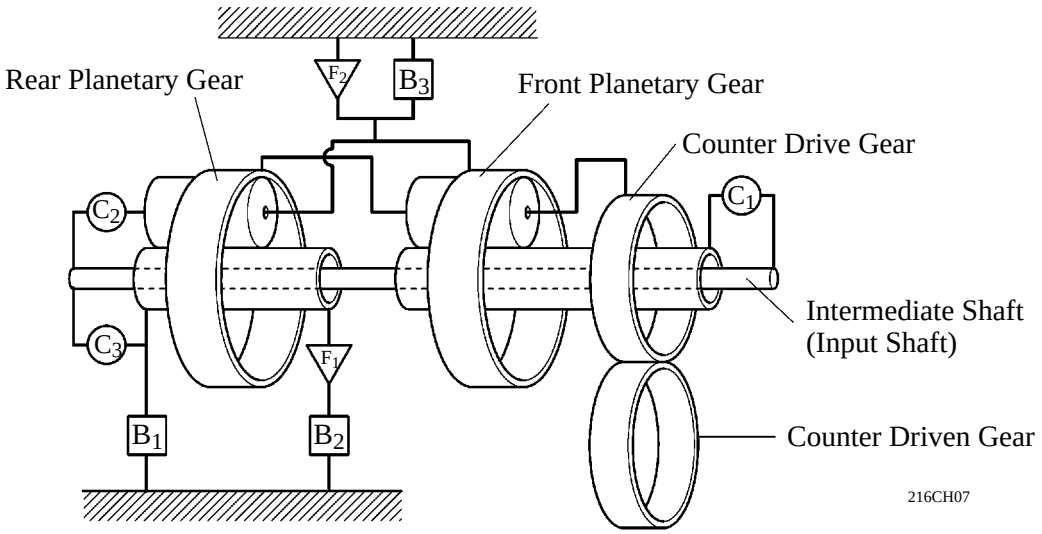
■PLANETARY GEAR UNIT

1. Construction

- A CR-CR type planetary gear is used in the planetary gear unit, which is located on the input shaft. This planetary gear is a type of the planetary gear unit that joins the front and rear planetary carriers to the front and rear ring gears. As a result, the unit has been made significantly simple and compact.
- A centrifugal fluid pressure canceling mechanism is used in the C_1 clutch, which is applied when shifting from the 3rd to 4th.



2. Function of Component

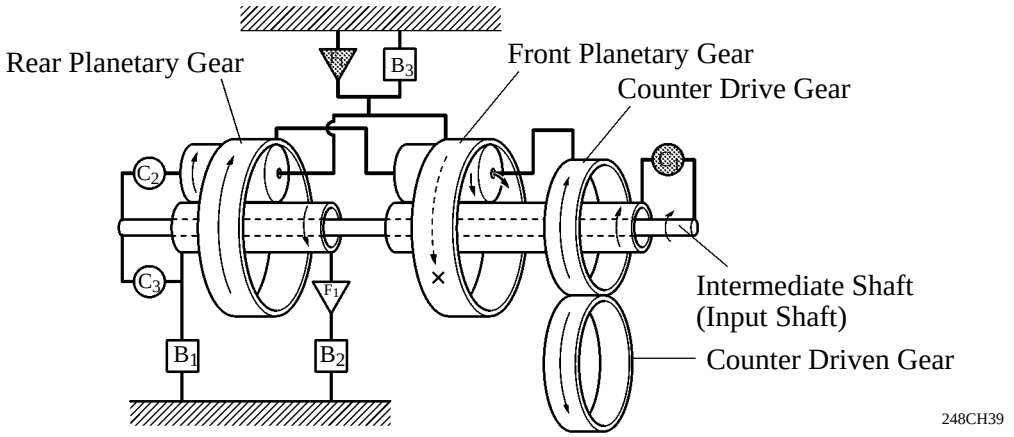
Component		Function
C_1	Forward Clutch	Connects input shaft and front planetary sun gear.
C_2	Direct Clutch	Connects intermediate shaft and rear planetary carrier.
C_3	Reverse Clutch	Connects intermediate shaft and rear planetary sun gear.
B_1	OD & 2nd Brake	Lock the rear planetary sun gear.
B_2	2nd Brake	Prevent rear planetary sun gear from turning counterclockwise.
B_3	1st & Reverse Brake	Lock the front planetary ring gear and rear planetary carrier.
F_1	No. 1 One-Way Clutch	Prevents rear planetary sun gear from turning counterclockwise.
F_2	No. 2 One-Way Clutch	Prevents front planetary ring gear and rear planetary carrier from turning counterclockwise.
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.

