RX-7
Factory Service Material

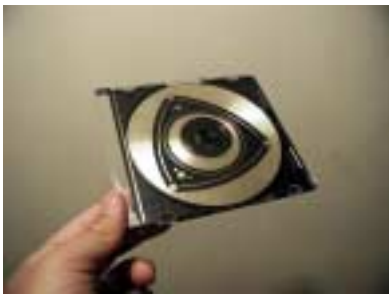
This manual can be downloaded for free from
http://members.xoom.com/diepat_rx7/fsm/rx7.htm

Or you can donate $10 to diepat@earthlink.net through **paypal.com** and a gift CD with all manuals and resources I carry will be sent to you.

This includes

1993 Factory Service Manual
1988 Factory Service Manual
1995 Printed Microfiche of all parts
1989 Printed Microfiche of all parts*
1990 Printed Microfiche of all parts*
1986 Printed Microfiche of all parts*
1987 Printed Microfiche of all parts*
1988 Printed Microfiche of all parts*

The $10 donation is used to offset the tremendous amount of time it takes to make everything available.



* These works are currently in process and may or not be readily available upon request. They will be hosted on the same link above and for download

AUTOMATIC TRANSMISSION

77U07B-001

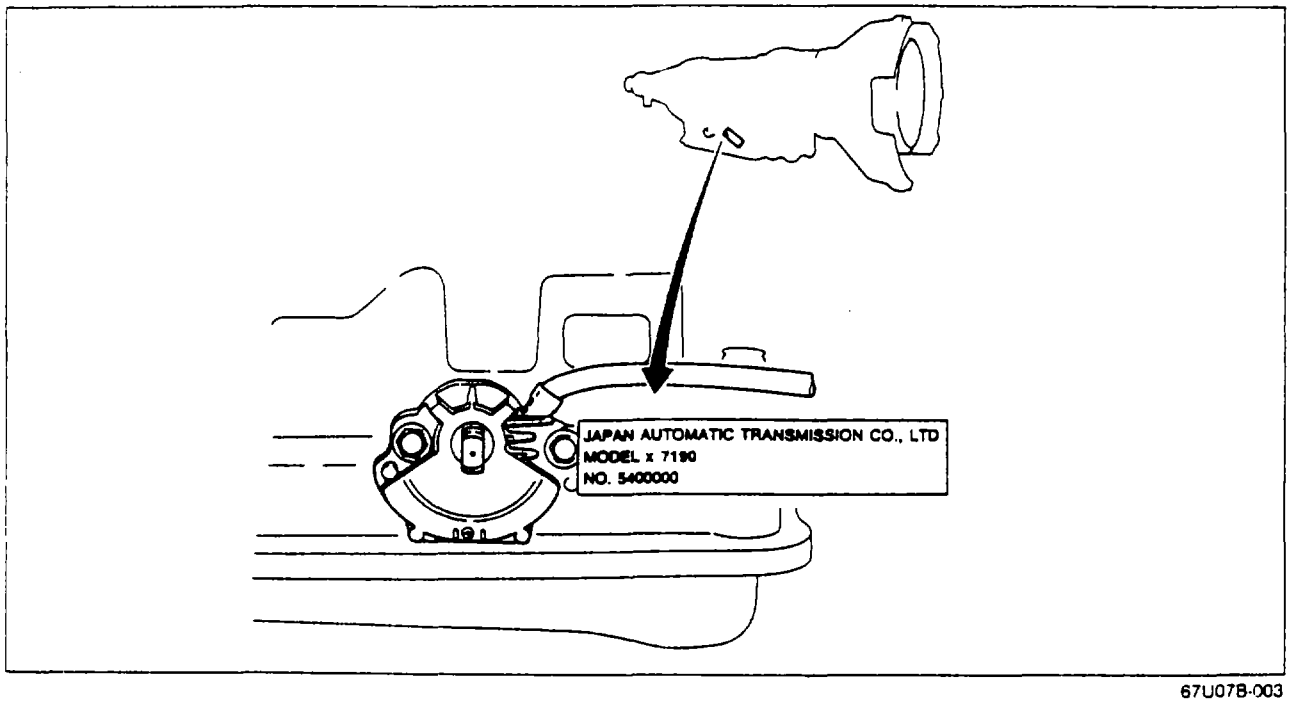
OUTLINE

SPECIFICATIONS

Model			L4N71B
Torque converter stall torque ratio			1.900 : 1
Gear ratio	First		2.841
	Second		1.541
	Third		1.000
	OD (Fourth)		0.720
	Reverse		2.400
Number of drive plates	Direct clutch		2
	Front clutch		4
	Rear clutch		5
	Low and reverse brake		5
Servo diameter (Piston outer diameter/retainer inner diameter) mm (in)	OD band servo		60/40 (2.36/1.57)
	2nd band servo		80/54 (3.15/2.13)
Speedometer gear ratio			19 · 6
Automatic transmission fluid (ATF)	Type		Dexron II
	Capacity liters (US qt, Imp qt)	Total	7.5 (7.9, 6.6)
		Oil pan	4.0 (4.2, 3.5)

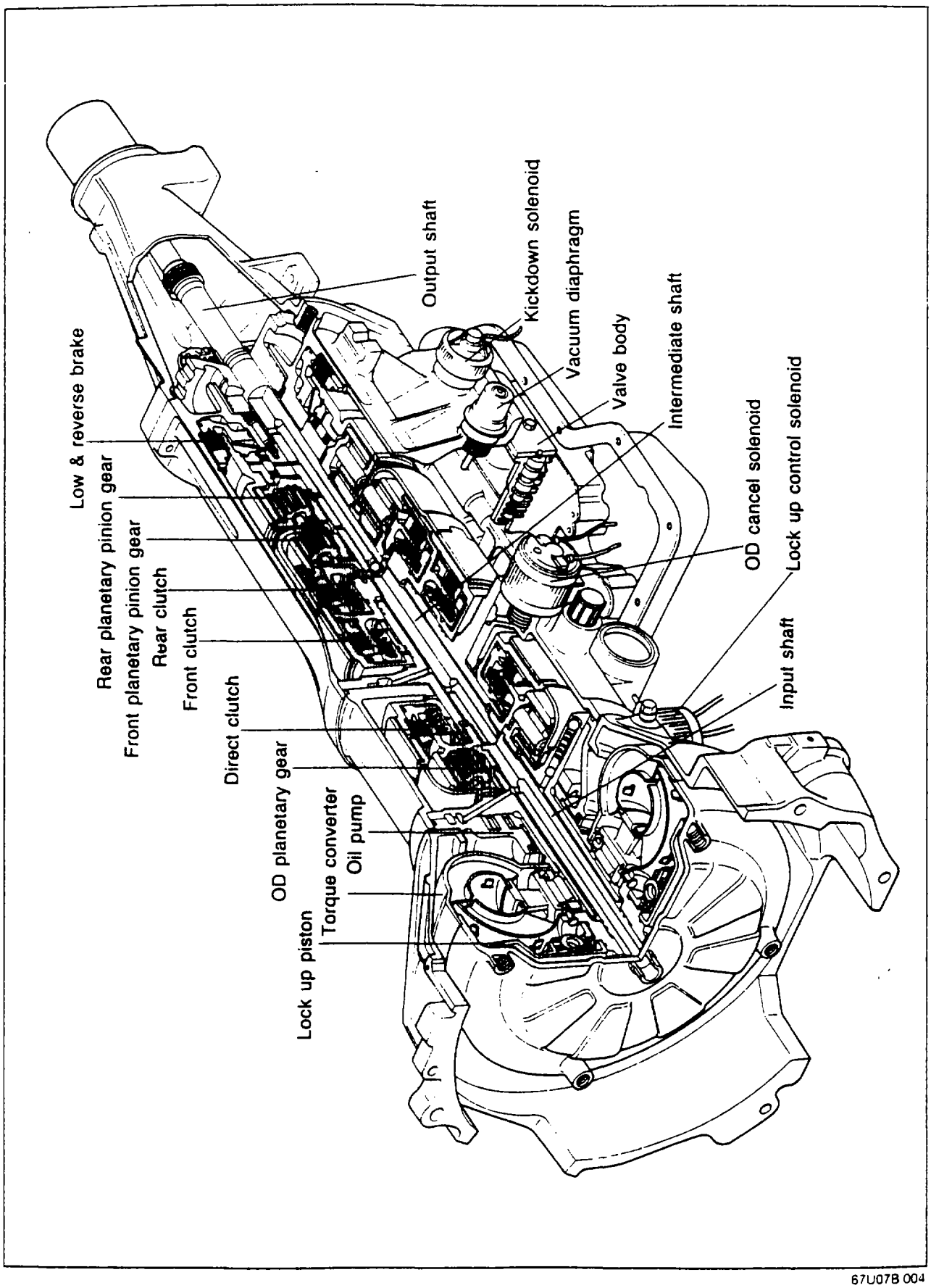
77U07B 020

MODEL AND SERIAL NUMBER



67U07B-003

STRUCTURAL VIEW

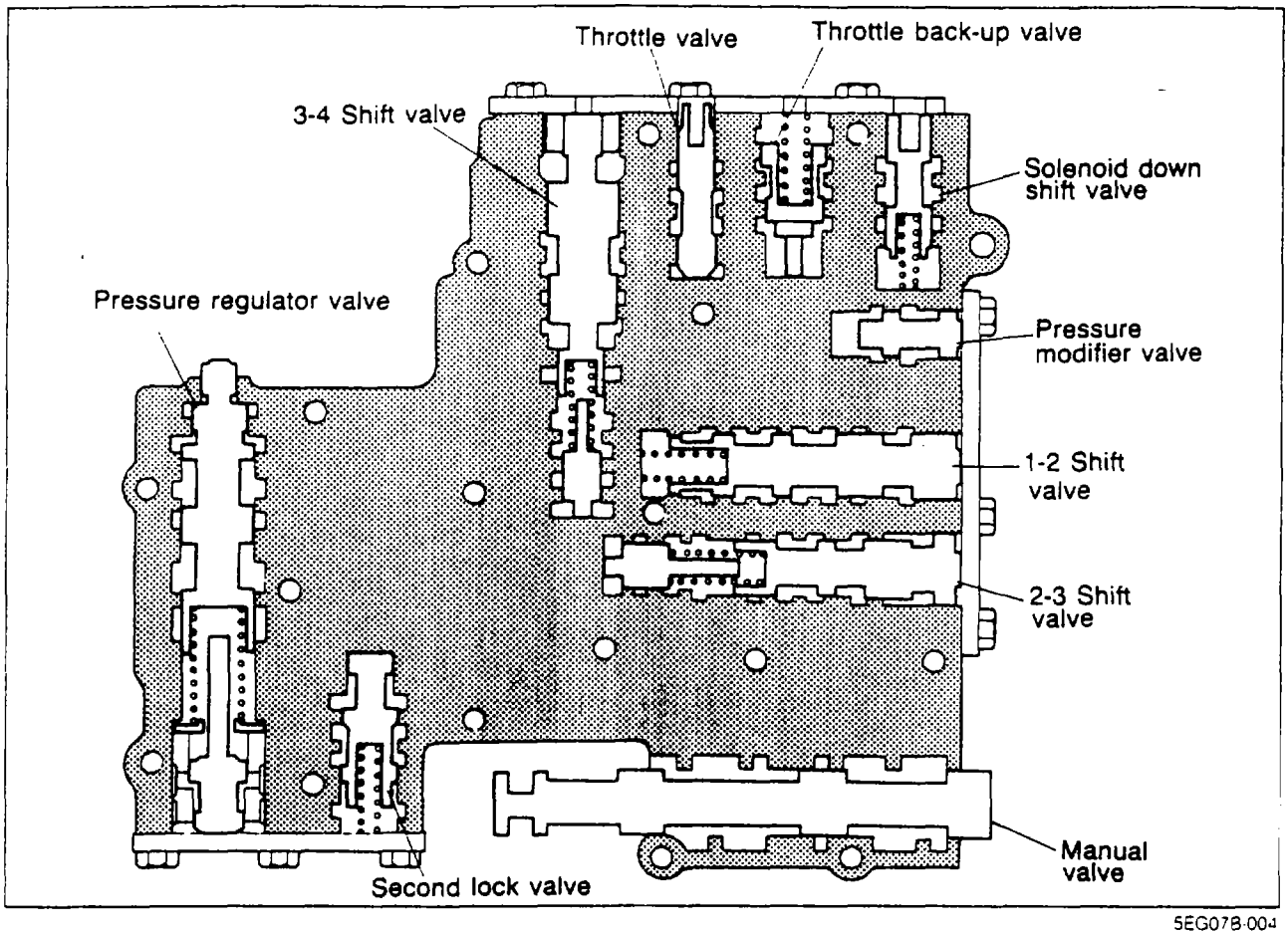


67U07B 004

VALVE AND FLUID PASSAGE LOCATION

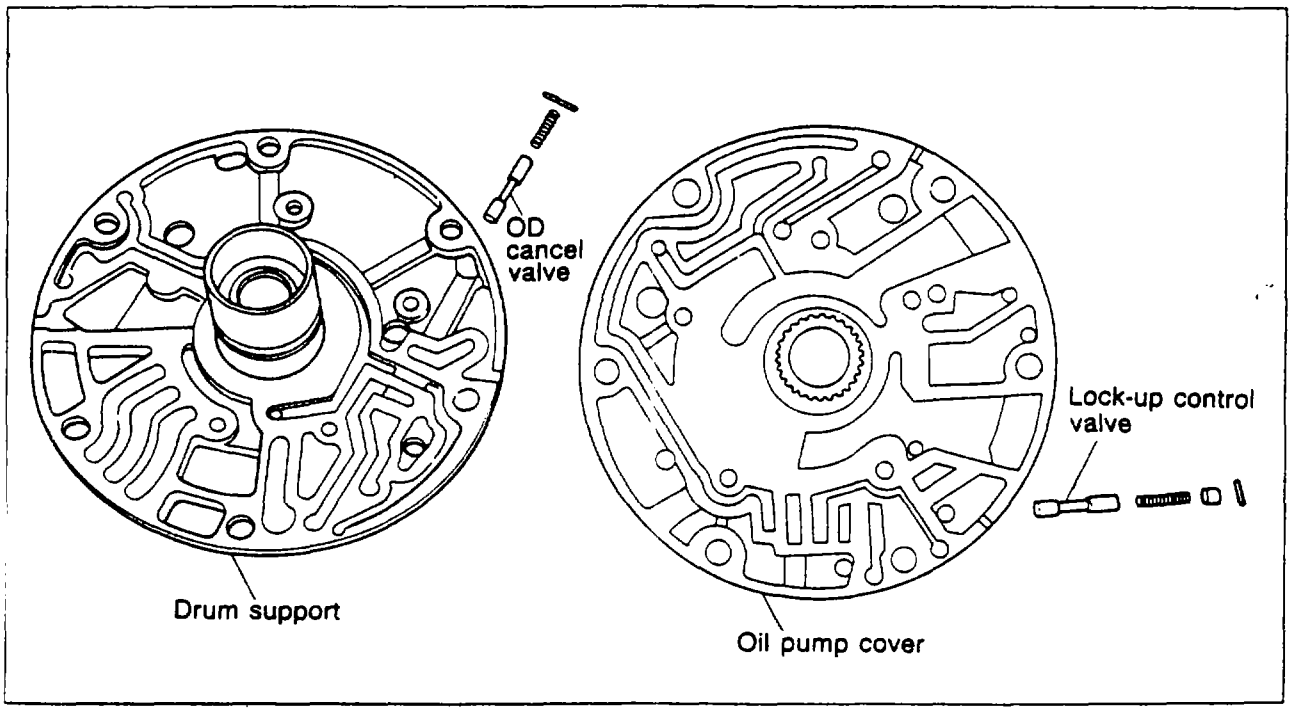
Valve

Control valve



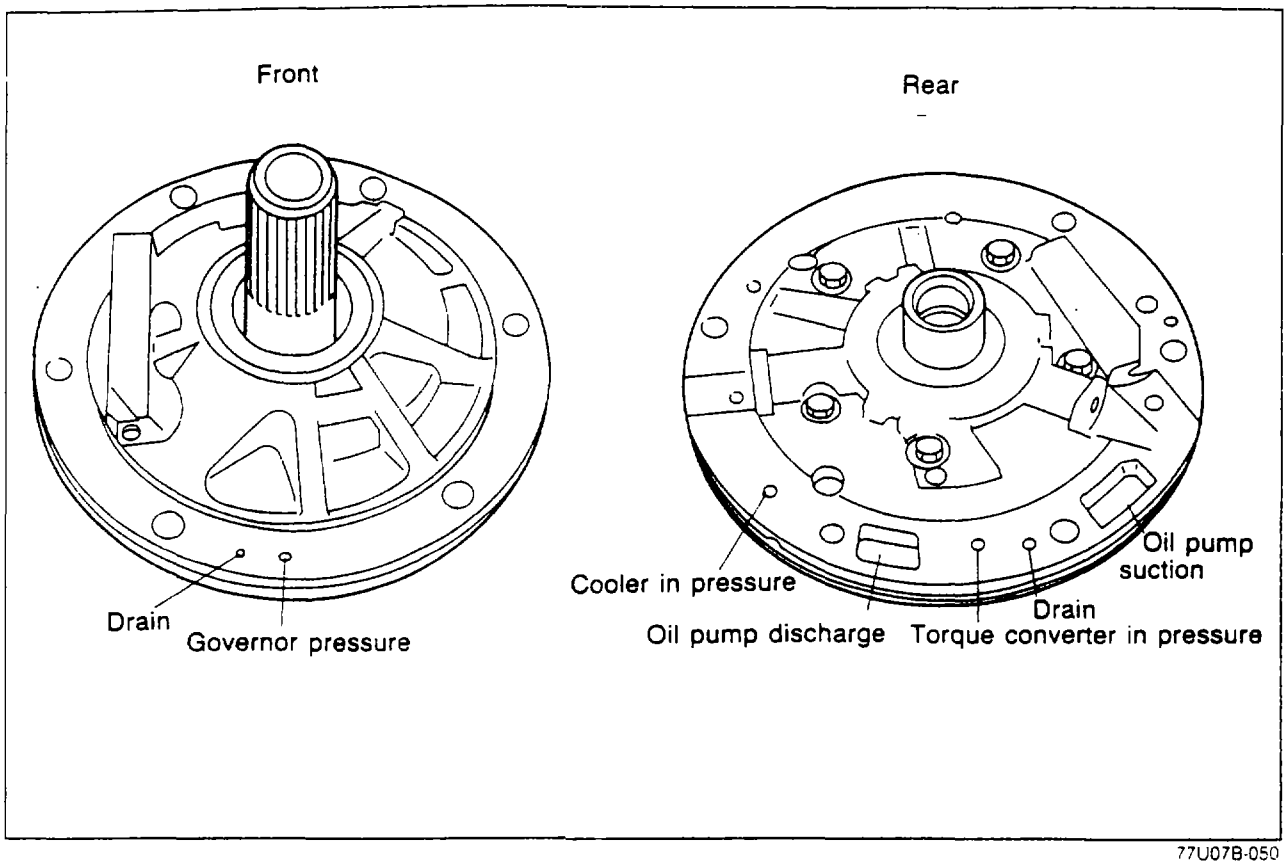
5EG07B-004

Lock-up control valve and OD cancel valve



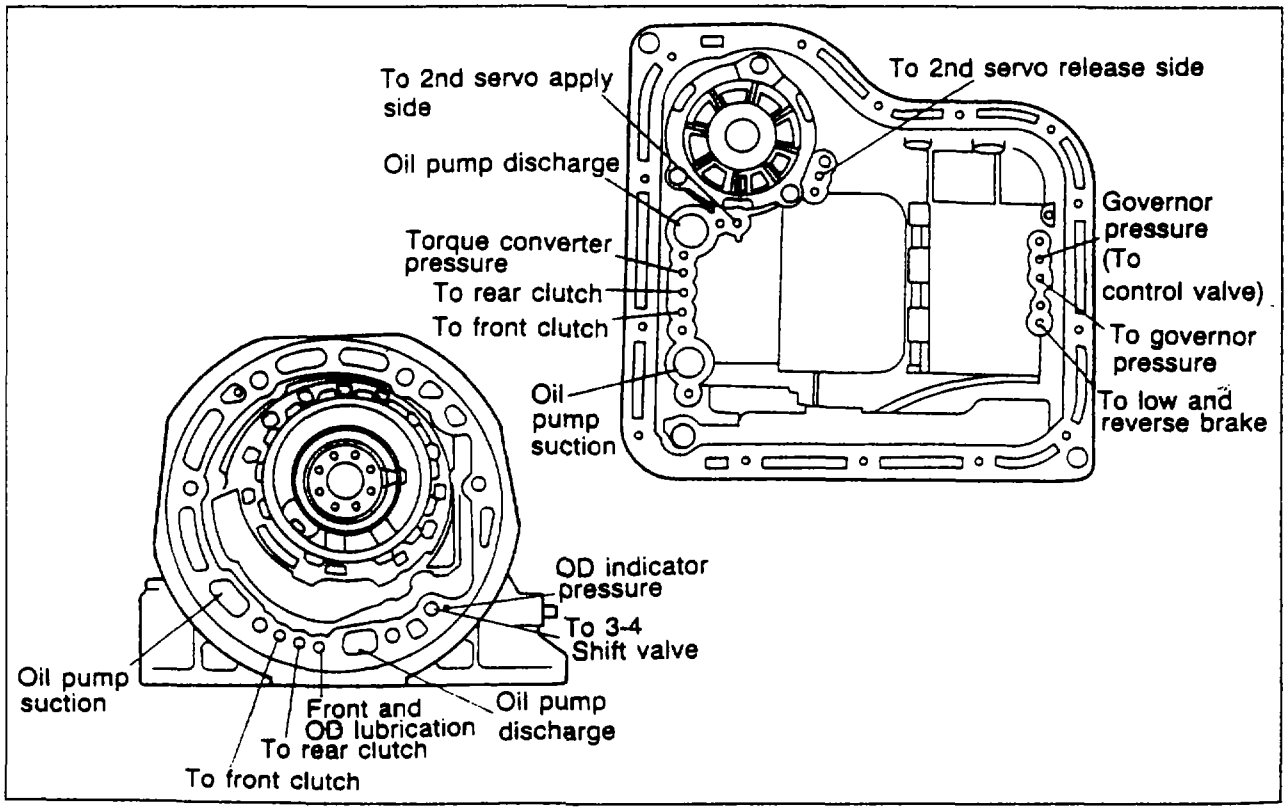
5EG07B-005

Fluid Passage
Oil pump



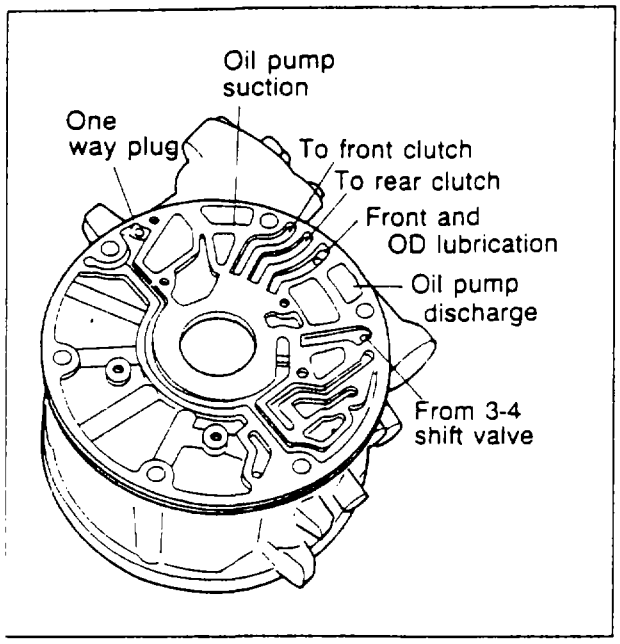
77U07B-050

Transmission case



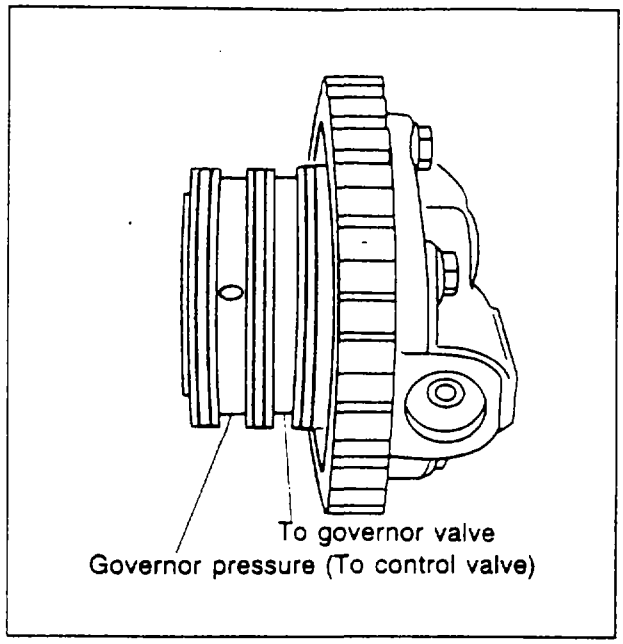
5EG07B-007

OD case



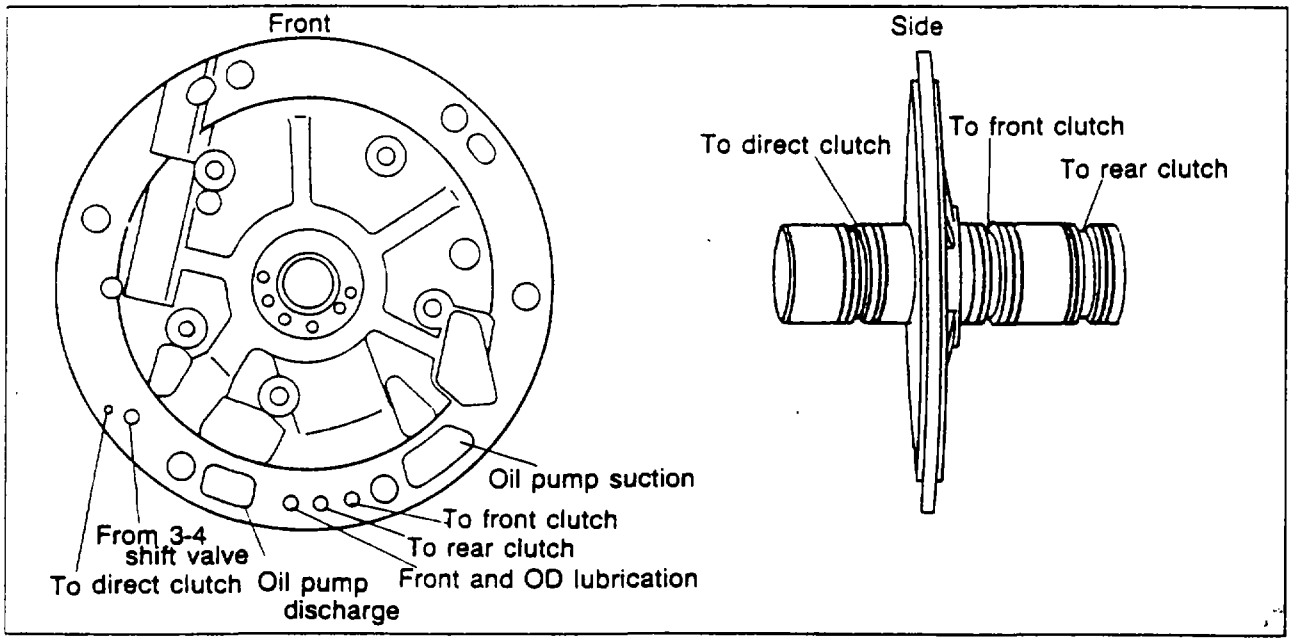
5EG07B-008

Oil distributor



5EG07B-009

Drum support



5EG07B-010

OPERATION TABLE

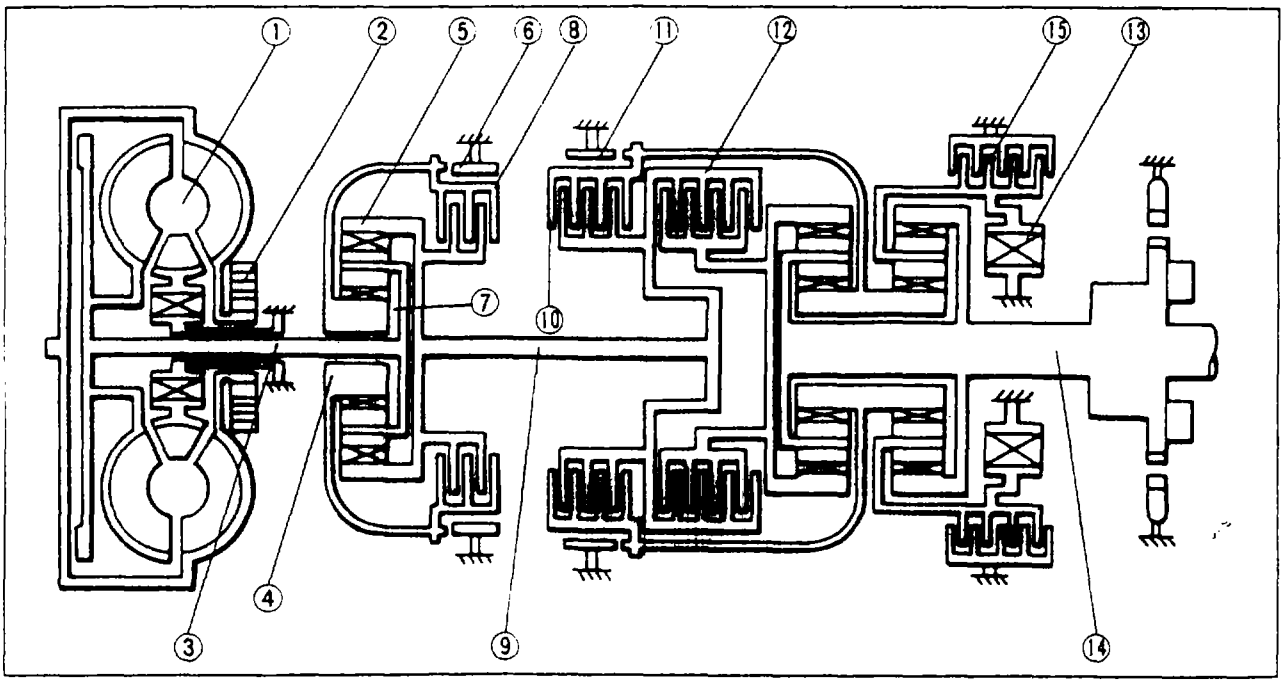
The individual transmission components operate as indicated in the table below for the respective gear positions.

Gearshift lever position		Direct clutch	OD band servo		Front clutch	Rear clutch	2nd band servo		Low and reverse brake	One-way clutch
			Operation	Release			Operation	Release		
P		○	○	○					○	
R		○	○	○	○			○	○	
N		○	○	○						
D	1st gear	○	○	○		○				○
	2nd gear	○	○	○		○	○			
	3rd gear	○	○	○	○	○	○	○		
	OD (4th gear)		○		○	○	○	○		
2		○	○	○		○	○			
1	2nd gear	○	○	○		○	○			
	1st gear	○	○	○		○			○	

The ○ indications indicate operation although the band servos remain deactivated due to the large release pressure side area.

5EG07B-011

POWER FLOW DIAGRAM



5EG07B-012

1. Torque converter
2. Oil pump
3. Input shaft
4. OD sun gear
5. OD clutch hub
6. OD brake band
7. OD planetary pinion carrier
8. Direct clutch
9. Intermediate shaft
10. Front clutch
11. 2nd brake band
12. Rear clutch
13. One-way clutch
14. Output shaft
15. Low and reverse brake

HYDRAULIC CONTROL SYSTEM

The transmission case and the oil pump body comprise a part of the hydraulic circuitry's oil passage route along with the control valves. The hydraulic control diagram (schematic) illustrates the entire hydraulic system. The hydraulic pressures of the individual circuits are categorized as listed below in accordance with their respective functions.

(Numbers indicate individual circuits)

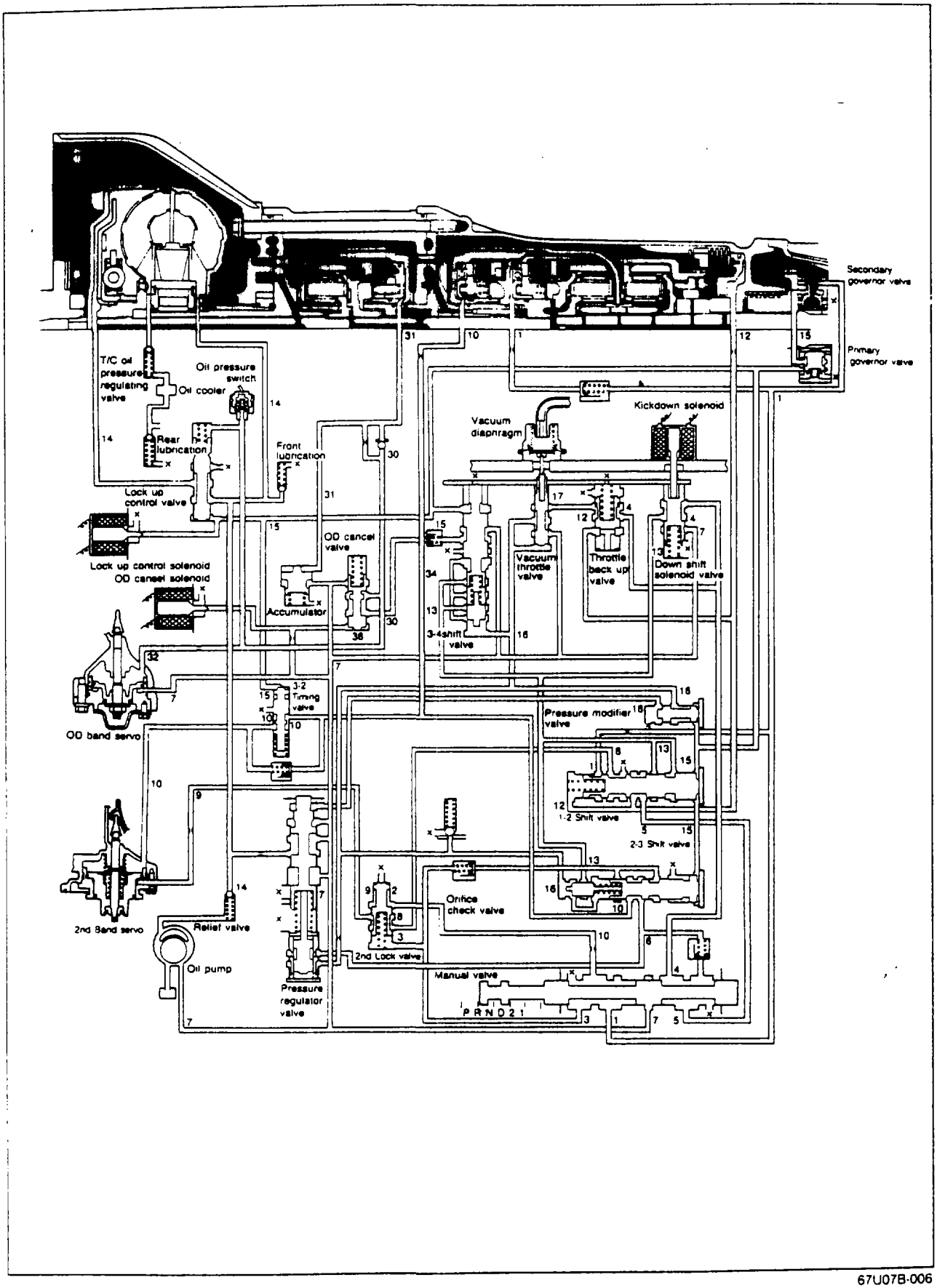
Line pressure source	7
Control element operation system line pressure	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 30, 31, 32, 33
Auxiliary line pressure	13
Throttle pressure	16, 17, 18, 19, 34
Governor pressure	15
Torque converter pressure	14

1. Line pressure
   The line pressure is the hydraulic pressure of the oil discharged from the oil pump after adjustment by the pressure regulator valve.
2. Throttle pressure
   Derived from the line pressure, the throttle pressure is the hydraulic pressure generated by the throttle valve which operates with the variation of the vacuum in the intake manifold.
3. Governor pressure
   Also derived from the line pressure, the governor pressure is the hydraulic pressure which varies with the vehicle's speed by the governor rotating together with the output shaft.

Note
Hydraulic control diagram (schematic) symbols
X : Drain
⌶ : Orifice

67U07B-082

N (neutral) Range



67U078-006

TROUBLESHOOTING GUIDE

It is highly important to follow proper troubleshooting procedures when attempting to determine an automatic transmission malfunction. The majority of such malufnctions often can be solved by simple inspections and adjustments. It is highly essentiai to follow the troubleshooting chart to determine if more extensive repairs are necessary.
Perform all necessary removat and disassembly work deemed necessary after first consulting the troubleshooting chart.

How to use the Troubleshooting Chart

1. The numbers indicate the order of inspection for detecting malfunctions.
2. Circled numbers indicate that the transmission must be removed from the vehicle.

67U07B-083

TROUBLESHOOTING CHART

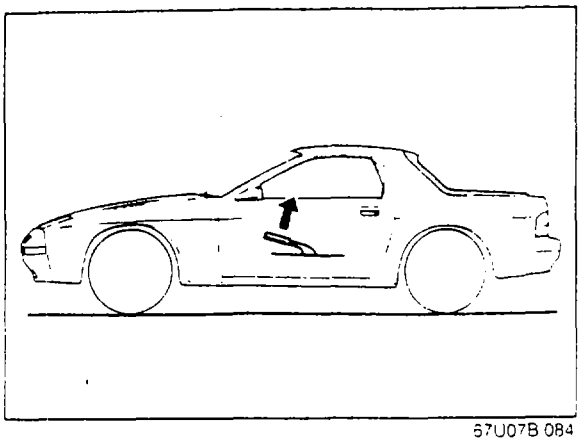
Condition \ Inspection point		ON VEHICLE: ATF level and condition	Range selector linkage	Inhibitor switch and wiring	Vacuum diaphragm and piping	Kickdown solenoid, kickdown switch and wiring	Engine idle speed and condition	Engine stall speed	Fluid pressure (Line and governor)	Control Valve body	Governor valve	OD band servo	2nd band servo	Transmission air check	Ignition switch and starter	Accumulator	OD control switch	OD cancel solenoid	Lock-up control solenoid and vacuum switch	OFF VEHICLE: Direct clutch	Front clutch	Rear clutch	OD brake band	2nd brake band	Low and reverse brake	Oil pump	Hydraulic circuit	Torque converter	One-way clutch	Parking linkage	Planetary gear	OD cancel valve	Lock-up control valve
Engine starting	Engine does not start in "N" or "P"	•	2	3	•	•	•	•	•	•	•	•	•	•	1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Engine starts in ranges other than "N" and "P"	•	1	2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Accelerating	Vehicle does not move in "D" (moves in "1", "2" & "R").	•	1	•	•	•	•	•	2	3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	④	•	•	•	•	•
	Vehicle does not move in forward ranges (moves in "R"). Extremely poor acceleration	1	2	•	•	•	•	•	3	4	•	•	•	5	•	•	•	•	•	⑥	•	•	•	•	•	⑦	•	•	•	•	•	•
	Vehicle does not move in "R" (moves in forward range). Extremely poor acceleration.	1	2	•	•	•	•	•	3	4	•	•	•	5	•	•	•	•	•	⑦	⑧	•	⑥	•	•	⑨	•	•	•	•	•	•
	Vehicle does not move in any range	1	2	•	•	•	•	•	3	4	•	•	•	5	•	•	•	•	⑨	•	•	•	•	•	⑥	⑦	•	•	⑧	•	•	•
	Slippage felt when accelerating.	1	2	•	6	•	•	•	3	4	•	•	•	5	•	•	•	•	•	•	•	•	•	•	⑦	⑧	•	•	•	•	•	•
	Vehicle moves in "N".	•	1	•	•	•	•	•	•	2	•	•	•	•	•	•	•	•	•	•	③	•	•	•	•	•	•	•	•	•	•	•
	Excessive creep	•	•	•	•	•	1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	No creep at all.	1	2	•	•	•	3	•	•	4	•	•	•	•	•	•	•	•	•	⑧	⑦	•	•	•	•	⑤	⑥	•	•	•	•	•	•
	Low max. speed and poor acceleration	1	2	•	•	•	6	3	4	5	•	•	•	•	•	•	•	•	•	⑨	⑩	⑪	•	⑦	⑧	⑫	•	•	•	•	•	•	•

Condition \ Inspection point		ON VEHICLE										OFF VEHICLE											
		ATF level and condition	Range selector linkage	Inhibitor switch and wiring	Vacuum diaphragm and piping	Kickdown solenoid, kickdown switch and wiring	Engine idle speed and condition	Engine stall speed	Fluid pressure (Line and governor)	Control Valve body	Governor valve	OD band servo	2nd band servo	Transmission air check	Ignition switch and starter	Accumulator	OD control switch	OD cancel solenoid	Lock-up control solenoid and vacuum switch	Direct clutch	Front clutch	Rear clutch	OD brake band	2nd brake band	Low and reverse brake	Oil pump	Hydraulic circuit	Torque converter	One-way clutch	Parking linkage	Planetary gear	OD cancel valve	Lock-up control valve
No shifting	Does not shift from 1 to 2	•	1	•	2	3	•	•	•	4	5	•	6	7	•	•	•	•	•	•	⑧	•	⑨	•	•	⑩	•	•	•	•	•	•	
	Does not shift from 2 to 3	•	1	•	2	3	•	•	•	4	5	•	6	7	•	•	•	•	•	•	⑧	•	•	•	•	⑨	•	•	•	•	•	•	
	Does not shift from 3 to OD	•	1	•	2	3	•	•	•	4	5	6	•	7	•	•	8	9	•	⑬	•	•	⑬	•	•	•	•	•	•	•	•	②	•	
	Lock up does not occur in OD.	•	•	•	•	•	•	•	•	•	1	2	•	•	•	•	•	•	3	•	•		④	•	•	•	•	•	•	•	•	•	⑤	
	Does not shift from 4 to 3.	1	•	•	2	•	•	•	•	3	4	•	•	5	•	•	6	7	•	⑧	⑨	•	⑩	•	•	•	⑪	•		•	•	•	②	•
	Does not shift from 3 to 2 or from 4 to 2.	1	•	•	2	•	•	•	•	3	4	•	5	6	•	•	•	•	•	•	⑦	•	⑧	⑨	•	•	⑩	•	•	•	•	•	•	
	Does not shift from 2 to 1 or from 3 to 1.	1	•	•	2	•	•	•	•	3	4	•	5	6	•	•	•	•	•	•	•	•	•	⑦	•	•	•	•	⑧	•	•	•	•	
	Does not kickdown when accelerator is depressed in 3 within the kickdown range	1	•	•	3	2	•	•	•	4	5	•	•	•	•	•	•	•	•	•	•	•	•	⑥	•	•	⑦	•	•	•	•	•	•	
	Does not kickdown when accelerator is depressed in 4 within the kickdown range	1	•	•	3	2	•	•	•	4	5	•	•	•	•	•	•	•	•	⑥	•	•	•	•	•	•	⑦	•	•	•	•	•	•	
	Excessive engine speed when accelerated in 3 due to delayed kickdown	1	2	•	•	•	•	•	3	4	5	•	•	6	•	•	•	•	•	•	⑦	•	•	•	•	•	⑧	•	•	•	•	•	•	
	Excessive engine speed when accelerated in 4 due to delayed kickdown.	1	2	•	•	•	•	•	3	4	5	•	•	6	•	•	•	•	•	•	•	•	⑦	•	•	•	⑧	•	•	•	•	•	•	
	Does not shift from 3 to 2 on "D" to "2" shift.	1	2	•	•	•	•	•	•	3	4	•	5	•	•	•	•	•	•	•	⑥	•	•	⑦	•	•	⑧	•	•	•	•	•	•	
	Does not shift from 3 to 2 on "D" to "1" shift.	1	2	•	•	•	•	•	3	4	5	•	6	•	•	•	•	•	•	•	⑦	•	•	⑧	•	•	⑨	•	•	•	•	•	•	
Shifting shock	Excessive "N" to "D" shifting shock.	•	•	•	2	•	1	•	3	4	•	•	•	•	•	•	•	•	•	•	•	⑤	•	•	•	•	•	•	•	•	•	•	
	Excessive 1 to 2 shifting shock.	1	•	•	2	•	•	3	•	•	•	•	4	5	•	•	•	•	•	•	•	•	•	⑥	•	•	•	•	•	•	•	•	⑦	
	Excessive 2 to 3 shifting shock.	•	•	•	1	•	•	•	2	3	•	•	4	•	•	•	•	•	•	•	•	•	•	⑤	•	•	•	•	•	•	•	•	⑥	
	Excessive 3 to 4 shifting shock.	•	•	•	1	•	•	•	2	3	•	•	•	•	•	•	•	•	•	•	•	•	④	•	•	•	•	•	•	•	•	•	⑤	

