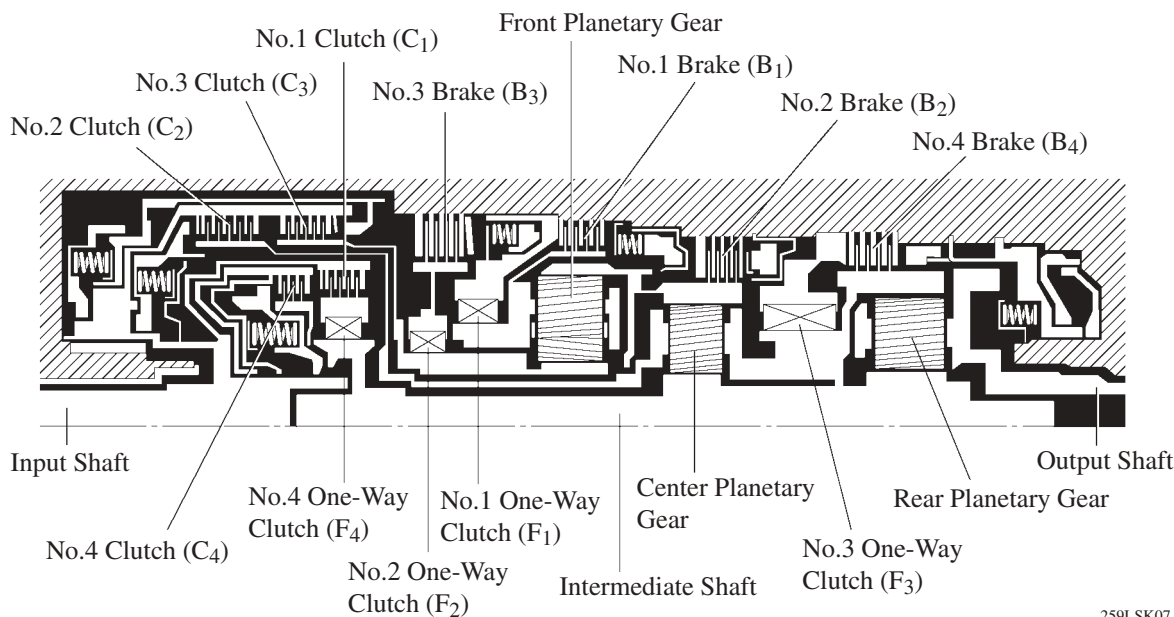


8. Planetary Gear Unit

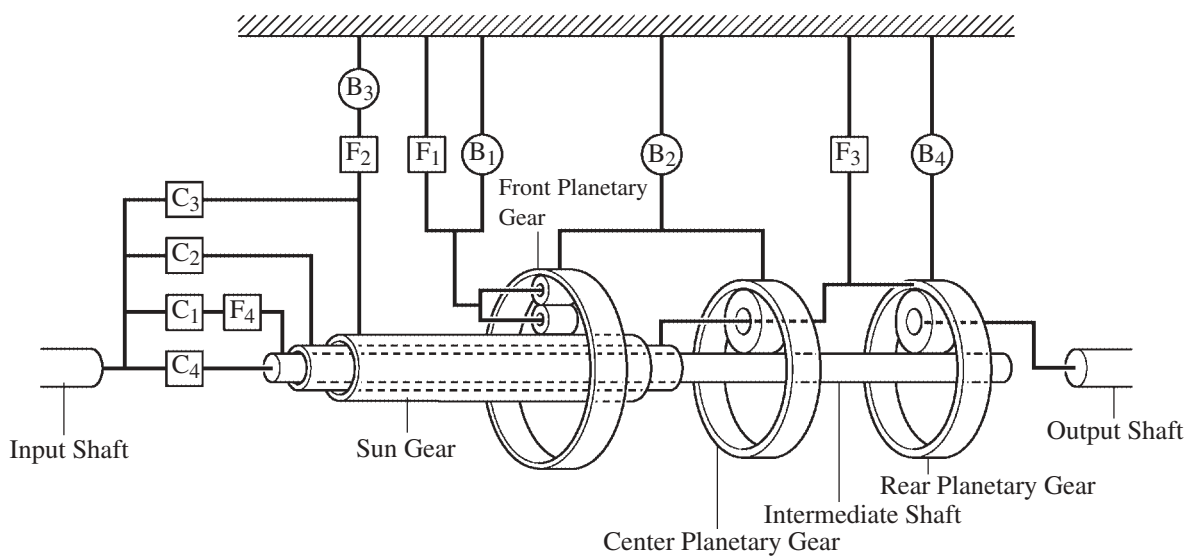
Construction

Planetary gear unit consists of three planetary gear units, four clutches, four brakes, and four one-way clutches.

