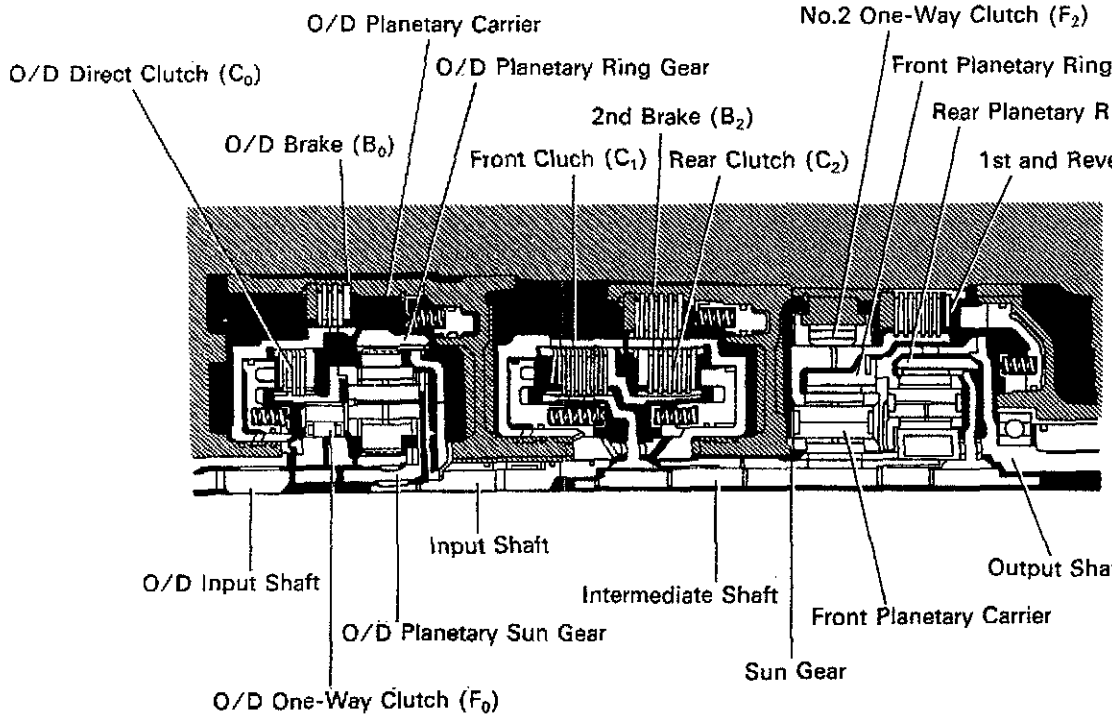
OPERATION

OPERATING CONDITIONS

AT000-01



Q03056

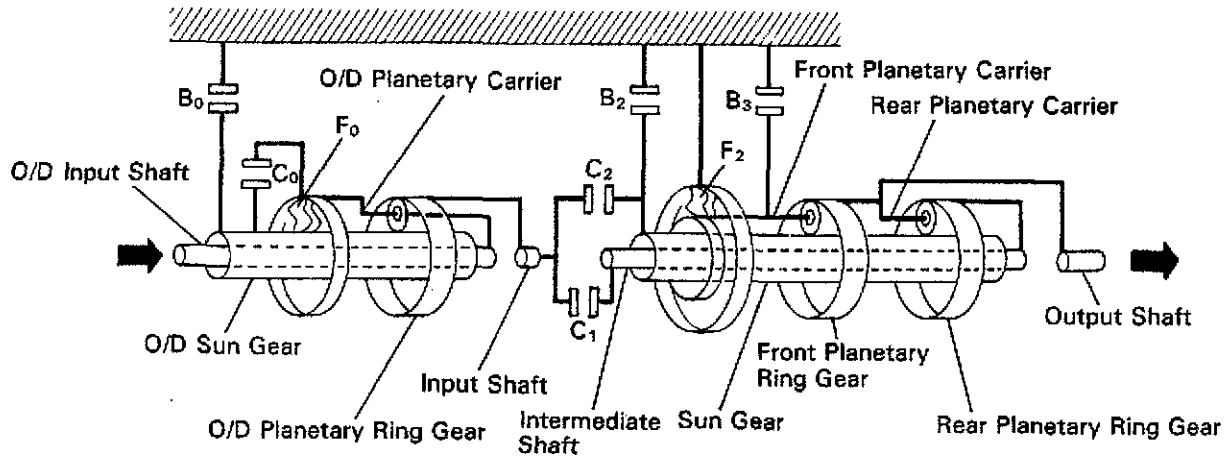
○ .... Operating

Shift lever position	Gear position	C_0	C_1	C_2	B_0	B_2	B_3	F_0	F_2
P	Parking	○						○	
R	Reverse	○		○			○	○	
N	Neutral	○						○	
D	1st	○	○					○	○
	2nd		○			○		○	
	3rd	○	○	○				○	
	O/D		○	○	○				
2	2nd	○	○			○		○	
L	1st	○	○				○	○	○

V01579

FUNCTION OF COMPONENTS

NOMENCLATURE	OPERATION
O/D Direct 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
