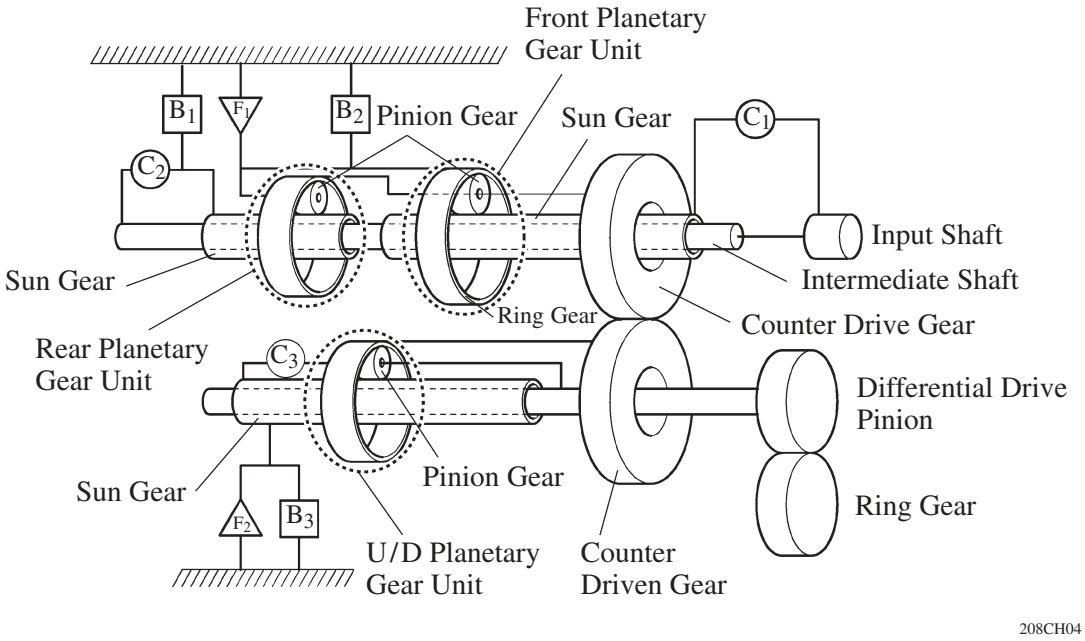
■ PLANETARY GEAR UNIT

1. Construction

- The counter drive and driven gears are placed in front of the front planetary gear and U/D planetary gear unit is placed above the counter shaft. Furthermore, the number of the brake and one-way clutch is minimized to realize the compact and high-capacity structure.
- A centrifugal fluid pressure canceling mechanism is used in the C_2 and C_3 clutches that are applied when shifting from 2nd to 3rd and from 3rd to 4th.