- A centrifugal fluid pressure canceling mechanism uses in the C_1 , C_2 , C_3 , and C_4 clutches that are applied when shifting 2nd → 3rd, 3rd → 4th, 4th → 5th, and 5th → 6th. For details, refer to [page 31](#).



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259LSK08

Function of Component

Component		Function
C ₁	No.1 Clutch	Connects input shaft and intermediate shaft.
C ₂	No.2 Clutch	Connects input shaft and center planetary carrier.
C ₃	No.3 Clutch	Connects input shaft and front sun gear.
C ₄	No.4 Clutch	Connects input shaft and intermediate shaft
B ₁	No.1 Brake	Prevents front planetary carrier from turning both clockwise and counterclockwise.
B ₂	No.2 Brake	Prevents front and center ring gear from turning both clockwise and counterclockwise.
B ₃	No.3 Brake	Prevents outer race of F ₂ from turning both clockwise and counterclockwise.
B ₄	No.4 Brake	Prevents center planetary carrier and rear ring gear from turning both clockwise and counterclockwise.
F ₁	No.1 One-Way Clutch	Prevents front planetary carrier from turning counterclockwise.
F ₂	No.2 One-Way Clutch	When B ₃ is operating, prevents front sun gear from turning counterclockwise.
F ₃	No.3 One-Way Clutch	Prevents center planetary carrier and rear ring gear from turning counterclockwise.
F ₄	No.4 One-Way Clutch	Prevents intermediate shaft 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.

