U660E AUTOMATIC TRANSAXLE

■ ELECTRONIC CONTROL SYSTEM

1. General

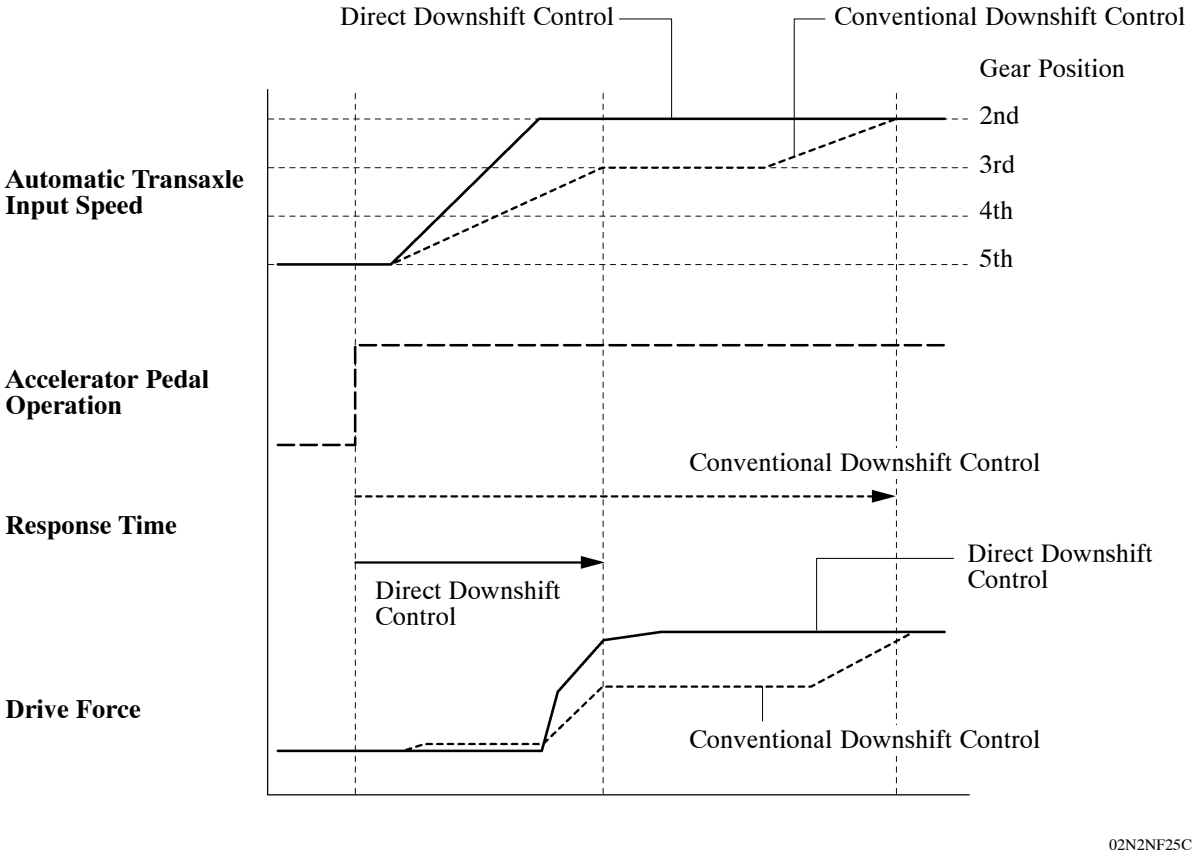
The electronic control system of the U660E automatic transaxle consists of the control listed below:

: New/Changed

System	Outline
Shift Timing Control	The ECT ECU supplies current to 6 solenoid valves (SL1, SL2, SL3, SL4, SL and/or SLU) based on signals from each sensor to shift the gear.
Clutch to Clutch Pressure Control	Controls the pressure that is applied directly to the C_1, C_2 clutches and B_1, B_3 brakes by actuating the shift solenoid valves (SL1, SL2, SL3 and SL4) in accordance with ECT ECU signals.
Line Pressure Optimal Control	Actuates solenoid valve SLT to control the line pressure in accordance with information from the ECT ECU and the operating conditions of the transaxle.
Powertrain Cooperative Control	Controls both the shift control and engine output control in an integrated way, achieving excellent shift characteristics and drivability.
Lock-up Timing Control	The ECT ECU supplies current to shift solenoid valves SL and SLU based on signals from each sensor and engages or disengages the lock-up clutch.
Flex Lock-up Clutch Control	Controls solenoid valves SLU and SL, provides an intermediate mode between the ON/OFF operation of the lock-up clutch, and increases the operating range of the lock-up clutch to improve fuel economy.
Coast Downshift Control	The ECT ECU performs downshift control so that fuel cut control can continue for as long as possible during deceleration.
Direct Downshift Control	Direct downshift control is used. This makes it possible to skip unnecessary shifts, enabling the vehicle to downshift directly from 6th to 3rd or from 5th to 2nd, enhancing downshift response when the accelerator pedal is depressed quickly.
Artificial Intelligence Shift Control (AI-shift Control)	Based on the signals from various sensors, the ECT ECU determines the road condition and the intention of the driver. Thus, the shift pattern is automatically regulated to an optimal level, improving drivability.
Multi-mode Automatic Transmission	The ECT ECU appropriately controls the automatic transaxle in accordance with the range selected while the shift lever is in the S.
Diagnosis	When the ECT ECU detects a malfunction, the ECT ECU makes a diagnosis and memorizes the malfunctioning part.
Fail-safe	Even if a malfunction is detected in the sensors or solenoids, the ECT ECU activates fail-safe control to prevent the vehicle's drivability from being significantly affected.

2. Direct Downshift Control

- For conventional downshift control, when shifting from 6th to 3rd or 5th to 2nd, downshifts use an intermediate gear, in order to achieve smooth acceleration response. In addition to conventional control, direct downshift control is used for this vehicle. This control skips unnecessary shifts, enabling the vehicle to downshift directly from 6th to 3rd or from 5th to 2nd.
- When the accelerator pedal is depressed quickly, direct downshift control enables direct downshifts with a quick shift response, skipping unnecessary shifts. Direct downshift control places the emphasis on reducing the time required to achieve the target gear. Conventional downshift control is used when the accelerator pedal is depressed slowly, providing smooth acceleration response. As a result, this logic achieves downshift responsiveness in accordance with the driver's intentions.



3. Multi-mode Automatic Transmission

The Multi-mode Automatic Transmission has been added the following functions.

- Holding the shift lever toward "+" with the shift lever in S will change the shift range to the S6 range regardless of the current range (S1 to S5).
- In order to prevent excessive engine speed, a function is adopted that automatically selects a higher shift range before engine speed becomes excessive.
- In order to protect the automatic transmission, a function is adopted that automatically selects a higher shift range when the fluid temperature is high.