



Forces of Nature

When you swing around a curve in the road, centrifugal force is at work as your vehicle hugs the outside of the curve. The force is so strong that, if you're moving fast enough, your vehicle will leave the road. Some of the newer highways have curves that are banked to compensate for the centrifugal force of cars going around them. When you come to an ordinary curve that isn't banked, you have to reduce your speed to stay on the road. The sharper the curve, the slower you must go. As you round the curve, your tires must grip the surface strongly enough to overcome the centrifugal force. This means that both the road surface and your tires must be in good shape for your vehicle to hold the road properly. Anything such as water, ice, gravel, or oil film reduce the grip needed to hold the road and overcome the pull of centrifugal force. Roads with crowns in the middle add to the danger.

Friction or gripping power is another natural force that greatly influences the behavior of your vehicle. In a passenger car there are only four contact points with the road, each about the size of the sole of your shoe. Trucks, because they're heavier and have bigger tires and often more of them, have a lot more gripping surface. This helps the driver to control the vehicle and hold it on the road.

Brakes are gripping devices that create friction. They turn the energy of the turning wheels into heat. Friction between the brake shoes and the drum stops the wheels, and the friction between the tire and the road pushes against the car's movement.

Water, mud, gravel and sand - not to mention ice and snow - all reduce the grip of your tires on the road. And don't forget that washboard roads do the same thing.

Skids are caused by lack of friction. If there's almost no friction, as ice melting at about 32 degrees, your vehicle is likely to skid in any direction. Centrifugal force causes sideslip. Skids also happen as a result of unequal tire pressure or brake pressure.

Gravity is another force of nature that helps hold your vehicle on the road. This has to do with the weight of your vehicle, and it's most important going up and down hills.

With a slight downgrade, just releasing pressure on the accelerator may be enough to take you down safely. On moderately steep grades, you may have to help the braking action of the engine by using the foot brakes. On a very steep downgrade, shifting into a lower gear to use the full braking power of the engine and save the brake linings may be necessary. Figure out what gear you want before you start down. It can be difficult to change gears once you start rolling.



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Safety Talk

Use the same gear going uphill as going down. Today's vehicles can go up and over steep hills at high speed, but it's best to slow down. There may be a vehicle ahead in your lane, just over the crest of the hill that moving slower than you. If you don't see him in time you can get on top of him without enough distance to avoid a collision. Watch your temperature gauge; if you're climbing a long grade the temperature will rise if you use too high a gear. Too low a gear will show a temperature drop.

The force of impact is another force of nature you should know something about. It's hard to picture the force with which a moving vehicle can hit, but a vehicle hitting a stationary object at 20 miles an hour would collide with a force equal to its being dropped 13-1/2 feet; at 40 miles an hour, it would hit a force equal to dropping a distance of 54 feet; and at 60 miles an hour the dropping distance is 121-1/2 feet. Did you ever jump off the high dive at a swimming pool? Usually it's about 10 feet above the water. So, if you can imagine raising the diving board to these heights, you get some idea of the force with which your vehicle would hit - with you inside - if there wasn't any water in the pool.

Speed multiplies the effects of the forces of nature. The faster a vehicle goes, the more centrifugal force you have to overcome in going around a curve, and the less friction you've got to help you stay on the road. When you add speed to the pull of gravity downhill, the greater the force of impact will be if you hit a moving or stationary object. Respect these forces of nature, and make sure they don't take the control of your vehicle out of your hands.

SOURCE: safetyawakenings.com



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