2. Function of Components

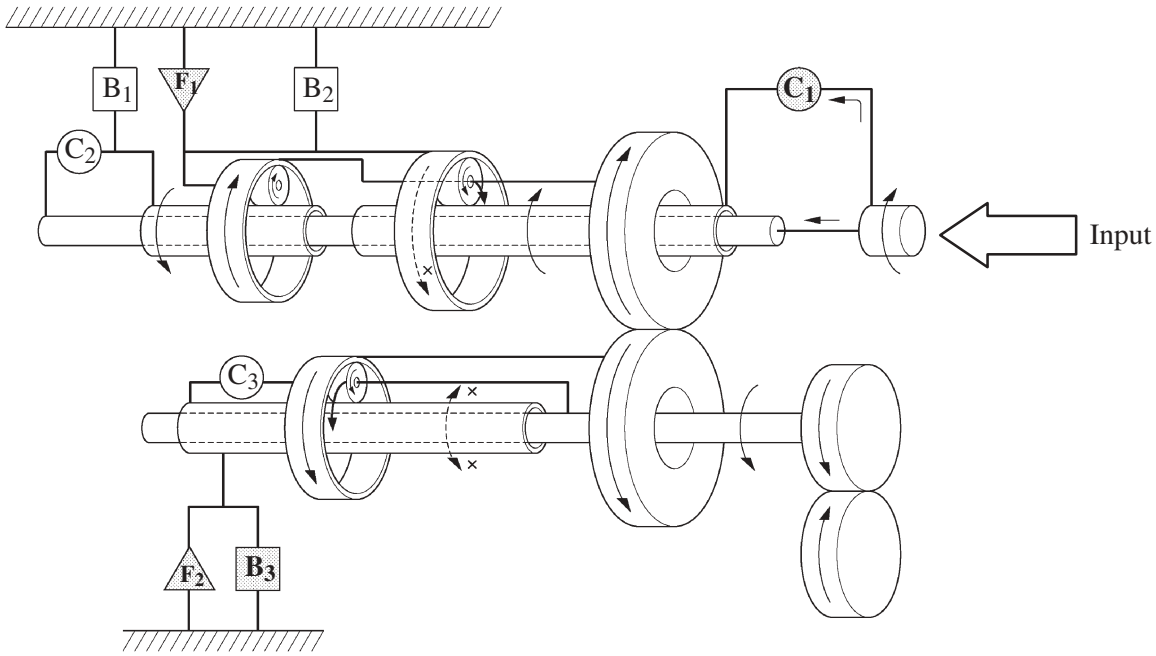
Component		Function
C_1	Forward Clutch	Connects input shaft and front planetary sun gear.
C_2	Reverse Clutch	Connects input shaft and rear planetary sun gear.
C_3	U/D Direct Clutch	Connects U/D planetary sun gear and U/D planetary carrier.
B_1	2nd & O/D Brake	Prevents rear planetary sun gear from turning either clockwise or counterclockwise.
B_2	1st & Reverse Brake	Prevents rear planetary carrier and front planetary ring gear from turning either clockwise or counterclockwise.
B_3	U/D Brake	Prevents U/D planetary sun gear from turning either clockwise or counterclockwise.
F_1	No. 1 One-Way Clutch	Prevents rear planetary carrier and front planetary ring gear from turning counterclockwise.
F_2	U/D One-Way Clutch	Prevents U/D planetary sun gear from turning clockwise.
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 speeds.

3. Transaxle Power Flow

Shift Lever Position	Gear	Solenoid Valve				Clutch			Brake			One-way Clutch	
		S4	DSL	SL1	SL2	C_1	C_2	C_3	B_1	B_2	B_3	F_1	F_2
P	Park			○	○						○		
R	Reverse			○			○			○	○		
N	Neutral			○	○						○		
D	1st			○	○	○					○	○	○
	2nd			○		○			○		○		○
	3rd		Δ	Δ		○	○				○		○
	4th	○	Δ	Δ		○	○	○					
3	1st			○	○	○					○	○	○
	2nd				○	○			○		○		○
	3rd		Δ	Δ		○	○				○		○
2	1st			○	○	○					○	○	○
	2nd				○	○			○		○		○
L	1st		○	○	○	○				○	○	○	○

