ rpm.
2. Shift the selector to D range.
3. Read the throttle pressure at idle.
4. Depress the brake pedal firmly with the left foot and gradually depress the accelerator pedal with the right foot.
5. Read the throttle pressure as soon as the engine speed becomes constant, then release the accelerator pedal.

Caution

Steps 4 to 5 must be performed within 5 seconds.

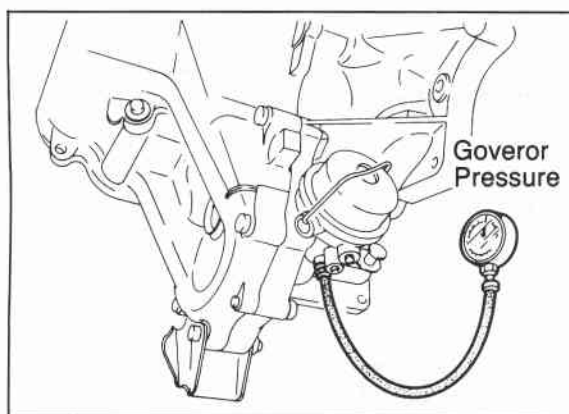
Specified throttle pressure:

Condition	Throttle pressure kPa (kg/cm ² , psi)
When idling	83—113 (0.85—1.15, 12—16)
At stall speed	540—610 (5.5—6.2, 78—88)

Evaluation

Condition	Possible Cause
Not within specification	Stuck throttle valve
	Stuck pressure regulator valve
	Improper adjustment of throttle cable

7B TROUBLESHOOTING (G4A-HL)



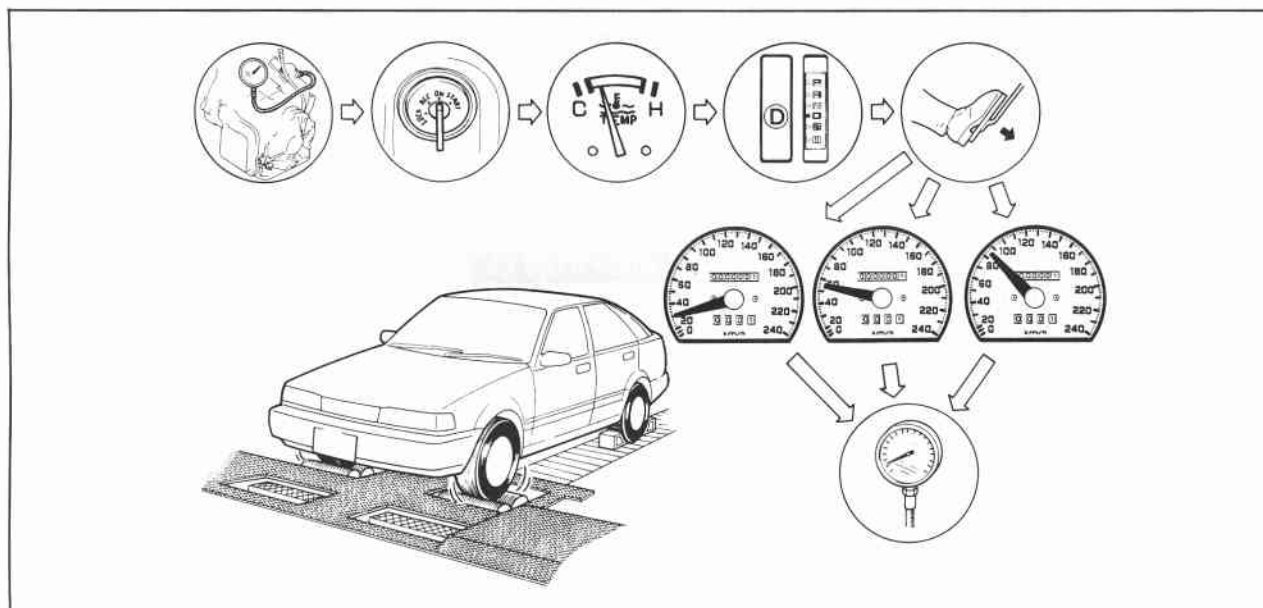
83U07B-054

Governor Pressure Test

Preparation

1. Connect the **SST** to the governor pressure output point.
2. Place the pressure gauge inside the vehicle.
3. Warm up ATF and check ATF level.

Procedure



76G07B-065

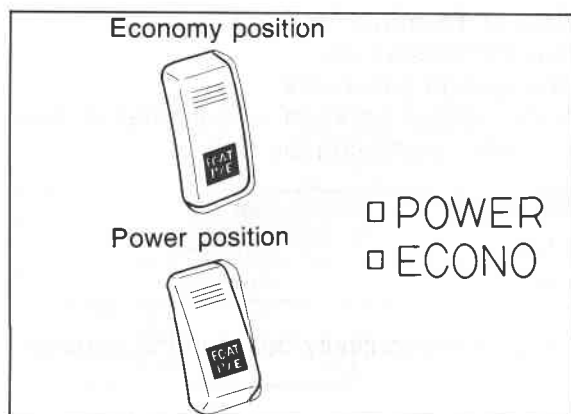
1. Drive the vehicle in D range.
2. Read the governor pressure at the speeds listed in the table below.

Specified governor pressure:

Vehicle Speed km/h (mph)	Governor Pressure kPa (kg/cm ² , psi)	
	FE engine	F8 engine
30 (19)	79—114 (0.81—1.16, 12—16)	82—117 (0.84—1.19, 12—17)
55 (34)	146—190 (1.49—1.94, 21—28)	157—201 (1.60—2.05, 23—29)
85 (53)	276—339 (2.81—3.46, 40—49)	302—366 (3.08—3.73, 44—53)

Evaluation

Condition	Possible Cause
Not within specification	Fluid leakage from the line pressure hydraulic circuit
	Fluid leakage from the governor pressure hydraulic circuit
	Defective or stuck governor valve



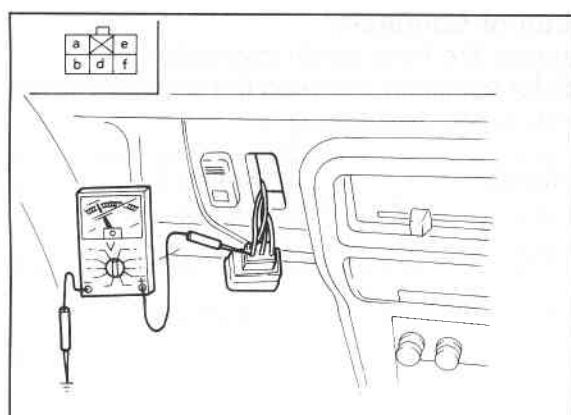
76G07B-066

ELECTRICAL SYSTEM COMPONENTS

MODE SWITCH (G4A-EL)

Inspection of Operation

1. Turn the ignition switch ON.
2. Check that the mode indicator illuminates at each model.
3. If it is not working properly, check terminal voltage of mode switch.



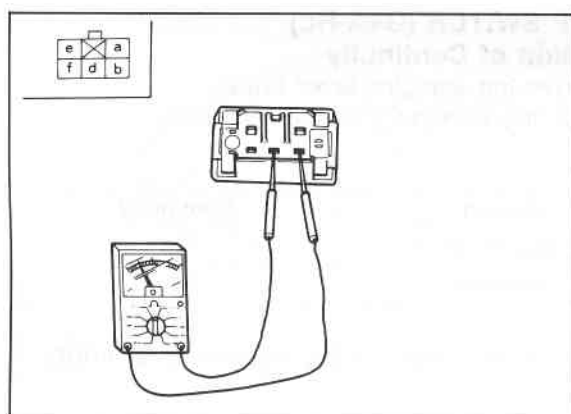
86U07B-049

Inspection of Continuity

1. Disconnect the mode switch.
2. Turn the ignition switch ON and light switch OFF.
3. Check the voltage between each terminal and ground.

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

4. If correct, check for continuity between the terminal.



86U07B-050

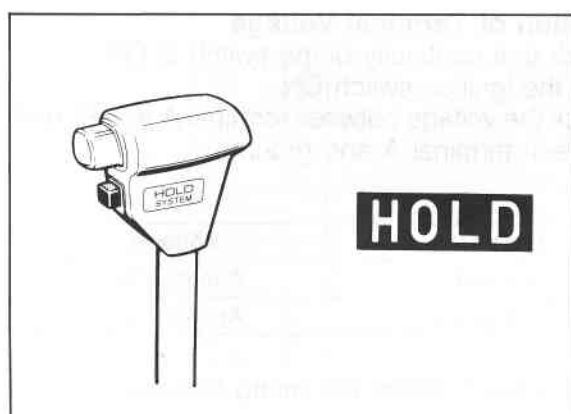
Inspection of Terminal Voltage

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

Mode	Connector terminal				
	a	f	d	e	b
Economy	○	○	○	○	
Power	○	○	○		○

○—○: Indicates continuity

3. If not correct, replace the mode switch.



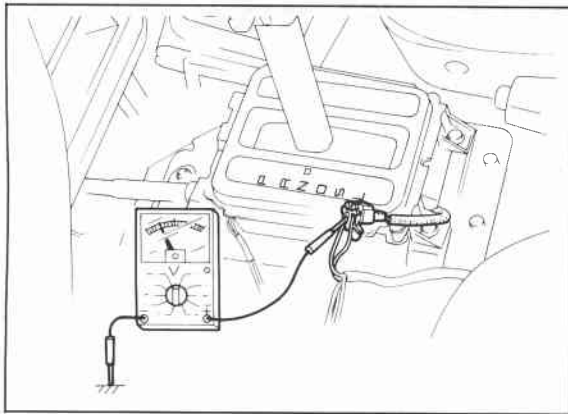
76G07B-067

HOLD SWITCH (G4A-EL)

Inspection of Operation

1. Turn the ignition switch ON.
2. Check that the hold indicator illuminates while switch depressed. Release the switch and mode indicator lights are out.
3. If it is not working properly, check terminal voltage of hold switch.

7B ELECTRICAL SYSTEM COMPONENTS



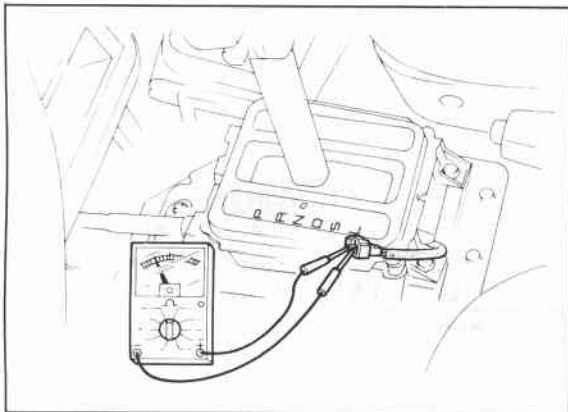
86U07B-052

Inspection of Terminal Voltage

1. Remove the consol box.
2. Turn the ignition switch ON.
3. Check the voltage between the terminal (B) and ground while depressing the switch.

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

4. If correct, check continuity between the terminal.



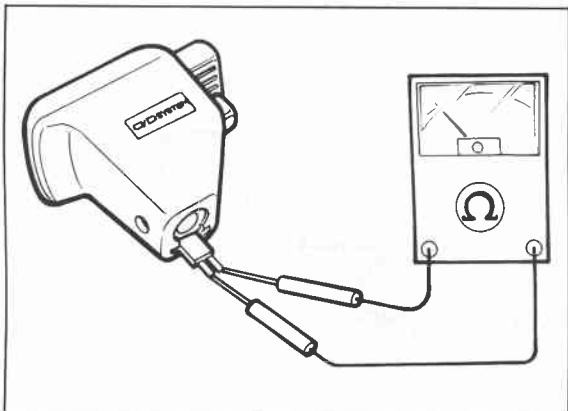
86U07B-053

Inspection of 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.



76G07B-068

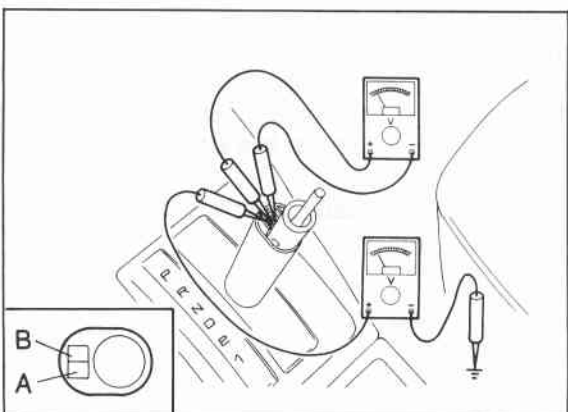
OD OFF SWITCH (G4A-HL)

Inspection of Continuity

1. Remove the selector lever knob.
2. Check the continuity of the terminals.

Switch	Continuity
Depressed	No
Released	Yes

3. If not correct, replace the selector lever knob.



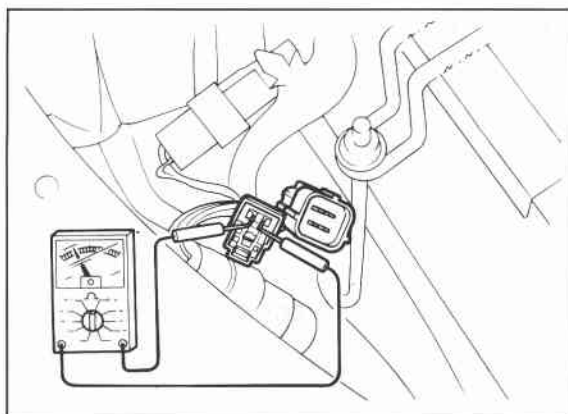
83U07B-063

Inspection of Terminal Voltage

1. Check that continuity of the switch is OK.
2. Turn the ignition switch ON.
3. Check the voltage between terminal A and B, and between terminal A and ground.

Terminal	Voltage
A and B	Approx. 12V
A and ground	Approx. 12V

4. If not correct, check the wiring harness.

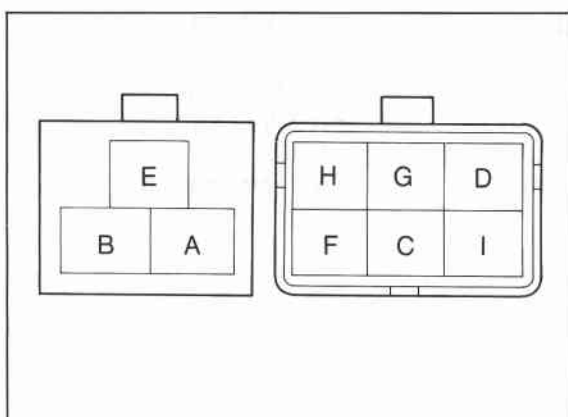


76G07B-069

INHIBITOR SWITCH

Inspection

1. Check that the starter turns with the ignition switch at START position and the selector in the P and N ranges, and does not operate in other positions.
2. Check that the back-up (reverse) light illuminates when shifted to the R range with the ignition switch in the ON position.
3. Check the inhibitor switch if it is not working properly.



76G07B-070

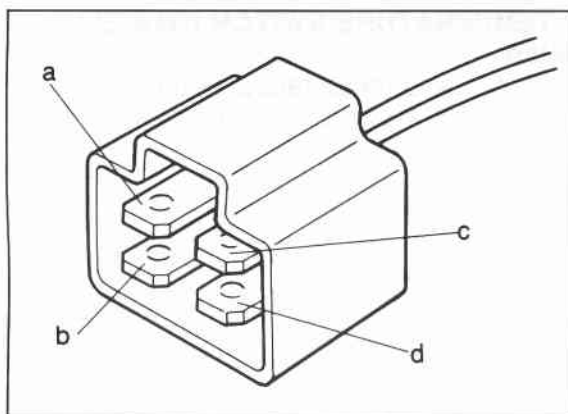
Inspection of continuity

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

G4A-EL

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

○—○: Indicates continuity



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G4A-HL

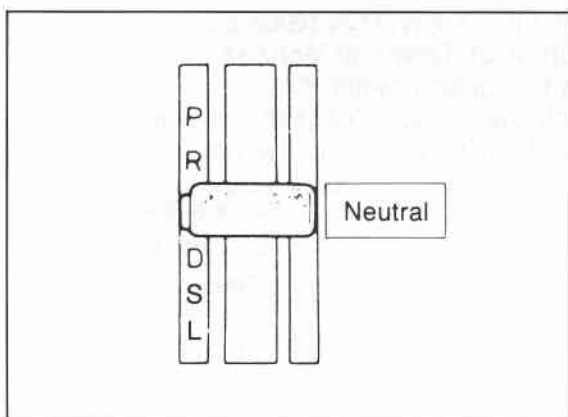
Position	Connector terminal			
	a	b	c	d
P			○—○	
R	○—○			
N			○—○	
D, 1, 2				

○—○: indicates continuity

3. If not correct, replace switch and perform adjustment of inhibitor switch.

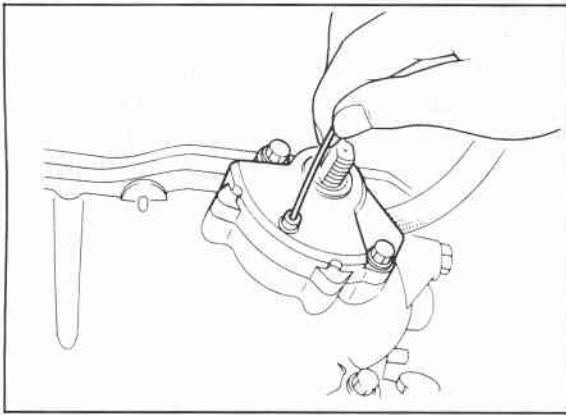
Adjustment

1. Shift the selector lever to N range.
2. Loosen the inhibitor switch mounting bolts.



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7B ELECTRICAL SYSTEM COMPONENTS



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3. Remove the screw and move the inhibitor switch so that the small hole is aligned with the screw hole.
4. Set the alignment by inserting a **2.0 mm (0.079 in)** diameter pin through the holes.
5. Loosely tighten the switch mounting bolts, remove the pin, and reinstall the screw.
6. Tighten the switch mounting bolts to specification.

Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)

7. Recheck the continuity of the individual terminals.

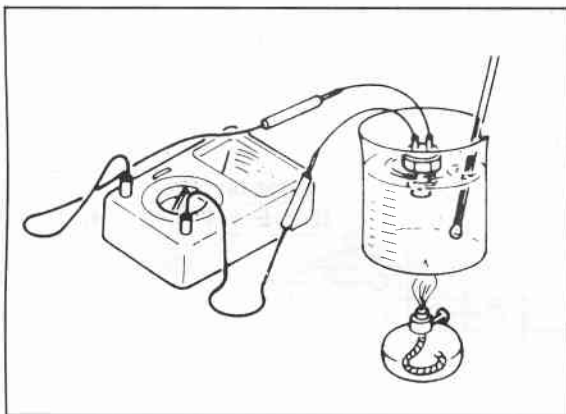
WATER TEMPERATURE SWITCH

Inspection

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

Connection guide

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



86U07B-481

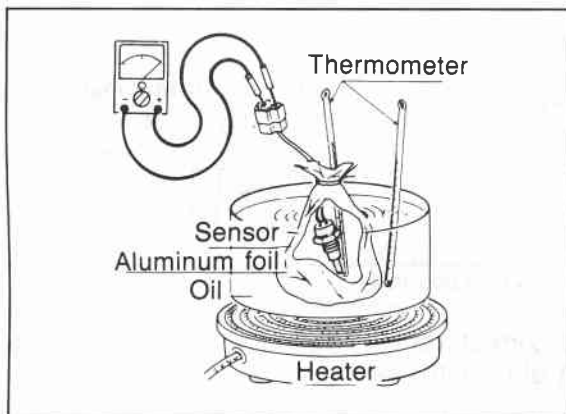
FLUID TEMPERATURE SWITCH (G4A-EL)

Inspection

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

Connection guide

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



76G07B-074

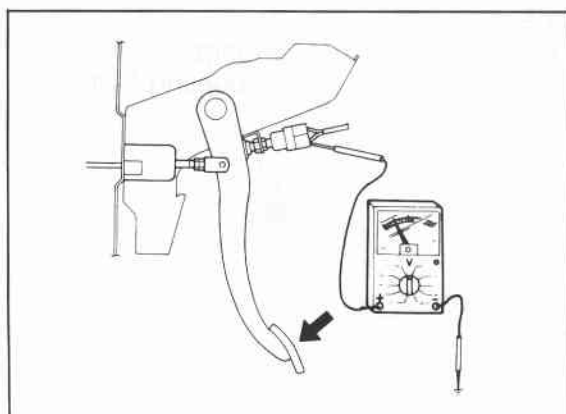
BRAKE LIGHT SWITCH (G4A-EL)

Inspection of Terminal Voltage

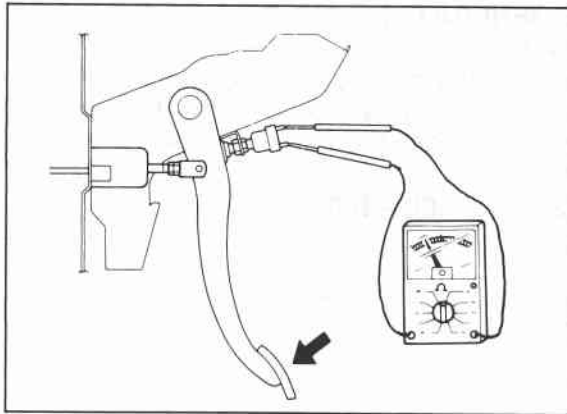
1. Turn the ignition switch ON.
2. Check the voltage between terminal (WG) and ground while depressing the brake pedal.

Terminal voltage	Brake pedal
Approx. 12V	Depressed
Below 1.5V	Released

3. If not correct, check continuity of the switch.



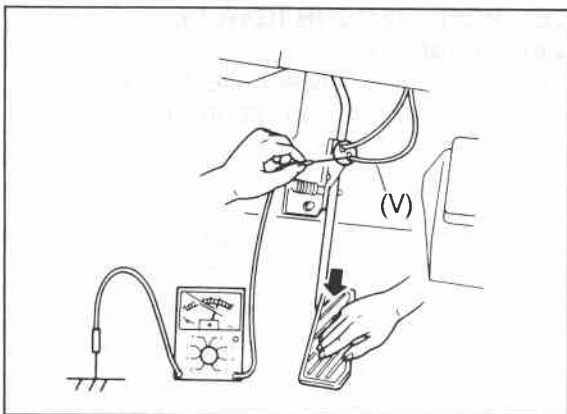
76G07B-075



79G07C-114

Inspection of Continuity

1. Disconnect the brake light switch connector.
2. Check for continuity between the terminals while depressing the brake pedal.



76G07B-076

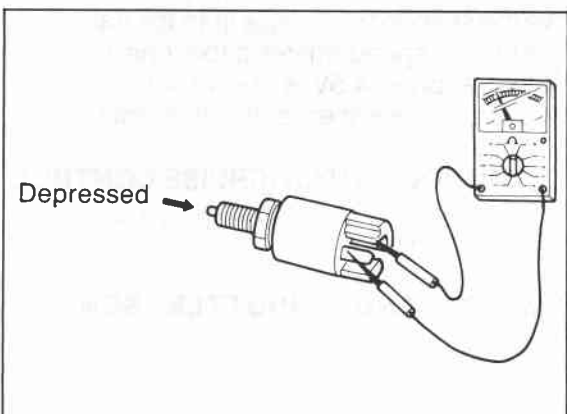
KICK-DOWN SWITCH (G4A-HL)

Inspection of Terminal Voltage

1. Turn the ignition switch ON.
2. Check the voltage at terminal (V) with a voltmeter.

Depressing stroke	Terminal voltage
7/8—8/8 (Full)	Approx. 12V
0—7/8	Below 1.5V

3. If not correct, check the wiring harness, switch, or adjust the switch position.



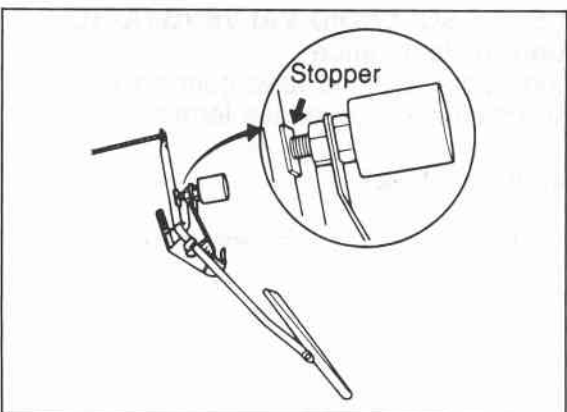
76G07B-077

Inspection of Continuity

1. Disconnect the kick-down switch connector.
2. Check for continuity of the switch with an ohmmeter.

Switch	Continuity
Pushed	Yes
Released	No

3. If not correct, replace the kick-down switch.

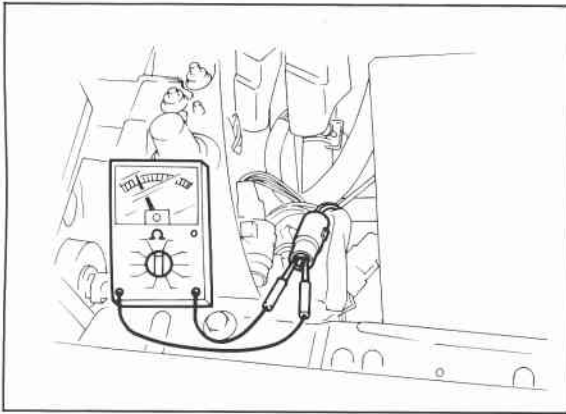


76G07B-078

Adjustment

1. Loosen the kick-down switch locknuts.
2. Depress the accelerator pedal fully.
3. Turn the switch until the threaded case touches the stopper.
4. Turn the switch counterclockwise by one half revolution.
5. Secure the switch with the locknut.

7B ELECTRICAL SYSTEM COMPONENTS



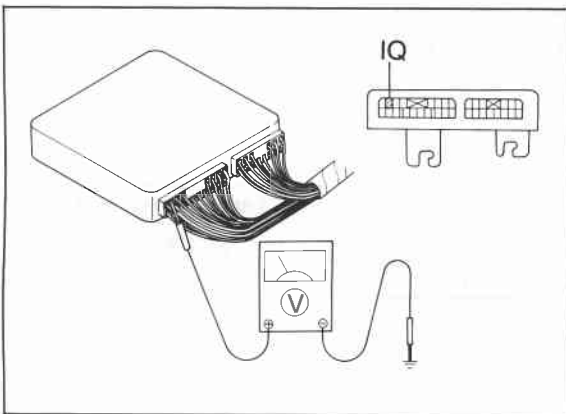
76G07B-079

PULSE GENERATOR (G4A-EL)

Inspection

1. Disconnect the pulse generator connector.
2. Check for continuity between the terminals, if necessary replace the pulse generator.

Resistance: 200—400 Ω

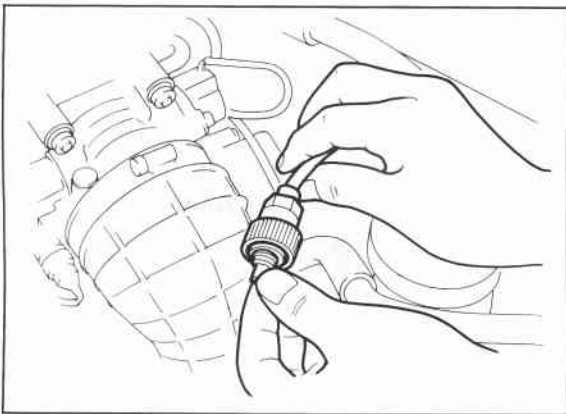


76G07B-080

VEHICLE SPEED SENSOR (G4A-EL)

Inspection of voltage

1. Connect a voltmeter between the 1Q terminal of the EC-AT control unit and ground as shown.
2. Turn the ignition switch ON.



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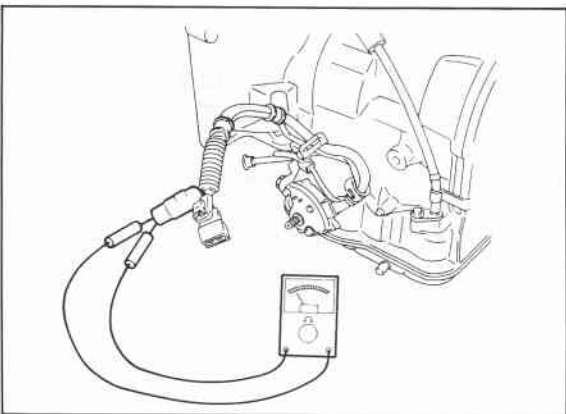
3. Remove the speedometer cable from the transaxle.
4. Slowly turn the speedometer cable one turn.
5. Check that approx. 4.5V is shown 4 times.
6. If not correct, check the combination meter.

CRUISE CONTROL SWITCH (CRUISE CONTROL UNIT)

Refer to Section 15.

IDLE SWITCH AND THROTTLE SENSOR (G4A-EL)

Refer to Section 4A.



76G07B-082

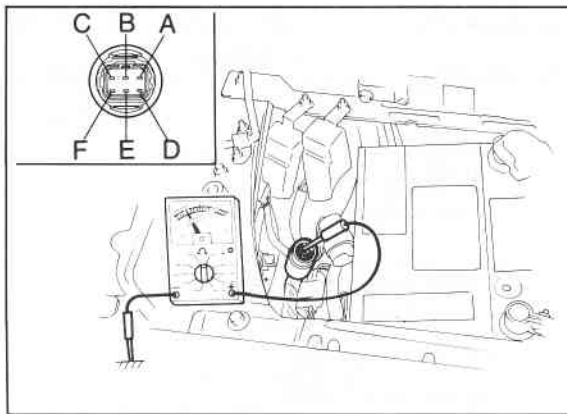
OD RELEASE SOLENOID VALVE (G4A-HL)

Inspection of Resistance

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

Resistance: 13—27 Ω

3. If not correct, replace the solenoid valve.



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SOLENOID VALVES (G4A-EL)

Inspection of Resistance

1. Disconnect the negative battery cable.
2. Disconnect the solenoid valve connector.
3. Measure the resistance of the terminals except (A) terminal, if necessary replace the solenoid valve.

Resistance: 13—27Ω

Note

1-2 solenoid valve : F

2-3 solenoid valve : C,E

3-4 solenoid valve : B

Lock-up solenoid valve : D

NO LOAD SIGNAL (G4A-EL)

Refer to STEP 3 in Troubleshooting.

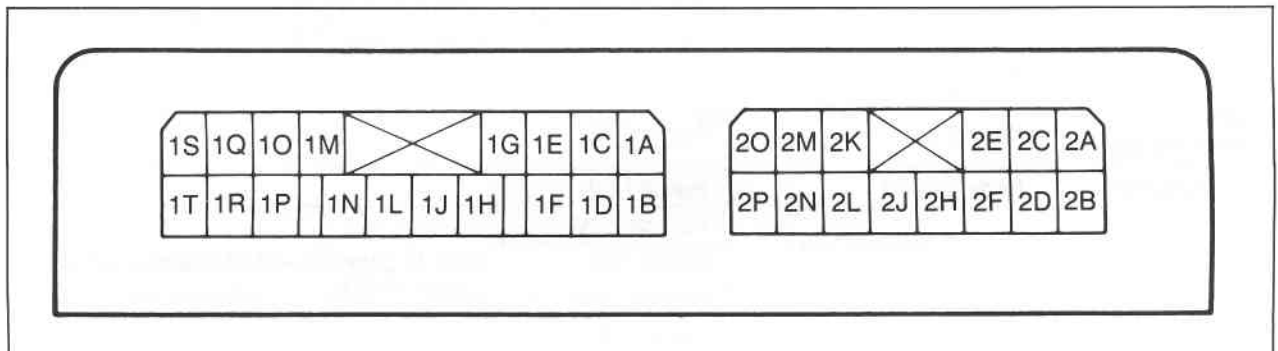
MODE, AND HOLD INDICATOR LIGHT (G4A-EL)

Refer to Section 15.

OD OFF INDICATOR LIGHT (G4A-HL)

Refer to Section 15.

EC-AT CONTROL UNIT (G4A-EL)



Terminal Voltage Chart

Terminal	Connected to		Voltage	Condition
1A (Input)	Hold switch		Approx. 12V	Switch depressed
			Below 1.5V	Switch released
1B (Input)	Mode switch (Power side)		Below 1.5V	POWER mode
			Approx. 12V	ECONOMY mode
1C (Input)	Inhibitor switch	L range	Approx. 12V	L range
			Below 1.5V	Other ranges
1D (Input)		S range	Approx. 12V	S range
			Below 1.5V	Other ranges
1E (Input)		D range	Approx. 12V	D range
			Below 1.5V	Other ranges
1F (Input)		N and P range	Below 1.5V	N or P range
			Approx. 12V	Other ranges
1G (Input)	Water temperature switch		Approx. 12V	Above 72°C (162°F)
			Below 1.5V	Below 65°C (149°F)
1H	—		—	—
1I	—		—	—

7B ELECTRICAL SYSTEM COMPONENTS

Terminal	Connected to	Voltage	Condition
1J	—	—	—
1K	—	—	—
1L (Input)	Idle switch	Below 1.5V	At idle
		Approx. 12V	Other speeds
1M	—	—	—
1N (Input)	Brake light switch	Approx. 12V	Brake pedal depressed
		Below 1.5V	Brake pedal released
1O (Input)	Throttle sensor	Approx. 5V	Ignition switch ON
		Below 1.5V	Ignition switch OFF
1P (Input)		Approx. 0.5—4.3V	Throttle valve fully closed to fully open
1Q (Input)	Vehicle speed sensor	Approx. 4.5V	During driving
		Approx. 4.5V or below 1.5V	Vehicle stopped
1R (Ground)	Throttle sensor	Below 1.5V	—
1S (Input)	Pulse generator	Approx. 12V	Engine running
		Below 1.5V	Engine stopped
1S (Ground)	Pluse generator	Below 1.5V	—
2A (Battery power)	Battery	Approx. 12V	Ignition switch ON
		Below 1.5V	Ignition switch OFF
2B (Ground)	Body ground	Below 1.5V	—
2C (Memory power)	Battery	Approx. 12V	—
2D (Ground)	Body ground	Below 1.5V	—
2E (Output)	1-2 shift solenoid valve	Approx. 12V	Refer to page 7B—26 of solenoid valve operation table
		Below 1.5V	
2F (Output)	2-3 shift solenoid valve	Approx. 12V	
		Below 1.5V	
2G	—	—	—
2H (Output)	3-4 shift solenoid valve	Approx. 12V	Refer to page 7B—26 of solenoid valve operation table
		Below 1.5V	
2I	—	—	—
2J (Output)	Lock-up solenoid valve	Approx. 12V	Lock-up
		Below 1.5V	Other
2K (Output)	Hold indicator	Below 1.5V	Hold mode
		Approx. 12V	Other modes
2L (Output)	Mode indicator	Approx. 12V	Hold mode
		Below 1.5V	Power or economy mode
2M (Output)	EC-AT Tester (malfunction code)	Approx. 12V	Normal
		Below 1.5V	If malfunction present
		Code signal	Self-diagnosis check connector grounded
2N	—	—	—
2O (Input)	Fluid temperature switch	Below 1.5V	Above 150°C (302°F)
		Approx. 10—12V	Below 143°C (289°F)
2P (Input)	EC-AT check connect	Approx. 12V	—

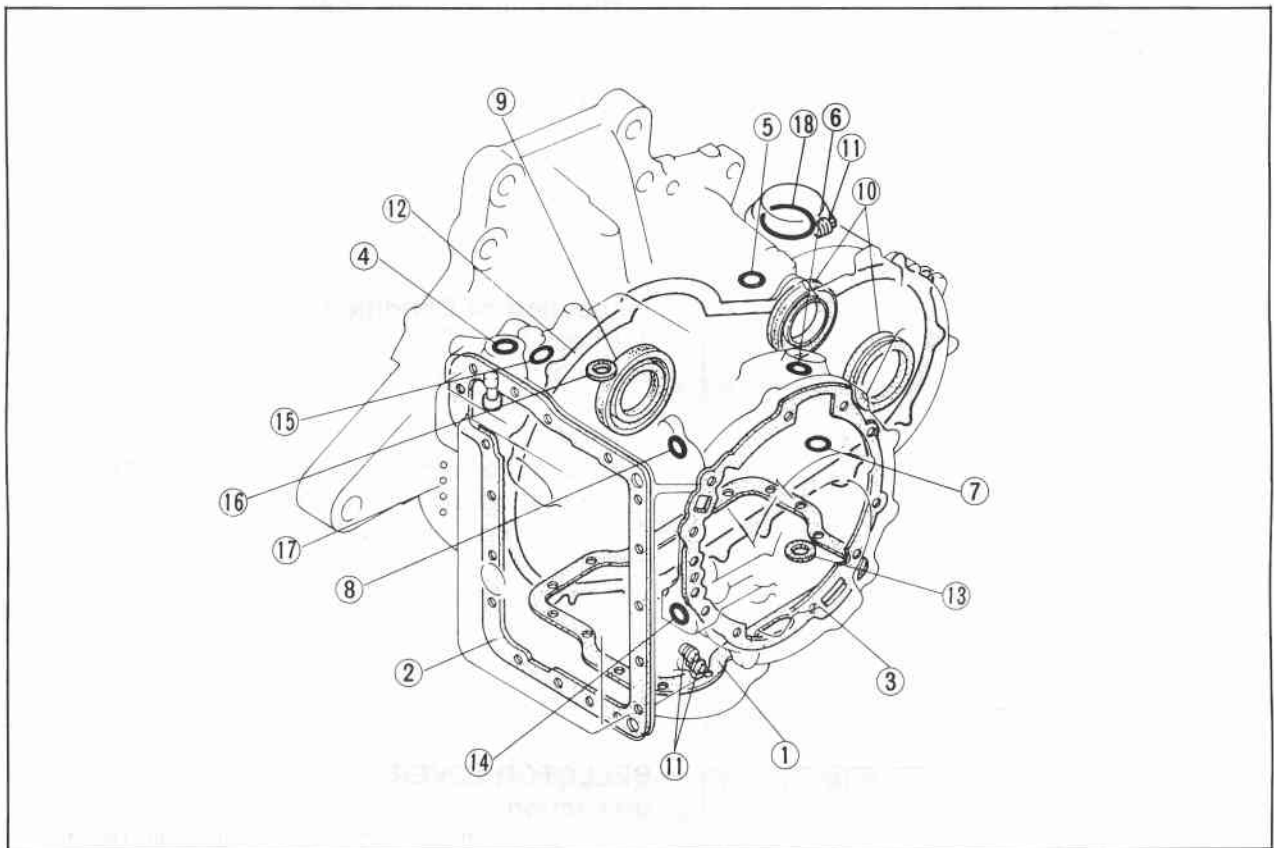
76G07B-084

ON-VEHICLE MAINTENANCE

AUTOMATIC TRANSAXLE FLUID (ATF)

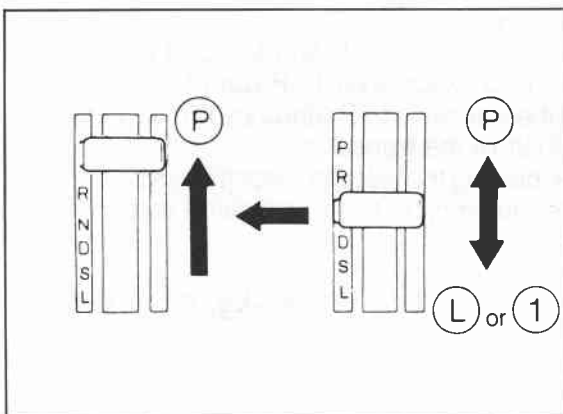
Inspection for Fluid Leaks

Check for fluid leaks; the following figure shows the locations where fluid leakage may possibly occur.



76G07B-085

- | | |
|-----------------------------|---------------------------------------|
| 1. Oil pan | 10. Driveshaft |
| 2. Control valve body cover | 11. Square head plug |
| 3. Oil pump | 12. Transaxle case |
| 4. Inhibitor switch | 13. Drain plug |
| 5. Speedometer driven gear | 14. Oil cooler return pipe |
| 6. Pulse generator (G4A-EL) | 15. Oil cooler outlet pipe |
| 7. Oil filler tube | 16. Fluid temperature switch (G4A-EL) |
| 8. Throttle cable | 17. Blind plugs |
| 9. Bearing cover | 18. Governor cover (G4A-HL) |



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Inspection of Level

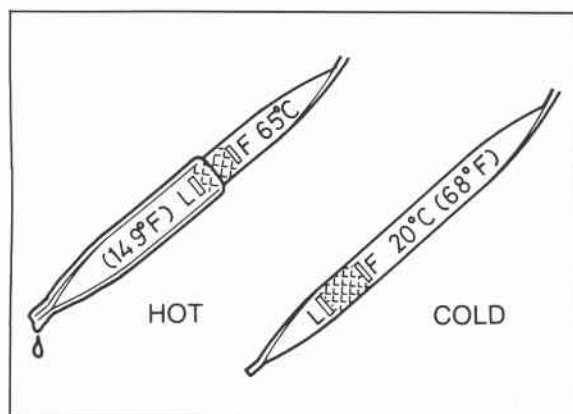
1. Apply the parking brake and position wheel chocks to prevent the car from rolling forward.

Note

Place the car on a flat, level surface.

2. Run the engine so that the automatic transaxle fluid reaches specified temperature.
3. While the engine is idling, shift the select lever from P to L or P to 1 and back again.
4. Let the engine idle.
5. Shift the select lever to P.

7B ON-VEHICLE MAINTENANCE



86U07B-064

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

Low temperature scale:

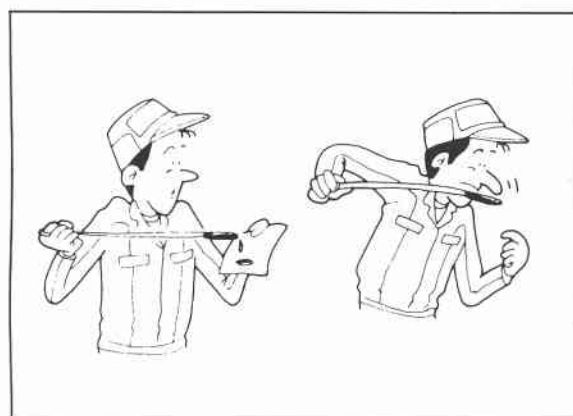
20°C (68°F)

High temperature scale:

65°C (149°F)

ATF type:

Dexron II or M III



86U07B-065

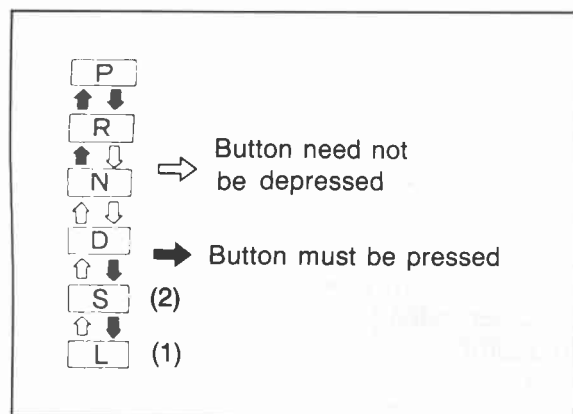
Inspection of Condition

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 fluid carefully.

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



76F07B-022

SELECTOR LEVER

Inspection

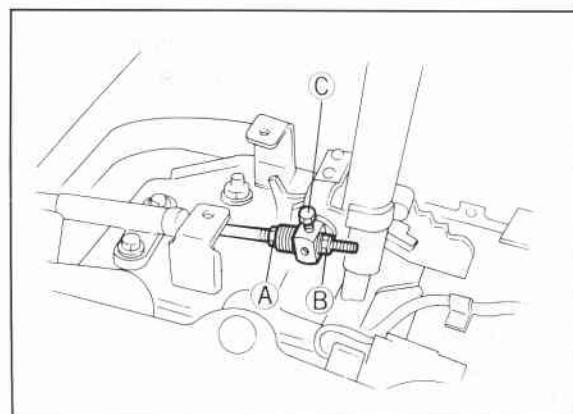
1. Check that the selector lever can only be shifted as shown in the figure.
2. Make sure there is a click at each range when shifted from P ↔ L or P ↔ 1 range.
3. Check that the position of the selector lever and the indicator are exact.
4. Check that the button returns smoothly when used to shift the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

Adjustment

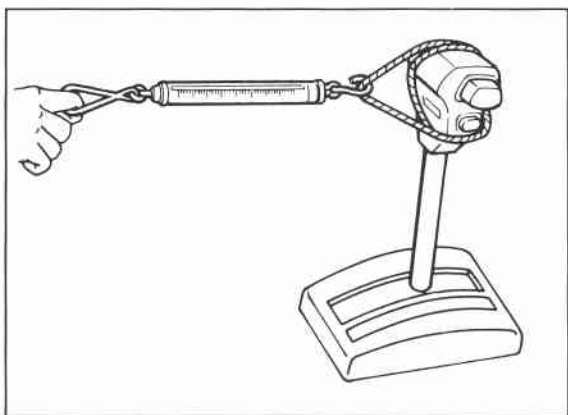
1. Loosen locknuts A, B, and lockbolt C.
2. Shift the selector lever to P range.
3. Shift the transaxle to P range by moving the manual shaft of the transaxle.
4. While holding the selector lever forward in P range, tighten lockbolt C to the specified torque.

Tightening torque:

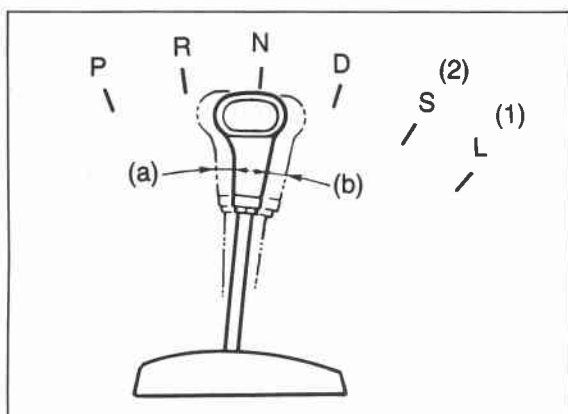
8—11 N·m (80—110 cm·kg, 67—95 in·lb)



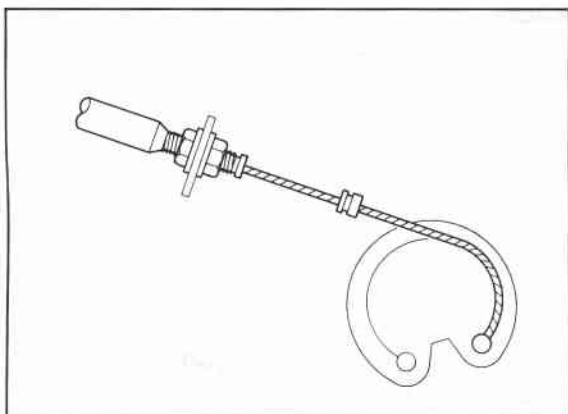
76F07B-023



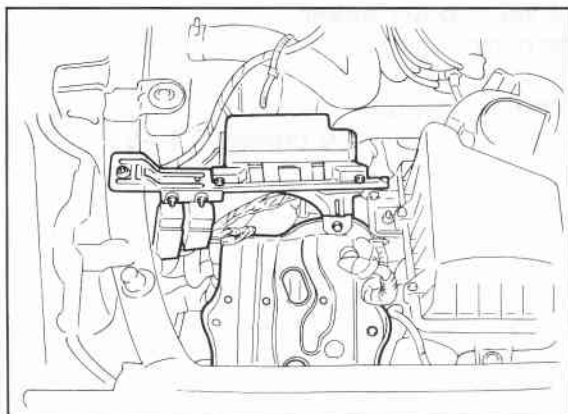
76F07B-024



76F07B-025



86U07B-066



76G07B-090

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

Tightening torque:

8—11 N·m (80—110 cm·kg, 67—96 in·lb)

7. Shift the selector lever to N range.
8. With the button on the selector lever knob pressed, push the selector toward R range with a force of **20 N (2 kg, 4.4 lb)** and check the amount of movement (a) at the selector lever knob.
9. Pull the selector lever toward D range in the same manner and check the amount of movement (b).
10. Verify the stroke difference of (a) and (b) is as specified.

Stroke difference: 8 mm (0.315 in) max.

Note

If not within specification, readjust locknuts A and B.

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

THROTTLE CABLE

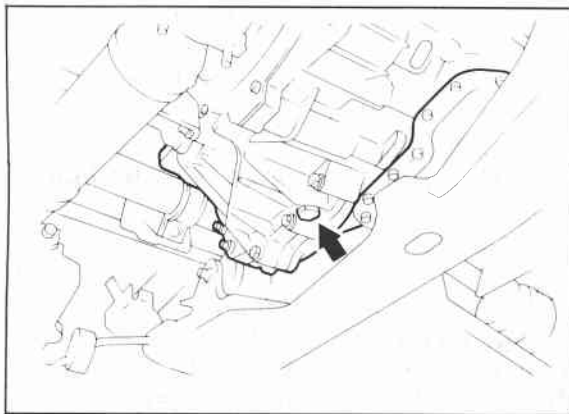
Inspection

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

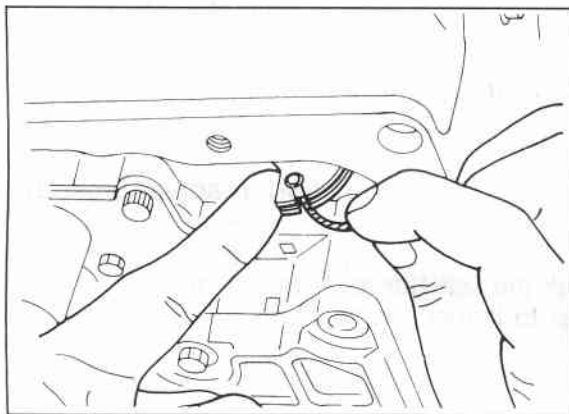
Removal

1. Remove the battery and battery carrier.
2. Disconnect the main fuse block. (G4A-EL)

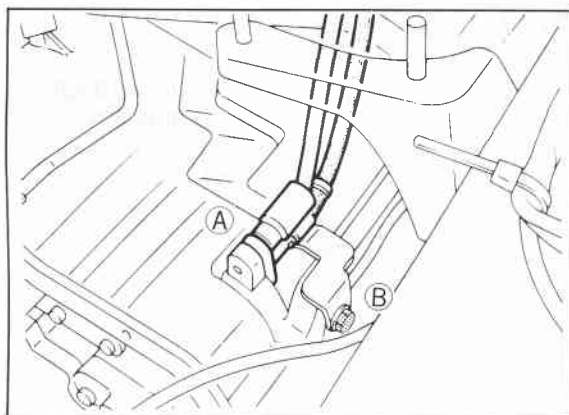
7B ON-VEHICLE MAINTENANCE



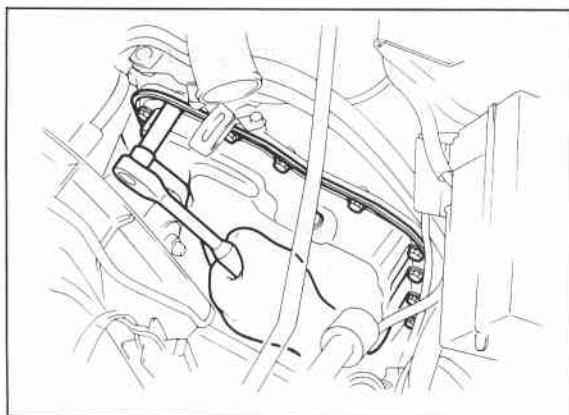
76G07B-091



76G07B-092



86U07B-075



86U07B-076

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

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

Installation

Install in the reverse order of removal referring to installation note.

Installation note

Throttle cable

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

Tightening torque:

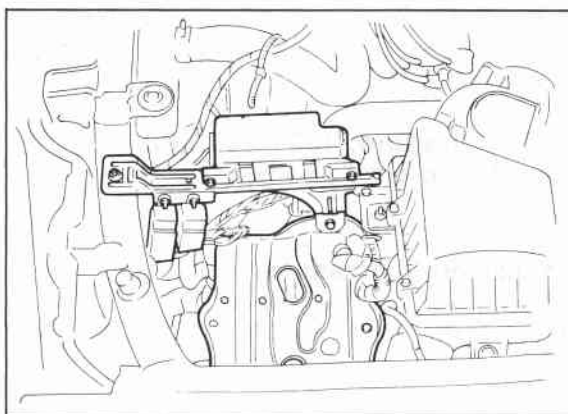
- Ⓐ 8—11 N·m
(80—110 cm·kg, 69—95 in·lb)
- Ⓑ 19—26 N·m
(1.9—2.6 m·kg, 14—19 ft·lb)

Control valve body cover

Install the control valve body cover and a new gasket.

Tightening torque:

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



76G07B-093

Main fuse block (G4A-EL)

Install the main fuse block.

Tightening torque:

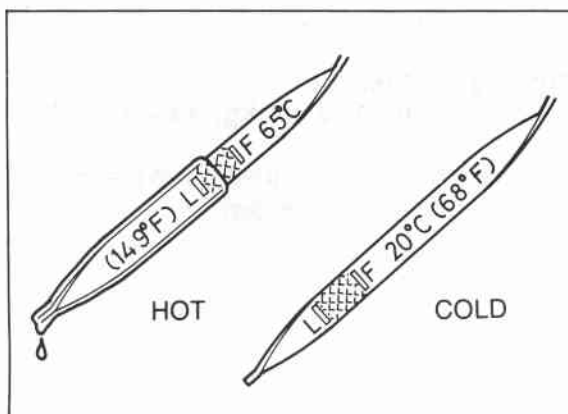
8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Battery carrier

Install the battery carrier.

Tightening torque:

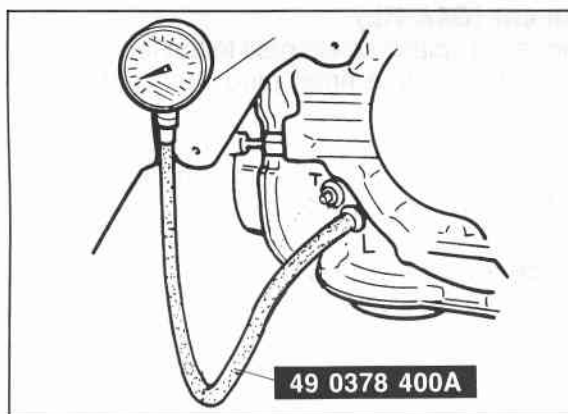
31—40 N·m (3.2—4.1 m·kg, 23—30 ft·lb)



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ATF level

After installation, add ATF, and with the engine idling, check the fluid level and for leaks. (Refer to page 7B—71)

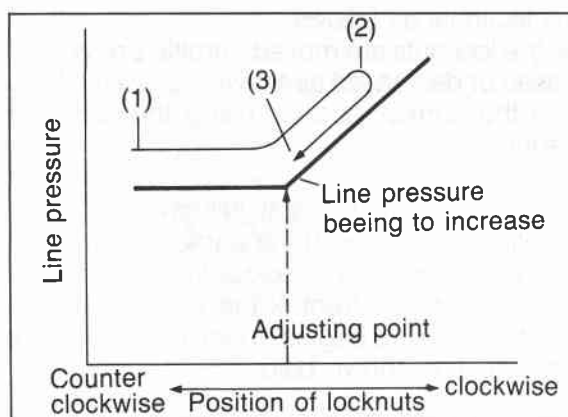


76G07B-095

Adjustment (G4A-EL)

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

Idle speed: 950 ± 50 rpm



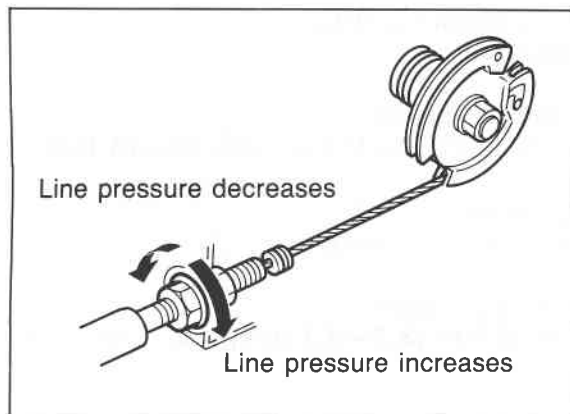
86U07B-482

4. Adjust locknuts as follows:

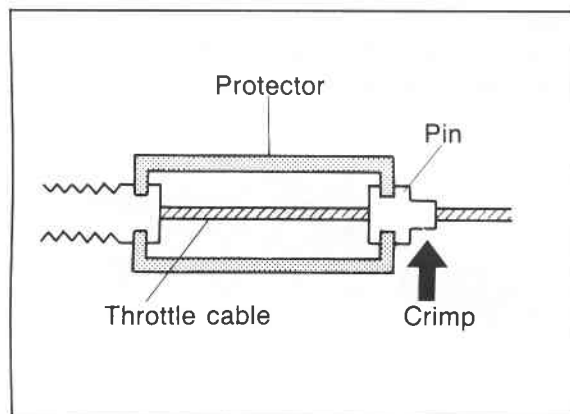
When the locknuts are moved, line pressure is increased or decreased as shown. Adjust the locknuts to the correct position using the following procedure.

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

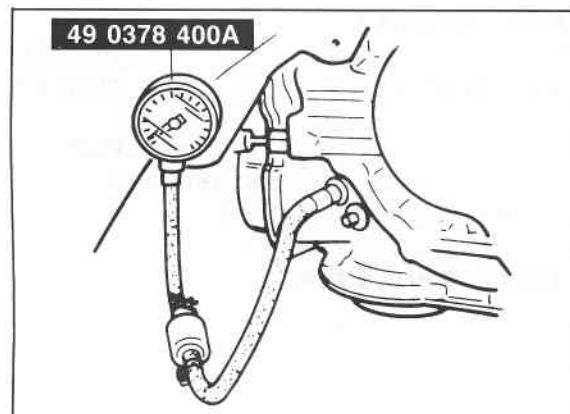
7B ON-VEHICLE MAINTENANCE



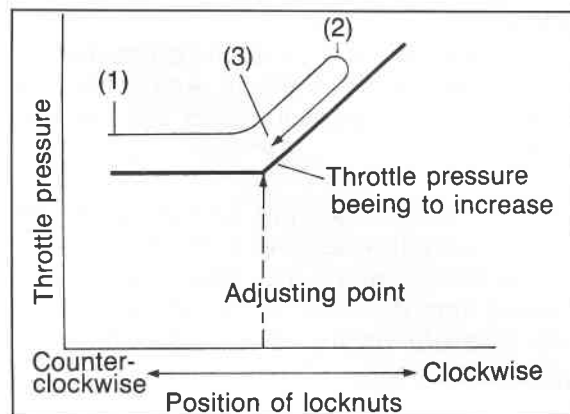
86U07B-483



86U07B-080



76G07B-096



76G07B-097

- (3) Adjust the locknuts in a counterclockwise direction until the line pressure decreases to the specification. Tighten the locknuts.

**Specified pressure: 432—450 kPa
(4.4—4.6 kg/cm², 63—66 psi)**

Note

Transmission in P range

5. Turn off the engine.

6. Reinstall the square head plug.

Tightening torque:

5—10 N·m (50—100 cm·kg, 43—87 in·lb)

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

Adjustment (G4A-HL)

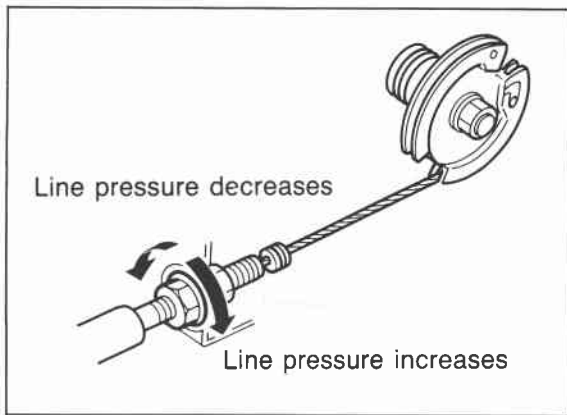
1. Remove the splash shield next to the left front tire.
2. Remove the square head plug T and install the SST.
3. Shift into P range and start the engine. Warm up the engine to normal operating temperature, and adjust the idle speed.

Idle speed: 900 $\pm$ 50 rpm

4. Adjust locknuts as follows:

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

- (1) Initially install the locknuts fully away from the throttle cam. (Loosen the cable all the way)
- (2) Adjust the locknuts in a clockwise direction as viewed from the front of the vehicle until the throttle pressure begins to increase above the specification shown below.



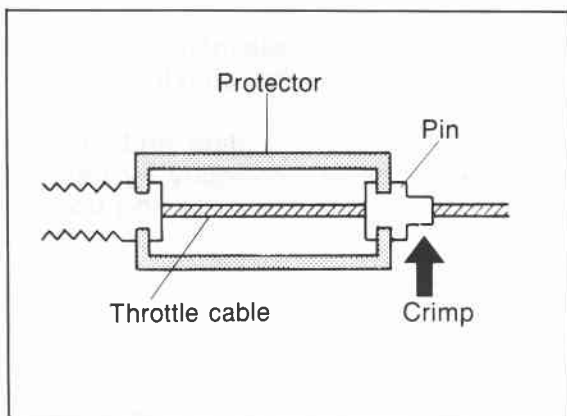
76G07B-098

- (3) Adjust the locknuts in a counterclockwise direction until the throttle pressure decreases to the specification. Tighten the locknuts.

**Specified pressure: 88—108 kPa
(0.9—1.1 kg/cm², 13—16 psi)**

Note
Transmission in P range

5. Turn off the engine.

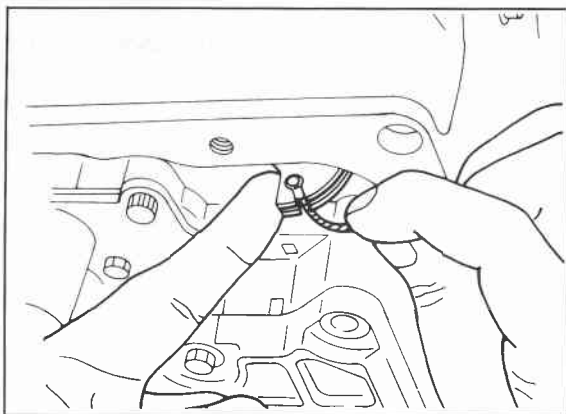


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6. Reinstall the square head plug.

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

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



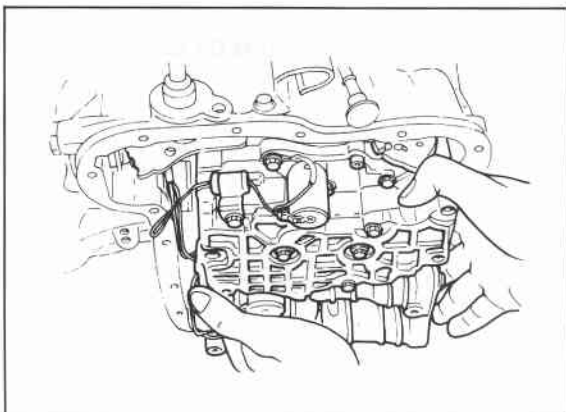
76G07B-099

CONTROL VALVE BODY

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

Removal

1. Remove the throttle cable. (Refer to 7B—73)
2. Disconnect the solenoid connector.

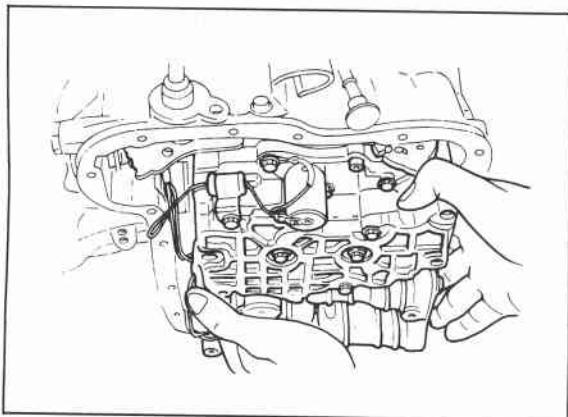


86U07B-082

3. Remove the control valve body.

Disassembly, Inspection and Assembly
Refer to control valve body section of INSPECTION AND REPAIR.

7B ON-VEHICLE MAINTENANCE



86U07B-083

Installation

Install in the reverse order of removal referring to installation note.

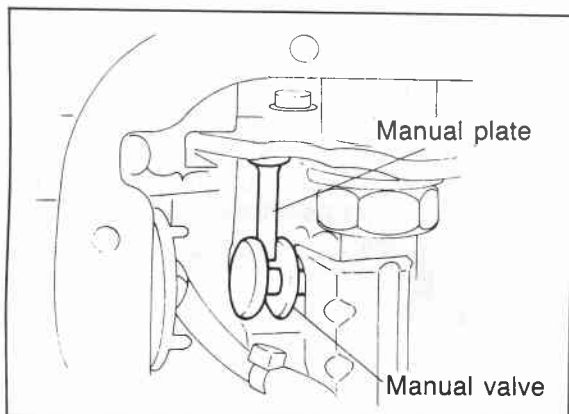
Installation note

Control valve body

Install the control valve body.

Tightening torque: 11—15 N·m

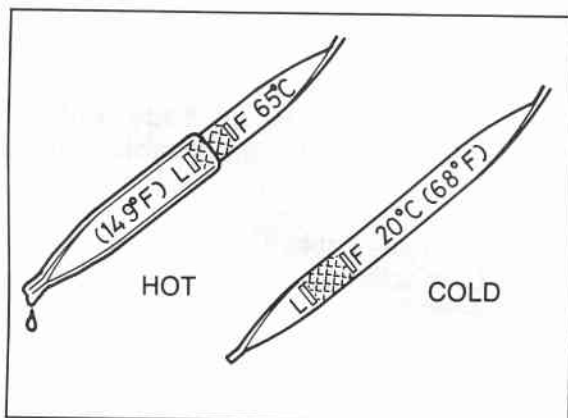
(110—150 cm·kg, 95—130 in·lb)



86U07B-084

Note

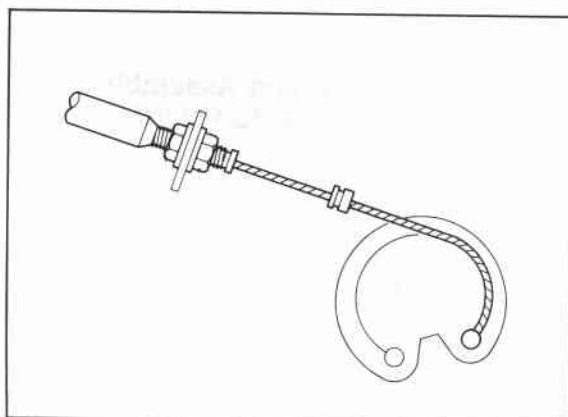
- a) To place the manual plate in the correct position of the manual valve, shift into "R" before installation.
- b) Verify that the manual plate and manual valve are assembled correctly by using a mirror, then tighten the mounting bolts.



76G07B-100

ATF level

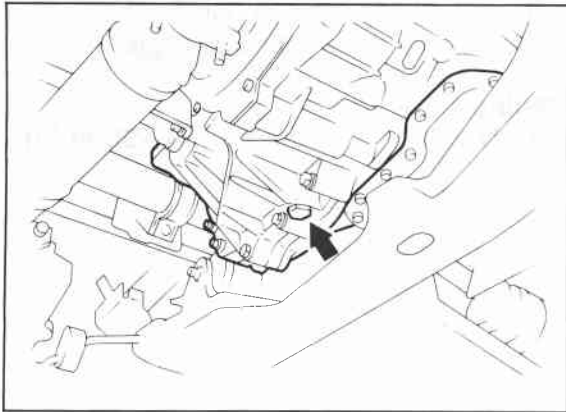
After installation, add ATF, and with the engine idling, check the fluid level and for leaks. (Refer to page 7B—71)



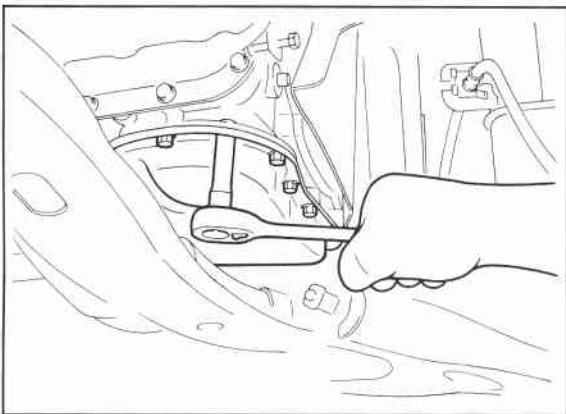
86U07B-086

Throttle cable

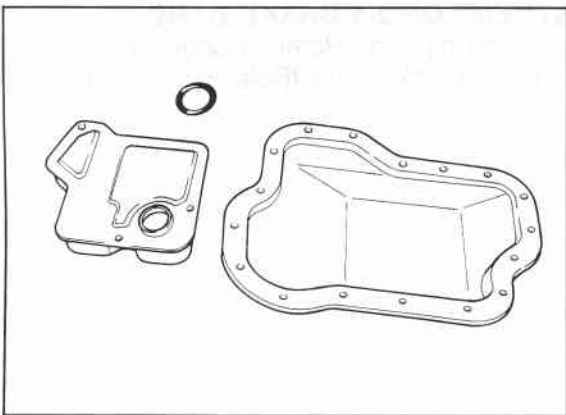
Adjust the throttle cable with the oil pressure test.



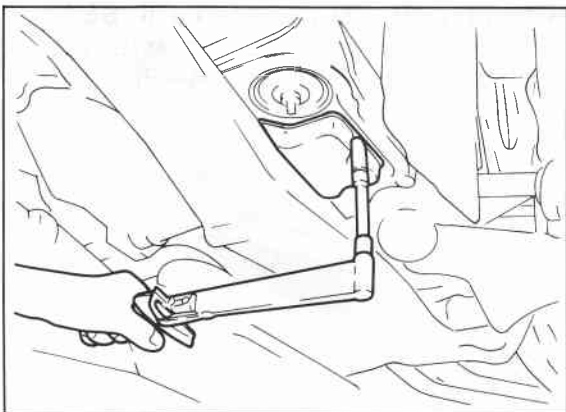
86U07B-087



86U07B-088



86U07B-089



86U07B-090

OIL STRAINER

Removal

1. Jack up the vehicle and support it with safety stands.
2. Drain the ATF.
3. Remove the left side splash shield.

4. Remove the oil pan and gasket.
5. Remove the oil strainer.
6. Remove the O-ring from the oil strainer.

Inspection

Check the following and repair or replace any faulty parts.

1. Deformed or cracked oil pan
2. Deformed or clogged oil strainer

Installation

1. Apply ATF to the O-ring and install it onto the oil strainer.
2. Install the oil strainer.

Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)

7B ON-VEHICLE MAINTENANCE

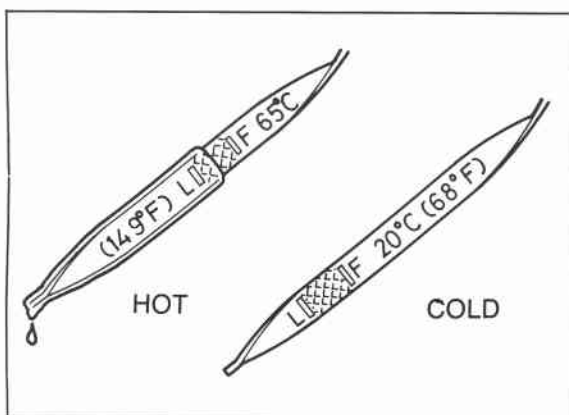


86U07B-091

3. Install the magnets on the oil pan as shown and install the oil pan along with a new gasket.

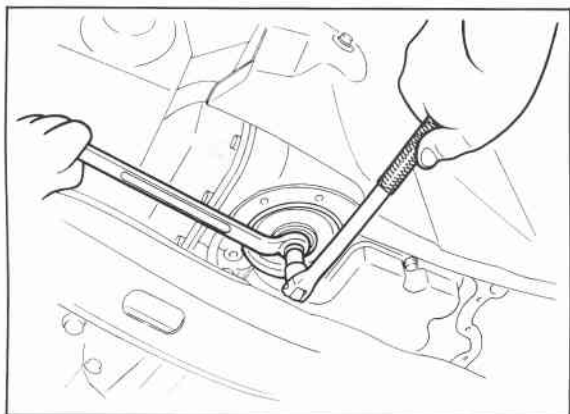
Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)



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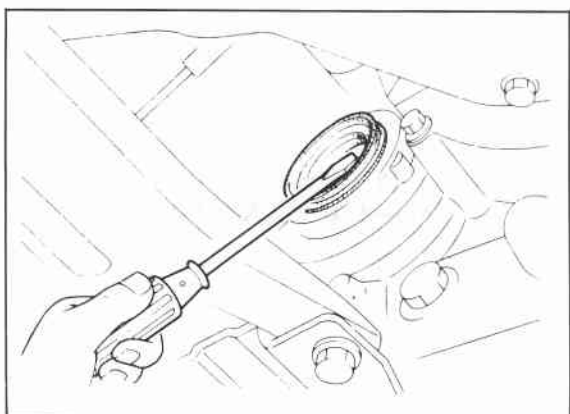
4. Add ATF, and with the engine idling, check the fluid level and for leaks. (Refer to page 7B—71)



76G07B-102

ADJUSTMENT OF 2-4 BRAKE BAND

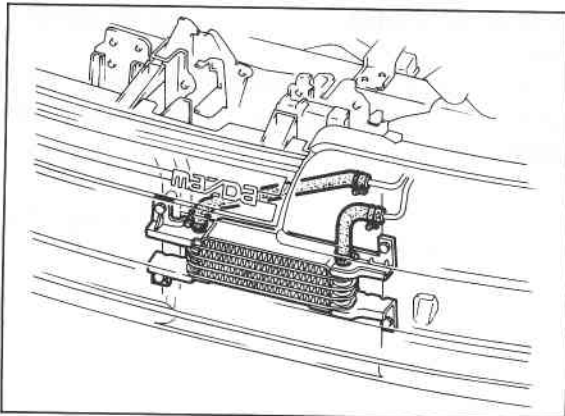
1. Remove the oil pan. (Refer to page 7B—79)
2. Adjust the 2-4 brake band. (Refer to page 7B—211)



86U07B-094

REPLACEMENT OF DRIVESHAFT OIL SEAL

Replace the oil seal in the same manner as for the manual transaxle. (Refer to page 7A—9)

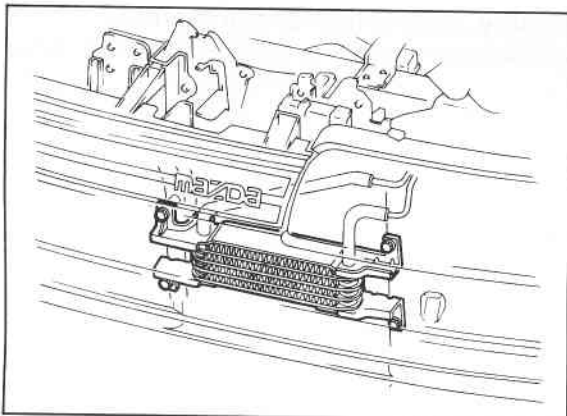


86U07B-095

OIL COOLER

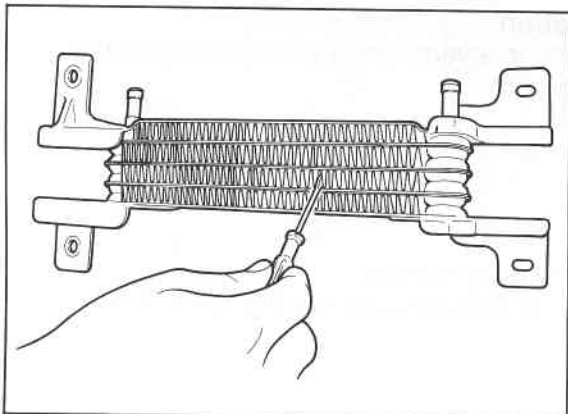
Removal

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



86U07B-096

3. Remove the oil cooler.

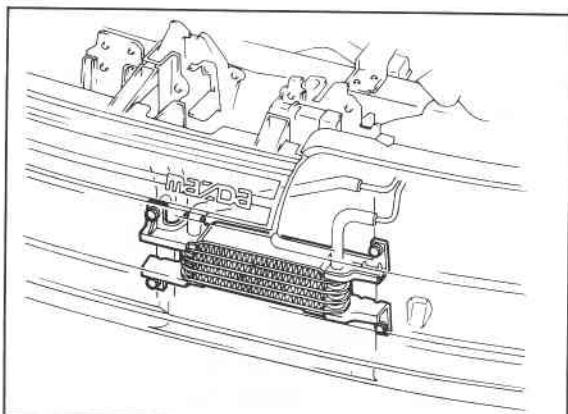


86U07B-097

Inspection

Check the following and repair or replace any faulty parts.

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



86U07B-098

Installation

Install the oil cooler referring to installation note.

Installation note

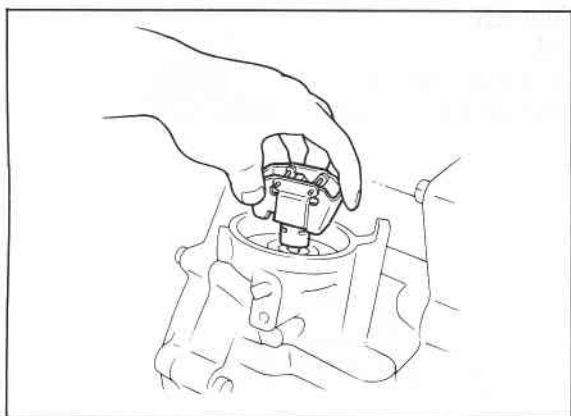
Oil cooler

Install the oil cooler.

Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)

7B ON-VEHICLE MAINTENANCE

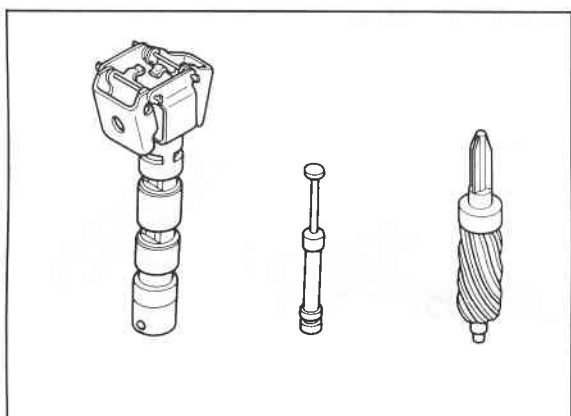


76G07B-103

GOVERNOR (G4A-HL)

Removal

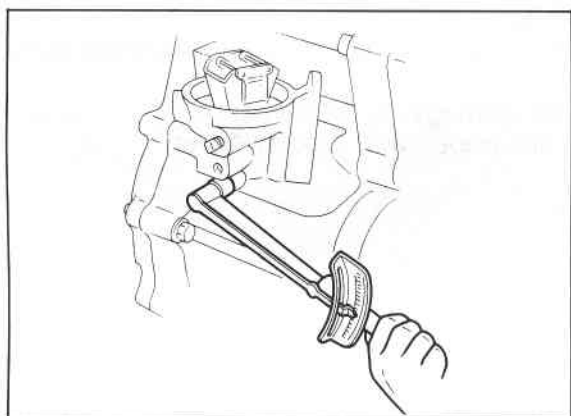
1. Remove the clip from the governor cover.
2. Remove the stopper bolt; then remove the governor assembly.



76G07B-104

Disassembly, Inspection and Assembly

Refer to Governor section of INSPECTION AND REPAIR.



76G07B-105

Installation

Install in the reverse order of removal referring to installation note.

Installation note

Stopper bolt

Tighten the stopper bolt.

Tightening torque:

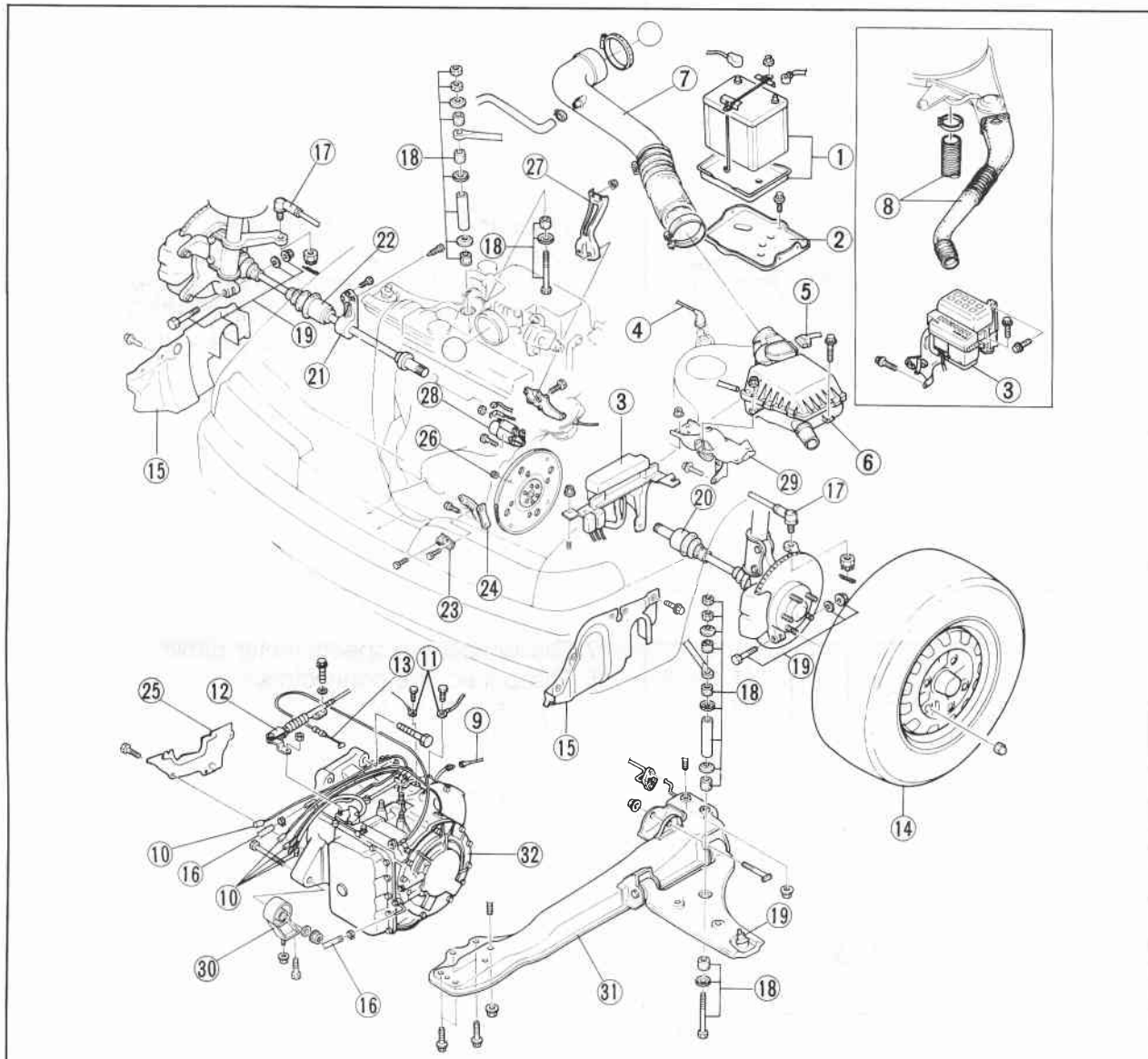
6—9 N·m (60—90 cm·kg, 52—78 in·lb)

REMOVAL

PRECAUTION

- (1) Drain the ATF before removal.
- (2) Jack up the vehicle and support it with safety stands after attaching the engine support.

