

# Description

## Power Flow

PART RANGE	TORQUE CONVERTER	1ST-HOLD CLUTCH	1ST GEAR 1ST CLUTCH	2ND GEAR 2ND CLUTCH	3RD GEAR 3RD CLUTCH	4TH		REVERSE GEAR	PARKING GEAR
						GEAR	CLUTCH		
<b>P</b>	○	x	x	x	x	x	x	x	○
<b>R</b>	○	x	x	x	x	x	○	○	x
<b>N</b>	○	x	x	x	x	x	x	x	x
<b>D<sub>4</sub></b>	1ST	○	x	○	x	x	x	x	x
	2ND	○	x	○*	○	x	x	x	x
	3RD	○	x	○*	○	x	x	x	x
	4TH	○	x	○*	x	○	○	x	x
<b>D<sub>3</sub></b>	1ST	○	x	○	x	x	x	x	x
	2ND	○	x	○*	○	x	x	x	x
	3RD	○	x	○*	○	x	x	x	x
<b>2</b>	○	x	○*	○	x	x	x	x	x
<b>1</b>	○	○	○	x	x	x	x	x	x

○: Operates, x: Doesn't operate, \*: Although the 1st clutch engages, driving power is not transmitted because the one-way clutch slips.

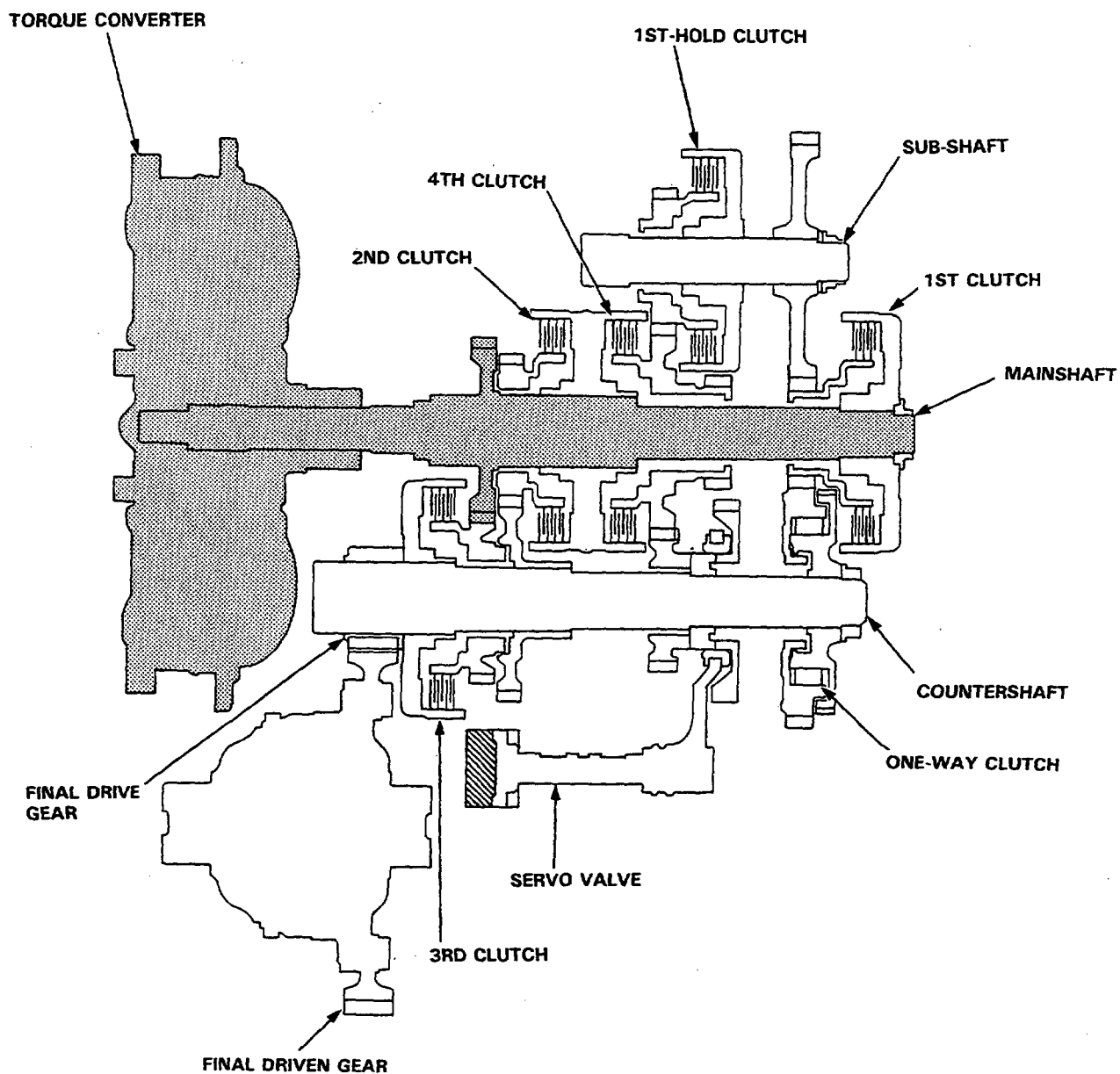


**[N] Position**

Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft.

