

Allison Automatic Transmissions

The modern school bus automatic transmission is much more than simply automatic; it is also a highly sophisticated electronic device. Possessing an Electronic Control Unit, (ECU) and a Transmission Control Module (TCM), these computers gather information from engine data and transmission calibrations. The more we understand these functions we can begin to reap the rewards of better vehicle performance, fuel economy and drivetrain life. As a driver what do we need to do to be operating these transmissions properly? Pay attention here, it gets technical. Please, just select “D” for drive. Let’s see why.

Electronic Control Unit (ECU)

After an automatic shift is completed the ECU compares this shift to an “ideal” shift profile in the ECU calibration and makes adjustments before the next shift of that kind is made. This is “Adaptive Logic” which establishes the initial conditions for that shift.

Transmission Control Module (TCM)

Even more advanced these units process information and send it to specific solenoids (switch-like devices) located in the control module. These solenoids control clutch pressures to provide “closed- loop “control. The closed-loop control makes “during shift” adjustments, (how cool is that...) .These adjustments in shift characteristics are based on vehicle conditions such as grade, load and engine power. After a shift the TCM will compare the shift to an “ideal” shift profile in the TCM calibration and make adjustments before the next shift of the same kind is made. This information then becomes part of the Adaptive Logic which establishes initial conditions for shifts.

When to Shift Your Allison Transmission

So on the flat or minor hills,(less than 3% grades)just stay in Drive to take advantage of all these electronics, but on steeper uphill or downhill you still need to shift your bus for optimum performance, control and safety.

Shift Range Preselection

This means selecting a lower gear range to match driving conditions you expect to encounter. The selection of a lower range often prevents cycling between that range and the next higher range on a series of short up and down hills. Learning to take advantage of preselected shifts will give you better control on slick or icy roads or downgrades. Downshifting to a lower range increases engine braking to help maintain your downhill target speed and lessen service brake usage.

Range Inhibits and Hold Feature

Your transmission will only shift to a lower gear when the road speed range for the lower gear would not result in engine over speed. The transmission will allow the downshift when the transmission output speed (mph) is in the calibrated range for that gear. Inhibits are also programmed in for directional shifts, allowing these shifts when stopped and the throttle is at idle. Best practice is to always stop, shift to Neutral then direction shift.(Drive –N- Reverse, Reverse –N-Drive)

Always select Neutral before shutting off your bus.

The hold feature will keep your transmission in the gear you selected on flat roads but will automatically upshift to protect the engine from excessive over speed.

Remember a bus going downhill can gain 10mph in as little as a 1/10 of a mile so knowing the road speed and engine speeds for each gear is essential for mountain driving.