3. Transaxle Power Flow

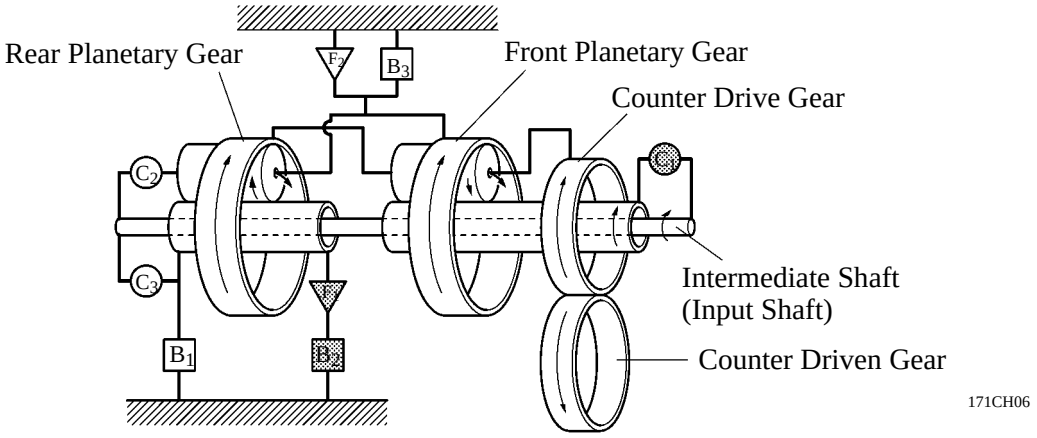
Shift Lever Position	Gear	Solenoid Valve		Clutch			Brake			One-Way Clutch	
		S1	S2	C_1	C_2	C_3	B_1	B_2	B_3	F_1	F_2
P	Park	ON	ON								
R	Reverse	ON	ON			○			○		
N	Neutral	ON	ON								
D	1st	ON	ON	○							○
	2nd	ON	OFF	○				○		○	
	3rd	OFF	OFF	○	○			○			
	4th	OFF	ON		○		○	○			
3	1st	ON	ON	○							○
	2nd	ON	OFF	○				○		○	
	3rd	OFF	OFF	○	○			○			
2	1st	ON	ON	○							○
	2nd	ON	OFF	○			○	○		○	
L	1st	ON	ON	○					○		○

○: Operation

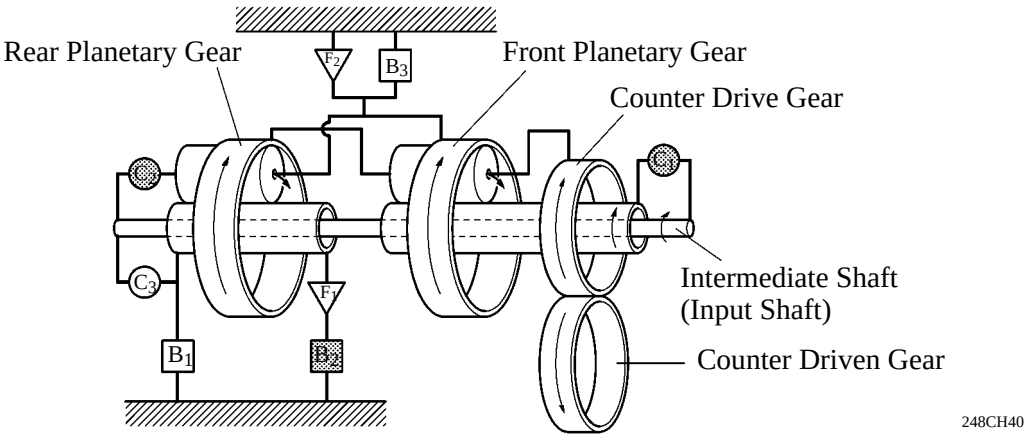
1st Gear (D, 3 or 2 Position)