**[P] Position**

Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft.  
The countershaft is locked by the parking pawl interlocking the parking gear.



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# Description

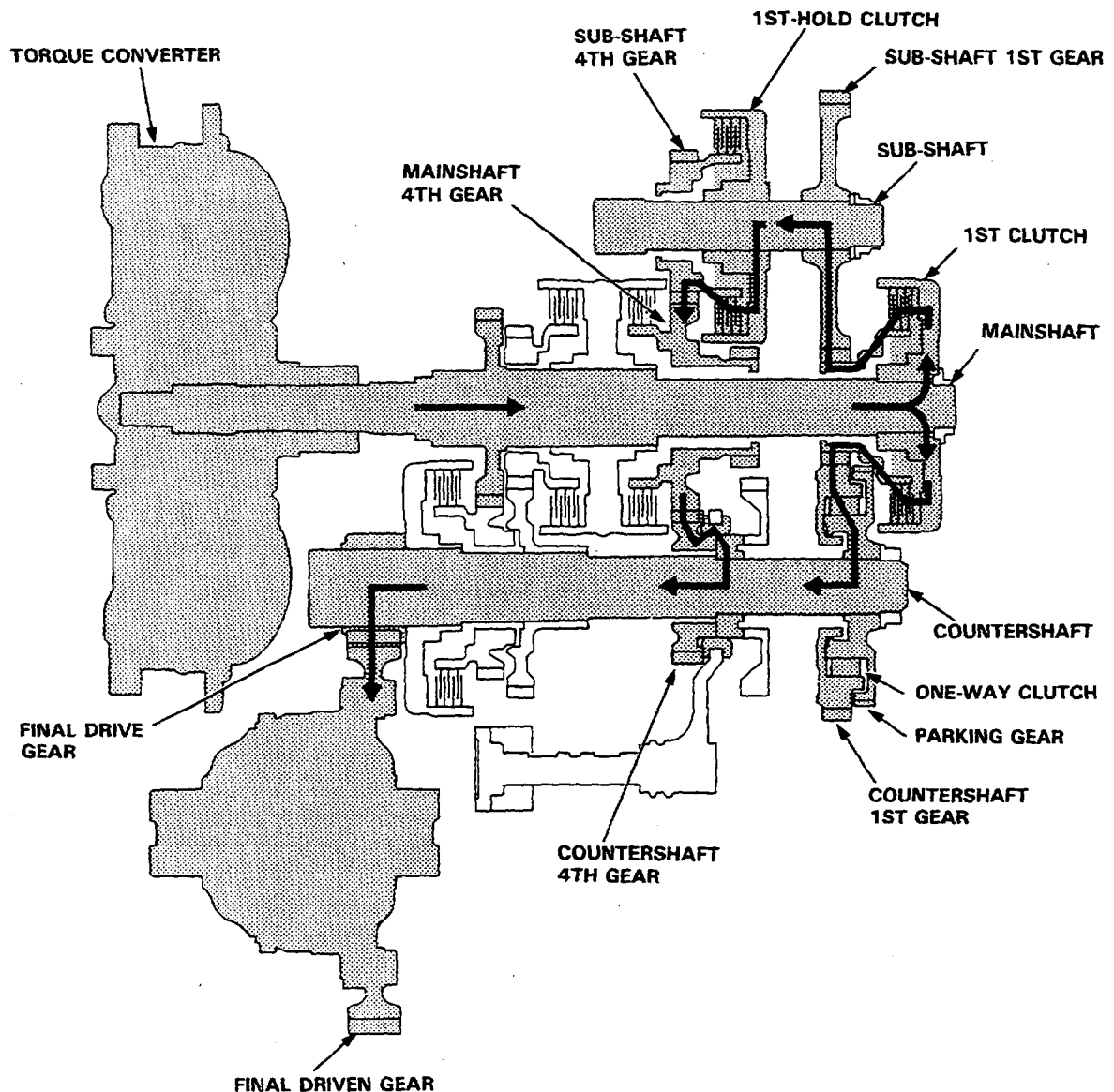
## Power Flow (cont'd)

### 1 Position Acceleration

In 1 position, hydraulic pressure is applied to the 1st clutch and 1st-hold clutch.