Components

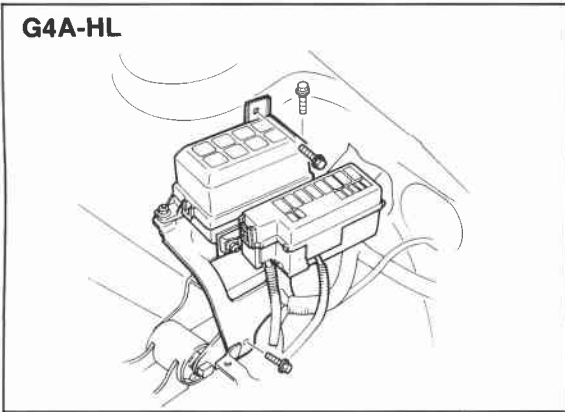


76G07B-106

- | | | |
|--------------------------------------|---------------------------------------|---|
| 1. Battery | 11. Grounds | 22. Joint shaft and driveshaft |
| 2. Battery carrier | 12. Selector cable | 23. Exhaust pipe bracket |
| 3. Main fuse block | 13. Throttle cable | 24. Gusset plates |
| 4. Distributor lead | 14. Front wheels | 25. Under cover |
| 5. Air flow meter connector (G4A-EL) | 15. Splash shields | 26. Torque converter nuts |
| 6. Air cleaner assembly (G4A-EL) | 16. Oil cooler outlet and inlet hoses | 27. Manifold bracket (G4A-EL) |
| 7. Air cleaner hose (G4A-EL) | 17. Tie-rod ends | 28. Starter |
| 8. Fresh air duct (G4A-HL) | 18. Stabilizer bar control links | 29. Engine mount No.4 |
| 9. Speedometer cable | 19. Lower arm ball joints | 30. Engine mount No.2 |
| 10. Connectors | 20. Driveshaft | 31. Crossmember and left side lower arm |
| | 21. Joint shaft bracket | 32. Transaxle |

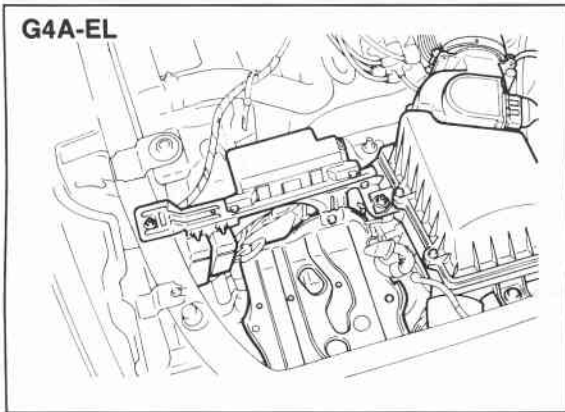
7B REMOVAL

G4A-HL

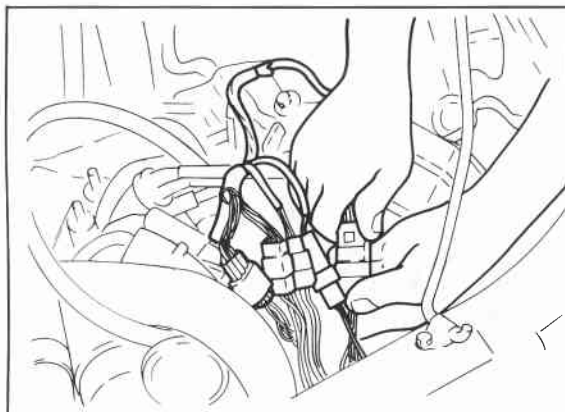


76G07B-107

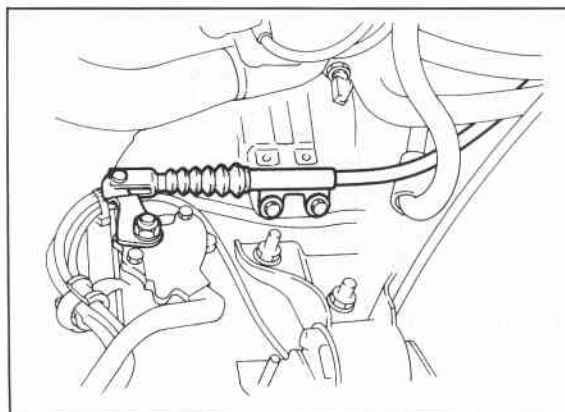
G4A-EL



76G07B-108



76G07B-109



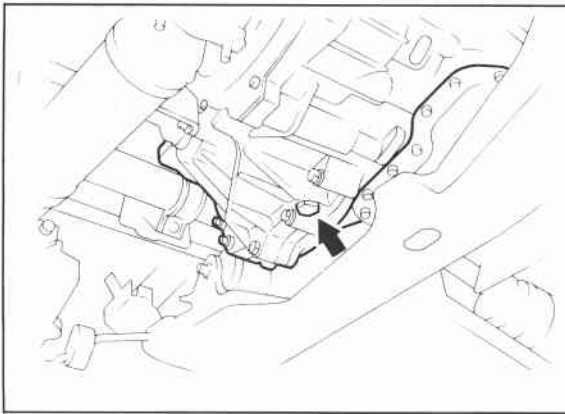
76G07B-110

1. Remove the battery and battery carrier.
2. Disconnect the main fuse block.

3. Disconnect the distributor lead.
4. Disconnect the air flow meter connector and remove the air cleaner assembly. (G4A-EL)
5. Remove the air cleaner hose. (G4A-EL)
6. Remove the fresh air duct. (G4A-HL)

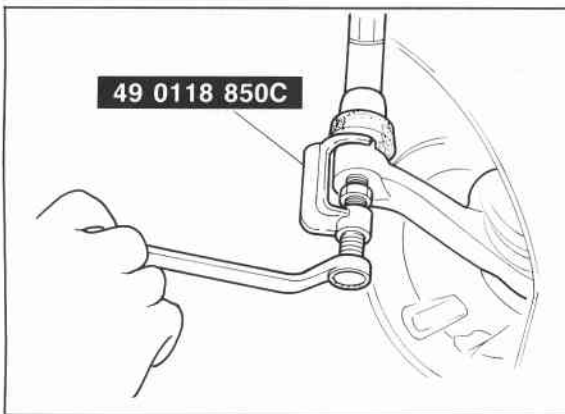
7. Disconnect the speedometer cable.
8. Disconnect the connectors.
 - (1) Inhibitor switch
 - (2) Solenoid valve
 - (3) Pulse generator (G4A-EL)
 - (4) Fluid temperature switch (G4A-EL)
9. Disconnect the grounds from the transaxle case.

10. Disconnect the selector cable.
11. Disconnect the throttle cable.



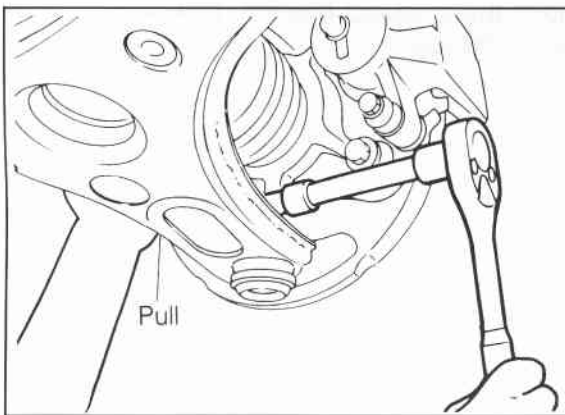
76G07B-111

12. Remove the front wheels.
13. Remove the splash shields.
14. Drain the ATF.
15. Disconnect the oil cooler outlet and inlet hoses.



76G07B-112

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

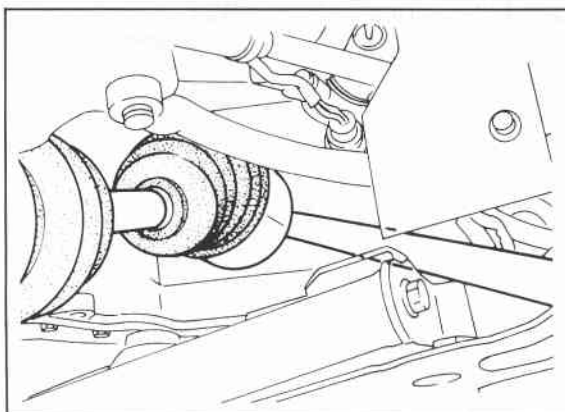


76G07B-113

17. Remove the stabilizer bar control links.
18. Remove the bolts and nuts at the left and right lower arm ball joints.
19. Pull the lower arms downward to separate them from the knuckles.

Caution

Do not damage the ball joint dust boots.



76G07B-114

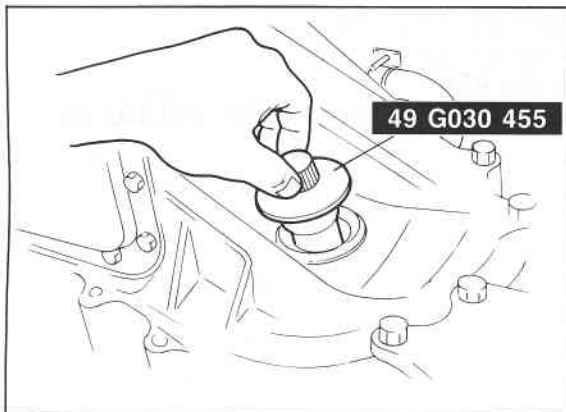
20. Separate the left driveshaft from the transaxle by prying with a bar inserted between the shaft and the case.

Caution

Do not damage the oil seal.

21. Remove the joint shaft bracket.
22. Separate the right driveshaft together with the joint shaft in the same manner.

7B REMOVAL

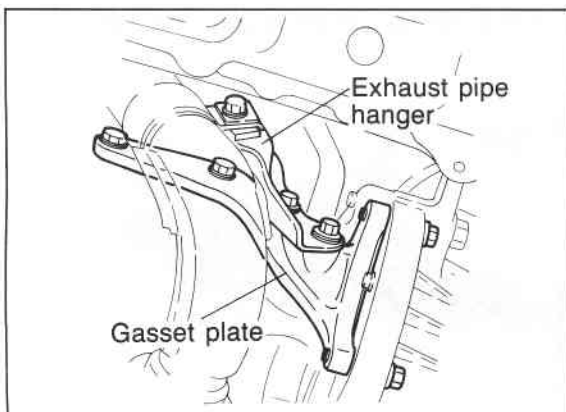


76G07B-115

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

Caution

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

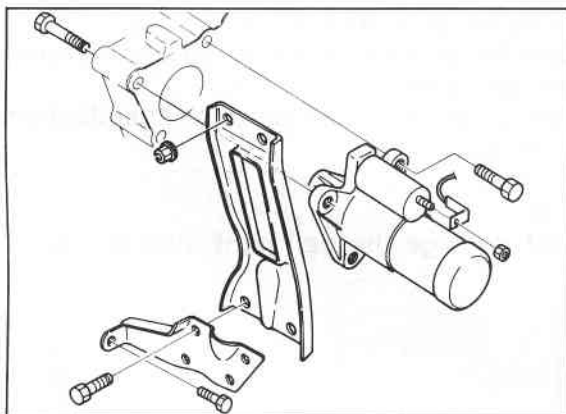


76G07B-116

24. Remove the exhaust pipe hanger and gasket plates.

25. Remove the under cover.

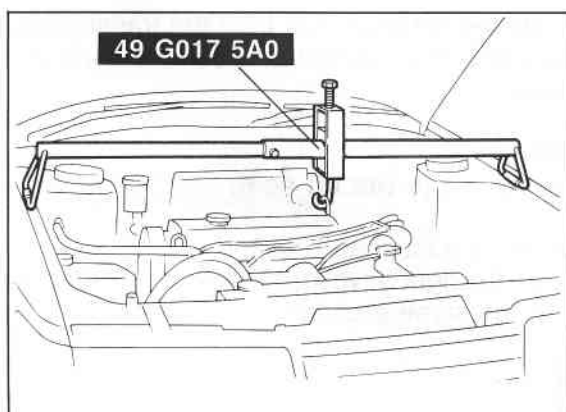
26. Remove the torque converter nuts.



76G07B-117

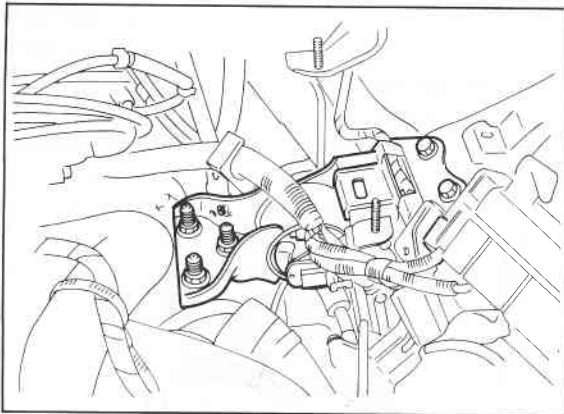
27. Remove the manifold bracket. (G4A-EL)

28. Remove the starter.



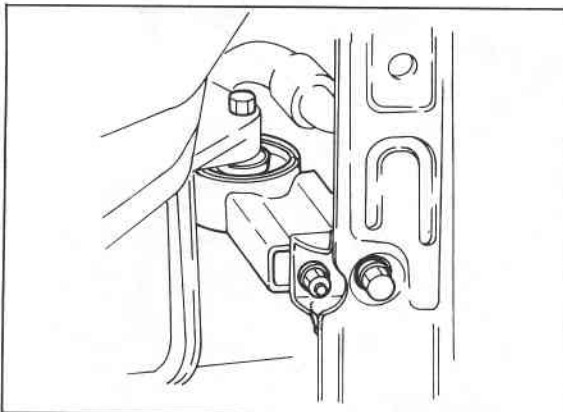
76G07B-118

29. Suspend the engine with the **SST**.



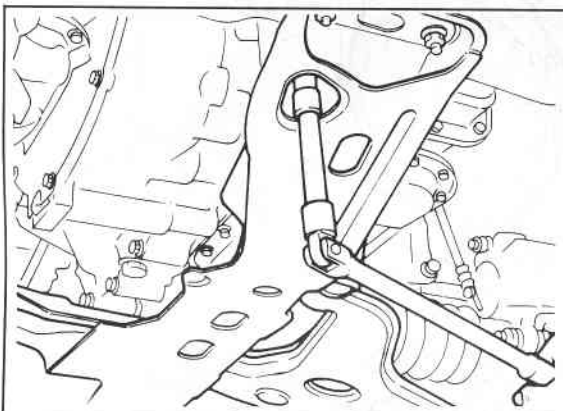
76G07B-119

30. Remove engine mount No. 4 and bracket.



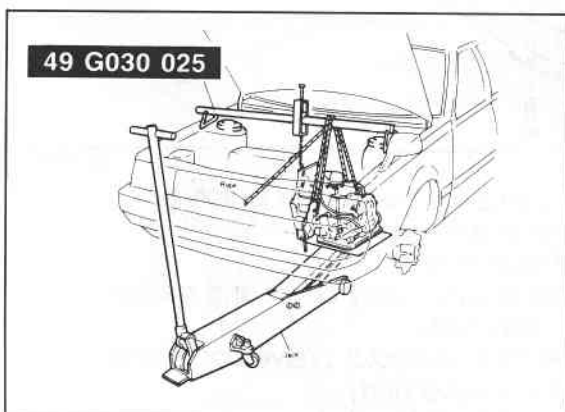
76G07B-120

31. Remove engine mount No. 2.



76G07B-121

32. Remove the crossmember and the left side lower arm as an assembly.



76G07B-122

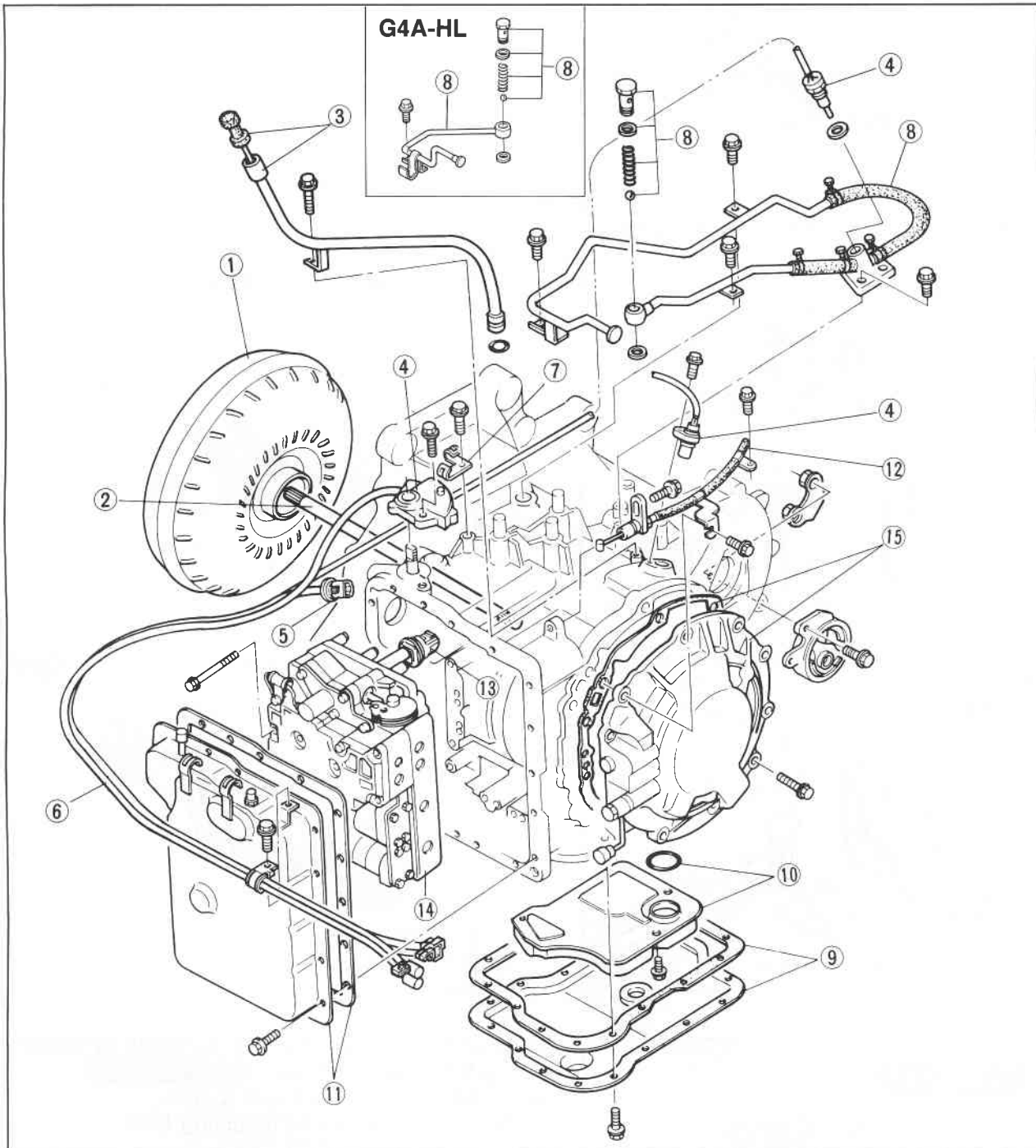
33. Lean the engine toward the transaxle by loosening the engine support hook bolt.
 34. Support the transaxle with a jack.
 35. Remove the transaxle mounting bolts.
 36. Remove the transaxle.

7B DISASSEMBLY

DISASSEMBLY

DISASSEMBLY-STEP 1

Components



86U07B-116

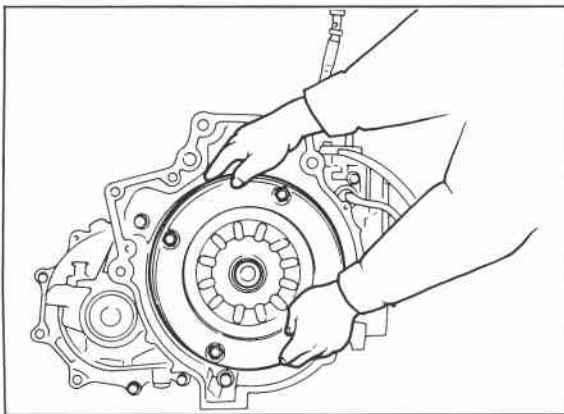
- | | |
|--|--|
| 1. Torque converter | 8. Oil pipes, oil hoses, and switch box |
| 2. Oil pump shaft | 9. Oil pan and gasket |
| 3. Oil level gauge and oil filler tube | 10. Oil strainer and O-ring |
| 4. Pulse generator, fluid temperature switch, and inhibitor switch | 11. Control valve body cover and gasket |
| 5. Solenoid connector | 12. Throttle cable |
| 6. Wire harnesses | 13. Solenoid connector (Valve body side) |
| 7. Harness clip | 14. Control valve body |
| | 15. Oil pump and gasket |

Procedure

Precaution

- (1) Drain the ATF before removing the transaxle from the vehicle.
- (2) Disassemble the transaxle in a clean area (dustproof workspace) to prevent dust entry into the mechanisms.
- (3) Clean the transaxle exterior thoroughly with steam and/or cleaning solvents prior to disassembly.
- (4) Inspect the individual transaxle components in accordance with the Troubleshooting during disassembly.
- (5) Use plastic hammers when applying force to separate the light alloy case joints.
- (6) Do not use rags during disassembly.
- (7) Neatly arrange the removed parts in order during disassembly.

86U07B-117

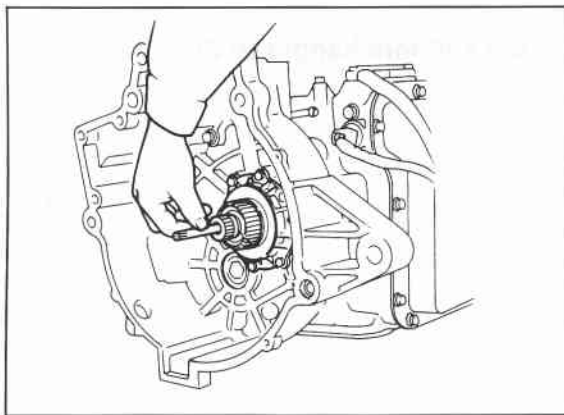


86U07B-118

1. Remove the torque converter from the converter housing.

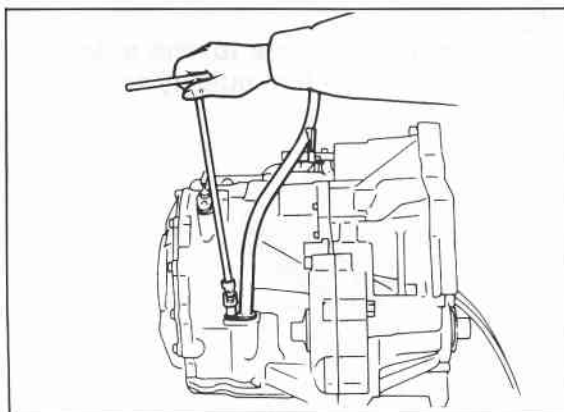
Note

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



86U07B-119

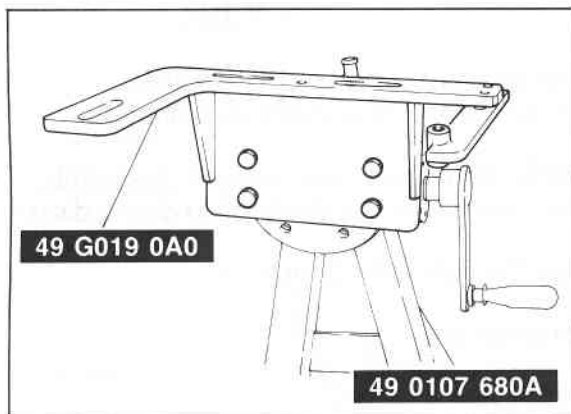
2. Pull out the oil pump shaft by hand.



86U07B-120

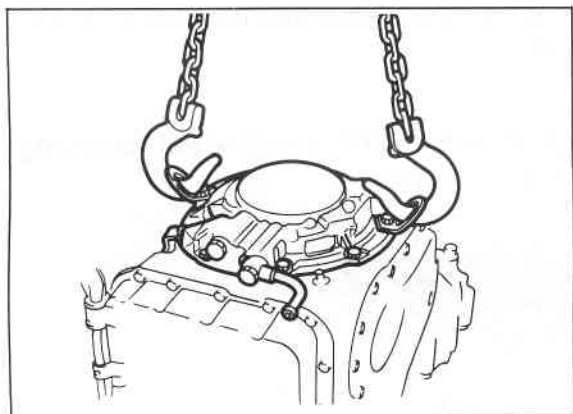
3. Remove the oil level gauge and oil filler tube.

7B DISASSEMBLY

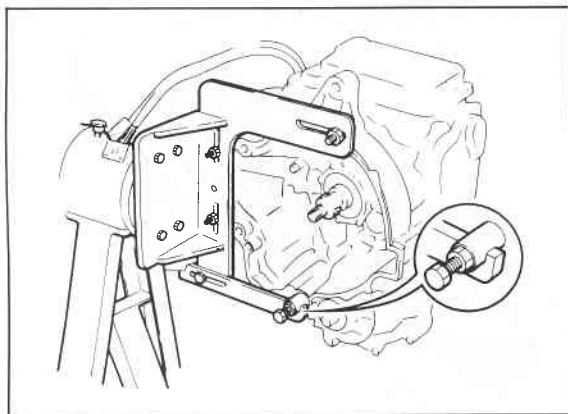


86U07B-121

4. Assemble the **SST**.

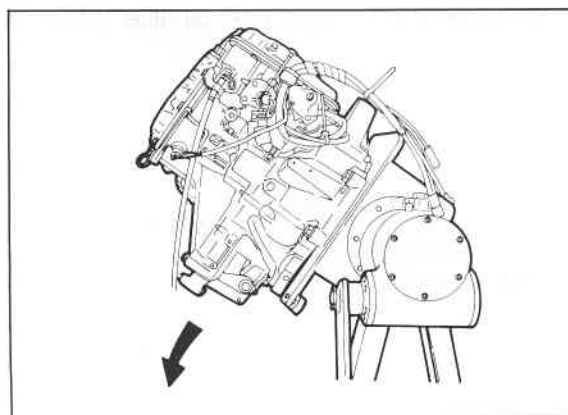


5. Lift the transaxle and mount it on the **SST**.



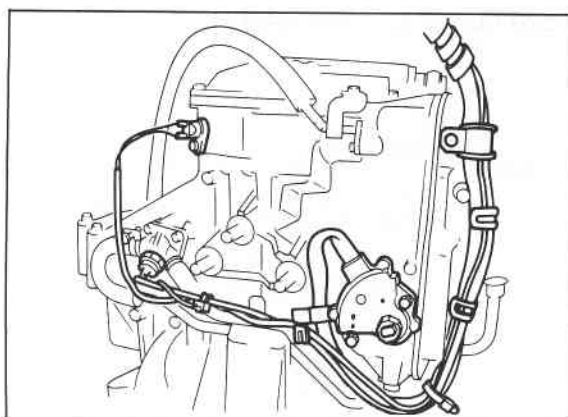
Note

Attach the suitable hanger to the oil pump as shown.



Warning

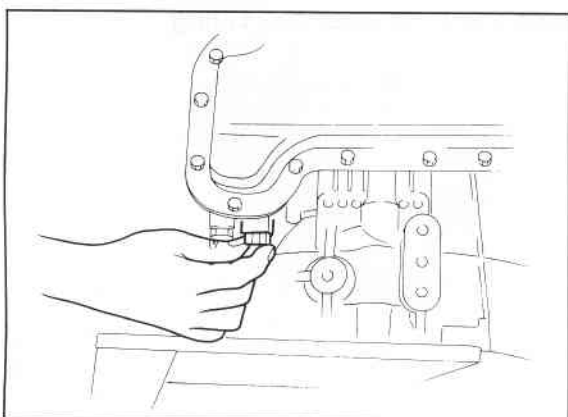
Avoid leaning the transaxle to one side during disassembly, it may turn quickly and cause injury.



76G07B-123

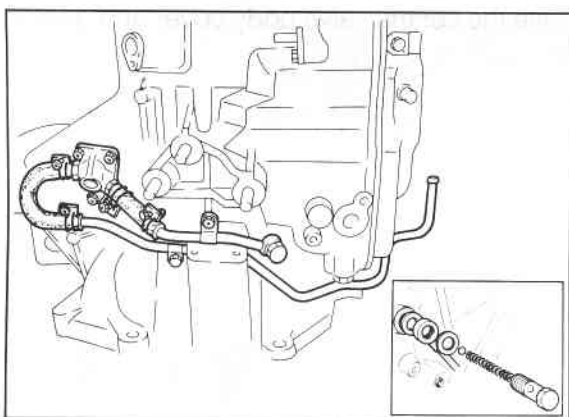
6. **G4A-EL**
Remove the pulse generator, fluid temperature switch, and inhibitor switch.

G4A-HL
Remove the inhibitor switch.



76G07B-124

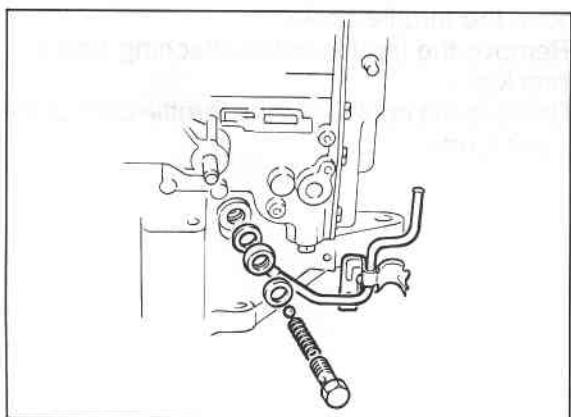
7. Disconnect the solenoid connector.
8. Remove the harnesses.



76G07B-125

9. **G4A-EL**
Remove the harness clip, then remove the oil pipes, oil hoses and switch box as an assembly.

Note
Remove the ball from the case.

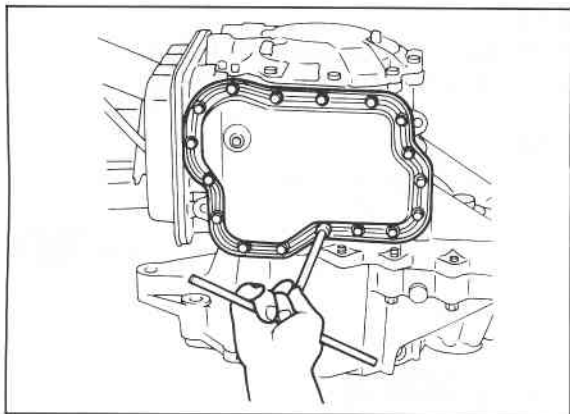


76G07B-126

G4A-HL
Remove the oil pipe.

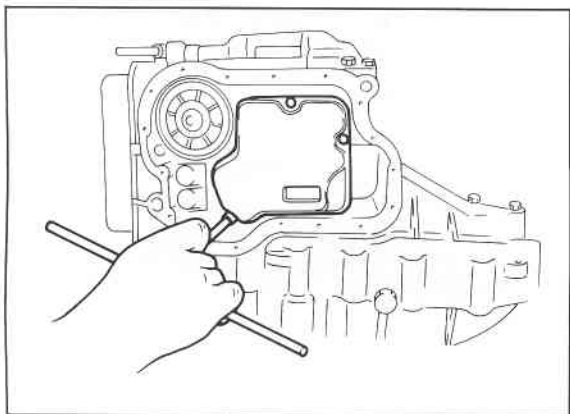
Note
Remove the ball from the case.

7B DISASSEMBLY



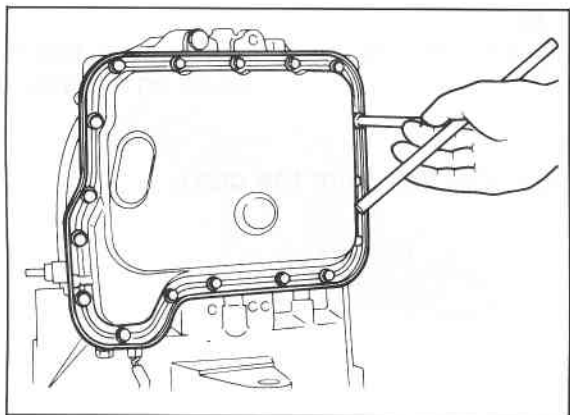
86U07B-128

10. Remove the oil pan and gasket.



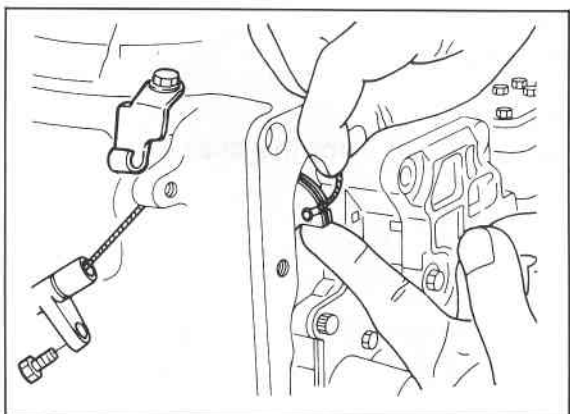
86U07B-129

11. Remove the oil strainer and O-ring.



86U07B-130

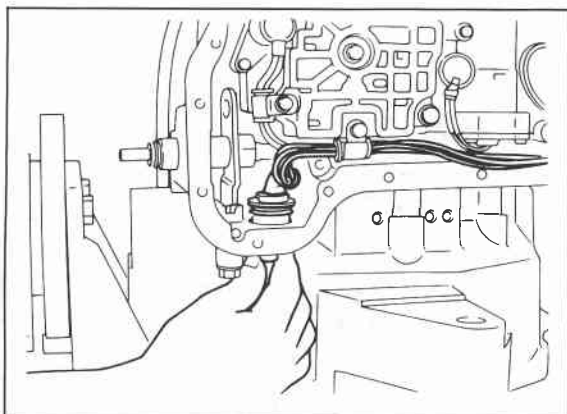
12. Remove the control valve body cover and gasket.



86U07B-131

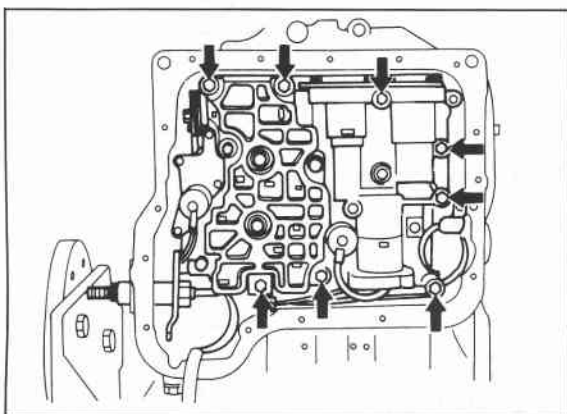
13. Remove the throttle cable.

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



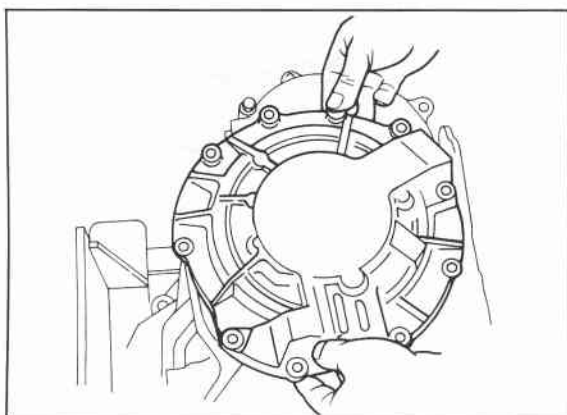
86U07B-132

14. Pinch the teeth of the solenoid connector and remove it by pushing inward.



86U07B-133

15. Remove the control valve body as an assembly.

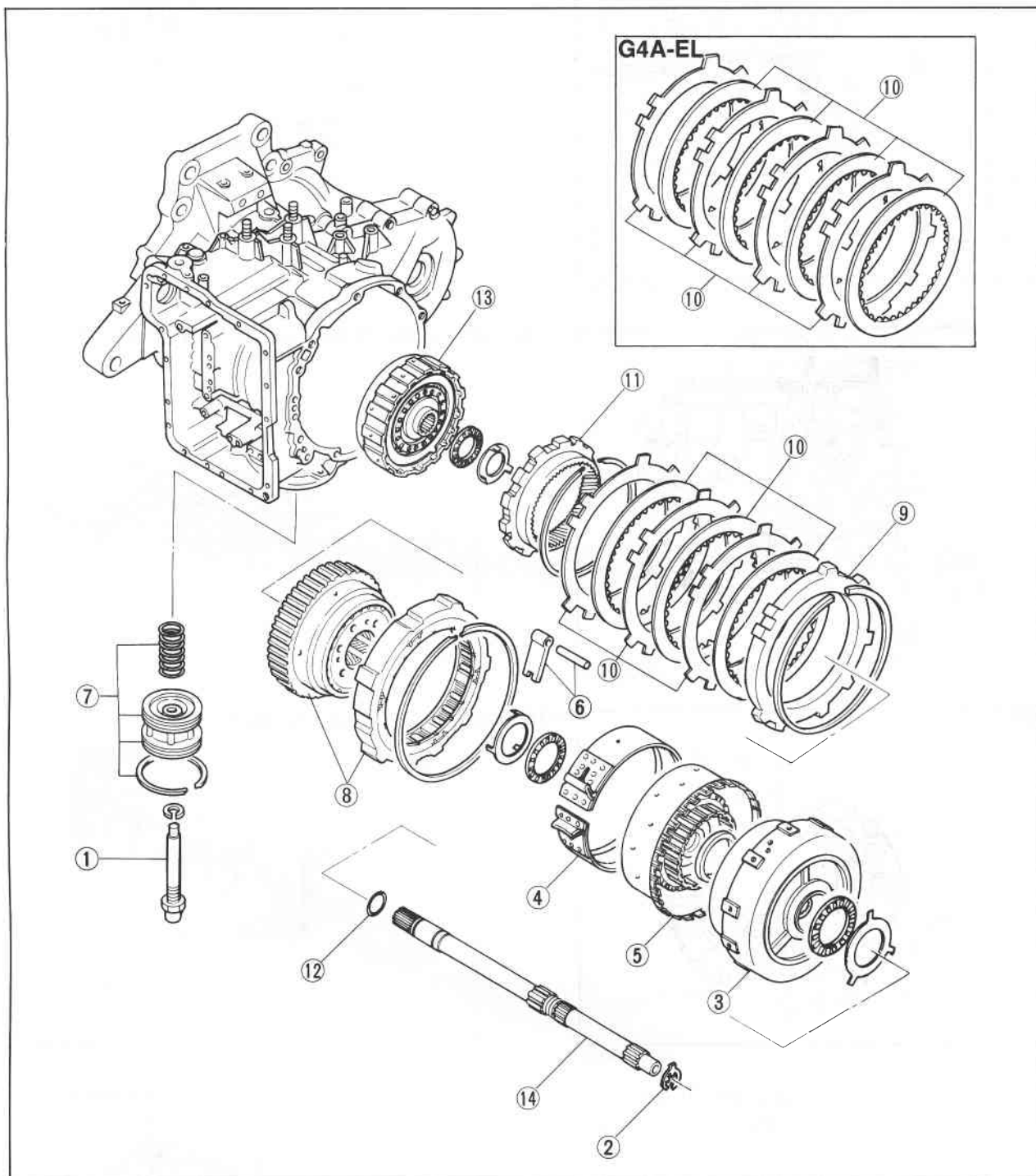


86U07B-134

16. Remove the oil pump as an assembly.

7B DISASSEMBLY

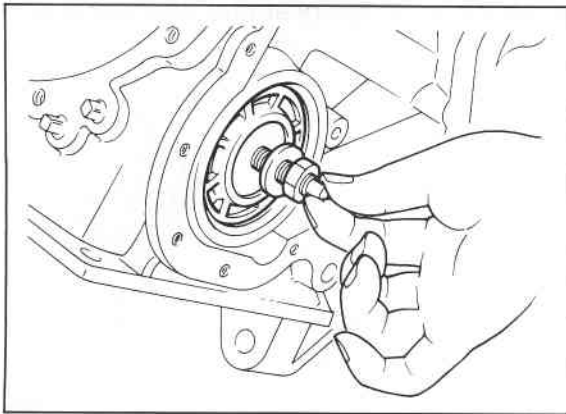
DISASSEMBLY-STEP 2 Components



86U07B-135

—Low and reverse brake—

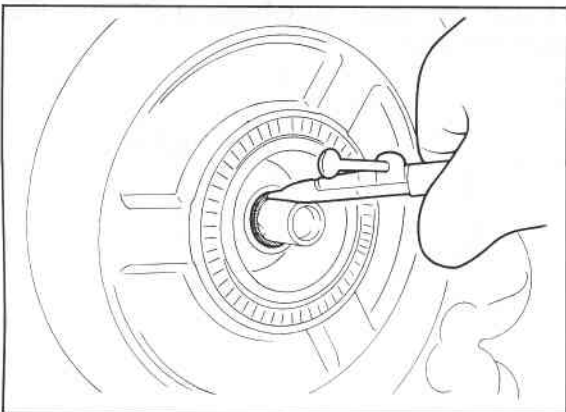
- 9. Retaining plate
- 10. Drive and driven plates
- 11. Internal gear
- 12. O-ring
- 13. 3-4 clutch assembly
- 14. Turbine shaft



86U07B-136

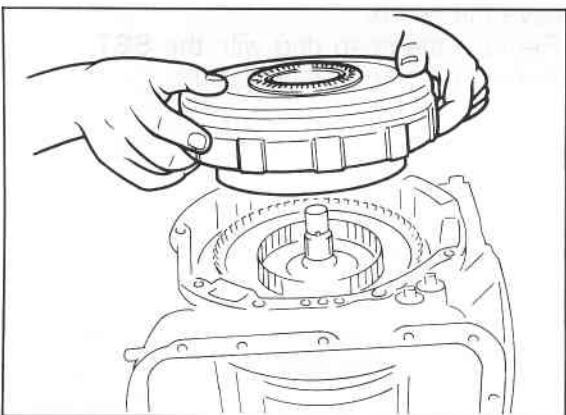
Procedure

1. Remove the piston stem from the servo.



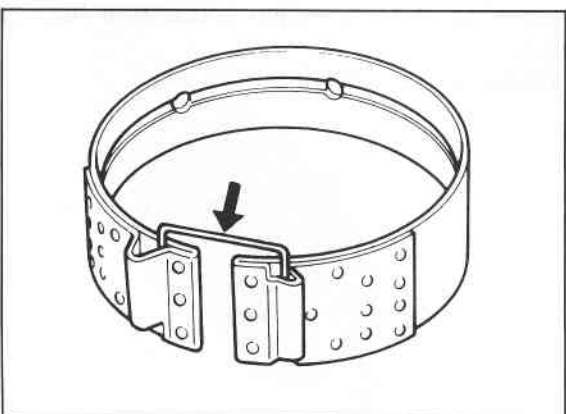
86U07B-137

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



86U07B-138

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



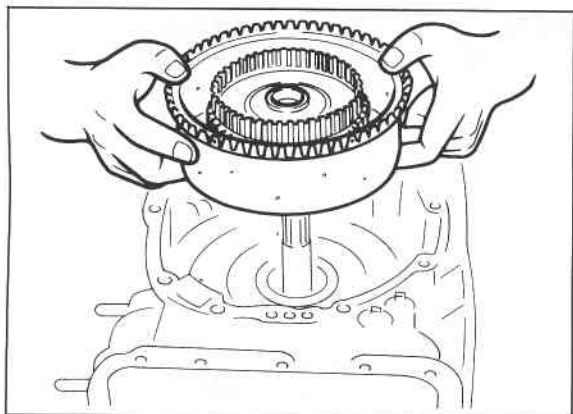
86U07B-139

3. Remove the 2-4 brake band.

Note

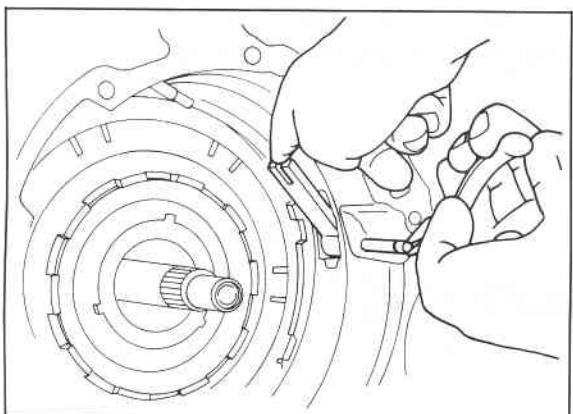
Use a piece of wire to secure the brake band so that it is not damaged by being stretched.

7B DISASSEMBLY



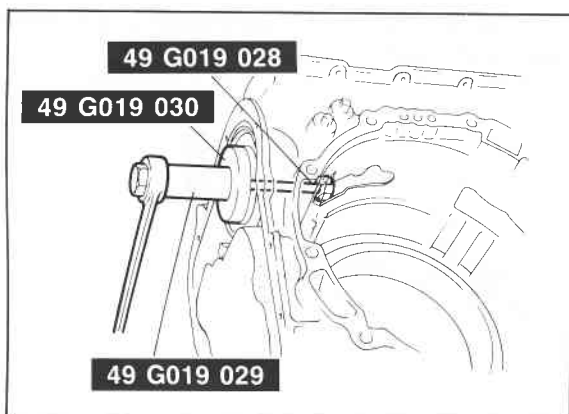
86U07B-140

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



86U07B-141

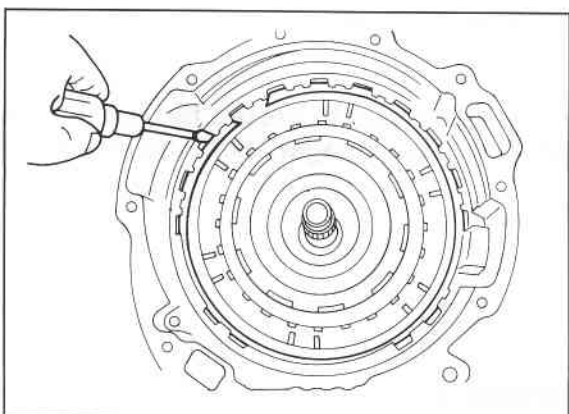
5. Pull the anchor shaft while holding the strut, then remove the strut.



86U07B-142

6. Remove the servo.

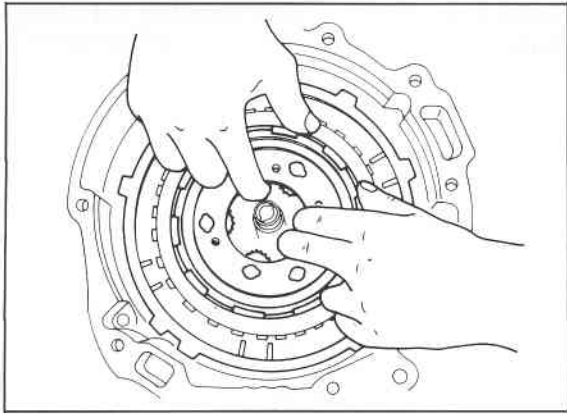
- (1) Remove the snap ring with the **SST**.
- (2) Remove the servo and spring.



86U07B-143

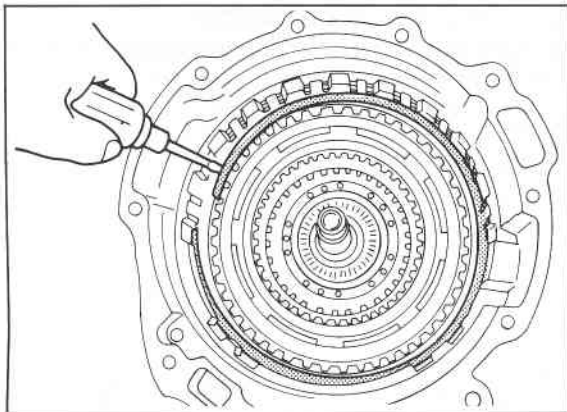
7. Remove the one-way clutch and carrier hub assembly.

- (1) Remove the snap ring.



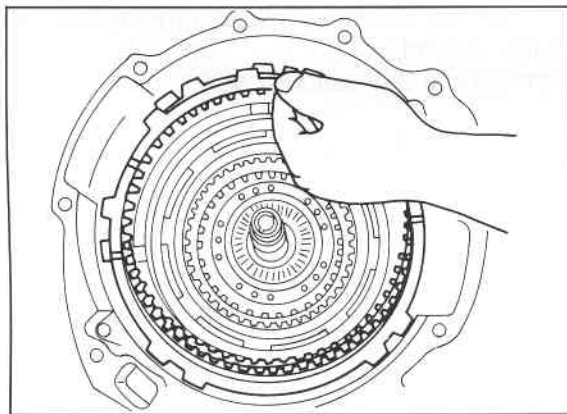
86U07B-144

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



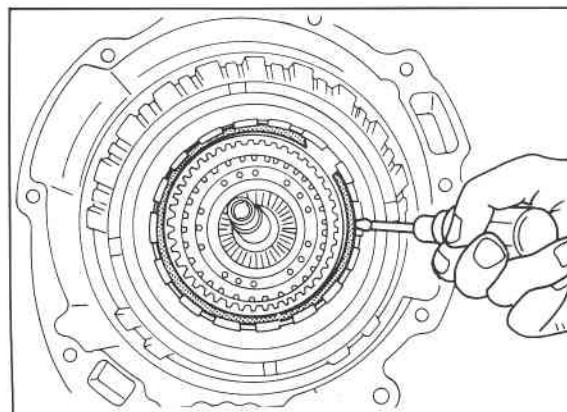
86U07B-145

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



86U07B-146

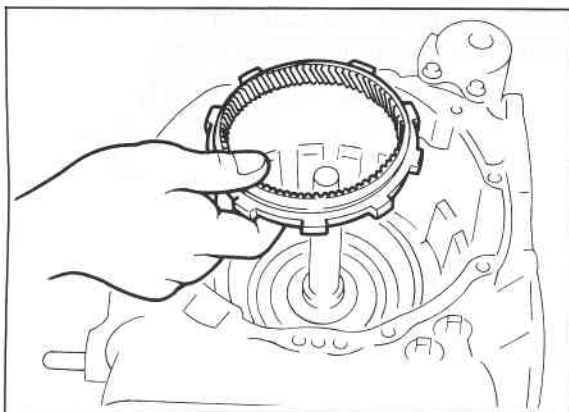
- (2) Remove the retaining plate and the drive and driven plates.



86U07B-147

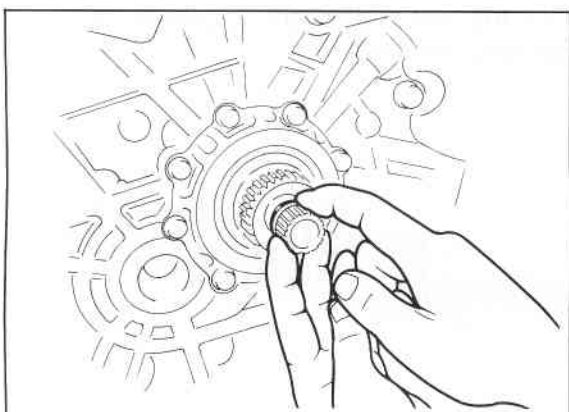
9. Remove the internal gear.
(1) Remove the snap ring.

7B DISASSEMBLY



86U07B-148

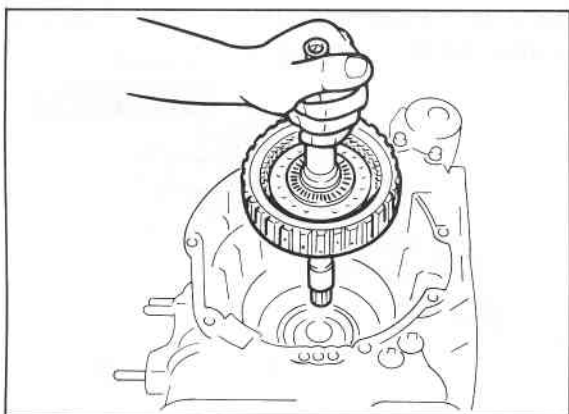
- (2) Remove the internal gear from the 3-4 clutch drum.



86U07B-149

10. Remove the 3-4 clutch assembly.

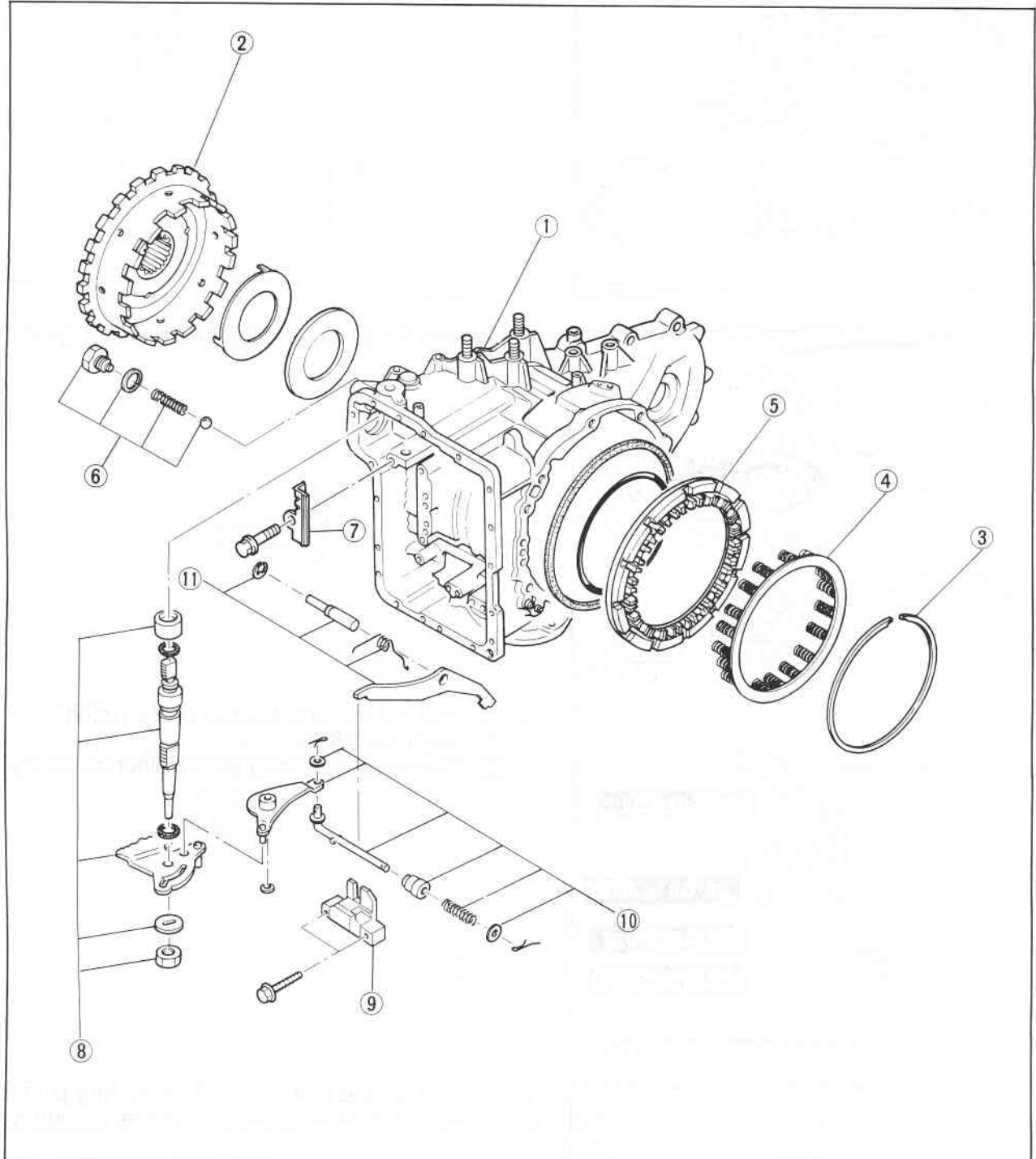
- (1) Remove the O-ring from the turbine shaft at the converter housing side.



86U07B-150

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

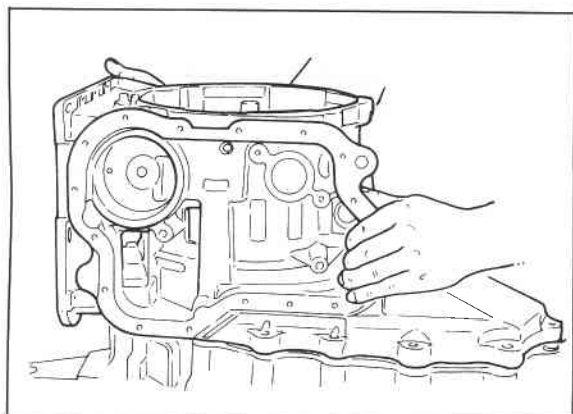
DISASSEMBLY-STEP 3 Component



86U07B-151

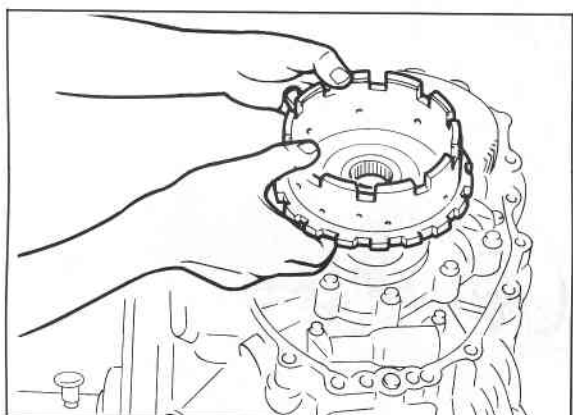
- | | |
|--|----------------------------------|
| 1. Transaxle case | 7. Bracket |
| 2. Output shell | 8. Manual shaft and manual plate |
| 3. Snap ring | 9. Actuator support |
| 4. Spring and retainer assembly | 10. Parking assist lever |
| 5. Low and reverse brake piston | 11. Parking pawl |
| 6. Plug, washer, spring, and detent ball | |

7B DISASSEMBLY



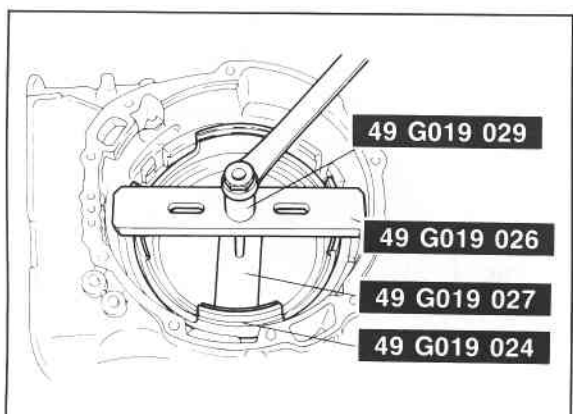
76G07B-127

1. Remove the bolts; then remove the transaxle case by tapping lightly with a plastic hammer.



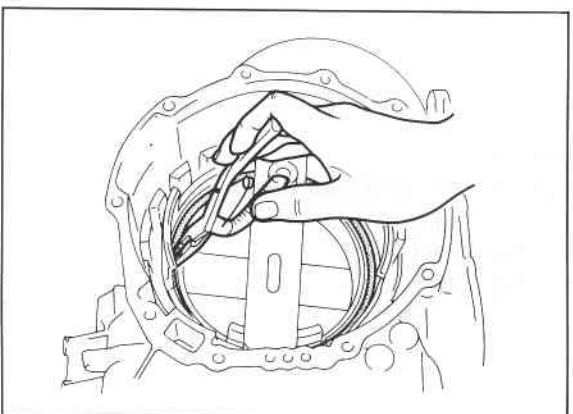
86U07B-153

2. Remove the output shell from the output gear.



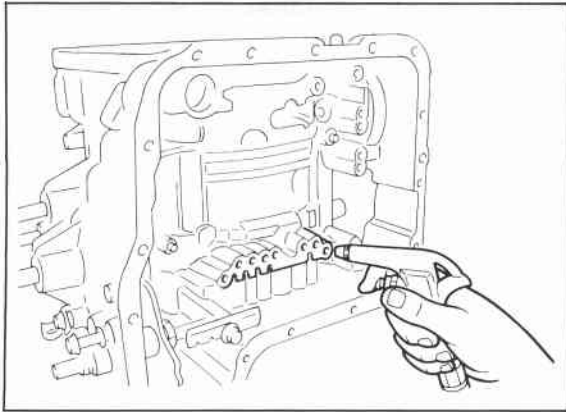
86U07B-154

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



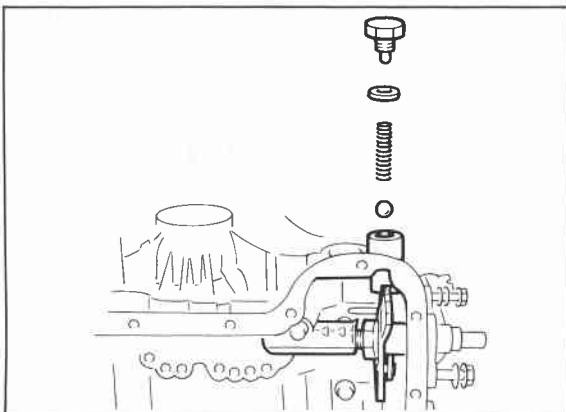
86U07B-155

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



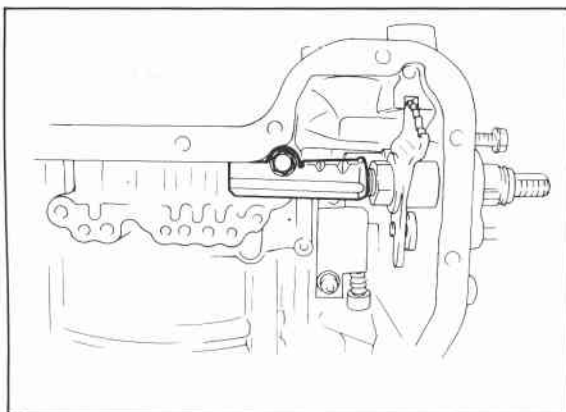
86U07B-156

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



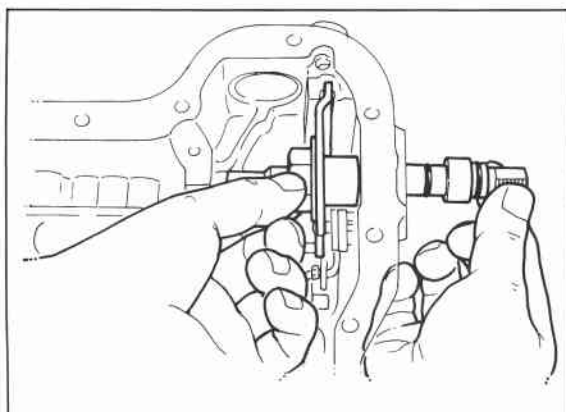
86U07B-157

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



86U07B-158

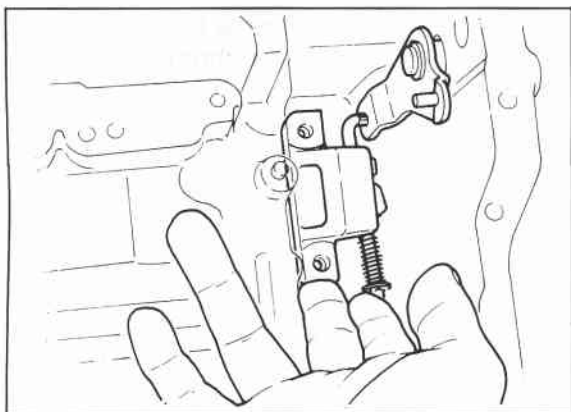
- (2) Remove the bracket.



86U07B-159

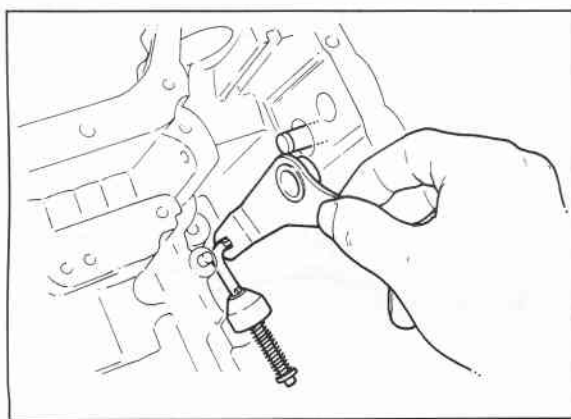
- (3) Loosen the nut and pull the manual shaft out.
- (4) Remove the nut, washer, spacer, and manual plate.

7B DISASSEMBLY



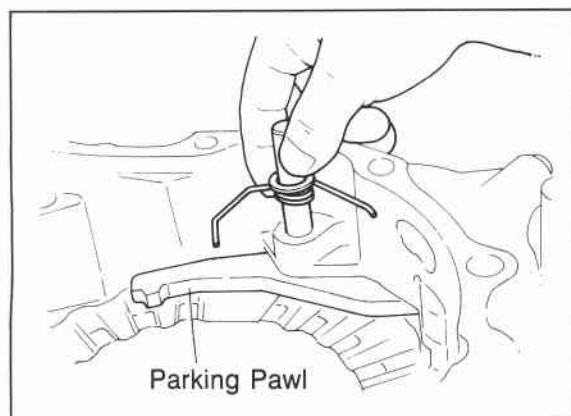
86U07B-160

5. Remove the actuator support.



86U07B-161

6. Remove the snap ring, then remove the parking assist lever.

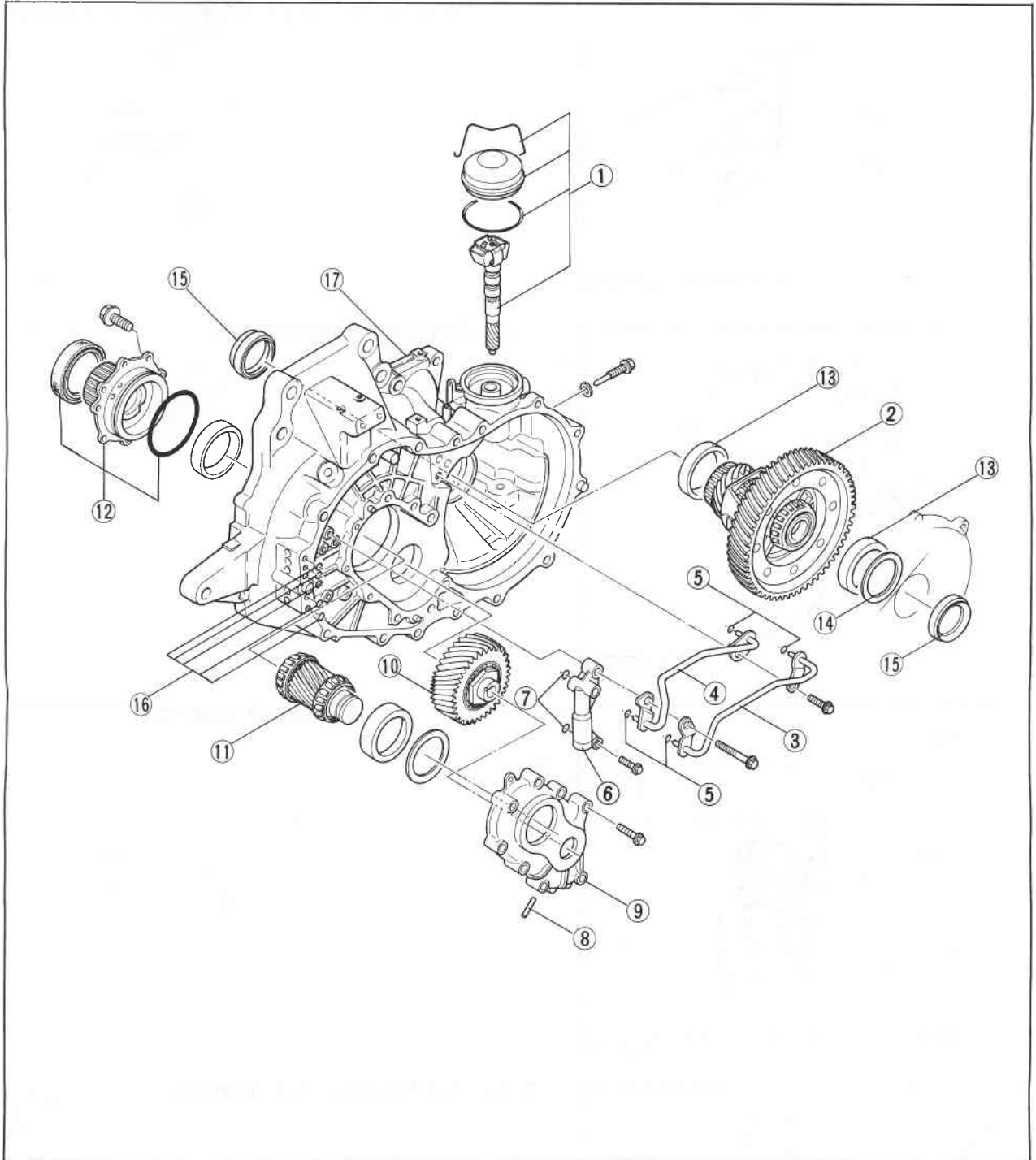


86U07B-162

7. Remove the parking pawl.

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

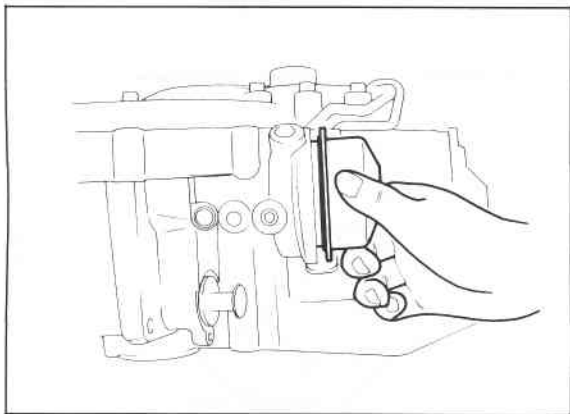
DISASSEMBLY—STEP 4 Component



76G07B-128

- | | |
|------------------------------------|----------------------------|
| 1. Governor assembly (G4A-HL) | 9. Bearing housing |
| 2. Differential assembly | 10. Idle gear assembly |
| 3. Governor outlet pipe (G4A-HL) | 11. Output gear assembly |
| 4. Governor inlet pipe (G4A-HL) | 12. Bearing cover assembly |
| 5. O-rings (G4A-HL) | 13. Bearing outer races |
| 6. 2-3 accumulator piston assembly | 14. Adjust shim |
| 7. O-rings | 15. Oil seals |
| 8. Roll pin | 16. O-rings |
| | 17. Converter housing |

7B DISASSEMBLY

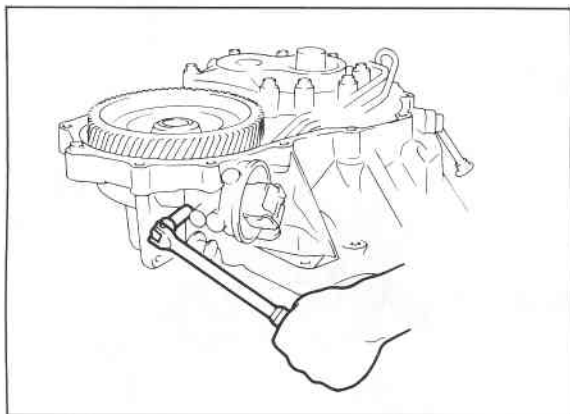


76G07B-129

Procedure

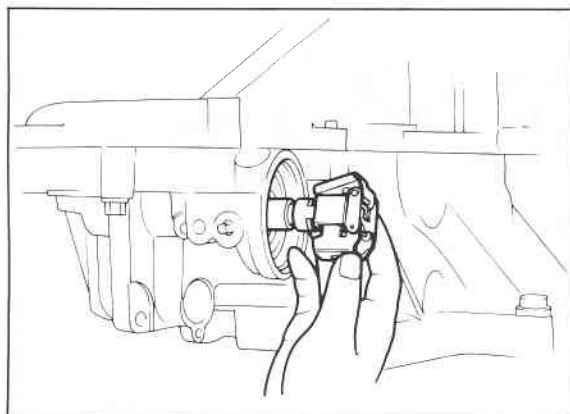
1. Remove the governor assembly.

(1) Remove the clip, governor cover and O-ring.



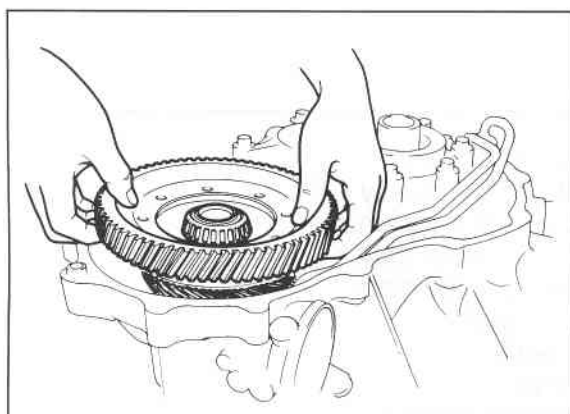
83U07B-165

(2) Remove the stopper bolt.



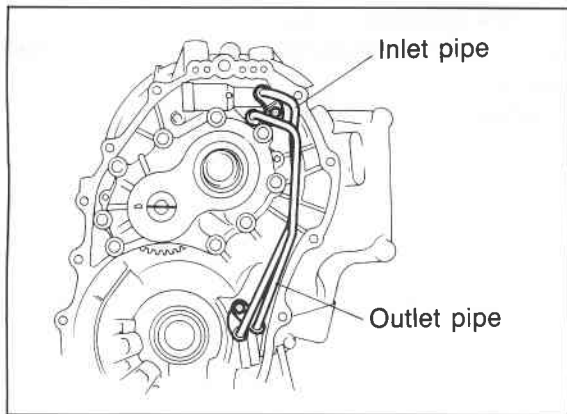
83U07B-166

(3) Remove the governor assembly.



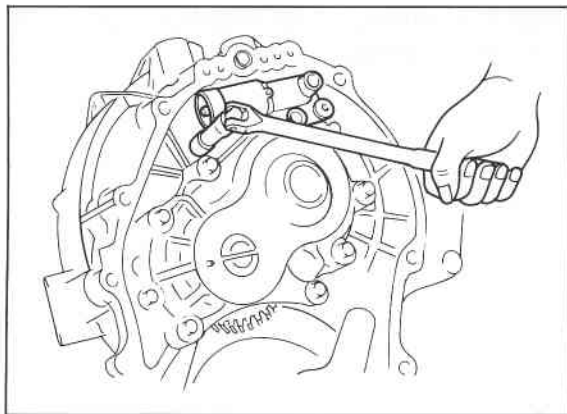
83U07B-167

2. Remove the differential assembly.



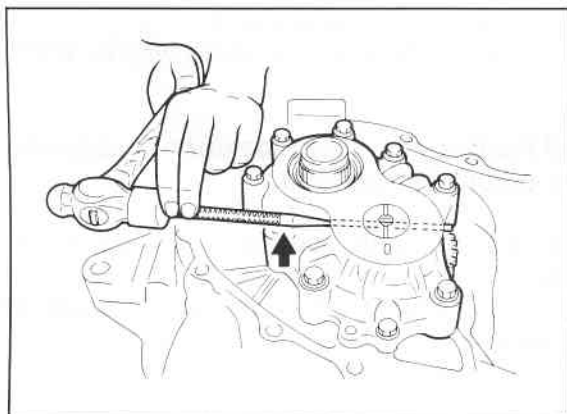
83U07B-168

3. Remove the governor outlet pipe, governor inlet pipe, and O-rings.



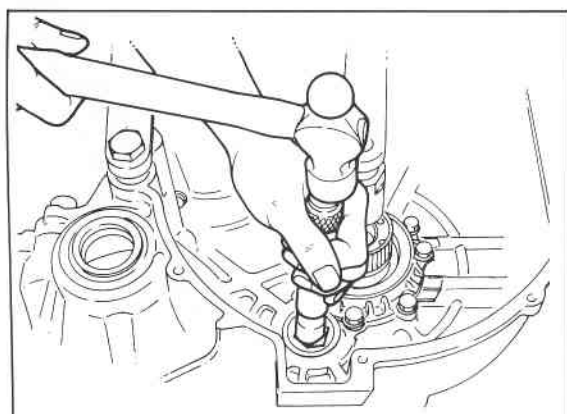
83U07B-169

4. Remove the 2-3 accumulator piston assembly and O-rings.



83U07B-170

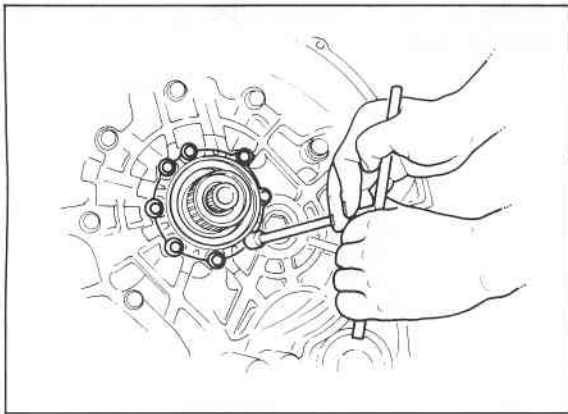
5. Remove the bearing housing.
 - (1) Remove the bolt indicated in the figure.
 - (2) Remove the roll pin with a pin punch.
 - (3) Remove the bearing housing by tapping lightly with a plastic hammer.



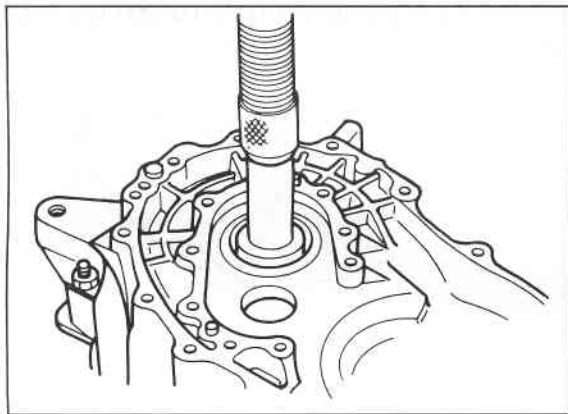
83U07B-171

6. Remove the idle gear assembly and output gear assembly by tapping out from the torque converter side.

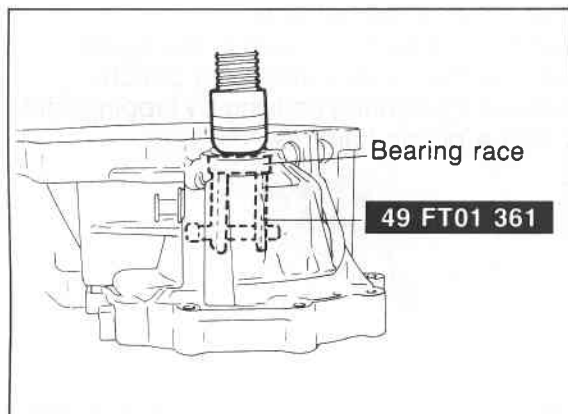
7B DISASSEMBLY



83U07B-172



83U07B-173



83U07B-174

7. Remove the bearing cover.

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

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

8. Remove the bearing outer races.

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

Note

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

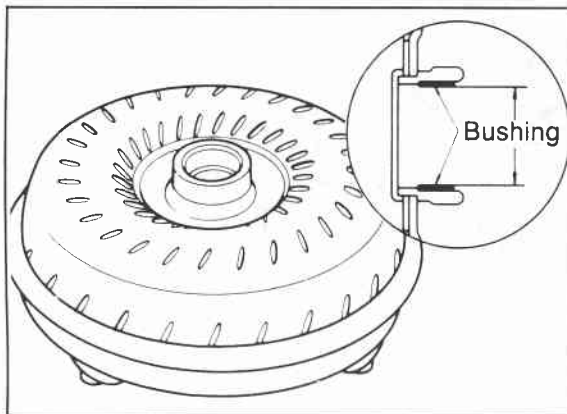
9. Check the oil seals for damage, replace if necessary.
10. Check the O-rings for damage, replace if necessary.

INSPECTION AND REPAIR

PRECAUTION

- (1) Several of the parts resemble each other; organize them so that they do not get mixed up.
- (2) Clean each part with cleaning oil, clean out the oil holes and oil passages with compressed air, and check that there are no obstructions.
- (3) When using cleaning oil and compressed air, wear protective eyewear.
- (4) If a clutch plate or brake band is replaced with a new one, soak it in ATF for 2 hours or more before installing.
- (5) Before assembly, apply ATF to all seal rings, rotating parts, and sliding parts.
- (6) All seals, gaskets and roll pins must be replaced with new ones during assembly.
- (7) Use petroleum jelly, not grease where required.
- (8) When it is necessary to replace a bushing, replace the assembly which includes that bushing.

76G07B-217



86U07B-172

TORQUE CONVERTER

The torque converter is welded together and cannot be disassembled.

