



INSIDE MODERN AUTOMATIC TRANSMISSIONS

Modern automatic transmissions are no longer purely mechanical systems. They rely heavily on electronics, software calibration, and adaptive control strategies. Key components such as solenoids, sensors, and shifter assemblies are factory-calibrated and must operate within precise electrical and software parameters to function correctly.

Transmission solenoids may be designated as normally high or normally low and assigned specific band numbers. Installing an incorrect solenoid can result in harsh shifts, improper timing, or ongoing drivability issues.

In addition, the transmission control module (TCM) continuously adapts to wear, temperature, and driving behavior by learning clutch fill times and pressure requirements. After repairs, these learned values often must be reset or relearned using scan-tool procedures to restore proper operation.

AUTOMATIC TRANSMISSIONS

Conventional automatic transmissions use a torque converter, planetary gear sets, and hydraulically applied clutch packs. Electronic solenoids regulate fluid pressure to engage or release these clutches, producing discrete gear changes. Diagnosis focuses on solenoid control, sensor inputs, hydraulic response, and adaptive values stored in the TCM.

DUAL-CLUTCH TRANSMISSIONS

Dual-clutch transmissions combine manual transmission mechanics with automatic electronic control. They use two input shafts and two clutches—one for odd gears and one for even gears. While one gear drives the vehicle, the next gear is



pre-selected on the alternate shaft, allowing extremely fast and smooth shifts. These systems depend heavily on precise software control and adaptation routines following service.

CONTINUOUSLY VARIABLE TRANSMISSIONS (CVT)

CVTs eliminate fixed gear steps entirely. Instead, they use variable-diameter pulleys connected by a steel belt or chain to create an infinite range of ratios. Engine speed can remain constant while vehicle speed increases, improving efficiency and fuel economy. Because CVTs rely extensively on hydraulic pressure regulation and electronic control, diagnosis and service are primarily scan-tool-driven.

New for the latest release is an Intelligent Variable Transmission (IVT) pressure learn test that's essential for completing transmission jobs on the Hyundai® Elantra.

WHAT'S NEW IN OUR SOFTWARE?

In the latest software release are complete guided component tests for the Nissan® NV1500. These tests include details advanced diagnostic procedures along with images helping a tech complete the job. Tests include TCM DCV Test, direct clutch solenoid, TCC, and low coast brake clutch solenoid resistance tests.

