Modern Automotive Technology
Chapter 63
Transaxle and Front Drive Axle Fundamentals
Learning Objectives

- Identify the major parts of a transaxle assembly.
- Explain the operation of a manual transaxle.
- Explain the operation of an automatic transaxle.
- Trace the flow of power through manual and automatic transaxles.
- Describe design differences in transaxles.
- Identify the parts of constant velocity drive axles.
- Compare design differences in CV-joints.
1. The Transaxle Input Shaft is splined to the clutch disc; turning the gears in the transaxle.

2. The Transaxle Output Gears are either freewheeling or fixed gears driven by input gears.
Clutch Disc Splined to Transmission Input Shaft
Transaxle Powerflow
(Transverse Engine)

Input Shaft
Input to Output Gear Power Flow

Reverse idler engaged

Idler turns output backwards

Input from engine

Output opposite normal rotation
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3. Transaxle Synchronizers are splined hub assemblies that can be used to lock freewheeling gears to their shafts for engagement.

4. The Transaxle Case is an aluminum housing that encloses and supports parts of transaxle.
Inner hub is splined to a transaxle shaft. Outer sleeve is free to slide on the hub.
Transaxle Case

- Clutch housing
- Differential
- Gasket
- Snap ring
- Oil seal
- Transmission housing
5. A Transverse Drive system is one in which the engine is mounted sideways in the engine compartment.

6. A Transaxle Differential transfers power to the axles and wheels and allows one wheel to turn at a different speed than the other.
Transverse Drive

Short drive axle assemblies connect the transaxle output to the hubs and wheels.
Transaxle Differential
(Longitudinal Engine)

Hypoid gears transfer driving power
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7. The Transaxle Output Shaft is a pinion shaft that transfers torque to ring and pinion gears and differential.

8. Transaxle Input Gears are either freewheeling or fixed gears on input shaft and mesh with output gears.
Automatic Transaxle

- Planetary gearsets
- Parking gear
- Differential
- Band
- Clutch
- Valve body
- Flywheel
- Housing
- Oil pump
- Torque converter
Automatic Transaxle
9. A **Longitudinal** drive system in which the engine is mounted lengthwise in the engine compartment.

10. A **Transaxle** is a transmission and a differential combined in a single assembly.
Drive Trains

Rear-Wheel Drive Vehicle

Front-Wheel Drive Vehicle
Automatic Transaxle

No planetary gear set is used
Solenoids and clutches control helical gears and torque converter lockup
Front Drive Axles

Automatic transmission

Flywheel

Right drive axle

Outboard universal joint

Inboard universal joint

Differential

Universals

Left drive axle
CV-Joints

Constant Velocity Joint
Tripod CV-Joint

- Seal
- Cover
- Needle bearings
- Balls
- Rubber boot
- Boot collar or strap
- Spider
- Yoke
- Interconnecting shaft
- Locking plate
- Spring retainer for boot
Axle Shafts

Three-piece drive axle
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