Inspection

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

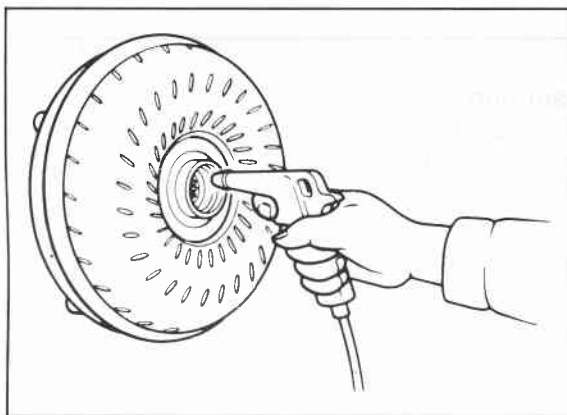
Bushing inner diameter

Standard: 53.030 mm (2.088 in)

Maximum: 53.076 mm (2.090 in)

Washing Inside of Converter

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



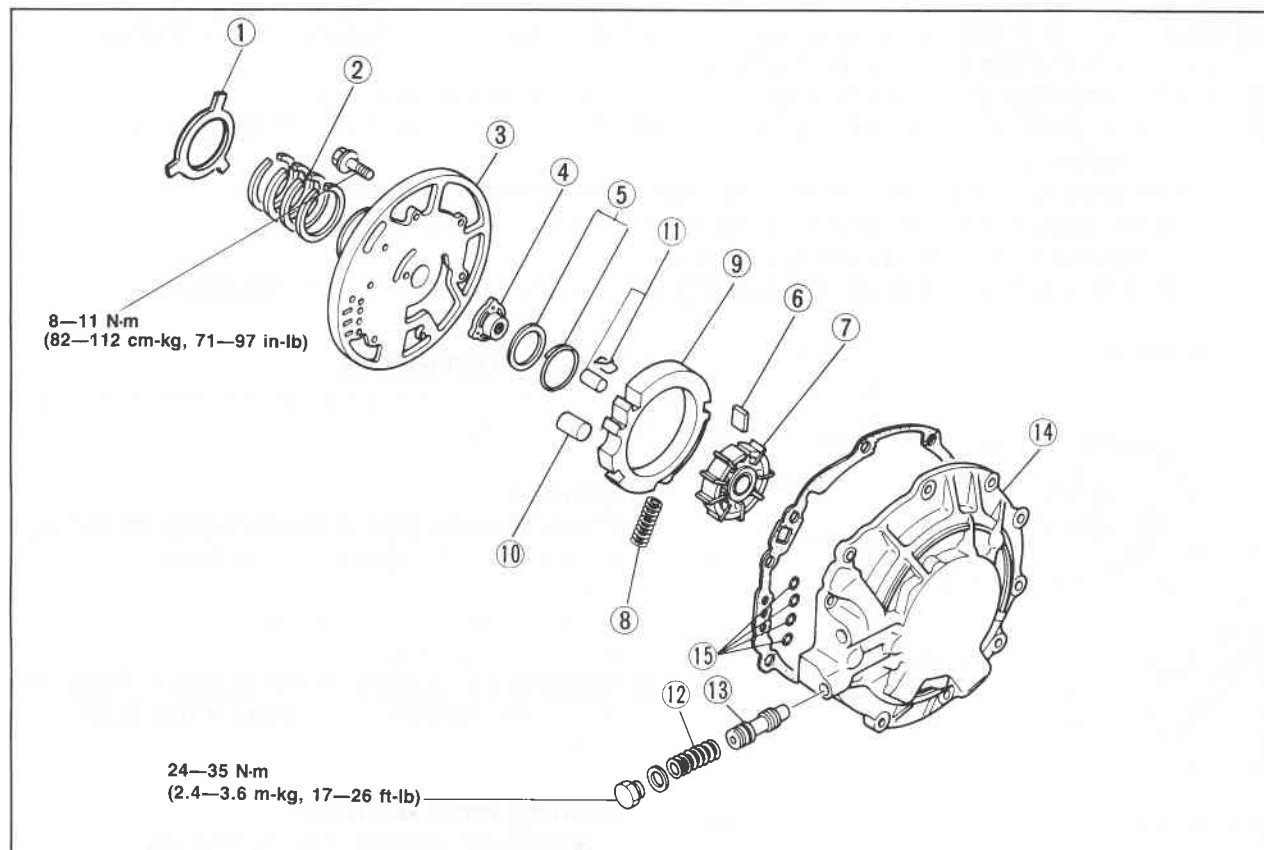
86U07B-173

7B INSPECTION AND REPAIR

OIL PUMP

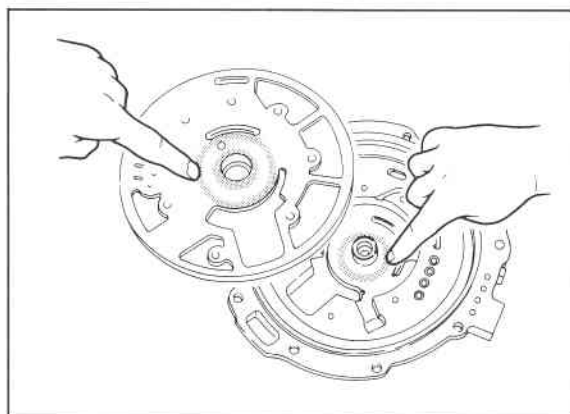
Disassembly

Disassemble in the sequence shown in the figure.



86U07B-174

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



86U07B-175

Inspection

Check the following and replace any faulty parts.

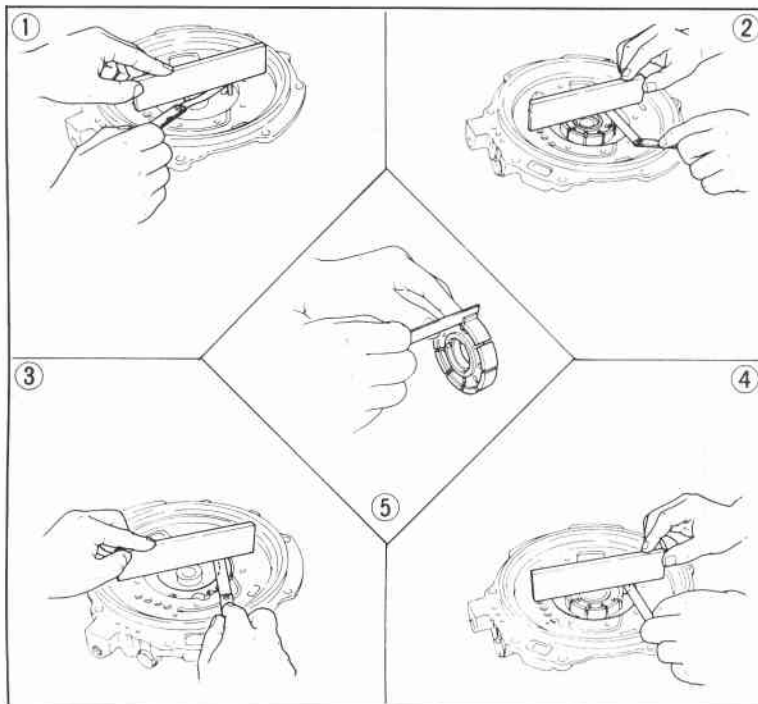
1. Sliding surfaces of the oil pump cover and oil pump body for damage or wear
2. Broken or worn seal ring
3. Weakened spring

Free length of springs:

- (1) For the cam ring (No. 8)
41.6 mm (1.64 in)
- (2) For the valve (No. 12)
35.0 mm (1.38 in)

4. Clearance

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



86U07B-176

1. Seal pin—Oil pump cover

Standard:

0.005—0.020 mm

(0.0002—0.0008 in)

Maximum: 0.060 mm (0.002 in)

2. Rotor—Oil pump cover

Standard:

0.005—0.020 mm

(0.0002—0.0008 in)

Maximum: 0.030 mm (0.0012 in)

3. Cam ring—Oil pump cover

Standard:

0.005—0.020 mm

(0.0002—0.0008 in)

Maximum: 0.080 mm (0.003 in)

4. Vane—Oil pump cover

Standard:

0.015—0.050 mm

(0.0006—0.0020 in)

Maximum: 0.080 mm (0.003 in)

5. Vane—Rotor groove

Standard:

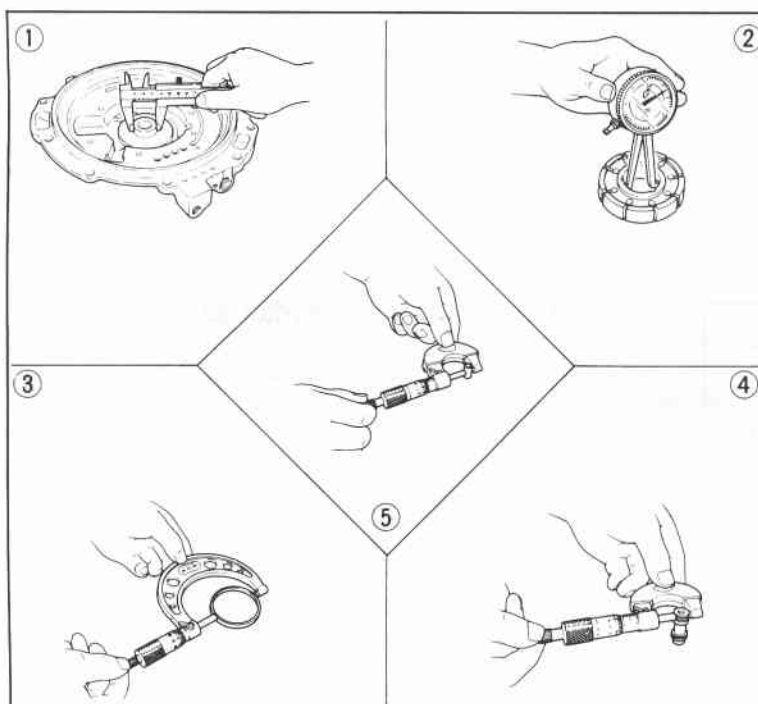
0.010—0.045 mm

(0.0004—0.0018 in)

Maximum: 0.065 mm (0.0026 in)

5. Wear limit

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



76G07B-218

1. Oil pump body sleeve.. outer diameter

Standard: 28.00 mm (1.102 in)

2. Rotor bushing inner diameter

Standard: 28.00 mm (1.102 in)

Maximum: 28.05 mm (1.104 in)

3. Guide ring outer diameter

Standard: 57.85 mm (2.278 in)

Minimum: 57.70 mm (2.272 in)

4. Valve..... outer diameter

Standard: 12.00 mm (0.472 in)

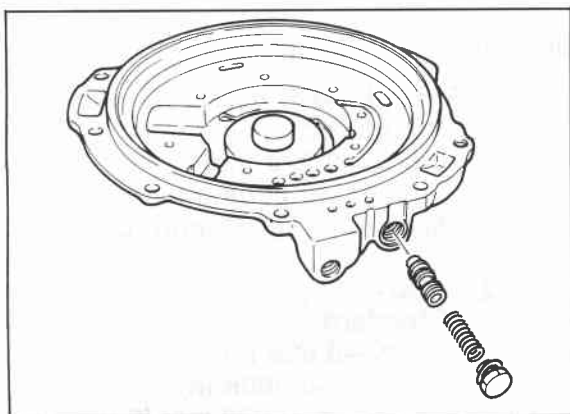
Minimum: 11.86 mm (0.467 in)

5. Seal pin..... outer diameter

Standard: 5.00 mm (0.197 in)

Minimum: 4.90 mm (0.193 in)

7B INSPECTION AND REPAIR



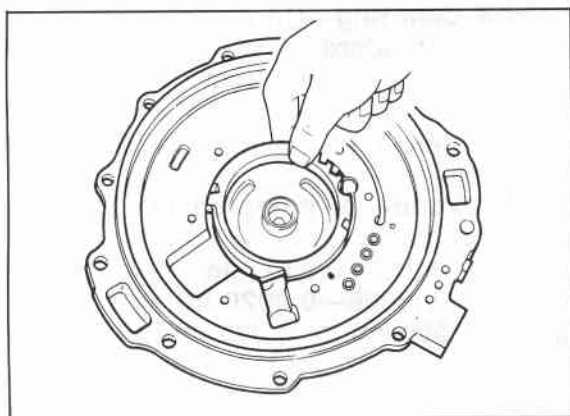
86U07B-178

Assembly

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

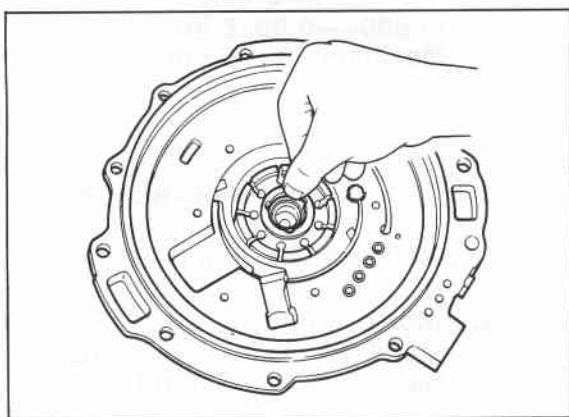
Tightening torque:

24—35 N·m (2.4—3.6 m·kg, 17—26 ft·lb)



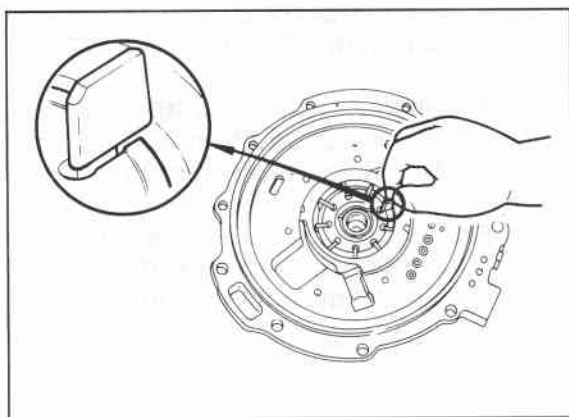
86U07B-179

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



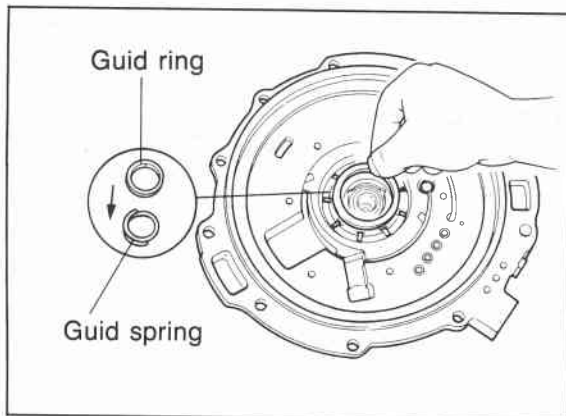
86U07B-180

4. Install the rotor onto the oil pump body.



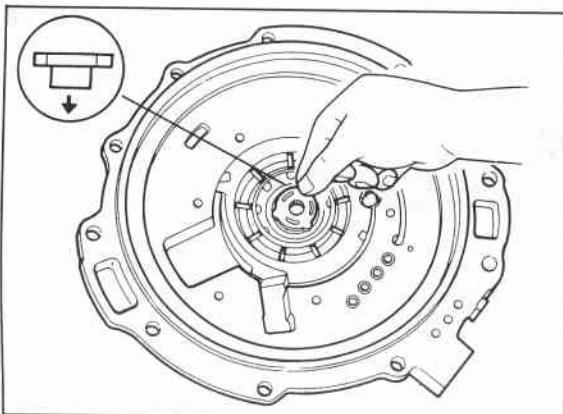
86U07B-181

5. Install the vanes into the rotor as shown.



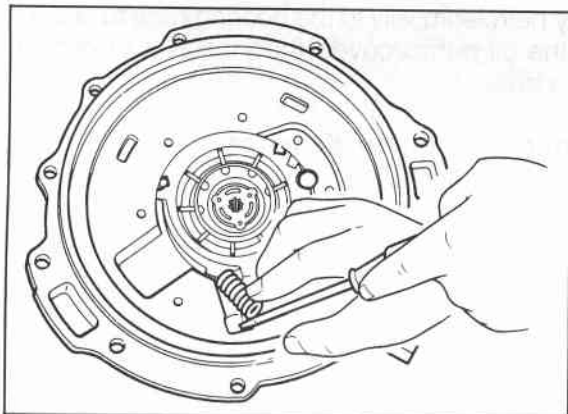
86U07B-182

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



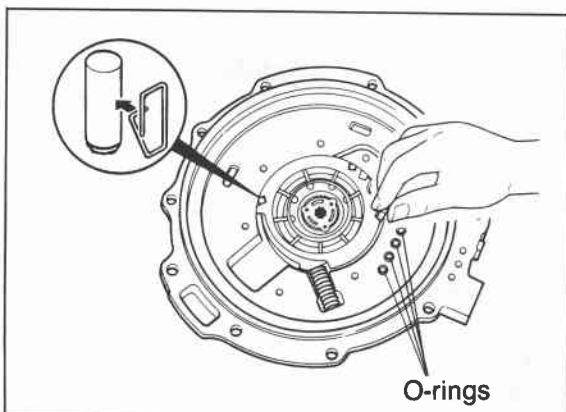
86U07B-183

7. Install the pump flange onto the rotor.



86U07B-184

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



86U07B-185

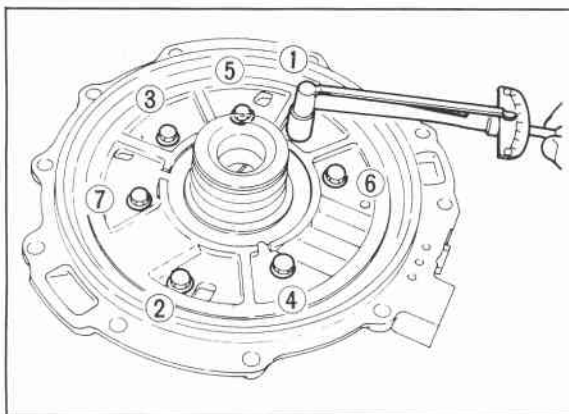
9. Install the seal pins and springs with the pins facing toward the oil pump body.

Note

Install the seal pins round end first.

10. Install the O-rings.

7B INSPECTION AND REPAIR

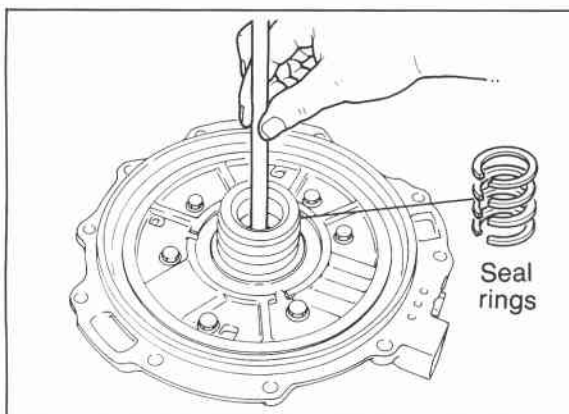


86U07B-186

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

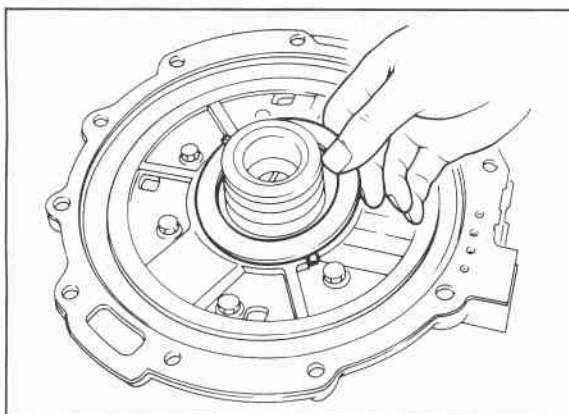
Tightening torque:

8—11 N·m (82—112 cm·kg, 71—97 in·lb)



86U07B-187

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



86U07B-188

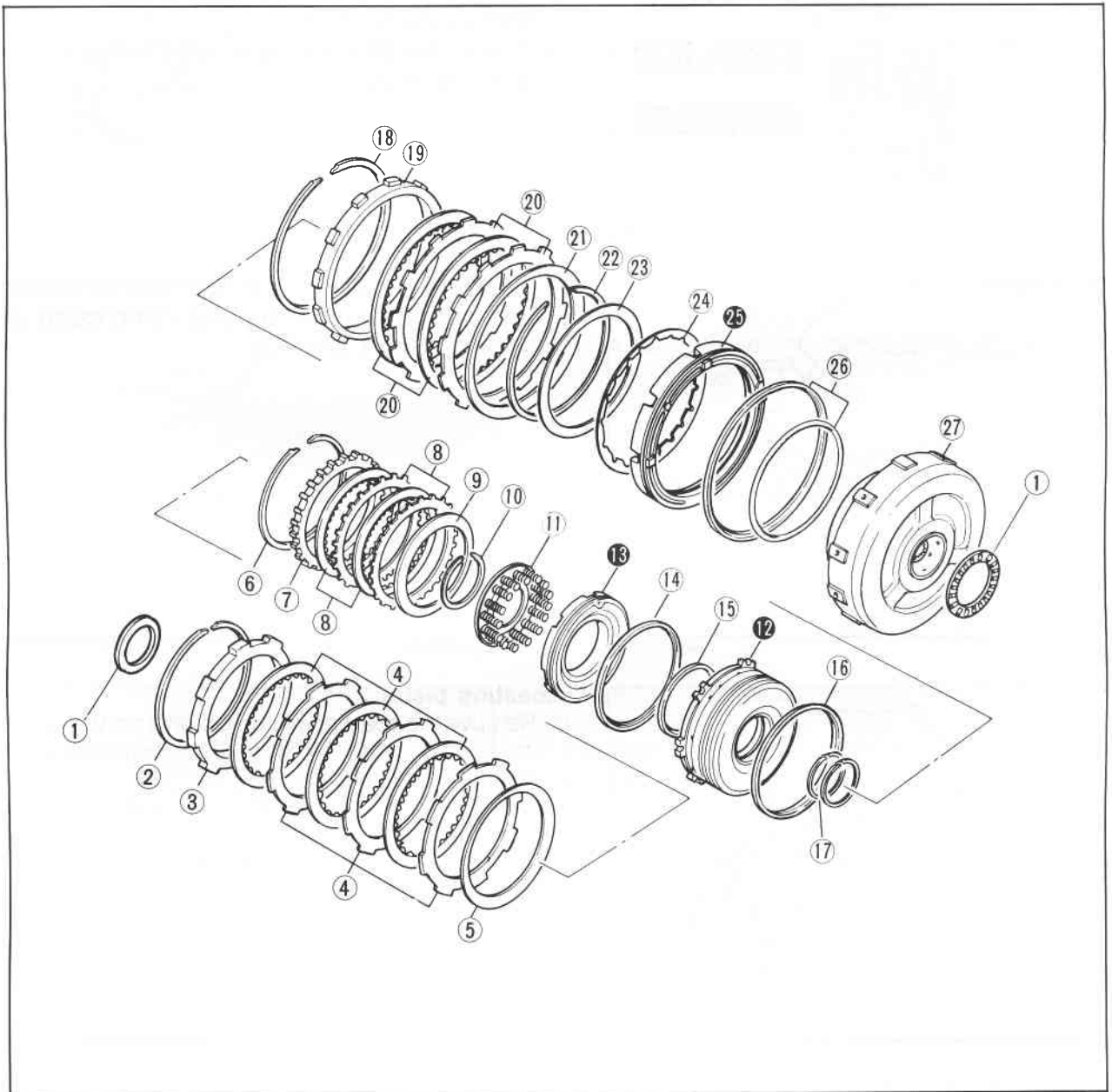
14. Apply petroleum jelly to the bearing race to secure it to the oil pump cover; then install it on the oil pump cover.

Bearing race outer diameter:

88.0 mm (3.46 in)

CLUTCH ASSEMBLY**Disassembly**

Disassemble in the sequence shown in the figure referring to the disassembly note for the specially marked parts.



86U07B-189

—Forward clutch—

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

—Coasting clutch—

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

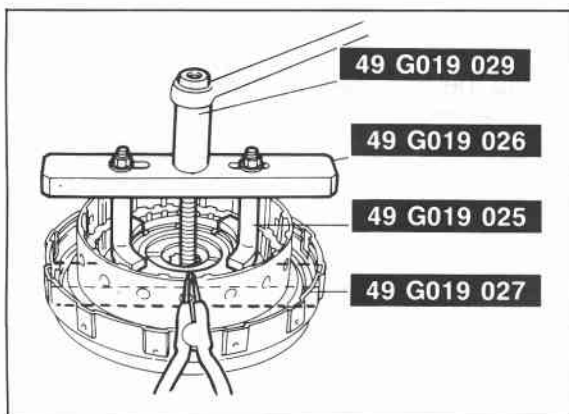
10. Snap ring
11. Spring and retainer assembly
12. Coasting clutch drum
13. Coasting piston
14. Outer seal
15. Inner seal
16. Outer seal
17. Seal rings

—Reverse clutch—

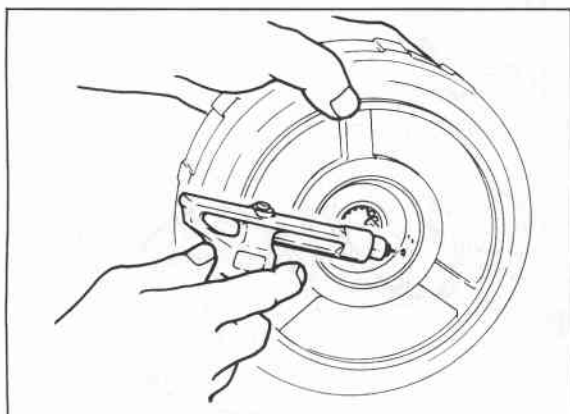
18. Snap ring

19. Retaining plate
20. Drive and driven plates
21. Dished plate
22. Snap ring
23. Return spring stopper
24. Piston return spring
25. Reverse piston
26. Seal rings (inner and outer)
27. Reverse and forward drum

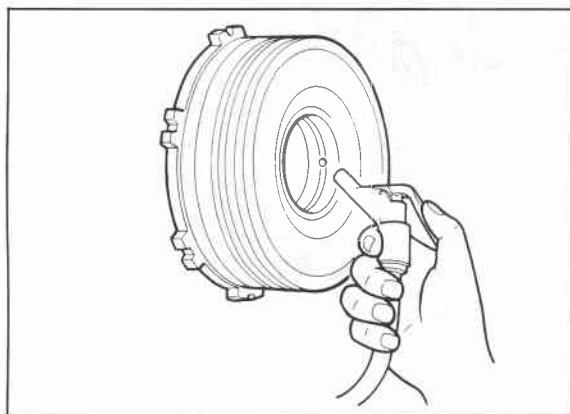
7B INSPECTION AND REPAIR



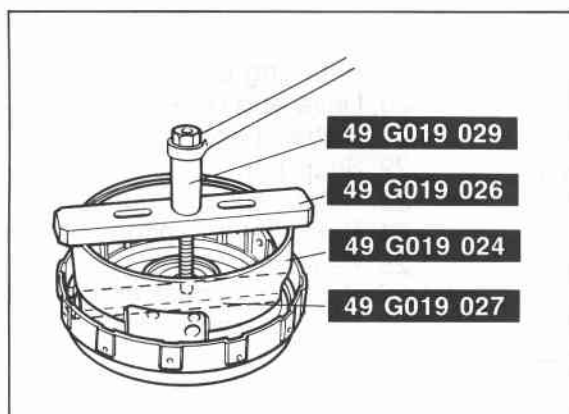
86U07B-190



86U07B-191



76G07B-130



86U07B-193

Disassembly note

Coasting clutch drum

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

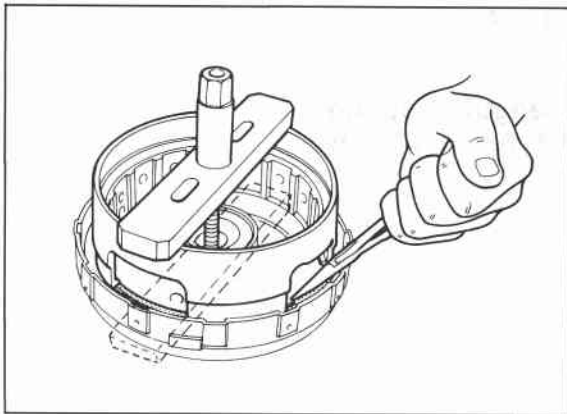
5. Remove the coasting clutch drum from the reverse and forward drum by applying compressed air through the fluid passage.

Coasting piston

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

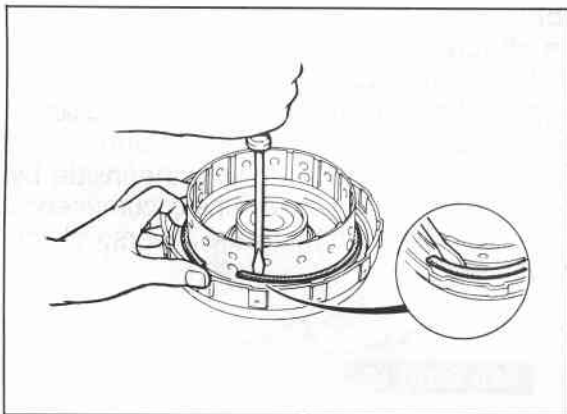
Reverse piston

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



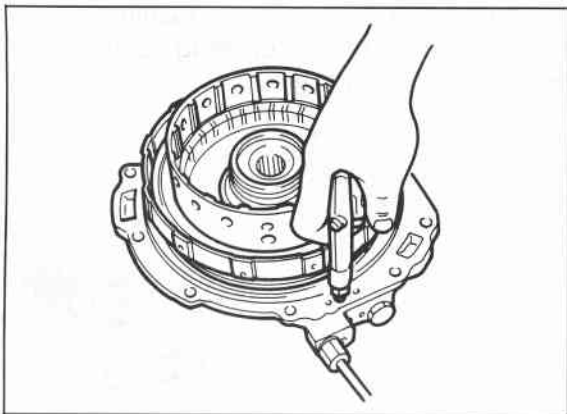
86U07B-194

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



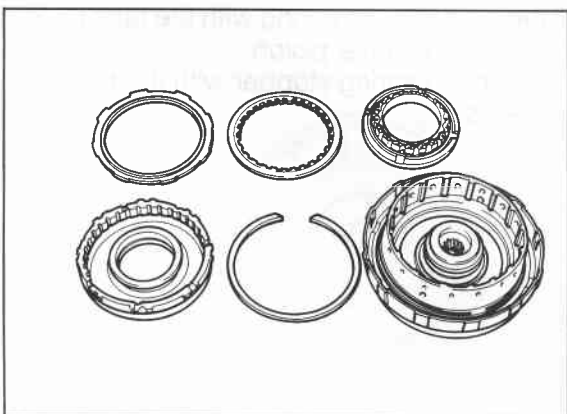
86U07B-195

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



86U07B-196

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



86U07B-197

Inspection

Check the following and repair or replace any faulty parts.

1. Drive and driven plates for damage or wear

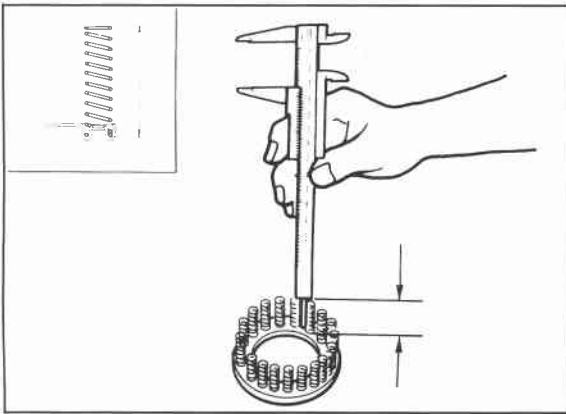
Drive plate thickness

Standard: 1.6 mm (0.063 in)

Minimum: 1.4 mm (0.055 in)

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

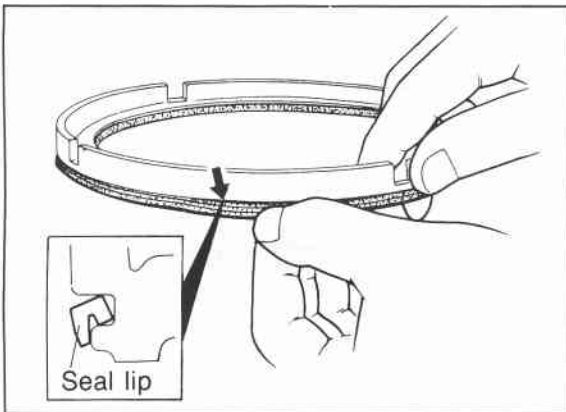
7B INSPECTION AND REPAIR



86U07B-198

6. Spring and retainer assembly for separation or deformation

Free length of spring:
29.8 mm (1.173 in)

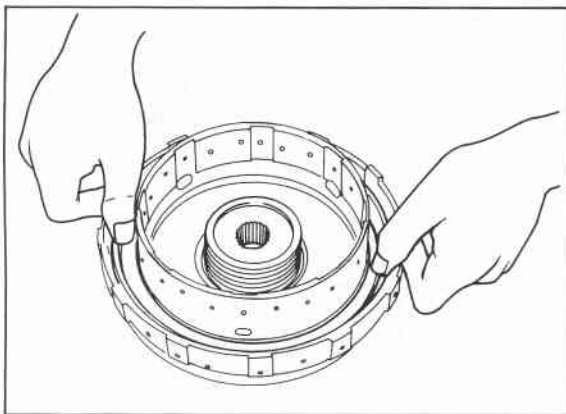


86U07B-199

Assembly Reverse clutch

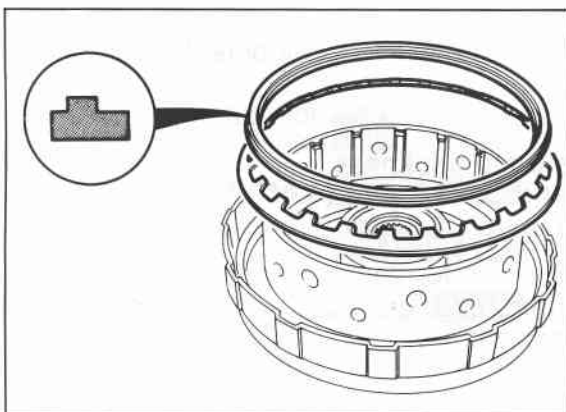
1. Install the reverse piston.

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



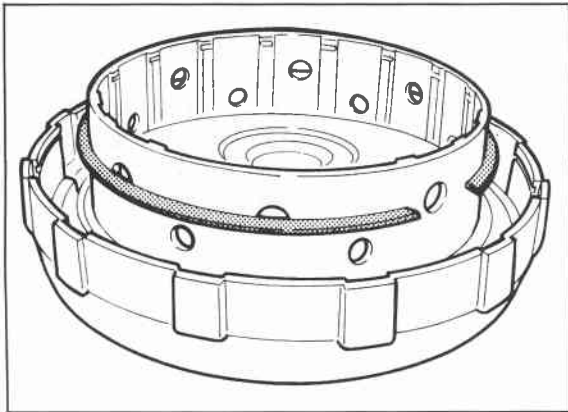
86U07B-200

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



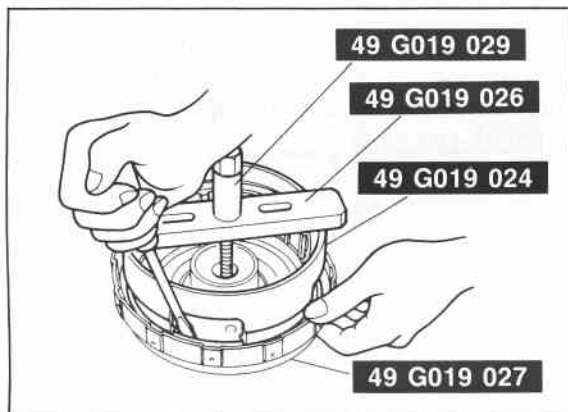
86U07B-201

2. Install the piston return spring with the tabs facing away from the reverse piston.
3. Install the return spring stopper with the step facing upwards.



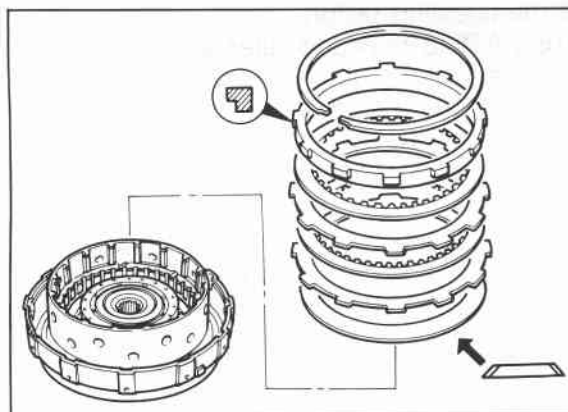
86U07B-202

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



86U07B-203

5. Install the **SST** on the reverse and forward drum.
6. Compress the spring and retainer assembly.
7. Install the snap ring with a screwdriver.
8. Remove the **SST**.



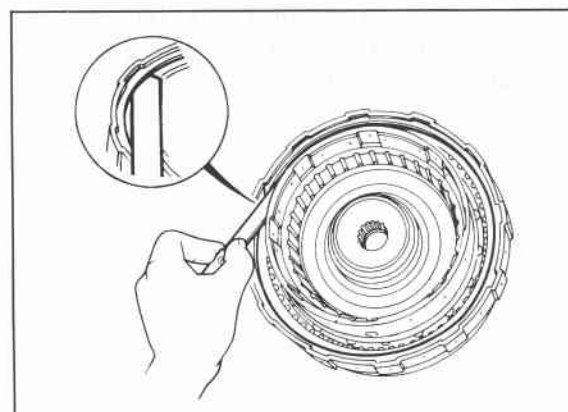
86U07B-204

9. Install the dished plate with the dished side facing the piston as shown.
10. Install the drive and driven plates.

Note

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

11. Install the retaining plate with the step facing downward.
12. Install the snap ring.



86U07B-205

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

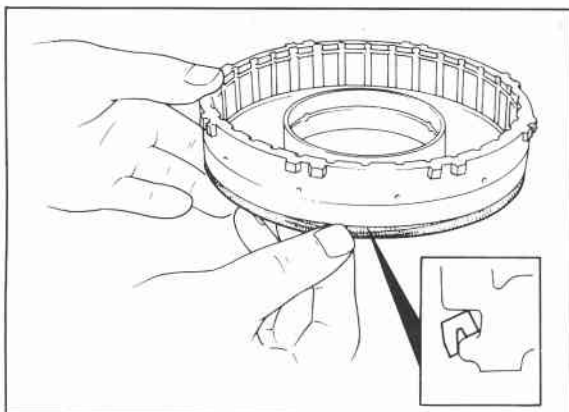
Reverse clutch clearance:
2.1—2.4 mm (0.083—0.094 in)

Retaining plate sizes

mm (in)

6.6 (0.260)	6.8 (0.268)	7.0 (0.276)
7.2 (0.283)	7.4 (0.291)	7.6 (0.299)

7B INSPECTION AND REPAIR

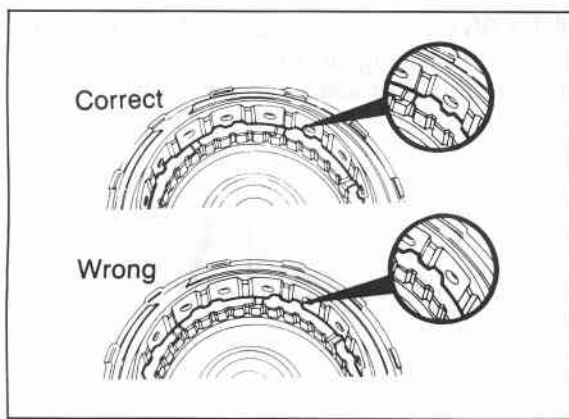


86U07B-206

Coasting clutch

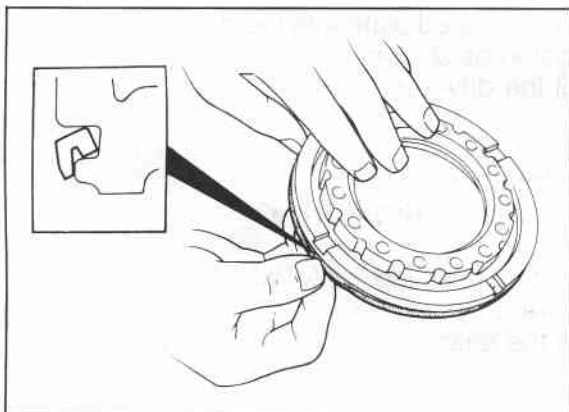
1. Install the coasting clutch drum.

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



86U07B-207

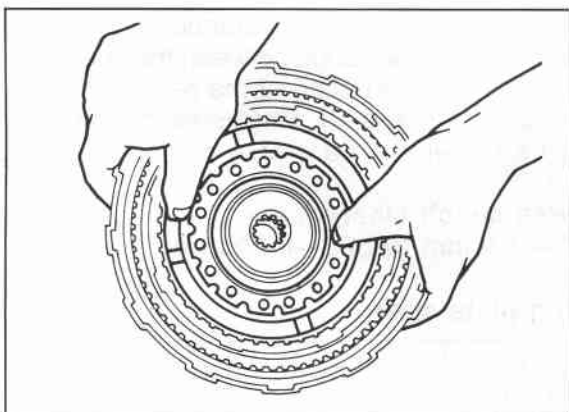
- (3) Install the coasting clutch drum the correct position in the reverse and forward drum.
- (4) Push evenly around the circumference, being careful not to damage the outer seal.



86U07B-208

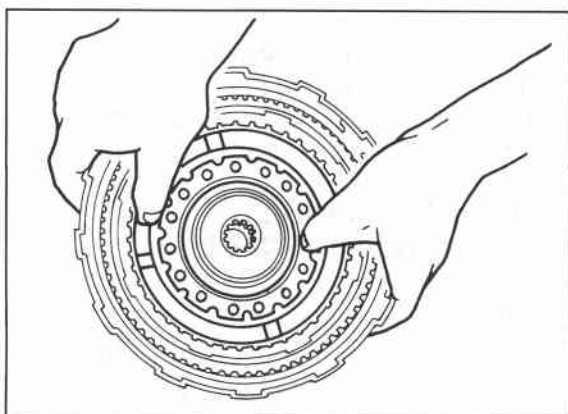
2. Install the coasting piston

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



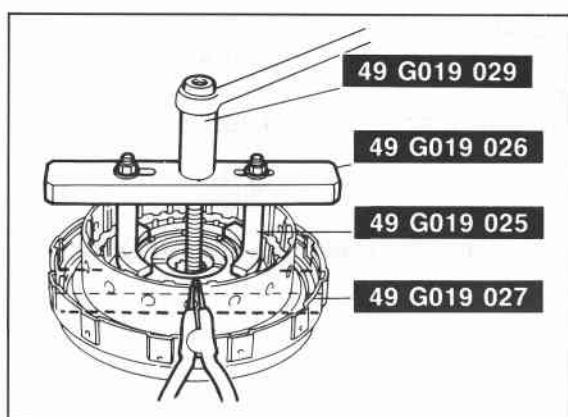
86U07B-209

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



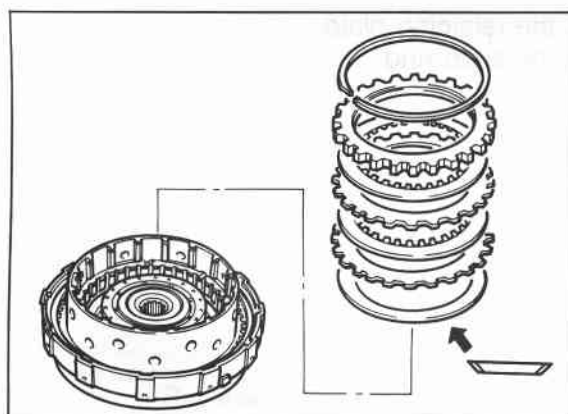
86U07B-210

3. Install the spring and retainer assembly.



86U07B-211

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



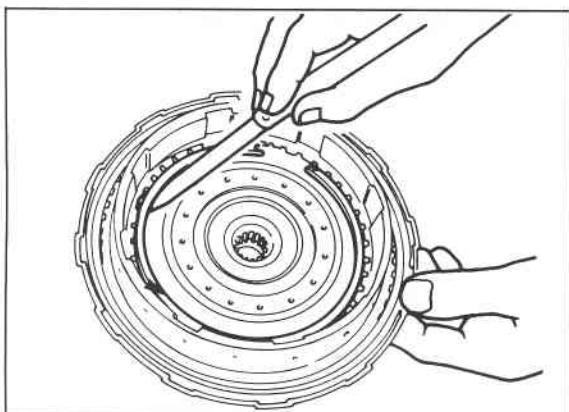
86U07B-212

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

Note
Installation order:
Driven-Drive-Driven-Drive

10. Install the retaining plate.
11. Install the snap ring.

7B INSPECTION AND REPAIR



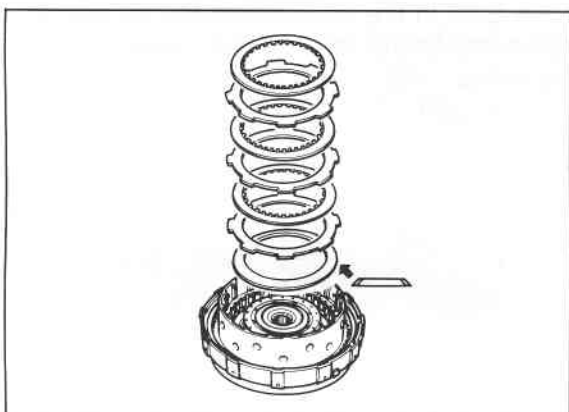
76G07B-131

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

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

Retaining plate sizes mm (in)

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



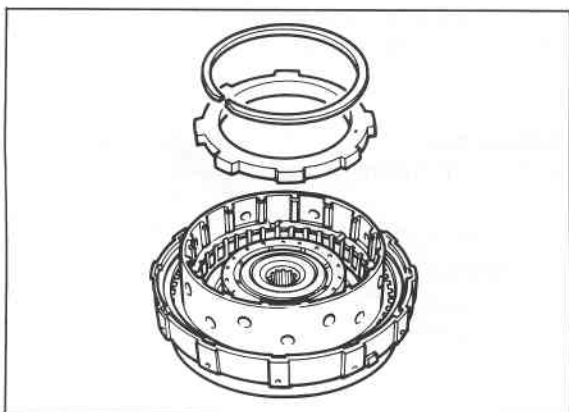
76G07B-132

Forward clutch

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

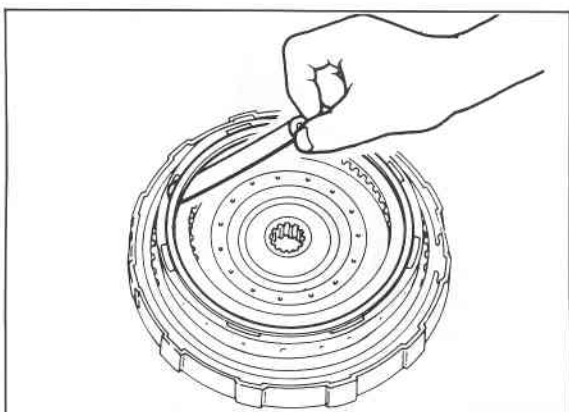
Note

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



86U07B-215

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



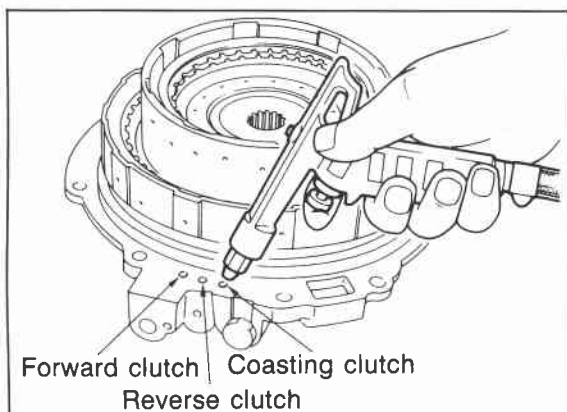
86U07B-216

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

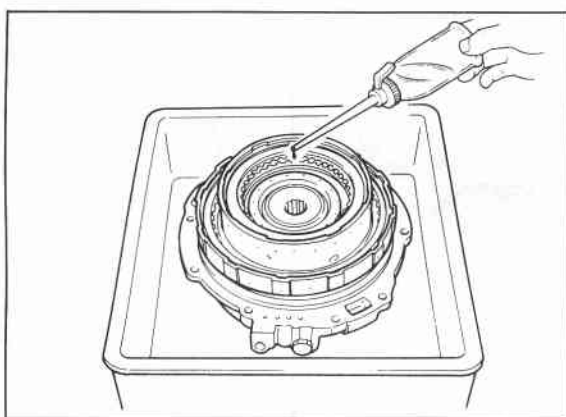
Forward clutch clearance:
1.0—1.2 mm (0.040—0.047 in)

Retaining plate sizes mm (in)

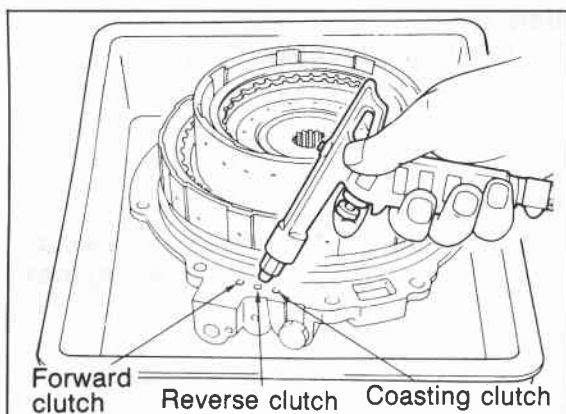
5.9 (0.232)	6.1 (0.240)	6.3 (0.248)
6.5 (0.256)	6.7 (0.264)	8.9 (0.350)



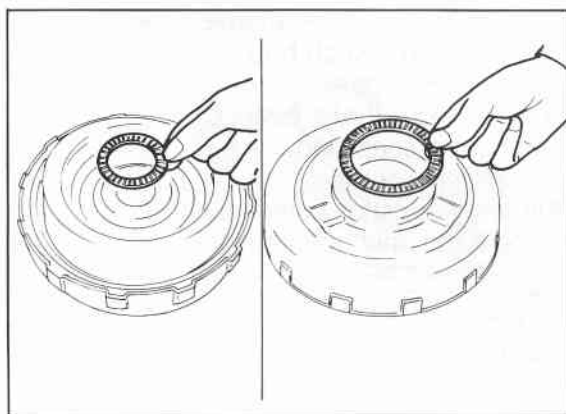
86U07B-217



86U07B-218



86U07B-219



86U07B-220

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

Applied air pressure:
392 kPa (4.0 kg/cm², 57 psi)

- (3) Pour in ATF so that the reverse piston, coasting clutch drum, and coasting clutch piston are fully submerged.

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

Caution
The compressed air must be under 392 kPa (4.0 kg/cm², 57 psi), and should not applied for over 3 seconds.

7. Apply petroleum jelly to the thrust bearings to secure them; then install them on both sides of the reverse and forward drum.

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

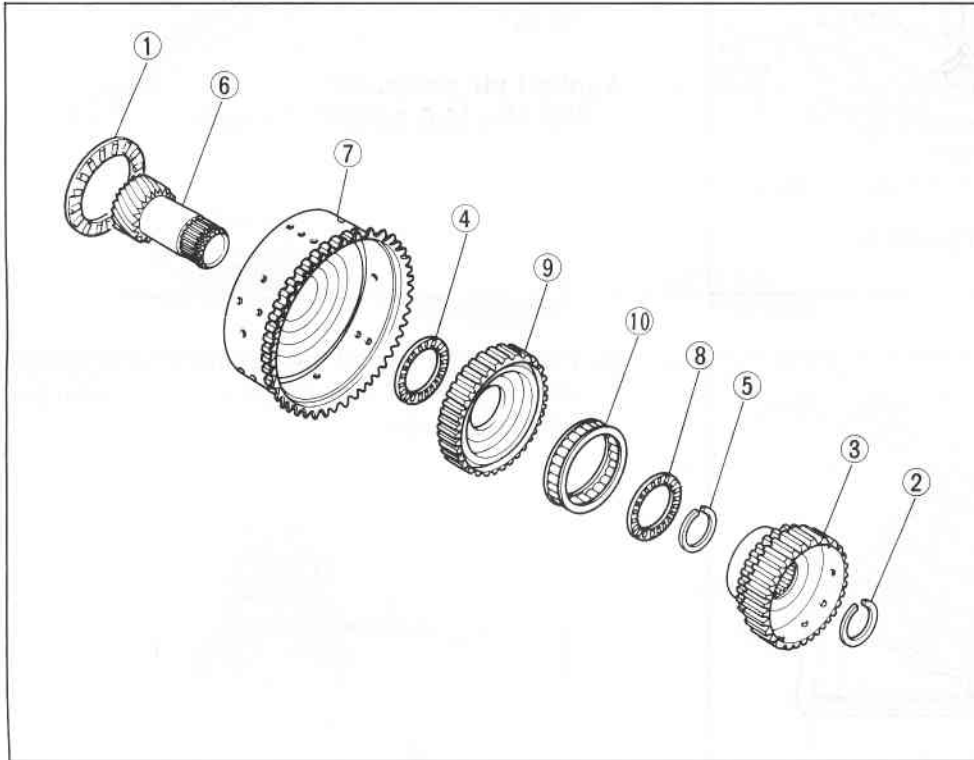
Small sun gear and one-way clutch side:
56.1 mm (2.21 in)

7B INSPECTION AND REPAIR

SMALL SUN GEAR AND ONE-WAY CLUTCH

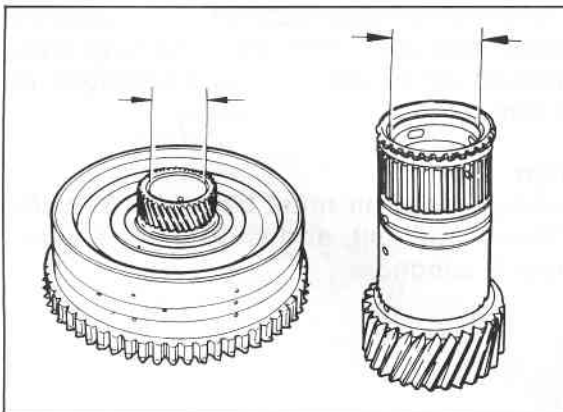
Disassembly

Disassemble in the sequence shown in the figure.



86U07B-221

1. Thrust bearing
2. Snap ring
3. One-way clutch inner race
4. Thrust bearing
5. Snap ring
6. Small sun gear
7. Sun gear drum
8. Thrust bearing
9. One-way clutch outer race
10. One-way clutch



86U07B-222

Inspection

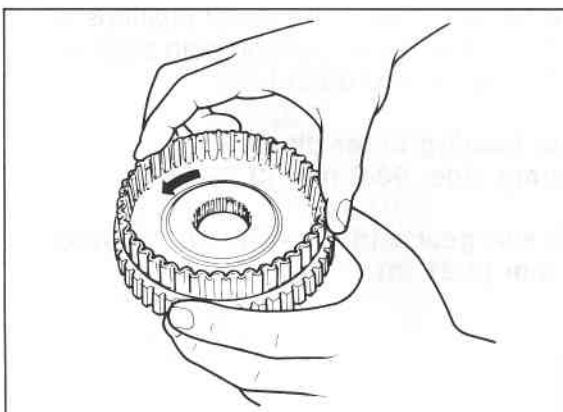
Check the following and replace any faulty parts.

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

Specification:

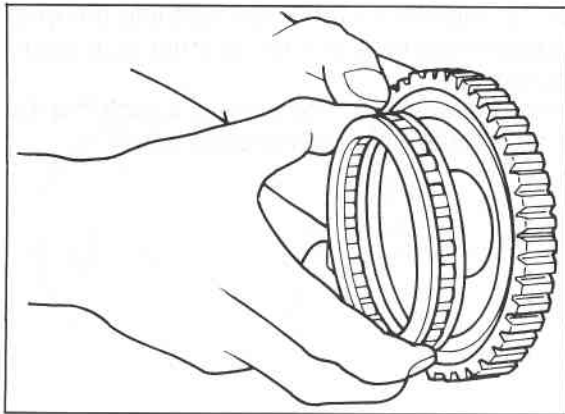
Sun gear drum: 33.425 mm (1.316 in) max.

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



86U07B-223

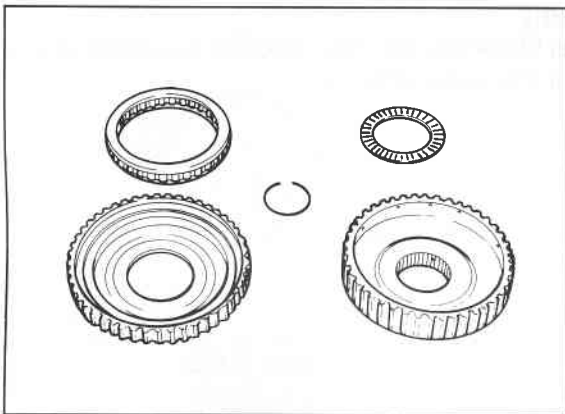
3. Inner and outer race for damage or wear
4. Damaged or worn clutch hub
5. Damaged or worn gear
6. Damaged or worn thrust bearing
7. Broken or worn snap ring
8. One-way clutch operation
Hold the one-way clutch outer race. Check that the inner race turns only counterclockwise.



86U07B-224

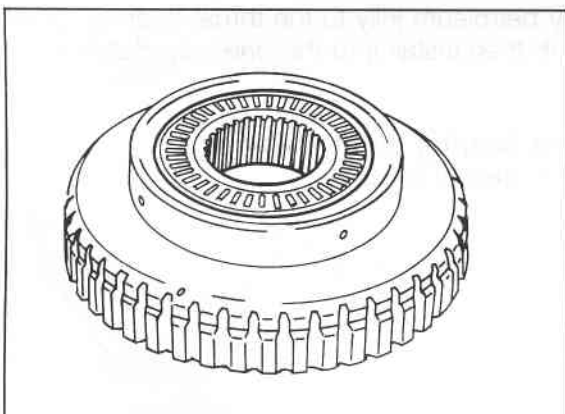
Replacement of one-way clutch

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



86U07B-225

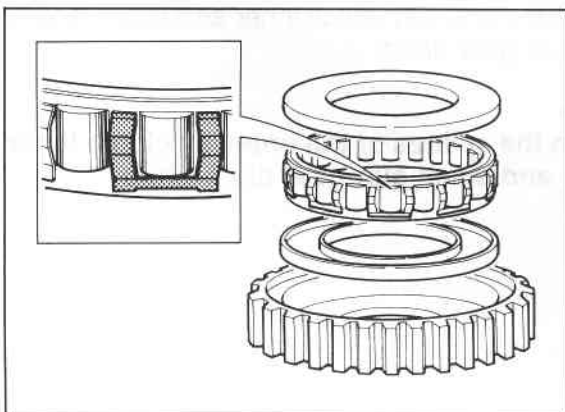
4. Inspect the one-way clutch inner and outer race, and replace if necessary.



86U07B-226

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

Thrust bearing outer diameter:
62.1 mm (2.44 in)



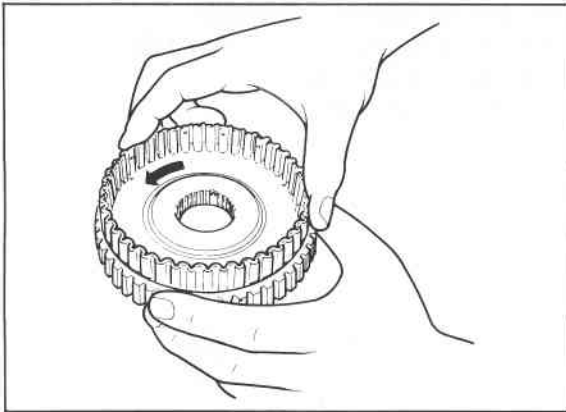
86U07B-227

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

Caution

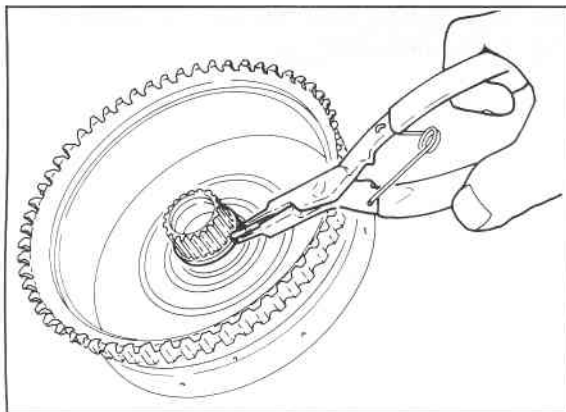
Check that the spring cage of the one-way clutch faces toward the outer race.

7B INSPECTION AND REPAIR



86U07B-228

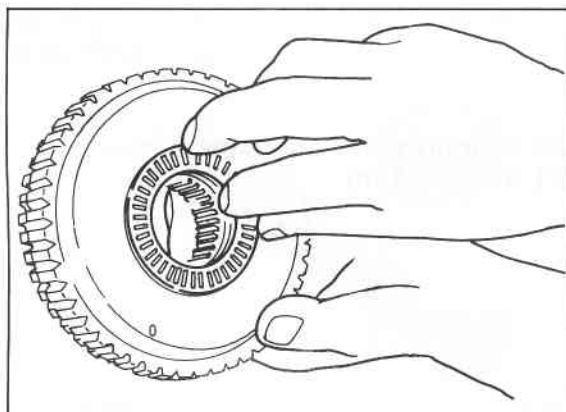
7. Install the one-way clutch inner race into the one-way clutch outer race by turning inner race counterclockwise.
8. Hold the one-way clutch outer race. Check that the inner race turns only counterclockwise.



86U07B-229

Assembly

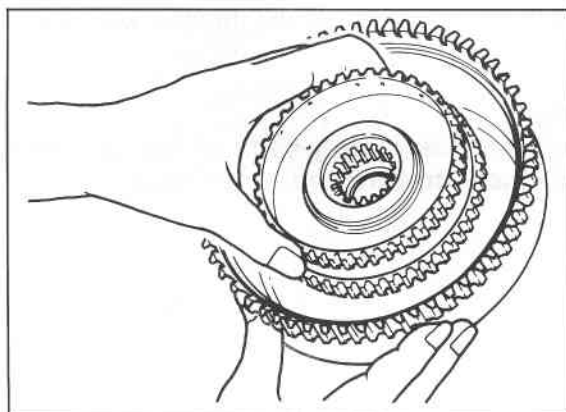
1. Install the small sun gear into the sun gear drum.
2. Install the snap ring.



86U07B-230

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

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

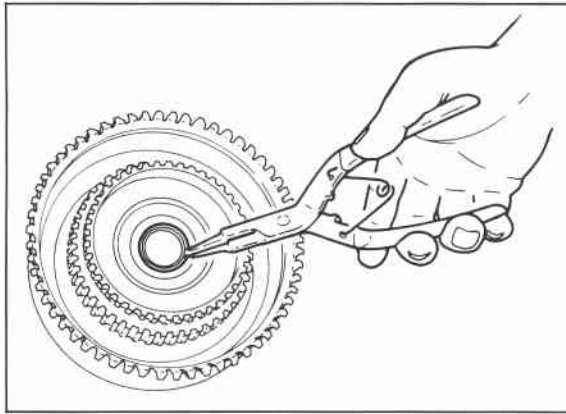


86U07B-231

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

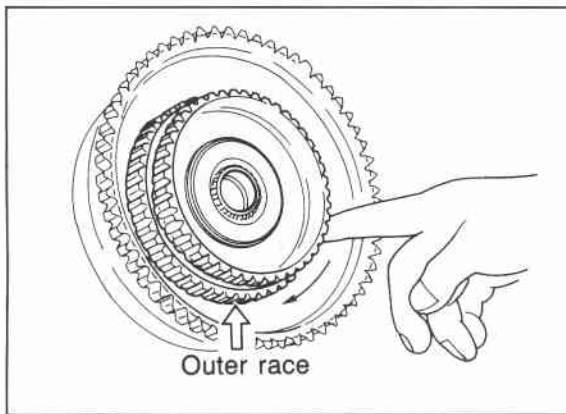
Note

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



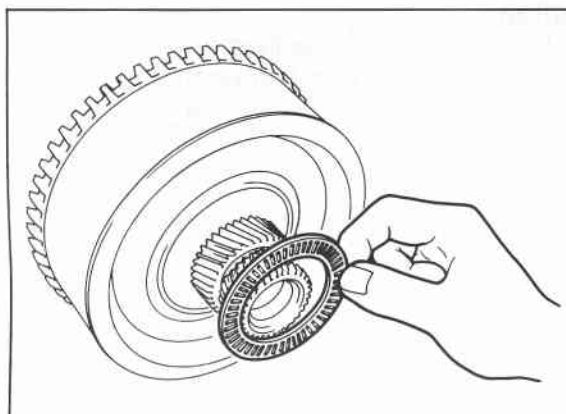
86U07B-232

5. Install the snap ring.



86U07B-233

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



86U07B-234

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

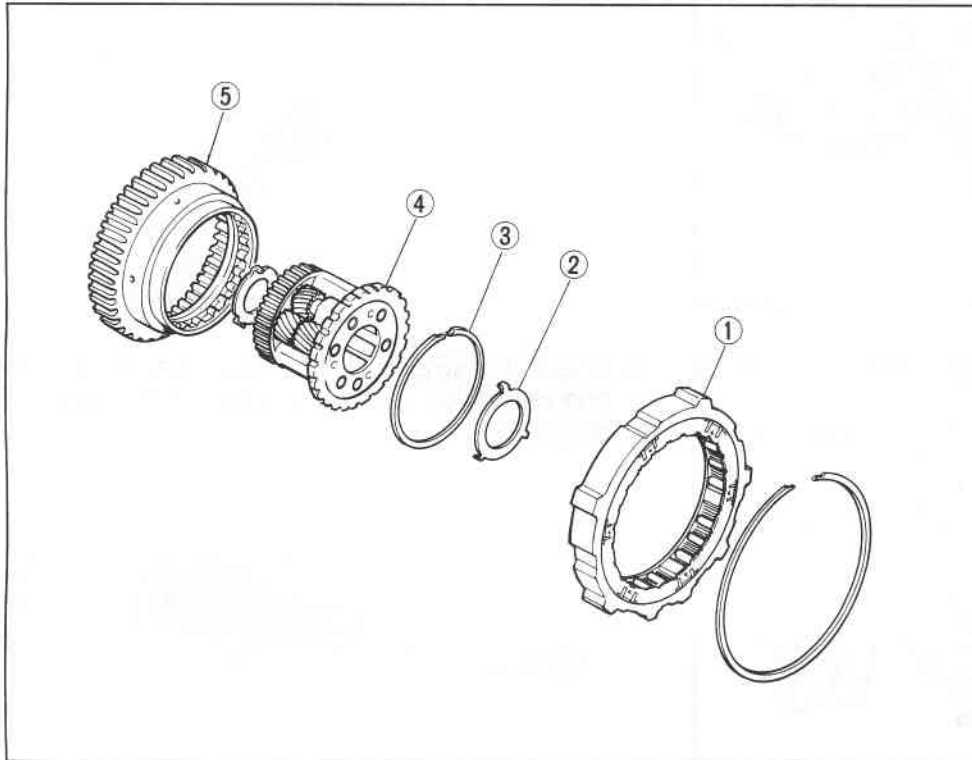
**Thrust bearing outer diameter:
72.0 mm (2.83 in)**

7B INSPECTION AND REPAIR

ONE-WAY CLUTCH AND CARRIER HUB ASSEMBLY

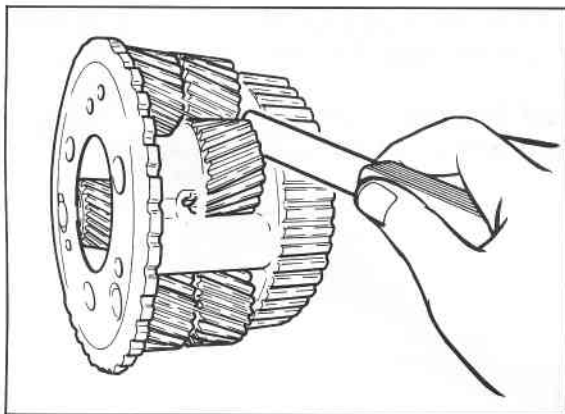
Disassembly

Disassemble in the sequence shown in the figure.



86U07B-235

1. One-way clutch
2. Bearing races
3. Snap ring
4. Carrier hub assembly
5. Inner race (Low and reverse hub)



86U07B-236

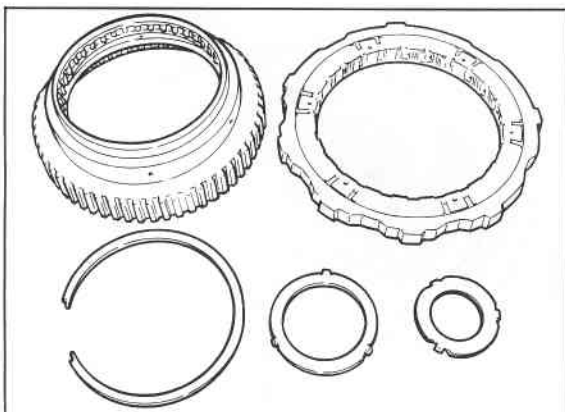
Inspection

Check the following and replace any faulty parts.

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

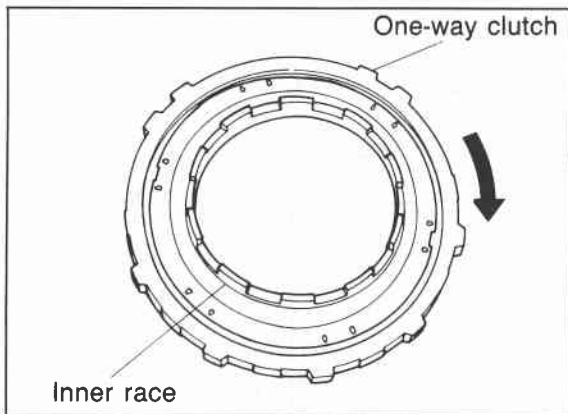
Clearance:

0.2—0.7 mm (0.008—0.028 in)



86U07B-237

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

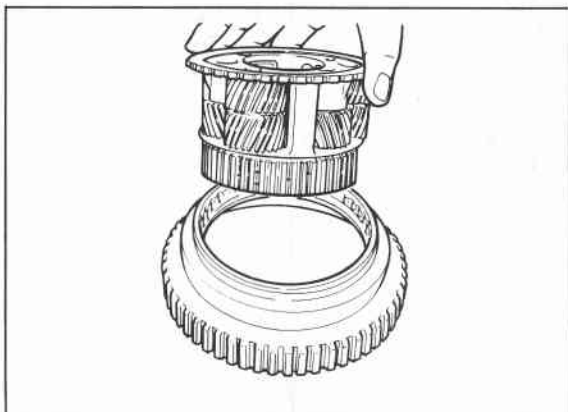


86U07B-238

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

Note

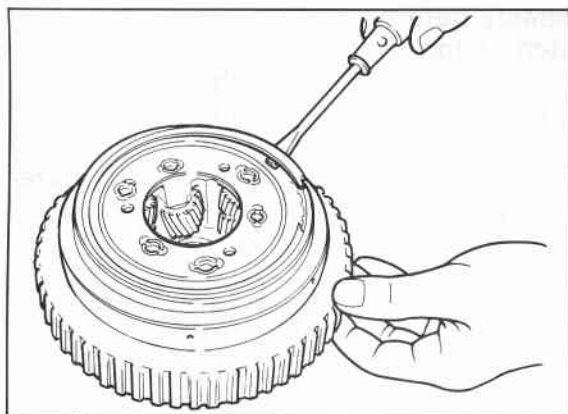
Assemble the one-way clutch and the inner race, then confirm that the one-way clutch rotates only clockwise and smoothly.



86U07B-239

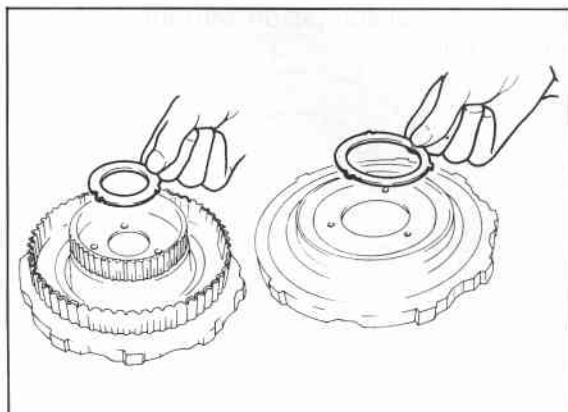
Assembly

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



86U07B-240

2. Install the snap ring.



86U07B-241

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

Bearing race outer diameter

Sun gear drum side: 72.0 mm (2.83 in)

3-4 clutch side: 57.0 mm (2.21 in)

Note

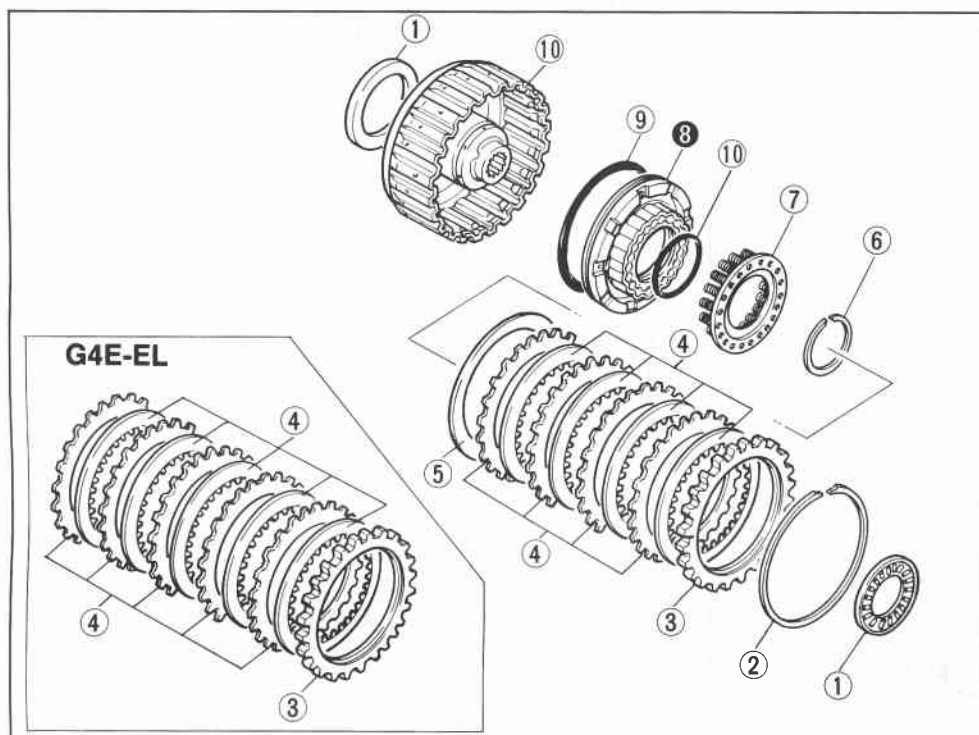
Install the tabs of the bearing race into the alignment holes.

7B INSPECTION AND REPAIR

3-4 CLUTCH

Disassembly

Disassemble in the sequence shown in the figure referring to the disassembly note for the specially marked part.



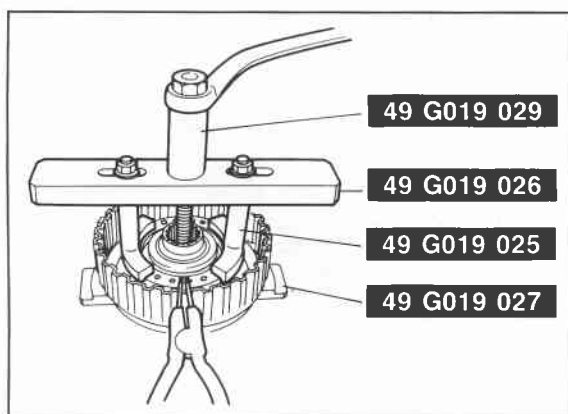
76G07B-133

1. Thrust bearings
2. Snap ring
3. Retaining plate
4. Drive and driven plates
5. Dished plate (G4A-HL)
6. Snap ring
7. Spring and retainer assembly
8. 3-4 clutch piston
9. Outer seal
10. Inner seal
11. 3-4 clutch drum

Disassembly note

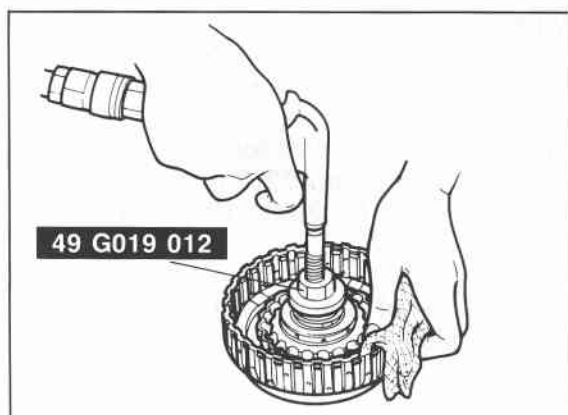
3-4 clutch piston

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

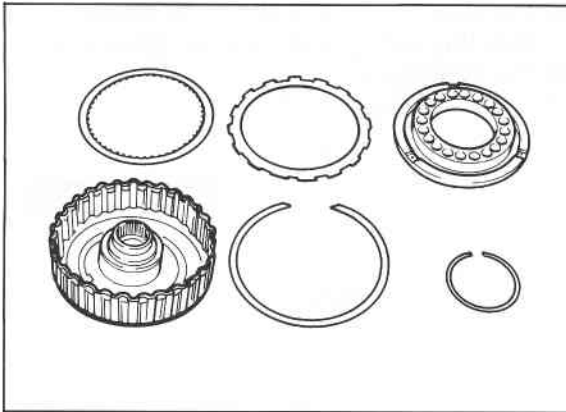


86U07B-243

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



86U07B-244



86U07B-245

Inspection

Check the following and repair or replace any faulty parts.

1. Drive and driven plates for damage or wear

Drive plate thickness

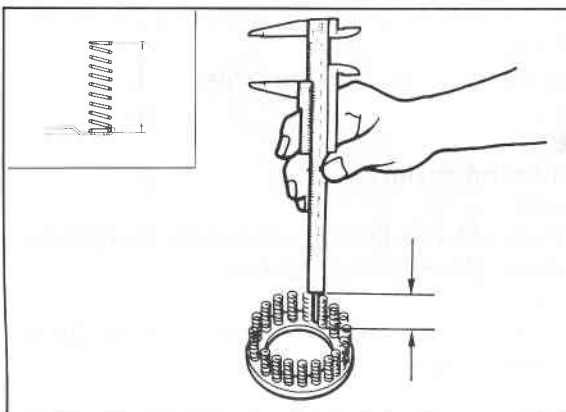
Standard: 1.6 mm (0.063 in)

Minimum: 1.4 mm (0.055 in)

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

Free length of spring:

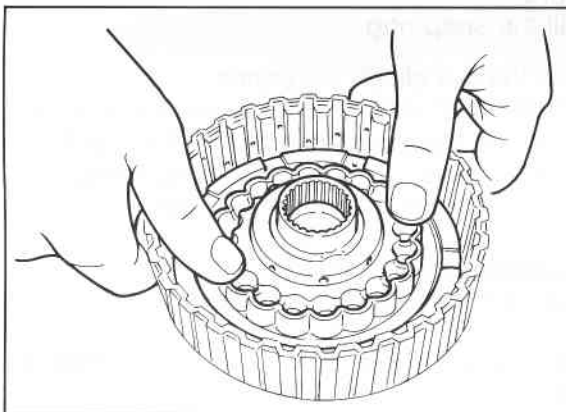
33.2 mm (1.307 in)



86U07B-246

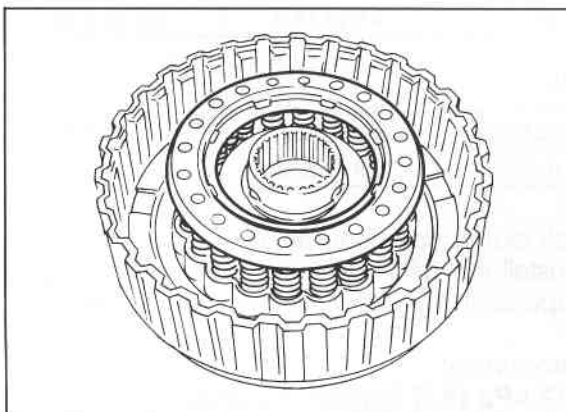
Assembly

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



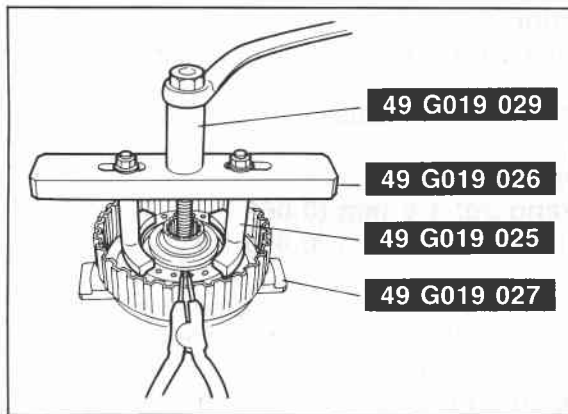
86U07B-247

2. Install the spring and retainer assembly.



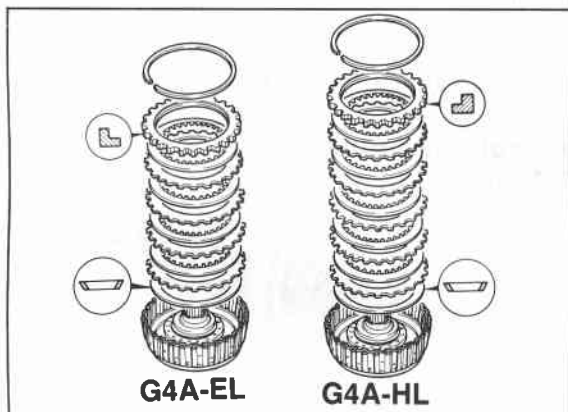
86U07B-248

7B INSPECTION AND REPAIR



86U07B-249

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



76G07B-134

7. Install the dished plate the dished side up ward (G4A-HL).
8. Install the drive and driven plates.

Note

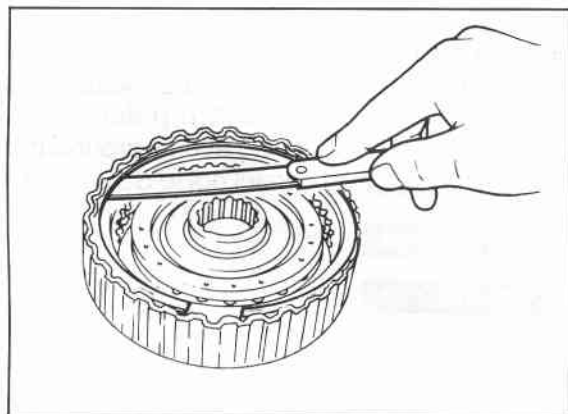
Installation order:

G4A-EL

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

G4A-HL

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



76G07B-135

9. Install the retaining plate with the step facing upward.
10. Install the snap ring.
11. Check the 3-4 clutch clearance.
 - (1) Measure the clearance between the snap ring and the retaining plate of the 3-4 clutch.
 - (2) If the clearance is not within specification, adjust it by selecting a proper retaining plate.

