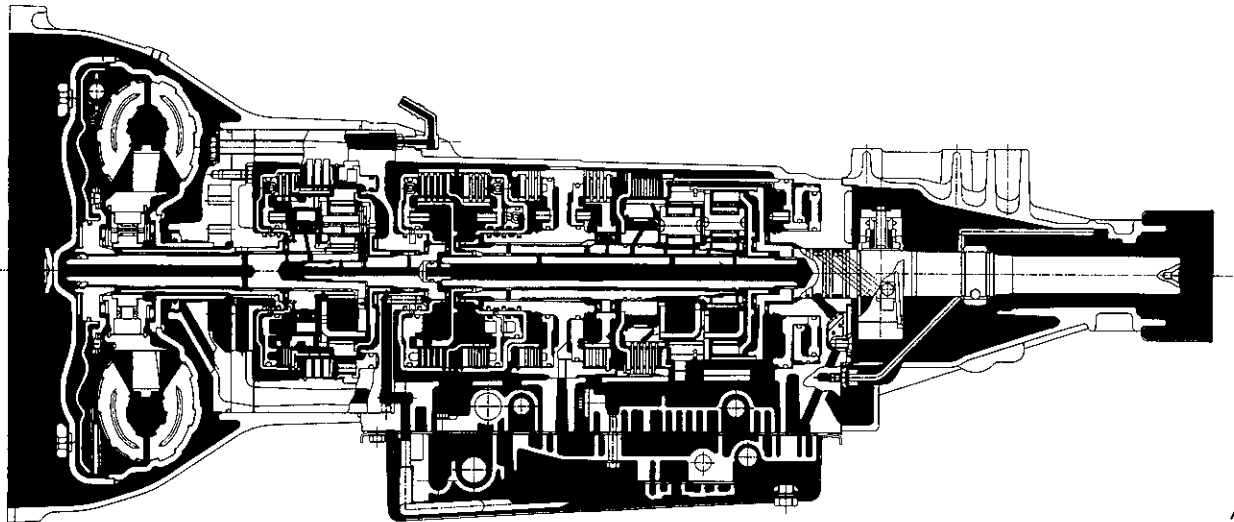


DESCRIPTION

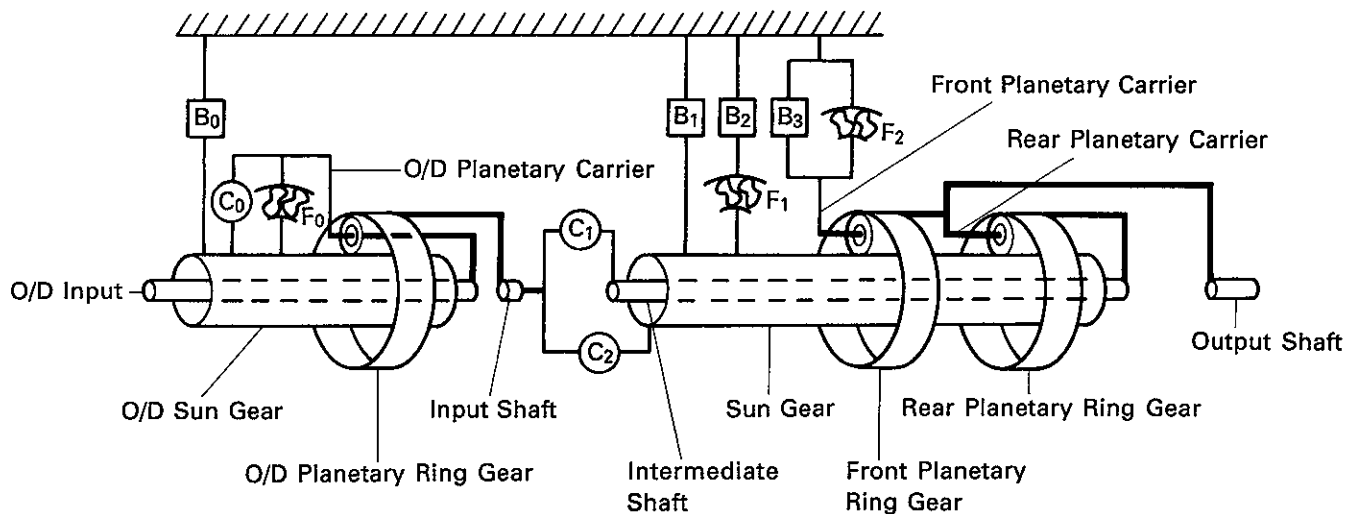
GENERAL

The A45DL is a 4-speed automatic transmission. A lock-up mechanism is built into the torque converter.