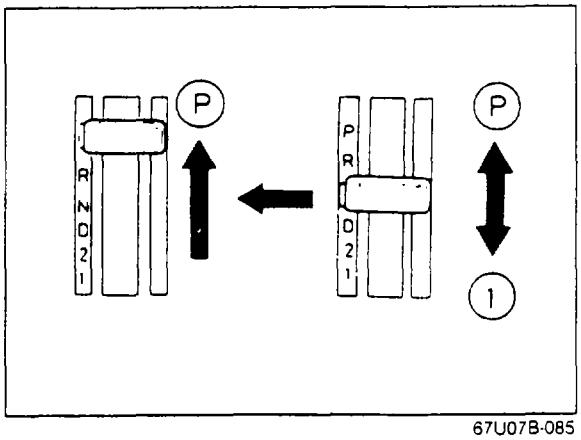
Condition	Inspection point	ON VEHICLE												OFF VEHICLE							
		ATF level and condition	Range selector linkage	Inhibitor switch and wiring	Vacuum diaphragm and piping	Kickdown solenoid, kickdown switch and wiring	Engine idle speed and condition	Engine stall speed	Fluid pressure (Line and governor) Control Valve body	Governor valve	OD band servo	2nd band servo	Transmission air check	Ignition switch and starter	Accumulator	OD control switch	OD cancel solenoid	Lock-up control solenoid and vacuum switch	Direct clutch	Front clutch	Rear clutch	OD brake band	2nd brake band	Low and reverse brake	Oil pump	Hydraulic circuit	Torque converter	One-way clutch	Parking linkage	Planetary gear	OD cancel valve	Lock-up control valve
Shifting shock	Vehicle brakes when shifted from 1 to 2.	1	•	•	•	•	•	•	2	•	•	•	•	•	•	•	•	•	•	(1)	•	•	(3)	•	•	•	(3)	•	•	•	•
	Vehicle brakes when shifted from 2 to 3	1	•	•	•	•	•	•	3	•	•	2	•	•	•	•	•	•	•	•	•	(4)	•	•	•	•	•	•	•	•	•
	Vehicle brakes when shifted from 3 to 4	1	•	•	•	•	•	•	3	•	•	2	•	•	•	•	•	•	•	(4)	•	•	•	•	(5)	•	•	•	•	•	•	•
	Shift shock felt when accelerator is released and deceleration occurs	•	1	•	2	3	•	•	4	5	6	•	•	•	•	7	•	•	•	•	•	•	•	•	(8)	•	•	•	•	•	•	•
	Excessively large 2 to 1 shock in "1" large	1	•	•	2	•	•	3	4	5	•	•	•	•	•	•	•	•	•	•	•	•	(6)	•	•	•	•	•	•	•	•	•
Shifting point	Excessively high 1to 2, 2 to 3 and 3 to 4 shift point	1	•	•	2	3	•	•	4	5	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	(7)	•	•	•	•	•	•
	Excessively high 4 to 3, 3 to 2 and 2 to 1 shift point	•	1	•	2	3	•	•	4	5	6	•	•	•	•	•	•	•	•	•	•	•	•	•	•	(7)	•	•	•	•	•	•
	Kickdown operates or engine overruns when depressing pedal in 3 beyond kickdown vehicle speed limit	1	2	•	•	•	•	•	3	4	5	•	•	•	•	•	•	•	•	(6)	•	•	•	•	•	•	(7)	•	•	•	•	•	•
	Kickdown operates or engine overruns when depressing pedal in 4 beyond kickdown vehicle speed limit	1	2	•	•	•	•	•	3	4	5	•	•	•	•	•	•	•	•	•	•	(6)	•	•	•	•	(7)	•	•	•	•	•	•
Shifting sequence	Shifts directly from 1 to 3.	1	•	•	•	•	•	•	2	•	3	•	•	4	•	•	•	•	•	•	(5)	•	•	•	•	(6)	•	•	•	•	•	•
	Shifts directly from 2 to 4	1	•	•	•	•	•	•	2	•	3	•	•	4	•	•	•	•	•	(5)	•	•	•	•	•	(6)	•	•	•	•	•	•
	Shifts from 2 to 1 or 2 to 3 in "2"	•	1	•	•	•	•	•	2	3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Shifts from 1 to 2 or 2 to 3 in "1"	•	1	•	•	•	•	•	2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	(3)	•	•	•	•	•	•
Slipping	Practically no shift shock, or slippage while 1 to 2 shifting.	1	2	•	3	•	•	•	4	5	•	6	•	7	•	•	•	•	•	•	•	(8)	•	•	•	(9)	•	•	•	•	•	•
	Practically no shift shock or slippage while 2 to 3 shifting	1	2	•	3	•	•	•	4	5	•	6	•	7	•	•	•	•	•	(8)	•	•	•	•	•	(9)	•	•	•	•	•	•
	Practically no shift shock or slippage while 3 to 4 shifting	1	2	•	3	•	•	•	4	5	•	6	•	7	•	•	•	•	•	•	•	(8)	•	•	•	(9)	•	•	•	•	•	•
	No shift shock or engine runaway in 1 to 2 shift.	1	2	•	3	•	4	5	•	6	•	•	•	7	•	•	•	•	•	•	•	•	(8)	•	(9)	•	•	•	•	•	•	•
	Engine overruns or slips when shifting 4 to 3	1	•	•	2	•	•	•	3	4	•	•	5	6	•	•	•	•	(7)	(8)	•	(9)	•	•	•	•	(10)	•	•	•	•	•	•
	Engine overruns or slips when shifting 3 to 2	1	•	•	2	•	•	•	3	•	•	•	4	5	•	•	•	•	•	(6)	•	(7)	•	•	•	(8)	•	•	•	•	•	•	•

	Inspection point / Condition	ON VEHICLE: ATF level and condition	Range selector linkage	Inhibitor switch and wiring	Vacuum diaphragm and piping	Kickdown solenoid, kickdown switch and wiring	Engine idle speed and condition	Engine stall speed	Fluid pressure (Line and governor)	Control Valve body	Governor valve	OD band servo	2nd band servo	Transmission air check	Ignition switch and starter	Accumulator	OD control switch	OD cancel solenoid	Lock-up control solenoid and vacuum switch	OFF VEHICLE: Direct clutch	Front clutch	Rear clutch	OD brake band	2nd brake band	Low and reverse brake	Oil pump	Hydraulic circuit	Torque converter	One-way clutch	Parking linkage	Planetary gear	OD cancel valve	Lock-up control valve
Noise	Transmission noisy in "P" and "N"	1	•	•	•	•	•	•	2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Noise	Transmission noisy in "D" "2" "1" and "R"	1	•	•	•	•	•	•	2	•	•	•	•	•	•	•	•	•	•	•	•	(3)	•	•	•	(4)	•	•	(5)	•	(6)	•	•	•
Others	No engine braking in "1"	•	1	•	•	•	•	•	2	3	•	•	•	4	•	•	•	•	•	•	•	•	•	•	(5)	•	(6)	•	•	•	•	•	•	•
Others	Vehicle moves in "P", or parking gear not disengaged when "P" is disengaged	•	1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	(2)	•	•	•	•
Others	Transmission overheats	1	•	•	•	•	•	4	5	6	•	2	3	7	•	•	•	•	•	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	•	•	(17)	•	•	•	•
Others	White smoke discharge from exhaust while running.	1	•	•	2	•	•	3	4	5	•	•	•	6	•	•	•	•	•	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	•	•	(16)	•	•	•	•
Others	Abnormal odor from oil level gauge pipe	1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	•	•	(11)	•	•	•	•
Others	Transmission shifts to 4 even if OD control switch is turned OFF	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1	2	•	•	•	•	•	•	•	•	•	•	•	•	•	3	•	•	•
Others	Vehicle surges in OD.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

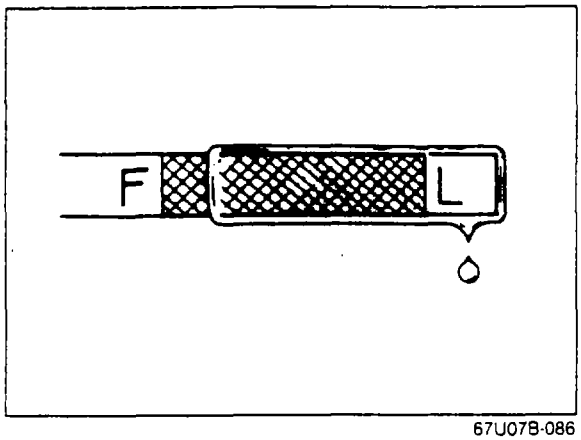
77U07B-051



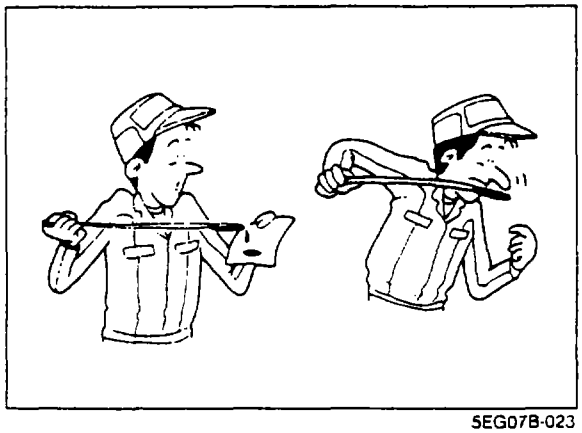
67U07B 084



67U07B-085



67U07B-086



5EG07B-023

ON-VEHICLE INSPECTION AND ADJUSTMENT

AUTOMATIC TRANSMISSION FLUID (ATF)

Inspection

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.

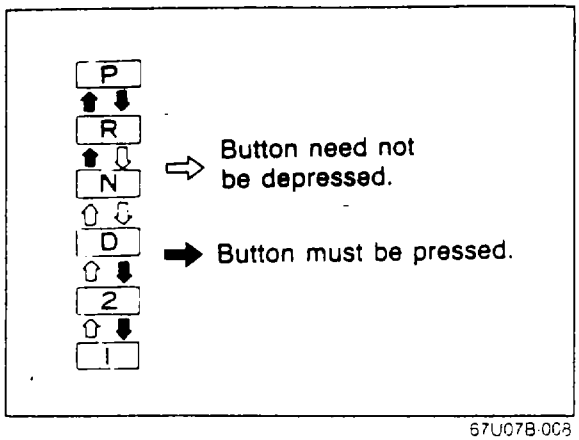
2 Run the engine so that the automatic transmission fluid reaches 50—80°C (122—176°F)
3 While the engine is idling, shift the select lever from "P" to "1" and back again.
4 Let the engine idle.
5 Shift the select lever to "P"

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

Condition

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

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

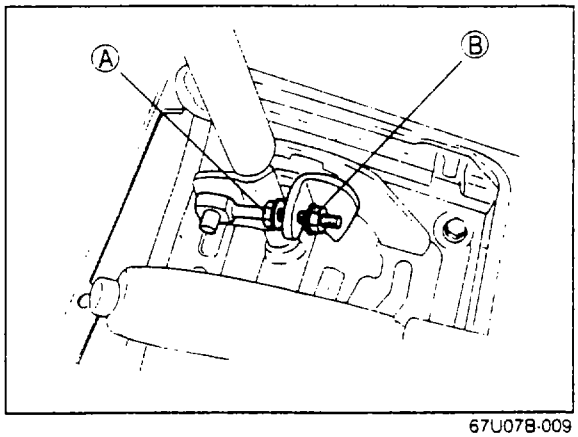


67U07B-008

SELECTOR LEVER

Inspection

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



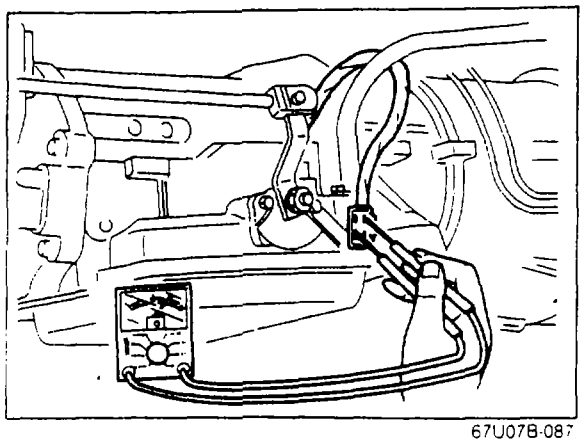
67U07B-009

Adjustment

1. Turn lock nuts Ⓐ and Ⓑ to the position shown in the figure.
2. Shift the gearshift lever to the "P" range.
3. Shift the transmission to the "P" range by moving the select lever of the transmission.
4. Turn the nut by hand until lock nut A touches the adjust lever lightly.
5. Back off lock nut Ⓐ one full turn.
6. Tighten lock nut Ⓑ to the specified torque.

Tightening torque: 7.8—11 N·m (0.8—1.1 m-kg, 69.6—96 in-lb)

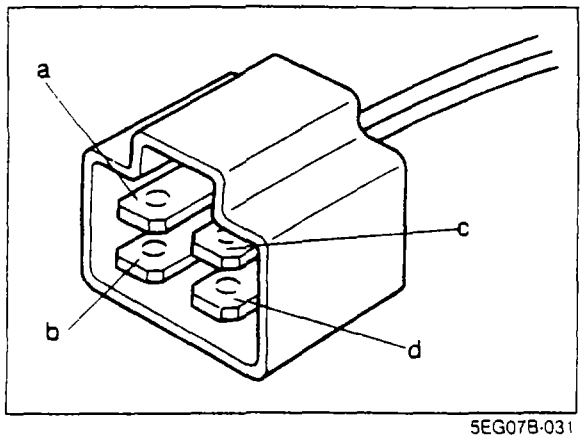
7. Check that there is a click at each range when shifted from the "P"—"1" range.
8. Check that the positions of the selector lever and the indicator are exact.
9. Check that the button returns smoothly when used to shift the selector.


67U07B-087

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.
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.
   (1) Jack up the vehicle and support it with stands.
   (2) Disconnect the inhibitor switch connector.
   (3) Using an ohmmeter, check the continuity of the terminals.



5EG07B-031

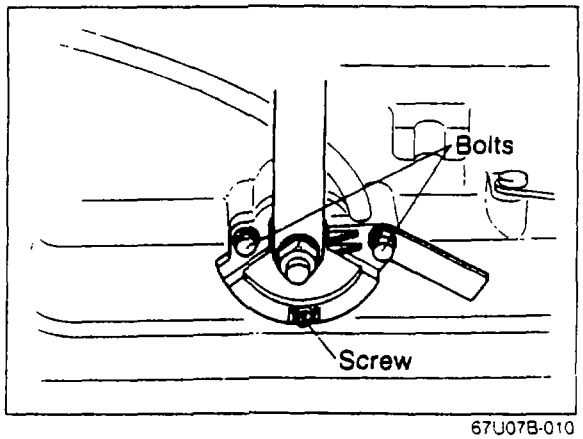
Connection guide

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

○—○ : Indicates continuity

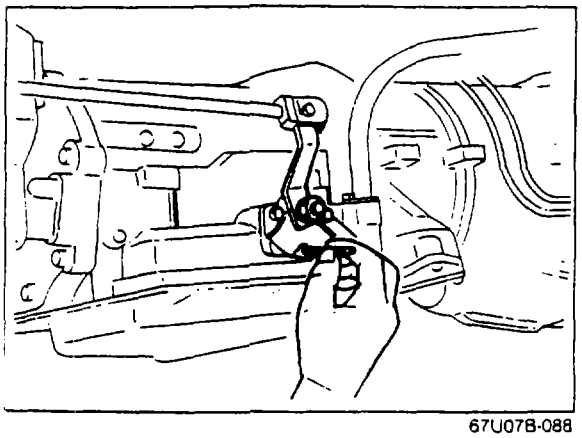
Adjustment

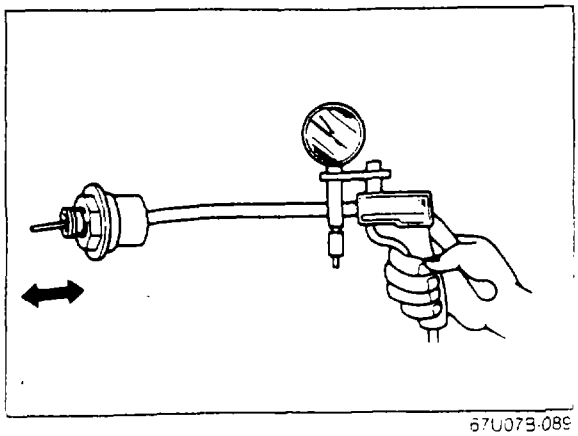
1. Shift the selector lever to the "N" range.
2. Jack up the vehicle and support it with stands.
3. Loosen the inhibitor switch mounting bolts.
4. Remove the screw on the switch body and slightly move the inhibitor switch so that the screw hole on the switch body is aligned with the small hole inside the switch. Check their alignment by inserting a **2.0 mm (0.079 in)** diameter pin into the holes.



67U07B-010

5. Temporarily tighten the switch attaching bolts, remove the pin, and tighten the screw into the hole.
6. Tighten the switch attaching bolts.
7. Check the continuity of the individual terminals with an ohmmeter in the respective ranges.

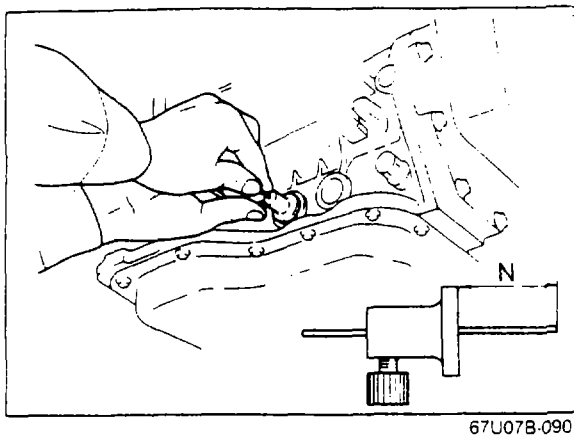

67U07B-088


67U07B-089

VACUUM DIAPHRAGM

Inspection

1. Remove the vacuum hose from vacuum diaphragm.
   Check for any ATF leakage.
   If leaking, replace.
2. Remove the vacuum diaphragm.
3. Check that the diaphragm rod moves when vacuum is applied to the vacuum diaphragm.

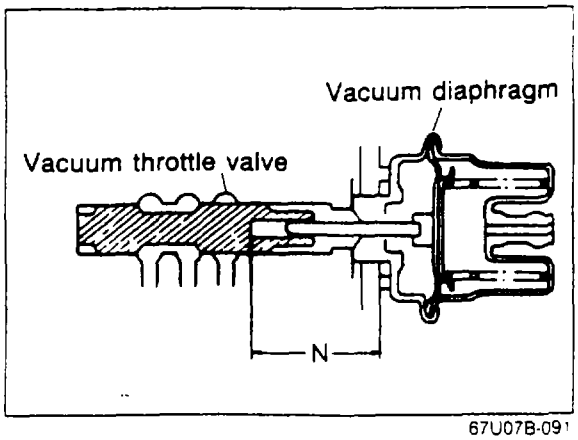


67U07B-090

Adjustment of Vacuum Diaphragm Rod

1. Measure the N dimension indicated in the figure using **adjust gauge** (49 G032 355) and a scale
2. Select the diaphragm rod in accordance with the table.

N dimension	Applicable diaphragm rod length
Below 25.65 mm (1.0099 in)	29.0 mm (1.14 in)
25.65—26.15 mm (1.0099—1.0295 in)	29.5 mm (1.16 in)
26.15—26.65 mm (1.0295—1.0492 in)	30.0 mm (1.18 in)
26.65—27.15 mm (1.0492—1.0650 in)	30.5 mm (1.20 in)
27.15 mm (1.0689 in) or over	31.0 mm (1.22 in)



67U07B-091

Note

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

b) Extract approximately 1.0 liter (1.1 US qt, 0.9 Imp qt) of ATF prior to removing the vacuum diaphragm.

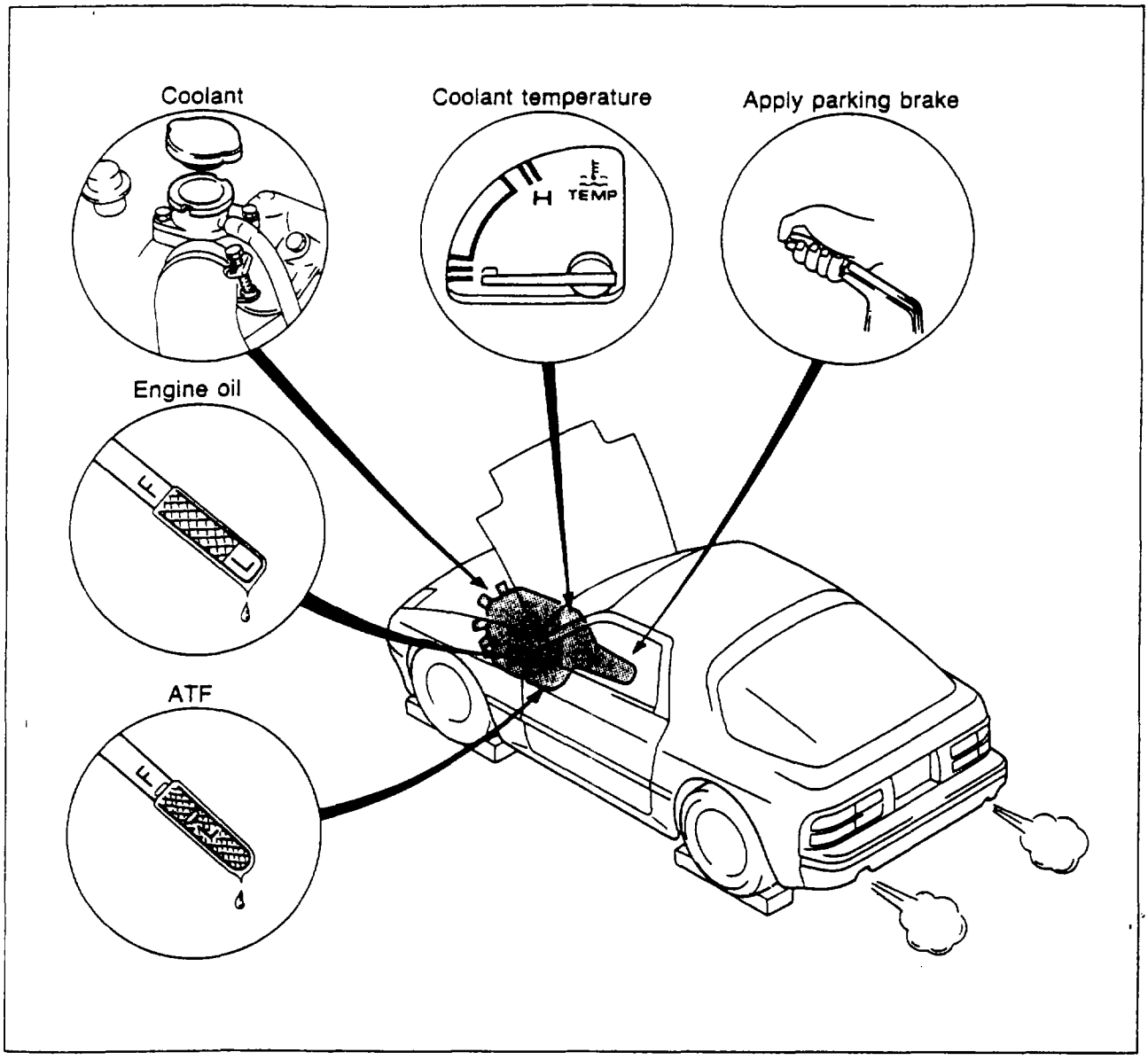
TEST

PREPARATION

Check the following items prior to testing:

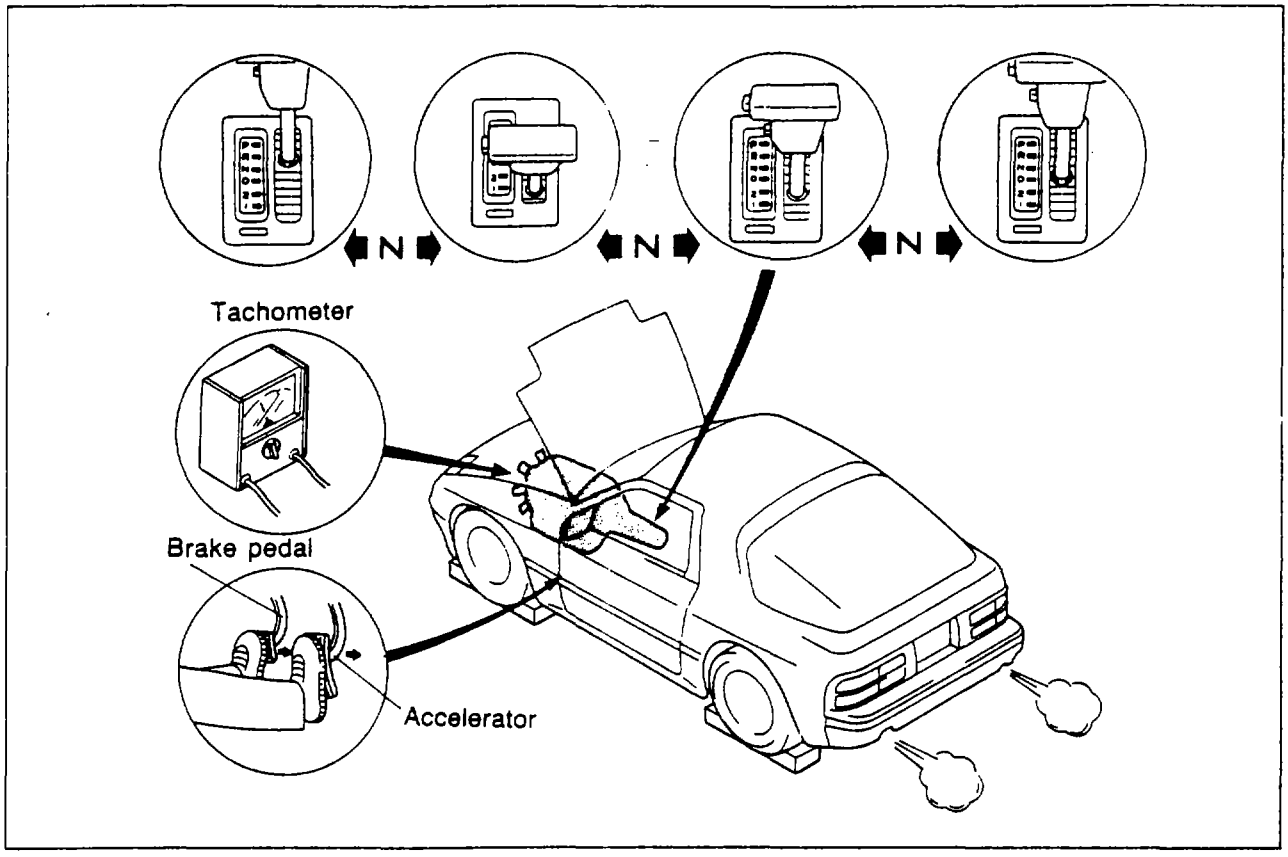
1. Engine coolant, engine oil and automatic transmission fluid levels.
2. Warm the engine thoroughly to raise the automatic transmission fluid temperature to operating level (50—80°C, 122—176°F).
3. Engage the parking brake and position wheel chocks to front and rear wheels when performing stall and line pressure tests.
4. Drive the vehicle in traffic to perform road tests and inspection of line pressure cutback point as well as governor pressure.

67U07B-092



5EG07B-052

STALL TEST



77U07B-052

Procedure

1. Follow test preparation procedures (page 7B—18).
2. Connect tachometer to engine.
3. Shift select or lever to "D" range.
4. Depress brake pedal firmly with left foot and gradually depress accelerator pedal with right foot.
5. Read and note engine speed as soon as engine speed becomes constant, and release accelerator pedal.

Note
Steps 3 to 4 must be accomplished within 5 seconds.

6. Shift selector lever to "N" range and run engine at idle speed for over one minute.

Note
This idling for over one minute is performed to cool ATF as well as to prevent oil degeneration.

7. Perform stall tests for all ranges in the same manner.

Standard stall speed: 2,000—2,300

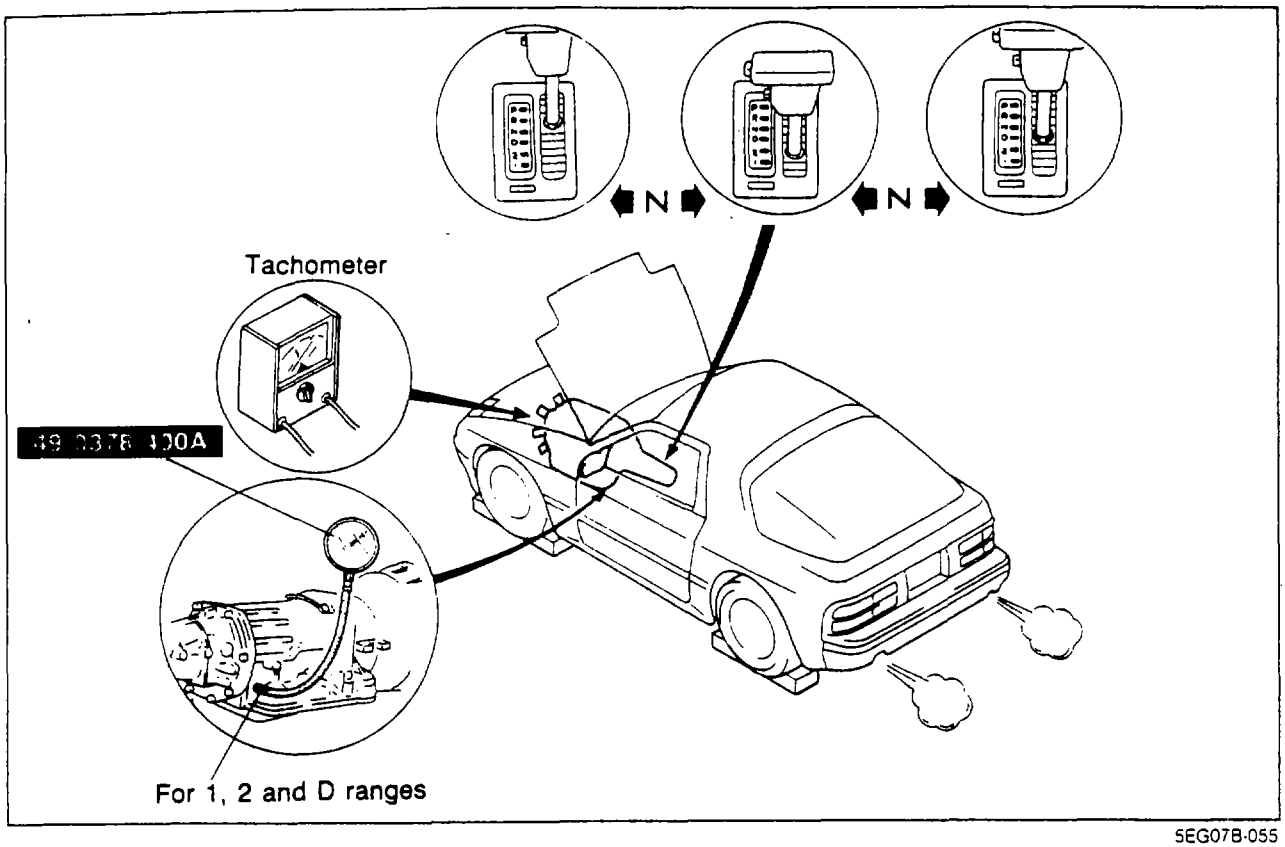
Note
Always provide adequate cooling time between individual range stall tests.

Evaluation of Stall Test

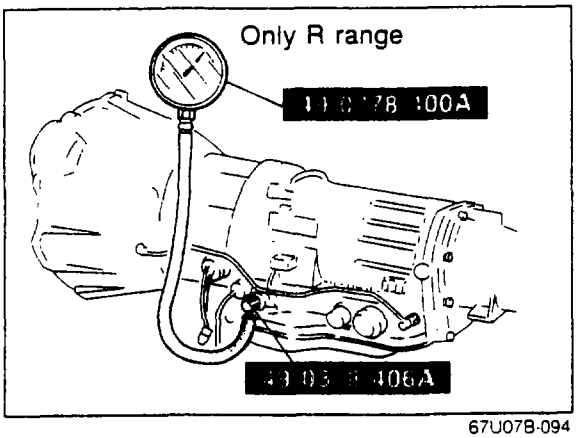
Condition		Possible cause	
Above standard	In all ranges	Insufficient line pressure	Worn oil pump
			Oil leakage from oil pump, control valve, and/or transmission case
			Stuck pressure regulator valve
			Direct clutch slipping
	In "D", "2" & "1" ranges	Rear clutch slipping	
	In "D" range only	One-way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

67U07B-093

LINE PRESSURE TEST



5EG07B-055



67U07B-094

Standard line pressure:

Range	Pressure kPa (kg/cm², psi)	
	Idle	Stall
D, 1	294—392 (3.0—4.0, 43—57)	883—1,079 (9.0—11.0, 129—157)
2	785—1,177 (8.0—12.0, 114—171)	785—1,177 (8.0—12.0, 114—171)
R	392—686 (4.0—7.0, 57—100)	1,569—1,863 (16.0—19.0, 229—272)

5EG07B-057

Procedure

1. Follow test preparation procedures (page 7B—18).
2. Connect tachometer to the engine and **oil pressure gauge** (49 0378 400A) and to the line pressure inspection hole on the right side of the transmission case.
3. Shift the selector lever to the "D" range.
4. Read the oil pressure at engine idle speed.
5. Depress the brake pedal firmly with the left foot and gradually depress the accelerator pedal with the right foot.
6. Read the oil pressure as soon as the engine speed becomes constant, and release the accelerator pedal.

Note
Steps 4 to 5 must be accomplished within 5 seconds.

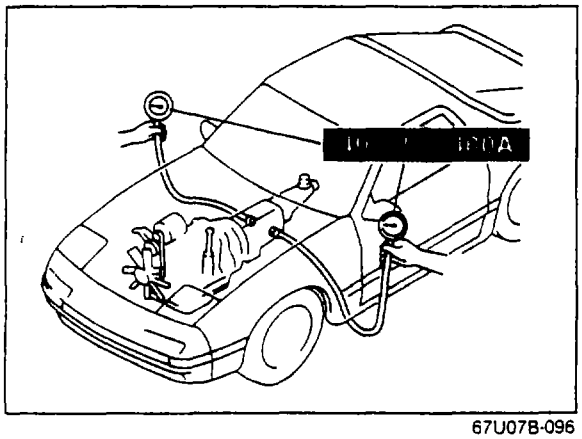
7. Shift the selector lever to "N" range and run the engine at idle speed for over one minute.
8. Read the line pressures at engine idle and stall speeds for each range in the same manner.

Note
The line pressure in the "R" range is tested by using the left side line pressure inspection hole.

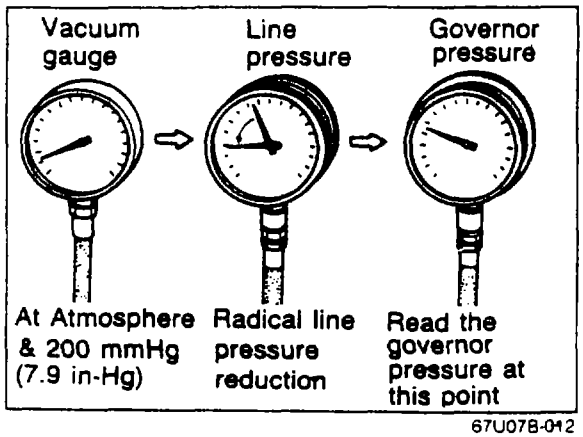
Evaluation of Line Pressure Test

Condition		Possible cause
Below standard	In all ranges	Worn oil pump
		Fluid leakage from the oil pump, control valve, and/or transmission case
		Stuck pressure regulator valve
		Fluid leakage from the direct clutch and/or OD band servo release side
	In "D", "1", "2" ranges	Fluid leakage from the rear clutch and/or governor hydraulic circuit
	In "R" range only	Fluid leakage from the low and reverse brake hydraulic circuit
Excessive line pressure at idle		Leaking or disconnected vacuum tube
		Leaking vacuum diaphragm

67U07B-095



67U07B-096



67U07B-012

LINE PRESSURE CUTBACK POINT

Inspection

1. Connect **oil pressure gauges** (49 0378 400A) to the line pressure and governor pressure inspection holes in the transmission case and place the gauges inside the vehicle.
2. Remove the hose to the vacuum diaphragm and seal the hose with a plug.
3. Connect a vacuum pump to the vacuum diaphragm and place the pump inside the vehicle.
4. Gradually accelerate the vehicle in "D" range.
5. Read the governor pressure at the point where the line pressure drops radically.
6. Apply **200 mmHg (7.87 inHg)** vacuum and repeat steps 4 and 5.

Standard

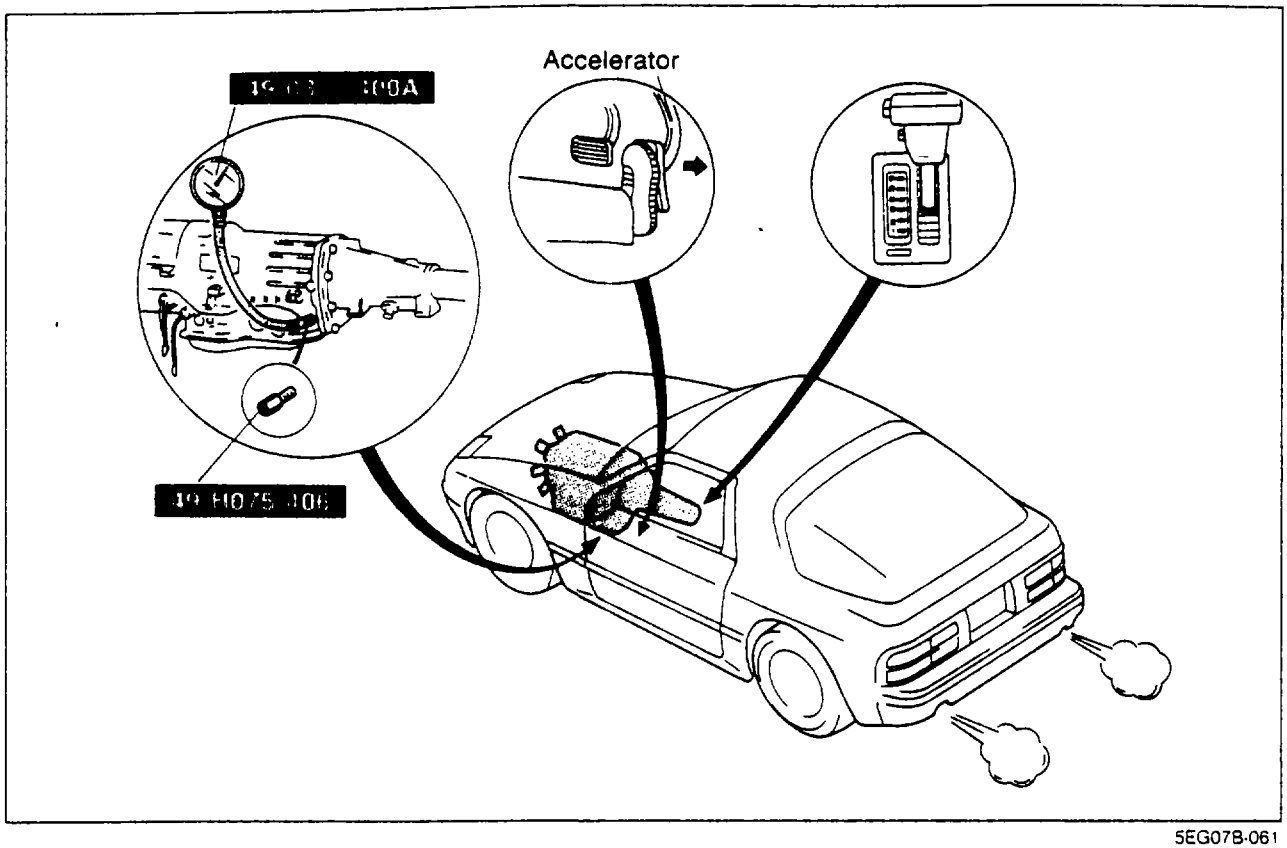
Vacuum mmHg (inHg)	Governor pressure kPa (kg/cm², psi)
Atmospheric pressure	98—157 (1.0—1.6, 14—23)
200 (7.87)	39—98 (0.4—1.0, 6—14)

Evaluation

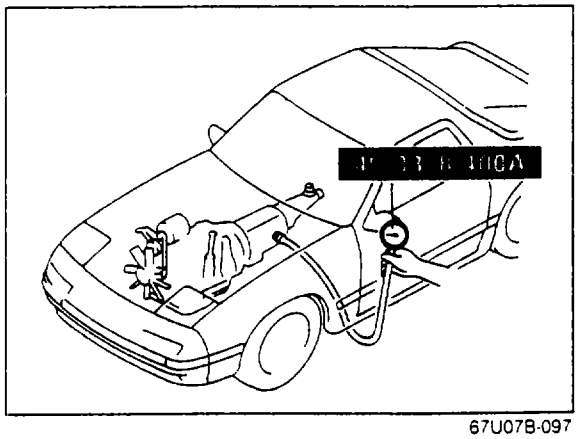
Incorrect pressures

1. Missing diaphragm rod and/or rod length radically off standard.
2. Stuck valve in the control valve.

GOVERNOR PRESSURE TEST



5EG07B-061



67U07B-097

Procedure

1. Connect **oil pressure gauge** (49 0378 400A) using **adaptor** (49 H075 406) to the governor pressure inspection hole in the transmission case and place the gauge inside the vehicle.
2. Drive the vehicle in "D" range.
3. Read the governor pressures at the speeds listed in the table below.

Standard governor pressure:

Vehicle speed km/h (mph)	Governor pressure kPa (kg/cm², psi)
30 (19)	69—128 (0.7—1.3, 10—18)
55 (34)	147—226 (1.5—2.3, 21—33)
85 (53)	196—392 (2.0—4.0, 28—57)

Evaluation

Condition	Possible cause
Out of standard	Fluid leakage from the line pressure hydraulic circuit
	Fluid leakage from the governor pressure hydraulic circuit
	Defective or stuck governor valve

5EG07B-063

ROAD TEST

Road tests are performed to inspect the following items. Adjust or repair malfunctions identified during road tests in accordance with the Troubleshooting Chart.

Gearshift Function Check Items

1. Shift shock must be minimal and shifting must be smooth.
2. Engine speed must not run away and the shifting must not be delayed.
3. Transmission must shift through $D_1 \rightarrow D_2 \rightarrow D_3 \rightarrow D_4$ in "D" range.
4. Transmission must shift from 3rd in "D" range to 2nd gear when the "2" range is selected.
5. Transmission must shift from 2nd to 1st when the "1" range is selected from 3rd gear in "D" range.
6. Transmission must not up-shift in "1" range.
7. Transmission must remain in 2nd gear in "2" range.
8. Transmission must positively lock in "P" range.
   The transmission must positively lock when "P" range is selected while moving at a speed below 4 km/h (2.5 mph) on level ground. The transmission must positively lock when set to "P" range with the brakes disengaged on a gentle slope.