3-4 clutch clearance:

1.3—1.5 mm (0.051—0.059 in)

Retaining plate sizes

mm (in)

G4A-EL

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

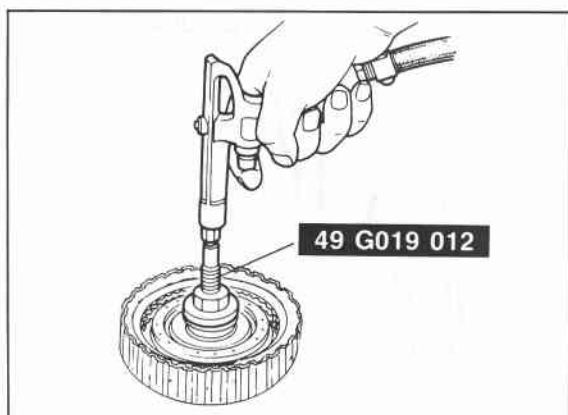
G4A-HL

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

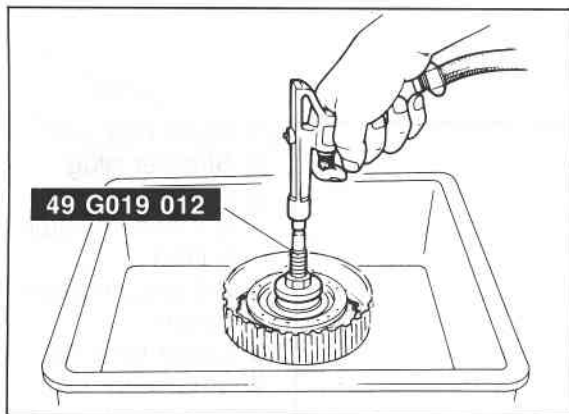
12. Check clutch operation as follows:
 - (1) Install the **SST** as shown, and check clutch operation by applying compressed air.

Air pressure:

392 kPa (4.0 kg/cm², 57 psi)



76G07B-136

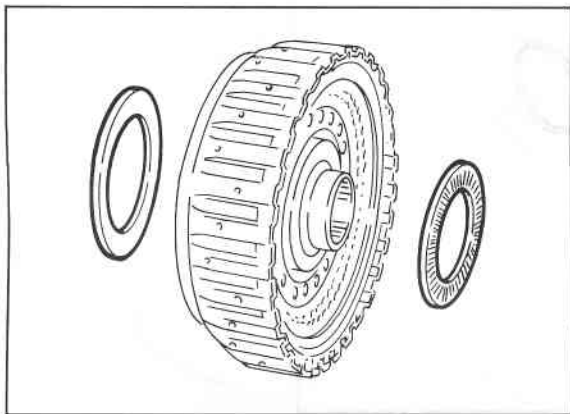


86U07B-253

- (2) Pour ATF into the clutch drum so that the 3-4 clutch piston is fully submerged.
- (3) Check that no bubbles come from the 3-4 clutch piston seal while applying compressed air.

Caution

The compressed air must be under 392 kPa (4.0 kg/cm², 57 psi) and not applied for over 3 seconds.



76G07B-137

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

Thrust bearing outer diameter

Carrier hub side: 56.1 mm (2.21 in)

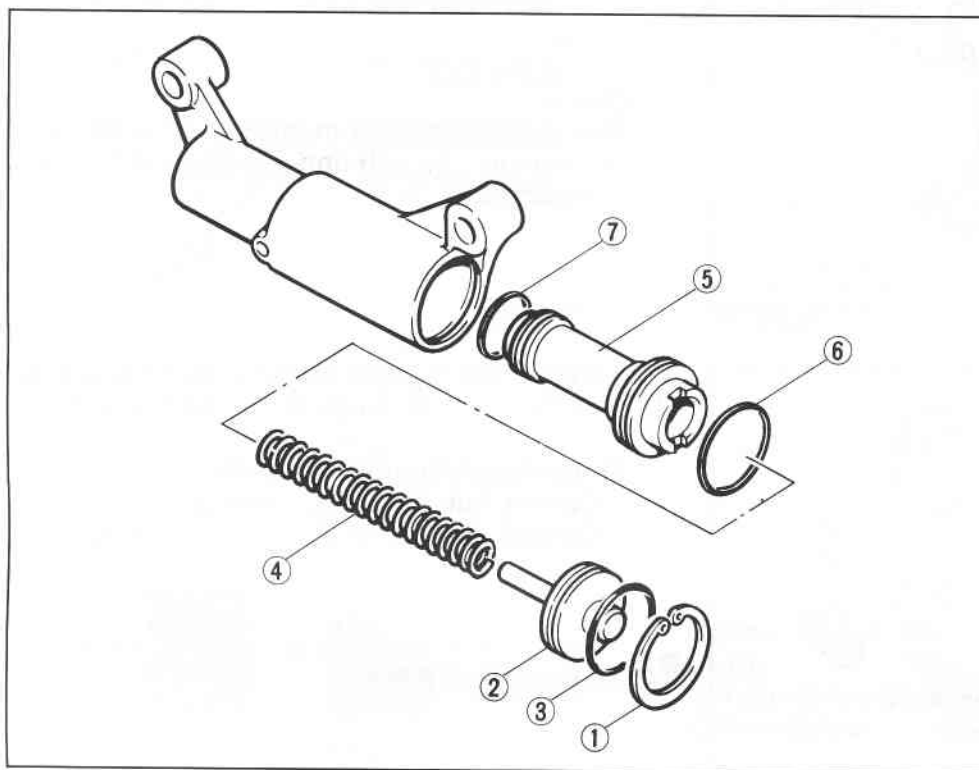
Output shell side: 72.1 mm (2.84 in)

7B INSPECTION AND REPAIR

2-3 ACCUMULATOR

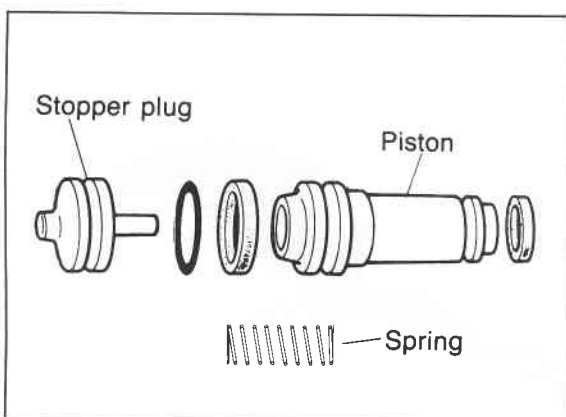
Disassembly

Disassemble in the sequence shown in the figure.



86U07B-255

1. Snap ring
2. Stopper plug
3. O-ring
4. 2-3 accumulator spring
5. 2-3 accumulator piston
6. Large seal ring
7. Small sea ring



76G07B-138

Inspection

Check the following and replace any faulty parts.

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

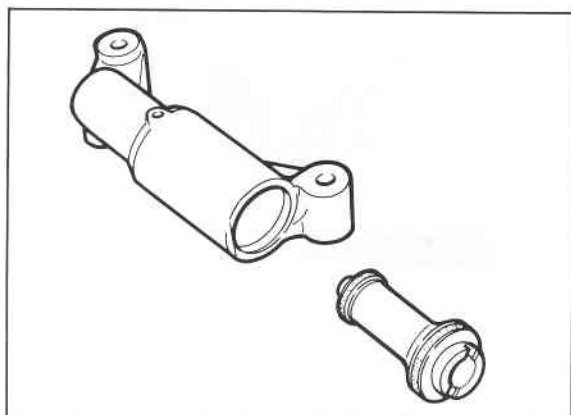
Free length of spring:

G4A-EL 83.3 mm (3.280 in)

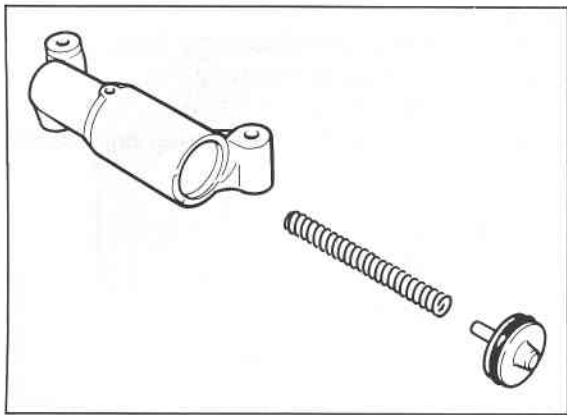
G4A-HL 76.0 mm (2.992 in)

Assembly

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

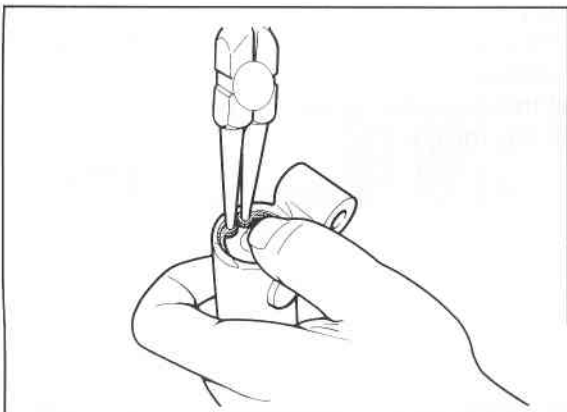


86U07B-257



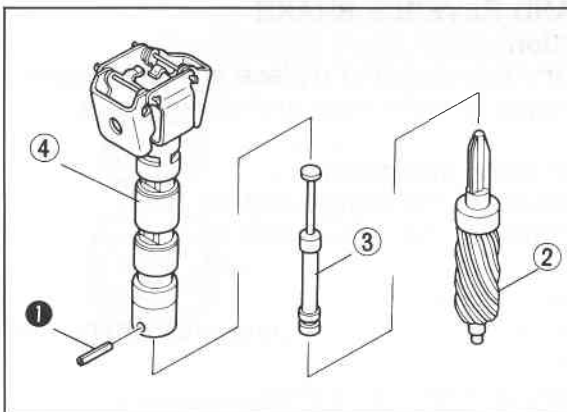
86U07B-258

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



86U07B-259

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



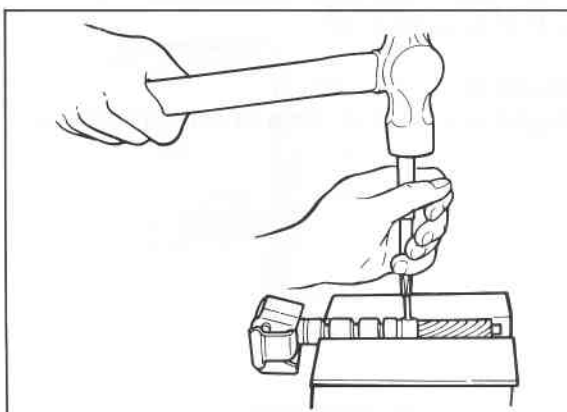
76G07B-139

GOVERNOR ASSEMBLY (G4A-HL)

Disassembly

Disassemble in the sequence shown in the figure referring to the disassembly note for the specially marked part.

1. Roll pin
2. Governor driven gear
3. Governor valve
4. Governor carrier and sleeve



83U07B-266

Disassembly note

Roll pin

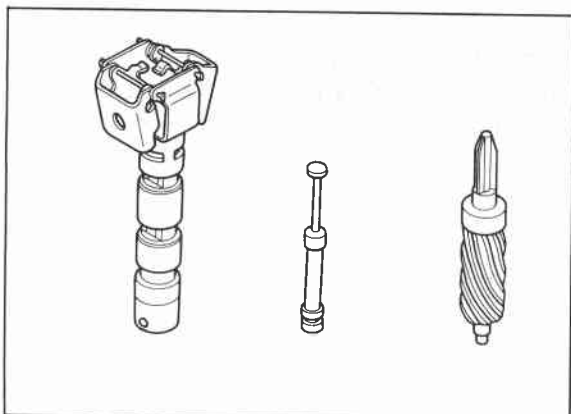
1. Secure the governor assembly in a vise.

Note

Use the protective plates to prevent damage to the governor assembly.

2. Remove the roll pin from the governor assembly.

7B INSPECTION AND REPAIR

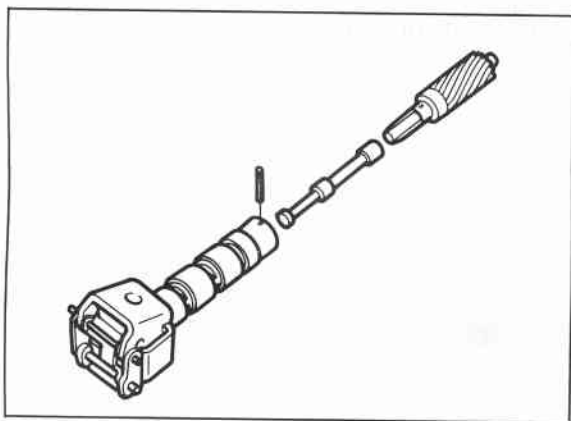


83U07B-267

Inspection

Check the following and replace any faulty parts.

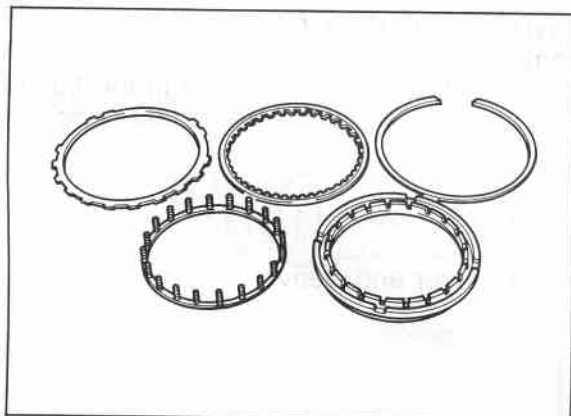
1. Damaged or worn governor gear
2. Damaged or worn governor valve
3. Cracked or damaged governor carrier and sleeve



83U07B-268

Assembly

1. Insert the governor valve to the governor carrier and sleeve.
2. Install the governor driven gear.
3. Install the roll pin.



86U07B-260

LOW AND REVERSE BRAKE

Inspection

Check the following and replace any faulty parts.

1. Damaged or worn drive and driven plates

Drive plate thickness

Standard: 1.6 mm (0.063 in)

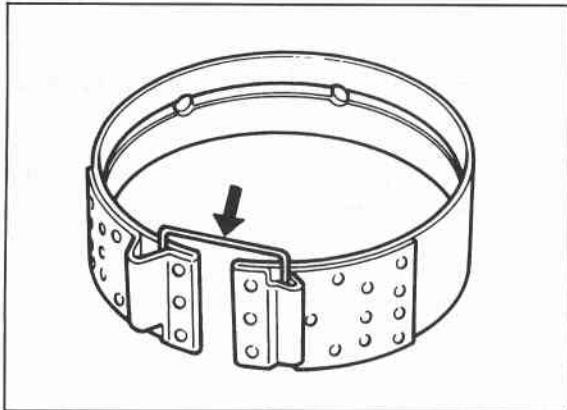
Minimum: 1.4 mm (0.055 in)

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

Free length of spring:

20.5 mm (0.807 in)

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



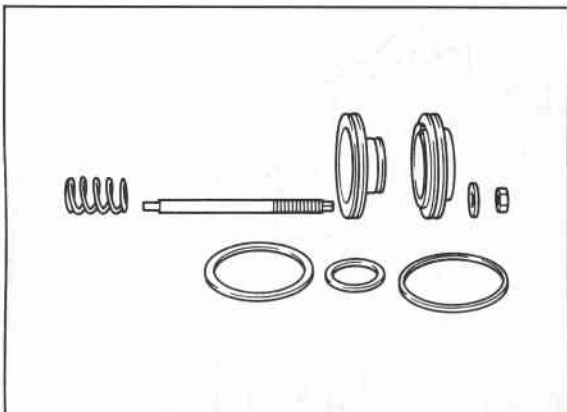
86U07B-261

2-4 BRAKE BAND

Inspection

Check the following and replace if necessary.

1. Damaged or worn 2-4 brake band



76G07B-140

BAND SERVO

Inspection

Check the following and replace any faulty parts.

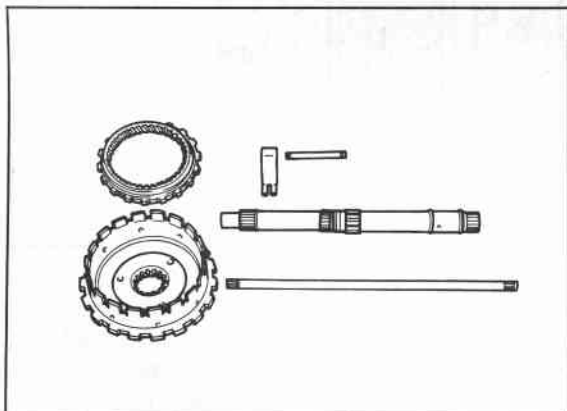
1. Damaged or worn piston
2. Weakened return spring

Free length of spring:

G4A-EL: 43.25 mm (1.703 in)

G4A-HL: FE engine 42.0 mm (1.654 in)

F8 engine 43.25 mm (1.703 in)

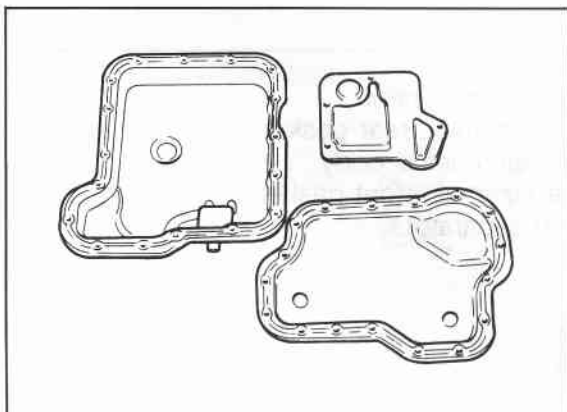


86U07B-263

OTHER INSPECTION

Check the following and replace any faulty parts.

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



86U07B-264

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

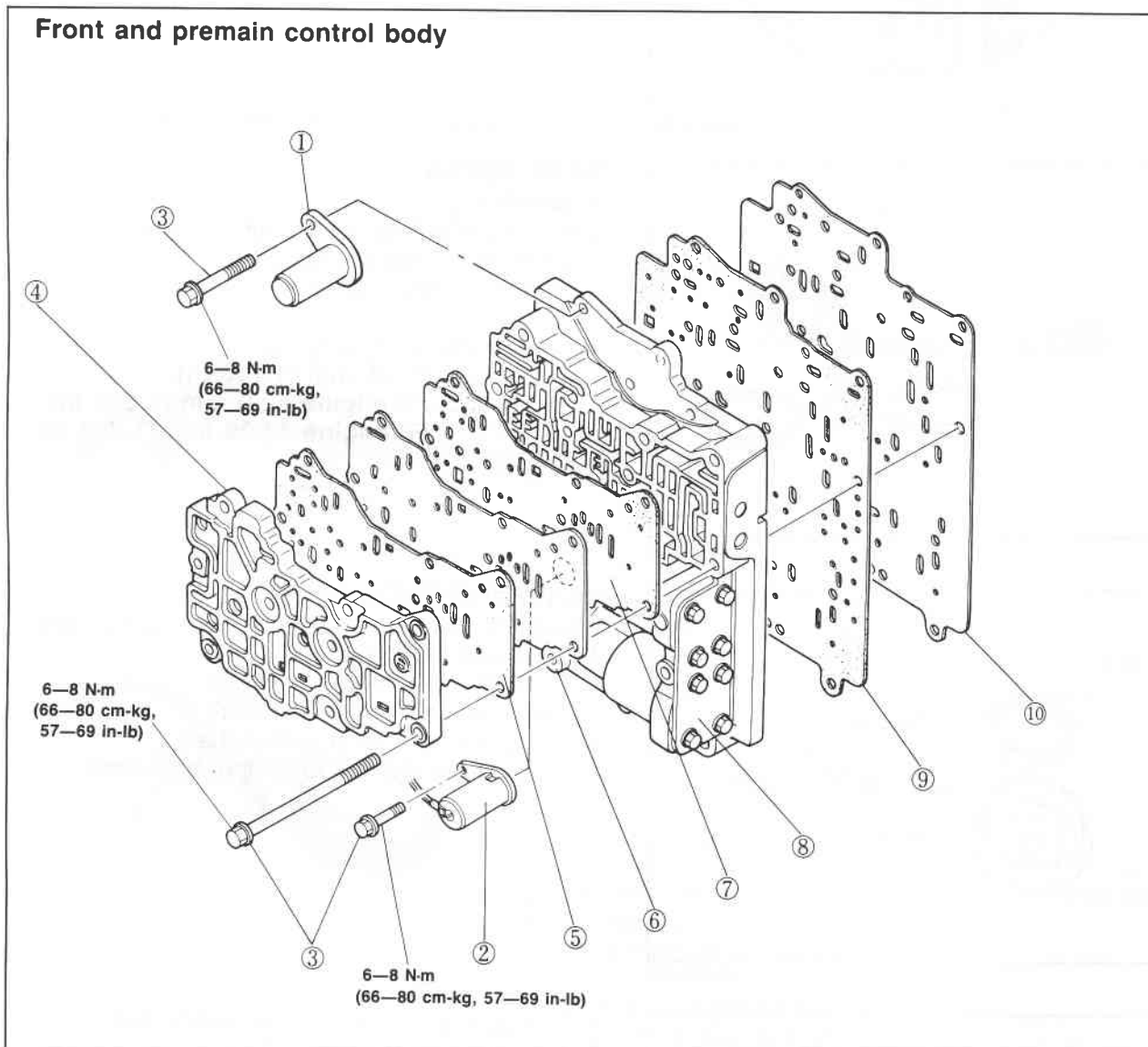
7B INSPECTION AND REPAIR

CONTROL VALVE BODY (G4A-EL)

Precaution

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

Components I

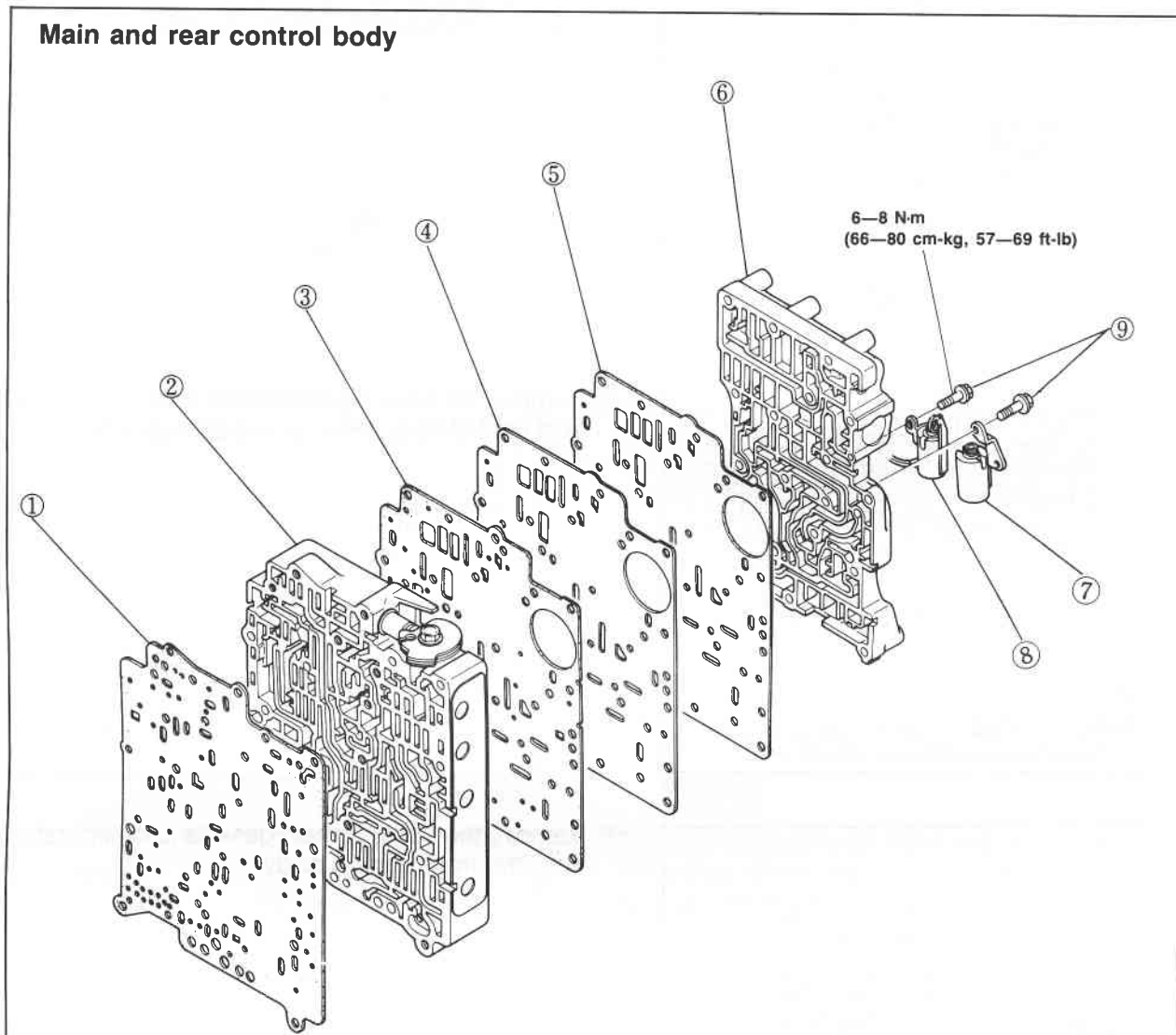


76G07B-141

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

Components II

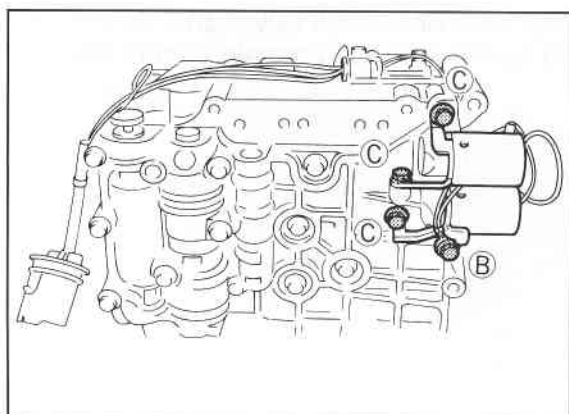
Main and rear control body



86U07B-266

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

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

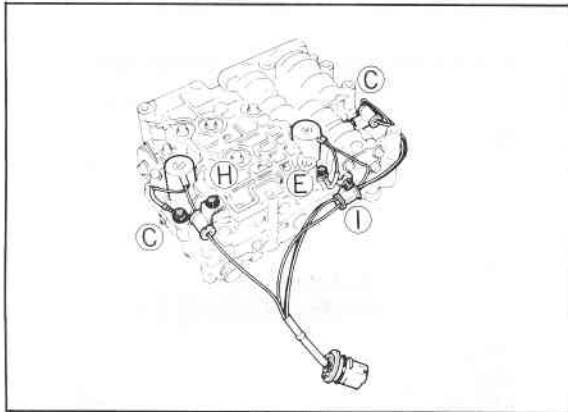


86U07B-267

Disassembly of Control Valve Body

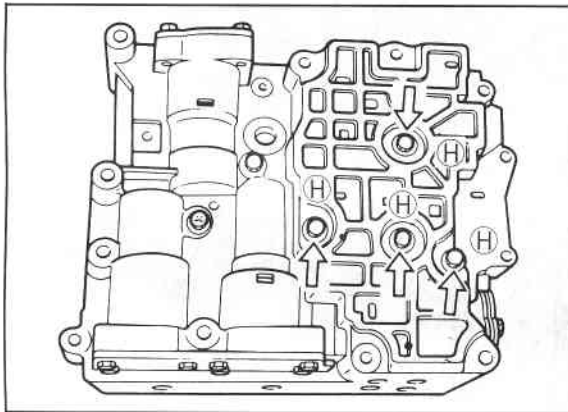
1. Remove the 3-4 solenoid valve and lock-up solenoid valve.
2. Remove the O-rings and oil strainers.

7B INSPECTION AND REPAIR



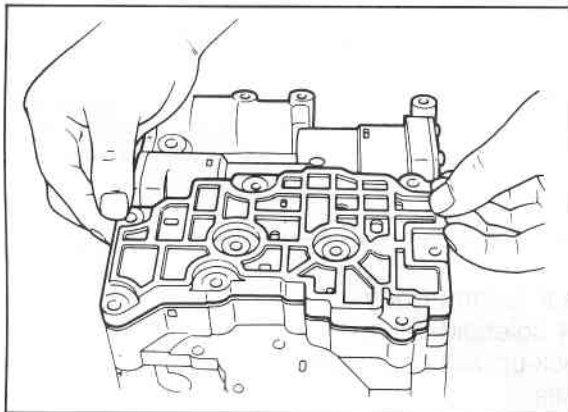
86U07B-268

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



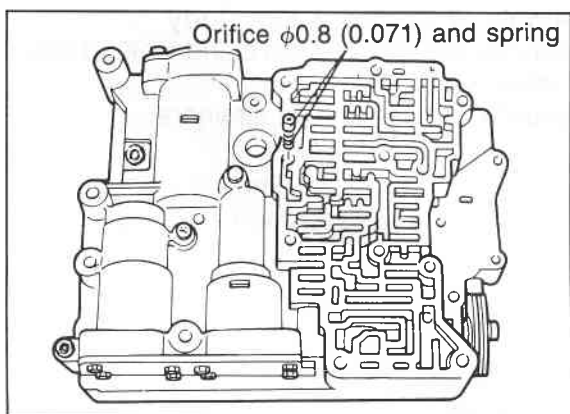
86U07B-269

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



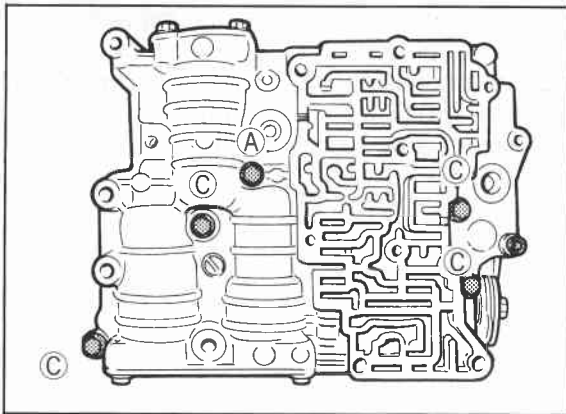
86U07B-270

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



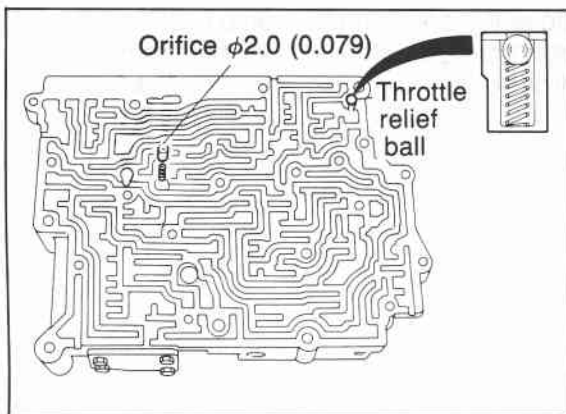
76G07B-142

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



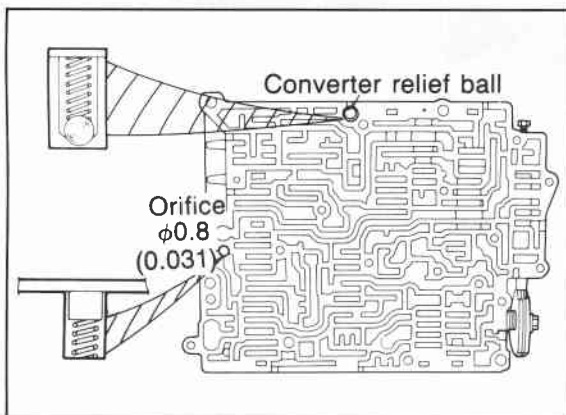
76G07B-144

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



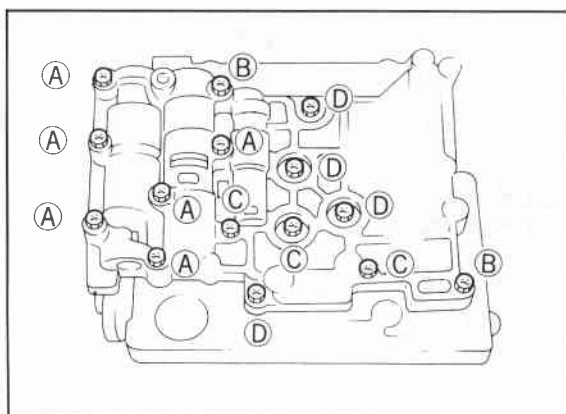
76G07B-145

9. Remove the premain/main gaskets and separator from the premain control body.
10. Remove the orifice check valve ($\phi 2.0$ mm, 0.079 in) and spring, and the throttle relief ball and spring from the premain control body.



76G07B-146

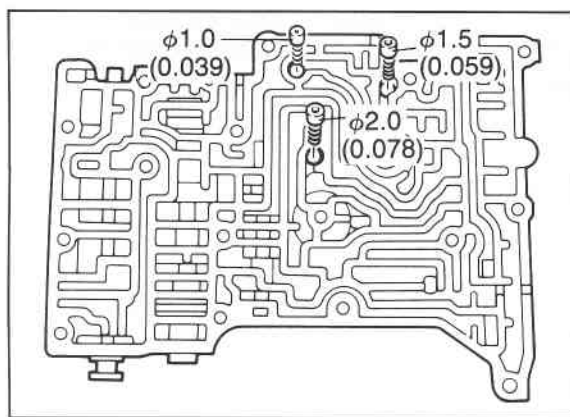
11. Remove the converter relief ball and spring, and the orifice check valve ($\phi 0.8$ mm, 0.031 in) and spring from the main control body.



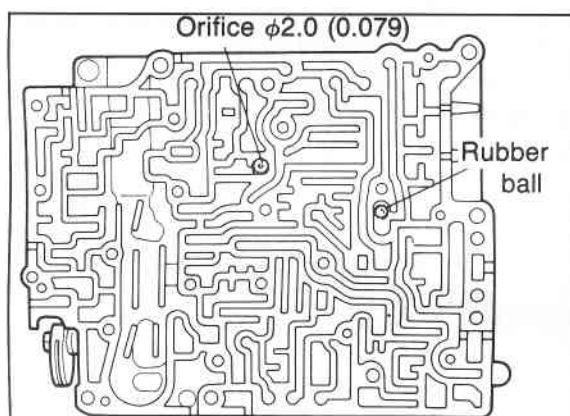
76G07B-147

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

7B INSPECTION AND REPAIR



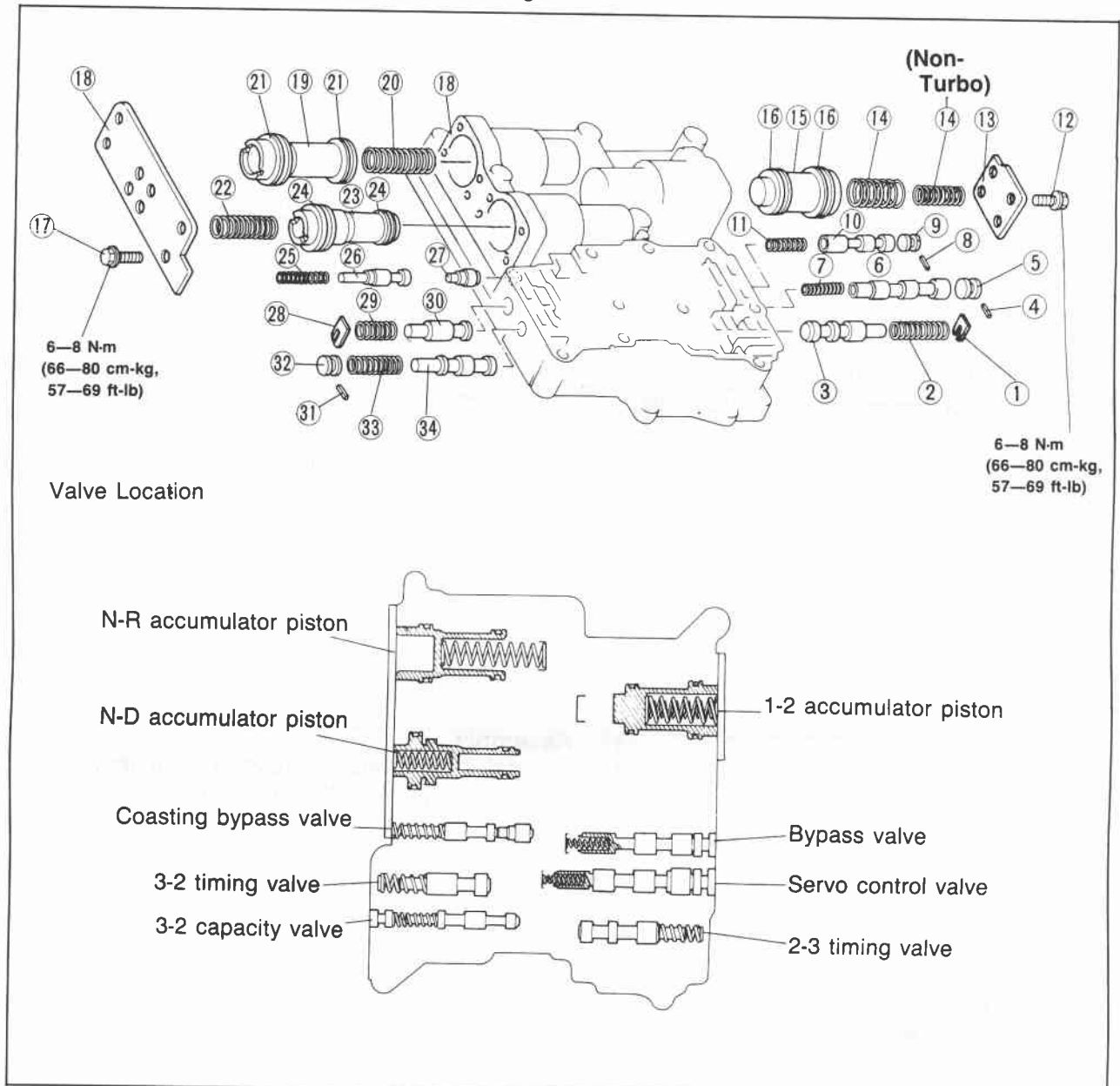
13. Remove the main/rear gaskets and separator from the rear control body.
14. Remove the orifice check valves ($\phi 1.5$ mm, 0.059 in; $\phi 1.0$ mm, 0.039 in; $\phi 2.0$ mm, 0.079 in) and spring from the rear control body.



15. Remove the orifice check valve ($\phi 2.0$ mm, 0.079 in) and spring and the rubber ball from the main control body.

Premain Control Body Disassembly

Disassemble in the sequence shown in the figure.



76G07B-150

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

7B INSPECTION AND REPAIR

Inspection

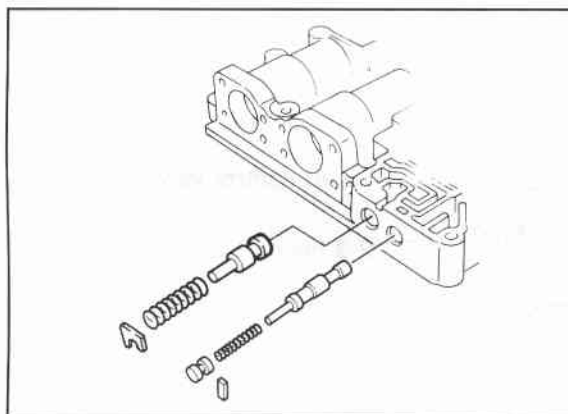
Check the following and replace any faulty parts.

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

Spring

Spring name	Outer dia. mm (in)	Free length mm (in)	Wire dia. mm (in)	Spring color
1-2 accumulator small spring	11.0 (0.433)	88.1 (3.348)	1.4 (0.055)	Gray
1-2 accumulator large spring	16.0 (0.630)	78.0 (3.071)	2.0 (0.079)	Blue
Bypass, Servo control spring	5.0 (0.197)	33.4 (1.315)	0.55 (0.022)	Maroon
2-3 timing spring	8.3 (0.327)	26.5 (1.043)	0.8 (0.031)	—
N-R accumulator rear spring	11.1 (0.437)	62.0 (2.441)	1.2 (0.047)	Light green
N-D accumulator front spring	9.8 (0.386)	52.9 (2.083)	1.0 (0.039)	Brown
Coasting bypass spring	5.8 (0.228)	37.7 (1.484)	0.6 (0.024)	Dark blue
3-2 timing spring	8.2 (0.323)	28.6 (1.126)	0.8 (0.031)	Red
3-2 capacity spring	5.4 (0.213)	30.6 (1.205)	0.5 (0.020)	White
Throttle relief ball spring	6.6 (0.260)	21.6 (0.850)	0.8 (0.031)	—

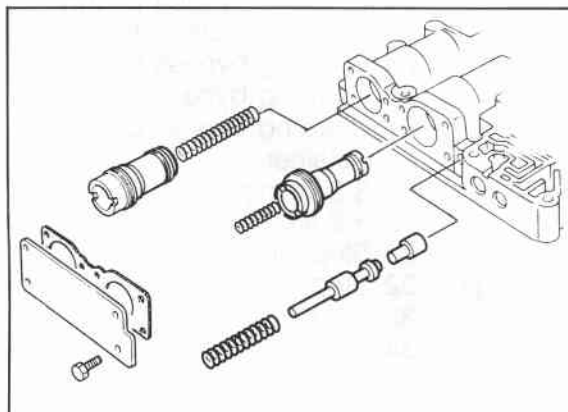
76G07B-151



86U07B-280

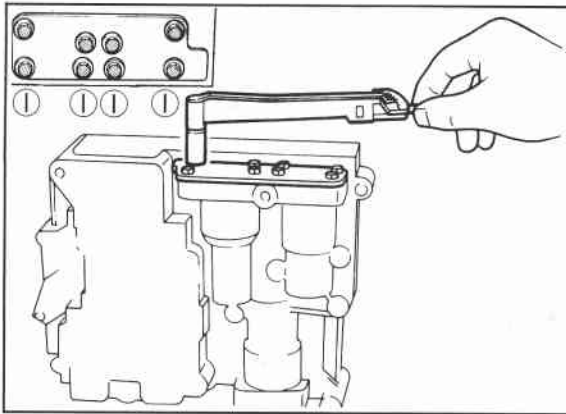
Assembly

1. Install the 3-2 capacity valve, 3-2 capacity spring, and stopper plug; then install the stopper pin.
2. Install the 3-2 timing valve, the 3-2 timing spring, and retainer.



76G07B-152

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

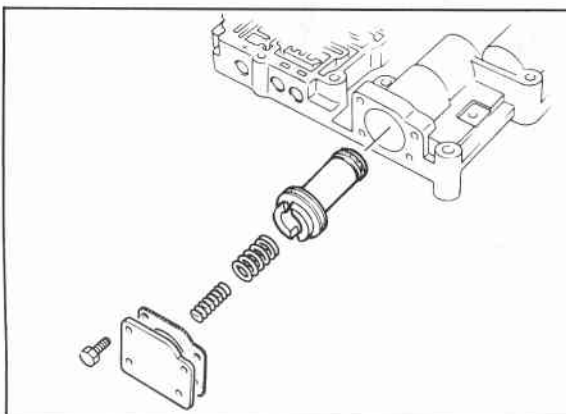


86U07B-282

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

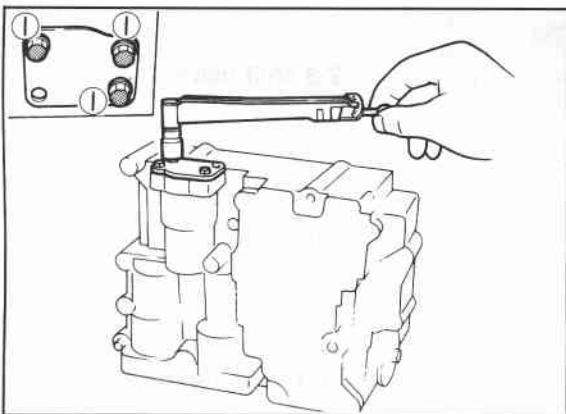
Tightening torque:

6—8 N·m (66—80 cm·kg, 57—69 in·lb)



86U07B-283

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

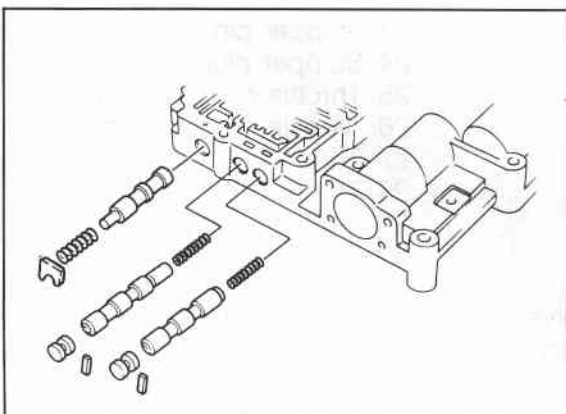


86U07B-284

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

Tightening torque:

6—8 N·m (66—80 cm·kg, 57—69 in·lb)



86U07B-285

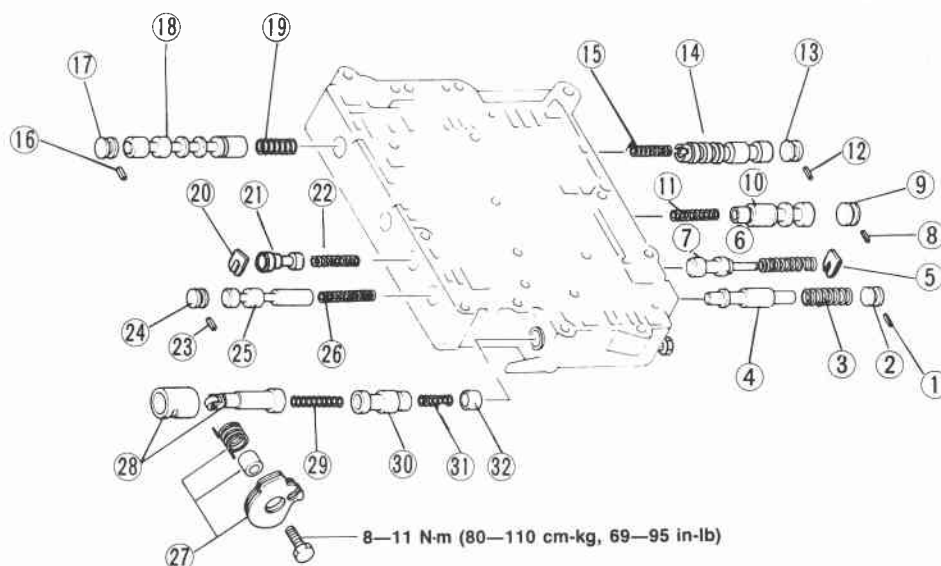
9. Install the bypass spring, bypass valve, stopper plug, and stopper pin.
10. Install the servo control spring, servo control valve, stopper plug, and stopper pin.
11. Install the 2-3 timing valve, 2-3 timing spring, and retainer.

7B INSPECTION AND REPAIR

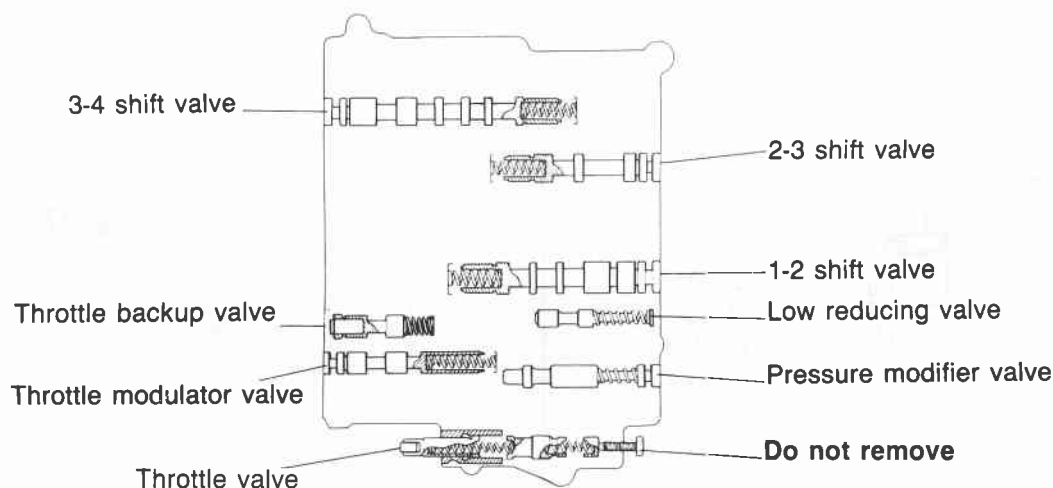
Main Control Body

Disassembly

Disassemble in the sequence shown in the figure.



Valve Location



86U07B-286

- | | | |
|-----------------------------|----------------------------|-------------------------------|
| 1. Stopper pin | 12. Stopper pin | 23. Stopper pin |
| 2. Stopper plug | 13. Stopper plug | 24. Stopper plug |
| 3. Pressure modifier spring | 14. 2-3 shift valve | 25. Throttle modulator valve |
| 4. Pressure modifier valve | 15. 2-3 shift spring | 26. Throttle modulator spring |
| 5. Retainer | 16. Stopper pin | 27. Throttle cam assembly |
| 6. Low reducing spring | 17. Stopper plug | 28. Throttle plug assembly |
| 7. Low reducing valve | 18. 3-4 shift valve | 29. Throttle spring |
| 8. Stopper pin | 19. 3-4 shift spring | 30. Throttle valve |
| 9. Stopper plug | 20. Retainer | 31. Throttle assist spring |
| 10. 1-2 shift valve | 21. Throttle backup valve | 32. Throttle adjust plug |
| 11. 1-2 shift spring | 22. Throttle backup spring | |

Inspection

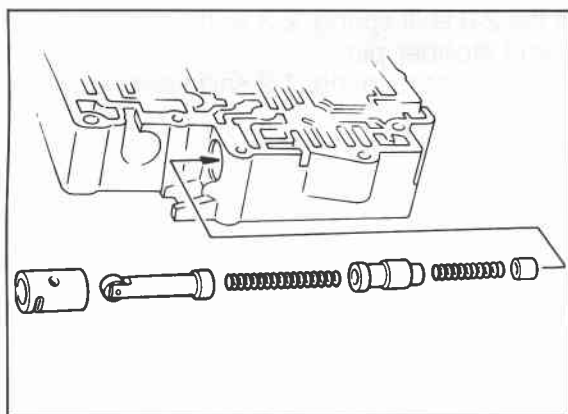
Check the following and replace any faulty parts.

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

Spring

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

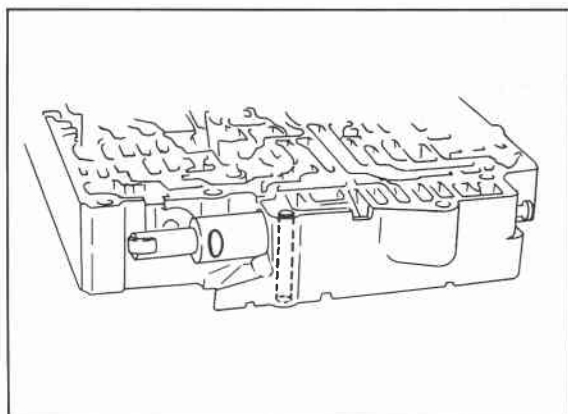
76G07B-219



86U07B-288

Assembly

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

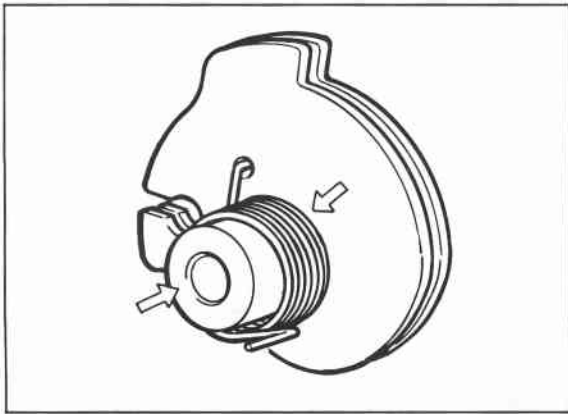


86U07B-289

Caution

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

7B INSPECTION AND REPAIR

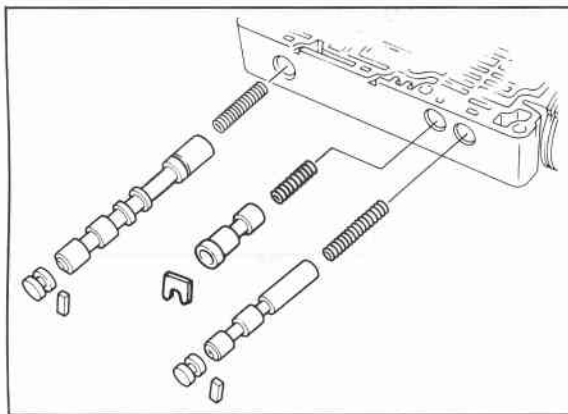


86U07B-290

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

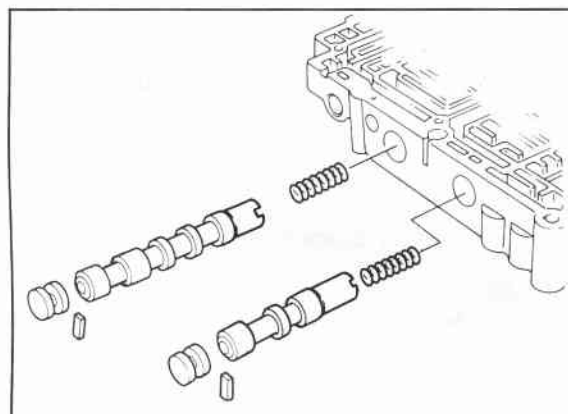
Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)



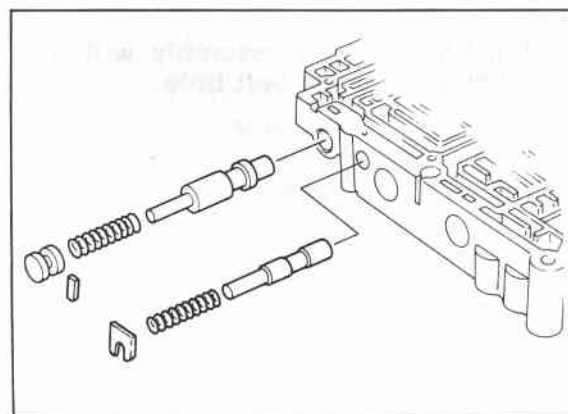
386U07B-291

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



86U07B-292

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



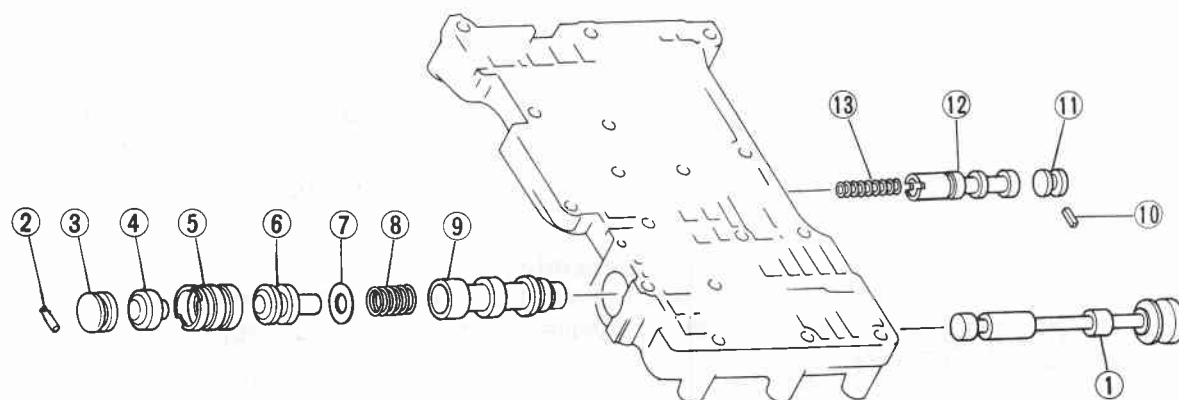
86U07B-293

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

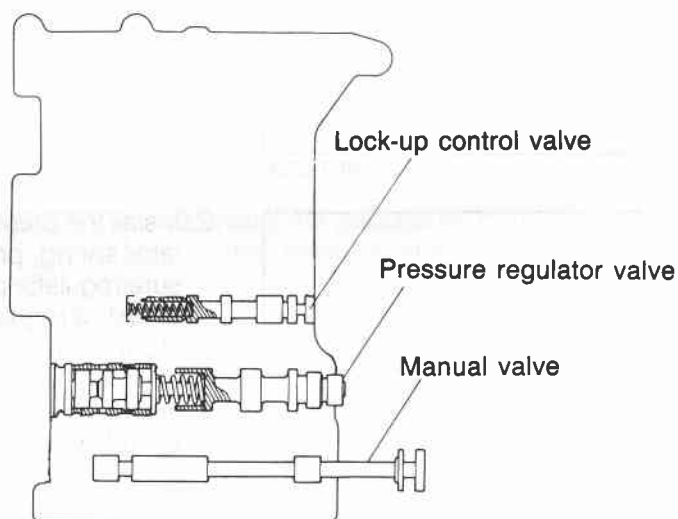
Rear Control Body

Disassembly

Disassemble in the sequence shown in the figure.



Valve Location



86U07B-294

1. Manual valve
2. Stopper pin
3. Stopper plug
4. Pressure regulator backup plug
5. Pressure regulator plug sleeve
6. Pressure regulator plug
7. Pressure regulator spring seat

8. Pressure regulator spring
9. Pressure regulator valve
10. Stopper pin
11. Stopper plug
12. Lock-up control valve
13. Lock-up control spring

7B INSPECTION AND REPAIR

Inspection

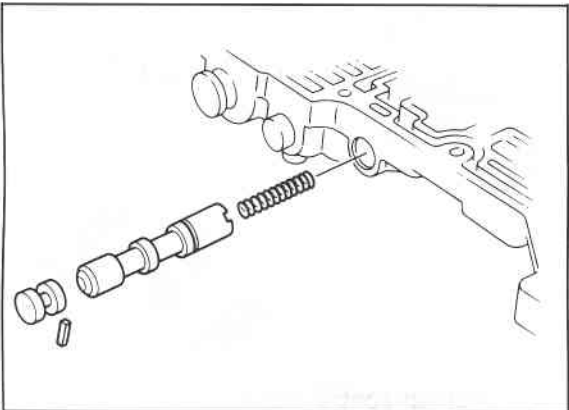
Check the following and replace any faulty parts.

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

Spring

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

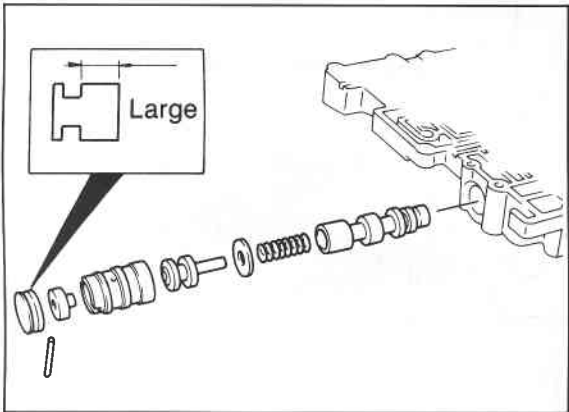
86U07B-295



86U07B-296

Assembly

- 1. Install the lock-up control spring, lock-up control valve, stopper plug, and stopper pin.

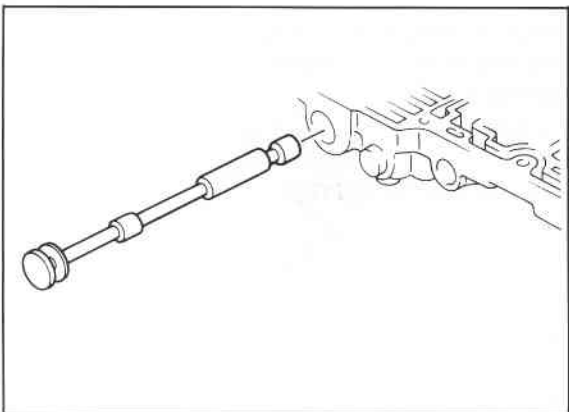


86U07B-297

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

Note

Install the stopper plug larger end first.



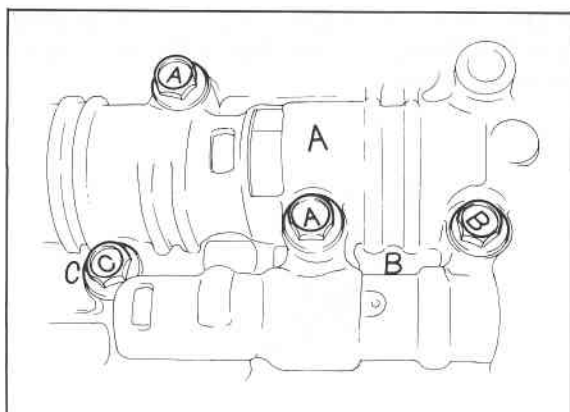
86U07B-298

- 3. Install the manual valve.

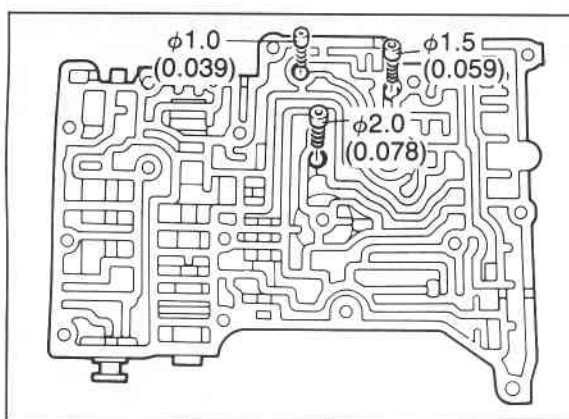
Assembly of Control Valve Body

Note

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

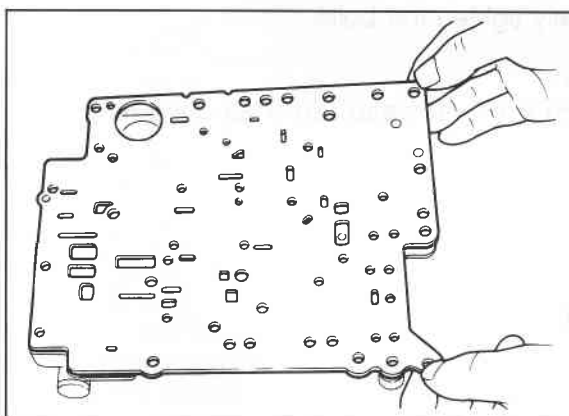


86U07B-299



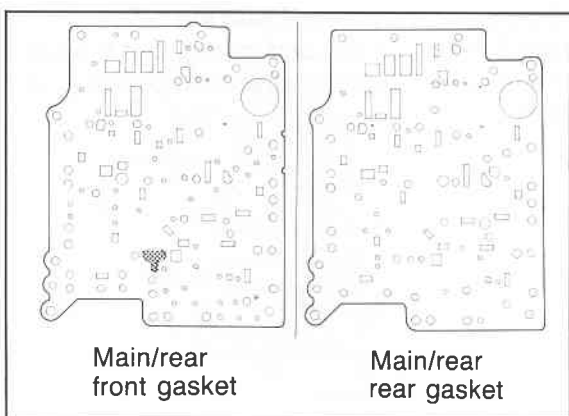
86U07B-300

1. Install the orifice check valves ($\phi 1.5$ mm, 0.059 in; $\phi 1.0$ mm, 0.039 in; $\phi 2.0$ mm, 0.079 in) and springs in the rear control body as shown.



86U07B-301

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

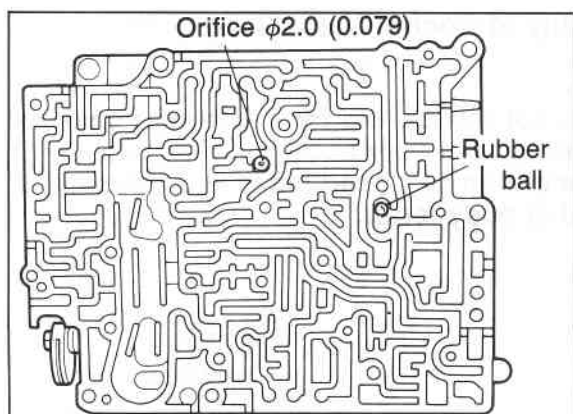


86U07B-302

Note

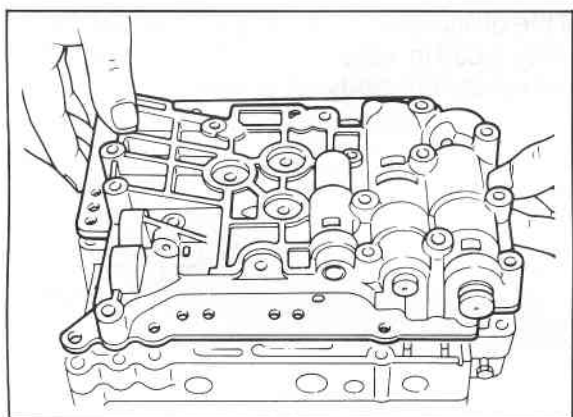
The main/rear rear gasket and main/rear front gasket are not interchangeable.

7B INSPECTION AND REPAIR



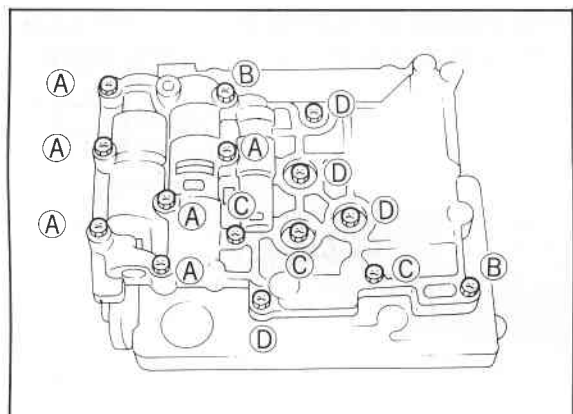
76G07B-153

3. Install the orifice check valve ($\phi 2.0$ mm, 0.079 in) and spring, and the rubber ball in the main control body as shown.



86U07B-304

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

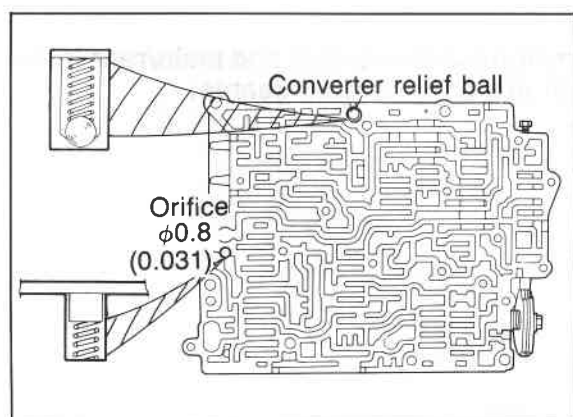


86U07B-305

5. Loosely tighten the bolts.

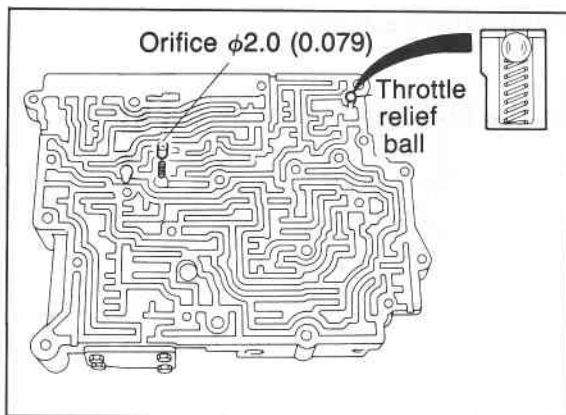
Note

Match the bolt head letter as shown.



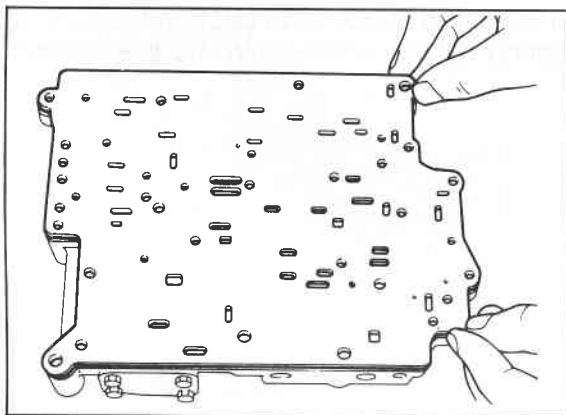
86U07B-306

6. Turn the assembly over and install the orifice check valve ($\phi 0.8$ mm, 0.031 in) and spring, and the converter relief ball and spring in the main control body as shown.



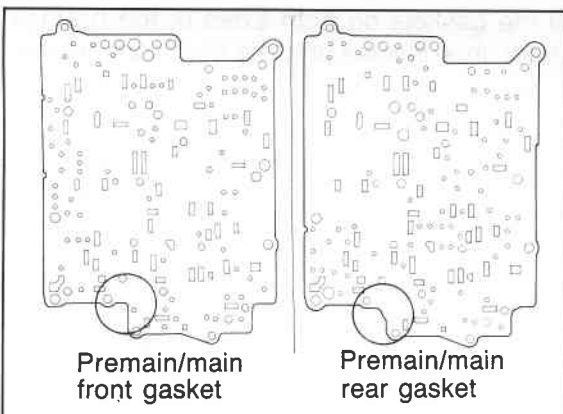
76G07B-154

7. Install the orifice check valve ($\phi 2.0$ mm, 0.079 in) and spring, and the throttle relief ball and spring in the premain control body as shown.



86U07B-308

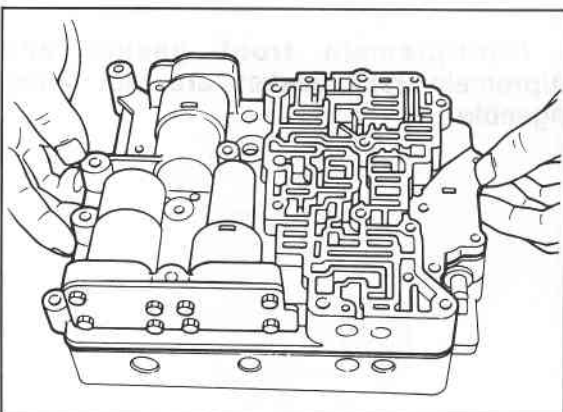
8. Install the gaskets on both sides of the main separator; then install it onto the premain control body.



86U07B-309

Note

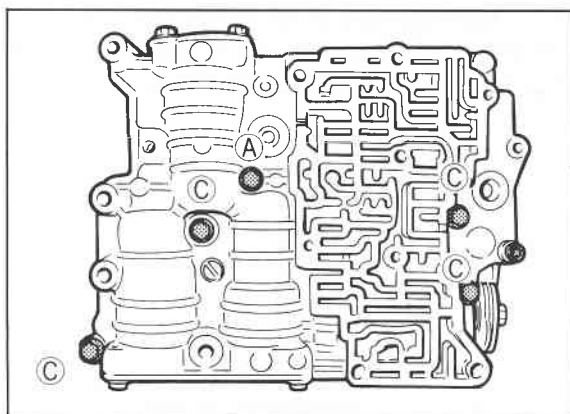
The premain/main rear gasket and premain/main front gasket are not interchangeable.



86U07B-310

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

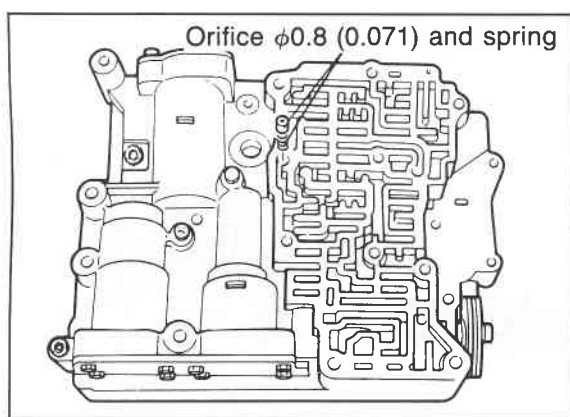
7B INSPECTION AND REPAIR



86U07B-311

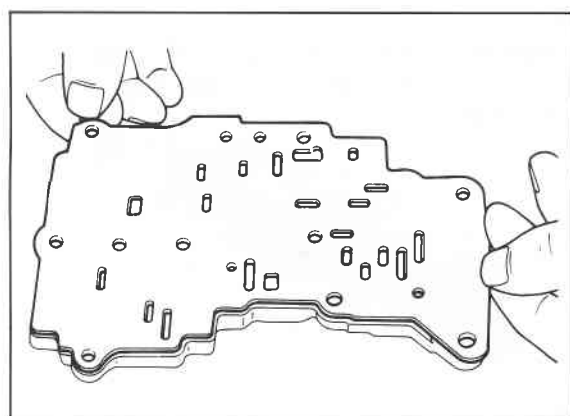
10. Loosely tighten the bolts.

Note
Match the bolt head letter as shown.



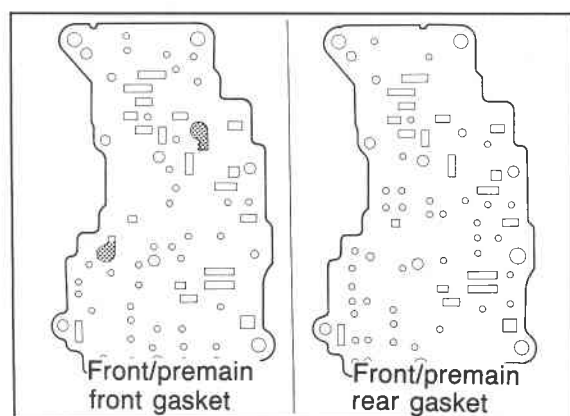
86U07B-312

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



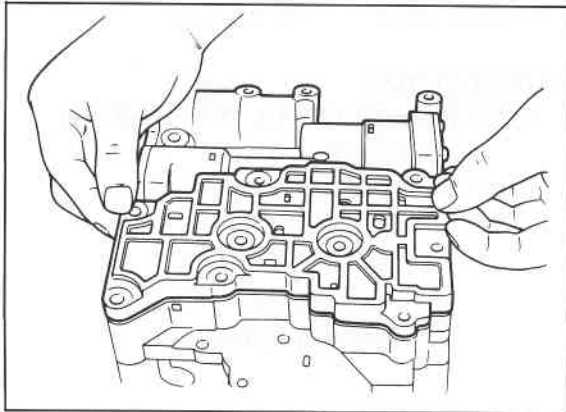
76G07B-156

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



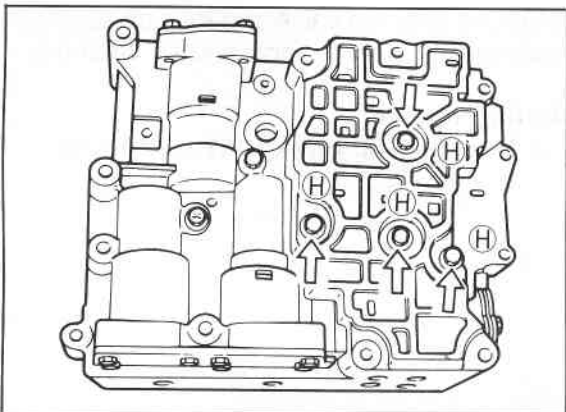
86U07B-314

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



76G07B-157

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

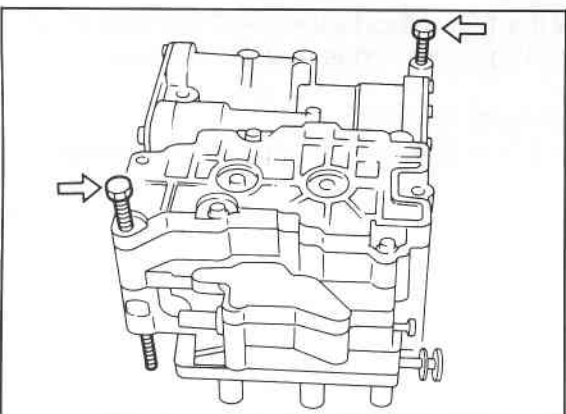


76G07B-158

14. Loosely tighten the bolts.

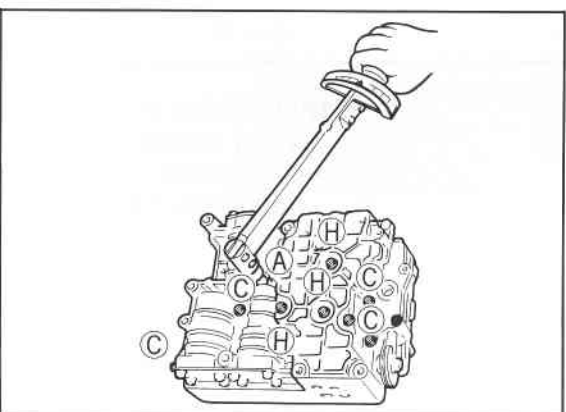
Note

Match the bolt head letter as shown.



76G07B-159

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



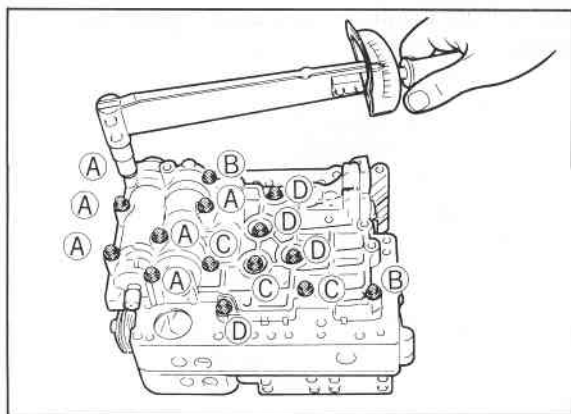
76G07B-160

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

Tightening torque:

6—8 N·m (66—80 cm·kg, 57—69 in·lb)

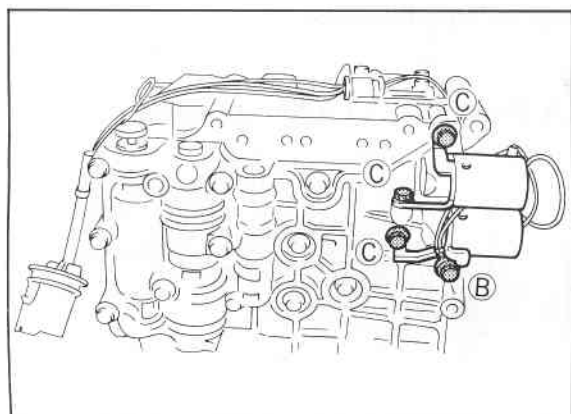
7B INSPECTION AND REPAIR



86U07B-319

(2) Tighten the rear control body.

