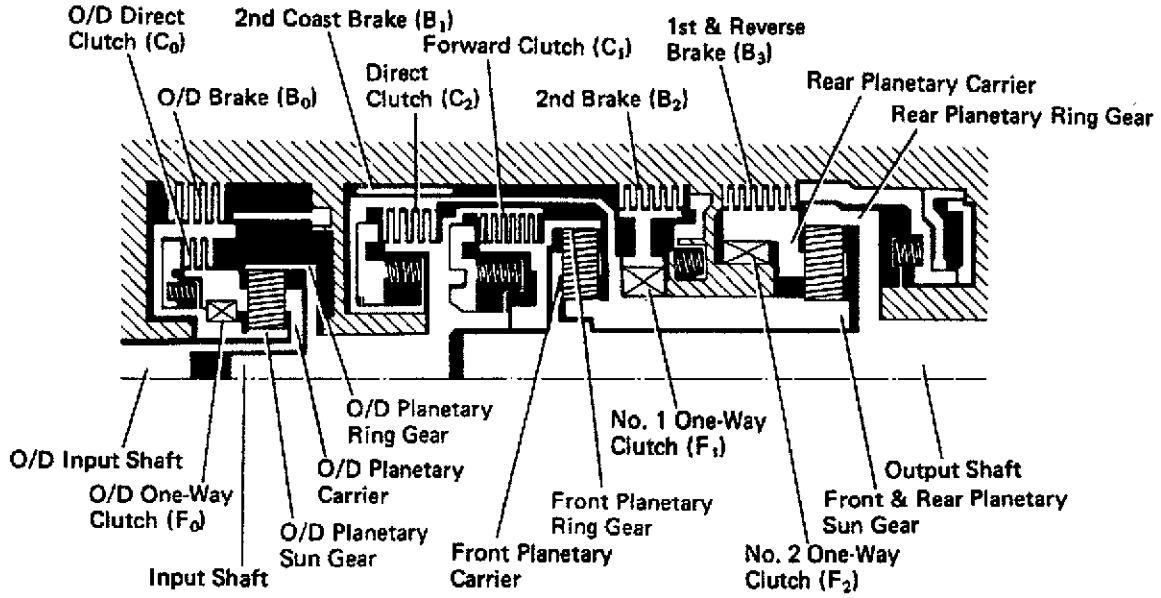
OPERATION

1. OPERATING CONDITIONS

AT02T-0E



AT2157

○ ..... Operating

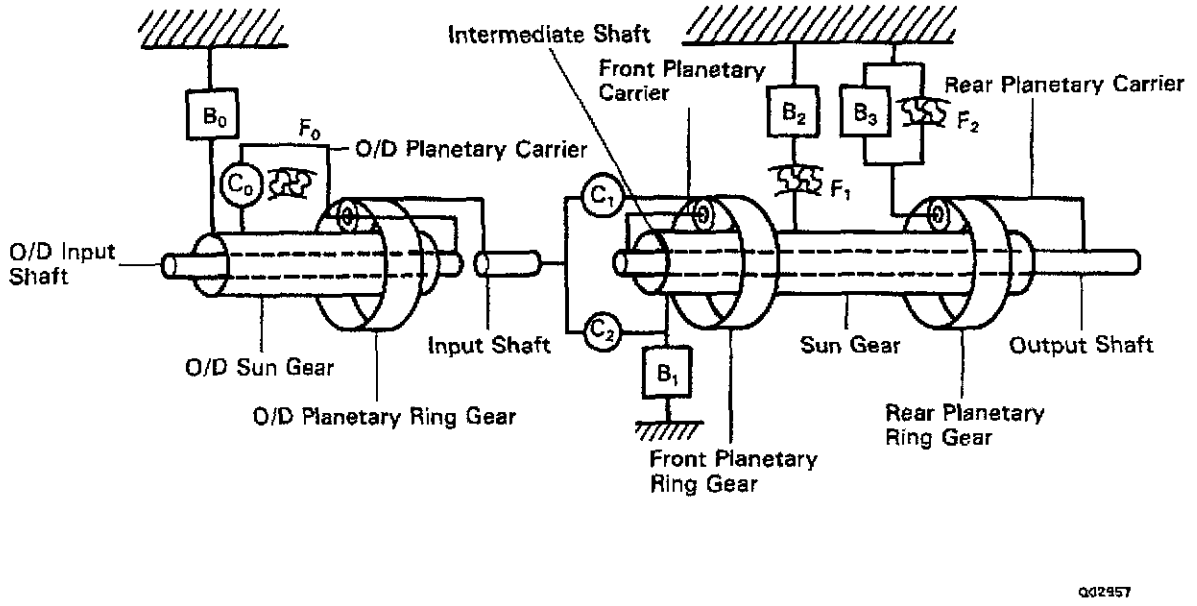
Shift lever position	Gear position	C_0	C_1	C_2	B_0	B_1	B_2	B_3	F_0	F_1	F_2
P	Parking	○									
R	Reverse	○		○				○	○		
N	Neutral	○									
D	1st	○	○						○		○
	2nd	○	○				○		○	○	
	3rd	○	○	○			○		○		
	O/D		○	○	○		○				
2	1st	○	○						○		○
	2nd	○	○			○	○		○	○	
	3rd	○	○	○			○		○		
L	1st	○	○					○	○		○
	*2nd	○	○			○	○		○	○	