67U07B-098

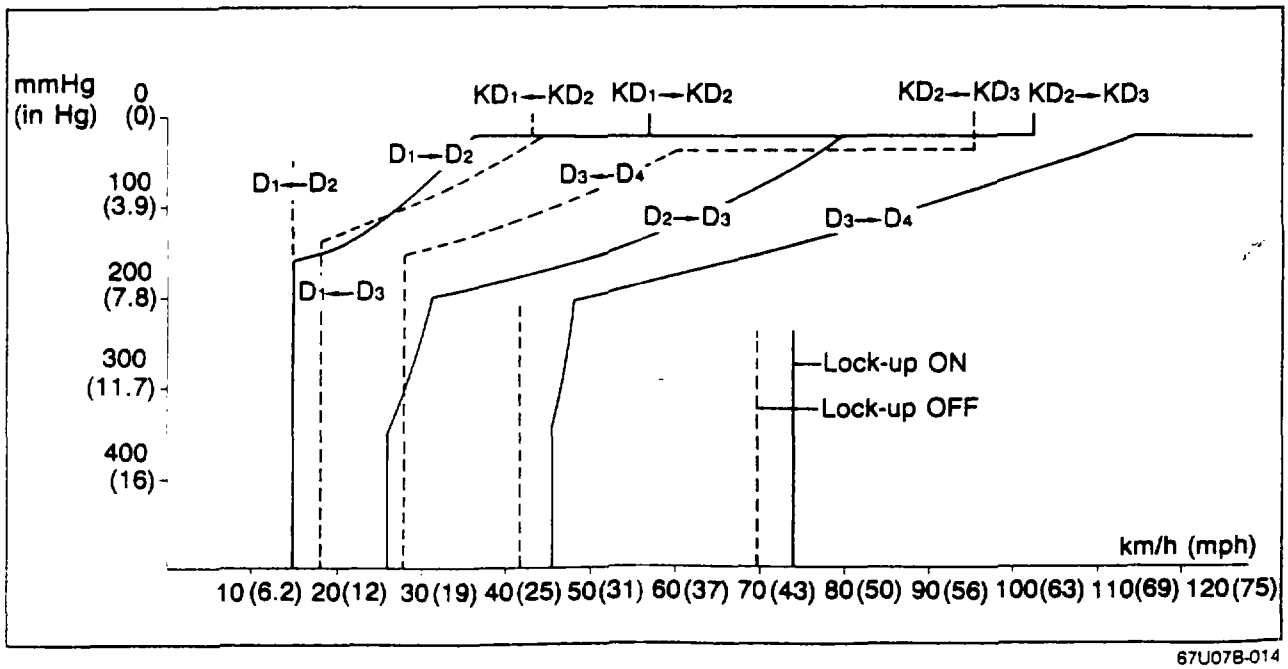
Vehicle Speed At Gearshift Table

Throttle condition	Gearshift	Vehicle speed at gearshift km/h (mph)	Throttle condition	Gearshift	Vehicle speed at gearshift km/h (mph)
Full throttle (kick-down)	$D_1 \rightarrow D_2$	54—61 (34—38)	Half throttle	$D_1 \rightarrow D_2$	11—18 (7—11)
	$D_2 \rightarrow D_3$	99—106 (62—66)		$D_2 \rightarrow D_3$	30—37 (19—23)
	$D_3 \rightarrow D_2$	91—98 (57—61)		$D_3 \rightarrow D_4$	48—54 (30—34)
	$D_2 \rightarrow D_1$	40—46 (25—29)	Fully closed	$D_3 \rightarrow D_1$	11—18 (7—11)
Entire throttle opening range	$I_2 \rightarrow I_1$	38—45(24—28)	Lock-up on	D_4	70—77 (44—48)

67U07B-013

1. Full throttle: The throttle opening during kickdown when the manifold vacuum is between **0—100 mmHg (0—3.9 inHg)**.
2. Half throttle: The throttle opening at manifold vacuum of **200 mmHg (7.9 inHg).**

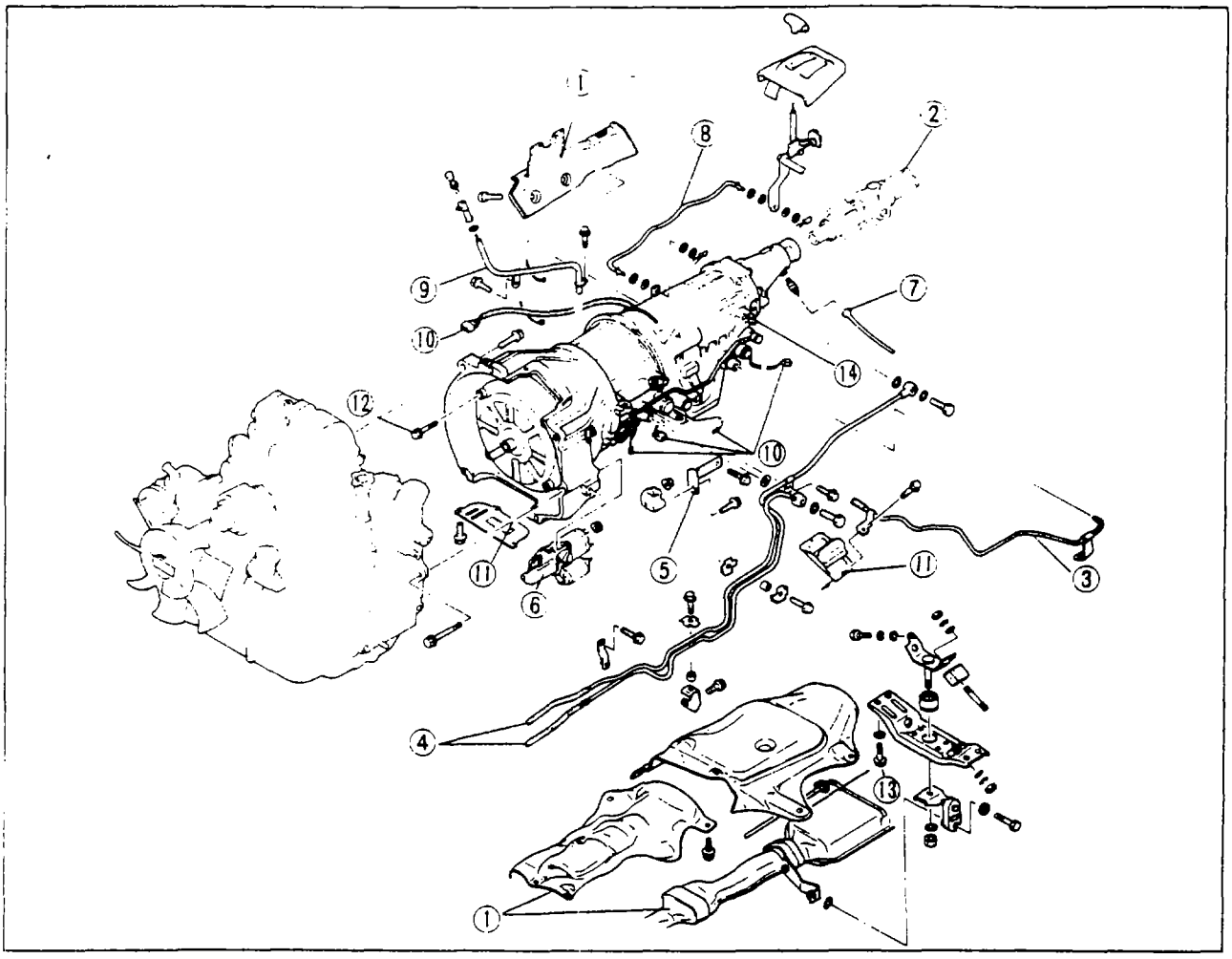
Basic Gearshift Pattern



67U07B-014

REMOVAL AND INSTALLATION

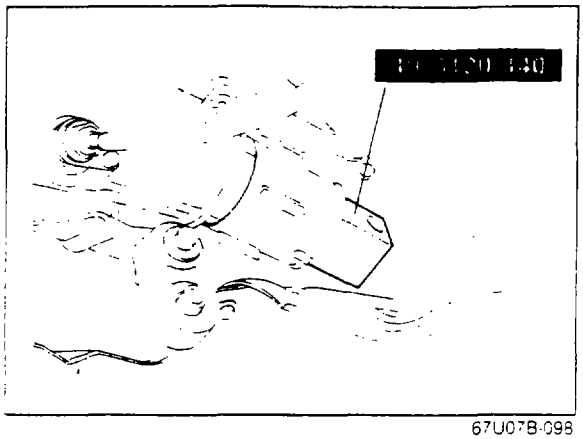
1. Disconnect the negative battery cable.
2. Raise the vehicle and support it with safety stands.
3. Remove in the sequence shown in the figure.
4. Install in the reverse order of removal.



67U07B-015

1. Exhaust pipe and heat insulator
2. Propeller shaft
3. Vacuum pipe
4. Oil pipe
5. Starter bracket
6. Starter
7. Speedometer cable
8. Shift rod
9. Oil level gauge and pipe
10. Harness coupler
11. Service hole cover
12. Bolt
13. Bolt
14. Transmission

77U07B-053



67U07B-098

Propeller Shaft

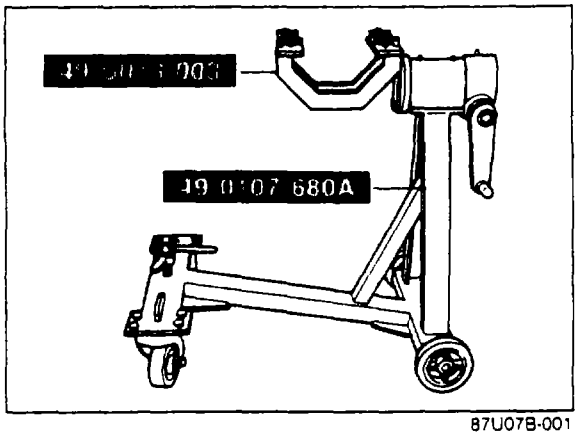
When the propeller shaft is removed from the extension housing, immediately install **main shaft holder** (49 S120 440) into the extension housing to prevent oil leakage.

DISASSEMBLY

Precaution

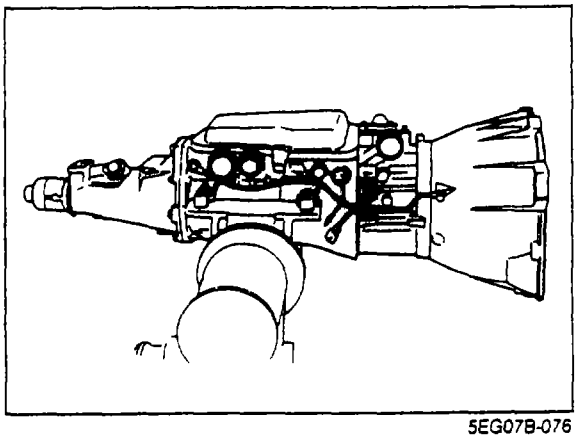
1. Always disassemble transmissions in a clean area (dustproof workspace) to prevent dust from entering into the mechanisms.
2. Always clean the transmission exterior thoroughly with steam and/or cleaning solvents prior to disassembly.
3. Always inspect the individual transmission components in accordance with the troubleshooting chart during disassembly.
4. Always use plastic hammers when applying force to separate the light alloy case joints.
5. Never use rags during disassembly.

67U07B-099



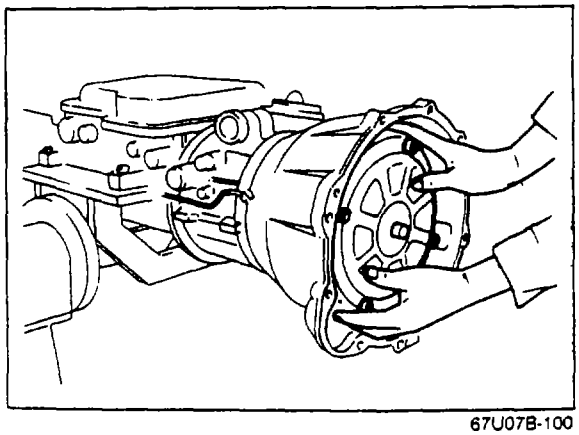
87U07B-001

1. Mount **transmission hanger** (49 U019 003) to **engine stand** (49 0107 680A).



5EG07B-076

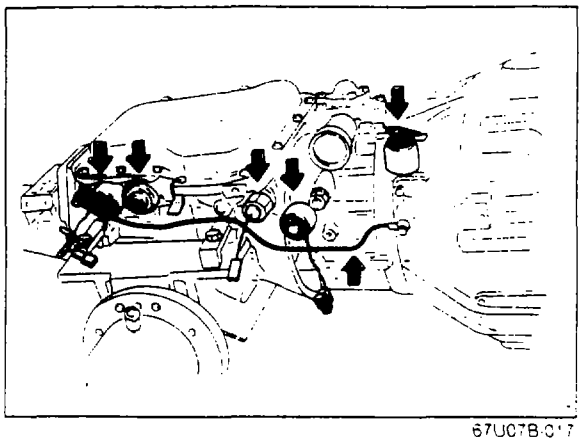
2. Mount the transmission assembly on the engine stand.
3. Drain the ATF from the transmission.



67U07B-100

4. Remove the torque converter from the converter housing.

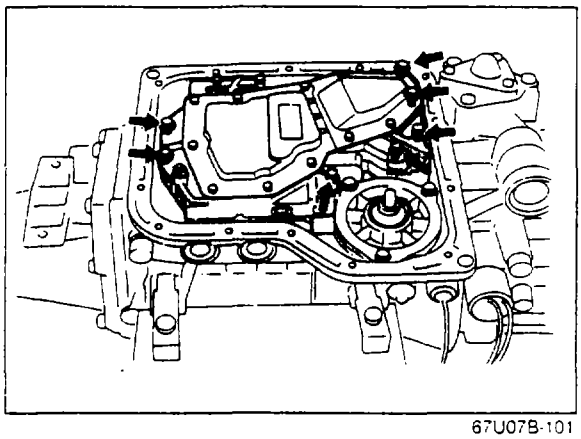
Note
Do not allow automatic transmission fluid to spill when removing the torque converter.



67U07B-017

5 Remove the governor pressure pipe, downshift solenoid, vacuum diaphragm, transmission oil pressure switch, OD cancel solenoid and lock-up control solenoid.

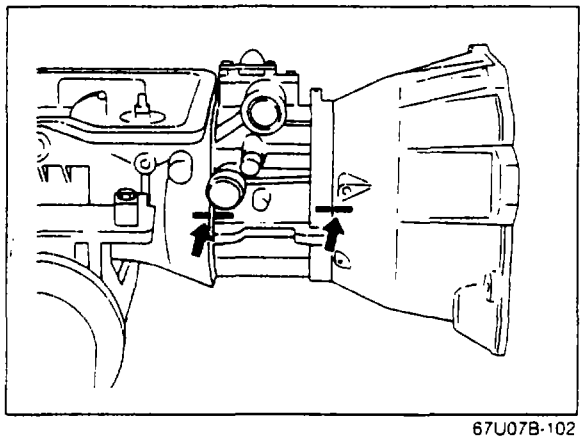
Caution
Be careful not to leave the vacuum rod in the tip of the vacuum diaphragm after removal.



67U07B-101

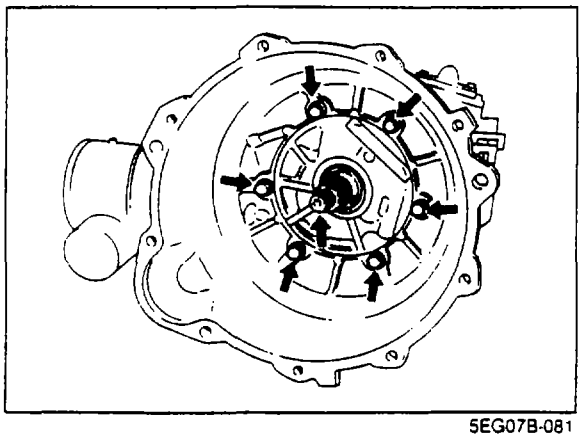
6 Remove the oil pan.
7 Remove the valve body assembly.

Note
Neatly arrange the different length bolts for proper reassembly.



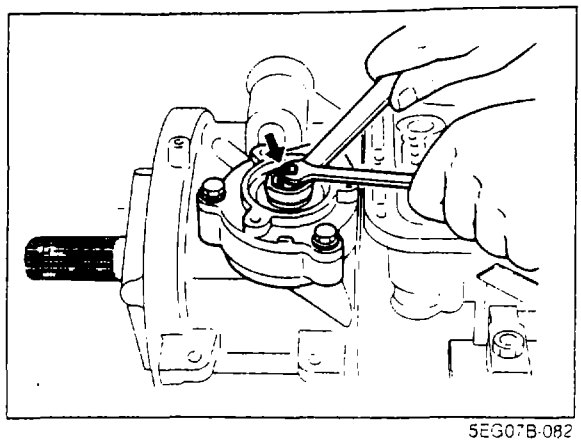
67U07B-102

8. Place matching marks on the converter housing, OD case and transmission case for proper reassembly.



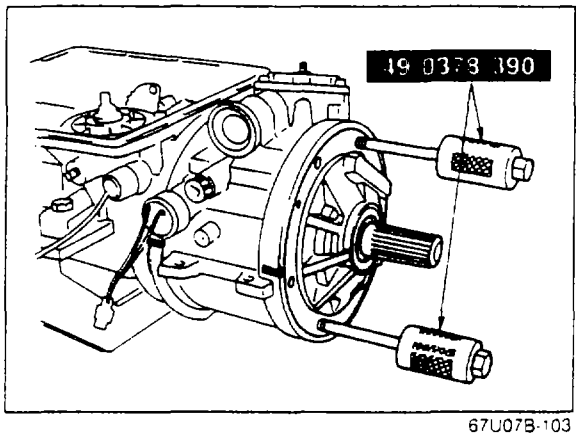
5EG07B-081

9. Remove the converter housing.
10. Remove the input shaft.



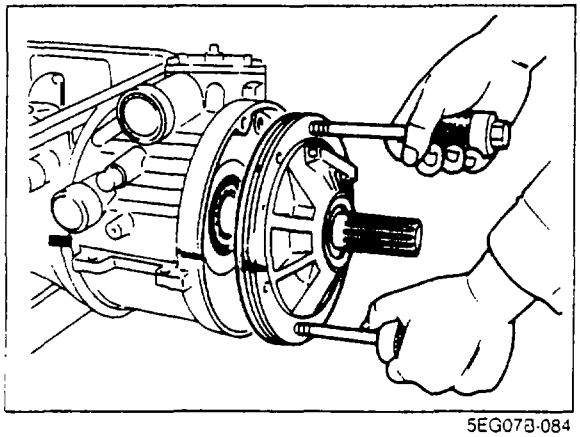
5EG07B-082

11. Remove the OD band servo cover.
12. Loosen the OD band servo lock nut and tighten the piston stem.



67U07B-103

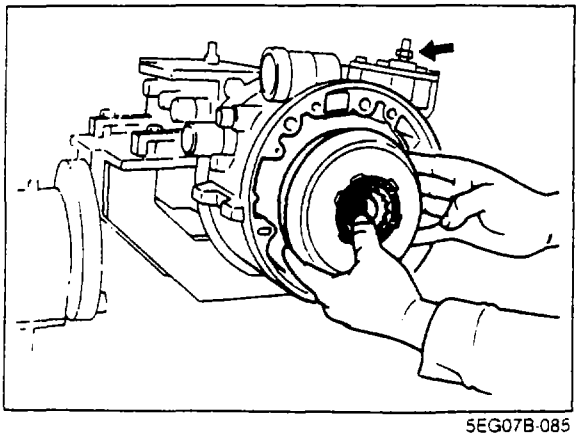
13. Mount **oil pump pullers** (49 0378 390) on the oil pump.



5EG07B-084

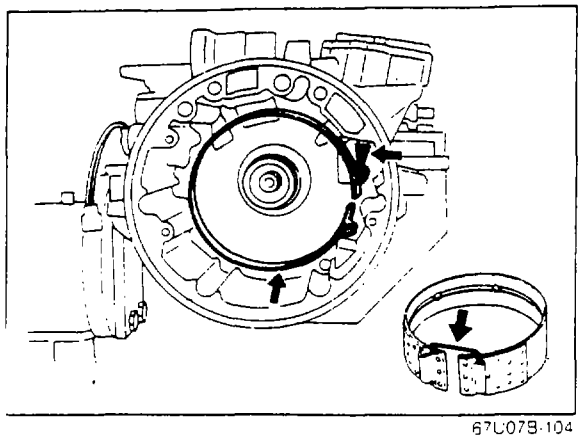
14. Slide the weights of the oil pump pullers and remove the oil pump.

Caution
Remove the oil pump gently to prevent the OD connecting shell, sun gear and planetary pinion carrier from falling off.



5EG07B-085

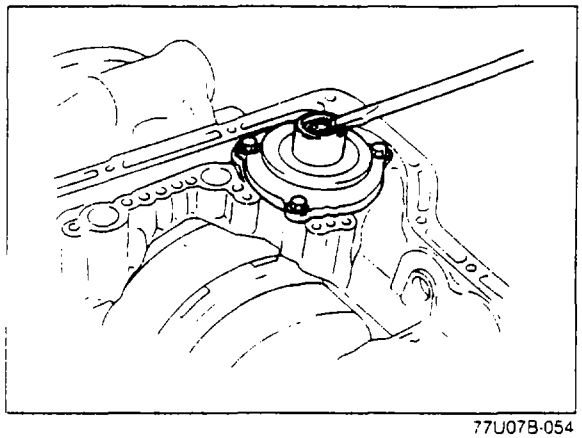
15. Loosen the piston stem of the OD band servo.
16. Remove the direct clutch assembly.



67U07B-104

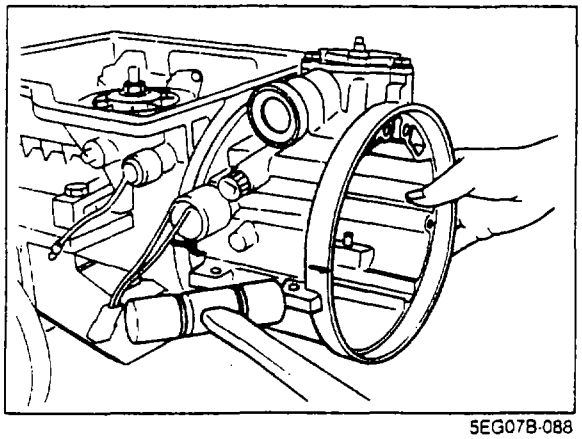
17 Remove the OD brake band and band strut.

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



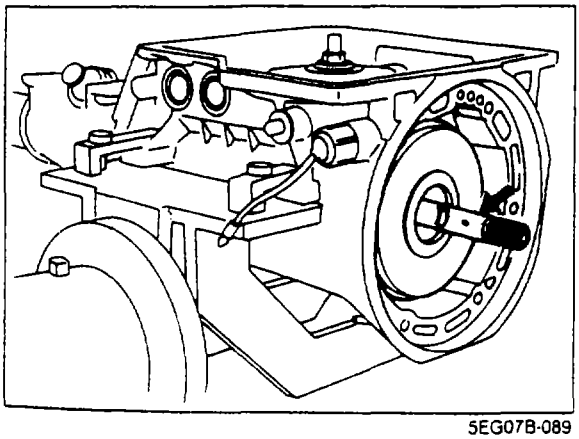
77U07B-054

18. Remove the clip with a flat-tip screwdriver.



5EG07B-088

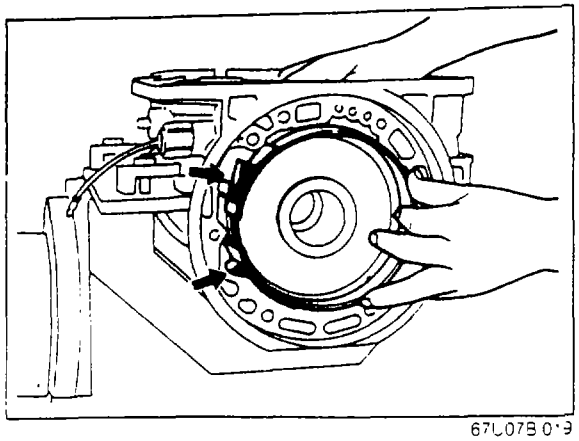
19. Separate the OD case from the transmission case by tapping it lightly with a plastic hammer.



5EG07B-089

20. Remove the intermediate shaft.

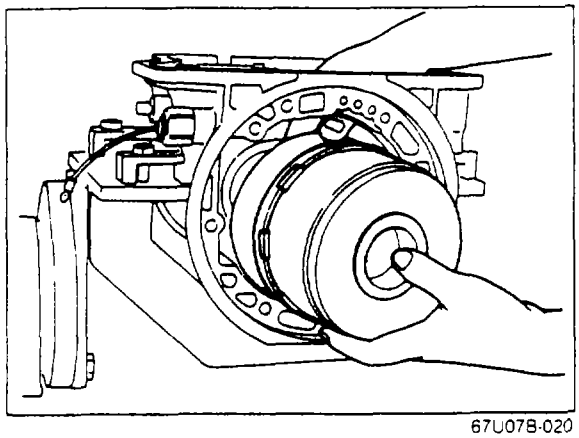
Note
The end with the oil hole is the front.



67U07B-019

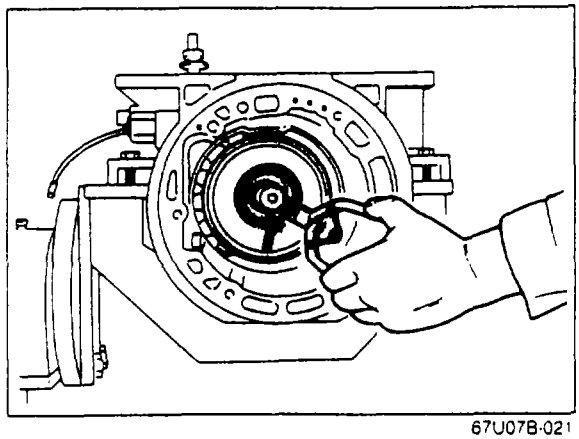
21. Remove the 2nd band servo, the brake band and band strut.
22. Insert the clip into the groove of the piston stem.

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



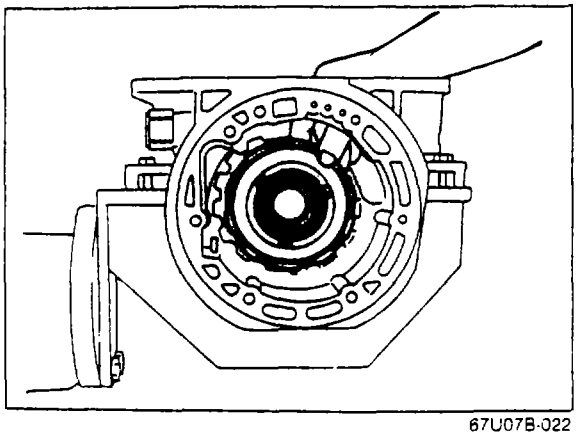
67U07B-020

23. Remove the front clutch, rear clutch, rear clutch hub, front planetary pinion carrier, connecting shell and sun gear as one piece.



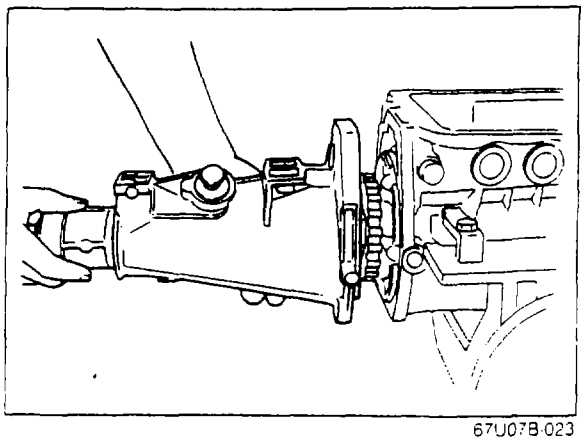
67U07B-021

24. Remove the snap ring on the output shaft with snap ring pliers.

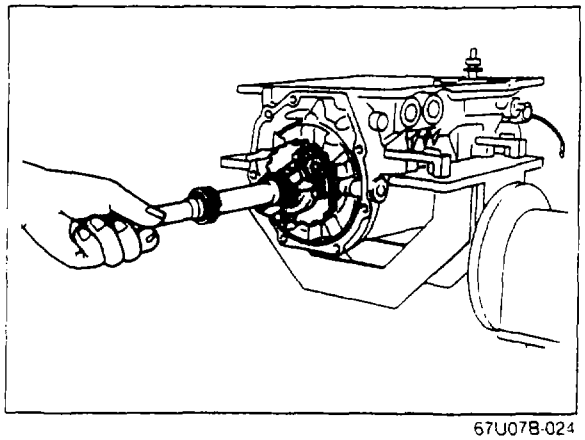


67U07B-022

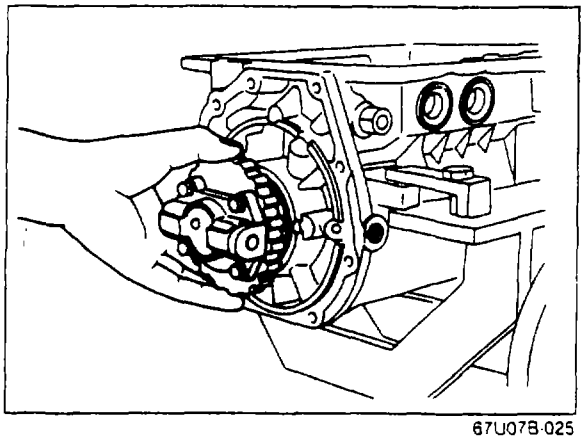
25. Remove the connecting drum, rear planetary carrier and internal gear as one piece.


67U078-023

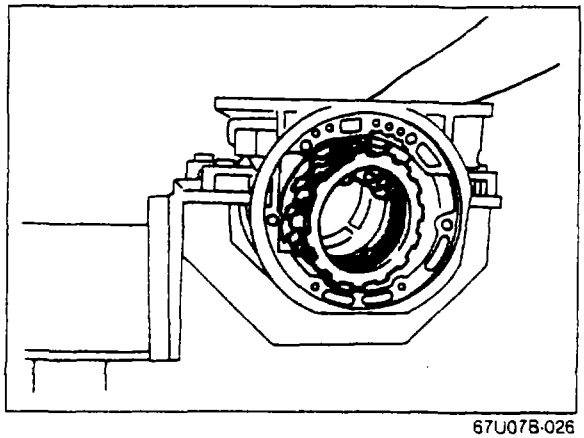
26 Remove the rear extension housing.


67U078-024

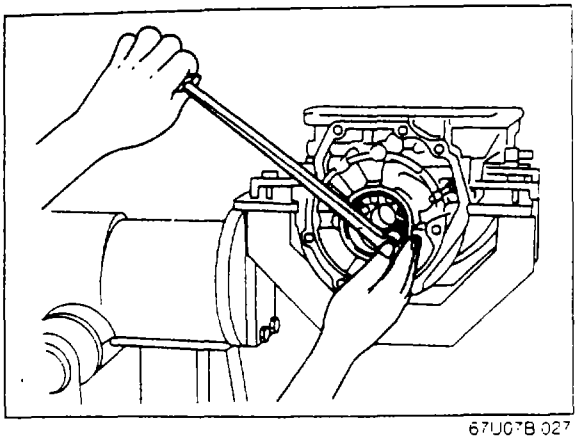
27 Pull out the output shaft.


67U078-025

28. Remove the governor valve and oil distributor as one piece.

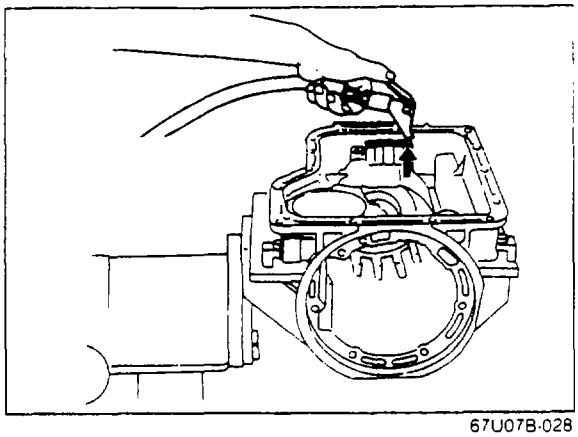

67U078-026

29. Remove the snap ring on the low and reverse brake with a flat-tip screwdriver.
30. Remove the retaining plate, drive plates, driven plates and dished plate.



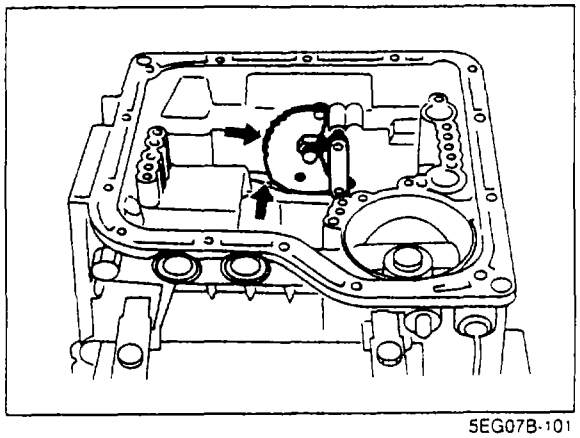
67U07B-027

31. Remove the hexagonal head bolt with **hexhead wrench** (49 0378 346) from the rear of the transmission case.
32. Remove the one-way clutch inner race, thrust ring and piston return spring.



67U07B-028

33. Apply compressed air to the oil passage as illustrated in the figure, and remove the low and reverse brake piston.



5EG07B-101

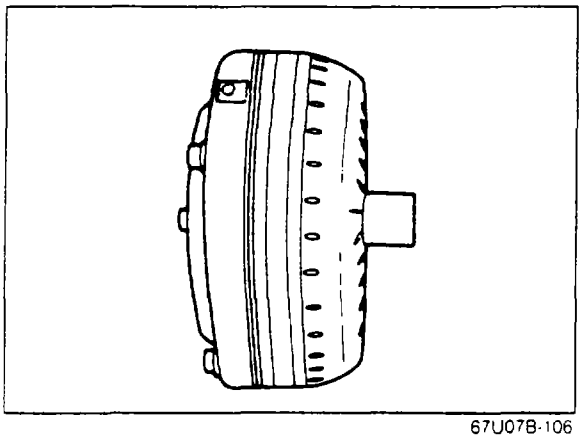
34. Remove the manual plate and parking rod.

INSPECTION AND REPAIR

Precaution

1. Several parts resemble each other; organize them so that they do not get mixed up.
2. Clean each part with solvent, clean out oil holes and oil passages with compressed air, and check that there are no obstructions.
3. When using compressed air to clean components, wear eye protection.
4. If drive plates are replaced with new ones, first soak the new ones in ATF for 2 hours or more.
5. Before assembly, apply ATF to all seal rings, rotating parts, "O" rings, and sliding parts.
6. All seals and gaskets must be replaced with new ones.
7. Use petroleum jelly, not grease during reassembly.
8. When it is necessary to replace a bushing, replace the sub-assembly which includes that bushing.

67U07B-105

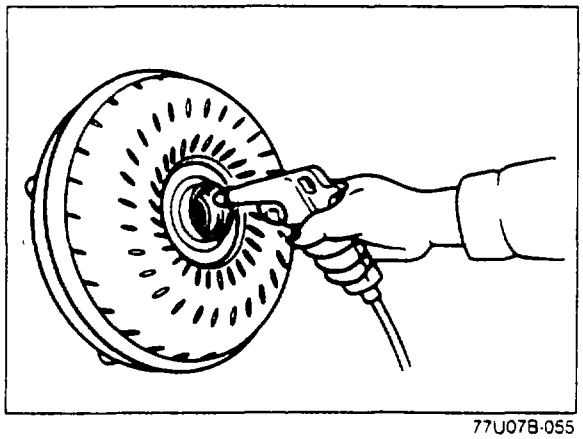


67U07B-106

TORQUE CONVERTER

Inspection

1. Check the outer part of the converter for damage or cracks, and replace it if there is any problem.
2. Check whether there is any rust on the pilot of the converter or on the base. If there is any, remove it completely.

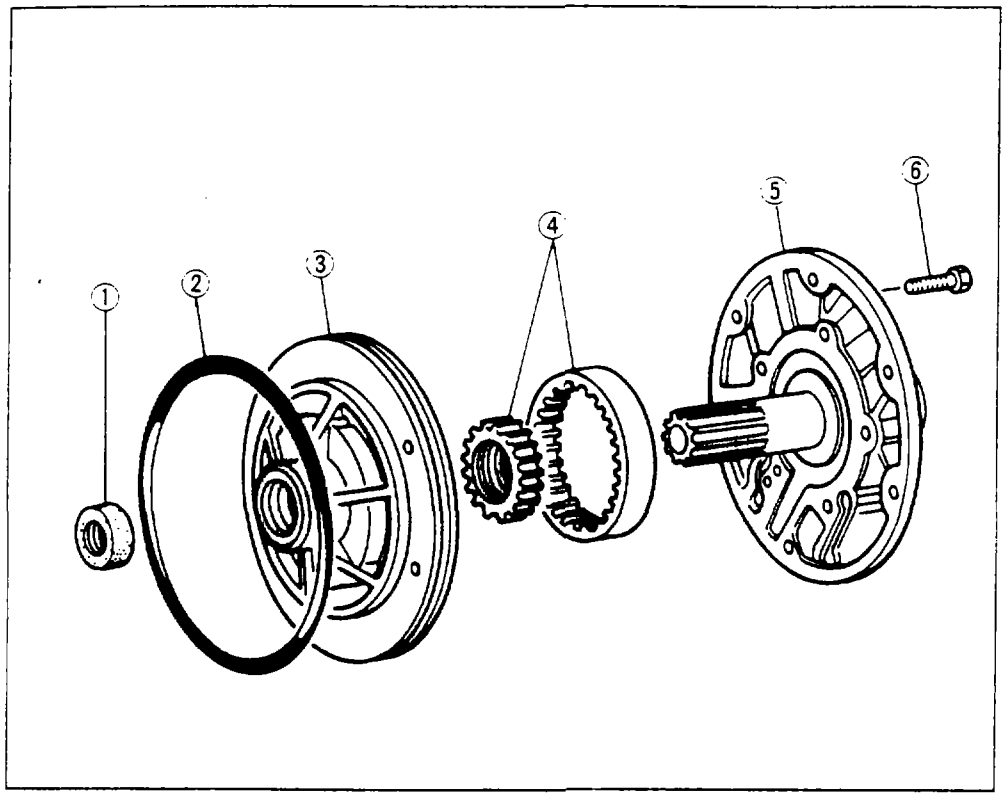


77U07B-055

Washing inside of converter

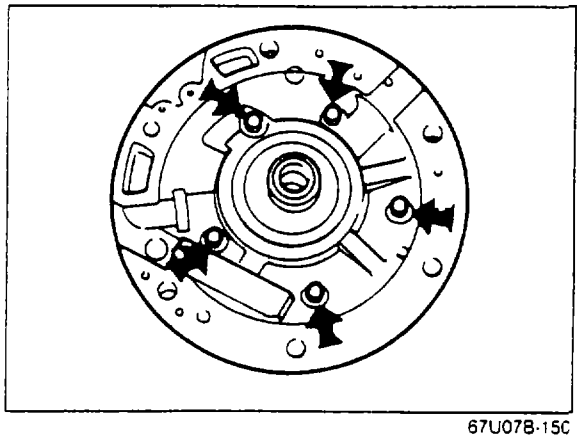
1. Drain any fluid remaining in the converter.
2. Pour approx. 0.5 liter (0.5 US qt, 0.4 Imp qt) of kerosene into the converter and shake it to clean the inside.
3. Pour out the kerosene.
4. Clean the inside of the converter with compressed air so that it is perfectly empty.
5. Pour in ATF.
6. Shake the converter to clean the inside, then pour out the ATF.

OIL PUMP
Components



77U07B-056

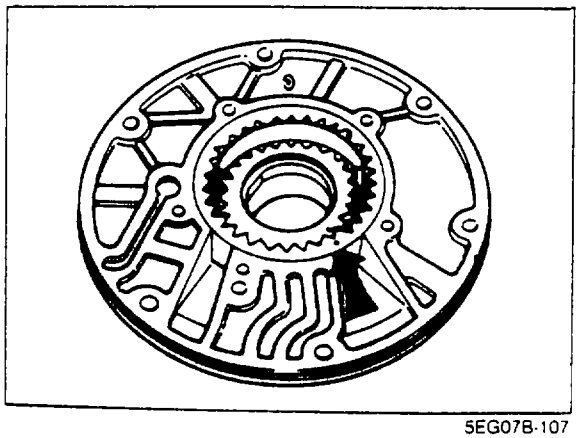
1. Oil seal
2. "O" ring
3. Pump housing
4. Inner and outer gears
5. Pump cover
6. Bolt



67U07B-150

Disassembly

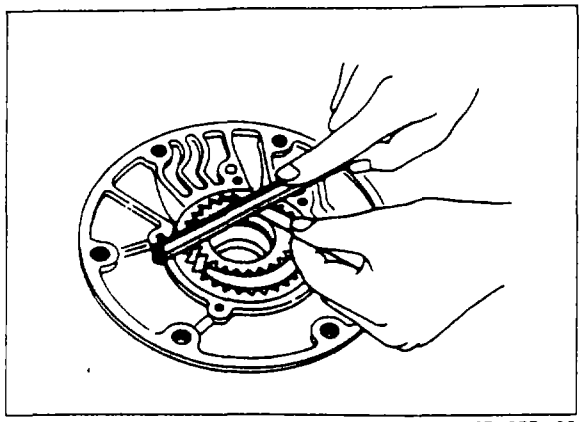
1. Remove the mounting bolts and remove the pump cover from the housing.



5EG07B-107

2. Mark the inner and outer gear positions for proper reassembly and remove the gears from the housing.

Caution
Do not use a punch to mark the gears.



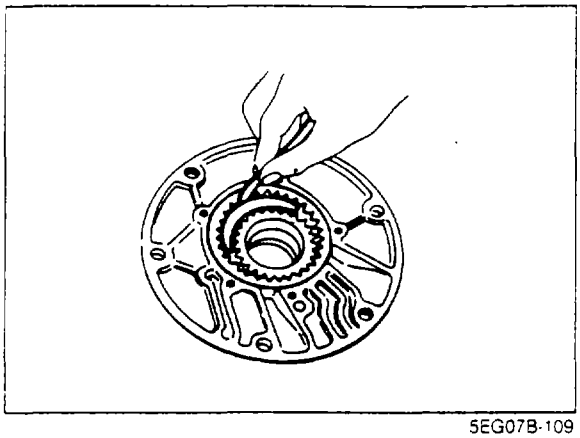
67U07B-107

Inspection

Check the following and replace any faulty parts.

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

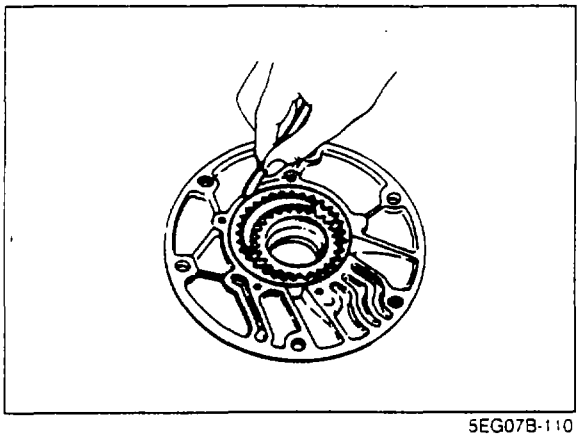
Standard clearance:
0.02—0.04 mm (0.0008—0.0016 in)
Clearance: 0.08 mm (0.0031 in) max.