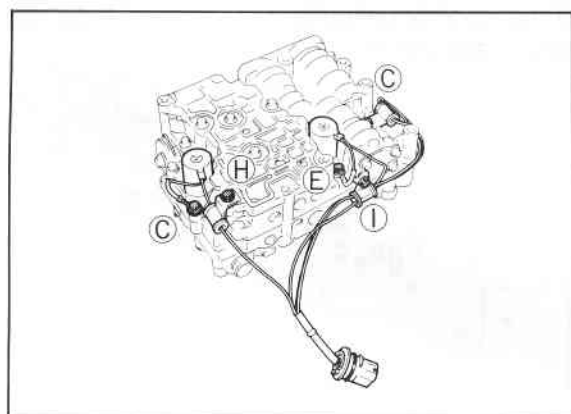
Tightening torque:
6—8 N·m (66—80 cm·kg, 57—69 in·lb)



76G07B-161

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

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



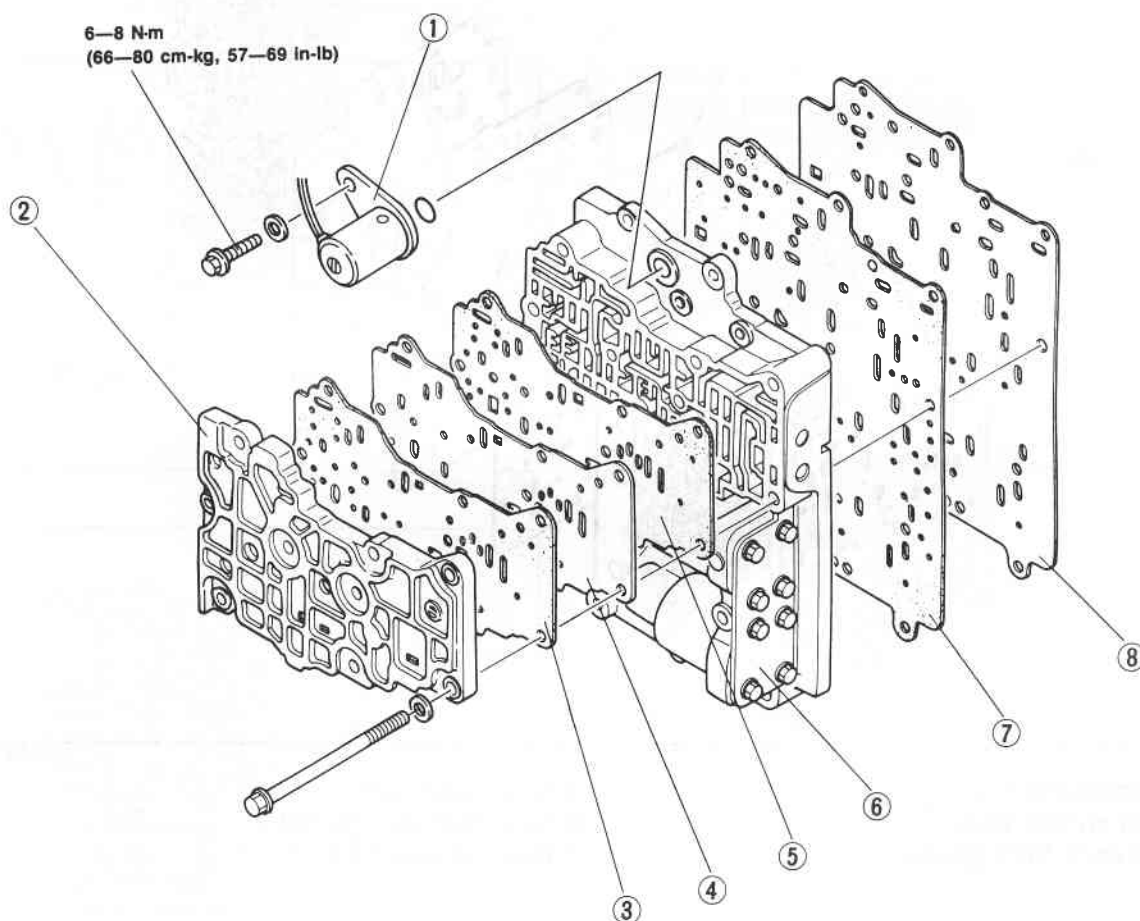
76G07B-162

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

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

CONTROL VALVE BODY (G4A-HL)**Precaution**

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

Components I**Front and premain control body**

76G07B-163

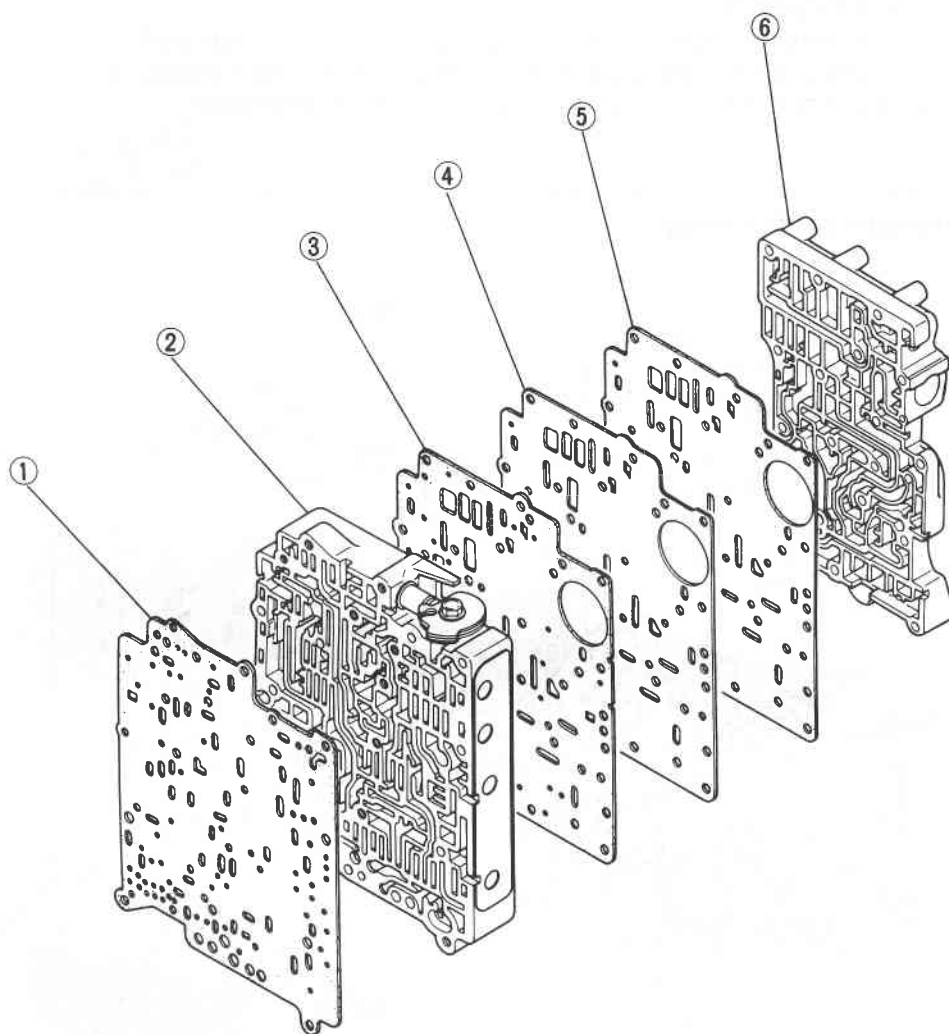
1. Lock-up solenoid valve
2. Front control body
3. Front/premain front gasket
4. Premain separator

5. Front/premain rear gasket
6. Premain control body
7. Premain/main front gasket
8. Main separator

7B INSPECTION AND REPAIR

Components II

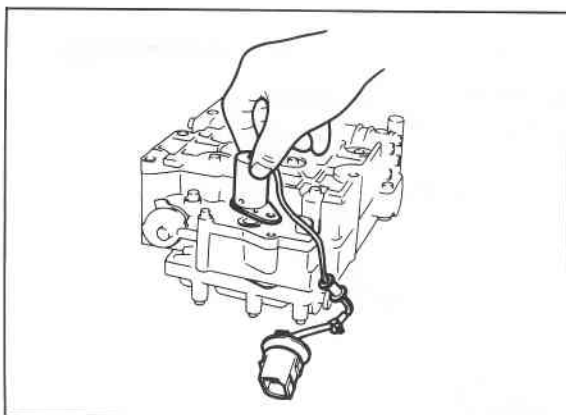
Main and rear control body



83U07B-274

1. Pre-main/main rear gasket
2. Main control body
3. Main/rear front gasket

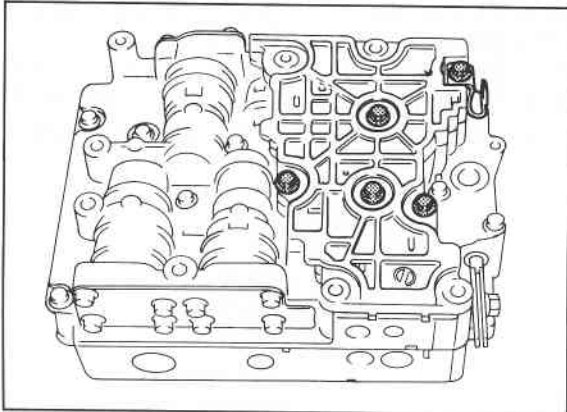
4. Rear separator
5. Main/rear rear gasket
6. Rear control body



83U07B-275

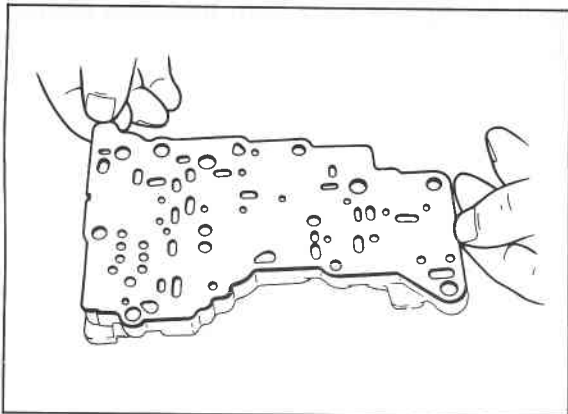
Disassembly of Control Valve Body

1. Remove the lock-up solenoid valve.
2. Remove the O-ring and oil strainer.



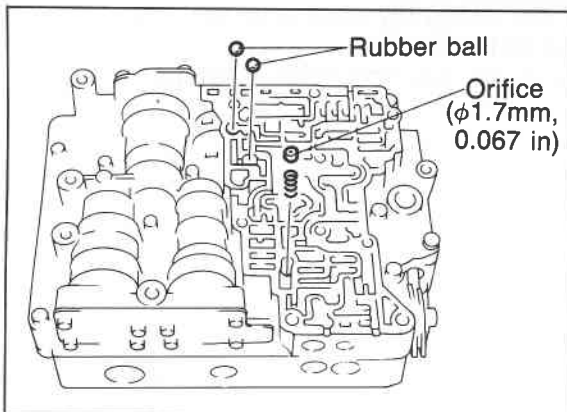
83U07B-276

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



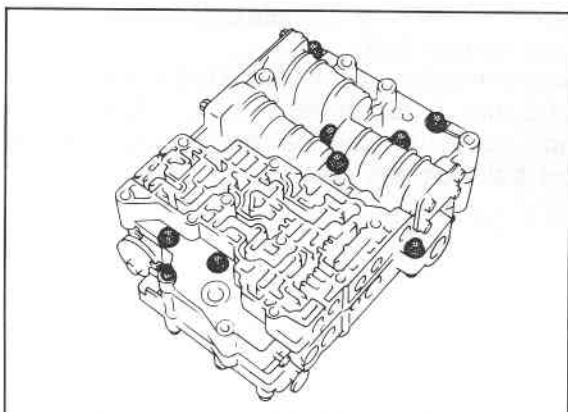
83U07B-277

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



83U07B-278

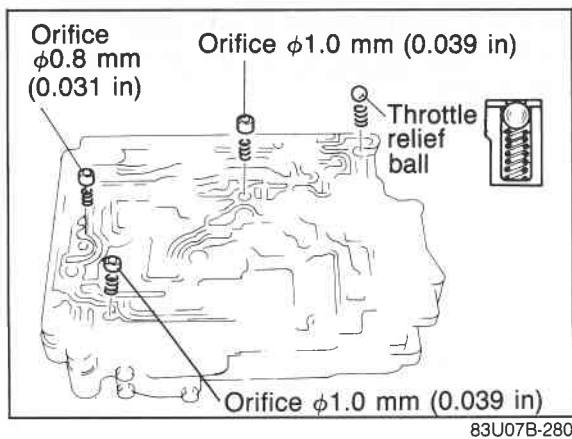
5. Remove the rubber balls, orifice check valve ($\phi 1.7$ mm, 0.067 in) and spring from the premain control body.



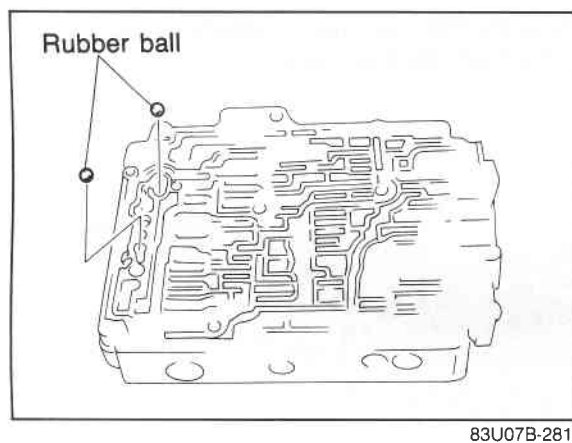
83U07B-279

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

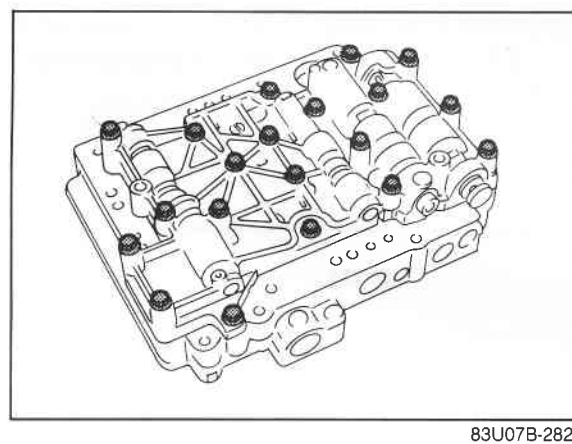
7B INSPECTION AND REPAIR



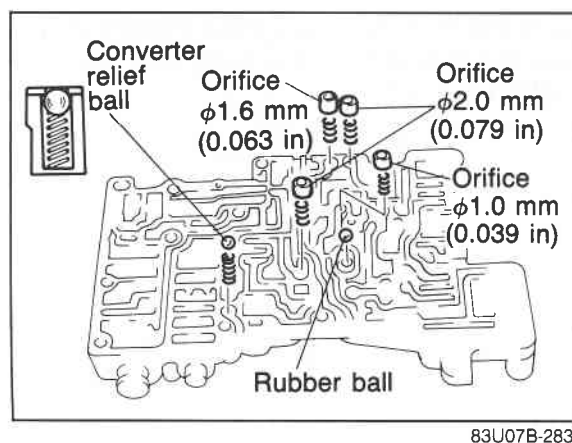
7. Remove the premain/main gaskets and separator from the premain control body.
8. Remove the orifice check valves ($\phi 1.0$ mm, 0.039 in; $\phi 0.8$ mm, 0.031 in) and springs, and the throttle relief ball and spring from the premain control body.



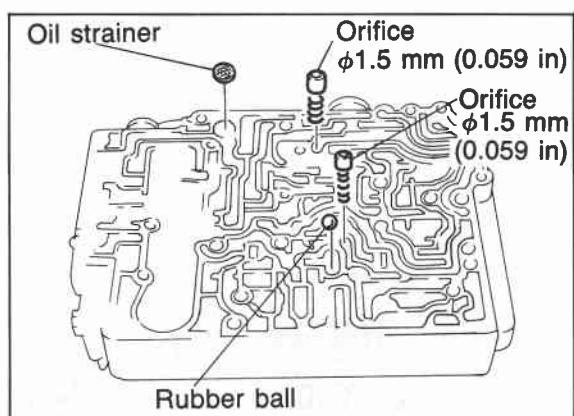
9. Remove the rubber balls from the main control body.



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



11. Remove the main/rear gaskets and separator from the rear control body.
12. Remove the orifice check valves ($\phi 2.0$ mm, 0.079 in; $\phi 1.6$ mm, 0.063 in; $\phi 1.0$ mm, 0.039 in) and springs, converter relief ball and spring, and the rubber ball from the rear control body.



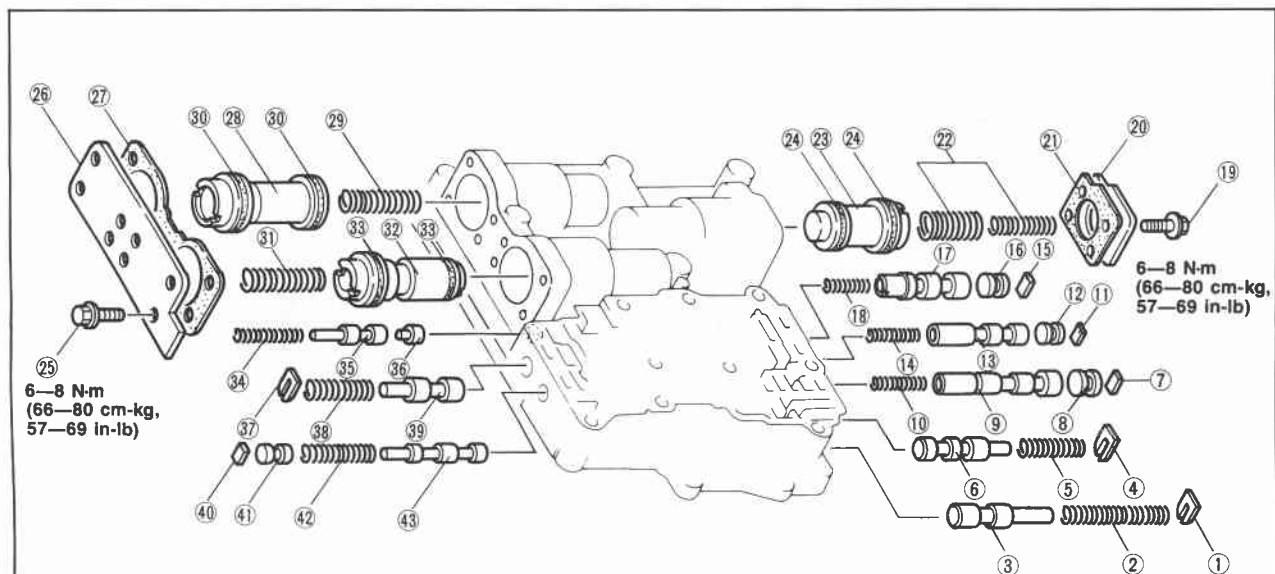
76G07B-164

13. Remove the orifice check valves ($\phi 1.5 \text{ mm}$, 0.059 in) and springs, oil strainer, and rubber ball from the main control body.

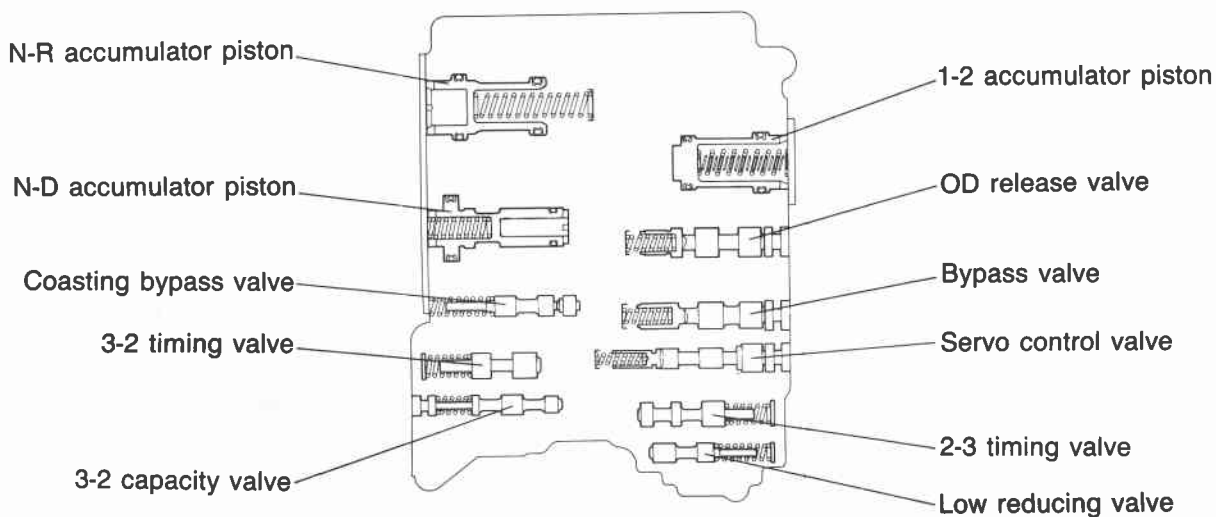
7B INSPECTION AND REPAIR

Premain Control Body Disassembly

Disassemble in the sequence shown in the figure.



Valve Location



83U07B-285

- | | | |
|--------------------------|---------------------------------|----------------------------------|
| 1. Retainer | 16. Stopper plug | 30. N-R accumulator seal rings |
| 2. Low reducing spring | 17. OD release valve | 31. N-D accumulator front spring |
| 3. Low reducing valve | 18. OD release spring | 32. N-D accumulator piston |
| 4. Retainer | 19. Bolt | 33. N-D accumulator seal rings |
| 5. 2-3 timing spring | 20. 1-2 accumulator plate | 34. Coasting bypass spring |
| 6. 2-3 timing valve | 21. 1-2 accumulator gasket | 35. Coasting bypass valve |
| 7. Stopper pin | 22. 1-2 accumulator springs | 36. Coasting bypass plug |
| 8. Stopper plug | 23. 1-2 accumulator piston | 37. Retainer |
| 9. Servo control valve | 24. 1-2 accumulator seal rings | 38. 3-2 timing spring |
| 10. Servo control spring | 25. Bolt | 39. 3-2 timing valve |
| 11. Stopper pin | 26. N-R accumulator plate | 40. Stopper pin |
| 12. Stopper plug | 27. N-R accumulator gasket | 41. Stopper plug |
| 13. Bypass valve | 28. N-R accumulator piston | 42. 3-2 capacity spring |
| 14. Bypass spring | 29. N-R accumulator rear spring | 43. 3-2 capacity valve |
| 15. Stopper pin | | |

Inspection

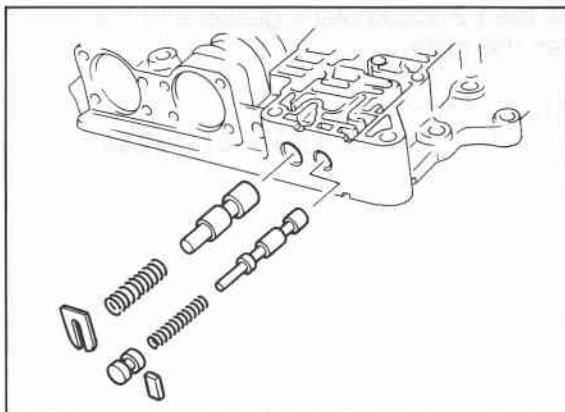
Check the following and replace any faulty parts.

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

Spring

Spring name		Outer dia. mm (in)	Free length mm (in)	Wire dia. mm (in)	Spring color
1-2 accumulator small spring	F8 engine	9.9 (0.400)	84.7 (3.335)	1.2 (0.047)	Red
1-2 accumulator large spring	FE engine	13.0 (0.512)	73.2 (2.881)	1.8 (0.071)	Pink
	F8 engine	16.0 (0.630)	84.7 (3.335)	2.0 (0.079)	White
Bypass spring		5.0 (0.197)	25.1 (0.988)	0.7 (0.028)	Yellow
Servo control spring		4.9 (0.193)	27.1 (1.067)	0.5 (0.020)	Light blue
2-3 timing spring		8.3 (0.327)	26.5 (1.043)	0.8 (0.031)	—
N-R accumulator rear spring		11.1 (0.437)	68.2 (2.685)	1.0 (0.039)	Blue
N-D accumulator front spring		9.8 (0.386)	60.9 (2.398)	1.1 (0.043)	Yellow
Low reducing spring		8.7 (0.343)	38.3 (1.508)	0.9 (0.035)	Black
OD release spring		6.0 (0.236)	32.6 (1.283)	0.6 (0.024)	Orange
Coasting bypass spring		5.8 (0.228)	31.3 (1.232)	0.6 (0.024)	Yellow
3-2 timing spring		8.2 (0.323)	28.55 (1.124)	0.8 (0.031)	Maroon
3-2 capacity spring		5.55 (0.219)	30.5 (1.201)	0.55 (0.022)	Light green
Throttle relief ball spring		6.6 (0.260)	20.3 (0.799)	0.8 (0.031)	Light green

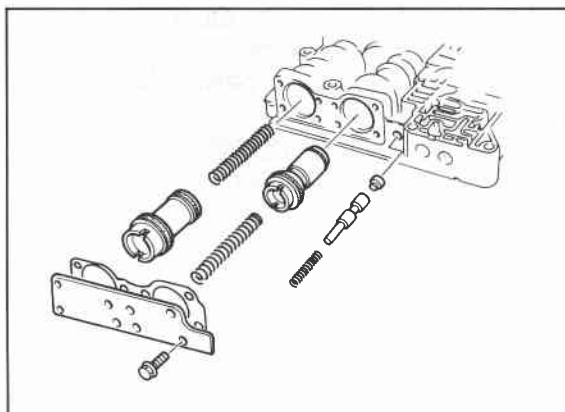
76G07B-165



83U07B-287

Assembly

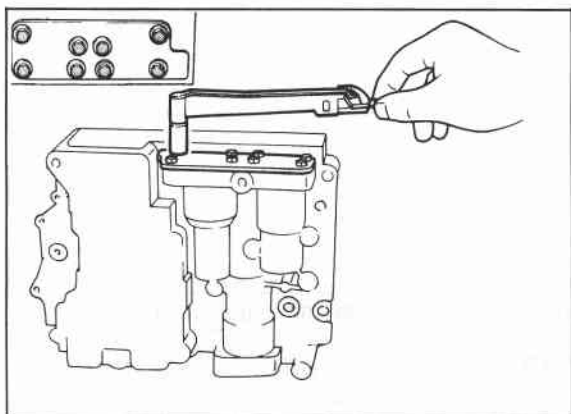
1. Install the 3-2 capacity valve, 3-2 capacity spring, stopper plug, and stopper pin.
2. Install the 3-2 timing valve, 3-2 timing spring, and retainer.



83U07B-288

3. Install the coasting bypass plug, coasting bypass valve, and coasting bypass spring.
4. Apply ATF to the O-rings, and install them onto the piston; then insert the N-R accumulator rear spring, and N-R accumulator piston.
5. Apply ATF to the O-rings, and install them onto the piston; then insert the N-D accumulator piston, and N-D accumulator front spring.

7B INSPECTION AND PREAIR

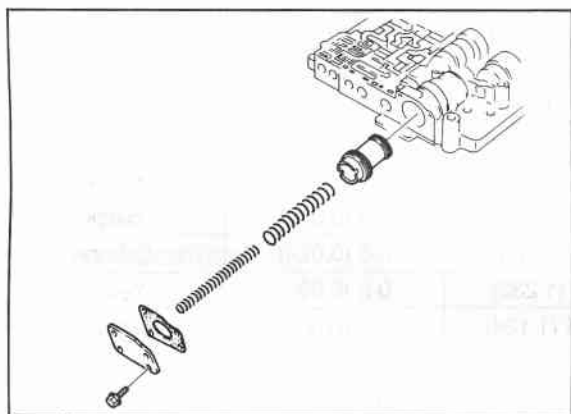


83U07B-289

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

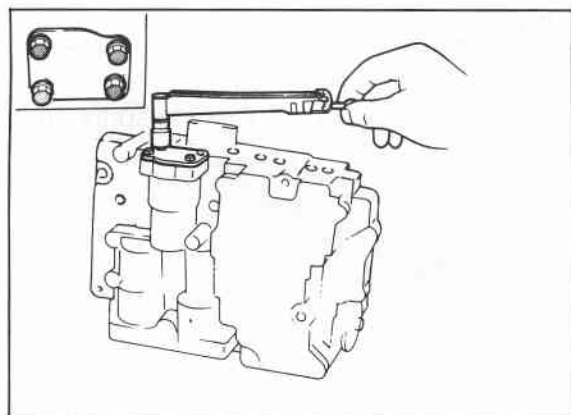
Tightening torque:

6—8 N·m (66—80 cm·kg, 57—69 in·lb)



83U07B-290

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

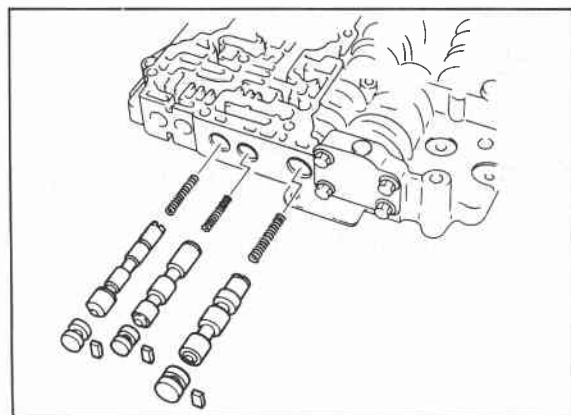


83U07B-291

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

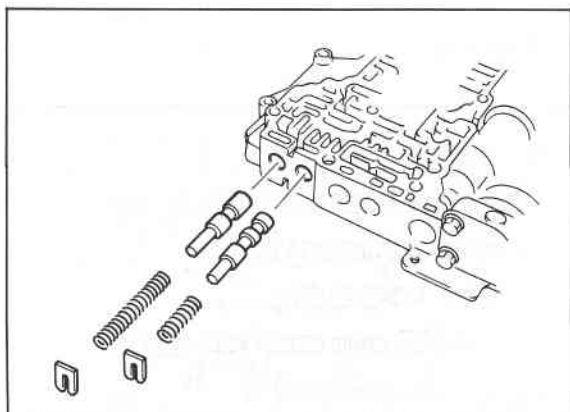
Tightening torque:

6—8 N·m (66—80 cm·kg, 57—69 in·lb)



83U07B-292

9. Install the OD release spring, OD release valve, stopper plug, and stopper pin.
10. Install the bypass spring, bypass valve, stopper plug, and stopper pin.
11. Install the servo control spring, servo control valve, stopper plug, and stopper pin.



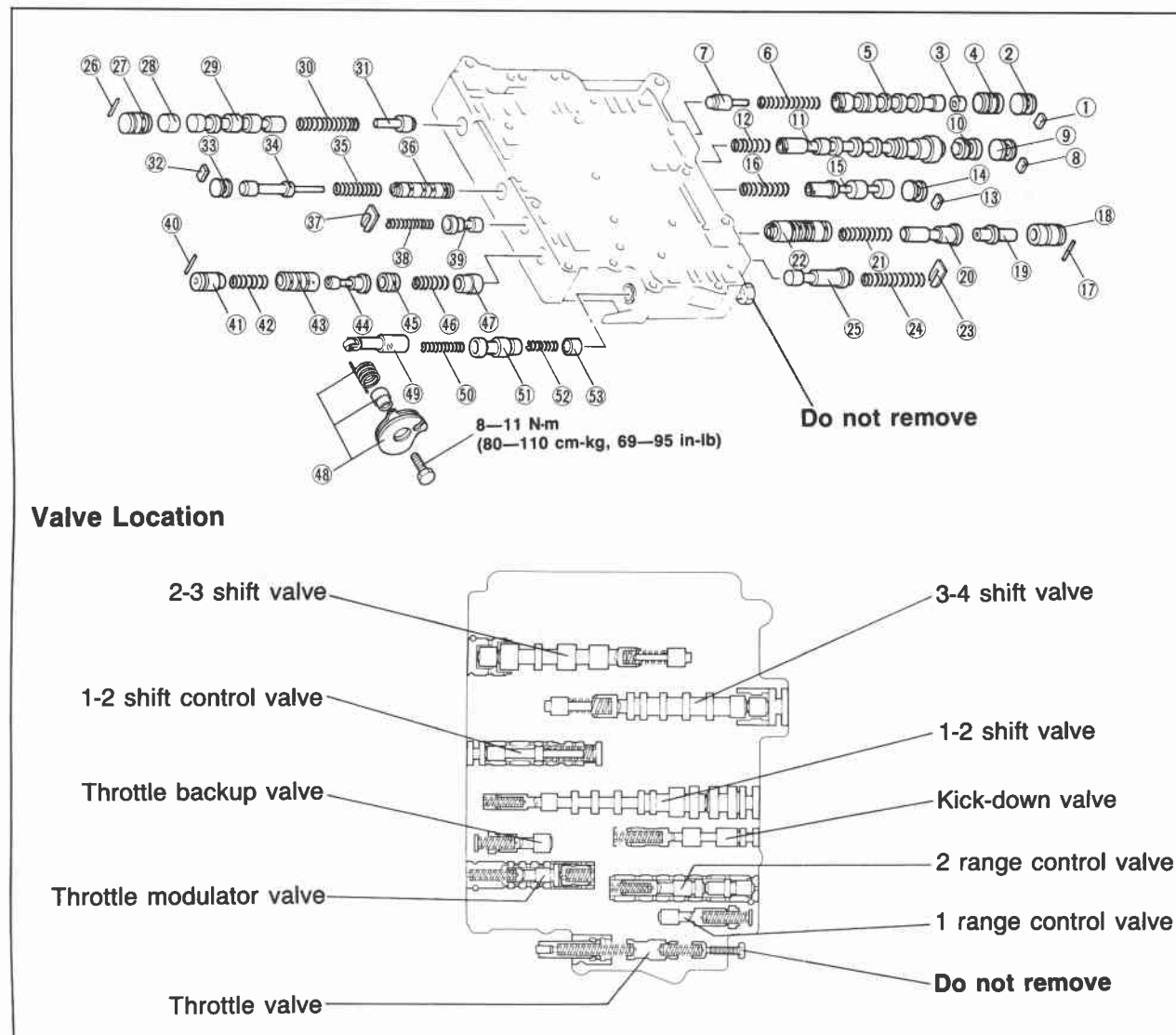
83U07B-293

12. Install the 2-3 timing valve, 2-3 timing spring, and retainer.
13. Install the low reducing valve, low reducing spring, and retainer.

7B INSPECTION AND REPAIR

Main Control Body Disassembly

Disassemble in the sequence shown in the figure.



83U07B-294

- | | | |
|----------------------------------|---------------------------------|-------------------------------------|
| 1. Stopper pin | 19. 2 range control plug | 37. Retainer |
| 2. Stopper plug | 20. 2 range control valve | 38. Throttle backup spring |
| 3. 3-4 shift front plug | 21. 2 range control spring | 39. Throttle backup valve |
| 4. 3-4 shift sleeve | 22. 2 range control rear sleeve | 40. Stopper pin |
| 5. 3-4 shift valve | 23. Retainer | 41. Throttle modulator sleeve A |
| 6. 3-4 shift spring | 24. 1 range control spring | 42. Throttle modulator front spring |
| 7. 3-4 shift rear plug | 25. 1 range control valve | 43. Throttle modulator sleeve B |
| 8. Stopper pin | 26. Stopper pin | 44. Throttle modulator valve |
| 9. Stopper plug | 27. 2-3 shift sleeve | 45. Throttle modulator sleeve C |
| 10. 1-2 shift plug | 28. 2-3 shift front plug | 46. Throttle modulator rear spring |
| 11. 1-2 shift valve | 29. 2-3 shift valve | 47. Throttle modulator plug |
| 12. 1-2 shift spring | 30. 2-3 shift spring | 48. Throttle cam assembly |
| 13. Stopper pin | 31. 2-3 shift rear plug | 49. Throttle plug assembly |
| 14. Stopper plug | 32. Stopper pin | 50. Throttle spring |
| 15. Kick-down valve | 33. Stopper plug | 51. Throttle valve |
| 16. Kick-down spring | 34. 1-2 shift control valve | 52. Throttle assist spring |
| 17. Stopper pin | 35. 1-2 shift control spring | 53. Throttle adjust plug |
| 18. 2 range control front sleeve | 36. 1-2 shift control sleeve | |

Inspection

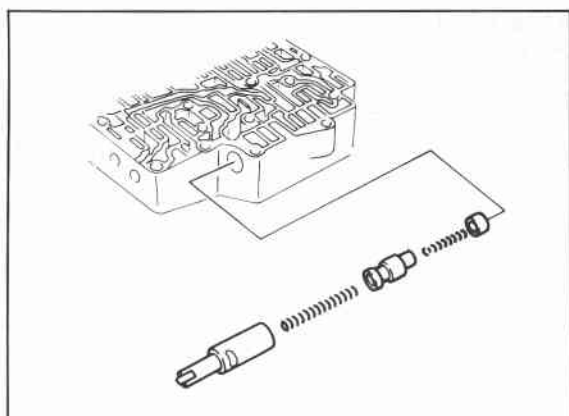
Check the following and replace any faulty parts.

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

Spring

Spring name	Outer dia. mm (in)	Free length mm (in)	Wire dia. mm (in)	Spring color
1-2 shift control spring	5.5 (0.217)	46.0 (1.811)	0.5 (0.020)	Light green
1-2 shift spring	5.0 (0.197)	24.9 (0.980)	0.5 (0.020)	Gray
2-3 shift spring	6.1 (0.240)	39.7 (1.563)	0.65 (0.026)	Pink
3-4 shift spring	6.4 (0.252)	37.0 (1.457)	0.6 (0.024)	—
Throttle backup spring	6.4 (0.252)	33.5 (1.319)	0.6 (0.024)	Pink
Throttle modulator front spring	5.0 (0.197)	27.8 (1.094)	0.6 (0.024)	Red
Throttle modulator rear spring	7.15 (0.281)	30.8 (1.213)	0.85 (0.033)	Red
1 rang control spring	6.15 (0.242)	39.2 (1.543)	0.65 (0.026)	White
2 rang control spring	3.95 (0.156)	32.1 (1.264)	0.45 (0.018)	—
Kick-down spring	5.4 (0.213)	38.1 (1.500)	0.8 (0.031)	—
Throttle assist spring	5.15 (0.203)	32.3 (1.272)	0.55 (0.022)	Dark green
Throttle spring	5.4 (0.213)	48.3 (1.902)	0.8 (0.031)	—
Converter relief ball spring	6.9 (0.272)	24.1 (0.949)	0.9 (0.035)	Maroon
Orifice check valve spring	5.0 (0.197)	12.5 (0.492)	0.23 (0.009)	—

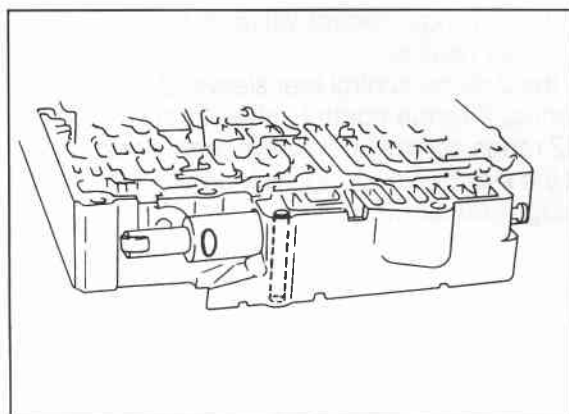
76G07B-220



83U07B-296

Assembly

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

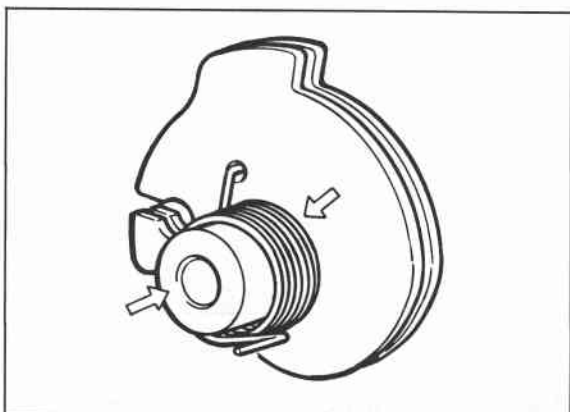


83U07B-297

Caution

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

7B INSPECTION AND REPAIR

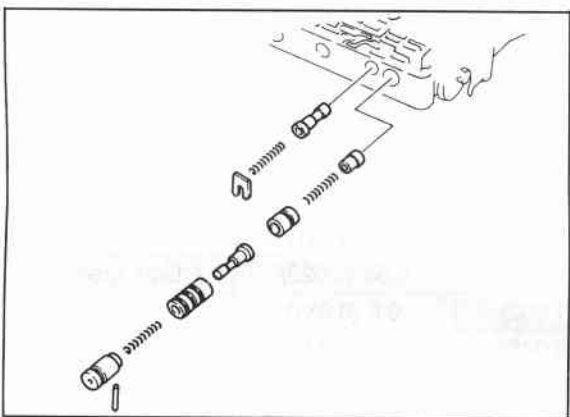


83U07B-298

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

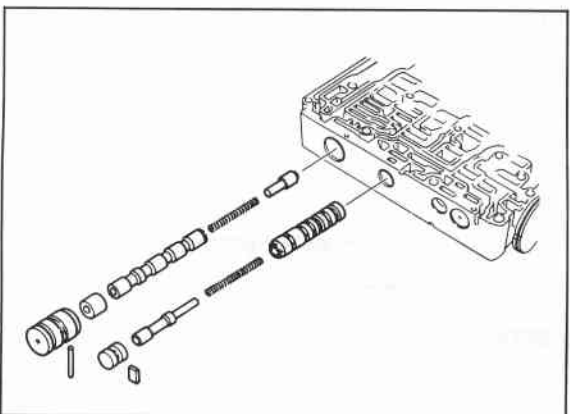
Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)



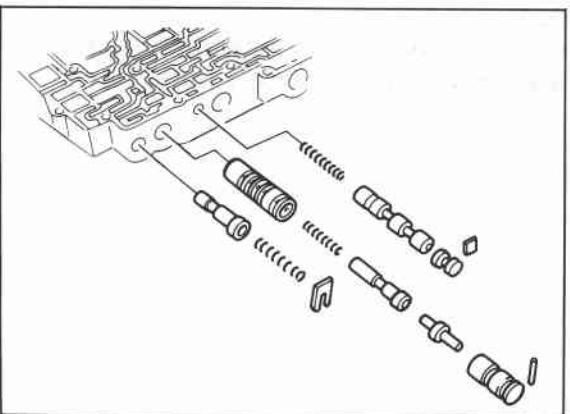
83U07B-299

4. Install the throttle modulator plug, throttle modulator rear spring, throttle modulator sleeve C, throttle modulator valve, throttle modulator sleeve B, throttle modulator front spring, throttle modulator sleeve A, and stopper pin.
5. Install the throttle backup valve, throttle backup spring, and retainer.



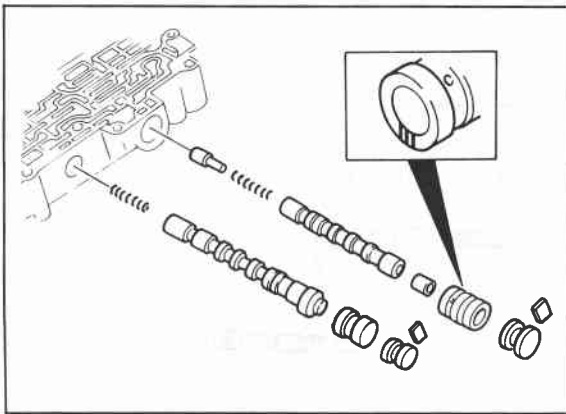
83U07B-300

6. Install the 1-2 shift control sleeve, 1-2 shift control spring, 1-2 shift control valve, stopper plug, and stopper pin.
7. Install the 2-3 shift rear plug, 2-3 shift spring, 2-3 shift valve, 2-3 shift front plug, 2-3 shift sleeve, and stopper pin.



83U07B-301

8. Install the 1 range control valve, 1 range control spring, and retainer.
9. Install the 2 range control rear sleeve, 2 range control spring, 2 range control valve, 2 range control plug, 2 range control front sleeve, and stopper pin.
10. Install the kick-down spring, kick-down valve, stopper plug, and stopper pin.



83U07B-302

11. Install the 1-2 shift spring, 1-2 shift valve, 1-2 shift plug, stopper plug, and stopper pin.
12. Install the 3-4 shift rear plug, 3-4 shift spring, 3-4 shift valve, 3-4 shift sleeve, 3-4 shift front plug, stopper plug, and stopper pin.

Note

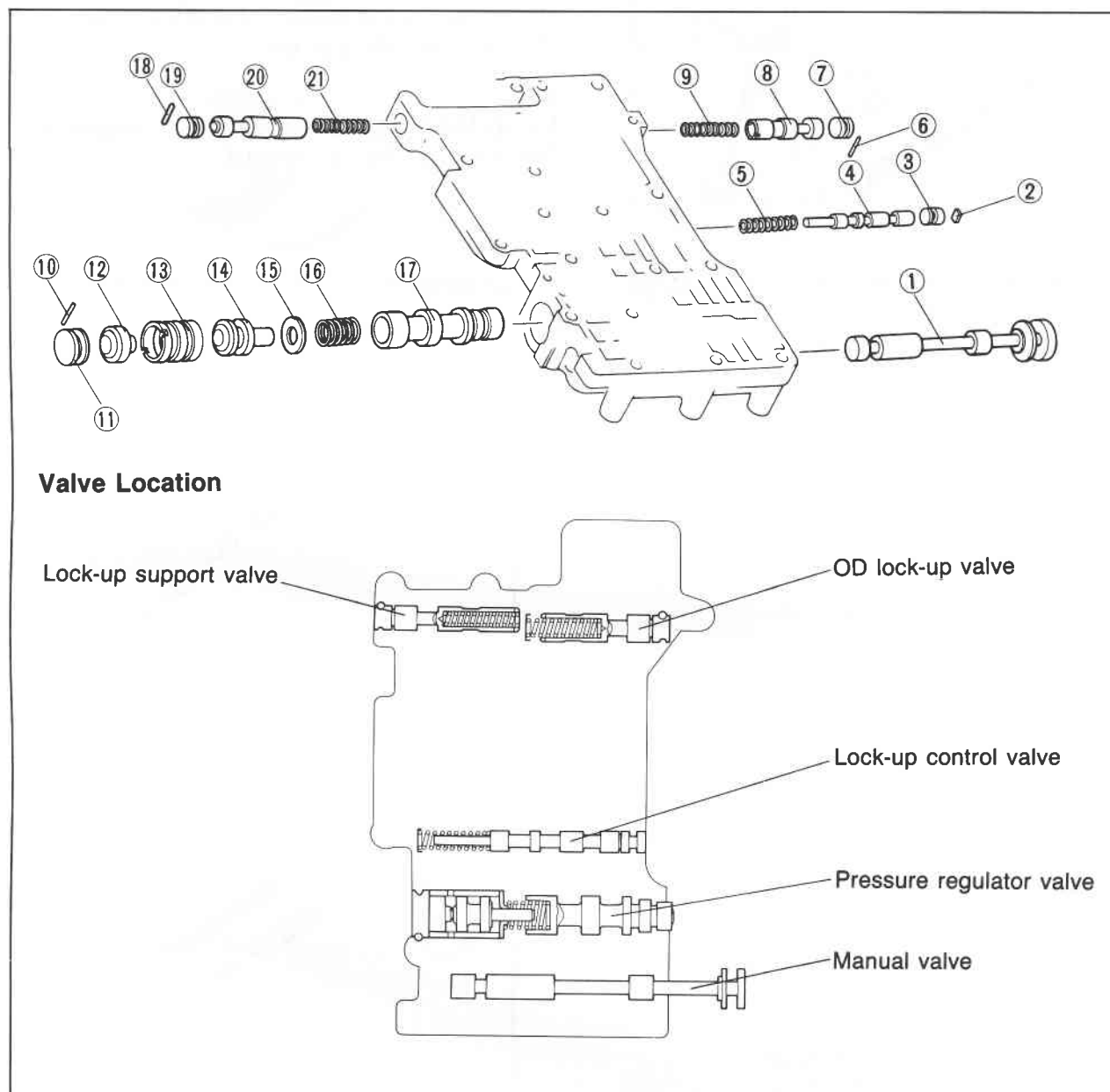
Install the 3-4 shift sleeve with the identification notches facing inward.

7B INSPECTION AND REPAIR

Rear Control Body

Disassembly

Disassemble in the sequence shown in the figure.



83U07B-303

- | | |
|---------------------------|------------------------------------|
| 1. Manual valve | 11. Stopper plug |
| 2. Stopper pin | 12. Pressure regulator backup plug |
| 3. Stopper plug | 13. Pressure regulator plug sleeve |
| 4. Lock-up control valve | 14. Pressure regulator plug |
| 5. Lock-up control spring | 15. Pressure regulator spring seat |
| 6. Stopper pin | 16. Pressure regulator spring |
| 7. Stopper plug | 17. Pressure regulator valve |
| 8. OD lock-up valve | 18. Stopper pin |
| 9. OD lock-up spring | 19. Stopper plug |
| 10. Stopper pin | 20. Lock-up support valve |
| | 21. Lock-up support spring |

Inspection

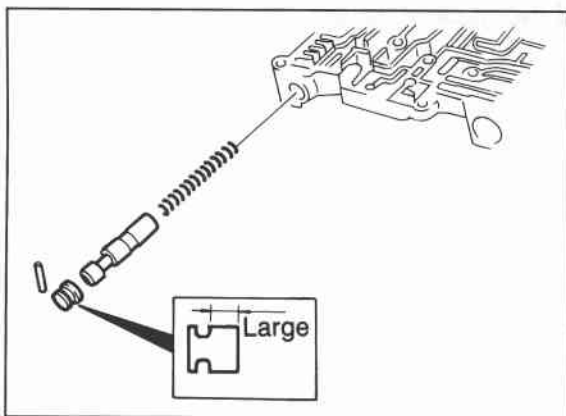
Check the following and replace any faulty parts.

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

Spring

Spring name	Outer dia. mm (in)	Free length mm (in)	Wire dia. mm (in)	Spring color
Pressure regulator spring	9.5 (0.374)	30.7 (1.209)	0.7 (0.028)	—
Lock-up control spring	7.3 (0.287)	46.2 (1.819)	0.8 (0.031)	Blue
Lock-up support spring	7.0 (0.276)	52.3 (2.059)	1.0 (0.039)	Yellow
OD lock-up spring	7.1 (0.280)	66.5 (2.618)	0.8 (0.031)	Red

76G07B-166



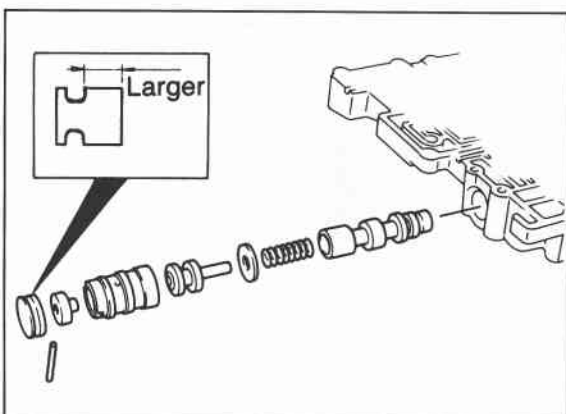
83U07B-305

Assembly

1. Install the lock-up support spring, lock-up support valve, stopper plug, and stopper pin.

Note

Install the stopper plug large end first.



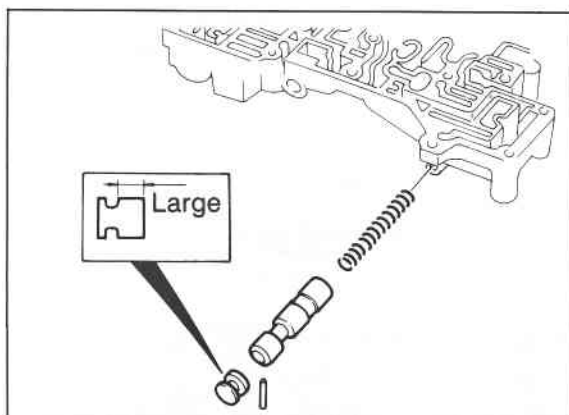
83U07B-306

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

Note

Install the stopper plug large end first.

7B INSPECTION AND REPAIR

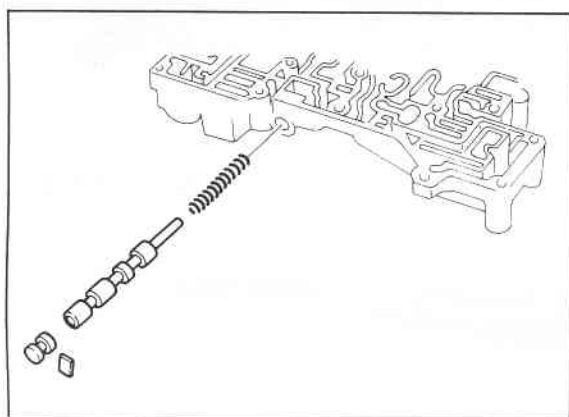


83U07B-307

3. Install the OD lock-up spring, OD lock-up valve, stopper plug, and stopper pin.

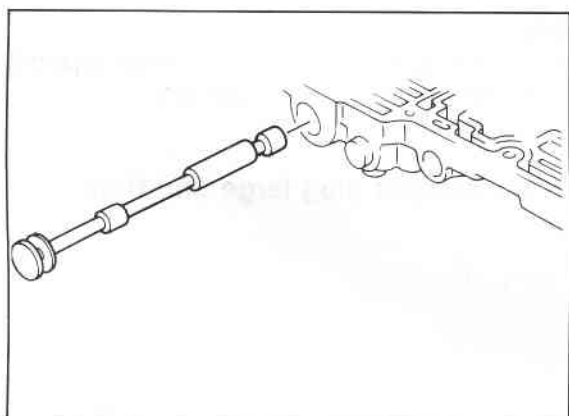
Note

Install the stopper plug large end first.



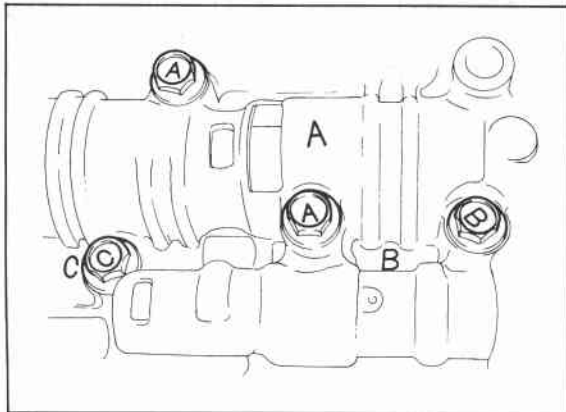
83U07B-308

4. Install the lock-up control spring, lock-up control valve, stopper plug, and stopper pin.



83U07B-309

3. Install the manual valve.

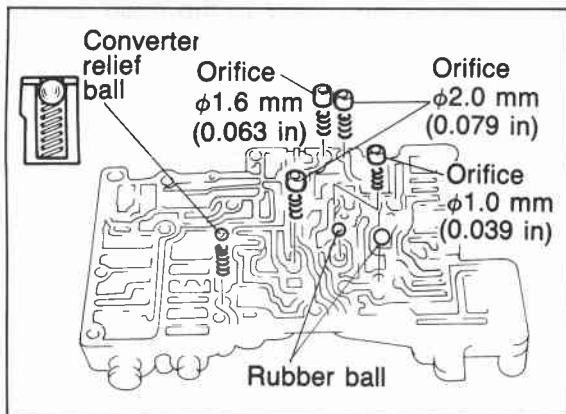


83U07B-310

Assembly of Control Valve Body

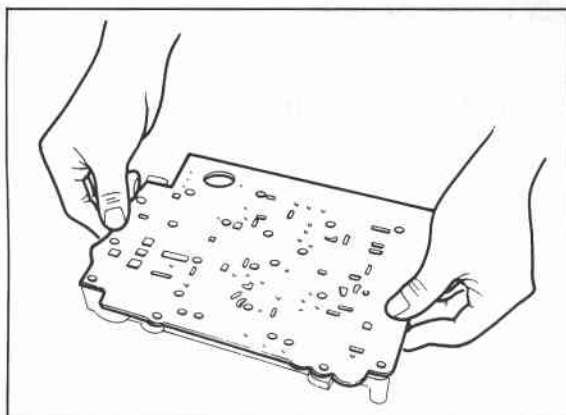
Note

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



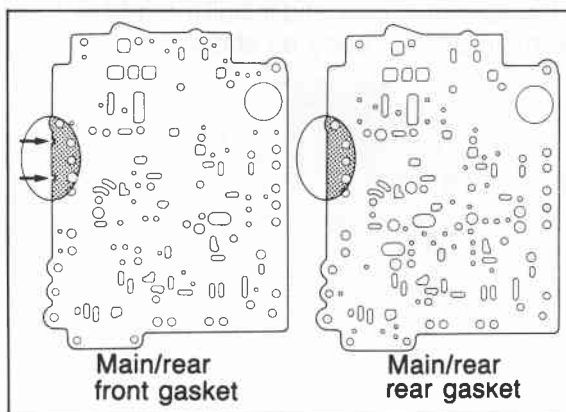
83U07B-311

1. Install the orifice check valves ($\phi 2.0$ mm, 0.079 in; $\phi 1.6$ mm, 0.063 in; $\phi 1.0$ mm, 0.039 in) and springs, converter relief ball and spring, and rubber balls in the rear control body as shown.



83U07B-312

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

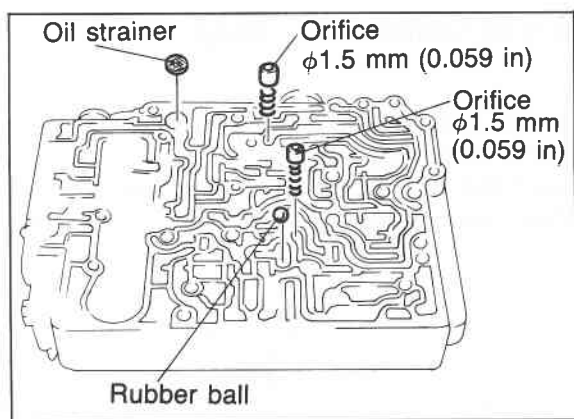


83U07B-313

Note

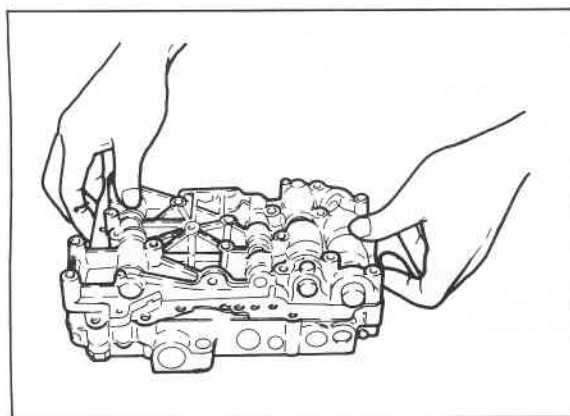
The main/rear rear gasket and main/rear front gasket are not interchangeable.

7B INSPECTION AND REPAIR



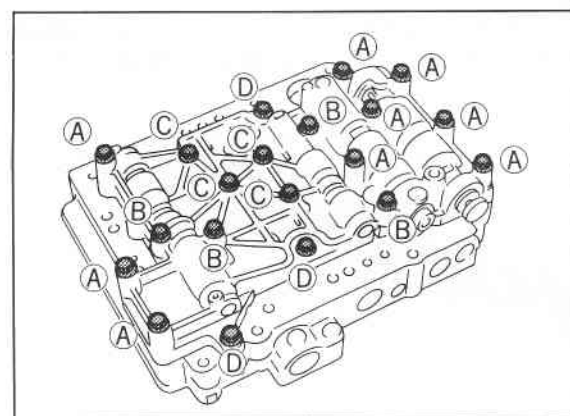
76G07B-167

3. Install the orifice check valves ($\phi 1.5$ mm, 0.059 in) and springs, oil strainer, and rubber ball in the main control body as shown.



83U07B-315

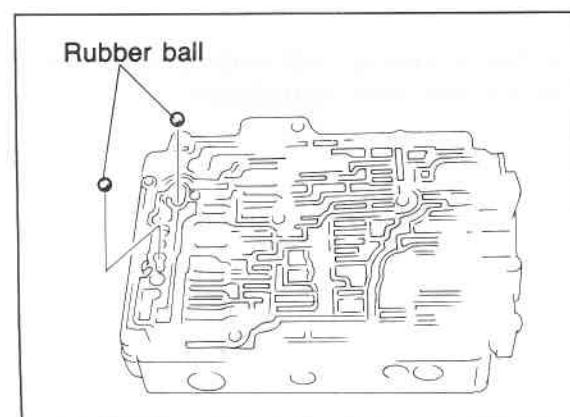
4. Install the rear control body to the main control body.



83U07B-316

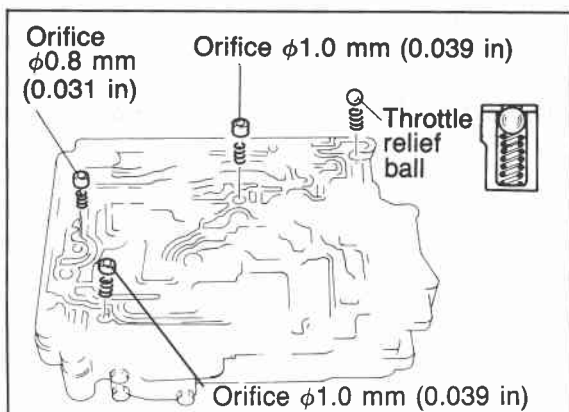
5. Loosely tighten the bolts.

Note
Match the bolt head letter as shown.



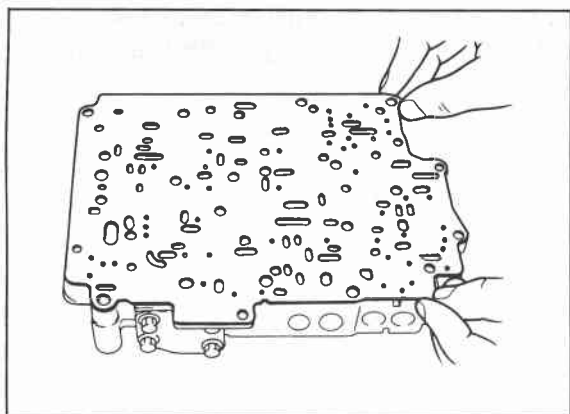
83U07B-317

6. Turn the assembly over and install the rubber balls in the main control body as shown.



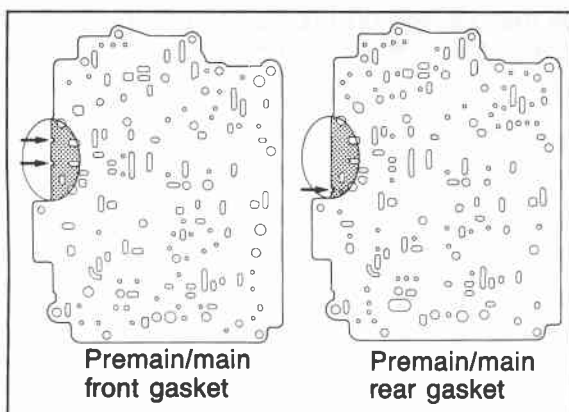
83U07B-318

7. Install the orifice check valves ($\phi 1.0$ mm, 0.039 in; $\phi 0.8$ mm; 0.031 in) and springs, and the throttle relief ball and spring in the premain control body as shown.



83U07B-319

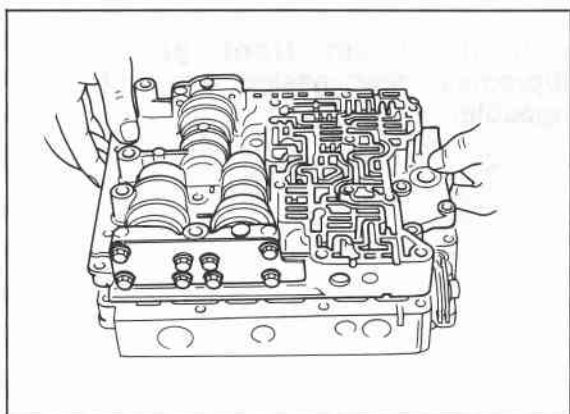
8. Install the gaskets on both sides of the main separator; then install it onto the premain control body.



83U07B-320

Note

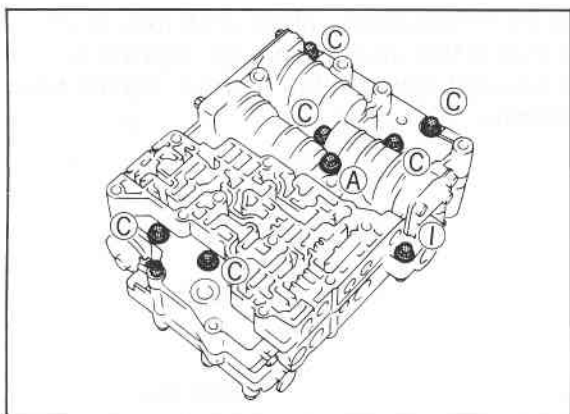
The premain/main rear gasket and premain/main front gasket are not interchangeable.



83U07B-321

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

7B INSPECTION AND REPAIR

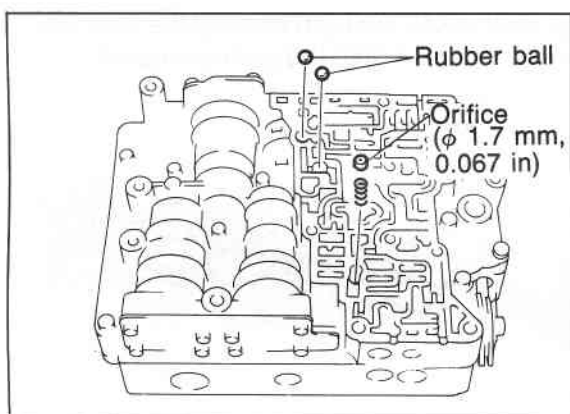


83U07B-322

10. Loosely tighten the bolts.

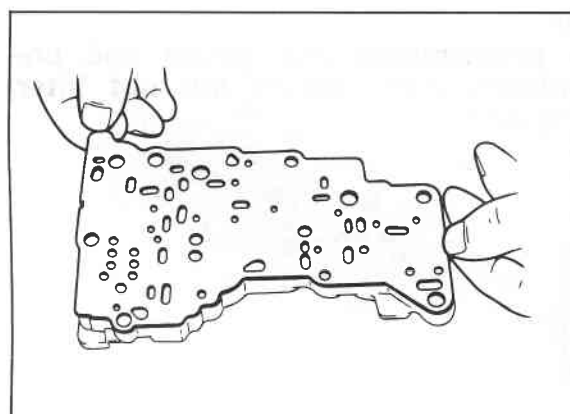
Note

Match the bolt head letter as shown.



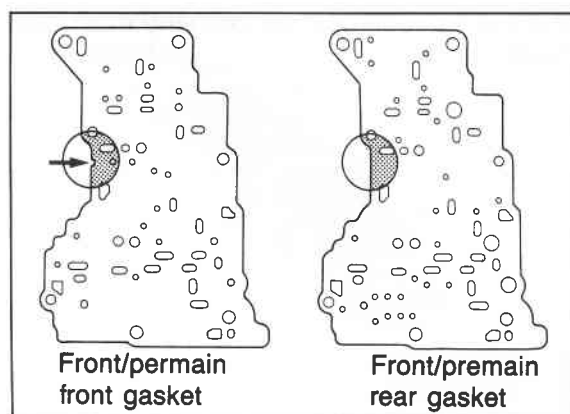
83U07B-323

11. Install the rubber balls, orifice check valve ($\phi 1.7$ mm, 0.067 in) in and spring in the premain control body as shown.



83U07B-324

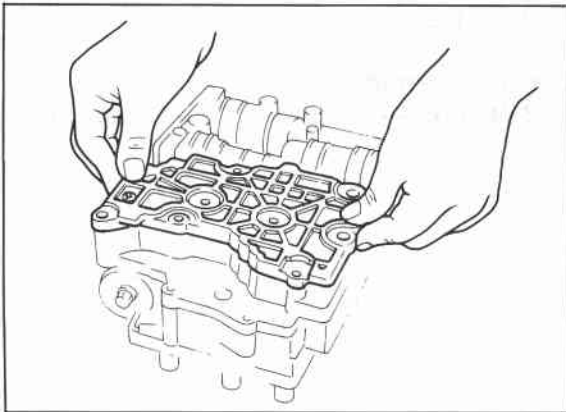
12. Install the gaskets on both sides of the premain separator; then install it onto the front control body.



83U07B-325

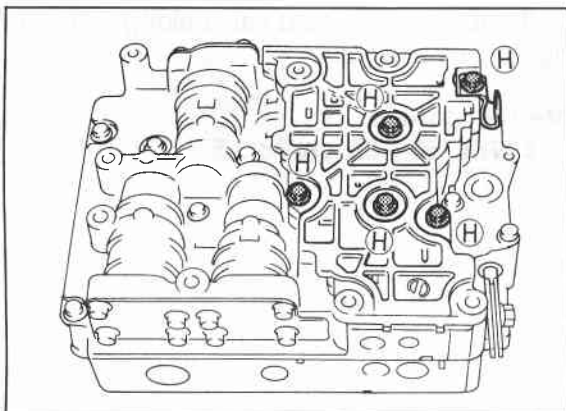
Note

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



83U07B-326

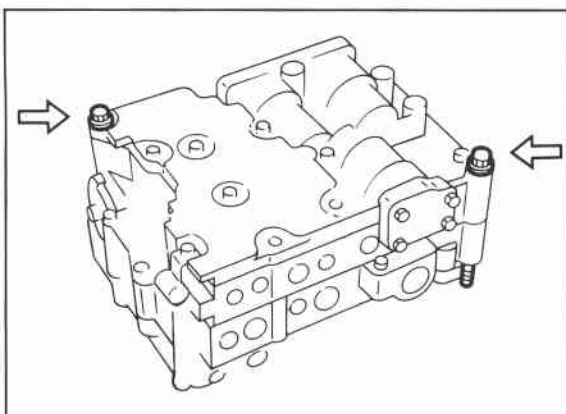
13. Install the front control body on the premain control body.



83U07B-327

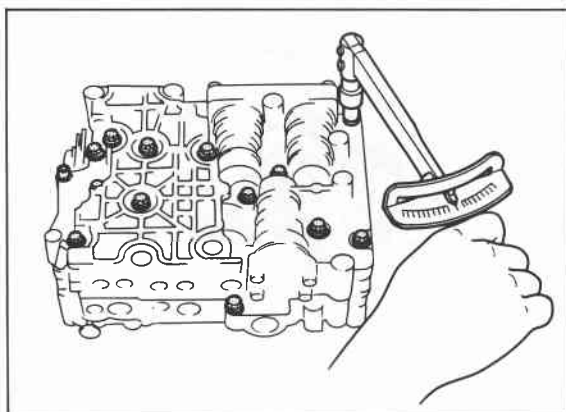
14. Loosely tighten the bolts and bracket.

Note
Match the bolt head letter as shown.



83U07B-328

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

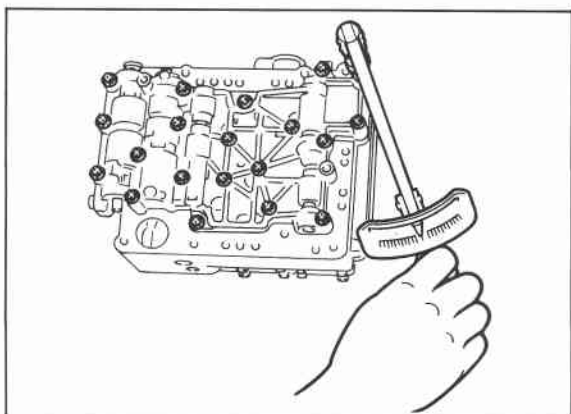


83U07B-329

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

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

7B INSPECTION AND REPAIR

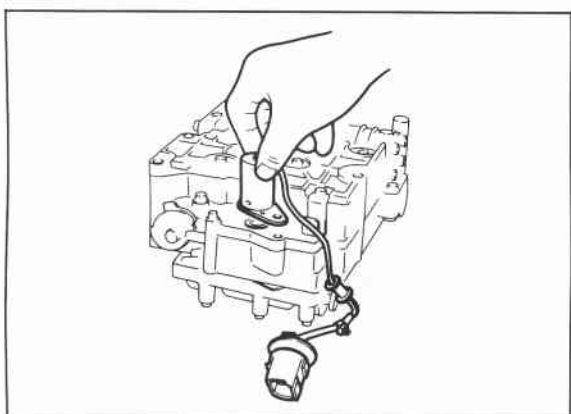


83U07B-330

(2) Tighten the rear control body.

Tightening torque:

6—8 N·m (66—80 cm·kg, 57—69 in·lb)



83U07B-331

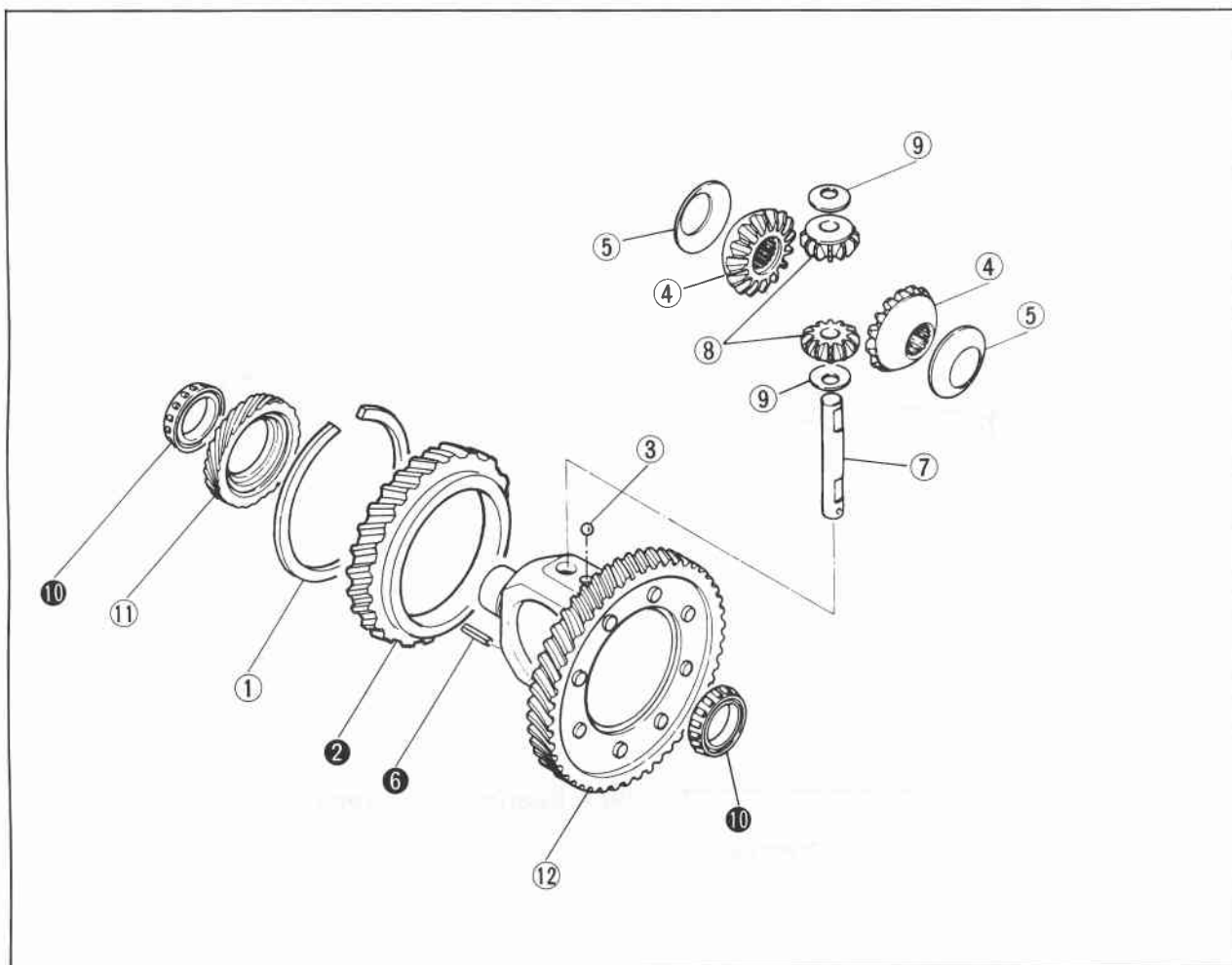
17. Install the lock-up solenoid valve along with new O-ring and oil strainer.

Tightening torque:

6—8 N·m (66—80 cm·kg, 57—69 in·lb)

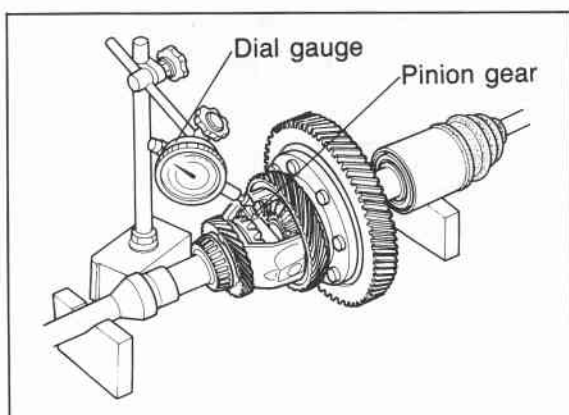
DIFFERENTIAL Disassembly

Disassemble in the sequence shown in the figure referring to the disassembly note for the specially marked parts.



76G07B-221

- | | |
|---------------------------------|--------------------------------------|
| 1. Snap ring (G4A-HL) | 7. Pinion shaft |
| 2. Governor drive gear (G4A-HL) | 8. Pinion gear |
| 3. Steel ball (G4A-HL) | 9. Pinion gear thrust washer |
| 4. Side gear | 10. Side bearing inner race |
| 5. Side gear thrust washer | 11. Speedometer drive gear |
| 6. Roll pin | 12. Ring gear and gear case assembly |



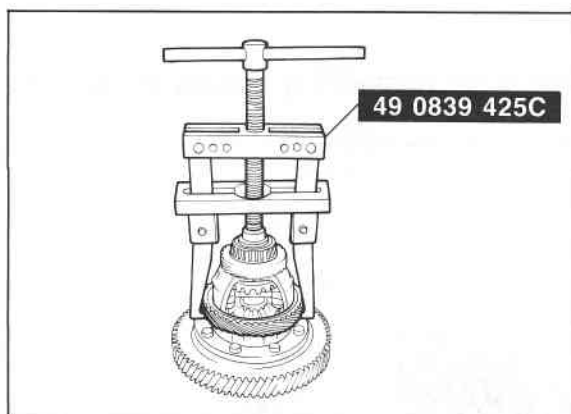
83U07B-333

Disassembly note Checking backlash

Before disassembly, measure the backlash of the side gears and pinion gears. If it is not within specification, replace the differential assembly.

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

7B INSPECTION AND REPAIR



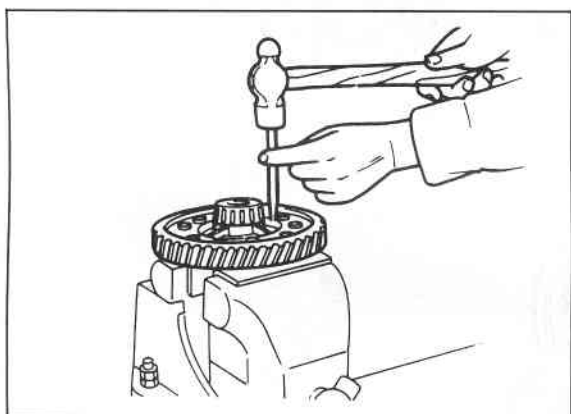
76G07B-168

Governor drive gear (G4A-HL)

Remove the governor drive gear with the **SST**.

Note

Be careful not to lose the steel ball.



86U07B-324

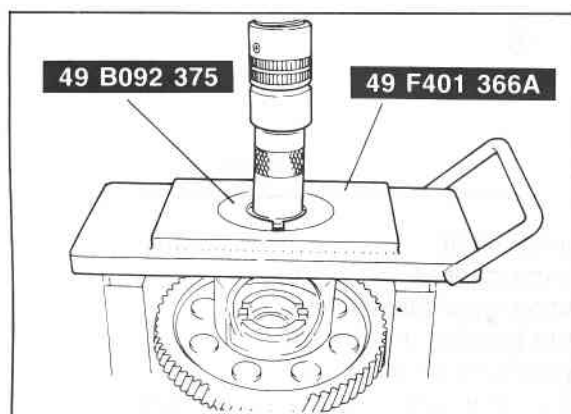
Roll pin

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

Note

a) Use the protective plates to prevent damage to the differential.

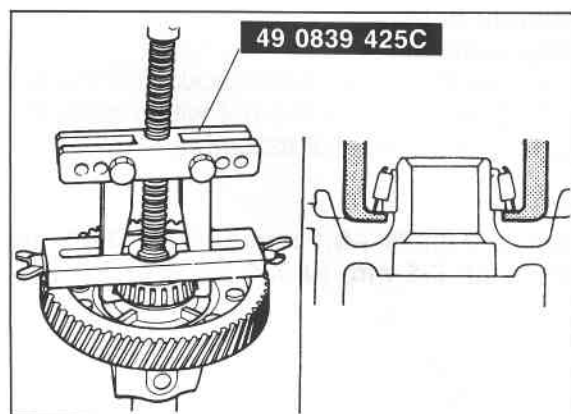
b) Insert the punch into the spring pin hole from the ring gear side.



86U07B-325

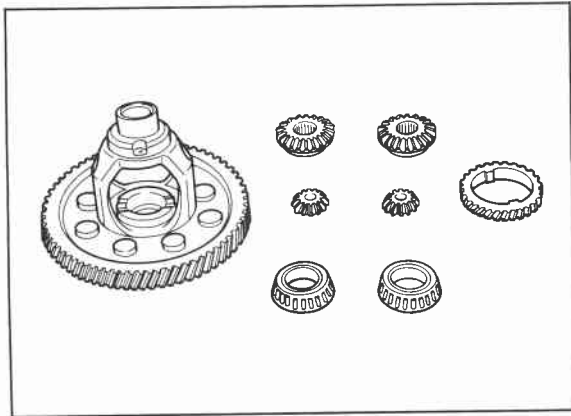
Side bearing inner race

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



86U07B-326

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

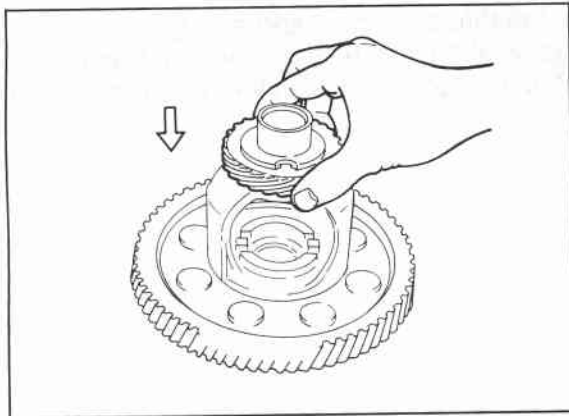


86U07B-327

Inspection

Check the following and replace any faulty parts.

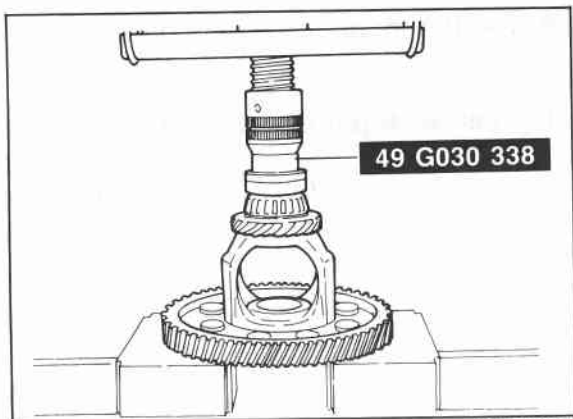
1. Damaged or worn gears
2. Cracked or damaged gear case
3. Damaged bearings



86U07B-328

Assembly

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



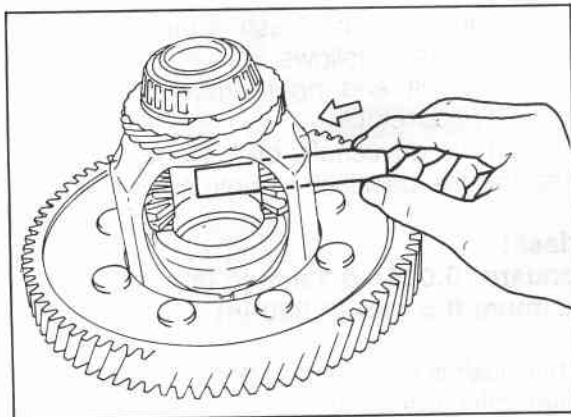
86U07B-329

2. Install the side bearing inner races.

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

Caution

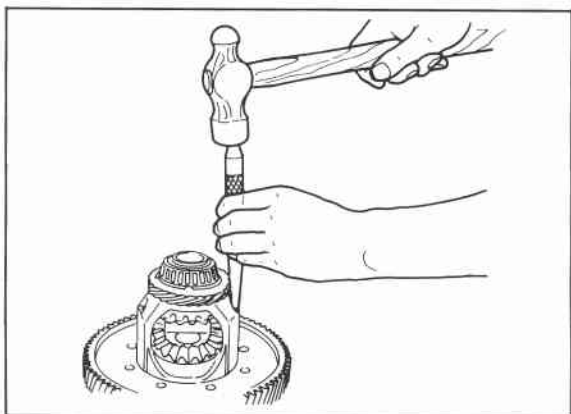
Do not reuse the bearings if they were removed.



