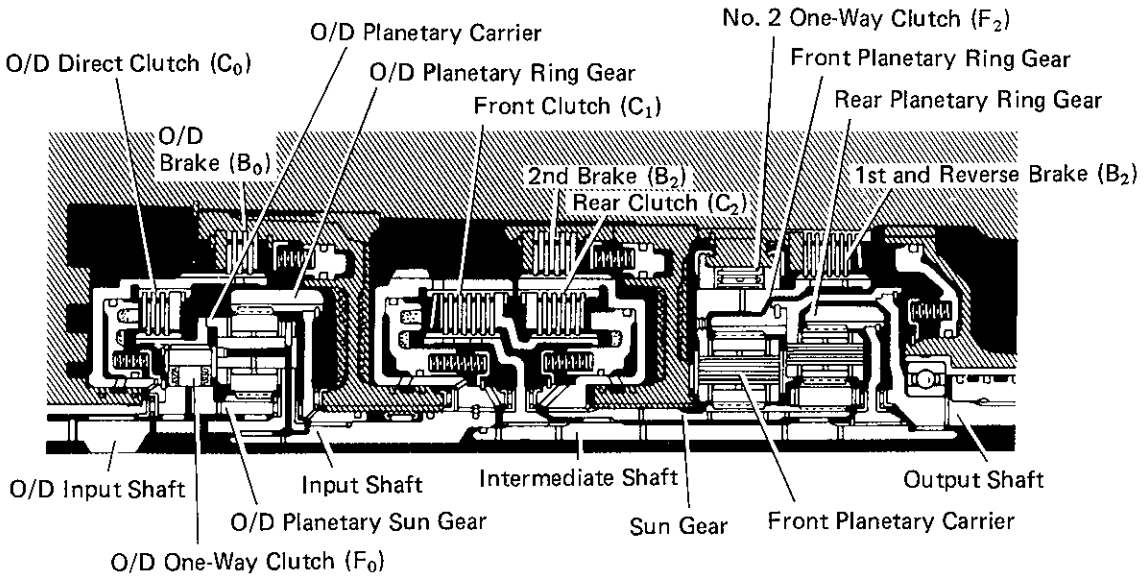
# OPERATION

## PLANETARY GEAR UNIT

The planetary gear unit is composed of three sets of planetary gears, three clutched which transmit power to the planetary gears, and three brakes and two one-way clutches which immobilize the planetary carrier and planetary sun gear.
Power from the engine transmitted the input shaft via the torque converter is than transmitted to the planetary gears by the operation of the clutches. By operation of the brakes and one-way clutches, either the planetary carrier or the planetary sun gear is immobilized, altering the speed of revolution of the planetary gear unit. Shift change is carried out by altering the combination of clutch and brake operation.
Each clutch and brake operates by hydraulic pressure; gear position is decided according to the throttle opening angle and vehicle speed, and shift change automatically occurs.




AT3918

### OPERATION OF EACH ELEMENT

| 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 |
| Front Clutch ($C_1$) | Connects input shaft and intermediate shaft |
| Rear Clutch ($C_2$) | Connects input shaft and front & rear planetary sun gear |
| 2nd Brake ($B_2$) | Prevents front & rear planetary sun gear from turning either clockwise or counterclockwise |
| 1st & Reverse Brake ($B_3$) | Prevents front planetary carrier from turning either clockwise or counterclockwise |
| No.2 One-Way Clutch ($F_2$) | Prevents front planetary carrier from turning counterclockwise |

