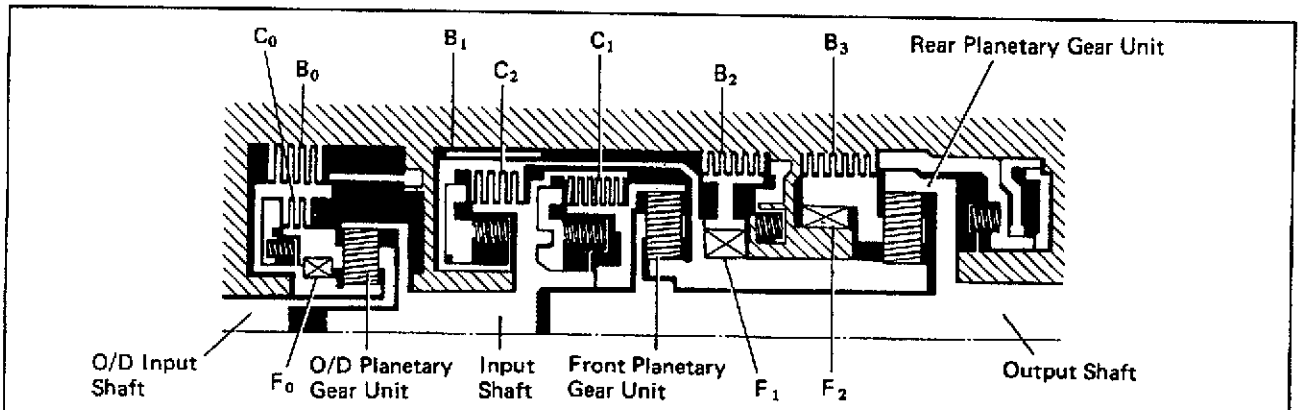
# OPERATION

## 1. OPERATING CONDITIONS

AT06X—02

### 1. Transmission



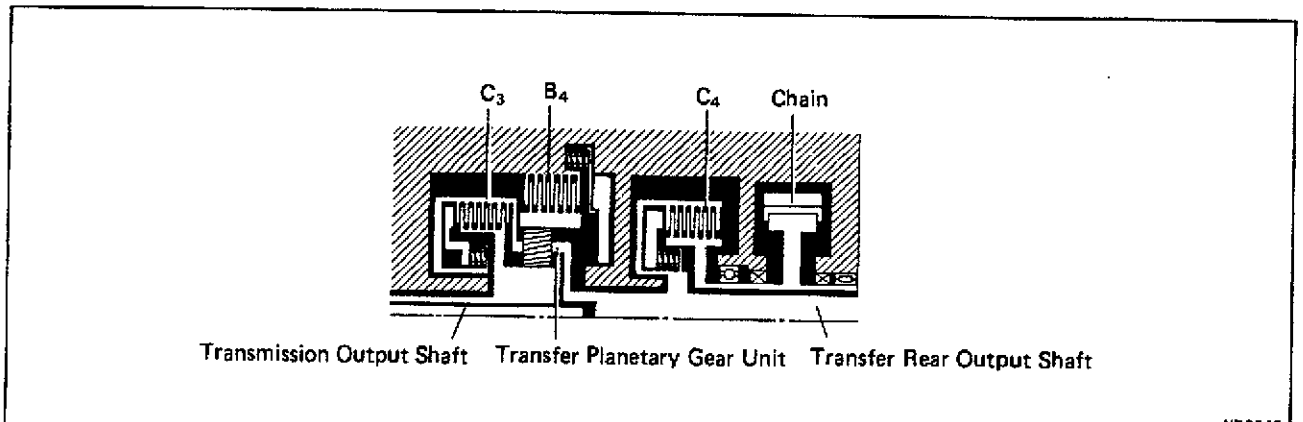

AT2157

| Range (i.e., Shift Lever Position) | Gear | No.1 Solenoid Valve | No.2 Solenoid Valve | $C_0$ | $C_1$ | $C_2$ | $B_0$ | $B_1$ | $B_2$ | $B_3$ I.P. | $B_3$ O.P. | $F_0$ | $F_1$ | $F_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Parking | ON | OFF | ● | | | | | | | | | | |
| R | Reverse | ON | OFF | ● | | ● | | | | ● | ● | ● | | |
| N | Neutral | ON | OFF | ● | | | | | | | | | | |
| D | 1st | ON | OFF | ● | ● | | | | | | | ● | | ● |
| | 2nd | ON | ON | ● | ● | | | | ● | | | ● | ● | |
| | 3rd | OFF | ON | ● | ● | ● | | | ● | | | ● | | |
| | O/D | OFF | OFF | | ● | ● | ● | | ● | | | | | |
| 2 | 1st | ON | OFF | ● | ● | | | | | | | ● | | ● |
| | 2nd | ON | ON | ● | ● | | | ● | ● | | | ● | ● | |
| | 3rd | OFF | ON | ● | ● | ● | | | ● | | | ● | | |
| L | 1st | ON | OFF | ● | ● | | | | | ● | ● | ● | | ● |
| | *2nd | ON | ON | ● | ● | | | ● | ● | | | ● | ● | |