86U07B-330

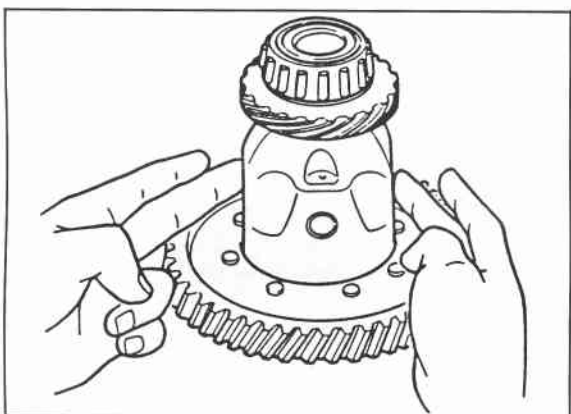
3. Install the pinion gears and thrust washers into the case.
4. Install the pinion shaft.

7B INSPECTION AND REPAIR



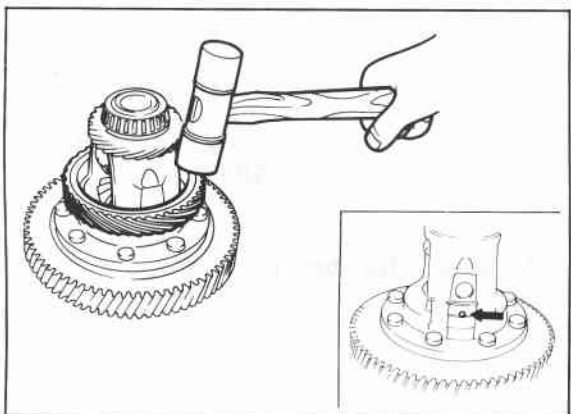
76G07B-222

5. Install the roll pin.



86U07B-332

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



76G07B-169

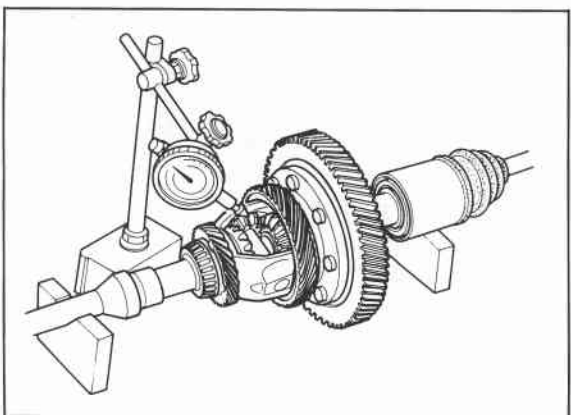
7. Set the steel ball in the hole in the gear case.

Note

Affix the ball with petroleum jelly.

8. Install the governor drive gear onto the gear case with a plastic hammer.

9. Install the snap ring.



76G07B-170

10. Check and adjust the backlash of the side gears and pinion gears as follows:

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

Backlash:

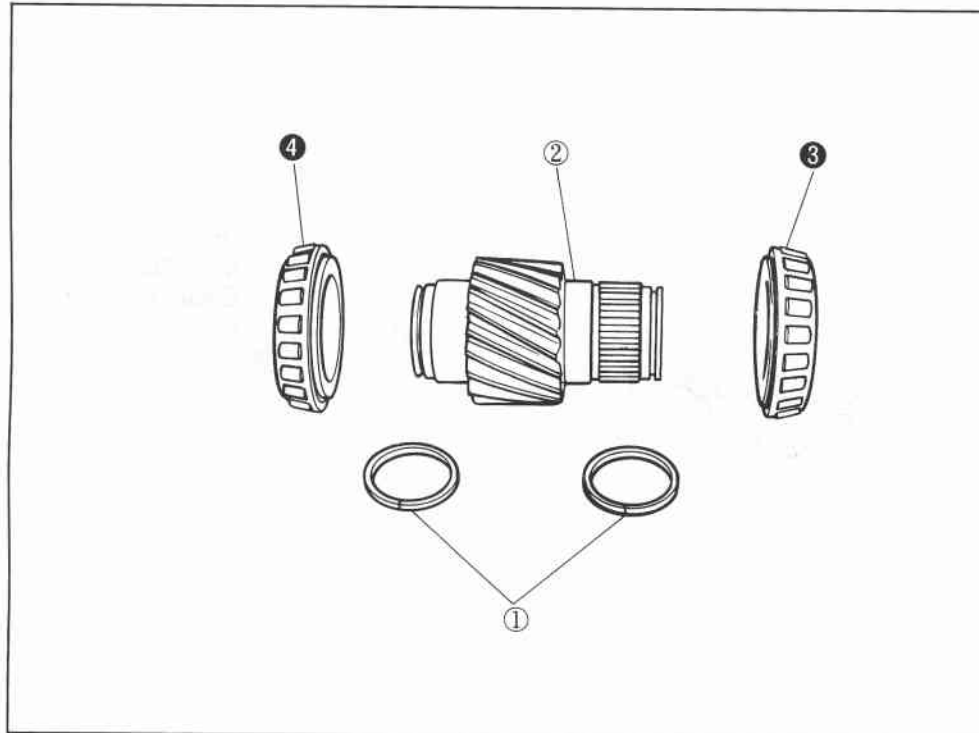
Standard 0.025—0.1 mm (0.001—0.004 in)
Maximum 0.5 mm (0.020 in)

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

OUTPUT GEAR

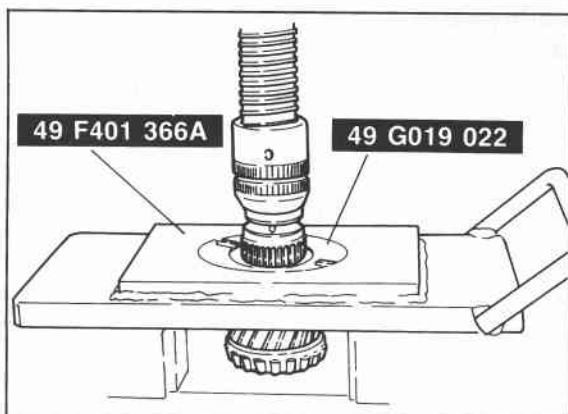
Disassembly

Disassemble in the sequence shown in the figure referring to the disassembly note for the specially marked parts.



86U07B-334

1. Seal ring
2. Output gear
3. Output gear bearing
4. Output gear bearing



86U07B-335

Disassembly note

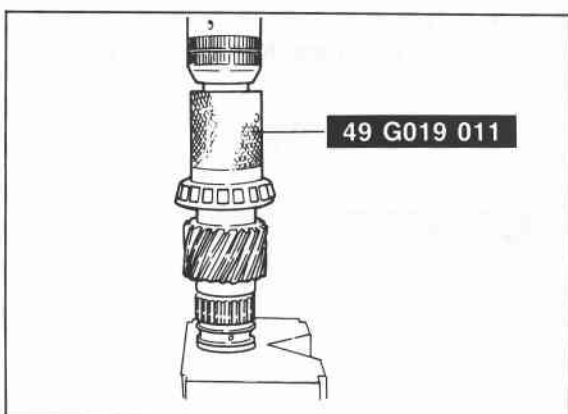
Output gear bearings

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

Inspection

Check the following and replace any faulty parts.

1. Damaged or worn output gear
2. Damaged bearing



86U07B-336

Assembly

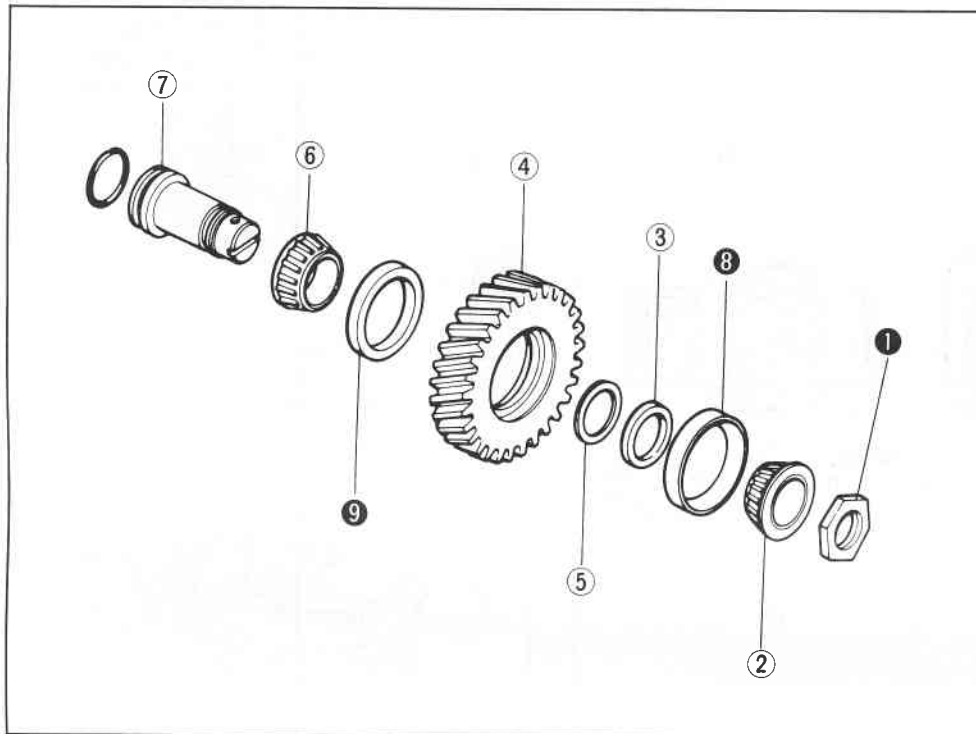
1. Press the output gear bearings onto the output gear with the **SST**.

7B INSPECTION AND REPAIR

IDLE GEAR

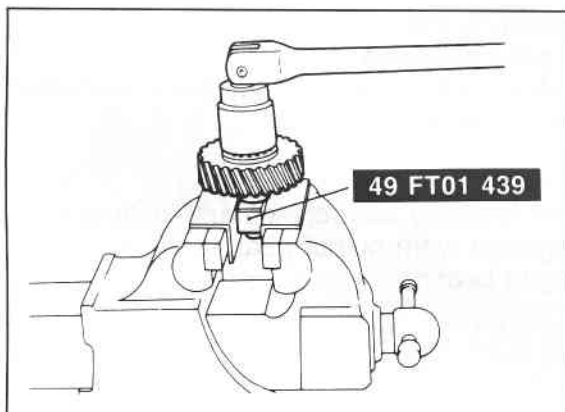
Disassembly

Disassemble in the sequence shown in the figure referring to the disassembly note for the specially marked parts.



86U07B-337

1. Locknut
2. Idle gear bearing
3. Spacer
4. Idle gear
5. Adjust shim
6. Idle gear bearing
7. Idle shaft
8. Bearing outer race
9. Bearing outer race



86U07B-338

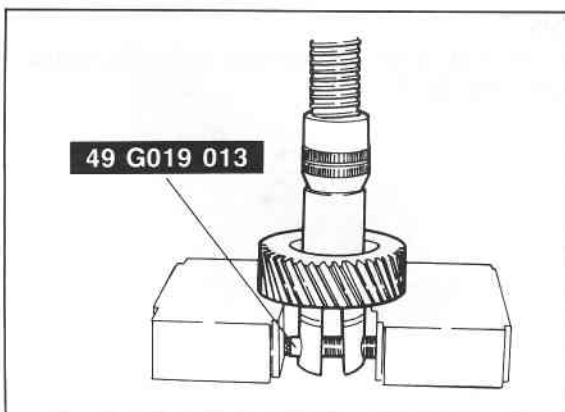
Disassembly note

Locknut

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

Note

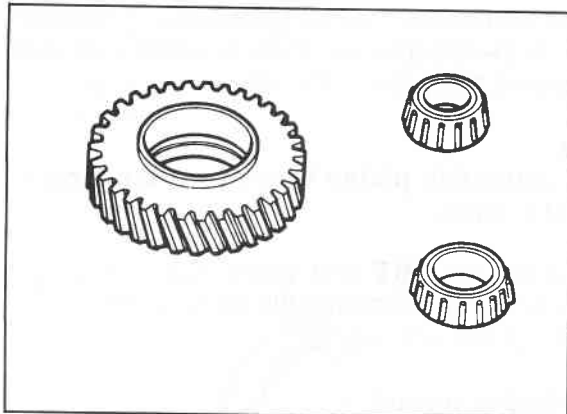
Use the protective plates to prevent damage to the **SST**.



86U07B-339

Bearing outer race

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

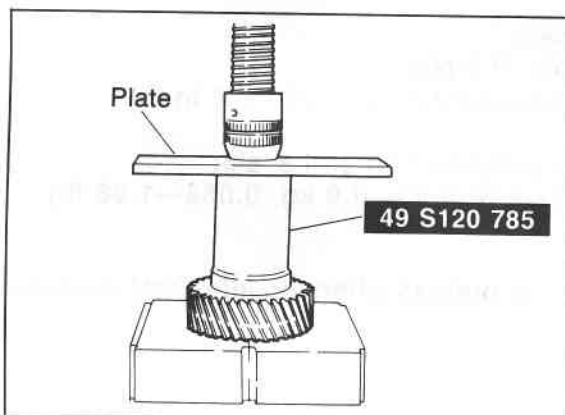


86U07B-340

Inspection

Check the following and replace any faulty parts.

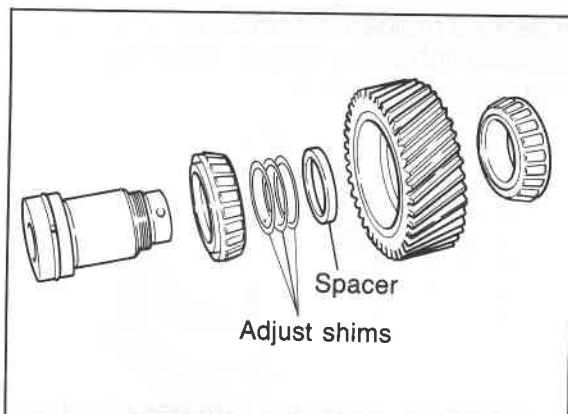
1. Damaged or worn idle gear
2. Damaged or worn bearing



86U07B-341

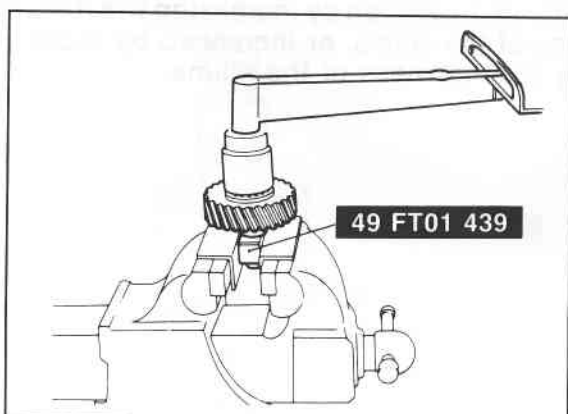
Assembly

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



86U07B-342

2. Install the idle gear bearing onto the idle shaft, then install the idle gear, adjust shim, spacer, and bearing.



86U07B-343

3. Secure the idle shaft in a vise with the **SST**; then tighten the locknut to the lower limit of the tightening torque.

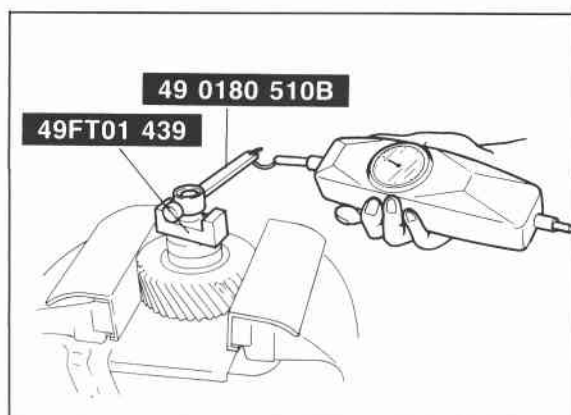
Tightening torque:

128 N·m (13 m·kg, 94 ft·lb)

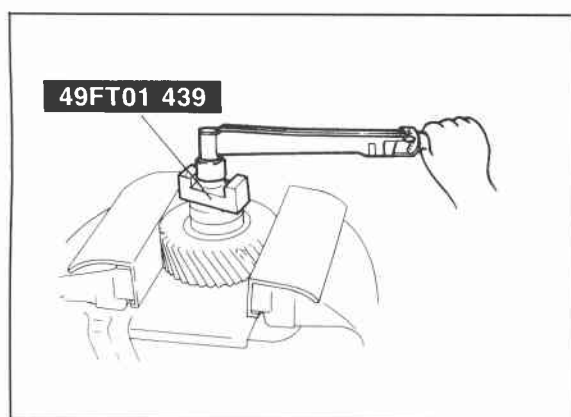
Note

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

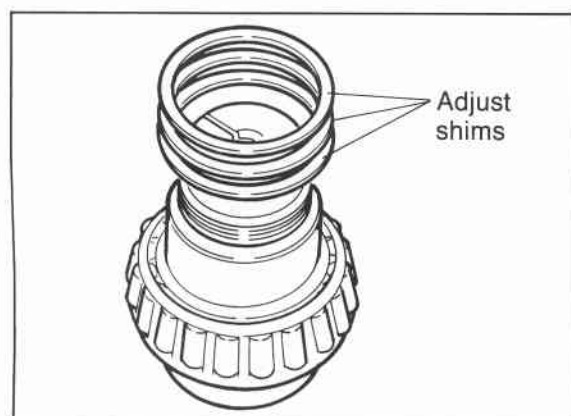
7B INSPECTION AND REPAIR



86U07B-344



86U07B-345



86U07B-346

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

Note

Use protective plates to prevent damage to the idle gear.

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

Tightening torque:

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

Preload:

0.03—0.9 N·m

(0.3—9.0 cm·kg, 0.26—7.8 in·lb)

Value indicated on pull scale:

0.3—9 N (0.03—0.9 kg, 0.066—1.98 lb)

Note

Read the preload when the idle shaft starts to turn.

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

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

Note

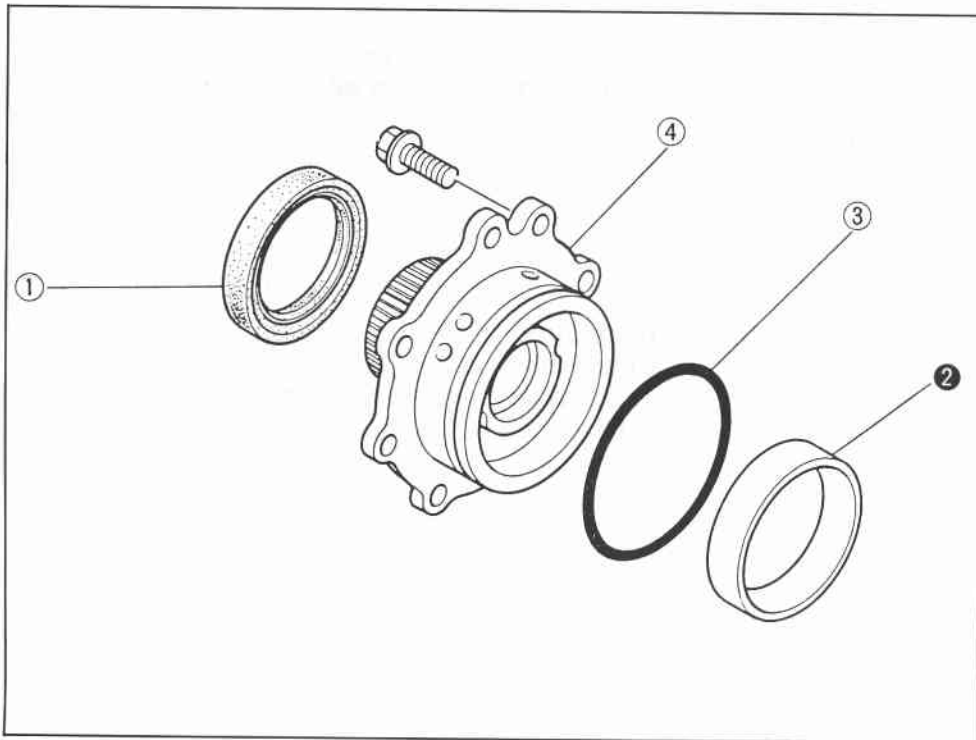
a) The maximum allowable number of shims is 7.

b) Preload is reduced by increasing the thickness of the shims, or increased by reducing the thickness of the shims.

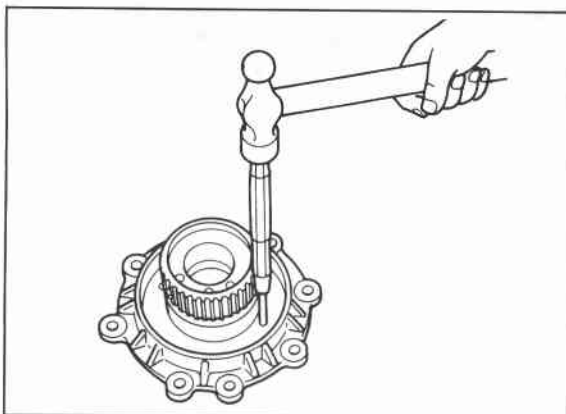
BEARING COVER ASSEMBLY

Disassembly

Disassemble in the sequence shown in the figure referring to the disassembly note for the specially marked parts.



86U07B-347



86U07B-348

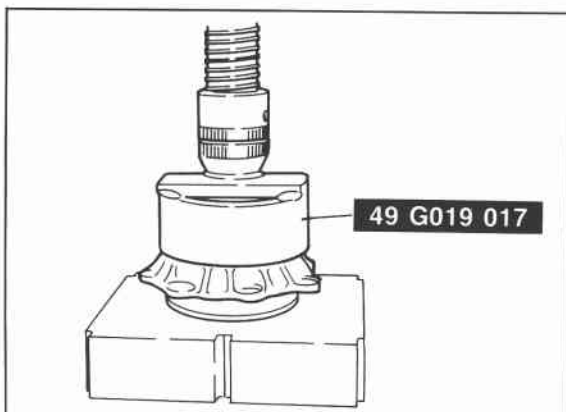
Disassembly note Bearing outer race

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

Inspection

Check the following and replace any faulty parts.

1. Damaged bearing cover
2. Damaged or worn bushing

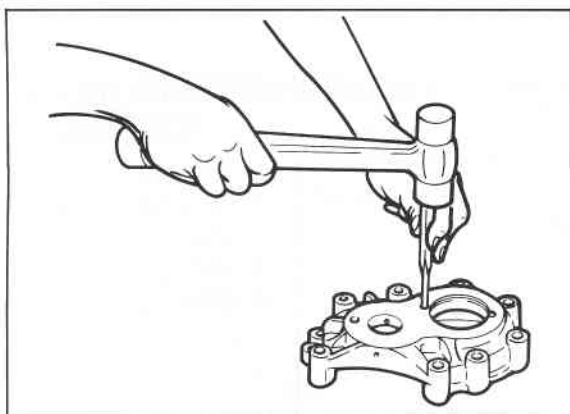


86U07B-349

Assembly

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

7B INSPECTION AND REPAIR



86U07B-350

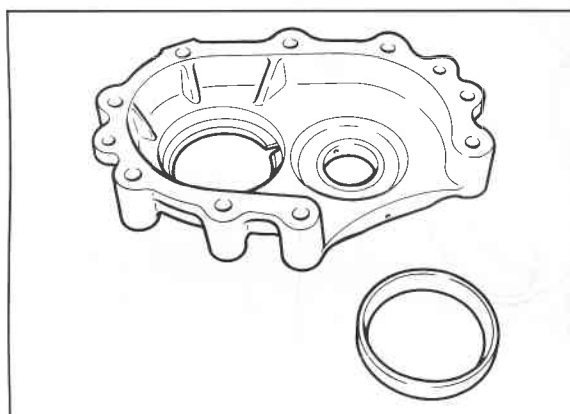
BEARING HOUSING

Disassembly

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

Note

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



86U07B-351

Inspection

Check the following and replace any faulty parts.

1. Damaged bearing housing
2. Damaged bearing outer race

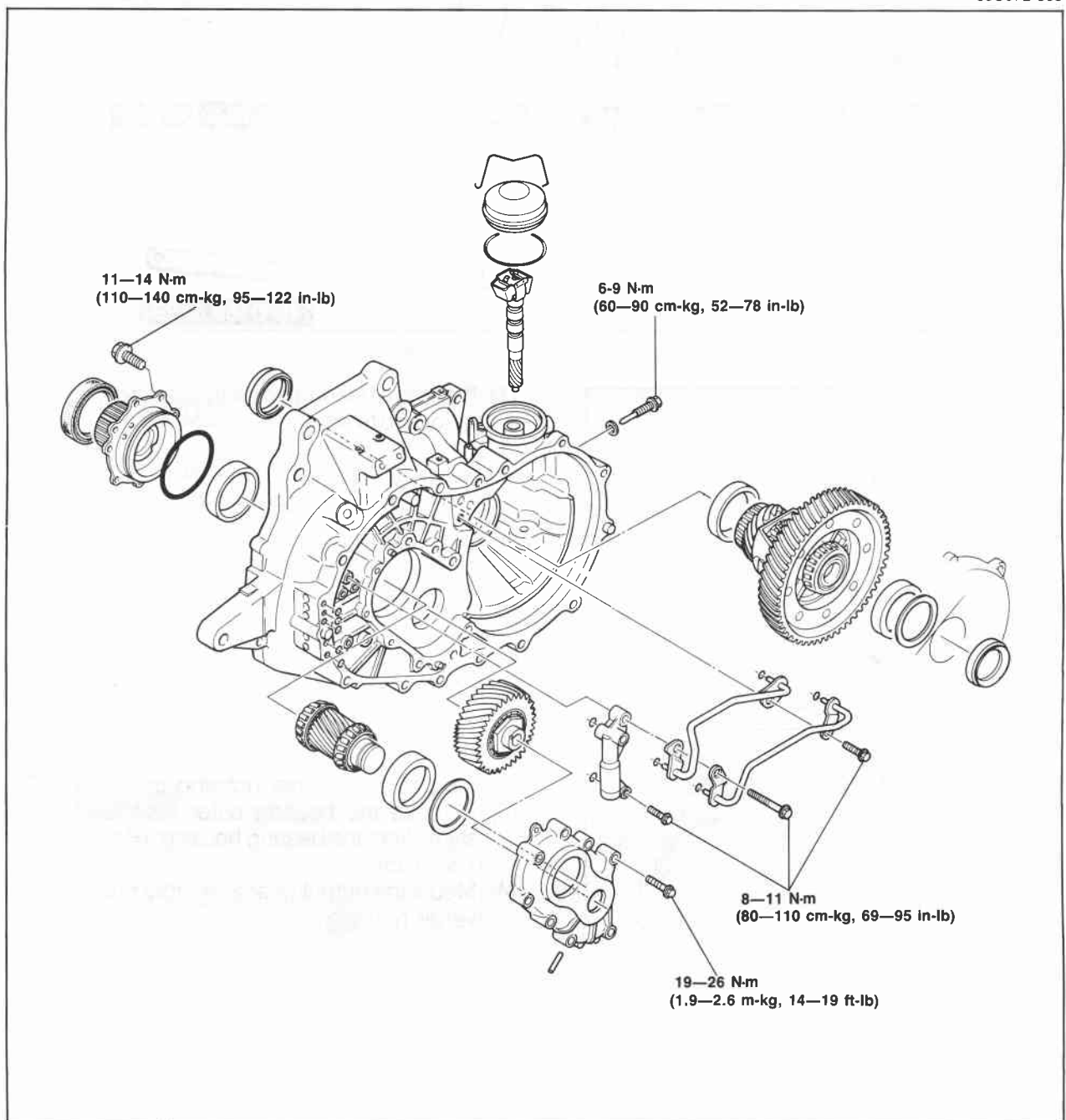
ASSEMBLY

PRECAUTION

- (1) The automatic transaxle consists of high-precision-finished parts, necessitating careful inspection before assembly because even a small nick could cause fluid leakage or affect performance.
- (2) Clean out oil holes and oil passages with compressed air, and check that there are no obstructions.
- (3) Before assembly, apply ATF to each O-ring, seal ring, rotating part, and friction part.
- (4) If the brake band or drive plates are replaced with new ones, first soak them in ATF for at least 2 hours before installing.
- (5) Each seal gasket and O-ring must be replaced with a new one.
- (6) Be sure to install all thrust bearings and races in the correct direction and position.

ASSEMBLY—STEP 1 Torque Specifications

83U07B-365



83U07B-366

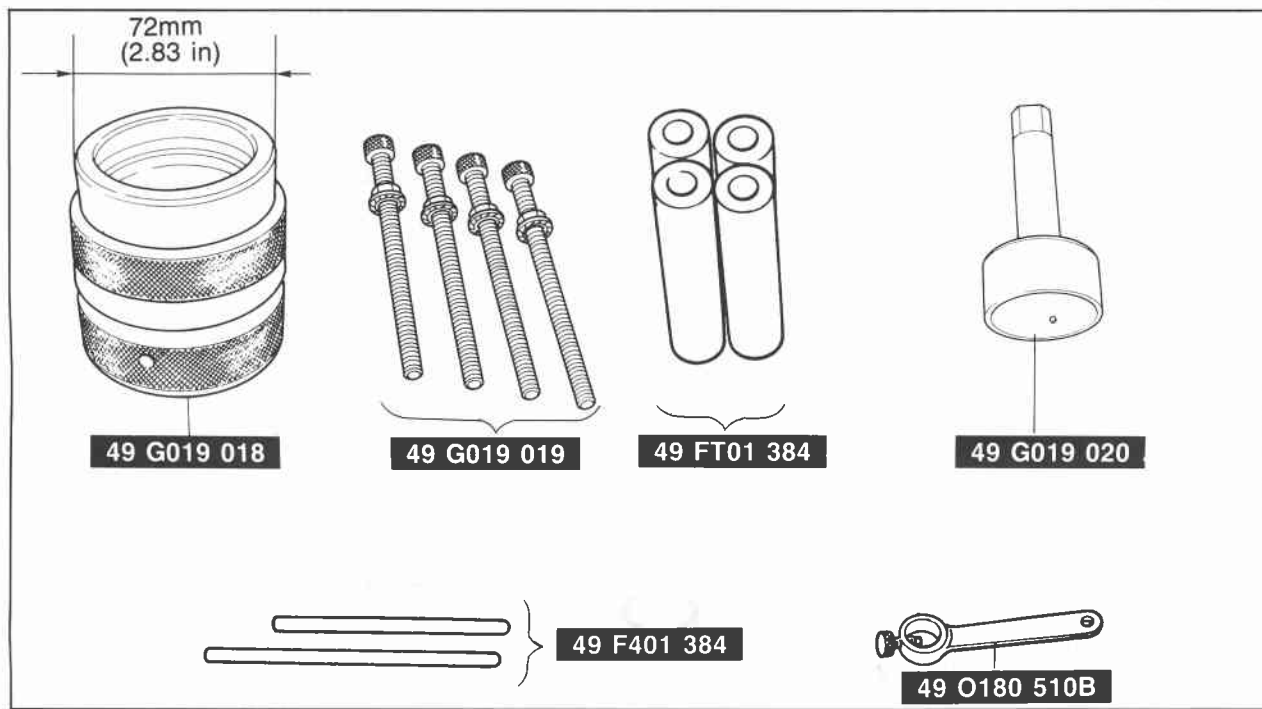
7B ASSEMBLY

Procedure

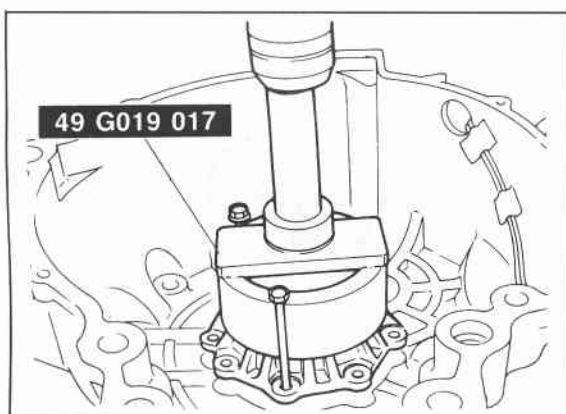
1. Adjust the preload of the output gear bearing and select the adjust shim(s) as described below.

Note

To adjust the preload, use the SST shown below.



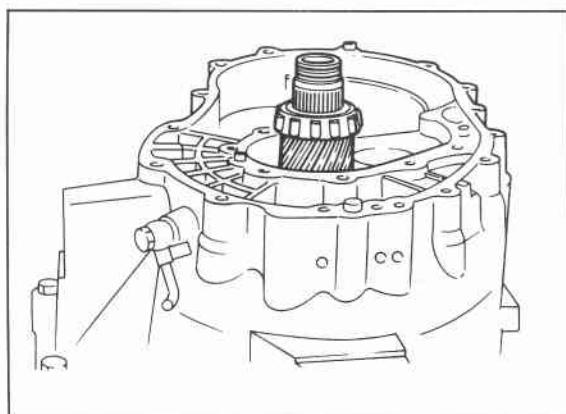
83U07B-367



83U07B-368

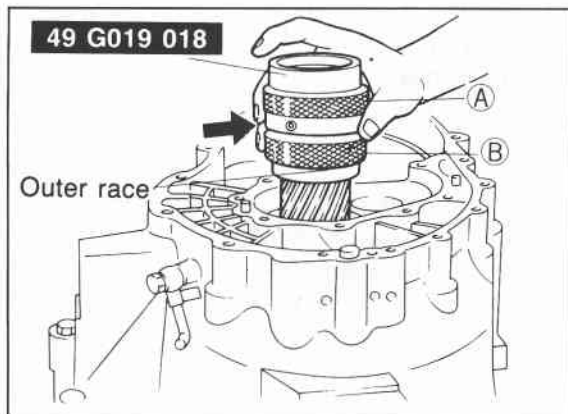
- (1) Press the bearing cover in after aligning it with guide bolts as shown.

**Tightening torque: 11—14 N·m
(110—140 cm·kg, 95—122 in·lb)**



76G07B-171

- (2) Install the converter housing onto the **SST**.
- (3) Remove the bearing outer race and adjust shims from the bearing housing. (Refer to page 7B—185)
- (4) Mount the output gear assembly onto the converter housing.

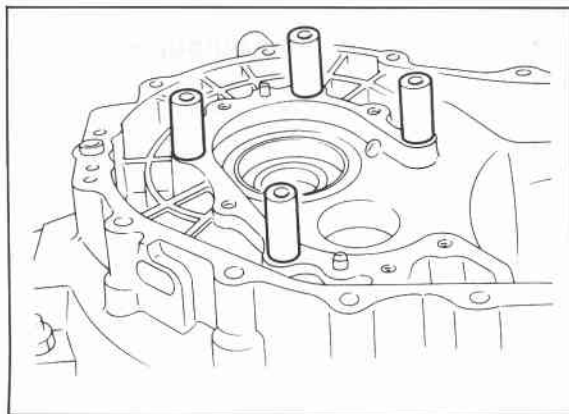


76G07B-172

- (5) Install the outer race removed in step (2) to the **SST**; then mount them on the output gear assembly.

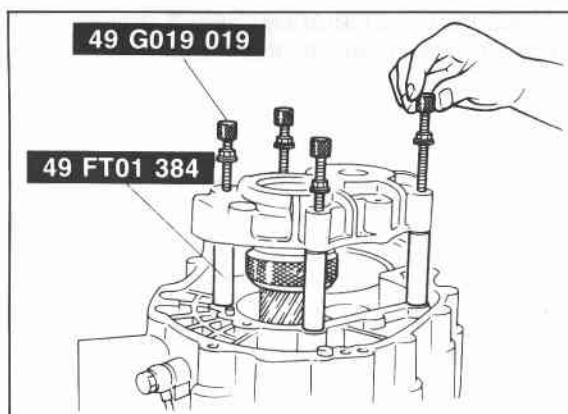
Caution

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



76G07B-173

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

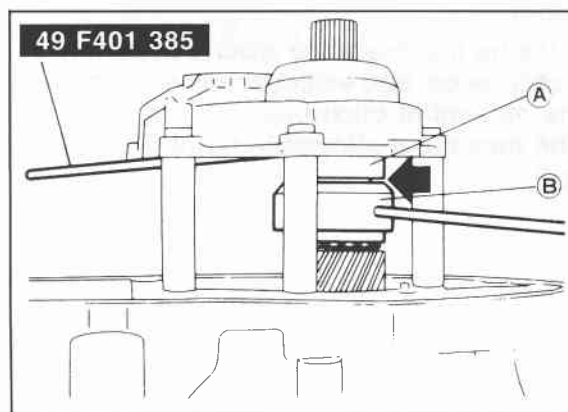


76G07B-174

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

Tightening torque:

19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)



76G07B-175

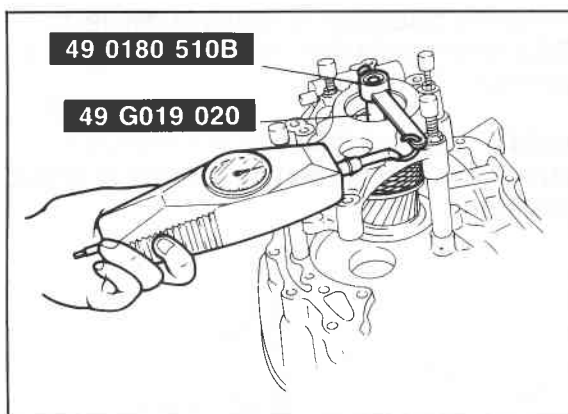
- (8) Turn the **SST** (selector) to increase the clearance indicated by the arrow with the **SST** (bars) until it no longer turns.

Note

This is to seat the bearing.

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

7B ASSEMBLY



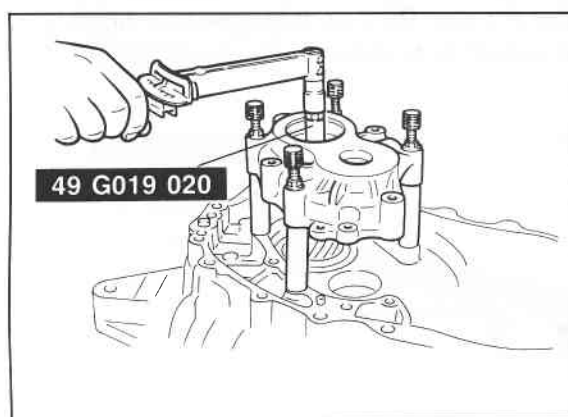
76G07B-176

- (10) Mount the **SST** and pull scale or torque wrench on the output gear.
- (11) Increase the clearance between A and B to obtain the specified preload/pull scale reading.

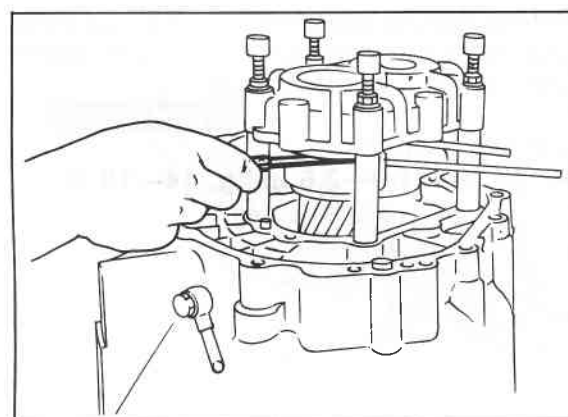
Preload: 0.5—0.9 N·m
(5.0—9.0 cm·kg, 4.34—7.81 in·lb)
Reading on pull scale: 5—9 N
(0.5—0.9 kg, 1.1—1.98 lb)

Note

Read the preload when the output gear starts to turn.



83U07B-375



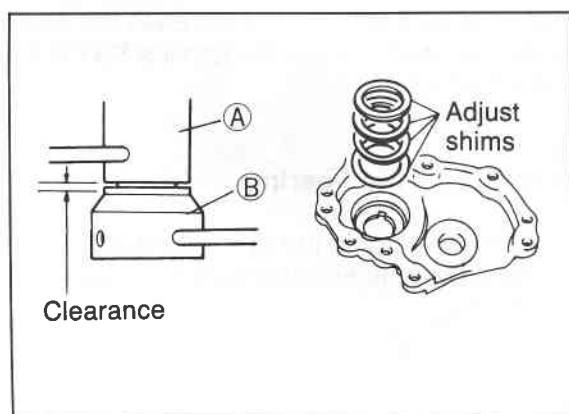
76G07B-177

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

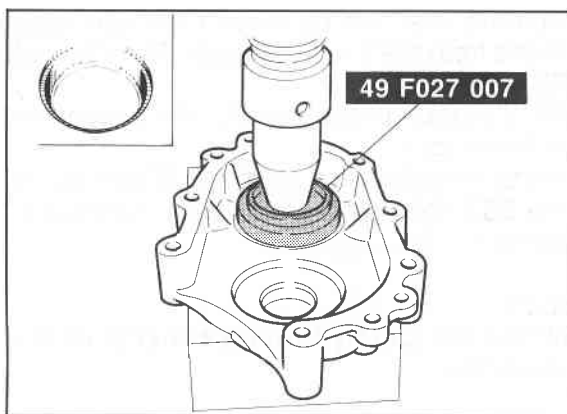
Thickness of shim	
0.10 mm (0.004 in)	0.18 mm (0.007 in)
0.12 mm (0.005 in)	0.20 mm (0.008 in)
0.14 mm (0.006 in)	0.50 mm (0.020 in)
0.16 mm (0.0063 in)	

Caution

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

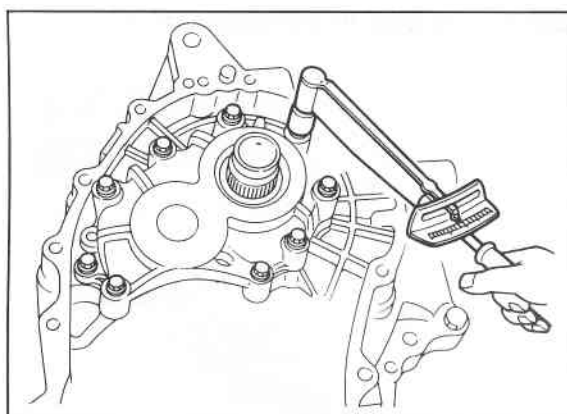


83U07B-377



76G07B-178

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



76G07B-179

- (15) Install the bearing housing.

Tightening torque:

19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

- (16) Check that the preload/pull scale reading is within specification. If not within specification return to step (2).

Preload: 0.03—0.9 N·m

(0.3—9.0 cm·kg, 0.26—7.81 in·lb)

Reading on pull scale:

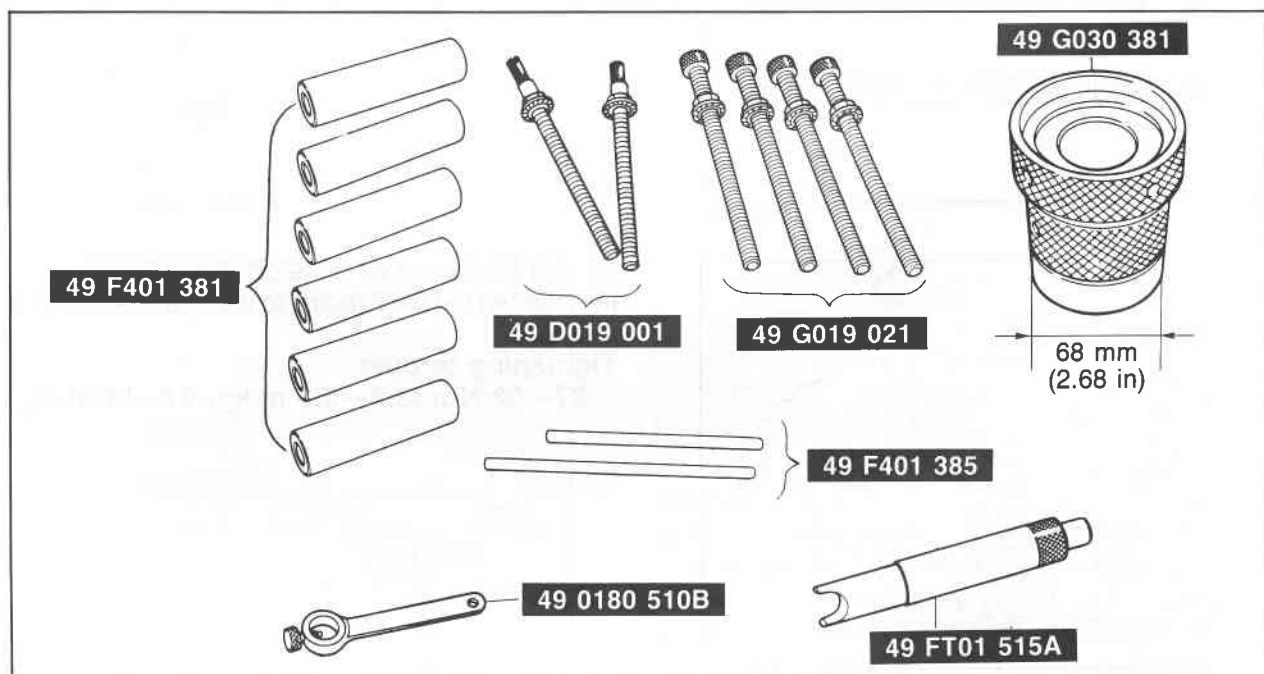
0.3—9 N (0.03—0.9 kg, 0.066—1.98 lb)

- (17) Remove the bearing housing.

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

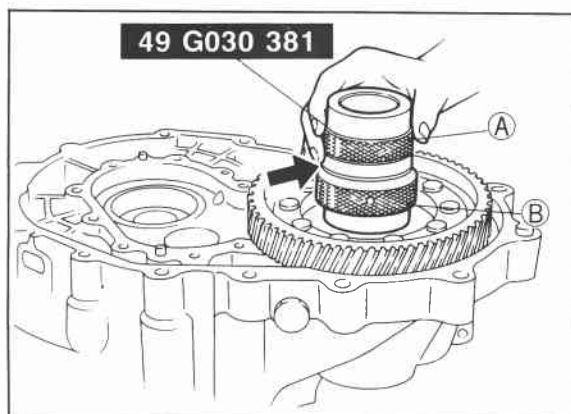
Note

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



83U07B-380

7B ASSEMBLY

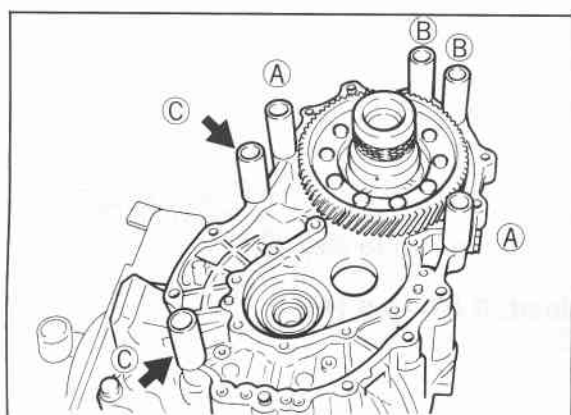


76G07B-180

- (1) Remove the bearing outer race and adjust shims from the transaxle case. (Refer to page 7B—106)
- (2) Set the differential assembly into the converter housing.
- (3) Install the outer race removed in step (1) into the **SST**; then set them on the differential assembly.

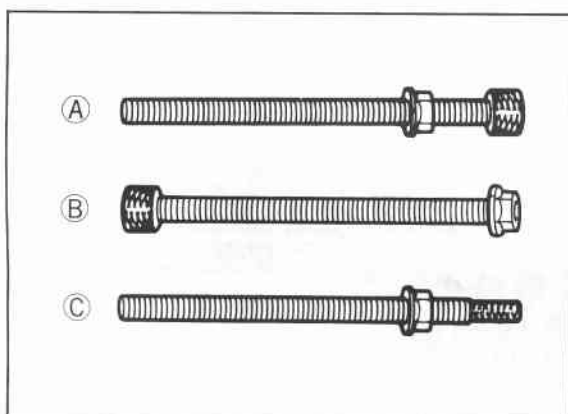
Caution

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



83U07B-382

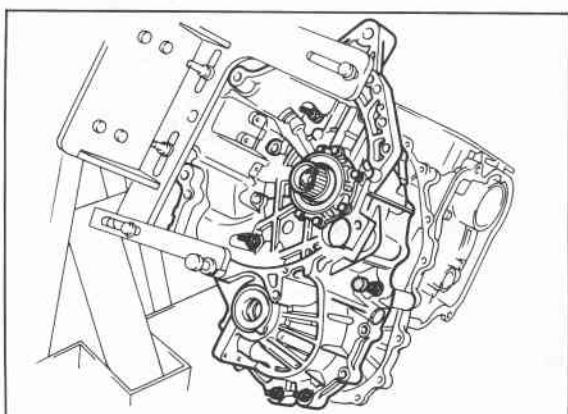
- (4) Set the six **SST** in the positions shown.



83U07B-383

Note

Install the bolts in the positions shown in the illustration above.

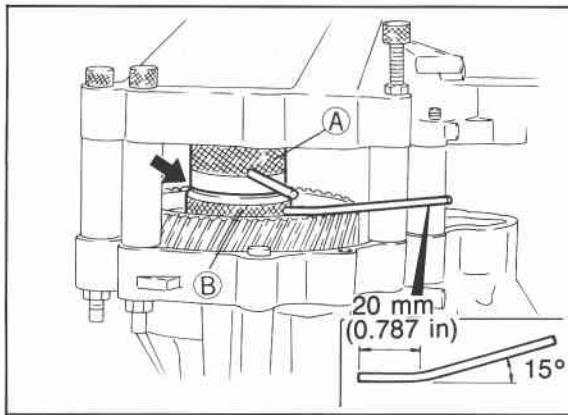


83U07B-384

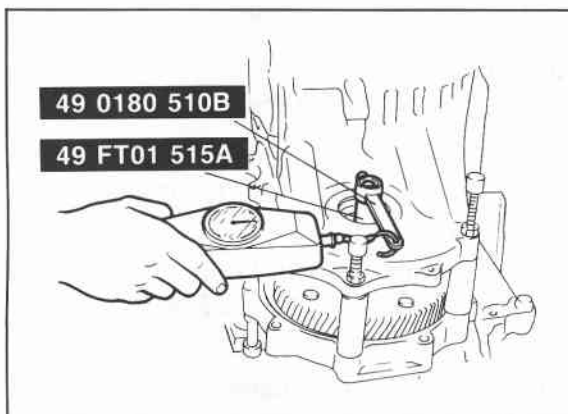
- (5) Set the transaxle case on the selectors.
- (6) Tighten the **SST** (bolts) to the specified torque.

Tightening torque:

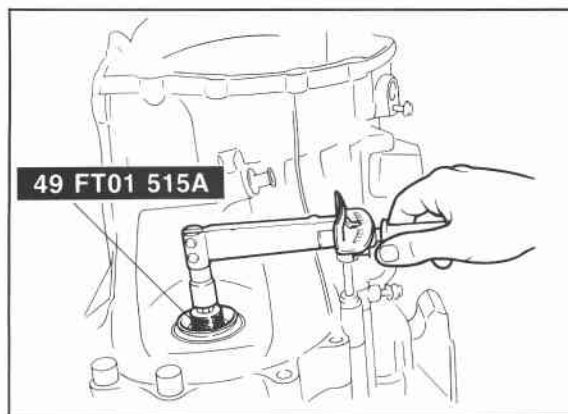
37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)



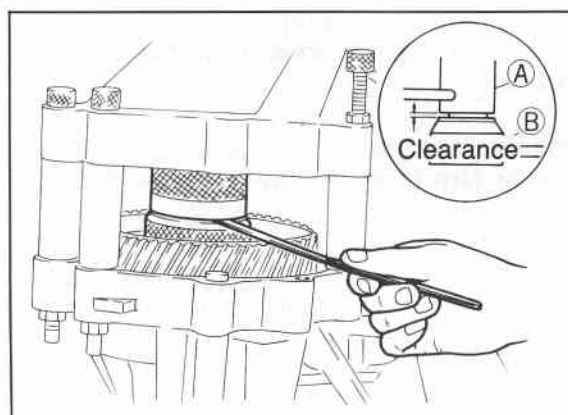
86U07B-371



86U07B-372



76G07B-224



86U07B-374

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

Note

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

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

- (9) Insert the **SST** through the oil seal hole of the transaxle case and attach it to the pinion shaft.
- (10) Mount the **SST** and pull scale or torque wrench.
- (11) Widen the clearance between A and B to obtain the specified preload/pull scale reading.

Preload:

0.5 N-m (5 cm-kg, 4.3 in-lb)

Reading on pull scale:

5 N (0.5 kg, 1.1 lb)

Note

Read the preload when the differential starts to turn.

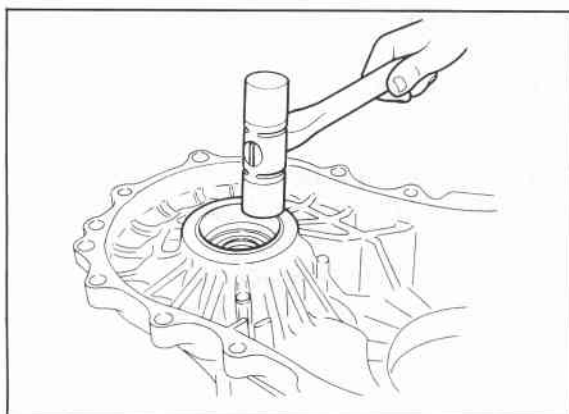
- (12) Measure the clearance between A and B.
- (13) Add **0.3 mm (0.0118 in)** to the measured clearance, and select the shim(s) closest in valve to that measurement.

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

Caution

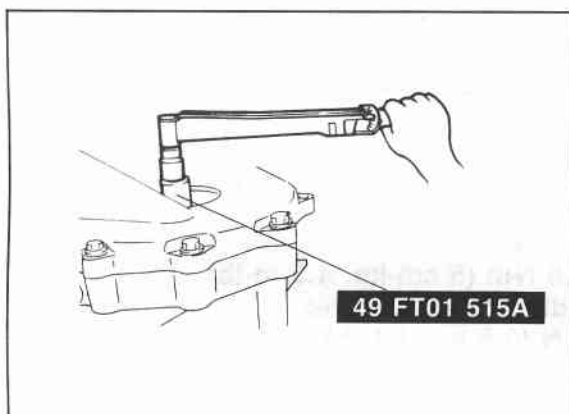
- a) Measure the clearance around the entire circumference, and select shims equivalent to the maximum clearance.
- b) The maximum allowable number of shims is 3.

7B ASSEMBLY



83U07B-389

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



83U07B-390

- (16) Install the transaxle case.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

- (17) Check that the preload is within specification.
If not within specification, return to step (2).

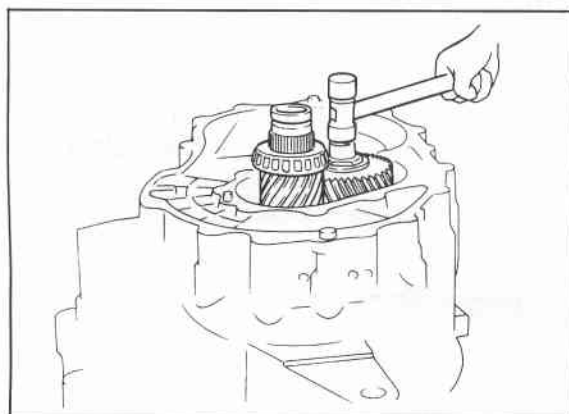
Preload: 2.9—3.9 N·m

(30—40 cm·kg, 26—35 in·lb)

Reading on pull scale: 29—39 N

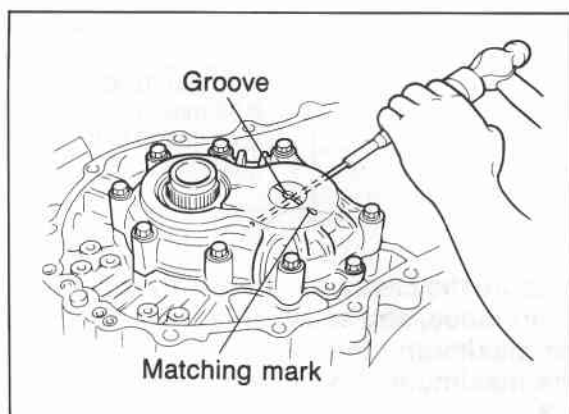
(3.0—4.0 kg, 6.6—8.8 lb)

- (18) Remove the transaxle case and differential assembly.



83U07B-391

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



83U07B-392

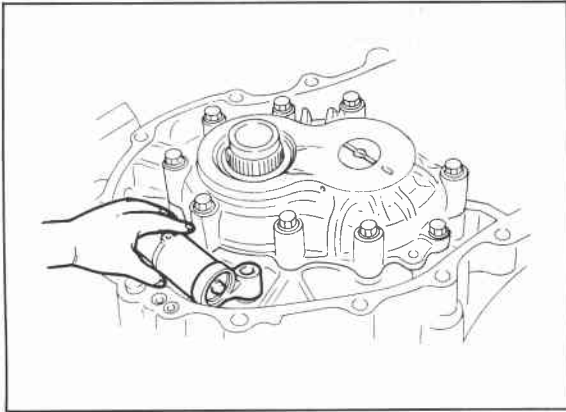
- 4. Install the bearing housing.

- (1) Install the bearing housing on the converter housing.

Tightening torque:

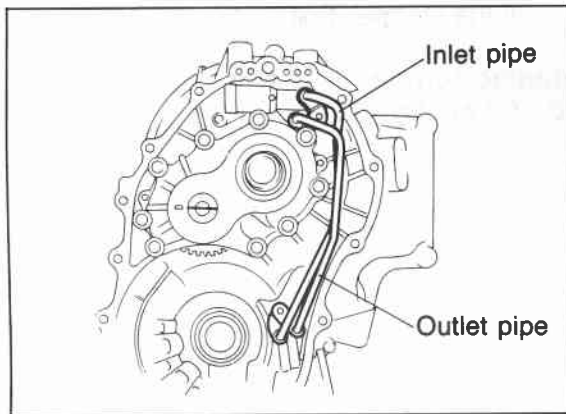
19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

- (2) Align the groove on the idle shaft with the matching mark on the bearing housing.
- (3) Tap the roll pin in with a pin punch and hammer.



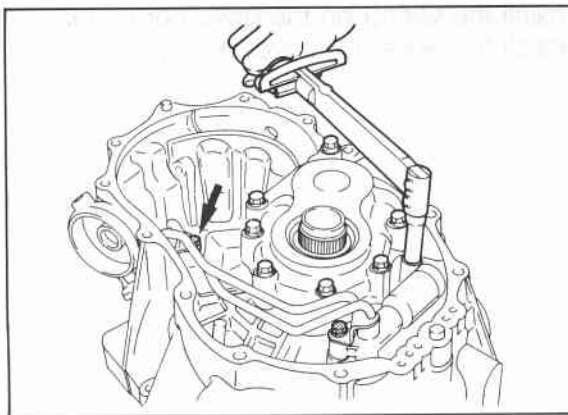
83U07B-393

5. Apply ATF to the O-rings and install them into the 2-3 accumulator; then temporarily install the 2-3 accumulator piston assembly in the converter housing.



83U07B-394

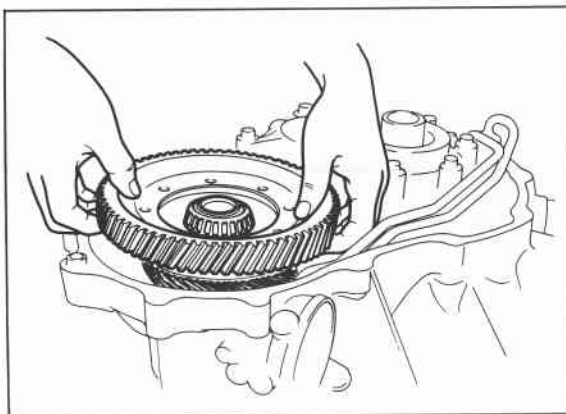
6. Apply ATF to the O-rings and install them onto the governor inlet pipe and governor outlet pipe; then temporarily install the inlet and outlet pipes.



83U07B-395

7. Tighten the bolts.

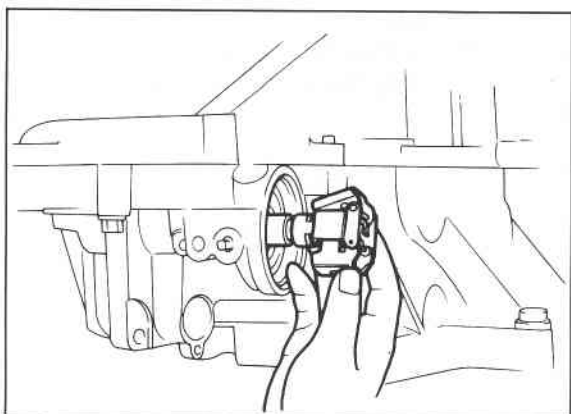
**Tightening torque: 8—11 N·m
(80—110 cm·kg, 69—95 in·lb)**



83U07B-396

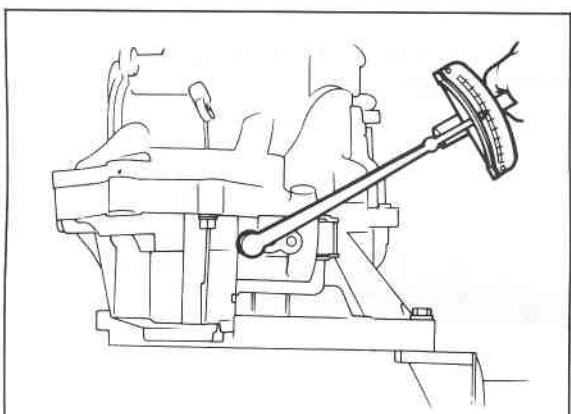
8. Set the differential assembly into the converter housing.

7B ASSEMBLY



83U07B-397

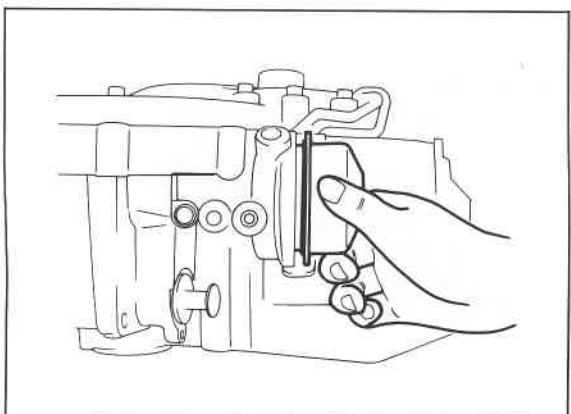
9. Install the governor assembly.
(1) Install the governor assembly.



83U07B-398

- (2) Install the stopper bolt.

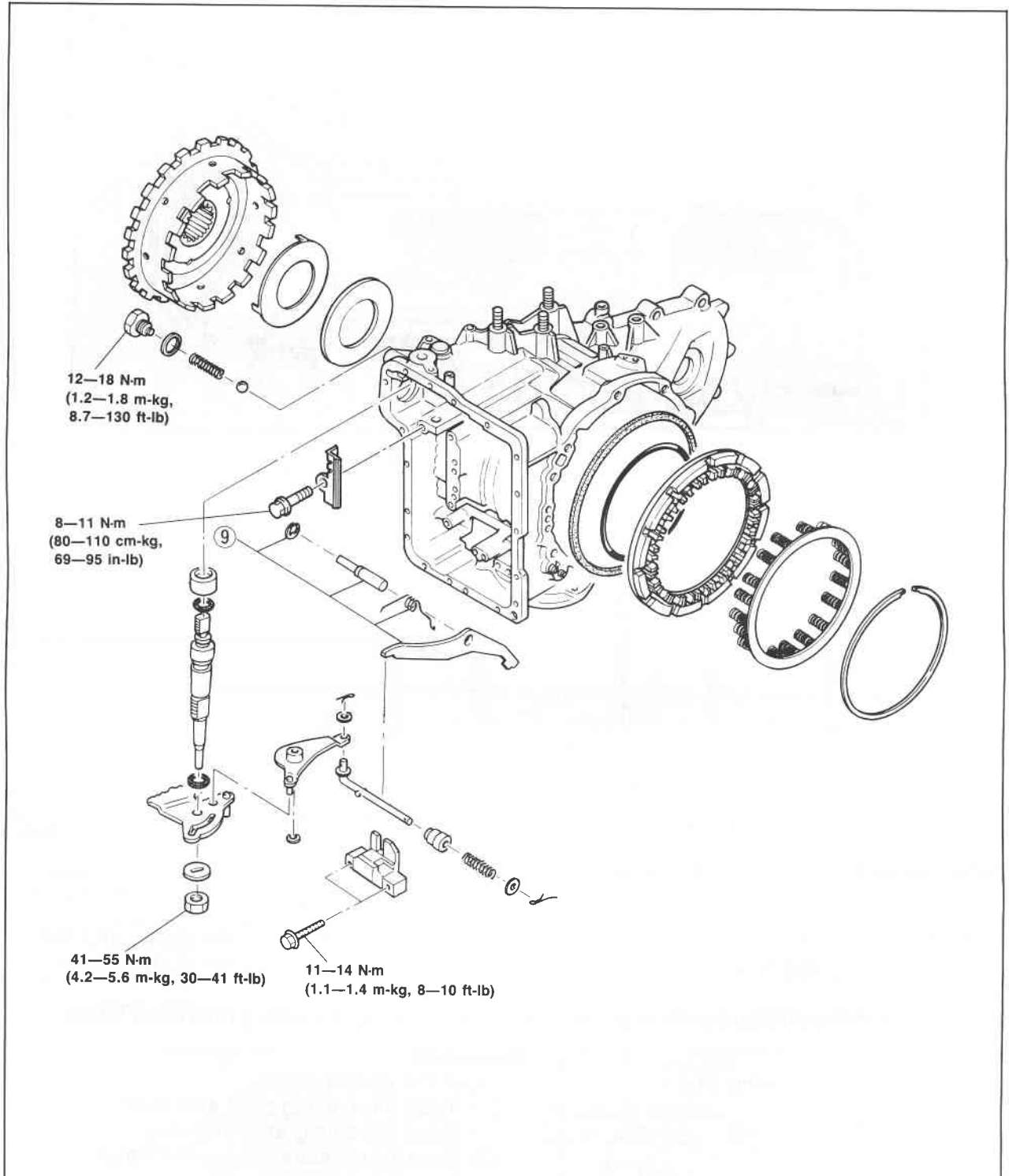
**Tightening torque: 6—9 N·m
(60—90 cm·kg, 52—78 in·lb)**



83U07B-399

- (3) Install the O-ring on the governor cover.
(4) Install the governor cover and clip.

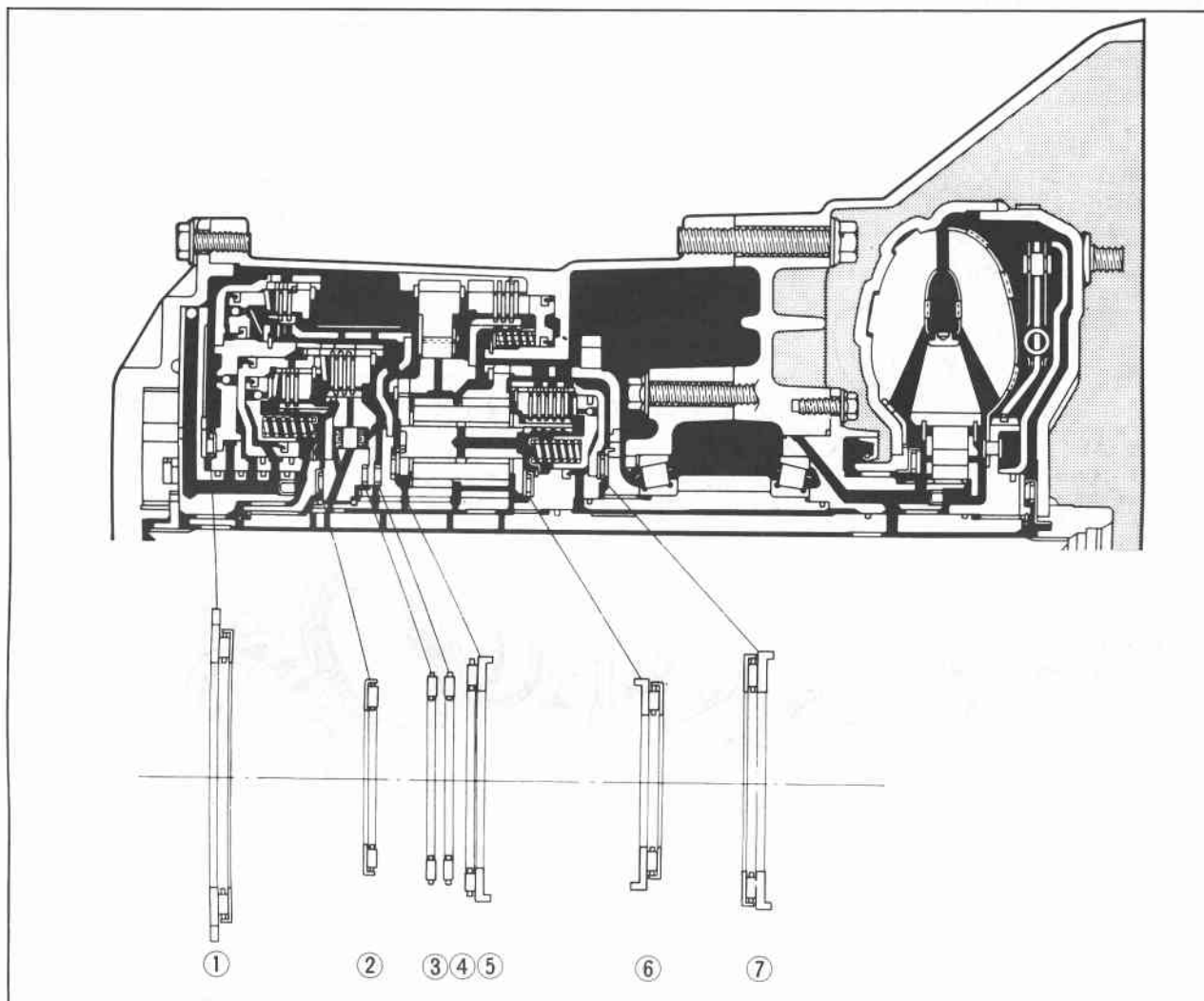
ASSEMBLY-STEP 2 Torque Specifications



86U07B-379

7B ASSEMBLY

Thrust Washer, Bearing, and Race Locations



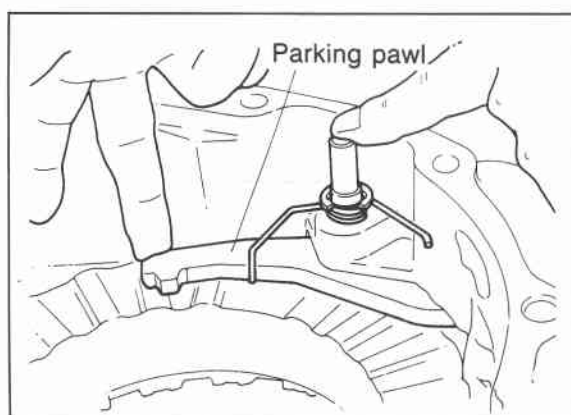
86U07B-380

Outer diameter of bearing and race

mm (in)

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

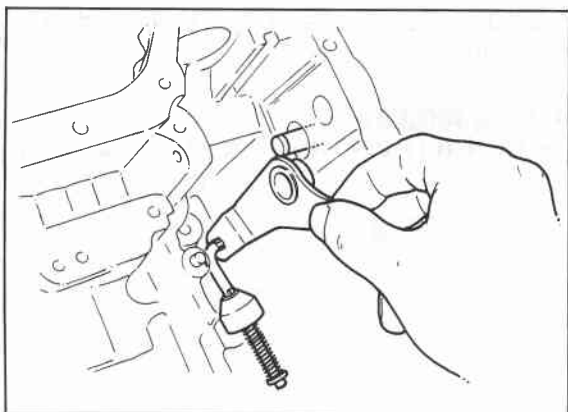
Note: Install with petroleum jelly to prevent the thrust bearing or bearing race from falling out.



86U07B-381

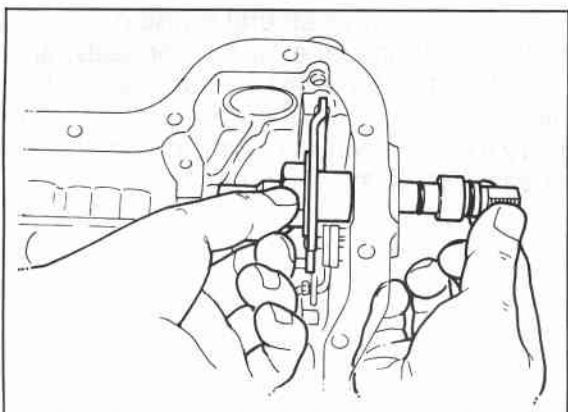
Procedure

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



86U07B-382

2. Install the parking assist lever and snap ring.

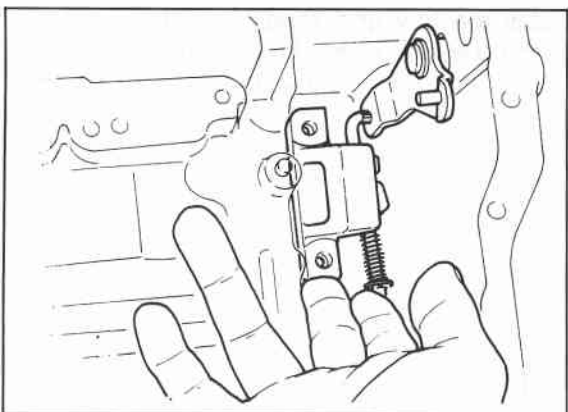


86U07B-383

3. Install the actuator support.

Tightening torque:

11—14 N·m (1.1—1.4 m·kg, 8.0—10 ft·lb)



86U07B-384

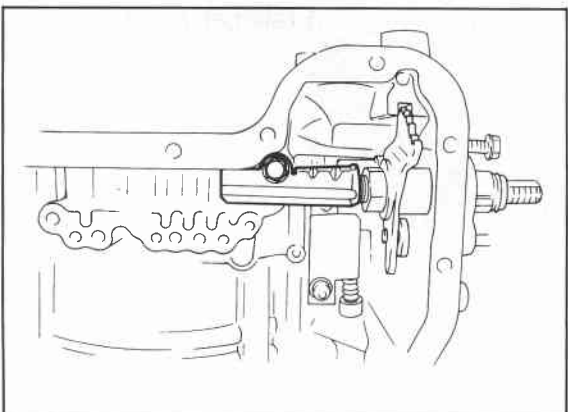
4. Install the manual shaft and manual plate.

(1) Install the manual plate, spacer, washer, and nut.

(2) Tighten the nut to specified torque.

Tightening torque:

41—55 N·m (4.2—5.6 m·kg, 30—41 ft·lb)



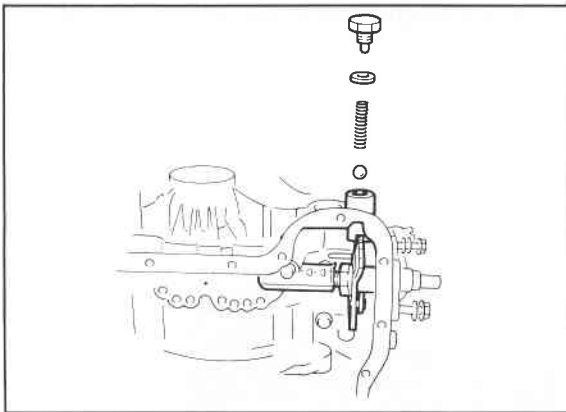
86U07B-385

(3) Install the bracket.

Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)

7B ASSEMBLY

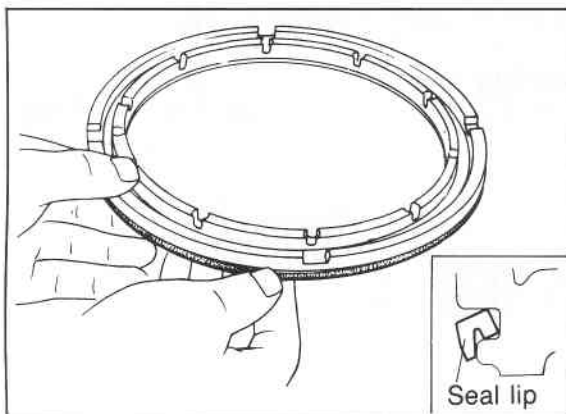


86U07B-386

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

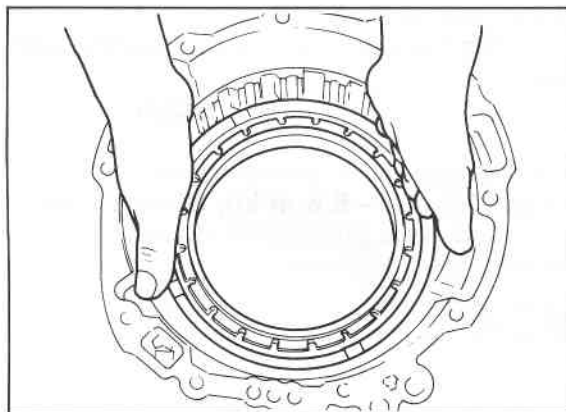
Tightening torque:

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



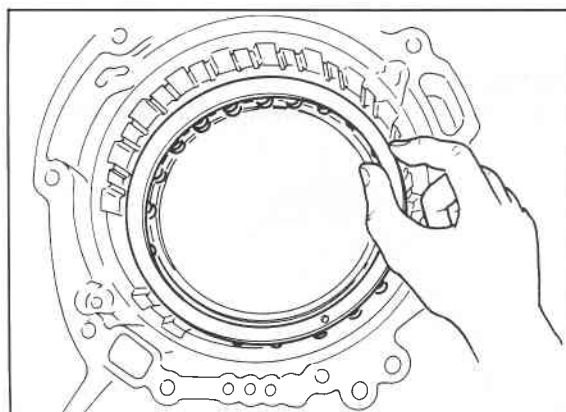
76G07B-181

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



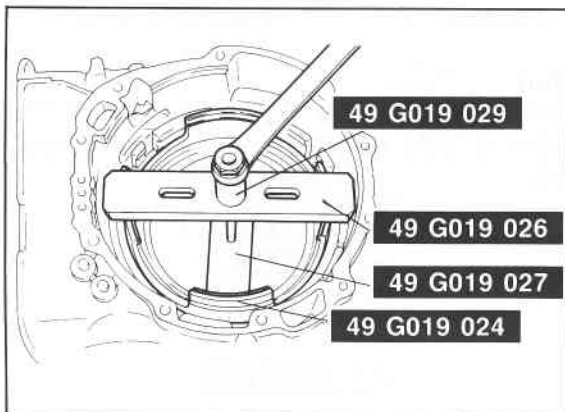
86U07B-388

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



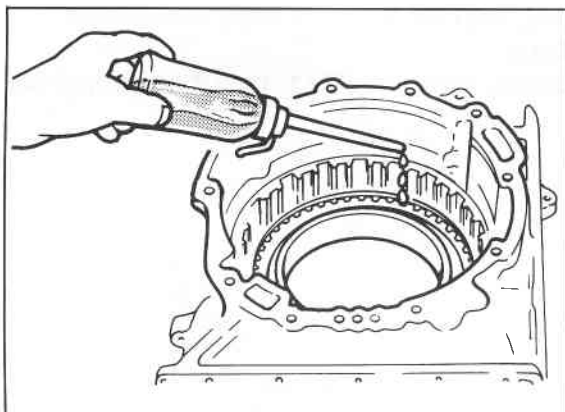
86U07B-389

- (4) Install the spring and retainer assembly.



86U07B-390

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

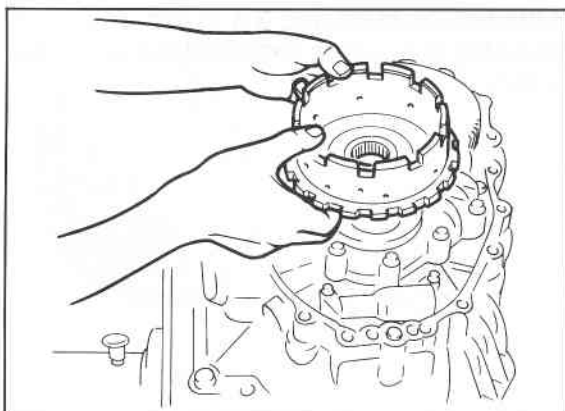


76G07B-182

6. Check the low and reverse brake piston operation.
 - (1) Pour in ATF so that the low and reverse brake piston is fully submerged.
 - (2) Check that no bubbles come from between the piston and seals when applying compressed air through the fluid passage. (Refer to page 7B—204)

Caution

The compressed air must be under 392 kPa (4.0 kg/cm², 57 psi) and not applied for over 3 seconds.

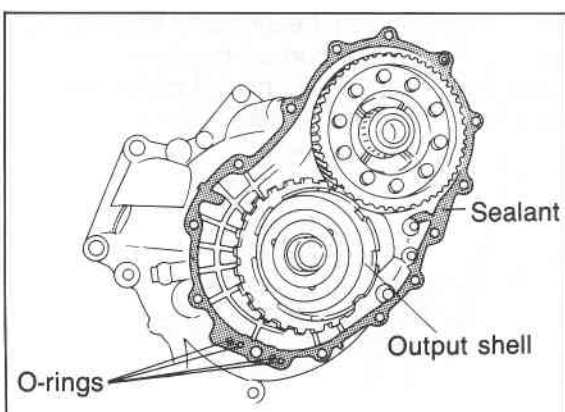


86U07B-392

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

Bearing race outer diameter.

72.0 mm (2.83 in)



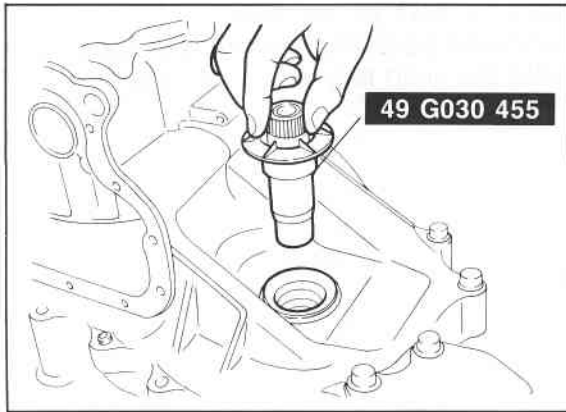
86U07B-393

8. Apply a thin coat of silicon sealant to the contact surfaces of the converter housing and transaxle case.
9. Install the O-rings.
10. Install the transaxle case to the converter housing.