AT5664

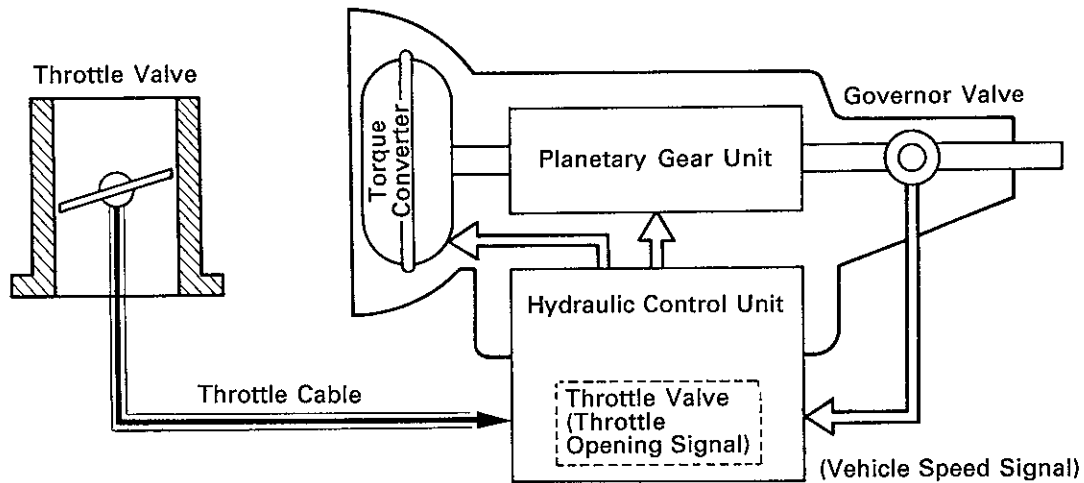
A45DL transmission is mainly composed of the torque converter, the overdrive (hereafter abbreviated as O/D) planetary gear unit, 3-speed planetary gear unit and the hydraulic control system.



AT3282

SHIFT CONTROL

Shifting in the fully hydraulic controlled automatic transmission is carried out by the hydraulic control unit in the following way:



AT3254

—THROTTLE VALVE—

The throttle valve in the hydraulic control unit generates hydraulic pressure in proportion to the amount that the accelerator pedal is depressed; this pressure (called "throttle pressure") acts as a throttle opening "signal" to the hydraulic control unit.

—GOVERNOR VALVE—

The governor valve generates hydraulic pressure in proportion to the speed of the vehicle; this pressure (called "governor pressure") acts as a vehicle speed "signal" to the hydraulic control unit.

—HYDRAULIC CONTROL UNIT—

Governor pressure and throttle pressure cause the shift valves in the hydraulic control unit to operate; the strengths of these pressures control the movements of these valves, and these valves control the fluid passage to the clutches and brakes in the planetary gear unit, which in turn control the shifting of the transmission.