5EG07B-109

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

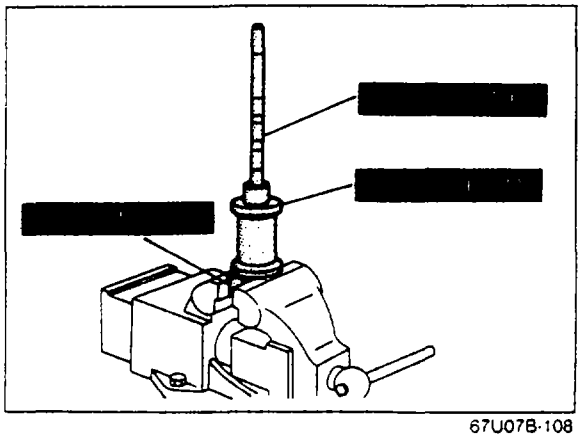
Standard clearance:
0.14—0.21 mm (0.0055—0.0083 in)
Clearance: 0.25 mm (0.0098 in) max.



5EG07B-110

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

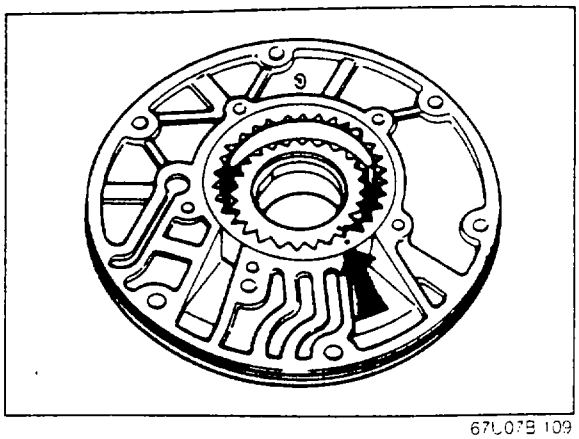
Standard clearance:
0.05—0.20 mm (0.0020—0.0079 in)
Clearance: 0.25 mm (0.0098 in) max.



67U07B-108

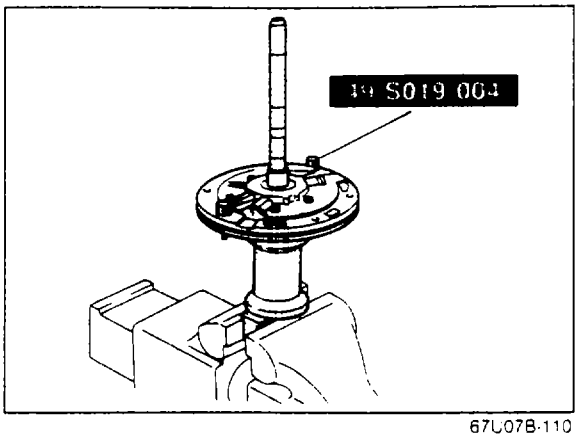
Assembly

1 Assemble **holder** (49 S019 001), **shaft** (49 S019 002) and **stand** (49 S019 003), secure the stand in a vise.



67L07B 109

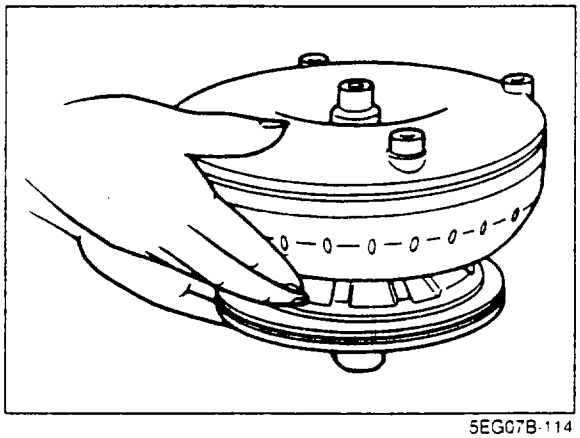
2. Install the pump housing on the centering tool.
3. Install the inner and outer gears in the pump housing with their matching marks toward the pump cover.



67L07B-110

4 Install the pump cover and set with **pins** (49 S019 004).
5. Tighten the installation bolts.

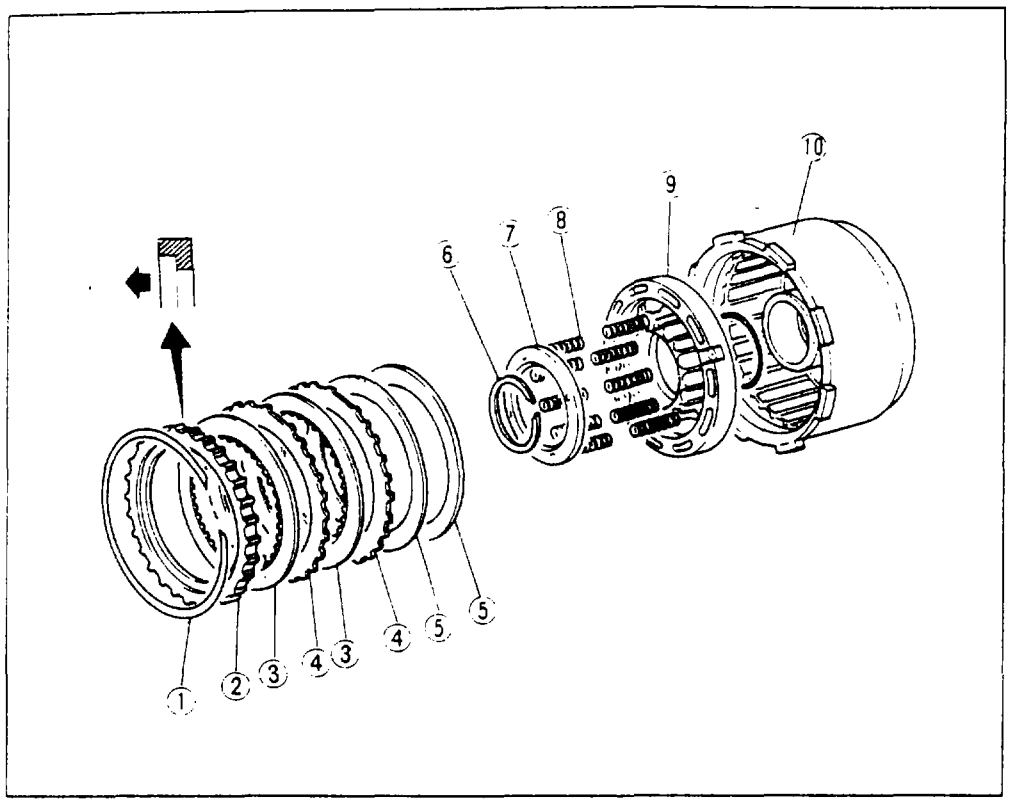
Tightening torque:
6.9—8.8 N·m (70—90 cm-kg, 61—78 in-lb)



5EG07B-114

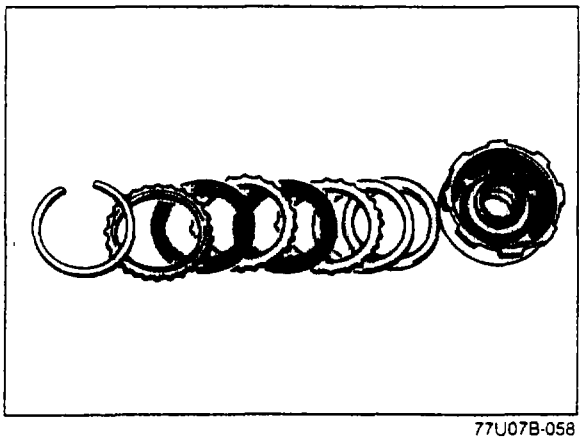
6. Set the torque converter on the oil pump. Check that the inner and outer gears turn smoothly.

DIRECT CLUTCH
Components



77U07B-057

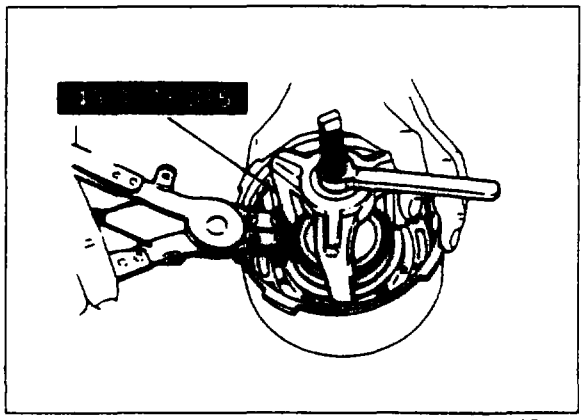
1. Snap ring
2. Retaining plate
3. Drive plates
4. Driven plates
5. Dished plates
6. Snap ring
7. Spring retainer
8. Spring
9. Piston
10. Direct clutch drum



77U07B-058

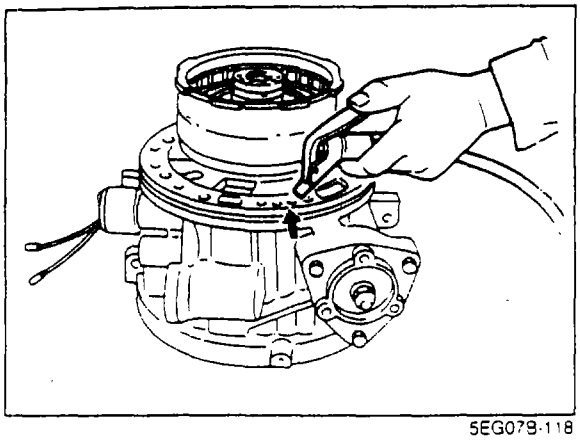
Disassembly

1. Remove the snap ring with a screwdriver and remove the retaining plates, drive plates, driven plates and dished plates.



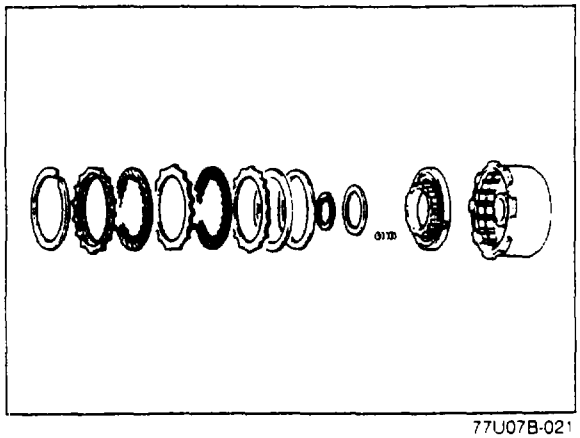
67U07B-111

2. Remove the snap ring with snap ring pliers after compressing the clutch spring with **clutch spring compressor** (49 0378 375).
3. Remove the spring retainer and spring.



5EG07B-118

4. Mount the direct clutch drum on the drum support.
5. Remove the piston by applying compressed air to the oil passage.



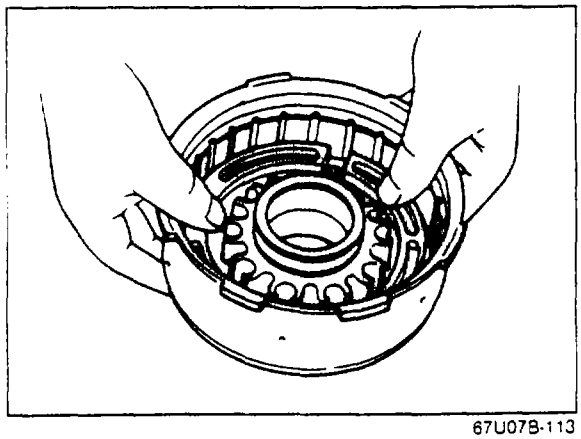
77U07B-021

Inspection

Check the following and replace or repair any faulty parts.

1. Damage or wear of drive plate facing.
2. Fracture or wear of snap ring.
3. Spring retainer deformation.
4. Spring fracture.
5. Degeneration of spring tension.
6. Ball movement of piston.

Free spring length: 30.5 mm (1.20 in)



67U07B-113

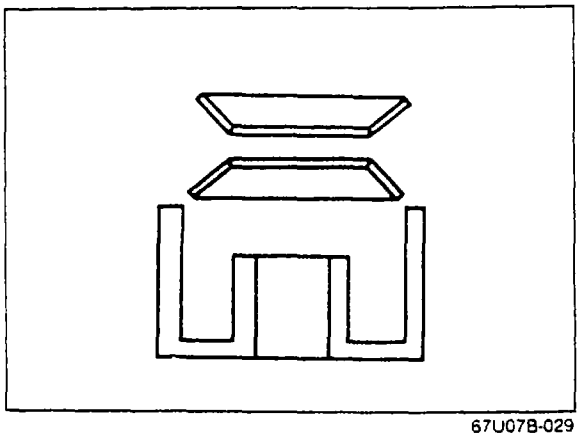
Assembly

1. Install the piston in the direct clutch drum.

Caution

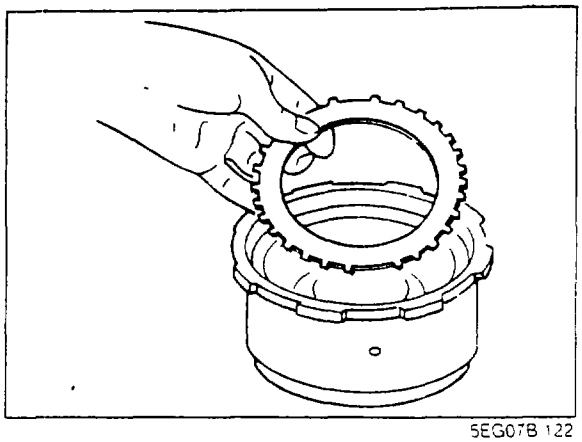
Apply even pressure to the perimeter of the piston to avoid damaging the seal rings when assembling the piston.

2. Install the springs and spring retainer and compress them with **clutch spring compressor** (49 0378 375).
3. Install the snap ring.



67U07B-029

4. Install the dished plates as shown in the figure.

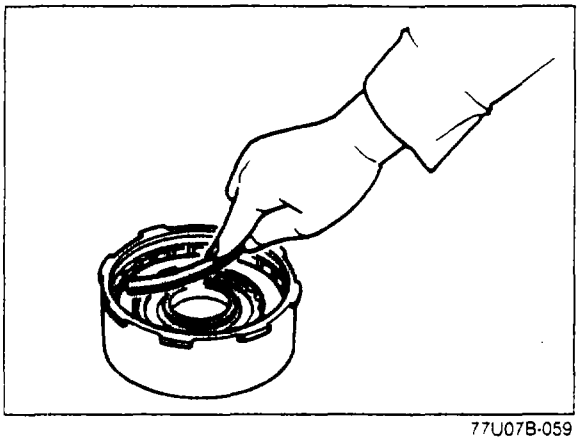


5EG07B 122

5. Install the driven plates, drive plates and retaining plate.

Caution
Align the notches of the driven plates with the lubrication hole of the clutch drum, and insert the plates into the drum.

6 Install the snap ring.



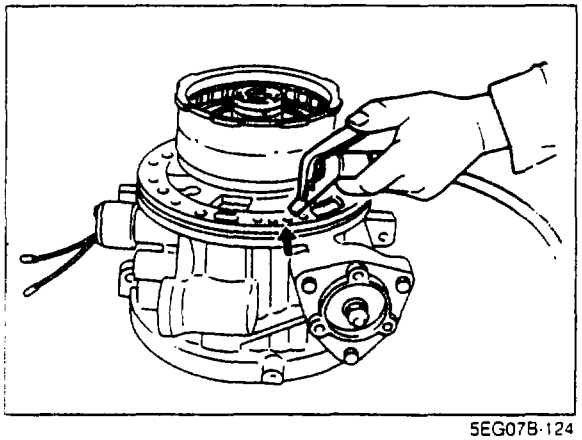
77U07B-059

7 Measure the clearance between the retaining plate and snap ring with a thickness gauge. Adjust the clearance with a retaining plate, if necessary.

Standard clearance:
1.6—1.8 mm (0.0630—0.0709 in)

Retaining plate sizes **mm (in)**

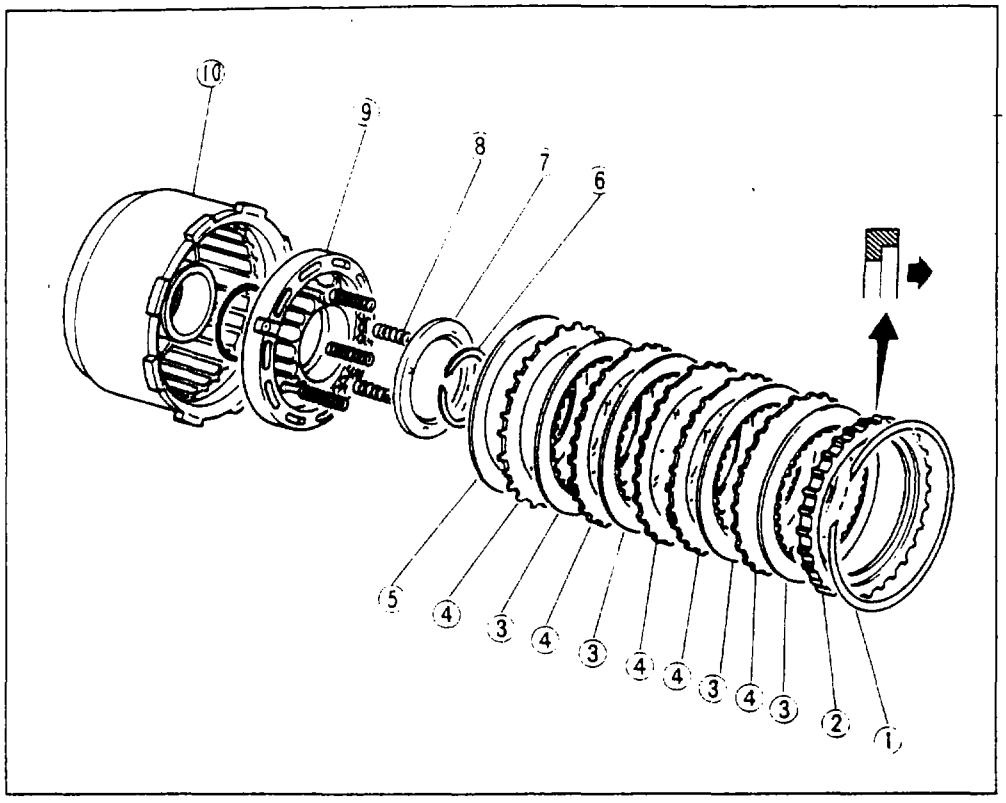
5.6 (0.220)	5 8 (0.228)	6.0 (0.236)
6 2 (0.244)	6 4 (0.252)	6.6 (0.260)
6 8 (0.268)	7.0 (0.276)	



5EG07B-124

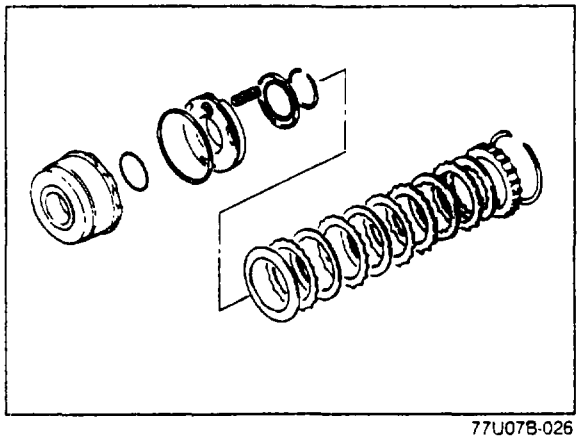
8. Check the direct clutch operation. Set the direct clutch on the drum support, and then apply compressed air to the oil passage.

FRONT CLUTCH
Components

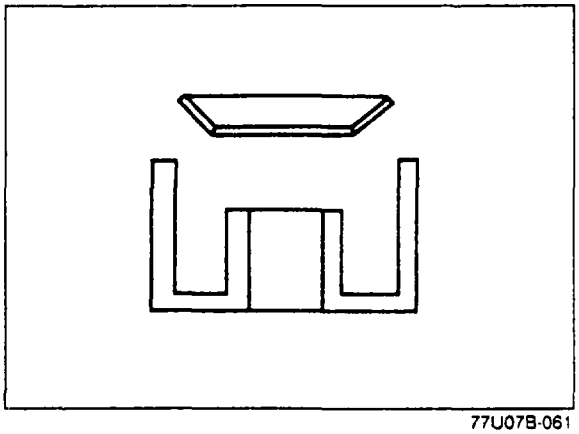


77U07B-060

1. Snap ring
2. Retaining plate
3. Drive plates
4. Driven plates
5. Dished plate
6. Snap ring
7. Spring retainer
8. Spring
9. Piston
10. Front clutch drum



77U07B-026



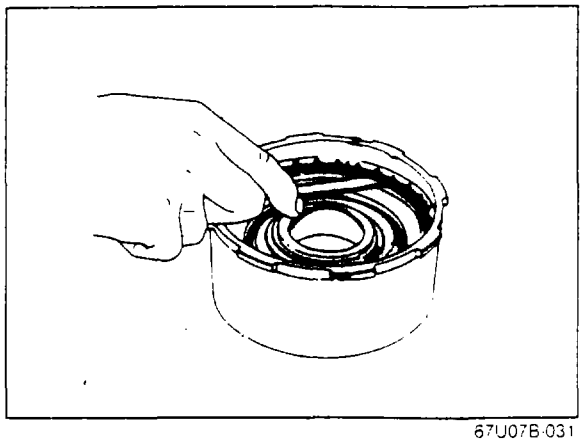
77U07B-061

Disassembly
The front clutch is disassembled the same as the direct clutch.

Inspection
Check the following and replace or repair any faulty part.
1. Damage or wear of drive plate facing.
2. Fracture or wear of snap ring.
3. Spring retainer deformation.
4. Degeneration of return spring tension.
5. Ball movement of piston.

Free spring length: 30.5 mm (1.20 in)

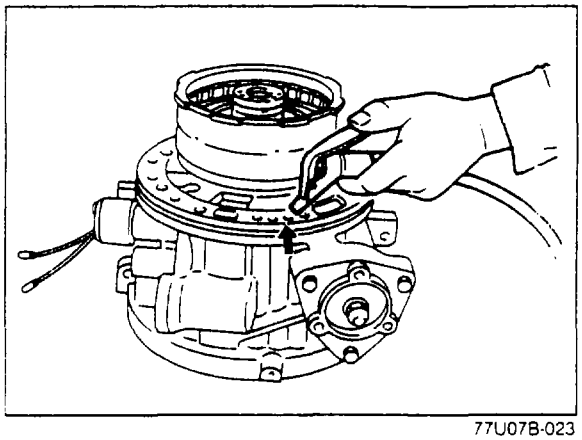
Assembly
1. The front clutch is assembled in the same way as the direct clutch. (Refer to 7B—39.)



67U07B-031

2 Measure and adjust the front clutch clearance.

Front clutch clearance:
1.6—1.8 mm (0.0630—0.0709 in)



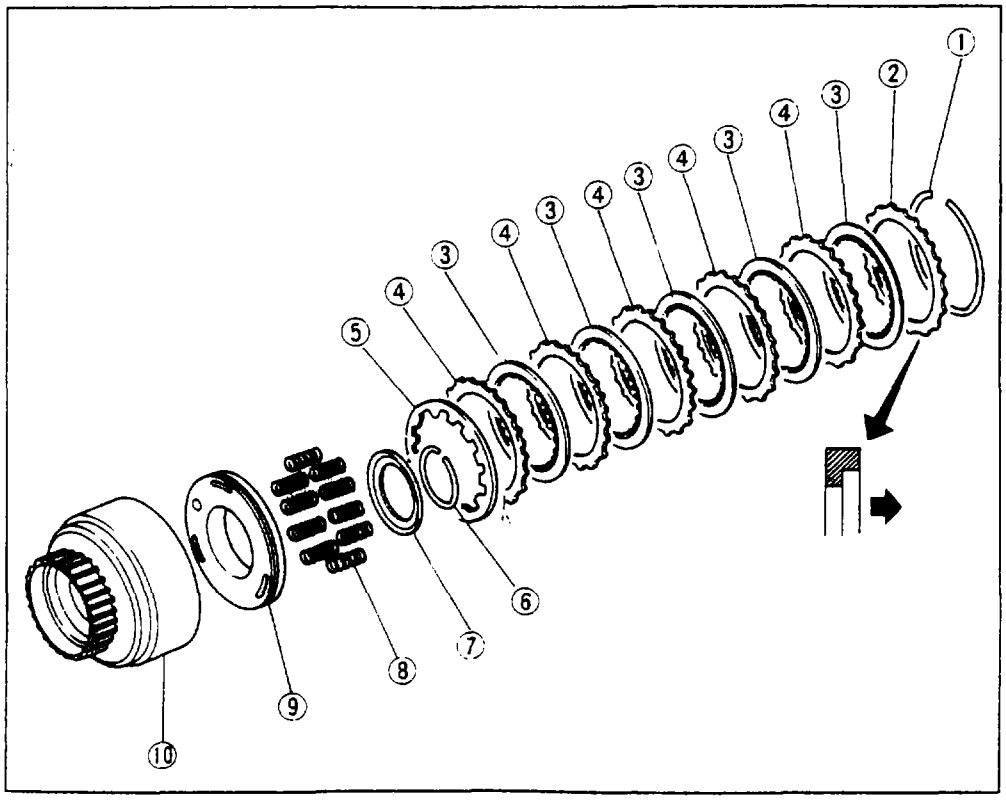
77U07B-023

Retaining plate sizes **mm (in)**

5.0 (0.197)	5.2 (0.205)	5.4 (0.213)
5.6 (0.221)	5.8 (0.228)	6.0 (0.236)
6.2 (0.244)		

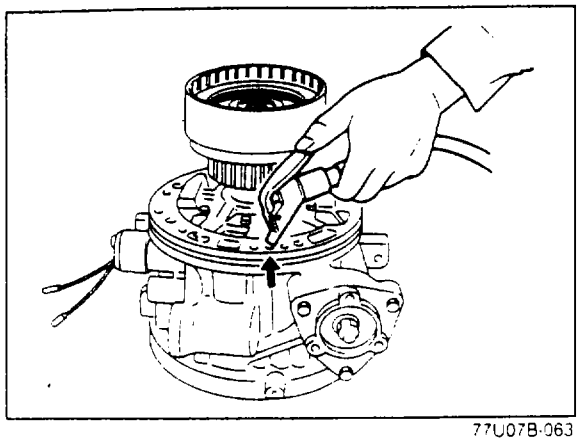
3. Check the front clutch operation by applying compressed air to the oil passage.

REAR CLUTCH
Components



77U07B-062

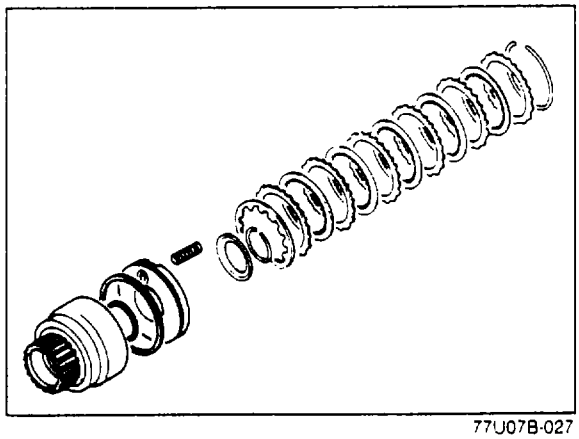
1. Snap ring
2. Retainer plate
3. Drive plates
4. Driven plates
5. Dished plate
6. Snap ring
7. Spring retainer
8. Spring
9. Piston
10. Rear clutch drum



77U07B-063

Disassembly

The rear clutch is disassembled in the same way as the direct clutch.



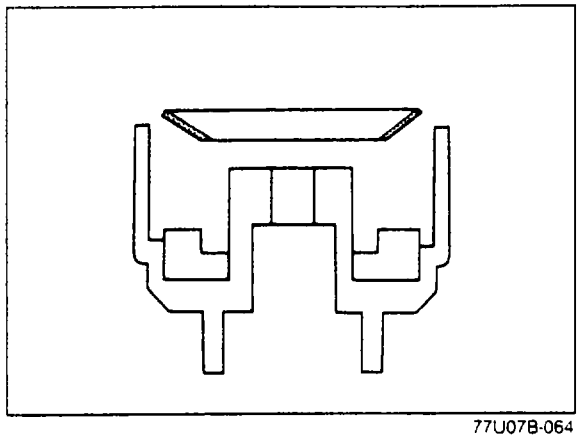
77U07B-027

Inspection

Check the following and replace or repair any faulty parts.

1. Damage or wear of drive plate facing
2. Fracture or wear of snap rings
3. Spring retainer deformation
4. Degeneration of return spring tension
5 Check ball movement of piston

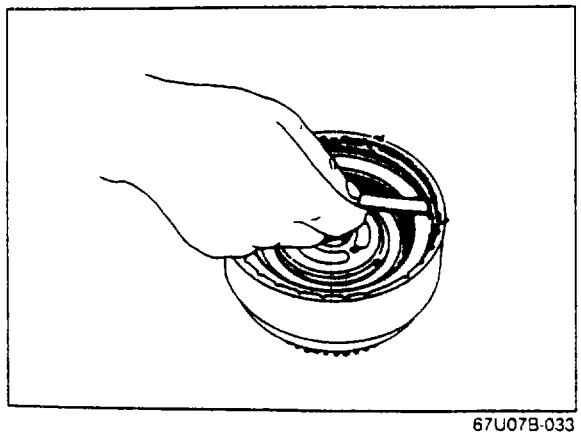
Free spring length: 30.5 mm (1.20 in)



77U07B-064

Assembly

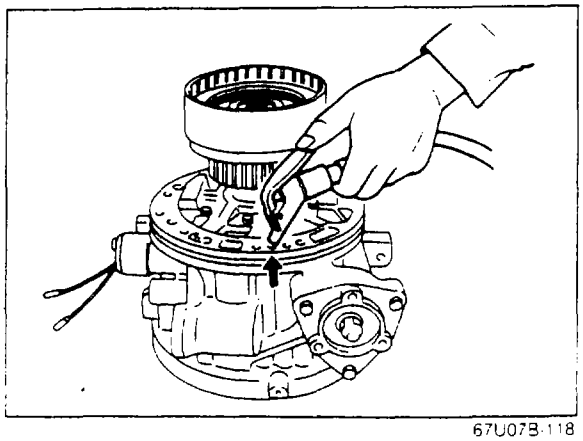
1. The rear clutch is assembled in the same way as the direct clutch.
2. Install the dished plate as shown in the figure.



67U07B-033

3. Measure and adjust the rear clutch clearance. Replace all drive and driven plates if the clearance is not within the standard.

Rear clutch clearance:
0.8—1.5 mm (0.031—0.059 in)

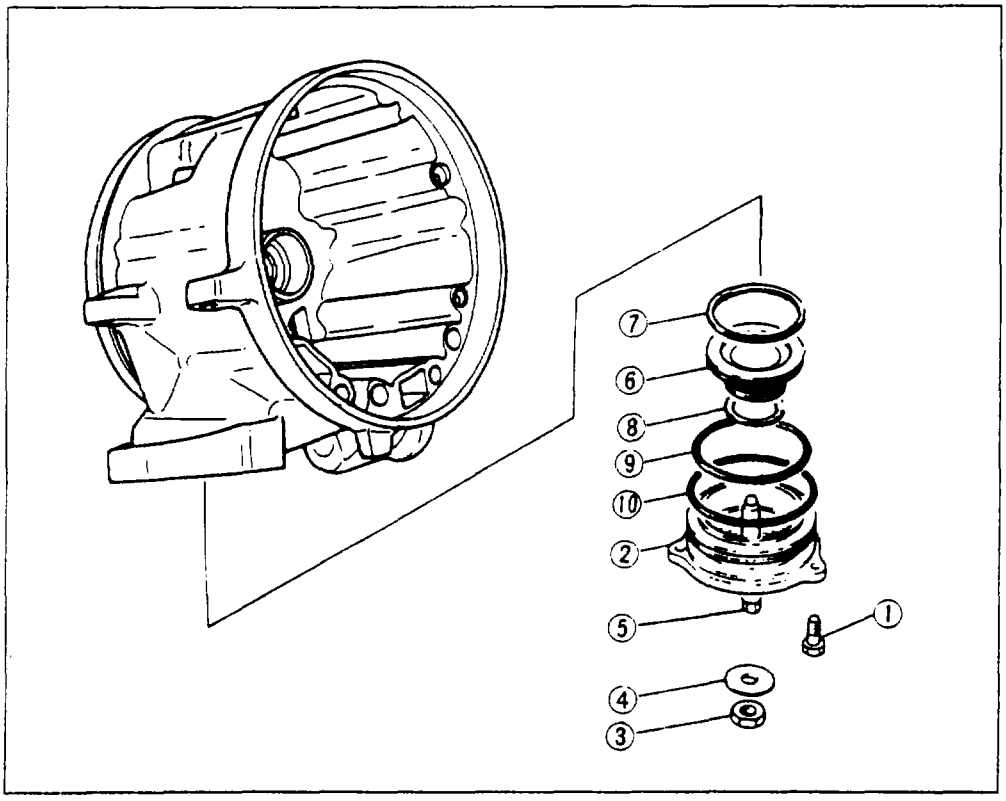


67U07B-118

4 Check the rear clutch operation. Set the rear clutch on the drum support, and apply compressed air to the oil passage.

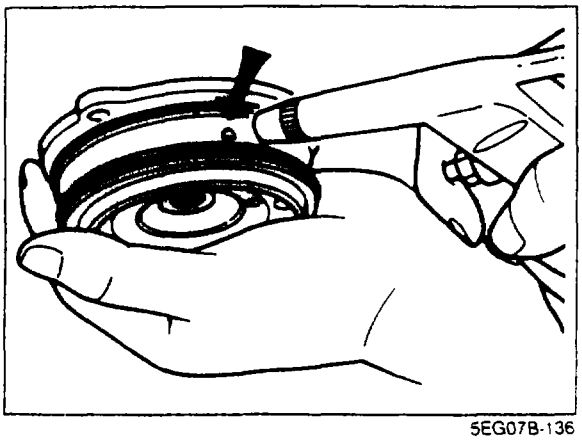
OD BAND SERVO

Component



1. Bolt
2. Body
3. Nut
4. Flat washer
5. Piston stem
6. Piston assembly
7. Piston seal
8. Piston seal
9. Lathe cut seal
10. "O" ring

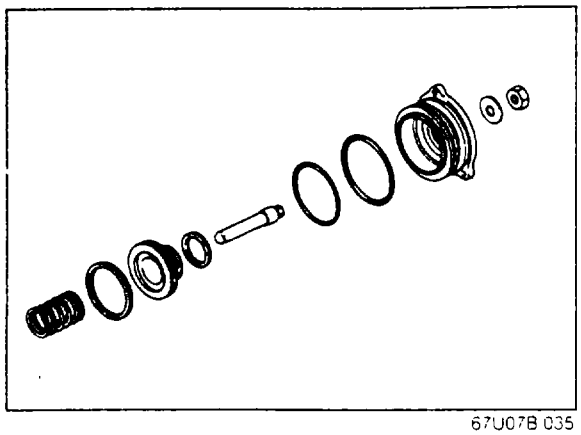
67U07B-034



5EG07B-136

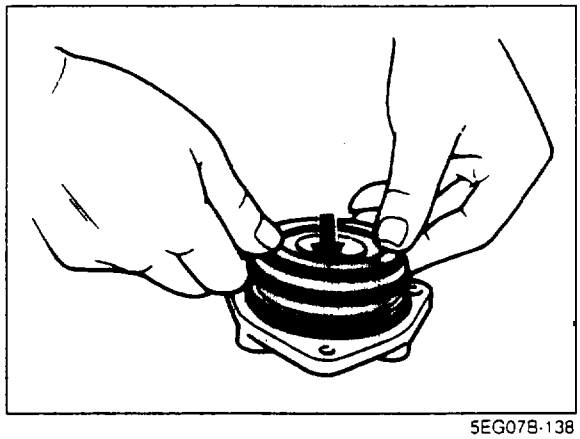
Disassembly

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



67U07B 035

Inspection
Check the following and replace or repair any faulty parts.
1. Damage or wear of piston stem.
2. Damage to individual seal rings.

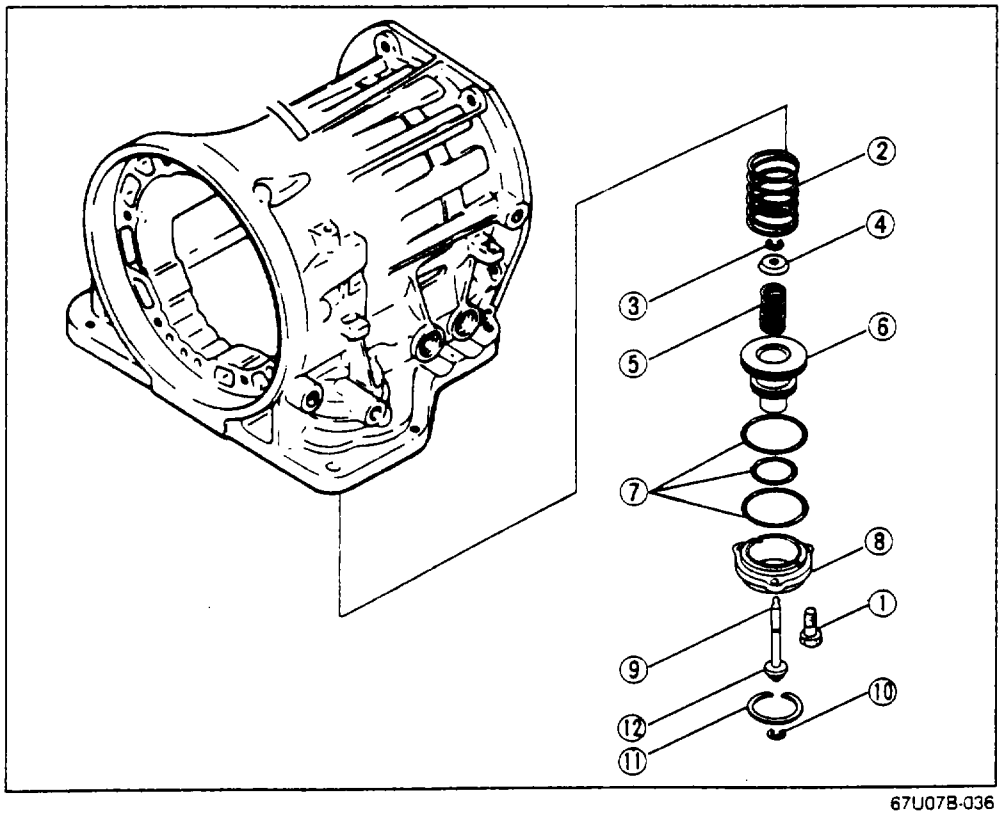


5EG07B-138

Assembly
Install the piston assembly into the body.

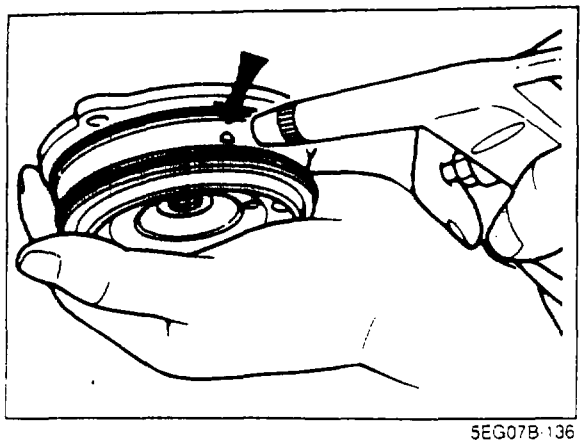
Caution
Apply even pressure to the perimeter of the piston to avoid damaging the seal rings when assembling the piston.

2ND BAND SERVO
Component



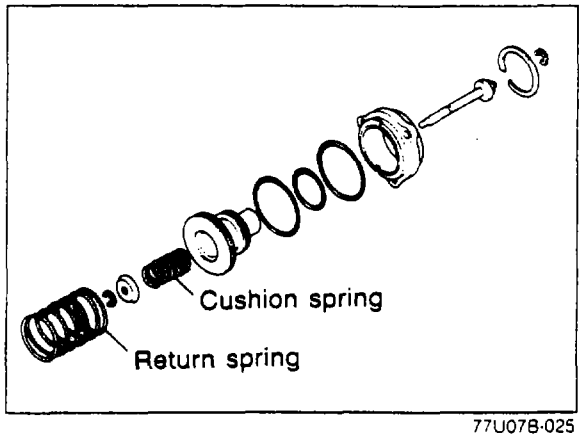
67U07B-036

1. Bolt
2. Spring
3. Clip
4. Spring retainer
5. Spring
6. Band servo piston
7. Piston seal
8. Servo retainer
9. Piston stem
10. Clip
11. Snap ring
12. Spacer



5EG07B-136

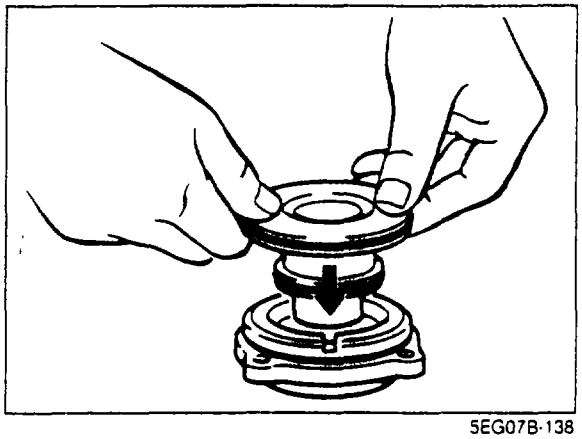
Disassembly
Remove the piston assembly from the body by applying compressed air to the oil passage hole.



77U07B-025

INSPECTION
Check the following and replace or repair any faulty parts.
1. Damage or wear of piston stem.
2. Damage to individual seal rings.
3. Degeneration of return spring or cushion spring.

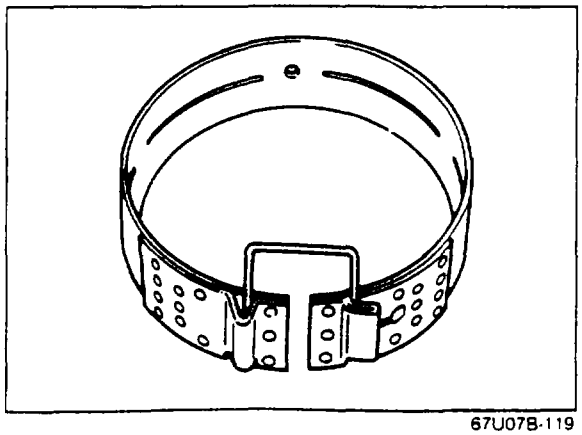
Free spring length:
Return: 36.0 mm (1.42 in)
Cushion: 42.8 mm (1.69 in)



5EG07B-138

Assembly
Install the piston assembly into the body.

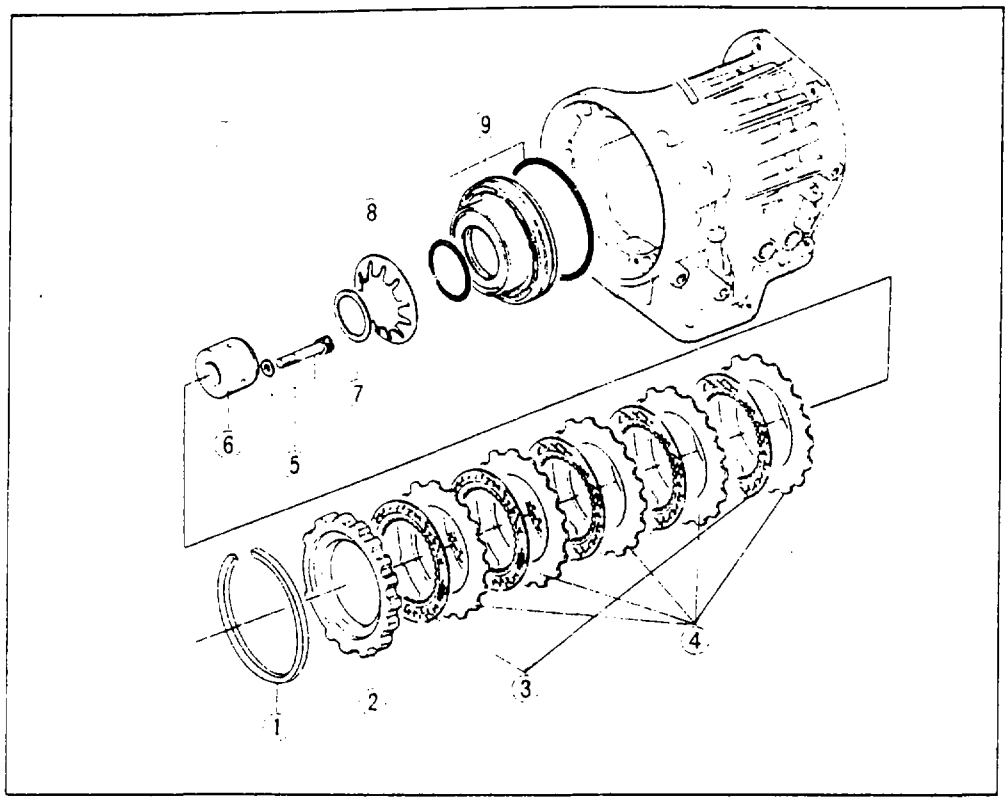
Caution
Apply even pressure to the perimeter of the piston to avoid damaging the seal rings when assembling the piston.