Tightening torque:

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

7B ASSEMBLY

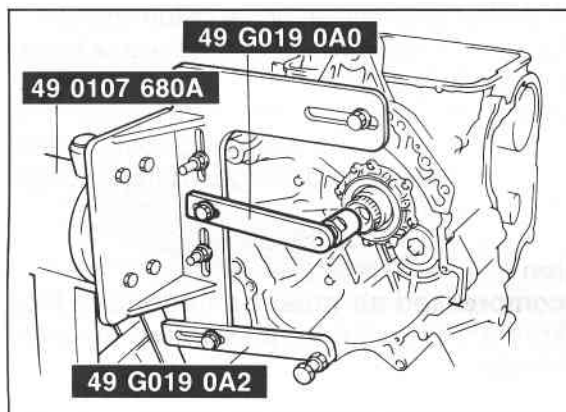


86U07B-394

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

Caution

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

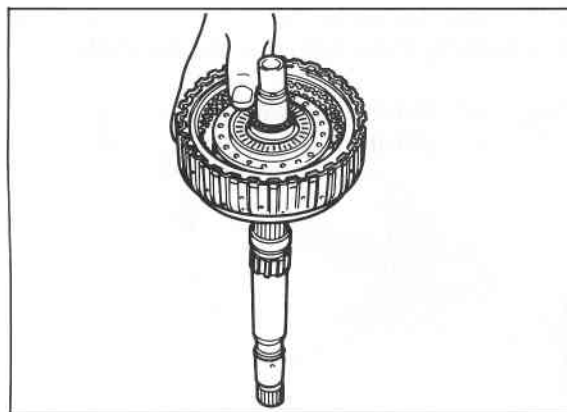


86U07B-395

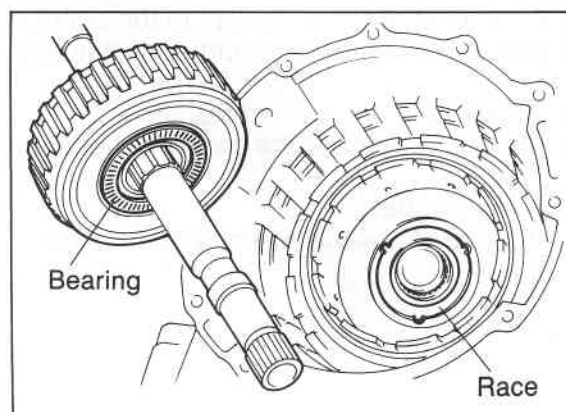
ASSEMBLY-STEP 3

Procedure

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

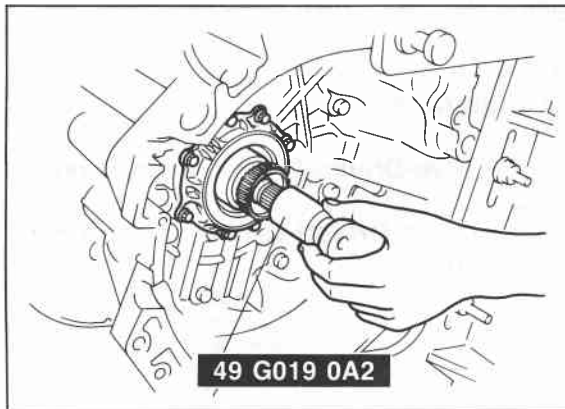


2. Install the turbine shaft and 3-4 clutch assembly.
 - (1) Assemble the turbine shaft and 3-4 clutch assembly.



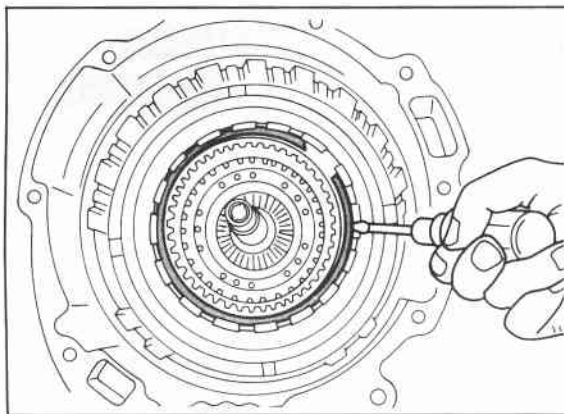
86U07B-397

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



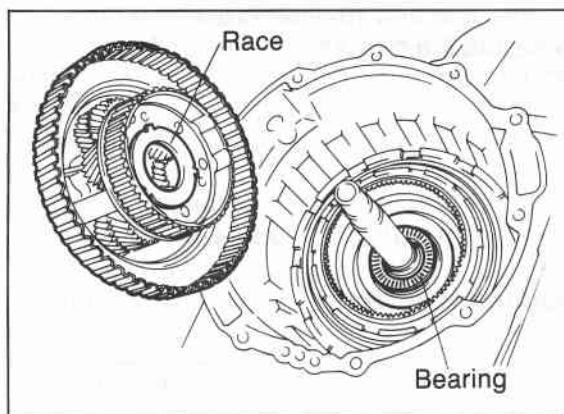
86U07B-398

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



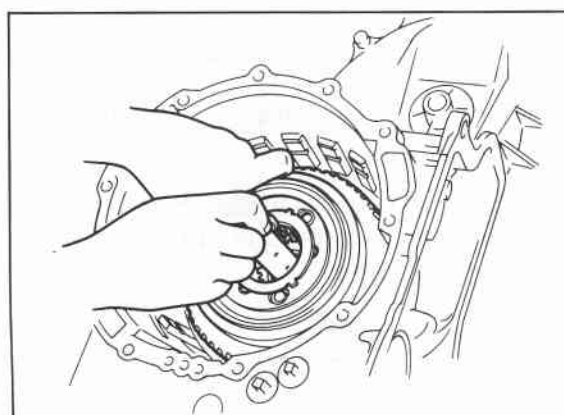
86U07B-399

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



86U07B-400

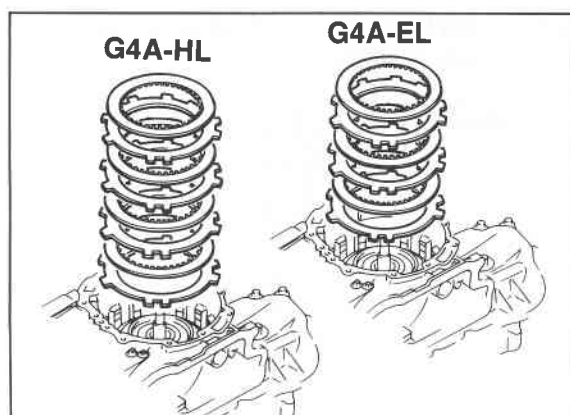
5. Install the carrier hub assembly.
 - (1) Check that the thrust bearing and bearing race are installed in the correct position.



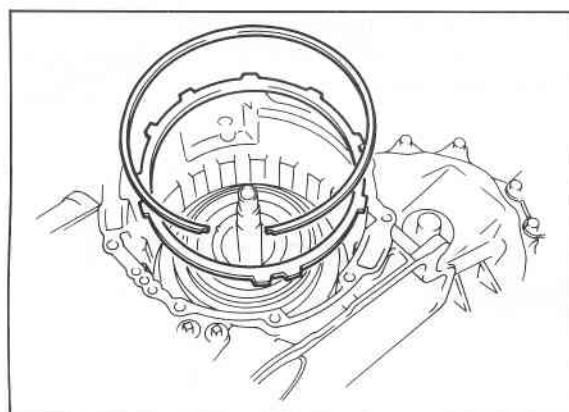
36U07B-401

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

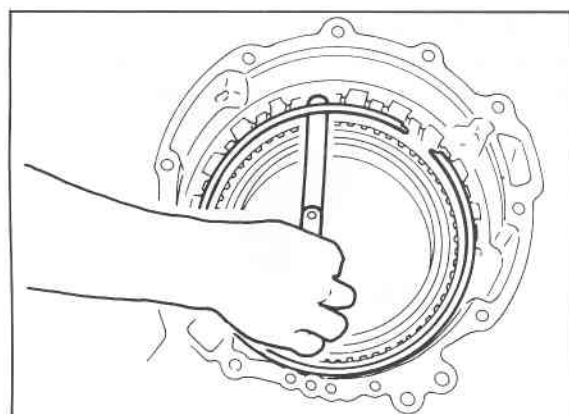
7B ASSEMBLY



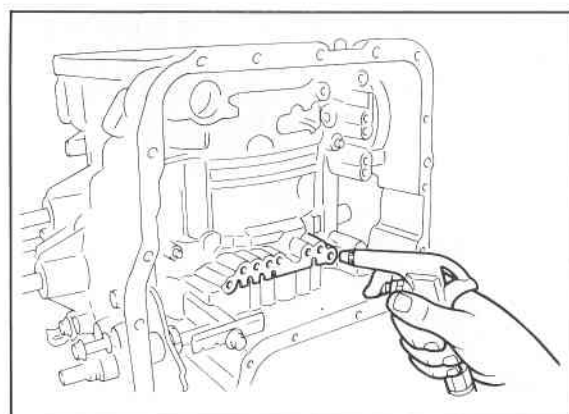
76G07B-183



86U07B-403



76G07B-184



86U07B-405

6. Install the drive and driven plates.

Note

Installation order:

G4A-EL

Driven-Drive-Driven-Drive-Driven-Drive

G4A-HL

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

7. Install the retaining plate.

8. Install the snap ring.

9. Check the low and reverse brake clearance.

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

Low and reverse brake clearance:

2.1—2.4 mm (0.083—0.094 in)

Retaining plate sizes

mm (in)

G4A-EL

10.0 (0.394)	10.2 (0.402)	10.4 (0.410)
10.6 (0.417)	10.8 (0.425)	

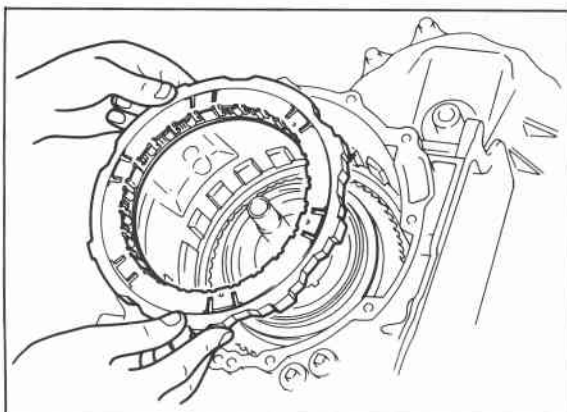
G4A-HL

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

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

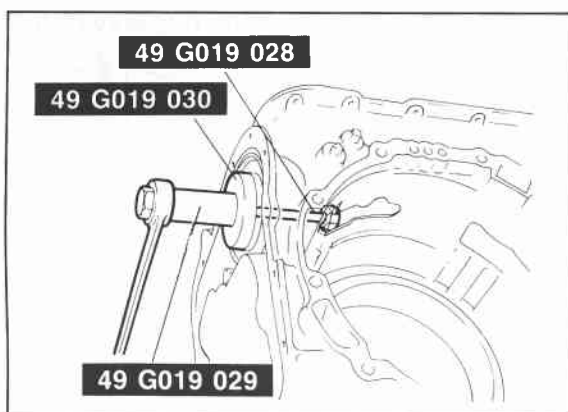
Air pressure:

392 kPa (4.0 kg/cm², 57 psi)



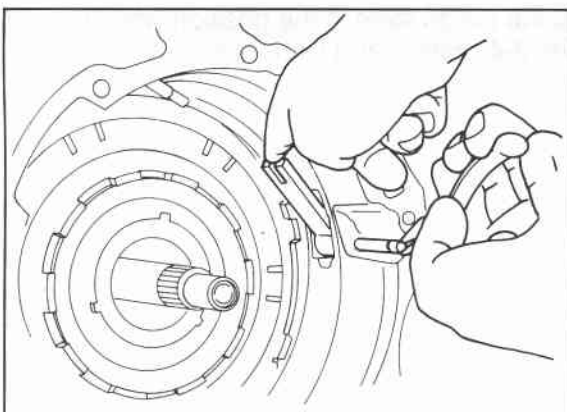
86U07B-406

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



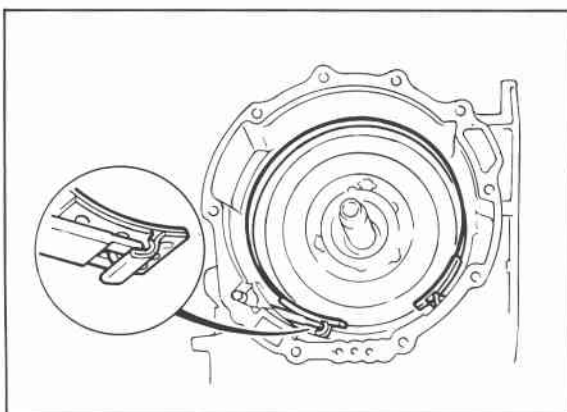
86U07B-407

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



86U07B-408

13. Install the anchor strut.

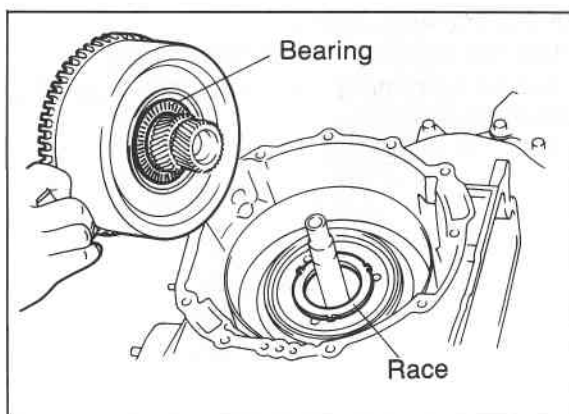


86U07B-409

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

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

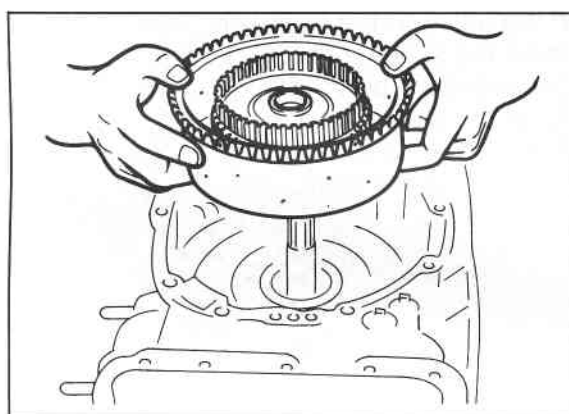
7B ASSEMBLY



86U07B-410

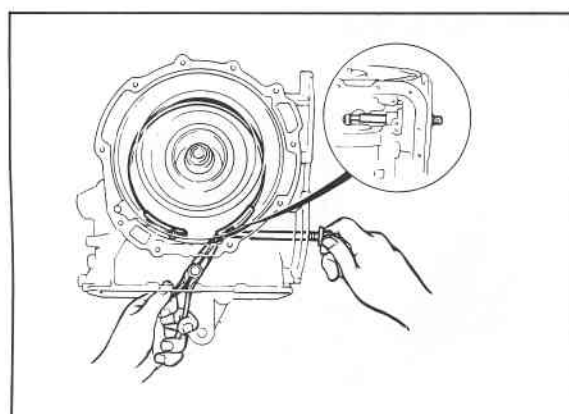
15. Install the small sun gear and one-way clutch.

- (1) Check that the thrust bearing and bearing race are installed in the correct position.



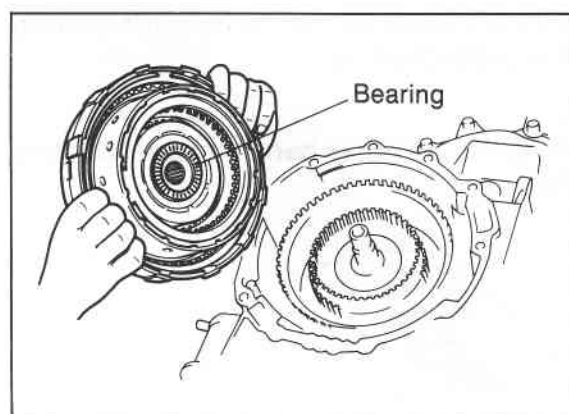
86U07B-411

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



86U07B-412

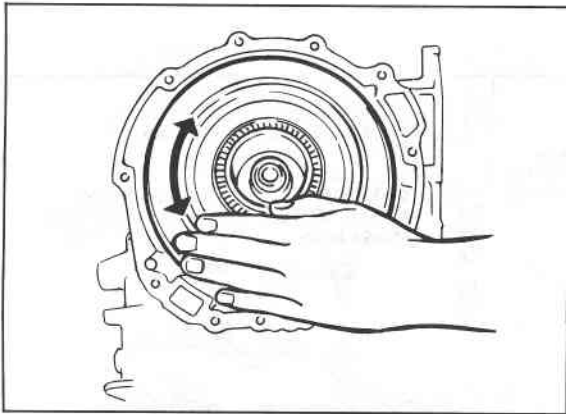
16. Install the piston stem in the position while pulling out the 2-4 brake band with a pliers; then loosely tighten the piston stem by hand.



86U07B-413

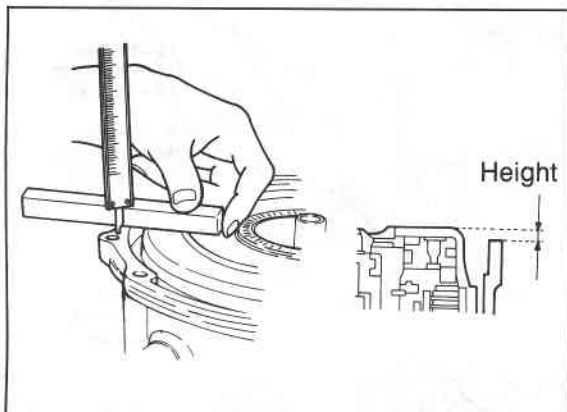
17. Install the clutch assembly.

- (1) Check that the thrust bearing is installed in the correct position.



86U07B-414

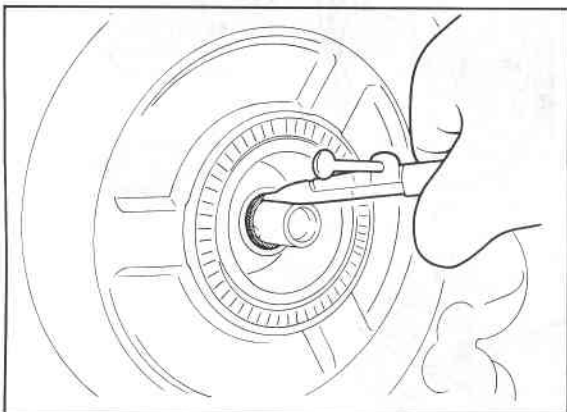
(2) Install the clutch assembly by rotating it.



76G07B-185

Note

Measure the height difference between the reverse and forward drum and transaxle case.
Standard height: 0.8 mm (0.032 in)

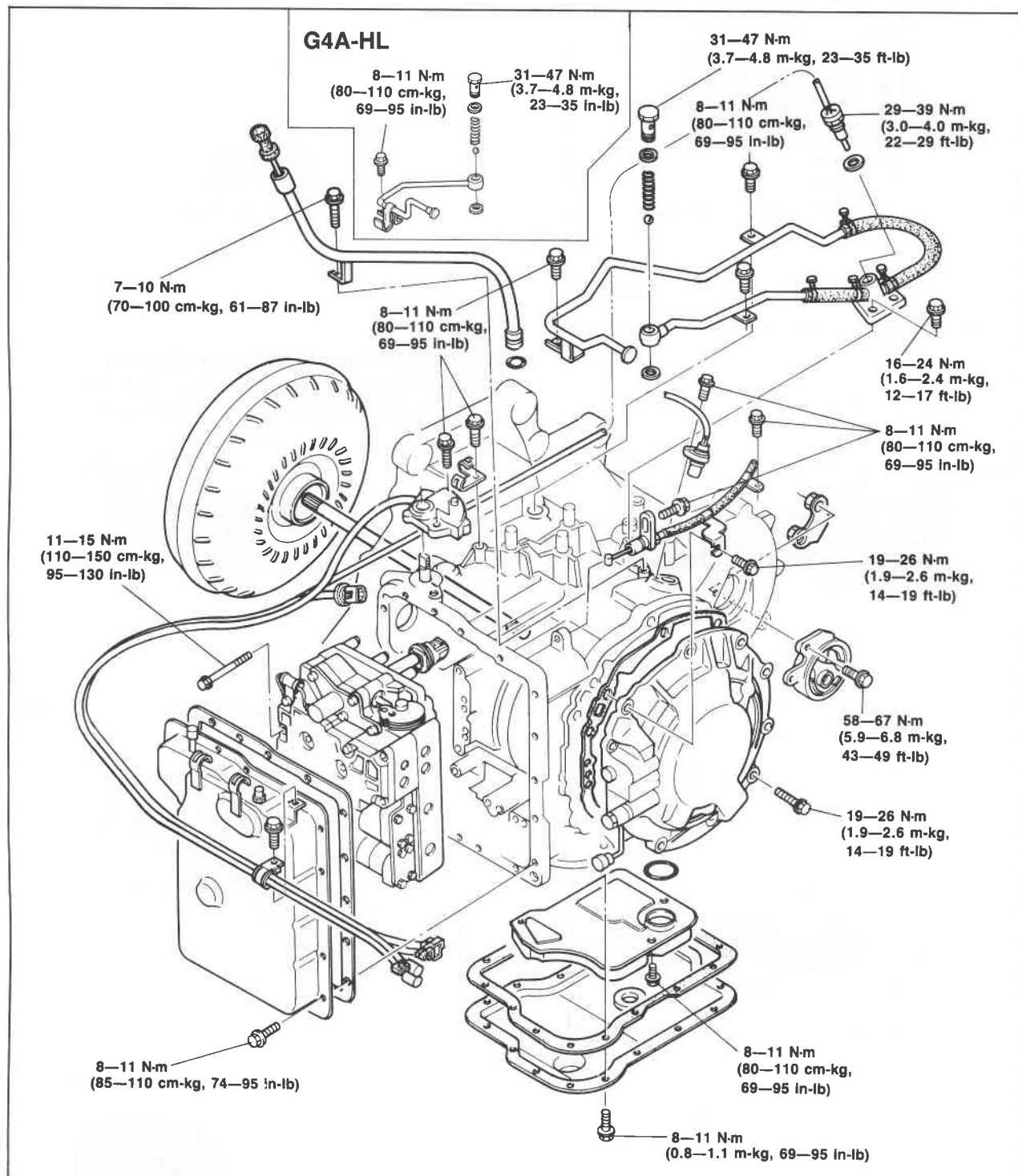


86U07B-416

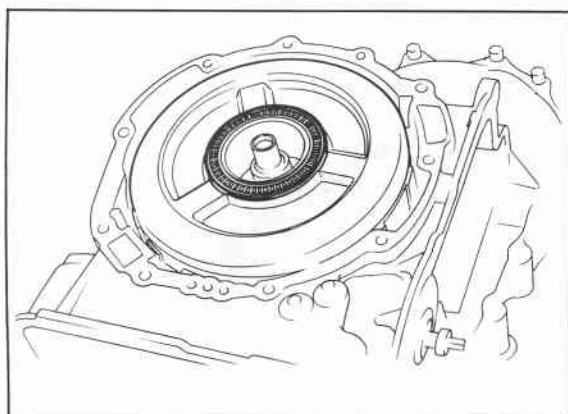
17. Install the snap ring into the bottom ring groove of the turbine shaft.

7B ASSEMBLY

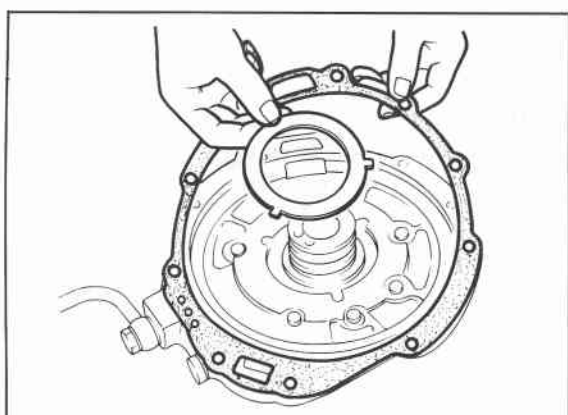
ASSEMBLY-STEP 4 Torque Specifications



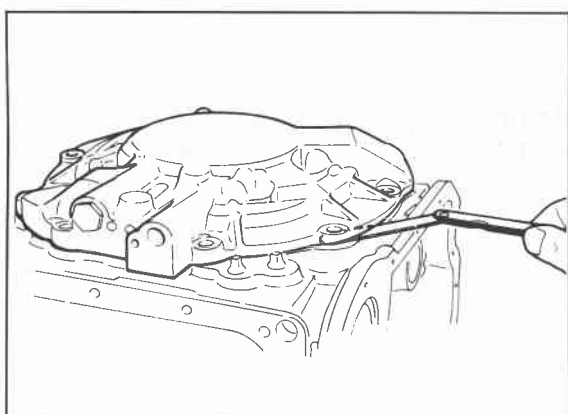
86U07B-417



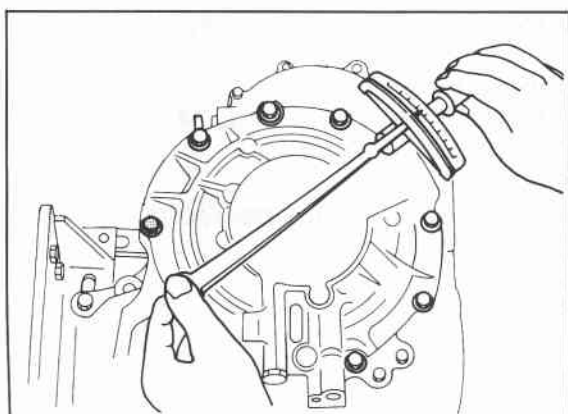
86U07B-418



86U07B-419



76G07B-223



86U07B-421

Procedure

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

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

(2) Remove the previous race and gasket.

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

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

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

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

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

(7) Remove the oil pump.

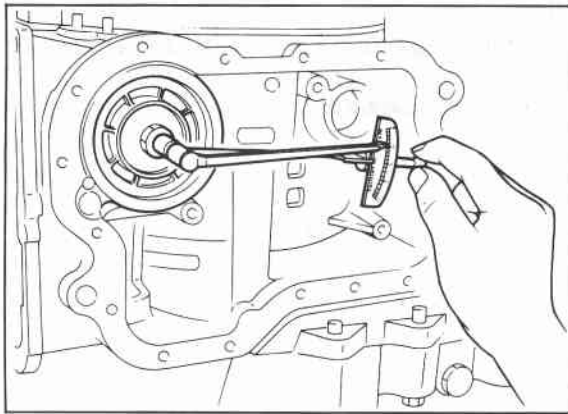
(8) Place the selected bearing race and a new gasket onto the oil pump.

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

Tightening torque:

19—26 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

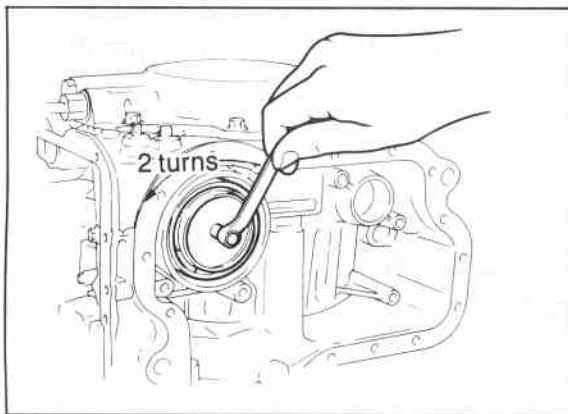
7B ASSEMBLY



86U07B-422

2. Adjust the 2-4 brake band.
 - (1) Loosen the locknut and tighten the piston stem to the specified torque.

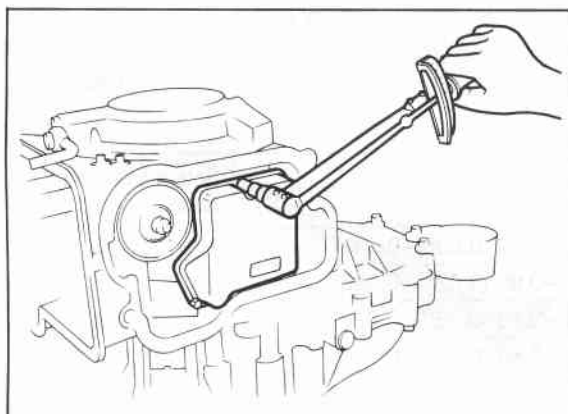
Tightening torque:
9—11 N·m (90—110 cm·kg, 78—95 in·lb)



86U07B-423

- (2) Loosen the piston stem 2 turns.
 - (3) Tighten the locknut to the specified torque.

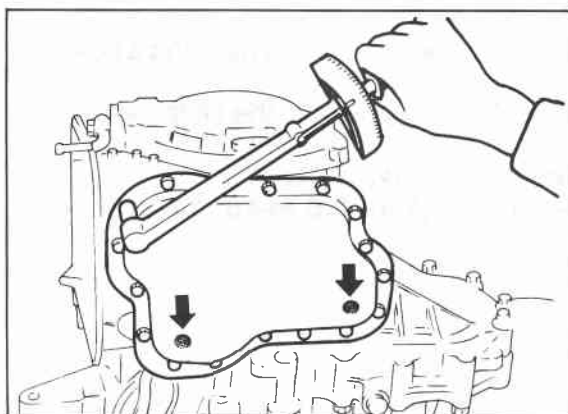
Tightening torque:
25—39 N·m (2.5—4.0 m·kg, 18—29 ft·lb)



86U07B-424

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

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

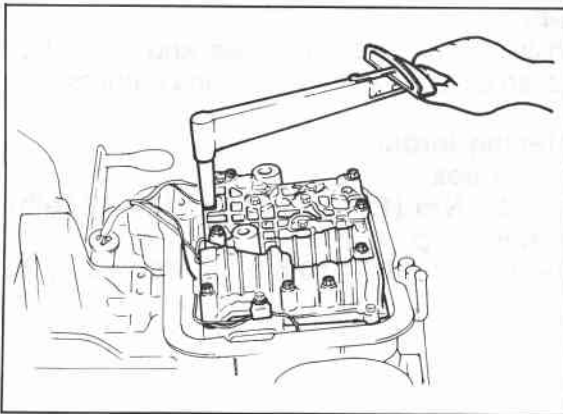


86U07B-425

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

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

Note
Install the magnets in the positions shown in the illustration.



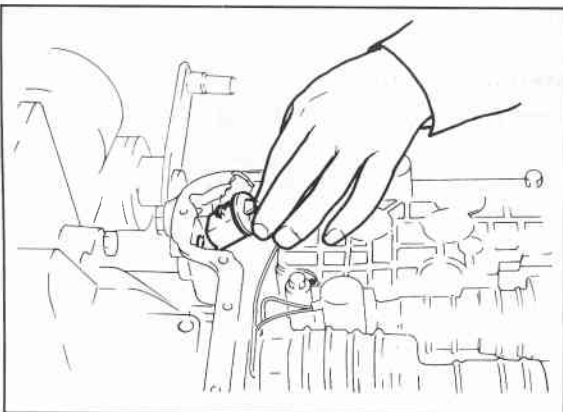
86U07B-426

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

Tightening torque:

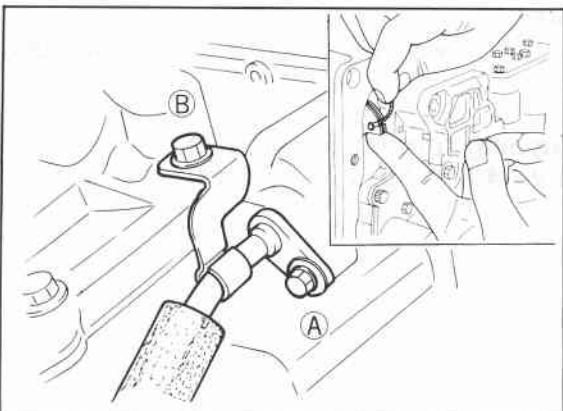
11—15 N·m

(110—150 cm·kg, 95—130 in·lb)



86U07B-427

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



86U07B-428

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

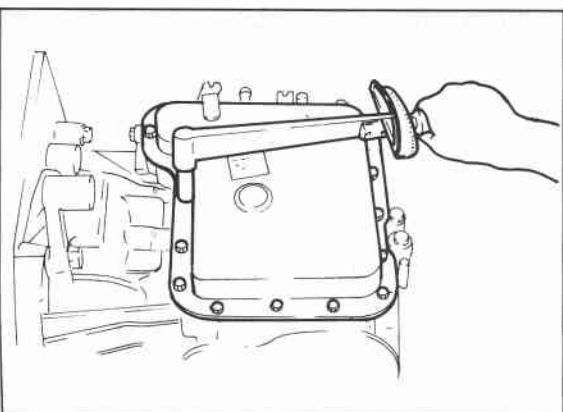
Tightening torque:

Ⓐ 8—11 N·m

(80—110 cm·kg, 69—95 in·lb)

Ⓑ 19—26 N·m

(1.9—2.6 m·kg, 14—19 ft·lb)



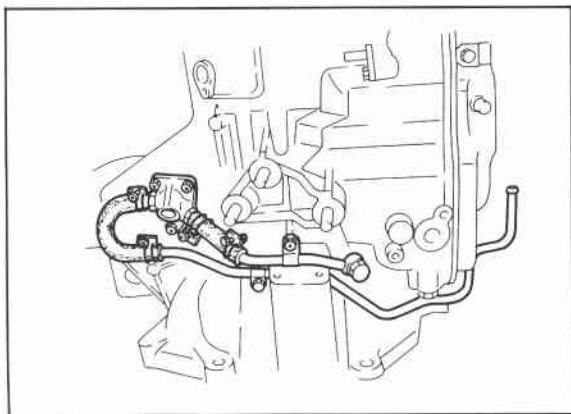
86U07B-429

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

Tightening torque:

8—11 N·m (85—110 cm·kg, 74—95 in·lb)

7B ASSEMBLY



76G07B-186

10. G4A-EL

- (1) Install the oil pipes, oil hoses, and switch box as an assembly; then install the harness clip.

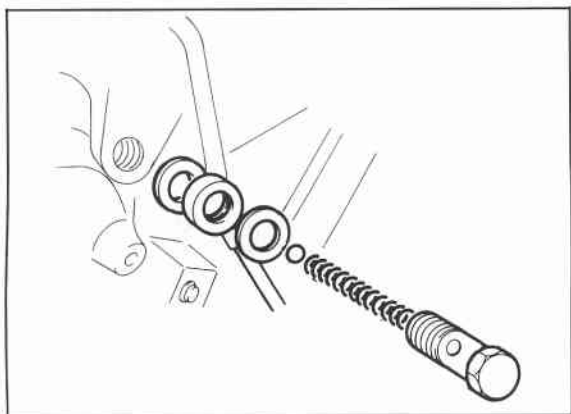
Tightening torque:

Switch box

16—24 N·m (1.6—2.4 m·kg, 12—17 ft·lb)

Harness clip

8—11 N·m (80—110 cm·kg, 69—95 in·lb)

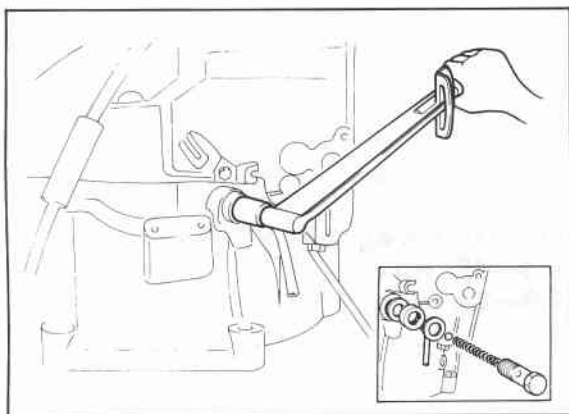


76G07B-187

- (2) Install the ball, spring, gasket, and a plug.

Tightening torque:

31—47 N·m (3.2—4.8 m·kg, 23—35 ft·lb)

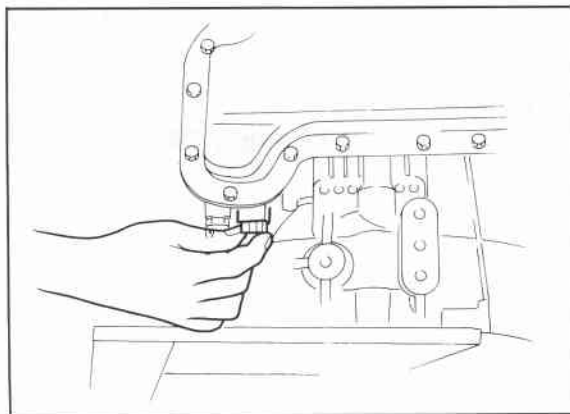


76G07B-188

G4A-HL

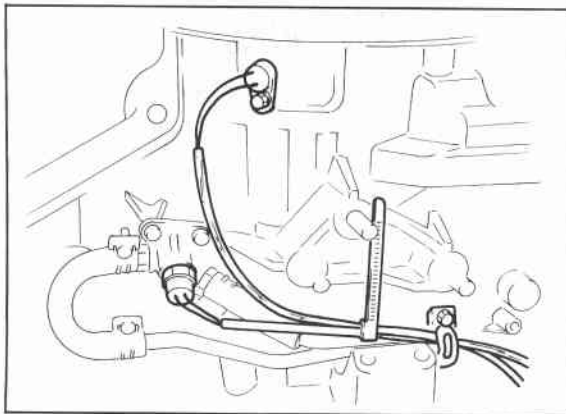
Install the oil pipe, ball, spring, oil pipe, gasket, and plug.

**Tightening torque: 31—47 N·m
(3.2—4.8 m·kg, 23—35 ft·lb)**



76G07B-189

11. Install the solenoid connector.



76G07B-190

12. Install the pulse generator and fluid temperature switch.

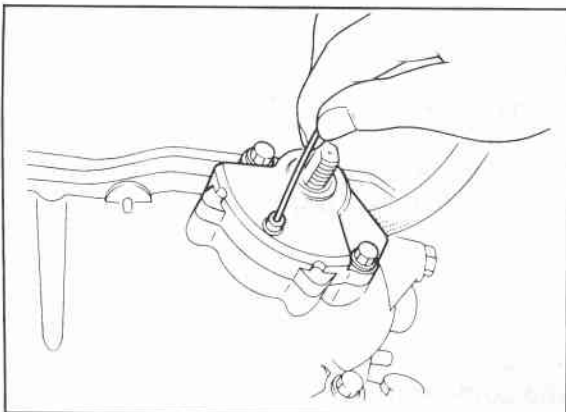
Tightening torque:

Pulse generator

8—11 N·m (80—110 cm·kg, 69—95 in·lb)

Fluid temperature switch

29—39 N·m (3.0—4.0 m·kg, 22—29 in·lb)



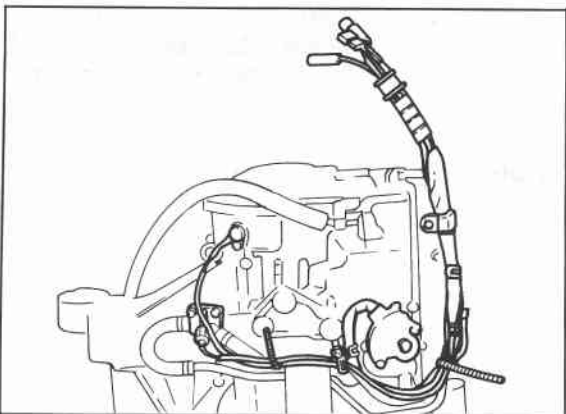
76G07B-191

13. Install the inhibitor switch.

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

Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)



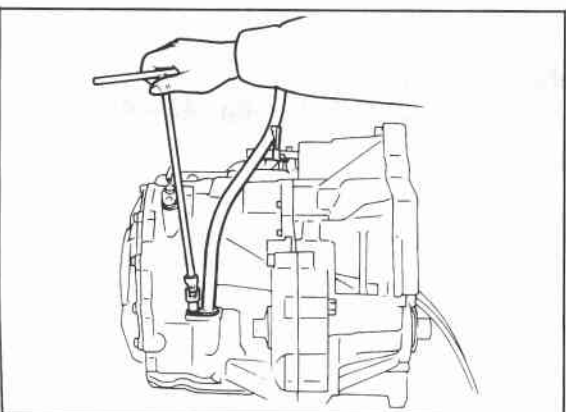
76G07B-192

14. Install the harness with the remaining clip.

Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)

15. Remove the transaxle from the **SST**.



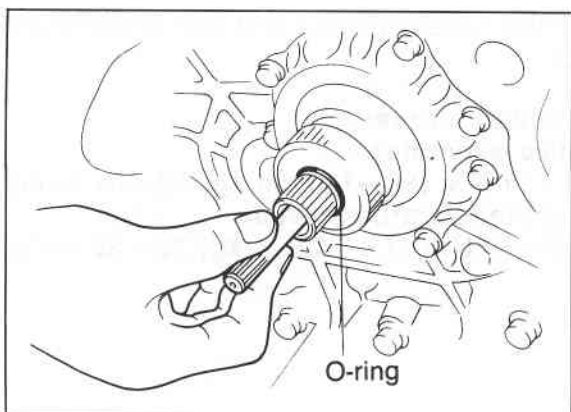
76G07B-193

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

Tightening torque:

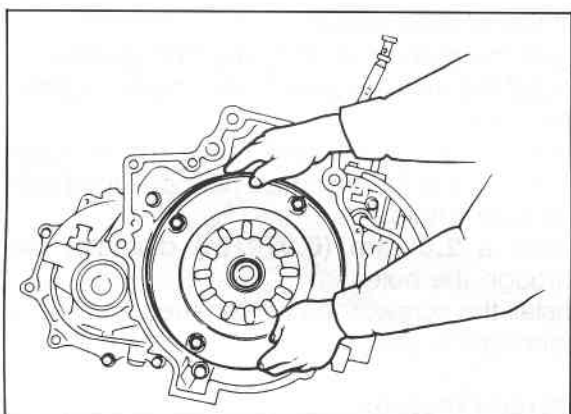
7—10 N·m (70—100 cm·kg, 61—87 in·lb)

7B ASSEMBLY



76G07B-194

17. Install the oil pump shaft.
18. Install a new O-ring onto the turbine shaft.



76G07B-195

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

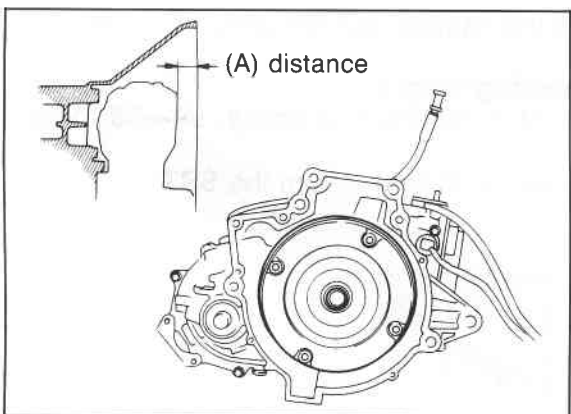
ATF type: Dexron II or M III

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

Caution

a) Hold the torque converter in an erect position when filling it with ATF, do not allow the fluid to overflow.

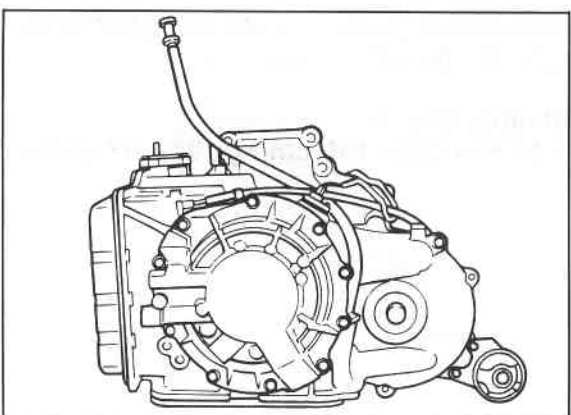
b) If the converter does not fit in easily, do not try to force it; install carefully.



76G07B-196

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

(A): approx. 25 mm (0.98 in)



76G07B-197

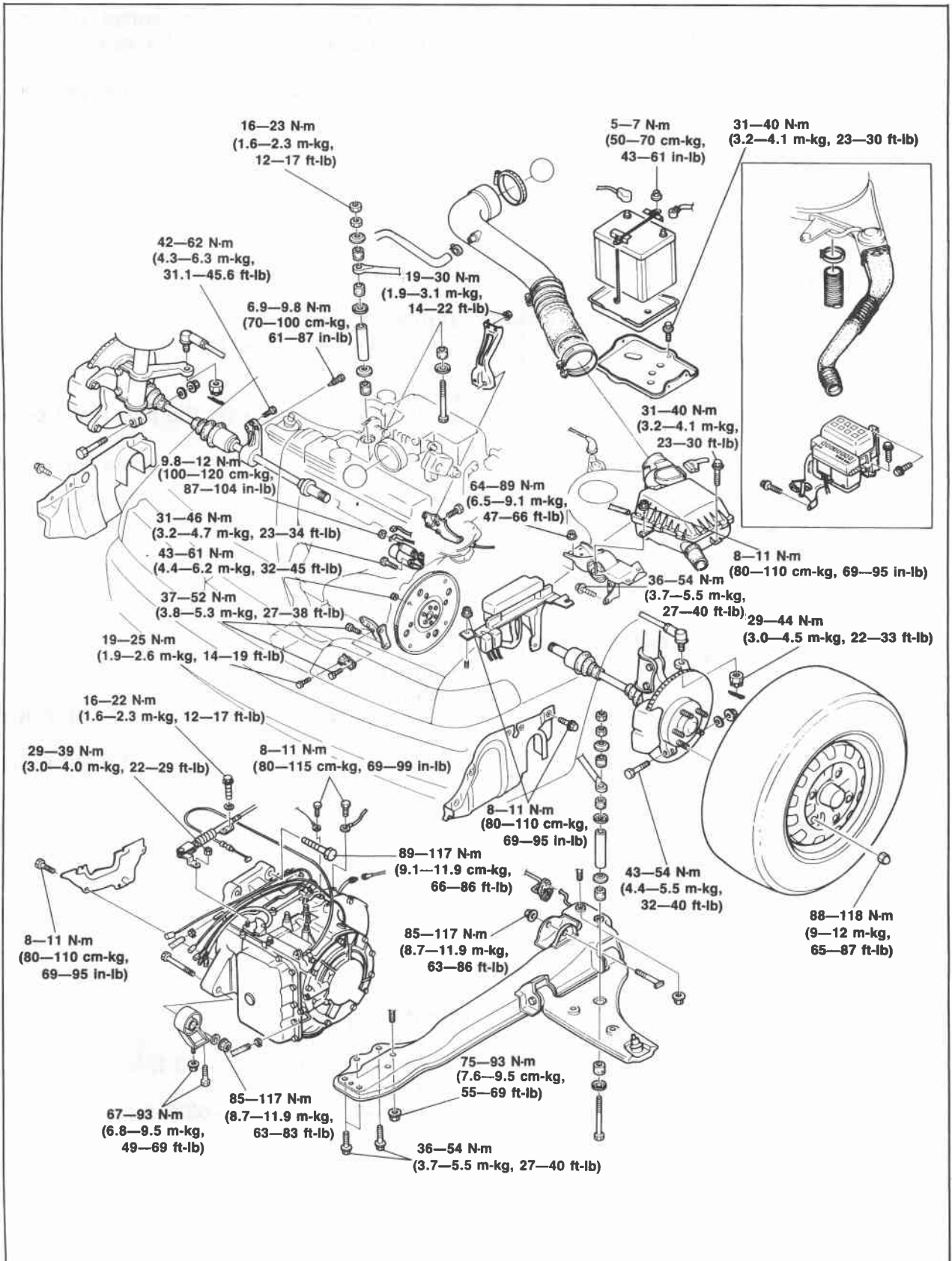
22. Install the engine mount No. 1

Tightening torque:

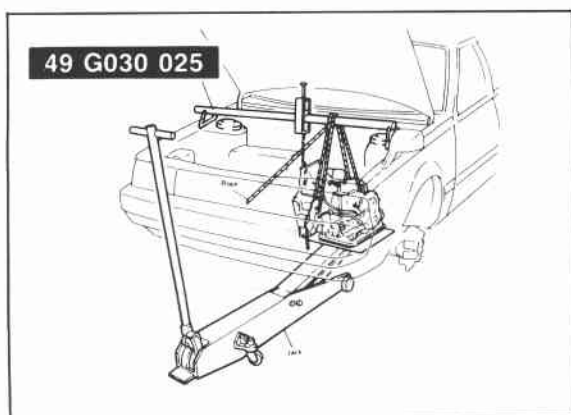
58—67 N·m (5.9—6.8 m·kg, 43—49 ft·lb)

INSTALLATION

TORQUE SPECIFICATIONS



7B INSTALLATION



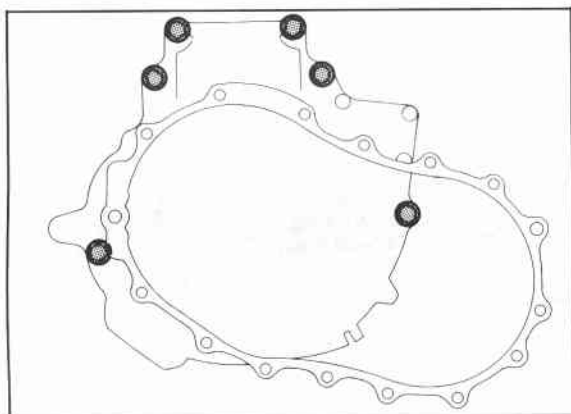
86U07B-441

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

Caution

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

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



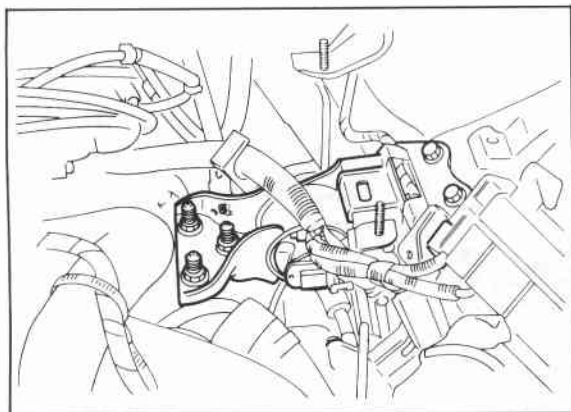
3. Mount the transaxle to the engine.

Tightening torque:

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

Note

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



4. Install engine mount No. 4 and bracket.

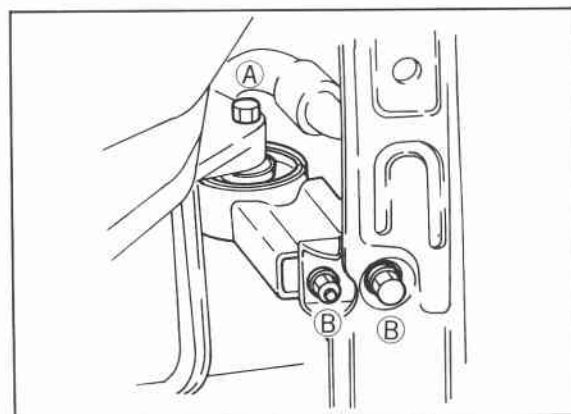
Tightening torque:

Bolt

36—54 N·m (3.7—5.5 m·kg, 27—40 ft·lb)

Nut

64—89 N·m (6.5—9.1 m·kg, 47—66 ft·lb)



5. Install engine mount No. 2.

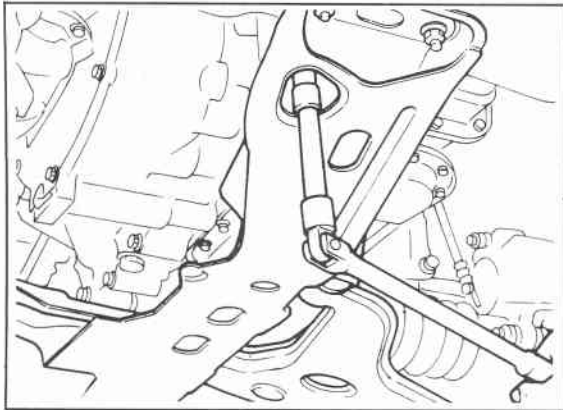
Tightening torque:

Ⓐ 85—117 N·m

(8.7—11.9 m·kg, 63—86 ft·lb)

Ⓑ 67—93 N·m

(6.8—9.5 m·kg, 49—69 ft·lb)



86U07B-445

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

Tightening torque:

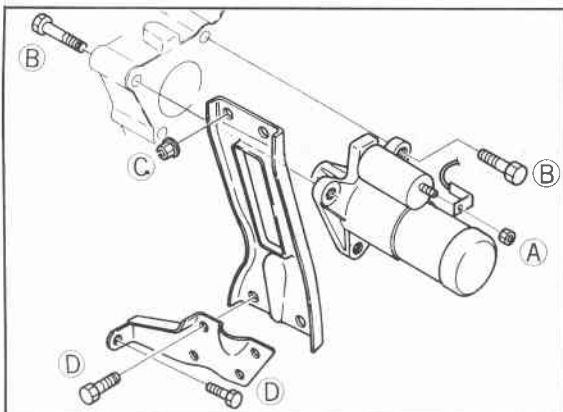
Bolt

36—54 N·m (3.7—5.5 m·kg, 27—40 ft·lb)

Nut

75—93 N·m (7.6—9.5 m·kg, 55—69 ft·lb)

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



86U07B-446

9. Install the starter and harnesses.

Tightening torque:

A 9.8—12 N·m

(100—120 cm·kg, 87—104 in·lb)

B 31—46 N·m

(3.2—4.7 m·kg, 23—34 ft·lb)

10. Install the manifold bracket.

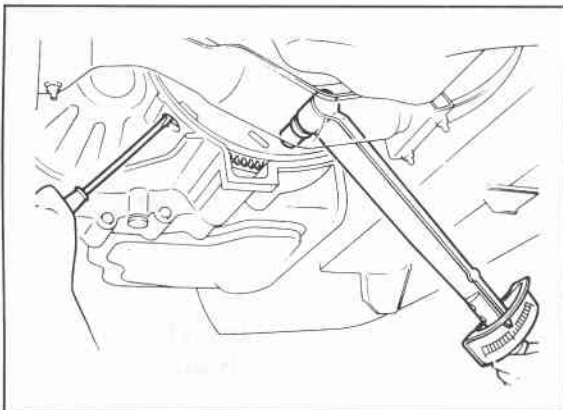
Tightening torque:

C 19—30 N·m

(1.9—3.1 m·kg, 14—22 ft·lb)

D 37—52 N·m

(3.8—5.3 m·kg, 27—38 ft·lb)



86U07B-447

11. Install the torque converter nuts.

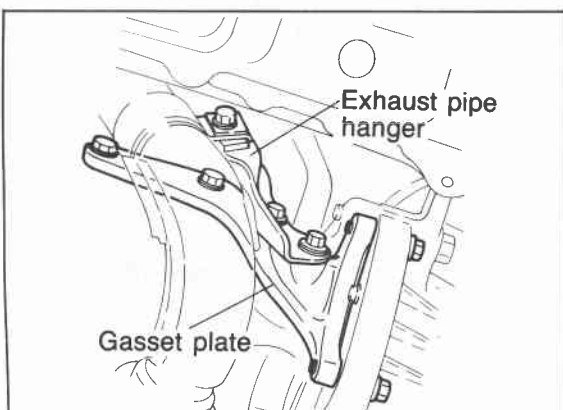
Tightening torque:

43—61 N·m (4.4—6.2 m·kg, 32—45 ft·lb)

12. Install the end plate.

Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)



86U07B-448

13. Install the gusset plates and exhaust pipe hanger.

Tightening torque:

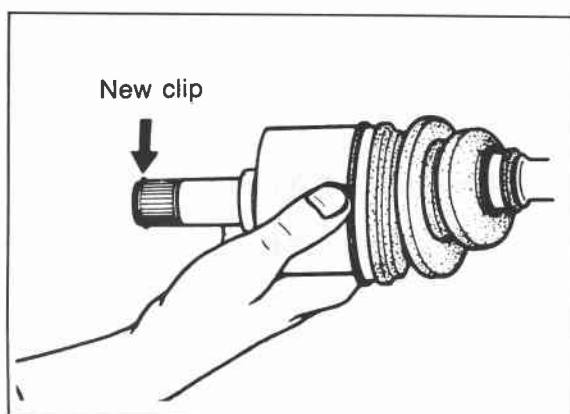
Gasket plate

37—52 N·m (3.8—5.3 m·kg, 27—38 ft·lb)

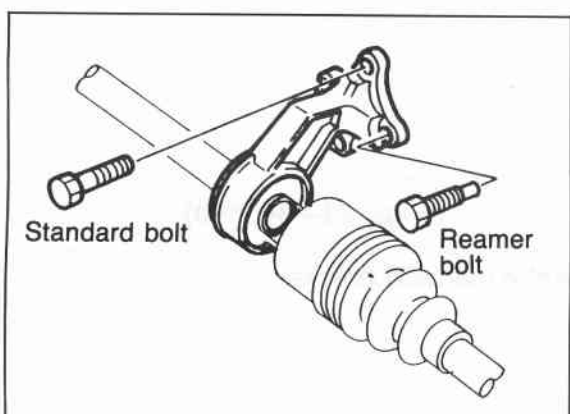
Exhaust pipe hanger

19—25 N·m (1.9—2.6 m·kg, 14—19 ft·lb)

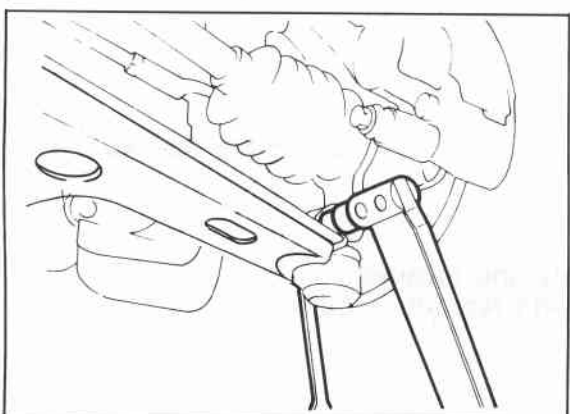
7B INSTALLATION



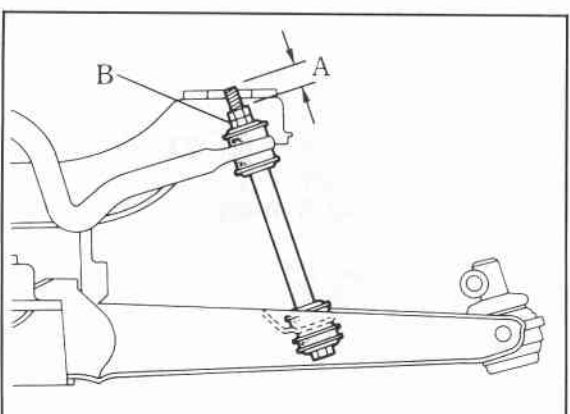
86U07B-449



86U07B-450



86U07B-451



86U07B-452

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

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

- (1) Remove the **SST** and insert the joint shaft into the transaxle.
- (2) Mount the joint shaft bracket onto the engine.

(3) Install and tighten the reamer bolts; then install and tighten the standard bolts.

Tightening torque:

Reamer bolts 6.9—9.8 N·m

(70—100 cm·kg, 61—87 in·lb)

Standard bolts 42—62 N·m

(4.3—6.3 m·kg, 31.1—45.6 ft·lb)

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

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

Caution

a) Do not damage the oil seal.

b) After installation, pull the front hub outward to verify that the driveshaft does not come.

16. Install the left driveshaft as follows:

(1) Pull the front hub outward to insert the driveshaft into the transaxle.

(2) Push the joint from the differential side to connect the driveshaft to the differential side gear.

Caution

a) Do not damage the oil seal.

b) After installation, pull the front hub outward to verify that the driveshaft does not come out.

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

Tightening torque:

43—54 N·m (4.4—5.5 m·kg, 32—40 ft·lb)

18. Install the undercover.

19. Install the stabilizer bar control link as follows:

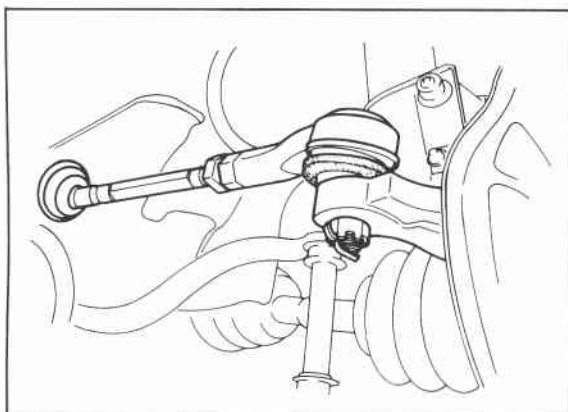
(1) Install the stabilizer bar control link.

(2) Adjust protrusion A to **20.1 mm (0.79 in)**.

(3) Tighten bolt B to the specified torque.

Tightening torque:

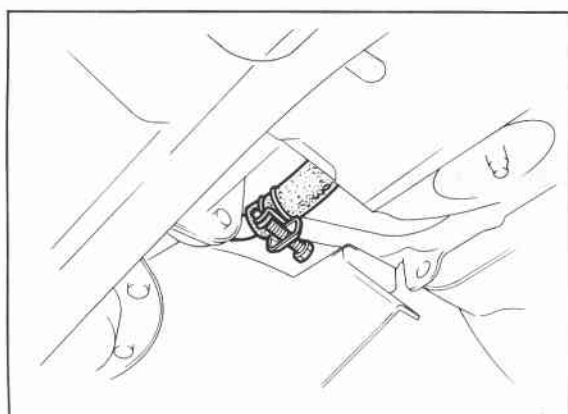
16—23 N·m (1.6—2.3 m·kg, 12—17 ft·lb)



86U07B-453

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

Tightening torque:
29—44 N·m (3.0—4.5 m·kg, 22—33 ft·lb)



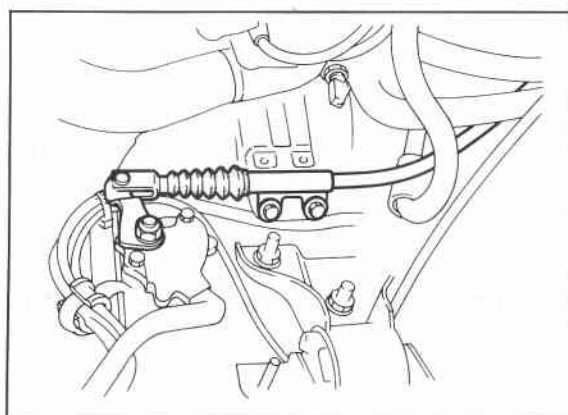
86U07B-454

21. Install the oil cooler outlet and inlet hoses.
 22. Install the splash shields.

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

23. Install the front wheels.

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



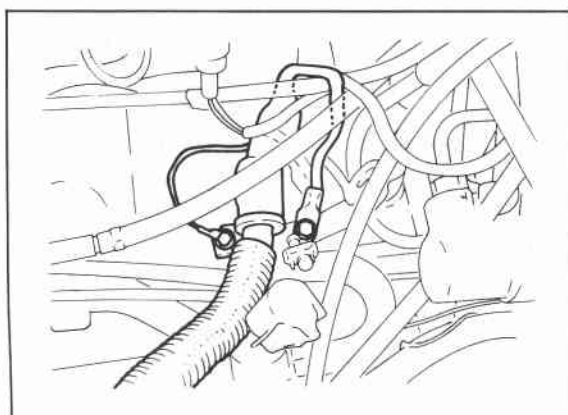
76G07B-198

24. Connect the throttle cable.

Note
Adjust the throttle cable with the oil pressure test. (Refer to page 7B—75, 76)

25. Connect the selector cable.

Tightening torque:
Nut
29—39 N·m (3.0—4.0 m·kg, 22—29 ft·lb)
Bolts
16—22 N·m (1.6—2.3 m·kg, 12—17 ft·lb)

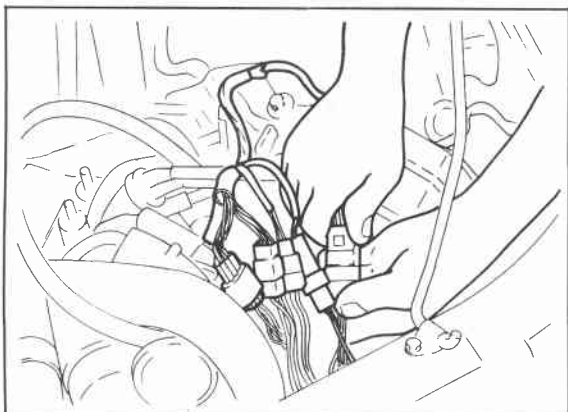


86U07B-456

26. Connect the ground wires to the transaxle case.

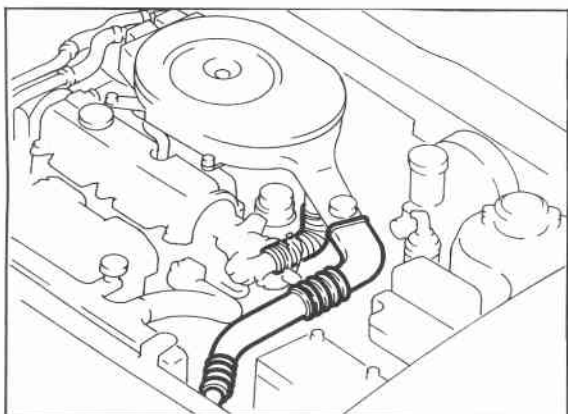
Tightening torque:
8—11 N·m (80—115 cm·kg, 69—99 in·lb)

7B INSTALLATION



76G07B-199

27. Connect the connectors as follows:
 - (1) Inhibitor switch
 - (2) Solenoid valve
 - (3) Pulse generator (G4A-EL)
 - (4) Fluid temperature switch (G4A-EL)
28. Connect the speedometer cable.



76G07B-200

29. Install the fresh air duct. (G4A-HL)
30. Install the air cleaner hose. (G4A-EL)
31. Install the air cleaner assembly; then connect the air flow meter connector and inlet hose. (G4A-EL)

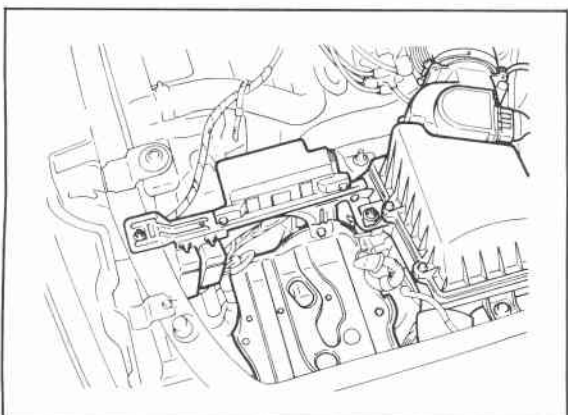
Tightening torque:

Bolt

31—40 N·m (3.2—4.1 m·kg, 23—30 in·lb)

Nut

8—11 N·m (80—110 cm·kg, 69—95 in·lb)



76G07B-201

32. Connect the distributor lead.
33. Install the main fuse block.

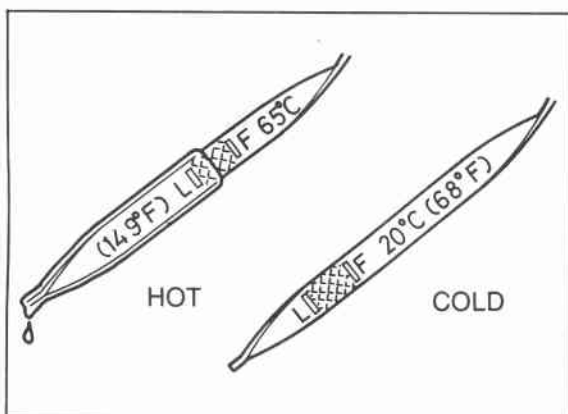
Tightening torque:

8—11 N·m (80—110 cm·kg, 69—95 in·lb)

34. Install the battery carrier and battery.

Tightening torque:

31—40 N·m (3.2—4.1 m·kg, 23—30 in·lb)

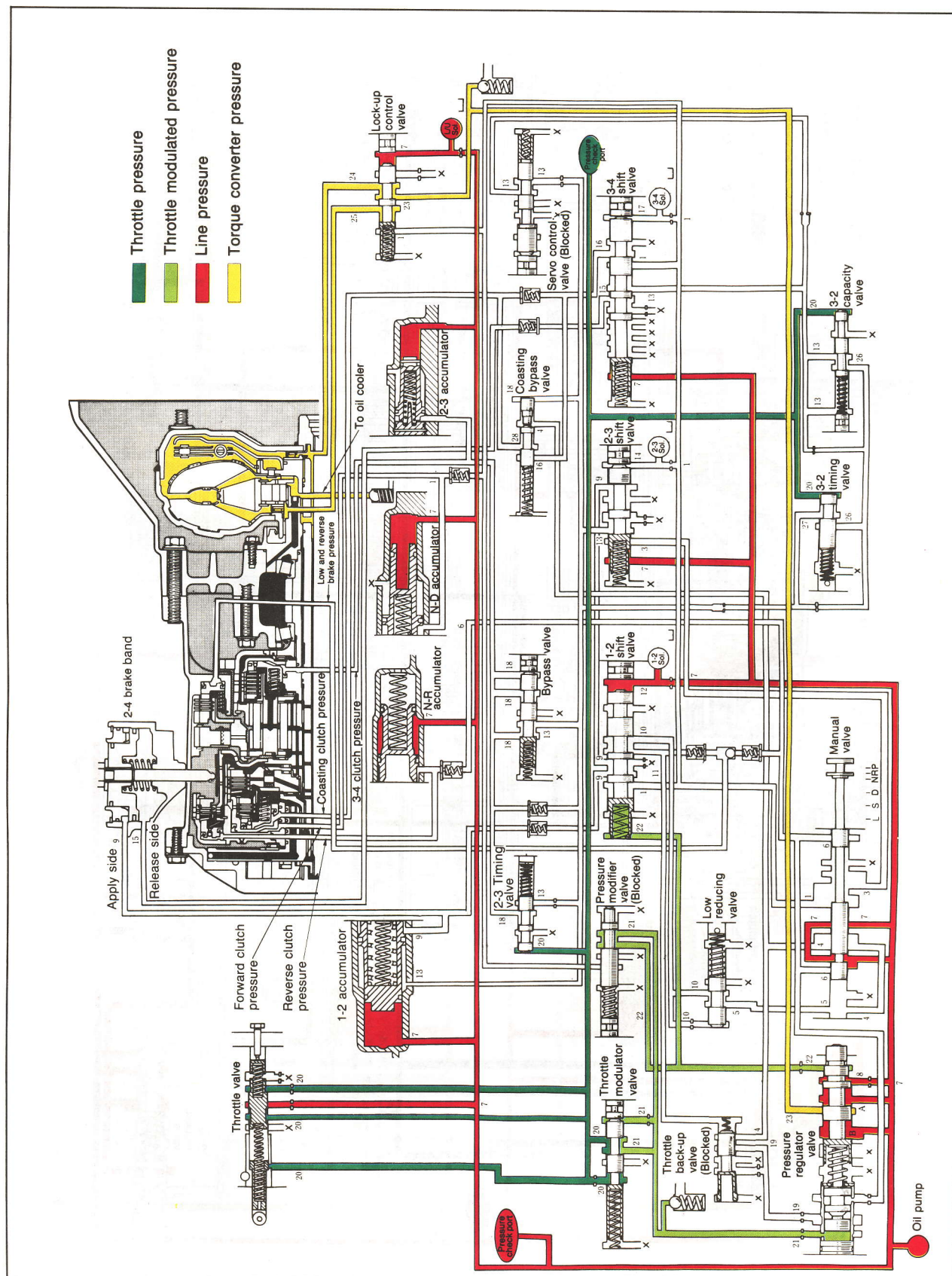


76G07B-202

35. Pour in ATF and check the following:
 - (1) With the engine idling, check that the fluid level is between the F and L marks on the dipstick. (Refer to page 7B—71)
 - (2) Check the manual linkage, and adjust if necessary. (Refer to page 7B—72)
 - (3) Check the inhibitor switch operation. (Refer to page 7B—65)
 - (4) Conduct a road test. (Refer to page 7B—34, 35)
 - (5) Check that there is no fluid leakage from the transaxle. (Refer to page 7B—71)

HYDRAULIC CIRCUIT (G4A-EL)

P RANGE

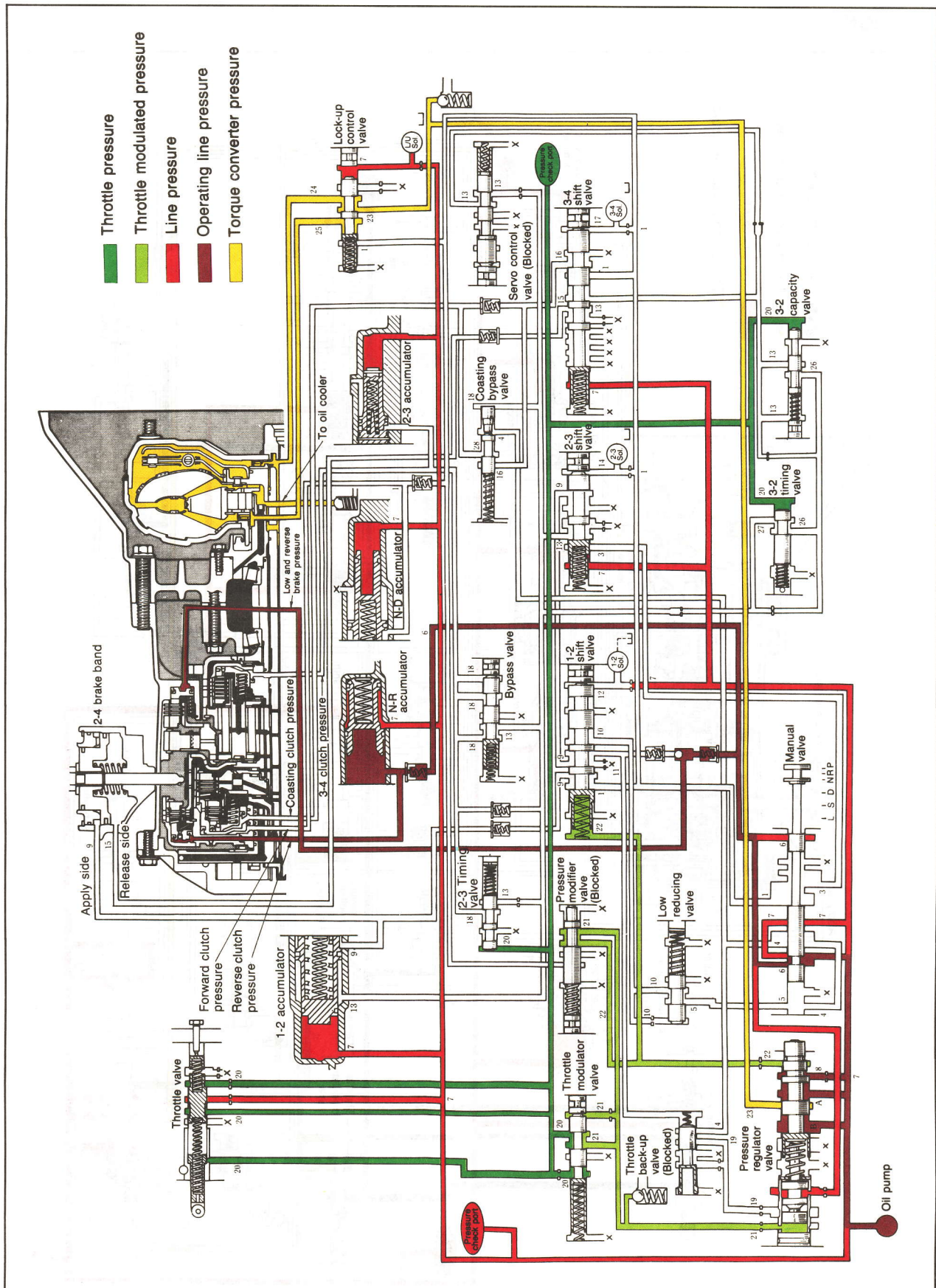


76G07B-203

7B-221

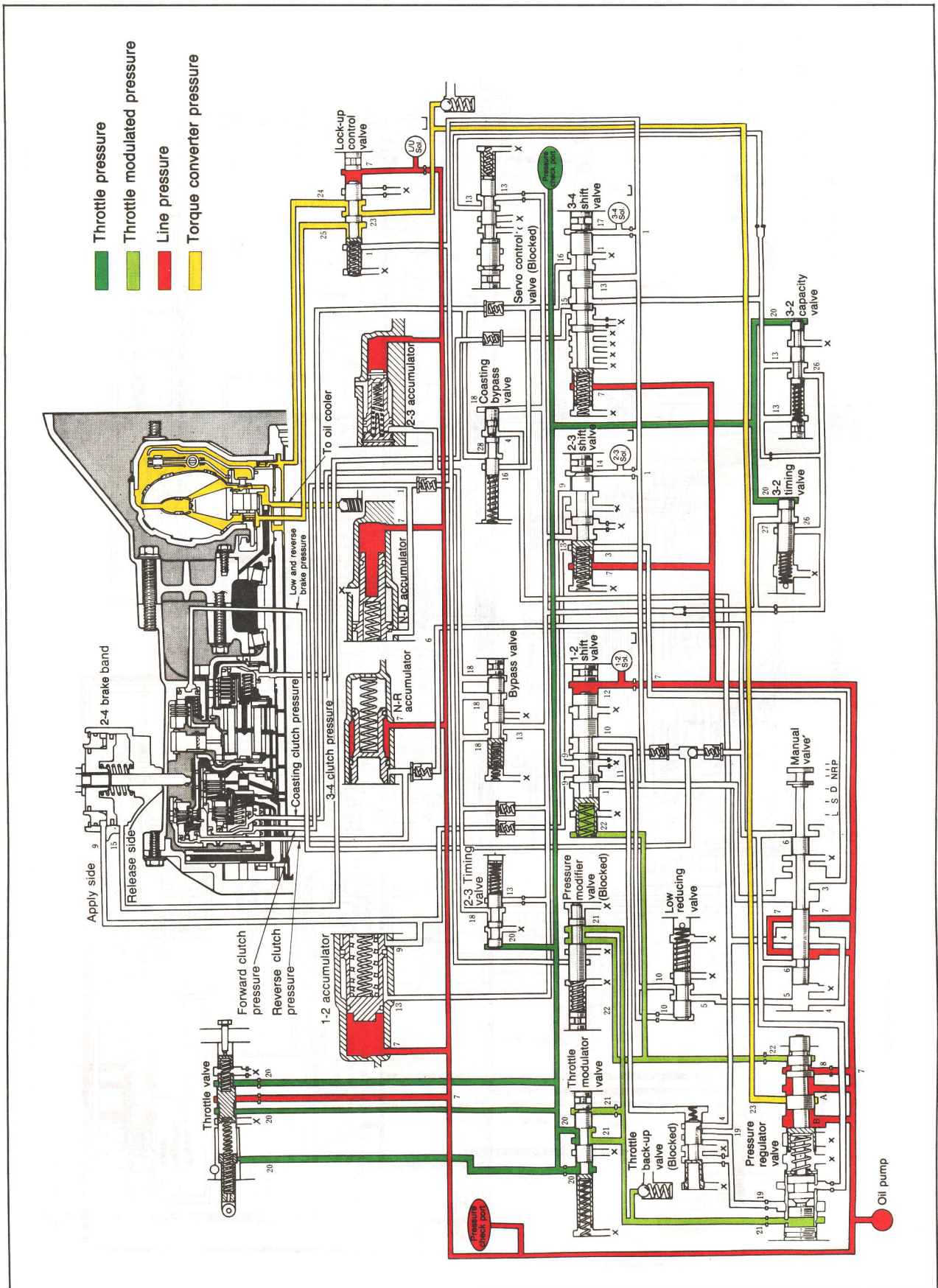
7B HYDRAULIC CIRCUIT (G4A-EL)

R RANGE



86U07B-462

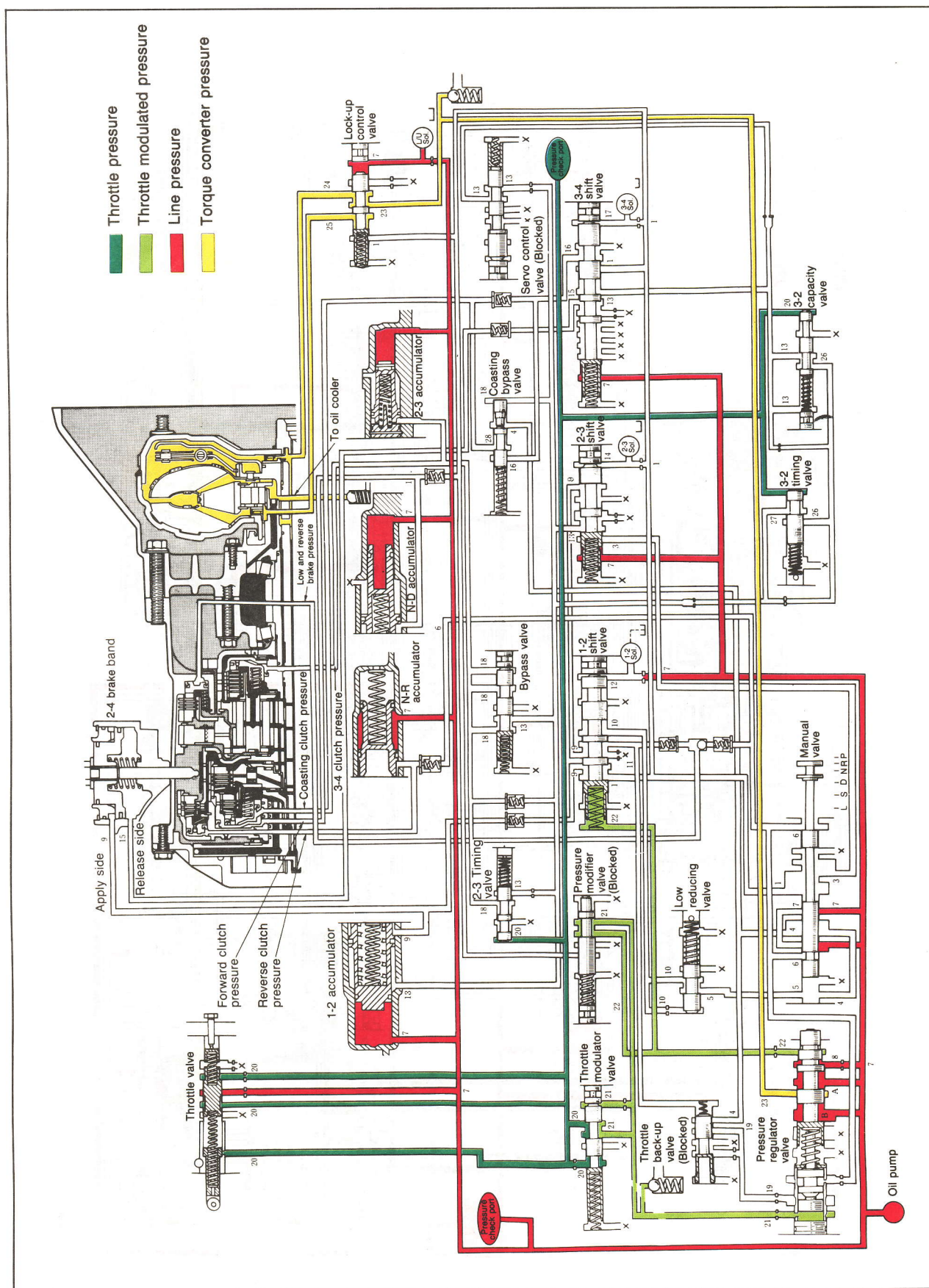
N RANGE; BELOW APPROX. 18 km/h (11 mph)