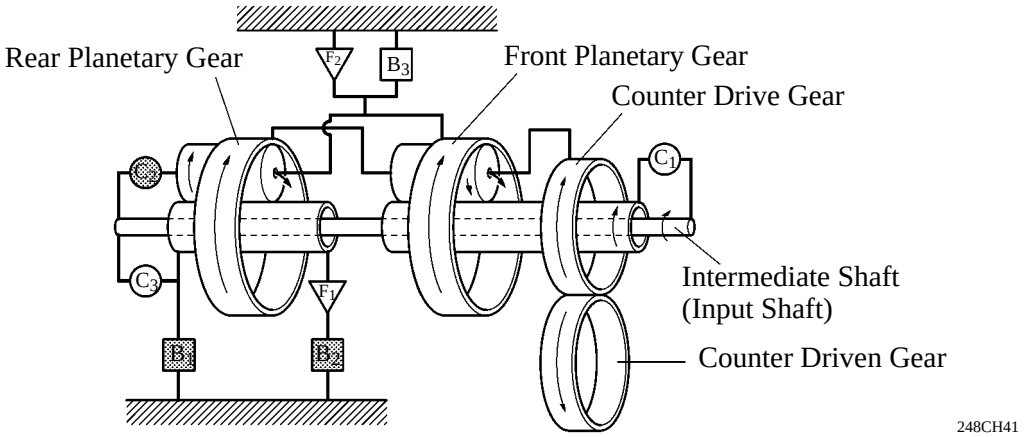
2nd Gear (D or 3 Position)



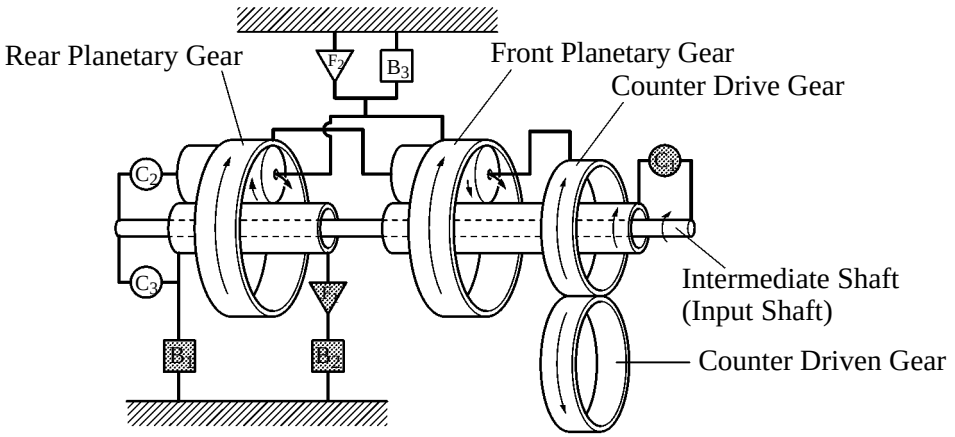
3rd Gear (D or 3 Position)



4th Gear (D Position)