67U07B-119

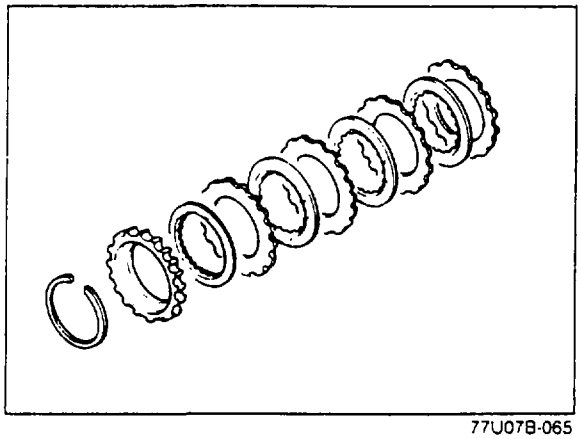
BRAKE BAND
Inspection
Check the following and replace any faulty part.
Crack or peeling of brake band or facing.

LOW AND REVERSE BRAKE
Components



5EG07B-140

1. Snap ring
2. Retaining plate
3. Drive plates
4. Driven plates
5. Bolt
6. One-way clutch inner race
7. Thrust washer
8. Return spring
9. Low and reverse brake piston, seal ring

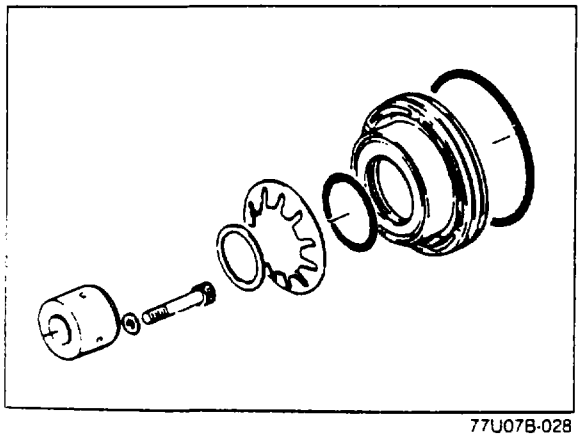


77U07B-065

Inspection

Check the following and replace or repair any faulty parts.

1. Damage or wear of drive plates.
2. Damage of driven plates.

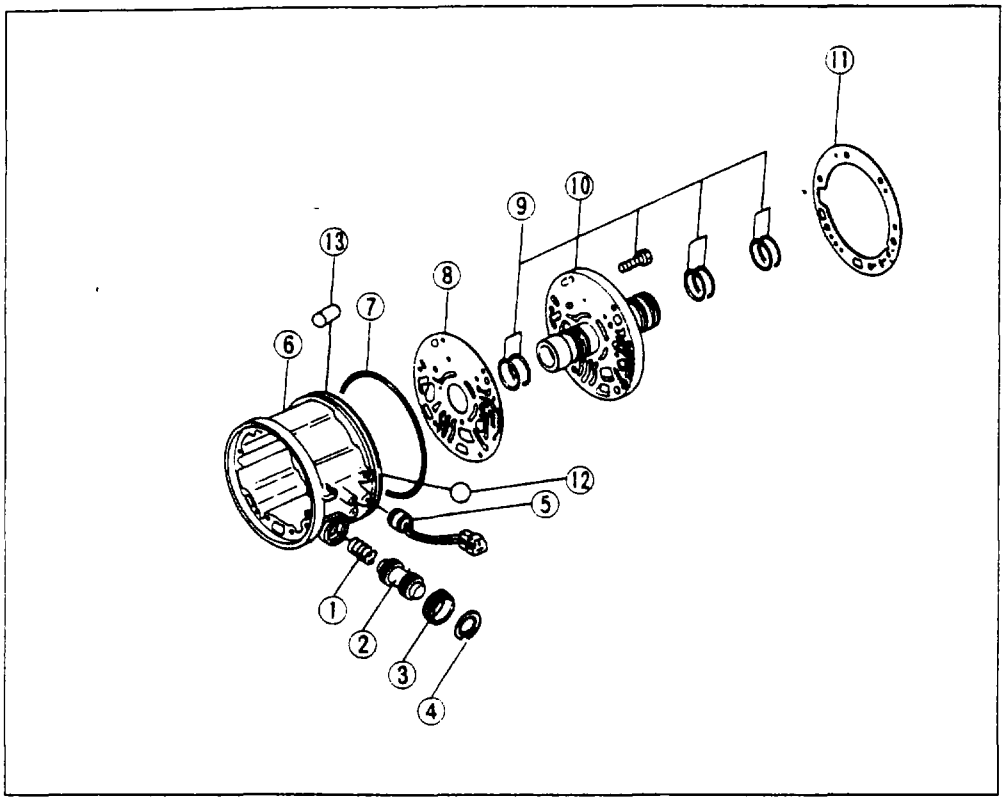


77U07B-028

3. Wear of one-way clutch inner race.
4. Damage to return spring or thrust washer.
5. Damage or wear of low and reverse brake piston or seal rings.
6. Ball movement of piston.

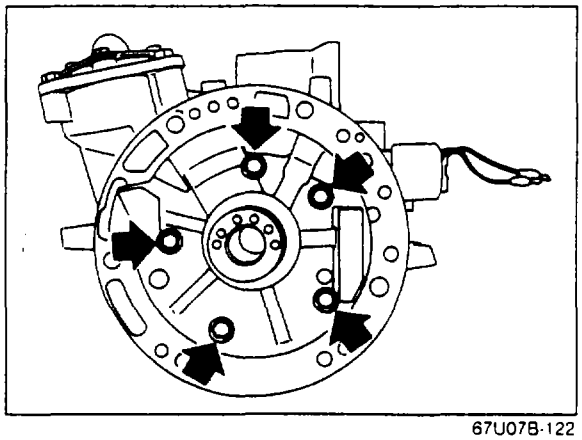
DRUM SUPPORT, ACCUMULATOR AND OD CASE

Components



1. Spring
2. Accumulator piston
3. Accumulator plug
4. Snap ring
5. OD cancel solenoid
6. OD case
7. Seal ring
8. Gasket
9. Seal ring
10. Drum support
11. Gasket
12. Steel ball
13. One-way valve

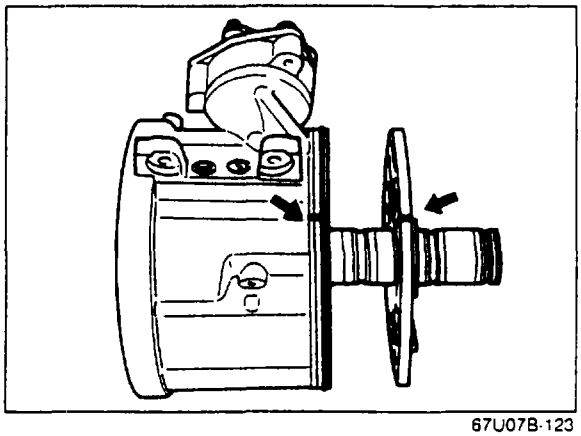
5EG07B-143



67U07B-122

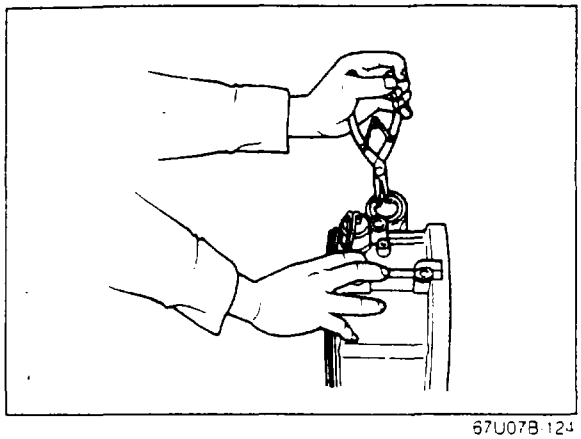
Disassembly

1. Remove the mounting bolts.



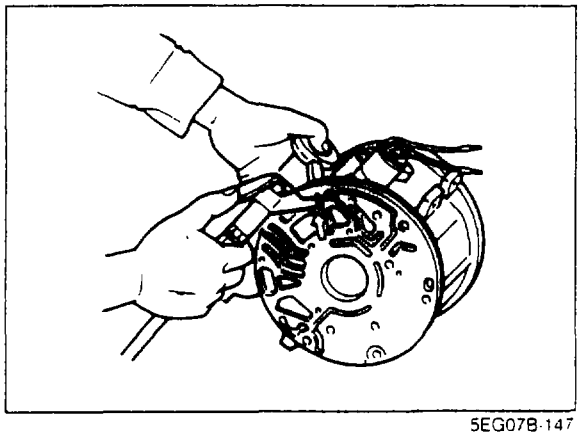
67U07B-123

2. Make matching marks on the OD case and drum support, and remove the drum support.



67U07B-124

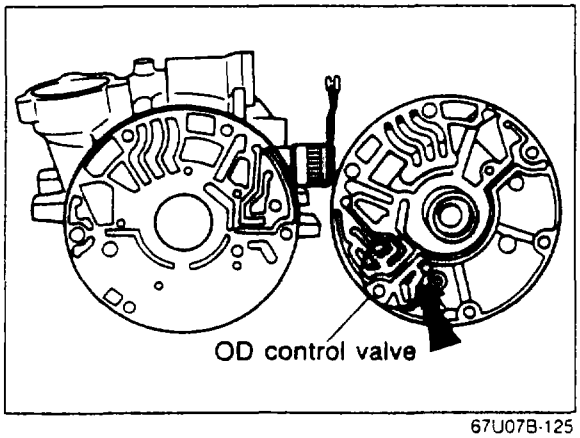
3. Remove the snap ring with snap ring pliers.



5EG07B-147

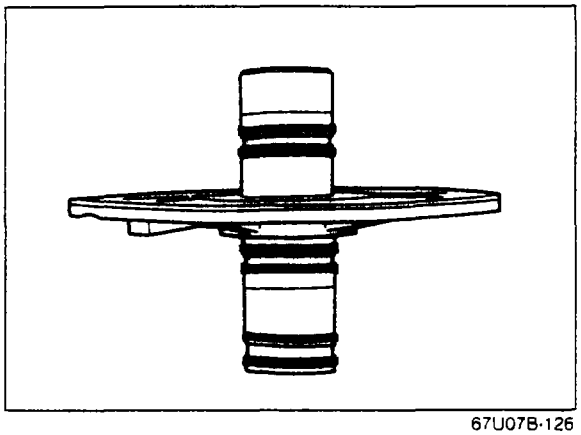
4. Blow out the oil passage with compressed air.
5. Remove the accumulator piston and spring.

Warning
Apply compressed air gradually to prevent residual oil from flying out.



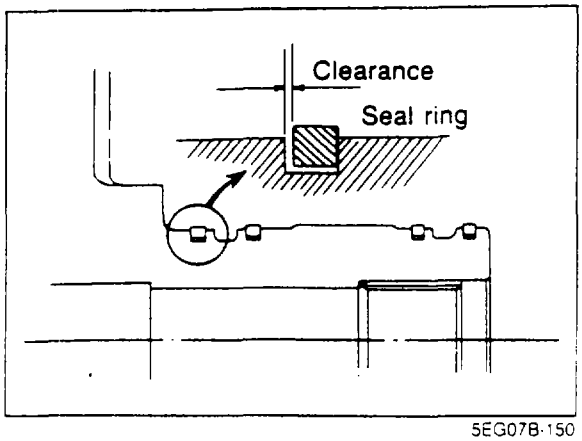
67U07B-125

Inspection
Drum support
Check the following and replace or repair any faulty parts.
1. Cracks in case.
2. Damage to oil passages.
3. Damage to gasket.
4. Damage to "O" ring.
5. OD control valve functions.



67U07B-126

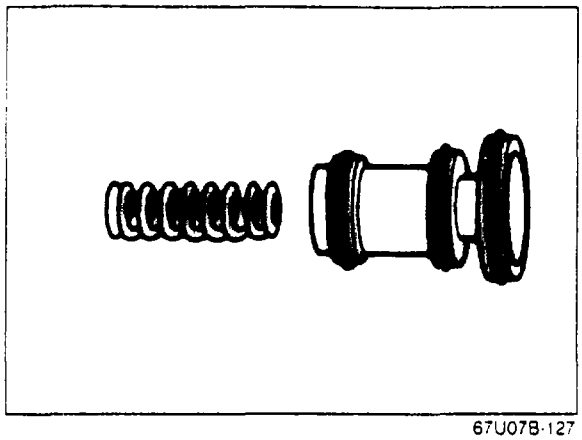
6. Fracture and wear of drum support seal rings



5EG07B-150

7. Measure the clearance between the seal ring and seal ring channel.

Standard clearance:
0.04—0.16 mm (0.0016—0.0063 in)
Clearance: 0.40 mm (0.0157 in) max.

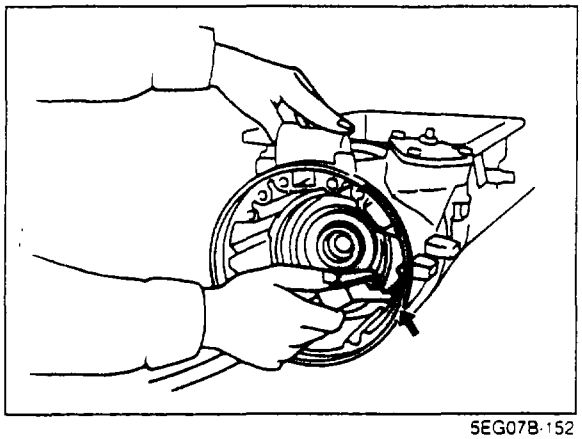


67U07B-127

Accumulator

Check the following and replace any faulty parts.
1. Damage or wear of piston.
2. Fracture or wear of snap ring.
3. Damage to seal rings.
4. Degeneration of return spring tension.

Free spring length: 39.7 mm (1.56 in)



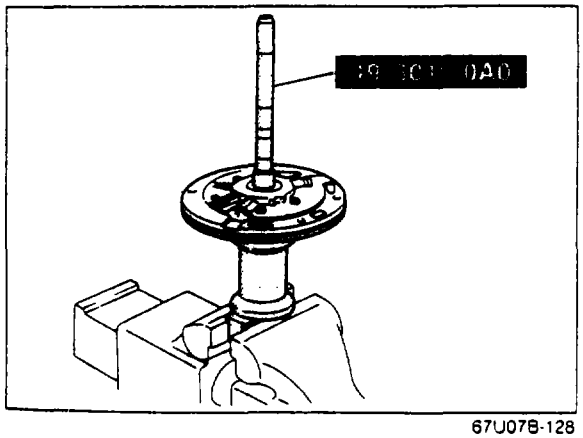
5EG07B-152

Assembly

1. Install the spring, accumulator piston, accumulator plug and snap ring.

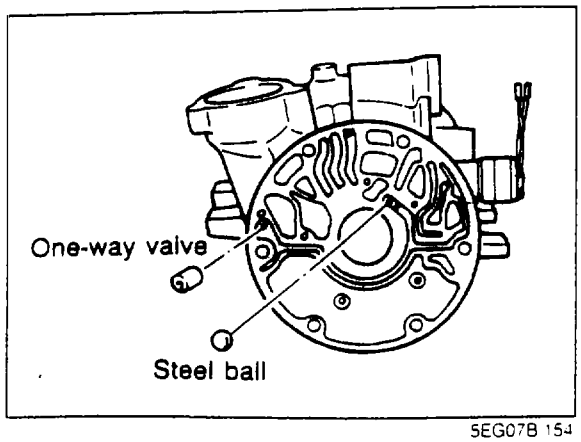
Caution
Apply even pressure to the perimeter of the piston to avoid damaging the seal rings when assembling the piston.

2. Check the accumulator operation by applying compressed air pressure to the oil passage.



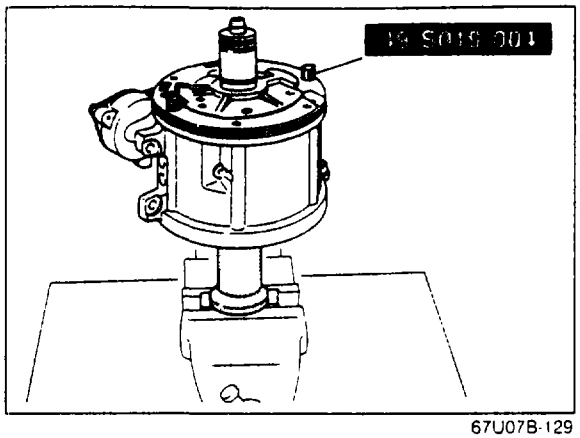
67U07B-128

3. Install the oil pump to **center tool set** (49 S019 0A0).
4. Mount the OD case on the oil pump.



5EG07B 154

5. Install the one-way valve and steel ball in position.



67U07B-129

6. Install the drum support on the OD case and align the matching marks.
7. Install **pins** (49 S019 004).
8. Tighten the drum support mounting bolts.

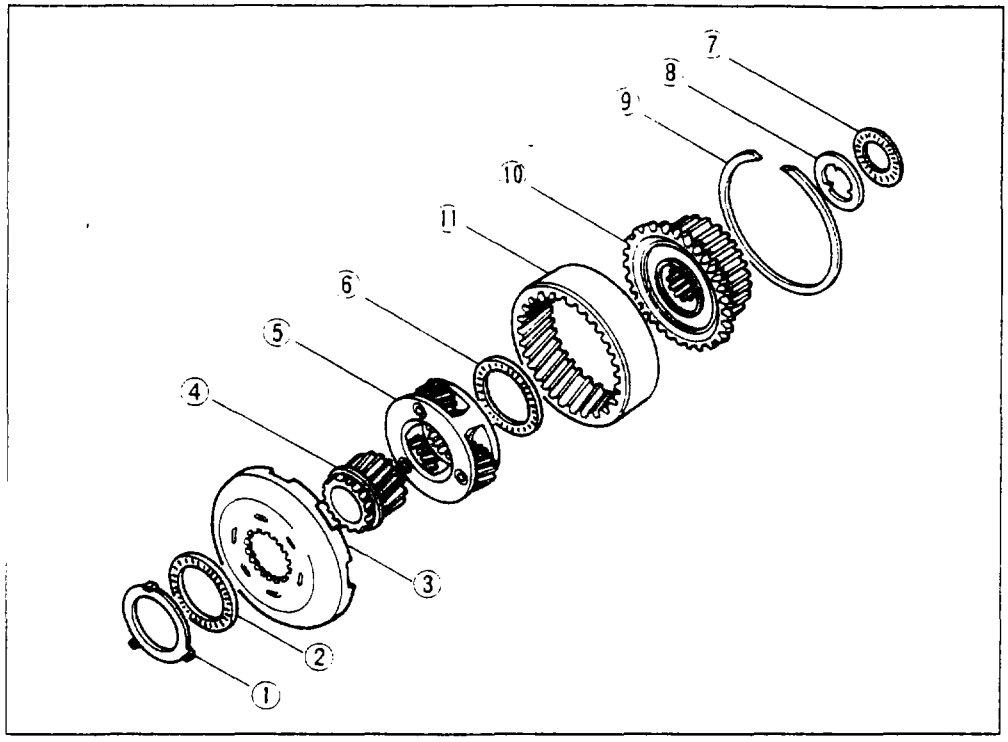
Tightening torque:
6.9—8.8 N·m (70—90 cm-kg, 61—78 in-lb)

OD PLANETARY GEAR UNIT

Disassembly and Assembly

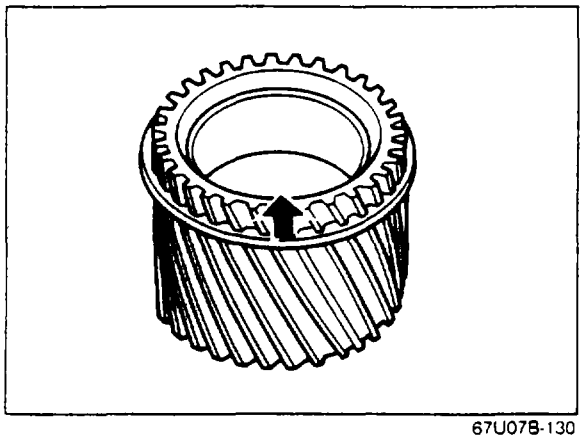
1. Disassemble in the sequence shown in the figure.
2. Assemble in the reverse order of disassembly.

67U07B-038



1. Bearing race
2. Bearing
3. Connecting shell
4. Sun gear
5. OD planetary pinion carrier
6. Bearing
7. Bearing
8. Bearing race
9. Snap ring
10. OD clutch hub
11. Internal gear

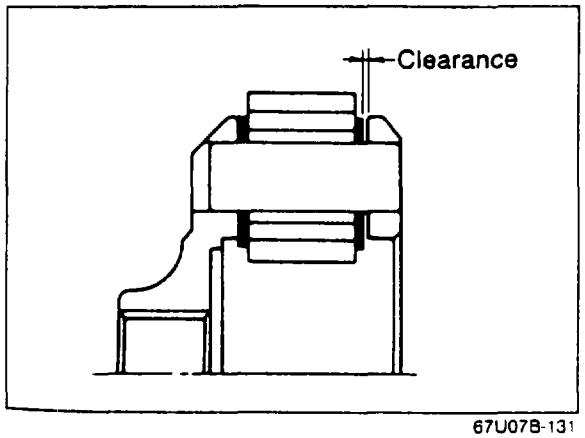
67U07B 039



67U07B-130

Sun gear

Pay close attention to the front and rear direction of the sun gear when inserting. The grooved side, indicated in the figure by an arrow, is the front.



67U07B-131

Inspection

Check the following and replace any faulty parts.

1. Fracture and wear of snap ring.
2. Wear of individual gears.
3. Rotation of front carrier pinion gear.
4. Measure the clearance between the pinion washer and planetary pinion carrier.

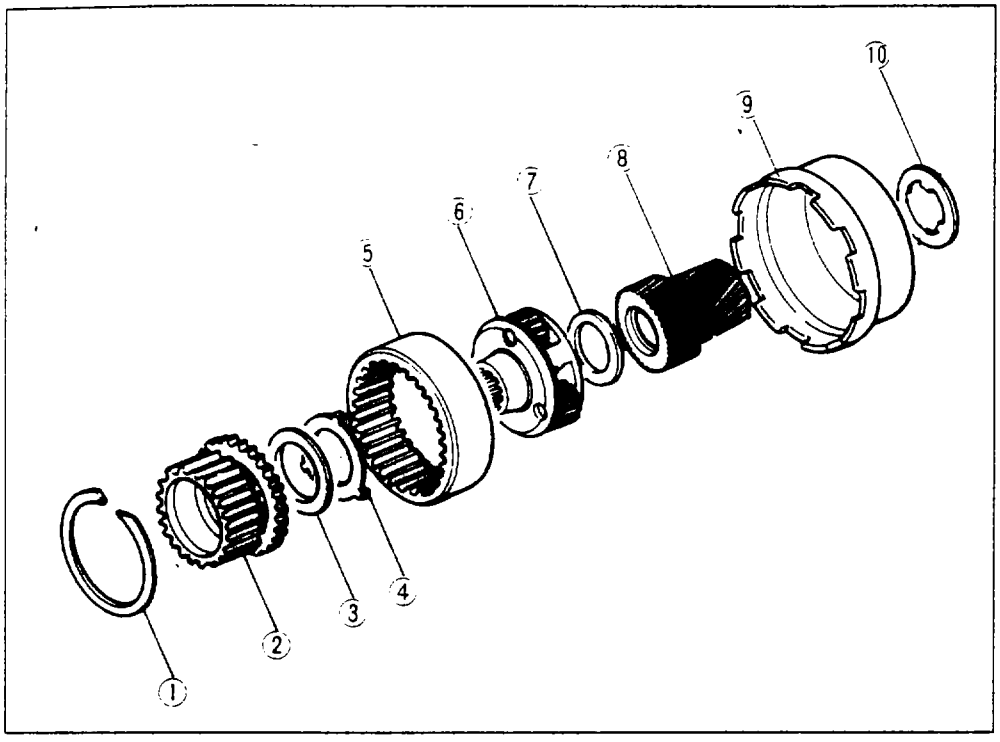
Standard clearance:
0.2—0.7 mm (0.0079—0.0276 in)
Limit: 0.8 mm (0.0315 in) max.

FRONT PLANETARY GEAR UNIT

Disassembly and Assembly

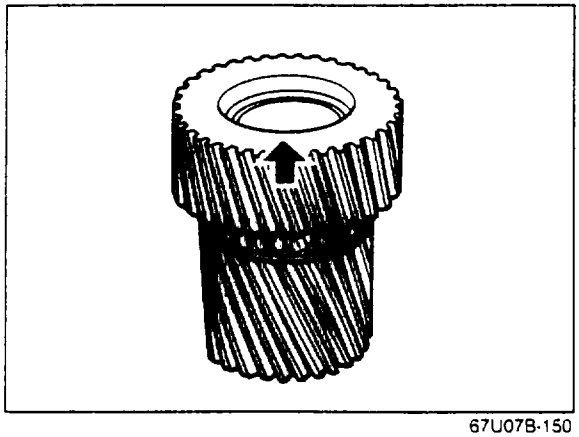
1. Disassemble in the sequence shown in the figure.
2. Assemble in the reverse order of disassembly.

67U07B-132



1. Snap ring
2. Rear clutch hub
3. Bearing
4. Bearing race
5. Internal gear
6. Front planetary pinion carrier
7. Bearing
8. Sun gear
9. Connecting shell
10. Bearing race

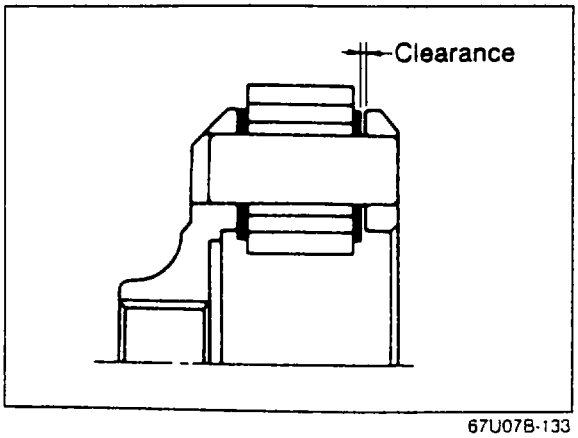
67U07B-040



67U07B-150

Sun gear

Pay close attention to the front and rear direction of the sun gear when inserting. The grooved side, indicated in the figure by an arrow, is the front.



67U07B-133

Inspection

Check the following and replace any faulty parts.

1. Fracture and wear of snap ring.
2. Wear of individual gears.
3. Rotation of front carrier pinion gear.
4. Measure the clearance between the pinion washer and planetary pinion carrier.

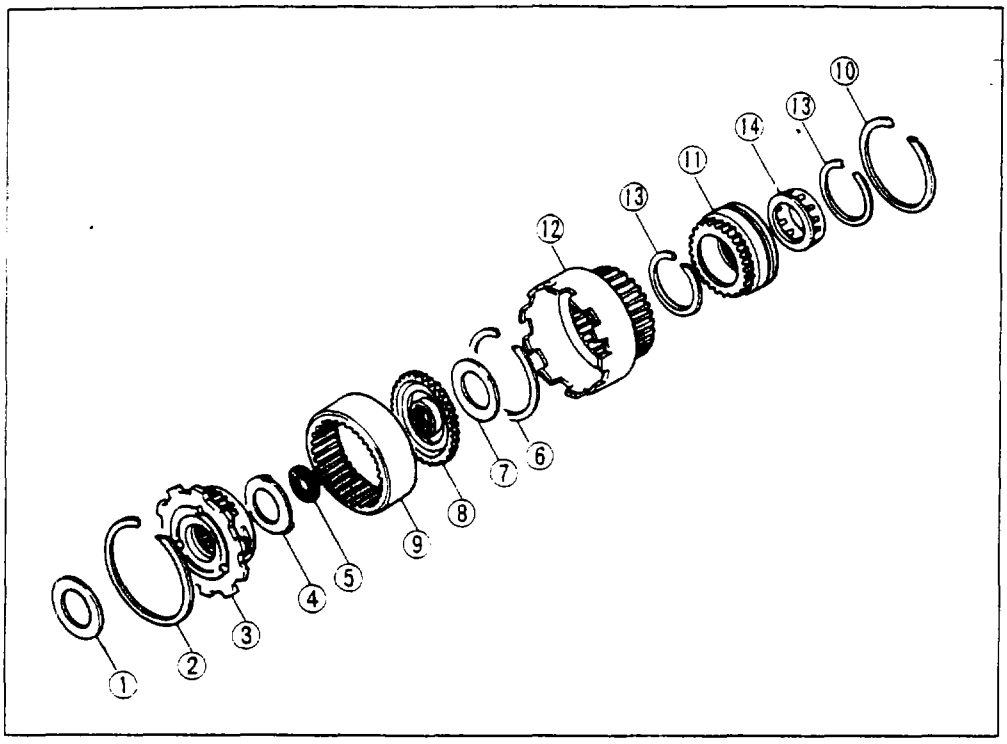
Standard clearance:
0.2—0.7 mm (0.0079—0.0276 in)
Clearance: 0.8 mm (0.0315 in) max.

REAR PLANETARY GEAR UNIT

Disassembly and Assembly

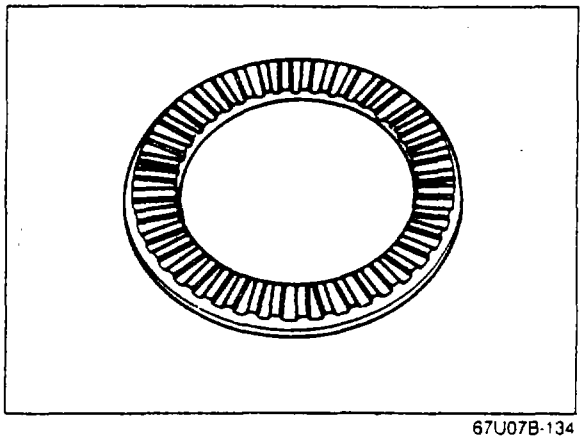
1. Disassemble in the order shown in the figure.
2. Assemble in the reverse order of disassembly.

67U07B-151



77U07B-066

1. Bearing
2. Snap ring
3. Rear planetary pinion carrier
4. Bearing race
5. Bearing
6. Snap ring
7. Bearing
8. Drive flange
9. Internal gear
10. Snap ring
11. Outer race
12. Connecting drum
13. Snap rings
14. One-away clutch

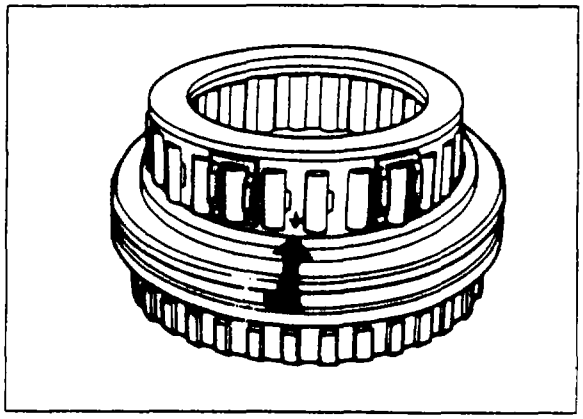


67U07B-134

Inspection

Check the following and replace or repair any faulty parts.

1. Fracture or wear of snap ring.
2. Damage or wear of individual gears.
3. Rotation and damage or wear on bearing.



67U07B-135

4. Rotation and wear of one-way clutch.

Caution

a) Install the side indicated by an arrow in the figure toward the front when inserting the one-way clutch into the one-way clutch outer race.

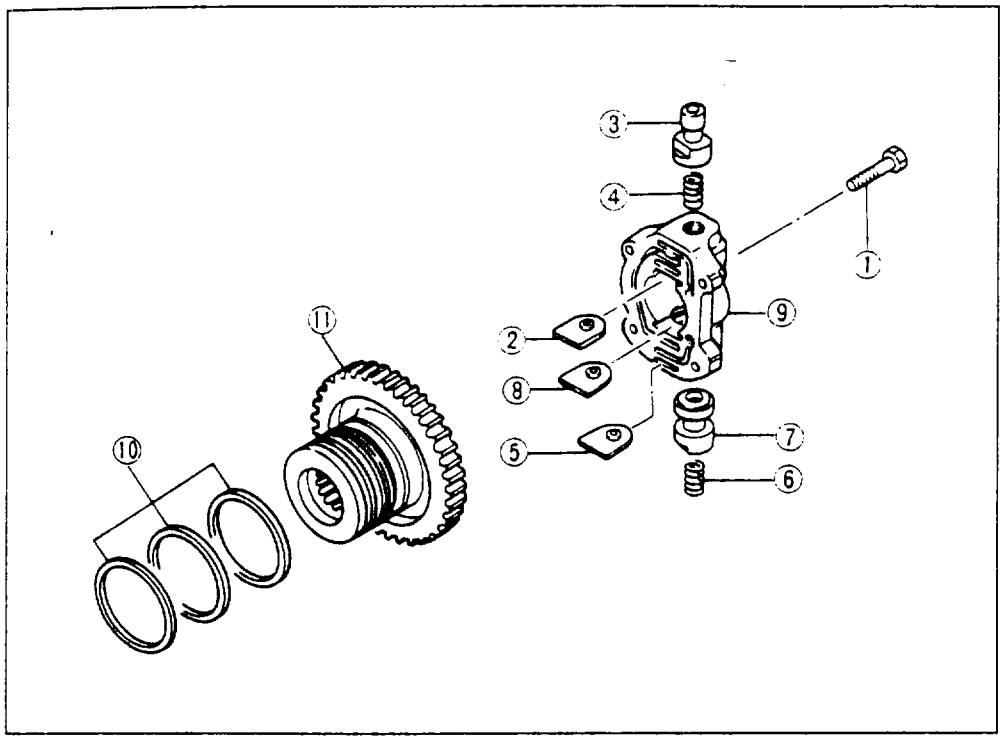
b) Check that the rotation is restricted to one direction and that it rotates smoothly.

OIL DISTRIBUTOR AND GOVERNOR

Disassembly and Assembly

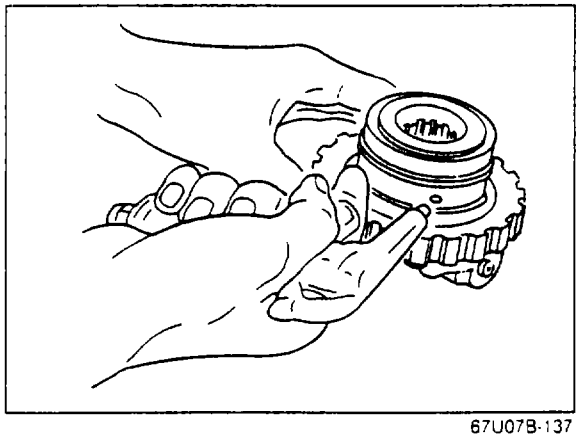
1. Disassemble in the sequence shown in the figure.
2. Assemble in the reverse order of disassembly.

67U07B-136



1. Bolt
2. Retainer plate
3. Secondary governor valve
4. Secondary spring
5. Retainer plate
6. Primary spring
7. Primary governor valve
8. Retainer plate
9. Valve body
10. Seal ring
11. Oil distributor

67U07B-042



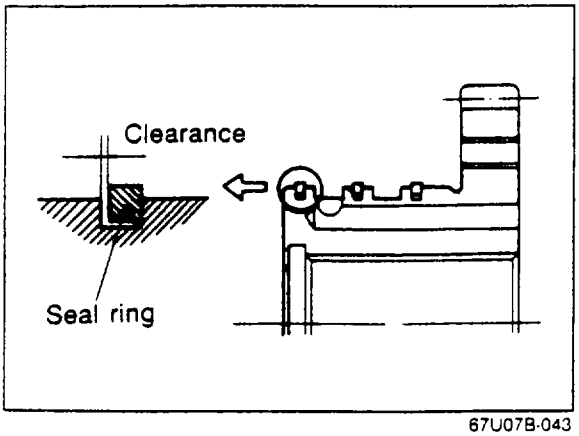
67U07B-137

Inspection

Check the following and replace or repair any faulty parts.

1. Damage or wear of valve.
2. Freedom of valve.
   Check that the valve moves slightly, and that a vibrating sound is heard when compressed air is applied as shown in the figure.

Caution
The compressed air must be under 500 kPa (5.0 kg/cm^2, 71 psi) and should not be applied for over 5 seconds.



67U07B-043

3. Weak spring.

   Free spring length:
   Primary: 21.8 mm (0.86 in)
   Secondary: 25.2 mm (0.99 in)

4. Measure the clearance between the seal rings and seal ring grooves.

   Standard clearance:
   0.04—0.16 mm (0.0016—0.0063 in)
   Clearance: 0.40 mm (0.0157 in) max.

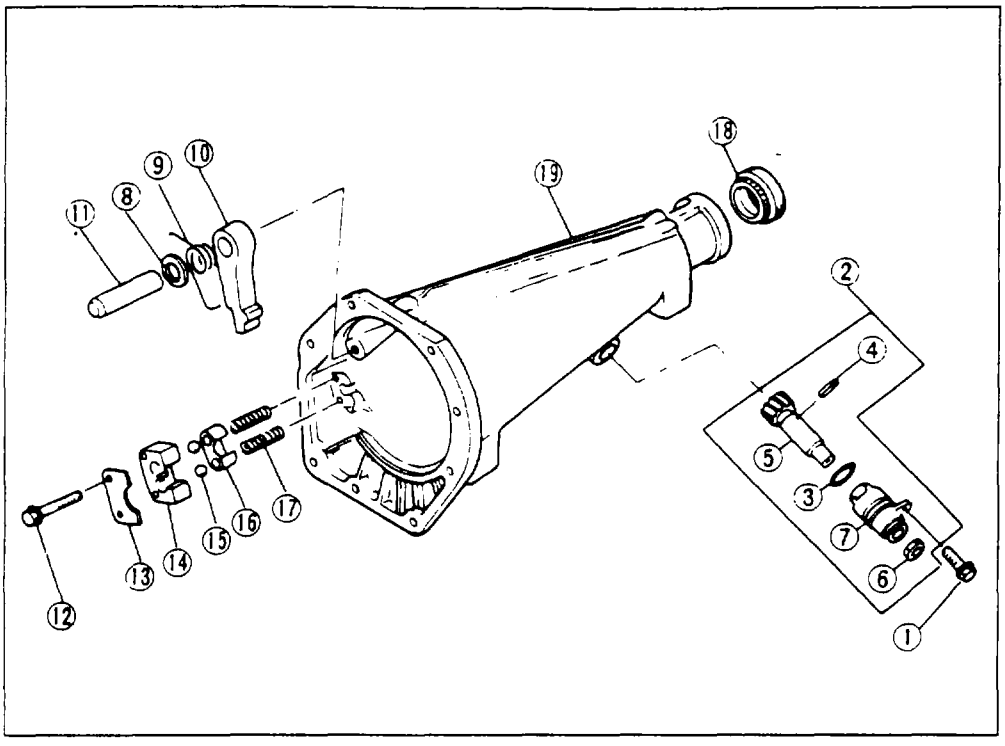
5. Damage to seal ring.

EXTENSION HOUSING

Disassembly and Assembly

1. Disassemble in the sequence shown in the figure.
2. Assemble in the reverse order of disassembly.

67U07B-138



1. Bolt
2. Speedometer drive gear assembly
3. "O" ring
4. Spring pin
5. Driver gear
6. Oil seal
7. Gear case
8. Dowel spacer
9. Return spring
10. Parking pawl
11. Pawl shaft
12. Bolt
13. Retaining plate
14. Actuator support
15. Steel ball
16. Retainer
17. Spring
18. Oil seal
19. Housing

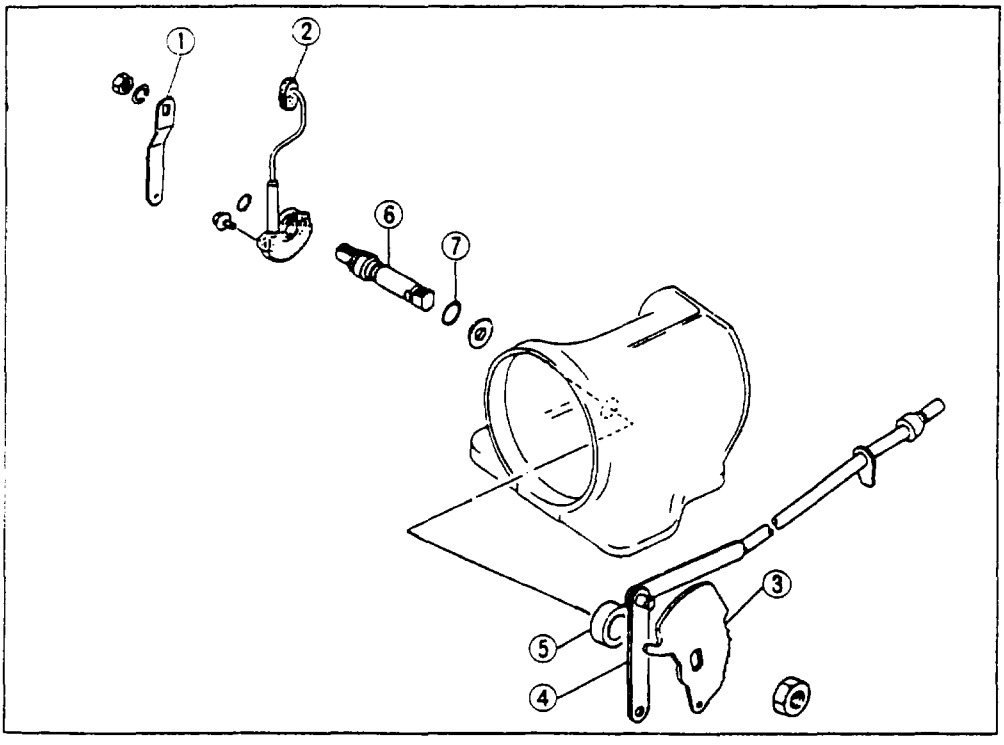
5EG07B-166

TRANSMISSION CASE

Disassembly and Assembly

1. Disassemble in the sequence shown in the figure.
2. Assemble in the reverse order of disassembly.

67U07B-139



1. Selector lever
2. Inhibitor switch
3. Manual plate
4. Parking rod
5. Spacer
6. Manual shaft
7. "O" ring

5EG07B-168

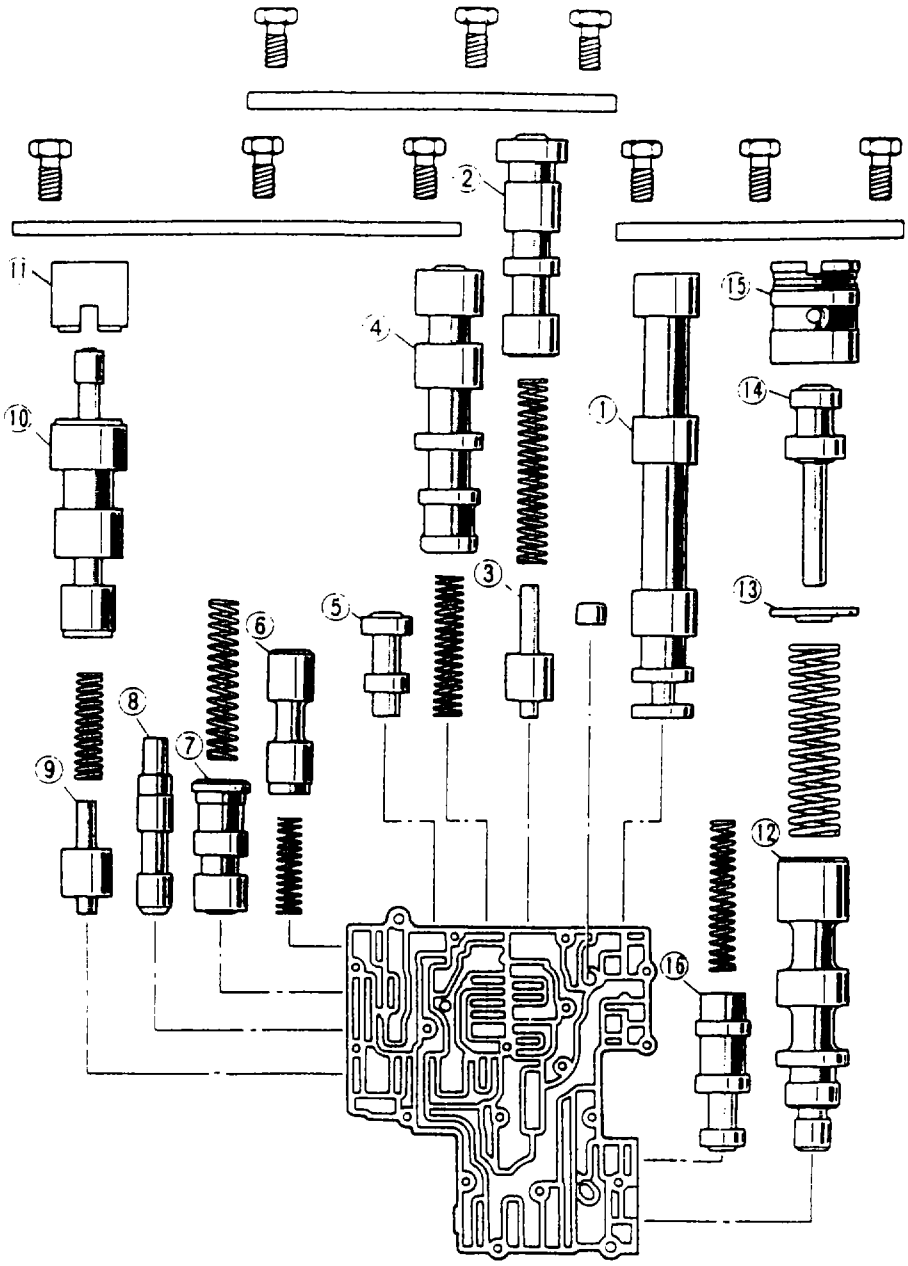
CONTROL VALVE

Precaution

1. Always pay close attention when handling the control valve, because it is composed of the most precise and delicate parts of the transmission.
2. Always neatly arrange the removed parts in order to avoid mixing up similar parts.
3. Always disassemble the control valve assembly and thoroughly clean it when the clutch and/or brake bands are burned and/or when the automatic transmission fluid is degenerated.