86U07B-463

7B HYDRAULIC CIRCUIT (G4A-EL)

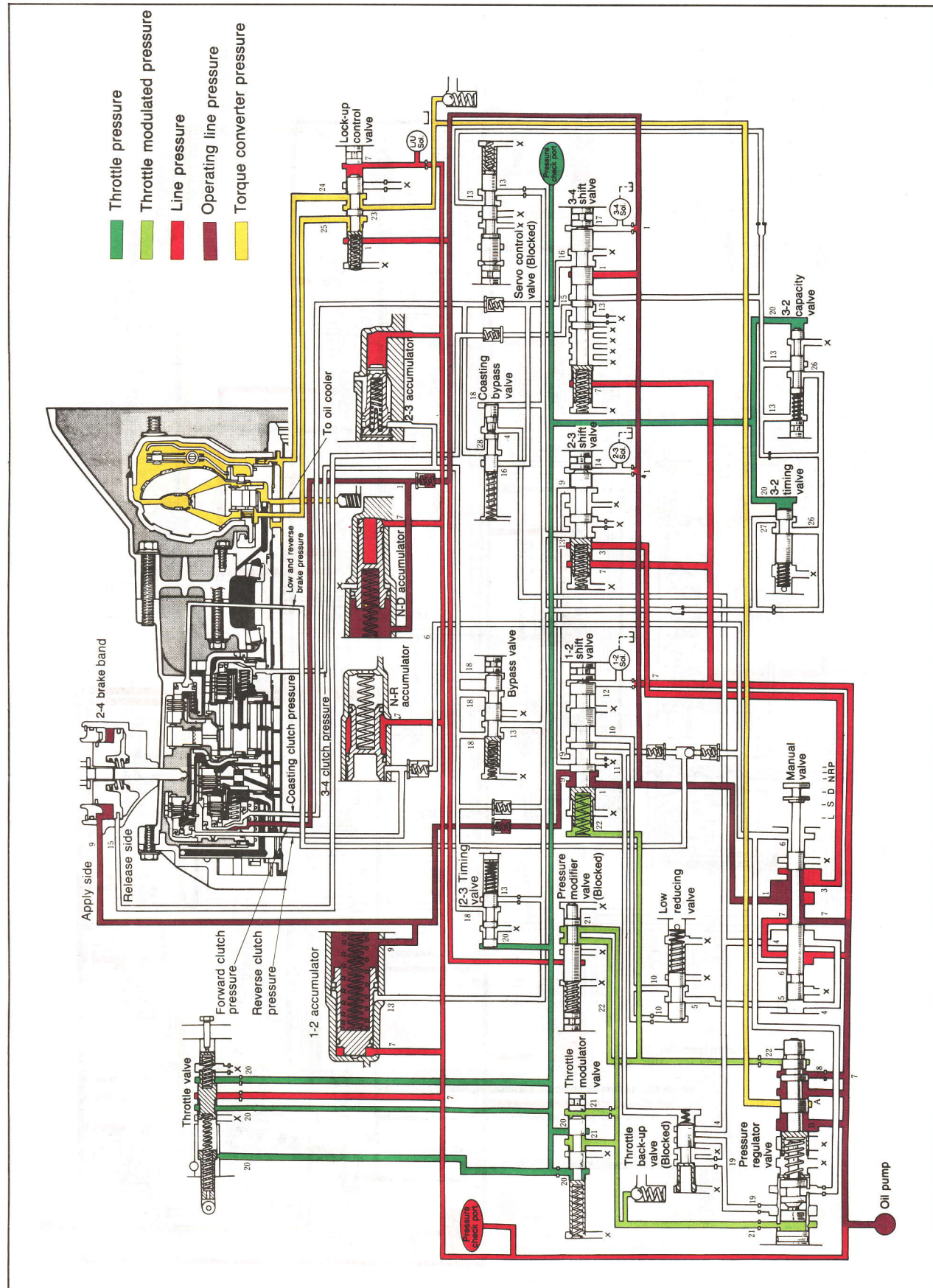
N RANGE; ABOVE APPROX. 18 km/h (11 mph)



86U07B-464

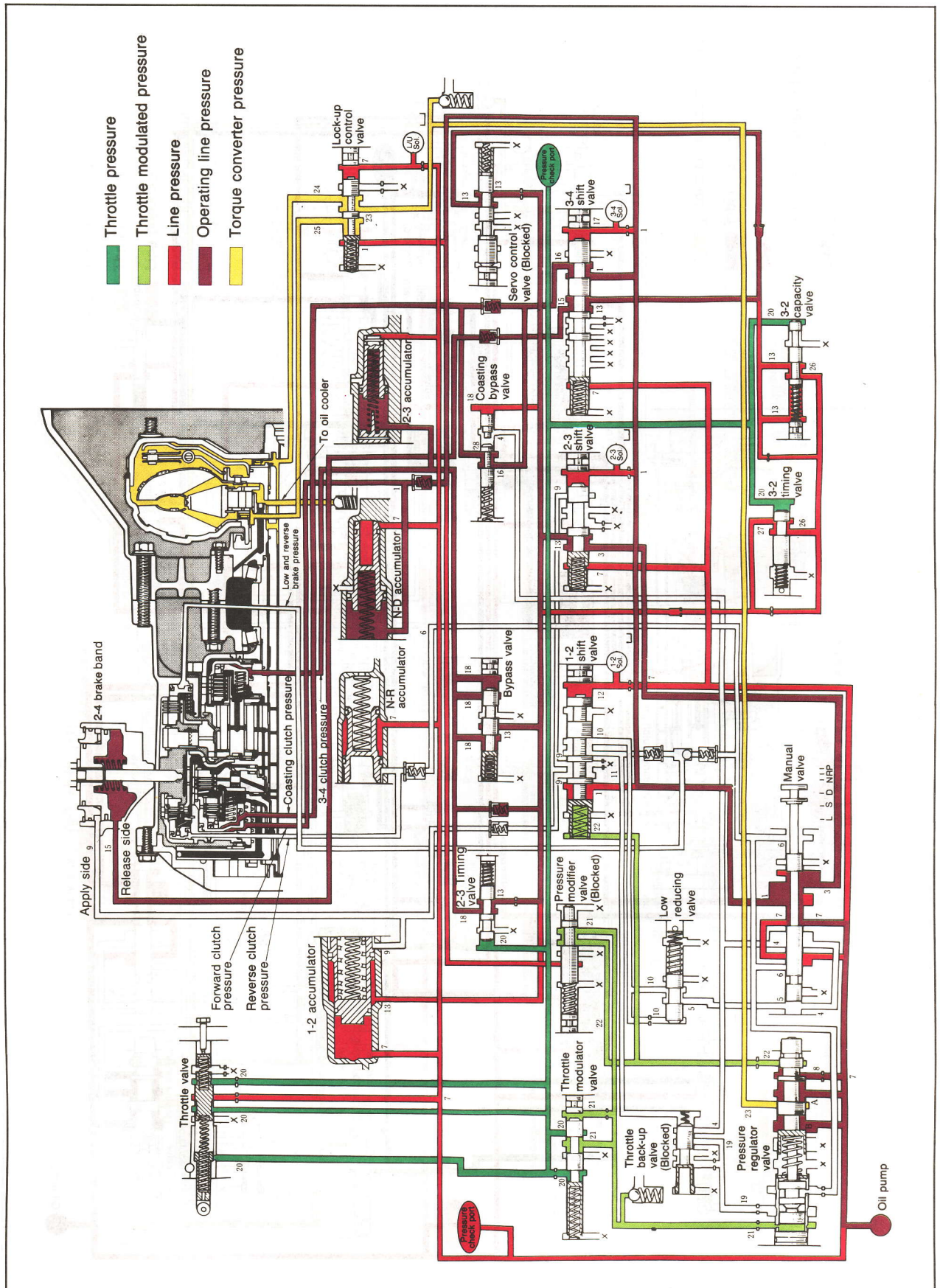
7B HYDRAULIC CIRCUIT (G4A-EL)

D RANGE; 2ND GEAR



86U07B-466

D RANGE; 3RD GEAR, BELOW APPROX. 40 km/h (25 mph)

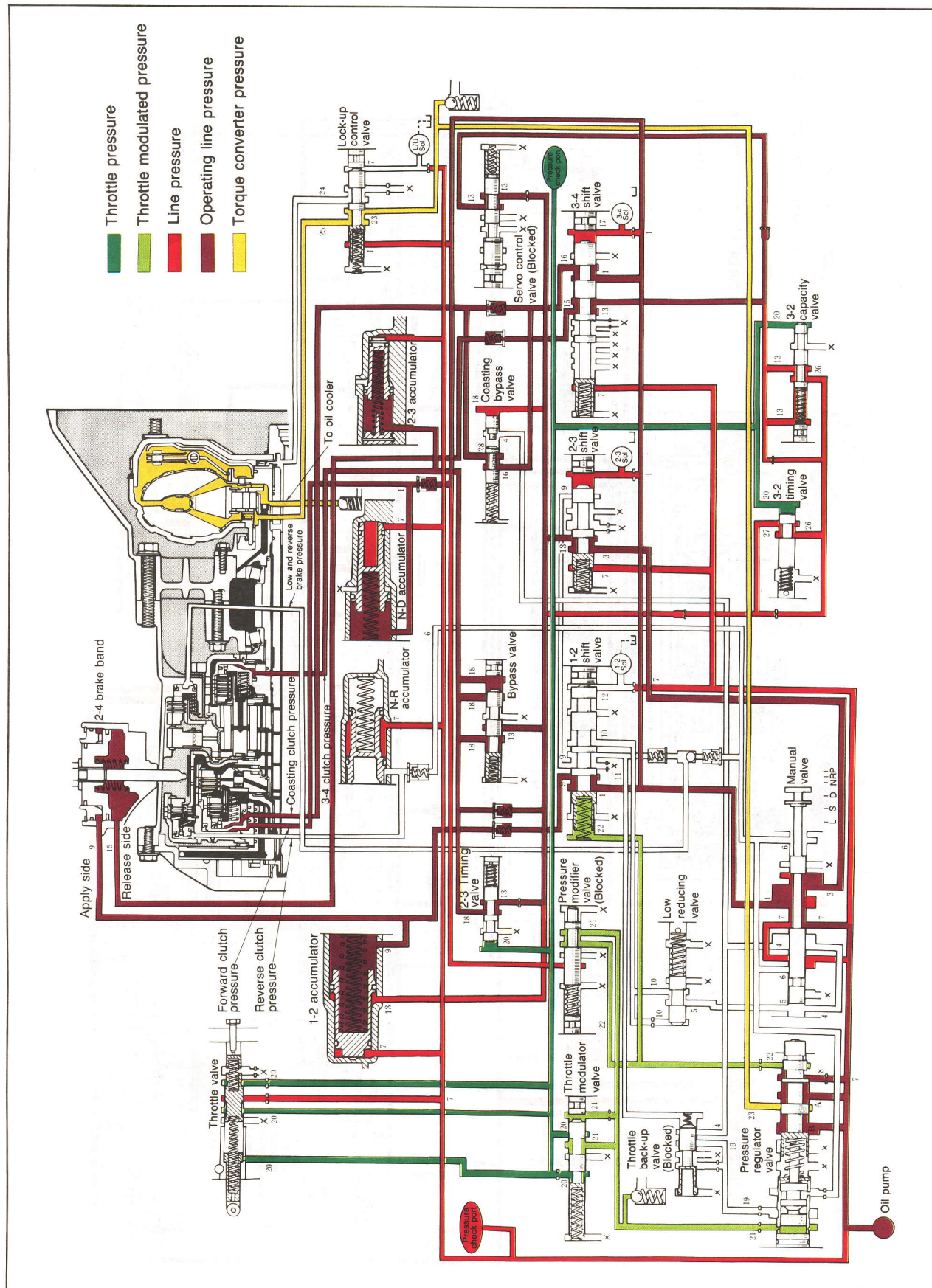


86U07B-467

7B-227

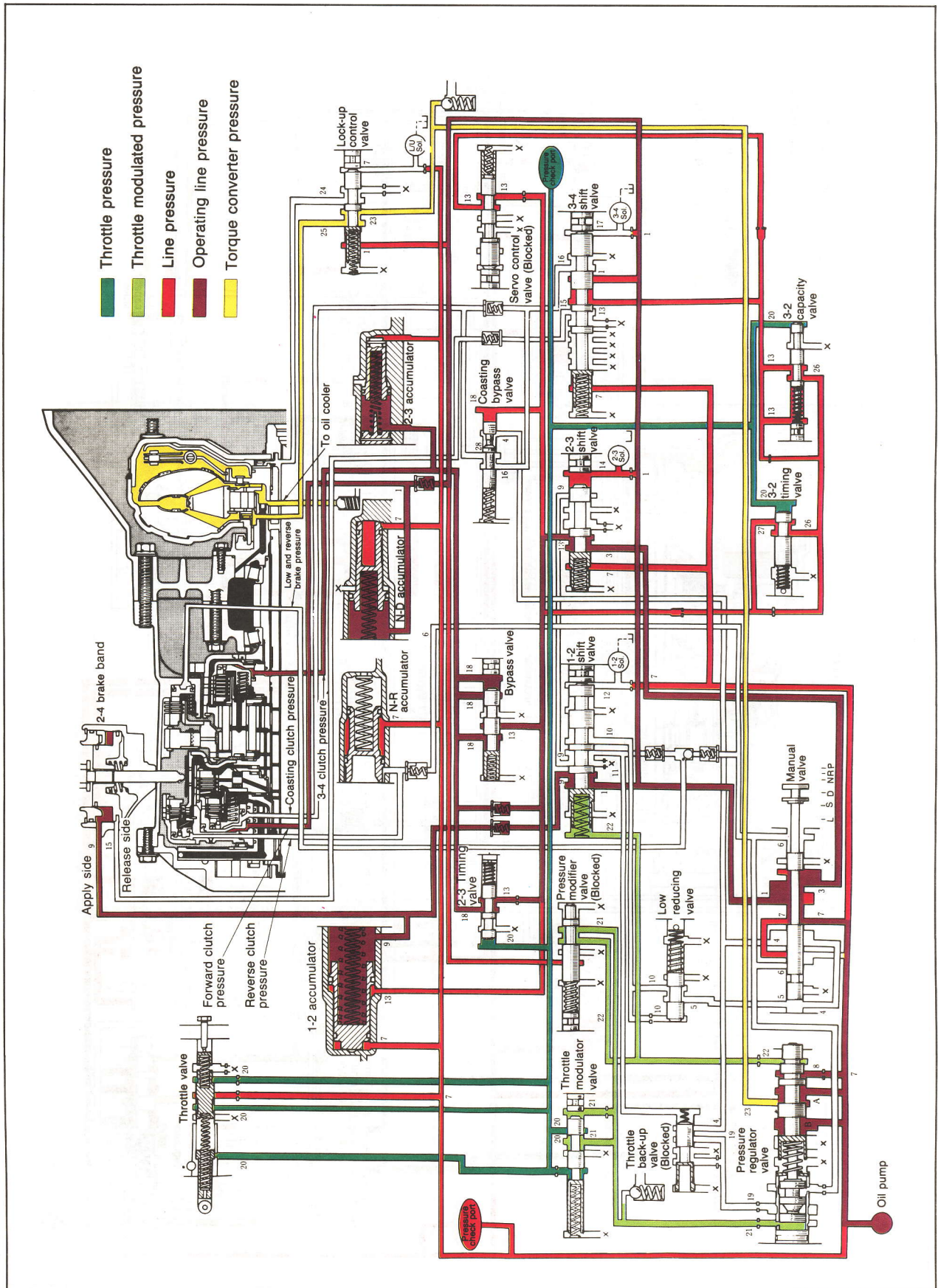
7B HYDRAULIC CIRCUIT (G4A-EL)

D RANGE; 3RD GEAR, ABOVE APPROX. 40 km/h (25 mph) LOCK-UP ON



86U07B-468

D RANGE; OD, LOCK-UP ON

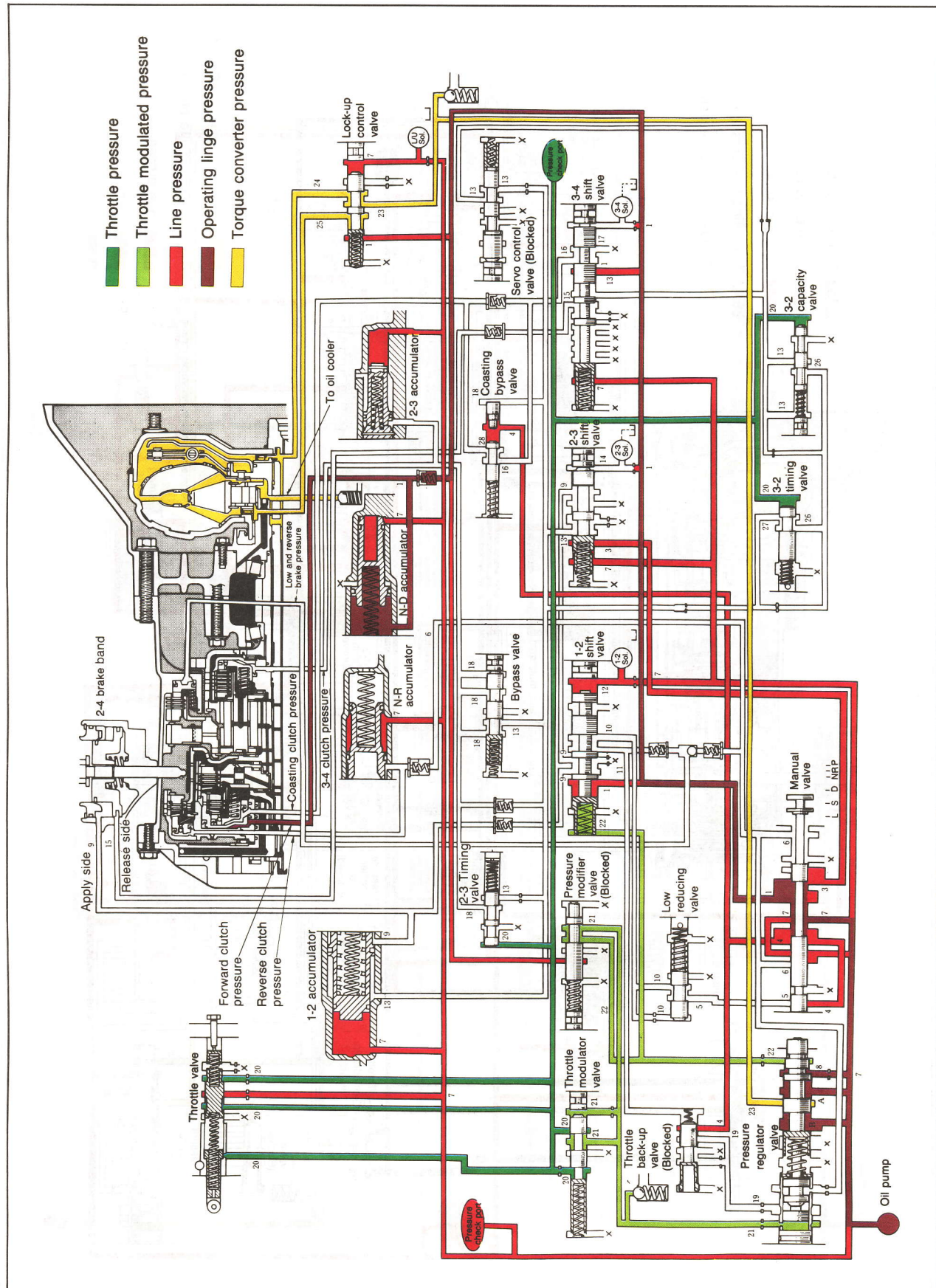


86U07B-469

7B—229

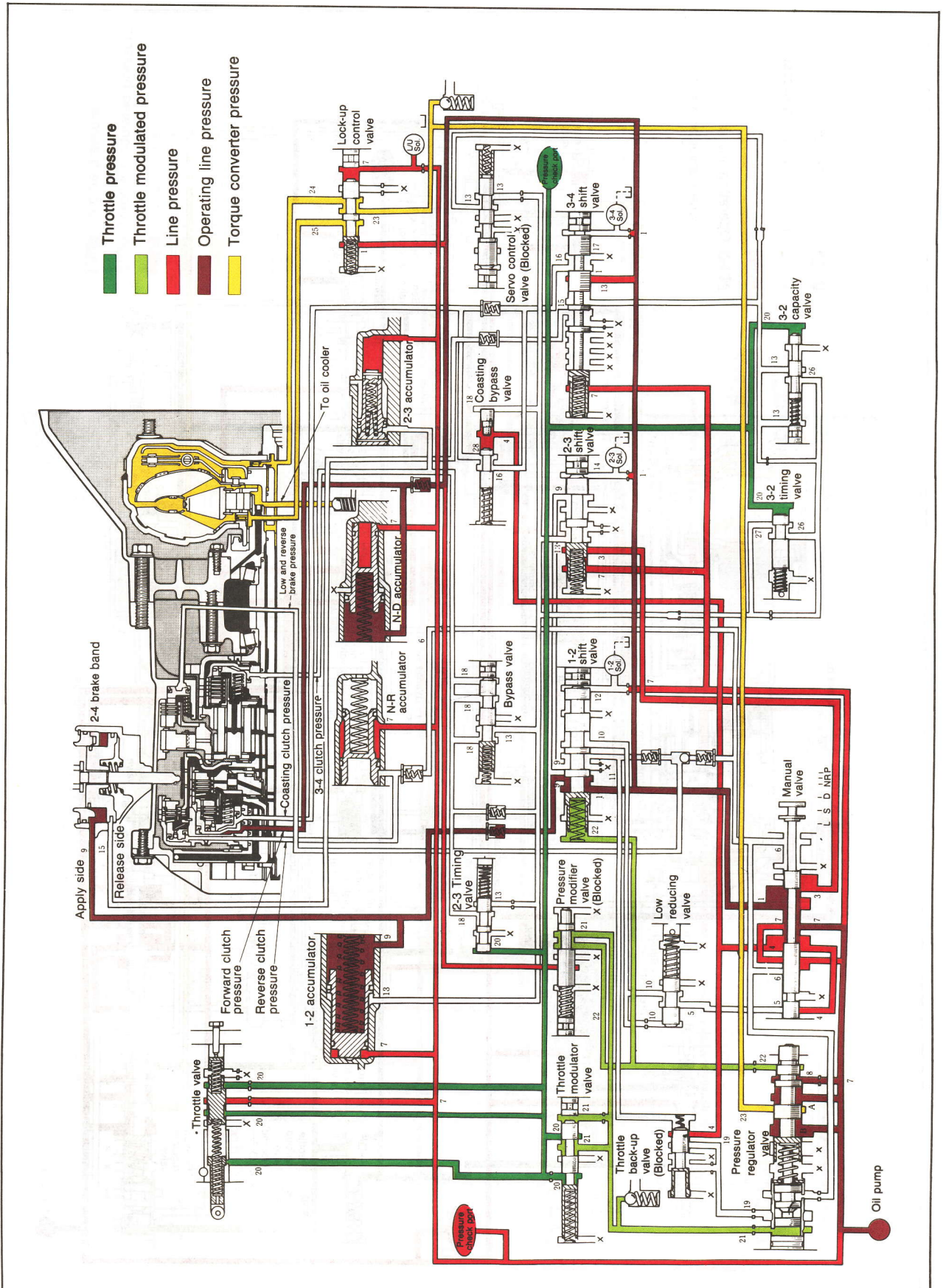
7B HYDRAULIC CIRCUIT (G4A-EL)

S RANGE; 1ST GEAR



86U07B-470

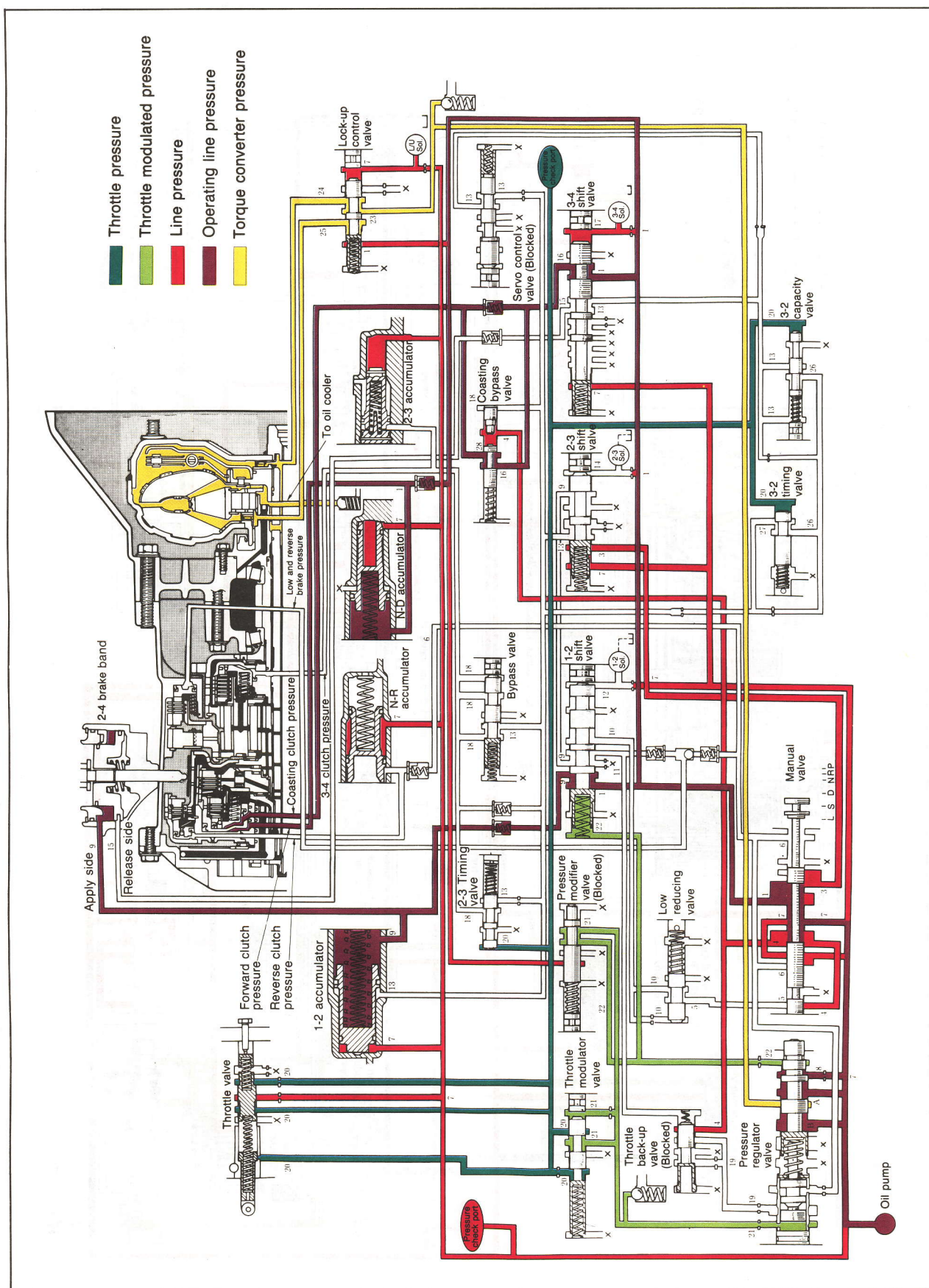
S RANGE; 2ND GEAR



86U07B-471

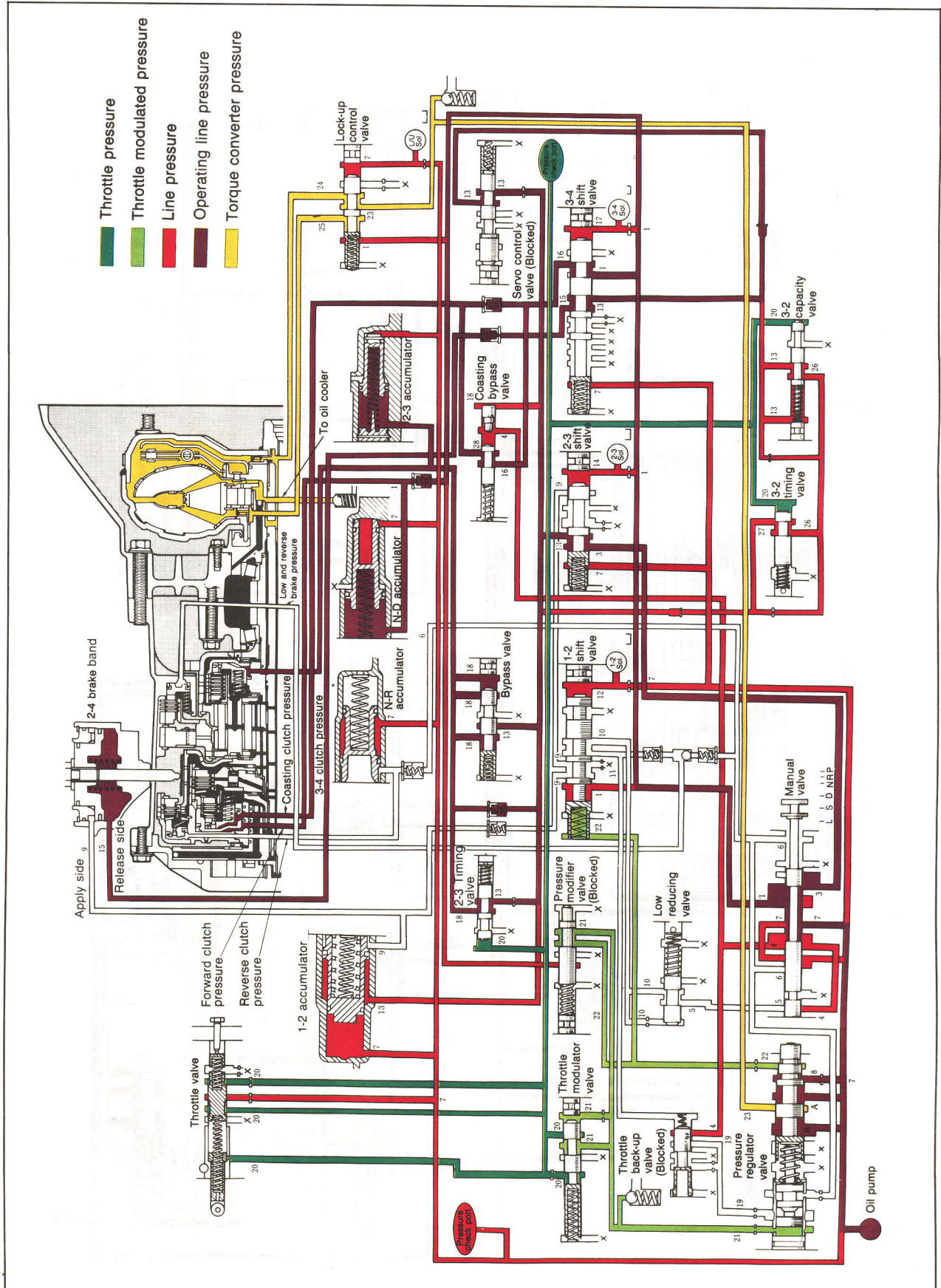
7B HYDRAULIC CIRCUIT (G4A-EL)

S RANGE; 2ND GEAR, HOLD



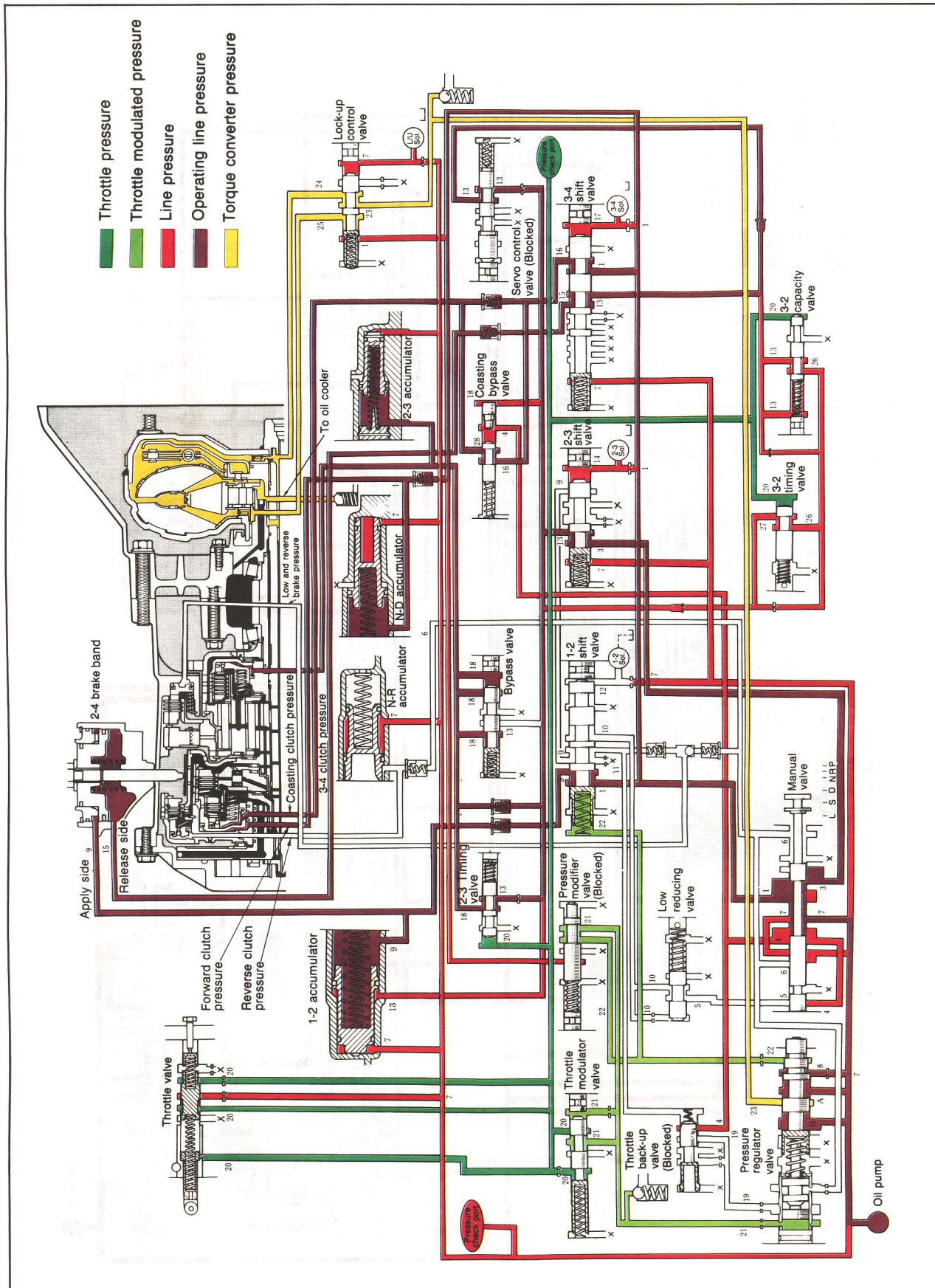
86U07B-472

S RANGE; 3RD GEAR, BELOW APPROX. 40 km/h (25 mph)



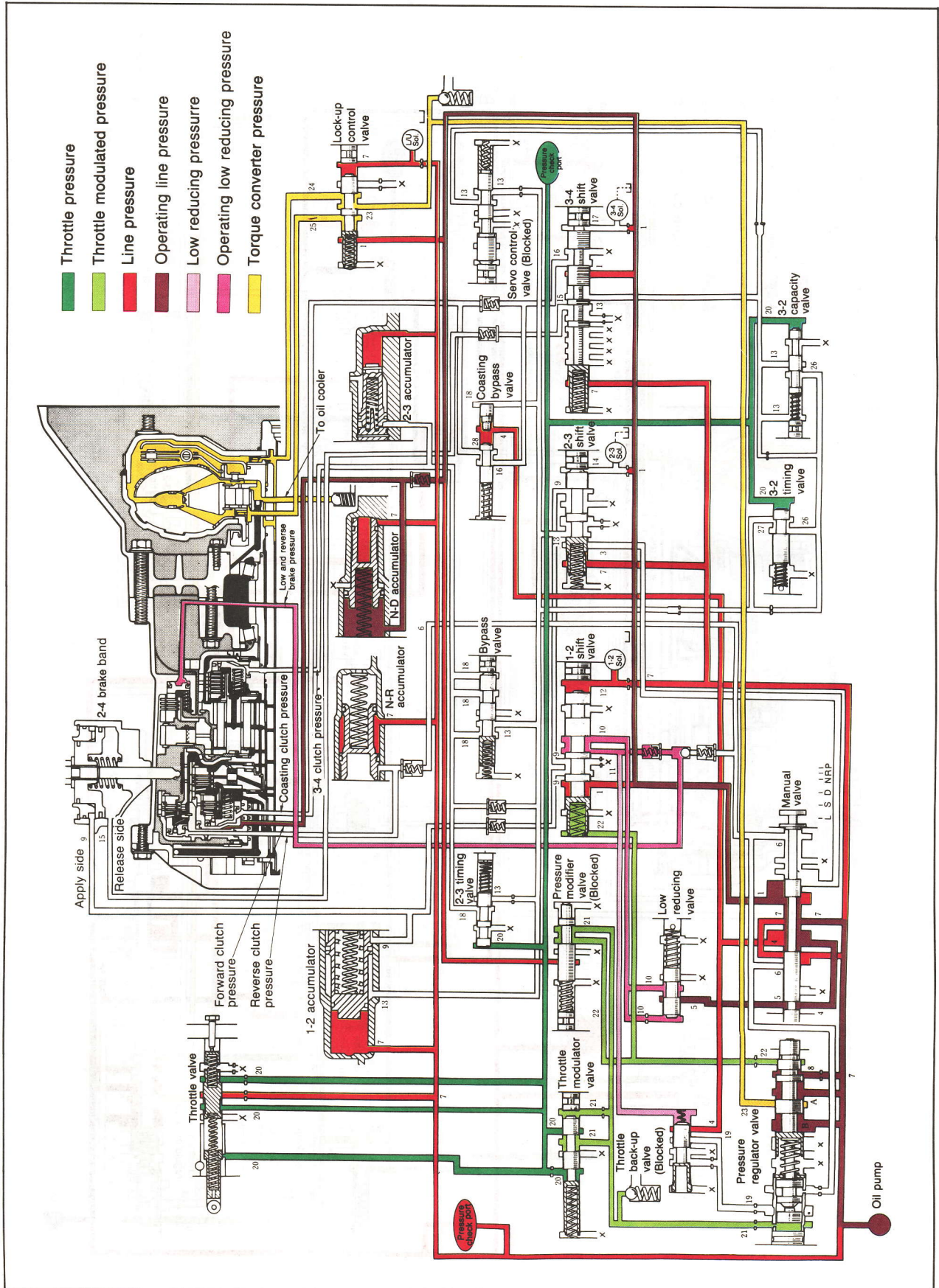
7B HYDRAULIC CIRCUIT (G4A-EL)

S RANGE; 3RD GEAR, ABOVE APPROX. 40 km/h (25 mph)



86U07B-474

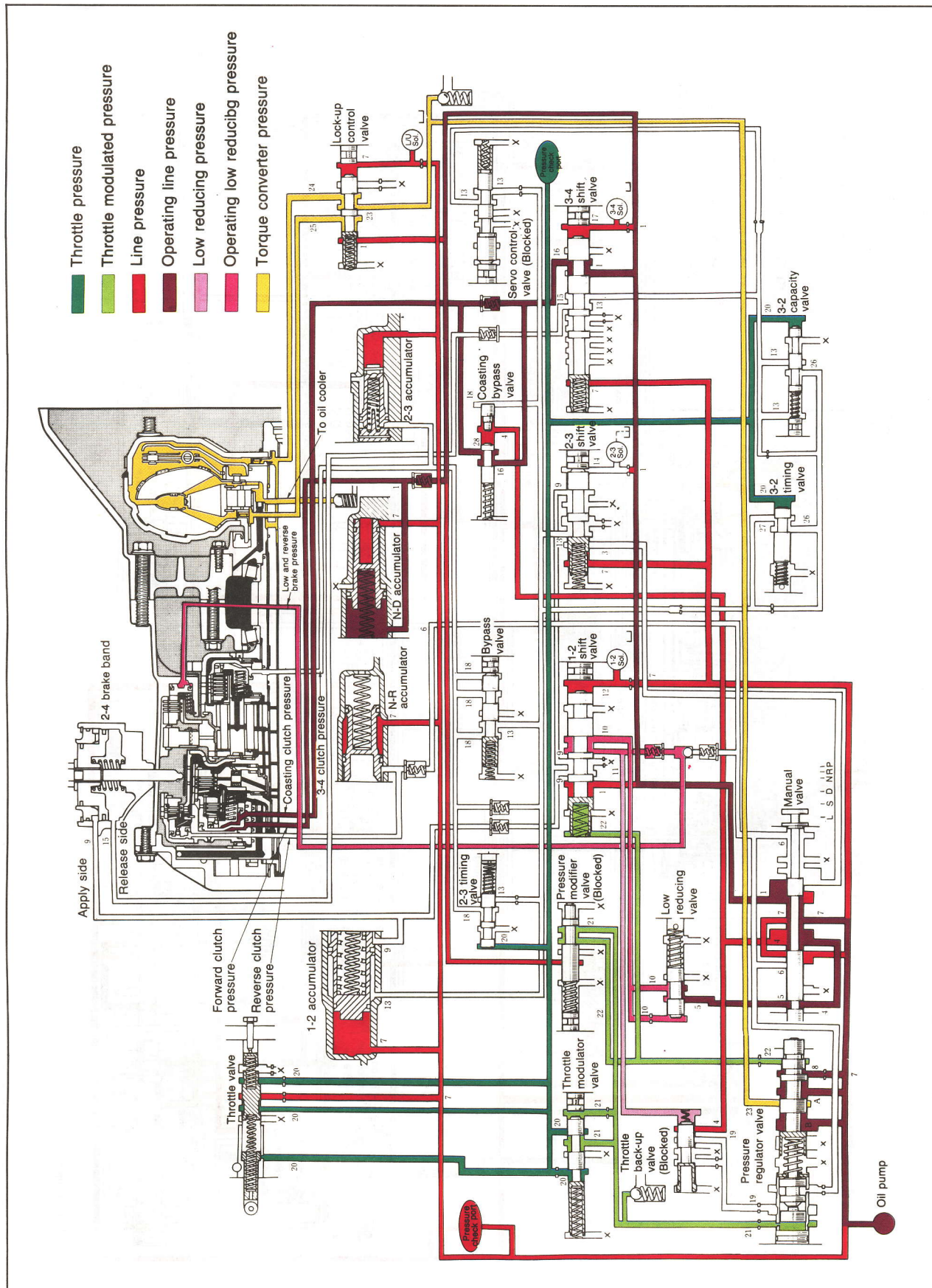
L RANGE; 1ST GEAR



86U07B-475

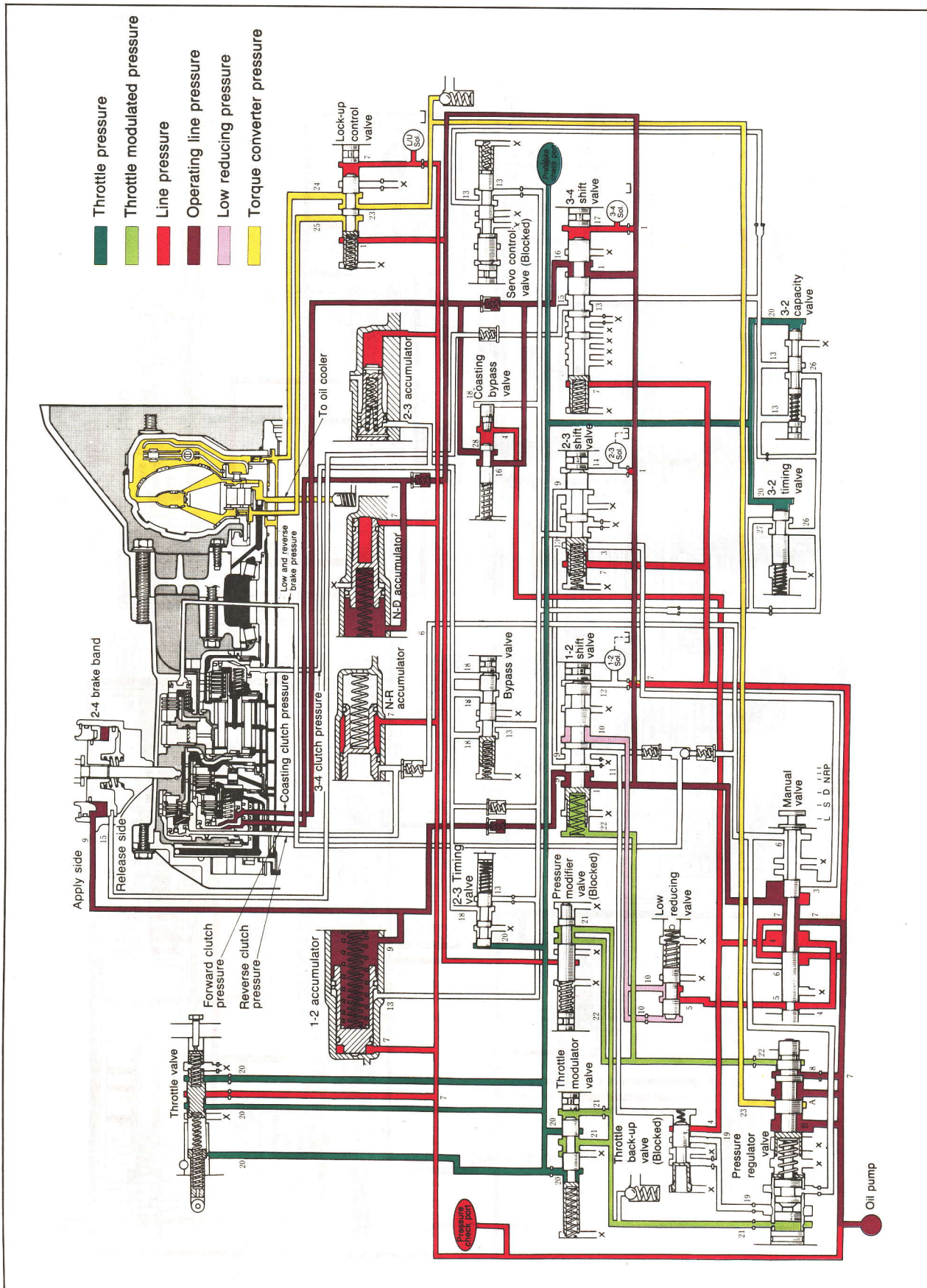
7B HYDRAULIC CIRCUIT (G4A-EL)

L RANGE; 1ST GEAR, HOLD



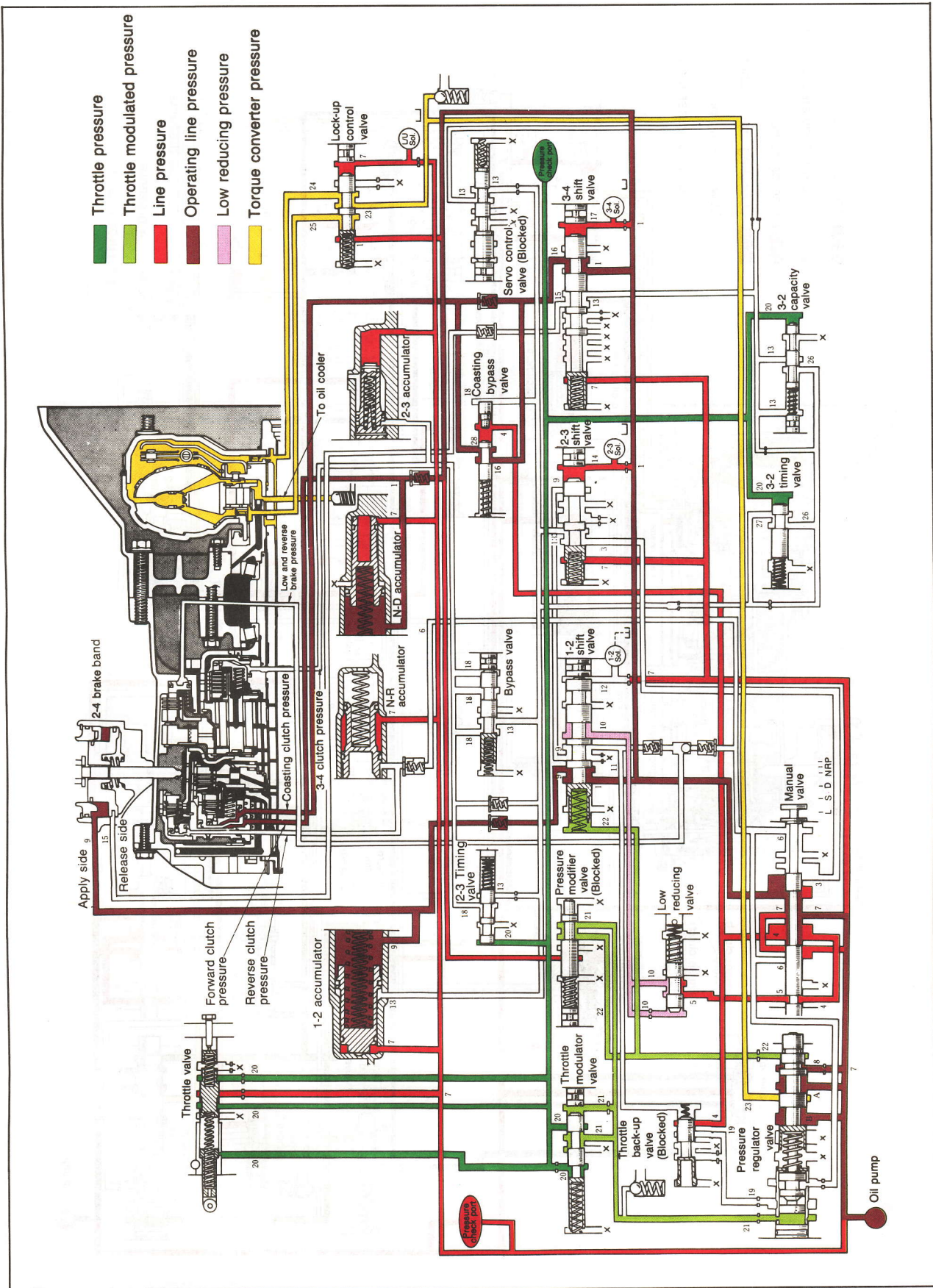
86U07B-476

L RANGE; 2ND GEAR, BELOW APPROX. 110 km/h (68 mph)



7B HYDRAULIC CIRCUIT (G4A-EL)

L RANGE; 2ND GEAR, ABOVE APPROX. 110 km/h (68 mph)

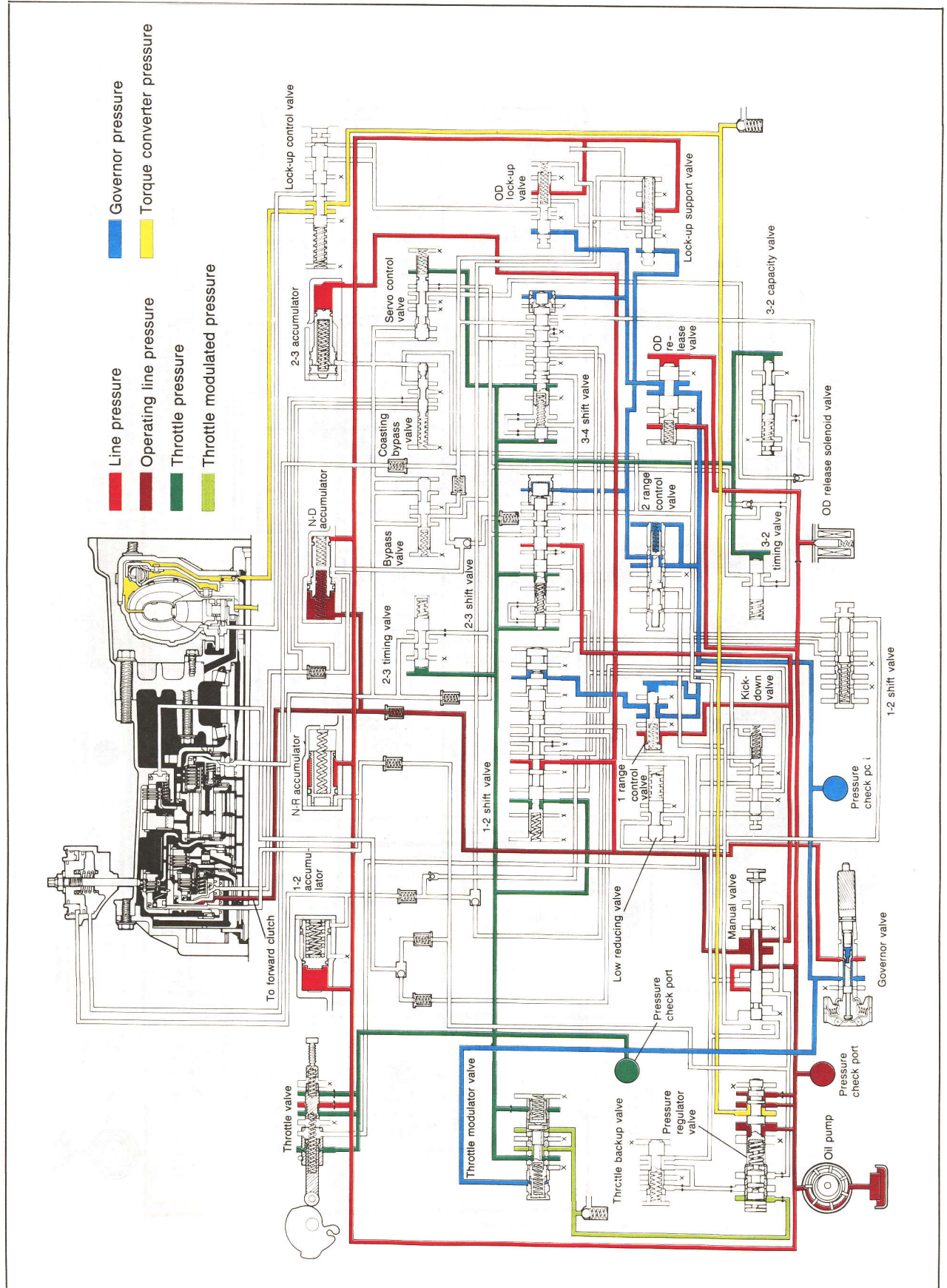


86U07B-478

R RANGE

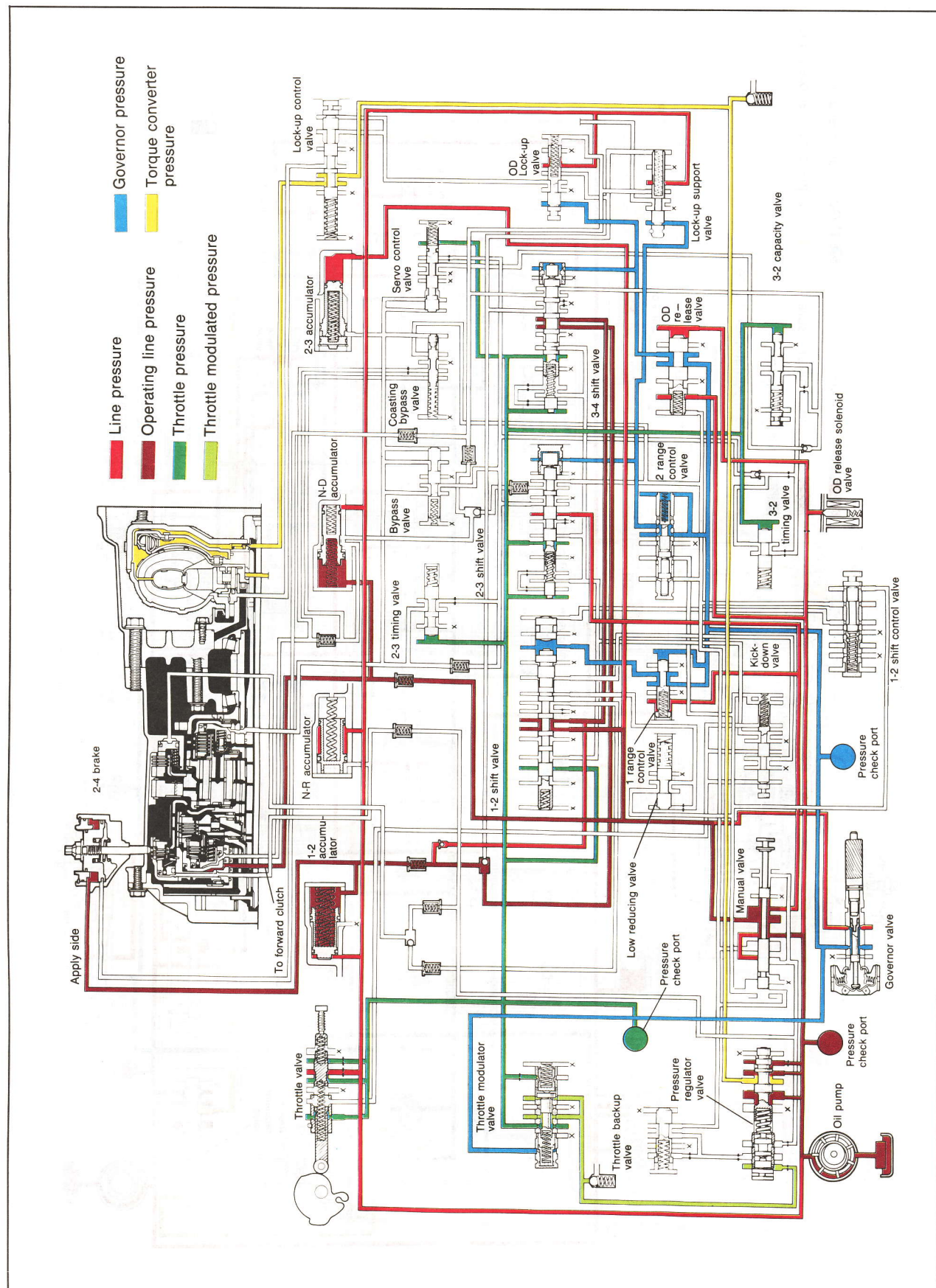


D RANGE; 1ST GEAR



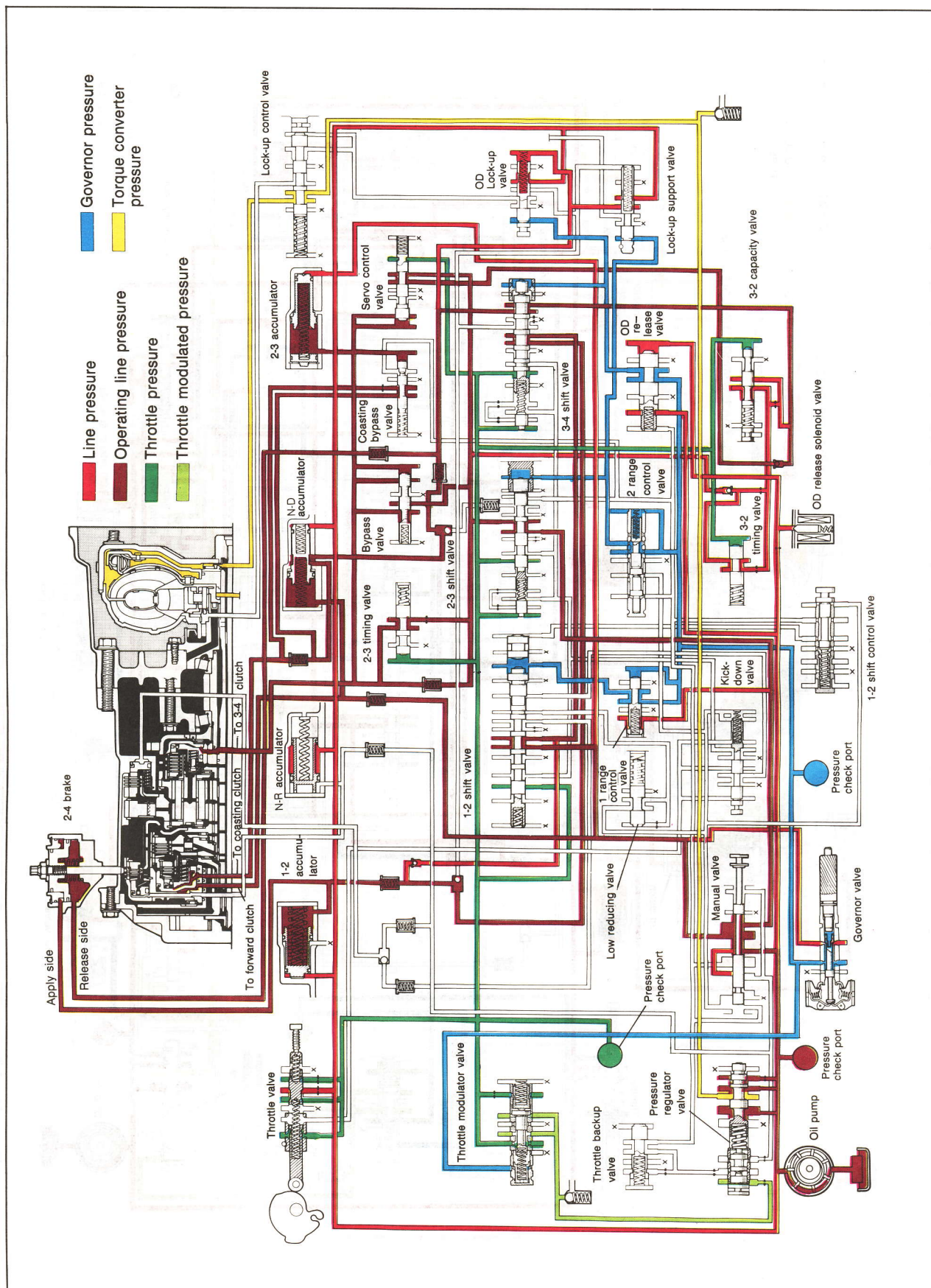
7B HYDRAULIC CIRCUIT (G4A-HL)

D RANGE; 2ND GEAR



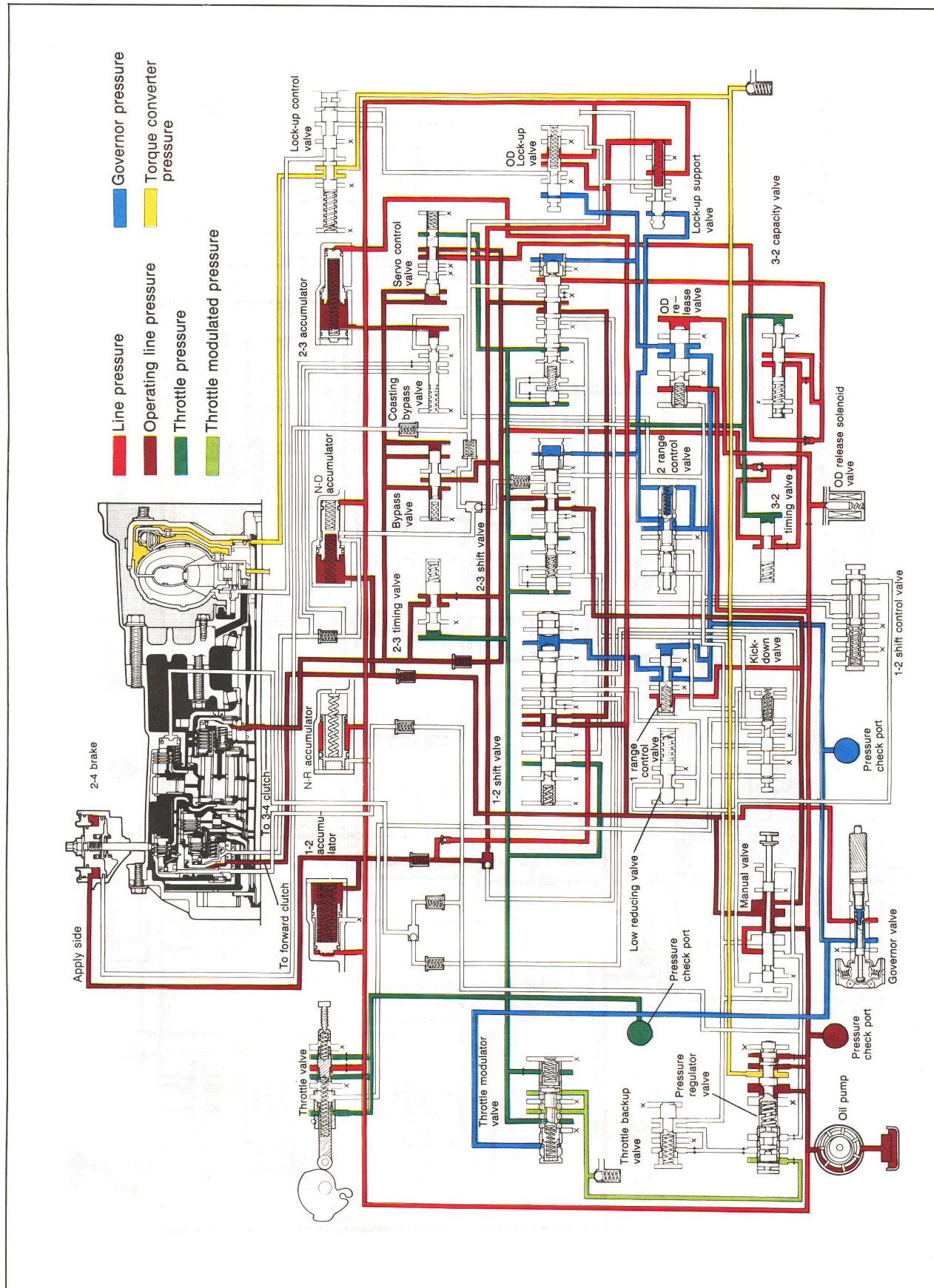
76G07B-206

D RANGE; 3RD GEAR



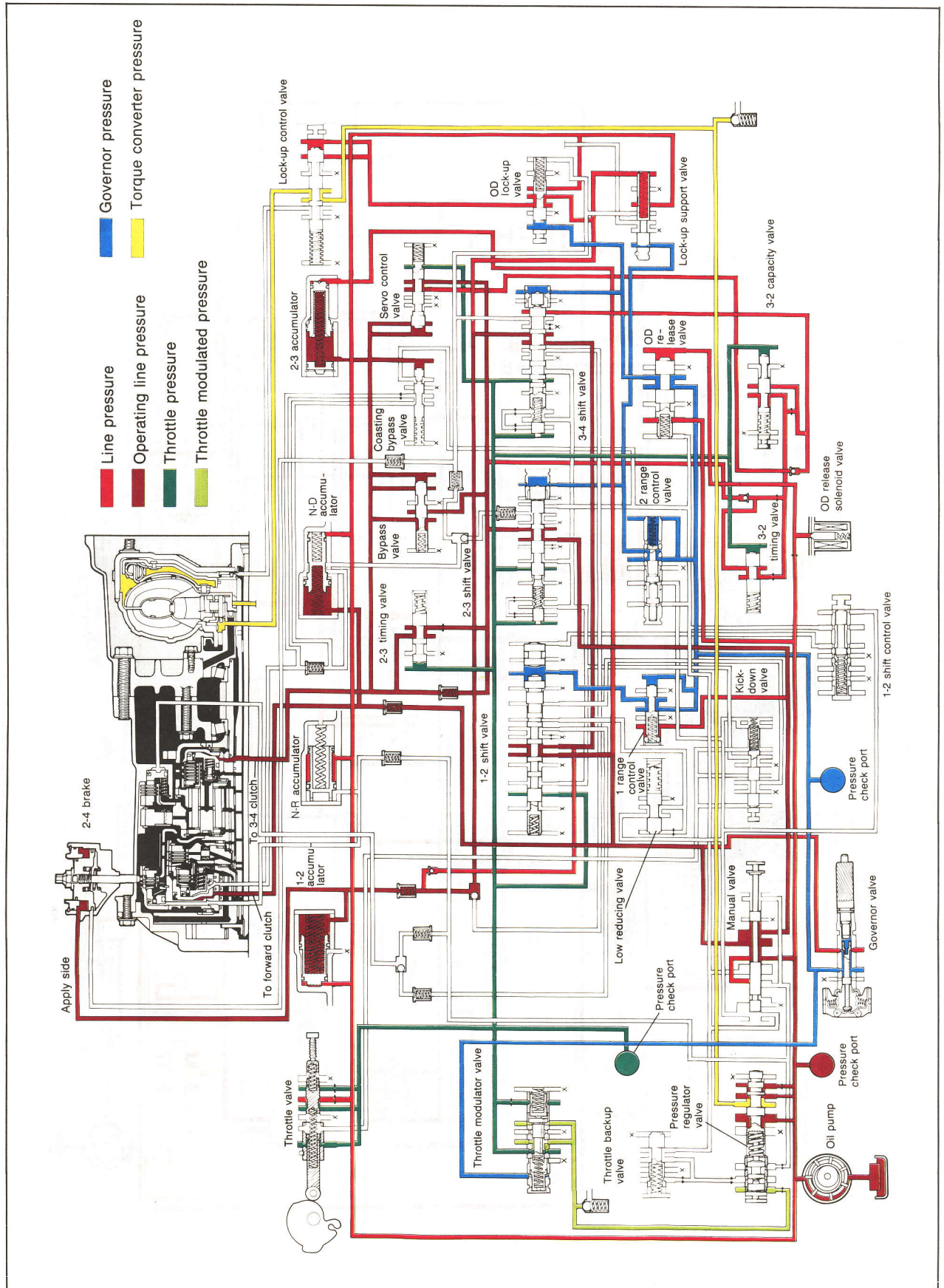
7B HYDRAULIC CIRCUIT (G4A-HL)

D RANGE; OD



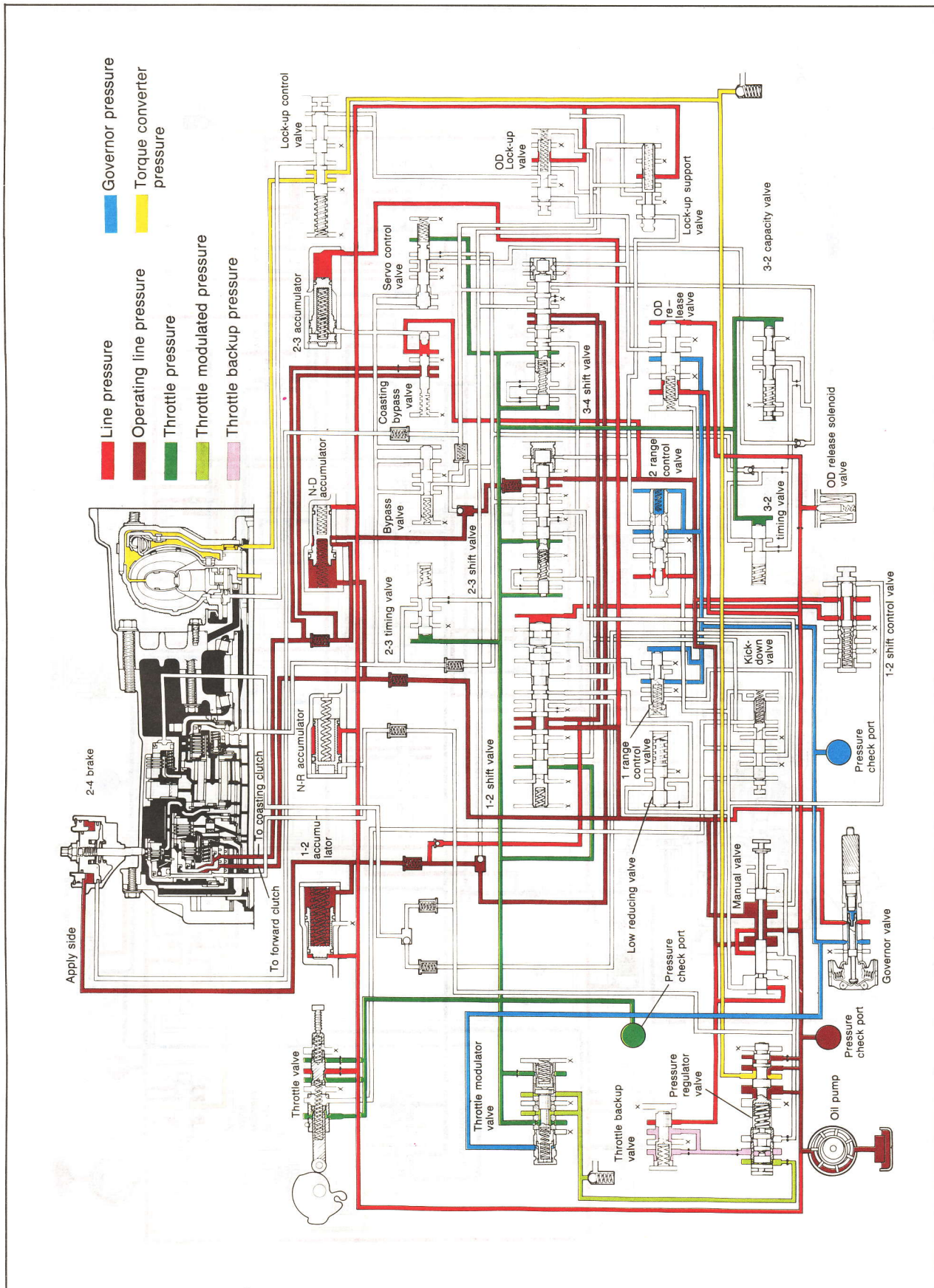
76G07B-208

D RANGE; OD, LOCK-UP ON



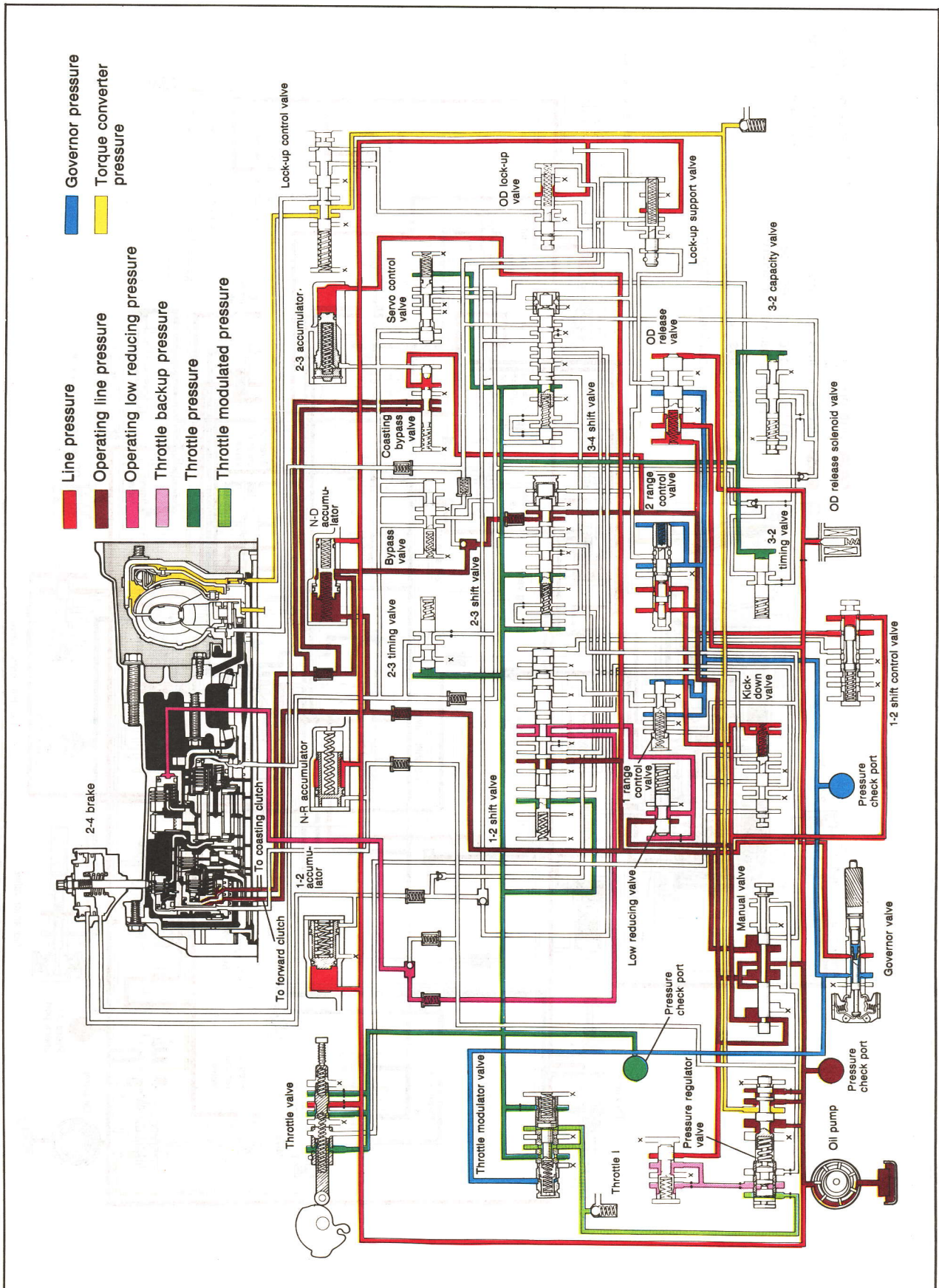
7B HYDRAULIC CIRCUIT (G4A-HL)

2 RANGE; 2ND GEAR



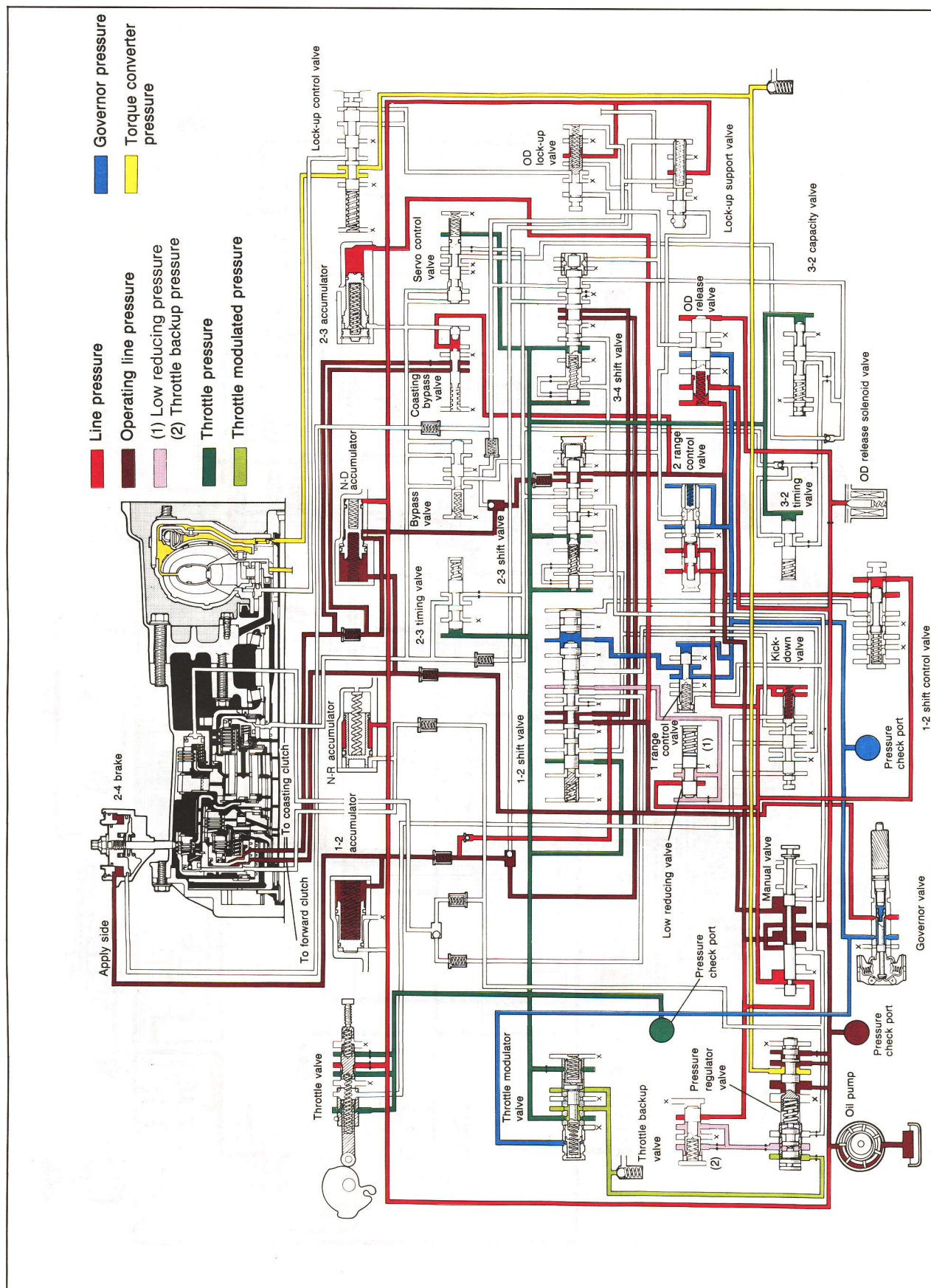
76G07B-210

1 RANGE; 1ST GEAR



7B HYDRAULIC CIRCUIT (G4A-HL)

1 RANGE; 2ND GEAR



76G07B-212