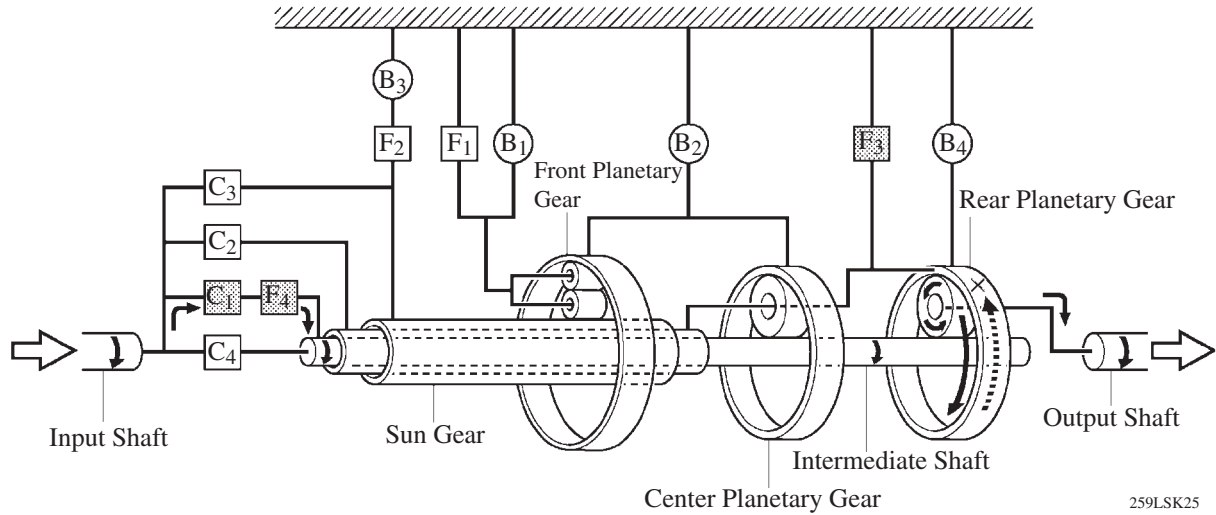
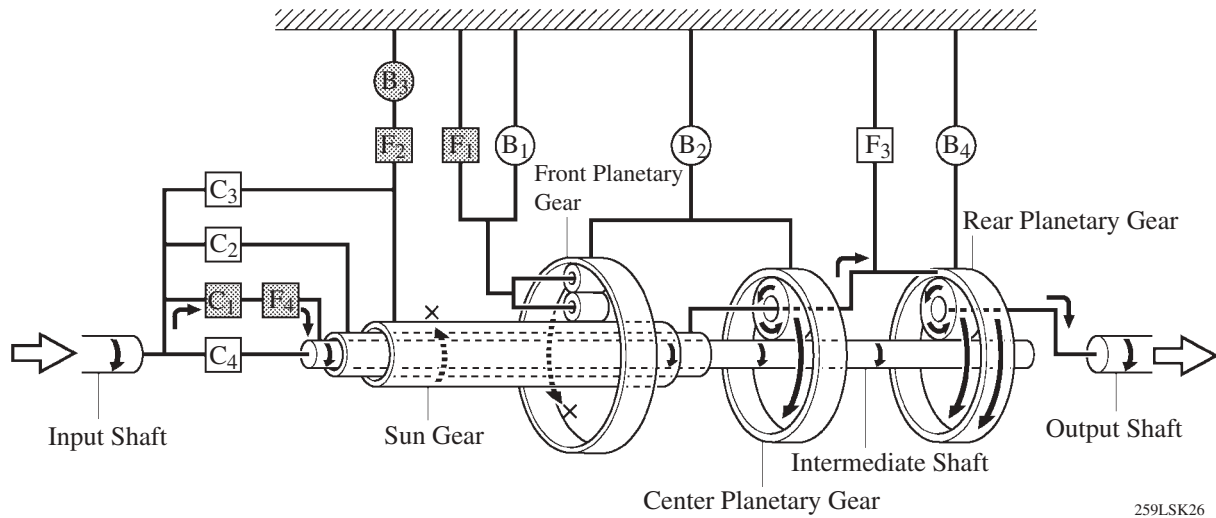
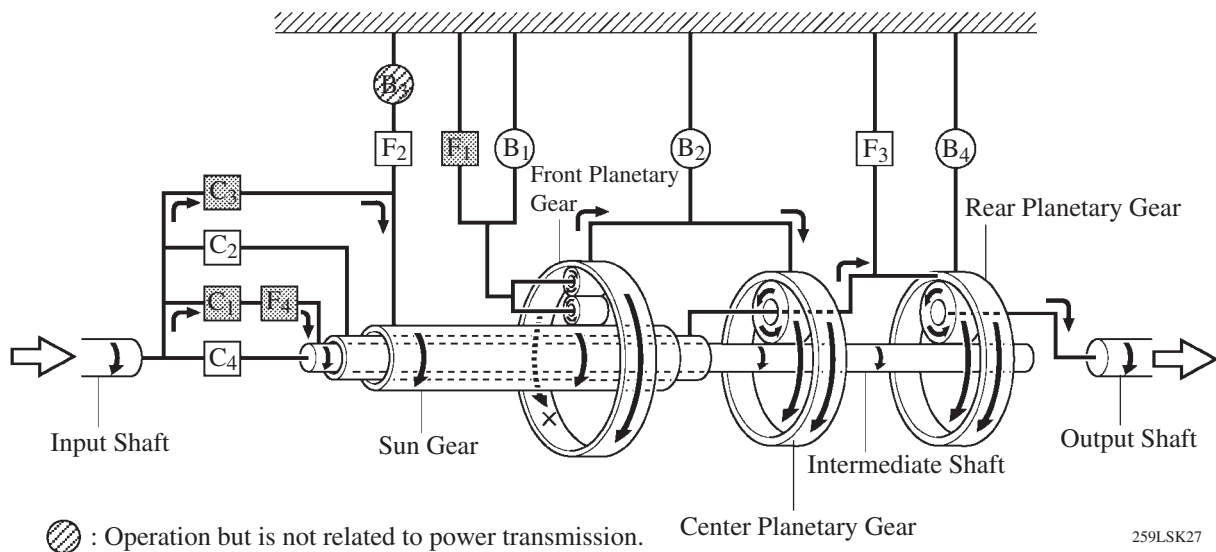
Transmission Power Flow