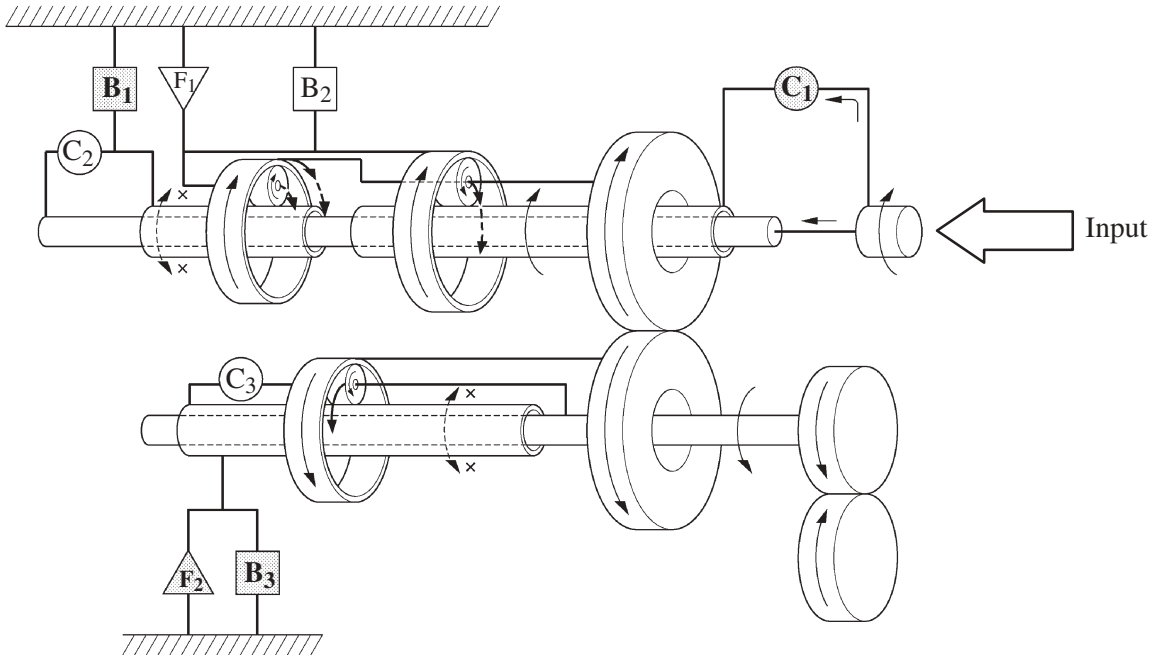
○: ON Δ: Lock-up ON

1st Gear (D, 3 or 2 Position)



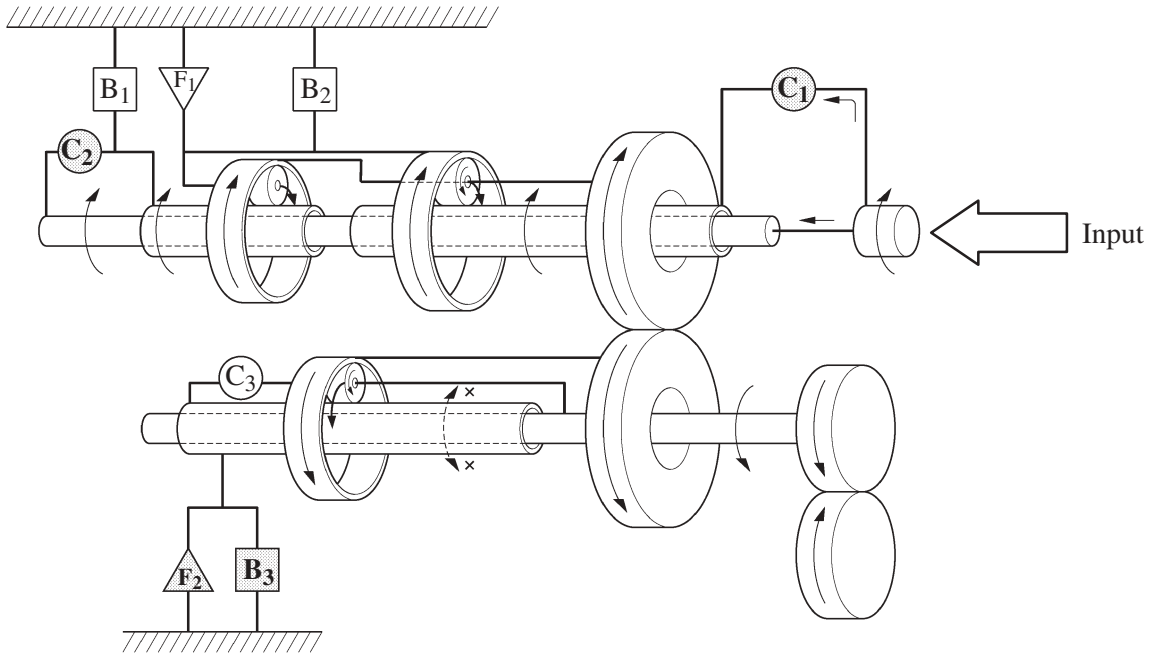
161ES09

2nd Gear (D, 3 or 2 Position)



