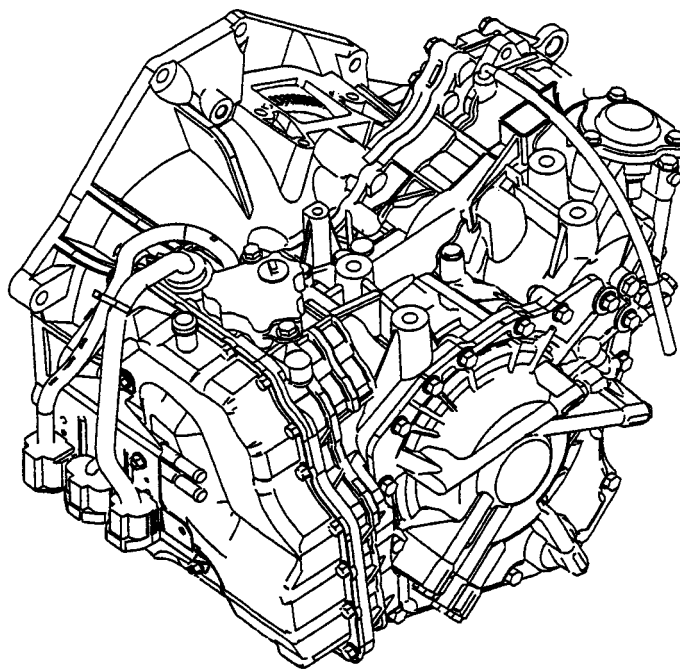
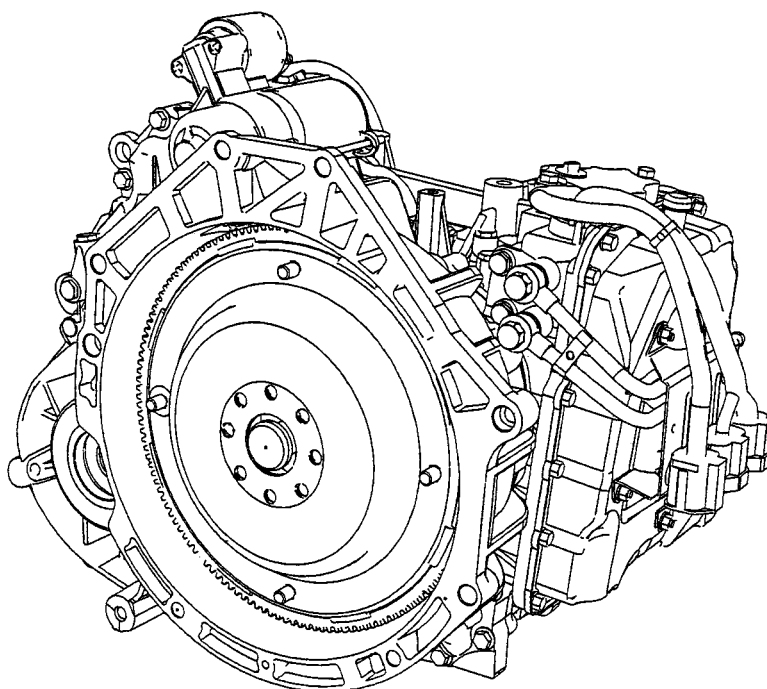