Shift Lever Position		Solenoid Valve							Clutch				Brake				One-way Clutch					
		S1	S2	S3	S4	SR	SL1	SL2	SLU	C ₁	C ₂	C ₃	C ₄	B ₁	B ₂	B ₃	B ₄	F ₁	F ₂	F ₃	F ₄	
P			ON	ON		ON		ON														
R*			ON	ON		ON		ON				○		○			○	○				
N			ON	ON		ON		ON														
D, S6	1st		ON	ON		ON		ON		○										○	○	
	2nd	ON	ON	ON		ON		ON	ON	○						○		○	○		○	
	3rd	ON		ON		ON		ON	ON	○		○				●		○			○	
	4th	ON				ON		ON	ON	○	○	●				●					○	
	5th	ON			ON		ON		ON	●	○	○		○		●						
	6th	ON	ON		ON		ON		ON	●	○			●	○	●						
S5	1st		ON	ON		ON		ON		○										○	○	
	2nd	ON	ON	ON		ON		ON	ON	○						○		○	○		○	
	3rd	ON		ON		ON		ON	ON	○		○				●		○			○	
	4th	ON				ON		ON	ON	○	○	●				●					○	
	5th	ON			ON		ON		ON	●	○	○		○		●						
S4	1st		ON	ON		ON		ON		○										○	○	
	2nd	ON	ON	ON		ON		ON	ON	○						○		○	○		○	
	3rd	ON		ON		ON		ON	ON	○		○				●		○			○	
	4th*	ON				ON		ON	ON	○	○	●	○			●						
S3	1st		ON	ON		ON		ON		○										○	○	
	2nd	ON	ON	ON		ON		ON	ON	○						○		○	○		○	
	3rd*	ON		ON		ON			ON	○		○	○	○		●						
S2	1st		ON	ON		ON		ON		○										○	○	
	2nd*	ON	ON	ON	ON	ON			ON	○			○		○	○						
S1	1st*		ON	ON		ON				○			○				○					