The power flow when accelerating is as follows;

1. Hydraulic pressure is applied to the 1st clutch on the mainshaft and power is transmitted via the 1st clutch to the mainshaft 1st gear.
2. Hydraulic pressure is also applied to the 1st-hold clutch on the sub-shaft. Power transmitted to the mainshaft 1st gear is conveyed via the countershaft 1st gear to the one-way clutch, and via the sub-shaft 1st gear to the 1st-hold clutch. The one-way clutch is used to drive the countershaft, and the 1st-hold clutch drives the countershaft via the 4th gears.
3. Power is transmitted to the final drive gear and drives the final driven gear.

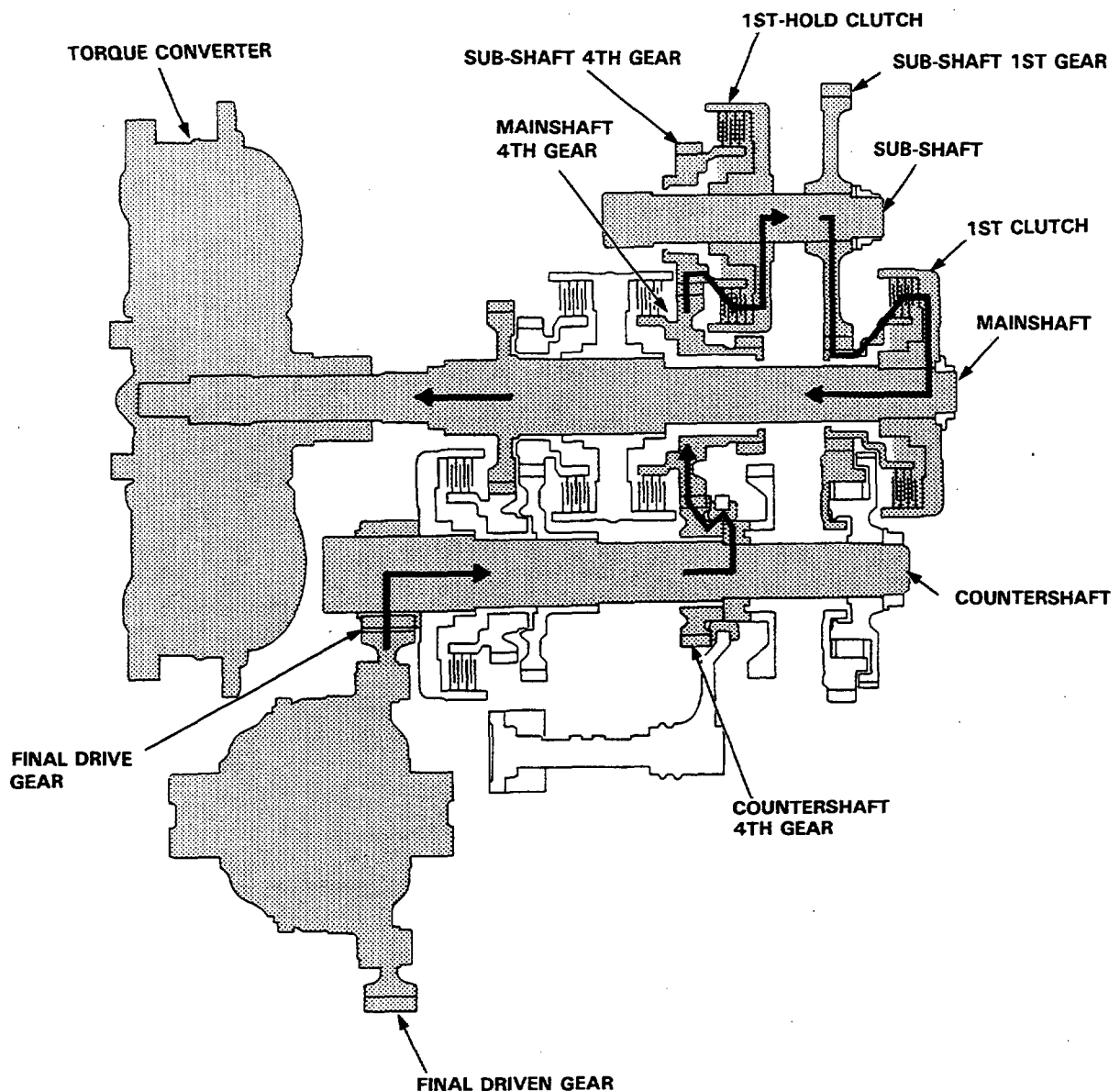




## 1 Position Deceleration

The power flow when decelerating is as follows;

1. Rolling resistance from the road surface goes through the front wheels to the final drive gear, then to the sub-shaft 1st gear via the 4th gear, and 1st-hold clutch which is applied during deceleration.
2. The one-way clutch becomes free at this time because torque reverses.
3. The counterforce conveyed to the countershaft 4th gear turns the sub-shaft 4th gear via the mainshaft 4th gear. At this time, since hydraulic pressure is also applied to the 1st clutch, counterforce is also transmitted to the mainshaft. As a result, engine braking can be obtained with 1st gear.