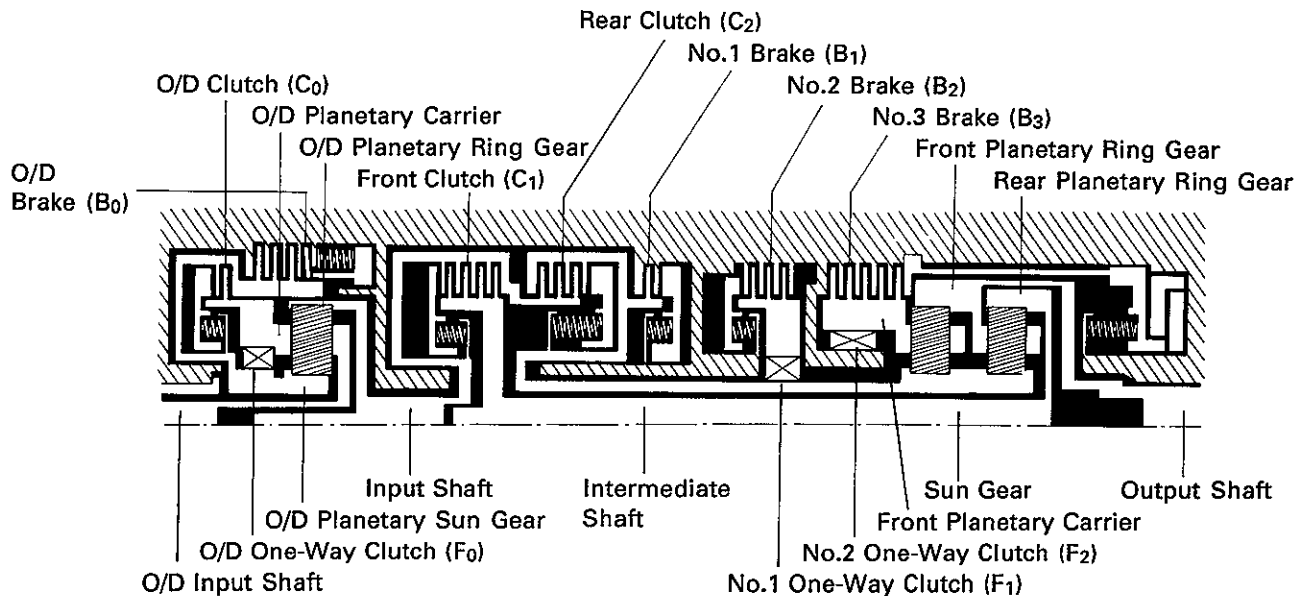
PLANETARY GEAR UNIT

The planetary gear unit is composed of three sets of planetary gears, three clutches which transmit power to the planetary gears, and four brakes and three 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 then 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.



AT3283

OPERATION OF EACH ELEMENT

NOMENCLATURE	OPERATION
O/D 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
No.1 Brake (B ₁)	Prevents front & rear planetary sun gear from turning either clockwise or counterclockwise
No.2 Brake (B ₂)	Prevents outer race of F ₁ from turning either clockwise or counterclockwise, thus preventing front & rear planetary sun gear from turning counterclockwise
No.3 Brake (B ₃)	Prevents front planetary carrier from turning either clockwise or counterclockwise
No.1 One-Way Clutch (F ₁)	When B ₂ is operating, prevents front & rear planetary sun gear from turning counterclockwise
No.2 One-Way Clutch (F ₂)	Prevents front planetary carrier from turning counterclockwise

OPERATION CONDITIONS FOR EACH GEAR

(See page AT-6)

HYDRAULIC CONTROL SYSTEM

The hydraulic control system is composed of the oil pump, the valve body, and 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.

OPERATION

Hydraulic pressure supplied by the oil pump is controlled by the regulator valve; the resulting oil pressure controlled by the regulator valve is called the "line pressure".