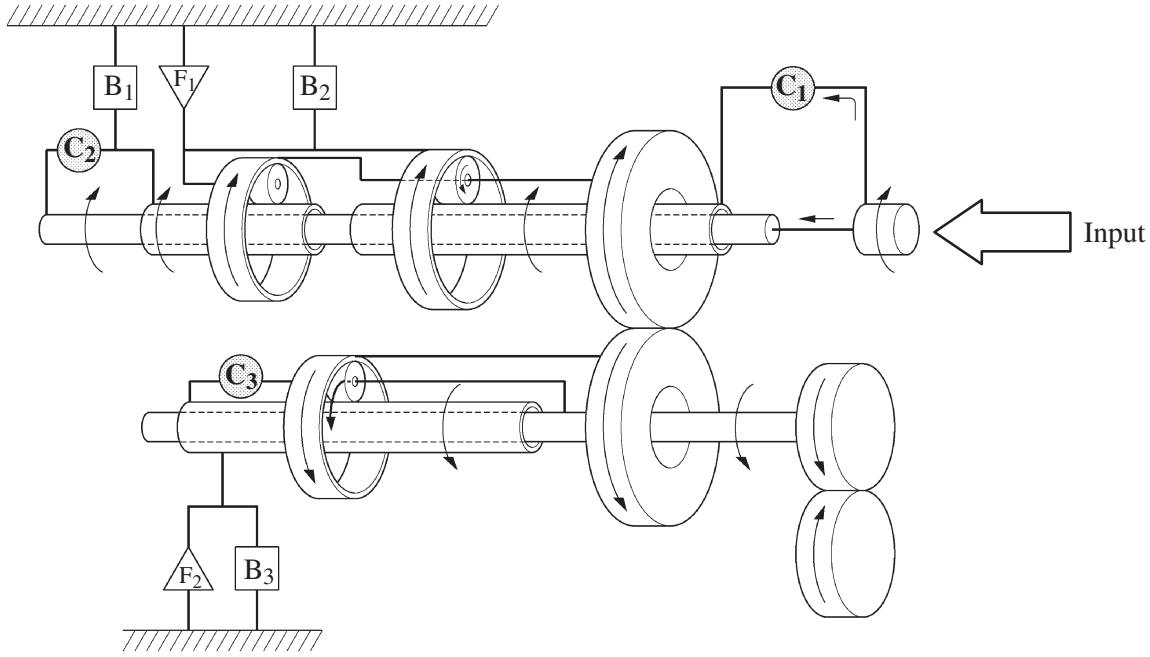
161ES10

3rd Gear (D or 3 Position)