Components

Upper valve body



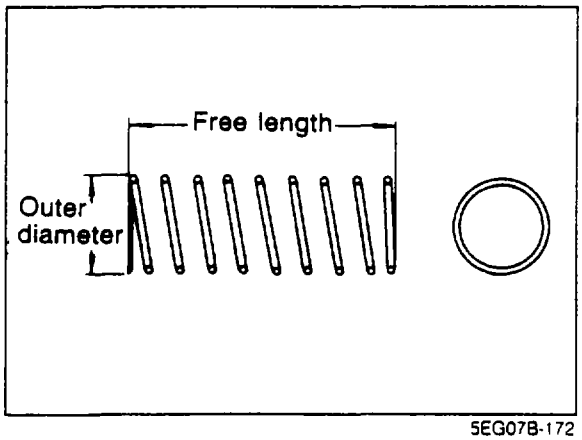
5EG07B-169

1. Manual valve
2. 2—3 Shift valve
3. 2—3 Shift plug
4. 1—2 Shift valve
5. Pressure modifier valve
6. Solenoid down-shift valve
7. Throttle back-up valve
8. Throttle valve
9. 3—4 Shift plug
10. 3—4 Shift valve
11. 3—4 Shift sleeve
12. Pressure regulator valve
13. Spring seat
14. Pressure regulator plug
15. Pressure regulator sleeve
16. Second lock valve

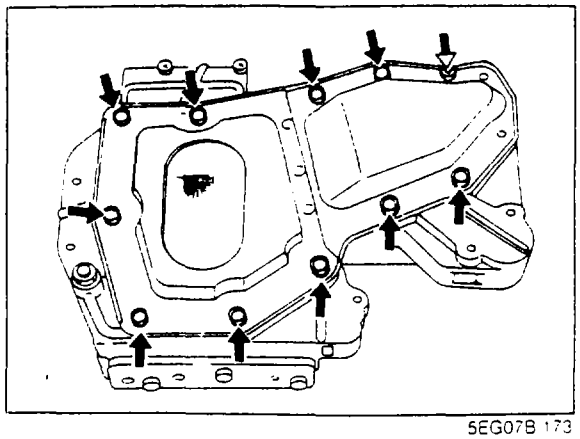
Valve Body Spring Chart

Spring	Outer dia. mm (in)	Free length mm (in)	No. of Coils	Wire dia. mm (in)
Pressure regulator	11.7 (0 46)	43.0 (1.69)	15.0	1.2 (0.047)
1—2 Shift valve	6.55 (0 26)	32.0 (1.26)	18.7	0 55 (0.022)
2—3 Shift valve	6.9 (0 27)	39.0 (1.55)	19.1	0.7 (0.028)
3—4 Shift valve	7 3 (0 29)	25.0 (0.98)	13.0	0.9 (0.035)
Throttle back up	7 3 (0 29)	31.8 (1.25)	15.5	0.8 (0.031)
Solenoid down shift	5.55 (0.22)	21.9 (0.86)	14 0	0.55 (0.022)
2nd Lock	5.55 (0.22)	33.5 (1.32)	18.0	0.55 (0.022)
Throttle relief	6 5 (0 26)	26.8 (1.06)	16.0	0 90 (0.035)
Orifice check	5.0 (0 20)	15.5 (0.61)	12.0	0.23 (0.0091)
3—2 Timing	7 5 (0.30)	23.2 (0.91)	10.8	0.80 (0.031)

67U07B-044



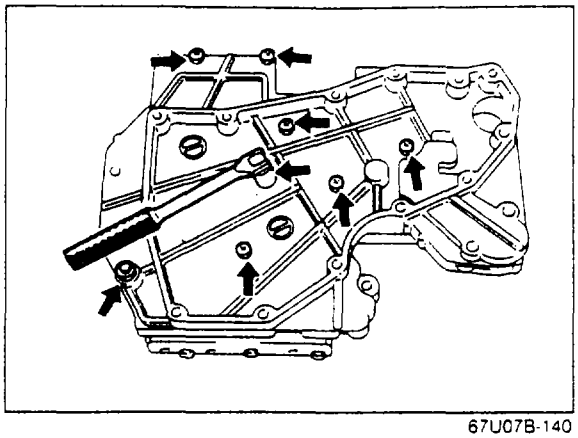
5EG07B-172



5EG07B-173

Disassembly

1. Remove the oil strainer.

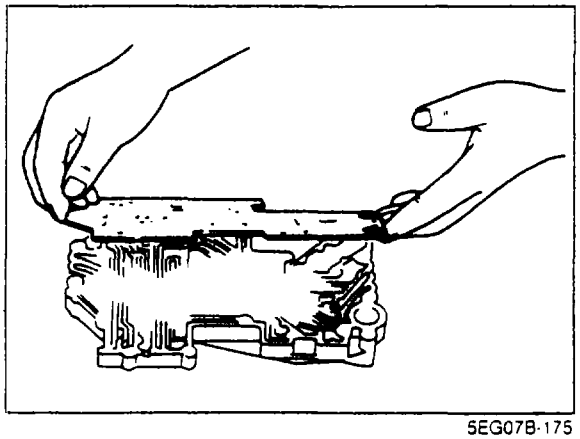


67U07B-140

2. Remove the lower valve body mounting bolts and nuts and remove the lower valve body

Caution

Use a socket wrench; do not use a screwdriver.

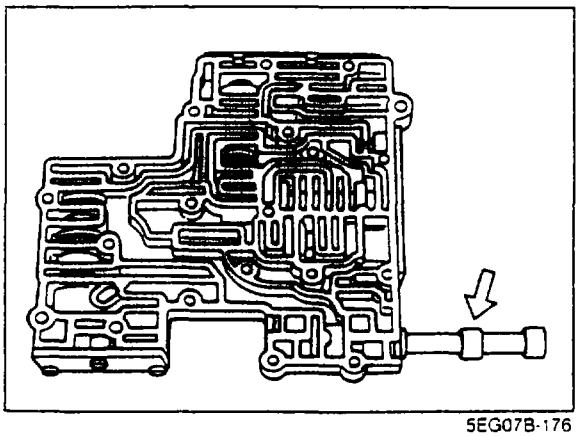


5EG07B-175

3. Turn over the valve body assembly and remove the upper body with separate plate from the lower body.
4. Remove the separate plate, orifice check valves, throttle relief ball and springs.

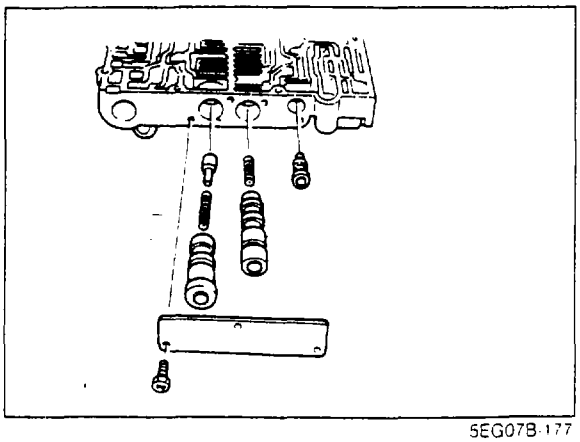
Caution

Remove the separate plate gently to avoid losing the orifice check valve and spring, as well as the throttle relief ball and spring in the valve body.



5EG07B-176

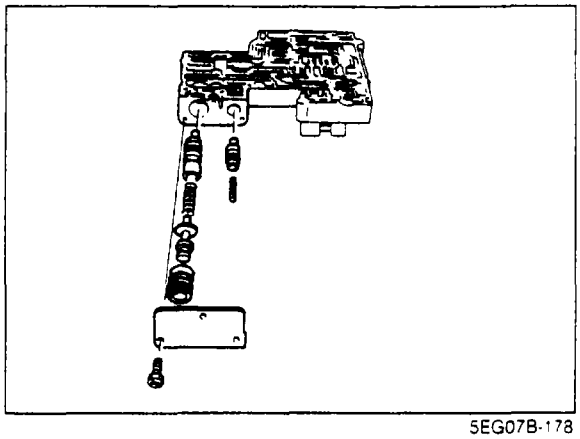
5. Remove the manual valve.



5EG07B-177

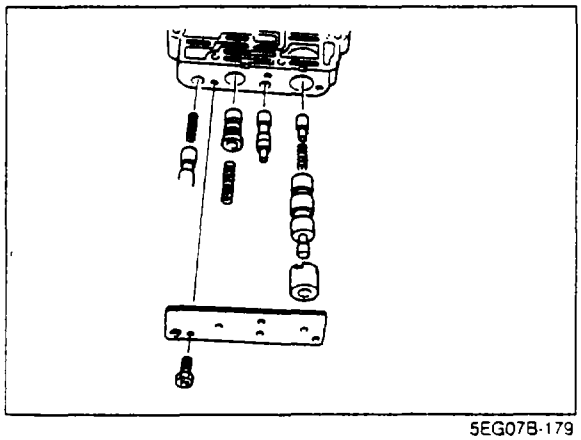
6 Remove the side plate and remove the pressure modifier valve, 1—2 shift valve and spring, and the 2—3 shift valve and spring.

Note
Remove the side plate slowly because the valves may pop out.



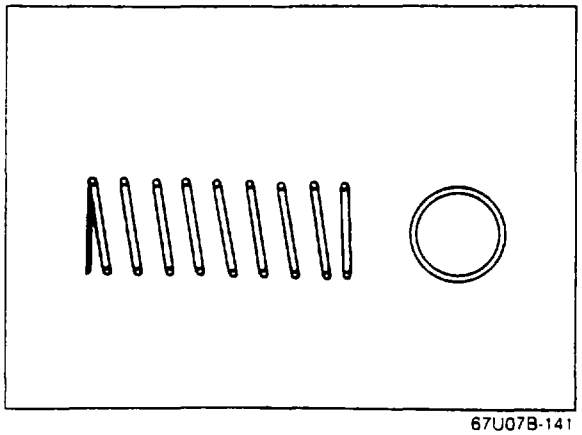
5EG07B-178

7 Remove the side plate and remove the pressure regulator plug, spring and valve, and the 2nd lock spring and valve.



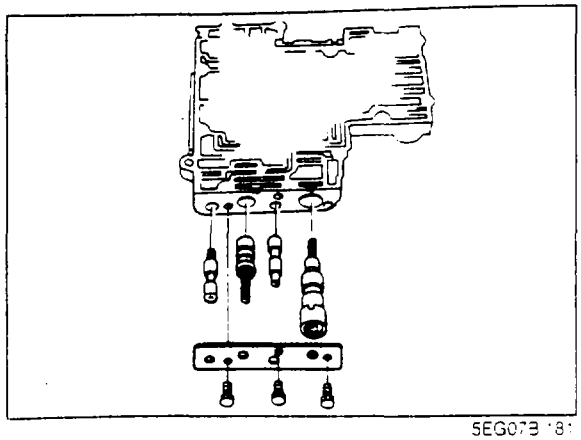
5EG07B-179

8. Remove the side plate, and remove the 3—4 shift valve, spring and plug, vacuum throttle valve, throttle back-up spring, and valve, and the solenoid downshift valve and spring.



67U07B-141

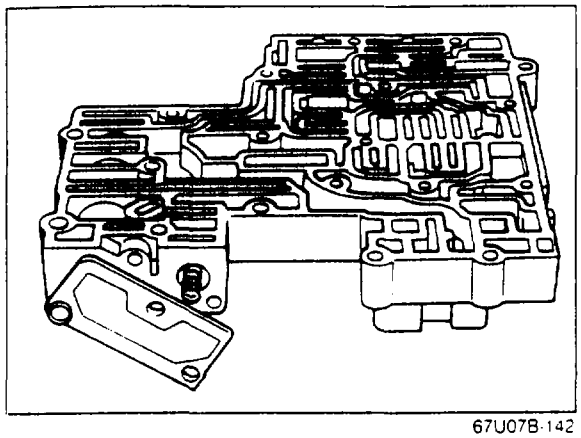
Inspection
Check the following and replace the assembly if any problems are found.
1. Damage or wear of individual valves
2. Damage to oil passages
3. Cracks or damage of valve body
4. Operating conditions of individual valves
5. Degeneration of return spring tension


5EG07B-81

Assembly

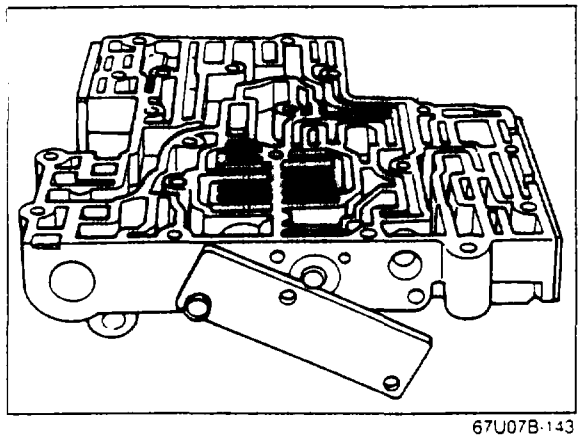
1. Insert the 3—4 shift plug, spring, valve and sleeve.
2. Insert the vacuum throttle valve.
3. Insert the throttle back-up valve and spring.
4. Insert the solenoid downshift spring and valve.
5. Install the side plate.

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


67U07B-142

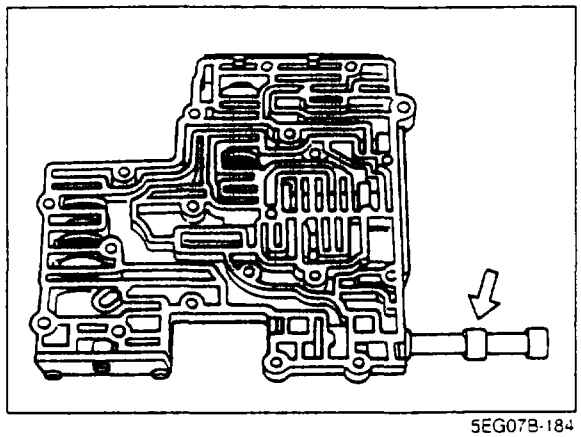
Note
The reassembly is to be performed consecutively by blocking the valves with the side plate held with a bolt at the end as illustrated in the figure.

6. Insert the pressure regulator valve, spring, plug and sleeve.
7. Insert the 2nd lock valve and spring.
8. Install the side plate in a position where it does not interfere with the set plate.

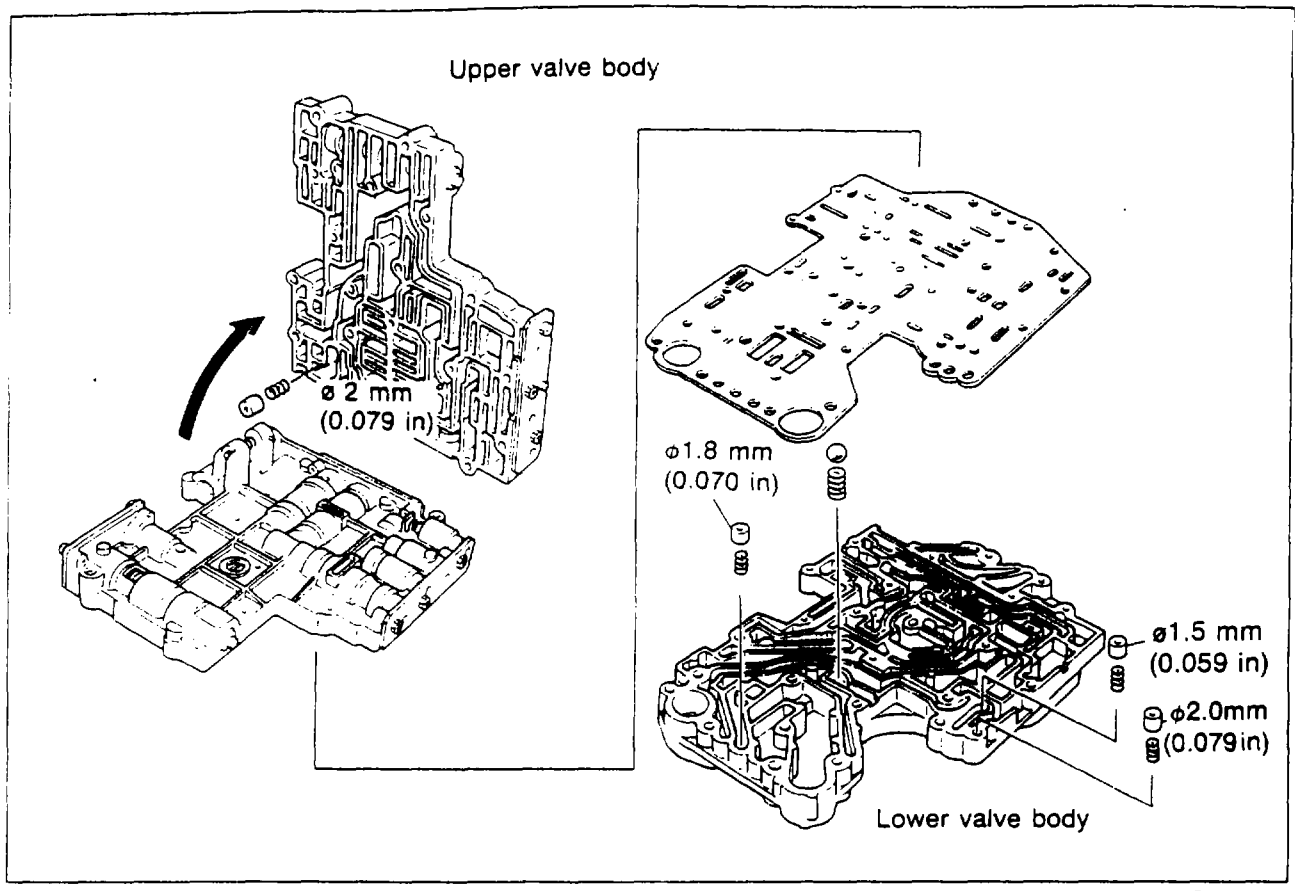

67U07B-143

9. Insert the 2—3 shift plug, spring and valve.
10. Insert the 1—2 shift spring and valve.
11. Insert the pressure modifier valve
12. Tighten the side plate to the specified torque.

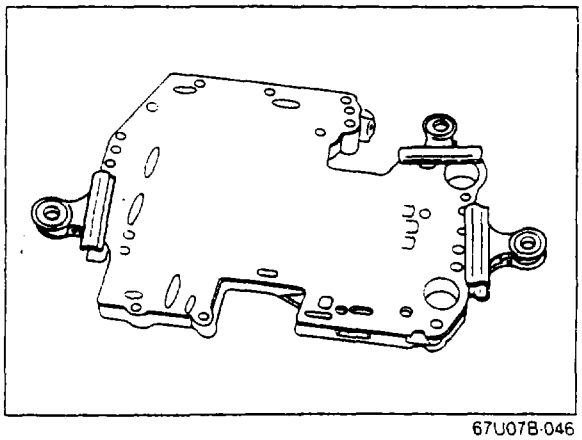
Tightening torque:
2.5—3.4 N·m (25—35 cm-kg, 22—30 in-lb)


5EG07B-184

13. Insert the manual valve.



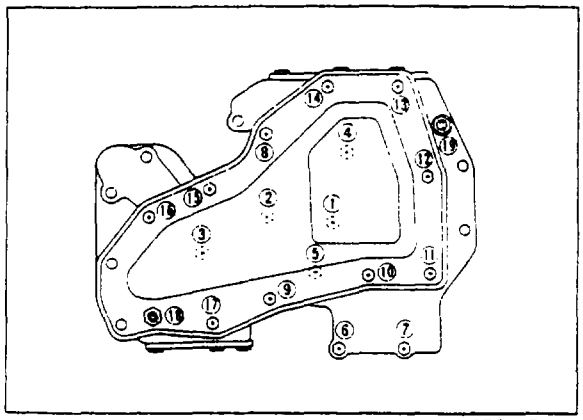
67U07B-045



67U07B-046

14. Insert the orifice check valve and spring, and the throttle relief ball and spring in the lower valve body.
15. Position the separation plate on the lower valve body, and then align the separation plate and lower valve body and hold them together with large clips.
16. Insert the orifice check valve and spring in the upper valve body.

Note
Check that the orifice check valve and throttle relief ball are properly inserted.



5EG07B-187

17. Install the upper valve body.
18. Mount the oil strainer.

Tightening torque:
1—7: 2.5—3.4 N·m
(25—35 cm-kg, 22—30 in-lb)
8—17: 2.9—3.9 N·m
(30—40 cm-kg, 26—35 in-lb)
18, 19: 4.9—6.9 N·m
(50—70 cm-kg, 43—61 in-lb)

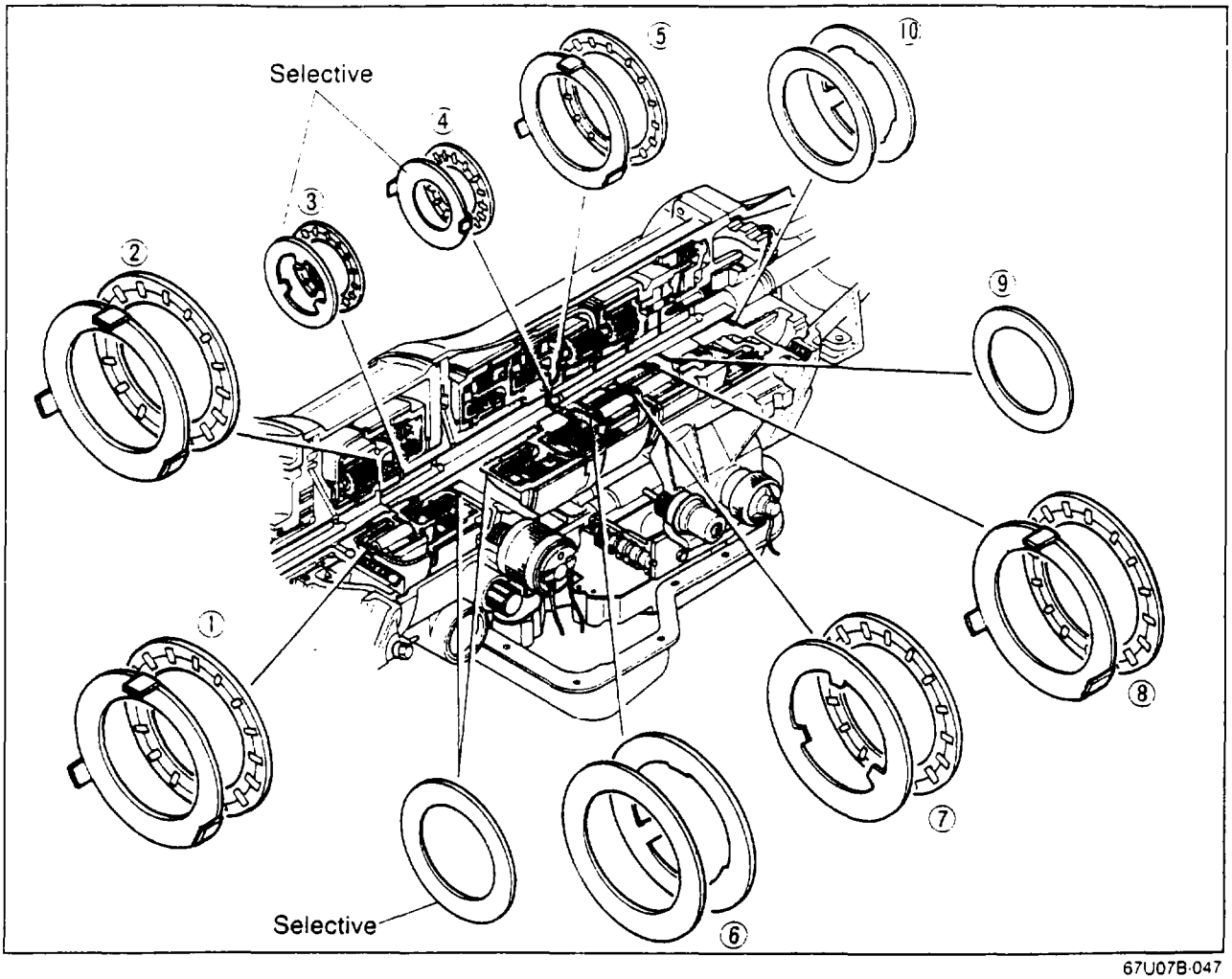
ASSEMBLY

Precaution

1. The automatic transmission is composed 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 brake band or drive plates are replaced with new ones, first soak them in ATF for at least 2 hours.
5. Each seal gasket and "O" ring must be replaced with a new one.
6. Be sure to install thrust bearings and races in the correct direction and position.

67U07B-144

Thrust Washer, Bearing and Race Location

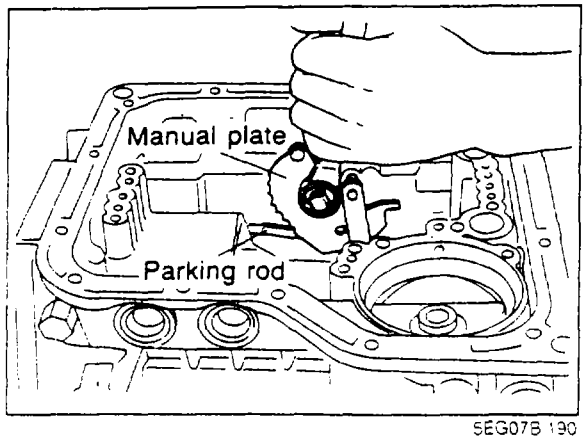


67U07B-047

Outer diameter of bearing and race

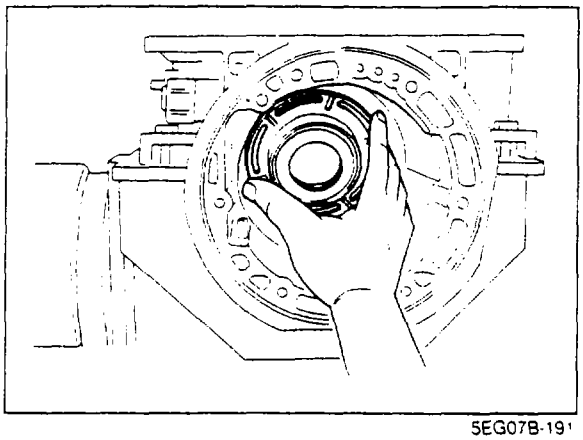
mm (in)

	1	2	3	4	5	6	7	8	9	10
Bearing	69.7 (2.74)	69.7 (2.74)	34.8 (1.37)	34.8 (1.37)	52.8 (2.08)	69.8 (2.75)	69.8 (2.75)	69.8 (2.75)	46.8 (1.84)	52.8 (2.08)
Race	70.0 (2.76)	70.0 (2.76)	33.0 (1.30)	33.0 (1.30)	51.7 (2.01)	70.0 (2.76)	70.0 (2.76)	70.0 (2.76)	—	51.6 (2.03)



5EG07B-190

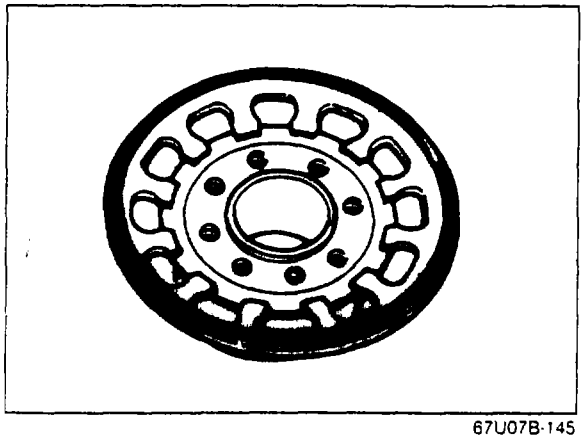
1. Mount the transmission case on the engine stand.
2. Install the manual plate and parking rod in the transmission case.



5EG07B-191

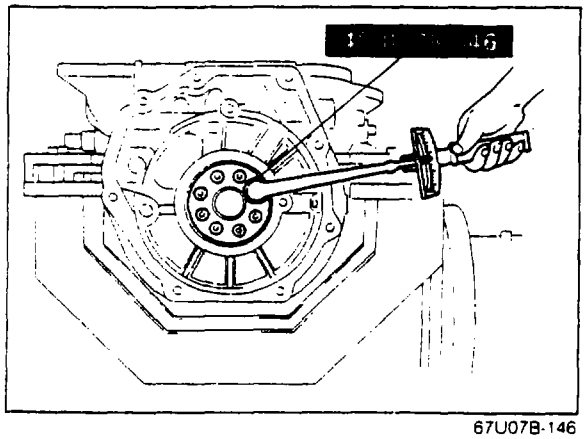
3. Install the low and reverse brake piston.

Caution
Apply automatic transmission fluid to the seal rings, and press the perimeter of the piston evenly when installing it.



67U07B-145

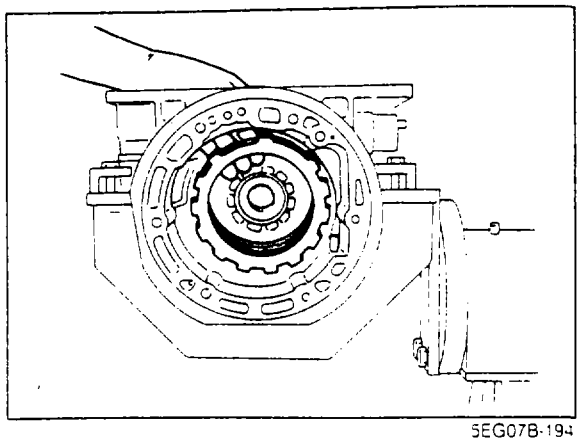
4. Assemble and install the one-way clutch inner race, thrust washer, and piston return spring to the transmission case.
5. Check that the return spring, thrust washer, and rings are properly positioned before securing the bolts.



67U07B-146

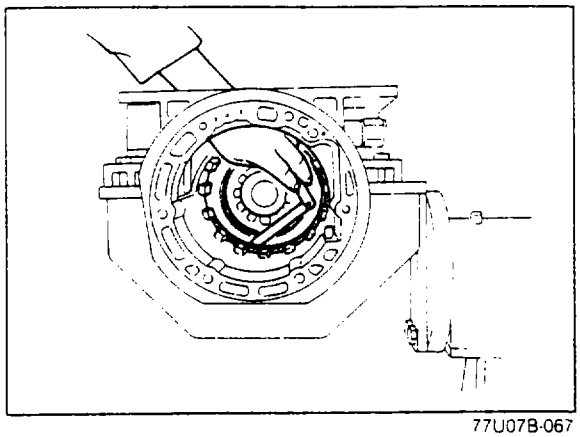
6. Tighten the inner race mounting bolts using **hex-head wrench** (49 0378 346).

Tightening torque:
13—18 N·m (1.3—1.8 m-kg, 9.4—13 ft-lb)



5EG07B-194

7. Install the driven plates, drive plates and retaining plate consecutively, and install the snap ring.



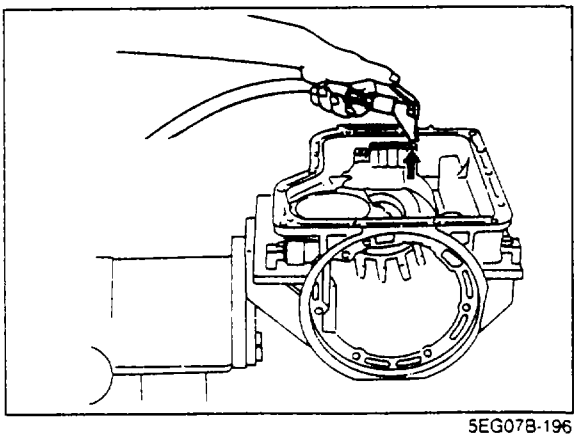
77U07B-067

8. Measure the clearance between the snap ring and the retaining plate. Adjust the clearance with a retaining plate, if necessary.

Standard clearance:
0.8—1.05 mm (0.0315—0.0413 in)

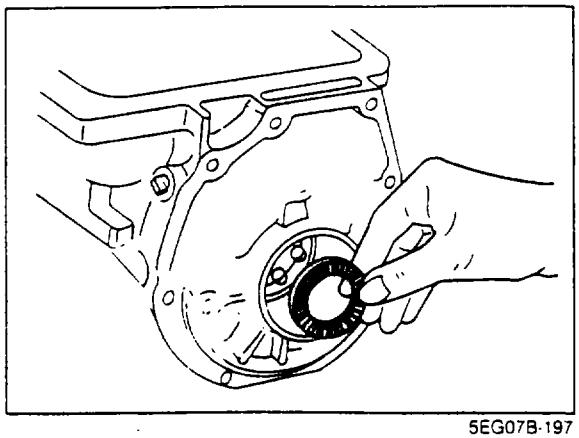
Retaining plate sizes **mm (in)**

7.2 (0.28)	7.4 (0.29)	7.6 (0.30)
7.8 (0.307)	8.0 (0.315)	8.2 (0.32)



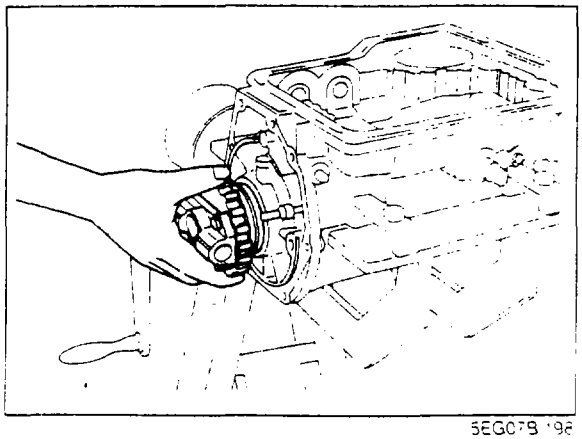
5EG07B-196

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



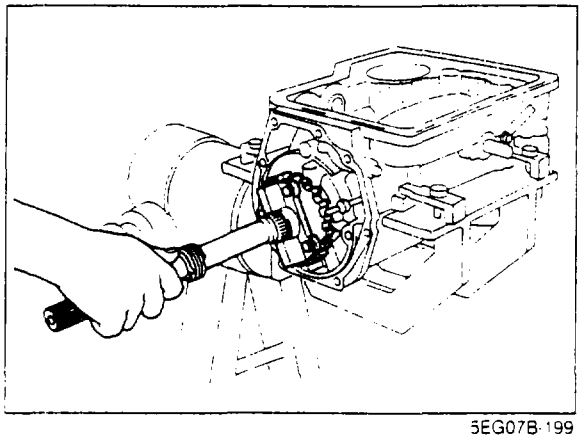
5EG07B-197

10. Install the bearing in the rear of the transmission case.



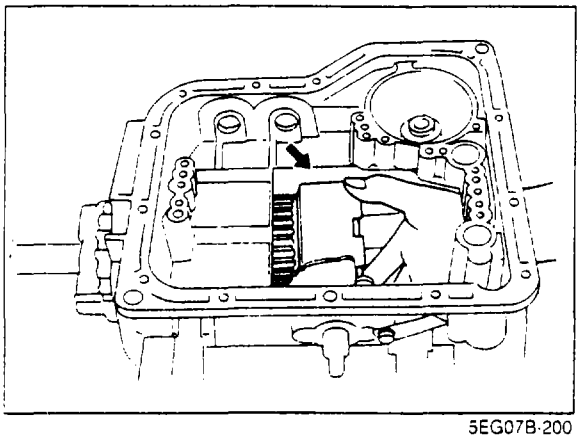
5EG07B-198

11. Install the oil distributor with the bearing race.



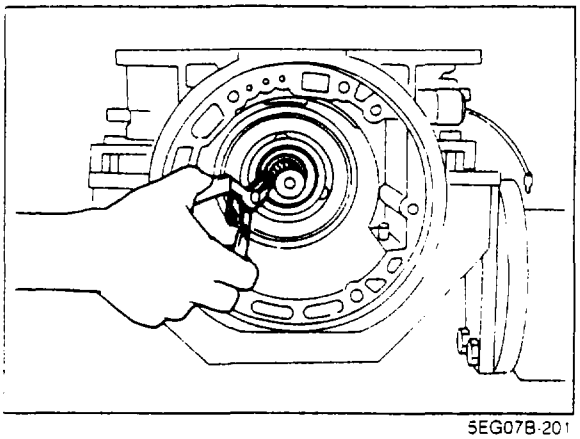
5EG07B-199

12. Insert the output shaft.



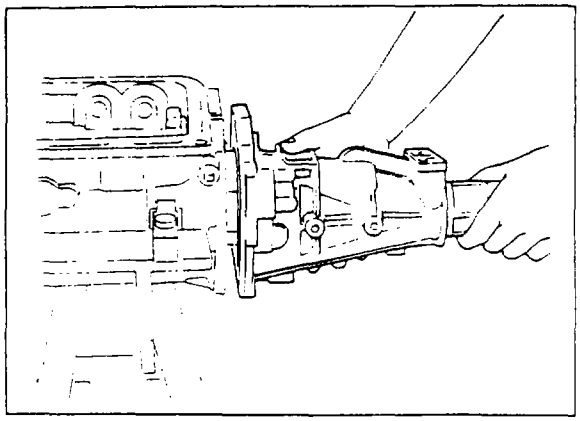
5EG07B-200

13 Install the connecting drum, internal gear and rear planetary pinion carrier as one piece in the low and reverse brake side.



5EG07B-201

14 Install the snap ring from the front side of the output shaft.

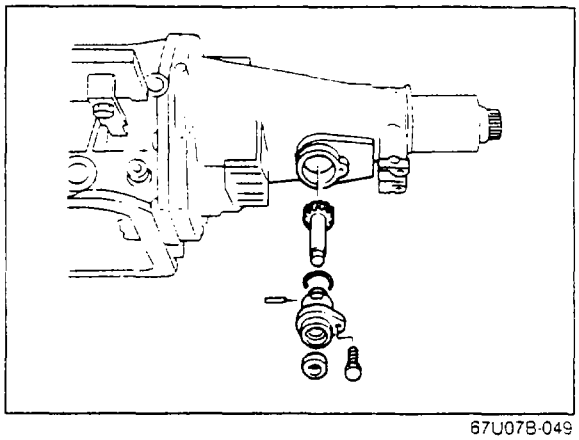


67U07B-048

15. Install the rear extension housing.

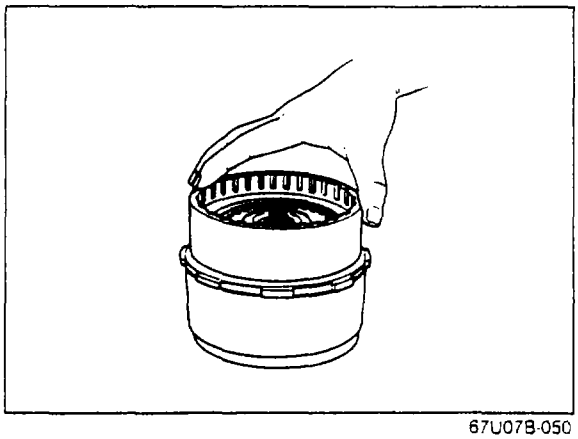
Tightening torque:
20—25 N·m (2.0—2.5 m-kg, 14—18 ft-lb)

16. Check that the output shaft locks by shifting the manual lever to the "P" range.



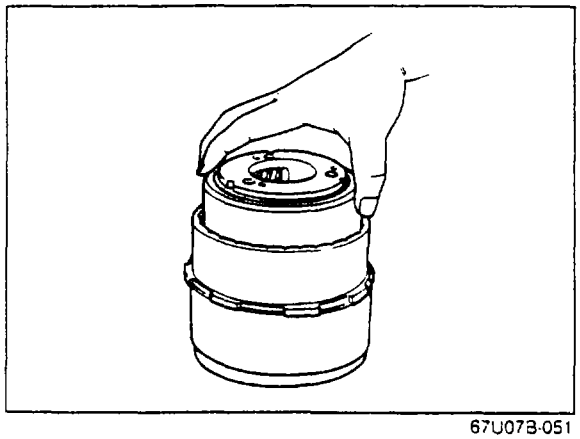
67U07B-049

17. Install the speedometer driven gear.



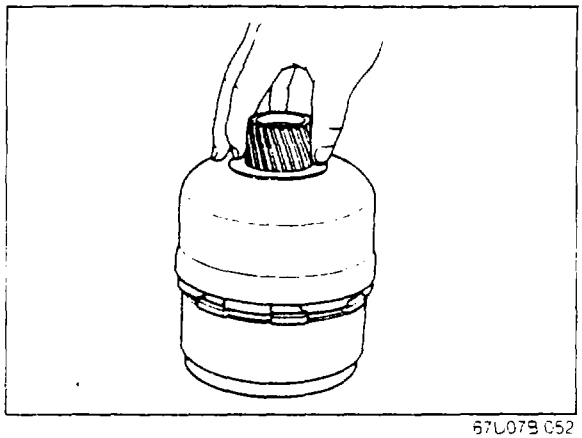
67U07B-050

18. Insert the rear clutch assembly on the top of the front clutch assembly.



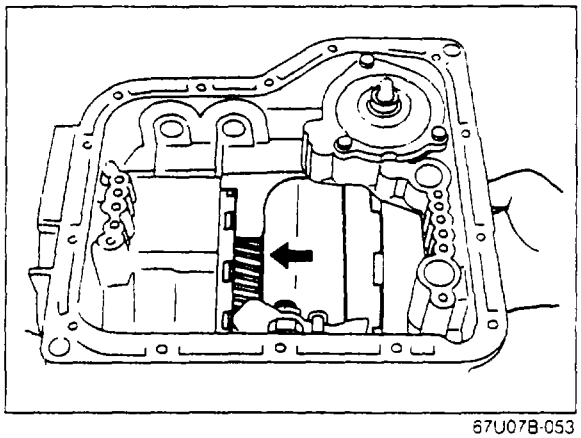
67U07B-051

19. Install the rear clutch hub and front planetary pinion carrier in the rear clutch assembly.



67U07B-052

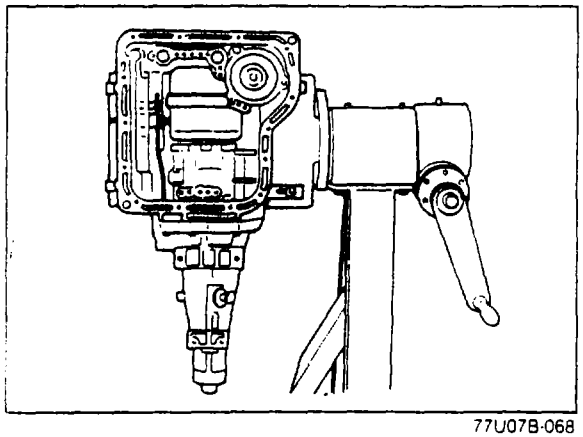
20. Install the connecting shell and sun gear from the top of the front planetary pinion carrier.