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

I.P. ..... Inner Piston
O.P. ..... Outer Piston

### 2. Transfer




ND0045

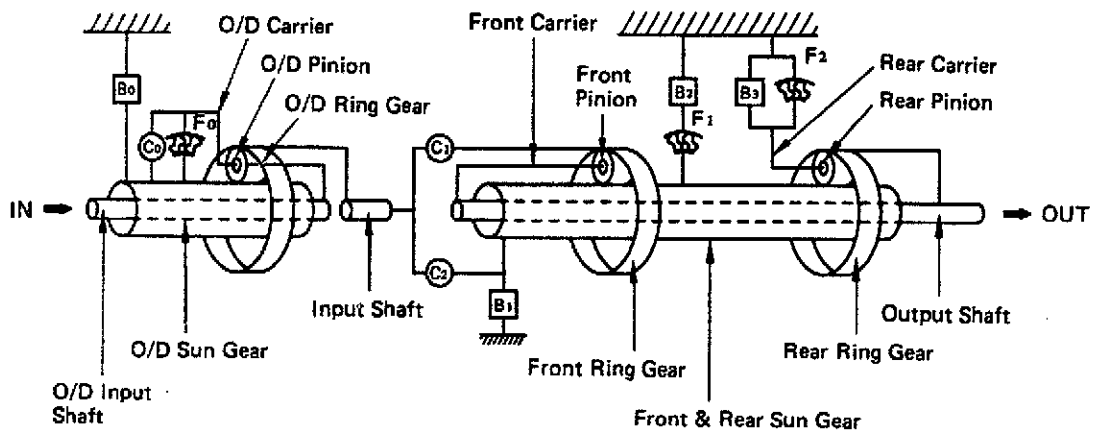
| Transfer gear position | No.4 solenoid valve | $C_3$ | $C_4$ | $B_4$ |
|---|---|---|---|---|
| H2 | OFF | ● | | |
| H4 | OFF | ● | ● | |
| L4 | ON | | ● | ● |

V03236

## 2. FUNCTION OF COMPONENTS

### 1. Transmission

| COMPONENT | | FUNCTION |
|---|---|---|
| $C_1$ | Forward Clutch | Connects input shaft and front planetary ring gear. |
| $C_2$ | Direct Clutch | Connects input shaft and front & rear planetary sun gear. |
| $C_0$ | O/D Direct Clutch | Connects overdrive sun gear and overdrive planetary carrier. |
| $B_1$ | 2nd Coast Brake | Prevents front & rear planetary sun gear from turning either clockwise or counterclockwise. |
| $B_2$ | 2nd Brake | Prevents outer race of $F_1$ from turning either clockwise or counterclockwise thus preventing the front & rear planetary sun gear from turning counterclockwise. |
| $B_3$ | 1st & Reverse Brake | Prevents rear planetary carrier from turning either clockwise or counterclockwise. |
| $B_0$ | O/D Brake | Prevents overdrive sun gear from turning either clockwise or counterclockwise. |
| $F_1$ | No.1 One-Way Clutch | When $B_2$ is operating, this clutch prevents the front & rear planetary sun gear from turning counterclockwise. |
| $F_2$ | No.2 One-Way Clutch | Prevents rear planetary carrier from turning counterclockwise. |
| $F_0$ | O/D One-Way Clutch | When the transmission is being driven by the engine, this clutch connects the overdrive sun gear and overdrive planetary carrier. |
| Planetary Gears | | These gears change the route through which driving force is transmitted in accordance with the operation of each clutch and brake in order to increase or reduce the input and output speed. |



