AUTOMATIC TRANSMISSION AND TRANSAXLE

C 24. Describe the operational characteristics of a hybrid vehicle drive train. (P-3)

Series Hybrids

A hybrid vehicle has two power sources. A series hybrid is basically an electric driven vehicle that has an internal combustion engine (ICE) to drive a generator which charges the battery or provides electrical power for the motor. On these vehicles the engine cannot drive the vehicle wheels. Some of these vehicles can be plugged into a power cord for the battery to be charged when the vehicle is parked. Because the drive wheels are always driven by the electric motor, which produces a great amount of torque, a conventional transmission is not needed. A simple fixed reduction gear and final drive unit is all that is required.

Parallel Hybrid

A parallel hybrid has an internal combustion engine (ICE) and one or more electric motors. The engine and motor(s) can drive the transmission independently or together. A generator charges the battery when the engine is running and through regenerative braking when the vehicle is braking or stopping. Because this vehicle can be powered by an engine it requires a transmission/transaxle just as conventional engine-powered vehicles do. The parallel hybrid may use a manual, automatic, continuously variable (CVT), or electronic continuously variable (ECVT) transmission/transaxle. Motor/generators may be located between the engine and transmission/transaxle or inside the transmission/transaxle. Torque converters may or may not be used. Some versions of a CVT use variable diameter pulleys and a steel belt. Some versions of an ECVT use internal motors and planetary gear sets. Differential type final drive gears transmit torque to the drive wheels.