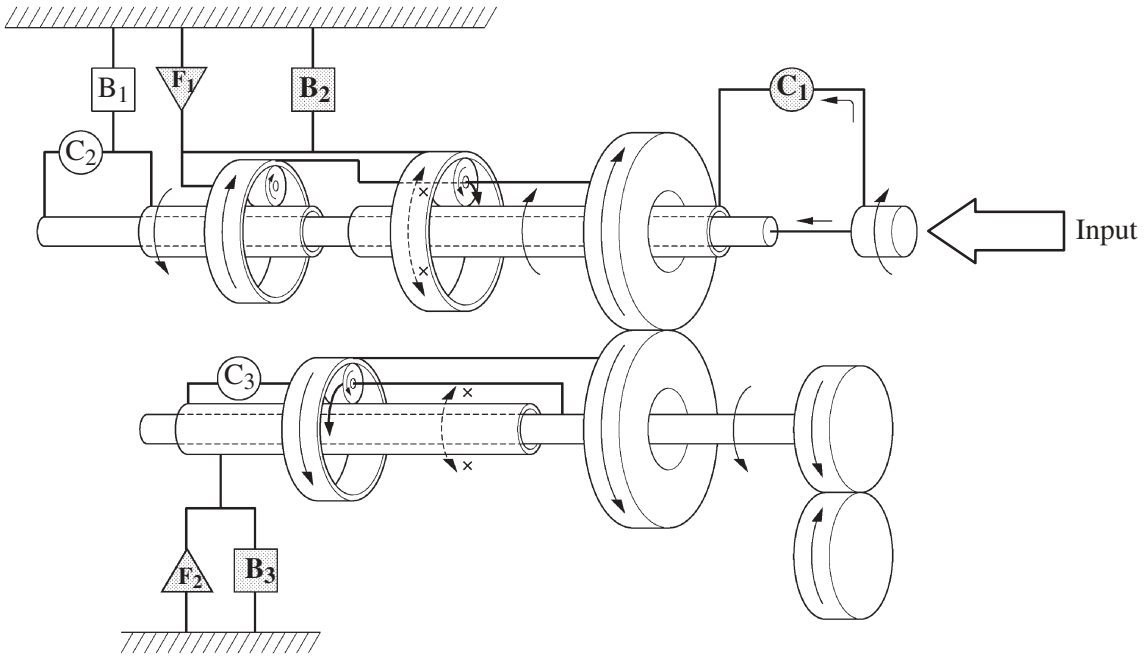
161ES11

4th Gear (D Position)



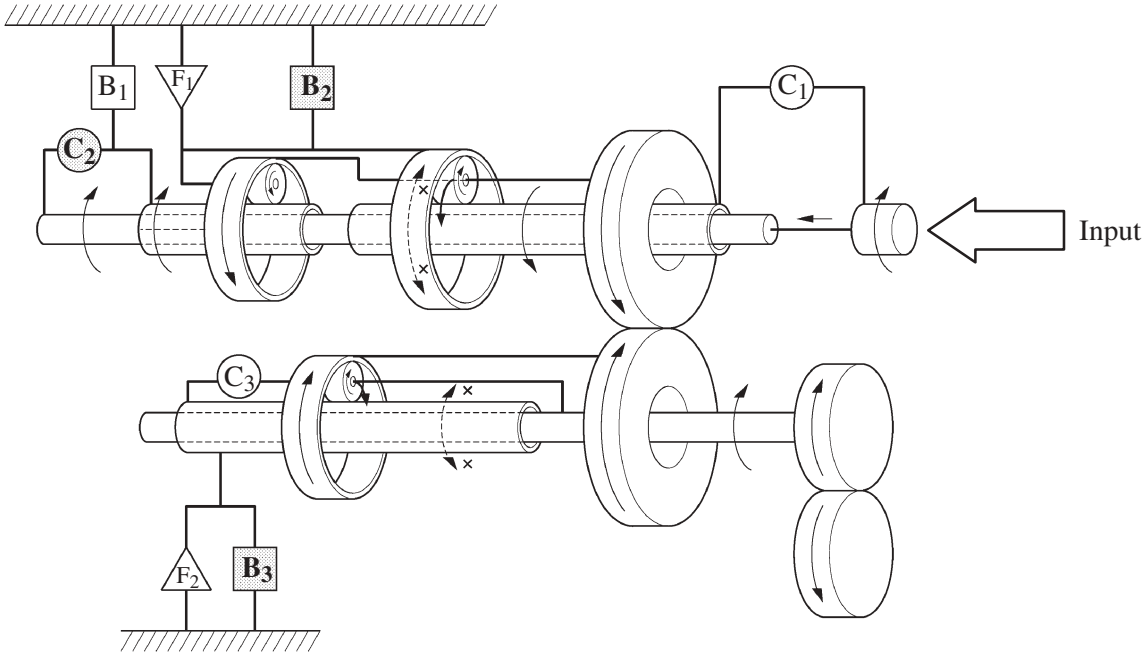
161ES12

1st Gear (L Position)



161ES13

Reverse Gear (R Position)