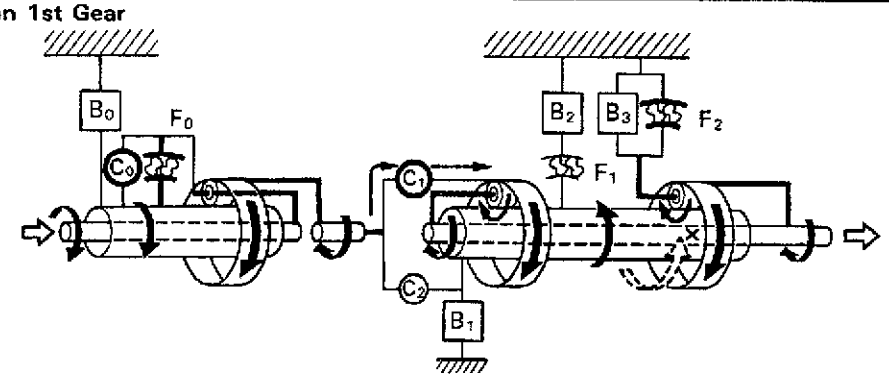

AT5440

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V03235

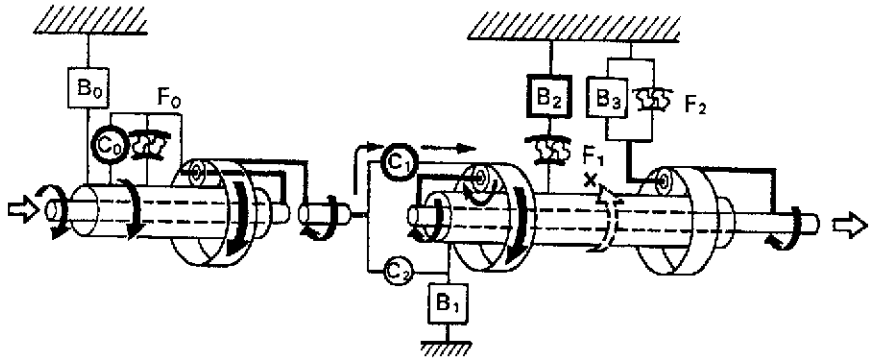
AT

**D or 2 Position 1st Gear**



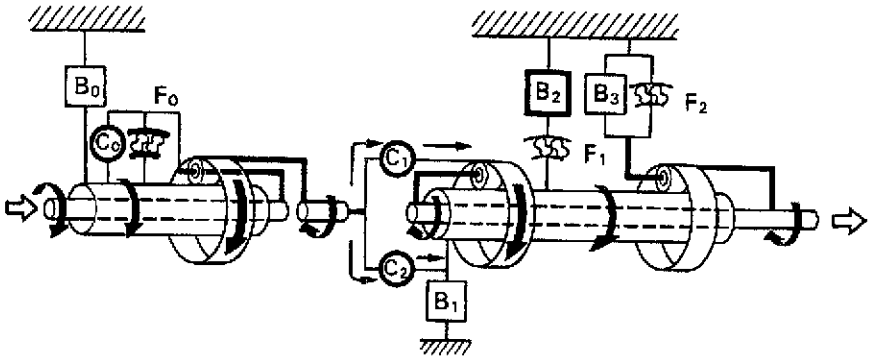

AT6675

**D Position 2nd Gear**



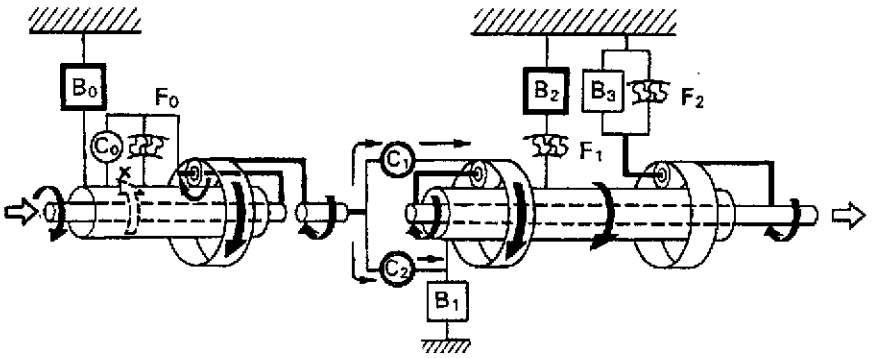

AT6676

**D or 2 Position 3rd Gear**



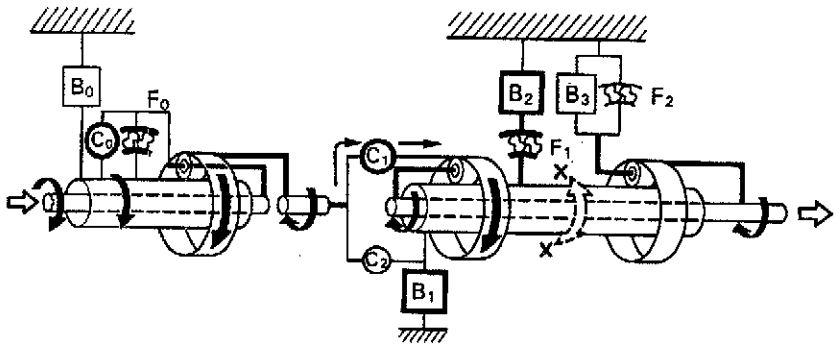

AT6677

**D Position O/D**



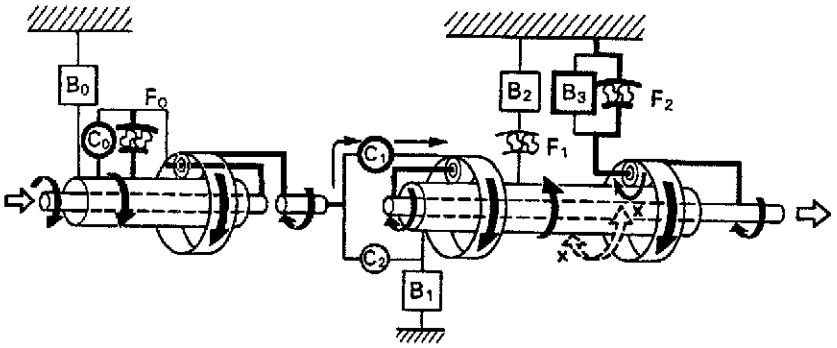

AT6678

2 or L Position 2nd Gear



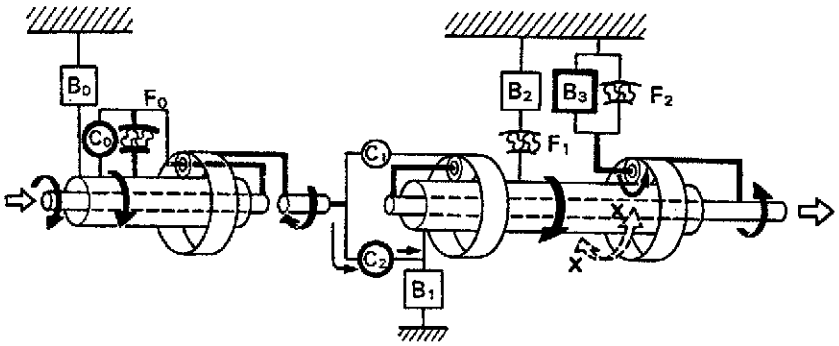