67U07B-053

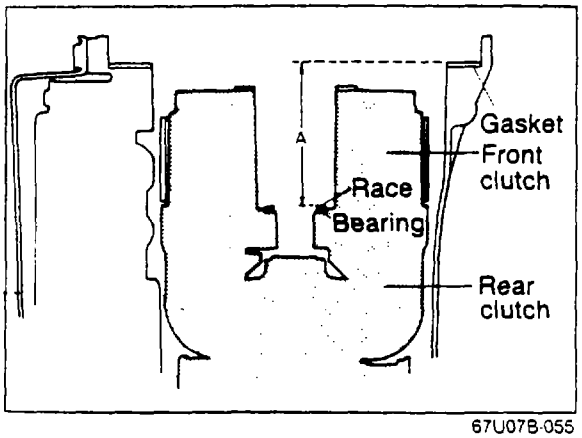
21. Install the clutch and front carrier assembly as one piece into the transmission case.

Caution
Pay close attention to prevent incorrect assembly of the many similar bearings and races.



77U07B-068

22. Check and adjust the total end play.
    (1) Position the front of the transmission case upward.
    (2) Insert the drum support bearing and race on the rear clutch.
    (3) Install a new drum support gasket in the transmission case.

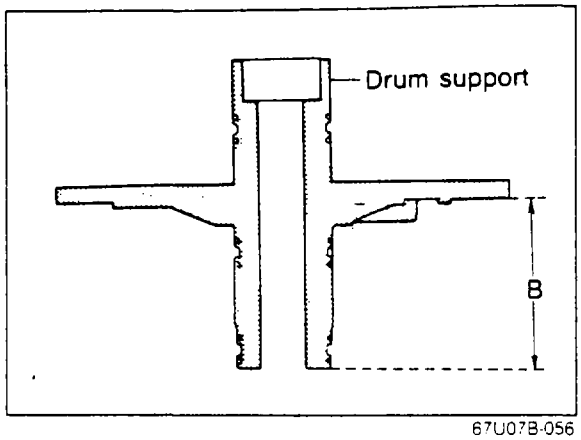


67U07B-055

    (4) Measure the A and B distances with a measurement bar and vernier calipers (Refer to 7B—69 for B).
    (5) Calculate the total end play by using the formula below.

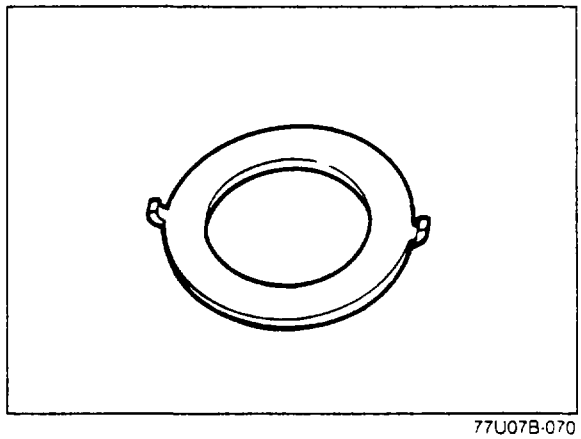
Formula: T = A — B — 0.1 mm (0.0039 in)

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



67U07B-056

Standard total end play:
0.25—0.50 mm (0.0098—0.0197 in)

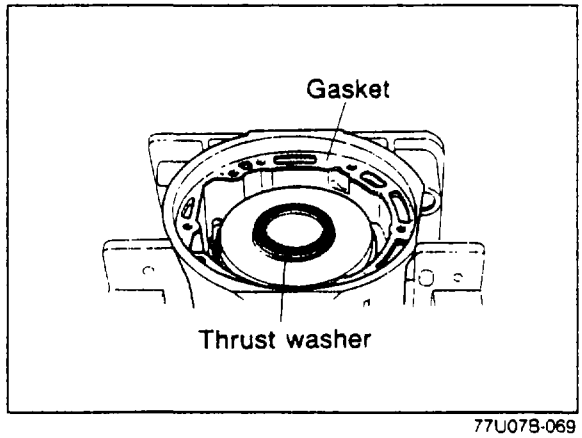


77U07B-070

(6) Adjust the total end play to the standard with a drum support bearing race.

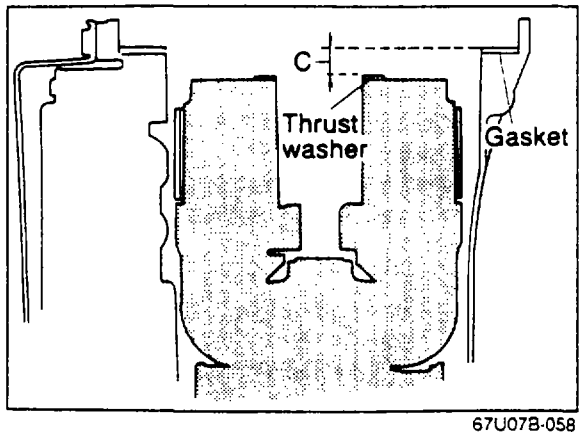
Bearing race sizes mm (in)

1.2 (0 047)	1.4 (0.055)	1.6 (0.063)
1.8 (0 071)	2.0 (0.079)	2.2 (0.087)



77U07B-069

23. Check and adjust the front clutch end play.
(1) Install the thrust washer in position.

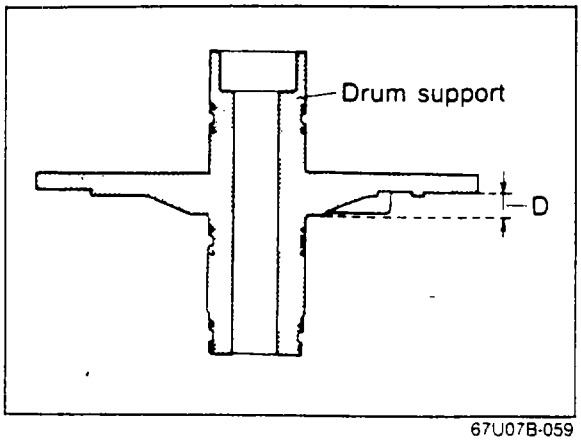


67U07B-058

(2) Measure the C and D distances with a measurement bar and vernier calipers (Refer to 7B—70 for D).
(3) Calculate the front clutch end play by using the formula below.

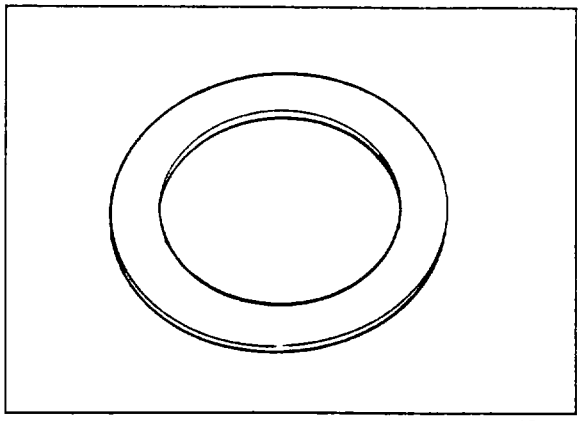
Formula: T = C — D — 0.1 mm (0.0039 in)

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



67U07B-059

Standard front clutch end play:
0.5—0.8 mm (0.0197 in)

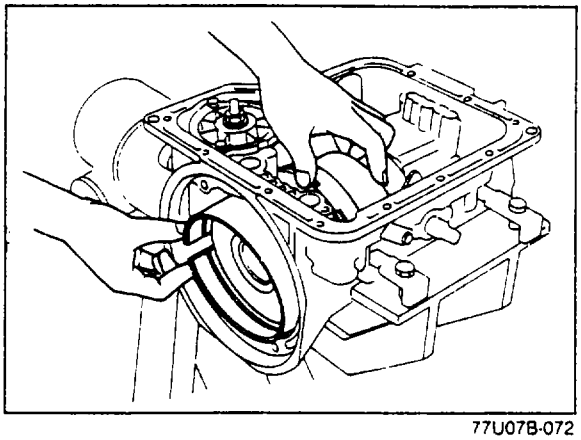


77U07B-071

(4) Adjust the front clutch end play to specification with a thrust washer.

Thrust washer sizes **mm (in)**

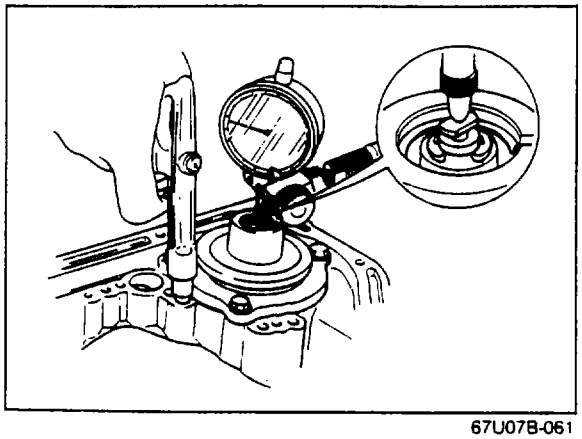
1.3 (0.051)	1.5 (0.059)	1.7 (0.067)
1.9 (0.075)	2.1 (0.083)	2.3 (0.091)
2.5 (0.098)	2.7 (0.106)	



77U07B-072

24. Install the 2nd brake band and band strut in position.

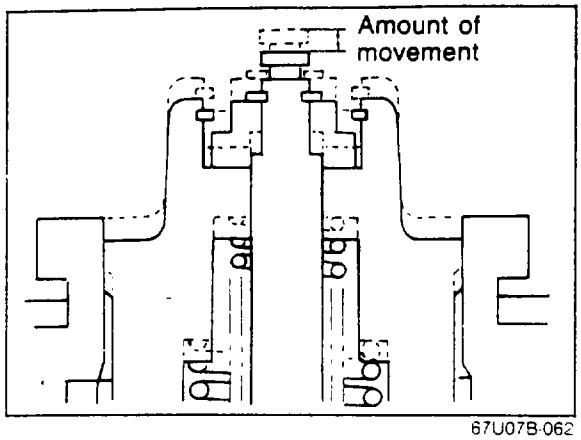
25. If the 2nd band or any parts of the 2nd band servo are replaced, select a new piston stem spacer.
(1) Replace any faulty parts and assemble the 2nd band servo with the original spacer and install it in the transmission case.
(2) Measure the amount of movement with a dial gauge when compressed air of **441—539 kPa (4.5—5.5 kg/cm^2, 64—78 psi)** is applied.
(3) Select the correct spacer according to the table on the next page.



67U07B-061

Caution
a) The adjusting pressure must not exceed the specification shown or the 2nd band will be overtightened.
b) Use an adjustable pressure regulator to control the adjusting pressure.

Note
When setting the adjusting air pressure with the pressure regulator, it must be set with the nozzle discharging air at full blow to the atmosphere.

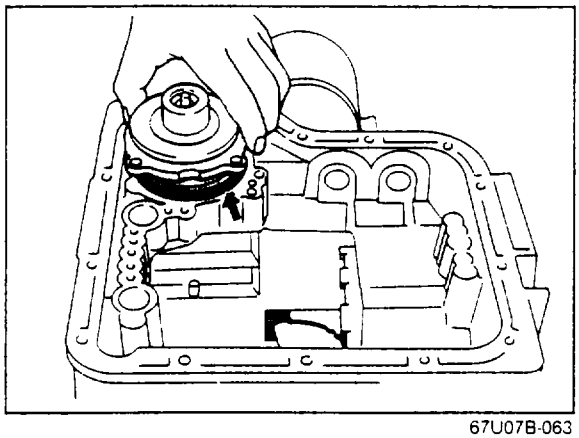


67U07B-062

mm (in)

Amount of Movement	Selected spacer thickness
0.05—0.55 (0.0020—0.0217)	A + 1.5 (0.059)
0.56—1.05 (0.0220—0.0413)	A + 1.0 (0.039)
1.06—1.55 (0.0417—0.0610)	A + 0.5 (0.020)
1.56—2.05 (0.0614—0.0807)	A
2.06—2.55 (0.0811—0.1004)	A—0.5 (0.020)
2.56—3.05 (0.1008—0.1201)	A—1.0 (0.039)
3.06—3.55 (0.1205—0.1398)	A—1.5 (0.059)

A: Thickness of original spacer used when making the measurement.



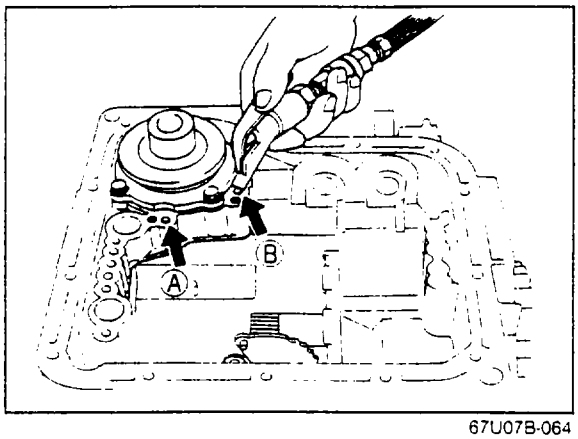
67U07B-063

Spacer thickness mm (in)

8.0 (0.31)	8.5 (0.33)	9.0 (0.35)	9.5 (0.37)
10.0 (0.39)	10.5 (0.41)	11.0 (0.43)	

26. Assemble the 2nd band servo.
27. Install the 2nd band servo.

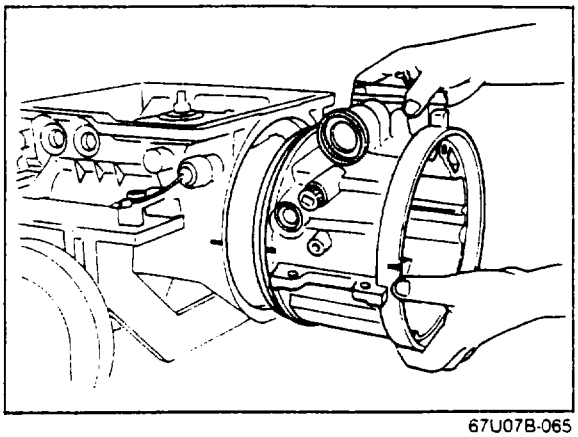
Caution
Apply even pressure to the perimeter of the 2nd band servo to avoid damaging the seal rings when installing.



67U07B-064

28. Check that the servo piston is operating by applying compressed air to the oil passage of the 2nd band servo.

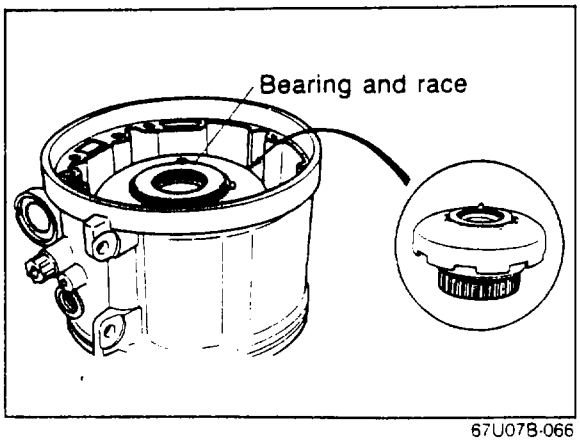
A: Engage
B: Release



67U07B-065

29. Install the gasket into the transmission case and mount the OD case.

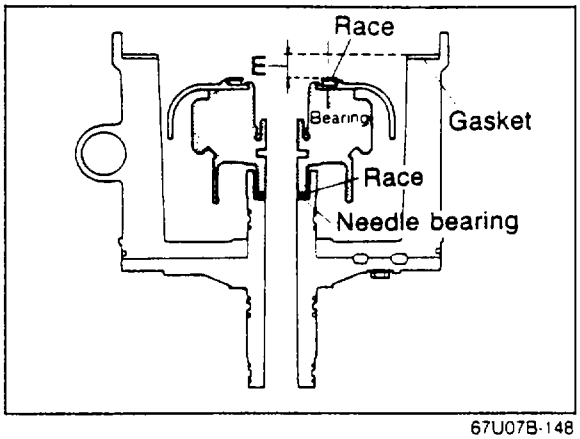
Note
a) Align the matching marks of the transmission case and OD case, and install by tapping lightly with a plastic hammer to avoid damaging the seal rings.
b) Install two bolts for alignment.



67U07B-066

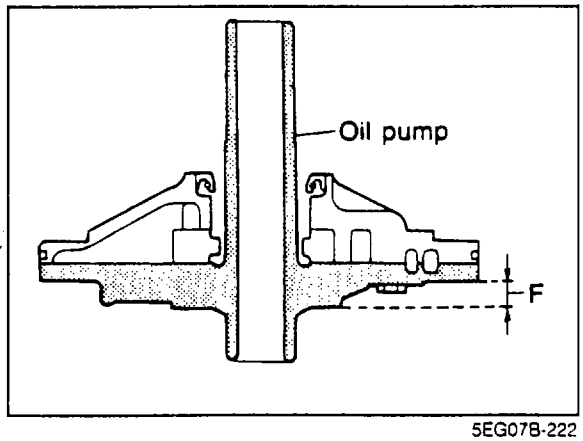
30. Check and adjust the OD geartrain total end play.
    (1) Position the OD case upright.
    (2) Install the bearing and race in the OD.
    (3) Install the planetary carrier, sun gear and connecting shell as one piece into the OD case.

Caution
Do not install the direct clutch drum.



67U07B-148

(4) Install the bearing and race on the connecting shell.
(5) Install a new oil pump gasket in the OD case.
(6) Measure the E and F distances with a measurement bar and vernier calipers.



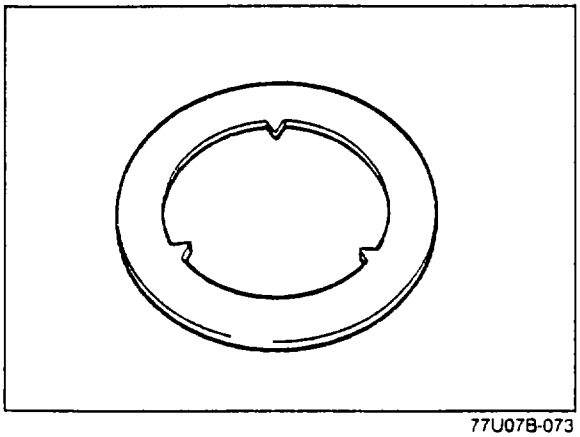
5EG07B-222

(7) Calculate the OD geartrain total end play by using the formula below.

Formula: T = E — F — 0.1 mm (0.0039 in)

T: Total end play.
E: The distance between the oil pump mounting surface (including the oil pump gasket) and the OD connecting bearing race surface.
F: The distance between the oil pump side connecting shell bearing race contact surface and the oil pump gasket contact surface.
0.1: The compression amount of a new gasket.

Standard total end play:
0.25—0.50 mm (0.0098—0.0197 in)

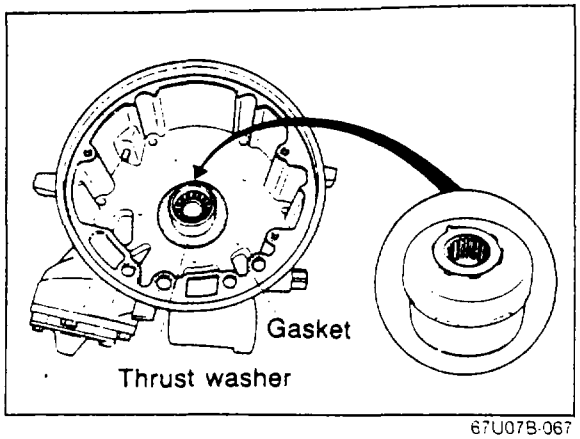


77U07B-073

(8) Adjust the total end play to the standard with a bearing race installed in the drum support.

Bearing race sizes mm (in)

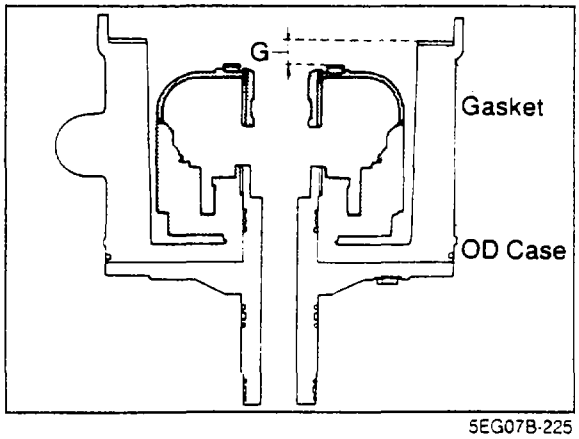
1.2 (0.047)	1.4 (0.055)	1.6 (0.063)
1.8 (0.071)	2.0 (0.079)	2.2 (0.087)



67U07B-067

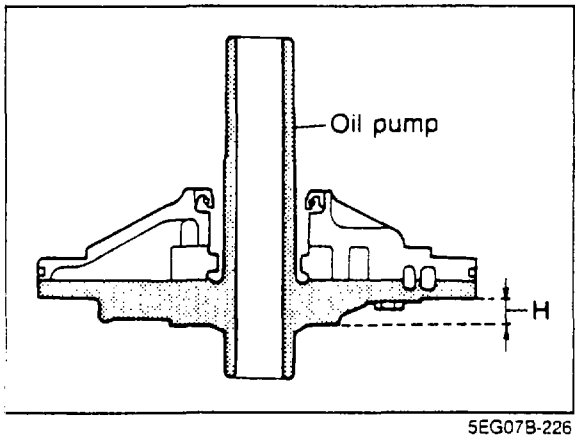
31. Check and adjust the direct clutch end play.
    (1) Install the thrust washer in the OD case.
    (2) Install the direct clutch, sun gear, connecting shell and the bearing and race in the OD case.

Caution
Do not install the planetary pinion carrier.



5EG07B-225

(3) Measure the G and H distances with a measurement bar and vernier calipers.



5EG07B-226

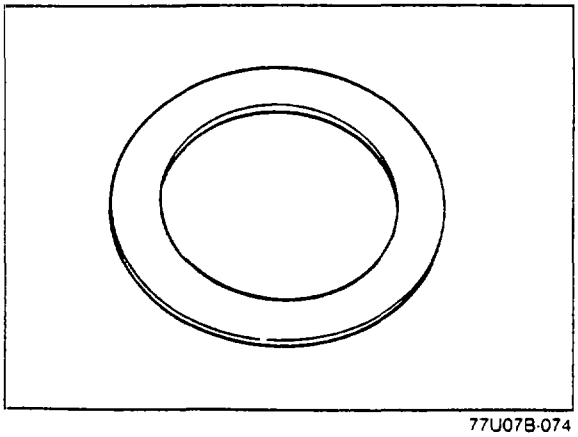
(4) Calculate the direct clutch end play by using the formula below.

Formula: T = G — H — 0.1 mm (0.0039 in)

T: Total end play.
G: The distance between the oil pump mounting surface (including the oil pump gasket) and the OD connecting bearing race surface.
H: The distance between the oil pump side connecting shell bearing race contact surface and the oil pump gasket contact surface.
0.1: The compression amount of a new gasket.

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

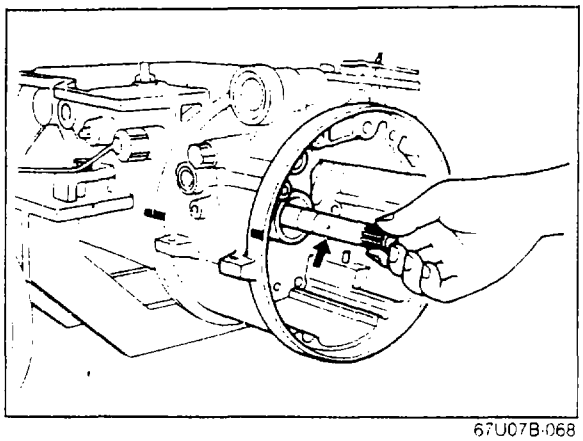
(5) Adjust the direct clutch end play to specification with a thrust washer.



77U07B-074

Thrust washer sizes **mm (in)**

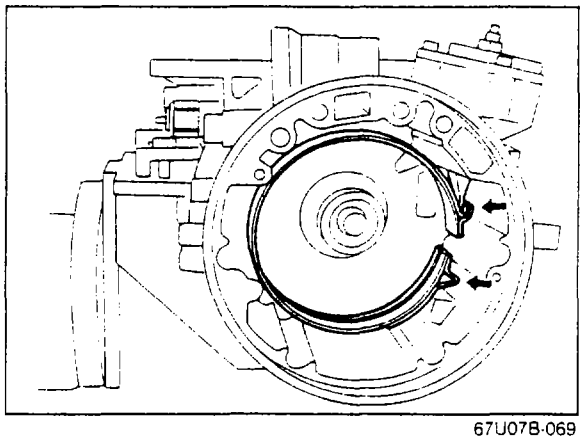
1.3 (0.051)	1.5 (0.059)	1.7 (0.067)
1.9 (0.075)	2.1 (0.083)	2.3 (0.091)
2.5 (0.098)	2.7 (0.106)	



67U07B-068

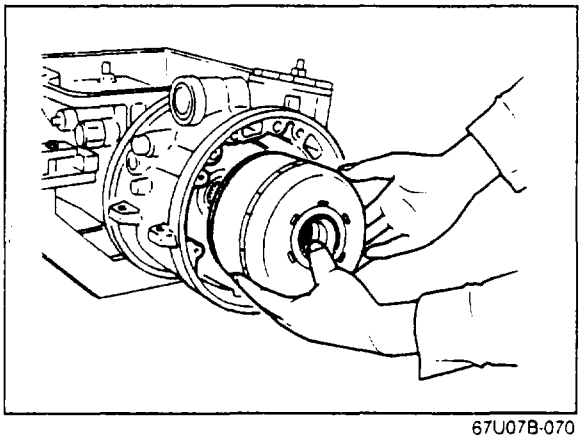
32. Insert the intermediate shaft.

Caution
Install the end with the oil hole toward the front.



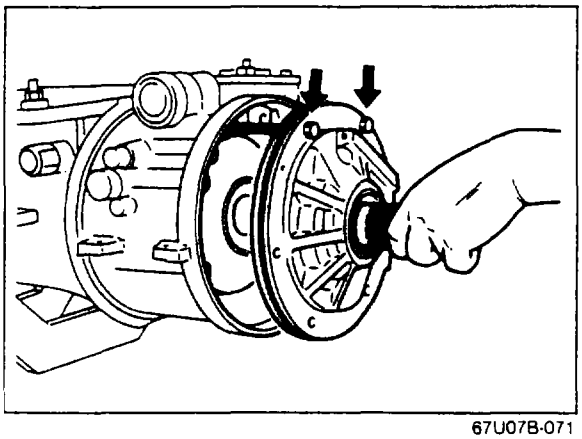
67U07B-069

33. Install the OD brake band and band strut.



67U07B-070

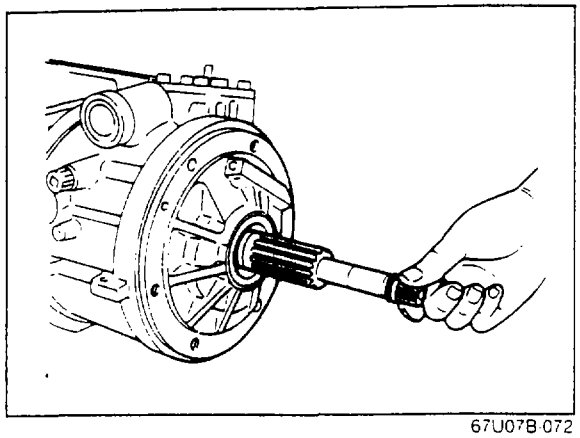
34 Install the direct clutch assembly.



67U07B-071

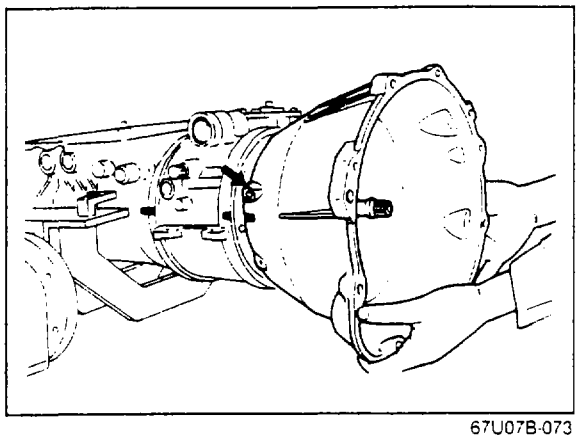
35 Install the oil pump.

Note
a) Attach the thrust washer and bearing race with petroleum jelly to the oil pump.
b) Position with two bolts and install by tapping lightly with a plastic hammer.



67U07B-072

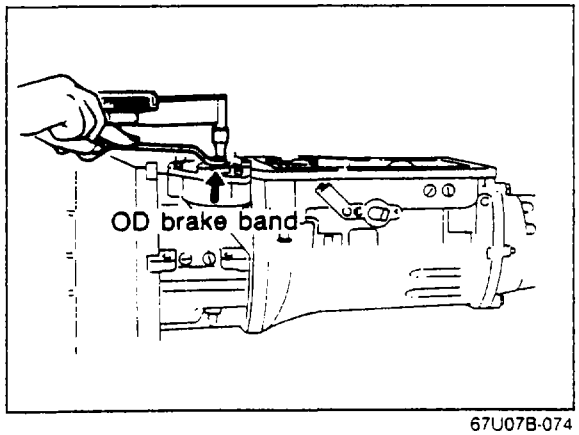
36. Install the input shaft.



67U07B-073

37. Install the "O" ring on the contact surface of the converter housing.
38. Apply sealant on the bolt flanges and converter housing contact surface.
39. Install the converter housing.

Tightening torque:
44—54 N·m (4.5—5.5 m-kg, 33—40 ft-lb)

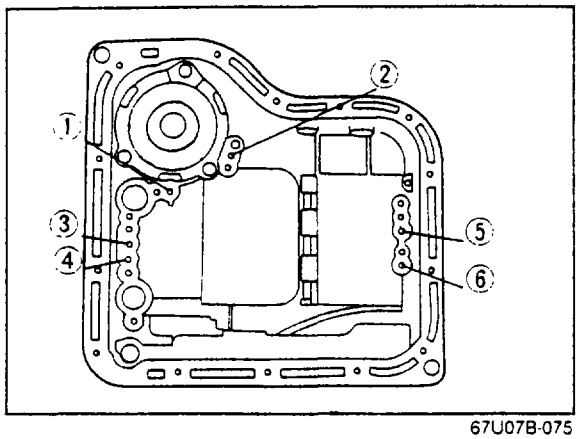


67U07B-074

40. Apply ATF to the piston stem.
41. Adjust the OD brake band.
    (1) Loosen the lock nut and tighten the piston stem.

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

    (2) Loosen the stem **2 turns**.



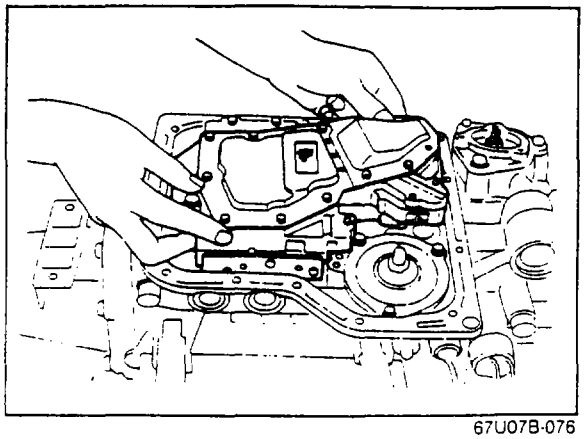
67U07B-075

    (3) Tighten the lock nut.

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

42. Perform a final air check of all piston operations.

Air check points
(1) 2nd Brake band apply
(2) 2nd Brake band release
(3) Rear clutch
(4) Front clutch
(5) Governor
(6) Low and reverse brake

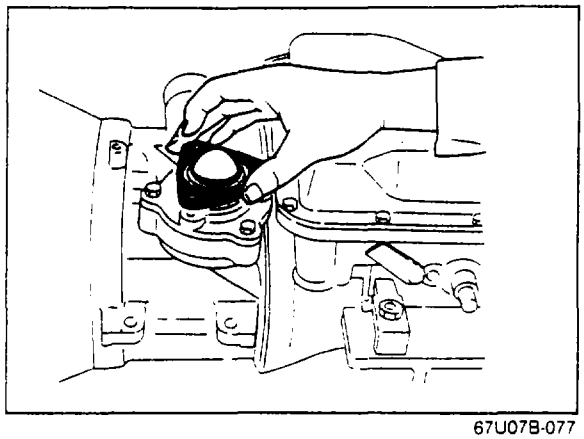


67U07B-076

43. Install the control valve assembly.

Tightening torque:
5.4—7.4 N·m (55—75 cm-kg, 48 65 in-lb)

Note
Insert the pin of the manual plate into the groove of the manual valve.

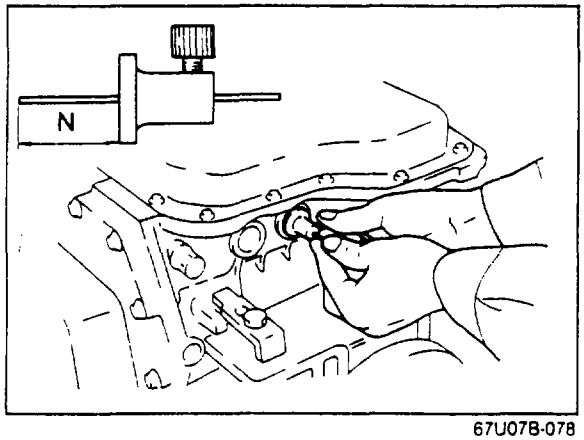


67U07B-077

44. Install a new gasket and the oil pan.

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

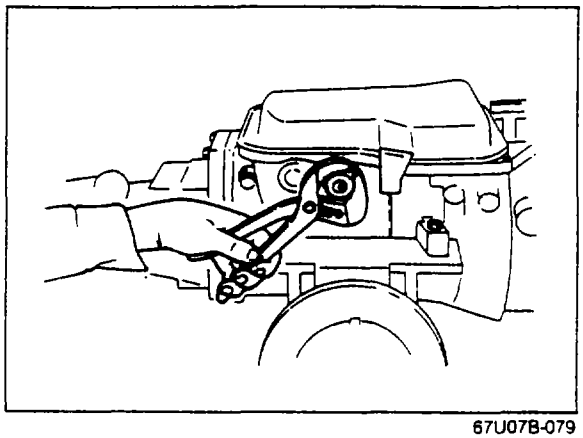
45. Install the OD band servo cover.



67U07B-078

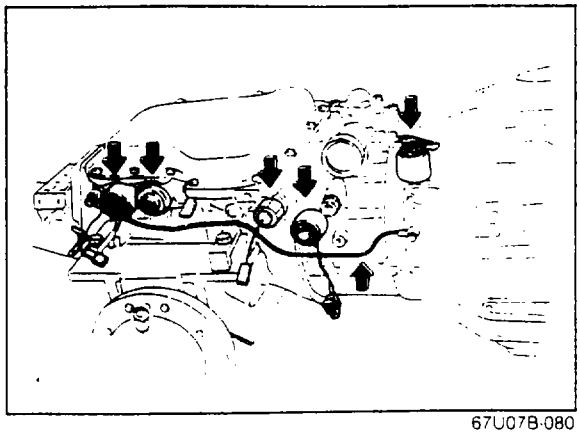
46. Select the diaphragm rod.
(1) Measure the N dimension using **adjust gauge** (49 G032 355) and scale.
(2) Select the diaphragm rod in accordance with the table below.

N dimension	Applicable diaphragm rod length
Below 25.65 mm (1.0099 in)	29.0 mm (1.14 in)
25.65—26.15 mm (1.0099—1.0295 in)	29.5 mm (1.16 in)
26.15—26.65 mm (1.0295—1.0492 in)	30.0 mm (1.18 in)
26.65—27.15 mm (1.0492—1.0689 in)	30.5 mm (1.20 in)
27.15 mm (1.0689 in) or over	31.0 mm (1.22 in)



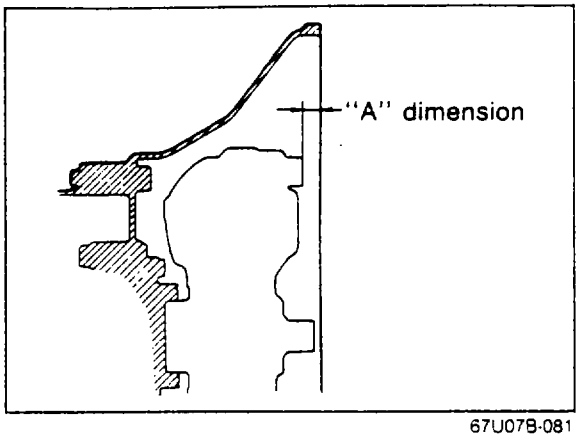
67U07B-079

47. Install the vacuum diaphragm.



67U07B-080

48. Install the kickdown solenoid, governor pressure pipe, OD cancel solenoid, transmission oil pressure switch and lock up control solenoid.
49. Install the torque converter.



67U07B-081

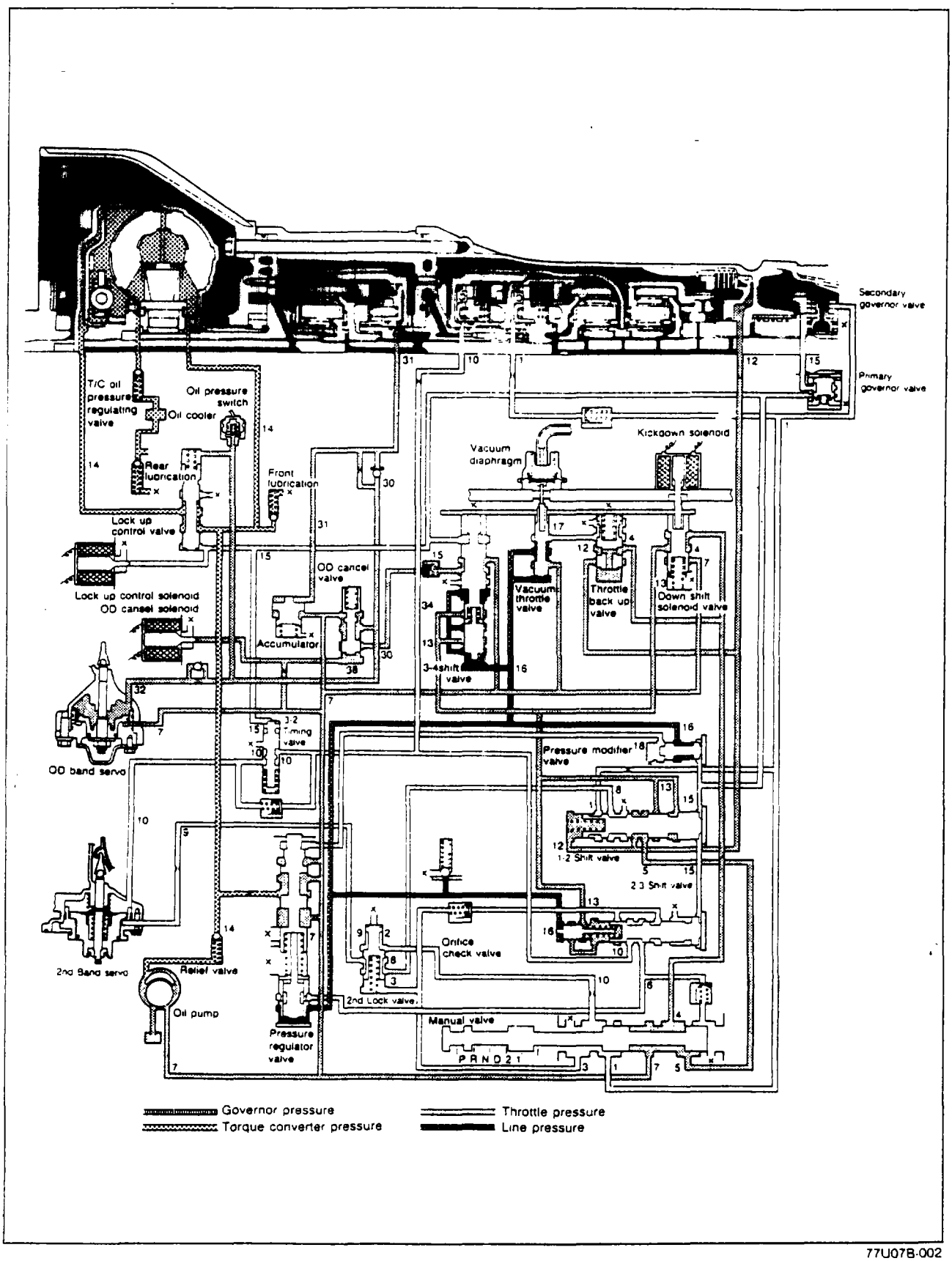
50. In order to ensure the torque converter is installed correctly, measure the clearance ("A") between the end of the torque converter and the end of the converter housing.

