CHAPTER 16

Drive Shafts and CV Joints

FIGURE 16.1 Typical rear-wheel-drive powertrain arrangement. The engine is mounted longitudinal (lengthwise).

FIGURE 16.2 Typical front-wheel-drive powertrain arrangement. The engine is usually mounted transversely (sideways).
FIGURE 16.3 Typical driveshaft (also called a propeller shaft). The driveshaft transfers engine power from the transmission to the differential.

FIGURE 16.4 This driveshaft was found to be dented during a visual inspection and has to be replaced.

FIGURE 16.5 A center support bearing is used on many vehicles with long two-part driveshafts.
Some driveshafts use rubber between an inner and outer housing to absorb vibrations and shocks to the driveline.

A simple universal joint (U-joint).

How the speed difference on the output of a typical U-joint varies with the speed and the angle of the U-joint.
FIGURE 16.9 The joint angle is the difference between the angles of the joint.

FIGURE 16.10 The angle of this rear Cardan U-joint is noticeable.

FIGURE 16.11 A double-Cardan U-joint.
A constant velocity (CV) joint can operate at high angles without a change in velocity (speed) because the joint design results in equal angles between input and output.

A Rzeppa fixed joint. This type of CV joint is commonly used at the wheel side of the drive axle shaft. This joint can operate at high angles to compensate for suspension travel and steering angle changes.

The protective CV joint boot has been torn away on this vehicle and all of the grease has been thrown outward onto the brake and suspension parts.
FIGURE 16.15 A tripod fixed joint. This type of joint is found on some Japanese vehicles. If the joint wears out, it is to be replaced with an entire drive axle shaft assembly.

FIGURE 16.16 The fixed outer joint is required to move in all directions because the wheels must turn for steering as well as move up and down during suspension movement.

FIGURE 16.17 Unequal-length driveshafts result in unequal drive axle shaft angles to the front drive wheels. This unequal angle side to side often results in a steering of the vehicle during acceleration called torque steer.
**FIGURE 16.18** A typical drive axle shaft with dampener weight.

**FIGURE 16.19** A tripod joint is also called a tripot, tripode, or tulip design.

**FIGURE 16.20** A cross-groove plunge joint is used on many German front-wheel-drive vehicles and as both inner and outer joints on the rear of vehicles that use an independent-type rear suspension.
FIGURE 16.21 Double-offset ball-type plunge joint.

FIGURE 16.22 Getting the correct boot kit or parts from the parts store is more difficult on many Chrysler front-wheel-drive vehicles because Chrysler has used four different manufacturers for its axle shaft assemblies.

FIGURE 16.23 Many CV joints are close to the exhaust system where they are exposed to higher than normal temperatures.