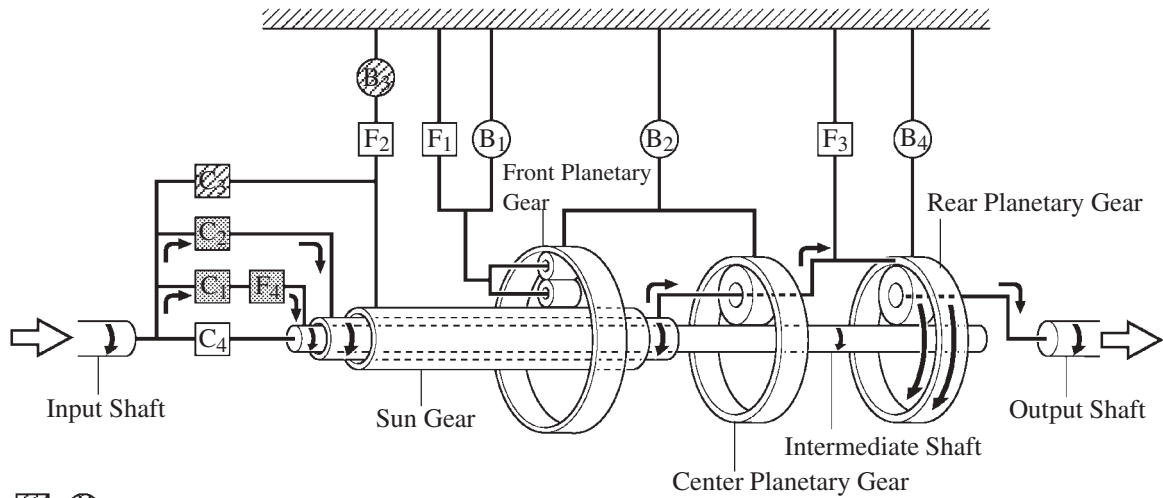
○: Operation

●: Operate but is not related to power transmission

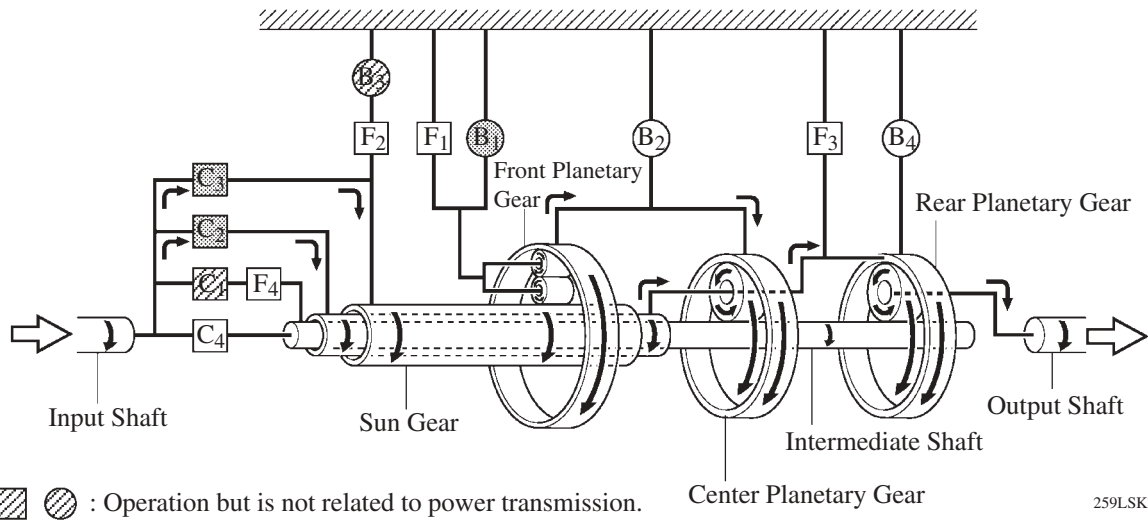
*: with Engine Brake

1st Gear (D Position or S Mode)**2nd Gear (D Position or S Mode)****3rd Gear (D Position or S Mode)**

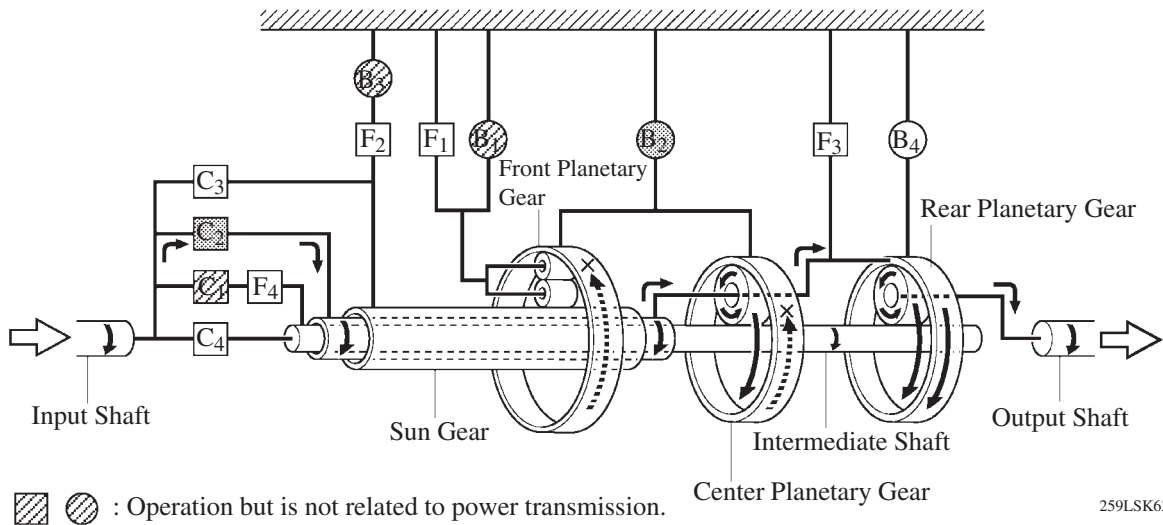
⊗ : Operation but is not related to power transmission.

4th Gear (D Position or S Mode)