* Down-shift only in the L position and 2nd gear — no up-shift.

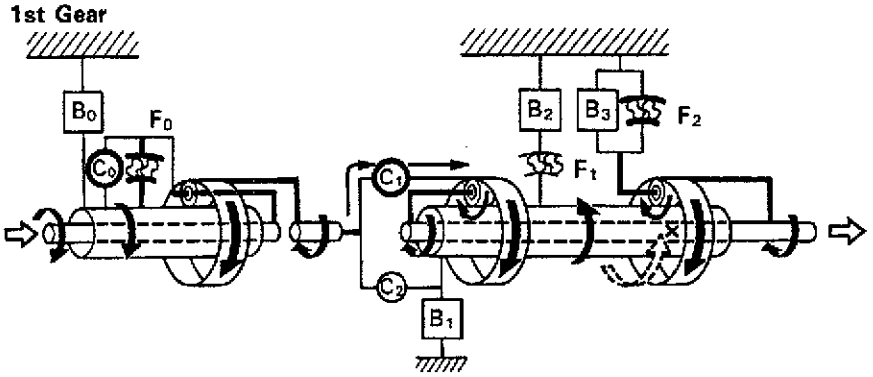
V03089

2. FUNCTION OF COMPONENTS

NOMENCLATURE	OPERATION
O/D Direct Clutch (C_0)	Connects overdrive sun gear and overdrive carrier
O/D Brake (B_0)	Prevents overdrive sun gear from turning either clockwise or counterclockwise
O/D One-Way Clutch (F_0)	When transmission is being driven by engine, connects overdrive sun gear and overdrive carrier
Forward Clutch (C_1)	Connects input shaft and front planetary ring gear
Direct Clutch (C_2)	Connects input shaft and front & rear planetary sun gear
2nd Coast Brake (B_1)	Prevents front & rear planetary sun gear from turning either clockwise or counterclockwise
2nd Brake (B_2)	Prevents outer race of F_1 from turning either clockwise or counterclockwise, thus preventing front & rear planetary sun gear from turning counterclockwise
1st & Reverse Brake (B_3)	Prevents rear planetary carrier from turning either clockwise or counterclockwise
No.1 One-Way Clutch (F_1)	When B_2 is operating, prevents front & rear planetary sun gear from turning counterclockwise
No.2 One-Way Clutch (F_2)	Prevents rear planetary carrier from turning counterclockwise