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# Description

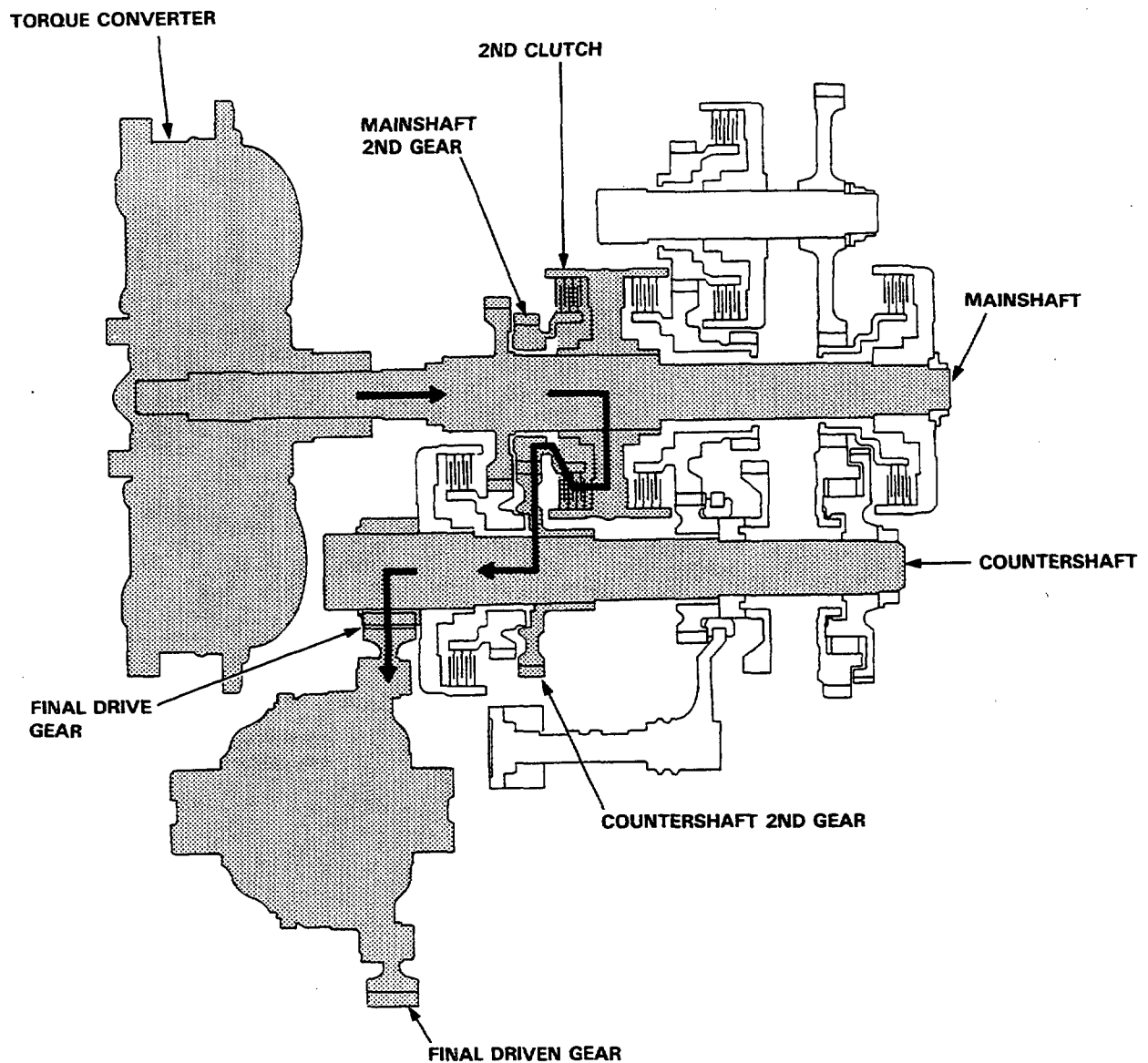
## Power Flow (cont'd)

### 2 Position

2 Position is provided to drive only 2nd speed.

1. Hydraulic pressure is applied to the 2nd clutch on the mainshaft, and power is transmitted via the 2nd clutch to the mainshaft 2nd gear.
2. Power transmitted to the mainshaft 2nd gear is conveyed via the countershaft 2nd gear, and drives the countershaft.
3. Power is transmitted to the final drive gear and drives the final driven gear.