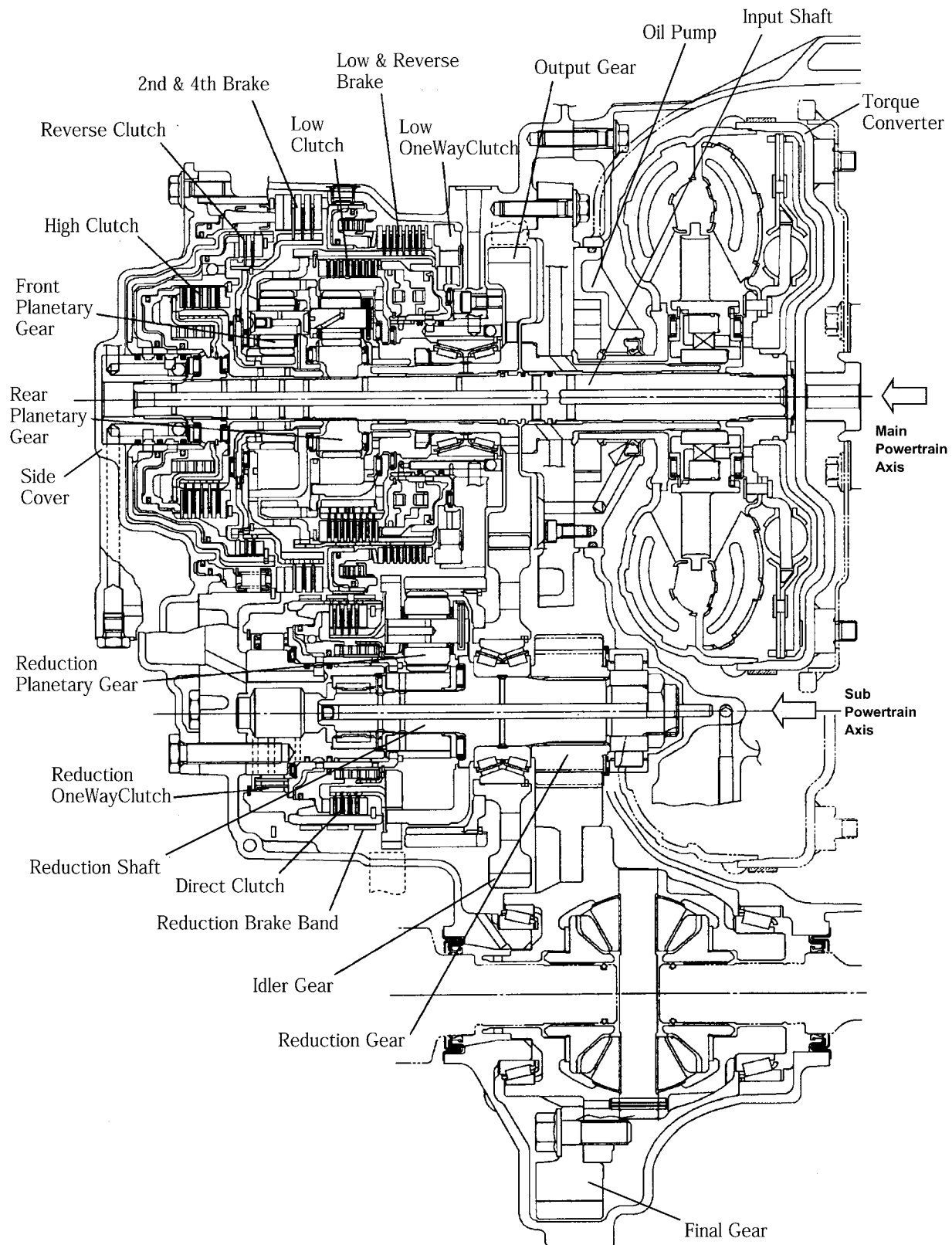