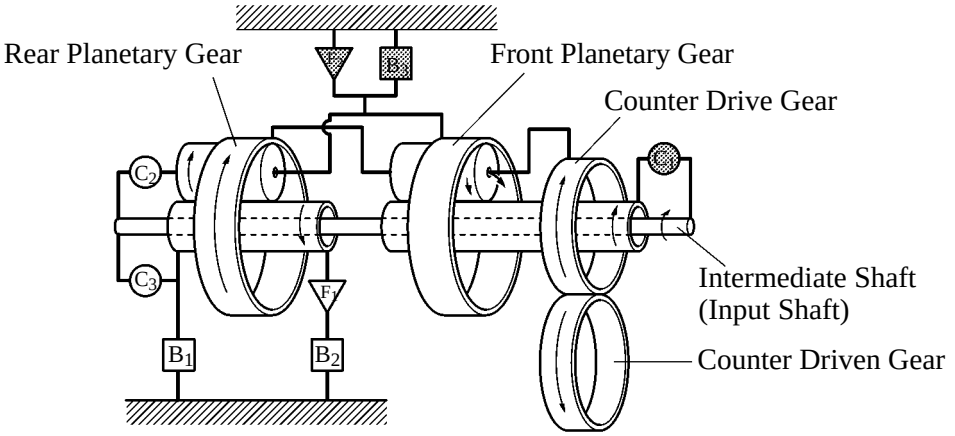


2nd Gear (2 Position)



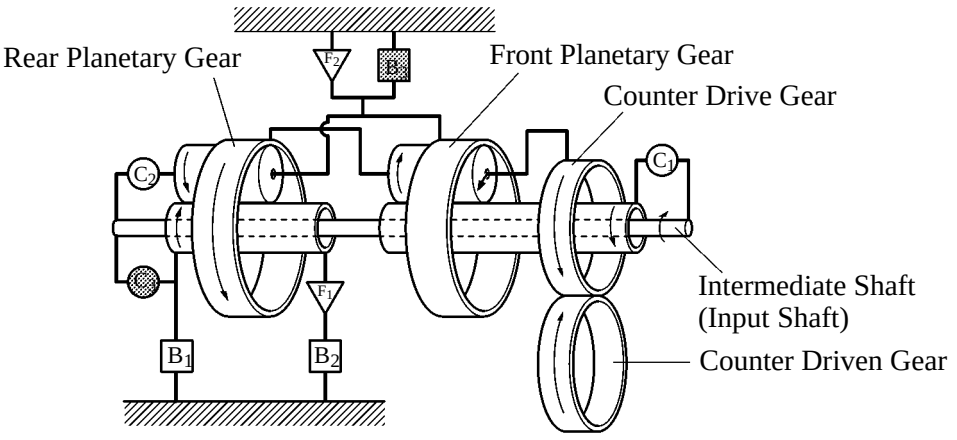
171CH09

1st Gear (L Position)



248CH42

Reverse Gear (R Position)