2nd Brake (B_2)	Prevents front & rear planetary sun gear from turning either clockwise or counterclockwise
1st & Reverse Brake (B_3)	Prevents front planetary carrier from turning either clockwise or counterclockwise
No.2 One-Way Cluch (F_2)	Prevents front planetary carrier from turning counterclockwise



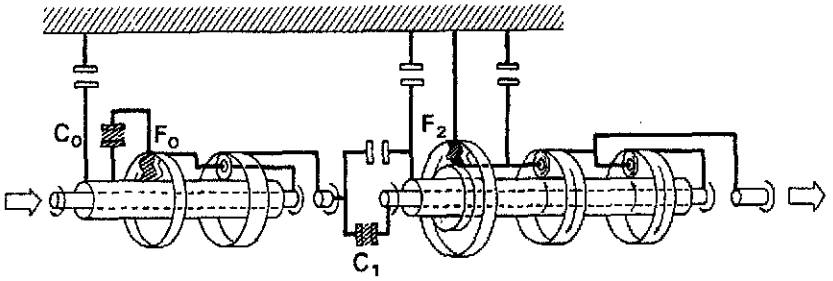
AT3917

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V01580

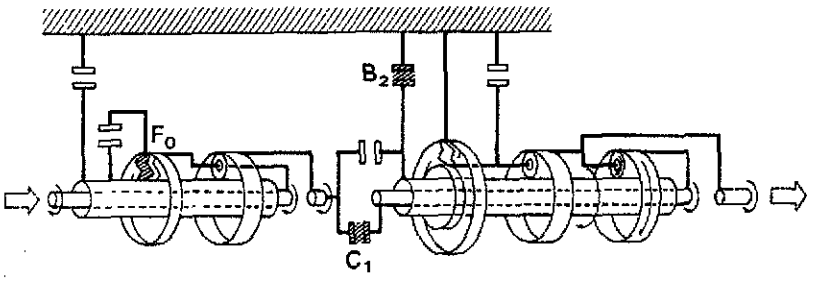
The conditions of operation for each gear position are shown on the following illustration:

D Range 1st Gear



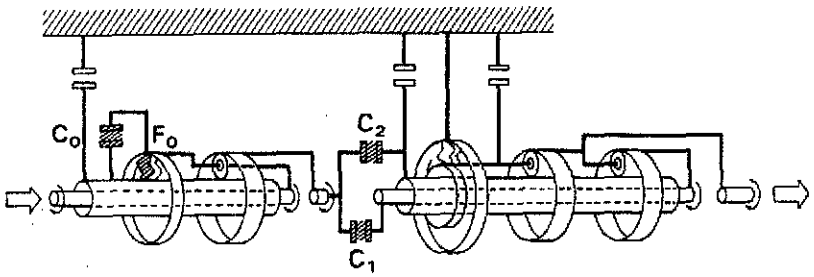
AT5949

D Range 2nd Gear



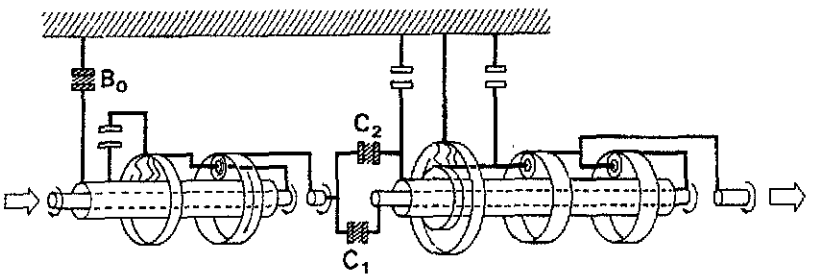
AT5950

D Range 3rd Gear



AT5951

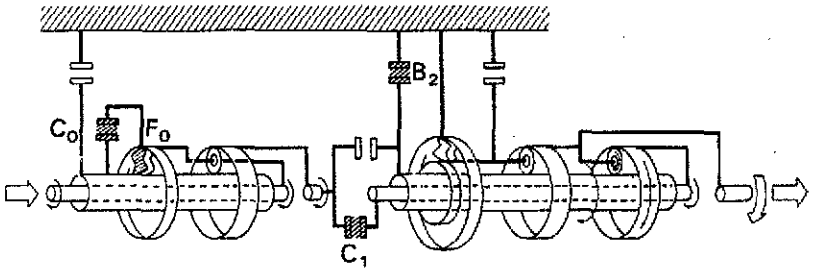
D Range O/D



AT5952

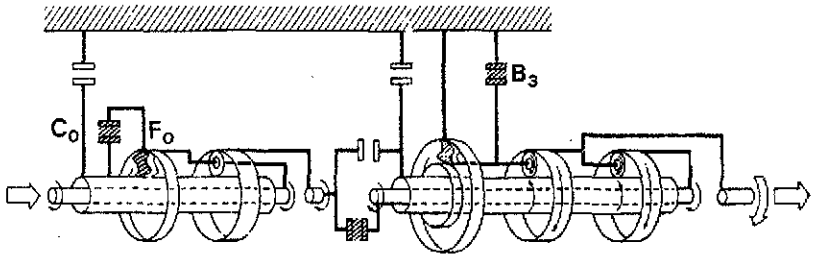
V03062

2 Range 2nd Gear



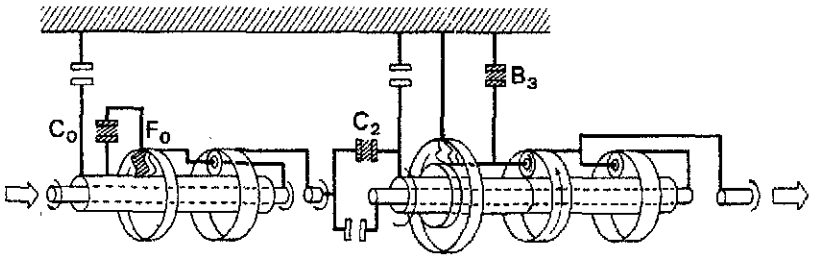
AT5953

L Range 1st Gear



AT5954

R Range Reverse Gear



AT5955

AT

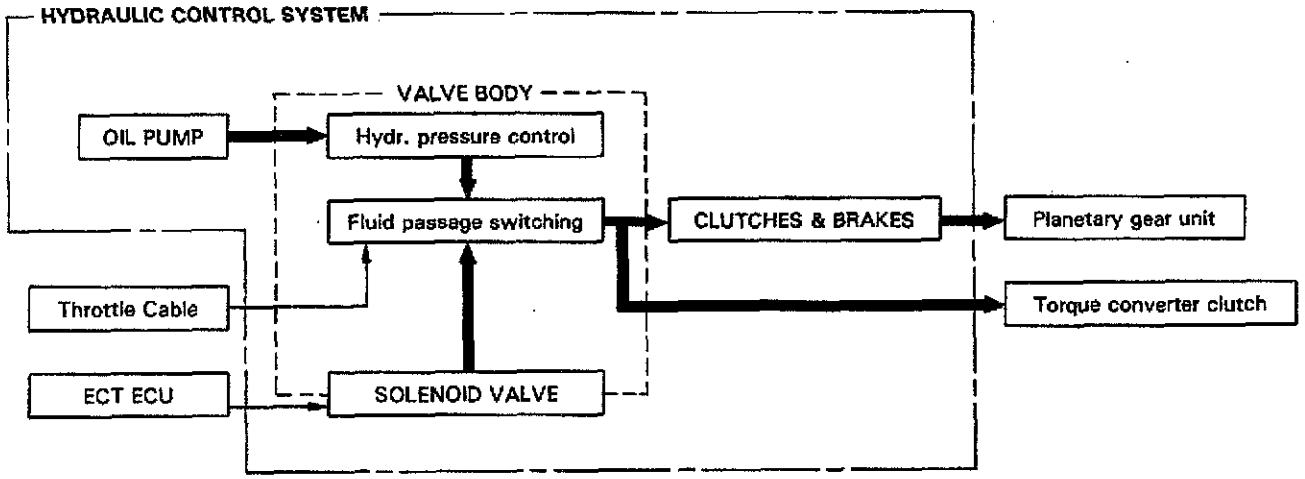
HYDRAULIC CONTROL SYSTEM

The hydraulic control system is composed of an oil pump, the valve body, solenoid valves, accumulators, 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.

There are four solenoid valves on the valve body.

These solenoid valves are turned on and off by signals from ECT ECU to operate the shift valves. These shift valves then switch the fluid passages so that fluid goes to the torque converter and planetary gear units.



V03055

ELECTRONIC CONTROL SYSTEM

The electronic control system for the A441E automatic transmission provide extremely precise control of the gear shift timing and lock—up timing in response to driving conditions as sensed by various sensors located throughout the vehicle and in response to the engine's running condition.