NOTE: Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of the 2nd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.



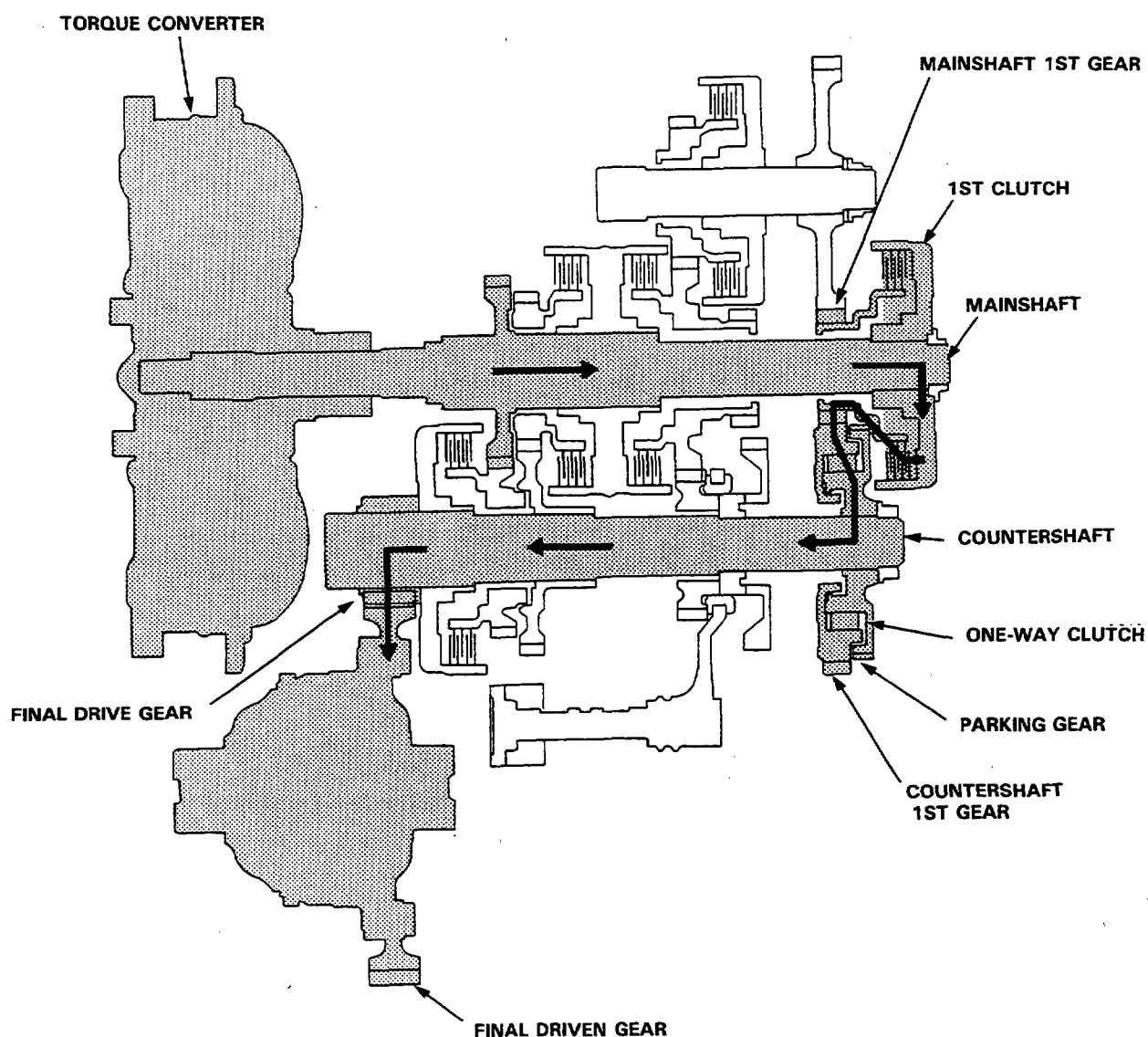


In **D<sub>4</sub>** or **D<sub>3</sub>** position, the optimum gear is automatically selected from 1st, 2nd, 3rd and 4th speeds, according to conditions such as the balance between throttle opening (engine load) and vehicle speed.

**D<sub>4</sub>** or **D<sub>3</sub>** Position, 1st speed

1. Hydraulic pressure is applied to the 1st clutch, which rotates together with the mainshaft, and the mainshaft 1st gear rotates.
2. Power is transmitted to the countershaft 1st gear, and drives the countershaft via the one-way clutch.
3. Power is transmitted to the final drive gear and drives the final driven gear.