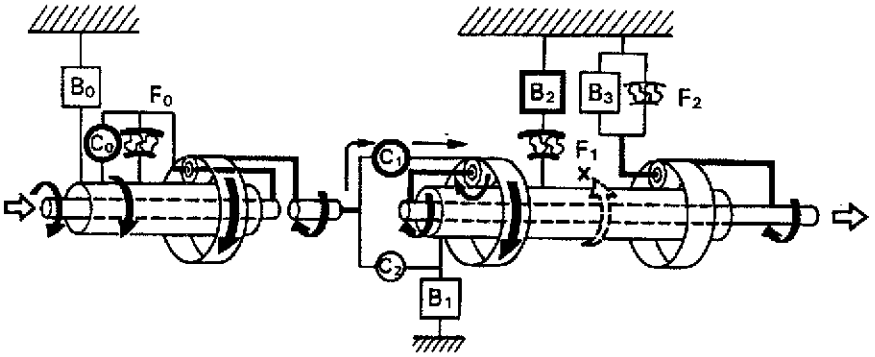


D or 2 Position 1st Gear



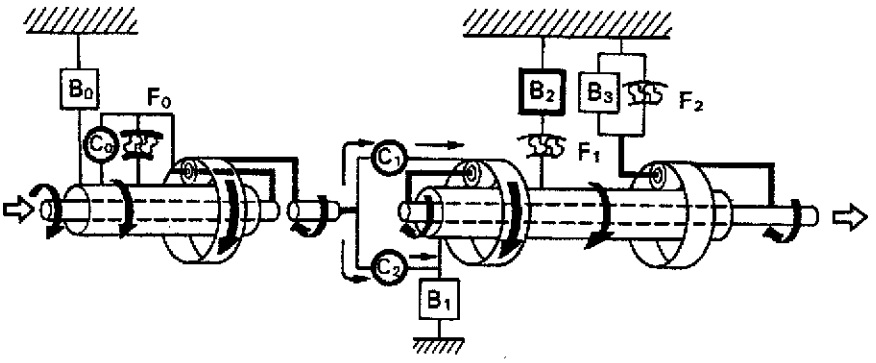
AT6675

D Position 2nd Gear



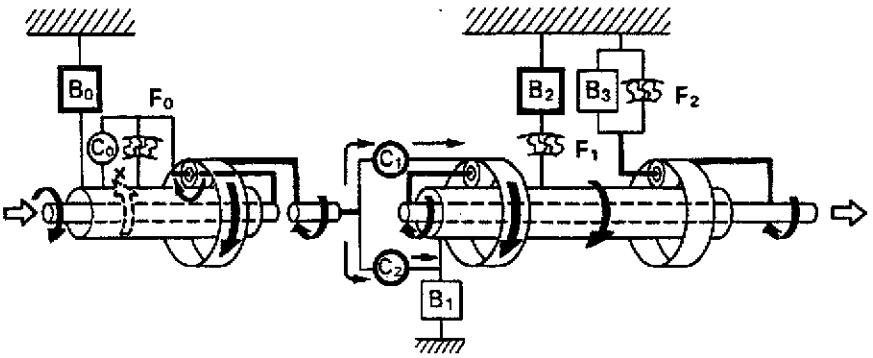
AT6676

D or 2 Position 3rd Gear



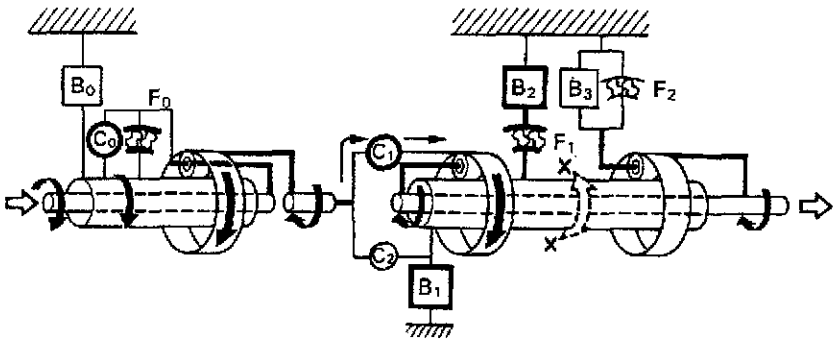
AT6677

D Position O/D



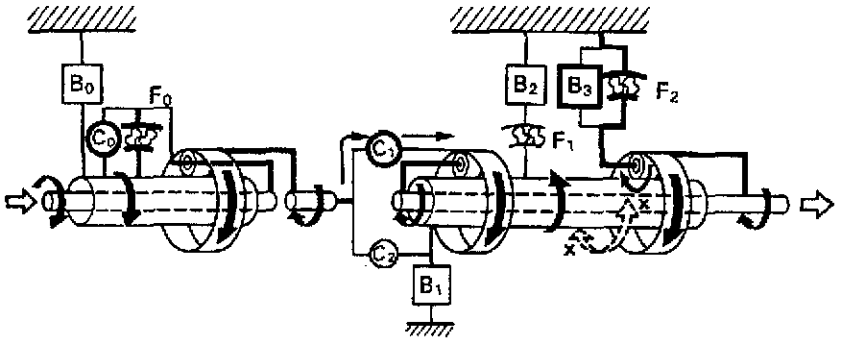
AT6678

2 or L Position 2nd Gear



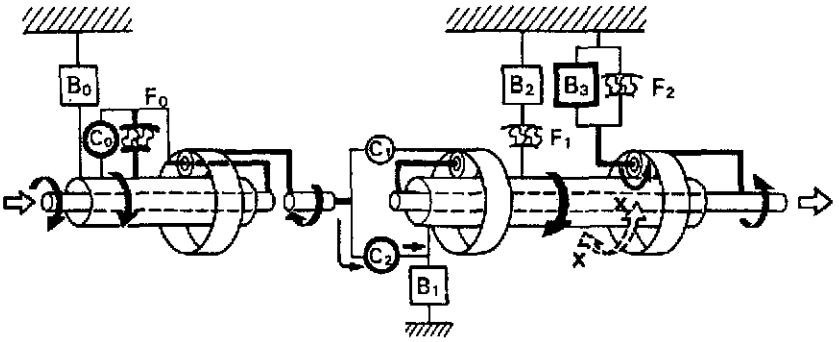
AT6679

L Position 1st Gear



AT6680

R Position Reverse Gear



AT6681

V02111

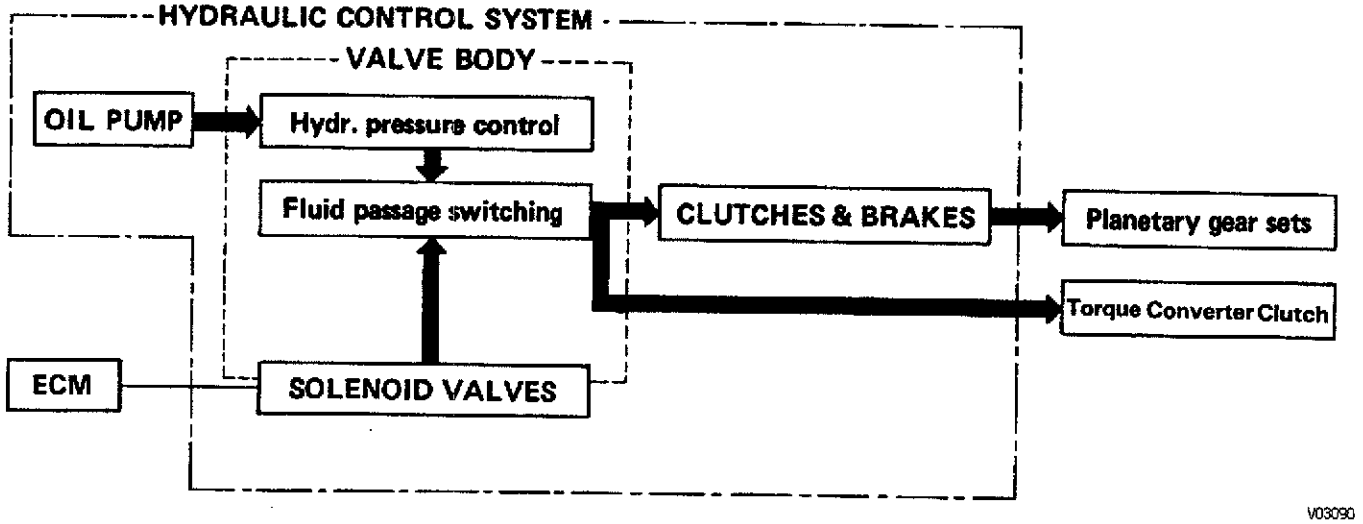
3. HYDRAULIC CONTROL SYSTEM

The hydraulic control system is composed of the oil pump, the valve body, the solenoid valves, and the clutches and brakes, as well as the fluid passages which connect all of these components. Based on the hydraulic pressure created by the oil pump, the hydraulic control system governs the hydraulic pressure acting on the torque converter clutch, clutches and brakes in accordance with the vehicle driving conditions.

There are 3 solenoid valves on the valve body.

The No.1 and No.2 solenoid valves are turned on and off by signals from the ECM to operate the shift valves and change the gear shift position.

The lock–up solenoid valve is operated by signals from the ECM to engage or disengage the lock–up clutch of the torque converter clutch.



- **LINE PRESSURE**

Line pressure is the most basic and important pressure used in the automatic transmission, because it is used to operate all of the clutches and brakes in the transmission.

If the primary regulator valve does not operate correctly, line pressure will be either too high or too low. Line pressure that is too high will lead to shifting shock and consequent engine power loss due to the greater effort required of the oil pump; line pressure that is too low will cause slippage of clutches and brakes, which will, in extreme cases, prevent the vehicle from moving. Therefore, if either of these problems are noted, the line pressure should be measured to see if it is within specification.