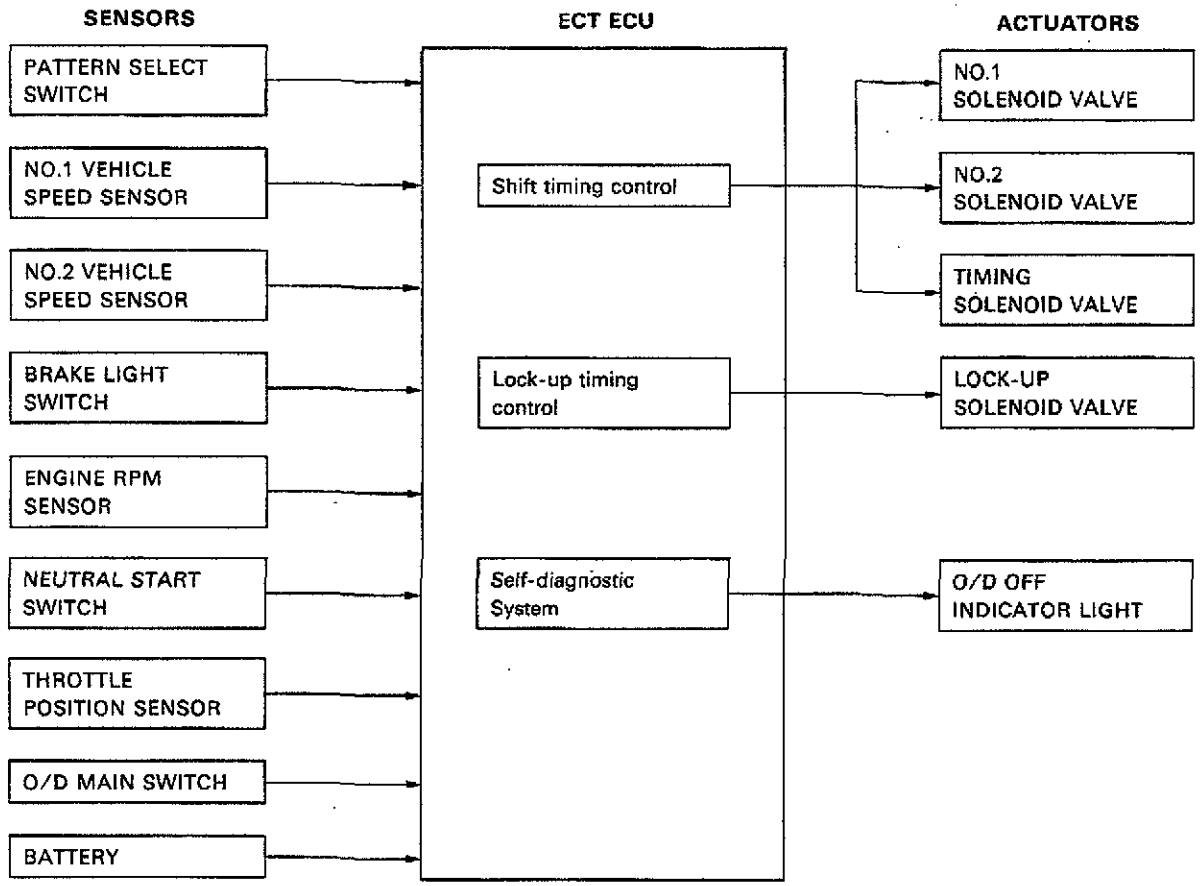
At the same time, the ECT ECU control reduces vehicle squat when the vehicle starts out the gear shift shock.

The electronic control system for controlling the shift timing and the operation of the lock—up clutch is composed of the following three parts:

(a) Sensors: These sense the vehicle speed and throttle position and send this data to the ECT ECU in the form of electronic signals.

(b) ECT ECU: This determines the shift and lock—up timing based upon the signals from the sensors.

(c) Actuators: Solenoid valves divert hydraulic pressure from one circuit of the hydraulic control unit to another thus controlling shifting and lock—up timing.



V03057

FUNCTION OF ECT ECU

- **Control of Shift Timing**

The ECT ECU has programmed into its memory the optimum shift pattern for each shift lever position (D, 2, L positions) and driving mode (Normal or Power).

Based on the appropriate shift pattern, the ECT ECU turns No.1, No.2 and timing solenoid valves on or off in accordance with the vehicle speed signal from the speed sensors and the throttle opening signal from the throttle position sensor. In this manner, the ECU ECT operates each shift valve, opening or closing the fluid passages to the clutches and brakes to permit up–shift or down–shift of the transmission.

AT

HINT: The electronic control system provides shift timing and lock–up control only while the vehicle is traveling forward. In REVERSE, and NEUTRAL, the transmission is mechanically, not electronically controlled.

- **Control of Lock–Up System**

The ECT ECU has programmed in its memory a lock–up clutch operation pattern for each driving mode (Normal or Power). Based on this lock–up pattern, the ECT ECU turns lock–up solenoid valve on or off in accordance with the speed signals received from the speed sensor and the throttle opening signals from the throttle position sensor.

Depending on whether lock–up solenoid valve is on or off, the lock–up relay valve performs changeover of the fluid passages for the converter pressure acting on the torque converter to engage or disengage the lock–up clutch.