AT6679

L Position 1st Gear




AT6680

R Position Reverse Gear



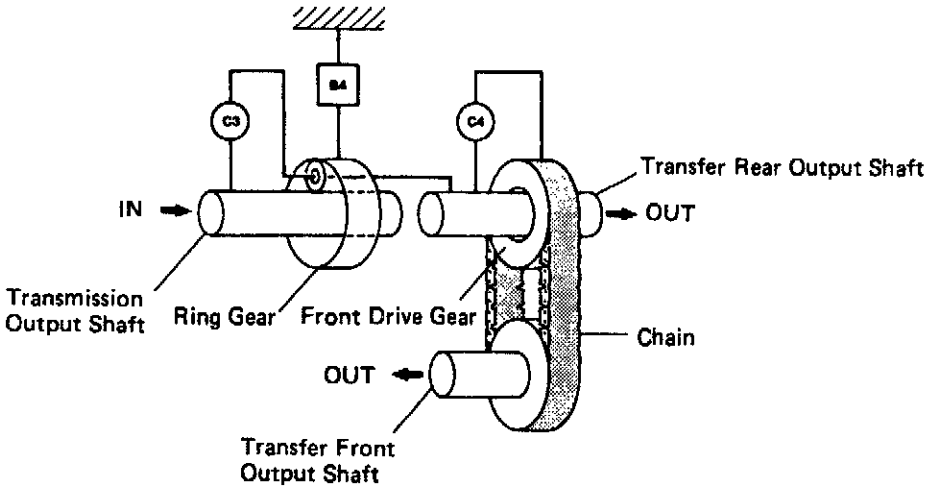

AT6681

V02111

A1

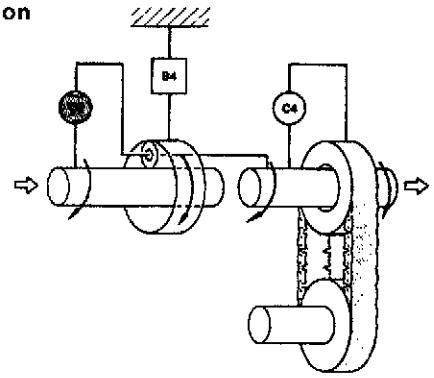
## 2. Transfer

| COMPONENT | | FUNCTION |
|---|---|---|
| $C_3$ | Forward Clutch | Connects transmission output shaft and transfer pinion gear. |
| $C_4$ | Direct Clutch | Connects transfer rear output shaft and front drive gear. |
| $B_4$ | O/D Direct Clutch | Prevents transfer ring gear from turning either clockwise or counterclockwise. |