NOTE: In **D<sub>4</sub>** or **D<sub>3</sub>** position, hydraulic pressure is not applied to the 1st-hold clutch.



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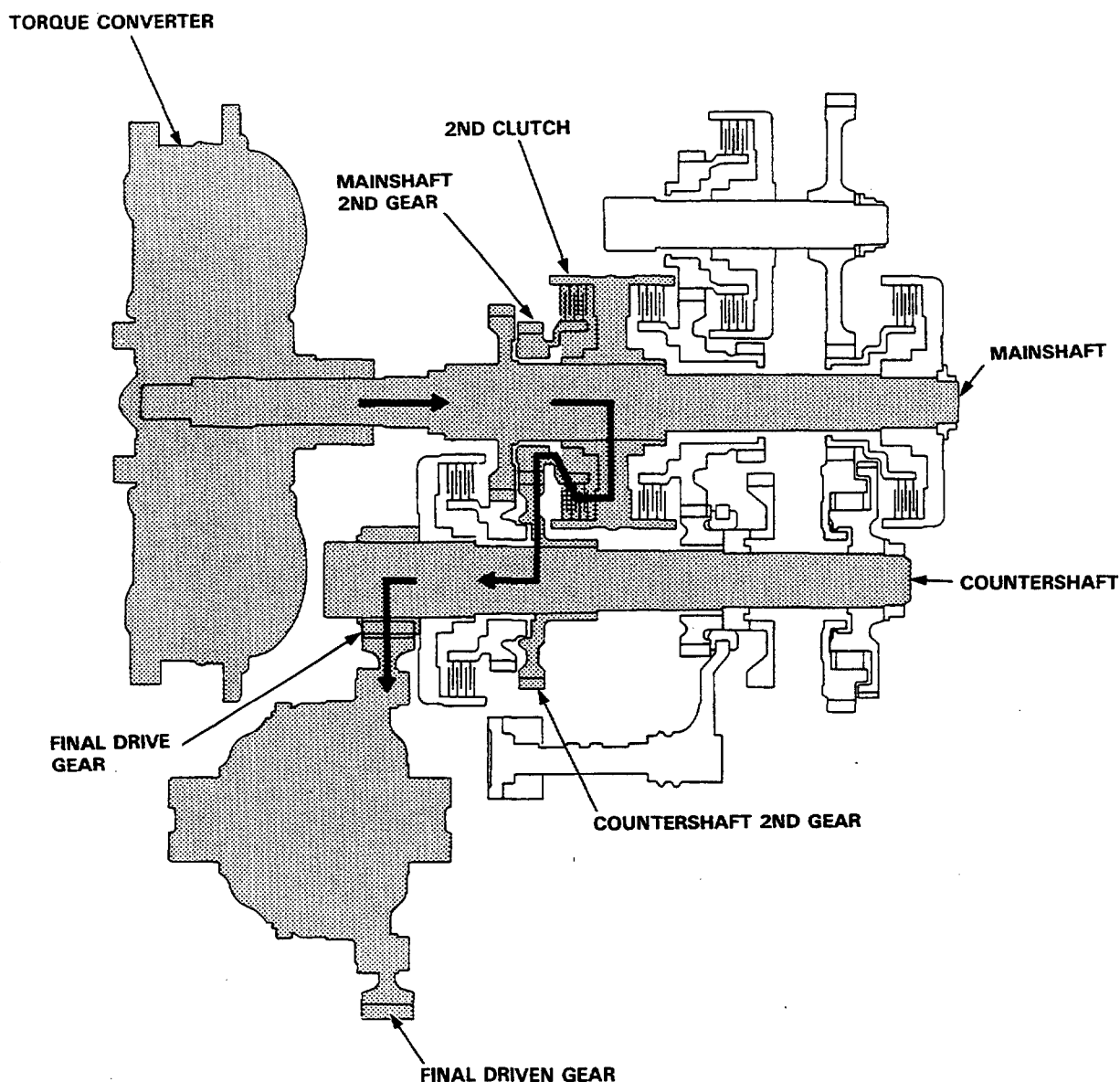
# Description

## Power Flow (cont'd)

**D<sub>4</sub>** or **D<sub>3</sub>** Position, 2nd speed

1. Hydraulic pressure is applied to the 2nd clutch, which rotates together with the mainshaft, and the mainshaft 2nd gear rotates.
2. Power is transmitted to the countershaft 2nd gear, and drives the countershaft.
3. Power is transmitted to the final drive gear and drives the final driven gear.