## OPERATING CONDITION FOR EACH GEAR

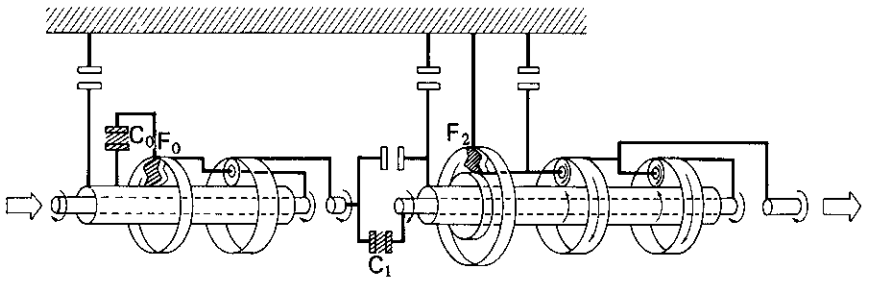
○.....Operating

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

## FUNCTION OF COMPONENTS

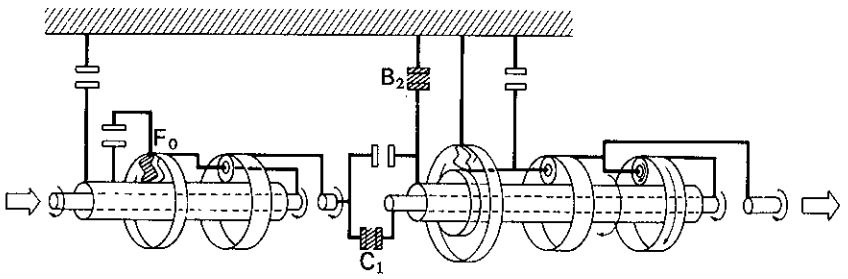
The conditions of operation for each gear position are shown on the following illustration:

**D or 3 Range 1st Gear**




AT5949

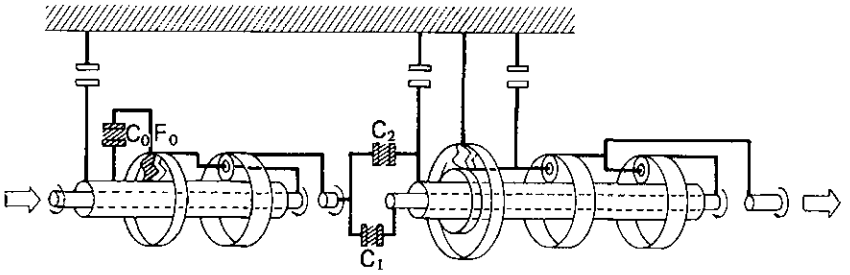
**D or 3 Range 2nd Gear**




AT5950

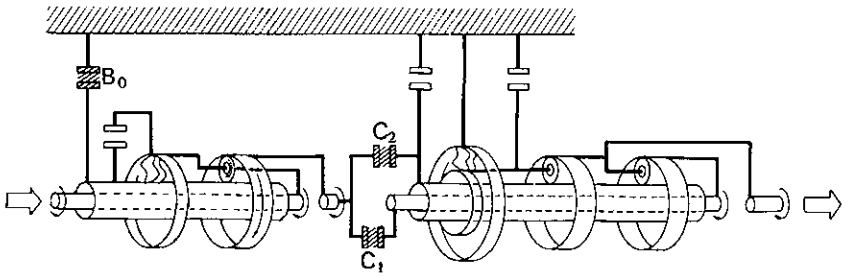
## FUNCTION OF COMPONENTS (Cont'd)