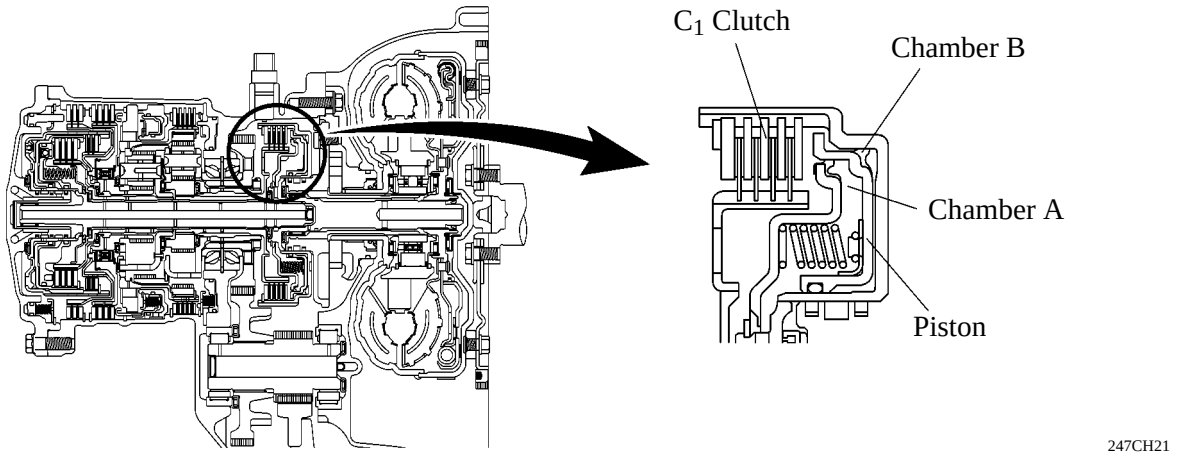
248CH43

4. Centrifugal Fluid Pressure Canceling Mechanism

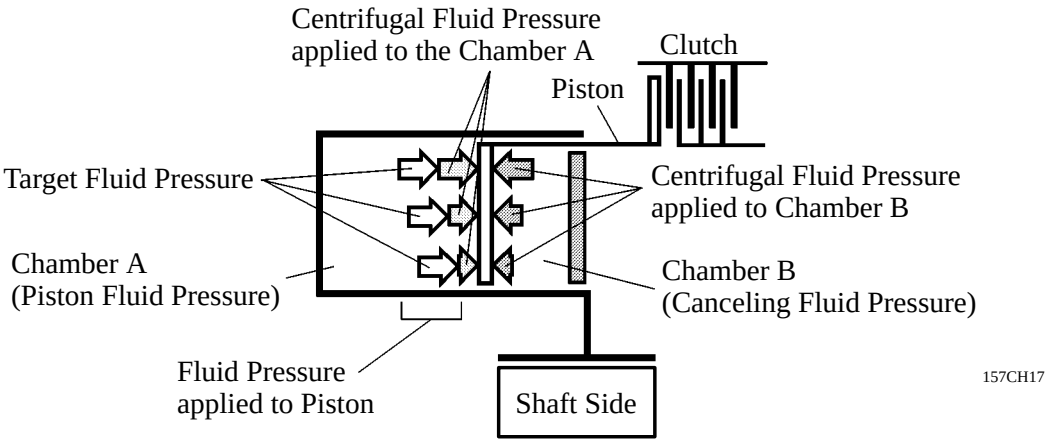
There are two reasons for improving the conventional clutch mechanism:

- To prevent the generation of pressure by the centrifugal force that 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 can 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 the 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.



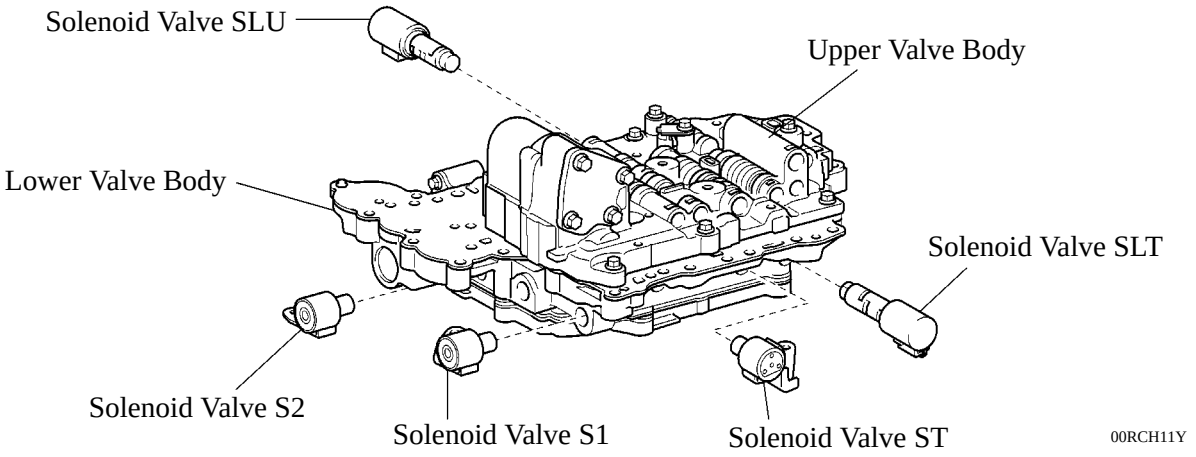
By utilizing the lubrication fluid such as that of the shaft, the same amount of centrifugal force is applied, thus canceling the centrifugal force that is applied to the piston itself. Accordingly, it is not necessary to discharge the fluid through the use of a check ball, and a highly responsive and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