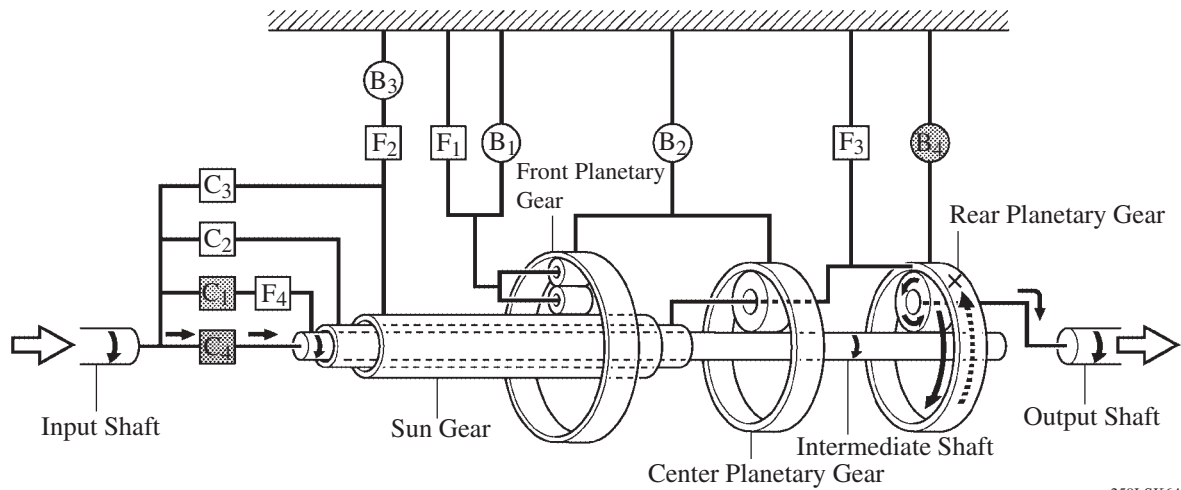
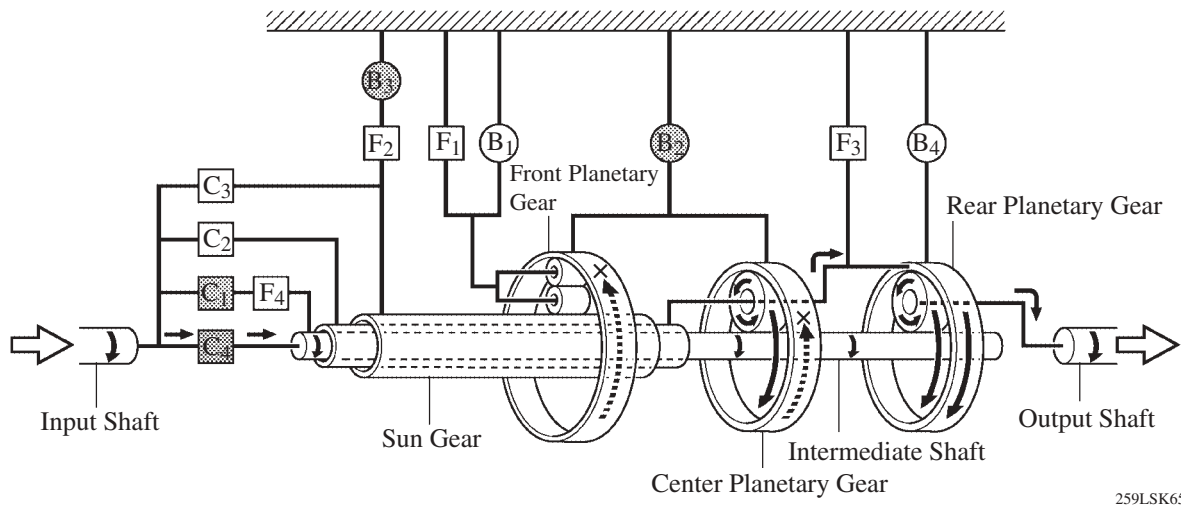
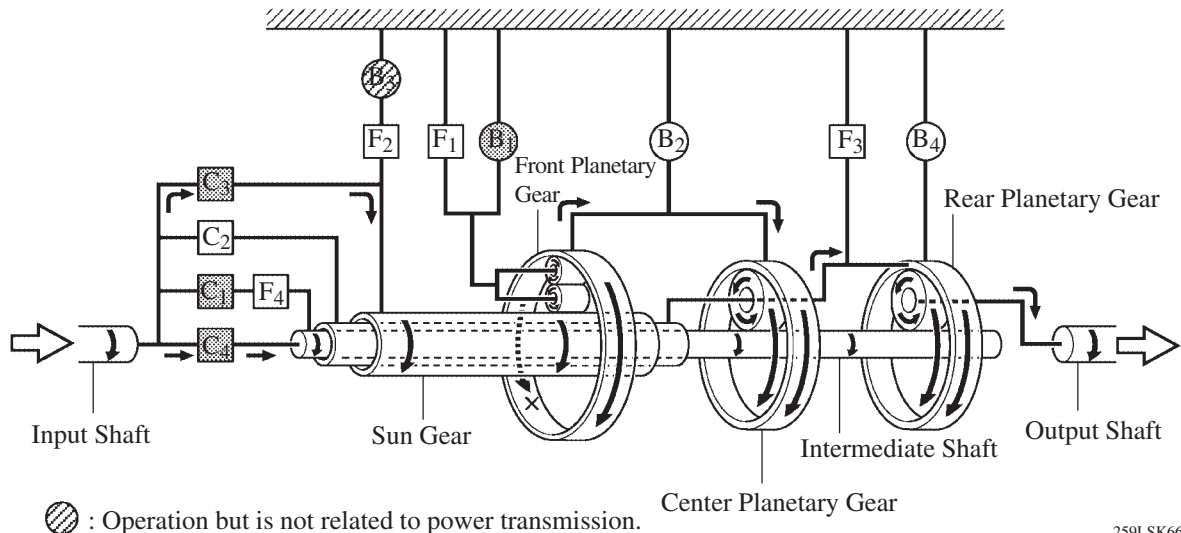
259LSK28

