FIGURE 57.1 Rolling contact bearings include (left to right) ball, roller, needle, and tapered roller.

FIGURE 57.2 Ball bearing point contact.
Radial load is the vehicle weight pressing on the wheels. The thrust load occurs as the chassis components exert a side force during cornering.

FIGURE 57.4
Roller bearing line contact.

A tapered roller bearing will support a radial load and an axial load in only one direction.
Many tapered roller bearings use a plastic cage to retain the rollers.

Non-drive wheel hub with inner and outer tapered roller bearings. By angling the inner and outer in opposite directions, axial loads are supported in both directions.

Sealed bearing and hub assemblies are used on the front and rear wheels of many vehicles.
FIGURE 57.9 Sealed bearing and hub assemblies are serviced as a complete unit as shown. This assembly includes the wheel speed sensor.

CHART 57.1

CHART 57.1

The higher the NLGI number, the fewer the greases. Number 2 is the most commonly used.

FIGURE 57.10 Typically sealed with a garter spring.
FIGURE 57.11 A garter spring helps hold the sharp lip edge of the seal tight against the shaft.

FIGURE 57.12 Removing the grease cap with grease cap pliers.

FIGURE 57.13 Using a seal puller to remove the grease seal.
FIGURE 57.14 Cleaning a wheel bearing with a parts brush and solvent.

FIGURE 57.15 A wheel bearing race puller.

FIGURE 57.16 Installing a bearing race with a driver.
FIGURE 57.17 Notice the new blue grease has been forced through the bearing.

FIGURE 57.18 A commonly used hand-operated bearing packer.

FIGURE 57.19 The wheel bearing is placed between two nylon cones, and then a grease gun is used to inject grease into the center of the bearing.
FIGURE 57.20 The wheel bearing adjustment procedure as specified for rear-wheel-drive vehicles.

FIGURE 57.21 A properly secured wheel bearing adjust nut.
FIGURE 57.22 A rear wheel sealed bearing hub assembly.

FIGURE 57.23 Removing the drive axle shaft hub nut. This nut is usually very tight and a drift (tapered) punch engaged into the cooling fins of the brake rotor keeps the hub from revolving when the nut is loosened.

FIGURE 57.24 A special puller makes the job of removing the hub bearing from the knuckle easy without damaging any components.
FIGURE 57.25 A typical full-floating rear axle assembly.

FIGURE 57.26 A three-quarter-floating rear axle.

FIGURE 57.27 A semi-floating rear axle housing is the most commonly used in light four-wheel-drive vehicles.
FIGURE 57.28 A retainer-plate type rear axle bearing. Access to the fasteners is through a hole in the axle flange.

FIGURE 57.29 A slide hammer type axle puller can be used to remove a retainer-plate type axle after the retaining fasteners have been removed.

FIGURE 57.30 To remove the axle from this vehicle equipped with a retainer-plate rear axle, the brake drum was placed back onto the axle studs backward so that the drum itself can be used as a slide hammer to pull the axle out of the axle housing. A couple of pulls and the rear axle is pulled out of the axle housing.
FIGURE 57.31 To remove the C-lock (clip), the lock bolt has to be moved before the pinion shaft.

FIGURE 57.32 The axle must be pushed inward slightly to allow the C-lock to be removed. After the C-lock has been removed, the axle can be easily pulled out of the axle housing.

FIGURE 57.33 Using a hydraulic press, an axle bearing is pressed from the axle. When pressing a new bearing back onto the axle, pressure should only be on the inner bearing race to prevent damaging the bearing.
FIGURE 57.34 Removing an axle seal using the axle shaft as the tool.

FIGURE 57.35 This is a normally worn bearing. If it does not have too much play, it can be reused.

FIGURE 57.36 (a) When corrosion etches into the surface of a roller or race, the bearing should be discarded. (b) If light corrosion stains can be removed with an oil-soaked cloth, the bearing can be reused.
FIGURE 57.37  (a) When just the end of a roller is scored, it is because of excessive preload. Discard the bearing.  (b) This is an even more advanced case of scoring. Under load, this rapidly lead to spalling.

FIGURE 57.38  (a) Always check for faint grooves in the race. This bearing should not be reused.  (b) Grooves like these are often matched by grooves in the race (above). Discard the bearing.

FIGURE 57.39  (a) Regular patterns of etching in the race are from corrosion. This bearing should be replaced.  (b) Light pitting comes from contaminants being pressed into the race. Discard the bearing.
FIGURE 57.40 (a) This bearing is worn unevenly. Notice the stripes. It should not be reused. Injury damage that causes low spots in the metal renders this bearing useless.

FIGURE 57.41 (a) In this more advanced case of pitting, you can see how the race has been damaged. (b) Recessed pitting is a result of overheating. Even a lightly burned bearing should be replaced.

FIGURE 57.42 (a) Pitting eventually leads to spalling, a condition where the metal falls away in large chunks. (b) Spalled roller, the metal has actually begun to flake away from the surface.
FIGURE 57.4 These dents resulted from the rollers hammering against the race, a condition called brinelling.

UNFIGURE 57.1 After safely hoisting the vehicle, remove the rear wheels and brake drums.

UNFIGURE 57.2 Remove the rear differential cover and inspect the magnet for metal particles that would indicate severe wear or damage.

UNFIGURE 57.3 Remove the rear differential cover and inspect the magnet for metal particles that would indicate severe wear or damage.
Figure 57.3
Remove the retaining bolt and allow the pinion shaft to be removed.

Figure 57.4
Push the axle inward toward the center of the vehicle to free the axle clip.

Figure 57.5
After removing the clip, the axle can then be removed. Note that the backing plate is wet, indicating that the axle seal has been leaking.
Figure 57.6: A seal removal tool being used to remove the axle seal.

Figure 57.7: If a retainer-type axle is being serviced, the bearing and seal need to be pressed off of the axle.

Figure 57.8: After installing a new bearing and seal, insert the axle and install the clip, then the pinion shaft.
Clean the differential housing before installing the cover gasket and cross. refill the differential with the specified fluid.