D or 3 Range 3rd Gear



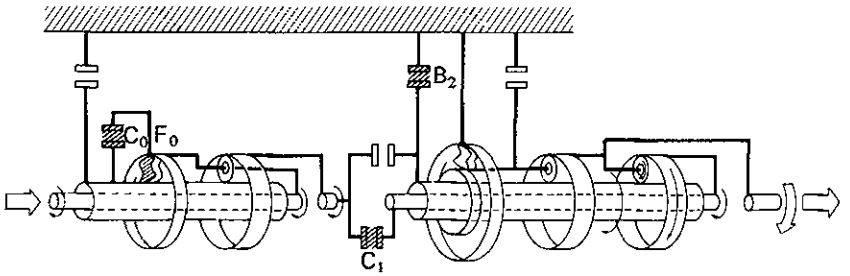

AT5951

D Range O/D



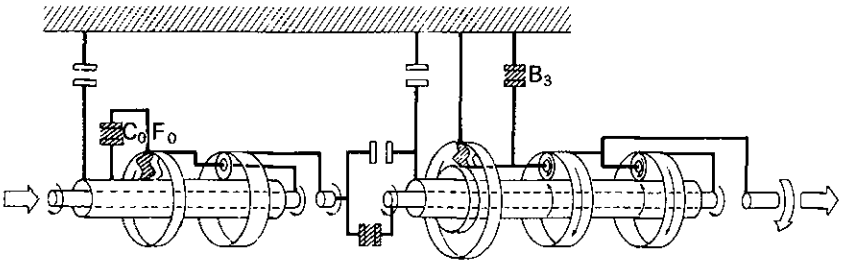

AT5952

2 Range 2nd Gear



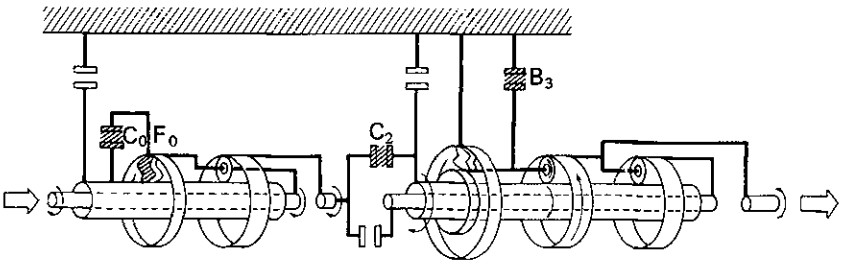

AT5953

L Range 1st Gear




AT5954

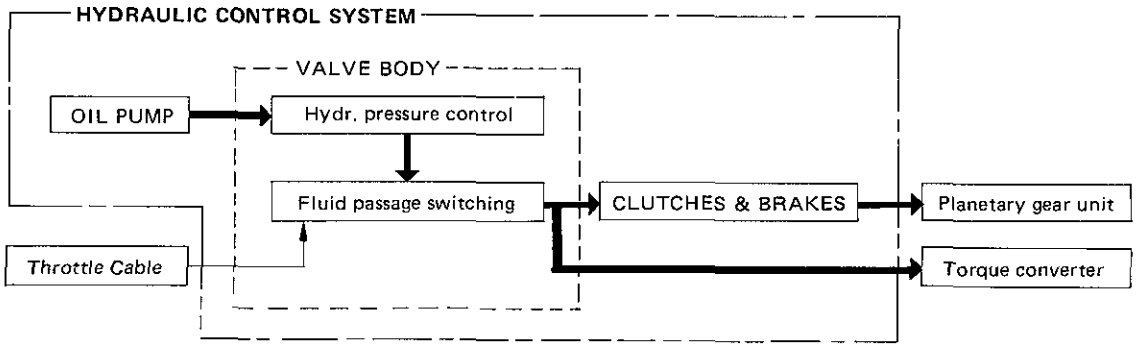
R Range Reverse Gear




AT5955

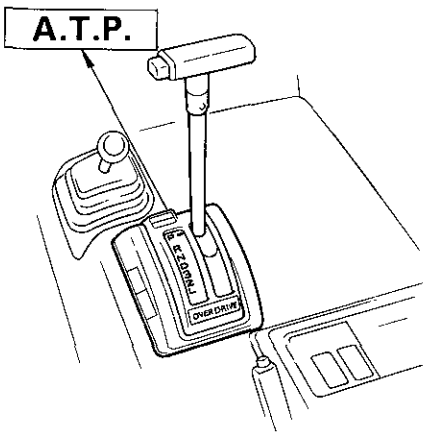
# Hydraulic Control System

The hydraulic control system is composed of the oil pump, the valve body, the accumulators, 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, clutches and brakes in accordance with the vehicle driving conditions.

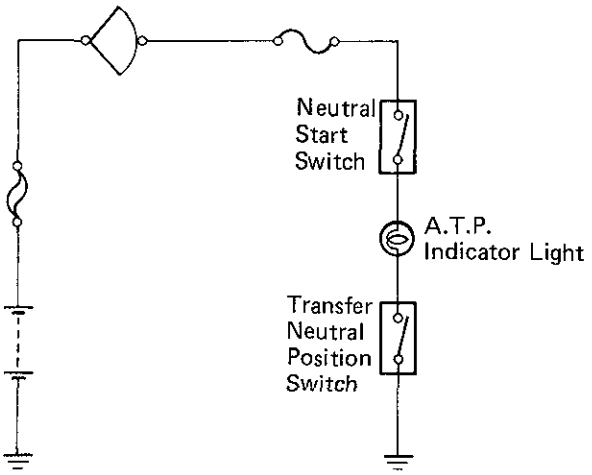



# A.T.P. (Automatic Transmission Parking) Indicator

The propeller shaft and wheels are free even when the transmission shift lever is set to "P" a long as the transfer shift lever is in "neutral" position. The A.T.P. indicator lights up to warn the driver that the propeller shaft and wheels are not locked. If the A.T.P. indicator light goes on, the transfer shift lever should be shifted to H2 or L4 position.




AT3919




AT3920