5th Gear (D Position or S Mode)

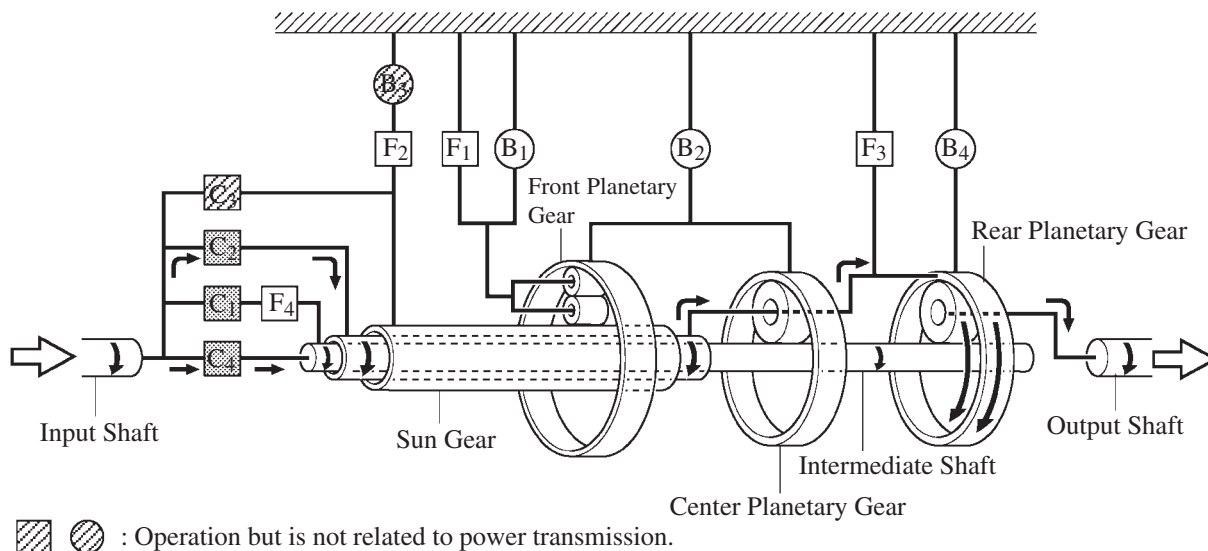
259LSK29

6th Gear (D Position or S Mode)

259LSK63

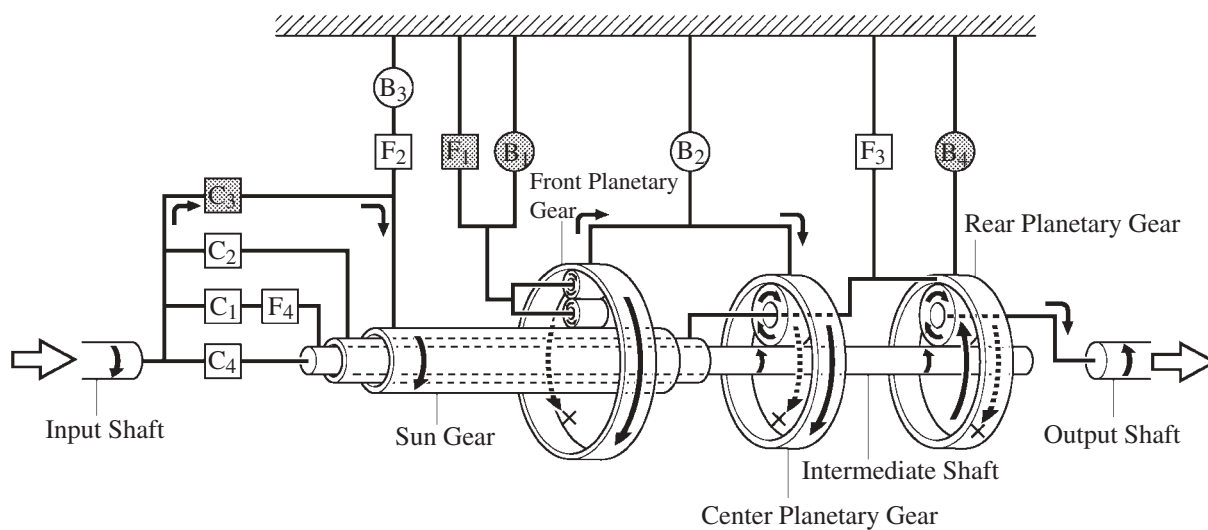
1st Gear with Engine Brake (S Mode/ 1st Range)**2nd Gear with Engine Brake (S Mode/ 2nd Range)****3rd Gear with Engine Brake (S Mode/ 3rd Range)**