NOTE: In **D<sub>4</sub>** or **D<sub>3</sub>** position, 2nd speed, hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 2nd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.

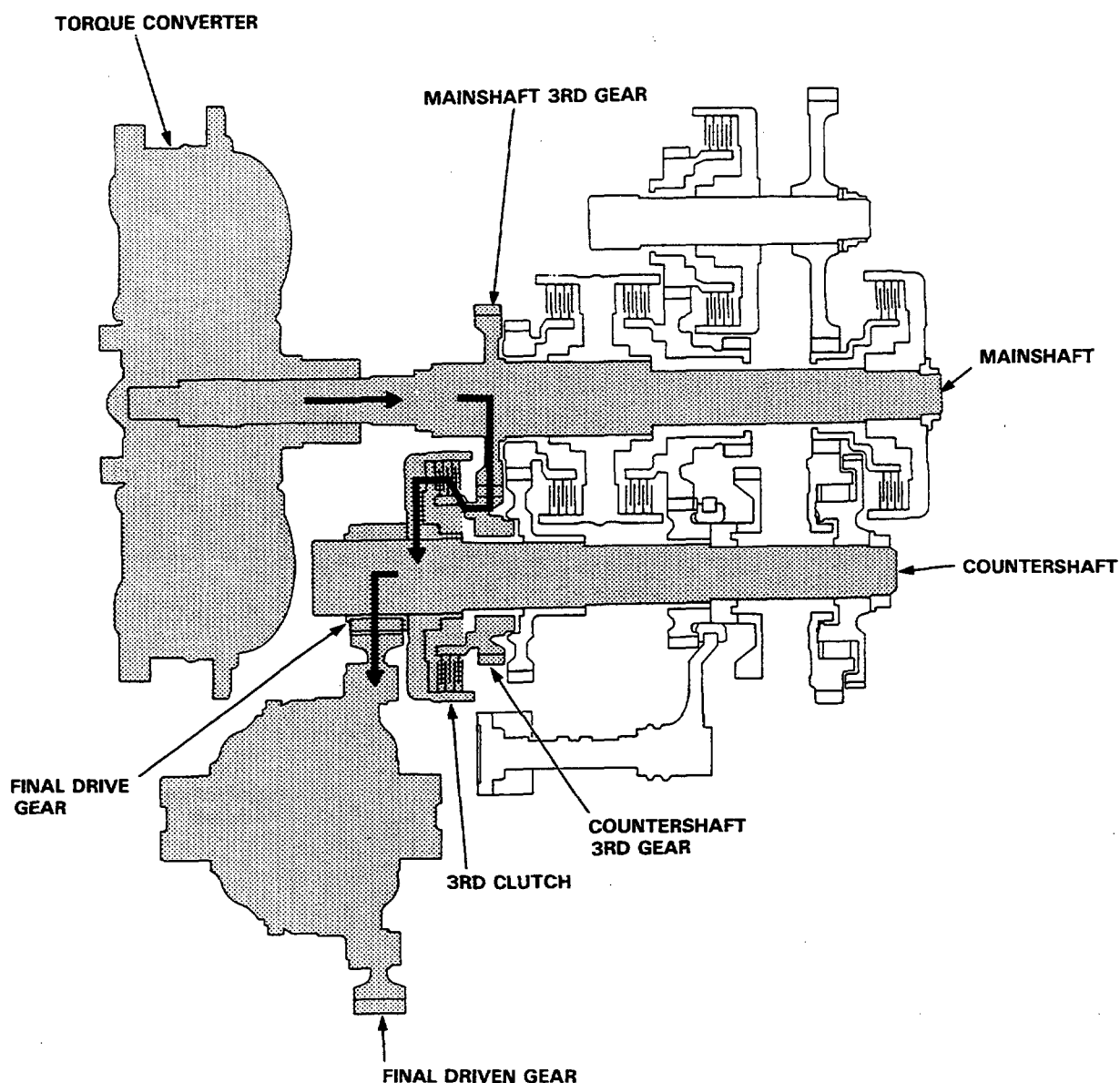




**D<sub>4</sub> or D<sub>3</sub> Position, 3rd speed**

1. Hydraulic pressure is applied to the 3rd clutch. Power from the mainshaft 3rd gear is transmitted to the countershaft 3rd gear.
2. Power is transmitted to the final drive gear and drives the final driven gear.

NOTE: In **D<sub>4</sub>** or **D<sub>3</sub>** position, 3rd speed, hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 3rd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.