**JF506E / 5F31J / 09A / JA5A-EL  
FORD, MAZDA, VOLKSWAGEN, ROVER, SEAT**



**MPV Van, Mondeo, Galaxy, X-type,  
Freelander, 75 / 45, Sharan, Jetta / Golf, Alhambra** \_\_\_\_\_





	O. D. Switch	Gear Position	Engine braking effect	Low clutch	2-4 brake	High clutch	Reverse clutch	Low and reverse brake	Reduction brake	Direct clutch	Low one-way clutch	Reduction one-way clutch
P		-	-					O				
R	-	Reverse	Yes			O	O	O				
		Reverse Inhibition Control	No			O		O				
N	-	-	-					O				
D	O/D OFF Switch OFF	First	No	O							●	●
		Second	No	O	O							●
		Third	No	O		O						●
		Fourth	No		O	O						●
		Fifth	Yes		O	O			O			
	O/D OFF Switch ON	Fifth	No	O							●	●
		Fifth	No	O	O							●
		Fifth	No	O		O						●
			Yes		O	O			O			
		Fifth*	Yes		O	O			O			
3	-		No	O	O							
			Yes	O		O			O			●
		Fourth*	Yes		O	O			O			
		Fifth*	Yes		O	O			O			
2			Yes	O	O				O			
		Third*	Yes	O		O			O			
		Fourth*	Yes		O	O			O			
		Fifth*	Yes		O	O			O			

O : Operating

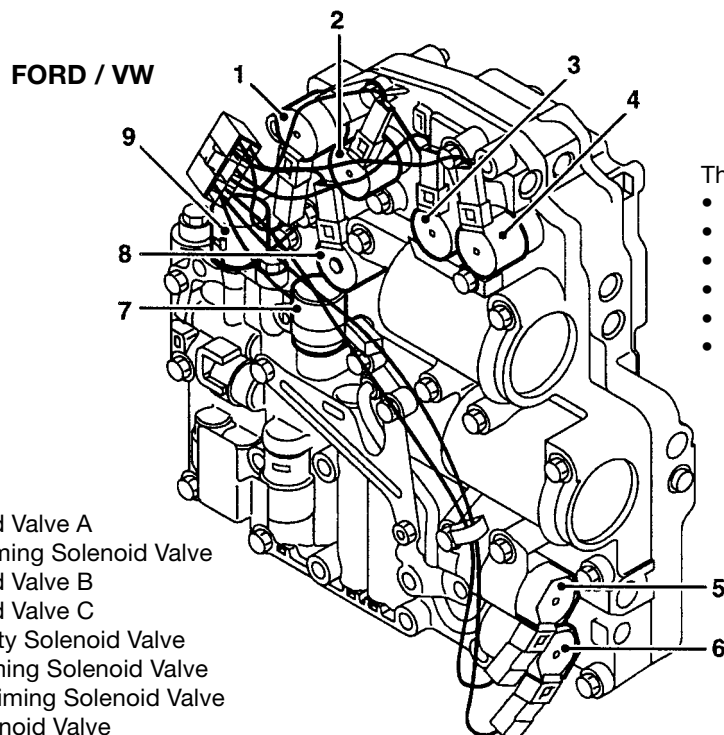
● : Transmits the torque only when driving

\* : To prevent engine overspeed, inhibits downshift until the engine speed is reduced to the preset speed