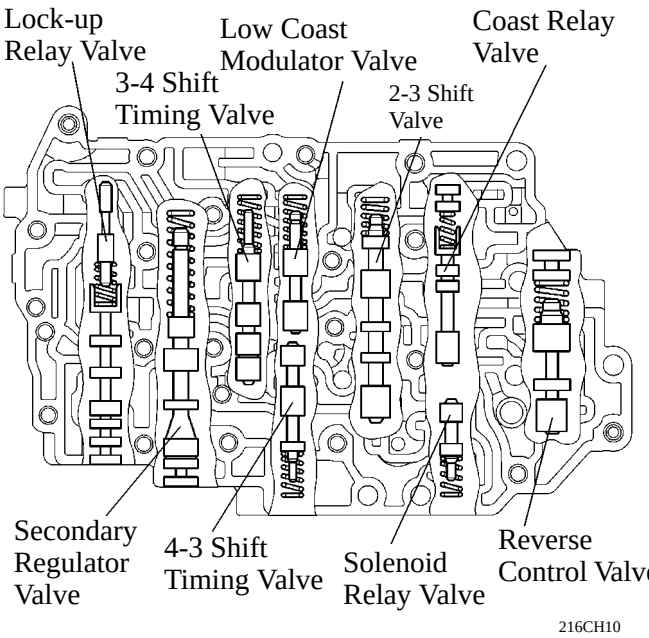
Fluid pressure applied to piston	-	Centrifugal fluid pressure applied to chamber B	=	Target fluid pressure (Original clutch pressure)

■VALVE BODY UNIT

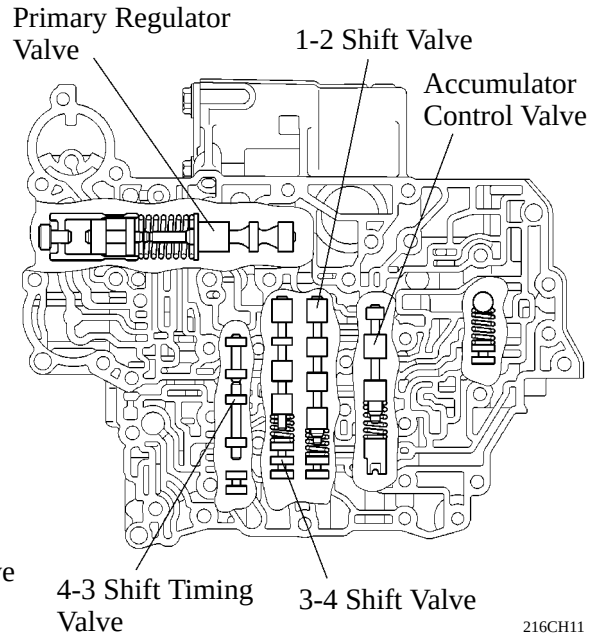
The valve body consists of the upper and lower valve bodies and 5 solenoid valves.
The 5 solenoid valves are installed in the lower valve body for serviceability.



▶ Upper Valve Body ◀



▶ Lower Valve Body ◀



▶ Function of Solenoid Valve ◀

Solenoid Valve	Action	Function
S1	For 2-3 shift valve control	Shifts gears by switching the 2-3 shift valve and controlling the C_2 clutch.
S2	For 1-2 and 3-4 shift valve control	Shifts gears by switching the 1-2 and 3-4 shift valves and controlling 2 clutches (C_1 and C_2) and 2 brakes (B_1 and B_2).
ST	For clutch to clutch pressure control	Switches 3-4 and 4-3 shift valves.
SLU	For clutch engagement pressure control	Controls the lock-up clutch.
SLT	For line pressure control	Controls the line pressure, secondary pressure, and accumulator back pressure.