- **THROTTLE PRESSURE**

Throttle pressure is always kept in accordance with the opening angle of the engine throttle valve. This throttle pressure acts on the primary regulator valve and, the line pressure is regulated according to the throttle valve opening.

In the hydraulically controlled automatic transmission, throttle pressure is used for regulating line pressure and as signal pressure for up–shift and down–shift of the transmission. In the electronically controlled transmission, however, throttle pressure is used only for regulating line pressure. Consequently, improper adjustment of the transmission throttle cable may result in a line pressure that is too high or too low. This, in turn, will lead to shifting shock or clutch and brake slippage.

4. ELECTRONIC CONTROL SYSTEM

The electronic control system, which controls the shift points and the operation of the lock–up clutch, is composed of the following 3 parts:

1. Sensors

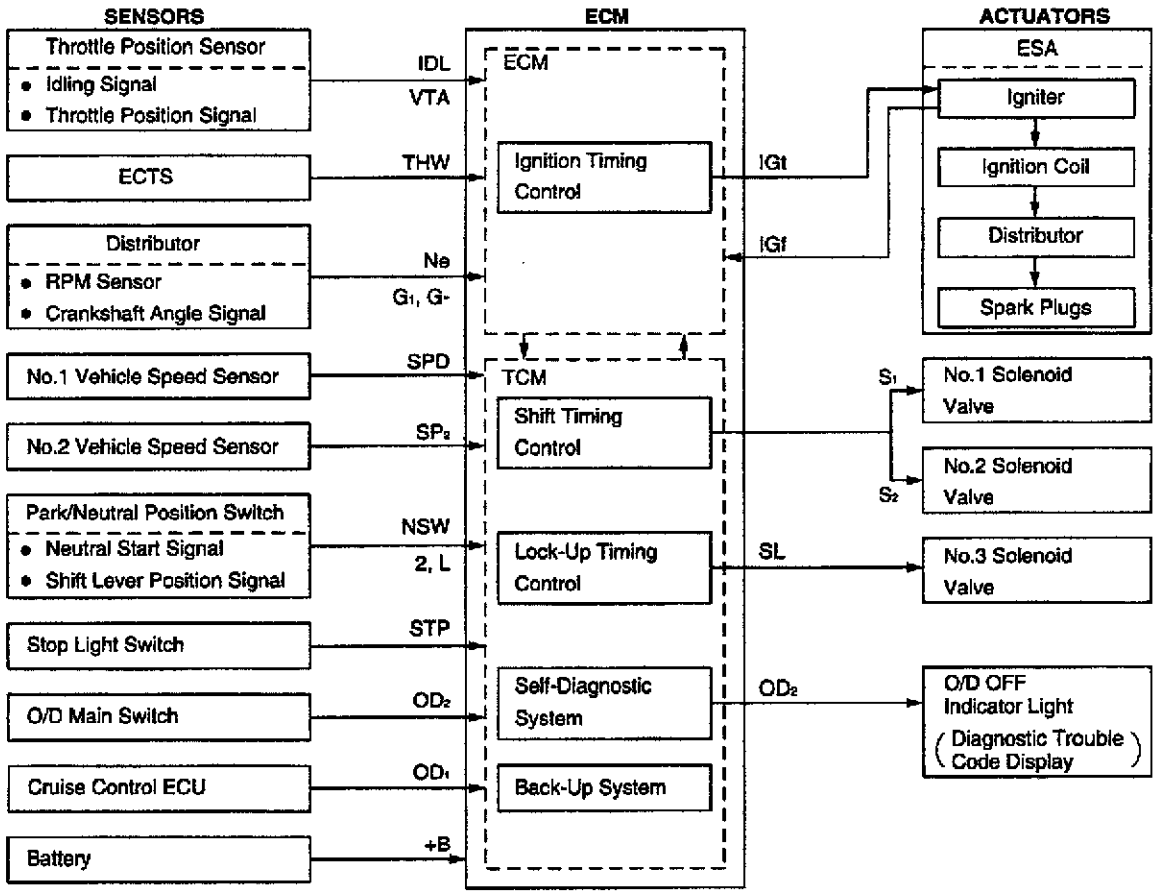
These sensors sense the vehicle speed, throttle opening and other conditions and send these data to the ECM in the form of electrical signals.

2. ECM

The ECM determines the shift and lock–up timing based upon the signals from sensors, and controls the solenoid valves of the hydraulic control unit accordingly.

3. Actuators

These are 3 solenoid valves that control hydraulic pressure acting on the hydraulic valves to control shifting and lock–up timing.



V05023