## Component description

**Note:** • All rotation are viewed from the side cover.

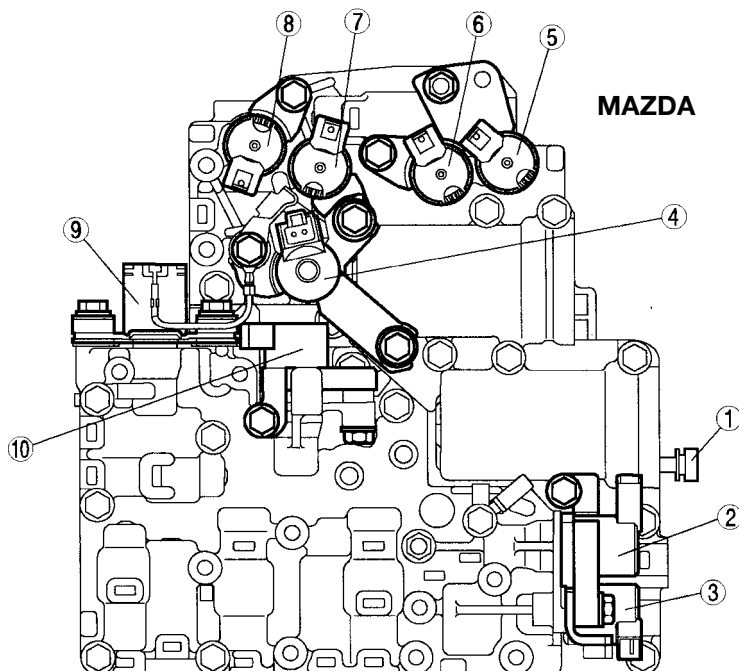
Component	Function
Low clutch	<ul style="list-style-type: none"> <li>Transmits rotation of low clutch drum to rear internal gear</li> <li>Operates in 1GR, 2GR, and 3GR position</li> </ul>
2-4 brake	<ul style="list-style-type: none"> <li>Prevents rotation of front sun gear</li> <li>Operates in 2GR, 4GR, and 5GR position</li> </ul>
High clutch	<ul style="list-style-type: none"> <li>Transmits rotation of high clutch drum to front planetary carrier</li> <li>Operates in 3GR, 4GR, and 5Gr position</li> </ul>
Reverse clutch	<ul style="list-style-type: none"> <li>Transmits rotation of reverse clutch drum to front sun gear</li> <li>Operates when vehicle is reversing</li> </ul>
Reduction brake	<ul style="list-style-type: none"> <li>Prevents rotation of direct clutch drum and prevents rottion of reduction sun gear</li> </ul>
Low and reverse brake	<ul style="list-style-type: none"> <li>Prevents rotation of low clutch drum and front planetary carrier</li> </ul>
Direct clutch	<ul style="list-style-type: none"> <li>Transmits rotation of reduction planetary carrier to reduction sun gear</li> <li>Operates in 5GR position</li> </ul>
Low one-way clutch	<ul style="list-style-type: none"> <li>Locks clockwise rotation of front planetary carrier</li> </ul>
Reduction one-way clutch	<ul style="list-style-type: none"> <li>Locks counterclockwise rotation of reduction sun gear</li> </ul>



The On/Off Solenoid Valves Are:

- Shift Solenoid Valve A
- Shift Solenoid Valve B
- Shift Solenoid Valve C
- Low Clutch Timing Solenoid Valve
- Reduction Timing Solenoid Valve
- 2-4 Brake Timing Solenoid Valve

1. Shift Solenoid Valve A
2. Reduction Timing Solenoid Valve
3. Shift Solenoid Valve B
4. Shift Solenoid Valve C
5. 2-4 Brake Duty Solenoid Valve
6. 2-4 Brake Timing Solenoid Valve
7. Low Clutch Timing Solenoid Valve
8. Lock-up Solenoid Valve
9. Line Pressure Duty Solenoid Valve



1	Manual valve
2	2-4 Brake Solenoid Valve
3	Neutral Shift Solenoid Valve
4	TCC Solenoid Valve
5	Shift Solenoid C

6	Shift Solenoid B
7	Reduction Timing Solenoid Valve
8	Shift Solenoid A
9	Pressure Control Solenoid
10	High Clutch Solenoid Valve

**FORD/VW**
**Shift Solenoid Sequence**

Shift Solenoid Valve	Shift Solenoid Sequence				
	1st	2nd	3rd	4th	5th
A	X	O	X	X	O
B	O	O	O	X	X
C	O	X	X	O	O
X = Solenoid Valve Off; O - Solenoid Valve On					

The reduction timing solenoid valve, low clutch timing solenoid valve and 2-4 timing solenoid valve are utilised by the EAT ECU to control the timing of the gear shift changes. These solenoid valves carry out four main functions:

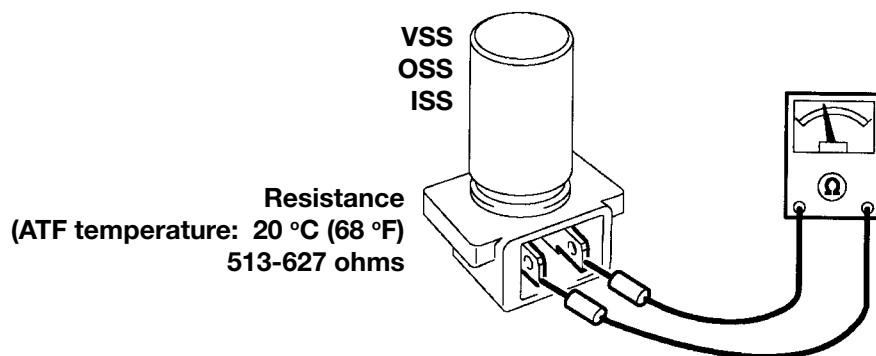
- Shift timing control: For some shifts these three solenoid valves are used to assist line pressure control or 2-4 brake pressure control.
- Line pressure cut back: When the gearbox takes up the drive, there should be a high line pressure present. The EAT ECU controls the low clutch timing solenoid valve which is related to the vehicle speed in order to switch the fluid circuit of the line pressure to on or off therefore controlling cut back.
- Reverse inhibition: If the vehicle exceeds 6 mph (10 km/h) and Reverse (R) is selected, the EAT ECU switches the low clutch timing solenoid valve on. This drains the gearbox fluid from the reverse clutch, therefore the clutch will be unable to engage.
- Idle neutral: The EAT ECU uses the low clutch timing and reduction timing solenoid valves to engage idle neutral.

	Mode	MAZDA Gear Position		Solenoid Valve				
				Shift Solenoid A	Shift Solenoid B	Shift Solenoid C	Reduction Timing Solenoid	Neutral Shift Solenoid
	P			O	O	O		
R	-	Reverse	Reverse inhibition control	O	O	O		O
N	-	-		O	O	O		
D	O/D OFF Switch OFF	First		O	O	O	O	
		Second		O	O		O	
		Third			O		O	
		Fourth				O	O	
		Fifth		O		O	O	
	O/D OFF Switch ON	Fifth		O	O	O	O	
		Fifth		O	O		O	
		Fifth			O		O	
							O	
		Fifth*		O		O	O	
3	-				O	O		O
						O		
		Fourth*				O		
		Fifth*		O		O	O	
2					O	O		
		Third*			O			
		Fourth*				O		
		Fifth*		O		O	O	

**ATF Temperature: 20 °C (68 °F)**

Solenoid Valve	Resistance (ohm)
2-4 Brake Solenoid Valve	2.6-3.2
TCC Solenoid Valve	12.0-13.2
High Clutch Solenoid Valve	2.6-3.2
Pressure Control Solenoid	2.6-3.2
Reduction Timing Solenoid Valve	14-18
Shift Solenoid C	14-18
Shift Solenoid B	14-18
Neutral Shift Solenoid Valve	14-18
Shift Solenoid A	14-18

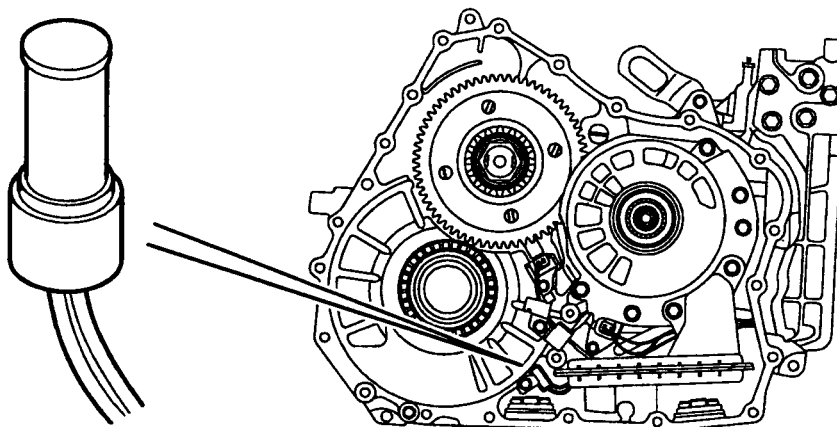
## Vehicle Speed (Output) Sensor Intermediate Shaft Sensor Input Speed Sensor