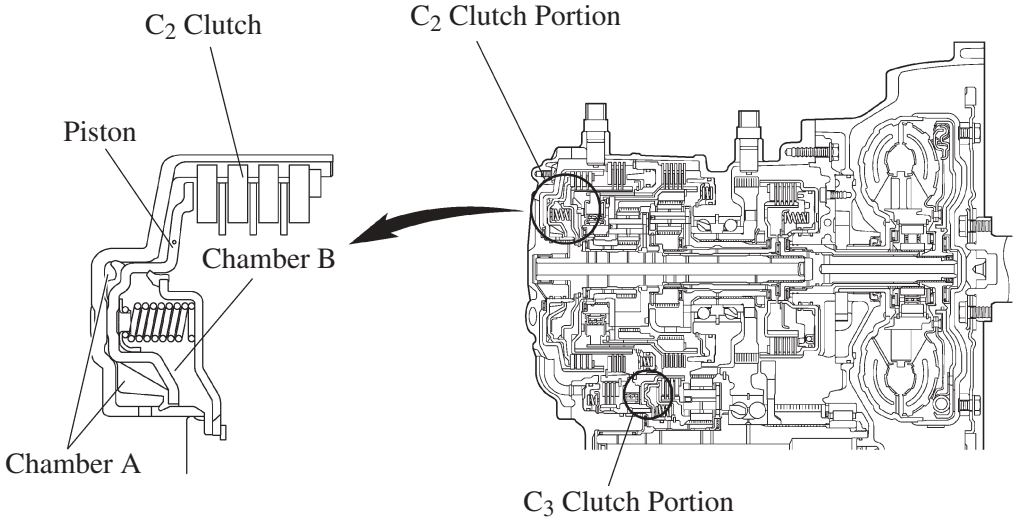
181CH66

4. Centrifugal Fluid Pressure Canceling Mechanism

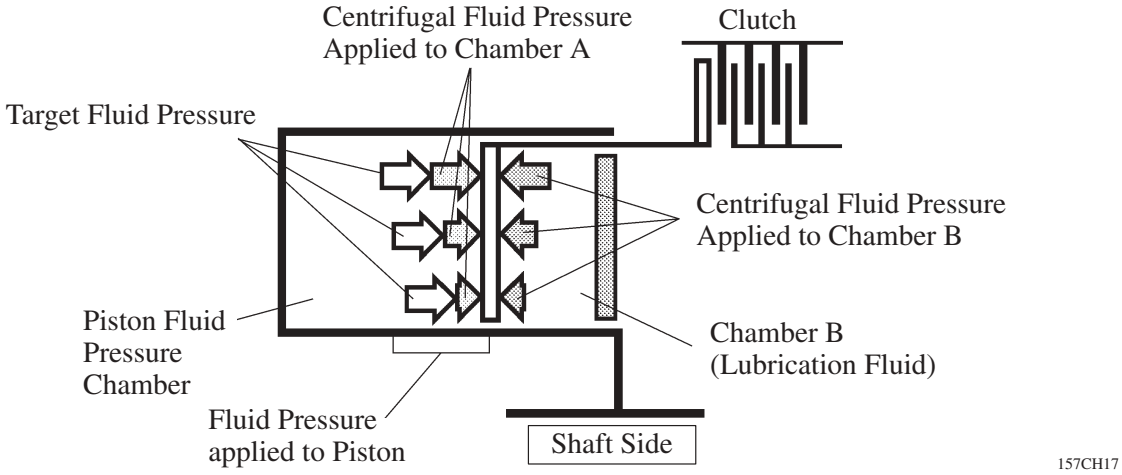
There are two reasons for improving the conventional clutch mechanism:

- To prevent the generation of pressure by the centrifugal force that is applied to the fluid in piston fluid pressure chamber (hereafter referred to as "chamber A") when the clutch is released, a check ball is provided to discharge the fluid. Therefore, before the clutch could be subsequently applied, it took time for the fluid to fill the chamber A.
- During shifting, in addition to the original clutch pressure that is controlled by the valve body, the pressure that acts on the fluid in chamber A also exerts influence, which is dependent upon revolution fluctuations.

To address these two needs for improvement, a canceling fluid pressure chamber (hereafter referred to as "chamber B") has been provided opposite chamber A.



By utilizing lubrication fluid such as that of the shaft, an equal centrifugal force is applied, thus canceling the centrifugal force that is applied to the piston itself. Accordingly, it is not necessary to discharge the fluid through the use of a check ball, and a highly responsive and smooth shifting characteristic has been achieved.



Fluid pressure applied to piston	–	Centrifugal fluid pressure applied to chamber B	=	Target fluid pressure (original clutch pressure)