4th Gear with Engine Brake (S Mode/4th Range)



259LSK67

Reverse (R Position)



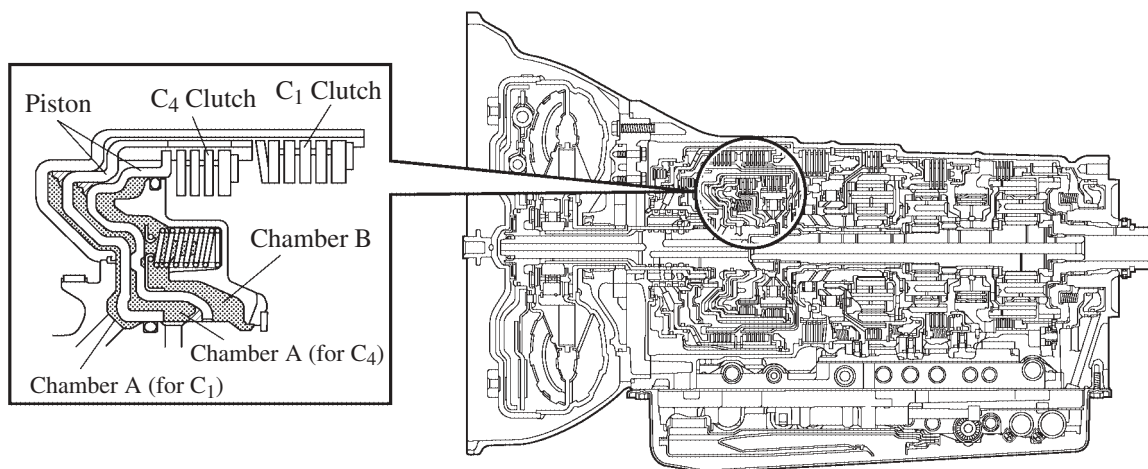
259LSK62

Centrifugal Fluid Pressure Canceling Mechanism

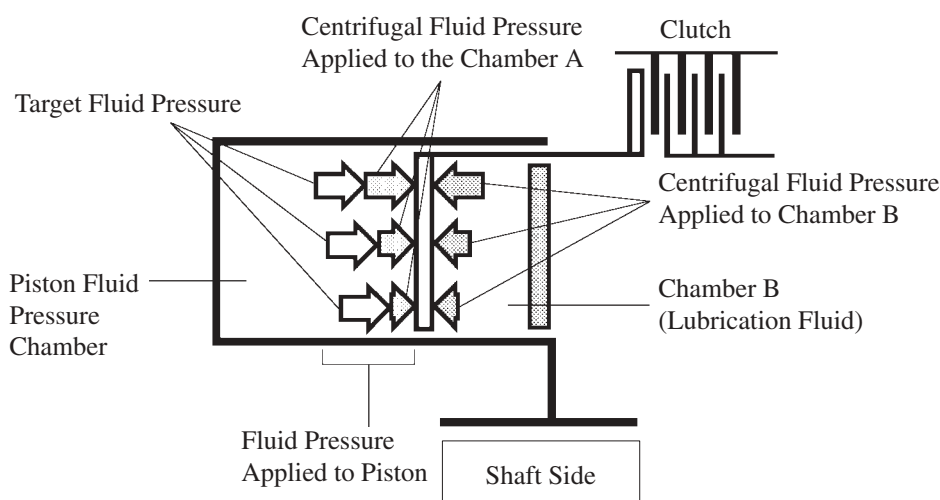
For the following reason, the centrifugal fluid pressure canceling mechanism is used on C₁, C₂, C₃, and C₄ clutch.

- Shifting clutch operation is affected not only by the valve body controlling fluid pressure but also by centrifugal fluid pressure applied to fluid in the clutch piston oil pressure chamber. Centrifugal fluid pressure canceling mechanism has chamber B to reduce this affect applied to the chamber A. As a result, smooth shifting with excellent response has been achieved.

2



259LSK09



157CH17

Fluid pressure
applied to piston

—

Centrifugal fluid pressure
applied to chamber B

=

Target fluid pressure
(original clutch pressure)