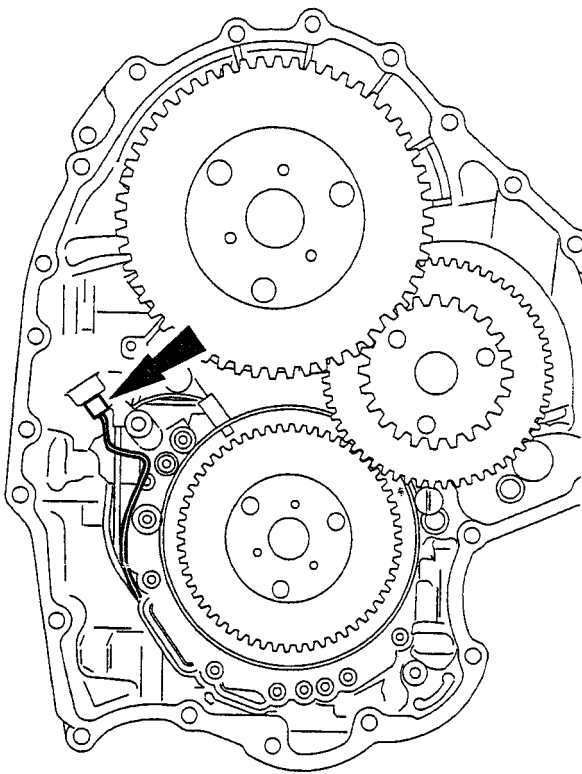


**Fluid Temperature Sensor Resistance Values**

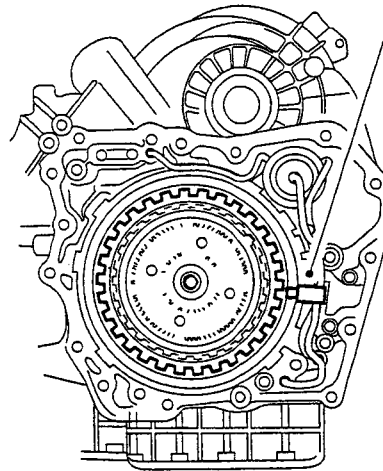
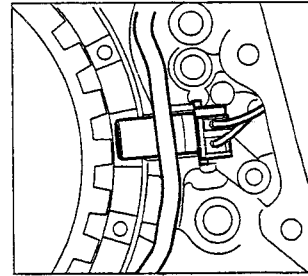
Temperature, °C (°F)	Resistance, kΩ
-40 (-40)	54.90
-20 (-4)	16.70
0 (32)	6.02
20 (68)	2.50
40 (104)	1.16
60 (140)	0.59
80 (176)	0.33
100 (212)	0.19
120 (248)	0.12
140 (284)	0.08

**Fluid Temperature Sensor**

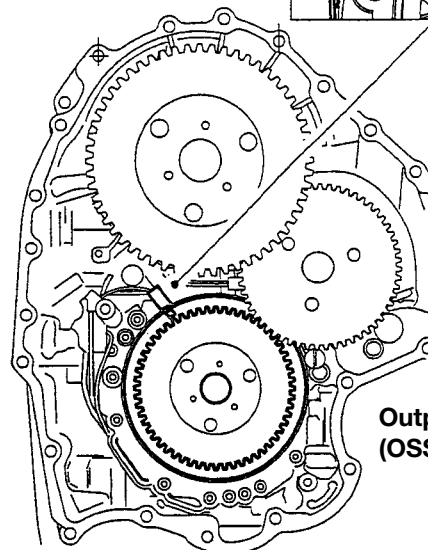
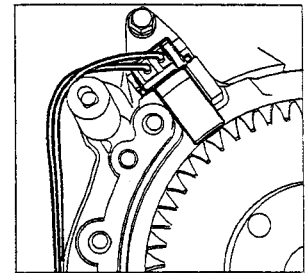