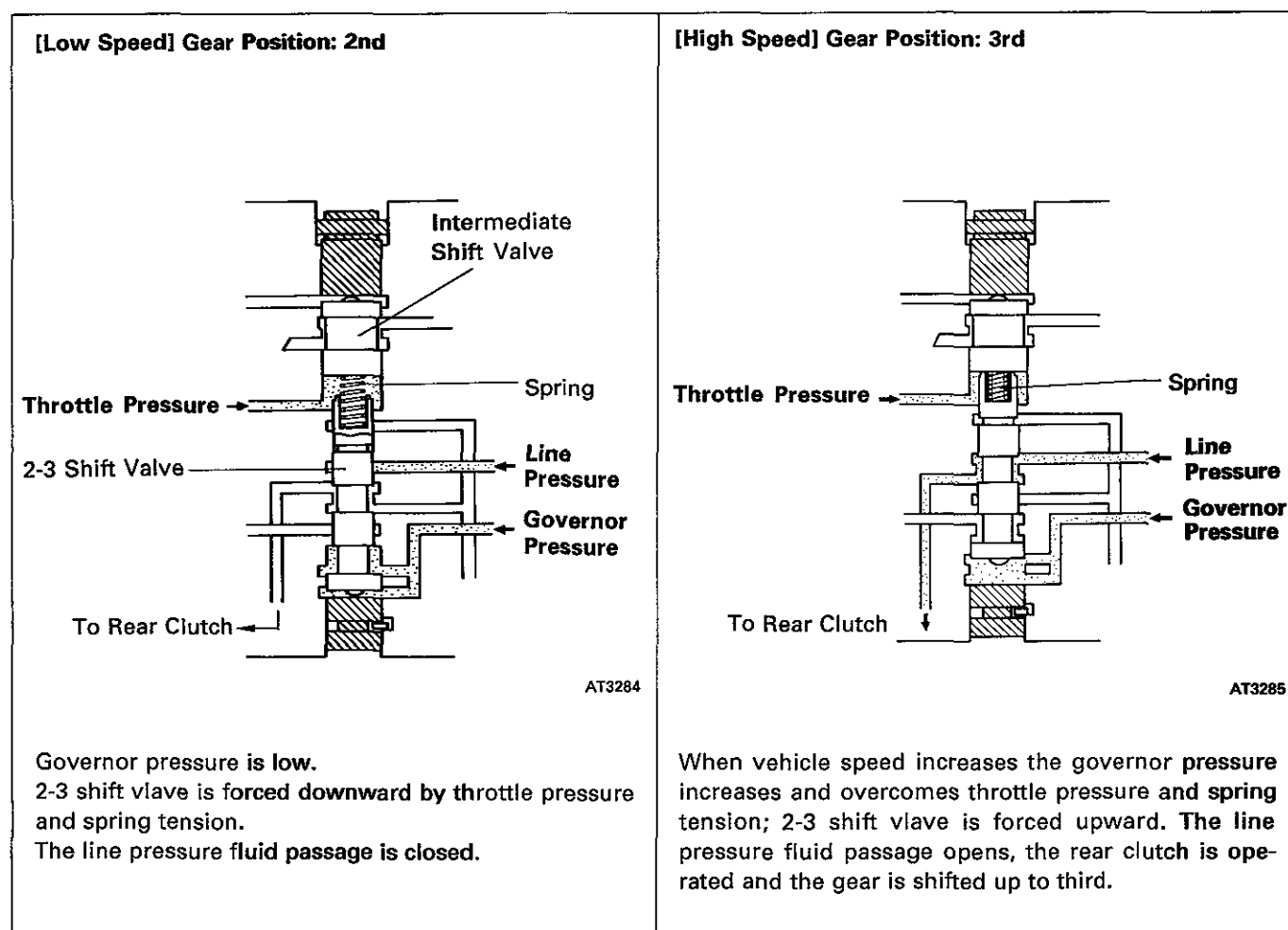
Line pressure produces the hydraulic pressure for throttle pressure and governor pressure. Also, line pressure produces hydraulic pressure for the operation of each brake and clutch in the planetary gear unit.

The throttle valve acts to produce hydraulic pressure, called the "throttle pressure", which responds to accelerator pedal modulation. Throttle pressure increases as the accelerator pedal is depressed.

The governor valve produces hydraulic pressure, called the "governor pressure", in response to vehicle speed. Governor pressure increases as vehicle speed increases.

In accordance with the difference between throttle pressure and governor pressure, each shift valve shifts, the fluid passages to the clutches and brakes in the planetary gear unit are opened and the clutches and brakes operate, and shift change occurs.

The operation of the hydraulic control system, using the 2-3 shift valve as an example, is shown below:



OPERATING MECHANISM FOR EACH GEAR**CLUTCH, BRAKE AND ONE-WAY CLUTCH**

○ Operating

Shift lever position	Gear position	C ₀	C ₁	C ₂		B ₀	B ₁	B ₂	B ₃		F ₀	F ₁	F ₂
				I.P.	O.P.				I.P.	O.P.			
P	Parking	○							○	○	○		
R	Reverse	○		○	○				○	○	○		
N	Neutral	○									○		
D	1st	○	○								○		○
	2nd	○	○					○			○	○	
	3rd	○	○	○				○			○		
	O/D		○	○		○		○					
2	1st	○	○								○		○
	2nd	○	○				○	○			○	○	
L	1st	○	○						○	○	○		○

I.P. Inner Piston

O.P. Outer Piston