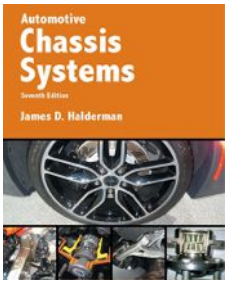
Automotive Chassis Systems



CHAPTER 04

Brake Principles and Friction Materials

FIGURE 4.1 Energy, which is the ability to perform work, exists in many forms.

FIGURE 4.2 Kinetic energy increases in direct proportion to the weight of the vehicle.

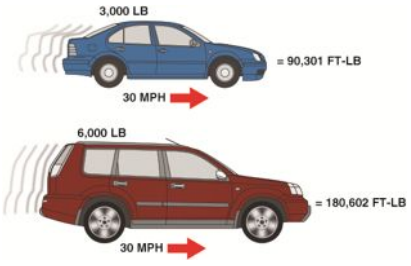


FIGURE 4.3 Kinetic energy increases as the square of any increase in vehicle speed.

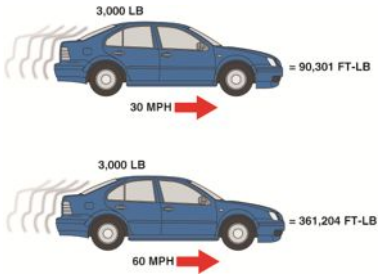


FIGURE 4.4 Inertia creates weight transfer that requires the front brakes to provide most of the braking force.

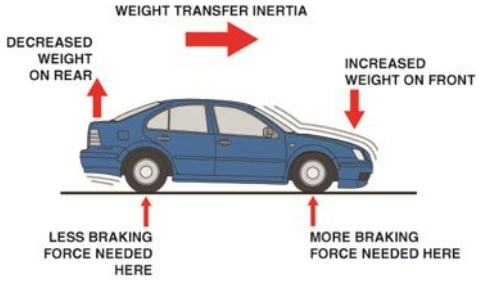


FIGURE 4.5 Front-wheel-drive vehicles have most of their weight over the front wheels.

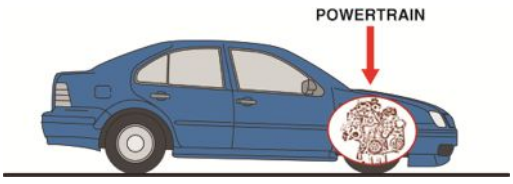


FIGURE 4.6 The static coefficient of friction of an object at rest is higher than the kinetic (dynamic) friction coefficient once in motion.

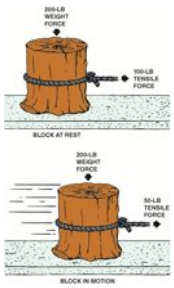


FIGURE 4.7 Some heat increases the coefficient of friction but too much heat can cause it to drop off sharply.

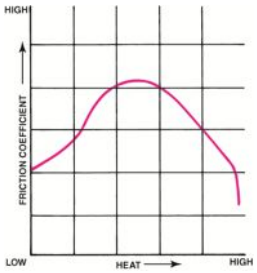


FIGURE 4.8 One cause of brake fade occurs when the phenolic resin, a part of the friction material, gets so hot that it vaporizes.

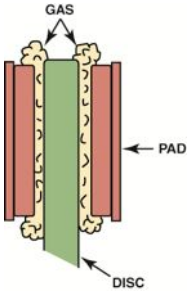


FIGURE 4.9 The gear selector is often called the "PRNDL," pronounced "prindle," regardless of the actual letters or numbers used.

FIGURE 4.10 Rapid braking causes the brake friction material to wear more compared to gentle less aggressive braking.

FIGURE 4.11 All boxes of brake linings and pads should be labeled with the leaf mark, which gives a visual clue as to the standard under which the brake friction materials meet certain state laws regarding the amount of copper.

FIGURE 4.12 The edge codes include a lot of information about the brake friction material.

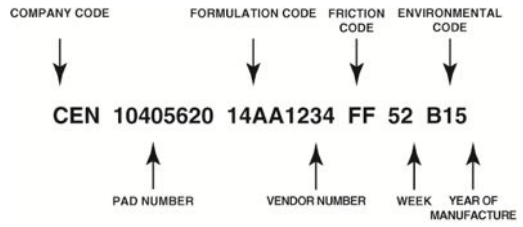


FIGURE 4.13 The "edge codes" are now printed on the backing of the brake pad because there is so much required information that it often does not fit on the edge of the brake pad or shoe.

FIGURE 4.14 Typical drum brake lining edge codes, showing the coefficient of friction codes for cold and hot circled.