**Selector Lever  
Lock Solenoid**



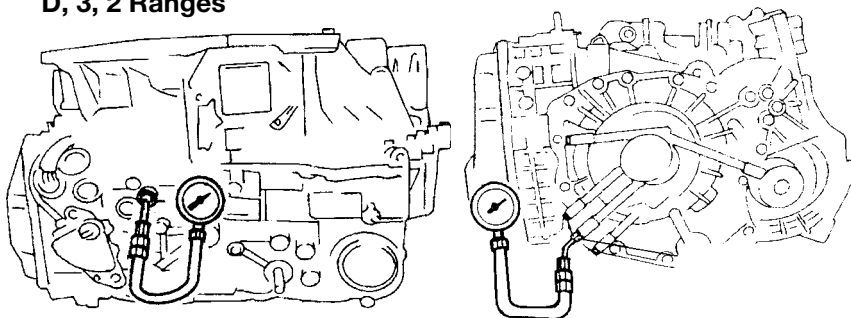
**Intermediate Shaft  
Speed Sensor**



**Output Shaft Speed  
(OSS) Sensor**

## D, 3, 2 Ranges

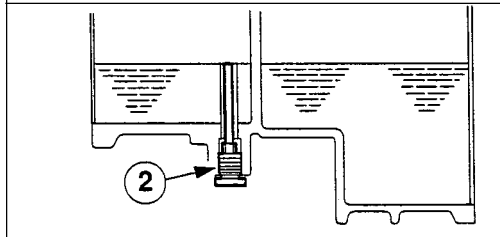
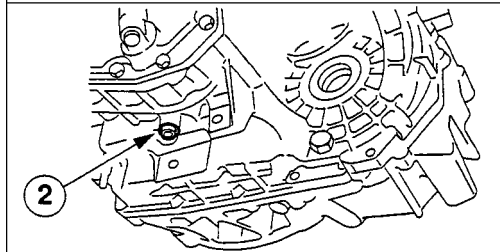
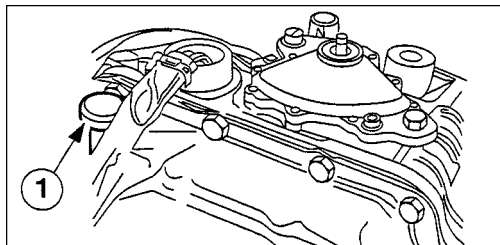
Position/ Range	Line Pressure (kPa(psi))
	<b>Idle</b>
D, 3	290-490 (42-71)
2, R	550-750 (80-109)



## Evaluation of Line Pressure Test

Condition			Possible Cause
Idle	Below Specification	Low pressure in all ranges	Worn oil pump Poor operation of each solenoid Fluid leaking from oil strainer, oil pump, pressure regulator valve, torque converter relief valve, and/or pressure relief valve Pressure regulator valve or pilot valve sticking Damaged pressure regulator valve spring or pilot valve spring
		Low pressure in D range only	Fluid leaking from hydraulic circuit of low clutch
		Low pressure in 3 and 2 ranges only	Fluid leaking from hydraulic circuit of low clutch and 2-4 brake
		Low pressure in R position only	Fluid leaking from hydraulic circuit of reverse clutch Fluid leaking from hydraulic circuit of low and reverse brake clutch

## Fluid Level Check



Throttle position sensor out of adjustment  
TFT sensor malfunction  
Poor operation of shift solenoid  
Pilot valve sticking  
Pressure reducing valve or plug sticking

Throttle position sensor out of adjustment  
Pressure control solenoid malfunction  
Poor operation of shift solenoid  
Pilot valve sticking  
Pressure reducing valve or plug sticking

- Once the temperature has reached 35°C/95°F remove the fluid level check plug. #2
- If transmission fluid flows out from the opening, wait until the flow stops.
- If no transmission fluid flows out, top up with transmission fluid through the filler neck #1 until fluid starts to escape from the level check plug opening.
- Install the fluid level check plug.

1	Oil Filler Neck
2	Fluid Level Check Plug