
#02-07-30-002A: Info - Operating Characteristics of 5L40E/5L50E Automatic Transmission - (Aug 9, 2004)

Subject: Operating Characteristics of 5L40E/5L50E Automatic Transmission



Models: 2003-2005 Cadillac CTS
2004-2005 Cadillac SRX, XLR
2005 Cadillac STS
with 5L40E/5L50E Automatic Transmission (RPOs M82, M22, MX5, MV3)

This bulletin is being revised to include additional models, model years and additional operating characteristics. Please discard Corporate Bulletin #02-07-30-002 (Section 07-Transmission/Transaxle).

Operating Characteristics of 5L40E/5L50E Automatic Transmission

The Hydra-Matic 5L40E/50E automatic transmissions have some unique operating characteristics with which customers may not be familiar. They have been designed to provide more of a manual transmission feel than other Hydra-Matic automatic transmissions.

These transmissions are used in 2003-05 Cadillac CTS, SRX, STS, and XLR as indicated in the accompanying table. Here are descriptions of the unique operating characteristics.

Normal Mode Operation (CTS, SRX, STS, XLR)

During normal mode operation, drivers may notice increased powertrain braking after releasing the accelerator pedal. The vehicle will not coast freely when the accelerator pedal is released but will start to gradually slow down as if the brakes were lightly applied. This feels very similar to releasing the accelerator pedal on a vehicle equipped with a manual transmission.

Sport Mode Operation (CTS)

Typically, Sport mode delays upshifts. The Sport mode simulates the performance driving of a manual transmission. Under certain conditions, the vehicle will maintain specific gears longer than a traditional automatic would. When driving in Normal mode in 5th gear, depressing the Sport button causes an immediate 5-4 downshift, which will be maintained for ten seconds. In any other gear, no downshift takes place when Sport is engaged. In Sport mode, the vehicle has firmer shifting and increased performance, and the transmission may remain in a gear longer than it would in Normal mode.

Driver Shift Control (DSC) (SRX, STS, XLR)

The driver manually overrides the automatic gear selection. Various mechanization options for input device and degree of override are allowed.

Performance Algorithm Shifting (PAS) (XLR, 2004 SRX)

PAS overrides normal automatic gear selection during closed throttle high lateral acceleration maneuver. Lower gear is accompanied by near synchronous engine speed control for quick response upon re-opening throttle (enable threshold bias in Sport mode).

Important: On SRX, this feature is enabled in Sport. On XLR, it is always enabled.

Performance Algorithm Liftfoot (PAL) (CTS, SRX, STS, XLR)

PAL prevents liftfoot upshifts while maintaining engine braking during repeated aggressive cornering.

Winter Mode (CTS)

The vehicle launches in 2nd or 3rd gear instead of 1st, to avoid wheel spin in snow or ice, if selected by the driver.

Shift Stabilization (CTS, SRX, STS, XLR)

Shift stabilization is used to minimize shift business, or hunting between ranges. Based on several inputs and a map of engine torque at various RPM and throttle position, the TCM determines before making an upshift whether the engine will be able to maintain vehicle speed in the next higher range. If it calculates that it cannot maintain speed, it will prevent the upshift from occurring.

Downgrade Detection Brake Assist (CTS, SRX, STS, XLR)

Shift to lower gear with braking on downgrade based on fuzzy logic rules calculated from a thermal brake model, terrain detection, desired acceleration, vehicle speed, and mass detection.

Adapts (CTS, SRX, STS, XLR)

Adapts continually compares actual shift times to desired shift times. The transmission controls make hydraulic adjustments to assure the actual shift times approach the ideal shift time the next time the shift is made for similar operating conditions of vehicle RPM, engine load, and road load conditions. The adaptive shift process continues for the life of the vehicle to provide consistent and optimized shifts.

	2003-2005	2004-2005	2005	2004-2005
	CTS	SRX	STS	XLR
Transmission	5L40E	5L40E/50E	5L40E/50E	5L50E
Normal				

Mode Operation	X	X	X	X
Sport Mode Operation	X			
Driver Shift Control		X	X	X
Performance Algorithm Shifting		X 2004 Only		X
Performance Algorithm Liftfoot	X	X	X	X
Winter Mode	X			
Shift Stabilization	X	X	X	X
Downgrade Detection Brake Assist	X	X	X	X
Adapts	X	X	X	X

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