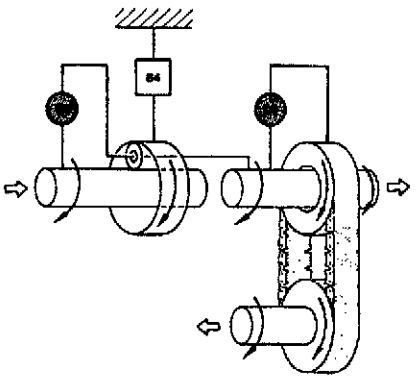



The conditions of operation for each gear position are shown in the following illustrations:

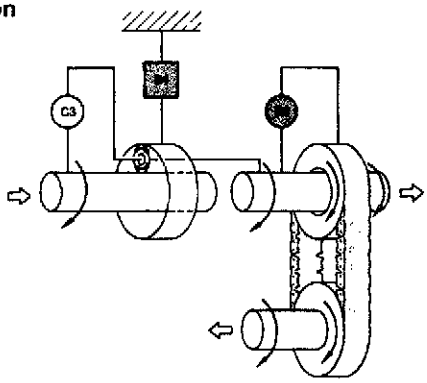
**H2 Position**




**H4 Position**




**L4 Position**



## 2. HYDRAULIC CONTROL SYSTEM

- **TRANSMISSION**

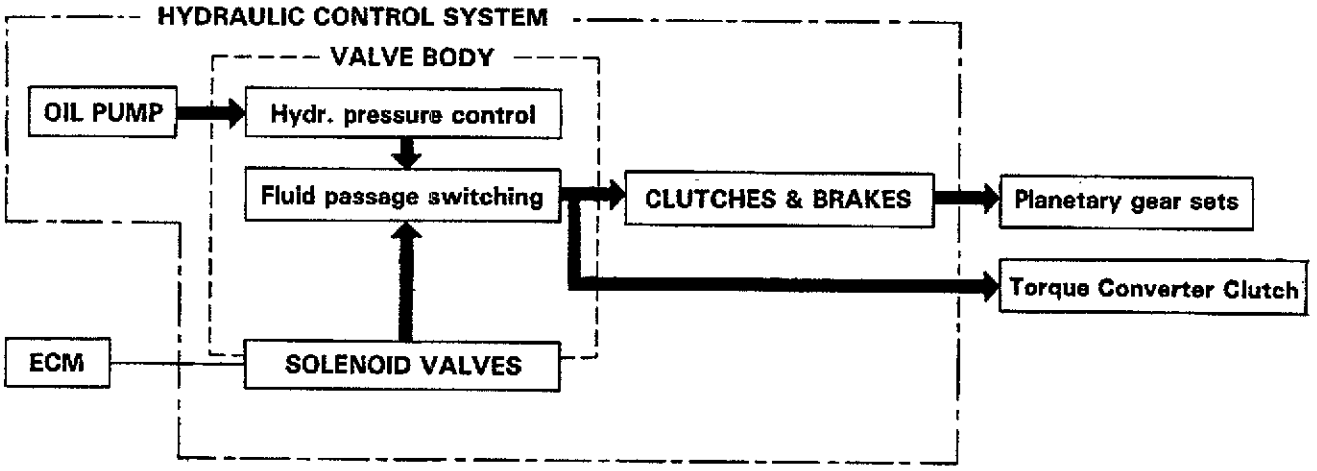
The hydraulic control system is composed of the oil pump, the valve body, the solenoid valves, and the clutches and brakes, as well as the fluid passages which connect all of these components. Based on the hydraulic pressure created by the oil pump, the hydraulic control system governs the hydraulic 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.

AT




V01537

- **TRANSFER**

The hydraulic control system consists of a valve body, No.4 solenoid valve, a brake ($B_4$) and 2 clutches ($C_3$, $C_4$) and passages that connect these elements. It hydraulically controls the planetary gear unit either manually, or automatically by the ECM.

## 3. 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.

