

GENERAL DESCRIPTION AND SYSTEM OPERATION

50–40LE AUTOMATIC TRANSMISSION

The 50–40LE automatic transmission is an electronically controlled four–speed transmission. It is designed for front–wheel–drive vehicles with a transversely mounted engine.

The 50–40LE consists of three planetary gear trains with clutches, brakes and sun gears, and a primary and secondary shaft. Two of the three planetary gear trains make up the transmission primary shaft. The underdrive planetary gear is a single planetary gear train and the front planetary has a double set of gears.

The outer set has the short planetary gears and the inner set consists of long planetary gears. The planetary sun gear is common to the inner and outer planetary gears of the front planetary gear. The secondary shaft consists of the underdrive planetary gear train

The two intermediate gears transmit power from the primary to the secondary shaft. From the secondary shaft the power is then transmitted to the differential gear by the differential drive pinion gear and the counter driven gear.

The fluid pressure in the hydraulic system is created by the oil pump. The oil pump is attached to the transaxle case and is part of the second coast and brake clutch assembly. The oil pump also lubricates all moving parts of the transaxle, supplies fluid pressure to the shift components. The brakes and clutches are controlled by gear shifting valves which are controlled by the solenoids in the valve body. The transmission has four forward gears and one reverse gear.

The transmission is controlled by an electronic shift system. The Transmission Control Module (TCM) processes input signals and data received from engine and transmission sensors. From the information received, the TCM controls the transmission hydraulic system.

The electronic shift system consists of the following:

- Transmission control module (TCM)
- Shift solenoids (SS1 and SS2)
- Linear solenoid (pressure)
- Lockup solenoid
- Input shaft speed (ISS) sensor
- Output shaft speed (OSS) sensor
- Transmission Fluid Temperature (TFT) sensor
- Park/neutral position (PNP) Switch

Transmission Control Module (TCM)

The TCM primarily controls shift points and lockup engagement. It has a 35 pin–connector and is located on the passenger side under the instrument panel. Shifting is caused by two solenoids which are actuated by the TCM.

The TCM also determines when the torque converter lock–up function is to be activated. Through the linear solenoid, when shifting occurs, the TCM actuates the solenoid valve to change the fluid pressure in the transmission.

Shift Solenoids

The shift solenoids are in the upper valve body. Both solenoids control shifting by opening and closing the fluid circulation system. The solenoids are grounded in the transmission and operate when they are supplied with battery voltage.

The battery voltage is controlled by the TCM, which sends a signal for up or down shifting, depending on vehicle speed, throttle position and driver demand.

Lockup Solenoid

The lockup solenoid is in the lower section of the upper valve body. The solenoid controls the torque converter lockup function. The solenoid is grounded in the transmission and operate when it is supplied with battery voltage.

The battery voltage is controlled by the TCM, which sends a signal for lockup engagement or disengagement according to vehicle speed, throttle position and driver demand.

Linear Solenoid

The linear solenoid is in the center of the upper valve body and regulates the transmission's fluid pressure system. It is internally grounded in the TCM and operates when it is supplied with battery voltage from the TCM, through the linear solenoid and back to the TCM.

The battery voltage is controlled by a varying current from the TCM. The strength of the current is a function of the throttle position.

Input Shaft Speed Sensor

The input shaft speed (ISS) sensor provides the TCM with the data on the speed of the transmission input shaft.

The input sensor is an electromagnetic type and measures the speed of the input shaft behind the torque converter by a toothed wheel on the forward/direct clutch drum.

The TCM uses the input sensor signal and vehicle speed to calculate shift times. Fuel pressure regulation, control of the torque converter lock–up function and engine torque reduction are based on the input shaft rpm and the vehicle speed received from the TCM.

Output Shaft Speed (OSS) Sensor

The output shaft speed (OSS) sensor provides the TCM with the data on the speed of the transmission output shaft.

The output sensor is an electromagnetic type and measures the speed of the output shaft by the parking lock ring gear.

The TCM uses the output sensor signal and vehicle speed to check shift times.

Transmission Fluid Temperature (TFT) Sensor

The TFT sensor provides the TCM with information on the transmission fluid temperature. The TFT sensor's integral resistance has negative temperature dependence (resistance declines as temperature rises). The TCM uses information from the TFT sensor to calculate the gear shift

points and to engage the torque converter lockup function.

Park/Neutral Position (PNP) Switch

The PNP switch is mounted to the manual detent lever on top of the transmission. Incorporated in the PNP switch are the backup lamp switch, starting interlock switch and switches to inform the TCM on gear engagement.