    "A": approx. 33.1 mm (1.30 in)

51. Remove the transmission from the engine stand.

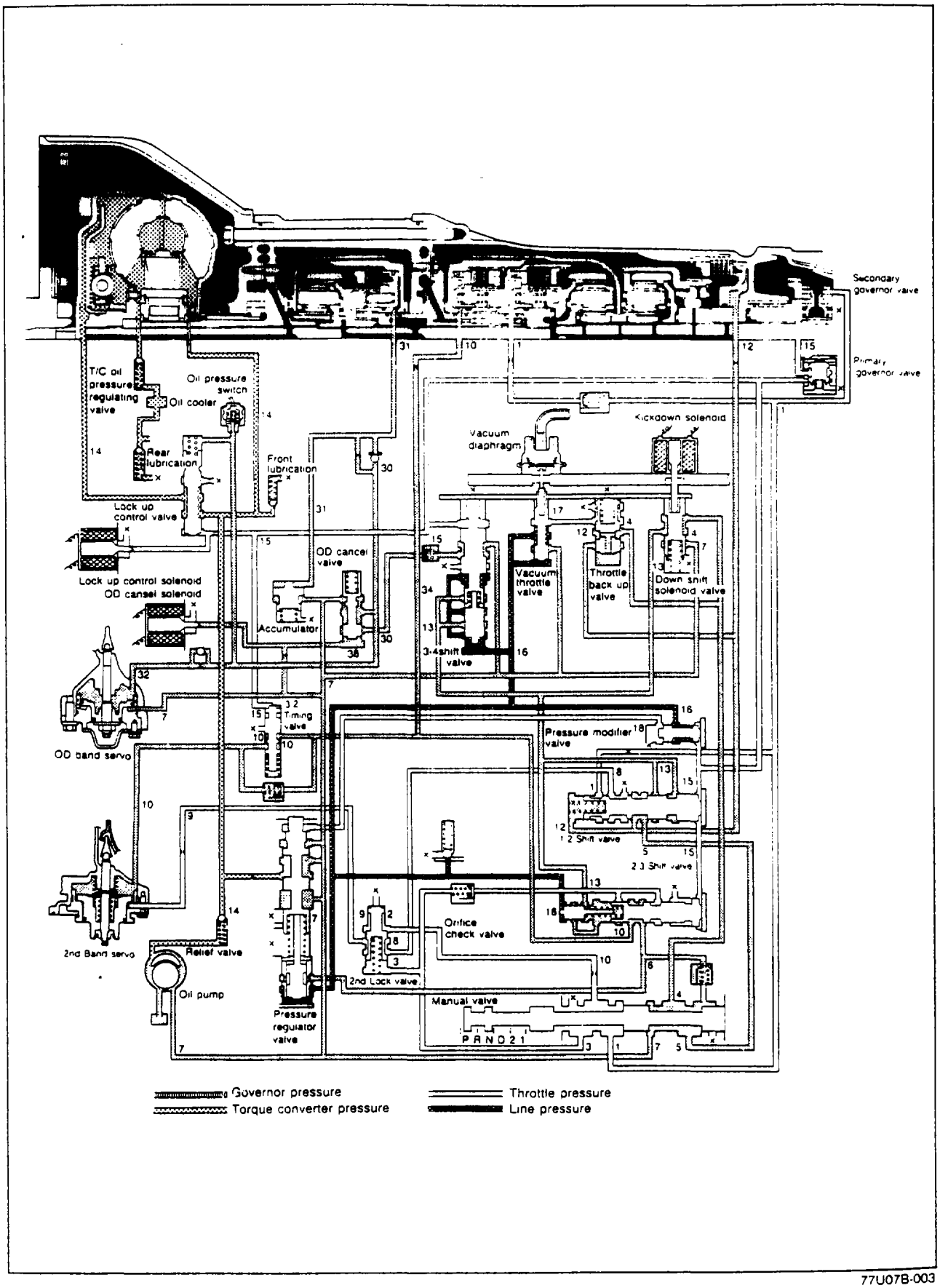
HYDRAULIC SYSTEM FLOW CHART

"P" range



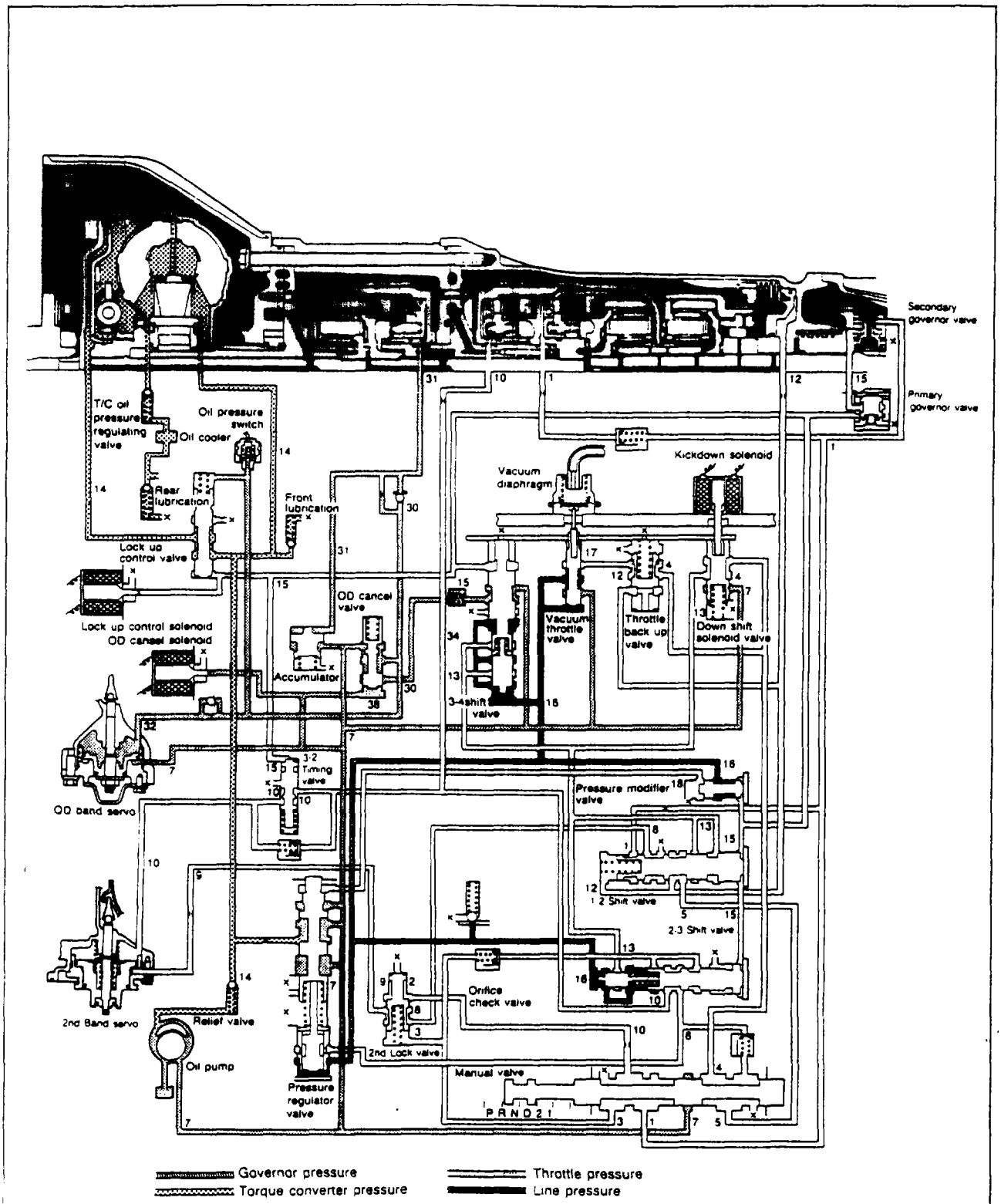
77U078-002

"R" range



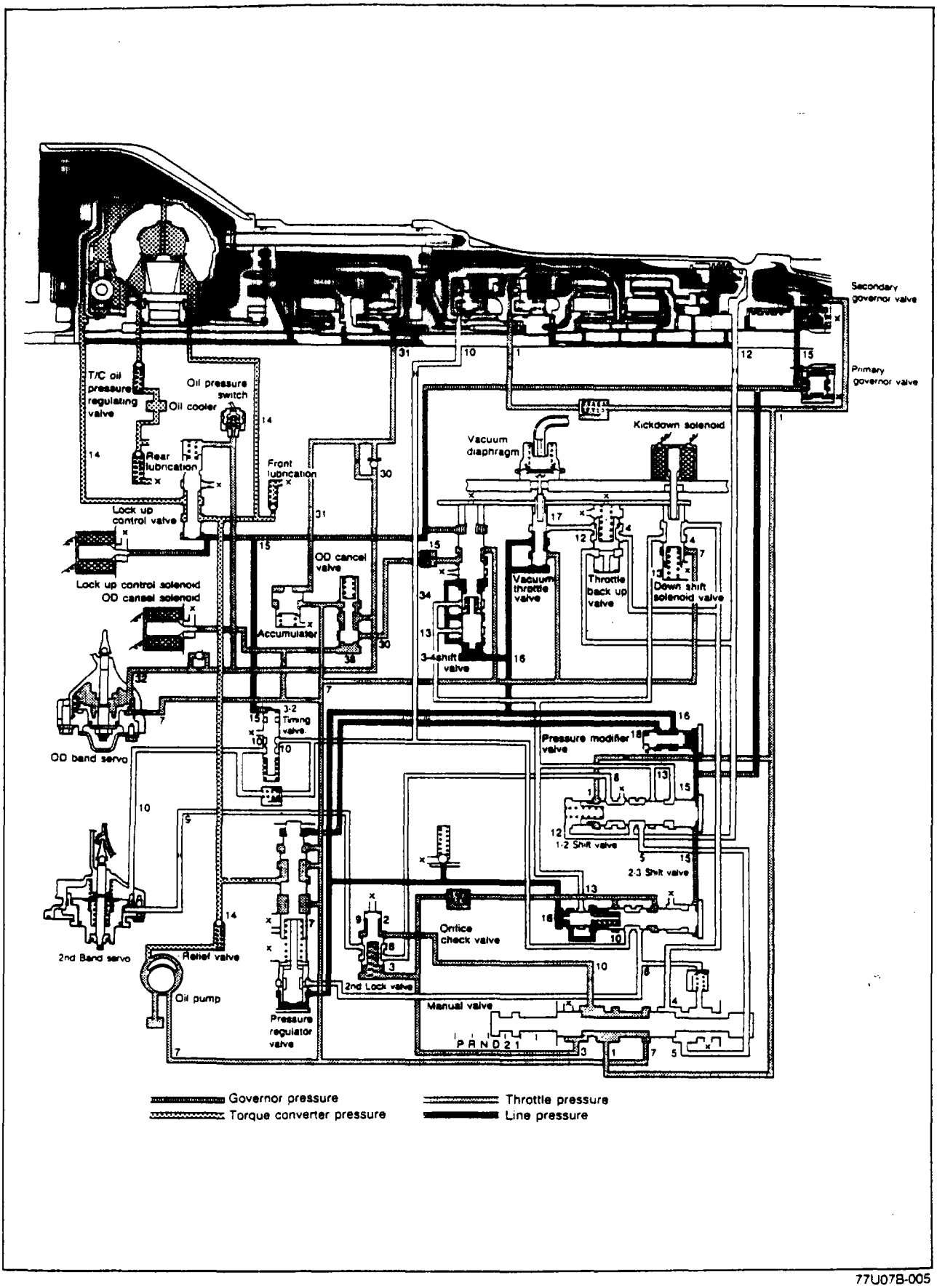
77U07B-003

"N" range



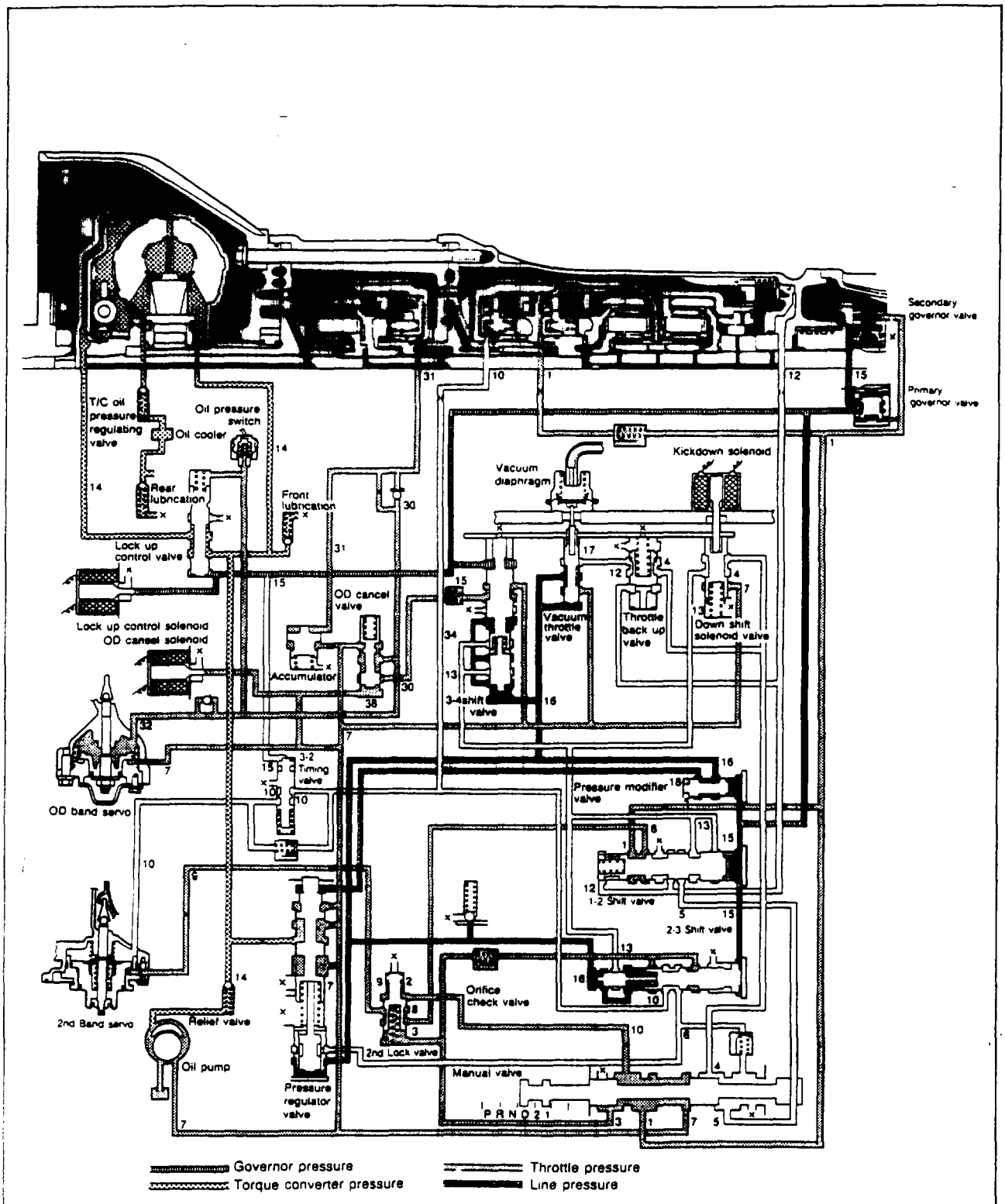
77U07B-004

"D_1" range



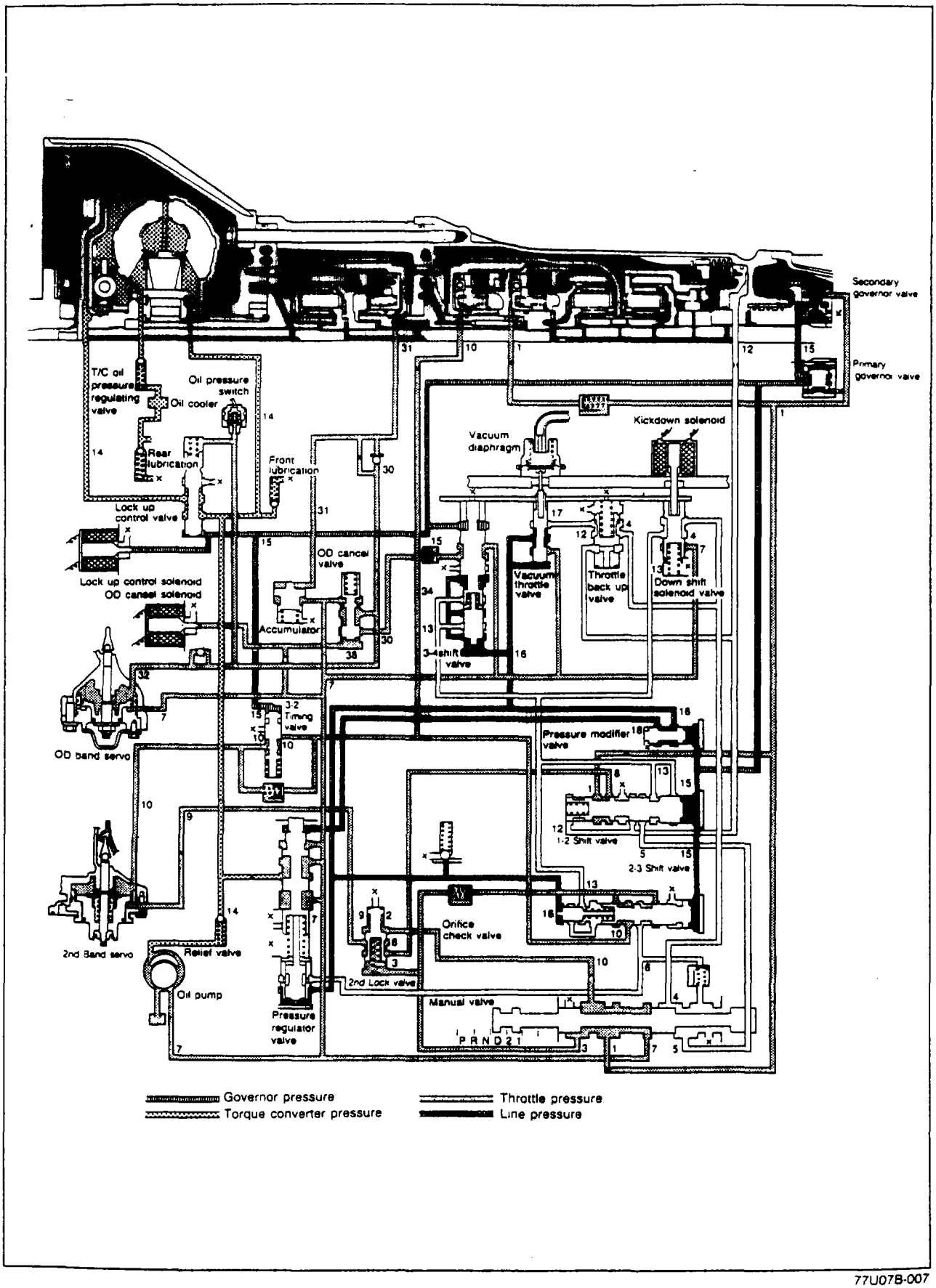
77U07B-005

"D_2" range



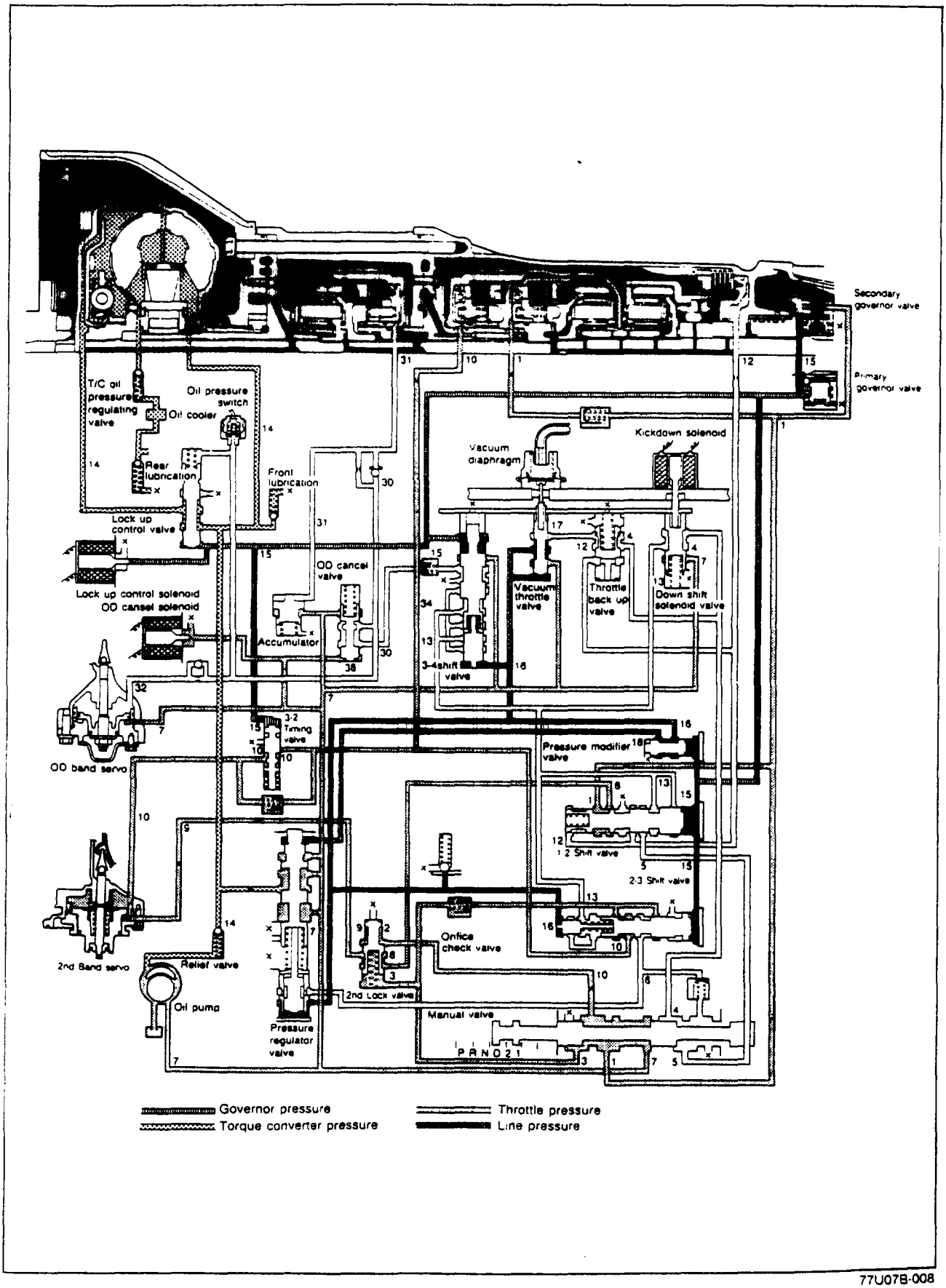
77U078-006

"D_3" range



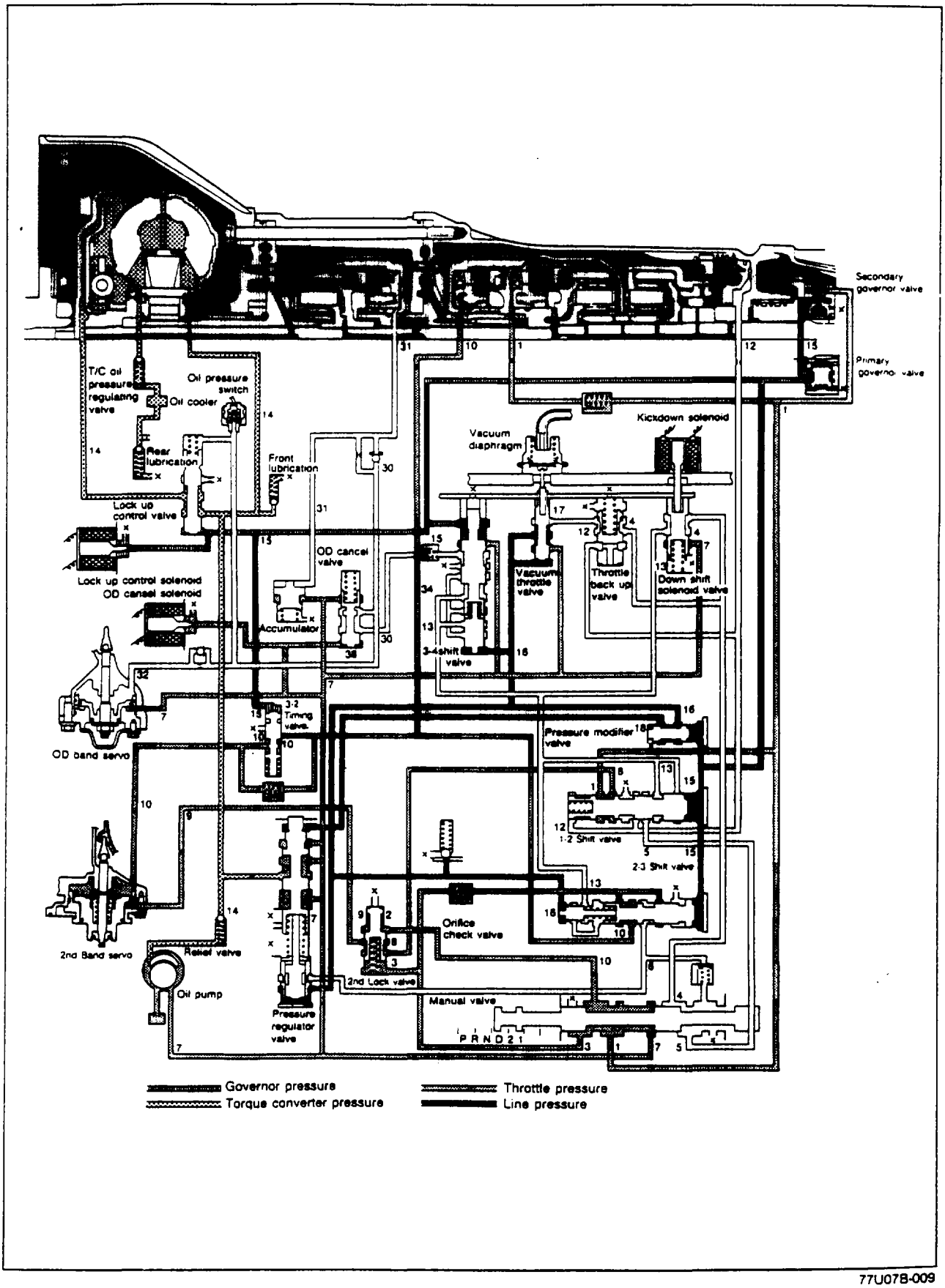
77U07B-007

"D" range (Overdrive)



77U07B-008

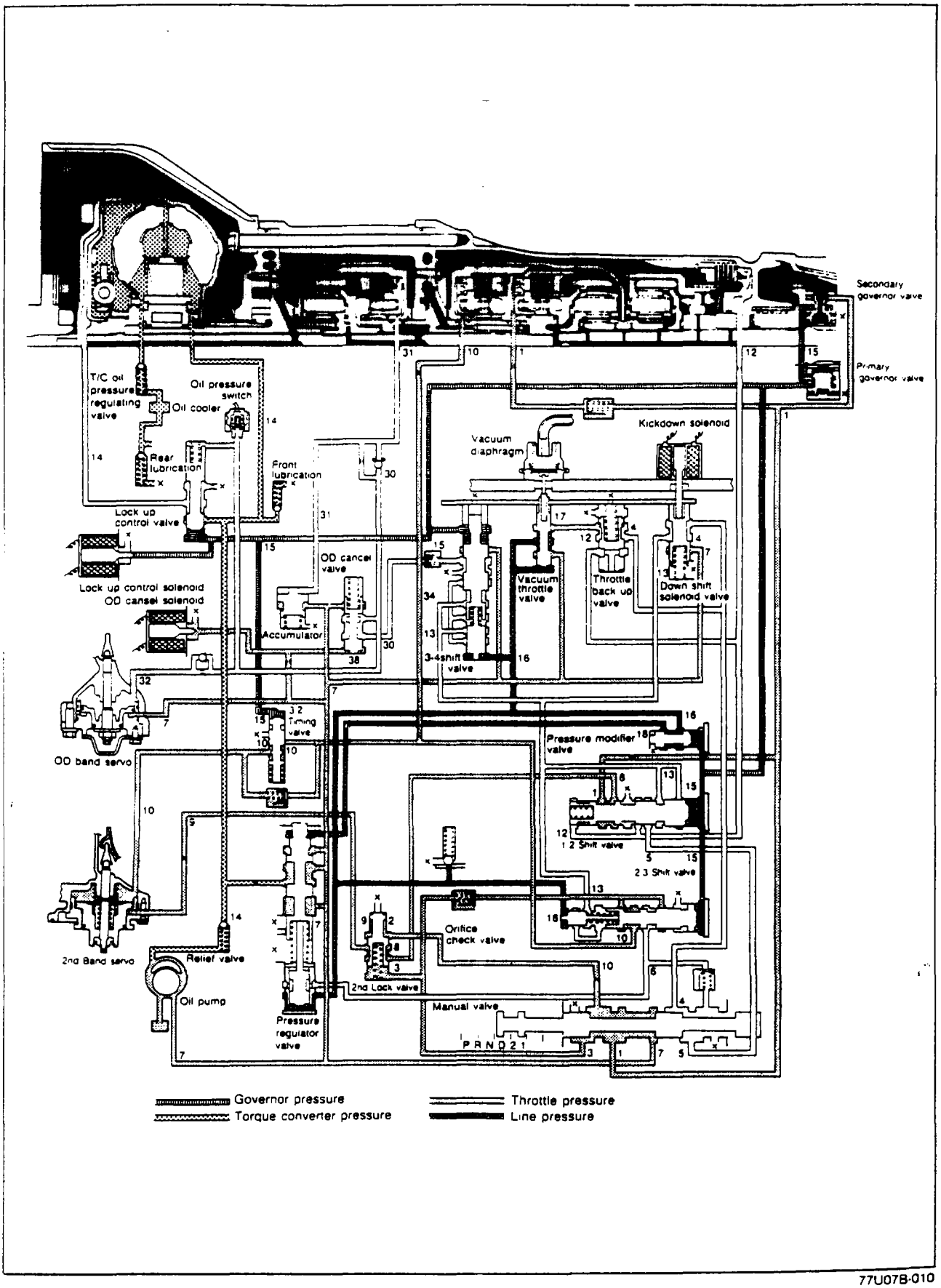
"D" range (Overdrive, Lock-up OFF)



77U078-009

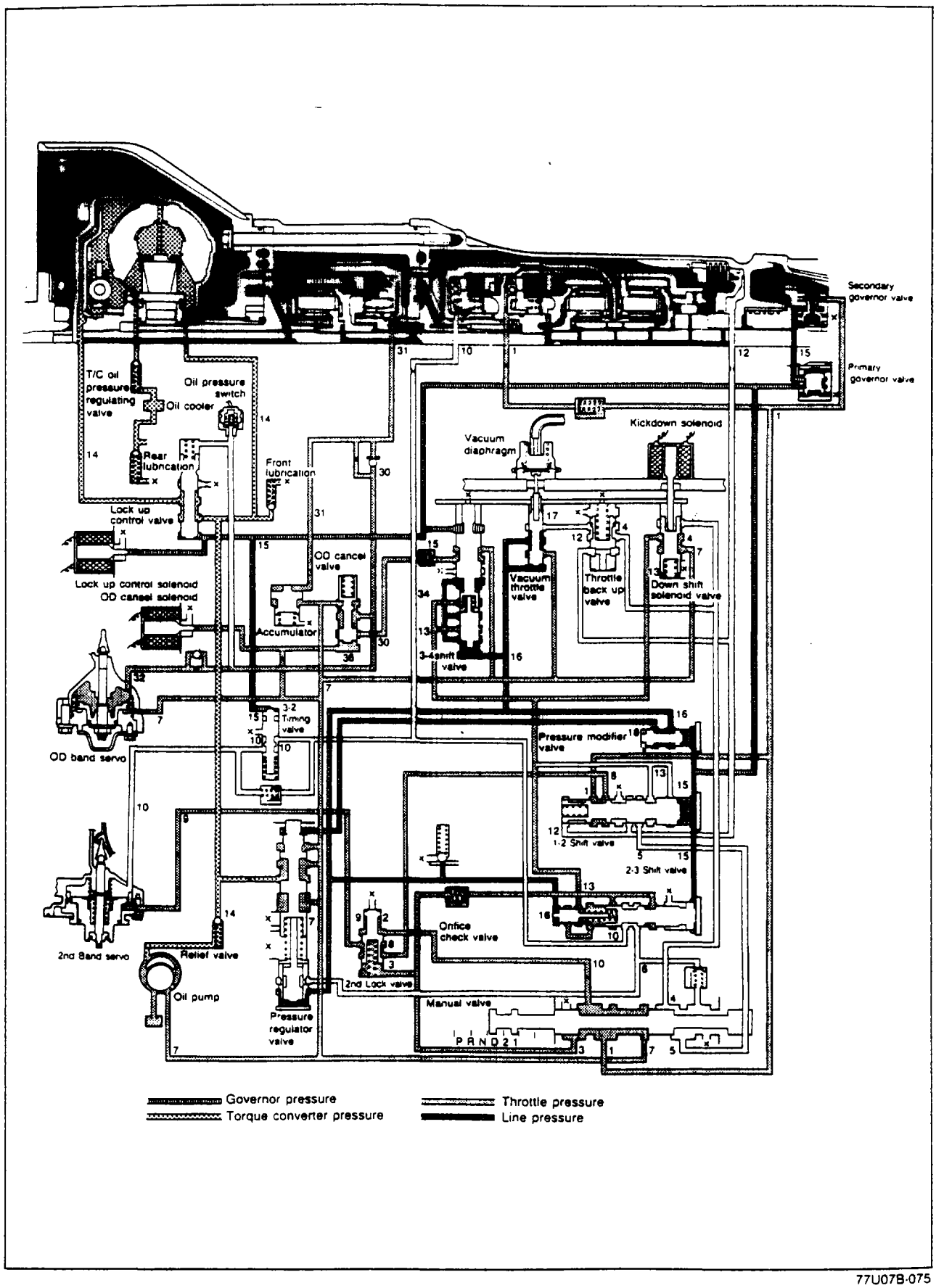
7B HYDRAULIC SYSTEM FLOW CHART

"D" range (Overdrive Lock-up ON)



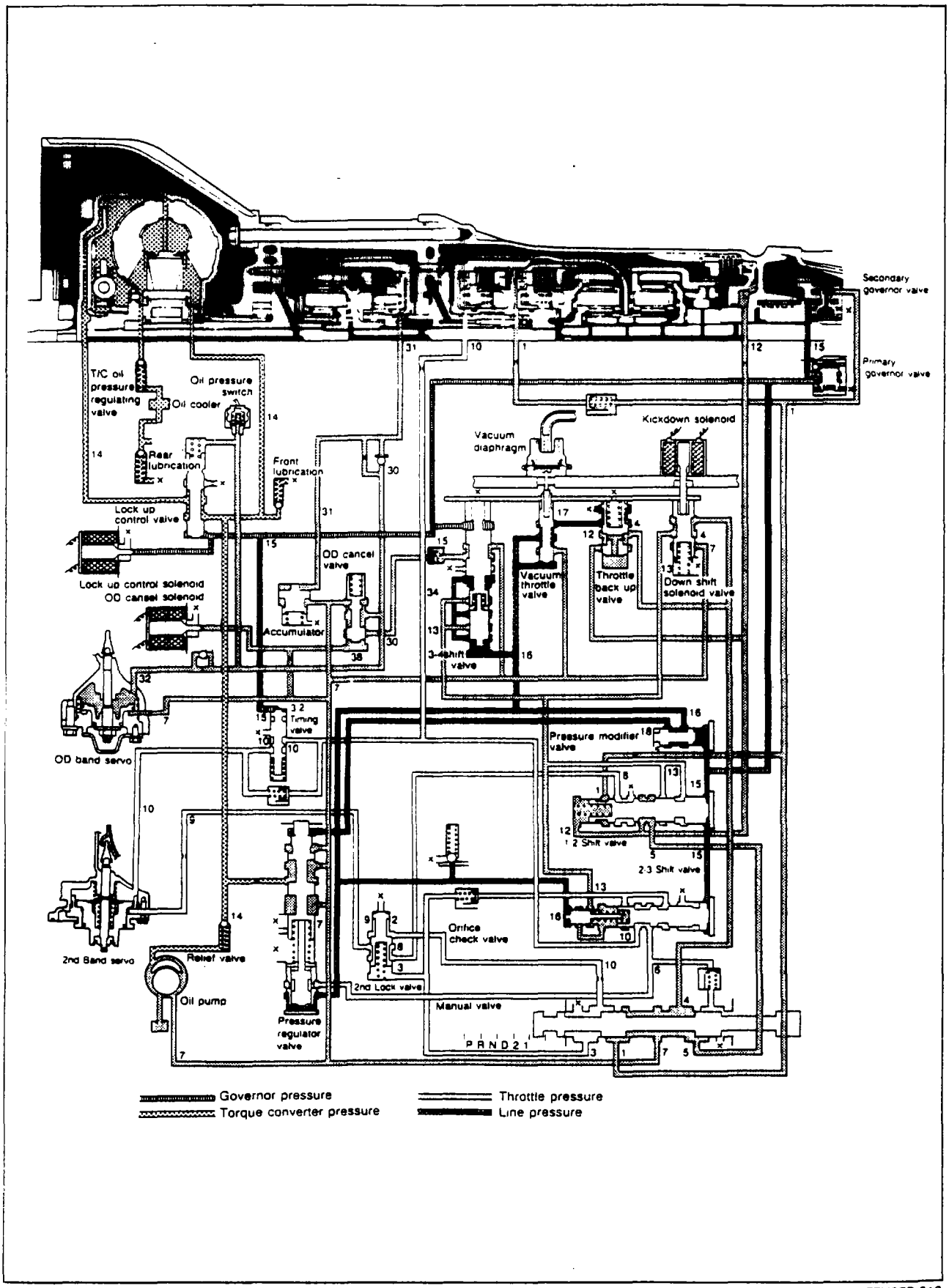
77U07B-010

"D" range (kickdown)



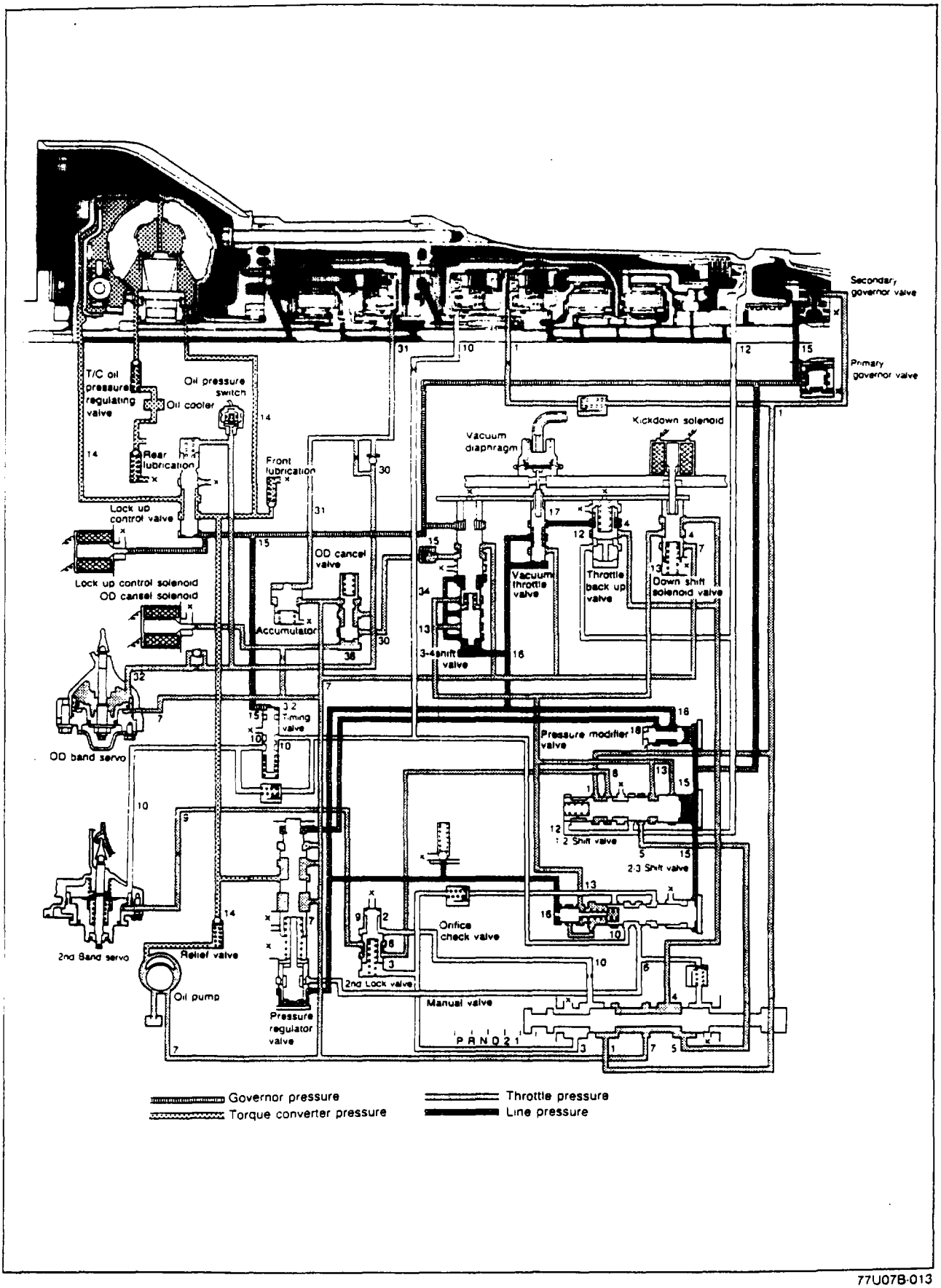
77U07B-075

"1₁" range



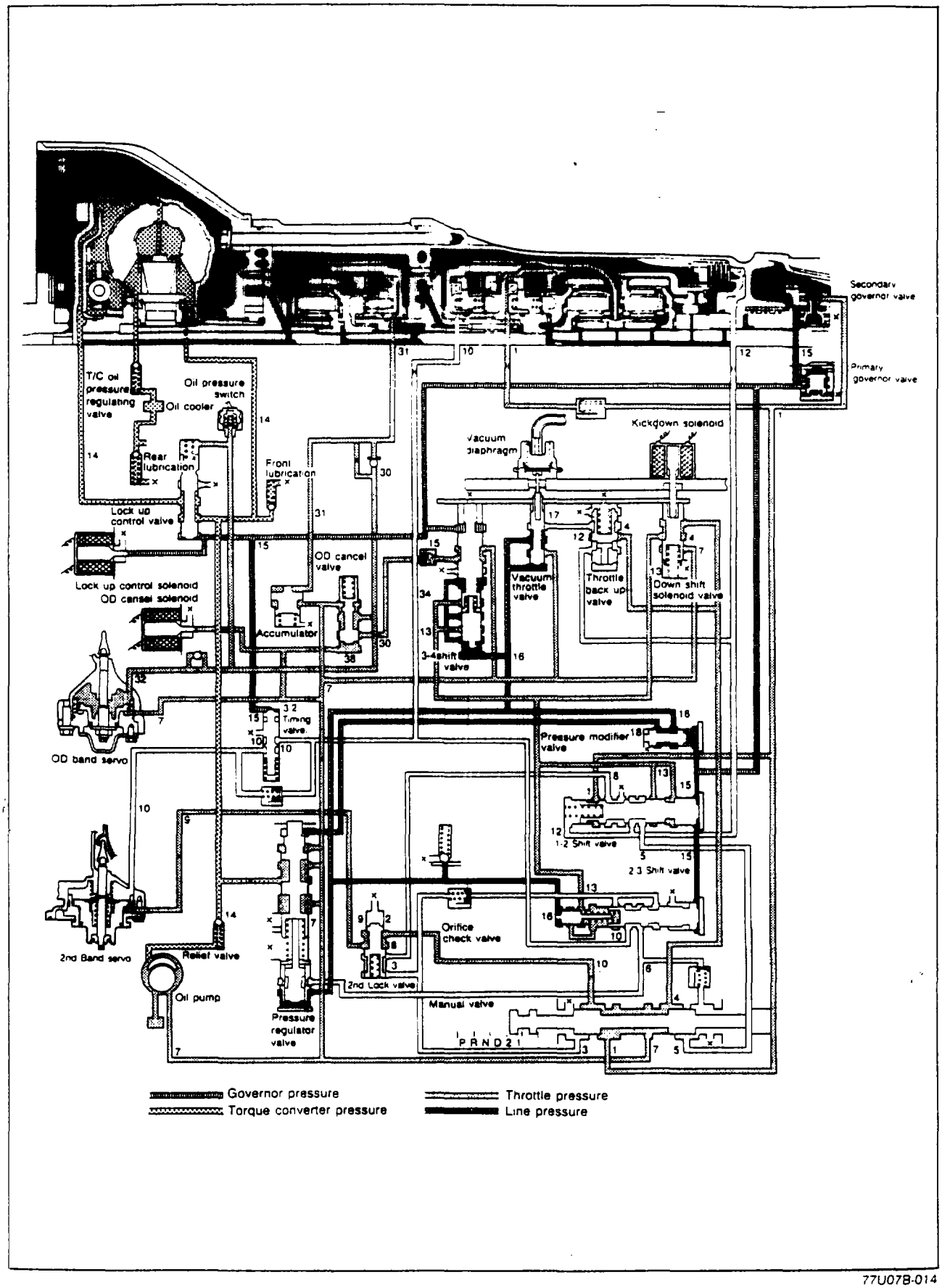
77U07B-012

"1₂" range



77U07B-013

"2" range



77U07B-014