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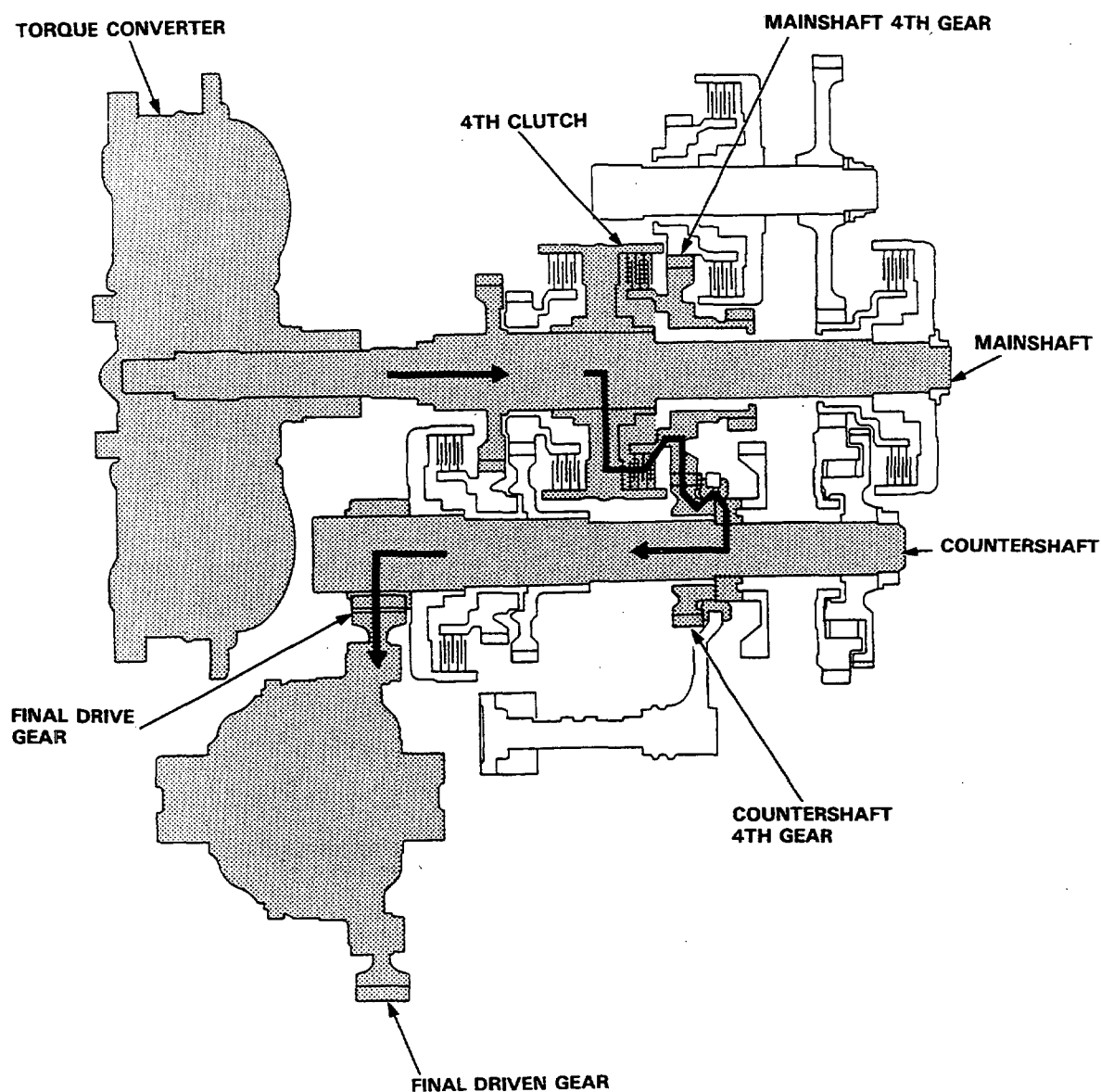
# Description

## Power Flow (cont'd)

### **D<sub>4</sub>** Position, 4th speed

1. Hydraulic pressure is applied to the 4th clutch, which rotates together with the mainshaft, and the mainshaft 4th gear rotates.
2. Power is transmitted to the countershaft 4th gear, and drives the countershaft.
3. Power is transmitted to the final drive gear and drives the final driven gear.

NOTE: In **D<sub>4</sub>** position, 4th speed, hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 4th gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.





## **R** Position

1. Hydraulic pressure is switched by the manual valve to the servo valve, which moves the reverse shift fork to the reverse position. The reverse shift fork engages with the reverse selector, reverse selector hub, and the countershaft reverse gear.
2. Hydraulic pressure is also applied to the 4th clutch. Power is transmitted from the mainshaft reverse gear via the reverse idler gear to the countershaft reverse gear.
3. Rotation direction of the countershaft reverse gear is changed via the reverse idler gear.
4. Power is transmitted to the final drive gear and drives the final driven gear.

